Activities, Environmental Impacts & Aspects
Iowa EMS Framework (HF 2570)

6 Plan Components
- Yard Waste Management
- Hazardous Household Waste Collection
- Water Quality Improvement
- Greenhouse Gas Reduction
- Recycling Services
- Environmental Education

PLANNING
- Environmental Policy Statement
- Environmental Aspects & Impacts
- Objectives & Targets
- Action Plan
- Identify Roles & Responsibilities
- Communication, Training & Awareness
- Monitoring & Measurement
- Assessment
- Reevaluation and Modification

IMPLEMENTATION AND OPERATION
- Legal & Other Requirements

CHECKING AND ACT

DNR
To Reduce Environmental Impacts Is the Main Purpose of an EMS
CAUTION: This is the Most Confusing and Difficult Part of the EMS

Recommended Site Visits in Assist in January
Environmental Impacts:

The organization identifies and evaluates the actual or potential aspects and impacts to the environment, whether adverse or beneficial, from its activities, services and facilities. During the evaluation process, significant impacts to the environment are determined.
Definitions

- **Activity = A Task or Operation Generally Occurring Within the EMS Fenceline**
  - Fueling/Operating Vehicles
  - Purchase of Chemicals
  - Environmental Education

- **Aspect = The Activity’s Interaction with the Environment**
  - Air Emissions
  - Natural Resources
  - Recycling
Definitions

- **Impact** = A Change to the Environment, Positive or Negative
  - Degradation of Air Quality
  - Decrease in Natural Resources
  - Increase in Landfill Space

- **Significant Impacts** = Those Environmental Impacts that the Organization Places the Highest Priority
EMS Terminology– “Aspects”

“Aspects are elements of an organization’s activities or products or services that can interact with the environment.”

- Generally a Difficult Concept and Confusion Between Aspects and Impacts
Keep a Simple Aspect/Impact Analysis in Your Head

- **Activity**
  - Changing Oil

- **Aspects (Interaction)**
  - Air Emissions
  - Use of Oil, Absorbents
  - Recycling of Oil
  - Spills

- **Impacts (Result)**
  - Degrade Air Quality
  - Consumption of Natural Resources
  - Increase Landfill Space
  - Degrade Water Quality
Methods for Identifying Aspects/Impacts

- Activities List Already Exists
- Evaluate Job Descriptions
- Evaluate Organization’s Budget
- **Input and Output Method**
- Interview Staff in Shop and Field
- EMS Core Team Meeting
Level of Detail in Activities Identification

- Too Little Detail During Activities Identification May Cause Significant Impacts to Be Missed
- Use Common Terminology for Shared Activities Between Facilities
  - Vehicle Fueling Vs. Fueling Vs. Fuel Island Use...
- Too Much Detail Will Slow the Activities/Impacts Identification Process
- If you Get to 1,000, STOP!
Level of Detail in Activities Identification

- Input and Output Method

**Composting Facility**

**Process:** Yard Waste Composting

**Inputs:**
Yard Waste

**Activities:**
Composting

**Outputs:**
Finished Compost

Too Broad
Level of Detail in Activities Identification

Recycling Facility

Process: Break Room Waste Generation

Inputs:
- Cardboard Kleenex
- Paper towels
- Paper plates
- Plastic trays
- Plastic wrap
- Plastic utensils
- Aluminum cans
- Plastic bottles
- Glass bottles
- Coffee
- Coffee filters
- Dish soap
- Hand soap

Activities:
- Opening food boxes
- Using Kleenex
- Using paper towels
- Using paper plates
- Using plastic trays
- Unwrapping plastic wrap
- Using plastic utensils
- Opening aluminum cans
- Opening plastic bottles
- Opening glass bottles
- Brewing coffee
- Washing dishes
- Washing hands

Outputs:
- Empty cardboard containers
- Used Kleenex
- Used paper towels
- Used paper plates
- Used plastic trays
- Used plastic wrap
- Used plastic utensils
- Empty aluminum cans
- Empty Plastic bottles
- Empty glass bottles
- Coffee grounds
- Used coffee filters
- Empty dish soap containers
- Empty hand soap containers

Too Much Detail
Level of Detail in Activities Identification

**Inputs:**
- Garbage
- Diesel Fuel
- Equipment
- Electricity
- Stormwater
- Laboratory Supplies
- Maintenance Supplies
- Admin. Supplies

**Activities:**
- Heavy Equipment Operation
- Equipment Maintenance
- Petroleum Product Storage
- Material Storage
- Use of Electricity
- Water Quality Monitoring
- Admin. Support
- Building Maintenance

**Outputs:**
- Waste Disposal
- Air Emissions
- Biogas
- Potential Spills
- Leachate
- Solid Waste
- Natural Resource Consumption

Landfill Facility

Process: Disposal of Waste

Adequate Detail
Environmental Aspects/Impacts

- Use process to identify activities, aspects and impacts.
  - First, Identify *Activities* Within the Fenceline that Could Have an Environmental Impact
  - Then, Identify How These Activities Specifically Interact with the Environment
  - Last, Document the Resulting Change, Positive or Negative (*Impacts*)

- *Each Activity May Have Multiple Aspects and Impacts*

- *Intelex Also Allows Further Segregation of Normal, Abnormal, and Emergency Conditions*
<table>
<thead>
<tr>
<th>Activity</th>
<th>Aspect</th>
<th>Impact(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>processing of composting</td>
<td>water quality</td>
<td>water degradation</td>
</tr>
<tr>
<td>building a liner</td>
<td>environmental</td>
<td>water quality</td>
</tr>
<tr>
<td>Heating/Cooling (Central Office)</td>
<td>Energy</td>
<td>Use of natural resources</td>
</tr>
<tr>
<td>flaring</td>
<td>consumption</td>
<td></td>
</tr>
<tr>
<td>landfilling</td>
<td>disposal</td>
<td>air space</td>
</tr>
<tr>
<td>farming</td>
<td>tillage</td>
<td>erosion</td>
</tr>
<tr>
<td>excavation</td>
<td>soil disturbance</td>
<td>erosion</td>
</tr>
<tr>
<td>Lighting use</td>
<td>Energy usage</td>
<td>Use of natural resources</td>
</tr>
<tr>
<td>Dishwashing, handwashing, toilet flushing (Central Office)</td>
<td>water usage</td>
<td>use of natural resources</td>
</tr>
<tr>
<td>stormwater management</td>
<td>water flow</td>
<td>erosion</td>
</tr>
<tr>
<td>Activity</td>
<td>Aspect</td>
<td>Normal/Abnormal Operations</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>---------------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>Provide HHW programs</td>
<td>Waste Generation and disposal</td>
<td>Normal</td>
</tr>
<tr>
<td>Provide Education programs</td>
<td>Waste Generation and disposal</td>
<td>Normal</td>
</tr>
<tr>
<td>Hauling Soil and Landfill Cell Construction</td>
<td>Land Usage</td>
<td>Normal</td>
</tr>
<tr>
<td>Operation of equipment</td>
<td>Dust Generations</td>
<td>Normal</td>
</tr>
<tr>
<td>Mowing</td>
<td>Air Emissions</td>
<td>Normal</td>
</tr>
<tr>
<td>Generation of solid waste at facility</td>
<td>Land Usage</td>
<td>Normal</td>
</tr>
<tr>
<td>Operation of equipment</td>
<td>Air Emissions</td>
<td>Normal</td>
</tr>
<tr>
<td>Idling vehicles at operations site</td>
<td>Air Emissions</td>
<td>Normal</td>
</tr>
<tr>
<td>Operation of equipment</td>
<td>Use of Materials</td>
<td>Normal</td>
</tr>
<tr>
<td>Bulking of HHM materials</td>
<td>Air Emissions</td>
<td>Normal</td>
</tr>
</tbody>
</table>
Example Aspects/Impacts List

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Emissions</td>
<td>Degradation Air Quality</td>
</tr>
<tr>
<td>Spills</td>
<td>Degradation Air, Water, and Soil Quality</td>
</tr>
<tr>
<td>Water Discharges</td>
<td>Degrade Water Quality</td>
</tr>
<tr>
<td>Natural Resources</td>
<td>Consumption of Natural Resources</td>
</tr>
<tr>
<td>Recycling</td>
<td>Increase Landfill Space</td>
</tr>
<tr>
<td>Waste Generation</td>
<td>Decrease Landfill Space</td>
</tr>
<tr>
<td>Habitat</td>
<td>Habitat Conservation</td>
</tr>
</tbody>
</table>
Best Practices for Aspects/Impacts Identification

- Every Activity Will be Assigned At Least One Aspects and Resulting Impact
- Common Terminology Will Assist in Assigning Impacts and Will Reduce Documentation Burden
- Engage Staff to Assist in Developing List
- Use Site Visit in January to Assist
Two Case Studies: Identifying Environmental Activities, Impacts & Aspects

Rathbun Area Solid Waste Commission

During a site visit, GS&P worked with staff to develop a list of activities, aspects and impacts

Waste Commission of Scott County

Through a series of internal meetings, the EMS Core Team identified activities, aspects and impacts
Activities and Impacts Exercise

Each Team Generate a List of Activities and Impacts From the Assigned Example.

- **Example #1**
  - Landfill
  - Transfer Station/Baling
  - Maintenance Shop
  - Composting Facility

- **Example #2**
  - Recyclables Collection
  - HHM Sorting
  - Recyclables Sorting
  - E-Waste Demanufacturing

- **Example #3**
  - Office Work
  - Ticketing Shack
  - Educational Workshop
  - Stormwater

- **Example #4**
  - Landfill
  - Storm Water Runoff
  - Compliance Sampling
  - Fueling Island
Example #3
Example #4
Activities and Impacts Exercise

Report Out and Discussion
Significant Impacts
Significant Impacts

- Due to Limited Budgets and Staff, EMS allows for the Prioritization of Environmental Impacts
- Determine **Significant Impacts** by Ranking Each Environmental Impact Against **Significance Criteria**
What are Significance Criteria?

Criteria Used By an Organization to Identify Environmental Impacts Having the Potential to Significantly Impact the Environment

- Facilitate Prioritization of Environmental Impacts to Be Addressed Through the EMS
Significance Criteria Considerations

- Address Facets of the Environmental Impacts
- Be Consistent With What is Important to the Organization’s Priorities
  - Alignment With EMS Policy
- Limit the Number of Criteria
  - No Less Than 3, No More Than Six
- Avoid Criteria With Substantial Overlap
- Finally, Screen for the Six Plan Components
  - They Should Be on the Significant Impact List
Example Criteria and Definitions

- **Regulated** - (legal requirement)
- **Community/Media Concerns** – (community concerns or perception)
- **Impact to Human Health** - (the potential or actual impact to human health)
- **Impact to Environment** - (the potential or actual impact to flora/fauna and/or other natural resources)
Example Criteria and Definitions

- **Magnitude** - (volume, size, or amount of the Impact)
- **Severity** - (measure of the intensity of the Impact; impact, damage, or deterioration)
- **Probability** - (measure of how likely it is that the Impact will occur)
Example Criteria and Definitions

- **Cost** - (the total money, time, and resources associated with controlling, mitigating or responding to an impact)

- **Operational impact** - (the level of influence, consequence, or effect an Impact can have on the day-to-day operations of the organization)

- **Is It a HF Consideration**
Scoring System

- The **Simpler**, the **Better**
  - Calculus is Not Going to Give you a Better Answer!

- Scoring System Can be Numerical or Descriptive
  - 1 to 5 or 1 to 10
  - Low, Medium, High
Scoring System (cont.)

- Document Scoring “Rules” to Provide for Consistency in the Process

- Activities/Impacts Will be Revisited on a Regular Basis, So Get Something on Paper to Start Working on and Then Move on!!
Scoring System Example

- **Assigned criteria values:**
  - Low/Not Applicable=1; Moderate=3; High=5

- **Equation:**
  
  \[(\text{Criterion 1}) + (\text{Criterion 2}) + (\text{Criterion 3}) + (\text{Criterion 4}) \times (\text{Criterion 5}) = \text{Total Score}\]

<table>
<thead>
<tr>
<th>Impact</th>
<th>Regulated?</th>
<th>Cost</th>
<th>Operation Impact</th>
<th>Likelihood</th>
<th>HF</th>
<th>Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degrade Water Quality from Spills</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>70</td>
</tr>
<tr>
<td>Recycling Office Paper</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>25</td>
</tr>
</tbody>
</table>
Methods for Establishing a Significance Threshold

- Sort from High to Low
  - Look for “Natural Break Point” Where Scores Change
  - Choose a Threshold Value

- Set a Limit at What Your Organization Can Handle
Case Study Follow-Up: Rathbun & Scott County Significance Criteria
Rathbun Example

<table>
<thead>
<tr>
<th>Regulated</th>
<th>Environment</th>
<th>all Impacts</th>
<th>Cost</th>
<th>Operations</th>
<th>Probability</th>
<th>Community</th>
<th>HF</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>105</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>105</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>105</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>105</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>105</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>105</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>95</td>
<td></td>
</tr>
</tbody>
</table>
## Scott County Example

<table>
<thead>
<tr>
<th>Regulated</th>
<th>Impact to Natural Resources</th>
<th>Impact to Human Health</th>
<th>Frequency</th>
<th>Outreach</th>
<th>HF2570</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>24</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>22</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>22</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>18</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>18</td>
</tr>
</tbody>
</table>
## Scott County Criteria Explained

<table>
<thead>
<tr>
<th>Significance Criteria</th>
<th>General Definition</th>
<th>Score of 1</th>
<th>Score of 3</th>
<th>Score of 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulated</td>
<td>Degree to which the environmental aspect is subject to federal, state and local regulations. Also includes company policies and other restrictions where applicable.</td>
<td>Not regulated.</td>
<td>Subject to permit conditions or best management practices.</td>
<td>Strictly regulated.</td>
</tr>
<tr>
<td>Impact to Natural Resources</td>
<td>Size, volume or magnitude of impact to soil, surface water, stormwater, groundwater, water or air quality.</td>
<td>Low to no potential for release to environment or potential impact of</td>
<td>Potential for release with minimal to no impact.</td>
<td>High potential for release with significant impact.</td>
</tr>
<tr>
<td>Impact to Human Health</td>
<td>Is there an impact to worker health?</td>
<td>Low to no potential for exposure to injury.</td>
<td>Potential for exposure with</td>
<td>High potential for exposure.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Number of times the activity occurs.</td>
<td>Rarely (once every few years).</td>
<td>Regularly (several times a year).</td>
<td>High Frequency (several times per week/continuous).</td>
</tr>
<tr>
<td>Outreach</td>
<td>Actual or potential concern or perceptions of community, media and other stakeholders.</td>
<td>No to low potential for impact to the community.</td>
<td>Some potential for community impact.</td>
<td>High potential for impact to the community.</td>
</tr>
</tbody>
</table>
### List of Significant Impacts (Cedar Rapids)

<table>
<thead>
<tr>
<th>Facility</th>
<th>Activity</th>
<th>Aspect</th>
<th>Normal / Abnormal Operations</th>
<th>Impact</th>
<th>Regulated</th>
<th>Frequency</th>
<th>Impact on Environment</th>
<th>Level of Service</th>
<th>Component of HF2570</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site 1</td>
<td>Leachate Collection</td>
<td>Water Quality</td>
<td>Abnormal</td>
<td>Leachate weeps/Contamination of surface water</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Site 1</td>
<td>Leachate Collection</td>
<td>Water Quality</td>
<td>Normal</td>
<td>Prevention of leaks/increase gas production</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>36</td>
</tr>
<tr>
<td>Site 1,2</td>
<td>Landfill Immediate Cover</td>
<td>Storm Water Management</td>
<td>Abnormal</td>
<td>Exposed trash/Leachate weeps</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>34</td>
</tr>
<tr>
<td>Site 1,2</td>
<td>Landfill Gas Collection</td>
<td>Air Quality</td>
<td>Abnormal</td>
<td>Air emissions/Explosion possibility</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>34</td>
</tr>
<tr>
<td>Compost</td>
<td>Processing Yard Waste</td>
<td>Air Quality</td>
<td>Normal</td>
<td>Producing compost</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>34</td>
</tr>
<tr>
<td>Site 2</td>
<td>Recycling of auto fluids</td>
<td>Water Quality</td>
<td>Abnormal</td>
<td>Contamination of ground water</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>34</td>
</tr>
<tr>
<td>Site 1</td>
<td>Ground Water Monitoring</td>
<td>Water Quality</td>
<td>Normal</td>
<td>Provides indication of ground water changes</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>32</td>
</tr>
<tr>
<td>Site 2</td>
<td>Leachate Collection</td>
<td>Water Quality</td>
<td>Normal</td>
<td>Prevention of leaks/increase gas production</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>32</td>
</tr>
</tbody>
</table>
Significant Impacts and Objectives and Targets

- All Significant Impacts Must Be Addressed in the EMS
  - Primarily Through the Adoption of an Objective and Target
  - Objectives and Targets Set, or Explain Why Not
  - Don’t Take On Too Many Impacts at One Time

- Conduct a Reality Check—Does It Makes Sense?
Significant Impacts Considerations

- Six Plan Components Must be Addressed
  - (Yard Waste Mgmt, HHHW Collection, Water Quality Improvement, GHG Reduction, Recycling Services, Environmental Education)

- Make Sure the Six Areas are Included in Significant Impacts List

- Other High Profile Issues
  - E-Waste, Odors, etc.

- To Increase Focus on a Designated Area of the Organization
  - Vehicle Fleet, Operational Efficiency, etc.
EMS Procedure

- Document Your Process in Determining Activities, Impacts, and Significance
  - Someone Will Have to Update This in the Future...and It May Not Be You!
- Include Responsibilities and Frequency of Updating Activities, Impacts, and Significance
  - Usually on an Annual Basis
- Consider “Management of Change”...How are You Going to Review and Incorporate Changes in Activities
- Keep in Mind Impacts and Significant Impacts May Change Through Time
Best Practices

- Engage Staff Across the Organization to Develop Activities List
- Employ the Core Team to Identify Significant Impacts
- Make Your Scoring Methods and Criteria Simple, but Meaningful
- Determine Significance Based on Scoring as well as Organizational Priorities and Limitations
- Make Sure to Address 6 Plan Components
- Document Your Methods and Final Decisions
- Review Your List on a Periodic Basis (Annually)
Questions