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Using Flowcharts to Map Your Operation's Activities and Processes

John D. Harrison

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USING FLOWCHARTS TO MAP YOUR OPERATION'S ACTIVITIES AND PROCESSES

John D. Harrison, Extension Specialist
Agricultural Waste Management
2300 Old Main Hill, Logan UT 84322-2300
Coordinates: jdh@cc.usu.edu
Telephone: (435) 797-3396
Cellular: (435) 770-3360

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During some phase of developing your Agriculture Environmental Management System (AEMS), you are likely to analyze your operation's waste management process and to provide the information needed to develop activity-specific policies, procedures, and work instructions to carry out the AEMS. Remember that the overall goal of the AEMS is to achieve sound management as it relates to reducing environmental and health risks. A successful AEMS depends on how well you identify opportunities for increasing the positive impacts and reducing the negative impacts of production. This means that your operation must be characterized for each process, activity, product, or service. Once the process is described, objectives and targets – which may be linked to regulations or some other standard – can be established. All of these activities are part of the planning process required to design the AEMS.

The key to success during these phases is to be systematic and to thoroughly analyze each process. Use the following flowcharts as a beginning place. Start with available information and view it from the perspective of a comprehensive management program.

FLOWCHARTS

This section describes flowcharts, which are a widely used process analysis tool. During the planning phase of developing the AEMS, these tools form the basis for identifying impacts and establishing objectives and targets. Once the AEMS is developed, flowcharts can be used to review the process and to diagnose problems.

A flowchart is a diagram that uses connecting lines and a set of symbols to show the steps from the beginning to the end of an activity or procedure. Standard symbols or custom symbols and figures or pictures can be used to make the flowchart. The key is consistency – once a symbol is used, it should always have the same meaning. Figure 1 shows some commonly used symbols.

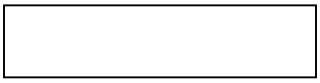
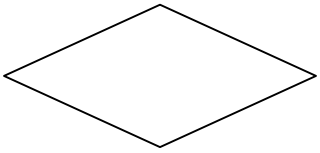
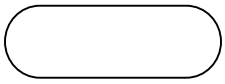
	Process	Represents any type of process or activity, such as tractor scraping, flushing, or daily spreading.
	Alternate Process	Represents an alternate type of process, such as contract services or custom operators. Although popular, this shape is not recognized by international or national standards organizations.
	Decision	Indicates a point at which a decision must be made. Generally, two flow lines point out of the shape – one out the bottom and one out the side. Each line will be marked with a decision option, such as "YES" and "NO" or "TRUE" and "FALSE." These lines also can show branch options such as "MAKE" versus "BUY."
	Input/Output	Represents the information that goes into or comes out of a process. Examples of input are soil and manure tests. Examples of outputs are soil and manure test reports.
	Document	Represents an activity recorded in a document, such as a computer file or printed report.
	Connector	Links a shape to another point in the flowchart without using a line. A letter or number in the circle links to the corresponding letter or number elsewhere in the chart. It is also used to connect multiple line at one point.
	Terminal	Indicates the start or end of a process. The beginning terminal shape generally is labeled "START" or "BEGIN." The ending terminal shape is labeled "STOP" or "END."

FIGURE 1. Flowchart Symbols

The relationship between activities and procedures can also be diagrammed. Macroscale flowcharts describe the main steps of an overall process whereas microscale flowcharts dissect an individual step. For example, Figure 2 shows a macroscale flow chart that describes the Agricultural Waste Management System process from waste production to waste utilization whereas Figure 3 shows a

microscale flowchart of the steps involved in one phase of the macroscale chart. Figure 3 describes the complete analysis of waste production within a freestall housing and open lot unit. The microscale chart begins with identifying the type of manure produced and proceeds in a step-by-step manner. Begin your assessment by ask yourself the following set of questions:

1. What type of animals do I have?
2. How many animals do I have?
3. What type of bedding do I use?
4. How much manure is produced per animal (actual or tabular values)?
5. What is the consistency of the manure when it is ready to be removed (liquid, slurry, or solid)?
6. How do I remove the manure from the freestall housing and open lot unit (tractor scrape, automatic scrape, flush or other)?
7. Once the manure is removed from the freestall housing and open lot unit, what is the next process that I must go through?

This is only a preliminary set of questions and should be reduced or expanded to meet your needs and goals.

The example shown in Figure 4 is an overview of typical manure management options for freestall housing and open lots.

AGRICULTURAL WASTE MANAGEMENT SYSTEM PROCESS*
(FLOWCHART OF THE BASIC FUNCTIONS OF THE PROCESS)

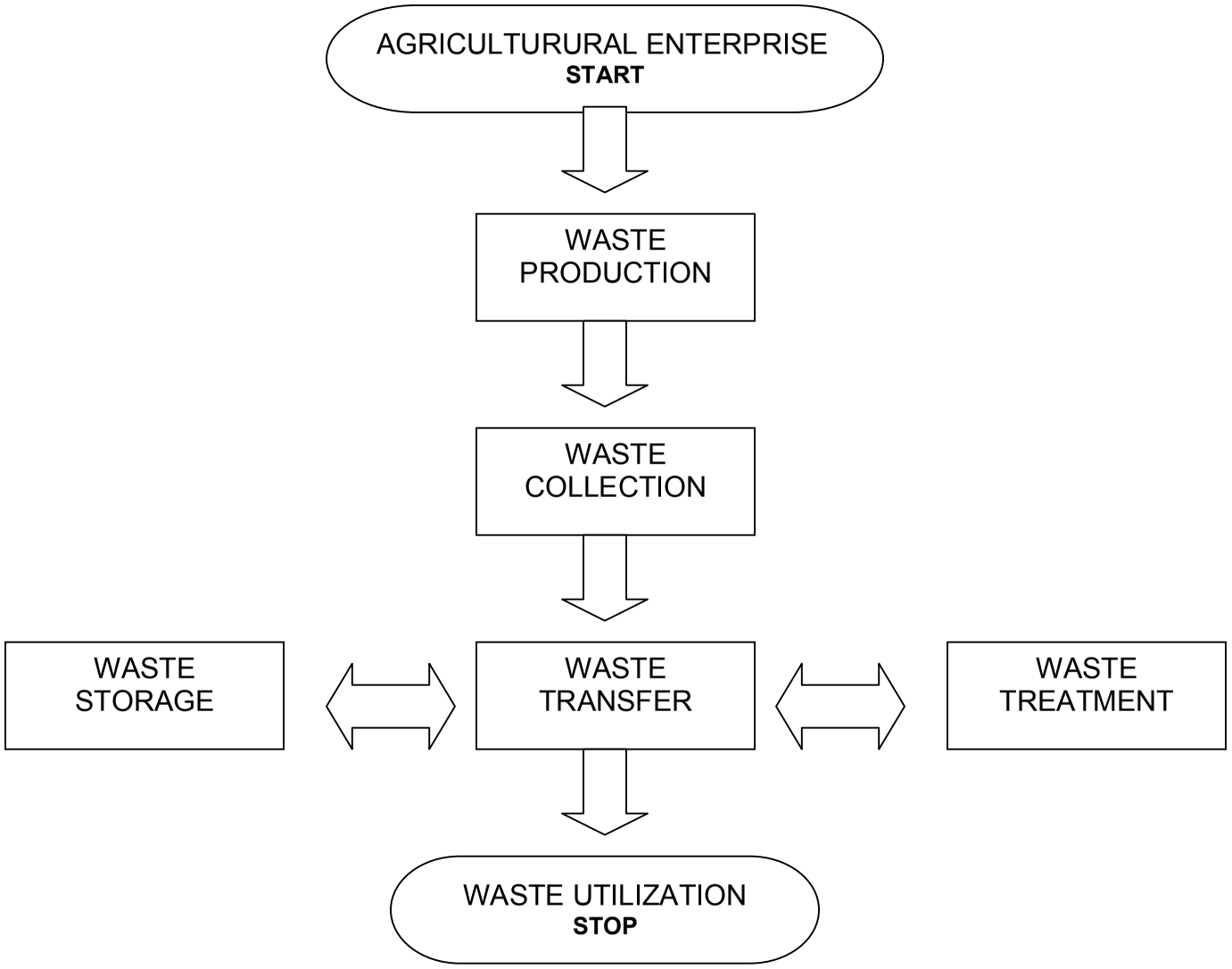


FIGURE 2.
*** AGRICULTURAL WASTES:** Wastes normally associated with the production and processing of food and fiber on farms, feedlots, ranches, ranges, and forests which may include animal manure, crop residues, and dead animals; also agricultural chemicals and their residues and containers, which contribute contaminants to surface and subsurface water. (ASAE S292.5)

Figure 3. Microscale flowchart of waste production in a freestall housing unit

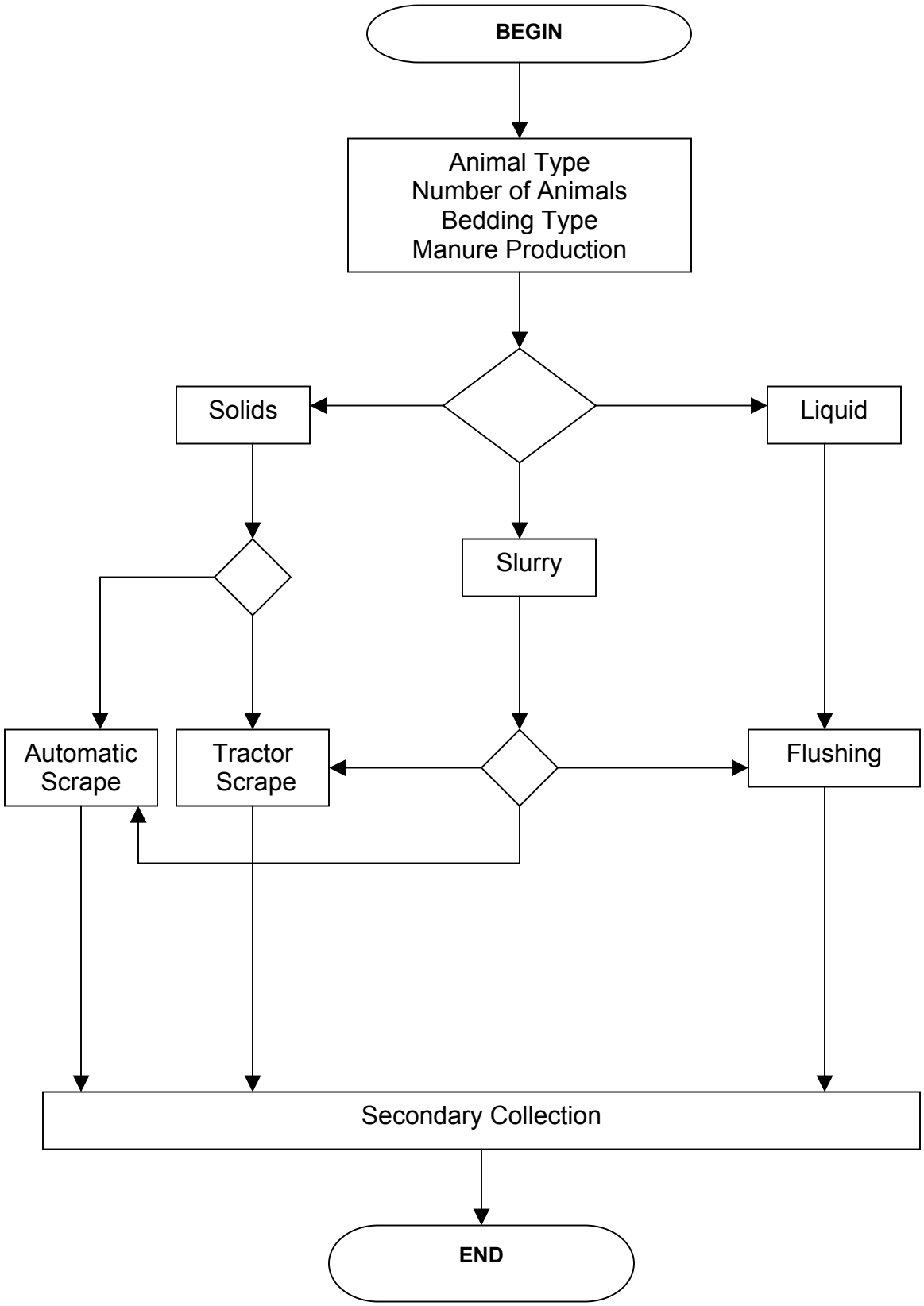


Figure 4
Process Map for Manure Management Options in Freestall Housing and Open Lots
(adapted from Ritter and Scarborough, 1995).