

# **Carcass Disposal Expert Decision Support System User's Guide**

## **Introduction to the EDSS**

The carcass disposal Expert Decision Support System (EDSS) is an interactive user interface which prompts the user to identify various conditions related to an emergency incident. The EDSS uses each response provided by the user to determine which disposal options are appropriate for a specific situation. The software provides critical management and response capabilities in the field to enhance the safe, effective, and rapid disposal decision-making process by first responders — all within a user-friendly environment.

## **Using this Guide**

This guide is written specifically for users of the EDSS and assumes familiarity with basic computer operations. In addition, familiarity with the user environment (distance to streams, depth to groundwater, soil type, etc.), resource availability and farm operations is required to determine the most appropriate disposal option. The basics of using the EDSS and screen shots of the questions used to determine disposal options are covered in the *Case Study* section of this manual.

## **System Requirements**

The EDSS requires the following platforms:

- Java: [www.java.com/getjava/](http://www.java.com/getjava/)
- A graphical web browser (internet explorer, firefox, etc.)

## **General Review of the EDSS**

The goal of the EDSS was to develop software based on the Handbook on Best Practices and Guidelines for Disposal Technologies for Contaminated Plant and Animal Material for emergency planners and first responders. The EDSS was intended to be a concise, yet thorough, review and summary of the current knowledge concerning various disposal methods. The system consists of an interactive user interface which prompts the user to identify various conditions related to an emergency incident. These conditions include a wide range of variables, from the animal involved, to the size of the outbreak, and the availability of resources required to implement a specific disposal option. The EDSS uses each response provided by the user to determine which disposal options are appropriate for a specific situation. This system provides critical management and response capabilities in the field to enhance the safe, effective, and rapid disposal decision-making process by first responders. Further, the EDSS software is public domain and available for distribution on compact disc, along with an electronic version of the handbook.

## **Methodology**

A small set of questions were developed to eliminate as many disposal options as possible early in the EDSS process. These fundamental questions deal with biosecurity

and logistical factors outlined in the handbook and were formatted as simple multiple choice or yes or no questions.

It was determined that information concerning pathogen type, the amount of material for disposal, and transportation availability were extremely important to all disposal methods. For instance, if the pathogen were a prion or spore-forming bacteria, 13 disposal options could be eliminated without further investigation. Because the intent of this software was to assist the user in choosing a disposal option in the most efficient manner, these questions are presented first. Next, three questions concerning trench burial and open-air burning options were added to further eliminate methods.

Once the fundamental disposal questions are answered, more detailed questions are presented for each disposal method. Questions concerning safety, logistics, infrastructure, environmental, and regulatory and legal factors were considered when addressing each disposal option; however the environmental and infrastructure and logistic factors were considered the primary focus. Questions concerning worker training, availability of equipment and supplies, environmental setback requirements were all considered when deciding which questions should be asked. For example, if the site of the animal contamination was within 150 feet of a private water well or water source then the burial disposal option would be eliminated and another option would need to be considered.

Finally, the program was constructed in such a way that as disposal options were eliminated they would no longer be factored in to the remaining questions. Economic and cost factors are addressed once disposal options are narrowed down by giving the user the average cost for the chosen options.

Throughout the software a help button is provided to assist the user in making a decision. If the user were to select this button it would start a second screen and show where this particular question was taken from in the Handbook. Tables, flowcharts and illustrations are presented.

### **Case Study - Outbreak of Newcastle Disease in Chickens**

An outbreak of Exotic Newcastle Disease (END) has been verified and a quarantine zone has been set up. An estimated one million chickens will be euthanized, and disposal methods need to be determined. Based on the assumption that the average weight of a chicken is 3 lbs, 1,500 tons need to be properly disposed of. The average size of a farm in Brazos County, Texas (where the spatial science laboratory is located) is 229 acres. Below are screen shots of the EDSS process as well as the details of the scenario. Information that is not included in this case study such as, distance from water sources, depth to groundwater and availability of resources was decided by flipping a coin just to show the possible options.

# Carcass Disposal EXPERT DECISION SUPPORT SYSTEM

Is the pathogen a

- prion (TSE), i.e. Mad Cow and Bovine Spongiform Encephalopathy
- spore-forming bacteria, i.e. Bacillus anthracis (Anthrax)
- virus, non-spore forming bacteria

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Next >>

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# Carcass Disposal EXPERT DECISION SUPPORT SYSTEM

What is the estimated amount of carcasses to be disposed?

- Low (< 100 tons)
- Medium (101 - 299 tons)
- High (> 300 tons)

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Next >>

Start over

Back to the last question

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# Carcass Disposal EXPERT DECISION SUPPORT SYSTEM

Are vehicles with capacity and suitability for transporting carcasses available?

- Yes
- No

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Next >>

Start over

Back to the last question

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# Carcass Disposal EXPERT DECISION SUPPORT SYSTEM

Is the carcass to be disposed of poultry?

- Yes
- No

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Next >>

Start over

Back to the last question

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# Carcass Disposal EXPERT DECISION SUPPORT SYSTEM

What is the land area of the site where the outbreak occurred?

- Less than 300 square feet
- 300 square feet to under 5 acres
- 5 acres to under 20 acres
- 20 acres and greater

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Next >>

Start over

Back to the last question

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Are the soil properties at the site known?

- Yes
- No

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Next >>

Start over

Back to the last question

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# Carcass Disposal EXPERT DECISION SUPPORT SYSTEM

Is a Fixed Alkaline Hydrolysis facility available and within a reasonable distance from the outbreak?

- Yes
- No

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Next >>

Start over

Back to the last question

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Can carcasses be loaded and transported in a timely fashion?

- Yes
- No

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Next >>

Start over

Back to the last question

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# Carcass Disposal EXPERT DECISION SUPPORT SYSTEM

Can the facility dispose of the number of carcasses in a reasonable amount of time (2,000 - 10,000 lbs/8h)?

- Yes
- No

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Next >>

Start over

Back to the last question

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# Carcass Disposal EXPERT DECISION SUPPORT SYSTEM

Is the site for burning large numbers of mortalities (more than 1000 cattle carcasses) at least 2 miles away from residential buildings, roads, utilities, crop fields, the public, religious, historical, and archaeological areas?

- Yes
- No

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Next >>

Start over

Back to the last question

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Is onsite burial site at least 300 ft from water sources?

- Yes
- No

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Next >>

Start over

Back to the last question

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Are the soil properties at the site conducive to carcass composting? (And see soil index values, highly permeable soils not conducive to burial.)

- Yes
- No

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Next >>

Start over

Back to the last question

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Is the slope of the land area between 1-3%?

- Yes
- No

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Next >>

Start over

Back to the last question

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Is the composting site at least 3ft above the high groundwater table?

- Yes
- No

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Next >>

Start over

Back to the last question

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# Carcass Disposal EXPERT DECISION SUPPORT SYSTEM

Are sufficient carbon sources (sawdust, straw, and broiler litter) available?

- Yes
- No

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Next >>

Start over

Back to the last question

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Can personnel and equipment (front-end loaders, grinding or milling equipment...) be easily obtained and moved to the site?

- Yes
- No

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Next >>

Start over

Back to the last question

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# Carcass Disposal EXPERT DECISION SUPPORT SYSTEM

Is there adequate height in the poultry house? (Pile should be 4-6 feet high with room for a loader to fit)

- Yes
- No

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Next >>

Start over

Back to the last question

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# Carcass Disposal EXPERT DECISION SUPPORT SYSTEM

## The recommended disposal methods are:

Fixed Alkaline Hydrolysis

Carcas In-house Windrow Composting

### Composting Option Information:

The decision on using composting as a carcass disposal option should be a joint decision by the Incident Command Structure (ICS) put in place by the authorities in the state or local area. The main problem with the composting process is making sure that impervious and rot resistant materials are used. Properly constructed there are usually no problems with odor or flies. Failure to properly construct the compost facility could trigger a nuisance or "takings" suit. Sovereign immunity may not be a defense to such an action.

\$40-60 per ton

### Alkaline Hydrolysis Option Information:



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