

State of Minnesota

Emergency Response Plan Foot and Mouth Disease (FMD)

March 15, 2002

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Preface

The purpose of this emergency response plan is to provide a framework that will facilitate early detection, control and eradication of a highly contagious Foreign Animal Disease as quickly as possible, so a crisis can be avoided, and the consequences minimized.

The Office International des Epizooties (OIE)¹ considers Foot and Mouth Disease (FMD) to be a List A Contagious disease: “Communicable diseases which have the potential for serious and rapid spread, irrespective of national borders, and which are of serious socioeconomic or public health importance and of major importance in the international trade of animals and animal products.”

With no known cure, an outbreak of FMD poses a serious threat to the State of Minnesota’s economy. More than any other animal disease, FMD can have an immediate, widespread and devastating impact on the productivity of the state’s food and animal industry.

This Emergency Response Plan represents the state’s coordinated response to an FMD outbreak. The plan follows guidelines set by the OIE, and the disease containment strategies are in accordance with USDA policy on FMD.

The Minnesota Board of Animal Health (BAH) is the lead state agency in responding to an introduction of FMD in Minnesota. Its expertise in animal disease control and eradication is essential to any successful response.

This Emergency Response Plan clearly demonstrates the importance of close coordination among state agencies, and between local, state and federal organizations. In addition to the Board of Animal Health, several other state agencies will play important roles, including the Department of Agriculture, Department of Public Safety, and the Pollution Control Agency.

The ability of the Board of Animal Health to respond to an outbreak of FMD was greatly enhanced by the State Legislature in 2001. Chapter 35 of Minnesota Statutes now provides for a Declaration of Emergency, increasing the BAH’s authority to restrict the movement of people, livestock, machinery and other personal property.

While the goal of the plan is to successfully eradicate any outbreak of FMD, its procedures address important public concerns: humane slaughter of infected and exposed animals, environmentally sound disposal of carcasses and other infected products, use of environmentally safe disinfectants, and the fair economic treatment of owners of infected or exposed herds.

¹OIE is the world organization for animal health.

Introduction

Foot-and-mouth disease (FMD) is a severe, highly communicable viral disease of cattle and swine. It also affects sheep, goats, deer, and other ruminants (cloven-hoofed, cud-chewing quadrupeds). FMD is not a threat to human health. This country has been free of FMD since 1929, when the last of nine U.S. outbreaks was eradicated. The disease is characterized by fever and by blister-like lesions in the mouth and on the teats and feet. Many affected animals recover, but the disease leaves them debilitated, and it causes losses in the production of meat and milk. Because it spreads widely and rapidly and because it has grave economic as well as physical consequences, FMD is one of the animal diseases that livestock owners dread most.

Cause

The disease is caused by a microscopic disease-producing virus. The virus has a remarkable capacity for remaining viable in carcasses, in animal byproducts, in water, in such materials as straw, bedding and manure, and even in pastures. There are at least seven separate types and many subtypes of the FMD virus and animals may be affected by one or more at the same time. Recovered animals may suffer repeated attacks of the disease since immunity to one type does not protect an animal against the others.

Signs

Vesicles (blisters) in the mouth, on the tongue and lips, on the teats, or between the toes—and the resulting excessive salivation or lameness—are the best-known signs of the disease. Blisters may not be observed until they have ruptured. Some of these other signs may appear in affected animals during an FMD outbreak:

- Temperatures rise markedly—especially in young animals—then usually fall in about 48 hours.
- Ruptured vesicles discharge either clear or cloudy fluid and leave raw, eroded areas surrounded by ragged fragments of loose tissue.
- Sticky, foamy, stringy saliva is produced.
- Consumption of feed is reduced because of painful tongue and mouth lesions.
- Lameness with reluctance to move is often observed.
- Abortions often occur.
- Milk flow of infected cows drops abruptly.
- Conception rates may be low.

Death from FMD occurs most often in newborn animals and with variable frequency in older animals. Meat animals do not normally regain lost flesh for many months. Recovered cows seldom produce milk at their former rates.

Where Does FMD Occur?

The disease is widespread. Various types of FMD virus have been identified in Africa, South America, Asia, and Europe. North America, Central America, Australia, New Zealand, Japan, Chile, and some countries in Europe are considered free of FMD because governments there have conducted effective programs to prevent its introduction or to eradicate it.

Confusion With Other Diseases

FMD can be confused with several similar—but less harmful—domestic diseases, such as vesicular stomatitis, bovine virus diarrhea, and foot rot. Whenever blisters or other typical signs are observed and reported, tests must be made to determine whether the disease causing them is FMD.

How It Spreads

FMD can be spread by animals, people, or materials that bring the virus into physical contact with susceptible animals. An outbreak may occur when:

- People wearing contaminated clothes or footwear or using contaminated equipment pass the virus to susceptible animals;
- Animals carrying the virus are introduced into susceptible herds;
- Contaminated facilities are used to hold susceptible animals;
- Contaminated vehicles are used to move susceptible animals;
- Raw or improperly cooked garbage containing infected meat or animal products is fed to susceptible animals;
- Susceptible animals are exposed to materials such as hay, feedstuffs, hides, or biologics contaminated with the virus;
- Susceptible animals drink contaminated water;
- A susceptible cow is inseminated with material from an infected bull.

Prevention and Control

FMD is one of the most difficult animal infections to control. Because the disease occurs in many parts of the world, there is always a chance of its accidental introduction into the United States. Animals and animal byproducts from areas known to be infected are prohibited entry into this country. A single infected animal or one contaminated sausage could carry the virus to American livestock. Animals in this country are highly susceptible to FMD. They have not developed immunity to it because FMD has not occurred here since 1929 and because U.S. veterinarians do not vaccinate against it. If an outbreak were to occur in the United States, this disease could spread rapidly to all sections of the country by routine livestock movements unless detected early and eradicated immediately. If FMD were to spread unchecked, the economic impact could reach billions of dollars in the first year. The Nation's deer and other wildlife populations could also rapidly become infected and remain a reservoir of infection.

FMD Control Strategy

The Office International des Epizooties (OIE), the US Department of Agriculture (USDA) and the Minnesota Board of Animal Health consider eradication to be the preferred strategy to manage a FMD outbreak.

I. What is an Eradication Strategy?

Eradication seeks to restore a disease-free status to an area that has become infected with FMD. This is an important economic goal. Without a re-established disease-free zone, an infected region will be limited or barred from participation in agricultural exports.

Since FMD is classified as a highly contagious disease, the most widely accepted means of re-establishing a disease-free zone are depopulation of infected and exposed herds, and surveillance of all susceptible herds in an Infected Zone.

Vaccination may be considered during an outbreak if other measures fail to control the spread of the disease.

II. Minnesota's FMD Control Strategy

The basic strategy adheres to principles set by the OIE and the USDA:

- Prevent contact between susceptible animals and the FMD virus;
- Stop the production of virus by infected animals; and
- Increase the resistance of susceptible animals.

These principles can be applied by:

- Stopping the spread of infection through quarantine and movement controls;
- Eliminating the sources of infection by euthanizing infected and exposed animals;
- Eliminating the virus by decontamination of premises, products, vehicles, equipment and materials and disposal of contaminated materials; and
- Establishing immunity by vaccination.

III. FMD Eradication Steps

- The infected herd is immediately depopulated;
- Carcasses and any contaminated materials are disposed of by approved methods;
- The entire premises is cleaned and disinfected;
- All dangerous contact herds will be depopulated;
- All animals are placed under quarantine on farms within the Infected Zone; and
- Herds within the Infected Zone will be inspected frequently until the area is declared disease free.

IV. Defining the FMD Area

The Executive Director, BAH (Minnesota State Veterinarian) defines the geographic areas for surveillance and control.

Surveillance Zone (SZ)

A geographical area of intense surveillance of livestock. Initially, the entire state may be designated as a SZ. This zone will be adjusted appropriately as the extent of the outbreak is better known.

Infected Zone (IZ)

An area subjected to intense surveillance and movement controls. The Infected Zone will extend a radius of at least 6.2 miles from an infected premises (IP). The size of this zone will depend on weather conditions, type of farms, time of year, species affected, and geography of areas affected.

Depopulation Zone (DZ)

An area around the infected premises that contains susceptible animals that will be depopulated.

V. Herd Classifications

Herds within surveillance and infected zones are defined as follows:

Infected premises (IP)

- A farm where FMD is confirmed by virus isolation or is positive to diagnostic tests.

Dangerous contact premises (DCP)

- A farm that contains susceptible animals, or products which have been in direct or indirect contact with an IP or infected animals, or
- A farm that contains susceptible animals located within the DZ.

Suspect premises (SP)

- All premises containing susceptible animals located within an IZ.

VI. Quarantine, Movement Controls (See Appendix F)

If the Board of Animal Health (BAH) determines that FMD exists and represents a substantial and imminent threat to the state's domestic animal population, it shall so certify to the governor. After receiving certification from the BAH, the governor may declare an emergency for the purposes of allowing the BAH to establish emergency restrictions on the movement of people, livestock, machinery and other personal property. The Department of Agriculture has the authority to control the movement of animal products.

VII. Tracing

FMD can be spread by animals, people, or materials that bring the virus into physical contact with susceptible animals. Spread of FMD may occur when:

- People wearing contaminated clothes or footwear or using contaminated equipment pass the virus to susceptible animals;
- Animals carrying the virus are introduced into susceptible herds;
- Contaminated vehicles are used to move susceptible animals;
- Susceptible animals are exposed to materials such as hay, feedstuffs, hides, or biologics contaminated with the virus; or
- A susceptible cow is inseminated with material from an infected bull.

Therefore, tracing all movements into and out of an IP is vital if the disease is to be contained. Tracing should also include consideration of potential exposure to windborne virus and possible contact with feral animals.

VIII. Surveillance

Surveillance is designed to define the extent of the disease. All herds in an IZ will be observed frequently for clinical signs of FMD.

IX. Valuation and Compensation

Livestock and poultry owners whose herds or flocks are destroyed will receive indemnity payments from the federal government if such funds are available. Under an emergency declaration in Minnesota financial institutions are barred from taking any punitive actions against livestock owners.

X. Euthanasia of Infected and Exposed Animals

Euthanasia will be carried out promptly and humanely.

XI. Disposal Procedures (See Appendix G)

To minimize threat of viral spread, disposal of FMD-diseased carcasses on site by burial is strongly preferred. The order of preference is:

- Burial on the infected premises;
- Burial on a neighboring infected premises, carcasses oversprayed with disinfectant prior to being transported between premises;
- Burning on the infected premises, carcasses oversprayed with disinfectant if burning will be delayed, and ashes buried on infected premises;
- Burning with air curtain incinerator or grinder, hotmix cylinder on the infected premises; and
- Burial on nearby landfill or other suitable premises, carcasses oversprayed with disinfectant prior to being transported between premises in leak-proof covered containers.

XII. Cleaning and Disinfecting (See Appendix D)

Proper cleaning and disinfecting will occur by implementing the following steps:

- Step 1: Preliminary disinfection of the premises by overspraying all contaminated areas with an approved disinfectant.
- Step 2: All material (manure, feedstuffs) oversprayed in Step 1 must be removed and all remaining contaminated materials disinfected or disposed of in an approved manner.
- Step 3: All equipment, buildings and roadways must be cleaned and disinfected and inspected by a representative of the BAH.

XIII. Sentinel and Restocking Measures

Restocking is supervised by the BAH and would begin with sentinel animals being placed on former IPs and DCPs. This would occur after surveillance finds no infected herds in the infected zone.

XIV. Public Awareness

The goals of this effort are to:

- Inform the general public of the situation and steps being taken to control the disease;
- Alert the agricultural community to the situation and the reasons for the eradication solution; and
- Encourage livestock producers to report any symptoms of FMD in their animals.

Federal (USDA) responsibilities will include:

USDA public affairs officials integrate with the Joint Public Information Center (JPIC) at State Emergency Operations Center (SEOC), as well as at the Joint Information Center (JIC) in Riverdale, MD. The public affairs specialists at the JIC will:

- Act as a liaison between the APHIS emergency operations center and the USDA's Office of Communications, state public information officer(s), other Federal agencies, industry, the public, the media, and other interested parties;
- Coordinate the writing and development of press releases, radio and television scripts, fact sheets, and other informational materials related to the outbreak;

- Work with APHIS to establish a national toll-free hotline and train staff to appropriately answer incoming calls regarding the outbreak;
- Coordinate the production of a regular report for internal use by USDA, APHIS headquarters, and project staff; and
- Coordinate the documentation of all eradication activities and develop a written chronology.

State responsibilities will include:

- Upon confirmation of a positive diagnosis, a press conference will be held at the SEOC. Participants will include the Commissioner of Agriculture, the Minnesota State Veterinarian (SV) and the Area Veterinarian in Charge (AVIC).
- Minnesota Department of Agriculture Public Information Officers will contact the appropriate producer groups seeking their cooperation in public awareness efforts.
- General farm organizations with membership in the area of the case will be contacted, requesting their assistance in organizing producer meetings to begin as soon as possible.
- A SEOC public information hotline will be activated, with operators trained in information about FMD and the control strategy.

Local (Field Operations Center) responsibilities will include:

A public information officer (PIO) will be appointed for the field operations center. The PIO will:

- Coordinate producer meetings that include presentations by diagnosticians, regulatory officials, practicing veterinarians in the area and producer leaders, with extended time for questions and answers;
- Contact local and regional news media to notify and advise them of available resources;
- Conduct daily press briefings at the Field Operations Center;
- Notify media of ongoing access restrictions due to biosecurity reasons; and
- Circulate APHIS and state hotline numbers.

FMD Emergency Operations Plan

I. Investigation of a Suspicious Case of FMD

A. Overview

A Foreign Animal Disease Diagnostician (FADD) will conduct an investigation by collecting information about the case, examining animals and collecting samples for laboratory analysis.

In consultation with the State Veterinarian and the Area Veterinarian In Charge (AVIC), the investigating FADD makes an initial assessment.

The initial assessment can result in these classifications:

- Not FMD (see Section II);
- Unlikely FMD (see Section III);
- Possible FMD (see Section IV);
- Highly Likely FMD (see Section V).

After laboratory results are obtained, these additional classifications are applicable:

- Negative FMD;
- Presumed FMD (see Section VI); and
- Confirmed FMD (see Section VII).

B. Procedures for Initial Investigation

1. A report of a suspected FMD case may come from one of three sources:
 - Livestock market veterinarian or Food Safety and Inspection Service veterinarian notes suspicious symptoms in animal(s) and contacts BAH;
 - Livestock Owner notices suspicious symptoms in animal(s) and contacts his private veterinarian, who gathers basic information on livestock owner and location, plus case overview, and calls BAH;
 - Trace from another state.
2. State Veterinarian confers with AVIC and FADD is notified.
3. AVIC assigns case a referral control number
4. FADD initiates an investigation within 4 hours. The FADD will examine animals, collect data for epidemiological analysis and confer with Executive Director/BAH and AVIC to determine an initial classification for the case.

II. Not FMD

A. Overview

The diagnosis is Not FMD when:

- The Foreign Animal Disease Diagnostician (FADD) finds no evidence of FMD;
- Consults with the State Veterinarian and the AVIC; and
- The FADD informs the Livestock Owner and the reporting veterinarian of the decision and completes the FAD Report Form.

III. Unlikely FMD

A. Overview

The investigating FADD, State Veterinarian, and AVIC make a determination that the case is Unlikely FMD.

The FADD:

- Reviews the case history with the Livestock Owner;
- Issues a written quarantine;
- Notifies the reporting veterinarian, if applicable;
- Initiates movement tracing;
- Sends tissues to FADDL, Priority 3 (P3), meaning they will be handled in the order received during regular working hours at the laboratory; and
- Exits the farm using normal biosecurity procedures.

IV. Possible FMD

A. Overview

The FADD, State Veterinarian, and AVIC make a determination that the case is Possible FMD.

The FADD:

- Reviews the case history with the Livestock Owner;
- Issues a written quarantine;
- Notifies the reporting veterinarian, if applicable;
- Initiates movement tracing;
- Sends tissues to FADDL, Priority 2 (P2), meaning FADDL will process tissue samples on the same day received; and
- Exits the farm using normal biosecurity procedures.

V. Highly Likely FMD

A. Overview

The FADD, Executive Director/BAH, and AVIC make a determination that animals on the site are Highly Likely to be infected with FMD.

B. Procedures for Highly Likely FMD

1. AVIC Responsibilities

- Alerts USDA, APHIS, Veterinary Services (VS), eastern regional office;
- Alerts USDA, APHIS, VS Emergency Program Staff;
- Alerts USDA Office of Inspector General (OIG); and
- Notifies USDA field staff.

2. State Veterinarian Responsibilities

- Notifies Duty Officer;
- Notifies BAH board members and schedules a meeting to consider certification for Governor's emergency declaration;
- Notifies BAH field staff to proceed to field operations center;
- Notifies BAH Office Manager;
- Notifies the local County Emergency Manager whose number is available from the Duty Officer; and
- Contacts USDA Foreign Animal Disease Diagnostic Laboratory, alerting lab that priority 1 sample coming.

3. Investigating FADD Responsibilities

- Conducts complete epidemiological investigation of herd;
- Issues a written quarantine;
- Requests livestock owner voluntarily restrict movement of people, machinery and other personal property;
- Notifies the reporting veterinarian, if applicable;
- Sends tissues to FADDL, Priority 1 (P1), meaning FADDL will process tissue samples immediately;
- Discusses depopulation and disposal with owner; and
- Exits the farm using normal biosecurity procedures.

4. Duty Officer, Division of Emergency Management Responsibilities

Contacts appropriate state agencies. These include, but are not limited to the:

- Governor's Office;
- Department of Agriculture;
- Pollution Control Agency; and
- Commissioner of Public Safety.

5. Minnesota Department of Agriculture Responsibilities

- Prepares to activate contracts for animal euthanizing teams;
- Prepares to activate contract for site cleaning and disinfection teams; and
- Prepares for restrictions on movements of agricultural products.

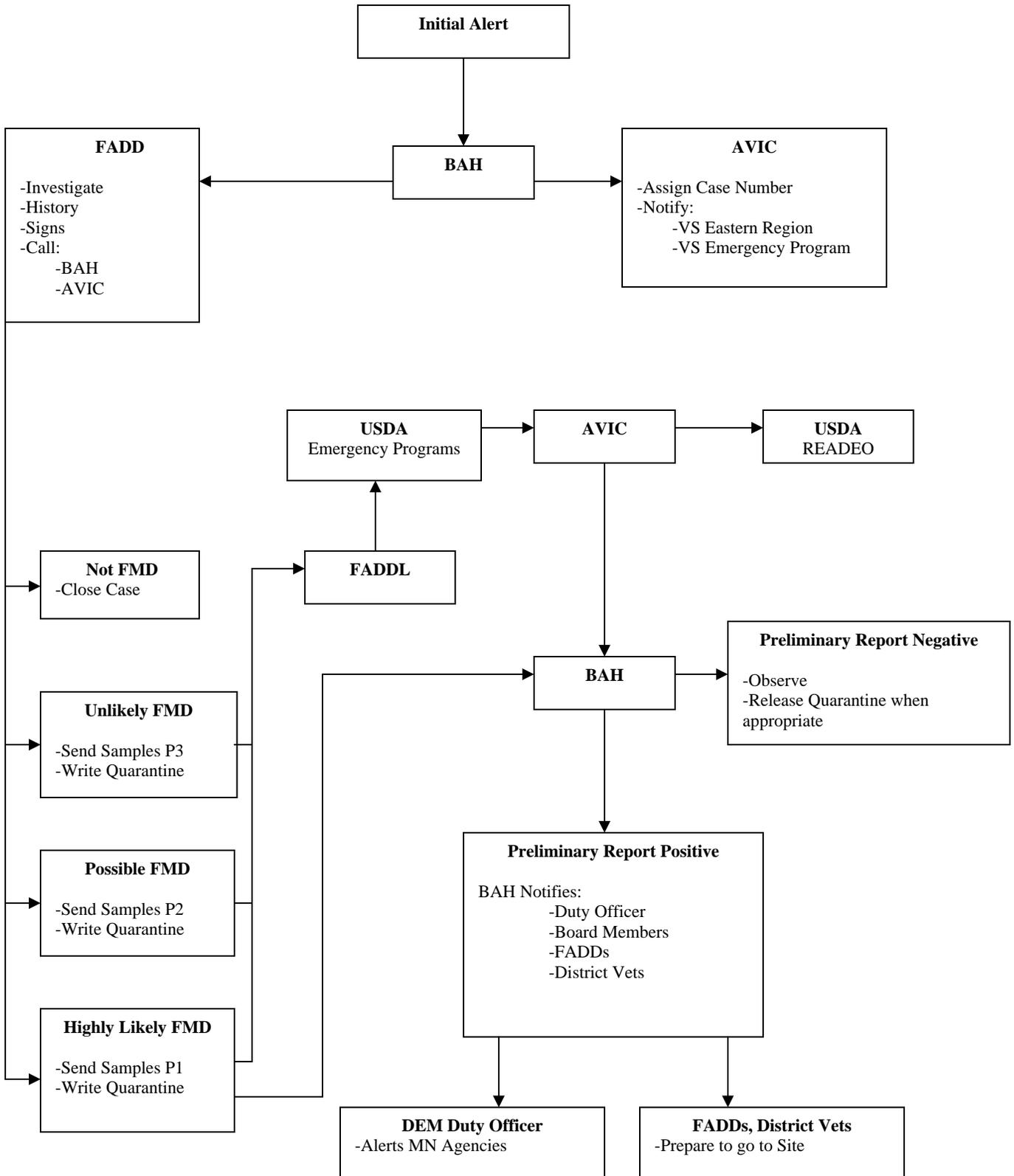
6. Minnesota Pollution Control Agency Responsibilities

- Prepares to activate contracts for animal disposal.

7. BAH Office Manager Responsibilities

- Makes arrangements for housing BAH team members.

Procedures for Not FMD, Unlikely FMD, Possible FMD, and Highly Likely FMD
(For a list of acronyms, see Appendix C)



VI. Presumed FMD

A. Overview

A presumed positive diagnosis is based on:

- Clinical signs consistent with FMD; and
- A sample positive to antigen or antibody testing or;
- Epidemiological information indicative of FMD.

B. Procedures for Presumed FMD

1. State Veterinarian

- Notifies the Duty Officer;
- Notifies the affected County Emergency Manager;
- Proceeds to the SEOC;

2. State Emergency Operations Center (SEOC) (see Appendix B for diagram of organization)

The Center's staff, supervised by the State Incident Manager and assisted by the State Veterinarian (acting as Deputy State Incident Manager):

- Appoints Field Operations Manager for the Field Operations Center;
- Prepares Declaration of Emergency for signature by the Governor;
- Sets up communications and data systems;
- Gathers and analyzes field data;
- Begins identifying Infected Zone and Surveillance Zone;
- Preliminary identification of Suspected Premises;
- Directs flow of supplies, resources and personnel to the Field Operations Center; and
- Establishes JPIC under the direction of the MN Department of Agriculture's Public Information Officer.

State Incident Manager

The State Incident Manager will be the Director of the Division of Emergency Management or designee, and will have overall responsibility for coordination of state resources and federal assistance in support of the state and local response to the incident.

Deputy State Incident Manager

Classifies entire state as Surveillance Zone, halting all movements of animals and animal products;

Joint Public Information Center (JPIC)

The JPIC will serve as the source of information regarding all incident activities at the state level. The JPIC will coordinate closely with both the APHIS Public Information Center at the national level and with the Public Information officer at the field operations center. The JPIC will provide a forum for the coordinated release of information. The Minnesota Department of Agriculture will serve as the lead information agency.

3. United States Department of Agriculture

- READEO team proceeds to the SEOC and Field Operations Center;
- Activates APHIS Emergency Operations Center; and
- The Area READEO Director proceeds to the SEOC to lead the federal response.

4. Field Operations Center

A Field Operations Center will be established to support the surveillance, depopulation, disposal, and cleaning and disinfecting activities in the field. The Field Operations Center may be co-located with the County Emergency Operations Center (EOC), and may require relocation as operations exceed the capacity of local government and the county EOC.

Field Operations Chief, appointed by the State Incident Manager/Deputy State Incident Manager.

- Manages the Field Operations Center and ensures operations are conducted in a Unified Command Structure with County Emergency Management

Field Veterinary Coordinator, appointed by the State Veterinarian. Duties include:

- Identifies Dangerous Contact Premises (DCP);
- Supervises and assigns veterinarians to trace movements of animals, vehicles, people, and products from the IP; and
- Supervises all depopulation and initial cleaning and disinfection activities at the IP.

Disposal Coordinator, appointed by the MPCA (see appendix G for full description of disposal operations)

- Consults with presumed IP owner and veterinarian on site characteristics in order to decide disposal method and location if needed;
- activates a site disposal foreman to IP;
- activates a staging foreman to the presumptive field operations center area;
- assembles critical staff to review disposal procedures;
- activates staff to lead disposal planning, fiscal, and logistics; and
- alerts state contractors to begin assembly.

Cleaning and Disinfection Coordinator, appointed by MDA.

Determines the number and type of personnel, vehicles, and equipment needed to conduct C&D operations on the presumed IP.

Public Information Officer,

- Operates public information effort at local level;
- Plans producer meetings; and
- Coordinates efforts with public information officer at SEOC.

VII. Confirmed FMD

A. Overview

A confirmatory report based on virus isolation and identification will follow the presumed positive diagnosis within 24 to 72 hours.

A. United States Department of Agriculture

- Activates Federal Emergency Response Plan for FMD;
- Issues Secretary of Agriculture's Emergency Declaration to transfer additional funds within the Department, if needed; and
- Stops all interstate movements of susceptible animals, articles and means of conveyance, as needed.

B. State Veterinarian

Minnesota's initial emergency response centers around securing an Emergency Declaration signed by the Governor so eradication efforts can proceed.

- Convenes BAH meeting to vote on a Declaration of Emergency; and
- Notifies the Duty Officer of Confirmed FMD.

C. State Emergency Operations Center (SEOC) Activities

The Center's staff, supervised by the State Incident Manager and assisted by the Executive Director of the Board of Animal Health (acting as Deputy State Incident Manager):

- Notifies state agencies of confirmation of FMD;
- Submits Declaration of Emergency for signature by the Governor;
- Sets up communications and data systems;
- Gathers and analyzes field data;
- Directs flow of supplies, resources and personnel to the Field Operations Center; and
- Establishes public information center under the direction of the MN Department of Agriculture's Public Information Officer.

Governor's Authorized Representative (GAR)

Appointed by the Governor to serve as a liaison between state and federal governments.

State Incident Manager

The State Incident Manager will be the Director of the Division of Emergency Management or designee, Department of Public Safety, and will have overall responsibility for coordination of state resources and federal assistance in support of the state and local response to the incident.

Deputy State Incident Manager

- Classifies entire state as Surveillance Zone, halting all movements of animals and animal products;
- Designates Infected Zone;
- Will redefine SZ boundaries when information verifies a smaller SZ is appropriate.

Joint Public Information Center (JPIC)

The JPIC will serve as the source of information regarding all incident activities. He will coordinate closely with both the APHIS Public Information Center at the national level and with the Public Information officer at the field operations center. The JPIC will provide a forum for the coordinated release of information. The Minnesota Department of Agriculture will serve as the lead information agency.

D. Field Operations Center

- 1. Field Operations Manager**, appointed by the SIM
Manages the Field Operations Center and ensures operations are conducted in a Unified Command Structure with County Emergency Management.
- 2. Field Veterinary Coordinator**, appointed by the State Veterinarian.
 - Assigns veterinarians to investigate Dangerous Contact Premises (DCP) and Suspect Premises (SP);
 - Supervises and assigns veterinarians to trace movements of animals, vehicles, people, and products from the IP;
 - Supervises diagnosis, quarantine, and all movement permits;
 - Supervises all depopulation and initial cleaning and disinfection activities at the IP; and
 - Verifies completion of C&D.
- 3. Disposal Coordinator**, appointed by MN Pollution Control Agency (see appendix G for full description of disposal operations)
 - Foreman on IP site;
 - Outbreak Area Staging and Coordinating foreman at Field Operations Center;
 - Disposal Logistics dispatching contractors to staging and thence to IP site;
 - Disposal Finance established; and
 - Disposal Planning established.
- 4. Regulatory Enforcement Coordinator**
 - Determines the number and types of personnel, vehicles and equipment needed to conduct regulatory enforcement operations;
 - Provides security around IPs;
 - Enforces animal movement restrictions;
 - Coordinates efforts with Highway Patrol and National Guard. If terrorism is suspected, also coordinates with FBI and USDA Office of Inspector General.
- 5. Finance and Administrative Officer**, appointed by the State Incident Manager/Deputy State Incident Manager.
 - Secures office equipment as needed;
 - Secures necessary phone and fax lines;
 - Manages human resources of center;
 - Records all expenses.
- 6. Information Technology Officer**, appointed by the State Incident Manager/Deputy State Incident Manager.
 - Collects and transmits data on field operations to SEOC;
 - Responsible for generating and distributing maps of Surveillance Zone with individual farm locations.
- 7. Supply Officer**, appointed by the State Incident Manager/Deputy State Incident Manager
 - Secures equipment and supplies necessary for field operations.

8. Cleaning and Disinfection Officer, appointed by MDA

- Determines the number and type of personnel, vehicles, and equipment needed to conduct C&D operations;
- Makes recommendations to the Field Operations Officer;
- Establishes and maintains appropriate C&D stations for trucks, cars machinery and other vehicles where needed;
- Assists in training, as needed;
- Maintains knowledge of approved disinfectants, safety procedures and regulations.

9. Public Information Officer, appointed by MDA

- Operates public information effort at local level;
- Plans producer meetings;
- Coordinates efforts with public information officer at SEOC

10. Euthanasia Coordinator, appointed by MDA

- Determines the number and type of personnel, vehicles, and equipment needed to conduct euthanasia operations.

E. Tracing

Tracing of all movements into and out of an IP is vital if the disease is to be contained. The following things are capable of spreading the virus from farm to farm and their movements must be traced.

- Livestock
- Animal products
- Vehicles (milk tankers, livestock transport vehicles, feed trucks, visitors' cars)
- Materials (hay, straw, crops, grains)
- People (veterinarians, AI service personnel, sales and feed representatives, trades people, technicians, visitors)

Tracing should also include consideration of potential exposure to windborne virus and possible contact with feral animals.

F. Surveillance

Surveillance is designed to:

- Define the extent of the disease;
- Detect new outbreaks;
- Establish disease-free zones.

In an Infected Zone, surveillance will be driven by findings from investigating veterinarians. Factors such as potential spread by wind or feral animals might warrant increased surveillance. Suspect premises should be inspected at least every third day. Producers should be educated about the clinical signs and encouraged to report suspicious cases.

G. Activities at Infected/Dangerous Contact Premises

The investigating veterinarian:

- Secures signatures on Livestock Indemnity Forms VS Form 1-23
- Monitors depopulation and burial of infected livestock;
- On a DCP checks all animal carcasses for signs of FMD:
 - If blisters or lesions are found, the site is reclassified as an IP and tissue samples collected from the dead animals are sent to the FADDL.
- Establishes and monitors biosecurity.

The investigating veterinarian supervises the following activities:

- Entrances to premises secured by local or state law enforcement officials;
- Depopulation team euthanizes animals;
- Dead animals and contaminated areas are oversprayed with an approved disinfectant;
- Disposal of livestock carcasses and contaminated material; and
- Cleaning and disinfection.

Once indemnity details are agreed on, the Livestock Owner and family may leave the premise under a permit issued by BAH.

H. Activities in the Infected Zone (SPs)

The investigating veterinarian:

- Visits each SP on a regular basis and examines animals for clinical signs;
- Reclassifies premises as IP if clinical signs of FMD present; and
- Writes quarantines, no animal movements allowed except by permit.

I. Activities in the Surveillance Zone

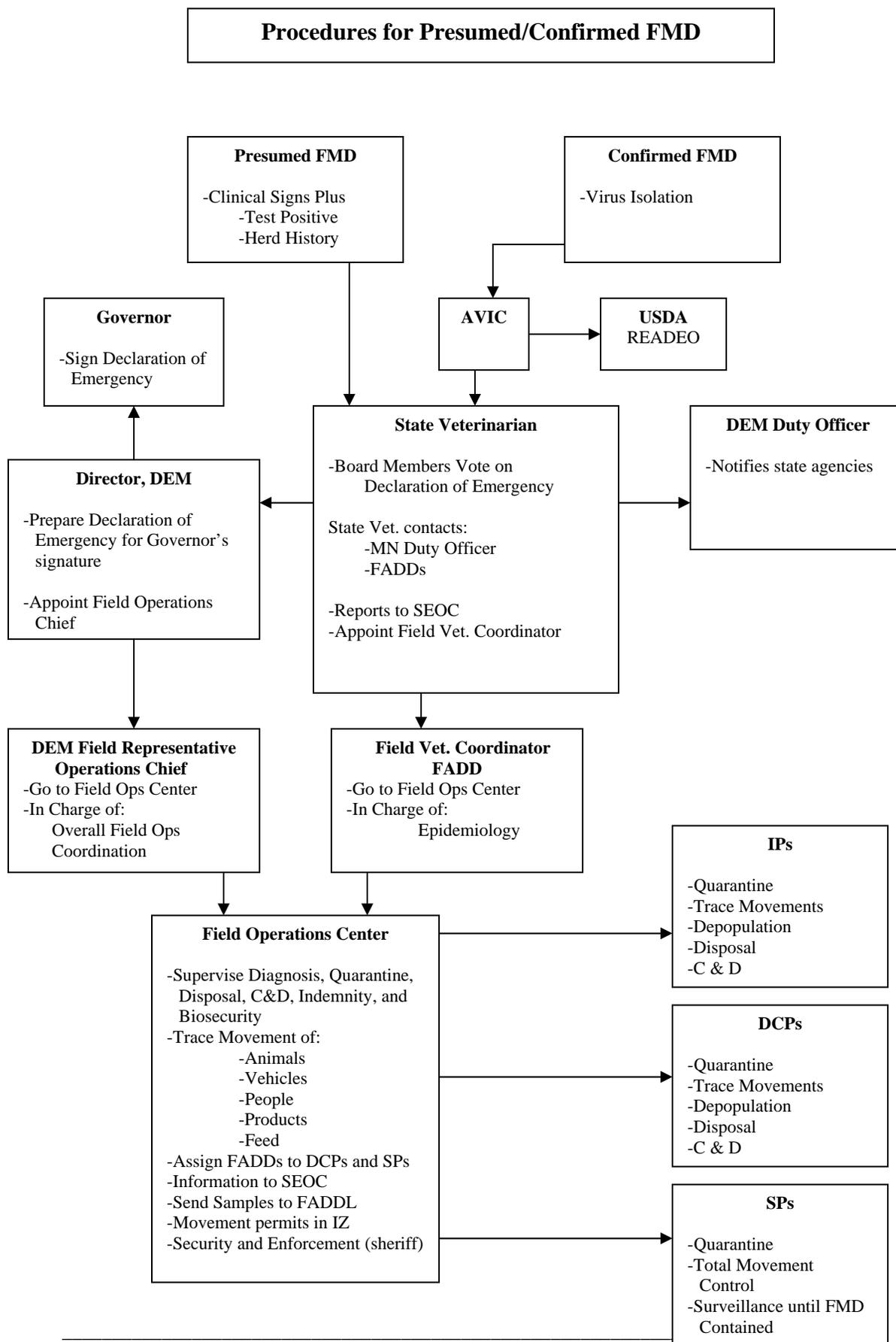
Susceptible livestock:

- Recommend no movement within zone;
- May not move out of zone.

Non-susceptible livestock and poultry:

- Recommend no movement within zone;
- Appropriate biosecurity, such as C&D of vehicles, required.

All reports by livestock owners and practicing veterinarians of any signs suspicious of FMD will be investigated by veterinarians assigned by the SEOC.

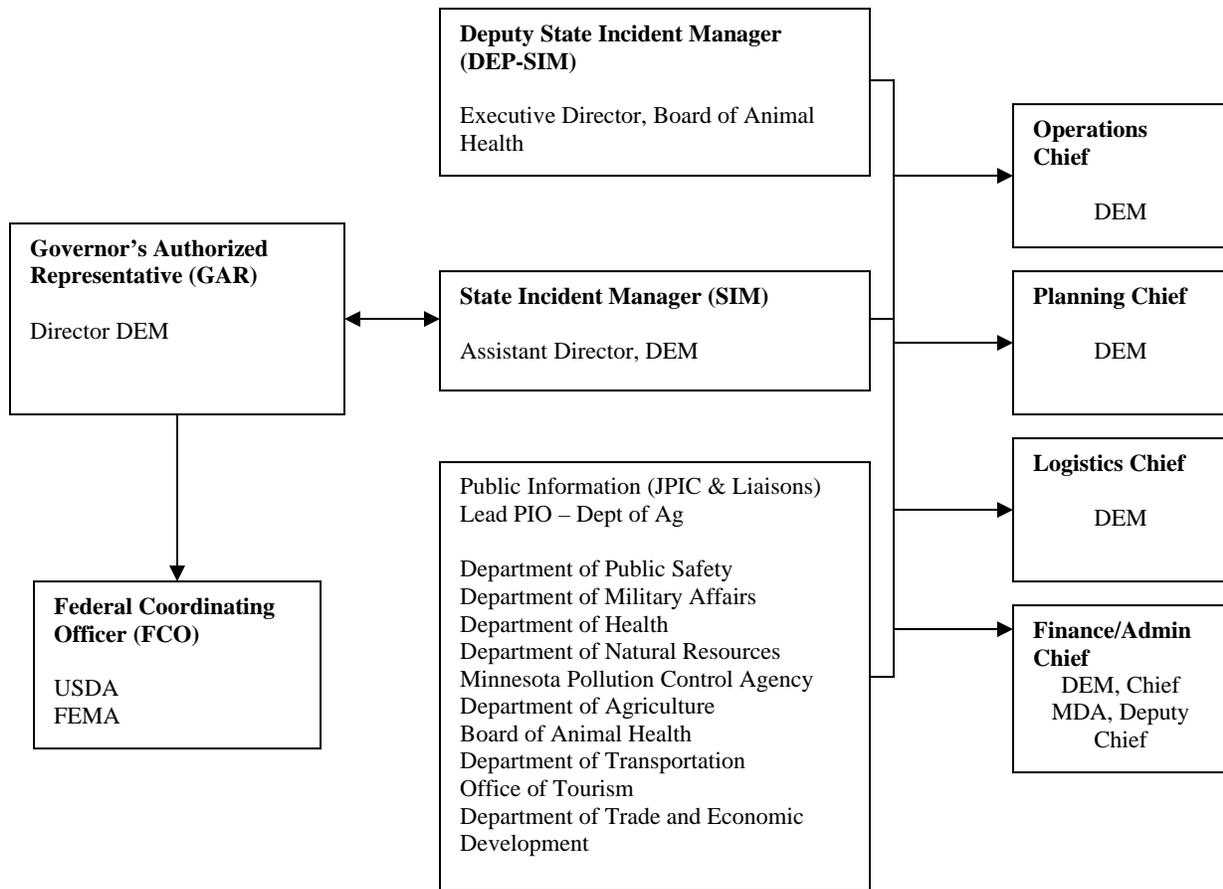


Appendix A

Directory of Phone Numbers

Job Title	Office phone	Fax	Cell phone	E-mail Address
Exec. Dir./BAH	651-296-2942 x27	651-296-7417	612-756-2814	bill.hartmann@bah.state.mn.us
Asst. Ex. Dir./BAH	651-296-2941 x18	651-296-7417	612-756-2813	keith.friendshuh@bah.state.mn.us
AVIC	651-290-3691	651-288-0654	612-840-1710	mark.l.davidson@aphis.usda.gov
Dist Vet—Suskovic	507-625-8616	507-389-6495	507-381-2042	greg.suskovic@bah.state.mn.us
Dist Vet—Schwartz FADD	507-376-6675	507-376-6082	507-920-8402	kern.schwartz@bah.state.mn.us
Dist Vet---Piehl FADD	320-259-0491		651-270-7234	john.w.piehl@aphis.usda.gov
Dist Vet—Peterson	507-444-2483	507-444-2483	507-456- 1113	brad.peterson@bah.state.mn.us
Dist Vet—Neirby FADD	507-334-8045	507-332-5530	507-838-5154	dale.neirby@bah.state.mn.us
Dist Vet—Jostock	320-769-2521	320-769-4679	507-828-2643	arnold.jostock@bah.state.mn.us
Dist Vet--Burmeister	651-290-3691	651-228-0654	651-270-7232	dawn.h.burmeister@aphis.usda.gov
Dist Vet—Brehmer	651-565-2148	651-228-0654	612-840-1718	leonard.w.brehmer@aphis.usda.gov
Dist Vet—Boldingh	218-643-2532	218-643-6211	612-756-2817	terry.boldingh@bah.state.mn.us
Dist Vet—Boehland FADD	218-924-4174		651-270-7229	leon.c.boehland@aphis.usda.gov
Dist Vet—Adkins	218-587-4196	218-587-3382	612-756-2764	galen.adkins@bah.state.mn.us
Mn Duty Officer	651-649-5451 800-422-0798			
USDA Emerg. Programs	202-720-5711			
MN Comm. of Ag.	651-297-3219	651-297-5522		
MN Asst. Com. of Ag.	651-297-2414	651-297-5522		
MN PCA disposal- Lee	651-297-8610	651-297-8321	612-867-4817	Stephen.lee@pca.state.mn.us
MN PCA-ER Team	Via duty officer	651-297-8321		
MN Farm Bureau	651-905-2100	651-905-2159		
MN Farmers Union	651-639-1223	651-639-0421		
MN NFO	320-352-2218			
MN Pork Producers	507-345-8814	507-345-8681		
MN Beef Producers	952-854-6980	952-854-6906		
MN Sheep Producers	320-864-5754			
MN Poultry Producers	651-646-4553	651-646-4554		
Assn. Meat Processors	507-263-3617	507-263-2510		
MN Milk Producers	507-765-4445			
MN Elk Breeders	320-543-3664	320-543-2983		
MN Turkey Producers	651-646-4553	651-646-4554		
MN Fur Breeders	320-597-3235			
MN Deer Farmers	320-654-0948			
Indian Affairs Council	651-284-3573	651-284-3567		

Appendix B: SEOC Organization



FOOT AND MOUTH DISEASE (FMD) NOTIFICATION PROCEDURES

Minnesota Duty Officer Program

I. Overview

Foot and Mouth Disease (FMD) is a highly contagious animal disease that affects all cloven-hoofed animals (cows, pigs, sheep, deer, etc.). FMD is *not* a health threat to the human population. The threat of FMD is the economic impact on the livelihood of the farmer, the local rural economy, and state commerce. The Minnesota Board of Animal Health (MBAH), with support of the state Department of Agriculture (MDA), will be the lead State agency in the diagnosis and response to the instance of Foot and Mouth Disease.

The Duty Officer response to a suspected case of Foot and Mouth Disease may originate from the Board of Animal Health requesting notification of affected State agencies; *or*, after regular business hours, a local veterinarian may request the assistance of the Board of Animal Health to investigate a suspected case of FMD.

II. Board of Animal Health requests state agency notification

A. Surveillance

The MBAH and US Department of Agriculture (USDA) will make a field diagnosis of a suspected case of FMD. They will label the sick animal as a (1) *Unlikely FMD*, (2) *Possible FMD*, or (3) *Highly Likely FMD* infection. A sample will be flown to the USDA diagnostic laboratory on Plum Island, NY for a diagnosis. With a *Highly Likely FMD* infection, one of the following individuals from MBAH will call the Minnesota Duty Officer at (800) 422-0798 or (651) 649-5451.

Board of Animal Health

1. Executive Director, Board of Animal Health
2. Assistant Executive Director, Board of Animal Health
3. Veterinarian, Board of Animal Health

The representative from MBAH will report (1) a “*Highly Likely FMD*” infection in Minnesota, (2) request will be made for notification of State agencies, alerting them of a highly likely FMD infection.

B. Notification of state agencies (Alert)

Upon receiving a call from MBAH reporting a “*Highly Likely FMD*” infection and requesting notification of State agencies, the Duty Officer is to notify the Director, Division of Emergency Management or “Assistant Director-In-Charge” and the following state agency contacts:

Department of Agriculture

- a. Person on-call

Governor’s Office

- a. Governor’s Chief of Staff

Department of Public Safety

- a. Commissioner of Public Safety
- b. Deputy Commissioner of Public Safety
- c. Planner, FMD, Division of Emergency Management

Minnesota Pollution Control Agency

On-call responder, Emergency Response Unit

C. Notification of state agencies (Presumed FMD)

A positive diagnosis by the USDA diagnostic laboratory, Plum Island, NY, for FMD will be called “*Presumed FMD*” and will be reported to the MBAH. The Executive Director, MBAH, will notify the Duty Officer of (1) a “*Presumed FMD*” infection in Minnesota, (2) request implementation of the State FMD Response Plan and activation of the State Emergency Operations Center (SEOC).

Upon receiving a call from the Board of Animal Health reporting a “*Presumed FMD*” infection, the Duty Officer is to notify the Director, Division of Emergency Management or “Assistant Director-In-Charge”. The Director, Division of Emergency Management, will direct the activation of the State Emergency Operations Center (SEOC).

III. Local veterinarian requesting assistance

A local veterinarian may call to report livestock with symptoms suspicious of a foreign animal disease and request assistance from the MBAH. The Duty Officer will make the following contacts:

Between 8:00 am and 4:30 pm Monday through Friday call:

Minnesota Board of Animal Health	(651) 296-2942 ext-27
USDA, APHIS, Veterinary Services	(651) 290-3691

Evenings, Holidays, and Weekends call:

MDA Person On-Call	
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Appendix C

Abbreviations

APHIS	Animal Plant Health Inspection Service
AVIC	Area Veterinarian in Charge
BAH	Minnesota Board of Animal Health
C & D	Cleaning and Disinfecting
DCP	Dangerous contact premises
DEM	Division of Emergency Management
DEP-SIM	Deputy State Incident Manager
DNR	Department of Natural Resources
ED/BAH	Executive Director / Board of Animal Health (State Veterinarian)
EP	Emergency Programs
FAD	Foreign Animal Disease
FADD	Foreign Animal Disease Diagnostician
FADDL	Foreign Animal Disease Diagnostic Laboratory
FBI	Federal Bureau of Investigation
FCO	Federal Coordinating Officer
FEMA	Federal Emergency Management Agency
FMD	Foot and Mouth Disease
FOC	Field Operation Center
GAR	Governor's Authorized Representative
IP	Infected premises
IZ	Infected zone
JIC	Joint Information Center
MDA	Minnesota Department of Agriculture
MN	Minnesota
MPCA	Minnesota Pollution Control Agency
OIE	Office International des Epizooties
OIG	Office of Inspector General
P1	Priority 1
P2	Priority 2
P3	Priority 3
PDS	Personal decontamination site
PIO	Public Information Officer
READEO	Regional Emergency Animal Disease Eradication Organization
SEOC	State Emergency Operations Center
SIM	State Incident Manager
SP	Suspect premises
SZ	Surveillance zone
SV	State Veterinarian
USDA	United States Department of Agriculture
VS	Veterinary Services

Appendix D: Cleansing and Disinfecting

DRAFT 8

Operational Procedures Manual for Cleaning and Disinfecting

Cleaning and disinfecting is an integral part of the Minnesota Board of Animal Health FMD Response Plan and is administered by the Minnesota Department of Agriculture (MDA). This manual provides guidelines for cleaning and disinfecting (C&D) procedures to be carried out in the field.

Cleaning and Disinfection (C&D) is the combination of physical and chemical processes that remove or kill pathogenic microorganisms. C&D is vital for disease eradication. Thorough C&D involves close cooperation between property owner and all personnel involved in C&D procedures. Effective C&D will reduce the period of time between slaughter and restocking on contaminated properties.

Disinfectants

I. Selection, Use, and Responsibilities

- A. The choice of a disinfectant is governed by several factors:
 - Type of surface to be disinfected,
 - Cleanliness of the surface,
 - Effectiveness (must be on the FMD Approved List), and
 - Time. Allow sufficient time for the disinfectant to act on the agent
- B. When using disinfectants:
 - Thoroughly rinse all surfaces with clean water before applying a disinfectant.
 - Do not mix one disinfectant with another.
 - Take proper precautions with all disinfectants and apply at the recommended dilutions.
 - Proper protective equipment should always be worn.

II. Precautions

All disinfectants must be used with care to avoid occupational injuries or health problems. Persons responsible for the disinfection operations must be familiar with the characteristics of the disinfectant they are using. It is essential to brief workers and the owner/manager on safety aspects before beginning cleaning and disinfection operations, including the potentially harmful effects of chemicals on animals, humans and the environment. First aid kits must be available on every infected premises (IP)/dangerous contact premises (DCP) or where hazardous chemicals are being used.

The use of any chemical or equipment should conform to the manufacturer's instructions and safety standards. All disinfectant label directions and precautions must be followed. All officers and workers must carry out their duties in accordance with current health and safety laws.

When diluting concentrated chemicals, the concentrate should ALWAYS be added to water, NEVER water to concentrate. Do not mix acid with alkaline disinfectants. Apart from the resulting chemical reaction, the effectiveness of both chemicals is nullified. Contact with concentrates on exposed skin may cause severe burning. All workers engaged in mixing or applying disinfectants must wear rubber boots, overalls, goggles and head covering for protection. Avoid the danger of inhalation by NOT applying a MIST spray.

If contact occurs:

- wash with copious amounts of water immediately;
- refer for hospital treatment if necessary.
- Eye contact should be irrigated copiously with clean wash and referred to a doctor.
- Disinfectant concentrate should be stored in one place on the property away from the main area of work in order to remove the danger of containers being ruptured inadvertently. Inventory should be checked each day for spillage of concentrate.
- Flush areas of the body exposed to lye with lots of water and treat with vinegar.

A disinfectant whose action is based upon its acidity is rendered useless if sprayed upon highly alkaline material, conversely, if the action is based upon the disinfectants alkalinity it is rendered useless when sprayed on highly acid material.

Disinfectants have poor penetration properties. It is important that surfaces be thoroughly cleaned of organic matter prior to application.

The amount of disinfectant necessary for a particular job can vary considerably. It is most important to remember that, after having cleaned a surface, the time of contact is of critical importance. For most applications, disinfectants must flood the surface and keep it thoroughly wet for at least 10 minutes.

III. Kinds of Disinfectants

The U.S. Environmental Protection Agency (EPA) registers (licenses) disinfectants for use against bacteria, viruses, and other microorganisms, including the FMD virus, on inanimate surfaces. USDA/APHIS has secured FIFRA Section 18 quarantine exemptions from EPA that allow the use of the following disinfectants, known to be effective at inactivating the FMD virus, by any individual in the United States:

- Oxy-Sept 333
- Oxine
- Sodium hypochlorite (3% solution) (three parts household bleach mixed with 2 parts water)
- Acetic acid (4% solution) (vinegar)
- Virkon-S

* See Attachment 2 – Suppliers and Distributors

The FMD virus is very susceptible to both low and high pH. The use of mild organic acids and alkaline compounds are effective disinfectants. Both USDA and EPA expect that additional disinfectants may be registered for use against the FMD virus such as citric acid, sodium carbonate (4%), sodium carbonate (4%) plus sodium silicate (0.1%), and sodium hydroxide (2%),. Before a product can be approved for use, EPA must review efficacy data that proves that the product effectively inactivates the FMD virus. The state lead agency may apply for a Section 18 emergency exemption for the product of interest. EPA will require valid efficacy data (testing and proof that the product effectively controls the virus) prior to approval of a Section 18 exemption request. If a state wishes to apply for a Section 18 exemption for sodium carbonate, sodium carbonate plus sodium silicate, or sodium hydroxide, it may rely upon the efficacy data submitted by APHIS on those compounds to satisfy the efficacy data requirements.

Mixing Rates

Disinfectant	Percent	Mix Ratio
Sodium hydroxide (lye)	2%	13 1/2 oz. can to 5 gallons water
Sodium carbonate (soda ash)	4%	1 lb. to 3 gallons warm water (monitored to ensure effectiveness of the working solution)
Acetic acid	2%	2 parts glacial acetic acid to 98 parts water or vinegar used at full strength
Oxy-Sept 333		
Virkon-S		
Metasilicate	4%	1 lb. to 3 gallons water
Sodium hypochlorite	3%	3 parts household bleach mixed with 2 parts water

I. Disinfection procedures

A. Personal Decontamination

The aim of personal decontamination is to safely remove any contamination on the body or clothing. When properly carried out, personal decontamination procedures permit the safe movement of personnel from property to property. These procedures must be rigorously applied.

Heavy personal contamination may occur while working on an IP/DCP or when active disease is found by diagnostic and surveillance teams. The heaviest contamination will occur:

- when living infected animals are physically inspected;
- when slaughtered animals are physically inspected and diagnostic samples taken;
- at the slaughter site on an IP or DCP;
- at the site of carcass disposal; and
- when removing manure, bedding and debris from buildings which housed infected livestock.

1. Personal decontamination site

A personal decontamination site (PDS) will be established near the exit point from each IP or DCP. The Site Supervisor in consultation with the C&D Foreman and owner/manager will be responsible for selecting the area. Selection criteria will include:

- The PDS must be placed as far from previous animal activity as practical. (Critical inspection and questioning of the owner/manager of the property will determine the extent of property contamination with regard to animal and manure contact).
- It should allow for future expansion and may be in use over a considerable period of time.
- It must be located in an area such that it is possible to leave the IP or DCP directly from the PDS without becoming recontaminated.
- Once the site for the PDS has been located, the area should be oversprayed with a disinfectant.
- The PDS should be on an impervious surface inside a building or temporary shelter with an adequate water supply and adequate drainage.
- If no impervious surface is available a heavy sheet of plastic (10 yards by 10 yards) may be used.

2. Personal decontamination procedure for the PDS

There are no antiviral disinfectants known to be effective against the FMD virus that are *approved for use on human skin*. Therefore, warm soapy water is recommended for washing face, hair, skin, etc. Alternatively, the pH of the washing solution can be lowered (by adding acetic acid) to enhance antiviral action. If other skin decontaminants are used, care must be taken to ensure they are effective against FMD.

Each person working on an IP/DCP should have:

- a clean change of clothes and shoes stored in the personal vehicle;
- a pair of disposable outerwear coveralls;
- a pair of washable, waterproof or disposable innerwear coveralls;
- knee high, shoeless rubber boots;
- rain gear; and
- winter wear.

Each person entering/exiting an IP/DCP or any quarantined area that is grossly contaminated must pass through the PDS. The following PDS procedures will apply to ALL personnel:

- a. Disposable items (coveralls, gloves, equipment) are placed in heavy gauge plastic garbage bags and buried or burned on the site.
- b. Industrial hard hats must be scrubbed with disinfectant.
- c. Visibly contaminated clothing must be disinfected, the skin washed and a clean pair of clothes used to leave the site.
- d. Rubber boots are scrubbed down paying particular attention to the soles.
- e. Raingear disinfected and hung up to dry at the Field Operation Center (FOC).

C&D procedures after leaving the IP/DCP and before entering the personal vehicle;

- a. boots are disinfected a second time at the personal vehicle.
- b. disposable inner coveralls and other disposables/trash are placed in a heavy mil plastic bag and stored in the vehicle trunk.
- c. rubber boots removed, disinfected and placed in a boot tray in the vehicle trunk
- d. workers change into shoes not worn on the IP.

Upon completing personal disinfection at the IP/DCP, personnel should return to the FOC and:

- a. conduct vehicle C&D. A vehicle washing station will be established for each FOC;
- b. properly dispose of any trash generated;
- c. obtain needed supplies; and
- d. attend briefings.

If a person leaves an IP or DCP for other duties they must not have contact with susceptible livestock for a period of time as directed by the FOC.

3. Personal decontamination on Suspected Premises

Visitors who have to leave a suspect property

It is possible that when a disease is suspected on a property, there will be visitors or private veterinarians present. A person and their vehicle should undergo disinfection if they wish to leave the SP. The following products are recommended for use when no other approved disinfectant is available:

- soap (or household detergent) and hot water for scrubbing; and
- acetic acid (household vinegar) use undiluted

B. Property decontamination

The IP Site Supervisor and C&D Foreman must ensure effective property decontamination, including decontamination of people, equipment and vehicles. The Site Supervisor and C&D Foreman will coordinate the following:

1. Inspect the IP or DCP and prepare a map of the property.
2. Maintain a logbook to record all events and recordings.
3. Indicate areas requiring specific decontamination action (consult with the official in charge of slaughter, disposal, and epidemiology).
4. Indicate areas NOT requiring special decontamination action.
5. List the actions to be taken in chronological order within each area.
6. Estimate a time frame to complete C&D.
7. Implement the agreed upon C&D plan.
8. C&D Foreman submits a daily progress report to the FOC.

A property decontamination program will include a:

- detailed property assessment
- preliminary disinfection
- first clean-up
- first disinfection.
- first inspection
- second disinfection
- final inspection

Continuous, close communication with the owner/manager is essential to achieve an effective decontamination program.

1. Property assessment

A property assessment team consisting of the Site Supervisor, C&D Foreman, Disposal Foreman and owner/manager will conduct an initial property assessment, (assessment packet). This assessment will be used to determine and identify those buildings, equipment and areas of animal movement which will be cleaned and disinfected or prepared for disposal. The assessment will identify:

- the areas and amount of manure to be removed for disposal or composting.
- structures and articles that cannot be effectively decontaminated such as wooden buildings, floors, doors, linings, roof insulation etc.,
- degree of contamination of non-animal areas; machine sheds, workshops, graineries etc.
- disposition of animal feed; open feed bags, loose grain, hay and straw, especially if in close proximity to animal activities,
- overhead electric power poles and lines, underground cables, telephone lines, fuse boxes, meters, water supply outlets and underground water lines,
- specialty electrical and electronic equipment requiring special decontamination,
- locate and mark all drains. All drains must be blocked and allowed to run only when the effluent has been thoroughly mixed with disinfectant
- water flow/drainage patterns. Water will be diverted if necessary,
- a materials and equipment unloading area located outside the decontamination area so that vehicles will not need decontaminating,
- An onsite location where the workforce will eat or have breaks should be identified away from the decontamination work area.

The assessment team will estimate the degree of contamination within the HOME and its immediate surroundings. Special attention will be paid to any porch, mudroom, office etc. If possible, decontamination procedures to allow the household to safely move off and on the premises will be identified.

2. Preliminary Disinfection (overspray)

The goal of preliminary disinfection is to rapidly reduce the amount and distribution of the FMD virus on the IP or DCP. Preliminary disinfection should begin as soon as possible after animals are slaughtered. All areas known to be contaminated, including euthanized animals, should be oversprayed with disinfectant, thus reducing the chances of inadvertent spread of the virus.

3. First Clean-up

- All manure, litter and bedding identified in the property assessment must be removed and either composted, burned or buried. After animal buildings have been cleared of manure, a more detailed cleaning (pressure washing) of the building is required, moving from the roof, working down to and including the floor.
- All loose insulation material (polystyrene, fiberglass and press boards) should be removed for burial or burning unless sound, impervious surfaces can be effectively decontaminated.
- All rotting wood, unsound walls or ceilings and other structures that cannot be effectively disinfected should be removed for burning or burying.
- **All material destroyed must first be valued.**
- Contaminated feedstuffs identified during the assessment must be removed and buried, burned or composted after valuation.
- Feed and water troughs must be emptied and cleaned out and either disinfected, burned or buried.
- Fixtures and fittings should be dismantled and stacked for cleaning and disinfection.
- Delicate electronic equipment must be protected (covered with plastic) for later disinfecting.

4. First full disinfection

The goal of the first disinfection is to inactivate the FMD virus by removing all organic matter down to an impervious surface using physical and chemical agents. The recommended order of cleaning is:

- roof,
- wall,
- floor.

Care must be taken to ensure that areas already disinfected are *not* recontaminated by people or machinery. An effective cleaning and disinfection program will include the use a high pressure washer and hot water together with a detergent and approved disinfectant and applied in such a manner as to kill the FMD virus but not destroy the surface being cleaned. After the first full disinfection, cleaned surfaces are allowed to dry to reveal any residual organic matter that will be removed in the second cleanup.

5. First inspection

The goal of the first inspection is to ensure that all tasks detailed on the property assessment have been performed. The First Inspection will be conducted by the C&D Site Supervisor and C&D Foreman.

Important aspects to be evaluated include:

- all contaminated materials not able to be cleaned and disinfected have been properly disposed;
- all fixtures and fittings have been dismantled where appropriate so that no organic material remains; and
- there is no observable organic matter on any exposed surface;
- all contaminated feedstuffs have been destroyed, and remaining feedstuffs disinfected if appropriate.

- all grossly contaminated sites (slaughter and disposal) have been effectively cleaned and disinfected;
- all liquids that have been disinfected have been properly managed;
- the conditions of quarantine, especially at exit/entry points, and warning notices are being maintained.
- all liquids that have been disinfected have been properly managed; and
- the conditions of quarantine, especially at exit/entry points, and warning notices are being maintained.

6. Second full power wash and disinfection

The second disinfection is a repeat of the first and concentrates activities on areas with a build-up of organic matter.

7. Final inspection

The final inspection is made by a veterinarian and is documented in the premises records. All equipment and personnel are finally disinfected at the decontamination site before removal. If the final inspection is satisfactory, reconstruction work can begin. The premises is left empty for a prescribed time before restocking with sentinel animals.

C. Vehicle and machinery decontamination

Contaminated vehicles, heavy equipment, machinery and their drivers may carry a disease dissemination risk. No vehicle or person may leave the IP or DCP without thorough decontamination. A vehicle and machinery C&D station will be established at each decontamination site. There must be sufficient equipment, water supply, materials and adequate drainage to decontaminate the expected number of vehicles. Runoff water from the C&D station *must not* flow from the area. If drainage is inadequate, a drainage ditch must be dug to ensure no effluent escapes beyond the decontamination site.

1. Cars

Personal vehicles should remain off IPs or DCPs. Site workers should park their vehicles on the road. These and other vehicles should be power washed and the interiors wiped down with disinfectant. An area with an asphalt/concrete surface with proper drainage and an adequate water supply may be designated as a regional vehicle disinfection station. A carwash facility is ideal for decontamination of vehicles if one is conveniently located.

2. Livestock trucks

All organic matter; manure, bedding and feed must be removed from the vehicle. This material should be burned, buried or composted. All surfaces must be cleaned and scrubbed down to bare metal and then soaked with disinfectant.

If the vehicle is known to have carried diseased or suspect stock, tracing is required to identify livestock and/or materials transported.

3. Milk trucks

Milk trucks may become contaminated and disseminate the virus in the following ways:

- picking up infected milk from a dairy farm while the disease is incubating;
- allowing contaminated aerosols to be released; and
- mechanical means (by vehicle and driver).

All dairy plants have a truck washing port. Milk trucks must be cleaned and disinfected at the end of each day (inside and out), using an approved disinfectant against the FMD virus. Disinfectants used within the tank must not leave a residue or they must be completely rinsed from the tank.

When picking up milk in a surveillance zone, it is recommended that milk trucks be disinfected before leaving the farm. Attention must be paid to wheels and hose inlets. The trucks exhaust vent must be fitted with hydrophobic membrane-type filter elements rated at 0.2 µm. The filter elements must allow air displacement flow rates during tanker emptying and filling without exceeding tanker vessel design pressures. Filter housings should be selected to permit cleaning and decontamination in place. Filter housing outlets should be protected against the ingress of rain, hose down water and insects.

Each driver must carry C&D equipment and supplies. Any spilled milk must be disinfected. They must disinfect themselves off each property within the surveillance zone.

If it is determined that the tanker is carrying infected milk, the volume of milk is determined, the milk mixed with the correct strength of disinfectant, agitated, left standing for one hour and then properly disposed. The interior of the tanker must be decontaminated along with all hoses and fittings. Principles of vehicle decontamination discussed previously must be observed.

4. Feed trucks

If tracing determines that a feed truck has been on an IP or DCP, the driver should be notified and take appropriate decontamination actions.

If it is necessary on a mixed animal enterprise to allow a feed truck onto an IP or DCP, the route within the IP or DCP should be specified to the driver so as to minimize contamination of the vehicle. The vehicle and driver must be thoroughly decontaminated before leaving the property. Wherever practical, animal feed should be delivered to the outer limits of the property and then transferred to the animals without the vehicle or driver of the delivery vehicle becoming contaminated.

5. Vehicles at alternative disposal sites

Under extraordinary circumstances, carcasses and other contaminated material may have to be moved off the IP or DCP for disposal elsewhere. BAH has permit procedures in place for the transport of carcasses in sealed trailers. When the vehicle is loaded, the carcasses or contaminated material will be oversprayed with disinfectant. The driver and vehicle body, wheels and undercarriage must be decontaminated thoroughly before departure.

6. Disposal site closure

On abandoning the burial site:

- all vehicles and equipment will be decontaminated off the site;
- the areas of disposal will be soaked in disinfectant; and
- the quarantine will remain in force for a period to be determined by the BAH.

II. AREAS OF SPECIAL CONSIDERATION

Decisions concerning C&D on the following areas of special concern will be made during the initial site assessment.

A. Solid/semi-solid manure

- If appropriate, previous manure spreading will be identified to determine disease risk.
- Manure removed from buildings and yards will be stockpiled and oversprayed with disinfectant and either composted or field spread when determined safe.

B. Slurry

- If appropriate, previous manure spreading will be identified to determine disease risk.
- The amount of spare space in a manure pit/lagoon will govern the course of action.

Safety

Manure pits/lagoons present their own special safety issues which will be addressed in the FMD health and safety plan.

C. Dairy equipment

There may be varying amounts of milk in bulk tanks on the IP or DCP. Milk can be rendered safe by adding a disinfectant and agitation. The milk should then held for 1 hour and then discharged to the manure storage system or properly disposed. The bulk tank must be disinfected.

D. Animal feed

There may be varying amounts of animal feed on the IP or DCP. Some may be unaffected, some safely decontaminated, and other feed may have to be destroyed. Decisions on disposition will be made during the initial assessment.

E. Hay and straw

Contaminated bales identified during the initial assessment must be composted, burned or buried or may be used by the disposal team, if appropriate.

F. Grain storage

If no underlying contamination exists in an open storage area, remove approximately 6 inches of exposed grain and overspray the new surface with disinfectant. The removed grain and scrapings should be buried, burned or composted.

G. Bagged feed

Opened bags and porous bags (burlap) of feed should be destroyed by burning, burial or composting. Unopened paper bags can be wiped with disinfectant and stored in an area which has been disinfected.

H. Silage bunker/bag

Remove 6 inches of the exposed face of the silage bunker or bag and spray the newly exposed surface with disinfectant. The removed material should be composted or disposed of.

I. Radios, tape recorders and cameras on IPs/DCPs

This equipment should be held in plastic bags and disinfected when removed from the site.

J. Captive-bolt pistols and firearms

Captive-bolt pistols, firearms and other euthanasia equipment must be cleaned and disinfected and maintained as appropriate.

K. Wool

There are three situations in a disease outbreak where wool and wool bales may cause problems:

- disease diagnosed at shearing;
- disease diagnosed after shearing; and
- disease diagnosed when wool bales have left the property and are in store.

C&D and or disposal decisions will be made during the initial site assessment.

Attachment 1: Equipment checklist

Personal equipment

- Industrial hard hat
- Knee length rubber boots
- Disposable overalls
- Waterproof jacket and trousers
- Cotton overalls
- Flashlight and batteries
- Gloves -industrial
- disposable
- Scrub brushes
- Boot tray or bucket
- Ear protection
- Heavy duty plastic garbage bags
- Spare clothing

Decontamination sites — IP or DCP

- plastic sheeting
- portable shower units
- Water tanks to 1500 gallons
- Water supply
- High pressure power washers
- Hoses (spray attachments)
- Disinfectant supplies
- Scrub brushes
- Boot trays
- Buckets
- Heavy duty plastic garbage bags
- Disposable overalls

Property decontamination

- Water supply
- Portable pumps
- Hoses
- High pressure power washers
- Fiberglass water tanks of sizes up to 1500 gallons
- Universal indicator strips
- Supply of disinfectant registered for use in Minnesota
 - acetic acid, (undiluted vinegar)-EPA Section 18
 - sodium hypochlorite, mixed three parts with two parts of water-EPA Section 18
 - Oxy-Sept, (peroxyacetic acid and hydrogen peroxide) EPA Reg. No. 1677-129, made by Ecolab
 - Oxine, (chlorine dioxide) EPA Reg. No. 9804-1, made by Biocide International
 - Virkon-S (Potassium Peroxymonosulfate) EPA Reg. No. 62432-1 made by Antec
- Soap and detergent
- Fuel for pumps and engines
- Generators
- Portable lighting
- Electric lead and connectors
- Backhoes
- Bulldozers
- Tractor and trailers
- Front-end loaders
- Vehicle-mounted sprayer
- Shovels

- Brooms
- Forks
- Crowbars
- Hand tools
- Plastic sheeting
- Industrial gloves
- Respirators
- Face shields
- Ear protection
- Backpack sprays

Vehicle decontamination at FOC, Road control points, Road and rail transport

- Water supply and tanks for storage
- Buckets
- Detergent and brushes
- Supply of approved disinfectants
- Sponges
- Shovels, hand brushes, scrapers
- High pressure power washers
- Hand sprayers
- Fuel for pump engines
- Face shields
- Personal equipment
- Lifting gear for crates

The equipment above will vary with specific circumstances.

Attachment 2: Suppliers and distributors of disinfectants

The Minnesota FMD Emergency Response Plan document recommends disinfectants that are effective against the FMD virus. The listed disinfectants are registered for use against the FMD virus in Minnesota.

Three products EPA registered, also registered in Minnesota for Foot and Mouth.

1. Oxy-Sept (peroxyacetic acid and hydrogen peroxide), EPA Reg. No. 1677-129, made by Ecolab.
2. Oxine (chlorine dioxide), EPA Reg. No. 9804-1, made by Biocide Int'l.
3. Virkon-S (Potassium Peroxymonosulfate) EPA Reg. No. 62432-1 made by Antec

EPA has also issued two section 18 exemptions to USDA that can be used by anyone, anywhere. They are:

1. Acetic acid (vinegar) used undiluted
2. Sodium hypochlorite (bleach) mixed 3 parts bleach with 2 parts water.

Attachment 3: Overview and strategy MDA C&D Assignments

A response to a Foot and Mouth Disease outbreak will be under the command of the Minnesota Board of Animal Health and Department of Agriculture with support from the Division of Emergency management.

CONCEPT OF OPERATIONS

Minnesota's strategy for combating FMD will be to immediately respond to a clinical diagnosis of FMD by killing the infected herd within 24 hours and disposal of the herd within 48 hours with cleaning and disinfecting of the infected premises to proceed in a timely fashion. MDA will provide lead oversight and technical expertise to the C&D operations

Upon a presumptive positive laboratory diagnosis of an FMD outbreak, MDA staff will be activated:

- The State Emergency Operations Center (SEOC) will activate. MDA will provide a C&D Operations Chief in the SEOC. (MDA's C&D logistics, planning and finance will interact with the SEOC functions but will likely work out of the MDA's ECC during the first days of the response.
- An FOC C&D Coordinator will assist in the establishment of a forward command and staging area at the county courthouse or other nearby site to support site C&D operations.
- A C&D Site Foreman will provide state oversight for C&D procedures on IPs and DCPs.
- C&D crews will be dispatched to the farm under direction of the Site Foreman.
- C&D Logistics will procure and dispatch additional materials and crews to the forward staging area as needed.
- C&D Planning will select C&D methods and products and track C&D status.
- Additional Site Foremen and C&D crews will be dispatched for C&D of neighboring farms as needed.
- If geographically separate outbreaks occur, additional forward command and staging areas will be established

MDA JOB DESCRIPTIONS

C&D Operations Chief – SEOC (one plus relief and support)

- Direction of MDA's C&D operations
- Input to SEOC Planning, logistics and Command
- Brief MDA Management
- MDA Liaison with other agencies
- Provide on-the-job training to relief person

FOC C&D Coordinator-(one per geographic area plus backup)

- Assist in the establishment of a forward command/staging area at the local emergency command center or similar facility with suitable space and communications, (establishes contact with Incident Command).
- Establish and maintain communications with State C&D Operations Chief and Site Foremen
- Stage incoming crews, equipment, materials, personnel; dispatch to individual sites in assigned outbreak area
- Request/order additional resources, track resources received and dispatched
- Move C&D crews and resources between sites in the assigned outbreak area
- Arrange for living needs on site; meals, sleep, portable toilets etc.
- Provide information to PIO assigned to the area

C&D Site Foreman (one per IP and assigned DCPs plus one for relief)

- Work with farmer, Site Vet and Disposal Foreman on C&D plan
- Provides state oversight to C&D crews
- Liaison with farmer

- Work with Disposal Foreman on bedding, feed, manure disposal issues
- Request/order additional materials as needed
- May oversee C&D crews on several contiguous DCPs
- Rotate out of foreman work after 4-7 days
- Report to MDA and SEOC Finance on resources used at site

C&D Planning Team Leader, MDA ECC

- Predict C&D needs for future operational time periods by communicating with FOC C&D Coordinators
- Assign and oversee C&D staff
- Track and report overall status of C&D operations
- Brief and interact with State Planning Section of SEOC
- Provide OJT for relief personnel

C&D Logistics Team Leader, MDA ECC

- Assign and oversee materials dispatcher, Contract procurer
- Report to C&D Operations Chief
- Determine positions which can be staffed by MDA emergency contractors
- Brief and interact with State Logistics section in SEOC
- Provide OJT for relief personnel

Materials Dispatcher-Logistics, MDA ECC

- Prearrange with C&D crew sources
- Prearrange with equipment, material suppliers
- Establish cache(s) of equipment, materials, supplies
- Procure and activate equipment, materials, supplies to forward staging areas from the cached supplies as needed
- Track equipment, materials, supplies ordered and delivered
- Report to MDA Finance
- Provide OJT for relief personnel

C&D Contractor Procurer-Logistics, MDA ECC

- Prearrange with C&D contractors including equipment (front end loaders, skid steer loaders, lighting equipment, operators, laborers)
- Through contractors dispatch crews to forward staging areas
- Procure and dispatch additional contractors and equipment
- Track contractors dispatched
- Arrange for portable office/bunk space delivered to each IP and FOC.
- Report to MDA Finance
- Provide OJT for relief personnel

MDA Crew Recruiter/Assigner, MDA ECC, Logistics

- Receive requests/orders for additional MDA staff
- Locate and assign appropriate staff
- Provide initial incident orientation and briefing to newly assigned staff
- Provide OJT for relief personnel

MDA Equipment/Supplies, MDA ECC, Logistics

- Stock and maintain biosecurity equipment and supplies for MDA staff
- Procure and dispatch additional materials to forward staging areas as needed
- Procure vehicles, cell phones, radio resources, etc. as required
- Report to MDA Finance
- Provide OJT for relief personnel

MDA Finance, MDA ECC

- Receive and track MDA expenditures
- Work with Logistics staff, MDA Budget and Finance and Dept. of Admin on procuring contractors
- Track MDA staff work assignments and hours
- Provide OJT for relief personnel

MDA Safety and Health, MDA ECC

- Advise MDA field staff on safety equipment and procedures
- Work with equipment logistics staff on PPE equipment and procedures
- Provide training

SEOC Joint Public Information Center and Field Operations Center

- Staff JPIC at SEOC
- Support local PIO function at forward command post/staging areas
- Prepare fact sheets as needed

Appendix F

Quarantine and Movement Controls

Movement Restrictions	IP and DCP	IZ	SZ
Susceptible Animals	quarantined all euthanized disposal on site	quarantined no movement intense surveillance	suspend imports, sales, and exhibitions. hi level biosecurity movement to slaughter subject to market conditions
Other Animals/Poultry	quarantined no movement	quarantined movement by permit	hi level biosecurity
People	permit #3	hi level biosecurity	hi level biosecurity
Vehicles and equipment	permit #3	hi level biosecurity	hi level biosecurity
Semen and embryos	disposal on site	no movement	hi level biosecurity
Carcasses, meat, milk, feed, other personal property, waste from susceptible animals	disposal on site or disinfection	disposal on site or disinfection hi level biosecurity	hi level biosecurity
Milk	disposal on site	proper disposal	subject to market condition

Permits

- # 1 – **Animals moved for slaughter** - Permit is for shipment of quarantined animals to a slaughter facility. Use VS Form 1-27, Permit for Movement of Restricted Animals.
- # 2 – **Animals moved into control zones** - Permits for the movement of susceptible animals into the SZ should be issued only in exceptional circumstances. Although such movements may pose no risk of spreading infection, compensation would be payable if these animals become infected. VS Form 1-27.
- #3 - **People, other animals and vehicles** - Movement of people, other animals, vehicles and equipment off IPs, should be restricted and subject to strict quarantine and decontamination procedures to prevent mechanical spread of FMD virus.
- Within the IZ, people who regularly travel from farm to farm and come into contact with susceptible animals must clean and disinfect hands, clothing, tools and vehicles between properties and keep detailed records of their movements. Dogs are to be confined or tied up.
 - Within the SZ, less stringent control procedures may be required.

Appendix G

Foot and Mouth Disease Carcass and Debris Disposal¹

I. SELECTION OF DISPOSAL METHOD

To minimize threat of viral spread, disposal of Foot and Mouth diseased carcasses on site by burial is strongly preferred. In order of preference:

1. burial on the infected premises
2. burial on a neighboring infected premises, carcasses doused with disinfectant prior to being transported between premises
3. burning on the infected premises, carcasses doused with disinfectant if burning will be delayed, and ashes buried on infected premises
4. burning with air curtain incinerator or grinder-hotmix cylinder on the infected premises
5. burial on nearby landfill or other suitable premises, carcasses doused with disinfectant prior to being transported between premises in leak-proof covered containers

It is imperative that disposal method decision-making start upon clinical diagnosis of disease

General factors to be considered are:

- nature and number of carcasses and other material for disposal;
- availability of sites suitable for burial or cremation at or adjacent to the infected site;
- accessibility to disposal site by heavy excavation and transport vehicles;
- nature and topography of soil/rock formation in the available area;
- level of seasonal high water-table;
- proximity to surface water, wells, and drainage tiles and ditches;
- presence of utilities, e.g. water, gas, electricity, telephone lines, drainage, sewerage, other improvements or structures, including aerial lines;
- proximity to built up areas and dwellings (particularly in the case of cremation);
- fire restrictions, hazards (in the case of cremation);
- other weather conditions including prevailing winds (it may be easier to cremate in excessively wet conditions);
- subsequent plans for the use of the area, e.g. the soil may be unstable where burial pits are placed.

Burial will most likely be the preferred method of disposal because it is:

- quicker;
- cheaper;

¹ This State of Minnesota Guidance borrows heavily from the AUSTRALIAN VETERINARY EMERGENCY PLAN aka AUSVETPLAN, 1996, Operational Procedures Manual, Disposal chapter. AUSVETPLAN is a series of technical response plans that describe the proposed

Australian approach to an exotic animal disease incursion. The documents provide guidance based on sound analysis, linking policy, strategies, implementation, coordination and emergency-management plans. The Agriculture and Resource Management Council of Australia and New Zealand produces the AUSVETPLAN, available on line at:

<http://www.aahc.com.au/ausvetplan/index.html>

Other sources of information and guidance include

“Emergency Carcass Disposal Recommendations”, MPCA draft document, Brynildson, and Jakes, review and comment by Anderson (DNR) and Friendshuh (BAH)

“Part H- Disposal”, pages 87-90, apparently a portion of a Department of Agriculture document unknown title document, pages 99-105, disposal and disinfection procedures

- environmentally cleaner; and
- easier to organize, i.e. less outside resources are required.

Large portions of Minnesota do not have adequate depth of acceptable soil type to seasonal high groundwater, or to bedrock to allow burial.

II. Personnel required

Each site's disposal personnel will include a person to decide the site and method to be used, one or more "Go Teams" to do the disposal, and a visit from a disinfection team when the disposal is done.

Site and Method Decider- a person activated upon clinical diagnosis. Consults maps, local experts, and the farmer, and decides what method and site will be used if presumptive diagnosis is positive.

Fuel Go Team- delivers fuel to site from stockpile, procures additional fuel

2 operators

2 Logging boom trailer

Fire Platform Construction Go Team- builds fire platform, loads carcasses, tends fire, buries ashes

Foreman, 2 operators, 3-4 laborers

Front end loader

Truck to haul coal and ties from road to burn-site

Logging boom trailer, logging skidder, fuel oil delivery truck

Burial Go Team- excavates pit, buries carcasses

Foreman, 1-2 operators, 2-3 laborers

Excavator, front end loader

Disinfectant Go Team-disinfects Construction Go Team personnel and equipment

Foreman, driver, 1-2 laborers

Vehicle with water and disinfectant tanks, power sprayer, personnel showers

Safety considerations

Safety of personnel is an over-riding consideration. Aspects to consider include: hygiene of the personnel working on the site (Tyvek coveralls, boots, gloves, and disinfection at end of job); the availability of rescue equipment if a person falls into the pit or if the pit wall collapses; hearing and dust protection, hard hats and safety boots. All operations should be controlled by the site supervisor and staff must be properly briefed before the commencement of operations.

III. Carcass Management Disposal on the infected premises

Disposal of animal carcasses and other infectious material may involve some adverse environmental consequences. It is important for the environmental aspects of proposed disposal activities to be properly considered, with advice from environmental agencies where possible, so as to ensure that the impact of such consequences be minimized. It is probably more important to handle disposal on the infected property to prevent spread of the disease.

Disposal off the infected premises

Where burial is not practical on the infected premises, consider transporting carcasses and/or infectious material to an adjacent site for disposal by burial. Candidate off site areas may include sanitary landfills, closed landfills owned by the State, other closed landfills or demo fills. This may occur when available space or water-table effectively prevent on-site disposal, or where infected premises are adjacent or in close proximity to a potential common disposal site.

Transport should be in a leak-proof container, such as a large dumpster, lined with tough

polyethylene and tightly covered, or a leakproof trailer with end-gate gaskets. It should not be overloaded — one to two feet (depending on distance to be traveled and temperature) should be left clear for expansion of carcasses.

Carcasses should not be slashed before loading. Vehicles should travel slowly to avoid splashing of contaminated material and should be accompanied to minimize the chances of accidents and to prevent breaches of biosecurity. The escorting officer must carry a supply of an approved disinfectant and basic equipment to deal with minor spills en-route. All vehicles must be cleaned and disinfected before leaving the infected premises and after unloading.

Sources of dumpster liner:

Sources of leakproof trailers:

Sanitary landfill disposal

Closed landfill disposal, especially sites in the CLP

Carcass management prior to disposal

Probable inactivation of virus within animal by production of lactic acid by decay

Possible spread of virus from outside skin of animal and adhering manure by scavengers, wind, etc.

Disinfection of carcasses prior to disposal etc

What disinfectants recommended by BAH and Ag?

Bury or burn ASAP after killing etc

Douse animal piles with suitable disinfectant etc

Is this useful? Any special techniques?

Consider runoff, scavenger control, etc. in siting carcass piles etc

IV. Burial

Site selection

A person knowledgeable about soil and groundwater must be activated as soon as a clinical diagnosis is made. This person will work with the landowner's personal knowledge, the County Soil Map, Extension or NRCS agents, and others will provide information and advice regarding potential burial or burn sites. Test trenching, borings, or other site investigation may be done while awaiting presumptive test results. Important considerations for burial site selection include;

- *access to the site* — for both equipment to dig the burial pit and for the delivery of livestock, carcasses or other materials to be buried;

- *environmental* —

- distance to surface water and wells (150 feet to a private well, 1500 feet to a public water supply well, further if possible with sandy or gravel soils);

- depth to water table (allow for 3 feet of cover or use a mound, allow 3 feet of burial chamber per layer of cows, allow 3 feet from bottom of trench to seasonal high water table in tight soils and 5 or more feet in loose soils);

- presence of fractured bedrock/karst conditions under site;

- proximity to buildings, especially houses, neighbors, or public lands including roads;

- slope of the land and drainage to and from the pit area, select high ground where possible;

- type and permeability of soil (fine grained clayey soil preferred);

- sufficient space for temporary storage of overburden; and

- direction of prevailing wind (odor);

- *construction considerations* — avoid rocky areas (slows digging and increases costs)

but select soils with good stability capable of withstanding the weight of equipment

used to construct and fill the pits. Use a "double mound" method of storing excavated top soil separately from excavated subsurface soil. Surface runoff should be prevented from entering

the pit by the construction of diversion banks if required. Similar banks should be

constructed to prevent any liquids escaping from the burial site. Fencing may be

necessary to exclude animals until the site is safe for use.

Earth-moving equipment

The preferred equipment for digging burial pits is an excavator. This equipment is the most efficient available for the construction of long, deep, vertically sided pits. Other advantages include the ability to easily store topsoil separate to subsoil and the equipment can be used if required to fill the pit with carcasses or other materials and closing the pit without disturbance of the carcasses.

Loaders, bulldozers, road graders and backhoes (for small jobs) may be used if excavators are unavailable. With the exception of backhoes, all other equipment requires the continual movement of the machine over the site while digging the pit. Excavators and backhoes essentially remain in a fixed position while digging, hence they move soil faster, with less cost and less damage to the site surrounding the pit. Most excavators have an attachable hammer for rock work if necessary.

Frost considerations

Burial pit construction

Gopher State One Call must be notified of planned excavation: 1-800-252-1166.

The dimensions of the burial pit will be dependent on the equipment used, site considerations and the volume of material to be buried. The preferred dimensions are for pits to be as deep as practically possible (reach of machinery, soil type and water-table level being the usual constraints), with vertical sides. The pit should be no wider than can be filled evenly with the material to be buried with the available equipment. For example if a dozer is used to dig a pit, then it should be no more than one blade width, say 9 feet, because it may be very difficult to push carcasses into the pit from one side and evenly fill the pit. The aim should be to avoid having to move carcasses once they are in the pit. The length of the pit will be determined by the volume of material to be buried.

In designing the dimensions of the pit, consideration needs to be given to the method to be used to fill the pit with carcasses or other material. Generally carcasses will be unloaded (out of tip trucks) or pushed into the pit (loader or dozer) from one of the long sides. Excavators can be used to fill pits with carcasses placed close by the pit. This is especially useful if soil stability does not permit trucks or other heavy equipment to operate close to the pit edge.

The following guidelines may be of assistance in determining the pit volume required. The base of the pit must be at least 3-5 feet above the water-table.

1. If there are 14 feet from ground surface to seasonal high groundwater, then leave 5 feet of separation to groundwater, use 6 feet of burial chamber for two layers of cows, and leave 3 feet of cover material.
2. If there are fewer than 14 feet to groundwater or bedrock, variations such as
 - a. Three feet of good soil separation, 3 ft. chamber of one layer of cows, plus 3 feet cover = 9 feet.
 - b. Three feet of good soil separation, 6 ft. chamber of two layers of cows, mound cover=9 feet.

On average, allow a fill capacity of about 2 cubic yards for each adult cow or 5 adult sheep or pigs. In addition, at least 3 feet of soil is required to cover carcasses, to ground level or top of mounded soil

	Cover	Bottom of trench to ground water	Cubic yards per animal	Cubic yards per 100 animals	Length needed for 100 animals for 9 ft wide X 6 ft depth burial chamber *
Cow	>= 3 ft.	3-5 ft.	2 yd ³	200 yd ³	100 feet
Pig	>= 3 ft.	3-5 ft.	0.4 yd ³	40 yd ³	20 feet
Sheep	>= 3 ft.	3-5 ft.	0.4 yd ³	40 yd ³	20 feet

*remember, a 6 foot deep burial chamber will require 9 foot excavation to allow for 3 foot cover

Some pit capacity must be reserved for contaminated bedding, straw, feed, and manure from the barns of infected animals. This material may pack well around and between carcasses in the pit.

When closing the pit, clayey surplus soil should be heaped over the pit as an overfill cap. The weight of soil acts to stop carcasses rising out of the pit due to gas entrapment, prevents scavengers digging up carcasses, helps filter out odors and assists in absorbing the fluids of decomposition. Do not pack the cap down, because decomposition gas will crack a tightly packed cover and allow bubble and fluid loss. Do we need vent pipes or similar??? After pit subsidence it will be necessary to replace any topsoil not utilized during pit closure.

Figure 1 Disposal of carcasses by burial

Gas production

Gas production from decomposition within unopened carcasses may result in considerable expansion in the volume of the buried material to the extent that the surface of the closed pit may rise and carcasses may be expelled from the pit. **It is recommended that large animal carcasses be opened by slashing the rumen of cattle or the caeca of horses** to permit escape of gas. There appears to be little benefit in opening small animal carcasses. If carcasses are to be opened this should be undertaken at the side of the pit, under no circumstances should personnel enter the pit during filling.

Lime may be added to pits to prevent earthworms bringing contaminated material to the surface after pit closure. Cover the carcasses with soil, 400 mm is suggested, and add an unbroken layer of slaked lime [Ca(OH)₂] before filling is completed. Lime should not be placed directly on carcasses because it slows, and may prevent, decomposition. Personal safety protection during lime placement ? respirators etc?.....

Site inspection

Inspection of the burial site after closure is recommended so that appropriate action can be taken in the event of seepage or other problems. The objective is that the site should return to its original condition. Before restocking is permitted the burial site should be again inspected to ensure there is no possible biological or physical danger to stock. **This would normally be several months following pit closure.** Is there some agency that would inspect or record the location of burial sites???

V. Cremation

Cremation should be considered only when burial is not possible because of high water table, extremely rocky conditions, or other circumstances. Available methods include pyres, existing incinerators and pit burning. Of these pyres are practical for situations with time pressures and numerous carcasses.

Pyres

The principle is to place carcasses on a platform of sufficient combustible material, ensuring the arrangement of fuel and carcasses allows adequate air flow to enter the pyre from below, so thus achieving the hottest fire and the most complete combustion in the shortest time. Ashes and debris are then buried on site.

Site selection

Important considerations are:

- *location* — choose a flat or high area, considering the possible effects of heat, smoke and odor that will be generated by the fire on nearby structures, under and above ground utilities, roads and residential areas;
- *access to the site and stable soil*—for equipment to construct the pyre and maintain the fire and for the delivery of fuel and livestock, carcasses or other materials to be burned;
- *environmental* — there should be sufficient depth to groundwater to allow ash burial, 3-5 feet with most soils. There should be an adequate fire break around the pyre — consult with Department of Natural Resources and local fire chief for advice and permits, and for fire equipment to stand near-by but not on the site during the burn;
- *fuel* — pyres require considerable fuel to achieve complete cremation. The amount and type of fuels available will vary considerably, all required fuel should be on site before the burn is commenced.

Preparation of fire-bed

The fire line should be a platform sited at 90 degrees to the direction of the prevailing wind to maximize ventilation. Air space can be provided by digging trenches under the pyre and/or elevating the fire-bed. Fuel supplies should be stacked and the fire built from the upwind side and carcasses loaded from the opposite side. Platforms should usually be built on ground surface to facilitate ventilation of the fire with ash buried in a trench dug later or under a mound. A platform can be built in a shallow trench to facilitate ash disposal, but that may lead to water problems in the trench if it rains.

- *Width* of the fire-bed is governed by the size of carcasses to be burnt, for adult cattle allow 8-10 feet. A double width fire line could be built only if equipment capable of tending the fire from one side in smoke will be available.
- *Length* — allow 3 feet per adult cow. If there is more than one line, allow sufficient space between fire lines for tending and refueling the fires

The pyre may be built within a shallow trench to facilitate burial of ashes after cremation. If building the fire-bed flush with the ground, dig trenches about the width of a backhoe shovel to act as air vent channels, in the same direction as the prevailing wind at about 3-4 foot intervals under the length of the proposed fire-bed. If elevating the fire-bed lay rows of baled straw and

heavy timbers parallel to the prevailing wind and then another layer of timbers crossing the bottom layer with a gap of about ½ to 1 timber-width between timbers. Then lay other fuel, such as lighter timber, chunks of coal, and/or straw bales over this timber support. Then lay a third layer of timbers.

Sources of timber

Weathered creosoted railroad ties from Burlington Northern Sante Fe Railroad (Greg Jefferies)

About 65,000 scrap ties in MN. Now in BNSF system

Of about 1million BNSF ties about 200,000 not now under disposal contract

Weathered creosoted telephone poles from PRI near St Cloud

Gary Olson 612-882-1224, 952-435-5311 home, 612-986-7306 cell

4 ft to 30 ft lengths of 6 in to 18 in poles at \$1-1.50 per foot

40 ft flatbed would carry about 35,000 pounds (about 40 40ft poles)

separation of creosoted from PCP poles pretty accurately

weathered cedar cross arms also available

Green 8 foot softwood timber from a paper mill

International Paper at Sartell

Potlatch at Brainerd

McMillian Bloedell at Deerwood

Dried ___ foot hardwood from a firewood supplier

DNR Forestry has contacts and will be placed into fuel supply logistics position

Mill slab, bark, sawdust from _____

Straw from local sources, preferably in bales or large rolls, depending on platform style chosen

Coal chunks from (power plants?), Great Western Dock and Terminal on Childs Road in St Paul, 651-774-5934
eastern Kentucky stoker coal, >5 ton for \$75 per ton, open M-F 7-4:30

Fuel oil from local sources

Possibly use Closed Landfill Program sites for stockpiling starter amount of ties and coal, perhaps use those locations for drill site for constructing some test piers.

Delivery of timber by fuel team to the site on logging trailers with grappling booms for unloading. These trailers deliver ties to the end of the farm's driveway, but do not enter the infection area. The ties or timber are moved to the platform area using a logging trailer with grappler boom. This trailer stays within the infected area.

Stake out fire platform area 10 foot width by 300 foot length per 100 cows

Use logging skidder or front end loader to roughly smooth the platform area or to dig a shallow 1 foot by 7 foot wide trench. Use the "inside" logging trailer with grappling boom to roughly place ties or timber in place

Method A.

Roll big straw roll out inside shallow trench. Place ties along top edge of each side of trench. Place 8 foot ties across trench at approximately 3 foot intervals. Place pallets across trench to provide quick fire and platform for coal. Place a several foot thick layer of coal on pallets. Place carcasses, more coal, fuel oil.

Method B. First row of 8-foot length timber laid parallel to prevailing wind, 1/2 to 1 timber-width apart

Second row of timber, (if logs roughly V-notched with chain saw to prevent rolling)

Straw and slab wood placed between first row logs

Second row of timber logs placed perpendicular to prevailing wind

Using front-end loader place slab wood, saw dust, coal, bark wood placed between second row logs

Third row of timber placed

Place the carcasses using logging trailer grappler or front-end loader

Fuel oil, ___ gallons per cow, poured onto carcasses and into platform using a local fuel oil delivery truck that enters and is kept in the infected farm. This truck also fuels the equipment.

Carcasses should be doused with disinfectant if significant time passes between killing and ignition. Guard against bird and other scavengers before ignition. Stack carcasses across the fire-bed with larger carcasses on the bottom and smaller carcasses on top, preferably with the carcasses on their backs and alternating head to tail, if possible. Excavators or front-end loaders or logging trailers with grappling booms are best, but lifting jibs, tractor fork-lifts or cranes and chains can be used. After placing carcasses on the fire-bed the extensor tendons may be cut to prevent legs being extended during burning.

Equipment required

- Logging trailers with grappler booms to transport timber to site driveway
- Trailers to transport straw to site driveway
- Dump truck and/or trailers to transport slab wood, saw dust, coal etc to site driveway
- Logging trailer to transport fuel from driveway to platform site, and to place carcasses
- Front end loader or backhoe and small dump truck to transport fuel from driveway to burn site and to replenish fire as needed
- Front end loader or back hoe or similar to dig shallow trench and/or wind channels under fire bed
- Small fuel oil truck to fuel onsite equipment and douse carcasses
- Fuel oil delivery truck to deliver to site driveway
- Back hoe or similar to drop additional fuel onto fire over 24-48 hours
- Bobcat or similar to move bedding straw, etc. from barn to fire site
- Front end loader or similar to bury ashes

When loading of the carcasses is complete and weather conditions suitable, saturate the fire-bed and carcasses with diesel or heating oil __ gallons per carcass (NOT GASOLINE) and prepare ignition points about every 10 yards along the length of the fire-bed. These can be made of rags soaked in fuel oil or kerosene.

Remove all vehicles, personnel and other equipment well away from the fire-bed. Start the fire by walking into the wind and lighting the ignition points along the way. The fire must be attended at all times and be re-fueled as necessary, use a tractor with a front mounted blade or a front-loader. Ensure any carcasses or parts thereof that fall off the fire are replaced on the fire. A well-constructed fire will burn all carcasses within 48 hours. The ashes should be buried and the site restored as well as possible.

Fuel requirements

Local availability will govern the type and amount of various fuels required. The following can be used as a guide per adult cow. For fuel estimation, one adult cattle carcass is equivalent to 4 adult pigs or shorn sheep, or 3 adult woolly sheep.

- heavy timber such as creosote treated ties or poles, pulpwood logs, firewood logs, waste building timbers, (not pentachlorophenol or green treated CCA wood) 3 pieces, 8 ft. x 1 ft. x 1 ft. for method B, 2 pieces for method A
- straw 1-3 bales or big roll bales
- small timber 50 pounds (pallet wood, slab wood, etc.)
- coal 500 pounds method B -1000 pounds method A, large chunks better than small
- liquid fuel, more than one gallon per carcass, fuel oil or diesel, NOT GASOLINE. Retain reserve supplies. (consideration might be given to dried corn, which has fuel value similar to wood. Perhaps corn could be blown into the fire from the side as the other fuels burn down?)

Chart 2 Fuel calculation chart or equation

Figure 2 platform of fuel and carcasses

Tires would provide long-lasting fire source in a pyre, however, tires create excessive air pollution and steel belted tires leave extensive tangles of hard-to-manage wire after burning. This will be difficult to bury and will interfere with later use of the area.

Air Curtain or Pit burning

Air curtain incineration involves digging a trench. Fuel and carcasses are loaded and the fire started. A high capacity fan and manifold system directs volumes of air from one side of the trench at high velocities. The air travels across the top of the fire and it is then drawn into the fire down the opposite side of the trench. The angle of the airflow results in a curtain of air acting as a top for the incinerator and provides oxygen that produces high burn temperatures. Sufficient hot air recirculates within the pit achieving complete combustion. Additional fuel is required to initially establish combustion, but once operating the continuing fuel requirement is reduced. The fire burns extremely hot, consumes fuel quickly, and produces little smoke.

This may be an option for sites where enough land is not available for burial or platform burning; or a site with down-wind nearby population. Pit burners may only be suitable on a relatively small scale. They would appear to be especially suited to pigs and fat sheep whose high fat content would support burning. Once stable continuous burning is achieved in the pit it becomes very efficient. Pit burning has the advantage of being transportable, but time for transport and set-up would likely be greater than 24-48 hours.

Pit burn site selection

- soil- pit construction should not be attempted in sandy soils, use of this method relies on having stable, vertical pit walls to support combustion air equipment and heavy equipment to deliver carcasses and additional fuels.
- Ground water table- depth of pit should be such that ground water does not seep into the pit
- Pit constructed based on prevailing wind direction, to aid in adding fuel and carcasses to the pit and to avoid blowing air against the wind.
- Dimension of pit- if the pit is too wide the efficiency of the air curtain is affected, and the air blows across and out instead of down.
- Possibly use a trench box, or stacked jersey barriers or similar to provide stability in pit

Source of mounted fans in Minnesota

Hot Mix Plant Burner

Bring in a portable tire chipper and mate it to a hot-mix burner?

Use bag house or water scrubber?

VI. ITEMS REQUIRING SPECIAL CONSIDERATION

All contaminated and potentially-contaminated carcasses, animal products, materials and wastes will be disposed of by one of the methods outlined above. However specific disposal considerations apply to the materials listed below.

Manure lagoons

Milk and dairy products

The disposal of milk products presents particular difficulties because large volumes are often involved. It is essential that milk should be treated to inactivate any virus before disposal. How??? Following inactivation, disposal options need to be considered. Usually milk held on farm is in small quantities and can be disposed of in the burial pit. On those properties where carcasses are cremated, milk should be disposed of in the effluent pit.

Where there are large volumes of contaminated milk at dairy factories or in tankers this should always be inactivated then pumped into a shallow fenced-off pit, which is covered over after the milk has evaporated or seeped into the surrounding soil.

Effluent (washing from dairy factories) presents special problems because of sheer volume. Chemical treatment of large volumes of effluent may render it unacceptable to a sewage disposal unit but 0.2% citric acid should cause no problems. The actual danger from effluent is greatly reduced by dilution and the free use of above normal quantities of water in the usual cleaning processes will further reduce the danger.

Where effluent is normally irrigated over pastures these should not be grazed for two weeks (or such period as described in the relevant Disease Strategy) after irrigation.

Rennet, casein, whey or other wastes must not be sprayed over pastures, discharged into drains, or fed to animals, unless treated with disinfectant, as for milk.

Semen and ova

Because of the potential value of such genetic material stored on infected premises should be reported to the Department of Agriculture to determine if the material constitutes a risk and if it is required to be destroyed.

GLOSSARY

Amplification (of virus)	Increase in the amount of virus. Some infected animal species produce much larger amounts of virus than others, these are known as amplifying hosts.
Animal by-products	Meat products and products of animal origin (e.g. eggs, milk) for human consumption or for use in animal feeding.
Surveillance zone (SZ)	A area larger than an Infected Zone (initially, potentially the entire state) where restrictions will reduce the chance of the disease spreading further afield. The SZ may reduce in size as confidence about the extent of the outbreak becomes clearer. In principle, animals and specified product will only be able to be moved out of the SZ into the free area by permit.
Dangerous contact animal	An animal showing no clinical signs of disease but which, by reason of its probable exposure to disease, will be subjected to disease control measures.
Dangerous contact premises	Premises that contains a dangerous contact animal(s).
Disease agent	The organism that causes the disease.
Disposal	Sanitary removal of animal carcasses and contaminated animal products by burial, burning or some other process so as to prevent the spread of disease.
Infected premises	A defined area (which may be all or part of a property) in which FMD is believed to exist.
Field operation center	An emergency operations center responsible for the command and control of field operations in a defined area.
Infected Zone	A relatively small declared area (compared to a SZ) around an infected premises that is subject to intense surveillance and movement controls
Movement control	Restrictions placed on movement of animals, people and things to prevent spread of disease.
Quarantine	Legal restrictions imposed on a place, animal, vehicle or other thing limiting movement.
Risk enterprise	Livestock-related enterprise with a high potential for disease spread or economic loss.
Role description	Statement of functions of a position within the overall operation.
Sentinel animals	Animals of known health status monitored for the purpose to detect the presence of a specific exotic disease agent.
Silage bunker/bags	Structure in which silage is stored.
Slurry tank	A tank that contains a suspension of solids in liquid, usually animal manure.
Surveillance	A systematic examination and testing of animals to determine the presence or absence of the FMD virus.
Suspect animal	An animal which may have been exposed to the FMD virus such that quarantine and intensive surveillance, but not pre-emptive slaughter, are warranted; or, an animal not known to have been exposed to the FMD virus but showing clinical signs requiring differential diagnosis.
Suspect premises	Premises containing suspect animals that will be subject to surveillance.
Trace-back	The process of locating animals, persons or animal products that may be implicated in the spread of disease.
Vector	A living organism (frequently an arthropod) that transmits an infectious agent from one host to another. A biological vector is one in which the infectious agent must develop or multiply before becoming infective to a recipient host. A mechanical vector is one that transmits an infectious agent from one host to another but is not essential to the life cycle of the agent.
Vector control area	An area in which the containment, control or reduction of specified vector populations is conducted.
Zoning	The process of defining disease free and infected area in order to facilitate trade.
Zoonosis	A disease that can be spread between animals and people.