

# Emergency Livestock Disposal Sites

## INTRODUCTION

Death of livestock is a normal occurrence and represents a loss to the livestock operation. Even the best livestock producers will have losses of two or three per cent, but higher rates can occur. Events such as fire, building collapse, suffocation or the outbreak of a major disease will result in a large number of animal deaths. Producers are encouraged to develop a plan to dispose of significant numbers of animal carcasses in the event of a catastrophic loss. The outbreak of a foreign animal disease will result in the death of many animals at the same time. Diseased animals are sometimes depopulated immediately to eradicate the disease. If the disease is readily transmissible, neighbouring animals and animals with previous contact with the infected herd are sometimes depopulated to prevent the disease from spreading. Selecting and executing a method of carcass disposal is a formidable task, so co-ordination between federal, provincial and municipal governments will be required.



## BACKGROUND

Instances of foreign animal disease are common. In Canada in 2009 there were 15 confirmed cases of Anaplasmosis in Manitoba, and nine in British Columbia; two cases of Anthrax in Saskatchewan; one dairy cow infected with Bovine Spongiform Encephalopathy (BSE) in Alberta; two elk herds infected with Chronic Wasting Disease (CWD) in Saskatchewan; two cattle herds infected with cysticercosis in Ontario; and six sheep flocks and/or goat herds infected with scrapie.

The following cases are examples of foreign animal disease events.

### Foot-and-mouth disease (1952)

A well-known outbreak of a foreign animal disease in Canada is the Saskatchewan Foot-and-mouth disease outbreak of 1952. The disease was officially diagnosed on February 25, 1952 near Regina, and depopulation was complete by May 4, 1952. In total, 1,742 head of livestock were destroyed, including 1,346 cattle, 296 hogs, 97 sheep, two horses and one goat. Burial pits were excavated on 10 infected farms, and livestock from 18 infected herds and 12 "contact" herds were transported to the farms for disposal. An infected dairy farm near Regina was the first burial site, located about one mile west of the RCMP grounds along Dewdney Avenue. Soil frozen to a depth of five feet was thawed by burning coal and oil so PFRA could prepare the trench, which measured 200 x 35 x 10 feet and held 200 head of cattle. Overseeing the operation were the Associate Chief Veterinarian for Canada and the Federal District Veterinarian for Saskatchewan.

### U.K. Foot and mouth disease (2001)

The scale of this epidemic presented unprecedented challenges in terms of carcass disposal, prompting authorities to seek sites for large-scale burial. A total of seven sites were identified as suitable, and work began almost immediately to bring them into use (five of the seven sites were operational within eight days of identification). In total, 1.3 million carcasses (about 20 per cent of the total six million) were disposed of in these mass burial sites. The U.K. experience demonstrated the value of thorough site assessments.



## **Bovine Spongiform Encephalopathy (2003)**

A more recent BSE event demonstrated the difficult nature of carcass disposal. A single animal tested positive for BSE on May 12, 2003, and about 2,300 head of cattle were subsequently destroyed and tested to discover if there were more instances of the infection. The carcasses tested negative and were disease-free, and the search began for a disposal location.

Provincial Crown land was the first choice, so a community pasture was investigated for environmental suitability. Test drilling determined that the subsurface geology was suitable for disposal by burial. However, the site was not suitable to local stakeholders. Fortunately, time was available to search for a disposal site, since the carcasses were in cold storage, the disease was not spreading, and there were no further carcasses accumulating. Alternative sites in three RMs were considered, and all three RM councils were helpful and supportive - they likely recognized the need for a suitable disposal location. A private landowner within the above RMs offered a location that proved to be environmentally secure.

## **Avian Influenza (2004)**

On February 19, 2004, the Canadian Food Inspection Agency (CFIA) confirmed the presence of Avian Influenza in the Fraser Valley area of southern British Columbia. In early April, the poultry industry suggested depopulation of birds in the Fraser Valley. Approximately 14 million birds from 600 farms were depopulated by the end of May; about 1.3 million birds on 42 farms were infected with the virus.

Carcass disposal presented a unique challenge, because the Fraser Valley is densely populated with both people and livestock. Further, onsite burial was not an option because shallow aquifers approach the ground surface. Many disposal options were considered, because the capacity of a single method was insufficient to handle the large volume of bird carcasses. Positive birds were disposed of largely by composting and incineration, while negative birds were processed by markets, rendering and composting.

## **EMERGENCY PREPAREDNESS**

The CFIA is responsible for directing the disposal of mortalities resulting from a federally reportable disease, and the province and municipality involved may be expected to provide support. If a large number of animals or poultry die due to an unlisted infectious disease, fire, flood or other natural disaster, the appropriate municipal authorities and various provincial government departments will direct disposal of the mortalities.

Rapid response is critical in the event of a foreign animal disease. Delays in determining and implementing a suitable containment, destruction and disposal plan may significantly increase the number of carcasses that need to be managed due to increased exposure to the disease agent. If the disease is zoonotic (capable of transfer from animals to people), the public may be at risk, as well.

Advance planning will facilitate effective animal disposal, and identifying sites in advance of an emergency will reduce pressures of limited time during the emergency.

## **COMMON DISPOSAL METHODS**

In an emergency, on-farm disposal is preferred because transportation is not required. Producers are encouraged to consider the environmental suitability of their farm for disposal of livestock in an emergency. However, on-farm disposal may not be an option for some farms due to environmental constraints. Where animals have been moved off the farm of origin and/ or are in transit, an alternate disposal location may be necessary. Ideally, this location would be suitable for burial, incineration and composting.

Common methods of animal disposal include rendering, burial, incineration and composting. Landfills are commonly used for animal disposal in many parts of the world, but in Saskatchewan very few landfills accept carcass material. Consideration should be given to the use of landfills for this purpose.

Rendering should not be relied upon for emergency disposal. Local capacity is limited to about 600 tonnes per week without disruption to normal processing.

Burial, incineration and composting are therefore the most likely emergency disposal methods. A comparison of disposal options is provided below.

## LANDFILLS

Landfills have been used as a means of carcass disposal in several major disease eradication efforts, including the 1984 and 2002 Avian Influenza outbreaks in Virginia, the 2001 outbreak of Foot and mouth disease in the United Kingdom, and the 2002 outbreak of Exotic Newcastle disease in southern California.

Landfilling of carcasses represents a means of waste containment rather than elimination, and long-term management of the waste may be required. According to a United States Department of Agriculture report, several risk assessments conclude that disposal of potentially Transmissible Spongiform Encephalopathy infected carcasses in an appropriately engineered landfill site represents very little risk to human or animal health.

During an emergency or instance of catastrophic loss, response time is often very limited, and landfills offer the advantage of infrastructure for waste disposal that is pre-existing and immediately available.

Because landfill sites exist prior to times of emergency, set-up time would, in theory, be minimal. However, time is required to establish availability of the site, and this is best done in advance of the emergency.

Landfills are typically owned by a municipality (urban or rural) or a private landowner. Also, landfills are governed by *The Municipal Refuse Management Regulations* handled by Saskatchewan Environment. Therefore, consultation with the landowner, municipality and Saskatchewan Environment is necessary. Disposal in a dedicated area of landfill is an option to be considered. Additionally, when new landfills are proposed, use of the landfill in emergency situations should be considered.

## PRIVATE LAND

Private land could be considered for potential emergency disposal sites. Purchase of the land by the Province becomes important, since the potential availability of private land is considered less secure than public land. Also, existing intensive livestock operations are very often suitable disposal sites, and the operator should consider if they are willing to accept livestock from neighbouring farms.

The property could be purchased from the landowner by the Province, and the land would then become Crown land. Crown land, landfills and private land as potential locations are summarized below. Vacant Crown land is preferred, but limited in land area and not evenly distributed throughout the province, so other options should also be considered.

## PROPOSED CRITERIA

The disposal of mortalities must not adversely impact the environment or public health. The site should have natural features that provide environmental protection for a variety of disposal methods. The Site Characterization Manual for the Development of Intensive Livestock Operations and Earthen Manure Storage (2005) provides groundwater protection criteria that apply to disposal by burial. Managing Livestock Mortalities (2010) provides additional criteria and considerations for site selection.

Proposed criteria are presented in Table 1 below. Additional selection criteria must be defined in cooperation with stakeholders, so the site will be available in an emergency for burial, incineration or composting.

Table 1: Proposed criteria.

Criteria	Test
Resident	500 m
Well Logs	Indicate geologically secure
Aquifers	> 15 m beneath surface
Oil/Gas wells	none on 1/4 section
Utilities (available)	Yes
Water (available)	Yes
Underground	Identify, avoid and determine separation distance
Air Photo	Use digital photo to identify location of residents and confirm land forms
Groundwater Velocity	< 0.15 m/yr (from Site Characterization - requires on-site testing)
Road	> 100 m
Road all-weather	< 2.5 miles
Railway	> 50 m
Surface Water	> 100 m
Geology	Exclude Alluvial plain, GlacioFluvial, Delta, Meltwater Channel
Cemetery	100 m
Gravel Pit	> 100m
Reserve	Excluded
Provincial Park	Excluded
Regional Park	Excluded
Town	1000 m

## SITE SELECTION

Characteristics of potential sites will determine their suitability. Soil conditions, proximity to water resources and setback distances need to be considered. Sites should be “pre-screened” for potential suitability using available information. These sites require detailed investigation prior to use.

On-site investigation (including drilling for soil samples) is required to confirm the properties of the pre-screened sites. If site conditions are found to be environmentally secure, and other criteria are favourable, then the site may be considered for emergency use. Ideally, any other local or provincial approvals that may be required would be in place for preselected sites.

## DISPOSAL METHODS

Option	Advantage	Disadvantage	Capacity <sup>1</sup>	Comments
Rendering	<ul style="list-style-type: none"> <li>Value-added products</li> <li>Destroys most pathogens</li> </ul>	<ul style="list-style-type: none"> <li>Transportation required</li> <li>Supplemental treatment required to deactivate TSE</li> </ul>	635 tonnes/week without disrupting normal operation. 3,200 tonnes/week max.	Available volume is limited, as capacity is required for routine processing. SRM disposal may not be available.
On-site burial	<ul style="list-style-type: none"> <li>Transportation not required</li> <li>Environmentally secure in much of Saskatchewan</li> <li>Rapid</li> </ul>	<ul style="list-style-type: none"> <li>Geotechnical investigation required to confirm site conditions</li> </ul>	2,600 tonnes/week/ excavator <sup>2</sup>	Much of Saskatchewan is underlain by till that is effective at containing contaminants
Central burial	<ul style="list-style-type: none"> <li>Geotechnical investigation may occur in advance</li> <li>Provides location for off-farm livestock</li> </ul>	<ul style="list-style-type: none"> <li>Transportation required</li> </ul>	70,000 tonnes/ quarter section <sup>3</sup>	A central burial site identified in advance be be valuable in an emergency
Composting	<ul style="list-style-type: none"> <li>On or off farm</li> <li>Publically acceptable</li> <li>Destroys most pathogens</li> </ul>	<ul style="list-style-type: none"> <li>May not deactivate TSE</li> <li>Careful management required</li> </ul>	12,000 tonnes/ quarter section <sup>4</sup>	End-use of compost may be dependent on nature of disease
Landfill burial	<ul style="list-style-type: none"> <li>Wide geographic dispersion</li> <li>Infrastructure exists for rapid disposal and long-term management</li> </ul>	<ul style="list-style-type: none"> <li>Agreements/ approvals may be required</li> <li>Transportation required</li> </ul>	800 tonnes/acre <sup>5</sup>	Saskatchewan Environment and the RM may have approval conditions
Incineration	<ul style="list-style-type: none"> <li>Destroys most pathogens</li> <li>Deactivates TSE with proper operation</li> </ul>	<ul style="list-style-type: none"> <li>Usually operated by contractors</li> </ul>	420 tonnes/week/ air-curtain <sup>6</sup>	Infrastructure is usually required

<sup>1</sup> The capacity will vary according to a number of variables. An estimate is presented for comparison.

<sup>2</sup> Assume the excavator will move 100 yards<sup>3</sup>/hour and works 24 hours/day, and the pit is 3 m deep.

<sup>3</sup> Assume the trenches are 3 m deep, spaced 6 m apart and set back 100 m from property boundaries.

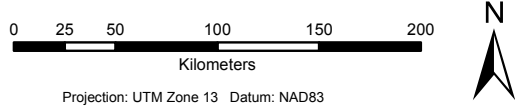
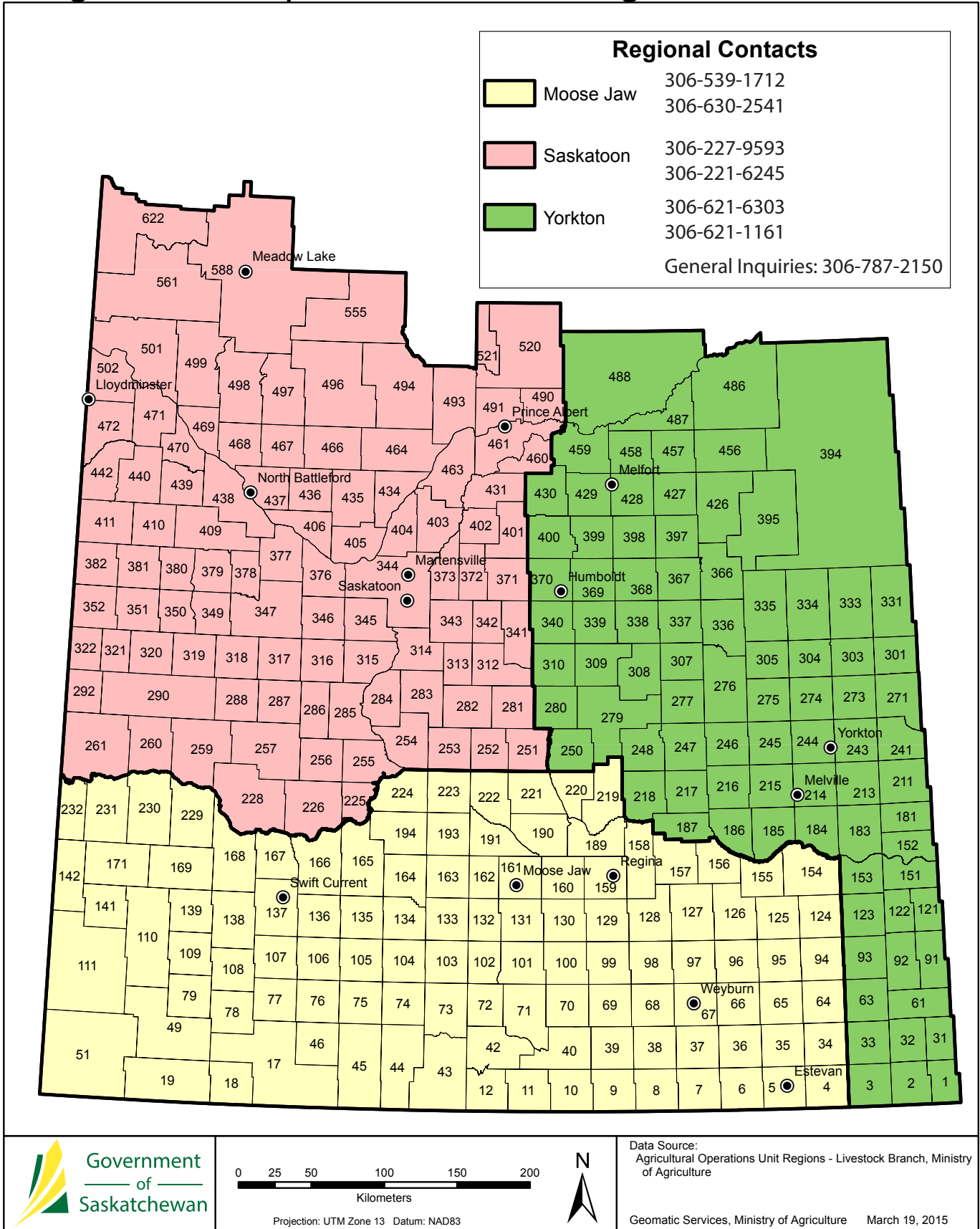
<sup>4</sup> Assume the windows are 2 m tall, spaced 6 m apart and set back 100 m from property boundaries.

<sup>5</sup> Assume the trenches are 3 m deep and spaced 6 m apart.

<sup>6</sup> Assume the incinerator burns 2.5 tons of carcass/hour and is operated 24 hours/day.



# Agricultural Operations Unit - Regional Boundaries



Data Source:  
Agricultural Operations Unit Regions - Livestock Branch, Ministry of Agriculture

Geomatic Services, Ministry of Agriculture March 19, 2015

© 2015 Government of Saskatchewan

