FOOT AND MOUTH DISEASE:

Disposal of Carcasses

Programme of Monitoring for the Protection of Public Health

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1. Purpose

This paper sets out the programme of environmental monitoring and health surveillance put in place to protect the public from potential health risks arising from the Foot and Mouth Disease control programme. This paper describes monitoring already underway as well as future programmes, both local and central, undertaken by the agencies involved.

2. Background

A Public Health Group chaired by the Deputy Chief Medical Officer considered the public health issues arising from the activities of the agencies involved with FMD carcass disposal. It was agreed that monitoring regimes, focussed upon the key issues of: human health, air quality, water supplies and the food chain, are needed to:

- Identify potential exposures or problems early so that action can be instigated;
- Investigate reported incidences of ill health that might be believed to be associated with carcass disposal;
- Underpin modelling studies;
- Provide sufficient data, where possible, to inform and reassure the public.

A multi-agency group is being established to interpret results and initiate appropriate actions.

This scheme addresses the monitoring needs of England. DH has been working closely with the other UK Health Departments to ensure that the UK picture is obtained. For completeness the paper refers to monitoring activity outside England, for example in Powys. It is intended that monitoring data collected under arrangements co-ordinated by the other Health Departments will be linked to the DH website to provide UK-wide perspective.

The monitoring roles of the key organisations involved are set out in Annex 1.

The potential public health risks associated with the disposal methods used are set out in the DH risk assessment: 'Foot and Mouth Disease - Effects on health of emissions from pyres used for disposal of animals'; and Guidance: 'Foot and Mouth Disease - Measures to minimise risk to public health from slaughter and disposal of animals'. Both are available on www.doh.gov.uk/fmdguidance/

The following Table outlines the methods of disposal and potential risks. The extant guidance (see www.doh.gov.uk/fmdguidance/) indicates clearly the measures necessary to minimise risk to public health from disposal of animals.

Table 1

Method of disposal	**Potential risk**
Rendering	No identified public health risk.
Incineration	No identified public health risk.
Licensed, engineered landfill	Leaching into private and public water sources/supplies is unlikely. Leachate may include additional components from animal carcasses.
Mass burial	Lined sites: as for licensed landfill sites. Other sites – limited risks where prior risk assessments carried out. Potential risks are contamination of private water sources/supplies (protozoal and other microbiological) and public water sources (protozoal only) [Where a site has been risk assessed and authorised under the Groundwater Regulations, the potential risks to water sources should have been addressed.]
Burial on farms	Potential risks are contamination of private water sources/supplies (protozoal and other microbiological) and public water sources (protozoal only) If carcasses of any cattle over 5 years are buried then there is potential prion risk. However, the extant guidance (see www.doh.gov.uk/fmdguidance/) makes it clear that these carcasses must not be landfilled or buried under any circumstances. [Where a site has been risk assessed and authorised under the Groundwater Regulations, the potential risks to water sources should have been addressed]
Pyres	Air pollutants - NO_2, SO_2, particles, PAH, dioxins, furans and PCBs. Short term effect of smoke downwind of pyres. Potential for dioxins to enter the food chain from deposits on soil downwind of pyres. Potential for ash from carcasses of older animals retaining a small risk from prions.
Carcasses awaiting disposal	Potential risks are to private water supplies (microbiological, protozoal and prion contamination) and public water supplies (protozoal and prion contamination). Extent of risk will depend on state of decomposition and type of ground.

3. Methods of Surveillance

3.1 *Potential Exposures*

Air Pollution Monitoring

Monitoring air pollution is only considered necessary during the burning period, as increases in concentrations of pollutants will be short lived.

- Some local authorities have carried out their own air pollution monitoring in response to carcass burning in their areas. Provisional data has been reported from Sennybridge (Eppynt) by Powys and Carmarthen CCs and Hazelsprings Farm by Allerdale DC. In some cases the monitoring has been undertaken by the Environment Agency (EA) on behalf of the local authority.

- The Department of the Environment, Transport and the Regions (DETR) has undertaken air monitoring in the vicinity of large pyres at Holsworthy and Okehampton. In addition the EA, on behalf of the DETR, carried out air monitoring at Chumleigh in Devon. The purpose of the monitoring is to validate modelling of emissions and to provide information concerning immediate public exposure to pollution levels. Contingency arrangements were made by the EA, on behalf of DETR, to monitor at Turnhill, Longtown and Tow Law but in the event these were not required.

- The EA, on behalf of DETR, is also assessing the impact of air curtain incinerators at Holsworthy (where air curtain incinerators are now being used in place of pyres) and assessing their burn efficiency at certain sites on behalf of the Ministry of Agriculture Fisheries and Food (MAFF). The DETR has also established air pollution monitoring at Hamsterley in Durham where the use of air curtain incinerators is planned. The monitoring programme is detailed in Annex 1. Results can be obtained from the Powys CC website www.powys.gov.uk for Sennybridge, and for other sites from the DETR website at www.aeat.co.uk/netcen/airqual/foot-and-mouth

Water Supplies

Any authorisation given by the EA under the Groundwater Regulations 1998 for a disposal site should include provision for such monitoring as is necessary in the particular circumstances to ensure that groundwater will not be contaminated.

- ***Public Drinking Water Supplies***

Treatment for public drinking water supplies includes sufficient disinfection to kill bacteria and viruses. At most works treating surface water, physical barriers are in place to minimise the risks from protozoa, such as *Cryptosporidium*. However such barriers are not present at many works treating groundwater. Water companies have assessed each of their treatment works to establish whether there is a significant risk of *Cryptosporidium* oocysts in water supplied from the works. Where such a risk is identified continuous monitoring for *Cryptosporidium* is carried out and treatment enhanced.

Although the risk assessments were carried out before the onset of FMD, water companies have reviewed all their water sources and currently none is considered as a

new risk. Water companies carry out routine monitoring of microbiological and chemical quality of their supplies. They are also being extra vigilant in the light of FMD disposal risks. The results of water quality monitoring are reported routinely to the Drinking Water Inspectorate (DWI) and published.

- ***Private Water Supplies***

  Responsibility for testing private water supplies rests with Local Authorities.

  DH has written to all local authorities to remind them that private water supplies are most vulnerable to pollution risks from any leachate that might arise from disposal sites and suggested that monitoring of supplies in the vicinity of disposal sites be undertaken.

  MAFF has undertaken to provide Local Authorities and local Consultants in Communicable Disease Control (CCDCs) with the disposal site locations for this purpose. Guidance from the Public Health Laboratory Service (PHLS) on monitoring private water supplies in the light of FMD disposal risks has also been issued to all local authorities. Regional Directors of Public Health (RDsPH) have also been alerted to the possible risks and tasked to check that potentially affected supplies in their areas are monitored. The EA, DWI and the PHLS will provide advice to local authorities on interpretation of results. Results will be collated through RDsPH locally and through the PHLS Communicable Disease Surveillance Centre (CDSC) nationally.

- ***Leachate***

  Monitoring for leachate from any of the sites is a high priority for the EA. The waste management licences associated with landfill sites require leachate management and ongoing monitoring, including monitoring of leachate levels and borehole testing of groundwater. Leachate levels are also being monitored at mass burial sites to determine any adverse effects they might impose upon sewage treatment plants where leachate is disposed of. Migration of leachate is also being monitored by borehole testing of groundwaters around mass disposal sites. Local surface waters are being tested downstream of mass burial sites and in association with farm cleanup procedures and incidents or complaints. The EA will also be giving high priority to investigating any of the burial sites used without a groundwater authorisation.

Monitoring the Food Chain

The main concern for the food chain is from dioxins in pyre smoke accumulating in soil and herbage and entering the food chain through animals grazing on affected areas.

- The Food Standards Agency (FSA) is undertaking monitoring around the larger pyres to assess deposition of dioxins on land used for food production or grazing, and uptake through likely food routes. A sampling programme for foods from areas near the large pyres in Wales (Sennybridge and Anglesey), Holsworthy, Cumbria and Scotland (Dumfries and Galloway) has been drawn up and incorporated into the monitoring strategy. The programme of monitoring by the FSA is as set out in Annex 1. Results are published on the FSA website: www.foodstandards.gov.uk

- The EA, on behalf of the FSA, has undertaken some soil and herbage monitoring for dioxin levels around the pyre at Holsworthy in Devon. This will provide information

about the existing background levels as well as likely deposition levels from the pyre. A survey of soil and herbage is also planned for Sennybridge.

3.2 ***Human Health Surveillance***

There are already systems in place that routinely detect health effects in the population. These are being enhanced by additional measures as appropriate.

- Guidance has been issued by the PHLS (CDSC) to doctors concerning reporting of possible cases of FMD in humans though very few are expected. PHLS through its Virus Reference Division is leading on testing and diagnosis of reported cases of possible foot and mouth infection in people. None of the reported possible cases has tested positive for FMD virus. The DH will receive information directly from the PHLS on any reported cases of FMD infection in people.

- Surveillance of other human illnesses, such as gastrointestinal infections, that might arise in connection with FMD carcass disposal is being co-ordinated nationally through the PHLS CDSC. DH has issued guidance on enhanced surveillance in consultation with CDSC. This has gone to Health Authority Directors of Public Health, CCDCs, Regional Epidemiologists and other relevant public health personnel. CCDCs will undertake surveillance locally and will report to the DH both through the RDsPH and CDSC.

- Air pollution is thought to exacerbate the condition of those already seriously ill with heart and lung disease. Asthma sufferers may experience immediate effects of short duration. The risk of any respiratory or cardiovascular health effects as a result of exposure to pollutants from pyres is estimated to be low. The numbers of people suffering any health effects would be too small to be detected from routine local or national statistics. Therefore Directors of Public Health have been liaising with GPs in their areas to identify any potential increase in problems. Pollution from pyres is not expected to lead to any significant risk of cancer. Information on cancer is routinely collected. It would be difficult to detect any increase in health effects as the numbers of people exposed are so small and, over time, other factors, such as smoking, would have a much greater effect. Nevertheless, DH has effective mechanisms for investigating potential clusters of disease.

- MAFF Health and Safety Unit has issued Guidance on the precautions to be taken by those working with carcasses. Existing occupational health surveillance arrangements have been modified to encompass all aspects of FMD work, including carcass disposal. The Army also has in place routine health surveillance that is being enhanced to take account of their involvement in disposal of carcasses.

4. Reporting Arrangements

The monitoring programme is to be published on the individual websites of the Departments and Agencies involved. A multi-agency group, chaired by DH has been set up to oversee the programme. A composite report will be produced on a monthly basis and published on the FMD website.

At any stage, should results of monitoring suggest a potential problem, this will trigger a joint response across relevant agencies.

ANNEX 1

Monitoring Role of Key Organisations

- **Department of Health (DH)**

The DH is responsible for health surveillance of the public arising from the FMD control programme. DH has been asked to assure the Government that public health is being safeguarded by all the organisations involved in dealing with this FMD outbreak and that adequate monitoring is in place for this purpose.

- **Ministry of Agriculture Fisheries and Food (MAFF)**

MAFF is responsible for controlling the FMD outbreak and for collating and maintaining information concerning all carcass disposal sites used. As employers, they are also responsible for the health and welfare of employees involved in disposal activities.

- **Environment Agency (EA)**

The EA is responsible for assessing and reporting on the impact of the disposal of FMD carcasses and related waste. As the main competent authority under the Waste Framework Directive the EA has a duty to ensure that waste being incinerated or landfilled does not harm human health or the environment and to monitor accordingly.
Mass burials are subject to an EA authorisation under the Groundwater Regulations. Such authorisations take account of risks of surface and ground water pollution. In assessing the impact of any disposal the EA will also consider the effects of the release of point sources and diffuse sources of pollutants.
[The EA does not have a legal responsibility to consider other risks from mass burial, such as those arising from soil ingestion or methane generation. However monitoring is already being undertaken and long term monitoring arrangements will be made.]

- **Department of Environment, Transport and the Regions (DETR)**

The burial of carcasses is covered by the Animal Waste Directive, for which MAFF has responsibility. However, under the Waste Framework Directive, DETR is responsible to the European Commission for ensuring that waste other than carcasses is disposed of without endangering human health or harming the environment. This includes ensuring that the impact of the outbreak on people and the environment is correctly monitored. For example, DETR is responsible for ensuring that the Environment Agency complies with statutory guidance on leachate control and gas management at licensed landfill sites.

Drinking Water Inspectorate (DWI)

DWI is responsible for assuring the safety and integrity of public water supplies, and auditing the performance of Water Companies in this regard.

- **Water Companies (WCs)**

Water Companies are responsible for delivering a public water supply that is safe and wholesome to drink and for undertaking routine monitoring of supplies to statutory standards.

- **Food Standards Agency (FSA)**

The FSA's role is to protect the public's health and consumer interests in relation to food and, in particular, regarding the disposal of carcasses, to ensure that suitable monitoring is in place to assess the safety of food produced in areas close to pyres.

- **Local Authorities (LAs)**

Las are responsible for monitoring local air quality in their areas and for ensuring that private water supplies in their areas are safe to drink and for monitoring them in accordance with statutory requirements.

- **Public Health Laboratory Service (PHLS)**

The PHLS is responsible for the surveillance of infectious diseases associated with the disposal of animals to control the FMD outbreak, including potential human cases of FMD. Through its Environmental Surveillance Unit at the Communicable Disease Surveillance Centre it will be collating information from, and advising upon interpretation of the results of testing of private water supplies.

Annex 1 Monitoring Programme

1. Human Health

Responsibility	Monitoring activity	Done by whom	Results Reported (when / where)
DH	<u>Health in the community</u> • Cases of FMD in the community; • Effect upon gastrointestinal disease in the community associated with FMD disposals; • Effects on respiratory and cardiovascular disease in the community associated with FMD disposals;	• CCDCs locally; • CDSC andPHLS Virus Reference Laboratory nationally; ▪ • GPs/ CCDCs locally as part of enhanced vigilance of routine surveillance. • CDSC regionally(Regional Epidemiologists)and nationally • [feasibility of GPRD network under consideration]	• DH through Regional Directors of Public Health • CDSC through Regional Epidemiologists
MAFF	<u>Occupational Health</u> • Health surveillance of their staff exposed to FMD virus during outbreak and routine health surveillance for other disorders/injuries	• MAFF's occupational Health Service	
MoD	• Health surveillance of army personnel exposed to FMD and other disorders/injuries.	• MoD's health surveillance unit	

2. Air pollution

Responsibility	Monitoring activity	Done by whom	Results Reported (when / where)
DETR	• Air pollution monitoring of SO_2, NO_2 and PM 10 at large pyres and in the vicinity of air curtain incinerators at: ▪ Holsworthy, Devon; ▪ Chulmleigh, Devon; ▪ Okehampton, Devon; ▪ Hamsterley, Durham.	• EA/DETR	• National Air Quality Archive: www.aeat.co.uk/netcen/airqual/foot-and-mouth/
	• Air pollution monitoring for PAHs, dioxins, furans and PCBs at: ▪ Holsworthy; ▪ Okehampton; ▪ Hamsterley.	• EA/DETR	• Powys CC website: www.powys.gov.uk
Local Authority ➢ Allerdale District Council ➢ Powys/Carmarthen CCs Council	• Air pollution monitoring during pyre burning: • Hazelsprings Farm: SO_2, NO_2, PM10, Benzene, Toluene, Xylene, PAHs, Dioxin/Furans • Sennybridge: SO_2, NO_2, PM10s, PCBs, PAHs, Dioxin/Furans	• Westlake Scientific • EA/Powys CC, Carmarthen CC	• Press release directly from LA. • Powys CC website: www.powys.gov.uk
EA Site operators	• Gas generation at licensed landfill and mass disposal sites: • Air curtain incinerators; Holsworthy: SO_2, NO_2, PM10s	• Landfill operator as part of waste management licence conditions • Mass burial site operator (MAFF) under temporary agreement; long term arrangements to be agreed. • EA as part of Quality Assurance inspection and monitoring • Site operator	• EA public register • EA public register

3. Water supplies

Responsibility	Monitoring activity	Done by whom	Results Reported (when / where)
Water Companies	<u>Public Supplies</u> • Monitoring of water quality of public drinking water supplies for *Cryptosporidium*, chemical contamination and other pathogens.	• Water companies	• Regulatory results on water companies public records
DWI	• Auditing of water company monitoring activities	• DWI	• Annual report published
Local Authorities	<u>Private supplies</u> • Monitoring of private water supplies in the vicinity of disposal sites	• Local Authorities	• To Regional Directors of Public Health.(RDsPH) • Environmental Surveillance Unit in CDSC -
Site Operators EA	<u>Leachate</u> • Leachate production and control at all licensed landfill sites at: • Leachate production and migration at mass burial sites: • Monitoring of streams affected by on farm clean up procedures / disinfection: downstream of all relevant farms notified by MAFF • Monitoring of groundwater / surface water at strategic points to assess impact of diffuse disposal points: water levels and chemical composition in various boreholes located in major aquifers	• Landfill operator as part of waste management licence conditions • Mass burial site operator (MAFF) under temporary agreement; long term arrangements to be agreed. • EA as part of Quality Assurance inspection and monitoring	• EA public register for all results.

4. Food chain

Responsibility	Monitoring activity	Done by whom	Results Reported (when / where)
FSA	• Monitoring of foods produced in vicinity of large pyres for dioxin presence: ▪ Devon – Holsworthy area: milk, eggs; ▪ Wales (Eppynt): lamb, eggs; ▪ Wales (Anglesey): eggs. • Monitoring of grass / soil for dioxin levels on land used for food production around large pyres: ▪ Devon – Holsworthy area; ▪ Wales – Eppynt; ▪ Wales - Anglesey; ▪ Cumbria	• Local Authorities in areas of large pyres on behalf of FSA • EA on behalf of FSA	• FSA website: www.foodstandards.gov.uk • FSA website: www.foodstandards.gov.uk
FSA	• Monitoring of vegetation / crop uptake around mass burial / pyre sites: ▪ Sites to be agreed with FSA • Monitoring ash for protein destruction to assess prion destruction at: Bonnington, Great Close, Holsworthy, Sennybridge, Longtown. • Monitoring ash at Holsworthy, Catterick, Staunton air curtain incinerators/box trenches.	• EA(under contract arrangements)	• Results supplied to FSA(on website)

5. Implementation of guidance on disposals and compliance with risk assessment

Responsibility	Monitoring activity	Done by whom	Results Reported (when / where)
EA	• Monitoring of sites to ensure Risk Assessment compliance;	• EA	• EA public register and environmental reports
	• Monitoring of land use of sites post-completion: ▪ Review monitoring conditions for licensed landfill sites and ensure compliance with these reviewed requirements by the licence holder. ▪ Review monitoring conditions for mass burial agreements and ensure compliance with these revised requirements by the site operator. ▪ Review the general environment surveillance monitoring undertaken by the Agency and others to establish whether it is sufficient to identify and fill any mid & far field impacts on the environment and fill any gaps in conjunction with other Agencies (this will include monitoring of air, water quality, conservation value and habitat quality). ▪ Identify consistent quality criteria for monitoring of permit conditions to ensure that the data are comparable and to facilitate issuing of consultant contracts for such monitoring by MAFF and other permit holders.	• EA as part of overall regulation of controlled landfill sites. • EA, if within controlled waste permitting regime, otherwise on complaint only. • EA • EA	• EA public register
EA Sewerage Undertakers(sewage sludge) and Water Companies(water treatment sludge)	• Monitoring of sludge used on agricultural land where potentially infected	• Water Companies and Sewerage Undertakers (exempt from current EA regulation) • EA Quality Assurance inspection and monitoring	• Water Utilities public registers • EA public register

Flowchart for FMD Monitoring Strategy