and specimens of body fluids and their components.

Human pathologic wastes, including tissues, organs, and body parts and body fluids used in the treatment, diagnosis, and study of diseases of humans.

II. WASTE CHARACTERISTICS

1.0 INTRODUCTION

This document identifies the technical information required to the operation and maintenance of a number of currently available medical waste treatment technologies.

The potential exposure of medical waste treatment technologies and provides general guidance on the proper operating medical waste treatment technologies and provides general guidance on the proper operating medical waste treatment technologies.
TABLE 1: Presence of medical waste types appropriate for treatment by each of the

Types

Used sharps include the following unused, discarded sharps in a class of

1. Unused sharps include the following unused, discarded sharps in a class of

CLASS 4 - USED SHARPS

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste

CLASS 5 - ANIMAL WASTE

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste

CLASS 6 - ISOLATION WASTES

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste

CLASS 7 - UNUSABLE SHARPS

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste

CLASS 8 - PHARMACEUTICALS

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste

CLASS 9 - COMMUNICABLE DISEASES

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste

CLASS 10 - BACTERIAL WASTE

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste

CLASS 11 - VIRAL WASTE

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste

CLASS 12 - RADIATION WASTE

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste

CLASS 13 - PHYSICAL WASTE

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste

CLASS 14 - METAL WASTE

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste

CLASS 15 - PLASTIC WASTE

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste

CLASS 16 - GLASS WASTE

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste

CLASS 17 - CARDBOARD WASTE

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste

CLASS 18 - PAPER WASTE

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste

CLASS 19 - WOOD WASTE

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste

CLASS 20 - OTHER WASTE

- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
- Non-hazardous waste
### Table 1.1 Medical Waste Types Appropriate For Treatment By Technology

<table>
<thead>
<tr>
<th>TECHNOLOGY</th>
<th>CLASS 1</th>
<th>CLASS 2</th>
<th>CLASS 3</th>
<th>CLASS 4</th>
<th>CLASS 5</th>
<th>CLASS 6</th>
<th>CLASS 7</th>
<th>RADIO-ACTIVE</th>
<th>HAZ AND CYTOTOXIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>INCINERATION</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X^1</td>
<td>X^1</td>
</tr>
<tr>
<td>STEAM AUTOCLAVE</td>
<td>X</td>
<td>X^2</td>
<td>X</td>
<td>X</td>
<td>X^2</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEMICAL TREATMENT</td>
<td>X</td>
<td>X^2</td>
<td>X</td>
<td>X</td>
<td>X^2</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MICROWAVE</td>
<td>X</td>
<td>X^2</td>
<td>X</td>
<td>X</td>
<td>X^2</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RADIOFREQUENCY</td>
<td>X</td>
<td>X^2</td>
<td>X</td>
<td>X</td>
<td>X^2</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAMMA IRRADIATION</td>
<td>X</td>
<td>X^2</td>
<td>X</td>
<td>X</td>
<td>X^2</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. The treatment of radioactive antineoplastic and hazardous waste which are mixed with medical wastes can be treated with incineration, however, special permits are usually required for this type of treatment. Additionally, incineration does not inactivate radioactive waste. Thus the ash from these processes may be radioactive and/or contain hazardous constituents.

2. Technology not recommended for treatment of body parts because the density of the waste may prevent adequate treatment. Grinding the waste may increase treatment efficacy however, the grinding process may present aesthetically unacceptable results.
12.1 Level I Microbial Infection

Microbial infection is defined as significant infection of all microorganisms with the exception of bacterial spores. This includes the infection of all microorganisms other than bacterial spores.

12.2 Level II Microbial Infection

Infection by a variety of physical or chemical processes. It is similar to infection which is defined as microbial infection. It may be accomplished by impurities in the impurities in the microbial infection of bacterial spores or tissues. It includes the infection by the impurities in the microbial infection of bacterial spores or tissues.

12.3 Level III Microbial Infection

Infection by a variety of physical or chemical processes. It is similar to infection which is defined as microbial infection. It may be accomplished by impurities in the impurities in the microbial infection of bacterial spores or tissues.

12.4 Level IV Microbial Infection

Infection by a variety of physical or chemical processes. It is similar to infection which is defined as microbial infection. It may be accomplished by impurities in the impurities in the microbial infection of bacterial spores or tissues.
<table>
<thead>
<tr>
<th>WASTE TREATMENT TECHNOLOGIES</th>
<th>MICROBIAL INACTIVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level I&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>STEAM AUTOCLAVE</td>
<td></td>
</tr>
<tr>
<td>Lab Test Results&lt;sup&gt;1&lt;/sup&gt;</td>
<td>yes</td>
</tr>
<tr>
<td>Field Test Results&lt;sup&gt;2&lt;/sup&gt;</td>
<td>yes</td>
</tr>
<tr>
<td>MICROWAVE</td>
<td></td>
</tr>
<tr>
<td>Field Test Results&lt;sup&gt;3&lt;/sup&gt;</td>
<td>NT</td>
</tr>
<tr>
<td>RADIO FREQUENCY</td>
<td></td>
</tr>
<tr>
<td>Field Test Results&lt;sup&gt;4&lt;/sup&gt;</td>
<td>NT</td>
</tr>
<tr>
<td>CHEMICAL</td>
<td></td>
</tr>
<tr>
<td>Lab Test Results&lt;sup&gt;5&lt;/sup&gt;</td>
<td>yes</td>
</tr>
<tr>
<td>Field Test Results&lt;sup&gt;6&lt;/sup&gt;</td>
<td>yes</td>
</tr>
</tbody>
</table>

<sup>a</sup> Inactivation of $10^5$ vegetative bacteria, and fungi  
<sup>b</sup> Inactivation of $10^5$ mycobacteria  
<sup>c</sup> Inactivation of at least $10^6$ B. subtilis (heat); or at least $10^4$ B. stearothermophilus (chemical)  
<sup>d</sup> Inactivation of at least $10^6$ B. stearothermophilus $10^6$ or greater  
<sup>1</sup> Benchtop and gravity displacement autoclaves, 121<sup>o</sup> C, 15 psi  
<sup>2</sup> Prevacuum system, 136<sup>o</sup> C, 30 psi; Double door gravity system, 163<sup>o</sup> C, 80 psi  
<sup>3</sup> Microwave treatment system (6 units at 2450 MHz each)  
<sup>4</sup> Short wave RF system, 11 - 13 MHz  
<sup>5</sup> Chemical only, sodium hypochlorite 1000 ppm and 3000 ppm FAC, prolonged exposure ($\geq$ 3 hrs)  
<sup>6</sup> Chemical/mechanical systems, sodium hypochlorite 1000, 2000, 3000 ppm FAC  

NT Not tested  
** Dependent on Prolonged exposure ($\geq$ 3 hrs)  
** Not achieved under normal operating conditions ($< 3$ hrs exposure)
For further information, please contact the relevant authorities or organizations. Additional resources and guidelines may be available through government agencies, industry groups, and professional organizations.
7

Standby treatment cycle. The recommended safety levels of treatment for standby operation

test loads should be placed in the system with normal waste load and recovered after a

The waste treatment system should be tested under normal operating conditions. The

1.3.5 Test load exposure

the load waste characterized by weight

merger (eg, aquatic plants, whole broth, summer, plasma, etc) that comprises at least 5 percent of

of the normal waste solids. Additionally, testing should include representative organics

should be included in the test regimen. Demonstration or demonstration of a minimum of 100

For mechanical/chemical treatment, monitor the amount of gas, 

minimum 100 g's. metered/monitoring points should be used

in the treatment, the needed waste must be processed for suitable results.

In the treatment stage, the treatment cycle includes a water treatment step and/or stabilization

to verify the treatment inactivation, a

inactivation of the test load, the indicator organisms should be prepared in a manner to

1.4 Test load preparation

valve unit for the chosen expiration

As long as the valves and other equipment are stored properly, this guarantee does not apply.

assumance statements that ensure the number of scores per step or part of suspension.

Commercially prepared scores strips and scores suspensions are supplied with a quality

1.3.3 Test organism quantification

Differentiation in 2 or 6 g, or scores under other recommended conditions until used.

for assurance on inactivation. After being loaded into the system, all scores should

Log book should be maintained for inspection by the individual responsible for quality

inception and the date of receipt for number and expiration date recorded in a log book. The

suppliers. When the organisms are received, the package and containers should be visibly

indicator scores and scores suspensions should be purchased from reputable

1.3.2 Test organism quantification

manufacturer’s instructions in the literature. However, nutrient use is difficult to use in the regulation of their extensive

indicator organisms for further treatment of medical waste have not been

However, nutrient use is difficult to use in the regulation of their extensive

indicator organisms for further treatment of medical waste have not been
**Table 13** Recommended Frequency of Efficiency Testing By Technology

<table>
<thead>
<tr>
<th>Technology</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiofrequency</td>
<td>Weekly</td>
</tr>
<tr>
<td>Microwave</td>
<td>Weekly</td>
</tr>
<tr>
<td>Chemical Decomposition</td>
<td>Weekly</td>
</tr>
<tr>
<td>Steam Autoclave</td>
<td>Weekly</td>
</tr>
<tr>
<td>Infection</td>
<td>Quarterly</td>
</tr>
</tbody>
</table>

For at least 72 hours, B. *neomiyahilus* should be incubated at 55°C, also for at least 72
so Clamp-cathing pleur at preal or eph (or actidion). B. *miihih* should be incubated at 32°C
infectioiin. B. *nitihilus* and B. *neomiyahilus* should be recovered on
This indicates the appropriate orienation of the table (infectioiin and encrypted). The number of
should recover the maximum number of viable (infected and noninfected) and the exception of
Recovery of indicator organisms should be accomplished easily. The methods used

1.3.6 **Organism Recovered**

Process should be revealed.

If normal operating procedures are changed, the frequencies of confirmation of vaccination. Vaccinations should be evaluated quarterly because of the exception of

procedure is presented in Table 1.3. All technologies should be evaluated bi-weekly with the

---

**8**

Examination of Water and Wastewater may be used in the American Public Health Association's (APHA) 1998 Standard Methods for the Determination of Heavy Metals in Wastewater. This section presents some guidance on when transmission efficiency testing is performed properly. This section presents some guidance on when transmission efficiency testing is performed properly. This section presents some guidance on when transmission efficiency testing is performed properly.

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1.3.7 Quality Control Procedures

---

<table>
<thead>
<tr>
<th>Equipment Change</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repair</td>
<td>Bi-weekly</td>
</tr>
<tr>
<td>Repair</td>
<td>Bi-weekly</td>
</tr>
<tr>
<td>Repair</td>
<td>Bi-weekly</td>
</tr>
<tr>
<td>Repair</td>
<td>Bi-weekly</td>
</tr>
<tr>
<td>Repair</td>
<td>Quarterly</td>
</tr>
</tbody>
</table>

---
13.7.4 Equipment

The maintenance of equipment is important to the safety of the operator. Equipment should be maintained according to the manufacturer's instructions.

13.7.3 References

References to the manufacturer's literature and the manufacturer's service manual should be made to ensure that the equipment is maintained as recommended.

13.7.2 Media

Media used in the laboratory should be stored appropriately. Such media should be stored at room temperature and protected from light. If media is frozen, it should be allowed to thaw at room temperature.

13.7.1 Organisms

Organisms should be purchased from reputable suppliers and used according to the manufacturer's instructions.