

4.1 Landfill - Background

1. Landfilling of SRM (including bovine deadstock from which the SRM has not been removed) or SRM which has been subjected to intermediate processing (such as rendering or composting) to decrease the volume, is considered a method of permanent containment of the abnormal prion.
2. The CFIA Science Directorate performed a risk assessment on this method of disposal and determined that landfill / mass burial of SRM or carcasses from which the SRM has not been removed presented a negligible risk of the transmission of BSE to domestic ruminants.

4.2 Landfill - Preinspection

1. All sites that intend to receive SRM or carcasses from which the SRM has not been removed for disposal must apply to the CFIA for a permit to receive and dispose of the SRM.
2. The owner or operator of the landfill site must submit a completed application for permit form to the local CFIA district office. The district office should forward this application and any associated documentation to the Area Program specialist responsible for TSE disposal.
3. The CFIA inspector (Area specialist responsible for TSE disposal) who will be responsible for conducting the inspection of the particular site will review the permit application for completeness. The application form must be accompanied by copies of:
 - i. all relevant municipal and provincial licenses and inspection reports;
 - ii. detailed site plans;
 - iii. normal operating procedures and any additional applicable quality assurance programs pertaining to the containment of SRM for landfills;
 - iv. the results of any recent analyses or verifications relevant to containment of SRM.

If any of the appropriate documentation is missing from the application, the CFIA inspector is to contact the owner or operator of the landfill site and inform them of any incompleteness in the application.

4. Upon receipt of all of a completed application for permit with all appropriate accompanying documentation, the CFIA inspector should contact the owner or operator of the landfill site and schedule an inspection visit.

4.3 Landfill – Site Inspection

1. Utilizing the documents provided by the landfill owner / operator and physical inspection the CFIA inspector should verify that the various components of the landfill described below meet or exceed the standards outlined. It is permissible to have a specific cell within a landfill designated for acceptance of SRM. In the later case the specific requirements would be applicable to the cell rather than the entire landfill.
2. Separation: Property of the landfill site must have adequate separation from adjacent properties to prevent direct exposure of domestic ruminants to SRM and lechate (i.e. fencing or other barriers may be used to satisfy this requirement). The site itself or implemented measures should discourage access by wild ruminants and scavengers.
3. Signage: Signage is to be legible, of appropriate size and be installed at all access points around perimeter. Signage should include information on hours of operation, phone numbers for emergency contacts and types of fill accepted.
6. Operation: Personnel trained in normal operating procedures as they pertain to SRM containment must be present during all hours when SRM is received and handled by the landfill. The facility has to be secured in a manner to prevent unauthorized access during non-operating hours.

Operating and maintenance manuals must be readily accessible to operating personnel who are present at the landfill site.

7. Liner: The liner for a landfill and the associated leachate containment systems may be constructed of natural clay, engineered clay compacted soil, rock, geomembranes (industry approved plastic sheeting or high density polyethylene) or a combination thereof such that the hydraulic conductivity is $\leq 1 \times 10^{-7}$ cm/s. Minimum bottom slopes of the liner are to be 2 percent on controlling slopes and 0.5 percent on the remaining slopes.

More complex liner systems may incorporate further protective layers such as sand or gravel and Geotextile mats.

8. Landfill Cap: A barrier made of soil alone or in combination with a geomembrane is placed over the landfill site to limit downward movement of moisture. If soil is used by itself a minimum of 60 cm thick layer of compacted natural or amended soil is required. If a geomembrane is used in addition, the soil layer can be reduced. The saturated hydraulic conductivity of the cap must be $\leq 1 \times 10^{-7}$ cm/s if the cap is not mounded to prevent pooling or ponding.

9. It is usual to have a drainage layer consisting of a minimum 30 cm of compacted sand and a top vegetation / soil layer consisting of a minimum of 60 cm of soil graded at a slope between 3 – 5 % with vegetation or an armoured surface.
10. Groundwater Protection: The seasonal high elevation of groundwater shall be maintained at a minimum of 500mm below the lowest point of the liner.

Groundwater lowering systems may provide for positive drainage of the groundwater away from the landfill area.

11. Surface Water Management: The landfill must have a surface water management system which diverts surface and storm water from the disposal area, controls run –off discharge from the landfill and controls erosion, sedimentation and flooding. This system shall be hydraulically separate from the landfill site’s leachate management system.
12. Leachate Control system: The landfill must have a leachate collection network that is hydraulically separate from the landfills storm water system. This system should:
 - i. function year round;
 - ii. have a means of monitoring flow;
 - iii. have adequate storage capacity;
 - iv. have appropriate accessibility for inspection and monitoring.The integrity of the leachate system is important as a part of the functioning of the overall landfill. If a problem occurs with leachate collection, results may impact on integrity of the containment of the entire landfill and thus of the SRM. Leachate generated at landfills receiving SRM will not be subject to further CFIA controls.
13. Cover material should be stockpiled or available above the working face before a vehicle arrives at the tipping point. SRM should be covered immediately after tipping.
14. Equipment: Equipment and parts of equipment which handle SRM must be designated as SRM equipment or be subject to cleaning on site by pressure washing to be clean of all organic material prior to alternate use. The external surfaces of the vehicle that may have come in contact with the SRM as it is tipped, packed or covered at the landfill site must be visibly clean prior to exiting the site.
15. Integrity breeches would include access by scavengers, domestic or wild ruminant, leachate escape or movement of SRM or landfill contents out of the area previously approved by permit must be reported to CFIA.

16. Records: Monitoring logs including but not limited to well logs, leachate treatment records, gas management records, storm water management records and disposal records are to be located on site.

The landfill owner or operator must keep records for a period of 10 years. A record must be kept for each day on which the SRM is removed, stained or received or the carcasses are collected or received.

Records must include:

- i. the person's name and address of person moving SRM to landfill site, and;
- ii. CFIA permit # for the conveyance, and;
- iii. the date of the reception, and;
- iv. the combined weight of the specified risk material and the carcasses or parts of carcasses received; and
- v. the date of landfill (if different from reception).

4.4 Landfill – Inspectors Report

1. All observations regarding the application, associated documentation and physical inspection should be recorded on an Inspector's Report (CFIA-ACIA 1520).
2. In summary, the report should specifically identify areas of discrepancies between the landfill site applying for a permit and the requirements as listed in this manual. Section 4.2, 4.3 Landfill.
3. All deficiencies need to be addressed with a written corrective action plan by the applicant and are to be verified for effectiveness by a follow-up on-site inspection prior to issuing a permit.
4. If inspections do not identify any areas of discrepancy or deficiency, the inspector should in final summary include a recommendation of the period of time for which the permit should be valid. Permits will be issued annually for landfill sites which fulfil all requirements listed in this manual provided on-going compliance monitoring is conducted. On-going compliance monitoring will be conducted via random inspections for verification of compliance with written standard operating procedures. Compliance monitoring will be conducted by CFIA inspectors at least once during the time which the permit is valid.
5. A copy of the report should be forwarded to the CFIA program staff responsible for SRM disposal at the Area office.