

401 KAR 48:070. Design requirements for contained landfills.

RELATES TO: KRS 224.01, 224.10, 224.40, 224.43, 224.99

STATUTORY AUTHORITY: KRS 224.10-100, 224.40-305

CERTIFICATION STATEMENT:

NECESSITY, FUNCTION, AND CONFORMITY: KRS Chapter 224 requires the cabinet to adopt rules and administrative regulations for the management, processing or disposal of wastes. KRS 224.40-305 requires that persons engaging in the management, processing and disposal of waste obtain a permit. This chapter establishes the minimum technical standards for solid waste sites or facilities. This administrative regulation sets forth the design requirements for contained landfills.

Section 1. General. The owner or operator of a contained landfill shall ensure a design for disposal of solid wastes meeting the requirements of 401 KAR Chapters 47 and 48.

Section 2. Surface Water. Owners or operators shall design landfills to ensure that:

- (1) Surface water flows and leachate are separated;
- (2) Surface contours minimize surface water running onto or through the operational or completed fill area;
- (3) Surface run-on and run-off ditches pass a 100 year twenty-four (24) hour storm flow;
- (4) Surface water sediment basins meet the following criteria:
 - (a) The minimum retarding storage volume and the principal spillway discharge shall be such that emergency spillway discharge shall not occur during the twenty-five (25) year twenty-four (24) hour storm event;
 - (b) The emergency spillway shall be capable of passing a 100 year twenty-four (24) hour storm event with no flow overtopping the structure; and
 - (c) The sediment storage volume and project operating period shall be stated. The minimum storage volume shall provide for one (1) year of operation. A shorter period may be approved when a maintenance program is included to restore the sediment storage volume.
- (5) All designs shall be verified by the unit hydrograph method of calculation unless another method is approved by the cabinet.
- (6) The edge of the downhill toe of the slope of a sediment pond dam is at least fifty (50) feet from the property line.

Section 3. Seismic Impact Zones. At a new contained solid waste landfill unit located in a seismic impact zone, all containment structures, including liners, leachate collection systems, and surface water control systems shall be designed to resist the maximum anticipated horizontal acceleration in lithified material for the site.

Section 4. Unstable Areas. The owner or operator of a contained solid waste landfill unit located in an unstable area shall demonstrate to the cabinet that engineering measures have been incorporated into the unit's design to ensure the stability of the liners, leachate collection systems, final cover, run-on and run-off systems, and any other component necessary for the protection of human health and the environment. The owner or operator shall consider the following factors, at a minimum, when determining whether an area is unstable:

- (1) On-site or local soil conditions that may result in significant differential settling;
- (2) On-site or local geologic or geomorphologic features; and
- (3) On-site or local human-made features (both surface and subsurface).

Section 5. Separate Areas for Handling Nonresidential Wastes. The applicant shall design an area separate from the daily working face to allow the safe handling of certain wastes. Separate areas are required for the handling of:

- (1) Loads containing burning waste;
- (2) Wastes from pick-up trucks and automobiles; and
- (3) Salvageable and recyclable materials when the facility intends to manage these materials.

Section 6. Equipment Requirements.

- (1) Sufficient equipment shall be available to spread and compact all wastes within two (2) hours of receipt.
- (2) Steel-wheeled compactors designed for landfill operation shall be specified for residential solid waste compaction.
- (3) The owner or operator shall provide the landfill equipment required to:
 - (a) Handle all daily, interim, long-term and final cover requirements;
 - (b) Maintain all roads and drainage features;
 - (c) Provide dust suppression;
 - (d) Maintain leachate and methane gas systems; and
 - (e) Properly compact waste at peak receipt rates. These rates shall be determined in tons per hour and kept on file with the cabinet.
- (4) Back-up equipment shall be available for waste spreading and compaction, application of daily cover and maintenance of leachate systems within twenty-four (24) hours of primary equipment incapacitation.
- (5) Landfill compactors shall have a minimum gross ground pressure of 325 pounds per linear inch of wheel width.
- (6) Any equipment used for compaction shall have a minimum gross weight of 30,000 pounds and a minimum of 130 engine horsepower.
- (7) The primary working face equipment used for waste spreading and compaction shall have the standard landfill guard package offered by the manufacturer, or an otherwise reasonable adaptation, to provide protection from waste damage hazards and other landfill operating hazards.
- (8) The operator shall propose an equipment operating and maintenance recordkeeping system. The system shall, at a minimum, track the availability of each piece of equipment in subsections (1) and (4) of this section.
- (9) Any equipment used for waste compaction shall have a specified maximum rated capacity.

Section 7. Compaction. For residential solid waste, the in-place waste density goal shall be to achieve greater than 1200 pounds per cubic yard in the completed cells. The density shall be determined by dividing the total weight of waste received by the cubic yards of airspace used. The landfill density shall be computed annually.

Section 8. Soil Requirements. The design of borrow areas and disposal cells shall ensure that enough soil is available to meet the requirements for liner and cap construction in 401 KAR 48:080 and the requirements for cover in 401 KAR 48:090.

Section 9. Personnel and Equipment Buildings.

- (1) Each landfill shall have buildings for its employees which provide the following:
 - (a) Air conditioning or tight, insect repelling screens on all doors and windows. Screen access doors shall have automatic closures. Screened buildings shall have proper mechanical ventilation;
 - (b) Safe drinking water;
 - (c) Sanitary facilities; and
 - (d) Heat.
- (2) Each landfill site shall include a building for maintenance of the equipment. The building shall be large enough to hold the largest piece of equipment required for site operation. The building shall be heated for winter repair operations.

(3) Each building shall have an alarm installed in accordance with the manufacturer's recommendations to detect the presence of explosive gases.

Section 10. Explosive Gas Program.

(1) The application for a contained landfill unit shall include a quarterly methane monitoring program to ensure that the standards of Section 11 of 401 KAR 47:030 are met.

(2) The methane monitoring system shall be developed based on the following factors:

- (a) Soil transmissivity;
- (b) The hydrogeologic conditions surrounding the disposal site;
- (c) The hydraulic conditions surrounding the disposal site; and
- (d) The location of facility structures and property boundaries.

(3) The minimum frequency of monitoring shall be quarterly.

(4) A gas venting system shall be designed for all landfills. A minimum of one (1) vent shall be required per acre of landfill to be filled unless otherwise approved by the cabinet.

Section 11. Roads.

(1) The owner or operator shall design a road from the publicly maintained highway to the landfill, if one does not exist.

(2) Each landfill shall have an all weather perimeter road around all waste disposal areas and to all monitoring and sediment control structures.

(3) Internal roads shall be all weather and designed for construction to within 200 feet of the daily working face.

(4) Narrow roads shall have properly spaced sections of sufficient width to allow passage of two (2) vehicles in the opposite direction.

(5) Roads shall be designed to carry the normal traffic and to properly drain.

(6) Enough space on the landfill property shall be provided for trucks awaiting entry. The landfill shall be designed to ensure that trucks can enter the site without delay from public roadways.

Section 12. Safety and Communication Plan. The landfill safety and communication plan shall contain:

(1) The safe operating and maintenance procedures for heavy equipment;

(2) Procedures to protect employees in a manner complying with the Kentucky Labor Cabinet OSHA requirements;

(3) A description of equipment to achieve emergency communication. At a minimum the applicant shall specify an on-site telephone or a two-way radio connection to an off-site telephone. The radio base station shall be monitored during landfill operations; and

(4) A fire fighting contingency plan containing a topographic map denoting the location of the landfill, a site map and an emergency contact. The operator shall mail a copy of the safety and communications plan to the local fire chief. The plan shall include the location of fire fighting water sources, roads, and major site features.

Section 13. Scales. Scales shall be provided to weigh all incoming wastes.

Section 14. Leachate Storage Tanks. In addition to the requirements set forth in this administrative regulation, 401 KAR 47:180 and 401 KAR 47:190, an application for a permit to construct a contained landfill that includes a tank for leachate storage shall contain:

(1) The estimated volume of leachate to be generated and a proposed system to record actual quantities stored and removed;

(2) A schedule of liquid removal;

(3) A description of the final treatment and disposal of the liquid stored;

(4) A description of the liquid storage facility design;

- (5) A method to measure the quantity of leachate extracted or removed and disposed;
- (6) A closure plan for the tanks; and
- (7) Design criteria to ensure that on-ground, in-ground, underground, and above ground tanks are constructed of materials, and installed in such a manner, that the tank system shall contain the stored liquid for the active life of the site to include closure care. A procedure for periodic testing of the tank system shall be employed to assure the tank system does not leak.

Section 15. Closure.

- (1) The operator of a contained solid waste landfill shall close each landfill unit and phase in a manner that minimizes the need for further maintenance and minimizes the closure care formation and release of leachate and explosive gases to air, groundwater, or surface water to the extent necessary to protect human health and the environment as required by 401 KAR 47:030 and 401 KAR 48:300.
- (2) The owner or operator shall prepare a closure plan that describes the steps necessary to close all units and phases of the contained solid waste landfill at any point during its active life in accordance with the closure performance standard in subsection (1) of this section. The closure plan shall contain:
 - (a) An overall description of the methods, procedures, and processes that shall be used to close each unit and phase of a contained solid waste landfill in accordance with the closure performance standard in subsection (1) of this section and the final cap system requirements in Section 9 of 401 KAR 48:080;
 - (b) An estimate of the maximum extent of operation that shall be open at any time during the active life of the landfill; and
 - (c) A schedule for completing all activities necessary to satisfy the closure performance standard.
- (3) Any modification to the closure plan shall be approved by the cabinet. A copy of the most recent approved closure plan shall be kept at the facility until closure of the contained landfill has been certified in accordance with subsection (5) of this section and the owner or operator has been released from financial assurance requirements for closure under 401 KAR 48:310.
- (4) The owner or operator shall begin closure activities of each landfill unit, in accordance with the approved closure plan, no later than thirty (30) days following the final receipt of wastes at that landfill unit. Closure of each unit shall be completed within 180 days of final receipt of waste. Extensions may be approved by the cabinet if the delay in closure is due to adverse weather conditions.
- (5) Following closure of each contained solid waste landfill unit, the owner or operator shall submit to the cabinet a certification by a professional engineer that closure has been completed in accordance with the approved closure plan.

Section 16. Alternative Specifications. Alternative specifications may be used only after approval by the cabinet upon a demonstration by a qualified registered professional engineer that they shall result in performance with regard to safety, stability and environmental protection equal to or better than that resulting from designs complying with the specifications of this administrative regulation.

(401 KAR 048:070. 16 Ky.R. 1772; 2209; 2371; eff. 5-8-1990; Crt eff. 8-13-2018, Crt eff. 7-22-2025.)