

902 KAR 100:022. Licensing requirements for land disposal of radioactive waste.

RELATES TO: KRS 211.842-211.852, 211.990(4) 40 C.F.R. 261, 42 U.S.C. 2011 - 2297g-4, Pub.L. 96-573, Pres. EO 11988

STATUTORY AUTHORITY: KRS 194A.050, 211.090, 211.844, 211.846, 211.852

NECESSITY, FUNCTION, AND CONFORMITY: KRS 211.844 requires the Cabinet for Health and Family Services to provide by administrative regulation for the registration and licensing of the possession or use of sources of ionizing or electronic product radiation and the handling and disposal of radioactive waste. This administrative regulation establishes procedures, criteria, terms, and conditions upon which the cabinet issues licenses for the land disposal of radioactive wastes received from other persons.

Section 1. Definitions. (1) "Active maintenance" means a significant activity needed during the period of institutional control to maintain a reasonable assurance that the performance objectives in Section 18 and Section 19 of this administrative regulation are met. This term includes ongoing activities, such as the pumping and treatment of water from a disposal unit, or one (1) time measures, such as replacement of a disposal unit cover. This term does not include custodial activities, such as repair of fencing, repair or replacement of monitoring equipment, revegetation, minor additions to soil cover, minor repair of disposal unit covers, and general disposal site upkeep such as mowing grass.

(2) "Buffer zone" means a portion of the disposal site that is controlled by the licensee and that lies under the disposal units and between the disposal units and the boundary of the site.

(3) "Chelating agent" means:

(a) Amine polycarboxylic acids, such as EDTA, DTPA, or hydroxy-carboxylic acids; and (b) Polycarboxylic acids, such as citric acid, carbonic acid, or gluconic acid.

(4) "Commencement of construction" means clearing of land, excavation, or other substantial action that would adversely affect the environment of a land disposal facility. This term does not mean disposal site exploration, necessary roads for disposal site exploration, borings to determine foundation conditions, or other preconstruction monitoring or testing to establish background information related to the suitability of the disposal site or the protection of environmental values.

(5) "Custodial agency" means an agency of the government designated to act on behalf of the government owner of the disposal site.

(6) "Disposal" means the isolation of radioactive wastes from the biosphere inhabited by man and his food chains by emplacement in a land disposal facility.

(7) "Disposal site" means that portion of a land disposal facility that is used for disposal of waste. It consists of disposal units and a buffer zone.

(8) "Disposal unit" means a discrete portion of the disposal site into which waste is placed for disposal. For near-surface disposal the unit is usually a trench.

(9) "Engineered barrier" means a manmade structure or device that is intended to improve the land disposal facility's ability to meet the performance objectives in this administrative regulation.

(10) "Explosive material" means a chemical compound, mixture, or device that produces a substantial instantaneous release of gas and heat spontaneously or by contact with sparks or flame.

(11) "Hazardous waste" means those wastes designated as hazardous by U.S. Environmental Protection Agency regulations in 40 C.F.R. Part 261.

(12) "Hydrogeologic unit" means a soil or rock unit or zone that by virtue of its porosity or permeability, or lack thereof, has a distinct influence on the storage or movement of ground

water.

(13) "Inadvertent intruder" means a person who might occupy the disposal site after closure and engage in normal activities, such as agriculture, dwelling construction, or other pursuits in which an individual might be unknowingly exposed to radiation from the waste.

(14) "Intruder barrier" means:(a) A sufficient depth of cover over the waste that inhibits contact with waste and helps to ensure that radiation exposures to an inadvertent intruder shall meet the performance objectives set forth in this administrative regulation; or

(b) Engineered structures that provide equivalent protection to the inadvertent intruder.

(15) "Land disposal facility" means the land, buildings, or equipment intended to be used for the disposal of radioactive wastes. A "geologic repository" as defined by C.F.R. Parts 60 or 63 is not considered a land disposal facility.

(16) "Monitoring" means observing and making measurements to provide data to evaluate the performance and characteristics of the disposal site.

(17) "Near-surface disposal facility" means a land disposal facility in which radioactive waste is disposed of within approximately the upper thirty (30) meters of the earth's surface.

(18) "Pyrophoric liquid" means a liquid that ignites spontaneously in dry or moist air at or below 130 degrees Fahrenheit (fifty-four and five-tenths (54.5) degrees Centigrade). A pyrophoric solid is a solid material, other than one classed as an explosive, which under normal conditions is liable to cause fires through friction, retained heat from manufacturing or processing, or which can be ignited readily and if ignited burns so vigorously and persistently as to create a serious transportation, handling, or disposal hazard. Included are spontaneously combustible and water-reactive materials.

(19) "Site closure and stabilization" means those actions that are taken upon completion of operations that prepare the disposal site for custodial care and that assure that the disposal site will remain stable and will not need ongoing active maintenance.

(20) "Stability" means structural stability.

(21) "Surveillance" means monitoring and observation of the disposal site for purposes of visual detection of need for maintenance, custodial care, evidence of intrusion, and compliance with other license and regulatory requirements.

(22) "Waste" means those low-level radioactive wastes that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level waste has the same meaning as in the Low-level Radioactive Waste Policy Act, Pub.L. 96-573, that is, radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or by-product material as defined in Section 11e.(2) of the Atomic Energy Act, 42 U.S.C. 2011 - 2297g-4(uranium or thorium tailings and waste).

Section 2. Applicability. This administrative regulation shall apply to a person prescribing land disposal that involves disposal in the uppermost portion of the earth, approximately thirty (30) meters, of radioactive waste received from another person except:

(1) Disposal of "by-product material" as defined by 902 KAR 100:010 in quantities greater than 10,000 kilograms and containing more than five (5) millicuries of radium-226; or

(2) Disposal of licensed material as provided for in 902 KAR 100:021.

Section 3. License Required. (1) A person shall not receive, possess, or dispose of waste received from another person at a land disposal facility unless authorized by a license issued by the cabinet as provided by this administrative regulation and 902 KAR 100:021.

(2) Each person shall file an application with the cabinet as provided by 902 KAR 100:040, Section 4, and obtain a license as provided in this administrative regulation before commencing

ing construction of a land disposal facility. Failure to comply with this requirement shall be grounds for denial of a license.

Section 4. Content of Application. In addition to the requirements of set forth in 902 KAR 100:040, Section 5, an application to receive from others, possess, or dispose of wastes shall consist of general information, specific technical information, institutional information, and financial information as set forth in Sections 5 through 9 of this administrative regulation.

Section 5. General Information. The general information shall include each of the following:

(1) Identity of the applicant including:

(a) The full name, address, telephone number, and description of the business or occupation of the applicant;

(b) If the applicant is a partnership, the name and address of each partner and the principal location where the partnership does business;

(c) If the applicant is a corporation or an unincorporated association, the state where it is incorporated or organized and the principal location where it does business and the names and addresses of its directors and principal officers; and

(d) If the applicant is acting as an agent or representative of another person in filing the application, all information required by this subsection shall be supplied with respect to the other person.

(2) Qualifications of the applicant.

(a) The organizational structure of the applicant, both off-site and on-site, including a description of lines of authority and assignments of responsibilities, whether in the form of administrative directives, contract provisions, or otherwise;

(b) The technical qualifications, including training and experience, of the applicant and members of the applicant's staff to engage in the proposed activities. Minimum training and experience requirements for personnel filling key positions described in paragraph (a) of this subsection shall be provided;

(c) A description of the applicant's personnel training program; and

(d) The plan to maintain an adequate complement of trained personnel to carry out waste receipt, handling, and disposal operations in a safe manner.

(3) A description of:

(a) The location of the proposed disposal site;

(b) The general character of the proposed activities;

(c) The types and quantities of radioactive waste to be received, possessed, or disposed of;

(d) Plans for use of the land disposal facility for purposes other than disposal of radioactive wastes; and

(e) The proposed facilities and equipment.

(4) Proposed schedules for construction, receipt of waste, and first emplacement of waste at the proposed land disposal facility.

Section 6. Specific Technical Information. The specific technical information shall include the following information needed for demonstration that the performance objectives and the applicable technical requirements of this administrative regulation shall be met:

(1) A description of the natural and demographic disposal site characteristics as determined by disposal site selection and characterization activities. The description shall include geologic, geotechnical, hydrologic, meteorologic, climatologic, and biotic features of the disposal site and vicinity;

(2) A description of the design features of the land disposal facility and the disposal units.

For near-surface disposal, the description shall include those design features related to:

- (a) Infiltration of water;
 - (b) Integrity of covers for disposal units;
 - (c) Structural stability of backfill, wastes, and covers;
 - (d) Contact of wastes with standing water;
 - (e) Disposal site drainage;
 - (f) Disposal site closure and stabilization;
 - (g) Elimination to the extent practicable of long-term disposal site maintenance;
 - (h) Inadvertent intrusion; occupational exposures;
 - (i) Disposal site monitoring; and
 - (j) Adequacy of the size of the buffer zone for monitoring and potential mitigative measures;
- (3) A description of the principal design criteria and their relationship to the performance objectives;
- (4) A description of the design basis natural events or phenomena and their relationship to the principal design criteria;
- (5) A description of codes and standards that the applicant has applied to the design and that will apply to construction of the land disposal facilities;
- (6) A description of the construction and operation of the land disposal facility. The description shall include, at a minimum, the:
- (a) Methods of construction of disposal units;
 - (b) Waste emplacement;
 - (c) Procedures for and areas of waste segregation;
 - (d) Types of intruder barriers;
 - (e) On-site traffic and drainage systems;
 - (f) Survey control program;
 - (g) Methods and areas of waste storage; and
 - (h) Methods to control surface water and ground water access to the wastes. The description shall also include the methods to be employed in the handling and disposal of wastes containing chelating agents or other nonradiological substances that might affect meeting the performance objectives of this administrative regulation;
- (7) A description of the disposal site closure plan, including those design features that are intended to facilitate disposal site closure and to eliminate the need for ongoing active maintenance;
- (8) An identification of the known natural resources at the disposal site whose exploitation could result in inadvertent intrusion into the low-level wastes after removal of active institutional control;
- (9) A description of the kind, amount, classification, and specifications of the radioactive material proposed to be received, possessed, or disposed of at the land disposal facility;
- (10) A description of the quality control program for the determination of natural disposal site characteristics and for quality control during the design, construction, operation, and closure of the land disposal facility and the receipt, handling, and emplacement of waste. Audits and managerial controls shall be included;
- (11) A description of the radiation safety program for control and monitoring of radioactive effluents to ensure compliance with the performance objective in Section 18 of this administrative regulation and occupational radiation exposure to ensure compliance with the requirements of 902 KAR 100:020 and to control contamination of personnel, vehicles, equipment, buildings, and the disposal site. Both routine operations and accidents shall be addressed. The program description shall include procedures, instrumentation, facilities, and equipment;
- (12) A description of the environmental monitoring program to provide data to evaluate po-

tential health and environmental impacts and the plan for taking corrective measures if migration of radionuclides is indicated; and

(13) A description of the administrative procedures that the applicant shall apply to control activities at the land disposal facility.

Section 7. Technical Analyses. The specific technical information shall also include the following analyses needed to demonstrate that the performance objectives of these administrative regulations shall be met:

(1) Pathways analyzed in demonstrating protection of the general population from releases of radioactivity shall include air, soil, ground water, surface water, plant uptake, and exhumation by burrowing animals. The analyses shall clearly:

(a) Identify and differentiate between the roles performed by the natural disposal site characteristics and design features in isolating and segregating the wastes; and

(b) Demonstrate that there is reasonable assurance that the exposures to humans from the release of radioactivity shall not exceed the limits set forth in Section 18 of this administrative regulation;

(2) Analyses of the protection of individuals from inadvertent intrusion shall include demonstration that there is reasonable assurance the waste classification and segregation requirements shall be met and that adequate barriers to inadvertent intrusion shall be provided;

(3) Analyses of the protection of individuals during operations shall include assessments of expected exposures due to routine operations and likely accidents during handling, storage, or disposal of waste. The analyses shall provide reasonable assurance that exposures shall be controlled to meet the requirements of 902 KAR 100:020; and

(4) Analyses of the long-term stability of the disposal site and the need for ongoing active maintenance after closure shall be based upon analyses of active natural processes such as erosion, mass wasting, slope failure, settlement of wastes and backfill, infiltration through covers over disposal areas and adjacent soils, and surface drainage of the disposal site. The analyses shall provide reasonable assurance that there shall not be a need for ongoing active maintenance of the disposal site following closure.

Section 8. Institutional Information. The institutional information submitted by the applicant shall include:

(1) A certification by the Commonwealth of Kentucky, or federal agency that owns the disposal site, that the Commonwealth of Kentucky or federal agency is prepared to accept transfer of the license if the provisions of Section 15 of this administrative regulation are met, and shall assume responsibility for custodial care after site closure and postclosure observation and maintenance; and

(2) If the proposed disposal site is on land not owned by the Commonwealth of Kentucky or federal government, the applicant shall submit evidence that arrangements have been made for assumption of ownership in fee by the Commonwealth of Kentucky or federal agency before the cabinet issues a license.

Section 9. Financial Information. The financial information shall be sufficient to demonstrate that the financial qualifications of the applicant are adequate to carry out the activities for which the license is sought and meet other financial assurance requirements of this administrative regulation.

Section 10. Standards for Issuance of a License. A license for the receipt, possession, or disposal of waste containing or contaminated with radioactive material shall be issued by the

cabinet upon finding that:

(1) The issuance of the license shall not constitute an unreasonable risk to the health and safety of the public;

(2) The applicant is qualified by reason of training and experience to carry out the disposal operations requested in a manner that protects health and minimizes danger to life and property;

(3) The applicant's proposed disposal site; disposal design; land disposal facility operations; including equipment, facilities, procedures, disposal site closure, and postclosure institutional care are adequate to protect the public health and safety in that they provide reasonable assurance that the general population shall be protected from releases of radioactivity as specified in the performance objective in Section 18 of this administrative regulation;

(4) The applicant's proposed disposal site; disposal site design; land disposal facility operations; including equipment, facilities, procedures, disposal site closure, and postclosure institutional control are adequate to protect the public health and safety in that they shall provide reasonable assurance that individual inadvertent intruders are protected in accordance with the performance objective in Section 19 of this administrative regulation;

(5) The applicant's proposed disposal facility operations, including equipment, facilities, and procedures, are adequate to protect the public health and safety in that they shall provide reasonable assurance that the standards for radiation protection set out in 902 KAR 100:019 shall be met;

(6) The applicant's proposed disposal site, disposal site design, land disposal facility operations, disposal site closure, and postclosure institutional care are adequate to protect the public health and safety in that they shall provide reasonable assurance that long-term stability of the disposed waste and the disposal site shall be achieved and shall eliminate to the extent practicable the need for ongoing active maintenance of the disposal site following closure;

(7) The applicant's demonstration provides reasonable assurance that the applicable technical requirements of this administrative regulation shall be met;

(8) The applicant's proposal for institutional control provides reasonable assurance that the care shall be provided for the length of time found necessary to ensure the findings in Subsection (3) through (6) of this section and that the institutional control meets the requirements of Section 27 of this administrative regulation; and

(9) The information on financial assurances meets the requirements of this administrative regulation.

Section 11. Conditions of Licenses. (1) A license issued under this administrative regulation, or a right thereunder, may be transferred, assigned, or in any manner disposed of, either voluntarily or involuntarily, through transfer of control of the license to a person. A transfer, assignment, or disposition shall occur only if the cabinet finds, after securing full information, that the transfer is in accordance with the provisions of the Act. The cabinet shall provide the approval or denial in writing in the form of a license amendment.

(2) The licensee shall submit a written statement under oath upon request of the cabinet, before termination of the license, and to enable the cabinet to determine if the license shall be modified, suspended, or revoked.

(3) The license shall be terminated only on the full implementation of the final closure plan as approved by the cabinet, including postclosure observation and maintenance.

(4) The licensee shall be subject to the provisions of the Act, 902 KAR Chapter 100, and orders of the cabinet. The terms and conditions of the license shall be subject to amendment, revision, or modification.

(5) Each person licensed by the cabinet as authorized by this administrative regulation shall

confine possession and use of materials to the locations and purposes authorized in the license.

(6) The licensee shall not dispose of waste until the cabinet has inspected the land disposal facility and has found it to be in conformance with the description, design, and construction described in the application for a license.

(7) The cabinet may incorporate in a license at issuance, or thereafter, by 902 KAR Chapter 100 or order, additional requirements and conditions with respect to the licensee's receipt, possession, and disposal of waste necessary in order to:

(a) Protect health or to minimize danger to life or property; and

(b) Require reports and the keeping of records and to provide for inspections of activities under the license as necessary or appropriate to effectuate the purposes of the Act and 902 KAR Chapter 100.

(8) The authority to dispose of wastes expires on the date stated in the license. An expiration date on a license applies only to the aboveground activities and to the authority to dispose of waste. Failure to renew the license shall not relieve the licensee of responsibility for carrying out site closure, postclosure observation, and transfer of the license to the site owner.

Section 12. Application for Renewal or Closure. (1) An application for renewal or an application for closure shall be filed at least ninety (90) days prior to license expiration.

(2) An application for renewal of a license shall be filed in accordance with Sections 4 through 9 of this administrative regulation. An application for closure shall be filed in accordance with Section 13 of this administrative regulation. Information contained in previous applications, statements, or reports filed with the cabinet under the license may be incorporated by reference if the references are clear and specific.

(3) In a case in which a licensee has filed an application in proper form for renewal of a license, the license shall not expire until the cabinet has taken action on the application for renewal.

(4) In determining if a license shall be renewed, the cabinet shall apply the criteria set forth in Section 10 of this administrative regulation.

Section 13. Contents of Application for Closure. (1) Prior to final closure of the disposal site, or as otherwise directed by the cabinet, the applicant shall submit an application to amend the license for closure. This closure application shall include a final revision and specific details of the disposal site closure plan included as part of the license application submitted under Section 6(7) of this administrative regulation that includes each of the following:

(a) Additional geologic, hydrologic, or other data pertinent to the long-term containment of emplaced wastes obtained during the operational period;

(b) The results of tests, experiments, or other analyses relating to backfill of excavated areas; closure and sealing; waste migration and interaction with emplacement media; or other tests, experiments, or analysis pertinent to the long-term containment of emplaced waste within the disposal site;

(c) Proposed revision of plans for:

1. Decontamination or dismantlement of surface facilities;

2. Backfilling of excavated areas; or

3. Stabilization of the disposal site for postclosure care; and

(d) Significant new information regarding the environmental impact of closure activities and long-term performance of the disposal site.

(2) Upon review and consideration of an application to amend the license for closure submitted in accordance with subsection (1) of this section, the cabinet shall issue an amendment au-

thorizing closure if there is reasonable assurance that the long-term performance objectives of this administrative regulation shall be met.

Section 14. Postclosure Observation and Maintenance. (1) The licensee shall observe, monitor, and carry out necessary maintenance and repairs at the disposal site until the site closure is complete and the license is transferred by the cabinet in accordance with Section 15 of this administrative regulation.

(2) Responsibility for the disposal site shall be maintained by the licensee for at least five (5) years.

(3) A shorter or longer time period for postclosure observation and maintenance may be established and approved as part of the site closure plan, based on site-specific conditions.

Section 15. Transfer of License. Following closure and the period of postclosure observation and maintenance, the licensee may apply for an amendment to transfer the license to the disposal site owner. The license shall be transferred if the cabinet finds:

(1) The closure of the disposal site has been made in conformance with the licensee's disposal site closure plan, as amended and approved as part of the license;

(2) Reasonable assurance has been provided by the licensee that the performance objectives of this administrative regulation are met;

(3) Funds and necessary records for care shall be transferred to the disposal site owner;

(4) The postclosure monitoring program is operational for implementation by the disposal site owner; and

(5) The Commonwealth of Kentucky or federal agency that shall assume responsibility for institutional control of the disposal site is prepared to assume responsibility and ensure that the institutional requirements found necessary under Section 10(8) of this administrative regulation shall be met.

Section 16. Termination of License. (1) Following a period of institutional control needed to meet the requirements found necessary under Section 10 of this administrative regulation, the licensee may apply for an amendment to terminate the license.

(2) This application shall be reviewed in accordance with the provisions of 902 KAR 100:040, Section 4.

(3) A license shall be terminated only if the cabinet finds:

(a) The institutional control requirements found necessary under Section 10(8) of this administrative regulation have been met;

(b) Additional requirements resulting from new information developed during the institutional control period have been met; and

(c) Permanent monuments or markers warning against intrusion have been installed.

Section 17. General Requirement. Land disposal facilities shall be sited, designed, operated, closed, and controlled after closure so that reasonable assurance exists that exposures to individuals are within the limits established in the performance objectives in Section 18 through Section 21 of this administrative regulation.

Section 18. Protection of the General Population from Releases of Radioactivity. A concentration of radioactive material that may be released to the general environment in groundwater, surface water, air, soil, plants, or animals shall not result in an annual dose exceeding an equivalent of twenty-five (25) millirems to the whole body, seventy-five (75) millirems to the thyroid, and twenty-five (25) millirems to any other organ of a member of the public. Reasona-

ble effort shall be made to maintain releases of radioactivity in effluents to the general environment as low as it is reasonably achievable.

Section 19. Protection of Inadvertent Intrusion. Design, operation, and closure of the land disposal facility shall ensure protection of an individual inadvertently intruding into the disposal site and occupying the site or contacting the waste any time after active institutional controls over the disposal site are removed.

Section 20. Protection of Individuals During Operations. Operations at the land disposal facility shall be conducted in compliance with the standards for radiation protection set out in 902 KAR 100:019, except for releases of radioactivity in effluents from the disposal facility, which shall be governed by Section 18 of this administrative regulation. Every reasonable effort shall be made to maintain radiation exposures as low as is reasonably achievable.

Section 21. Stability of the Disposal Site After Closure. The disposal facility shall be sited, designed, used, operated, and closed to achieve long-term stability of the disposal site and to eliminate to the extent practicable the need for ongoing active maintenance of the disposal site following closure so that only surveillance, monitoring, or minor custodial care are required.

Section 22. Disposal Site Suitability Requirements for Land Disposal. Disposal site suitability for near-surface disposal. The following are the minimum characteristics a disposal site shall have to be acceptable for use as a near-surface disposal facility:

(1) The primary emphasis in disposal site suitability is isolation of wastes, and the disposal site features that ensure that the long-term performance objectives are met.

(2) The disposal site shall be capable of being characterized, modeled, analyzed, and monitored.

(3) Within the region where the facility is to be located, a disposal site shall be selected so that projected population growth and future developments are not likely to affect the ability of the disposal facility to meet the performance objectives of this administrative regulation.

(4) Areas shall be avoided having known natural resources that, if exploited, would result in failure to meet the performance objectives of this administrative regulation.

(5) The disposal site shall be generally well drained and free of areas of flooding or frequent ponding. Waste disposal shall not take place in a 100-year flood plain, coastal high-hazard area, or wetland, as defined in U.S. Executive Order 11988, Flood plain Management Guidelines.

(6) Upstream drainage areas shall be minimized to decrease the amount of run-off that could erode or inundate waste disposal units.

(7)(a) The disposal site shall provide sufficient depth to the water table that ground water intrusion, perennial or otherwise, into the waste shall not occur.

(b) The cabinet shall consider an exception to this requirement to allow disposal below the water table if it can be conclusively shown that disposal site characteristics may result in molecular diffusion being the predominant means of radionuclide movement and the rate of movement may result in the performance objectives being met.

(c) In no case shall waste disposal be permitted in the zone of fluctuation of the water table.

(8) The hydrogeologic unit used for disposal shall not discharge ground water to the surface within the disposal site.

(9) Areas shall be avoided if tectonic processes, such as faulting, folding, seismic activity, or vulcanism may occur with a frequency and extent to significantly affect the ability of the disposal site to meet the performance objectives of this administrative regulation or may preclude

defensible modeling and prediction of long-term impacts.

(10) Areas shall be avoided if surface geologic processes such as mass wasting, erosion, slumping, landsliding, or weathering occur with a frequency and extent to significantly affect the ability of the disposal site to meet the performance objectives of this administrative regulation, or may preclude defensible modeling and prediction of long-term impacts.

(11) The disposal site shall not be located where nearby facilities or activities could adversely impact the ability of the site to meet the performance objectives of this administrative regulation or significantly mask the environmental monitoring program.

Section 23. Disposal Site Design for Land Disposal. Disposal site design for near-surface disposal.

(1) Site design features shall be directed toward long-term isolation and avoidance of the need for continuing active maintenance after site closure.

(2) The disposal site design and operation shall be compatible with the disposal site closure and stabilization plan and lead to disposal site closure that provides reasonable assurance that the performance objectives shall be met.

(3) The disposal site shall be designed to complement and improve the ability of the disposal site's natural characteristics to assure that the performance objectives shall be met.

(4) Covers shall be designed to minimize water infiltration, to direct percolating or surface water away from the disposed waste, and to resist degradation by surface geologic processes and biotic activity.

(5) Surface features shall direct surface water drainage away from disposal units at velocities and gradients that shall not result in erosion that shall require ongoing active maintenance in the future.

(6) The disposal site shall be designed to minimize the contact of water with waste during storage, the contact of standing water with waste during disposal, and the contact of percolating or standing water with wastes after disposal.

Section 24. Land Disposal Facility Operation and Disposal Site Closure; Near-surface Disposal Facility Operation and Disposal Site Closure.

(1) Wastes designated as Class A in 902 KAR 100:021 shall be segregated from other wastes by placing in disposal units that are sufficiently separated from disposal units for the other waste classes so that an interaction between Class A wastes and other wastes shall not result in the failure to meet the performance objectives of this administrative regulation. This segregation is not necessary for Class A wastes if they meet the stability requirements in 902 KAR 100:021, Section 7(2).

(2) Wastes designated as Class C in 902 KAR 100:021 shall be disposed of so that the top of the waste is a minimum of five (5) meters below the top surface of the cover or shall be disposed of with intruder barriers that are designed to protect against an inadvertent intrusion for at least 500 years.

(3) Except as provided in subsection (1) of this section, only waste classified as Class A, B, or C shall be acceptable for near-surface disposal. All waste shall be disposed of in accordance with requirements of subsections (4) through (11) of this section.

(4) Wastes shall be emplaced in a manner that maintains the package integrity during emplacement, minimizes the void spaces between packages, and allows the void spaces to be filled.

(5) Void spaces between waste packages shall be filled with earth or other material to reduce future subsidence within the fill.

(6) Waste shall be placed and covered in a manner that limits the radiation dose rate at the

surface of the cover to levels that at a minimum shall permit the licensee to comply with all provisions of 902 KAR 100:019, Sections 10 and 11, if the license is transferred as authorized by Section 15 of this administrative regulation.

(7) The boundaries and locations of each disposal unit shall be accurately located and mapped by means of a land survey.

(8) Near-surface disposal units shall be marked in a way that the boundaries of each unit can be easily defined.

(9) Three (3) permanent survey marker control points, referenced to United States Geological Survey (USGS) or National Geodetic Survey (NGS) survey control stations, shall be established on the site to facilitate surveys.

(10) The USGS or NGS control stations shall provide horizontal and vertical controls as checked against USGS or NGS record files.

(11) A buffer zone of land shall be maintained between any buried waste and the disposal site boundary and beneath the disposed waste. The buffer zone shall be of adequate dimensions to carry out environmental monitoring activities specified in Section 25 of this administrative regulation and take mitigative measures if needed.

(12) Closure and stabilization measures set forth in the approved site closure plan shall be carried out as each disposal unit is filled and covered.

(13) Active waste disposal operations shall not have an adverse effect on completed closure and stabilization measures.

(14) Only wastes containing or contaminated with radioactive materials shall be disposed of at the disposal site.

(15) A proposal for disposal of waste that is not generally acceptable for near-surface disposal because the waste form and disposal methods need to be different, and in general more stringent than those specified for Class C waste, may be submitted to the cabinet for approval.

Section 25. Environmental Monitoring. (1)(a) If a license application is submitted, the applicant shall have conducted a preoperational monitoring program to provide basic environmental data on the disposal site characteristics.

(b) The applicant shall obtain information about the ecology, meteorology, climate, hydrology, geology, geochemistry, and seismology of the disposal site.

(c) For those characteristics that are subject to seasonal variation, data shall cover at least a twelve (12) month period.

(2)(a) During the land disposal facility site construction and operation, the licensee shall maintain an environmental monitoring program.

(b) Measurements and observations shall be made and recorded to provide data to evaluate the potential health and environmental impacts during both the construction and the operation of the facility and to enable the evaluation of long-term effects and the need for mitigative measures.

(c) The monitoring system shall be capable of providing early warning of releases of radionuclides from the disposal site before they leave the site boundary.

(3) After the disposal site is closed, the licensee responsible for postoperational surveillance of the disposal site shall maintain a monitoring system based on the operating history and the closure and stabilization of the disposal site. The monitoring system shall be capable of providing early warning of releases of radionuclides from the disposal site before they leave the site boundary.

(4) The licensee shall have plans for taking corrective measures if the environmental monitoring program detects migration of radionuclides that would indicate that the performance objectives may not be met.

Section 26. Alternative Requirements for Design and Operations. The cabinet may, upon request or on its own initiative, authorize provisions other than those set forth in Sections 23 through 25 of this administrative regulation for the segregation and disposal of waste and for the design and operation of a land disposal facility on a specific basis if it finds reasonable assurance of compliance with the performance objectives of this administrative regulation.

Section 27. Institutional Requirements. (1) Land ownership. Disposal of radioactive waste received from other persons may be permitted only on land owned, in fee, by the Commonwealth of Kentucky or federal government.

(2) Institutional control.

(a) The land owner or custodial agency shall carry out an institutional control program to physically control access to the disposal site following transfer of control of the disposal site from the disposal site operator.

(b) The institutional control program shall also include, in part, carrying out an environmental monitoring program at the disposal site, periodic surveillance, minor custodial care, and other requirements as determined by the cabinet in accordance with 10 C.F.R. 61.59, and administration of funds to cover the costs for these activities.

(c) The period of controls shall be determined by the cabinet in accordance with 10 C.F.R. 61.59, but controls may not be relied upon for more than 100 years following transfer of control of the disposal site to the owner.

Section 28. Alternative Requirements for Waste Classification and Characteristics. The cabinet licensing a low-level disposal facility may, upon request or on its own initiative, authorize other provisions for the classification and characteristics of waste on a specific basis if, after evaluation of the specific characteristics of the waste, disposal site, or method of disposal, it finds reasonable assurance of compliance with the performance objectives specified in this administrative regulation.

Section 29. Applicant Qualifications and Assurances. Each applicant shall show that he either possesses the necessary funds or has reasonable assurance of obtaining the necessary funds or, by a combination of the two (2), to cover the estimated costs of conducting all licensed activities over the planned operating life of the project, including costs of construction and disposal.

Section 30. Funding for Disposal Site Closure and Stabilization. (1) The applicant shall provide assurances prior to the commencement of operations that sufficient funds shall be available to carry out disposal site closure and stabilization, including:

(a) Decontamination or dismantlement of land disposal facility structures;

(b) Closure and stabilization of the disposal site so that following transfer of the disposal site to the site owner, the need for ongoing active maintenance shall be eliminated to the extent practicable and only minor custodial care, surveillance, and monitoring shall be required; and

(c) Assurances shall be based on cabinet-approved cost estimates reflecting the cabinet-approved plan for disposal site closure and stabilization. The applicant's cost estimates shall take into account total costs that would be incurred if an independent contractor were hired to perform the closure and stabilization work.

(2) In order to avoid unnecessary duplication and expense, the cabinet may accept financial sureties that have been consolidated with earmarked financial or surety arrangements established to meet requirements of other federal or state agencies or local governing bodies for the

decontamination, closure, and stabilization. If the cabinet accepts these arrangements they shall be adequate to satisfy these requirements and that the portion of the surety that covers the closure of the disposal site that shall be clearly identified and committed for use in accomplishing these activities.

(3) The licensee's surety mechanism shall be submitted annually for review by the cabinet to assure that sufficient funds are available for completion of the closure plan, assuming that the work has to be performed by an independent contractor.

(4) The amount of surety liability shall change in accordance with the predicted cost of future closure and stabilization. Factors affecting closure and stabilization cost estimates include:

(a) Inflation;

(b) Increases in the amount of disturbed land;

(c) Changes in engineering plans;

(d) Closure and stabilization that has already been accomplished; and

(e) Other conditions affecting costs. This shall yield a surety that is at least sufficient at all times to cover the costs of closure of the disposal units that are expected to be used before the next license renewal.

(5)(a) The term of the surety mechanism shall be open unless it can be demonstrated that another arrangement would provide an equivalent level of assurance.

1. This assurance shall be provided with a surety mechanism written for a specified period of time (for example, five (5) years) yet which shall be automatically renewed unless the party who issues the surety notifies the cabinet and the beneficiary (the site owner) and the principal (the licensee) not less than ninety (90) days prior to the renewal date of the intention not to renew.

2. In this situation the licensee shall submit a replacement surety within thirty (30) days after notification of cancellation.

(b) If the licensee fails to provide a replacement surety acceptable to the cabinet, the site owner may collect on the original surety.

(6)(a) Proof of forfeiture shall not be necessary to collect the surety so that if the licensee could not provide an acceptable replacement surety within the required time, the surety shall be automatically collected prior to its expiration.

(b) The conditions described in this section shall be clearly stated on a surety instrument that is not open-ended, and shall be agreed to by all parties. Liability under the surety mechanism shall remain in effect until the closure and stabilization program has been completed and approved by the cabinet and the license has been transferred to the site owner.

(7)(a) Financial surety arrangements acceptable to the cabinet include:

1. Surety bonds;

2. Cash deposits;

3. Certificates of deposit;

4. Deposits of government securities;

5. Escrow accounts;

6. Irrevocable letters or lines of credit;

7. Trust funds; and

8. Combinations of the above.

(b) Self-insurance, or an arrangement that essentially constitutes pledging the assets of the licensee, shall not satisfy the surety requirement for private sector applicants because this does not provide additional assurance other than that which already exists through license requirements.

Section 31. Financial Assurances for Institutional Controls. (1) Prior to the issuance of the

license, the applicant shall provide for cabinet review and approval or denial a copy of a binding arrangement, such as a lease, between the applicant and the disposal site owner that ensures that sufficient funds shall be available to cover the costs of monitoring and required maintenance during the institutional control period. The binding arrangement shall be reviewed periodically by the cabinet to ensure that changes in inflation, technology, and disposal facility operations are reflected in the arrangements.

(2) Subsequent changes to the binding arrangement specified in subsection (1) of this section relevant to institutional control shall be submitted to the cabinet for approval or denial.

Section 32. Maintenance of Records, Reports, and Transfers. (1) Each licensee shall maintain records and make reports in connection with the licensed activities as required by the conditions of the license or by 902 KAR Chapter 100 or orders of the cabinet.

(2)(a) A record required by 902 KAR Chapter 100 or by license conditions shall be maintained for a period specified by the appropriate administrative regulation in 902 KAR Chapter 100 or by license condition.

(b) If a retention period is not otherwise specified, these records shall be maintained and transferred to the officials specified in subsection (5) of this section as a condition of license termination unless the cabinet otherwise authorizes disposition.

(3)(a) A record that shall be maintained as required by this section shall be the original, a reproduced copy, or microform if this reproduced copy or microform is capable of producing copy that is clear and legible at the end of the required retention period.

(b)1. The record may also be stored in electronic media with the capability of producing legible, accurate, and complete records during the retention period.

2. Records such as letters, drawings, and specifications shall include all pertinent information such as stamps, initials, and signatures.

(c) The licensee shall maintain adequate safeguards against tampering with and loss of records.

(4) If there is a conflict between the cabinet's administrative regulations, license condition, or other written cabinet approval or authorization pertaining to the retention period for the same type of record, the longest retention period specified shall take precedence.

(5) In addition to the requirements of subsections (1) through (4) of this section, copies of records of the location and the quantity of radioactive wastes contained in the disposal site shall be transferred upon license termination to the chief executive of the nearest municipality, the chief executive of the county in which the facility is located, the county zoning board or land development and planning agency, the Governor of the Commonwealth of Kentucky, other Kentucky local agencies, and federal governmental agencies as designated by the cabinet when the license is terminated.

(6) Following receipt and acceptance of a shipment of radioactive waste, the licensee shall record:

- (a) The date that the shipment is received at the disposal facility;
- (b) The date of disposal of the waste;
- (c) A traceable shipment manifest number;
- (d) A description of any engineered barrier or structural overpack provided for disposal of the waste;
- (e) The location in the disposal site;
- (f) The condition of the waste packages as received;
- (g) Any discrepancies between materials listed on the manifest and those received;
- (h) The volume of pallets, bracing, or other shipping or onsite generated materials that are contaminated, and are disposed of as contaminated or suspect materials; and

(i) Any evidence of leaking or damaged packages or radiation or contamination levels in excess of limits specified in U.S. Department of Transportation and 902 KAR Chapter 100.

(7) The licensee shall briefly describe repackaging operations of the waste packages included in the shipment, plus other information required by the cabinet as a license condition.

(8) The licensee shall retain these records until the cabinet transfers or terminates the license that authorizes the activities established in this section.

(9) Each licensee authorized to dispose of radioactive waste received from other persons shall file a copy of its financial report or a certified financial statement annually with the cabinet in order to update the information base for determining financial qualifications.

(10)(a) Each licensee authorized to dispose of waste materials received from other persons, authorized by this administrative regulation, shall submit an annual report to the cabinet. Reports shall be submitted by the end of the first calendar quarter of each year for the preceding year.

(b) The reports shall include:

1. Specification of the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in airborne effluents during the preceding year;
2. The results of the environmental monitoring program;
3. A summary of licensee disposal unit survey and maintenance activities;
4. A summary, by waste class, of activities and quantities of radionuclides disposed of;
5. Instances in which observed site characteristics were significantly different from those described in the application for a license; and
6. Other information the cabinet may require to protect public health and safety.

(c) The report shall specifically cover instances in which the quantities of radioactive materials released during the reporting period, monitoring results, or maintenance performed are significantly different from those expected in the materials previously reviewed as part of the licensing action.

(11)(a) In addition to the other requirements of this section, the licensee shall store or have stored, manifest and other information pertaining to receipt and disposal of radioactive waste in an electronic recordkeeping system.

(b) The manifest information that shall be stored electronically is:

1. That required in 902 KAR 100:021, Sections 9 and 10, with the exception of shipper and carrier telephone numbers and shipper and consignee certifications; and
2. The information required in subsection (6) of this section.

(c) As specified in license conditions, the licensee shall report the stored information, or subsets of the information, on a computer-readable medium.

Section 33. Tests at Land Disposal Facilities. Each licensee shall perform, or allow the cabinet to perform, any tests appropriate or necessary for the administration of this administrative regulation, including, in part, tests of:

- (1) Radioactive wastes and facilities used for the receipt, storage, treatment, handling, or disposal of radioactive wastes;
- (2) Radiation detection and monitoring instruments; and
- (3) Other equipment and devices used in connection with the receipt, possession, handling, treatment, storage, or disposal of radioactive waste.

Section 34. Cabinet Inspections of Land Disposal Facilities. (1) Each licensee shall:

(a) Afford to the cabinet at all reasonable times opportunity to inspect radioactive waste not yet disposed of and the premises, equipment, operations, and facilities in which radioactive

wastes are received, possessed, handled, treated, stored, or disposed;

(b) Provide the cabinet with the necessary equipment to meet the activities, such as monitoring, surveying, and recordkeeping as required by this section; and

(c) Make available to the cabinet for inspection, upon notice, records kept by it as required by this administrative regulation.

(2) Authorized representatives of the cabinet may copy and take away copies of any record required to be kept by this administrative regulation. (12 Ky.R. 1128; eff. 1-3-86; Am. 18 Ky.R. 1487; eff. 1-10-92; 38 Ky.R. 364; 942; EFF. 11-16-11.)