

ENERGY AND ENVIRONMENT CABINET
Department for Environmental Protection
Division of Waste Management
(Amended After Comments)

401 KAR 45:160. Surface and groundwater monitoring and corrective action for special waste sites or facilities.

RELATES TO: KRS ~~224.1~~~~[224.01]~~, 224.10, 224.40, 224.46, 224.50, 224.99, 40 C.F.R. 302.4, Appendix A

STATUTORY AUTHORITY: KRS 224.10-100, 224.40-305, 224.50-760, 40 C.F.R. 302.4

NECESSITY, FUNCTION, AND CONFORMITY: KRS Chapter 224 requires the cabinet to adopt administrative regulations for the treatment, management, processing, or disposal of wastes. KRS 224.40-305 requires persons who establish, construct, operate, maintain or permit the use of a waste site or facility to obtain a permit. This chapter establishes the permitting standards for special waste sites or facilities, and the standards applicable to all special waste sites or facilities. This administrative regulation sets forth the standards for groundwater and surface water monitoring and corrective action at special waste sites or facilities. This administrative regulation does not establish requirements for surface or groundwater monitoring of special waste sites or facilities where biosolids from the treatment of domestic sewage or sewage sludge from a treatment facility have been land applied, except as it applies to biosolid permit corrective action plans.

Section 1. Applicability.

(1) The requirements of this administrative regulation apply to owners and operators of special waste landfills, Type A special waste landfarming or composting sites or facilities, other special waste sites or facilities at which the cabinet determines groundwater and surface water monitoring shall be required pursuant to 401 KAR 45:100 Section 3(3), and special waste sites or facilities required to perform corrective action as a result of documented groundwater contamination.

(2) Designs, reports, and plans constituting the public practice of geology, as defined in KRS 322A.010, shall be developed by a person registered pursuant to KRS Chapter 322A, except as provided for by KRS 322A.080.

(3) Landfarming and composting sites or facilities required to monitor surface water shall comply with Section 6(26) of 401 KAR 45:100. Landfarming and composting sites or facilities required to perform corrective action shall comply with Section 5 of this administrative regulation. The owner or operator shall satisfy the requirements of this administrative regulation for all wastes and waste constituents contained in the site or facility. The cabinet may waive baseline groundwater characterization and groundwater monitoring, subject to the provisions of 401 KAR 30:020.

Section 2. Design Requirements for Groundwater Monitoring Systems. The groundwater quality monitoring system to be utilized in the groundwater monitoring plan shall accurately analyze groundwater quality and characterize regional and local groundwater flow and flow systems. The monitoring system shall consist at a minimum, of the following:

(1) Background wells shall be located so that they will not be affected by groundwater contamination from the disposal area. Background wells shall be placed as described in paragraphs (a) and (b) of this subsection.

(a) At least one (1) background well at a point hydraulically upgradient from the disposal area in the direction of increasing static head that is capable of providing data representative of groundwater not affected by the special waste site or facility.

(b) When the special waste site or facility occupies the most upgradient position in the flow system or the upgradient area is not representative, sufficient downgradient or side gradient monitoring wells shall be placed to accurately characterize the groundwater quality and regional and local groundwater flow systems~~[- Background wells shall be located so that they will not be affected by groundwater contamination from the disposal area]; and~~

(2) At least two (2) monitoring wells at points hydraulically downgradient in the direction of decreasing static head from the area in which special waste has been or will be disposed. The cabinet may allow springs for monitoring points if the springs are hydraulically downgradient from the area in which special waste has been or will be disposed, if the springs are developed and protected in a manner approved by the cabinet, and if the springs are capable of detecting any contamination from the disposal facility. Downgradient monitoring wells shall be located so that they will provide early detection of groundwater contamination and progressive monitoring of the phases and units of the site or facility.

(3) An alternative monitoring plan may be proposed in an application for a special waste site or facility in accordance with Section 3(2) of 401 KAR 45:110.

Section 3. Requirements for Monitoring Well Construction.

(1) Precautions shall be taken during drilling and construction of monitoring wells to avoid introducing contaminants into the borehole. Only potable water shall be used in drilling monitoring wells, unless otherwise approved by the cabinet. Drilling muds shall not be used except with prior approval of the cabinet. Air systems and drilling lubricants shall not introduce contaminants into the boreholes.

(2) Decontamination of all equipment to be placed into the boring shall be performed before use at the site and between boreholes. Where possible, upgradient wells shall be drilled first.

(3) Monitoring wells shall be cased as follows:

(a) In a manner to ensure the integrity of the monitoring well borehole by isolating water bearing units which are sampled by each well;

(b) With a minimum casing diameter of four (4) inches, unless otherwise approved by the cabinet in writing;

(c) With screens and appropriate gravel or sand where necessary, to enable collection of samples at depths where appropriate aquifer flow zones exist;

(d) To allow the casing to protrude at least one (1) foot above ground;

(e) To provide a drill hole diameter that is a minimum of four (4) inches larger than the outside diameter of the well casing;

(f) To produce an annular space above the sampling depth that is sealed to prevent contamination of samples and the groundwater; and

(g) If plastic casing is used, it shall be threaded and gasket sealed to preclude potential sample contamination from solvent welded joints, unless otherwise provided by the cabinet in the permit.

(4) Monitoring well casings shall be enclosed in a protective cover that shall:

(a) Be of sufficient strength to protect the well from damage by heavy equipment and vandalism, and also include protective barrier steel posts at the corners of the concrete pad;

(b) Be installed into firm rock, unless otherwise approved by the cabinet;

(c) Be grouted and placed with a cement collar below the frost line to hold it firmly in position, unless otherwise approved by the cabinet;

(d) Be numbered and painted in a highly visible color;

(e) Protrude at least one (1) inch higher above grade than the monitoring well casing;

(f) Have a locking cap; and

- (g) Be made of steel or any other material of equivalent strength.
- (5) Each monitoring well shall have a concrete pad extending two (2) feet around the well and sloped away from the well.

Section 4. Sampling and Analysis.

- (1) Parameters listing. Owners or operators of special waste sites or facilities that require groundwater monitoring shall conduct sampling and analysis from each monitoring well for the parameters listed in Section 8 of this administrative regulation.
- (2) Reporting of analysis results. Analyses of data required by this section shall be submitted to the cabinet on a form provided by the cabinet within sixty (60) days of sampling or fifteen (15) days after completion of analyses, whichever is sooner, unless the cabinet approves another time period in the permit. Frequency of sampling shall be as indicated in Section 8 of this administrative regulation.
- (3) If analysis of the sample results indicates contamination, the owner or operator shall notify the cabinet within forty-eight (48) hours of receiving the analysis results and shall arrange for the cabinet to split a sample no later than ten (10) days from the receipt of the results.

Section 5. Groundwater Contamination Assessment and Corrective Action.

- (1) The owner or operator of a special waste site or facility shall prepare and submit a groundwater assessment plan if laboratory analyses of one (1) or more public or private water supplies or monitoring wells at the site or facility shows the presence of one (1) or more parameters listed in 40 C.F.R. 302.4 Appendix A [~~as of September 1991~~], above the maximum contaminant level (MCL) as specified in 401 KAR 30:031 or significant increase over established background levels for parameters that have no MCL. For parameters that have no maximum contaminant levels, a significant increase over background shall be determined using a statistical test as specified in Section 6 of this administrative regulation.
- (2) Confirmation sampling. The owner or operator of a special waste site or facility shall not be required to submit a groundwater assessment plan if the following conditions are met:
 - (a) Within ten (10) days after receipt of sample results showing groundwater contamination the owner or operator resamples the affected wells; and
 - (b) Analysis from resampling shows to the cabinet's satisfaction that groundwater contamination has not occurred.
- (3) The owner or operator of a special waste site or facility shall be required to provide alternate water supplies to affected parties within twenty-four (24) hours of notification of the cabinet that sample results indicate contamination of a drinking water supply if it has been determined that the special waste site or facility is the probable source of contamination.
- (4) The groundwater assessment plan shall be submitted to the cabinet within thirty (30) days of the occurrence of the conditions described in subsection (1) of this section. The assessment plan shall specify the manner in which the owner or operator will determine the existence, quality, quantity, areal extent, and depth of groundwater degradation, and the rate and direction of migration of contaminants in the groundwater. The assessment plan shall be prepared by a registered geologist pursuant to subsection (2) of Section 1 [~~qualified professional in the field of hydrogeology~~] and shall be implemented upon approval by the cabinet in accordance with the approved implementation schedule. The assessment plan shall be implemented within sixty (60) days after approval by the cabinet. The plan shall contain, at a minimum, the following information:
 - (a) The number, location, size, casing type and depth of wells, lysimeters, borings, pits, piezometers, and other assessment structures or devices to be used;
 - (b) Sampling and analytical methods for the parameters to be evaluated;

- (c) Analyses of all parameters listed in the approved monitoring plan in the permit application, and any other parameter required by the cabinet; and
- (d) Evaluation procedures, including the use of previously gathered groundwater quality information, to determine the concentration, rate, and extent of groundwater degradation or pollution from the facility.
- (5) For public or private water supplies that may be adversely affected by the facility, the owner or operator shall submit a detailed hydrogeologic study addressing the potential effect of the site or facility on the water supply.
- (6) If the cabinet determines that the assessment plan is inadequate, the cabinet may modify the plan and approve the plan as modified.
- (7) Within ninety (90) days after the implementation of the groundwater assessment plan, the owner or operator shall submit a groundwater assessment report containing the new data collected, analysis of the data, and recommendations on the necessity for abatement.
- (8) The cabinet may require abatement measures prior to approval of the groundwater assessment plan.
- (9) Within ninety (90) days of cabinet approval of the groundwater assessment report, but no later than one (1) year from the event specified in subsection (1) of this section, the owner or operator shall submit a remedial action plan to include the following:
 - (a) The specific methods or techniques to be used to abate groundwater contamination from the facility;
 - (b) The specific methods or techniques to be used to prevent further groundwater contamination from the facility; and
 - (c) A description of the means used to restore or replace public or private water supplies affected by contamination from the special waste facility.
- (10) The owner or operator of a special waste site or facility shall take any other steps deemed necessary by the cabinet to ensure protection of human health and the environment.
- (11) Corrective action measures under this administrative regulation shall be initiated and completed within a period of time as specified by the cabinet considering the extent of degradation determined pursuant to subsection (1) of this section.
- (12) Corrective action measures under this administrative regulation may be terminated upon approval of the cabinet when the owner or operator demonstrates that concentrations have been reduced to levels below the maximum contaminant level or naturally occurring background.

Section 6. Statistical Methods for Groundwater Analysis. The owner or operator of a special waste site or facility shall use the following statistical procedure in determining whether background values or concentration limits have been significantly exceeded:

- (1) If the level of a parameter is to be compared to the parameter's background value and that background value has a sample coefficient of variation less than one (1.00):
 - (a) The owner or operator shall take at least four (4) portions from a sample at each well and determine whether the difference between the mean of the parameter at each well, using all portions taken, and the background value for the parameter is significant at the 0.05 level using the Cochran's Approximation to the Behrens-Fisher Students' t-test. If the test indicates that the difference is significant, the owner or operator shall repeat the same procedures, with at least the same number of portions as used in the first test, with fresh samples from the monitoring wells. If this second round of analyses indicates that the difference is significant, the owner or operator shall conclude that a statistically significant change has occurred; or
 - (b) With prior approval from the cabinet, the owner or operator may use an equivalent statistical procedure for determining whether a statistically significant change has occurred. The cabinet shall approve such a procedure in the permit if it is found that

the alternative procedure reasonably balances the probability of falsely identifying a noncontaminating facility and the probability of failing to identify a contaminating facility in a manner that is comparable to that of the statistical procedure described in paragraph (a) of this subsection.

(2) In all other situations, the owner or operator shall use a statistical procedure approved in the permit which provides reasonable confidence that the migration of contamination from a special waste site or facility into and through the groundwater will be indicated. The cabinet shall approve a statistical procedure in the permit that:

- (a) Is appropriate for the distribution of the data used to establish background values or concentration limits; and
- (b) Provides a reasonable balance between the probability of falsely identifying a noncontaminating facility and the probability of failing to identify a contaminating facility.

Section 7. Baseline Groundwater Quality Characterization Parameters. For special waste sites or facilities that require groundwater monitoring, the following parameters are to be analyzed and the resulting data submitted in the permit application:

(1) For all landfarming or composting sites or facilities required to monitor groundwater, the characterization shall be based on the following ~~[(dissolved)]~~metals and other waste analysis based parameters:

- (a)
 - 1. Specific conductance;
 - 2. Chemical oxygen demand;
 - 3. Total organic carbon;
 - 4. Chloride;
 - 5. Iron;
 - 6. Manganese;
 - 7. Sodium;
 - 8. Total nitrogen;
 - 9. Nitrate nitrogen;
 - 10. Chromium;
 - 11. Cadmium;
 - 12. Coliform bacteria;
 - 13. pH;
 - 14. Calcium;
 - 15. Magnesium;
 - 16. Potassium;
 - 17. Sulfate Bicarbonate; and
 - 18. Carbonate.

(b) Groundwater elevation in monitoring wells recorded as a distance from the elevation at the well head referenced to mean sea level based on a United States Geological Survey (USGS) datum.

(2) For special waste landfills, used solely for the disposal of coal combustion by-products, the characterization shall be based on the following dissolved metals and other parameters:

- (a)
 - 1. Chloride;
 - 2. Chemical oxygen demand;
 - 3. Total dissolved solids;
 - 4. Total organic carbon;
 - 5. Specific conductance;
 - 6. pH;

7. Copper;
8. Nickel;
9. Zinc;
10. Iron;
11. Sodium;
12. Arsenic;
13. Cadmium;
14. Lead;
15. Mercury;
16. Selenium;
17. Calcium;
18. Magnesium;
19. Potassium;
20. Sulfate;
21. Bicarbonate; and
22. Carbonate.

- (b) Groundwater elevations recorded as a distance from the elevation at the well head referenced to mean sea level based on a United States Geological Survey (USGS) datum.
- (3) For special waste sites or facilities other than those specified in subsections (1) and (2) of this section, the characterization shall be for parameters determined by the cabinet based on a review of the chemical analysis of the waste provided in the application.

Section 8. Groundwater Monitoring Parameters.

- (1) Owners or operators of landfarming or composting sites or facilities requiring groundwater monitoring shall monitor for the following parameters on a semiannual basis:

- (a)
 1. Chemical oxygen demand;
 2. Total organic carbon;
 3. Total nitrogen;
 4. Nitrate nitrogen;
 5. Lead;
 6. Chromium;
 7. Cadmium; and
 8. Coliform bacteria.

- (b) Groundwater elevations in monitoring wells recorded as a distance from the elevation at the well head referenced to mean sea level based on a USGS datum; and
- (c) Monitoring of additional parameters may be required by the cabinet based on the waste analysis.
- (2) Owners or operators of special waste landfills used solely for the disposal of coal combustion by-products shall monitor semiannually for the following:

- (a)
 1. Chloride;
 2. Chemical oxygen demand;
 3. Total dissolved solids;
 4. Total organic carbon;
 5. Specific conductance;
 6. pH; and
 7. Copper.

- (b) Groundwater elevations in monitoring wells recorded as a distance from the elevation at the well head referenced to mean sea level based on a USGS datum.

(c) Monitoring of additional parameters may be required by the cabinet based on a significant increase from the baseline characterization.

(d) If, after four (4) initial monitoring events, analysis for the parameters in paragraphs (a) to (c) of this subsection indicates no exceedances above levels specified in Section 5(1) of this administrative regulation, the owner or operator may, upon request, be granted permission from the cabinet to reduce the monitoring parameters to those listed in paragraph (a) of this subsection.

(3) Owners or operators of special waste sites or facilities other than those referenced in subsections (1) and (2) of this section shall monitor quarterly for parameters to be determined by the cabinet based upon chemical analysis of the waste to be disposed.

Section 9. Surface Water Monitoring and Corrective Action.

(1) Special waste sites or facilities required to monitor surface water shall do so in accordance with a plan provided in the permit application. The plan shall be sufficient to characterize the quality of surface water unaffected by the site or facility and to determine if water leaving the site or facility has been contaminated.

(a) Baseline sampling shall include a minimum of two (2) samples collected at no less than thirty (30) day intervals and shall be sufficient to characterize baseline conditions.

(b) Operational surface water monitoring shall be completed in accordance with the surface water monitoring plan approved in the permit application and shall be sufficient to determine if the site or facility is contaminating surface water.

(2) Corrective action shall be completed by a special waste site or facility owner or operator as necessary to comply with 401 KAR 30:031.

REBECCA GOODMAN, Secretary

APPROVED BY AGENCY: January 10, 2024

FILED WITH LRC: January 10, 2024 at 3:30 p.m.

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REGULATORY IMPACT ANALYSIS AND TIERING STATEMENT

Contact Person: Michael Mullins

(1) Provide a brief summary of:

(a) What this administrative regulation does:

This administrative regulation regulates groundwater monitoring plans for special waste facilities.

(b) The necessity of this administrative regulation:

This administrative regulation is necessary to provide the regulated community pertinent information related to groundwater monitoring plans.

(c) How this administrative regulation conforms to the content of the authorizing statutes:

The authorizing statutes provides the department the authority to promulgate administrative regulations and administer special waste programs. 401 KAR Chapter 45 establishes different permitting options for entities that manage special waste. Some of those permits will require a groundwater monitoring plan. This administrative regulation provides regulated entities information related to those plans.

(d) How this administrative regulation currently assists or will assist in the effective administration of the statutes:

This administrative regulation assists in the effective administration of the statute by providing details related to groundwater monitoring plans.

(2) If this is an amendment to an existing administrative regulation, provide a brief summary of:

(a) How the amendment will change this existing administrative regulation:

The amendment in response to comments clarifies that the administrative regulation only applies to biosolids when corrective action plans are necessary.

(b) The necessity of the amendment to this administrative regulation:

These amendments are necessary to let the regulated entity know that corrective actions plans can be used to require groundwater monitoring plans for biosolids.

(c) How the amendment conforms to the content of the authorizing statutes:

The amendment conforms to the authorizing statutes by providing the regulated community a more concise administrative regulation related to groundwater monitoring plan as well as clarifying that groundwater monitoring plans do not apply to the land application of biosolids unless a corrective action plan is necessary.

(d) How the amendment will assist in the effective administration of the statutes:

This amendment will help in the effective administration of the statutes by ensuring that the requirements for groundwater monitoring plans apply to biosolids when a corrective action plan is necessary.

(3) List the type and number of individuals, businesses, organizations, or state and local governments affected by this administrative regulation:

The total universe of potential impacted entities is 399. 394 of those are wastewater treatment plants that either already have a permit (54) or could get a permit in the future (340). The remaining 5 are private entities (contractors) that already have permits.

(4) Provide an analysis of how the entities identified in question (3) will be impacted by either the implementation of this administrative regulation, if new, or by the change, if it is an amendment, including:

(a) List the actions that each of the regulated entities identified in question (3) will have to take to comply with this administrative regulation or amendment:

Each entity mentioned in question (3) will need to follow this administrative regulation for requirements related to groundwater monitoring plans for special waste management except for biosolids.

(b) In complying with this administrative regulation or amendment, how much will it cost each of the entities identified in question (3):

There will not be an additional cost to the regulated entities in complying with this administrative regulation. This administrative regulation didn't substantially change for special waste management of for special wastes that are not biosolids.

(c) As a result of compliance, what benefits will accrue to the entities identified in question (3):

The regulated entities will benefit by understanding that this administrative regulation doesn't apply to biosolids and from portions of the administrative regulation that were amended to clarify the intent that has caused confusion in the past.

(5) Provide an estimate of how much it will cost the administrative body to implement this administrative regulation:

(a) Initially:

There will not be a cost to the agency to implement this amendment

(b) On a continuing basis:

There will not be a cost to the agency to implement this amendment on a continuing basis

(6) What is the source of the funding to be used for the implementation and enforcement of this administrative regulation:

The funding source for this program will be a mix of restricted funds from the fees charged for application review and general funds.

(7) Provide an assessment of whether an increase in fees or funding will be necessary to implement this administrative regulation, if new, or by the change if it is an amendment:

There will not be a need to increase fees or funding associated with this amendment. The agency currently regulates wastewater treatment plant sludges and will simply use the current personnel and funding to implement the new process.

(8) State whether or not this administrative regulation establishes any fees or directly or indirectly increases any fees:

There are no new fees associated with this administrative regulation. The current fee that is charged for application review (401 KAR 45:250) will continue to be applied to biosolid applications under this new process.

(9) TIERING: Is tiering applied?

No. All entities that submit an application for a biosolids permit will have their application reviewed in accordance with the application information submitted and will not be treated differently.

FISCAL NOTE

(1) What units, parts, or divisions of state or local government (including cities, counties, fire departments, or school districts) will be impacted by this administrative regulation?

This administrative regulation will impact not only the Department for Environmental Protection's Division of Waste Management but also local governments that have wastewater treatment plants that generate sludge.

(2) Identify each state or federal statute or federal regulation that requires or authorizes the action taken by the administrative regulation.

KRS 224.10-100, 224.40-305, 224.50-760, 40 C.F.R. 302.4, 40 C.F.R. Part 503

(3) Estimate the effect of this administrative regulation on the expenditures and revenues of a state or local government agency (including cities, counties, fire departments, or school districts) for the first full year the administrative regulation is to be in effect.

(a) How much revenue will this administrative regulation generate for the state or local government (including cities, counties, fire departments, or school districts) for the first year?

This administrative regulation will not generate any additional revenue.

(b) How much revenue will this administrative regulation generate for the state or local government (including cities, counties, fire departments, or school districts) for subsequent years?

This new administrative regulation will not generate any additional revenue for the agency.

(c) How much will it cost to administer this program for the first year?

There will be no additional costs associated with this new biosolids process. The agency will use existing staff and funding to accomplish the goals of the statute.

(d) How much will it cost to administer this program for subsequent years?

Currently the agency does not believe there will be an increase in costs to run the program in the future.

Note: If specific dollar estimates cannot be determined, provide a brief narrative to explain the fiscal impact of the administrative regulation.

Revenues (+/-):The amendments to this administrative regulation will not generate any revenues. The amendments are only necessary to clarify the groundwater monitoring plan provisions do not apply to biosolid land application. The amendments also make clarifications that will make the administrative regulation easier to understand.

Expenditures (+/-):The cabinet will use existing staff and the same funding source to meet the requirements in this administrative regulation.

Other Explanation:

(4) Estimate the effect of this administrative regulation on the expenditures and cost savings of regulated entities for the first full year the administrative regulation is to be in effect.

(a) How much cost savings will this administrative regulation generate for the regulated entities for the first year?

Regulated entities will not realize any cost savings from the amendments to this administrative regulation.

(b) How much cost savings will this administrative regulation generate for the regulated entities for subsequent years?

Regulated entities will not realize any cost savings from the amendments to this administrative regulation.

(c) How much will it cost the regulated entities for the first year?

There will not be a cost increase to regulated entities related to this proposal.

(d) How much will it cost the regulated entities for subsequent years?

There will not be a cost increase to regulated entities related to this proposal.

Note: If specific dollar estimates cannot be determined, provide a brief narrative to explain the fiscal impact of the administrative regulation.

Cost Savings (+/-):There will not be a cost savings to the regulated community related to these amendments. The amendments state that groundwater monitoring plans are not required for the land application of biosolids. The other amendments are aimed at clarifying existing language that has caused confusion to the regulated community due to an outdated reference.

Expenditures (+/-):The expenditures will be relatively the same to regulated entities.

Other Explanation:

(5) Explain whether this administrative regulation will have a major economic impact, as defined below.

"Major economic impact" means an overall negative or adverse economic impact from an administrative regulation of five hundred thousand dollars (\$500,000) or more on state or local government or regulated entities, in aggregate, as determined by the promulgating administrative bodies. This proposal will not have a major economic impact as defined KRS 13A.010(13).