CHAPTER 67 EO10 v.6 (NOIA)

CHAPTER 67
STANDARDS FOR THE LAND APPLICATION OF SEWAGE SLUDGE

567—67.1(455B) Purpose and scope~~Land application of sewage sludge~~.

67.1(1) ~~General.~~ This chapter establishes standards for the land application of sewage sludge generated during the treatment of domestic sewage in a treatment works. This chapter applies to any generator, applicator, or both, and to sewage sludge applied to the land. ~~No person shall land apply sewage sludge through any practice for which requirements are established in this chapter except in accordance with such requirements.~~

a. In areas that are not specifically addressed in this chapter or in 567—Chapter 68, but which are addressed in federal regulations for sewage sludge applied to land at 40 CFR Part 503, ~~as amended through July 1, 2021,~~ the federal regulations shall apply under this rule and are hereby adopted by reference under this chapter.

b. On a case-by-case basis, the~~this~~ department may impose requirements for the land application of sewage sludge in addition to or more stringent than the requirements in this chapter when necessary to protect public health and the environment from any adverse effect of a pollutant in the sewage sludge.

67.1(2) Sewage sludge generators shall ensure that the applicable requirements in this chapter are met when ~~the~~ sewage sludge is land applied ~~to the land~~. If a~~the~~ sewage sludge generator determines that a person being supplied sewage sludge for land application is not complying with applicable requirements of the land application program, the generator shall work with the applicator to obtain compliance with the requirements. If subsequent compliance cannot be achieved, the generator shall not supply additional sewage sludge to the applicator.

~~[ARC 2482C, IAB 4/13/16, effective 5/18/16; ARC 6192C, IAB 2/9/22, effective 3/16/22]~~

67.1(3) ~~567—67.2(455B)~~ *Exclusions.* In accordance with 40 CFR §503.6, t~~T~~his chapter does not establish requirements for the land application of ~~the following solid wastes.~~

~~**67.2(1) S**~~ sludge generated at an industrial facility, ~~not including sludge generated from separately treated domestic sewage at an industrial facility.~~

~~**67.2(2) H**~~hazardous sewage sludge, ~~sewage sludge determined to be hazardous in accordance with 40 CFR Part 261.~~

~~**67.2(3) S**~~ sewage sludge with a polychlorinated biphenyl (PCB) concentration of 50 mg/kg or higher.

~~**67.2(4) I**~~ incinerator ash.

~~**67.2(5) G**~~ grit and screenings, or

~~**67.2(6) D**~~ drinking water treatment sludge.

~~[ARC 6192C, IAB 2/9/22, effective 3/16/22]~~

567—67.2~~3~~(455B) Sampling and analysis. ~~Any sewage sludge generator who intends to land apply sewage sludge shall:~~

67.2~~3~~(1) Any sewage sludge generator who intends to land apply sewage sludge shall:

a. Sample and analyze the waste to determine whether it meets the criteria for sewage sludge for Class I, II, or III; and

b. ~~**67.3(2)**~~ Analyze the waste to determine if any sources exist which may contribute significant quantities of potentially hazardous chemicals or other toxic substances. If any are found, the generator shall inform the department of their presence and shall analyze the waste for chemicals or substances in accordance with department guidelines ~~provided by the department~~.

67.2~~3~~(2~~3~~) Unless rules for specific programs under ~~US~~EPA or department authority provide otherwise, or unless other methods are approved by the department for a specific situation, samples taken and analyses made to document contamination under this chapter shall be conducted in accordance with the methods described in 567—67.9~~10~~(455B).

567—67.3~~4~~(455B) Land application plan~~program~~. All sewage sludge generators wishing to land apply sewage sludge shall establish and maintain in writing a long-range plan~~program~~ for land application of sewage sludge. ~~This program shall be developed for a minimum period of five years and shall be updated annually.~~ A copy of this plan~~program~~ shall be available at the facility for department inspection ~~by the department~~.

67.3(1) The long-range plan shall be:

a. Developed for a minimum period of five years;

Commented [1]: "67.1(1), "No person shall..." - Redundant.

Commented [2]: New 67.1(3), Exclusions - simplifying text, removing subrule numbers & adding CFR reference. 40 CFR 503.6.

Commented [3]: "Plan" is the correct terminology.

Commented [4]: Moved to new 67.3(1)"a" & "b" below.

b. Updated annually; and

c. Designed to ensure that land application can be conducted in accordance with the requirements of this chapter.

67.3(2) At a minimum, the~~this~~ long-term plan~~program~~ shall contain the following information in detail for the next calendar year and in general terms for the following four years. ~~The plan shall include, but not be limited to, the following~~:

a. ~~67.4(1)~~ An outline of the sewage sludge sampling schedule and procedures that will be followed; ~~to ensure that the sewage sludge being applied to land continues to meet the requirements~~.

b. ~~67.4(2)~~ A determination of the amount of land required for proper~~to allow~~ land application of the sewage sludge; ~~to be conducted in accordance with the requirements~~.

c. ~~67.4(3)~~ Identification of the land areas and appropriate land application methods that will be used; ~~for land application of the sewage sludge. Those areas and application methods shall be selected as necessary to ensure that land application can be conducted in accordance with the requirements~~.

d. ~~67.4(4)~~ For each land application area, the names of the landowners and the applicators, an ~~for all areas to be used for land application, and~~ identification of any legal arrangements related to the use of an area, and ~~these areas. The programs shall also a~~n outline of any restrictions or special conditions that exist regarding the use of an area~~these areas~~ for the land application of sewage sludge.;

e. ~~67.4(5)~~ An overall land application schedule, including ~~for the land application of sewage sludge. This schedule shall indicate~~ the areas being used, the time of year that land application will occur on each area, and the estimated application rate for each area;~~.~~ and

f. ~~67.4(6)~~ A determination of all of the following:

(1) The types and capacities of the required application equipment, ~~required for land application of sewage sludge in accordance with the developed application schedule~~ including an~~. The program shall also~~ outline of how the ~~application~~ equipment will be made available and who will be responsible for conducting land application operations.;

~~67.4(7)~~ ~~A determination of~~ (2) tThe types and capacities of necessary sludge storage and handling structures; ~~used to ensure that the land application of sewage sludge is conducted in accordance with the land application schedule~~.

(3) ~~The program shall also outline w~~Whether any additional sludge storage or handling facilities are needed; and.

~~67.4(8) A plan~~(4) A timeline to construct or obtain any required additional sludge storage, handling, or application facilities or equipment ~~that are required by the land application program~~.

~~[ARC 6192C, IAB 2/9/22, effective 3/16/22]~~

567—67.4~~5~~(455B) Special definitions.

67.4(1) *Definitions in Iowa Code.* "Sewage sludge" is defined in Iowa Code section 455B.171(34). For the purposes of this chapter, the term includes materials derived from sewage sludge.

67.4(2) *Definitions in the CFR.* The following terms applicable to this chapter are defined in the referenced locations:

a. 40 CFR §503.9: "dry weight basis," "food crops," and "person who prepares sewage sludge."

b. 40 CFR §503.11: "agronomic rate," "annual whole sludge application rate," "bulk sewage sludge," and "cumulative pollutant loading rate."

c. 40 CFR §503.31: "land with a high potential for public exposure" and "land with a low potential for public exposure."

~~*"Agronomic rate"* is the whole sludge application rate designed to provide the amount of nitrogen needed by the crop grown on the land and to minimize the amount of nitrogen that passes to the groundwater.~~

~~*"Annual whole sludge application rate"* is the maximum amount of sewage sludge (dry weight basis) that can be applied to a unit area of land during a 365-day period.~~

67.4(3) The following definitions apply to this chapter:

"Applicator" or *"sewage sludge applicator"* means~~is~~ any person who applies sewage sludge to the land.

~~*"Bulk sewage sludge"* is sewage sludge that is not sold or given away in a bag or other container for application to the land.~~

"Class I sewage sludge" means~~is~~ sewage sludge that meets the criteria under ~~subrule~~ 67.6~~7~~(1).

Commented [5]: New 67.3(1)"a" & "b" - existing text; moved from beginning of old 67.4.

Commented [6]: New 67.3(1)"c" - existing text; Moved from ends of old 67.4(1), (2), & (3) (below).

Commented [7]: "The plan shall..." - Redundant.

Commented [8]: "to ensure that..." - Moved to new 67.3(1)"c".

Commented [9]: to be conducted..." - Moved to new 67.3(1)"c".

Commented [10]: "for land app.." - Redundant.

Commented [11]: "Those areas and..." - Moved to new 67.3(1)"c".

Commented [12]: New 67.3(2)"d" - Existing text; simplifying.

Commented [13]: "including..." - Existing text; simplifying.

Commented [14]: "required application..." - Existing text; simplifying.

Commented [15]: "in accordance with..." - intent now captured in new 67.4(2)"e".

Commented [16]: "including an..." - Existing text; simplifying.

Commented [17]: Old 67.4(7) - now 67.3(2)"f"(2) & (3).

Commented [18]: "used to ensure..." - intent now captured in new 67.3(2)"e".

Commented [19]: New 67.3(2)"f"(3) - combines ends of old 67.4(7) & old 67.4(8), so additional facilities info is in 1 spot.

Commented [20]: New 67.4(1) & (2) - lists terms struck from old 67.5 that are defined in Iowa Code & CFR.

Commented [21]: New 67.4(1) & (2) - lists terms struck from old 67.5 that are defined in Iowa Code & CFR.

Commented [22]: New 67.4(1) & (2) - lists terms struck from old 67.5 that are defined in Iowa Code & CFR.

Commented [23]: New 67.4(1) & (2) - lists terms struck from old 67.5 that are defined in Iowa Code & CFR.

Commented [24]: Agronomic rate - Matches 40 CFR 503.11(b). Moved to new 67.4(2).

Commented [25]: Annual whole sludge app rate - Matches 40 CFR 503.11(c). Moved to new 67.4(2).

Commented [26]: New 67.4(3) - Existing requirement; new subrule for definitions that are being kept.

Commented [27]: Bulk sewage sludge - Matches 40 CFR 503.11(e). Moved to new 67.4(2).

"Class II sewage sludge" means~~is~~ sewage sludge that meets the criteria under ~~subrule~~ 67.7~~8~~(1).

"Class III sewage sludge" means~~is~~ any sewage sludge that cannot meet either Class I sewage sludge criteria or Class II sewage sludge criteria.

~~*"Cumulative pollutant loading rate"* is the maximum amount of an inorganic pollutant that can be applied to an area of land.~~

~~*"Dry weight basis"* means calculated on the basis of having been dried at 105 degrees Celsius until reaching a constant mass (i.e., essentially 100 percent solids content).~~

~~*"Food crops"* are crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco.~~

"Generator" or *"sewage sludge generator"* means~~is~~ any person who generates sewage sludge, who derives a material from sewage sludge, or both.

~~*"Land with a high potential for public exposure"* is land that the public uses frequently. This includes, but is not limited to, a public contact site and a reclamation site located in a populated area (e.g., a construction site located in a city).~~

~~*"Land with a low potential for public exposure"* is land that the public uses infrequently. This includes, but is not limited to, agricultural land, forest, and a reclamation site located in an unpopulated area (e.g., a strip mine located in a rural area).~~

~~*"Person who prepares sewage sludge"* is either the person who generates sewage sludge during the treatment of domestic sewage in a treatment works or the person who derives a material from sewage sludge.~~

~~*"Sewage sludge"* is solid, semisolid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or the grit and screenings generated during preliminary treatment of domestic sewage in a treatment works.~~

~~[**ARC 6192C**, IAB 2/9/22, effective 3/16/22]~~

567—67.5~~6~~(455B) Permit requirements. Prior to any land application of sewage sludge, a permit must be obtained by the sewage sludge generator in accordance with the following requirements:

67.5~~6~~(1) The permit for the land application of sewage sludge produced by a wastewater treatment facility that has been issued a construction permit from the department will be issued concurrently and as part of an ~~state~~ operation permit or NPDES permit. The issuance process and permit terms will be the same as those~~that~~ specified for NPDES permits in 567—Chapter 60~~4~~.

67.5~~6~~(2) The department will review, on a case-by-case basis, requests for a permit to land apply sewage sludge or any material derived from sewage sludge if the sewage sludge is produced outside of the state of Iowa or produced by a wastewater treatment plant that has not been issued a construction permit from the department.

~~[**ARC 6192C**, IAB 2/9/22, effective 3/16/22]~~

567—67.6~~7~~(455B) Land application requirements for Class I sewage sludge.

67.6~~7~~(1) *Class I ~~sewage sludge~~ criteria.* Class I sewage sludge is sewage sludge that meets the pollutant concentrations in ~~paragraph~~ 67.6~~7~~(1)*"a,"* the Class A pathogen reduction requirements in ~~paragraph~~ 67.6~~7~~(1)*"b,"* and the vector attraction reduction (VAR) requirements in ~~paragraph~~ 67.6~~7~~(1)*"c."* ~~below.~~

a. ~~P~~Class I pollutant concentrations~~ for Class I sewage sludge~~. The concentration of each pollutant in the sewage sludge shall not exceed the concentration for the pollutant in Table 1.

TABLE 1—POLLUTANT CONCENTRATIONS

Pollutant	Monthly Average Concentration in mg per kg, dry weight basis~~milligrams per kilogram*~~
Arsenic	41
Cadmium	39
Copper	1500
Lead	300
Mercury	17
Nickel	420
Selenium	100
Zinc	2800

Commented [28]: Cumulative pollutant loading rate - Matches 40 CFR 503.11(f). Moved to new 67.4(2).

Commented [29]: Dry weight basis - Matches 40 CFR 503.9(h). Moved to new 67.4(2).

Commented [30]: Food crops - Matches 40 CFR 503.9(l). Moved to new 67.4(2).

Commented [31]: Land with a high potential for public exposure - Matches 40 CFR 503.31(d). Moved to new 67.4(2).

Commented [32]: Land with a high potential for public exposure - Matches 40 CFR 503.31(e). Moved to new 67.4(2).

Commented [33]: Person who prepares sewage sludge - Matches 40 CFR 503.9(r). Moved to new 67.4(2).

Commented [34]: Sewage sludge - Very similar to Iowa Code 455B.171(34). Moved to new 67.4(1).

Commented [35]: New 67.5, Permit requirements - Existing text; Iowa Code 455B.174(4)(a)(1) & 455B.183(1)(a); was old 67.6.

Commented [36]: New 67.5(1) - Existing text; 40 CFR 503.3(a)(1).

Commented [37]: New 67.5(2) - Existing text; 40 CFR 503.5.

Commented [38]: Table 1-Pollutant Concentrations - Existing text; 40 CFR 503.13 Table 3.

~~*Dry weight basis~~

b. *Class I~~Class A~~ pathogen requirements (Class A)~~ for Class I sewage sludge~~.* The sewage sludge shall comply with ~~subparagraphs~~ 67.6~~7~~(1)*"b"*(1) and (2)~~ below~~.

(1) The sewage sludge shall comply with one of the following monitoring processes. Compliance with pathogen density shall not be based on an average value. Each individual sample result shall meet the numerical pathogen standards.

1. The ~~density of~~ fecal coliform density in the sewage sludge shall be less than 1,000 Most Probable Number (MPN) per gram of total solids (dry weight basis), or

2. The ~~density of~~ *Salmonella* sp. bacteria density in the sewage sludge shall be less than three MPN~~ost Probable Number~~ per four grams of total solids (dry weight basis).

(2) The sewage sludge shall comply with one of the following analytical and treatment processes.

1. The sewage sludge temperature~~ of the sewage sludge~~ shall be maintained at a specific value for a period of time using one of the procedures detailed below.

- When the percent solids of the sewage sludge is 7 percent or higher, the sewage sludge temperature~~ of the sewage sludge~~ shall be 50 degrees Celsius (°C) or higher; the time period shall be 20 minutes or longer; and the temperature and time period shall be determined using Equation 1, except when small particles of sewage sludge are heated by either warmed gases or an immiscible liquid.
- When the percent solids of the sewage sludge is 7 percent or higher and small particles of sewage sludge are heated by either warmed gases or an immiscible liquid, the sewage sludge temperature~~ of the sewage sludge~~ shall be 50°C~~ degrees Celsius~~ or higher; the time period shall be 15 seconds or longer; and the temperature and time period shall be determined using Equation 1.
- When the percent solids of the sewage sludge is less than 7 percent and the time period is at least 15 seconds, but less than 30 minutes, the temperature and time period shall be determined using Equation 1.

Equation 1: $D = 131{,}700{,}000/10^{0.1400t}$

Where D = time in days; t = temperature in ~~degrees Celsius~~°C

- When the percent solids of the sewage sludge is less than 7 percent; the sewage sludge temperature~~ of the sewage sludge~~ is 50°C~~ degrees Celsius~~ or higher~~,~~ and the time period is 30 minutes or longer, the temperature and time period shall be determined using Equation 2.

Equation 2: $D = 50{,}070{,}000/10^{0.1400t}$

Where D = time in days; t = temperature in ~~degrees Celsius~~°C

2. The sewage sludge shall meet all of the following requirements:

- The ~~pH of the sewage~~ sludge pH shall be raised to above 12 and shall remain above 12 for 72 hours;
- The sludge temperature~~ of the sewage sludge~~ shall be above 52°C~~ degrees Celsius~~ for 12 hours or longer during the period that the sludge pH~~ of the sewage sludge~~ is above 12; and
- At the end of the 72-hour period during which the ~~pH of the sewage~~ sludge pH is above 12, the ~~sewage~~ sludge shall be air dried to achieve a percent solids in the ~~sewage~~ sludge greater than 50 percent.

3. Sewage sludge treated in other known processes shall be analyzed prior to pathogen treatment to determine whether it~~the sewage sludge~~ contains enteric viruses and viable helminth ova. After pathogen treatment, ~~T~~the density of enteric viruses in the sewage sludge ~~after pathogen treatment~~ shall be less than one plaque-forming unit per four grams of total solids (dry weight basis), and ~~, T~~the density of viable helminth ova ~~in the sewage sludge after pathogen treatment~~ shall be less than one per four grams of total solids (dry weight basis). Once the process has been demonstrated to achieve the required pathogen reduction, the process must be operated under the same conditions that were used during the demonstration.

4. Sewage sludge treated by unknown processes or by processes operating at conditions less stringent than the operating conditions at which the sewage sludge could qualify as Class I under other alternatives shall be analyzed prior to pathogen treatment to determine whether the sewage sludge contains enteric viruses and viable helminth ova. The density of enteric viruses in the sewage sludge shall be less than one plaque-forming unit per four grams of total solids (dry weight basis), and ~~, T~~the density of viable helminth ova ~~in the sewage sludge~~ shall be less than one per four grams of total solids (dry weight basis).

5. Sewage sludge shall be treated in one of the Processes to Further Reduce Pathogens (PFRP) described in ~~567—~~67.10(2)~~1(455B)~~.

Commented [39]: 67.6(1)"b"1., "The density..." - Existing text; 40 CFR 503.32(a)(3)(i).

Commented [40]: 67.6(1)"b"2., "The density..." - Existing text; 40 CFR 503.32(a)(3)(i).

Commented [41]: 67.6(1)"b"(2)1. - "The temperature of..." - Existing text; 40 CFR 503.32(a)(3)(ii).

Commented [42]: "Equation 1" - Existing text; 40 CFR 503.32(a)(3)(ii)(A), Eq. (2).

Commented [43]: "Equation 2" - Existing text; 40 CFR 503.32(a)(3)(ii)(D), Eq. (3).

Commented [44]: 67.6(1)"b"(2)2. - "The sewage sludge..." - Existing text; 40 CFR 503.32(a)(4)(ii).

Commented [45]: 67.6(1)"b"(2)3. - "Sewage sludge treated..." - Existing text; 40 CFR 503.32(a)(5)(ii) & (iii).

Commented [46]: 67.6(1)"b"(2)6. - "Sewage sludge treated..." - Existing text; 40 CFR 503.32(a)(6).

Commented [47]: 67.7(1)"b"(2)5. - "Sewage sludge shall..." - Existing text; 40 CFR 503.32(a)(7)(ii).

6. Sewage sludge shall be treated in a process that is equivalent to a ~~Process to Further Reduce Pathogens (~~PFRP~~)~~, as determined by the department.

c. Class I ~~Vector attraction reduction~~ VAR requirements ~~for Class I sewage sludge~~. The sewage sludge shall meet one of the following VAR~~vector attraction reduction~~ requirements.

(1) The mass of volatile solids in the sewage sludge shall be reduced by a minimum of 38 percent.

(2) ~~Digest a~~A portion of the previously anaerobically digested sewage sludge shall be digested anaerobically in the laboratory in a bench-scale unit for 40 additional days at a temperature between 30°C and 37°C ~~degrees Celsius~~. If, at the end of the 40 days, the volatile solids in the ~~sewage~~ sludge at the beginning of that period are~~is~~ reduced by less than 17 percent, VAR~~vector attraction reduction~~ is achieved.

(3) ~~Digest a~~A portion of the previously aerobically digested sewage sludge that has 2 percent solids or less shall be digested aerobically in the laboratory in a bench-scale unit for 30 additional days at 20°C ~~degrees Celsius~~. If, at the end of the 30 days, the volatile solids in the ~~sewage~~ sludge at the beginning of that period is reduced by less than 15 percent, VAR~~vector attraction reduction~~ is achieved.

(4) The specific oxygen uptake rate (SOUR) for sewage sludge treated in an aerobic process shall be equal to or less than 1.5 milligrams (mg) of oxygen per hour per gram of total solids (dry weight basis) at a temperature of 20°C ~~degrees Celsius~~.

(5) Sewage sludge shall be treated in an aerobic process for 14 days or longer. During that time, the sewage sludge temperature ~~of the sewage sludge~~ shall be higher than 40°C ~~degrees Celsius~~ and the average sewage sludge temperature ~~of the sewage sludge~~ shall be higher than 45°C ~~degrees Celsius~~.

(6) The ~~pH of~~ sewage sludge pH shall be raised to 12 or higher, measured at 25°C ~~degrees Celsius~~, by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for two~~2~~ hours and then at 11.5 or higher for an additional 22 hours.

(7) The percent solids of sewage sludge that does not contain unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 75 percent based on the moisture content and total solids prior to mixing with other materials.

(8) The percent solids of sewage sludge that contains unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 90 percent based on the moisture content and total solids prior to mixing with other materials.

(9) Sewage sludge shall be injected below the land surface~~, of the land~~ and no significant amount of the ~~sewage~~ sludge shall be present on the land surface within one hour after ~~the sewage sludge is~~ injection~~ed~~.

(10) Sewage sludge applied to the land surface or placed on a surface disposal site shall be incorporated into the soil within six hours after application to or placement on the land.

67.6~~7~~(2) ~~*M*~~*Class I management practices ~~for Class I sewage sludge~~.* Class I sewage sludge may be land-applied in conformance with the following rules:

a. Class I sewage sludge may be applied to a lawn or a home garden.

b. Class I s~~S~~ewage sludge shall be applied to the land at an annual whole sludge application rate that is equal to or less than the agronomic nitrogen uptake rate, unless otherwise specified by the department.

c. An information sheet shall be provided to ~~the~~a person who receives Class I sewage sludge that is sold or given away in a container for land application ~~to the land~~. The ~~label or~~ information sheet shall contain ~~the following information~~:

(1) The name and address of the sewage sludge generator~~.~~;

(2) A statement that land application of the sewage sludge ~~to the land~~ is prohibited except in accordance with the instructions on the information sheet; and~~.~~

(3) The annual application rate for the sewage sludge.

67.6~~7~~(3) ~~*Frequency of m*~~*Class I monitoring ~~frequency for Class I sewage sludge~~.*

a. ~~The frequency of monitoring for t~~The pollutants listed in Table 1, the pathogen density requirements, and the VAR~~vector attraction reduction~~ requirements shall be monitored at the frequency stated in Table 2.

TABLE 2—MONITORING FREQUENCY ~~OF MONITORING~~

Amount of sewage sludge per 365-day period, dry weight basis	Monitoring Frequency
Greater than 0 but less than 290 metric tons (mt) (or 320 English tons)	once per year
Equal to or greater than 290 but less than 1,500 mt~~metric tons~~	once per quarter

Commented [48]: 67.7(1)"b"(2)6. - "Sewage sludge shall..." - Existing text; 40 CFR 503.32(a)(8)(ii).

Commented [49]: 67.7(1)"b"(2)6. - "Vector attraction reduction..." - Existing text; 40 CFR 503.33(b).

Commented [50]: "67.7(2)"c", "An info sheet..." - Existing text; 40 CFR 503.14(e).

Commented [51]: Table 2-Frequency of Monitoring - Existing text; 40 CFR 503.16, Table 1. English ton conversions are not in the CFR.

(320 to 1,653 English tons)	(4 times per year)
Equal to or greater than 1,500 but less than 15,000 mt~~metric tons~~ (1,653 to 16,535 English tons)	once per 60 days (6 times per year)
Equal to or greater than 15,000 mt~~metric tons~~ (or 16,535 English tons)	once per month (12 times per year)

b. After the sewage sludge has been monitored for two years, the department may reduce the monitoring frequency ~~of monitoring~~, but in no case shall the monitoring frequency ~~of monitoring~~ be less than once per year when sewage sludge is land applied ~~to the land~~.

67.6~~7~~(4) ~~*R*~~*Class I record keeping ~~for Class I sewage sludge~~.*

a. Both the generator and bulk sludge applicator of Class I sewage sludge shall develop the following information and ~~shall~~ retain it~~the information~~ for five years:

(1) The concentration of each pollutant listed in Table 1 in the sewage sludge.

(2) The following certification statement: "I certify, under penalty of law, that the Class I sewage sludge requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

(3) ~~A d~~Descriptions of how the ~~Processes to Further Reduce Pathogens requirements (~~PFRP~~)~~ are met, ~~(4) A description of~~ how one of the VAR~~vector attraction reduction~~ requirements is met, and ~~(5) A description of~~ how the management practices are met for each site.

b. Treatment works with a design flow rate of 1 million gallons per day (mgd) or greater and treatment works that serve 10,000 people or more shall submit the above information to ~~the~~ EPA, using EPA's NPDES eReporting Tool (NeT), by February 19 of each year for the previous calendar year.

~~[ARC 6192C, IAB 2/9/22, effective 3/16/22]~~

567—67.7~~8~~(455B) Land application requirements for Class II sewage sludge.

67.7~~8~~(1) *Class II ~~sludge~~ criteria.* Class II sewage sludge is sewage sludge that meets the pollutant concentrations in ~~paragraph~~ 67.7~~8~~(1)*"a,"* the pathogen reduction requirements~~standards~~ in ~~paragraph~~ 67.7~~8~~(1)*"b,"* and the VAR~~vector attraction reduction~~ requirements in ~~paragraph~~ 67.7~~8~~(1)*"c,"* ~~below.~~

a. Class II ~~P~~pollutant concentrations ~~for Class II sewage sludge~~. The concentration of any pollutant in Class II~~the~~ sewage sludge shall not exceed the ceiling concentration for the pollutant in Table 3.

TABLE 3—CEILING CONCENTRATIONS

Pollutant	Ceiling Concentration in mg per kg, dry weight basis~~milligrams per kilogram*~~
Arsenic	75
Cadmium	85
Copper	4300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7500
~~*Dry weight basis~~	

b. ~~P~~Class II pathogen reduction requirements ~~for Class II sewage sludge~~. Class II~~The~~ sewage sludge shall meet one of the following three alternatives:~~.~~

(1) Seven samples of the sewage sludge shall be collected at the time of disposal~~the sewage sludge is disposed~~, and the geometric mean of the ~~density of~~ fecal coliform density shall be less than 2,000,000 MPN~~ost Probable Number~~ per gram of total solids (dry weight basis)~~.~~;

(2) Sewage sludge shall be treated in a~~one of the Processes to Significantly Reduce Pathogens (~~PSRP~~)~~ described in ~~567—~~67.10(1)~~1(455B).~~; or

(3) Sewage sludge shall be treated in a process that is equivalent to a ~~Process to Significantly Reduce Pathogens (~~PSRP~~)~~, as determined by the department.

c. ~~Vector attraction reduction~~ Class II VAR requirements ~~for Class II sewage sludge~~. The Class II VAR requirements are the same as those for Class I sewage sludge in 67.6(1)*"c."* ~~The sewage sludge shall meet one~~

Commented [52]: "67.6(4)"b", "Treatment works with..." - Existing text; 40 CFR 503.18.

Commented [53]: Table 3-Ceiling Concentrations - Existing text. 40 CFR 503.13, Table 1.

Commented [54]: 67.7(1)"b"(1), "Seven samples..." - Existing text; 40 CFR 503.32(b)(2).

Commented [55]: 67.7(1)"b"(2), "Sewage sludge..." - Existing text; 40 CFR 503.32(b)(3).

Commented [56]: 67.7(1)"b"(3), "Sewage sludge..." - Existing text; 40 CFR 503.32(b)(4).

Commented [57]: New 67.7(1)"c", "Vector attraction..." - The 10 alternatives for VAR for Class II sludge are the same as for Class I sludge, so this will now reference 67.6(1)"c", the VAR for Class I sewage sludge.

~~of the following vector attraction reduction requirements.~~

~~(1) The mass of volatile solids in the sewage sludge shall be reduced by a minimum of 38 percent.~~

~~(2) Digest a portion of the previously anaerobically digested sewage sludge anaerobically in the laboratory in a bench-scale unit for 40 additional days at a temperature between 30 and 37 degrees Celsius. If, at the end of the 40 days, the volatile solids in the sewage sludge at the beginning of that period is reduced by less than 17 percent, vector attraction reduction is achieved.~~

~~(3) Digest a portion of the previously aerobically digested sewage sludge that has a percent solids of 2 percent or less aerobically in the laboratory in a bench-scale unit for 30 additional days at 20 degrees Celsius. If, at the end of the 30 days, the volatile solids in the sewage sludge at the beginning of that period is reduced by less than 15 percent, vector attraction reduction is achieved.~~

~~(4) The specific oxygen uptake rate (SOUR) for sewage sludge treated in an aerobic process shall be equal to or less than 1.5 milligrams of oxygen per hour per gram of total solids (dry weight basis) at a temperature of 20 degrees Celsius.~~

~~(5) Sewage sludge shall be treated in an aerobic process for 14 days or longer. During that time, the temperature of the sewage sludge shall be higher than 40 degrees Celsius and the average temperature of the sewage sludge shall be higher than 45 degrees Celsius.~~

~~(6) The pH of sewage sludge shall be raised to 12 or higher, measured at 25 degrees Celsius, by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for 2 hours and then at 11.5 or higher for an additional 22 hours.~~

~~(7) The percent solids of sewage sludge that does not contain unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 75 percent based on the moisture content and total solids prior to mixing with other materials.~~

~~(8) The percent solids of sewage sludge that contains unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 90 percent based on the moisture content and total solids prior to mixing with other materials.~~

~~(9) Sewage sludge shall be injected below the surface of the land and no significant amount of the sewage sludge shall be present on the land surface within one hour after the sewage sludge is injected.~~

~~(10) Sewage sludge applied to the land surface or placed on a surface disposal site shall be incorporated into the soil within six hours after application to or placement on the land.~~

67.7~~8~~(2) ~~*M*~~*Class II management practices* ~~*for Class II sewage sludge*~~. Class II sewage sludge may be land applied in conformance with the following:

a. Class II sewage sludge shall not be land applied:

(1) ~~t~~To a lawn or a home garden; or~~.~~

(2) If it is likely to adversely affect a threatened or endangered species listed under section 4 of the Endangered Species Act, 16 U.S.C. 1533, effective December 27, 2022, or the species' designated critical habitat.

b. Land application sites accepting Class II sewage sludge not meeting pollutant concentrations listed in Table 1 in~~of~~ ~~subrule~~ 67.6~~7~~(1) are subject to the cumulative pollutant loading rates listed in Table 4.

TABLE 4—CUMULATIVE POLLUTANT LOADING RATES

Pollutant	Cumulative Pollutant Loading Rate	
	kg~~kilograms~~ per hectare	pounds per acre
Arsenic	41	36
Cadmium	39	34
Copper	1500	1335
Lead	300	267
Mercury	17	15
Nickel	420	373
Selenium	100	89
Zinc	2800	2490

~~*c.* Sewage sludge shall not be applied to the land if it is likely to adversely affect a threatened or endangered species listed under section 4 of the Endangered Species Act or its designated critical habitat.~~

*c~~d~~. Class II s~~S~~ewage sludge shall be land applied: ~~to the land~~

Commented [58]: New 67.7(2)"a"(2). - was old 67.8(2)"c". Existing text; 40 CFR 503.14(a).

Commented [59]: Table 4-Cumulative Pollutant Loading Rates - Existing text; 40 CFR 503.13, Table 2.

Commented [60]: Old 67.8(2)"c" - Existing text; 40 CFR 503.14(a). Consolidated into new 67.7(2)"a"(2).

Commented [61]: New 67.7(2)"c". "Sewage sludge shall..." - Existing text; 40 CFR 503.14(d).

(1) At an annual whole sludge application rate that is equal to or less than the agronomic nitrogen uptake rate, unless otherwise specified by the department; and

~~c. The sewage sludge shall be applied~~ (2) Only to soils classified as acceptable throughout the top five feet of soil profile. ~~The s~~Sewage sludge shall not be applied to soils classified as sand, loamy sand, or silt. The acceptability of a soil shall be determined using the USDA soil classifications.

~~d.~~ Land application sites shall have soil pH maintained above 6.0, unless

(1) Crops prefer soils with lower pH conditions;

(2) The sludge meets the pollution concentrations contained in Table 1; or

(3) The site does not exceed calcium carbonate equivalent levels according to sound farm management practices.

If the soil pH is below 6.0, ~~it is acceptable to use~~ agricultural lime can be used to increase the pH to an acceptable level.

~~e.~~ If ~~the~~ sewage sludge is applied to land on which the soil loss exceeds the soil loss limits established by the county soil conservation district, the ~~sewage~~ sludge shall be injected on the contour or shall be applied to the surface and mechanically incorporated into soil within 48 hours of application. ~~The s~~Sewage sludge shall not be applied to ground having greater than 9 percent slope unless approved by the department.

~~f.~~ Sewage sludge application on frozen or snow-covered ground should be avoided~~,~~ unless special precautions are taken, such as proven farm management practices to avoid runoff. If application on frozen or snow-covered ground is necessary, it shall be limited to land areas of less than 5 percent slope unless otherwise approved by the department.

~~g.~~ In accordance with Table I in 567—paragraph 60.2(2)"c," ~~S~~sewage sludge shall not be applied to ~~the~~ land that is 35 feet or less from an open waterway. If sewage sludge is applied within 200 feet~~,~~ upgradient ~~but no closer than 35 feet,~~ of a stream, lake, sinkhole, or tile line surface intake ~~located downgradient of the land application site~~, it shall be injected or applied to the surface and mechanically incorporated into the soil within 48 hours of application unless otherwise approved by the department.

~~h.~~ If ~~the~~ sewage sludge is applied to land subject to flooding more frequently than once in ten years, the sludge shall be injected or shall be applied to the surface and mechanically incorporated into the soil within 48 hours. Information on which land is subject to flooding more frequently than once in ten years is available from the department.

~~i.~~ Sewage sludge shall not be applied within 200 feet of an occupied residence or any well. Distances may be reduced to a minimum of 35 feet with the written agreement of both the well or residence owner and, in the case of residences, the occupant, and an approved farm management plan that~~which~~ addresses soil erodibility, harvest residuals, buffer strips, and other sound farm management practices. The farm management plan shall be approved by the local soil conservation district ~~commission~~ in accordance with rules implementing Iowa Code sections 161A.42 to 161A.51.

j. After the land application of sewage sludge, all of the following restrictions shall apply:

~~l.~~ (1) Food crops with harvested parts that touch the sewage sludge/soil mixture and that are totally above the land surface shall not be harvested for 14 months ~~after application of sewage sludge.~~;

~~m.~~ (2) Food crops, feed crops, and fiber crops shall not be harvested for 30 days ~~after application of sewage sludge~~;

~~n.~~ (3) Animals shall not be allowed to graze on the land for 30 days ~~after application of sewage sludge.~~;

~~o.~~ (4) Turf grown on land where sewage sludge is applied shall not be harvested for one year after application ~~of the sewage sludge~~ when the harvested turf is placed on either land with a high potential for public exposure or a lawn, unless otherwise specified by the department;

~~p.~~ (5) Public access to land with a high potential for public exposure shall be restricted for one year ~~after application of sewage sludge.~~; and

~~q.~~ (6) Public access to land with a low potential for public exposure shall be restricted for 30 days ~~after application of sewage sludge~~.

~~r.~~ k. When required by the director, groundwater monitoring wells and surface monitoring points shall be installed and a monitoring program implemented. Samples must be analyzed by a laboratory that~~which~~ is equipped and competent to perform the required tests ~~required by the director~~. The results shall be forwarded to the department on a stipulated schedule.

Commented [62]: Added reference to new wastewater separation distances table in Chapter 60, which now contains these distances.

Commented [63]: Combined existing text in old 67.8(2)"l" to "q" under one header; new 67.7(2)"i".

Commented [64]: Old 67.8(2)"l" (new 67.7(2)"j"(1)) - Existing text; 40 CFR 503.32(b)(5)(i).

Commented [65]: Old 67.8(2)"m" (new 67.7(2)"j"(2)) - Existing text; 40 CFR 503.32(b)(5)(iv).

Commented [66]: Old 67.8(2)"m" (new 67.7(2)"j"(3)) - Existing text; 40 CFR 503.32(b)(5)(v).

Commented [67]: Old 67.8(2)"o" (new 67.8(2)"i"(4)) - Existing text; 40 CFR 503.32(b)(5)(vi).

Commented [68]: Old 67.8(2)"p" (new 67.7(2)"j"(5)) - Existing text; 40 CFR 503.32(b)(5)(vii).

Commented [69]: 67.8(2)"q" (new 67.7(2)"j"(6)) - Existing text; 40 CFR 503.32(b)(5)(viii).

~~s~~l. The sewage sludge generator shall provide ~~the notice and necessary~~ information necessary to comply with the requirements of this chapter to the sewage sludge applicator and landowner.

~~t~~m. The sewage sludge applicator shall provide written notice to the department~~,~~ prior to the initial application of sewage sludge~~, to the department~~. The notice shall include:

(1) The location, by legal description, of the land application site ~~and the landowner~~, and~~.~~

(2) The name, address, telephone number, and NPDES~~National Pollutant Discharge Elimination System~~ permit number (if appropriate) of the landowner, sewage sludge generator, and ~~the~~ applicator.

67.7~~8~~(3) ~~*Frequency of m*~~ *Class II monitoring* ~~*frequency for Class II sewage sludge*~~.

a. The ~~frequency of monitoring for the~~ pollutants listed in Table 3, the pathogen density requirements, and the VAR~~vector attraction reduction~~ requirements shall be monitored at the frequency stated in Table 2~~5~~.

~~TABLE 5 FREQUENCY OF MONITORING~~

~~Amount of sewage sludge per 365-day period dry weight basis~~	~~Monitoring Frequency~~
~~Greater than 0 but less than 290 metric tons (or 320 English tons)~~	~~once per year~~
~~Equal to or greater than 290 but less than 1,500 metric tons (320 to 1,653 English tons)~~	~~once per quarter (4 times per year)~~
~~Equal to or greater than 1,500 but less than 15,000 metric tons (1,653 to 16,535 English tons)~~	~~once per 60 days (6 times per year)~~
~~Equal to or greater than 15,000 metric tons (or 16,535 English tons)~~	~~once per month (12 times per year)~~

b. After the Class II sewage sludge has been monitored for two years, the department may reduce the monitoring frequency ~~of monitoring~~, but in no case shall the monitoring frequency ~~of monitoring~~ be less than once per year when sewage sludge is land applied ~~to the land~~.

67.7~~8~~(4) ~~*R*~~*Class II record-keeping* ~~*for Class II sewage sludge*~~.

a. Both the generator and applicator of Class II sewage sludge shall develop all of the following information and ~~shall~~ retain it~~the information~~ for five years:

(1) The concentration of each pollutant listed in Table 3 in the sewage sludge.

(2) The following certification statement: "I certify, under penalty of law, that the Class II sewage sludge requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

(3) A description of how the ~~Processes to Significantly Reduce Pathogens (~~PSRP~~)~~ and VAR requirements are met.

~~(4) A description of how the vector attraction reduction requirements are met.~~

(4~~5~~) A description of how the management practices for Class II sewage sludge are met for each site.

(5~~6~~) The location and surface area of each site.

(6~~7~~) The date and time ~~and amount~~ of sewage sludge ~~applied to~~application at each site.

(7~~8~~) If subjected to cumulative loading limits, the amount and cumulative amount of each pollutant listed in Table 4 of ~~paragraph~~ 67.7~~8~~(2)*"b"* in the sewage sludge applied to each site.

(8~~9~~) The amount of sewage sludge (i.e., metric tons) applied to each site.

b. Treatment works with a design flow rate of 1 mgd~~million gallons per day~~ or greater and treatment works that serve 10,000 people or more shall submit the above information to ~~the~~ EPA, using EPA's NPDES eReporting Tool (NeT), by February 19 of each year for the previous calendar year. In addition, a supplemental sewage sludge report that includes the land application information listed in ~~subparagraphs~~ 67.7~~8~~(4)*"a"*(6) to (9) shall be submitted to the department by the same due date.

~~[ARC 6192C, IAB 2/9/22, effective 3/16/22]~~

567—67.8~~9~~(455B) Class III sewage sludge.

67.8~~9~~(1) Class III sewage sludge is any sewage sludge that cannot meet either Class I ~~sewage sludge criteria~~ or Class II sewage sludge criteria.

67.8~~9~~(2) Class III sewage sludge shall not be utilized for beneficial use for land application as specified in the chapter.

67.8~~9~~(3) Class III sewage sludge shall be disposed according to ~~the surface disposal subpart of the~~ 40 CFR Part 503, Subpart C, "Surface Disposal,"~~regulation and 567—103.6(455B)~~ or according to ~~the incineration~~

Commented [70]: Old 67.8(2)"t"(1), "and the landowner..." - moved "landowner" to (2) below.

Commented [71]: Old Table 5, Frequency of Monitoring - This table (5) matches Table 2, the frequency of monitoring for Class I sludge, so Table 5 has been replaced w/ a reference to Table 2.

Commented [72]: 67.8(4)"a"(7), "and amount..." - This is already in 67.8(4)"a"(9).

Commented [73]: "67.8(4)"b", "Treatment works with..." - Existing text; 40 CFR 503.18.

subpart of the 40 CFR Part 503, Subpart E, "Incineration" regulation.

567—67.910(455B) Sampling and analytical methods.

67.910(1) *General.* Representative samples of sewage sludge that are applied to the land shall be collected and analyzed. MThe methods and calculation procedures listed below shall be used to analyze samples of sewage sludge and calculation procedures shall be used to calculate the percent of volatile solids reduction for sewage sludge.

67.910(2) *Enteric viruses.* ASTM D4994-19, "Standard Practice for Recovery of Viruses From Wastewater Sludges," ASTM International, West Conshohocken, PA, 2019, www.astm.org.40 CFR §503.8(b)(1) is adopted by reference.

67.910(3) *Fecal coliform.*

a. 40 CFR §503.8(b)(2) is adopted by reference.SM 9221 E-2011 or SM 9222 D-2011, "Standard Methods for the Examination of Water and Wastewater," American Public Health Association, Washington, D.C.;

b. EPA Method 1680: Fecal Coliforms in Sewage Sludge (Biosolids) by Multiple-Tube Fermentation using Lauryl Tryptose Broth (LBT) and EC Medium, EPA-821-R-14-009, September 2014;.

c. EPA Method 1681: Fecal Coliforms in Sewage Sludge (Biosolids) by Multiple-Tube Fermentation using A-1 medium, EPA-821-R-06-013, July 2006.

67.910(4) *Helminth ova.* 40 CFR §503.8(b)(3) is adopted by reference.Yanko, W., "Occurrence of Pathogens in Distribution and Marketing Municipal Sludges," U.S. Environmental Protection Agency, Washington, D.C., EPA/600/1-87/014 (NTIS PB88-154273), 1988.

67.910(5) *Inorganic pollutants.*

a. Metals. 40 CFR §503.8(b)(4) is adopted by reference."Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, 3rd Edition, Final Updates V (2015), www.epa.gov/hw-sw846/sw-846-compendium.

b. Nonmetals. For nonmetals not identified elsewhere in this chapter, methods listed in 567—paragraph 83.5(1)"c."approved at 40 CFR Part 136, as amended through August 28, 2017.

67.910(6) *Salmonella sp. bacteria.*

a. 40 CFR §503.8(b)(5) is adopted by reference.

b. SM 9260 B-2011, "Standard Methods for the Examination of Water and Wastewater," American Public Health Association, Washington, D.C.; EPA Method 1682: *Salmonella* in Sewage Sludge (Biosolids) by Modified Semisolid Rappaport-Vassiliadis (MSRV) Medium, EPA-821-R-06-14, July 2006.; or Kenner, B.A. and H.P. Clark, "Detection and Enumeration of Salmonella and Pseudomonas aeruginosa," J. Water Pollution Control Federation, 46(9):2163-2171, 1974.

67.910(7) *Specific oxygen uptake rate.* 40 CFR §503.8(b)(6) is adopted by reference.SM 2710 B-2011, "Standard Methods for the Examination of Water and Wastewater," American Public Health Association, Washington, D.C.

67.910(8) *Total, fixed, and volatile solids.* 40 CFR §503.8(b)(7) is adopted by reference.SM 2540 G-2011, "Standard Methods for the Examination of Water and Wastewater," American Public Health Association, Washington, D.C.

67.910(9) *Percent volatile solids reduction calculation.* "Environmental Regulations and Technology - Control of Pathogens and Vectors in Sewage Sludge," EPA-625/R-92/013, July 2003.

[ARC 6192C, IAB 2/9/22, effective 3/16/22]

567—67.101(455B) Pathogen treatment processes.

67.101(1) 40 CFR Part 503, Appendix B, section A, Processes to sSignificantly rReduce pPathogens (PSRP), is adopted by reference.

a. Aerobic digestion. Sewage sludge is agitated with air or oxygen to maintain aerobic conditions for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 40 days at 20 degrees Celsius and 60 days at 15 degrees Celsius.

b. Air drying. Sewage sludge is dried on sand beds or on paved or unpaved basins. The sewage sludge dries for a minimum of three months. During two of the three months, the ambient average daily temperature is above zero degrees Celsius.

c. Anaerobic digestion. Sewage sludge is treated in the absence of air for a specific mean cell residence

Commented [74]: 67.8(3), "the surface disposal..." - Existing text; correcting terminology & removing outdated citation to 103.6.

Commented [75]: 67.9, Sampling & analytical methods - Existing text; 40 CFR 503.8.

Commented [76]: 67.9(1), "The methods and..." - Simplifying text.

Commented [77]: New 67.9(2), Enteric viruses - Matches 40 CFR 503.8(b)(1); replace text w/ CFR reference.

Commented [78]: New 67.9(3)"a", Fecal coliform - Matches 40 CFR 503.8(b)(2); replace text w/ CFR reference.

Commented [79]: New 67.9(4), Helminth ova - Matches 40 CFR 503.8(b)(3); replace text w/ CFR reference.

Commented [80]: New 67.9(5)"a", Metals - Matches 40 CFR 503.8(b)(4); replace text w/ CFR reference.

Commented [81]: New 67.9(6)"a", 40 CFR reference - replacing 1st & 3rd methods in old 67.10(6) w/ CFR reference.

Commented [82]: New 67.9(6)"b" - Contains the existing salmonella method reference that is not in the CFR.

Commented [83]: New 67.9(7), "Specific oxygen..." - Matches 40 CFR 503.8(b)(6); replace text w/ CFR reference.

Commented [84]: New 67.9(8), "Total, fixed..." - Matches 40 CFR 503.8(b)(7); replace text w/ CFR reference.

Commented [85]: New 67.10(1), PSRP - Matches 40 CFR Part 503, Appendix B, section A. Replace w/ CFR reference.

~~time at a specific temperature. Values for the mean cell residence time and temperature shall be between 15 days at 35 to 55 degrees Celsius and 60 days at 20 degrees Celsius.~~

~~*d. Composting.* Using either the within-vessel, static aerated pile, or windrow composting methods, the temperature of the sewage sludge is raised to 40 degrees Celsius or higher and remains at 40 degrees Celsius or higher for five days. For four hours during the five days, the temperature in the compost pile exceeds 55 degrees Celsius.~~

~~*e. Lime stabilization.* Sufficient lime is added to the sewage sludge to raise the pH of the sewage sludge to 12 after two hours of contact.~~

67.10~~1~~(2) 40 CFR Part 503, Appendix B, section B, Processes to ~~f~~Further R~~r~~educe ~~p~~Pathogens (PFRP), is adopted by reference.

Commented [86]: New 67.10(2), PFRP - Matches 40 CFR Part 503, Appendix B, section B. Replace w/ CFR reference.

~~*a. Composting.* Using either the within-vessel composting method or the static aerated pile composting method, the temperature of the sewage sludge is maintained at 55 degrees Celsius or higher for three days.~~

~~Using the windrow composting method, the temperature of the sewage sludge is maintained at 55 degrees Celsius or higher for 15 days or longer. During the period when the compost is maintained at 55 degrees Celsius or higher, there shall be a minimum of five turnings of the windrow.~~

~~*b. Heat drying.* Sewage sludge is dried by direct or indirect contact with hot gases to reduce the moisture content of the sewage sludge to 10 percent or lower. Either the temperature of the sewage sludge particles exceeds 80 degrees Celsius or the wet bulb temperature of the gas in contact with the sewage sludge as the sewage sludge leaves the dryer exceeds 80 degrees Celsius.~~

~~*c. Heat treatment.* Liquid sewage sludge is heated to a temperature of 180 degrees Celsius or higher for 30 minutes.~~

~~*d. Thermophilic aerobic digestion.* Liquid sewage sludge is agitated with air or oxygen to maintain aerobic conditions and the mean cell residence time of the sewage sludge is ten days at 55 to 60 degrees Celsius.~~

~~*e. Beta ray irradiation.* Sewage sludge is irradiated with beta rays from an accelerator at dosages of at least 1.0 megarad at room temperature (ca. 20 degrees Celsius).~~

~~*f. Gamma ray irradiation.* Sewage sludge is irradiated with gamma rays from certain isotopes, such as Cobalt 60 and Cesium 137, at room temperature (ca. 20 degrees Celsius).~~

~~*g. Pasteurization.* The temperature of the sewage sludge is maintained at 70 degrees Celsius or higher for 30 minutes or longer.~~

~~[**ARC 6192C**, IAB 2/9/22, effective 3/16/22]~~

These rules are intended to implement Iowa Code section 455B.174.

~~[Filed 7/29/94, Notice 3/16/94—published 8/17/94, effective 9/21/94]~~
~~[Filed 3/8/07, Notice 1/3/07—published 3/28/07, effective 5/2/07]~~
~~[Filed ARC 2482C (Notice ARC 2353C, IAB 1/6/16), IAB 4/13/16, effective 5/18/16]~~
~~[Filed ARC 6192C (Notice ARC 6038C, IAB 11/17/21), IAB 2/9/22, effective 3/16/22]~~