

# 61-9.503

## Standards for the Use or Disposal of Sewage Sludge

Regulation History as Published in State Register			
Date	Document Number	Volume	Issue
July 27, 2001	2615	25	7
June 27, 2003	2783	27	6
May 23, 2008	3155	32	5
June 27, 2014	4444	38	6
November 22, 2019	4888	43	11

### Table of Contents

<b>PART A. GENERAL PROVISIONS.....</b>	<b>268</b>
503.1. Purpose and applicability.....	268
503.2. Compliance period.....	268
503.3. Permits.....	269
503.4. Relationship to other regulations.....	269
503.5. Additional or more stringent requirements.....	270
503.6. Exclusions.....	270
503.7. Requirement for a person who prepares sewage sludge.....	271
503.8. Sampling and analysis.....	271
503.9. General definitions.....	272
<b>PART B. LAND APPLICATION.....</b>	<b>275</b>
503.10. Applicability.....	275
503.11. Special definitions.....	276
503.12. General requirements.....	277
503.13. Pollutant limits.....	282
503.14. Management practices.....	284
503.15. Operational standards - pathogens and vector attraction reduction.....	285
503.16. Frequency of monitoring.....	286

503.17. Recordkeeping.....	287
503.18. Reporting.....	292
<b>PART C. SURFACE DISPOSAL.....</b>	<b>292</b>
503.20. Applicability.....	292
503.21. Special definitions.....	293
503.22. General requirements.....	294
503.23. Pollutant limits (other than domestic septage).....	295
503.24. Management practices.....	296
503.25. Operational standards - pathogens and vector attraction reduction.....	298
503.26. Frequency of monitoring.....	298
503.27. Recordkeeping.....	299
503.28. Reporting.....	300
<b>PART D. PATHOGENS AND VECTOR ATTRACTION REDUCTION.....</b>	<b>301</b>
503.30. Scope.....	301
503.31. Special definitions.....	301
503.32. Pathogens.....	302
503.33. Vector attraction reduction.....	308
<b>PART E. INCINERATION.....</b>	<b>310</b>
503.40. Applicability.....	310
503.41. Special definitions.....	310
503.42. General Requirements.....	311
503.43. Pollutant limits.....	311
503.44. Operational standard - total hydrocarbons.....	314
503.45. Management practices.....	315
503.46. Frequency of monitoring.....	316
503.47. Recordkeeping.....	317
503.48. Reporting.....	317
503.50. Odor Control Requirements.....	318
<b>APPENDIX A. PROCEDURE TO DETERMINE THE ANNUAL WHOLE SLUDGE APPLICATION RATE FOR A SEWAGE SLUDGE.....</b>	<b>319</b>
<b>APPENDIX B. PATHOGEN TREATMENT PROCESSES.....</b>	<b>320</b>
<b>APPENDIX C. PCB. POLYCHLORINATED BIPHENYLS.....</b>	<b>321</b>

**PART A**  
**GENERAL PROVISIONS**

**503.1. Purpose and applicability.**

(a) Purpose.

(1) This part establishes standards, which consist of general requirements, pollutant limits, management practices, and operational standards, for the final use or disposal of sewage sludge generated during the treatment of domestic sewage in a treatment works. Standards are included in this part for sewage sludge applied to the land, placed on a surface disposal site, or fired in a sewage sludge incinerator. Also included in this part are pathogen and alternative vector attraction reduction requirements for sewage sludge applied to the land or placed on a surface disposal site.

(2) In addition, the standards in this part include the frequency of monitoring and recordkeeping requirements when sewage sludge is applied to the land, placed on a surface disposal site, or fired in a sewage sludge incinerator. Also included in this part are reporting requirements for Class I sludge management facilities, publicly owned treatment works (POTWs) with a design flow rate equal to or greater than one million gallons per day, POTWs that serve 10,000 people or more, and all sewage sludge disposal when sewage sludge is applied to the land, placed on a surface disposal site, or fired in a sewage sludge incinerator.

(b) Applicability.

(1) This part applies to any person who prepares sewage sludge, applies sewage sludge to the land, or fires sewage sludge in a sewage sludge incinerator and to the owner/operator of a surface disposal site.

(2) This part applies to sewage sludge applied to the land, placed on a surface disposal site, or fired in a sewage sludge incinerator.

(3) This part applies to the exit gas from a sewage sludge incinerator stack.

(4) This part applies to land where sewage sludge is applied, to a surface disposal site, and to a sewage sludge incinerator.

(5) The requirements incorporated into this regulation pursuant to State Register Document 4444, including Appendix C, expire and are no longer effective five years from the State Register Document 4444 amendments' effective date.

**503.2. Compliance period.**

(a) Compliance with the standards in this part shall be achieved as expeditiously as practicable, but in no case later than February 19, 1994. When compliance with the standards requires construction of new pollution control facilities, compliance with the standards shall be achieved as expeditiously as practicable, but in no case later than February 19, 1995.

(b) The requirements for frequency of monitoring, recordkeeping, and reporting in this part for total hydrocarbons in the exit gas from a sewage sludge incinerator are effective February 19, 1994 or, if compliance with the operational standard for total hydrocarbons in this part requires the construction of new pollution control facilities, February 19, 1995.

(c) All other requirements for frequency of monitoring, recordkeeping, and reporting in this part are effective on July 20, 1993.

(d) Unless otherwise specified in subpart E, compliance with the requirements in sections 503.41 (c) through (r), 503.43(c), (d), and (e), 503.45(a)(1) and (b) through (f), 503.46(a)(1), (a)(3), and (c), and 503.47(f) that were revised on September 3, 1999, shall be achieved as expeditiously as practicable, but in no case later than September 5, 2000. When new pollution control facilities must be constructed to comply with the revised requirements in subpart E, compliance with the revised requirements shall be achieved as expeditiously as practicable but no later than September 4, 2001.

(e) Compliance with 503 Appendix C-PCB, shall be required upon publication of the revised regulation in the South Carolina State Register.

### **503.3. Permits.**

(a) The requirements in this part shall be implemented through a permit, with the exception of 503 Appendix C-PCB in accordance with 503.3(b):

(1) issued to a “treatment works treating domestic sewage”, as defined in R.61-9.122.2, in accordance with R.61-9.122, 124, and 505, by the State in accordance with 40 CFR 123 or,

(2) issued to any person who prepares, generates, or disposes of sewage sludge when the sewage sludge is applied to the land, placed on a surface disposal site, or fired in a sewage sludge incinerator, or

(3) issued under subtitle C of the Solid Waste Disposal Act; subpart C of the Safe Drinking Water Act; the Marine Protection, Research, and Sanctuaries Act of 1972; or the Clean Air Act. “Treatment works treating domestic sewage” shall submit a permit application in accordance with R.61-9.122.21.

(4) A person who derives a bulk or bag material from sewage sludge shall not be required to obtain a permit if: (1) the sewage sludge meets the ceiling concentrations in Table 1 of section 503.13; the pollutant concentration limits in Table 3 of section 503.13; the Class A pathogen requirements of section 503.32(a); one of the vector attraction reduction requirements in section 503.33(b)(1) through section 503.33(b)(8); and the requirements in 503 Appendix C-PCB, and (2) there is a permit in effect for either the preparer, generator and/or applier of the sewage sludge.

(b) Direct Enforceability. In addition to any other requirement of this regulation or a permit, sewage sludge use via land application shall be in accordance with Appendix C-PCB. This includes but is not limited to: bulk sewage sludge applied to agricultural land, forests or public contact sites; sewage sludge sold or given away in a bag or other container for application to the land; domestic septage; reclamation sites; or other materials mixed with sludge before application.

(c) The requirements under this part may be addressed in permits issued to land appliers.

### **503.4. Relationship to other regulations.**

(a) Disposal of sewage sludge in a municipal solid waste landfill unit, as defined in 40 CFR 258.2 and R.61-107, that complies with the requirements in 40 CFR Part 258 and R.61-107 constitutes compliance with section 405(d) of the CWA. Any person who prepares sewage sludge that is disposed in a municipal solid waste landfill unit shall ensure that the sewage sludge meets the requirements in 40 CFR Part 258 and R.61-107 concerning the quality of materials disposed in a municipal solid waste landfill unit.

(b) The disposal of sewage sludge involving the composting or co-composting of the sewage sludge with yard trash, land-clearing debris, or a combination of yard trash and land clearing debris shall comply with the requirements established in R.61-107. The submission and information requirements shall be determined by the Department.

(c) The disposal of sewage sludge utilizing an innovative and experimental solid waste management technology or process shall comply with the requirements addressed in R.61-107.

(d) The disposal of sewage sludge involving firing of sewage sludge in a sewage sludge incinerator or the heat drying/heat conditioning of the sewage sludge shall comply with the requirements addressed in 40 CFR Part 60, 40 CFR Part 61, and R.61-62.

(e) The processing of wastewater or the disposal of effluent from the processing of wastewater shall comply with the requirements addressed in R.61-62. Any activity covered by the Clean Air Amendments of 1990, shall comply within the time frame specified in the Clean Air Amendment or applicable federal regulations.

#### **503.5. Additional or more stringent requirements.**

(a) On a case-by-case basis, the Department may impose requirements for the use or disposal of sewage sludge in addition to or more stringent than the requirements in this part when necessary to protect public health and the environment from any adverse effect of a pollutant in the sewage sludge.

(b) Nothing in this part precludes a State or political subdivision thereof or interstate agency from imposing requirements for the use or disposal of sewage sludge more stringent than the requirements in this part or from imposing additional requirements for the use or disposal of sewage sludge.

(c) Sludge generated at an industrial facility. See R.61-9.504 for permit requirements for Industrial sludges.

(d) Commercial and mixed Domestic/Commercial septage. See R.61-9.504 for permit requirements.

#### **503.6. Exclusions.**

(a) Treatment processes. This part does not establish requirements for processes used to treat domestic sewage or for processes used to treat sewage sludge prior to final use or disposal, except as provided in section 503.32 and section 503.33.

(b) Selection of a use or disposal practice. This part does not require the selection of a sewage sludge use or disposal practice. The determination of the manner in which sewage sludge is used or disposed is a local determination.

(c) Co-firing of sewage sludge. This part does not establish requirements for sewage sludge co-fired in an incinerator with other wastes or for the incinerator in which sewage sludge and other wastes are co-fired.

(1) Domestic Sludge. Other wastes do not include auxiliary fuel, as defined in section 503.41(b), fired in a domestic sewage sludge incinerator.

(2) Industrial Sludge. See R.61-9.504 for permit requirements for Industrial sludges.

(d) Sludge generated at an industrial facility. This part (R.61-9.503) does not establish requirements for the use or disposal of sludge generated at an industrial facility during the treatment of industrial wastewater, including sewage sludge generated during the treatment of industrial wastewater combined with domestic sewage. See R.61-9.504 for permit requirements for Industrial sludges and industrial sewage sludge generated during the treatment of industrial wastewater combined with domestic sewage.

(e) Hazardous sewage sludge. This part does not establish requirements for the use or disposal of sewage sludge determined to be hazardous in accordance with 40 CFR Part 261.

(f) Sewage sludge with high PCB concentration. This part does not establish requirements and no land application of these materials may occur for the use or disposal of sewage sludge with a concentration of polychlorinated biphenyls (PCBs) equal to or greater than 50 milligrams per kilogram of total solids (dry weight basis). Requirements for land application of sludges (including sewage sludge, sludges and septage that may be mixed with grease trap waste) with PCB concentrations of less than 50 milligrams per kilogram (mg/kg dry weight basis) or less than 50 parts per million (ppm) are included in 503 Appendix C-PCB.

(g) Incinerator ash. This part does not establish requirements for the use or disposal of ash generated during the firing of sewage sludge in a sewage sludge incinerator.

(h) Grit and screenings. This part does not establish requirements for the use or disposal of grit (e.g., sand, gravel, cinders, or other materials with a high specific gravity) or screenings (e.g., relatively large materials such as rags) generated during preliminary treatment of domestic sewage in a treatment works.

(i) Drinking water treatment sludge. This part does not establish requirements for the use or disposal of sludge generated during the treatment of either surface water or ground water used for drinking water.

(j) Commercial and Industrial septage. This part (R.61-9.503) does not establish requirements for the use or disposal of commercial septage, industrial septage, a mixture of domestic septage and commercial septage, or a mixture of domestic septage and industrial septage. See R.61-9.504 for any permit requirements.

(k) Coal ash. This part does not establish requirements for the use or disposal of coal ash.

### **503.7. Requirement for a person who prepares sewage sludge.**

Any person who prepares sewage sludge shall ensure that the applicable requirements in this part are met when the sewage sludge is applied to the land, placed on a surface disposal site, or fired in a sewage sludge incinerator.

### **503.8. Sampling and analysis.**

(a) Sampling. Representative samples of sewage sludge that is applied to the land, placed on a surface disposal site, or fired in a sewage sludge incinerator shall be collected and analyzed. The Department may establish minimum requirements in permits for the proper method of sampling and analysis of sewage sludge.

(b) Methods. The materials listed below are incorporated by reference in this part. The materials are incorporated as they exist on the date of approval, and notice of any change in these materials will be published in the Federal Register. They are available for inspection at the Office of the Federal Register, 7th Floor, suite 700, 800 North Capitol Street, NW, Washington, DC, and at the Office of Water Docket, room L-102, U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC. Copies may be

obtained from the standard producer or publisher listed in the regulation. Methods in the materials listed below shall be used to analyze samples of sewage sludge.

(1) Enteric viruses. ASTM Designation: D 4994-89, “Standard Practice for Recovery of Viruses From Wastewater Sludges”, 1992 Annual Book of ASTM Standards: Section 11 -Water and Environmental Technology, ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

(2) Fecal coliform. Part 9221 C and E. or Part 9222 D., “Standard Methods for the Examination of Water and Wastewater”, 18th Edition, 1992, American Public Health Association, 1015 15th Street, NW, Washington, DC, 20005.

(3) Helminth ova. Yanko, W.A., “Occurrence of Pathogens in Distribution and Marketing Municipal Sludges”, EPA 600/1-87-014, 1987. National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 (PB 88-154273/AS).

(4) Inorganic pollutants. “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods”, EPA Publication SW-846, Second Edition (1982) with Updates I (April 1984) and II (April 1985) and Third Edition (November 1986) with Revision I (December 1987), II, IIA and IIB. Second Edition and Updates I and II are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 (PB-87-120-291). Third Edition and Revision I are available from Superintendent of Documents, Government Printing Office, 941 North Capitol Street, NE., Washington, DC, 20002 (Document Number 955-001-00000-1).

(5) Salmonella sp. bacteria. Part 9260 D., “Standard Methods for the Examination of Water and Wastewater”, 18th Edition, 1992, American Public Health Association, 1015 15th Street, NW, Washington, DC, 20005; or Kenner, B.A. and H.P. Clark, “Detection and enumeration of Salmonella and Pseudomonas aeruginosa”, Journal of the Water Pollution Control Federation, Vol. 46, no. 9, September 1974, pp. 2163-2171. Water Environment Federation, 601 Wythe Street, Alexandria, Virginia 22314.

(6) Specific oxygen uptake rate. Part 2710 B., “Standard Methods for the Examination of Water and Wastewater”, 18th Edition, 1992, American Public Health Association, 1015 15th Street, NW, Washington, DC, 20005.

(7) Total, fixed, and volatile solids. Part 2540 G., “Standard Methods for the Examination of Water and Wastewater”, 18th Edition, 1992, American Public Health Association, 1015 15th Street, NW, Washington, DC, 20005.

### **503.9. General definitions.**

All terms not defined herein have the meaning given them in R.61-9.122, R.61-9.124, R.61-9.129, R.61-9.133, R.61-9.403, or R.61-9.505.

(a) “Apply sewage sludge or sewage sludge applied to the land” means land application of sewage sludge.

(b) “Base flood” is a flood that has a one percent chance of occurring in any given year (i.e., a flood with a magnitude equalled once in 100 years).

(c) “Class I sludge management facility” is any publicly owned treatment works (POTW), as defined in 40 CFR 501.2, required to have an approved pretreatment program under R.61-9.403.8(a) (including any POTW located in a State that has elected to assume local program responsibilities pursuant to R.61-9.403.10(e)) and any treatment works treating domestic sewage, as defined in R.61-9.122.2, classified as a

Class I sludge management facility by the EPA Regional Administrator, or, in the case of approved State programs, the Regional Administrator in conjunction with the Department, because of the potential for its sewage sludge use or disposal practice to affect public health and the environment adversely.

(d) “Cover crop” is a small grain crop, such as oats, wheat, or barley; grasses; or other crop grown for agronomic use.

(e) “CWA” see R.61-9.122.2(b) Definitions.

(f) “Domestic septage” is either liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage. Domestic septage does not include liquid or solid material removed from a septic tank, cesspool, or similar treatment works that receives either commercial wastewater or industrial wastewater and does not include grease removed from a grease trap at a restaurant.

(g) “Domestic sewage” is waste and wastewater from humans, or household operations that is discharged to or otherwise enters a treatment works.

(h) “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).

(i) “EPA” means the United States Environmental Protection Agency.

(j) “Feed crops” are crops produced primarily for consumption by animals.

(k) “Fiber crops” are crops such as flax and cotton.

(l) “Food crops” are crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco.

(m) “Ground water” is water below the land surface in the saturated zone.

(n) “Industrial wastewater” is wastewater generated in a commercial or industrial process. See R.61-9.504 for additional definitions.

(o) “Municipality” see R.61-9.122.2(b) Definitions. The definition includes under section 503 of this regulation a special district created under State law, such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity, or an integrated waste management facility as defined in section 201(e) of the CWA, as amended, that has as one of its principal responsibilities the treatment, transport, use, or disposal of sewage sludge.

(p) “Permitting authority” means the Department.

(q) “Person” see definition in R.61-9.122.2(b) Definitions.

(r) “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.

(s) “Place sewage sludge or sewage sludge placed” means disposal of sewage sludge on a surface disposal site.

(t) “Pollutant” is an organic substance, an inorganic substance, a combination of organic and inorganic substances, or a pathogenic organism that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could, on the basis of information available to the Department, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction), or physical deformations in either organisms or offspring of the organisms.

(u) “Pollutant limit” is a numerical value that describes the amount of a pollutant allowed per unit amount of sewage sludge (e. g., milligrams per kilogram of total solids); the amount of a pollutant that can be applied to a unit area of land (e. g., kilograms per hectare); or the volume of a material that can be applied to a unit area of land (e.g., gallons per acre).

(v) “Runoff” is rainwater, leachate, or other liquid that drains overland on any part of a land surface and runs off of the land surface.

(w) “Sewage sludge” is solid, semi-solid, or liquid residue generated during the treatment of municipal wastewater or domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; 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 grit and screenings generated during preliminary treatment of domestic or industrial sewage in a treatment works. See R.61-9.504 for Industrial sludge definition.

(x) “State” means the State of South Carolina.

(y) “Store or storage of sewage sludge” is the placement of sewage sludge on land on which the sewage sludge remains for two years or less. This does not include the placement of sewage sludge on land for treatment.

(z) “Treat or treatment of sewage sludge” is the preparation of sewage sludge for final use or disposal. This includes, but is not limited to, thickening, stabilization, and dewatering of sewage sludge. This does not include storage of sewage sludge.

(aa) “Treatment works” is either a Federally owned, publicly owned, or privately owned device or system used to treat (including recycle and reclaim) either domestic sewage or a combination of domestic sewage and industrial waste of a liquid nature.

(bb) “Wetlands” see R.61-9.122.2(b) Definitions.

(cc) [Reserved]

(dd) “Person who applies sewage sludge” may be the generator, preparer, or a land applier.

**PART B**  
**LAND APPLICATION**

**503.10. Applicability.**

(a) This part applies to any person who prepares sewage sludge that is applied to the land, to any person who applies sewage sludge to the land, to sewage sludge applied to the land, and to the land on which sewage sludge is applied.

(b) Bulk sewage sludge.

(1) [Reserved]

(2) The Department, may apply any or all of the general requirements in section 503.12 and the management practices in section 503.14 to bulk sewage sludge meeting the pollutant concentrations in section 503.13(b)(3), the Class A pathogen requirements in section 503.32(a), and one of the vector attraction reduction requirements in section 503.33(b)(1) through section 503.33(b)(8), on a case-by-case basis after determining that the general requirements or management practices are needed to protect public health and the environment from any reasonably anticipated adverse effect that may occur from any pollutant in the bulk sewage sludge.

(c)(1) [Reserved]

(2) The Department, may apply any or all of the general requirements in section 503.12 or the management practices in section 503.14 to derived bulk material meeting the pollutant concentrations in section 503.13(b)(3), the Class A pathogen requirements in section 503.32(a), and one of the vector attraction reduction requirements in section 503.33(b)(1) through section 503.33(b)(8), on a case-by-case basis after determining that the general requirements or management practices are needed to protect public health and the environment from any reasonably anticipated adverse effect that may occur from any pollutant in the bulk sewage sludge.

(d) The requirements in this part may be applied by the Department, on a case-by-case basis, when a bulk material derived from sewage sludge is applied to the land if the sewage sludge from which the bulk material is derived meets the ceiling concentrations in Table 1 of section 503.13 and the pollutant concentrations in Table 3 of section 503.13; the Class A pathogen requirements in section 503.32(a); and one of the vector attraction reduction requirements in section 503.33(b)(1) through (b)(8).

(e) Sewage sludge sold or given away in a bag or other container for application to the land. The general requirements in section 503.12 and the management practices in section 503.14 do not apply, except for section 503.12(o), section 503.12(p), section 503.12(q), and section 503.14(e), when sewage sludge is sold or given away in a bag or other container for application to the land if the sewage sludge sold or given away in a bag or other container for application to the land meets the ceiling concentrations in Table 1 of section 503.13 and the pollutant concentrations in Table 3 of section 503.13; the Class A pathogen requirements in section 503.32(a); and one of the vector attraction reduction requirements in section 503.33(b)(1) through (b)(8).

(f) The general requirements in section 503.12 and the management practices in section 503.14 do not apply, except for section 503.12(o), section 503.12(p), section 503.12(q), and section 503.14(e), when a material derived from sewage sludge is sold or given away in a bag or other container for application to the land if the derived material meets the ceiling concentrations in Table 1 of section 503.13 and the pollutant

concentrations in Table 3 of section 503.13; the Class A pathogen requirements in section 503.32(a); and one of the vector attraction reduction requirements in section 503.33(b)(1) through (b)(8).

(g) The requirements in this part do not apply, except for section 503.14(e), when a material derived from sewage sludge is sold or given away in a bag or other container for application to the land if the sewage sludge from which the material is derived meets the ceiling concentrations in Table 1 of section 503.13 and the pollutant concentrations in Table 3 of section 503.13; the Class A pathogen requirements in section 503.32(a); and one of the vector attraction reduction requirements in section 503.33(b)(1) through (b)(8).

(h) If other materials are mixed with the sewage sludge, the final product must meet the applicable requirements related to pollution limits (in section 503.13), pathogen reduction (in section 503.15(a)), and vector attraction reduction (in section 503.15(c)) after the materials have been added to the sewage sludge.

### **503.11. Special definitions.**

(a) “Agricultural land” is land on which a food crop, a feed crop, or a fiber crop is grown. This includes range land and land used as pasture.

(b) “Agronomic rate” is the whole sludge application rate (dry weight basis) designed: (1) to provide the amount of nitrogen needed by the food crop, feed crop, fiber crop, cover crop, or vegetation grown on the land and (2) to minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water and (3) to provide the amount of other organic and inorganic plant nutrients which promote crop or vegetative growth, such as calcium-carbonate equivalency.

(c) “Annual pollutant loading rate” is the maximum amount of a pollutant that can be applied to a unit area of land during a 365 day period.

(d) “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.

(e) “Bulk sewage sludge” is sewage sludge that is not sold or given away in a bag or other container for application to the land.

(f) “Cumulative pollutant loading rate” is the maximum amount of an inorganic pollutant that can be applied to an area of land.

(g) “Forest” is a tract of land thick with trees and underbrush.

(h) “Land application” is the spraying or spreading of sewage sludge onto the land surface; the injection of sewage sludge below the land surface; or the incorporation of sewage sludge into the soil so that the sewage sludge can either condition the soil or fertilize crops or vegetation grown in the soil.

(i) “Monthly average” is the arithmetic mean of all measurements taken during the month.

(j) “Other container” is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.

(k) “Pasture” is land on which animals feed directly on feed crops such as legumes, grasses, grain stubble, or stover.

(l) “Public contact site” is land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.

(m) “Range land” is open land with indigenous vegetation.

(n) “Reclamation site” is drastically disturbed land that is reclaimed using sewage sludge. This includes, but is not limited to, strip mines and construction sites.

### **503.12. General requirements.**

(a) No person shall apply sewage sludge to the land except in accordance with the requirements in this part.

(b) No person shall apply bulk sewage sludge subject to the cumulative pollutant loading rates in section 503.13(b)(2) to agricultural land, forest, a public contact site, or a reclamation site if any of the cumulative pollutant loading rates in section 503.13(b)(2) has been reached.

(c) No person shall apply domestic septage to agricultural land, forest, or a reclamation site during a 365 day period if the annual application rate in section 503.13(c) has been reached during that period.

(d) The person who prepares bulk sewage sludge that is applied to agricultural land, forest, a public contact site, or a reclamation site shall provide the person who applies the bulk sewage sludge written notification of the concentration of total nitrogen (as N on a dry weight basis) in the bulk sewage sludge.

(e)(1) The person or the permittee who applies sewage sludge to the land shall obtain information needed to comply with the requirements in this part.

(2)(i) Before bulk sewage sludge subject to the cumulative pollutant loading rates in section 503.13(b)(2) is applied to the land, the person who proposes to apply the bulk sewage sludge shall contact the Department or the permitting authority for the State in which the bulk sewage sludge will be applied to determine whether bulk sewage sludge subject to the cumulative pollutant loading rates in section 503.13(b)(2) has been applied to the site.

(ii) If bulk sewage sludge subject to the cumulative pollutant loading rates in section 503.13(b)(2) has not been applied to the site, the cumulative amount for each pollutant listed in Table 2 of section 503.13 may be applied to the site in accordance with section 503.13(a)(2)(i).

(iii) If bulk sewage sludge subject to the cumulative pollutant loading rates in section 503.13(b)(2) has been applied to the site and the cumulative amount of each pollutant applied to the site in the bulk sewage sludge is known, the cumulative amount of each pollutant applied to the site shall be used to determine the additional amount of each pollutant that can be applied to the site in accordance with section 503.13(a)(2)(i).

(iv) If bulk sewage sludge subject to the cumulative pollutant loading rates in section 503.13(b)(2) has been applied to the site since July 20, 1993 and the cumulative amount of each pollutant applied to the site in the bulk sewage sludge since that date is not known, an additional amount of each pollutant shall not be applied to the site in accordance with section 503.13(a)(2)(i).

(f) When a person who prepares bulk sewage sludge provides the bulk sewage sludge to a person who applies the bulk sewage sludge to the land, the person who prepares the bulk sewage sludge shall provide

the person who applies the sewage sludge notice and necessary information to comply with the requirements in this part.

(g) When a person who prepares sewage sludge provides the sewage sludge to another person who prepares the sewage sludge, the person who provides the sewage sludge shall provide the person who receives the sewage sludge notice and necessary information to comply with the requirements in this part.

(h) The person who applies bulk sewage sludge to the land shall provide the owner or lease holder of the land on which the bulk sewage sludge is applied notice and necessary information to comply with the requirements in this part.

(i) Any person who prepares bulk sewage sludge that is applied to land in a State other than the State in which the bulk sewage sludge is prepared shall provide written notice, prior to the initial application of bulk sewage sludge to the land application site by the applier, to the Department or the permitting authority for the State in which the bulk sewage sludge is proposed to be applied. The notice shall include:

(1) The location, by either street address or latitude and longitude, of each land application site.

(2) The approximate time period bulk sewage sludge will be applied to the site.

(3) The name, address, telephone number, and National Pollutant Discharge Elimination System permit number (if appropriate) for the person who prepares the bulk sewage sludge.

(4) The name, address, telephone number, and National Pollutant Discharge Elimination System permit number (if appropriate) for the person who will apply the bulk sewage sludge.

(j) Any person who applies bulk sewage sludge subject to the cumulative pollutant loading rates in section 503.13(b)(2) to the land shall provide written notice, prior to the initial application of bulk sewage sludge to a land application site by the applier, to the Department or permitting authority for the State in which the bulk sewage sludge will be applied and the Department or permitting authority for the State shall retain and provide access to the notice. The notice shall include:

(1) The location, by either street address or latitude and longitude, of the land application site.

(2) The name, address, telephone number, and National Pollutant Discharge Elimination System permit number (if appropriate) of the person who will apply the bulk sewage sludge.

(k) The Department may establish categories of land application sites and develop separate permitting requirements for each category as deemed necessary.

(1) The Department may establish requirements in permits for site selection regarding appropriate conditions for land application of sewage sludge.

(2) The Department may establish additional permitting restrictions based upon soil and groundwater conditions to insure protection of the groundwater and surface water of the State. Criteria may include but is not limited to soil permeability, clay content, and depth to groundwater.

(l) The Department may establish in permits the application buffer setbacks for property boundaries, roadways, residential developments, dwellings, water wells, drainageways, and surface water as deemed necessary to protect public health and the environment. Factors taken into consideration in the establishment

of setbacks would indicate sludge application method, adjacent land usage, public access, aerosols, runoff prevention, and adjacent groundwater usage.

(m) The Department may establish permit conditions to require that sludge application remain consistent with the lime and fertilizer requirements for the cover, feed, food, and fiber crops based on published lime and fertilizer recommendations (such as “Nutrient Management for South Carolina”, Cooperative Extension Service, Clemson University, EC 476).

(n) The Department may establish minimum requirements in permits for soil and/or groundwater monitoring, for bulk application sites, to verify compliance with this Regulation. Factors taken into consideration in the establishment of soil and groundwater monitoring will include groundwater depth, operation flexibility, application frequency, type of sludge, size of application area, and loading rate.

(1) The Department may establish pre-application and post-application site monitoring requirements in permits for limiting nutrients or limiting pollutants as determined by the Department.

(2) The Department may establish permit conditions which require the permittee to reduce, modify, or eliminate the sludge applications based on the results of this data.

(3) The Department may modify or revoke and reissue the permit based on this data.

(o) Any person who prepares bulk sewage sludge and applies it to the land, or provides the bulk sewage sludge to a person who applies the bulk sewage sludge, or provides the bulk sewage sludge to another person who treats or processes the bulk sewage sludge prior to land applying it, shall apply to the Department for a permit to land apply the bulk sewage sludge and shall receive an approved permit from the Department prior to the actual application. Any person who prepares sewage sludge and sells or gives it away in a bag or other container, or provides the sewage sludge to a person who sells or gives it away in a bag or other container, or provides the sewage sludge to another person who treats, mixes, alters or processes the sewage sludge for sale or gives it away in a bag or other container shall receive an approved permit from the Department prior to the sale or distribution of the material. The application for land applying, or bagging, or selling, or giving away sludges will be in the form of a report prepared by a qualified Professional Engineer, qualified soil scientist, qualified agronomist, or other qualified individual. This report shall at a minimum contain:

(1) Sludge generator information shall be included as follows:

(i) Facility name, address, telephone number, county, and NPDES or other permit number(if applicable).

(ii) Plant discharge capacity in millions of gallons per day (MGD) (if applicable), amount of sludge generated per year (dry weight basis), description of sludge storage and amount of stockpiled sludge (if applicable), description of sludge treatment, and current method of disposal.

(2) Sludge analysis information shall be included as follows:

(i) Test results or rationale that demonstrates the non-hazardous nature of the sludge to the satisfaction of the Department.

(ii) Name, address, lab certification number, and telephone number of the laboratory conducting the analyses.

(iii) Sludge shall be analyzed for:

(A) Total solids (mg/l) and volatile solids (mg/kg).

(B) Nutrients (on a dry weight basis).

(1) Total Kjeldahl Nitrogen (mg/kg).

(2) Total inorganic nitrogen (mg/kg).

(3) Total ammonia nitrogen (mg/kg) and Total nitrate nitrogen (mg/kg).

(4) Total phosphorus (mg/kg).

(5) Total potassium (mg/kg).

(6) Calcium Carbonate Equivalency (if sewage sludge is alkaline stabilized).

(C) Pollutants (on a dry weight basis).

(1) Arsenic (mg/kg).

(2) Cadmium (mg/kg).

(3) Copper (mg/kg).

(4) Lead (mg/kg).

(5) Mercury (mg/kg).

(6) Molybdenum (mg/kg).

(7) Nickel (mg/kg).

(8) Selenium (mg/kg).

(9) Zinc (mg/kg).

(10) Other compounds required by the permit or any pollutant required for monitoring under effluent guidelines (40 CFR Part 136; Subchapter N (40 CFR Parts 400 through 402 and 404 through 471)) may be required to be monitored for in the sewage sludge (if applicable).

(D) If an analysis must be performed on the sludge to document compliance with pathogen reduction requirements and vector attraction reduction requirements, these analyses shall be submitted in the report along with an explanation.

(iv) Sludge handling and application information shall be included as follows:

(A) Description of method of transport (if applicable).

(B) The time of year of the sludge application and how it relates to crop planting and harvesting schedule (if applicable).

(C) Name, address, and telephone number of the contractor applying the sludge (if applicable).

(D) Type of equipment used to spread the sludge (if applicable).

(v) Application site information shall be included (as appropriate):

(A) Name and address of landowner and location of application site(s).

(B) Name and address of the party managing the site(s) (if different than the owner).

(C) Previous years when sludge was applied under permits by the Department and application amounts.

(D) Additional soil additives applied on the site(s).

(E) Description of method to control access to the site(s).

(F) Method of odor control (if applicable).

(G) Site location(s) on maps including:

(1) Topography and drainage characteristics.

(2) Adjacent land usage and location of inhabited dwellings.

(3) All water supply wells on adjacent property.

(4) Adjacent surface water bodies.

(5) Sludge use or disposal boundaries and buffer zones.

(6) Location of proposed groundwater monitoring wells (if applicable).

(7) Right-of-Ways

(8) Soil test, description of soil types, and boring locations (if applicable).

(vi) Site Monitoring Plan information shall be included as follows (when required):

(A) Groundwater monitoring information (if applicable).

(B) Soil monitoring methods and locations (if applicable).

(C) Surface water sampling methods and locations (if applicable).

(D) Metals testing, if required, due to previous application(s) (if applicable).

(E) Method to insure that the soil pH will remain within agronomic ranges during the life of the site (e.g. alkaline stabilized sludge projects).

(vii) The Department, at its discretion, may identify specific application information that may be excluded from a submission if the applicant has an alternate permitted method of disposal for the bulk sewage sludge (e.g. a municipal solid waste landfill disposal permit). The Department, may allow an applicant to exclude application information from a submission of a modified application or addition to a previously permitted activity.

(p) The Department, at its discretion, may request of an applicant any additional information deemed necessary to complete or correct deficiencies in the sludge disposal permit application before processing the application or issuing or denying the issuance of a permit.

(q) Applicants for land application of sludge must submit their applications on permit application forms if designated by the Department.

(r) If a deleterious impact to the groundwaters of the State from sewage sludge use or disposal practices is documented, through groundwater monitoring levels exceeding the standards set forth in R.61-68 or a significant adverse trend occurs, then it will be the obligation of the generator/preparer of the sewage sludge as directed by the Department to conduct an investigation to determine the vertical and horizontal extent of groundwater impact. The Department may require remediation of the groundwater to within acceptable levels for groundwater as set forth in R.61-68.

### **503.13. Pollutant limits.**

(a) Sewage sludge.

(1) Bulk sewage sludge or sewage sludge sold or given away in a bag or other container shall not be applied to the land if the concentration of any pollutant in the sewage sludge exceeds the ceiling concentration for the pollutant in Table 1 of section 503.13.

(2) If bulk sewage sludge is applied to agricultural land, forest, a public contact site, or a reclamation site, either:

(i) the cumulative loading rate for each pollutant shall not exceed the cumulative pollutant loading rate for the pollutant in Table 2 of section 503.13; or

(ii) the concentration of each pollutant in the sewage sludge shall not exceed the concentration for the pollutant in Table 3 of section 503.13.

(3) If bulk sewage sludge is applied to a lawn or a home garden, the concentration of each pollutant in the sewage sludge shall not exceed the concentration for the pollutant in Table 3 of section 503.13.

(4) If sewage sludge is sold or given away in a bag or other container for application to the land, either:

(i) the concentration of each pollutant in the sewage sludge shall not exceed the concentration for the pollutant in Table 3 of section 503.13, or

(ii) the product of the concentration of each pollutant in the sewage sludge and the annual whole sludge application rate for the sewage sludge shall not cause the annual pollutant loading rate for the

pollutant in Table 4 of section 503.13 to be exceeded. The procedure used to determine the annual whole sludge application rate is presented in appendix A of this part.

(b) Pollutant concentrations and loading rates -sewage sludge.

(1) Ceiling concentrations.

TABLE 1 OF SECTION 503.13 - CEILING CONCENTRATIONS

Pollutant	Ceiling Concentration (milligrams per kilogram) Dry weight basis
Arsenic	75
Cadmium	85
Copper	4300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7500

(2) Cumulative pollutant loading rates.

TABLE 2 OF SECTION 503.13 - CUMULATIVE POLLUTANT LOADING RATES

Pollutant	Cumulative Pollutant Loading Rate (kilograms per hectare)
Arsenic	41
Cadmium	39
Copper	1500
Lead	300
Mercury	17
Nickel	420
Selenium	100
Zinc	2800

(3) Pollutant concentrations.

TABLE 3 OF SECTION 503.13 - POLLUTANT CONCENTRATIONS

Pollutant	Monthly Average Concentrations (milligrams per kilogram) Dry weight basis
Arsenic	41
Cadmium	39
Copper	1500
Lead	300

Pollutant	Monthly Average Concentrations
	(milligrams per kilogram) Dry weight basis
Mercury	17
Nickel	420
Selenium	100
Arsenic	41
Zinc	2800

(4) Annual pollutant loading rates.

TABLE 4 OF SECTION 503.13 - ANNUAL POLLUTANT LOADING RATES

Pollutant	Annual Pollutant Loading Rate (kilograms per hectare per 365 day period)
Arsenic	2.0
Cadmium	1.9
Copper	75
Lead	15
Mercury	0.85
Nickel	21
Selenium	5.0
Zinc	140

(c) Domestic septage. The annual application rate for domestic septage applied to agricultural land, forest, or a reclamation site shall not exceed the annual application rate calculated using equation (1), or the agronomic rate.

$$\text{AAR} = \frac{\text{N}}{0.0026} \quad (\text{Equation 1})$$

Where:

AAR = Annual application rate in gallons per acre per 365 day period.

N = Amount of nitrogen in pounds per acre per 365 day period needed by the crop or vegetation grown on the land.

(d) Additional parameters may be required, from the application information or subsequent monitoring in a permit thereafter, but such needs will be assessed on an individual project basis. Any pollutant required for monitoring under effluent guidelines (40 CFR 136; Subchapter N (40 CFR Part 400 through 402 and 404 through 471)) may be required (in a permit) to be monitored for in the sewage sludge.

**503.14. Management practices.**

(a) Bulk 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.

(b) Bulk sewage sludge shall not be applied to agricultural land, forest, a public contact site, or a reclamation site that is flooded, frozen, or snow-covered so that the bulk sewage sludge enters a wetland or other waters of the State, as defined in R.61-9.122.2, except as provided in a permit issued pursuant to section 402 or 404 of the CWA.

(c) Bulk sewage sludge shall not be applied to agricultural land, forest, or a reclamation site that is 10 meters or less from waters of the State, as defined in R.61-9.122.2, unless otherwise specified by the Department.

(d) Bulk sewage sludge shall be applied to agricultural land, forest, a public contact site, or a reclamation site at a whole sludge application rate that is equal to or less than the agronomic rate for the bulk sewage sludge, unless, in the case of a reclamation site, otherwise specified by the Department.

(e) Either a label shall be affixed to the bag or other container in which sewage sludge that is sold or given away for application to the land, or an information sheet shall be provided to the person who receives sewage sludge sold or given away in an other container for application to the land. The label or information sheet shall contain the following information:

(1) The name and address of the person who prepared the sewage sludge that is sold or given away in a bag or other container for application to the land.

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

(3) The annual whole sludge application rate for the sewage sludge that does not cause any of the annual pollutant loading rates in Table 4 of section 503.13 to be exceeded.

(4) The annual whole sludge application rate for the sewage sludge that does not cause the agronomic rate for appropriate crops to be exceeded (to be presented in tons/acre or other units approved by the Department).

(f) Screening of septage is required prior to land application. The screenings must be disposed of properly (e.g. municipal waste landfill).

### **503.15. Operational standards - pathogens and vector attraction reduction.**

(a) Pathogens -sewage sludge.

(1) The Class A pathogen requirements in section 503.32(a) or the Class B pathogen requirements and site restrictions in section 503.32(b) shall be met when bulk sewage sludge is applied to agricultural land, forest, a public contact site, or a reclamation site.

(2) The Class A pathogen requirements in section 503.32(a) shall be met when bulk sewage sludge is applied to a lawn or a home garden.

(3) The Class A pathogen requirements in section 503.32(a) shall be met when sewage sludge is sold or given away in a bag or other container for application to the land.

(b) Pathogens -domestic septage. The requirements in either section 503.32(c)(2), or section 503.32(c)(3) shall be met when domestic septage is applied to agricultural land, forest, or a reclamation site.

(c) Vector attraction reduction -sewage sludge.

(1) One of the vector attraction reduction requirements in section 503.33(b)(1) through section 503.33(b)(10) shall be met when bulk sewage sludge is applied to agricultural land, forest, a public contact site, or a reclamation site.

(2) One of the vector attraction reduction requirements in section 503.33(b)(1) through section 503.33(b)(8) shall be met when bulk sewage sludge is applied to a lawn or a home garden.

(3) One of the vector attraction reduction requirements in section 503.33(b)(1) through section 503.33(b)(8) shall be met when sewage sludge is sold or given away in a bag or other container for application to the land.

(d) Vector attraction reduction -domestic septage. The vector attraction reduction requirements in section 503.33(b)(9), section 503.33(b)(10), or section 503.33(b)(12) shall be met when domestic septage is applied to agricultural land, forest, or a reclamation site.

### **503.16. Frequency of monitoring.**

(a) Sewage sludge.

(1) The frequency of monitoring for the pollutants listed in Table 1, Table 2, Table 3 and Table 4 of section 503.13; the pathogen density requirements in section 503.32(a) and in section 503.32(b)(2) and the vector attraction reduction requirements in section 503.33(b)(1) through (b)(4) and sections 503.33(b)(7) and (b)(8) shall be the frequency in Table 1 of section 503.16. Facilities which generate less than 290 metric tons of sludge per year and dispose of the sludge once per year or less, may request a reduction in monitoring to a frequency of once per year. The Department will review these requests on a case-by-case basis.

**TABLE 1 OF SECTION 503.16 - FREQUENCY OF MONITORING - LAND APPLICATION**

<u>Amount of sewage sludge<sup>1</sup></u> (metric tons per 365-day period)	<u>Frequency</u>
Greater than zero but less than 1,500.	Once per quarter (four times per year)
Equal to or greater than 1,500 but less than 15,000.	Once per 60 days (six times per year)
Equal to or greater than 15,000.	Once per month (12 times per year)

<sup>1</sup>Either the amount of bulk sewage sludge applied to the land or the amount of sewage sludge prepared for sale or give-away in a bag or other container for application to the land (dry weight basis).

(2) After the sewage sludge has been monitored for two years at the frequency in Table 1 of section 503.16, the Department may reduce the frequency of monitoring for pollutant concentrations and for the pathogen density requirements in section 503.32(a)(5)(ii) and (a)(5)(iii), but in no case shall the frequency of monitoring be less than once per year when sewage sludge is applied to the land.

(b) Domestic septage. If either the pathogen requirements in section 503.32(c)(1) and section 503.32(c)(2) or section 503.32(c)(3), and the vector attraction reduction requirements in section

503.33(b)(12) are met when domestic septage is applied to agricultural land, forest, or a reclamation site, each container of domestic septage applied to the land shall be monitored for compliance with those requirements.

### **503.17. Recordkeeping.**

(a) Sewage sludge.

(1) The person who prepares the sewage sludge in section 503.10(b)(2) or in section 503.10(e) shall develop the following information and shall retain the information for five years:

(i) The concentration of each pollutant listed in Table 3 of section 503.13 in the sewage sludge.

(ii) The following certification statement: “I certify, under penalty of law, that the information that will be used to determine compliance with the Class A pathogen requirements in section 503.32(a) and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in section 503.33(b)(1) through 503.33(b)(8)] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

(iii) A description of how the Class A pathogen requirements in section 503.32(a) are met.

(iv) A description of how one of the vector attraction reduction requirements in section 503.33(b)(1) through section 503.33(b)(8) is met.

(2) The person who derives the material in section 503.10(c)(2) or in section 503.10(f) shall develop the following information and shall retain the information for five years:

(i) The concentration of each pollutant listed in Table 3 of section 503.13 in the material.

(ii) The following certification statement: “I certify, under penalty of law, that the information that will be used to determine compliance with the Class A pathogen requirements in section 503.32(a) and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in section 503.33(b)(1) through (b)(8)] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

(iii) A description of how the Class A pathogen requirements in section 503.32(a) are met.

(iv) A description of how one of the vector attraction reduction requirements in section 503.33(b)(1) through section 503.33(b)(8) is met.

(3) If the pollutant concentrations in section 503.13(b)(3), the Class A pathogen requirements in section 503.32(a), and the vector attraction reduction requirements in either section 503.33(b)(9) or section 503.33(b)(10) are met when bulk sewage sludge is applied to agricultural land, forest, a public contact site, or a reclamation site:

(i) The person who prepares the bulk sewage sludge shall develop the following information and shall retain the information for five years.

(A) The concentration of each pollutant listed in Table 3 of section 503.13 in the bulk sewage sludge.

(B) The following certification statement: “I certify, under penalty of law, that the information that will be used to determine compliance with the Class A pathogen requirements in section 503.32(a) was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

(C) A description of how the pathogen requirements in section 503.32(a) are met.

(ii) The person who applies the bulk sewage sludge shall develop the following information and shall retain the information for five years.

(A) The following certification statement: “I certify, under penalty of law, that the information that will be used to determine compliance with the management practices in section 503.14 and the vector attraction reduction requirement in [insert either section 503.33(b)(9) or (b)(10)] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

(B) A description of how the management practices in section 503.14 are met for each site on which bulk sewage sludge is applied.

(C) A description of how the vector attraction reduction requirements in either section 503.33(b)(9) or section 503.33(b)(10) are met for each site on which bulk sewage sludge is applied.

(4) If the pollutant concentrations in section 503.13(b)(3) and the Class B pathogen requirements in section 503.32(b) are met when bulk sewage sludge is applied to agricultural land, forest, a public contact site, or a reclamation site:

(i) The person who prepares the bulk sewage sludge shall develop the following information and shall retain the information for five years:

(A) The concentration of each pollutant listed in Table 3 of section 503.13 in the bulk sewage sludge.

(B) The following certification statement: “I certify, under penalty of law, that the information that will be used to determine compliance with the Class B pathogen requirements in section 503.32(b) and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in section 503.33(b)(1) through (b)(8), if one of those requirements is met] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

(C) A description of how the Class B pathogen requirements in section 503.32(b) are met.

(D) When one of the vector attraction reduction requirements in section 503.33(b)(1) through section 503.33(b)(8) is met, a description of how the vector attraction reduction requirement is met.

(ii) The person who applies the bulk sewage sludge shall develop the following information and shall retain the information for five years.

(A) The following certification statement: “I certify, under penalty of law, that the information that will be used to determine compliance with the management practices in section 503.14, the site restrictions in section 503.32(b)(5), and the vector attraction reduction requirements in [insert either section 503.33(b)(9) or (b)(10), if one of those requirements is met] was prepared for each site on which bulk sewage sludge is applied under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

(B) A description of how the management practices in section 503.14 are met for each site on which bulk sewage sludge is applied.

(C) A description of how the site restrictions in section 503.32(b)(5) are met for each site on which bulk sewage sludge is applied.

(D) When the vector attraction reduction requirement in either section 503.33(b)(9) or section 503.33(b)(10) is met, a description of how the vector attraction reduction requirement is met.

(E) The date bulk sewage sludge is applied to each site.

(5) If the requirements in section 503.13(a)(2)(i) are met when bulk sewage sludge is applied to agricultural land, forest, a public contact site, or a reclamation site:

(i) The person who prepares the bulk sewage sludge shall develop the following information and shall retain the information for five years.

(A) The concentration of each pollutant listed in Table 1 of section 503.13 in the bulk sewage sludge.

(B) The following certification statement: “I certify, under penalty of law, that the information that will be used to determine compliance with the pathogen requirements in [insert either section 503.32(a) or 503.32(b)] and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in section 503.33(b)(1) through (b)(8), if one of those requirements is met] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

(C) A description of how the pathogen requirements in either section 503.32(a) or section 503.32(b) are met.

(D) When one of the vector attraction requirements in section 503.33(b)(1) through section 503.33(b)(8) is met, a description of how the vector attraction requirement is met.

(ii) The person who applies the bulk sewage sludge shall develop the following information, retain the information in section 503.17(a)(5)(ii)(A) through section 503.17(a)(5)(ii)(G) indefinitely, and retain the information in section 503.17(a)(5)(ii)(H) through section 503.17(a)(5)(ii)(M) for five years.

(A) The location, by either street address or latitude and longitude, of each site on which bulk sewage sludge is applied.

(B) The number of hectares in each site on which bulk sewage sludge is applied.

(C) The date bulk sewage sludge is applied to each site.

(D) The cumulative amount of each pollutant (i.e., kilograms) listed in Table 2 of section 503.13 in the bulk sewage sludge applied to each site, including the amount in section 503.12(e)(2)(iii).

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

(F) The following certification statement: “I certify, under penalty of law, that the information that will be used to determine compliance with the requirements to obtain information in section 503.12(e)(2) was prepared for each site on which bulk sewage sludge was applied under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

(G) A description of how the requirements to obtain information in section 503.12(e)(2) are met.

(H) The following certification statement: “I certify, under penalty of law, that the information that will be used to determine compliance with the management practices in section 503.14 was prepared for each site on which bulk sewage sludge was applied under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

(I) A description of how the management practices in section 503.14 are met for each site on which bulk sewage sludge is applied.

(J) The following certification statement when the bulk sewage sludge meets the Class B pathogen requirements in section 503.32(b): “I certify, under penalty of law, that the information that will be used to determine compliance with the site restrictions in section 503.32(b)(5) for each site on which Class B sewage sludge was applied was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

(K) A description of how the site restrictions in section 503.32(b)(5) are met for each site on which Class B bulk sewage sludge is applied.

(L) The following certification statement when the vector attraction reduction requirement in either section 503.33(b)(9) or (b)(10) is met: “I certify, under penalty of law, that the information that will be used to determine compliance with the vector attraction reduction requirement in [insert either section 503.33(b)(9) or 503.33(b)(10)] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

(M) If the vector attraction reduction requirements in either section 503.33(b)(9) or section 503.33(b)(10) are met, a description of how the requirements are met.

(6) If the requirements in section 503.13(a)(4)(ii) are met when sewage sludge is sold or given away in a bag or other container for application to the land, the person who prepares the sewage sludge that is

sold or given away in a bag or other container shall develop the following information and shall retain the information for five years:

(i) The annual whole sludge application rate for the sewage sludge that does not cause the annual pollutant loading rates in Table 4 of section 503.13 to be exceeded.

(ii) The concentration of each pollutant listed in Table 4 of section 503.13 in the sewage sludge.

(iii) The following certification statement: “I certify, under penalty of law, that the information that will be used to determine compliance with the management practice in section 503.14(e), the Class A pathogen requirement in section 503.32(a), and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in section 503.33(b)(1) through section 503.33(b)(8)] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

(iv) A description of how the Class A pathogen requirements in section 503.32(a) are met.

(v) A description of how one of the vector attraction requirements in section 503.33(b)(1) through section 503.33(b)(8) is met.

(b) Domestic septage. When domestic septage is applied to agricultural land, forest, or a reclamation site, the person who applies the domestic septage shall develop the following information and shall retain the information for five years:

(1) The location, by either street address or latitude and longitude, of each site on which domestic septage is applied.

(2) The number of acres in each site on which domestic septage is applied.

(3) The date domestic septage is applied to each site.

(4) The nitrogen requirement for the crop or vegetation grown on each site during a 365 day period.

(5) The rate, in gallons per acre per 365 day period, at which domestic septage is applied to each site.

(6) The following certification statement: “I certify, under penalty of law, that the information that will be used to determine compliance with the pathogen requirements in [insert either section 503.32(c)(1) or section 503.32(c)(2)] and the vector attraction reduction requirements in [insert section 503.33(b)(9), section 503.33(b)(10), or section 503.33(b)(12)] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

(7) A description of how the pathogen requirements in either section 503.32(c)(1) or (c)(2) are met.

(8) A description of how the vector attraction reduction requirements in section 503.33(b)(9), section 503.33(b)(10), or section 503.33(b)(12) are met.

### **503.18. Reporting.**

(a) Any generator of sewage sludge that is applied to the land, any person who prepares sewage sludge that is applied to the land, or any person who applies sewage sludge to the land, including Class I sludge management facilities, POTWs (as defined in 40 CFR 501.2) with a design flow rate equal to or greater than one million gallons per day, and POTWs that serve 10,000 people or more shall submit a report on February 19 of each year. As of December 21, 2020, all reports submitted in compliance with this section must be submitted electronically in compliance with this section and 40 CFR Part 3 (including, in all cases, subpart D to Part 3), 40 CFR 122.22, and 40 CFR Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to the start dates for electronic reporting (see Table 1 in 40 CFR 127.16), the Department may also require operators to electronically submit annual reports under this section if required to do so by State law.

(1) The information in section 503.17(a), except the information in section 503.17(a)(3)(ii), section 503.17(a)(4)(ii) and in section 503.17(a)(5)(ii), for the appropriate requirements on or before February 19 of each year, for the period of January 1 through December 31 of the previous calendar year.

(2) The information in section 503.17(a)(5)(ii)(A) through (a)(5)(ii)(G) on or before February 19 of each year, for the period of January 1 through December 31 of the previous calendar year when 90 percent or more of any of the cumulative pollutant loading rates in Table 2 of section 503.13 is reached at a land application site.

(b) [Reserved]

## **PART C SURFACE DISPOSAL**

### **503.20. Applicability.**

(a) This part applies to any person who prepares sewage sludge that is placed on a surface disposal site, to the owner/operator of a surface disposal site, to sewage sludge placed on a surface disposal site, and to a surface disposal site.

(b) This part does not apply to sewage sludge stored on the land or to the land on which sewage sludge is stored. It also does not apply to sewage sludge that remains on the land for longer than two years when the person who prepares the sewage sludge demonstrates that the land on which the sewage sludge remains is not an active sewage sludge unit. The demonstration shall include the following information, which shall be retained by the person who prepares the sewage sludge for the period that the sewage sludge remains on the land:

(1) The name and address of the person who prepares the sewage sludge.

(2) The name and address of the person who either owns the land or leases the land.

(3) The location, by either street address or latitude and longitude, of the land.

(4) An explanation of why sewage sludge needs to remain on the land for longer than two years prior to final use or disposal.

(5) The approximate time period when the sewage sludge will be used or disposed.

(c) This part does not apply to sewage sludge treated on the land or to the land on which sewage sludge is treated.

### **503.21. Special definitions.**

(a) “Active sewage sludge unit” is a sewage sludge unit that has not closed.

(b) “Aquifer” is a geologic formation, group of geologic formations, or a portion of a geologic formation capable of yielding ground water to wells or springs.

(c) “Contaminate an aquifer” means to introduce a substance that causes the maximum contaminant level for nitrate in 40 CFR 141.62(b) or R.61-68 (Water Classifications and Standards) to be exceeded in the ground water or that causes the existing concentration of nitrate in ground water to increase when the existing concentration of nitrate in the ground water exceeds the maximum contaminant level for nitrate in 40 CFR 141.62(b) or R.61-68 (Water Classifications and Standards).

(d) “Cover” is soil or other material used to cover sewage sludge placed on an active sewage sludge unit.

(e) “Displacement” is the relative movement of any two sides of a fault measured in any direction.

(f) “Fault” is a fracture or zone of fractures in any materials along which strata on one side are displaced with respect to strata on the other side.

(g) “Final cover” is the last layer of soil or other material placed on a sewage sludge unit at closure.

(h) “Holocene time” is the most recent epoch of the Quaternary period, extending from the end of the Pleistocene epoch to the present.

(i) “Leachate collection system” is a system or device installed immediately above a liner that is designed, constructed, maintained, and operated to collect and remove leachate from a sewage sludge unit.

(j) “Liner” is soil or synthetic material that has a hydraulic conductivity of  $1 \times 10^7$  centimeters per second or less.

(k) “Lower explosive limit” for methane gas is the lowest percentage of methane gas in air, by volume, that propagates a flame at 25 degrees Celsius and atmospheric pressure.

(l) “Qualified ground-water scientist” is an individual with a baccalaureate or post-graduate degree in the natural sciences or engineering who has sufficient training and experience in ground-water hydrology and related fields, as may be demonstrated by State registration, professional certification, or completion of accredited university programs, to make sound professional judgments regarding ground-water monitoring, pollutant fate and transport, and corrective action.

(m) “Seismic impact zone” is an area that has a 10 percent or greater probability that the horizontal ground level acceleration of the rock in the area exceeds 0.10 gravity once in 250 years.

(n) “Sewage sludge unit” is land on which only sewage sludge is placed for final disposal. This does not include land on which sewage sludge is either stored or treated. Land does not include waters of the State, as defined in R.61-9.122.2. Does not include beneficial use activities covered under Part B, which comply with agronomic rate requirements and metals limitations.

(o) “Sewage sludge unit boundary” is the outermost perimeter of an active sewage sludge unit.

(p) “Surface disposal site” is an area of land that contains one or more active sewage sludge units.

(q) “Unstable area” is land subject to natural or human-induced forces that may damage the structural components of an active sewage sludge unit. This includes, but is not limited to, land on which the soils are subject to mass movement.

### **503.22. General requirements.**

(a) No person shall place sewage sludge on an active sewage sludge unit unless the requirements in this part are met.

(1) The following activities or conditions constitute surface disposal (unless the Department has issued a permit for the specific activity):

(i) Storage of sewage sludge, excluding sludge treatment, for more than two (2) years constitutes surface disposal.

(ii) The design storage capacity of sewage sludge will not be permitted to exceed two (2) years at the treatment plant design conditions, or

(iii) Accumulation of sewage sludge in a wastewater treatment unit to greater than fifty (50) percent of the capacity of the unit or to an average depth of greater than design depth constitutes surface disposal of sludge under this regulation, or

(iv) Storage of sewage sludge that adversely impacts the overall facility operation and maintenance or results in an excessive sludge inventory, may result in a facility being identified as a surface disposal site.

(2) For any facility, except a landfill or a sludge only monofill, meeting the definition of a surface disposal site on or after the date of this regulation, a report detailing the final closure of the site must be submitted to the Bureau of Water Pollution Control, Department of Health and Environmental Control, within one (1) year after the date of this regulation. The facility must be closed within five (5) years after the date of this regulation, and a plan must provide a schedule showing how the closure will be accomplished.

(3) Surface disposal of sewage sludge to existing active surface disposal facilities that are not permitted under R.61-258 must cease within three (3) years after the date of this regulation, or sufficient amounts of sludge must be removed from the facility in order to change the facility’s classification.

(b) An active sewage sludge unit located within 60 meters of a fault that has displacement in Holocene time; located in an unstable area; or located in a wetland, except as provided in a permit issued pursuant to either section 402 or 404 of the CWA, shall close by March 22, 1994, unless, in the case of an active sewage sludge unit located within 60 meters of a fault that has displacement in Holocene time, otherwise specified by the Department.

(c) The owner/operator of an active sewage sludge unit shall submit a written closure and post closure plan to the Department 180 days prior to the date that the active sewage sludge unit closes. The plan shall describe how the sewage sludge unit will be closed and, at a minimum, shall include:

(1) A discussion of how the leachate collection system will be operated and maintained for three years after the sewage sludge unit closes if the sewage sludge unit has a liner and leachate collection system.

(2) A description of the system used to monitor for methane gas in the air in any structures within the surface disposal site and in the air at the property line of the surface disposal site, as required in section 503.24(j)(2).

(3) A discussion of how public access to the surface disposal site will be restricted for three years after the last sewage sludge unit in the surface disposal site closes.

(d) The owner of a surface disposal site shall provide written notification to the subsequent owner of the site that sewage sludge was placed on the land.

(e) Surface disposal of sludge in a landfill, including sludge only monofills, shall comply with State Solid Waste regulations and requirements in permits.

(f) Surface disposal of sludge by land application may be considered if the proposed application rates are at or below the agronomic rates as defined in section 503.11(b); additional requirements as defined in section 503.12 may be applied on a case-by-case basis.

(g) If a deleterious impact to the groundwaters of the State from sewage sludge use or disposal practices is documented, through groundwater monitoring levels exceeding the standards set forth in R.61-68 or a significant adverse trend occurs, then it will be the obligation of the generator/preparer of the sewage sludge as directed by the Department to conduct an investigation to determine the vertical and horizontal extent of groundwater impact. The Department may require remediation of the groundwater to within acceptable levels for groundwater as set forth in R.61-68.

**503.23. Pollutant limits (other than domestic septage).**

(a) Active sewage sludge unit without a liner and leachate collection system

(1) Except as provided in section 503.23(a)(2) and section 503.23(b), the concentration of each pollutant listed in Table 1 of section 503.23 in sewage sludge placed on an active sewage sludge unit shall not exceed the concentration for the pollutant in Table 1 of section 503.23.

**TABLE 1 OF SECTION 503.23 - POLLUTANT CONCENTRATIONS - ACTIVE SEWAGE SLUDGE UNIT WITHOUT A LINER AND LEACHATE COLLECTION**

Pollutant	Concentration (milligrams per kilograms) Dry weight basis
Arsenic	73
Chromium	600
Nickel	420

(2) Except as provided in section 503.23(b), the concentration of each pollutant listed in Table 1 of section 503.23 in sewage sludge placed on an active sewage sludge unit whose boundary is less than 150 meters from the property line of the surface disposal site shall not exceed the concentration determined using the following procedure.

(i) The actual distance from the active sewage sludge unit boundary to the property line of the surface disposal site shall be determined.

(ii) The concentration of each pollutant listed in Table 2 of section 503.23 in the sewage sludge shall not exceed the concentration in Table 2 of section 503.23 that corresponds to the actual distance in section 503.23(a)(2)(i).

**TABLE 2 OF SECTION 503.23 - POLLUTANT CONCENTRATIONS - ACTIVE SEWAGE SLUDGE UNIT WITHOUT A LINER AND LEACHATE COLLECTION SYSTEM THAT HAS A UNIT BOUNDARY TO PROPERTY LINE DISTANCE LESS THAN 150 METERS**

Unit boundary to property line distance. (meters)	Pollutant concentration (Dry weight Basis)		
	Arsenic (mg/kg)	Chromium (mg/kg)	Nickel (mg/kg)
0 to less than 25	30	200	210
25 to less than 50	34	220	240
50 to less than 75	39	260	270
75 to less than 100	46	300	320
100 to less than 125	53	360	390
125 to less than 150	62	450	420

(b) Active sewage sludge unit without a liner and leachate collection system -site-specific limits

(1) At the time of permit application, the owner/operator of a surface disposal site may request site-specific pollutant limits in accordance with section 503.23(b)(2) for an active sewage sludge unit without a liner and leachate collection system when the existing values for site parameters specified by the Department are different from the values for those parameters used to develop the pollutant limits in Table 1 of section 503.23 and when the Department determines that site-specific pollutant limits are appropriate for the active sewage sludge unit.

(2) The concentration of each pollutant listed in Table 1 of section 503.23 in sewage sludge placed on an active sewage sludge unit without a liner and leachate collection system shall not exceed either the concentration for the pollutant determined during a site-specific assessment, as specified by the Department, or the existing concentration of the pollutant in the sewage sludge, whichever is lower.

(c) Additional parameters may be required in the initial analysis and subsequent monitoring thereafter, but such needs will be assessed on an individual project basis. Any pollutant required for monitoring under effluent guidelines (40 CFR Part 136; Sub Chapter N (40 CFR Part 400 through 402 and 404 through 471)) may be required (in a permit) to be monitored for in the sewage sludge.

**503.24. Management practices.**

(a) Sewage sludge shall not be placed on an active sewage sludge unit 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.

(b) An active sewage sludge unit shall not restrict the flow of a base flood.

(c) When a surface disposal site is located in a seismic impact zone, an active sewage sludge unit shall be designed to withstand the maximum recorded horizontal ground level acceleration.

(d) An active sewage sludge unit shall be located 60 meters or more from a fault that has displacement in Holocene time, unless otherwise specified by the Department.

(e) An active sewage sludge unit shall not be located in an unstable area.

(f) An active sewage sludge unit shall not be located in a wetland, except as provided in a permit issued pursuant to section 402 or 404 of the CWA.

(g)(1) Run-off from an active sewage sludge unit shall be collected and shall be disposed in accordance with National Pollutant Discharge Elimination System permit requirements (see R.61-9.122 and 124) and any other applicable requirements.

(2) The run-off collection system for an active sewage sludge unit shall have the capacity to handle run-off from a 24-hour, 25-year storm event.

(h) The leachate collection system for an active sewage sludge unit that has a liner and leachate collection system shall be operated and maintained during the period the sewage sludge unit is active and for three years after the sewage sludge unit closes.

(i) Leachate from an active sewage sludge unit that has a liner and leachate collection system shall be collected and shall be disposed in accordance with the applicable requirements during the period the sewage sludge unit is active and for three years after the sewage sludge unit closes.

(j)(1) When a cover is placed on an active sewage sludge unit, the concentration of methane gas in air in any structure within the surface disposal site shall not exceed 25 percent of the lower explosive limit for methane gas during the period that the sewage sludge unit is active and the concentration of methane gas in air at the property line of the surface disposal site shall not exceed the lower explosive limit for methane gas during the period that the sewage sludge unit is active.

(2) When a final cover is placed on a sewage sludge unit at closure, the concentration of methane gas in air in any structure within the surface disposal site shall not exceed 25 percent of the lower explosive limit for methane gas for three years after the sewage sludge unit closes and the concentration of methane gas in air at the property line of the surface disposal site shall not exceed the lower explosive limit for methane gas for three years after the sewage sludge unit closes, unless otherwise specified by the Department.

(k) A food crop, a feed crop, or a fiber crop shall not be grown on an active sewage sludge unit, unless the owner/operator of the surface disposal site demonstrates to the Department that through management practices public health and the environment are protected from any reasonably anticipated adverse effects of pollutants in sewage sludge when crops are grown.

(l) Animals shall not be grazed on an active sewage sludge unit, unless the owner/operator of the surface disposal site demonstrates to the Department that through management practices public health and the environment are protected from any reasonably anticipated adverse effects of pollutants in sewage sludge when animals are grazed.

(m) Public access to a surface disposal site shall be restricted for the period that the surface disposal site contains an active sewage sludge unit and for three years after the last active sewage sludge unit in the surface disposal site closes.

(n)(1) Sewage sludge placed on an active sewage sludge unit shall not contaminate an aquifer.

(2) Results of a ground-water monitoring program developed by a qualified ground-water scientist or a certification by a qualified ground-water scientist shall be used to demonstrate that sewage sludge placed on an active sewage sludge unit does not contaminate an aquifer.

### **503.25. Operational standards - pathogens and vector attraction reduction.**

(a) Pathogens -sewage sludge (other than domestic septage). The Class A pathogen requirements in section 503.32(a) or one of the Class B pathogen requirements in section 503.32(b)(2) through section 503.32(b)(4) shall be met when sewage sludge is placed on an active sewage sludge unit, unless the vector attraction reduction requirement in section 503.33(b)(11) is met.

(b) Vector attraction reduction -sewage sludge (other than domestic septage). One of the vector attraction reduction requirements in section 503.33(b)(1) through section 503.33(b)(11) shall be met when sewage sludge is placed on an active sewage sludge unit.

(c) Vector attraction reduction -domestic septage. One of the vector attraction reduction requirement in section 503.33(b)(9) through section 503.33(b)(12) shall be met when domestic septage is placed on an active sewage sludge unit.

### **503.26. Frequency of monitoring.**

(a) Sewage sludge (other than domestic septage).

(1) The frequency of monitoring for the pollutants in Tables 1 and 2 of section 503.23; the pathogen density requirements in section 503.32(a) and in section 503.32(b)(2); and the vector attraction reduction requirements in section 503.33(b)(1) through (b)(4) and section 503.33(b)(7) and (b)(8) for sewage sludge placed on an active sewage sludge unit shall be the frequency in Table 1 of section 503.26. Facilities which generate less than 290 metric tons of sludge per year and dispose of the sludge once a year or less, may request a reduction in monitoring to a frequency of once per year. The department will review these requests on a case-by-case basis.

TABLE 1 OF SECTION 503.26 - FREQUENCY OF MONITORING - SURFACE DISPOSAL

<u>Amount of sewage sludge<sup>1</sup> (metric tons per 365 day period)</u>	<u>Frequency</u>
Greater than zero but less than 1,500.	Once per quarter (four times per year)
Equal to or greater than 1,500 but less than 15,000.	Once per 60 days (six times per year)
Equal to or greater than 15,000.	Once per month (12 times per year)

<sup>1</sup> Amount of sewage sludge placed on an active sewage sludge unit (dry weight basis).

(2) After the sewage sludge has been monitored for two years at the frequency in Table 1 of this section, the Department may reduce the frequency of monitoring for pollutant concentrations and for the pathogen density requirements in section 503.32(a)(5)(ii) and (a)(5)(iii), but in no case shall the frequency of monitoring be less than once per year when sewage sludge is placed on an active sewage sludge unit.

(b) Domestic septage. If the vector attraction reduction requirements in section 503.33(b)(12) are met when domestic septage is placed on an active sewage sludge unit, each container of domestic septage shall be monitored for compliance with those requirements.

(c) Air. Air in structures within a surface disposal site and at the property line of the surface disposal site shall be monitored continuously for methane gas during the period that the surface disposal site contains an active sewage sludge unit on which the sewage sludge is covered and for three years after a sewage sludge unit closes when a final cover is placed on the sewage sludge.

### **503.27. Recordkeeping.**

(a) When sewage sludge (other than domestic septage) is placed on an active sewage sludge unit:

(1) The person who prepares the sewage sludge shall develop the following information and shall retain the information for five years.

(i) The concentration of each pollutant listed in Table 1 of section 503.23 in the sewage sludge when the pollutant concentrations in Table 1 of section 503.23 are met.

(ii) The following certification statement: “I certify, under penalty of law, that the information that will be used to determine compliance with the pathogen requirements in [insert section 503.32(a), section 503.32(b)(2), section 503.32(b)(3), or section 503.32(b)(4), when one of those requirements is met] and the vector attraction reduction requirements in [insert one of the vector attraction reduction requirements in section 503.33(b)(1) through (b)(8), if one of those requirements is met] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

(iii) A description of how the pathogen requirements in section 503.32(a), section 503.32(b)(2), section 503.32(b)(3), or section 503.32(b)(4) are met when one of those requirements is met.

(iv) A description of how one of the vector attraction reduction requirements in section 503.33(b)(1) through section 503.33(b)(8) is met when one of those requirements is met.

(2) The owner/operator of the surface disposal site shall develop the following information and shall retain that information for five years.

(i) The concentration of each pollutant listed in Table 2 of section 503.23 in the sewage sludge when the pollutant concentrations in Table 2 of section 503.23 are met or when site-specific pollutant limits in section 503.23(b) are met.

(ii) The following certification statement: “I certify, under penalty of law, that the information that will be used to determine compliance with the management practices in section 503.24 and the vector attraction reduction requirement in [insert one of the requirements in section 503.33(b)(9) through section

503.33(b)(11), if one of those requirements is met] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

(iii) A description of how the management practices in section 503.24 are met.

(iv) A description of how the vector attraction reduction requirements in section 503.33(b)(9) through section 503.33(b)(11) are met if one of those requirements is met.

(b) When domestic septage is placed on a surface disposal site:

(1) If the vector attraction reduction requirements in section 503.33(b)(12) are met, the person who places the domestic septage on the surface disposal site shall develop the following information and shall retain the information for five years:

(i) The following certification statement: “I certify, under penalty of law, that the information that will be used to determine compliance with the vector attraction reduction requirements in section 503.33(b)(12) was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

(ii) A description of how the vector attraction reduction requirements in section 503.33(b)(12) are met.

(2) The owner/operator of the surface disposal site shall develop the following information and shall retain that information for five years:

(i) The following certification statement: “I certify, under penalty of law, that the information that will be used to determine compliance with the management practices in section 503.24 and the vector attraction reduction requirements in [insert section 503.33(b)(9) through section 503.33(b)(11), if one of those requirements is met] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine or imprisonment.”

(ii) A description of how the management practices in section 503.24 are met.

(iii) A description how the vector attraction reduction requirements in section 503.33(b)(9) through section 503.33(b)(11) are met if one of those requirements is met.

### **503.28. Reporting.**

(a) Any generator of sewage sludge disposed of at a surface disposal site, any person who prepares sewage sludge that is disposed of at a surface disposal site, or any person who disposes of sewage sludge at a surface disposal site, including Class I sludge management facilities, POTWs (as defined in 40 CFR 501.2) with a design flow rate equal to or greater than one million gallons per day, and POTWs that serve 10,000 people or more shall submit a report with the information in section 503.27(a) to the Department on or before February 19 of each year, for the period of January 1 through December 31 of the previous calendar year. As of December 21, 2020, all reports submitted in compliance with this section must be submitted electronically in compliance with this section and 40 CFR Part 3 (including, in all cases, subpart D to Part 3), 40 CFR 122.22, and 40 CFR Part 127. Part 127 is not intended to undo existing requirements

for electronic reporting. Prior to the start dates for electronic reporting (see Table 1 in 40 CFR 127.16), the Department may also require operators to electronically submit annual reports under this section if required to do so by State law.

## **PART D PATHOGENS AND VECTOR ATTRACTION REDUCTION**

### **503.30. Scope.**

(a) This part contains the requirements for a sewage sludge to be classified either Class A or Class B with respect to pathogens.

(b) This part contains the site restrictions for land on which a Class B sewage sludge is applied.

(c) This part contains the pathogen requirements for domestic septage applied to agricultural land, forest, or a reclamation site.

(d) This part contains alternative vector attraction reduction requirements for sewage sludge that is applied to the land or placed on a surface disposal site.

### **503.31. Special definitions.**

(a) “Aerobic digestion” is the biochemical decomposition of organic matter in sewage sludge into carbon dioxide and water by microorganisms in the presence of air.

(b) “Anaerobic digestion” is the biochemical decomposition of organic matter in sewage sludge into methane gas and carbon dioxide by microorganisms in the absence of air.

(c) “Density of microorganisms” is the number of microorganisms per unit mass of total solids (dry weight) in the sewage sludge.

(d) “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).

(e) “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).

(f) “Pathogenic organisms” are disease-causing organisms. These include, but are not limited to, certain bacteria, protozoa, viruses, and viable helminth ova.

(g) “pH” means the logarithm of the reciprocal of the hydrogen ion concentration measured at twenty-five degrees Centigrade or measured at another temperature and then converted to an equivalent value at twenty-five degrees Centigrade.

(h) “Specific oxygen uptake rate (SOUR)” is the mass of oxygen consumed per unit time per unit mass of total solids (dry weight basis) in the sewage sludge.

(i) “Total solids” are the materials in sewage sludge that remain as residue when the sewage sludge is dried at 103 to 105 degrees Celsius.

(j) “Unstabilized solids” are organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process to include extended aeration, activated sludge or other treatment processes approved by the Department.

(k) “Vector attraction” is the characteristic of sewage sludge that attracts rodents, flies, mosquitos, or other organisms capable of transporting infectious agents.

(l) “Volatile solids” is the amount of the total solids in sewage sludge lost when the sewage sludge is combusted at 550 degrees Celsius in the presence of excess air.

### **503.32. Pathogens.**

(a) Sewage sludge -Class A.

(1) The requirement in section 503.32(a)(2) and the requirements in either section 503.32(a)(3), section 503.32(a)(4), section 503.32(a)(5), section 503.32(a)(6), section 503.32(a)(7), or section 503.32(a)(8) shall be met for a sewage sludge to be classified Class A with respect to pathogens.

(2) The Class A pathogen requirements in section 503.32(a)(3) through section 503.32(a)(8) shall be met either prior to meeting or at the same time the vector attraction reduction requirements in section 503.33, except the vector attraction reduction requirements in section 503.33(b)(6) through section 503.33(b)(8), are met.

(3) Class A -Alternative 1.

(i) Either the density of fecal coliform in the sewage sludge shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of Salmonella sp. bacteria in the sewage sludge shall be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed; at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land; or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in section 503.10(b), section 503.10(c), section 503.10(e), or section 503.10(f).

(ii) The temperature of the sewage sludge that is used or disposed shall be maintained at a specific value for a period of time.

(A) When the percent solids of the sewage sludge is seven percent or higher, the temperature of the sewage sludge shall be 50 degrees Celsius or higher; the time period shall be 20 minutes or longer; and the temperature and time period shall be determined using equation (2), except when small particles of sewage sludge are heated by either warmed gases or an immiscible liquid.

$$D = \frac{131,700,000}{10^{0.1400t}} \quad (\text{Equation 2})$$

Where,

D = time in days.

t = temperature in degrees Celsius.

TABLE 1 OF SECTION 503.32 - If the sewage sludge is 7% solids or higher.

Temperature (Celsius)	Time
50.0 (minimum)	13.17 days
60.0	12 hours 43 minutes
65.0	2 hours 39 minutes
70.0	30 minutes
71.3	20 minutes (minimum)

(B) When the percent solids of the sewage sludge is seven percent or higher and small particles of sewage sludge are heated by either warmed gases or an immiscible liquid, the temperature of the sewage sludge shall be 50 degrees Celsius or higher; the time period shall be 15 seconds or longer; and the temperature and time period shall be determined using equation (2).

TABLE 2 OF SECTION 503.32 - If the sewage sludge is 7% solids or higher and small particles of sewage sludge are heated by warm gases or an immiscible liquid.

Temperature (Celsius)	Time
50.0 (minimum)	13.17 days
65.0	2 hours 39 minutes
71.3	20 minutes
80.0	1 minute 12 seconds
84.9	15 seconds (minimum)

(C) When the percent solids of the sewage sludge is less than seven 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 (2).

TABLE 3 OF SECTION 503.32 - If the sewage sludge is less than 7% solids and the time period is at least 15 seconds, but less than 30 minutes.

Temperature (Celsius)	Time
70.0	30 minutes (Maximum time. See (D) for greater than 30 minutes)
71.3	20 minutes
75.0	6 minutes
80.0	1 minute 12 seconds
84.9	15 seconds (minimum)

(D) When the percent solids of the sewage sludge is less than seven percent; the temperature of the sewage sludge is 50 degrees Celsius or higher; and the time period is 30 minutes or longer, the temperature and time period shall be determined using equation (3).

$$D = \frac{50,070,000}{10^{0.1400t}} \text{ (Equation 3)}$$

Where,

D = time in days.

t = temperature in degrees Celsius.

TABLE 4 OF SECTION 503.32 - If the sewage sludge is less than 7% solids and the temperature of the sewage sludge is 50 degrees Celsius or higher; and the time period is 30 minutes or longer.

Temperature (Celsius)	Time
50.0 (minimum)	5.0 days
55.0	1.0 day
60.0	4 hours 48 minutes
65.0	58 minutes
67.0	30 minutes (minimum)

(iii) The temperature used in equation (2) and equation (3) will be the lowest, continuously measured temperature within the reaction vessel during a 24-hour period or the lowest measured temperature during any 24-hour period, if a continuous treatment process is used. If a batch treatment process is used, the temperature used in the equation (2) and equation (3) will be the lowest temperature measured during the batch treatment.

(iv) For design temperatures measuring greater than 70 degrees Celsius, continuous temperature monitoring shall be required.

(4) Class A -Alternative 2.

(i) Either the density of fecal coliform in the sewage sludge shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of Salmonella sp. bacteria in the sewage sludge shall be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed; at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land; or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in section 503.10(b), section 503.10(c), section 503.10(e), or section 503.10(f).

(ii)(A) The pH of the sewage sludge that is used or disposed shall be raised to above 12 and shall remain above 12 for 72 hours.

(B) The temperature of the sewage sludge shall be above 52 degrees Celsius for 12 hours or longer during the period that the pH of the sewage sludge is above 12.

(C) At the end of the 72 hour period during which the pH of the sewage sludge is above 12, the sewage sludge shall be air dried to achieve a percent solids in the sewage sludge greater than 50 percent.

(5) Class A -Alternative 3.

(i) Either the density of fecal coliform in the sewage sludge shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of Salmonella sp. bacteria in sewage sludge shall be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed; at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land; or at the time the sewage sludge or material

derived from sewage sludge is prepared to meet the requirements in section 503.10(b), section 503.10(c), section 503.10(e), or section 503.10(f).

(ii)(A) The sewage sludge shall be analyzed prior to pathogen treatment to determine whether the sewage sludge contains enteric viruses.

(B) When the density of enteric viruses in the sewage sludge prior to pathogen treatment is less than one Plaque-forming Unit per four grams of total solids (dry weight basis), the sewage sludge is Class A with respect to enteric viruses until the next monitoring episode for the sewage sludge.

(C) When the density of enteric viruses in the sewage sludge prior to pathogen treatment is equal to or greater than one Plaque-forming Unit per four grams of total solids (dry weight basis), the sewage sludge is Class A with respect to enteric viruses when the density of enteric viruses in the sewage sludge after pathogen treatment is less than one Plaque-forming Unit per four grams of total solids (dry weight basis) and when the values or ranges of values for the operating parameters for the pathogen treatment process that produces the sewage sludge that meets the enteric virus density requirement are documented.

(D) After the enteric virus reduction in paragraph (a)(5)(ii)(C) of this subsection is demonstrated for the pathogen treatment process, the sewage sludge continues to be Class A with respect to enteric viruses when the values for the pathogen treatment process operating parameters are consistent with the values or ranges of values documented in paragraph (a)(5)(ii)(C) of this subsection.

(iii)(A) The sewage sludge shall be analyzed prior to pathogen treatment to determine whether the sewage sludge contains viable helminth ova.

(B) When the density of viable helminth ova in the sewage sludge prior to pathogen treatment is less than one per four grams of total solids (dry weight basis), the sewage sludge is Class A with respect to viable helminth ova until the next monitoring episode for the sewage sludge.

(C) When the density of viable helminth ova in the sewage sludge prior to pathogen treatment is equal to or greater than one per four grams of total solids (dry weight basis), the sewage sludge is Class A with respect to viable helminth ova when the density of viable helminth ova in the sewage sludge after pathogen treatment is less than one per four grams of total solids (dry weight basis) and when the values or ranges of values for the operating parameters for the pathogen treatment process that produces the sewage sludge that meets the viable helminth ova density requirement are documented.

(D) After the viable helminth ova reduction in paragraph (a)(5)(iii)(C) of this subsection is demonstrated for the pathogen treatment process, the sewage sludge continues to be Class A with respect to viable helminth ova when the values for the pathogen treatment process operating parameters are consistent with the values or ranges of values documented in paragraph (a)(5)(iii)(C) of this subsection.

(6) Class A -Alternative 4.

(i) Either the density of fecal coliform in the sewage sludge shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of Salmonella sp. bacteria in the sewage sludge shall be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed; at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land; or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in section 503.10(b), section 503.10(c), section 503.10(e), or section 503.10(f).

(ii) 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) at the time the sewage sludge is used or disposed; at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land; or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in section 503.10(b), section 503.10(c), section 503.10(e), or section 503.10(f), unless otherwise specified by the Department.

(iii) The density of viable helminth ova in the sewage sludge shall be less than one per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed; at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land; or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in section 503.10(b), section 503.10(c), section 503.10(e), or section 503.10(f), unless otherwise specified by the Department.

(7) Class A -Alternative 5.

(i) Either the density of fecal coliform in the sewage sludge shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of Salmonella, sp. bacteria in the sewage sludge shall be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed; at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land; or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in section 503.10(b), section 503.10(c), section 503.10(e), or section 503.10(f).

(ii) Sewage sludge that is used or disposed shall be treated in one of the Processes to Further Reduce Pathogens described in appendix B of this part.

(8) Class A -Alternative 6.

(i) Either the density of fecal coliform in the sewage sludge shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of Salmonella, sp. bacteria in the sewage sludge shall be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed; at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land; or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in section 503.10(b), section 503.10(c), section 503.10(e), or section 503.10(f).

(ii) Sewage sludge that is used or disposed shall be treated in a process that is equivalent to a Process to Further Reduce Pathogens, as determined by the Department.

(b) Sewage sludge -Class B.

(1)(i) The requirements in either section 503.32(b)(2), section 503.32(b)(3), or section 503.32(b)(4) shall be met for a sewage sludge to be classified Class B with respect to pathogens.

(ii) The site restrictions in section 503.32(b)(5) shall be met when sewage sludge that meets the Class B pathogen requirements in section 503.32(b)(2), section 503.32(b)(3), or section 503.32(b)(4) is applied to the land.

(2) Class B -Alternative 1.

(i) Seven representative samples of the sewage sludge that is used or disposed shall be collected.

(ii) The geometric mean of the density of fecal coliform in the samples collected in (b)(2)(i) of this subsection shall be less than either 2,000,000 Most Probable Number per gram of total solids (dry weight basis) or 2,000,000 Colony Forming Units per gram of total solids (dry weight basis).

(3) Class B -Alternative 2. Sewage sludge that is used or disposed shall be treated in one of the Processes to Significantly Reduce Pathogens described in appendix B of this part.

(4) Class B -Alternative 3. Sewage sludge that is used or disposed shall be treated in a process that is equivalent to a Process to Significantly Reduce Pathogens, as determined by the Department.

(5) Site Restrictions.

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

(ii) Food crops with harvested parts below the surface of the land shall not be harvested for 20 months after application of sewage sludge when the sewage sludge remains on the land surface for four months or longer prior to incorporation into the soil.

(iii) Food crops with harvested parts below the surface of the land shall not be harvested for 38 months after application of sewage sludge when the sewage sludge remains on the land surface for less than four months prior to incorporation into the soil.

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

(v) Animals shall not be grazed on the land for 30 days after application of sewage sludge.

(vi) 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.

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

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

(ix) The Department may establish in permits the required application buffer setbacks for property boundaries, roadways, residential developments, dwellings, water wells, drainageways, and surface water as deemed necessary to protect public health.

(x) The Department may establish minimum requirements in permits for soil and/or groundwater monitoring, for bulk application sites, to verify compliance with the Regulation.

(c) Domestic septage.

(1) [Reserved]

(2) The pH of domestic septage applied to agricultural land, forest, or a reclamation site shall be raised to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for 30 minutes and the site restrictions in section 503.32(b)(5)(i) through section 503.32(b)(5)(iv) shall be met.;  
or

(3) Any pathogen reduction process described in appendix B of this part and the site restrictions in section 503.32(b)(5)(i) through section 503.32(b)(5)(iv) shall be met.

### **503.33. Vector attraction reduction.**

(a)(1) One of the vector attraction reduction requirements in section 503.33(b)(1) through section 503.33(b)(10) shall be met when bulk sewage sludge is applied to agricultural land, forest, a public contact site, or a reclamation site.

(2) One of the vector attraction reduction requirements in section 503.33(b)(1) through section 503.33(b)(8) shall be met when bulk sewage sludge is applied to a lawn or a home garden.

(3) One of the vector attraction reduction requirements in section 503.33(b)(1) through section 503.33(b)(8) shall be met when sewage sludge is sold or given away in a bag or other container for application to the land.

(4) One of the vector attraction reduction requirements in section 503.33(b)(1) through section 503.33(b)(11) shall be met when sewage sludge (other than domestic septage) is placed on an active sewage sludge unit.

(5) One of the vector attraction reduction requirements in section 503.33(b)(9), section 503.33(b)(10), or section 503.33(b)(12) shall be met when domestic septage is applied to agricultural land, forest, or a reclamation site and one of the vector attraction reduction requirements in section 503.33(b)(9) through section 503.33(b)(12) shall be met when domestic septage is placed on an active sewage sludge unit.

(6) [Reserved]

(b)(1) The mass of volatile solids in the sewage sludge shall be reduced by a minimum of 38 percent (see calculation procedure in “Environmental Regulations and Technology-Control of Pathogens and Vector Attraction in Sewage Sludge”, EPA-625/R-92/013, 1992, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268).

(2) When the 38 percent volatile solids reduction requirement in section 503.33(b)(1) cannot be met for an anaerobically digested sewage sludge, vector attraction reduction can be demonstrated by digesting a portion of the previously 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. When 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) When the 38 percent volatile solids reduction requirement in section 503.33(b)(1) cannot be met for an aerobically digested sewage sludge, vector attraction reduction can be demonstrated by digesting a portion of the previously digested sewage sludge that has a percent solids of two percent or less aerobically in the laboratory in a bench-scale unit for 30 additional days at 20 degrees Celsius. When 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 by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for two 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)(i) Sewage sludge shall be injected below the surface of the land.

(ii) No significant amount of the sewage sludge shall be present on the land surface within one hour after the sewage sludge is injected.

(iii) When the sewage sludge that is injected below the surface of the land is Class A with respect to pathogens, the sewage sludge shall be injected below the land surface within eight hours after being discharged from the pathogen treatment process.

(10)(i) Sewage sludge applied to the land surface or placed on an active sewage sludge unit shall be incorporated into the soil within six hours after application to or placement on the land, unless otherwise specified by the Department.

(ii) When sewage sludge that is incorporated into the soil is Class A with respect to pathogens, the sewage sludge shall be applied to or placed on the land within eight hours after being discharged from the pathogen treatment process.

(11) Sewage sludge placed on an active sewage sludge unit shall be covered with soil or other material at the end of each operating day.

(12) The pH of domestic septage shall be raised to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for 30 minutes.

(13) The vector attraction reduction requirement may be met through an alternative method to be determined by the Department on a case-by-case basis, if the sludge is not covered by 40 CFR 503.

## **PART E INCINERATION**

### **503.40. Applicability.**

- (a) This part applies to a person who fires sewage sludge in a sewage sludge incinerator, to a sewage sludge incinerator, and to sewage sludge fired in a sewage sludge incinerator.
- (b) This part applies to the exit gas from a sewage sludge incinerator stack.

### **503.41. Special definitions.**

- (a) “Air pollution control device” is one or more processes used to treat the exit gas from a sewage sludge incinerator stack.
- (b) “Auxiliary fuel” is fuel used to augment the fuel value of sewage sludge. This includes, but is not limited to, natural gas, fuel oil, coal, gas generated during anaerobic digestion of sewage sludge, and municipal solid waste (not to exceed 30 percent of the dry weight of sewage sludge and auxiliary fuel together). Hazardous wastes are not auxiliary fuel.
- (c) “Average daily concentration” is the arithmetic mean of the concentrations of a pollutant in milligrams per kilogram of sewage sludge (dry weight basis) in the samples collected and analyzed in a month.
- (d) “Control efficiency” is the mass of a pollutant in the sewage sludge fed to an incinerator minus the mass of that pollutant in the exit gas from the incinerator stack divided by the mass of the pollutant in the sewage sludge fed to the incinerator.
- (e) “Dispersion factor” is the ratio of the increase in the ground level ambient air concentration for a pollutant at or beyond the property line of the site where the sewage sludge incinerator is located to the mass emission rate for the pollutant from the incinerator stack.
- (f) “Fluidized bed incinerator” is an enclosed device in which organic matter and inorganic matter in sewage sludge are combusted in a bed of particles suspended in the combustion chamber gas.
- (g) “Hourly average” is the arithmetic mean of all measurements taken during an hour. At least two measurements must be taken during the hour.
- (h) “Incineration” is the combustion of organic matter and inorganic matter in sewage sludge by high temperatures in an enclosed device.
- (i) “Incinerator operating combustion temperature” is the arithmetic mean of the temperature readings in the hottest zone of the furnace recorded in a day (24 hours) when the temperature is averaged and recorded at least hourly during the hours the incinerator operates in a day.
- (j) “Monthly average” is the arithmetic mean of the hourly averages for the hours a sewage sludge incinerator operates during the month.
- (k) “Performance test combustion temperature” is the arithmetic mean of the average combustion temperatures in the hottest zone of the furnace for each of the runs in a performance test.

(l) “Risk specific concentration” is the allowable increase in the average daily ground level ambient air concentration for a pollutant from the incineration of sewage sludge at or beyond the property line of the site where the sewage sludge incinerator is located.

(m) “Sewage sludge feed rate” is either the average daily amount of sewage sludge fired in all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located for the number of days in a 365 day period that each sewage sludge incinerator operates, or the average daily design capacity for all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located.

(n) “Sewage sludge incinerator” is an enclosed device in which only sewage sludge and auxiliary fuel are fired.

(o) “Stack height” is the difference between the elevation of the top of a sewage sludge incinerator stack and the elevation of the ground at the base of the stack when the difference is equal to or less than 65 meters. When the difference is greater than 65 meters, stack height is the creditable stack height determined in accordance with 40 CFR 51.100 (ii).

(p) “Total hydrocarbons” means the organic compounds in the exit gas from a sewage sludge incinerator stack measured using a flame ionization detection instrument referenced to propane.

(q) “Wet electrostatic precipitator” is an air pollution control device that uses both electrical forces and water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

(r) “Wet scrubber” is an air pollution control device that uses water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

### **503.42. General Requirements.**

No person shall fire sewage sludge in a sewage sludge incinerator except in compliance with the requirements in this part.

### **503.43. Pollutant limits.**

(a) Firing of sewage sludge in a sewage sludge incinerator shall not violate the requirements in the National Emission Standard for Beryllium in subpart C of 40 CFR Part 61.

(b) Firing of sewage sludge in a sewage sludge incinerator shall not violate the requirements in the National Emission Standard for Mercury in subpart E of 40 CFR Part 61.

(c) Pollutant limit -lead.

(1) The average daily concentration for lead in sewage sludge fed to a sewage sludge incinerator shall not exceed the concentration calculated using Equation (4).

$$C = \frac{0.1 \times \text{NAAQS} \times 86,400}{\text{DF} \times (1 - \text{CE}) \times \text{SF}} \quad (\text{Equation 4})$$

Where:

C = Average daily concentration of lead in sewage sludge.

NAAQS = National Ambient Air Quality Standard for lead in micrograms per cubic meter.

DF = Dispersion factor in micrograms per cubic meter per gram per second.

CE = Sewage sludge incinerator control efficiency for lead in hundredths.

SF = Sewage sludge feed rate in metric tons per day (dry weight basis).

(2) The dispersion factor (DF) in equation (4) shall be determined from an air dispersion model in accordance with section 503.43(e).

(i) When the sewage sludge stack height is 65 meters or less, the actual sewage sludge incinerator stack height shall be used in the air dispersion model to determine the dispersion factor (DF) for equation (4).

(ii) When the sewage sludge incinerator stack height exceeds 65 meters, the creditable stack height shall be determined in accordance with 40 CFR 51.100 (ii) and the creditable stack height shall be used in the air dispersion model to determine the dispersion factor (DF) for equation (4).

(3) The control efficiency (CE) for equation (4) shall be determined from a performance test of the sewage sludge incinerator, in accordance with section 503.43(e).

(d) Pollutant limit - arsenic, cadmium, chromium, and nickel.

(1) The average daily concentration for arsenic, cadmium, chromium, and nickel in sewage sludge fed to a sewage sludge incinerator each shall not exceed the concentration calculated using equation (5).

$$C = \frac{RSC \times 86,400}{DF \times (1 - CE) \times SF} \quad (\text{Equation 5})$$

Where:

C = Average daily concentration of arsenic, cadmium, chromium, or nickel in sewage sludge.

CE = Sewage sludge incinerator control efficiency for arsenic, cadmium, chromium, or nickel in hundredths.

DF = Dispersion factor in micrograms per cubic meter per gram per second.

RSC = Risk-specific concentration for arsenic, cadmium, chromium, or nickel in micrograms per cubic meter.

SF = Sewage sludge feed rate in metric tons per day (dry weight basis).

(2) The risk specific concentrations for arsenic, cadmium, and nickel used in equation (5) shall be obtained from Table 1 of section 503.43.

TABLE 1 OF SECTION 503.43—RISK-SPECIFIC CONCENTRATION FOR ARSENIC, CADMIUM, AND NICKEL

Pollutant	Risk Specific Concentration (micrograms per cubic meter)
Arsenic	0.023
Cadmium	0.057
Nickel	2.0

(3) The risk specific concentration for chromium used in equation (5) shall be obtained from Table 2 of section 503.43 or shall be calculated using equation (6).

TABLE 2 OF SECTION 503.43—RISK-SPECIFIC CONCENTRATION FOR CHROMIUM

Type of Incinerator	Risk Specific Concentration (micrograms per cubic meter)
Fluidized bed with wet scrubber	0.65
Fluidized bed with wet scrubber and wet electrostatic precipitator	0.23
Other types with wet scrubber	0.064
Other types with wet scrubber and wet electrostatic precipitator	0.016

$$RSC = \frac{0.0085}{r} \quad (\text{Equation 6})$$

Where:

RSC= risk specific concentration for chromium in micrograms per cubic meter used in equation (5).

r= decimal fraction of the hexavalent chromium concentration in the total chromium concentration measured in the exit gas from the sewage sludge incinerator stack in hundredths.

(4) The dispersion factor (DF) in equation (5) shall be determined from an air dispersion model in accordance with section 503.43(e).

(i) When the sewage sludge incinerator stack height is equal to or less than 65 meters, the actual sewage sludge incinerator stack height shall be used in the air dispersion model to determine the dispersion factor (DF) for equation (5).

(ii) When the sewage sludge incinerator stack height is greater than 65 meters, the creditable stack height shall be determined in accordance with 40 CFR 51.100 (ii) and the creditable stack height shall be used in the air dispersion model to determine the dispersion factor (DF) for equation (5).

(5) The control efficiency (CE) for equation (5) shall be determined from a performance test of the sewage sludge incinerator in accordance with section 503.43(e).

(e) Air dispersion modeling and performance testing.

(1) The air dispersion model used to determine the dispersion factor in section 503.43 (c)(2) and (d)(4) shall be appropriate for the geographical, physical, and population characteristics at the sewage sludge incinerator site. The performance test used to determine the control efficiencies in section 503.43(c)(3) and (d)(5) shall be appropriate for the type of sewage sludge incinerator.

(2) For air dispersion modeling initiated after September 3, 1999, the modeling results shall be submitted to the Department thirty (30) days after completion of the modeling. In addition to the modeling results, the submission shall include a description of the air dispersion model and the values used for the model parameters.

(3) The following procedures, at a minimum, shall apply in conducting performance tests to determine the control efficiencies in section 503.43(c)(3) and (d)(5) after September 3, 1999:

(i) The performance test shall be conducted under representative sewage sludge incinerator conditions at the highest expected sewage sludge feed rate within the design capacity of the sewage sludge incinerator.

(ii) The Department shall be notified at least thirty (30) days prior to any performance test so the Department may have the opportunity to observe the test. The notice shall include a test protocol with incinerator operating conditions and a list of test methods to be used.

(iii) Each performance test shall consist of three separate runs using the applicable test method. The control efficiency for a pollutant shall be the arithmetic mean of the control efficiencies for the pollutant from the three runs.

(4) The pollutant limits in section 503.43(c) and (d) of this section shall be submitted to the permitting authority no later than thirty (30) days after completion of the air dispersion modeling and performance test.

(5) Significant changes in geographical or physical characteristics at the incinerator site or in incinerator operating conditions require new air dispersion modeling or performance testing to determine a new dispersion factor or a new control efficiency that will be used to calculate revised pollutant limits.

(f) Additional parameters may be required in the initial analysis and subsequent monitoring thereafter, but such needs will be assessed on an individual project basis. Any pollutant required for monitoring under effluent guidelines (40 CFR Part 136; Subchapter N (40 CFR Parts 400 through 402 and 404 through 471)) may be required (in a permit) to be monitored in the sewage sludge.

#### **503.44. Operational standard - total hydrocarbons.**

(a) The total hydrocarbons concentration in the exit gas from a sewage sludge incinerator shall be corrected for zero percent moisture by multiplying the measured total hydrocarbons concentration by the correction factor calculated using equation (7).

$$\text{Correction factor (percent moisture)} = \frac{1}{(1 - X)} \quad (\text{Equation 7})$$

Where:

X= decimal fraction of the percent moisture in the sewage sludge incinerator exit gas in hundredths.

(b) The total hydrocarbons concentration in the exit gas from a sewage sludge incinerator shall be corrected to seven percent oxygen by multiplying the measured total hydrocarbons concentration by the correction factor calculated using equation (8).

$$\text{Correction factor (oxygen)} = \frac{14}{(21 - Y)} \quad (\text{Equation 8})$$

Where:

Y= Percent oxygen concentration in the sewage sludge incinerator stack exit gas(dry volume/dry volume).

(c) The monthly average concentration for total hydrocarbons in the exit gas from a sewage sludge incinerator stack, corrected for zero percent moisture using the correction factor from equation (7) and to seven percent oxygen using the correction factor from equation (8), shall not exceed 100 parts per million on a volumetric basis when measured using the instrument required by section 503.45(a).

#### **503.45. Management practices.**

(a)(1) An instrument that continuously measures and records the total hydrocarbons concentration in the sewage sludge incinerator stack exit gas shall be installed, calibrated, operated, and maintained for a sewage sludge incinerator.

(2) The total hydrocarbons instrument shall employ a flame ionization detector; shall have a heated sampling line maintained at a temperature of 150 degrees Celsius or higher at all times; and shall be calibrated at least once every 24-hour operating period using propane.

(b) An instrument that continuously measures and records the oxygen concentration in the sewage sludge incinerator stack exit gas shall be installed, calibrated, operated, and maintained for a sewage sludge incinerator.

(c) An instrument that continuously measures and records information used to determine the moisture content in the sewage sludge incinerator stack exit gas shall be installed, calibrated, operated, and maintained for a sewage sludge incinerator.

(d) An instrument that continuously measures and records combustion temperatures shall be installed, calibrated, operated, and maintained for a sewage sludge incinerator.

(e) Operation of a sewage sludge incinerator shall not cause the operating combustion temperature for the sewage sludge incinerator to exceed the performance test combustion temperature by more than twenty (20) percent.

(f) An air pollution control device shall be appropriate for the type of sewage sludge incinerator, and the operating parameters for the air pollution control device shall be adequate to indicate proper performance of the air pollution control device. For sewage sludge incinerators subject to the requirements in subpart O of 40 CFR part 60, operation of the air pollution control device shall not violate the requirements for the air pollution control device in subpart O of 40 CFR part 60. For all other sewage sludge incinerators, operation of the air pollution control device shall not cause a significant exceedance of the average value for the air pollution control device operating parameters from the performance test required by section 503.43(c)(3) and (d)(5).

(g) Sewage sludge shall not be fired in a sewage sludge incinerator 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.

(h) The instruments required in section 503.45(a) through (d) shall be appropriate for the type of sewage sludge incinerator.

**503.46. Frequency of monitoring.**

(a) Sewage sludge.

(1) The frequency of monitoring for beryllium shall be as required in subpart C of 40 CFR part 61, and for mercury as required in subpart E of 40 CFR part 61.

(2) The frequency of monitoring for arsenic, cadmium, chromium, lead, and nickel in sewage sludge fed to a sewage sludge incinerator shall be the frequency in Table 1 of section 503.46. Facilities which generate less than 290 metric tons of sludge per year and dispose of the sludge once per year or less, may request a reduction in monitoring to a frequency of once per year. The Department will review these requests on a case-by-case basis.

TABLE 1 OF SECTION 503.46—FREQUENCY OF MONITORING—INCINERATION

Amount of sewage sludge* (metric tons per 365 day period)	Frequency
Greater than zero but less than 1,500.	Once per quarter (four times per year)
Equal to or greater than 1,500 but less than 15,000.	Once per 60 days (six times per year)
Equal to or greater than 15,000.	Once per month (12 times per year)

\*Amount of sewage sludge fired in a sewage sludge incinerator (dry weight basis).

(3) After the sewage sludge has been monitored for two years at the frequency in Table 1 of section 503.46, the Department may reduce the frequency of monitoring for arsenic, cadmium, chromium, lead, and nickel.

(b) Total hydrocarbons, oxygen concentration, information to determine moisture content, and combustion temperatures. The total hydrocarbons concentration and oxygen concentration in the exit gas from a sewage sludge incinerator stack, the information used to measure moisture content in the exit gas, and the combustion temperatures for the sewage sludge incinerator shall be monitored continuously.

(c) Air pollution control device operating parameters. The frequency of monitoring for the sewage sludge incinerator air pollution control device operating parameters shall be specified by the Department.—For sewage sludge incinerators subject to the requirements in subpart O of 40 CFR part 60, the frequency of monitoring for the appropriate air pollution control device operating parameters shall be the frequency of monitoring in subpart O of 40 CFR part 60. For all other sewage sludge incinerators, the appropriate air pollution control device operating parameters shall be monitored at least daily.

### **503.47. Recordkeeping.**

- (a) The person who fires sewage sludge in a sewage sludge incinerator shall develop the information in section 503.47(b) through section 503.47(n) and shall retain that information for five years.
- (b) The concentration of lead, arsenic, cadmium, chromium, and nickel in the sewage sludge fed to the sewage sludge incinerator.
- (c) The total hydrocarbons concentrations in the exit gas from the sewage sludge incinerator stack.
- (d) Information that indicates the requirements in the National Emission Standard for beryllium in subpart C of 40 CFR Part 61 are met.
- (e) Information that indicates the requirements in the National Emission Standard for mercury in subpart E of 40 CFR Part 61 are met.
- (f) The operating combustion temperatures for the sewage sludge incinerator.
- (g) Values for the air pollution control device operating parameters.
- (h) The oxygen concentration and information used to measure moisture content in the exit gas from the sewage sludge incinerator stack.
- (i) The sewage sludge feed rate.
- (j) The stack height for the sewage sludge incinerator.
- (k) The dispersion factor for the site where the sewage sludge incinerator is located.
- (l) The control efficiency for lead, arsenic, cadmium, chromium, and nickel for each sewage sludge incinerator.
- (m) The risk specific concentration for chromium calculated using equation (6), if applicable.
- (n) A calibration and maintenance log for the instruments used to measure the total hydrocarbons concentration and oxygen concentration in the exit gas from the sewage sludge incinerator stack, the information needed to determine moisture content in the exit gas, and the combustion temperatures.

### **503.48. Reporting.**

- (a) Any generator of sewage sludge when sewage sludge is incinerated, any person who prepares sewage sludge that is incinerated, or any person who incinerates sewage sludge, including Class I sludge management facilities, POTWs (as defined in 40 CFR 501.2) with a design flow rate equal to or greater than one million gallons per day, and POTWs that serve a population of 10,000 people or greater shall submit the information in section 503.47(b) through section 503.47(h) to the Department on or before February 19 of each year, for the period of January 1 through December 31 of the previous calendar year. Reports required by this regulation do not exclude any person from submitting reports required by other Department regulations or by other applicable EPA regulations. As of December 21, 2020, all reports submitted in compliance with this section must be submitted electronically in compliance with this section and 40 CFR Part 3 (including, in all cases, subpart D to Part 3), 40 CFR 122.22, and 40 CFR Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to the start dates for

electronic reporting (see Table 1 in 40 CFR 127.16), the Department may also require operators to electronically submit annual reports under this section if required to do so by State law.

### **503.50. Odor Control Requirements.**

The permit holder shall use best management practices normally associated with the proper operation and maintenance of a sludge wastewater treatment site, any sludge storage or lagoon areas, transportation of sludges, and all individual activities permitted under R.61-9.503 to ensure that an undesirable level of odor does not exist.

(a) The permittee shall prepare an odor abatement plan for the sewage sludge treatment sites, any sludge storage or lagoon areas, and land application or surface disposal sites. Permittees that land-apply sludge must prepare the plan within 180 days of the effective date of this regulation (effective date of June 26, 2003). Permittees that have facilities described above that require plans have one (1) year from the June 26, 2003 effective date to prepare the plan. Odor abatement plans must be submitted for new projects with the submission of permit applications. The plan must include the following topics:

(1) Operation and maintenance practices which are used to eliminate or minimize undesirable odor levels in the form of best management practices for odor control;

(2) Use of treatment processes for the reduction of undesirable odors;

(3) Use of setbacks; and

(4) Contingency plans and methods to address odor problems for the different types of disposal/application methods used.

(b) Unless otherwise requested, prior to issuance of a new or expanded land application disposal permit (either NPDES or Land Application), the Department may review the odor abatement plan for compliance with this Part (503.50). The Department may require changes to the plan as appropriate.

(c) No permittee may cause, allow, or permit emission into the ambient air of any substance or combinations of substances in quantities that an undesirable level of odor is determined to result unless preventative measures of the type set out below are taken to abate or control the emission to the satisfaction of the Department. When an odor problem comes to the attention of the Department through field surveillance or specific complaints, the Department may determine, in accordance with section 48-1-120 of the Pollution Control Act, if the odor is at an undesirable level by considering the character and degree of injury or interference to:

(1) The health or welfare of the people;

(2) Plant, animal, freshwater aquatic, or marine life;

(3) Property; or

(4) Enjoyment of life or use of affected property.

(d) After determining that an undesirable level of odor exists, the Department may require:

(1) the permittee to submit a corrective action plan to address the odor problem,

(2) remediation of the undesirable level of odor within a reasonable timeframe, and

(3) in an order, specific methods to address the problem.

(e) If the permittee fails to control or abate the odor problems addressed in this section within the specified timeframe, the Department may revoke disposal/application activities associated with the site or the specific aspect of the sludge management program.

#### **APPENDIX A. PROCEDURE TO DETERMINE THE ANNUAL WHOLE SLUDGE APPLICATION RATE FOR A SEWAGE SLUDGE**

Section 503.13(a)(4)(ii) requires that the product of the concentration for each pollutant listed in Table 4 of section 503.13 in sewage sludge sold or given away in a bag or other container for application to the land and the annual whole sludge application rate (AWSAR) for the sewage sludge not cause the annual pollutant loading rate for the pollutant in Table 4 of section 503.13 to be exceeded. This appendix contains the procedure used to determine the AWSAR for a sewage sludge that does not cause the annual pollutant loading rates in Table 4 of section 503.13 to be exceeded.

The relationship between the annual pollutant loading rate (APLR) for a pollutant and the annual whole sludge application rate (AWSAR) for a sewage sludge is shown in equation (1).

$$\text{APLR} = C \times \text{AWSAR} \times 0.001 \quad (1)$$

Where:

APLR= Annual pollutant loading rate in kilograms per hectare per 365 day period.

C= Pollutant concentration in milligrams per kilogram of total solids (dry weight basis).

AWSAR= Annual whole sludge application rate in metric tons per hectare per 365 day period (dry weight basis).

0.001= A conversion factor.

To determine the AWSAR, equation (1) is rearranged into equation (2):

$$\text{AWSAR} = \frac{\text{APLR}}{C \times 0.001} \quad (2)$$

The procedure used to determine the AWSAR for a sewage sludge is presented below.

#### **PROCEDURE:**

1. Analyze a sample of the sewage sludge to determine the concentration for each of the pollutants listed in Table 4 of section 503.13 in the sewage sludge.

2. Using the pollutant concentrations from Step 1 and the APLRs from Table 4 of section 503.13, calculate an AWSAR for each pollutant using equation (2) above.

3. The AWSAR for the sewage sludge is the lowest AWSAR calculated in Step 2.

## **APPENDIX B. PATHOGEN TREATMENT PROCESSES**

### **A. PROCESSES TO SIGNIFICANTLY REDUCE PATHOGENS (PSRP)**

1. 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.

2. 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.

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

4. 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.

5. 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.

### **B. PROCESSES TO FURTHER REDUCE PATHOGENS (PFRP)**

1. 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 or higher for 15 days or longer. During the period when the compost is maintained at 55 degrees or higher, there shall be a minimum of five turnings of the windrow.

2. 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.

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

4. 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 10 days at 55 to 60 degrees Celsius.

5. 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).

6. Gamma ray irradiation. Sewage sludge is irradiated with gamma rays from certain isotopes, such as Cobalt 60 and Cesium 137, at dosages of at least 1.0 megarad at room temperature (ca. 20 degrees Celsius).

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

#### **APPENDIX C. PCB. POLYCHLORINATED BIPHENYLS**

(1) Beginning with the effective date of this appendix, sludges for land application (including sewage sludge, sludges and septage that may be mixed with grease trap waste) must be sampled at least quarterly (based on calendar year quarters) for PCBs using EPA SW-846 Method 8082A with an appropriate sample preparation method approved for use by the Department based on the matrix of the sample. This includes but is not limited to: bulk sewage sludge applied to agricultural land, forests or public contact sites; sewage sludge sold or given away in a bag or other container for application to the land; domestic septage; reclamation sites; or other materials mixed with sludge before application. Reporting the above information, in addition to requirements specified later in this appendix, should be included in annual reports required by permits.

(2) If levels of PCBs are greater than or equal to one (1) milligram per kilogram (mg/kg dry weight basis), but less than ten (10) milligrams per kilogram (mg/kg dry weight basis), confirmation sludge sampling must be done as soon as practicable and the results provided to the Department within five (5) calendar days of receipt by the permittee.

(3) If levels of PCBs are greater than or equal to ten (10) milligrams per kilogram (mg/kg dry weight basis), confirmation sludge sampling must be done as soon as practicable and the results provided to the Department within five (5) calendar days of receipt of the results by the permittee. In addition, representative soil sampling of land application sites that may have received sludge during the monitoring period must be conducted within 30 days of knowledge of the confirmation sampling that confirms sludge PCB levels equal to or greater than ten (10) milligrams per kilogram (mg/kg dry weight basis). The results of the soil sampling must be provided to the Department within five (5) calendar days of receipt by the permittee. The Department may require any further action as deemed necessary and consistent with applicable laws.