

STATE OF OHIO

Sewage Sludge

Chapter 3745-40 of the ADMINISTRATIVE CODE

Most Recent Revision:

Adopted August 29, 2007
Effective October 1, 2007

Ohio Environmental Protection Agency
Division of Surface Water
Permits & Compliance Section

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(A) As used in this chapter:

- (1) "Aerobic digestion" means the biochemical decomposition of organic matter in sewage sludge material into carbon dioxide and water by microorganisms in the presence of oxygen.
- (2) "Agronomic rate" means the whole sewage sludge application rate (dry weight basis) intended to provide the food crop, feed crop, fiber crop, cover crop, pasture, or vegetation the appropriate nitrogen for the reasonably expected yield, and to minimize the amount of nitrogen in the sewage sludge that passes to waters of the state.
- (3) "Anaerobic digestion" means the biochemical decomposition of organic matter in sewage sludge into methane gas and carbon dioxide by microorganisms in the absence of oxygen.
- (4) "ASTM D4994-89" means the American society for testing and material (ASTM) standard test methods for standard practice for recovery of viruses from wastewater sludges, as that standard was approved in 2002. ASTM test methods are generally available in public libraries or from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, at 610/832-9555, or on the internet at <http://www.ASTM.org>.
- (5) "Authorized site" means an area of land bordered by fences, tree lines, streams, roads, or other means of demarcation, upon which sewage sludge is land applied.
- (6) "Available water capacity" means the capacity of soils to hold water available for use by most plants.
- (7) "Bedrock" means any continuous or connected solid rock exposed at the surface of the earth or covered by soil or glacial deposits.
- (8) "Bulk sewage sludge" means sewage sludge that is not sold or given away in a bag or other container for application to the land.
- (9) "Class I sludge management facility" means any publicly owned treatment works as defined in 40 C.F.R. 501.2, required to have an approved pretreatment program under 40 C.F.R. 403.8(a) (including any publicly owned treatment works located in a state that has elected to assume local program responsibilities pursuant to 40 C.F.R. 403.10(e)) and any treatment works treating domestic sewage, as defined in 40 C.F.R. 122.2, classified as a class I sludge management facility by the United States environmental protection agency regional administrator in conjunction with the director, because of the potential for its

sewage sludge use or disposal practice to affect public health and the environment adversely.

- (10) "Community public water system" means a water system that has at least fifteen service connections used by year-round residents or regularly serves at least twenty-five year-round residents. Examples of community water systems may include, but are not limited to, cities, villages, nursing homes and mobile home parks.
- (11) "Cover crop" means a small grain crop, such as oats, wheat, or barley, not grown for harvest.
- (12) "Crop year" means the period of time for a particular crop to be planted and harvested, or one year's time, whichever is shorter.
- (13) "Cumulative pollutant loading rate" means the maximum amount of an inorganic pollutant that can be applied to an area of land.
- (14) "Dioxin" means all of the seven 2, 3, 7, 8 chlorinated dibenzo-p-dioxin congeners, ten 2, 3, 7, 8 chlorinated dibenzofuran congeners, and twelve coplanar polychlorinated biphenyl congeners in table A-1 of this rule.

-Table A-1-

CAS number	Congener
1746-01-6	2, 3, 7, 8-tetrachlorodibenzo-p-dioxin
40321-76-4	1, 2, 3, 7, 8-pentachlorodibenzo-p-dioxin
39227-28-6	1, 2, 3, 4, 7, 8-hexachlorodibenzo-p-dioxin
57653-85-7	1, 2, 3, 6, 7, 8-hexachlorodibenzo-p-dioxin
19408-74-3	1, 2, 3, 7, 8, 9-hexachlorodibenzo-p-dioxin
35822-46-9	1, 2, 3, 4, 6, 7, 8-heptachlorodibenzo-p-dioxin
3268-87-9	1, 2, 3, 4, 6, 7, 8, 9-octachlorodibenzo-p-dioxin
51207-31-9	2, 3, 7, 8-tetrachlorodibenzofuran
57117-41-6	1, 2, 3, 7, 8-pentachlorodibenzofuran
57117-31-4	2, 3, 4, 7, 8-pentachlorodibenzofuran
70648-26-9	1, 2, 3, 4, 7, 8-hexachlorodibenzofuran
57117-44-9	1, 2, 3, 6, 7, 8-hexachlorodibenzofuran
72918-21-9	1, 2, 3, 7, 8, 9-hexachlorodibenzofuran
60851-34-5	2, 3, 4, 6, 7, 8-hexachlorodibenzofuran
67562-39-4	1, 2, 3, 4, 6, 7, 8-heptachlorodibenzofuran
55673-89-7	1, 2, 3, 4, 7, 8, 9-heptachlorodibenzofuran
39001-02-0	1, 2, 3, 4, 6, 7, 8, 9-octachlorodibenzofuran
32598-13-3	3, 3', 4, 4'-tetrachlorobiphenyl

Definitions.

70362-50-4	3, 4, 4', 5-tetrachlorobiphenyl
57465-28-8	3, 3', 4, 4', 5-pentachlorobiphenyl
32598-14-4	2, 3, 3', 4, 4'-pentachlorobiphenyl
31508-00-6	2', 3, 4, 4', 5-pentachlorobiphenyl
65510-44-3	2, 3', 4, 4', 5'-pentachlorobiphenyl
74472-37-0	2, 3, 4, 4', 5-pentachlorobiphenyl
32774-16-6	3, 3', 4, 4', 5, 5'-hexachlorobiphenyl
38380-08-4	2, 3, 3', 4, 4', 5-hexachlorobiphenyl
69782-90-7	2, 3, 3', 4, 4', 5'-hexachlorobiphenyl
52663-72-6	2, 3', 4, 4', 5, 5'-hexachlorobiphenyl
39635-31-9	2, 3, 3', 4, 4', 5, 5'-heptachlorobiphenyl

- (15) "Director" means director of the Ohio environmental protection agency.
- (16) "Disposal" means the final use of sewage sludge, including, but not limited to, land application, land reclamation, surface disposal, or disposal in a landfill or an incinerator.
- (17) "Division" means the Ohio environmental protection agency division of surface water, with any division approvals or authorizations manifested through its chief.
- (18) "Domestic septage" means 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.
- (19) "Dry weight basis" means calculated on the basis of having been dried at one hundred five degrees Celsius until reaching a constant mass (i.e., essentially one hundred per cent solids content).
- (20) "Effective neutralizing power" has the same meaning as in division (N) of section 905.51 of the Revised Code.
- (21) "Endangered Species Act" means "Endangered Species Act, 16 U.S.C. section 1533, as amended through June 1, 2007.
- (22) "Environmental Regulations and Technology - Control of Pathogens and Vector Attraction in Sewage Sludge" means "Environmental Regulations and Technology - Control of Pathogens and Vector Attraction in Sewage Sludge, USEPA/625/R-92/013, revised July 2003", United States environmental protection agency, national center for environmental publications and information, 11029 Kenwood road, Cincinnati, OH 45242.

- (23) "Exceptional quality sludge" means sewage sludge that meets all of the following qualifications:
- (a) Satisfies the class A pathogen standards in paragraphs (N)(1) to (N)(6) of rule 3745-40-05 of the Administrative Code;
 - (b) Satisfies one of the vector attraction reduction requirements in paragraphs (Q)(1) to (Q)(8) of rule 3745-40-05 of the Administrative Code;
 - (c) Does not exceed the ceiling concentration limitations for metals listed in paragraph (F)(1) of rule 3745-40-05 of the Administrative Code; and
 - (d) Does not exceed the concentration limitations for metals listed in paragraph (F)(3) of rule 3745-40-05 of the Administrative Code.
- (24) "Facility storage of sewage sludge" means the storage of sewage sludge at the permittee's treatment works.
- (25) "Feed crops" means crops produced primarily for consumption by animals.
- (26) "Fiber crops" means crops such as flax and cotton.
- (27) "Field storage of sewage sludge" means an area where sewage sludge may be stored for greater than thirty days but not to exceed ninety days.
- (28) "Fineness index" has the same meaning as in division (O) of section 905.51 of the Revised Code.
- (29) "Food crops" means crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco.
- (30) "Frequently flooded" means an authorized site or area of an authorized site that has been flooded an average of more than once in two years. Frequently flooded, and the months when flooding is expected, shall be determined by consulting the appropriate "National Cooperative Soil Survey" publication.
- (31) "Grade" means the percentage of total Kjeldahl nitrogen, available phosphorus, and soluble potassium stated in the same terms and order.
- (32) "Grassed waterway" means a natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion and conducts surface water away from cropland.
- (33) "Ground cover" means vegetation canopy or crop residue on agricultural land.

- (34) "Ground water source water assessment and protection area" and "wellhead protection area" mean the surface and subsurface area that provides water to a community public water system well(s) as delineated or endorsed by the director.
- (35) "Immediate incorporation" means sewage sludge is mechanically incorporated into the soil within six hours after surface application.
- (36) "Industrial wastewater" means wastewater generated in a commercial or industrial process.
- (37) "Isolation distance" means the distance to a specified object from the nearest edge of the sewage sludge application area.
- (38) "Landfill" means a sanitary landfill facility, as defined in rules adopted under section 3734.02 of the Revised Code, that is licensed under section 3734.05 of the Revised Code.
- (39) "Land application," "land apply," "applied to the land," and "application to the land" mean 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 for the purposes of conditioning the soil or fertilizing crops or vegetation grown on the soil.
- (40) "Land reclamation" means the returning of disturbed land to productive uses.
- (41) "Land with a high potential for public exposure" means land that does not meet the definition of "land with a low potential for public exposure".
- (42) "Land with a low potential for public exposure" means agricultural land and land reclamation sites.
- (43) "Liming material" has the same meaning as in division (A) of section 905.51 of the Revised Code.
- (44) "Medical care facility" means "home" as defined in section 3721.01 of the Revised Code, "hospital" as defined in section 3727.01 of the Revised Code, "adult care facility" as defined in section 3722.01 of the Revised Code, "nursing facility" as defined in section 5111.20 of the Revised Code and similar facilities.
- (45) "NPDES" means national pollutant discharge elimination system.
- (46) "Nuisance odor" means an emission of any gas, vapor, aerosol or combination thereof from the management of sewage sludge, in whatever quantities, that causes, either alone or in reaction with other air contaminants: injurious effects

to public health or the environment or unreasonable interference with the comfortable enjoyment of life or property.

- (47) "Occupied building" means a structure, permanent in nature, occupied or capable of being occupied. "Occupied building" does not include "medical care facility".
- (48) "Occurrence of Pathogens in Distribution and Marketing Municipal Sludges" means "Occurrence of Pathogens in Distribution and Marketing Municipal Sludges, USEPA 600/1-87-014, 1988". This document is available on the internet at <http://www.epa.gov/ncepihom/>.
- (49) "Other container" means an open or closed receptacle. This includes, but is not limited to, a bucket, box and carton and a vehicle or trailer with a load capacity of one metric ton or less.
- (50) "Pasture" means land on which animals feed directly on vegetation such as legumes, grasses, grain stubble or stover.
- (51) "Pathogen" means disease-causing organisms. These include, but are not limited to, certain bacteria, protozoa, viruses, and viable helminth ova.
- (52) "Permittee" means the holder of a valid NPDES permit or the holder of an approved sewage sludge management plan.
- (53) "pH" means the logarithm of the reciprocal of the hydrogen ion concentration measured at twenty-five degrees Celsius or measured at another temperature and then converted to an equivalent value at twenty-five degrees Celsius.
- (54) "Phosphorus index" means an assessment technique for determining the relative risk of phosphorus movement from various landforms to waters of the state. Factors assessed include, but are not limited to, proximity to waters of the state, slope, soil and weather conditions, soil type, buffer strips, soil surface condition, surface and sub-surface drainage, and application method.
- (55) "Pollutant" means 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 administrator of the United States environmental protection agency, 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.

- (56) "Regional storage of sewage sludge" means an area of land or constructed facility engineered for the storage of sewage sludge destined for land application on more than one site.
- (57) "Representative sample" means a sample of a universe or whole which can be expected to exhibit the average properties of the universe or whole.
- (58) "Runoff" means rainwater, leachate or other liquid that drains overland on any part of a land surface and runs off of the land surface.
- (59) "Same day incorporation" means incorporation of sewage sludge within twenty-four hours after surface application.
- (60) "Sewage" means any liquid waste containing sludge, sludge materials, or animal or vegetable matter in suspension or solution, and may include household wastes as commonly discharged from residences and wastes discharged from commercial, institutional, or similar facilities.
- (61) "Sewage sludge" means a solid, semi-solid, or liquid residue generated during the treatment of sewage in a treatment works and shall include sewage sludge materials, including but not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes. "Sewage sludge" does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator, grit and screenings generated during preliminary treatment of domestic sewage in a treatment works, animal manure, residue generated during treatment of animal manure, or domestic septage.
- (62) "Sewage sludge facility" means an entity that performs treatment on or is responsible for the disposal of sewage sludge.
- (63) "Sinkhole" means a surface depression produced when underlying material, such as carbonate bedrock, dissolves resulting in a direct conduit to groundwater.
- (64) "Sludge" means sewage sludge and a solid, semi-solid, or liquid residue that is generated from an industrial wastewater treatment process and that is applied to land for agronomic benefit. "Sludge" does not include ash generated during the firing of sludge in a sludge incinerator, grit and screening generated during preliminary treatment of sewage in a treatment works, animal manure, residue generated during treatment of animal manure, or domestic septage.
- (65) "Sludge management" means the use, storage, treatment, or disposal of, and management practices related to, sludge and sludge materials.
- (66) "Sludge management permit" means a permit for sludge management that is issued under division (J) of section 6111.03 of the Revised Code.

Definitions.

- (67) "Sludge materials" means solid, semi-solid, or liquid materials derived from sludge, or mixed with sludge, and includes products from a treatment works that result from the treatment, blending, or composting of sludge.
- (68) "Soil phosphorus test" means a soil test procedure using the "Bray-Kurtz P1 extraction" or the "Mehlich 3 extraction" that produces an index of plant available phosphorus expressed in either parts per million or pounds per acre.
- (69) "Specific oxygen uptake rate (SOUR)" means the mass of oxygen consumed per unit time per unit mass of total solids (dry weight basis) in the sewage sludge or sewage sludge material.
- (70) "Staging area" means field placement of sewage sludge at the time of delivery in such a manner as to facilitate land application within twenty-four hours. Staging includes the transfer of liquid sewage sludge from transport vehicles to land application equipment for injection.
- (71) "Standard of fineness" means standard of fineness as defined in section 905.54 of the Revised Code.
- (72) "Standard Methods for the Examination of Water and Wastewater" means "Standard Methods for the Examination of Water and Wastewater, 21st Edition, American Public Health Association, American Water Works Association and Water Environment Federation, 2005." This document is available on the internet at <http://www.standardmethods.org/>.
- (73) "Stockpile area" means an area where sewage sludge may be stored for greater than twenty-four hours but not to exceed thirty days.
- (74) "Storage of sewage sludge" means the placement of sludge on land on which the sludge remains for not longer than two years, but does not include the placement of sludge on land for treatment.
- (75) "Surface application" and "surface apply" mean the placement of sewage sludge on the land for agronomic benefit. "Surface application" includes immediate incorporation and same day incorporation.
- (76) "Surface disposal" means the placement of sludge on an area of land for disposal including, but not limited to, monofills, surface impoundments, lagoons, waste piles, or dedicated disposal sites.
- (77) "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" means "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, USEPA publication SW-846, third edition (September 1994)". This document is available on the internet at <http://www.epa.gov/sw-846/main.htm>.

- (78) "Total solids" means the materials in sewage sludge or sewage sludge material that remain as residue when the sewage sludge or sewage sludge material is dried at one hundred three to one hundred five degrees Celsius.
- (79) "Treatment" means the preparation of sewage sludge for final use or disposal and includes, but is not limited to, thickening, stabilization, and dewatering of sewage sludge.
- (80) "Treatment works" means any plant, disposal field, lagoon, dam, pumping station, building sewer connected directly to treatment works, incinerator, or other works used for the purpose of treating, stabilizing, blending, composting, or holding sewage, sludge, sludge materials, industrial waste, or other waste, except as otherwise defined.
- (81) "Underground injection control (UIC) class V drainage well" means a drainage well used to drain surface fluid, primarily storm runoff, into a subsurface formation which may include, but is not limited to, an agricultural or stormwater drainage well and an identified unsealed gas/oil well.
- (82) "Unstabilized solids" means organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.
- (83) "Use" means, but is not limited to, the land application of sewage sludge for agronomic benefit.
- (84) "Vector attraction" means the characteristic of sewage sludge that attracts rodents, flies, mosquitos, or other organisms capable of transporting infectious agents.
- (85) "Vegetation" means, but is not restricted to, pasture, range land, or forest.
- (86) "Volatile solids" means the amount of the total solids in sewage sludge lost when the sewage sludge is combusted at five hundred fifty degrees Celsius in the presence of excess air.
- (87) "Water Pollution Control Act" means the "Federal Water Pollution Control Act" (commonly referred to as the "Clean Water Act") 33 U.S.C. 1251 et seq. as amended through July 1, 2007.
- (88) "Waters of the state" means all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and other bodies or accumulations of water, surface and underground, natural or artificial, regardless of the depth of the strata in which underground water is located, that are situated wholly or partly within, or border upon, this state, or are within its

Purpose, applicability and exclusions.

- (A) The purpose of this chapter is to establish standards applicable to the disposal, use, storage, or treatment of sewage sludge, which standards are intended to reasonably protect public health and the environment, encourage the beneficial reuse of sewage sludge, and minimize the creation of nuisance odors. Said standards shall be consistent with section 405 of the federal "Water Pollution Control Act" and regulations adopted under it.
- (B) This chapter is applicable to any person engaged in the disposal, use, storage, or treatment of sewage sludge in the state of Ohio.
- (C) A permittee may be exempted from certain requirements applicable to the land application of sewage sludge when such land application is performed for research, demonstration, or educational purposes and the permittee has received a letter of authorization from the division. Said letter of authorization shall specify with certainty the land application requirements to which the exemption applies.
- (D) This chapter does not establish requirements for the ash generated during the incineration of sewage sludge.
- (E) This chapter does not establish requirements for the disposal, use, storage, or treatment of sewage sludge determined to be hazardous waste as defined in section 3734.01 of the Revised Code.
- (F) This chapter does not establish requirements for the disposal, use, storage, or treatment of sewage sludge with a concentration of polychlorinated biphenyls equal to or greater than fifty milligrams per kilogram of total solids on a dry weight basis.
- (G) This chapter does not establish requirements for the use or disposal of grit (sand, gravel, cinders, or other materials with a high specific gravity) or screenings (relatively large materials such as rags) generated during treatment of sewage in a treatment works.
- (H) This chapter does not establish requirements for the disposal, use, storage, or treatment of domestic septage and grease trap waste.
- (I) This chapter does not establish requirements for the disposal, use, storage, or treatment of final effluent.
- (J) This chapter does not establish requirements for the disposal, use, storage, or treatment of sludge generated at an industrial facility during treatment of industrial wastewater with or without such sewage as is present.
- (K) This chapter does not establish requirements for the disposal, use, storage, or treatment of sludge generated during the treatment of drinking water.

Effective: October 1, 2007

R.C. 119.032 review date: October 1, 2012

Promulgated Under: R.C. 119.03

Statutory Authority: R.C. 6111.03, 6111.042

Rule Amplifies: R.C. 6111.03, 6111.042

Prior Effective Dates: 4/8/2002

[Comment: For dates of non-regulatory government publications, publications of recognized organizations and associations, federal rules and federal statutory provisions referenced in this rule, see rule 3745-40-01 of the Administrative Code.]

- (A) Except as provided in paragraph (D) of this rule, no person shall engage in the disposal, use, storage, or treatment of sewage sludge for which requirements are established in this chapter, except pursuant to a valid NPDES permit or under an approved sewage sludge management plan, and such permit or plan identifies and regulates the specific disposal, use, storage, or treatment of that sewage sludge.
- (B) A permittee is responsible that any disposal, use, storage, or treatment of sewage sludge is in compliance with this chapter and the conditions of its NPDES permit or sewage sludge management plan.
- (C) A permittee of an approved sewage sludge management plan for the land application of sewage sludge issued by the director under paragraph (A)(2) of rule 3745-42-02 of the Administrative Code, shall either:
 - (1) Cease operations; or
 - (2) Continue operations under the sewage sludge management plan until such time as an NPDES permit is issued or, if said permittee possesses an NPDES permit, said permit is modified or renewed and such issuance, modification, or renewal identifies and regulates the specific disposal, use, storage, or treatment of sewage sludge.
- (D) NPDES permits shall contain terms and conditions which are consistent with this chapter.
- (E) The director may specify in NPDES permits the net volume, net weight, quality, and pollutant concentration of the sewage sludge, and the manner and frequency of the disposal, use, storage, or treatment of the sewage sludge, to protect public health and the environment from adverse effects relating to those activities. The director shall impose other permit conditions to protect public health and the environment, minimize the creation of nuisance odors, and achieve compliance with this chapter and in doing so shall consider whether the permit conditions are consistent with the goal of encouraging the beneficial reuse of sewage sludge.
- (F) The director may condition permits on the implementation of disposal, use, storage, treatment, distribution, or land application agronomic management methods and the filing of periodic reports on the amounts, composition, and quality of sewage sludge.

[Comment: For dates of non-regulatory government publications, publications of recognized organizations and associations, federal rules and federal statutory provisions referenced in this rule, see rule 3745-40-01 of the Administrative Code.]

- (A) For exceptional quality sewage sludge sold or given away in a bag or other container, or distributed in bulk, for land application, a label shall be affixed to such bag or other container or an information sheet shall be provided to the person who receives such sewage sludge. The label or information sheet shall contain at least the following information:
- (1) The name, address, telephone number, and NPDES permit number of the permittee;
 - (2) A statement that the material is or contains a by-product of wastewater treatment;
 - (3) A statement that the Ohio EPA, division of surface water, may be contacted at 1-877-644-2001;
 - (4) The concentration of total Kjeldahl nitrogen, ammonia nitrogen, total phosphorus, and total potassium of the sewage sludge in milligrams per kilogram (dry weight basis);
 - (5) The concentration of total Kjeldahl nitrogen, available phosphorus, and soluble potassium of the sewage sludge as a "grade"; and
 - (6) When applicable for a liming material, the effective neutralizing power, fineness index, and standard of fineness of the sewage sludge.
- (B) Except as provided below, exceptional quality sewage sludge shall be exempt from paragraphs (D) to (R) of this rule.
- (C) The director may apply any or all of the requirements in paragraphs (D) to (R) of this rule to exceptional quality sewage sludge on a case-by-case basis after determining that the requirements are needed to protect public health and the environment.
- (D) Bulk sewage sludge shall be land applied at a rate that is equal to or less than the agronomic rate except as provided for in rule 3745-40-07 of the Administrative Code.
- (E) A permittee who generates bulk sewage sludge shall provide a label or information sheet to the following persons: all persons who receive bulk sewage sludge from the permittee; all persons who land apply bulk sewage sludge received from the permittee; and the owner or lease holder of the land upon which the bulk sewage sludge is land applied. Such label or information sheet shall provide all notices and

information necessary to comply with the requirements of this chapter including the following:

- (1) The name, address, telephone number, and NPDES permit number of the permittee;
 - (2) A statement that the material is or contains a by-product of wastewater treatment;
 - (3) A statement that the Ohio EPA, division of surface water, may be contacted at 1-877-644-2001;
 - (4) The concentration of total Kjeldahl nitrogen, ammonia nitrogen, total phosphorus, and total potassium of the sewage sludge in milligrams per kilogram (dry weight basis);
 - (5) The concentration of total Kjeldahl nitrogen, available phosphorus, and soluble potassium of the sewage sludge as a "grade"; and
 - (6) When applicable for a liming material, the effective neutralizing power, fineness index, and standard of fineness of the sewage sludge.
- (F) For soils with soil phosphorus test results greater than one hundred fifty parts per million (three hundred pounds per acre) Bray-Kurtz P1 extraction or one hundred seventy parts per million (three hundred forty pounds per acre) Mehlich 3 extraction, land application of bulk sewage sludge shall either:
- (1) Cease until such time that soil phosphorus test results are less than or equal to one hundred fifty parts per million (three hundred pounds per acre) Bray-Kurtz P1 extraction or one hundred seventy parts per million (three hundred forty pounds per acre) Mehlich 3 extraction; or
 - (2) Continue when it has been demonstrated to the division, using a phosphorus index, that a low relative risk of phosphorus movement to waters of the state exists at the authorized site.
- (G) Land application of liquid bulk sewage sludge shall be at the agronomic rate for the reasonably expected yield or the available water capacity of the soil, whichever is less at the time of land application.
- (H) The permittee shall post signs at sites where class B bulk sewage sludge is land applied. The signs shall read "NOTICE: CLASS B SEWAGE SLUDGE HAS BEEN APPLIED TO THIS SITE." Such signs shall include the name of the permittee and the permittee's telephone number. Such sign(s) shall be posted within twenty-five feet of an obvious access point(s) and shall be unobstructed from view. Any authorized site with road frontage shall have at least one sign facing the road, within twenty-five feet of the road when possible, and shall be unobstructed from

view. The text shall be in black capital letters on a white background and the letters shall be one inch in height. At sites with a low potential for public exposure, such signs shall be in place from the time land application begins to a minimum of thirty days after the termination of land application activity at the site. At sites with a high potential for public exposure such signs shall be in place from the time land application begins to a minimum of one year after the termination of land application activity at the site.

- (I) No person shall land apply bulk sewage sludge if such application is likely to adversely affect a threatened or endangered species listed under section 4 of the "Endangered Species Act, or its designated critical habitat.

- (J) No person shall land apply bulk sewage sludge to food crop, feed crop, fiber crop, or cover crop land over fifteen per cent slope or to pasture or vegetation over twenty per cent slope unless one of the following activities is performed:
 - (1) Same day incorporation or subsurface injection with operations done on the contour; or
 - (2) The field is established and managed in contour strips with alternate strips in cover crop, pasture, or vegetation.

- (K) No person shall land apply bulk sewage sludge to land that is frozen or snow-covered so that the bulk sewage sludge enters waters of the state except as provided in a permit issued pursuant to Chapter 6111. of the Revised Code. The following criteria shall be met for surface application of bulk sewage sludge on frozen or snow-covered ground:
 - (1) An isolation distance of one hundred feet shall be maintained from waters of the state (excluding groundwater); and
 - (2) The following ground cover shall be maintained.
 - (a) Where slope is less than or equal to six per cent, the soil surface at the time of surface application shall have at least eighty per cent ground cover; or
 - (b) Where slope is greater than six per cent, the soil surface at the time of surface application shall have at least ninety per cent ground cover or shall be established and managed in contour strips with at least eighty per cent ground cover on the strips receiving sewage sludge land.

- (L) No person shall land apply bulk sewage sludge to land that is flooded so that the bulk sewage sludge enters waters of the state except as provided in a permit issued under Chapter 6111. of the Revised Code. Surface application of bulk sewage sludge shall be limited to same day incorporation on areas of authorized sites that are frequently flooded during periods when flooding is expected.

(M) No person shall land apply bulk sewage sludge in a grassed waterway.

(N) No person shall land apply bulk sewage sludge within the isolation distances listed in table N-1 of this rule.

-Table N-1-

	Surface application	Injected
Waters of the state (excluding groundwater)	33 feet	
Occupied building	300 feet	100 feet
Medical care facility	1000 feet	300 feet
Private potable water source	300 feet	100 feet
Bedrock	3 feet	
Sinkhole or UIC class V drainage	300 feet without a grass buffer, 100 feet with a grass buffer	

(O) No person shall land apply bulk sewage sludge within a ground water source water assessment and protection area or wellhead protection area that has been delineated or endorsed by the director for a community public water system. The isolation distance from a community public water system well, where no delineated or endorsed ground water source water assessment and protection area or wellhead protection area exists, shall be one thousand feet.

(P) No person shall locate a bulk sewage sludge staging area, stockpile area, field storage of sewage sludge area, or regional storage of sewage sludge facility within the isolation distances listed in table P-1 of this rule.

-Table P-1-

Waters of the state (excluding groundwater)	100 feet
Occupied building	300 feet
Private potable water source	300 feet
Bedrock	3 feet
Sinkhole or UIC class V drainage well	300 feet
Medical care facility	1000 feet

(Q) No person shall locate a staging area, stockpile area, field storage of sewage sludge area, or regional storage of sewage sludge facility within a ground water source water assessment and protection area or wellhead protection area that has been endorsed or delineated by the director for a community public water system. The isolation distance from a community public water system well, where no delineated or endorsed ground water source water assessment and protection area or wellhead protection area exists, shall be one thousand feet.

- (R) No person shall locate a staging area, stockpile area, or field storage of sewage sludge area in low-lying wet areas or on soils that are frequently flooded. Runoff shall be diverted around a stockpile area or field storage of sewage sludge area using straw bales or other appropriate means of control. Soil conditions, slope, and ground cover shall be reviewed to assure proper drainage. The maximum amount of material to be delivered in one crop year to a staging area, stockpile area, or field storage of sewage sludge area is the agronomic rate of bulk sewage sludge for the authorized site and any contiguous sites. No person shall locate a field storage of sewage sludge area without previous authorization from the division. The division may decrease the maximum time sewage sludge may remain at a stockpile area or field storage of sewage sludge area or prohibit the use of a stockpile area or field storage of sewage sludge area at a land application site to protect public health or the environment and to minimize the creation of nuisance odors.
- (S) No person shall locate a regional storage of sewage sludge facility without previous authorization from the division. Sewage sludge shall not remain at a regional storage of sewage sludge facility for more than two years. A permit to install, as per Chapter 3745-42 of the Administrative Code, shall be required for the construction of a regional storage of sewage sludge facility. An NPDES permit shall be obtained by the operator of a regional storage of sewage sludge facility prior to any treatment of sewage sludge at the regional storage of sewage sludge facility.
- (T) Facility storage of sewage sludge shall be provided by the permittee such that there shall be no adverse effects from sewage sludge handling at the permittee's treatment works. Facility storage of sewage sludge shall consist of one hundred twenty days sewage sludge storage for the design capacity of the treatment works. Facility storage of sewage sludge may consist of any combination of additional volume in sludge stabilization units (digesters), separate tanks, sewage sludge treatment lagoons, drying beds, dewatered sewage sludge storage pad areas, or other means to store either liquid or dewatered sewage sludge. In lieu of some of the one hundred twenty day facility storage of sewage sludge requirement, a permittee may demonstrate to the director that they have engineered or contracted alternatives to facility storage of sewage sludge in place. Alternatives to facility storage of sewage sludge include, but are not limited to, the following:
- (1) Contracts in effect with a sanitary landfill and sufficient transportation to dispose of sewage sludge that cannot be otherwise managed through facility storage of sewage sludge or other means of use or disposal;
 - (2) Contracts in effect with another permitted facility and sufficient transportation to transfer sewage sludge that cannot be otherwise managed through facility storage of sewage sludge or other means of use or disposal; or
 - (3) Ownership or leasing of, or contracts in effect with, a regional storage of sewage sludge facility and sufficient transportation to transfer sewage sludge that cannot

- (A) No person shall land apply sewage sludge if the concentration of any pollutant in the sewage sludge exceeds the ceiling concentration for that pollutant established in paragraph (F) of this rule.
- (B) No person shall land apply to an authorized site sewage sludge subject to the cumulative pollutant loading rates established in paragraph (F) of this rule if any of the cumulative pollutant loading rates have been reached at the authorized site.
- (C) No person shall land apply sewage sludge to a lawn or a home garden if the sewage sludge is not exceptional quality as defined in rule 3745-40-01 of the Administrative Code.
- (D) No person shall land apply sewage sludge sold or given away in a bag or other container if the sewage sludge is not exceptional quality as defined in rule 3745-40-01 of the Administrative Code.
- (E) Minimum soil pH for land application of bulk sewage sludge shall be 5.5 S.U. If the soil pH at an authorized site is less than 5.5 S.U., sufficient liming material shall be added such that the bulk sewage sludge/soil mixture pH is calculated to reach 5.5 S.U. or greater.
- (F) The pollutant ceiling concentrations, cumulative pollutant loading rates, and pollutant monthly average concentrations for sewage sludge shall not exceed the concentrations listed in table F-1, table F-2 and table F-3 of this rule:

(1) Pollutant ceiling concentrations.

-Table F-1-

Pollutant	Ceiling concentration (milligrams per kilogram dry weight basis)
Arsenic	75
Cadmium	85
Copper	4,300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7,500

2) Cumulative pollutant loading rates.

-Table F-2-

Pollutant	Cumulative pollutant loading rate (pounds per acre)
Arsenic	36.6
Cadmium	34.8
Copper	1,339.9
Lead	267.9
Mercury	15.2
Nickel	375.1
Selenium	89.3
Zinc	2,500.4

(3) Pollutant monthly average concentrations.

-Table F-3-

Pollutant	Monthly average concentration (milligrams per kilogram dry weight basis)
Arsenic	41
Cadmium	39
Copper	1,500
Lead	300
Mercury	17
Nickel	420
Selenium	100
Zinc	2,800

(G) Before bulk sewage sludge subject to the cumulative pollutant loading rates in paragraph (F) of this rule is land applied to an authorized site in Ohio, the person who proposes to apply the bulk sewage sludge shall contact the division to determine whether bulk sewage sludge subject to the cumulative pollutant loading rates in paragraph (F) of this rule has been land applied to the authorized site since July 20, 1993.

- (1) If land application of bulk sewage sludge subject to the cumulative pollutant loading rates has not occurred since July 20, 1993, the cumulative amount for each pollutant listed in paragraph (F) of this rule may be land applied to the authorized site in accordance with this chapter.
- (2) If bulk sewage sludge subject to the cumulative pollutant loading rates has been land applied to the authorized site since July 20, 1993, and the cumulative amount of each pollutant applied to the authorized site since that date is known, the cumulative amount of each pollutant land applied to the authorized site shall be used to determine the additional amount of each pollutant that can be applied to the authorized site in accordance with this chapter.

- (3) If bulk sewage sludge subject to the cumulative pollutant loading rates has been land applied to the authorized site since July 20, 1993, and the cumulative amount of each pollutant land applied to the authorized site since that date is not known, an additional amount of each pollutant shall not be land applied to the authorized site.
- (H) Any person who land applies bulk sewage sludge subject to the cumulative pollutant loading rates in paragraph (F) of this rule to an authorized site in Ohio shall provide written notice to the division prior to initial application of bulk sewage sludge to the authorized site. The division shall retain and provide access to the notice. The notice shall include the following:
- (1) The location of the land application site by either street address or latitude and longitude; and
 - (2) The name, address, telephone number and NPDES permit number of the generator of the bulk sewage sludge.
- (I) For a sewage sludge to be classified as class A with respect to pathogens, the sewage sludge shall meet one of the class A pathogen requirements established in paragraphs (N)(1) to (N)(6) of this rule.
- (J) The class A pathogen requirements in paragraphs (N)(1) to (N)(6) of this rule shall be met either prior to meeting or at the same time as meeting the vector attraction reduction requirements in paragraphs (Q)(1) to (Q)(5), (Q)(9), and (Q)(10) of this rule.
- (K) One of the class A pathogen requirements in paragraphs (N)(1) to (N)(6) of this rule or one of the class B pathogen requirements in paragraphs (O)(1) to (O)(3) of this rule and, when applicable, the site restrictions in paragraph (P) of this rule, shall be met when sewage sludge is applied to the land.
- (L) The site restrictions in paragraph (P) of this rule shall be met when sewage sludge that meets the class B pathogen requirements in paragraphs (O)(1) to (O)(3) of this rule is applied to the land.
- (M) One of the vector attraction reduction requirements in paragraphs (Q)(1) to (Q)(10) of this rule shall be met when sewage sludge is applied to the land.
- (N) Class A pathogen reduction alternatives. Either the density of fecal coliform in the sewage sludge shall be less than one thousand most probable number (MPN) per gram of total solids (dry weight basis) or the density of *Salmonella* sp. bacteria in the sewage sludge shall be less than three MPN 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; and at the time the sewage sludge is prepared to meet the requirements in paragraph (C) of rule 3745-40-04 of the Administrative Code. In addition, one of the following class A pathogen reduction alternatives shall be met.

- (1) Alternative one, time and temperature regime. 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 per cent solids of the sewage sludge is seven per cent or higher, the temperature of the sewage sludge shall be fifty degrees Celsius or higher, the time period shall be twenty minutes or longer and the temperature and time period shall be determined using equation number one, except when small particles of sewage sludge are heated by either warmed gases or an immiscible liquid. Equation number one is:

Equation number one is: $D = 131,000,000 / 10^{0.1400T}$

Where D equals time in days and T equals temperature in degrees Celsius.

- (b) When the per cent solids of the sewage sludge is seven per cent 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 fifty degrees Celsius or higher, the time period shall be fifteen seconds or longer and the temperature and time period shall be determined using equation number one.
- (c) When the per cent solids of the sewage sludge is less than seven per cent and the time period is at least fifteen seconds, but less than thirty minutes, the temperature and time period shall be determined using equation number one.
- (d) When the per cent solids of the sewage sludge is less than seven per cent, the temperature of the sewage sludge is fifty degrees Celsius or higher, and the time period is thirty minutes or longer, the temperature and time period shall be determined using equation number two. Equation number two is:

Equation number two is: $D = 50,070,000 / 10^{0.1400T}$

Where D equals time in days and T equals temperature in degrees Celsius.

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- (2) Alternative two, high pH and high temperature process. The pH of the sewage sludge that is used or disposed shall be raised to above twelve and shall remain above twelve for seventy-two hours.
 - (a) The temperature of the sewage sludge shall be above fifty-two degrees Celsius for twelve hours or longer during the period that the pH of the sewage sludge is above twelve.
 - (b) At the end of the seventy-two hour period during which the pH of the sewage sludge is above twelve, the sewage sludge shall be air dried to achieve a per cent solids in the sewage sludge greater than fifty per cent.
- (3) Alternative three, other processes.
 - (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 (N)(3)(c) of this rule 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 (N)(3)(c) of this rule.
 - (e) The sewage sludge shall be analyzed prior to pathogen treatment to determine whether the sewage sludge contains viable helminth ova.
 - (f) 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.

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- (g) 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 variable 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.
 - (h) After the viable helminth ova reduction in paragraph (N)(3)(g) of this rule 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 (N)(3)(g) of this rule.
- (4) Alternative four, unknown processes.
- (a) 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 is prepared to meet the requirements in paragraph (C) of rule 3745-40-04 of the Administrative Code, unless otherwise specified by the director.
 - (b) 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 is prepared to meet the requirements in paragraph (C) of rule 3745-40-04 of the Administrative Code, unless otherwise specified by the director.
- (5) Alternative five, processes to further reduce pathogens. Sewage sludge that is land applied shall be treated in one of the following processes to further reduce pathogens.
- (a) Process to further reduce pathogens number one, composting. Using either the in-vessel composting method or the static aerated pile composting method, the temperature of the sewage sludge is maintained at fifty-five degrees Celsius or higher for three days. Using the windrow composting method, the temperature of the sewage sludge is maintained at fifty-five degrees Celsius or higher for fifteen days or longer. During the period when the compost is maintained at fifty-five degrees Celsius or higher,

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there shall be a minimum of five turnings of the windrow. Such facility shall operate in accordance with the requirements of Chapters 3704. and 6111. of the Revised Code, section 3745.11 of the Revised Code, and rules adopted thereunder. Such facility shall not be subject to the requirements of rules 3745-27-40 to 3745-27-47 of the Administrative Code and Chapter 3745-37 of the Administrative Code if all of the following conditions are met:

- (i) The owner or operator of the facility is the same owner or operator of the facility that generates the sewage sludge; and
 - (ii) The owner or operator of the facility co-composts sewage sludge exclusively with type A feedstock, bulking agents, or additives as defined in rules 3745-27-01 and 3745-27-40 of the Administrative Code.
- (b) Process to further reduce pathogens number two, heat drying. Sewage sludge is dried by direct or indirect contact with hot gases to increase the per cent solids of the sewage sludge to ninety per cent or greater. Either the temperature of the sewage sludge particles exceeds eighty degrees Celsius or the wet bulb temperature of the gas in contact with the sewage sludge as the sewage sludge leaves the dryer exceeds eighty degrees Celsius.
 - (c) Process to further reduce pathogens number three, heat treatment. Liquid sewage sludge is heated to a temperature of one hundred eighty degrees Celsius or higher for thirty minutes.
 - (d) Process to further reduce pathogens number four, thermophilic aerobic digestion. Liquid sewage sludge is agitated with air or oxygen to maintain aerobic conditions and the mean cell residence time of the sewage sludge is ten days at fifty-five to sixty degrees Celsius.
 - (e) Process to further reduce pathogens number five, beta ray irradiation. Sewage sludge is irradiated with beta rays from an accelerator at dosages of at least 1.0 megarad at room temperature (approximately twenty degrees Celsius).
 - (f) Process to further reduce pathogens number six, gamma ray irradiation. Sewage sludge is irradiated with gamma rays from certain isotopes, such as ^{60}Co cobalt and ^{137}Cs cesium, at dosages of at least 1.0 megarad at room temperature (approximately twenty degrees Celsius).
 - (g) Process to further reduce pathogens number seven, pasteurization. The temperature of the sewage sludge is maintained at seventy degrees Celsius or higher for thirty minutes or longer.

- (6) Alternative six, processes equivalent to a process to further reduce pathogens. Sewage sludge that is used or disposed shall be treated in a process equivalent to a process to further reduce pathogens as approved by the pathogen equivalency committee of the United States environmental protection agency.

(O) Class B pathogen reduction alternatives.

- (1) Alternative one, geometric mean of seven samples.
- (a) Seven representative samples of the sewage sludge that is used or disposed shall be collected.
 - (b) The geometric mean of the density of fecal coliform in the samples shall be less than either two million MPN per gram of total solids (dry weight basis) or two million colony forming units per gram of total solids (dry weight basis).
- (2) Alternative two, processes to significantly reduce pathogens. Sewage sludge that is used or disposed shall be treated in one of the following processes to significantly reduce pathogens.
- (a) Process to significantly reduce pathogens number one, 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 forty days at twenty degrees Celsius and sixty days at fifteen degrees Celsius.
 - (b) Process to significantly reduce pathogens number two, air drying. Sewage sludge is dried on sand beds or on paved or unpaved basins. The sewage sludge dries for a minimum of three months. During two of the three months, the ambient average daily temperature is above zero degrees Celsius.
 - (c) Process to significantly reduce pathogens number three, 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 fifteen days at thirty-five to fifty-five degrees Celsius and sixty days at twenty degrees Celsius.
 - (d) Process to significantly reduce pathogens number four, composting. Using either the in-vessel, static aerated pile or windrow composting methods, the temperature of the sewage sludge is raised to forty degrees Celsius or higher and remains at forty degrees Celsius or higher for five days. For four hours during the five days, the temperature of the sewage sludge exceeds fifty-five degrees Celsius. Such facility shall operate in accordance with the requirements of Chapters 3704. and 6111. of the Revised Code, section

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3745.11 of the Revised Code, and rules adopted thereunder. Such facility shall not be subject to the requirements of rules 3745-27-40 to 3745-27-47 of the Administrative Code and Chapter 3745-37 of the Administrative Code if all of the following conditions are met:

- (i) The owner or operator of the facility is the same owner or operator of the facility that generates the sewage sludge; and
 - (ii) The owner or operator of the facility co-composts sewage sludge exclusively with type A feedstock, bulking agents, or additives as defined in rules 3745-27-01 and 3745-27-40 of the Administrative Code.
- (e) Process to significantly reduce pathogens number five, lime treatment. Sufficient lime is added to the sewage sludge to raise the pH of the sewage sludge to twelve after two hours of contact.
- (3) Alternative three, processes equivalent to a process to significantly reduce pathogens. Sewage sludge that is used or disposed shall be treated in a process equivalent to a process to significantly reduce pathogens as approved by the pathogen equivalency committee of the United States environmental protection agency.
- (P) Site restrictions for sewage sludge treated by a class B pathogen reduction process.
- (1) Food crops with harvested parts that touch the sewage sludge/soil mixture and are totally above the land surface shall not be harvested for fourteen months after the application of sewage sludge.
 - (2) Food crops with harvested parts below the surface of the land shall not be harvested for twenty months after the application of sewage sludge when the sewage sludge remained on the land surface for four months or longer prior to incorporation into the soil.
 - (3) Food crops with harvested parts below the surface of the land shall not be harvested for thirty-eight months after the application of sewage sludge when the sewage sludge remained on the land surface for less than four months prior to incorporation into the soil.
 - (4) All other food crops, feed crops, and fiber crops shall not be harvested for thirty days after the application of sewage sludge.
 - (5) Animals shall not be grazed on the land for thirty days after the application of sewage sludge.

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- (6) Turf grown on land where sewage sludge is applied shall not be harvested for one year after the application of 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 director.
- (7) Public access to land with a high potential for public exposure shall be restricted for one year after the application of sewage sludge.
- (8) Public access to land with a low potential for public exposure shall be restricted for thirty days after the application of sewage sludge.

(Q) Vector attraction reduction options.

- (1) Vector attraction reduction option number one. The mass of volatile solids in the sewage sludge shall be reduced by a minimum of thirty-eight per cent.
- (2) Vector attraction reduction option number two. When the thirty-eight per cent volatile solids reduction requirement in paragraph (Q)(1) of this rule 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 forty additional days at a temperature between thirty and thirty-seven degrees Celsius. When at the end of the forty days the volatile solids in the sewage sludge at the beginning of that period is reduced by less than seventeen per cent, vector attraction reduction is achieved.
- (3) Vector attraction reduction option number three. When the thirty-eight per cent volatile solids reduction requirement in paragraph (Q)(1) of this rule 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 per cent solids of two per cent or less aerobically in the laboratory in a bench-scale unit for thirty additional days at twenty degrees Celsius. When at the end of the thirty days the volatile solids in the sewage sludge at the beginning of that period is reduced by less than fifteen per cent, vector attraction reduction is achieved.
- (4) Vector attraction reduction option number four. 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 twenty degrees Celsius.
- (5) Vector attraction reduction option number five. Sewage sludge shall be treated in an aerobic process for fourteen days or longer. During that time, the temperature of the sewage sludge shall be higher than forty degrees Celsius and the average temperature of the sewage sludge shall be higher than forty-five degrees Celsius.

- (6) Vector attraction reduction option number six. The pH of sewage sludge shall be raised to twelve or higher by alkali addition and, without the addition of more alkali, shall remain at twelve or higher for two hours and then at 11.5 or higher for an additional twenty-two hours.
- (7) Vector attraction reduction option number seven. The per cent solids of sewage sludge that does not contain unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than seventy-five per cent based on the moisture content and total solids prior to mixing with other materials.
- (8) Vector attraction reduction option number eight. The per cent solids of sewage sludge that contains unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than ninety per cent based on the moisture content and total solids prior to mixing with other materials.
- (9) Vector attraction reduction option number nine. Sewage sludge shall be injected below the surface of the land.
 - (a) No significant amount of the sewage sludge shall be present on the land surface within one hour after the sewage sludge is injected.
 - (b) 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) Vector attraction reduction option number ten. Immediate incorporation of sewage sludge.
 - (a) Sewage sludge applied to the land surface shall be incorporated into the soil within six hours after application to or placement on the land, unless otherwise specified by the director.
 - (b) 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.

Effective: October 1, 2007

R.C. 119.032 review date: October 1, 2012

Promulgated Under: R.C. 119.03

Statutory Authority: R.C. 6111.03, 6111.042

Rule Amplifies: R.C. 6111.03, 6111.042

Prior Effective Dates: 4/8/2002

[Comment: For dates of non-regulatory government publications, publications of recognized organizations and associations, federal rules and federal statutory provisions referenced in this rule, see rule 3745-40-01 of the Administrative Code.]

- (A) For land applied sewage sludge, the frequency of monitoring for the pollutants established in rule 3745-40-05 of the Administrative Code, the pathogen reduction requirements established in paragraphs (N)(1) to (N)(6) and (O)(1) of rule 3745-40-05 of the Administrative Code, and the vector attraction reduction requirements established in paragraphs (Q)(1) to (Q)(8) of rule 3745-40-05 of the Administrative Code, shall be in accordance with table A-1 of this rule.

-Table A-1-

Amount of sewage sludge generated (dry U.S. tons per calendar year)	Frequency of monitoring
Greater than zero but less than seventy	annually
Greater than or equal to seventy but less than three hundred twenty	semi-annually
Greater than or equal to three hundred twenty but less than one thousand six hundred fifty	quarterly
Greater than or equal to one thousand six hundred fifty but less than sixteen thousand five hundred	monthly
Greater than or equal to sixteen thousand five hundred	semi-monthly

- (B) For land applied sewage sludge, the frequency of monitoring for total Kjeldahl nitrogen, ammonia nitrogen, phosphorus, potassium, pH, and, when applicable for a liming material, effective neutralizing power, fineness index, and standard of fineness, shall be in accordance with table B-1 of this rule.

-Table B-1-

Amount of sewage sludge generated (dry U.S. tons per calendar year)	Frequency of monitoring
Greater than zero but less than seventy	annually
Greater than or equal to seventy but less than three hundred twenty	quarterly
Greater than or equal to three hundred twenty	monthly

- (1) The total Kjeldahl nitrogen, ammonia nitrogen, total phosphorus, and total potassium content of the sewage sludge shall be reported in milligrams per kilogram (dry weight basis); and
- (2) The total Kjeldahl nitrogen, available phosphorus, and soluble potassium content of the sewage sludge shall be reported as a "grade".

- (C) For land applied sewage sludge, the frequency of monitoring for the per cent total solids, per cent volatile solids, and weight in dry metric tons shall be in accordance with Table C-1 of this rule.

-Table C-1-

Amount of sewage sludge generated (dry U.S. tons per calendar year)	Frequency of monitoring
Greater than zero but less than seventy	monthly
Greater than or equal to seventy but less than three hundred twenty	weekly
Greater than or equal to three hundred twenty	daily

- (D) After the sewage sludge has been monitored for two years at the frequencies specified by this rule, the director may, upon request of the permittee, reduce the frequency of monitoring for the pollutants established in rule 3745-40-05 of the Administrative Code and for the pathogen density requirements established in paragraphs (N)(3)(b) and (N)(3)(f) of rule 3745-40-05 of the Administrative Code.
- (E) For authorized sites, the frequency of monitoring for soil pH and soil phosphorus level (Bray-Kurtz P1 extraction or Mehlich 3 extraction) shall be such that the most recent results are not more than two years old at the time of bulk sewage sludge land application.
- (F) Within six months of the effective date of this rule, and annually thereafter, all treatment works with an average daily final effluent flow greater than or equal to one million gallons per day shall monitor for dioxin in sewage sludge, as the term dioxin is defined in rule 3745-40-01 of the Administrative Code. Within six months of the effective date of this rule, and within six months of each NPDES permit renewal thereafter, all treatment works with an average daily final effluent flow greater than or equal to one hundred thousand gallons per day but less than one million gallons per day shall monitor for dioxin in sewage sludge, as the term dioxin is defined in rule 3745-40-01 of the Administrative Code. All analysis for dioxin in sewage sludge required in this rule shall be performed by a laboratory equipped to provide accurate results.
- (1) The 2, 3, 7, 8-TCDD total toxicity equivalence of the dioxin in sewage sludge, calculated from the twenty-nine dioxin congeners defined in rule 3745-40-01 of the Administrative Code, shall be reported as part of the permittees monthly operating report.
- (2) All dioxin in sewage sludge monitoring results shall be retained by the permittee for five years and shall be submitted to the division upon request. The results shall include the following:

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- (a) Total class concentrations of the dibenzo-p-dioxins and dibenzofurans in parts per trillion;
 - (b) Concentrations of the twenty-nine individual congeners in parts per trillion; and
 - (c) Calculation of the 2, 3, 7, 8-TCDD total toxicity equivalence in parts per trillion.
- (3) The following analytical methods shall be used for the analysis of dioxin in sewage sludge.

- (a) United States environmental protection agency method number 1613B shall be used for the seven 2, 3, 7, 8 chlorinated dibenzo-p-dioxin congeners and ten 2, 3, 7, 8 chlorinated dibenzofuran congeners.

[Comment: Method number 1613B may be obtained from: "National Technical Information Service No. PB93-236024, (800) 553-NITS, or Educational Resources Information Center Number W-105, (800) 443-ERIC".]

- (b) United States environmental protection agency method number 1668A (USEPA number 821/C-97-005821/C-97-005) shall be used for the twelve coplanar polychlorinated biphenyl congeners.

[Comment: Method number 1668A may be obtained from: "Office of Water Methods and Guidance Diskette 2, Office of Water Resource Center, (202) 260-7786".]

- (4) Non-detected values shall be reported as one half of the detection limit.
- (5) The toxicity equivalence factors (TEF) listed in table F-1 of this rule shall be used in the calculation of the 2, 3, 7, 8-TCDD total toxicity equivalence.

-Table F-1-

Congener	TEF
2, 3, 7, 8-tetrachlorodibenzo-p-dioxin	1.0
1, 2, 3, 7, 8-pentachlorodibenzo-p-dioxin	0.5
1, 2, 3, 4, 7, 8-hexachlorodibenzo-p-dioxin	0.1
1, 2, 3, 6, 7, 8-hexachlorodibenzo-p-dioxin	0.1
1, 2, 3, 7, 8, 9-hexachlorodibenzo-p-dioxin	0.1
1, 2, 3, 4, 6, 7, 8-heptachlorodibenzo-p-dioxin	0.01
1, 2, 3, 4, 6, 7, 8, 9-octachlorodibenzo-p-dioxin	0.001
2, 3, 7, 8-tetrachlorodibenzofuran	0.1
1, 2, 3, 7, 8-pentachlorodibenzofuran	0.05

2, 3, 4, 7, 8-pentachlorodibenzofuran	0.5
1, 2, 3, 4, 7, 8-hexachlorodibenzofuran	0.1
1, 2, 3, 6, 7, 8-hexachlorodibenzofuran	0.1
1, 2, 3, 7, 8, 9-hexachlorodibenzofuran	0.1
2, 3, 4, 6, 7, 8-hexachlorodibenzofuran	0.1
1, 2, 3, 4, 6, 7, 8-heptachlorodibenzofuran	0.01
1, 2, 3, 4, 7, 8, 9-heptachlorodibenzofuran	0.01
1, 2, 3, 4, 6, 7, 8, 9-octachlorodibenzofuran	0.001
3, 3', 4, 4'-tetrachlorobiphenyl	0.0001
3, 4, 4', 5-tetrachlorobiphenyl	0.0001
3, 3', 4, 4', 5-pentachlorobiphenyl	0.1
2, 3, 3', 4, 4'-pentachlorobiphenyl	0.0001
2, 3', 4, 4', 5-pentachlorobiphenyl	0.0001
2', 3, 4, 4', 5-pentachlorobiphenyl	0.0001
2, 3, 4, 4', 5-pentachlorobiphenyl	0.0005
3, 3', 4, 4', 5, 5'-hexachlorobiphenyl	0.01
2, 3, 3', 4, 4', 5-hexachlorobiphenyl	0.0005
2, 3, 3', 4, 4', 5'-hexachlorobiphenyl	0.0005
2, 3', 4, 4', 5, 5'-hexachlorobiphenyl	0.00001
2, 3, 3', 4, 4', 5, 5'-heptachlorobiphenyl	0.0001

(G) A permittee shall collect and analyze representative samples of sewage sludge in accordance with this rule. The following methods shall be used to analyze samples of sewage sludge and are adopted by reference in this chapter. Other methods may be used only if such methods are approved by the division.

- (1) Enteric viruses. ASTM designation: ASTM D 4994-89.
- (2) Fecal coliform. Part 9221 E. or part 9222 D., "Standard Methods for the Examination of Water and Wastewater".
- (3) Helminth ova. Yanko, W.A. "Occurrence of Pathogens in Distribution and Marketing Municipal Sludges".
- (4) Inorganic pollutants. "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods".
- (5) Salmonella sp. bacteria. Part 9260 D., "Standard Methods for the Examination of Water and Wastewater" 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, VA 22314.
- (6) Specific oxygen uptake rate. Part 2710 B., "Standard Methods for the Examination of Water and Wastewater".

- (7) Total, fixed, and volatile solids. Part 2540 G., "Standard Methods for the Examination of Water and Wastewater".
 - (8) Per cent volatile solids reduction. "Environmental Regulations and Technology - Control of Pathogens and Vector Attraction in Sewage Sludge".
- (H) The permittee who provides treatment to exceptional quality sewage sludge shall develop the following information, shall retain the information for five years, and shall make the information available to the division upon request:
- (1) The concentration of each pollutant listed in paragraph (F) of rule 3745-40-05 of the Administrative Code;
 - (2) A description of how the class A pathogen reduction requirements of rule 3745-40-05 of the Administrative Code are met;
 - (3) A description of how the vector attraction reduction requirements in paragraphs (Q)(1) to (Q)(8) of rule 3745-40-05 of the Administrative Code are met;
 - (4) The results of all other analyses required by paragraphs (A), (B), (C), (F), and (G) of this rule; and
 - (5) The following certification statement signed by the permittee:

"I certify, under penalty of law, that the information that will be used to determine compliance with class A pathogen reduction alternative (insert one of the class A alternatives in paragraphs (N)(1) to (N)(6) of rule 3745-40-05 of the Administrative Code) and vector attraction reduction requirement (insert one of the vector attraction reduction requirements in paragraphs (Q)(1) to (Q)(8) of rule 3745-40-05 of the Administrative Code) 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."
- (I) The permittee who provides treatment to bulk sewage sludge shall develop the following information, shall retain the information for five years, and shall make the information available to the division upon request:
- (1) The concentration of each pollutant listed in paragraph (F) of rule 3745-40-05 of the Administrative Code;
 - (2) A description of how the pathogen reduction requirements of rule 3745-40-05 of the Administrative Code are met;

- (3) When applicable, a description of how the vector attraction reduction requirements in paragraphs (Q)(1) to (Q)(8) of rule 3745-40-05 of the Administrative Code are met;
- (4) The results of all analyses required by paragraphs (A), (B), (C), (D), (F), and (G) of this rule; and
- (5) The following certification statement signed by the permittee:

"I certify, under penalty of law, that the information that will be used to determine compliance with class (insert A or B) pathogen reduction alternative (insert one of the class A alternatives in paragraphs (N)(1) to (N)(6) of rule 3745-40-05 of the Administrative Code or one of the class B alternatives in paragraphs (O)(1) to (O)(3) of rule 3745-40-05 of the Administrative Code) 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."; and

- (6) When applicable, the following certification statement signed by the permittee:

"I certify, under penalty of law, that the information that will be used to determine compliance with vector attraction reduction requirement (insert one of the vector attraction reduction requirements in paragraphs (Q)(1) to (Q)(8) of rule 3745-40-05 of the Administrative Code) 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."

- (J) The person who land applies bulk sewage sludge shall develop the following information, shall retain the information for five years, and shall make the information available to the division upon request:
 - (1) A description of how the land application agronomic management requirements of rule 3745-40-04 of the Administrative Code are met for each site on which bulk sewage sludge is applied;
 - (2) For class B sewage sludge, a description of how the site restrictions of rule 3745-40-05 of the Administrative Code are met for each site on which bulk sewage sludge is applied;
 - (3) When applicable, a description of how the vector attraction reduction requirements in paragraphs (Q)(9) to (Q)(10) of rule 3745-40-05 of the Administrative Code are met for each site on which bulk sewage sludge is applied;

- (4) The agronomic rate calculations used to determine the bulk sewage sludge loading rate in dry tons per acre for each site on which bulk sewage sludge is applied;
- (5) The following certification statement signed by the person who land applies bulk sewage sludge:

"I certify, under penalty of law, that the information that will be used to determine compliance with the land application agronomic management requirements of rule 3745-40-04 of the Administrative Code 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.";

- (6) When applicable, the following certification statement signed by the person who land applies bulk sewage sludge:

"I certify, under penalty of law, that the information that will be used to determine compliance with the site restrictions in rule 3745-40-05 of the Administrative Code 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."; and

- (7) When applicable, the following certification statement signed by the person who land applies bulk sewage sludge:

"I certify, under penalty of law, that the information that will be used to determine compliance with vector attraction reduction requirement (insert one of the vector attraction reduction requirements in paragraphs (Q)(9) to (Q)(10) of rule 3745-40-05 of the Administrative Code) was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

- (K) The person who land applies bulk sewage sludge subject to the cumulative pollutant loading rates of paragraph (F)(2) of rule 3745-40-05 of the Administrative Code shall develop the following information, shall retain the information indefinitely, and shall make the information available to the division upon request:

- (1) The location, by street address, latitude and longitude, or unique identification number, of each site on which bulk sewage sludge is applied;

- (2) The number of acres in each site on which bulk sewage sludge is applied;
- (3) The date bulk sewage sludge is applied to each site;
- (4) The amount of sewage sludge, in dry tons, applied to each site;
- (5) The cumulative amount of each pollutant listed in paragraph (F)(2) of rule 3745-40-05 of the Administrative Code applied to each site;
- (6) A description of how the requirements to obtain information in paragraph (G) of rule 3745-40-05 of the Administrative Code are met; and
- (7) The following certification statement signed by the permittee:

"I certify, under penalty of law, that the information that will be used to determine compliance with the requirement to obtain information in paragraph (G) of rule 3745-40-05 of the Administrative Code 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."

Effective: October 1, 2007

R.C. 119.032 review date: October 1, 2012

Promulgated Under: R.C. 119.03
Statutory Authority: R.C. 6111.03, 6111.042
Rule Amplifies: R.C. 6111.03, 6111.042
Prior Effective Dates: 4/8/2002

- (A) An NPDES permit may authorize the use of exceptional quality sewage sludge, as defined in rule 3745-40-01 of the Administrative Code, at a land reclamation site.
- (1) If the land reclamation site is under the jurisdiction of the Ohio department of natural resources, division of mineral resources management, a land reclamation plan, approved by the Ohio department of natural resources, division of mineral resources management, shall be required prior to the application of any exceptional quality sewage sludge to the land reclamation site.
 - (2) The director may specify in an NPDES permit any terms and conditions for the use of exceptional quality sewage sludge at a land reclamation site when the director has determined that such terms and conditions are necessary to protect public health and the environment.
- (B) A site specific NPDES permit shall authorize the use of sewage sludge, other than exceptional quality sewage sludge, at a land reclamation site.
- (1) If the land reclamation site is under the jurisdiction of the Ohio department of natural resources, division of mineral resources management, a land reclamation plan, approved by the Ohio department of natural resources, division of mineral resources management, shall be required prior to the submittal of an application to the director for a site specific NPDES permit.
 - (2) The director may specify in a site specific NPDES permit any terms and conditions for the use of sewage sludge, other than exceptional quality sewage sludge, at a land reclamation site when the director has determined that such terms and conditions are necessary to protect public health and the environment.
- (C) The agronomic rate may be exceeded during land reclamation projects using sewage sludge but shall not exceed sixty-five dry tons per acre, or the cumulative pollutant loading rates of paragraph (F) of rule 3745-40-05 of the Administrative Code, whichever is less.
- (D) The surface disposal of sewage sludge is prohibited.
- (E) Sewage sludge disposed in a sanitary landfill, as such is defined in rules adopted under section 3734.02 of the Revised Code and licensed under section 3734.05 of the Revised Code, shall, in addition to compliance with the requirements of this chapter, be in compliance with the rules adopted under Chapter 3734. of the Revised Code.
- (F) When sewage sludge is removed from a sewage sludge treatment lagoon, the disposal, use, storage, or further treatment of said sewage sludge shall be in accordance with this chapter.

- (G) Sewage sludge may be transferred to another facility provided that said facility has a valid NPDES permit for the disposal, use, storage, or treatment of sewage sludge.
- (H) For sewage sludge disposed in a sanitary landfill, contained in a sewage sludge treatment lagoon, or transferred to another facility, the frequency of monitoring for the per cent total solids, per cent volatile solids, and weight in dry metric tons shall be in accordance with table H-1 of this rule.

-Table H-1-

Amount of sewage sludge produced (dry U.S. tons per calendar year)	Frequency of monitoring
Greater than zero but less than seventy	monthly
Greater than or equal to seventy but less than three hundred twenty	weekly
Greater than or equal to three hundred twenty	daily

Effective: October 1, 2007

R.C. 119.032 review date: October 1, 2012

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