

**ARTICLE 10. ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM
DISPOSAL, USE, AND TRANSPORTATION OF BIOSOLIDS**

R18-9-1001. Definitions

In addition to the definitions in A.R.S. § 49-255 and A.A.C. R18-9-A901, the following terms apply to this Article:

1. "Aerobic digestion" means the biochemical decomposition of organic matter in biosolids into carbon dioxide and water by microorganisms in the presence of air.
2. "Agronomic rate" means the whole biosolids application rate on a dry-weight basis that meets the following conditions:
 - a. The amount of nitrogen needed by existing vegetation or a planned or actual crop has been provided, and
 - b. The amount of nitrogen that passes below the root zone of the crop or vegetation is minimized.
3. "Anaerobic digestion" means the biochemical decomposition of organic matter in biosolids into methane gas and carbon dioxide by microorganisms in the absence of air.
4. "Annual biosolids application rate" means the maximum amount of biosolids (dry-weight basis) that can be applied to an acre or hectare of land during a 365-day period.
5. "Annual pollutant loading rate" means the maximum amount of a pollutant that can be applied to an acre or hectare of land during a 365-day period.
6. "Applicator" means a person who arranges for and controls the site-specific land application of biosolids in Arizona.
7. "Biosolids" means sewage sludge, including exceptional quality biosolids, that is placed on, or applied to the land to use the beneficial properties of the material as a soil amendment, conditioner, or fertilizer. Biosolids do not include any of the following:
 - a. Sludge determined to be hazardous under A.R.S. Title 49, Chapter 5, Article 2 and 40 CFR 261;
 - b. Sludge with a concentration of polychlorinated biphenyls (PCBs) equal to or greater than 50 milligrams per kilogram of total solids (dry-weight basis);
 - c. Grit (for example, sand, gravel, cinders, or other materials with a high specific gravity) or screenings generated during preliminary treatment of domestic sewage by a treatment works;
 - d. Sludge generated during the treatment of either surface water or groundwater used for drinking water;
 - e. Sludge generated at an industrial facility during the treatment of industrial wastewater, including industrial wastewater combined with domestic sewage;
 - f. Commercial septage, industrial septage, or domestic septage combined with commercial or industrial septage;
or
 - g. Special wastes as defined and controlled under A.R.S. Title 49, Chapter 4, Article 9.
8. "Bulk biosolids" means biosolids that are transported and land-applied in a manner other than in a bag or other container holding biosolids of 1.102 short tons or 1 metric ton or less.
9. "Class I sludge management facility" means any POTW identified under 40 CFR 403.8(a) as being required to have an approved pretreatment program (including a POTW for which the Department assumes local program responsibilities under 40 CFR 403.10(e)) and any other treatment works treating domestic sewage classified as a Class I sludge management facility by the regional administrator in conjunction with the Director or by the Director because of the potential for its sludge use or disposal practices to adversely affect public health or the environment.
10. "*Clean water act*" means the federal water pollution control act amendments of 1972, as amended (P.L. 92-500; 86 Stat. 816; 33 United States Code sections 1251 through 1376). A.R.S. 49-201(6)
11. "Coarse fragments" means rock particles in the gravel-size range or larger.
12. "Coarse or medium sands" means a soil mixture of which more than 50% of the sand fraction is retained on a No. 40 (0.425 mm) sieve.
13. "Cumulative pollutant loading rate" means the maximum amount of a pollutant applied to a land application site.
14. "Domestic septage" means the liquid or solid material removed from a septic tank, cesspool, portable toilet, marine sanitation device, or similar system or device that receives only domestic sewage. Domestic septage does not include commercial or industrial wastewater or restaurant grease-trap wastes.
15. "Domestic sewage" means waste or wastewater from humans or household operations that is discharged to a publicly or privately owned treatment works. Domestic sewage also includes commercial and industrial wastewaters that are discharged into a publicly-owned or privately-owned treatment works if the industrial or commercial wastewater combines with human excreta and other household and nonindustrial wastewaters before treatment.
16. "Dry-weight basis" means the weight of biosolids calculated after the material has been dried at 105°C until reaching a constant mass.
17. "Exceptional quality biosolids" means biosolids certified under R18-9-1013(A)(6) as meeting the pollutant concentrations in R18-9-1005 Table 2, Class A pathogen reduction in R18-9-1006, and one of the vector attraction

- reduction requirements in subsections R18-9-1010(A)(1) through R18-9-1010(A)(8).
18. "Feed crops" means crops produced for animal consumption.
 19. "Fiber crops" means crops grown for their physical characteristics. Fiber crops, including flax and cotton, are not produced for human or animal consumption.
 20. "Food crops" means crops produced for human consumption.
 21. "Gravel" means soil predominantly composed of rock particles that will pass through a 3-inch (75 mm) sieve and be retained on a No. 4 (4.75 mm) sieve.
 22. "Industrial wastewater" means wastewater that is generated in a commercial or industrial process.
 23. "Land application," "apply biosolids," or "biosolids applied to the land" means spraying or spreading biosolids on the surface of the land, injecting biosolids below the land's surface, or incorporating biosolids into the soil to amend, condition, or fertilize the soil.
 24. "Monthly average" means the arithmetic mean of all measurements taken during a calendar month.
 25. "Municipality" means a city, town, county, district, association, or other public body, including an intergovernmental agency of two or more of the foregoing entities created by or under state law. The term includes special districts such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity that has as one of its principal responsibilities, the treatment, transport, use, or disposal of biosolids.
 26. "*Navigable waters*" means the waters of the United States as defined by section 502(7) of the clean water act (33 United States Code section 1362(7)). A.R.S. 49-201(21).
 27. "Other container" means a bucket, bin, box, carton, trailer, pickup truck bed, or a tanker vehicle or an open or closed receptacle with a load capacity of 1.102 short tons or one metric ton or less.
 28. "Pathogen" means a disease-causing organism.
 29. "*Person*" means an individual, employee, officer, managing body, trust, firm, joint stock company, consortium, public or private corporation, including a government corporation, partnership, association or state, a political subdivision of this state, a commission, the United States government or a federal facility, interstate body or other entity. A.R.S. § 49-201(26)
 30. "Person who prepares biosolids" means a person who generates biosolids during the treatment of domestic sewage in a treatment works, packages biosolids, or derives a new product from biosolids either through processing or by combining it with another material, including blending several biosolids together.
 31. "pH" means the logarithm of the reciprocal of the hydrogen ion concentration.
 32. "Pollutant" means an organic substance, an inorganic substance, a combination of organic and inorganic substances, or a pathogenic organism that, after release into the environment and upon exposure, ingestion, inhalation, or assimilation into an organism, either directly from the environment or indirectly by ingestion through the food chain, could cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction), or physical deformities in either organisms or reproduced offspring.
 33. "Pollutant limit" means:
 - a. A numerical value that describes the quantity of a pollutant allowed in a unit of biosolids such as milligrams per kilogram of total solids,
 - b. The quantity of a pollutant that can be applied to a unit area of land such as kilograms per hectare, or
 - c. The volume of biosolids that can be applied to a unit area of land such as gallons per acre.
 34. "Privately owned treatment works" means a device or system owned by a non-governmental entity used to treat, recycle, or reclaim, either domestic sewage or a combination of domestic sewage and industrial waste that is generated off-site.
 35. "Public contact site" means a park, sports field, cemetery, golf course, plant nursery, or other land with a high potential for public exposure to biosolids.
 36. "Reclamation" means the use of biosolids to restore or repair construction sites, active or closed mining sites, landfill caps, or other drastically disturbed land..
 37. "Responsible official" means a principal corporate officer, general partner, proprietor, or, in the case of a municipality, a principal executive official or any duly authorized agent.
 38. "Runoff" means rainwater, leachate, or other liquid that drains over any part of a land surface and runs off of the land surface.
 39. "Sand" means soil that contains more than 85% grains in the size range that will pass through a No. 4 (4.75 mm) sieve and be retained on a No. 200 (0.075 mm) sieve.
 40. "*Sewage sludge*":
 - (a) Means solid, semisolid or liquid residue that is generated during the treatment of domestic sewage in a treatment works.
 - (b) Includes domestic septage, scum or solids that are removed in primary, secondary or advanced wastewater

treatment processes, and any material derived from sewage sludge.

- (c) *Does not include ash that is generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings that are generated during preliminary treatment of domestic sewage in a treatment works.*
A.R.S. 49-255(6)

41. "Sewage sludge unit" means 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 navigable waters.
42. "Specific oxygen uptake rate (SOUR)" means the mass of oxygen consumed per unit time per unit mass of total solids (dry-weight basis) in biosolids.
43. "Store biosolids" or "storage of biosolids" means the temporary holding or placement of biosolids on land before land application.
44. "Surface disposal site" means an area of land that contains one or more active sewage sludge units.
45. "Ton" means a net weight of 2000 pounds and is known as a short ton.
46. "Total solids" means the biosolids material that remains when sewage sludge is dried at 103°C to 105°C.
47. "Treatment of biosolids" means the thickening, stabilization, dewatering, and other preparation of biosolids for land application. Storage is not a treatment of biosolids.
48. "Unstabilized solids" means the organic matter in biosolids that has not been treated or reduced through an aerobic or anaerobic process.
49. "Vectors" means rodents, flies, mosquitos, or other organisms capable of transporting pathogens.
50. "Volatile solids" means the amount of total solids lost when biosolids are combusted at 550°C in the presence of excess air.
51. "Wetlands" means those areas that are inundated or saturated by surface water or groundwater at a frequency and duration to support, and do under normal circumstances support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, cienegas, tinajas, and similar areas.

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R18-9-1002. Applicability and Prohibitions

- A. This Article applies to:
 1. Any person who:
 - a. Prepares biosolids for land application or disposal in a sewage sludge unit,
 - b. Transports biosolids for land application or disposal in a sewage sludge unit,
 - c. Applies biosolids to the land,
 - d. Owns or operates a sewage sludge unit, or
 - e. Owns or leases land to which biosolids are applied,
 2. Biosolids applied to the land or placed on a surface disposal site,
 3. Land where biosolids are applied, and
 4. A surface disposal site.
- B. The land application of biosolids in a manner consistent with this Article is exempt from the requirements of the aquifer protection program established under A.R.S. Title 49, Chapter 2, Article 3 and 18 A.A.C. 9, Articles 1, 2, and 3.
- C. Except as provided in subsection (D), the land application of biosolids in a manner that is not consistent with Articles 9 and 10 of this Chapter is prohibited.
- D. The Department may permit the land application of biosolids in a manner that differs from the requirements in R18-9-1007 and R18-9-1008 if the land application is permitted under the aquifer protection permit program established under A.R.S. Title 49, Chapter 2, Article 3, and 18 A.A.C. 9, Articles 1, 2, and 3.
- E. Surface disposal site.
 1. Any person who prepares biosolids that are placed in a sewage sludge unit, or places biosolids in a sewage sludge unit, or who owns or operates a biosolids surface disposal site shall comply with 40 CFR 503, Subpart C, which is incorporated by reference in R18-9-A905(A)(9), and
 - a. The pathogen reduction requirements in R18-9-1006, and
 - b. The vector attraction reduction requirements in R18-9-1010.
 2. In addition to the requirements under subsection (E)(1), any person who owns or operates a biosolids surface disposal site shall apply for, and obtain, a permit under 18 A.A.C. 9, Articles 1 and 2.
- F. A person shall not apply bulk biosolids to the land or place bulk biosolids in a surface disposal site if the biosolids are likely to adversely affect a threatened or endangered species as listed under section 4 of the Endangered Species Act (16 U.S.C. 1533), or its designated critical habitat as defined in 16 U.S.C. 1532.
- G. The incineration of biosolids is prohibited.

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R18-9-1003. General Requirements

- A. A person shall not use or transport biosolids, apply biosolids to land, or place biosolids on a surface disposal site in Arizona, except as established in this Article.
- B. The management practices in R18-9-1007 and R18-9-1008 do not apply if biosolids are exceptional quality biosolids.
- C. The applicator shall obtain, submit to the Department, and maintain the information required to comply with the requirements of this Article.
- D. The applicator shall not receive bulk biosolids without prior written confirmation of the filing of a "Request for Registration" under R18-9-1004.
- E. The land owner or lessee of land on which bulk biosolids, that are not exceptional quality biosolids, have been applied shall notify any subsequent land owner and lessee of all previous land applications of biosolids and shall disclose any site restrictions listed in R18-9-1009 that are in effect at the time the property is transferred.
- F. A person who prepares biosolids shall ensure that the applicable requirements in this Article are met when the biosolids are applied to the land or placed on a surface disposal site.
- G. If necessary to protect public health and the environment from any adverse effect of a pollutant in the biosolids, the Department may impose, on a case-by-case basis, requirements for the use or disposal of biosolids, including exceptional quality biosolids, in addition to, or more stringent than, the requirements in this Article. The Department shall notify the preparer, applier, or land owner of these requirements by letter and include the justification for the requirements and the length of time or applicability for the requirements.

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R18-9-1004. Applicator Registration, Bulk Biosolids

- A. Any person intending to land-apply bulk biosolids in Arizona shall submit, on a form provided by the Department, a completed "Request for Registration."
- B. An applicator shall not engage in land application of bulk biosolids, unless the applicator has obtained a prior written acknowledgment of the Request for Registration or a supplemental request from the Department.
- C. The Request for Registration for all biosolids, except exceptional quality biosolids, shall include:
 - 1. The name, address, and telephone number of the applicator and any agent of the applicator;
 - 2. The name and telephone number of a primary contact person who has specific knowledge of the land application activities of the applicator;
 - 3. Whether the applicator holds a NPDES or AZPDES permit, and, if so, the permit number;
 - 4. The identity of the person, if different from the applicator, including the NPDES or AZPDES permit number, who will prepare the biosolids for land application; and
 - 5. The following information, unless the information is already on file at the Department as part of an approved land application plan, for each site on which application is anticipated to take place:
 - a. The name, mailing address, and telephone number of the land owner and lessee, if any;
 - b. The physical location of the site by county;
 - c. The legal description of the site, including township, range, and section, or latitude and longitude at the center of each site;
 - d. The number of acres or hectares at each site to be used;
 - e. Except for sites described in R18-9-1005(D)(2)(c), background concentrations of the pollutants listed in Table 4 of R18-9-1005 from representative soil samples;
 - f. The location of any portion of the site having a slope greater than 6%; and
 - g. Public notice. Proof of placement of a public notice announcing the potential use of the site for the application of biosolids when a site has not previously received biosolids, or when a site has not been used for land application for at least three consecutive years.
 - i. The notice shall appear at least once each week for at least two consecutive weeks in the largest newspaper in general circulation in the area in which the site is located.
 - ii. If a site is not used for land application for at least three consecutive years, the applicator shall renounce the site following the process described in subsection (C)(5)(g)(i) before its reuse.
- D. The Request for Registration for exceptional quality biosolids shall include the information in subsections (C)(1) through (C)(4).
- E. A responsible official of the applicator shall sign the Request for Registration.
- F. The Department shall mail a written acknowledgment of a Request for Registration or supplemental request, within 15 business days of receipt of the request.
- G. An applicator wishing to use a site that has not been identified in a Request for Registration shall file a supplemental request

with the Department before using the new site. Public notice requirements under R18-9-1004(C)(5)(g) apply.

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R18-9-1005. Pollutant Concentrations

- A. A person shall not apply biosolids with pollutant concentrations that exceed any of the ceiling concentrations established in Table 1.
- B. A person shall not apply biosolids sold or given away in a bag or other container that are not exceptional quality biosolids to a site if any annual pollutant loading rate in Table 3 will be exceeded. A person shall determine annual application rates using the methodology established in Appendix A.
- C. A person shall not apply bulk biosolids to a lawn or garden unless the biosolids are exceptional quality biosolids.
- D. Unless using exceptional quality biosolids, a person shall not apply bulk biosolids to a site when:
 - 1. The pollutant concentrations exceed the levels in Table 2, or
 - 2. Any cumulative pollutant loading rate in Table 4 will be exceeded. A person shall determine compliance with the site cumulative pollutant loading rates using the following:
 - a. By identifying all known biosolids application events and information relevant to a site since September 13, 1979.
 - b. By calculating the existing cumulative level of the pollutants established in Table 4 using actual analytical data from the application events or if actual analytical data from application events before April 1996 are not available, background concentrations determined by taking representative soil samples of the site, if it is known that the site received biosolids before April 1996.
 - c. Background soil tests are not required for those sites that have not received biosolids before April 23, 1996.

Table 1. Ceiling Concentrations

Pollutant	Ceiling concentrations (milligrams per kilogram) (1)
Arsenic	75.0
Cadmium	85.0
Chromium	3000.0
Copper	4300.0
Lead	840.0
Mercury	57.0
Molybdenum	75.0
Nickel	420.0
Selenium	100.0
Zinc	7500.0

(1) Dry-weight basis.

Table 2. Monthly Average Pollutant Concentrations

Pollutant	Concentration limits (milligrams per kilogram) (1)
Arsenic	41.0
Cadmium	39.0
Copper	1500.0
Lead	300.0
Mercury	17.0
Nickel	420.0
Selenium	100.0
Zinc	2800.0

(1) Dry-weight basis.

Table 3. Annual Pollutant Loading Rates

Pollutant	Annual pollutant loading rates (in kilograms per hectare)
Arsenic	2.0
Cadmium	1.9
Copper	75.0
Lead	15.0
Mercury	0.85
Nickel	21.0
Selenium	5.0
Zinc	140.0

Table 4. Cumulative Pollutant Loading Rates

Pollutant	Cumulative pollutant loading rates (in kilograms per hectare)
Arsenic	41.0
Cadmium	39.0
Copper	1500.0
Lead	300.0
Mercury	17.0
Nickel	420.0
Selenium	100.0
Zinc	2800.0

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R18-9-1006. Class A and Class B Pathogen Reduction Requirements

- A. An applicator shall ensure that all biosolids applied to land meet Class A or Class B pathogen reduction requirements at the time the biosolids are:
 - 1. Placed on an active sewage sludge unit unless the biosolids are covered with soil or other material at the end of each operating day, or
 - 2. Land applied.
- B. Biosolids that are sold or given away in a bag or other container for land application, or that are applied on a lawn or home garden, shall meet the Class A pathogen reduction requirements established in subsection (D).
- C. Land on which biosolids with Class B pathogen reduction requirements are applied is subject to the use restrictions established in R18-9-1009.
- D. Biosolids satisfy the Class A pathogen reduction requirements when the density of fecal coliform is less than 1000 Most Probable Number per gram of total solids (dry-weight basis), or the density of *Salmonella sp.* bacteria is less than three Most Probable Number per four grams of total solids (dry-weight basis), and any one of the following alternative pathogen treatment options is used:
 - 1. Alternative 1. The pathogen treatment process meets one of the following time and temperature requirements:
 - a. When the percent solids of the biosolids are seven percent or greater, the temperature of the biosolids shall be held at 50°C or higher for at least 20 minutes. The temperature and time period is determined using the equation in subsection (D)(1)(b), except when small particles of the biosolids are heated by either warmed gases or an immiscible liquid;
 - b. When the percent solids of the biosolids are seven percent or greater, and small particles of the biosolids are heated by either warmed gases or an immiscible liquid, a temperature of 50°C or higher shall be held for 15 seconds or longer. The temperature and time period is determined using the following equation:

$$D = \frac{131,700,000}{10^{[0.1400t]}}$$
 D = time in days and t = temperature in degrees Celsius;
 - c. When the percent solids of the biosolids are less than seven percent, the temperature of the biosolids is 50°C

or higher and the time period is 30 minutes or longer. The temperature and time period shall be determined using the following equation:

$$D = \frac{50,070,000}{10^{[0.1400t]}}$$

D = time in days and t = temperature in degrees Celsius; or

- d. When the percent solids of the biosolids are less than seven percent, and the time of heating is at least 15 seconds, but less than 30 minutes, the time and temperature is determined using the following equation:

$$D = \frac{131,700,000}{10^{[0.1400t]}}$$

D = time in days and t = temperature in degrees Celsius.

2. Alternative 2. The pathogen treatment process meets all the following parameters:
 - a. The pH of the quantity of biosolids treated is raised to 12 or higher and held at least 72 hours;
 - b. During the period that the pH is above 12, the temperature of the biosolids is held above 52°C for at least 12 hours; and
 - c. At the end of the 72-hour period during which the pH is above 12, the biosolids are air dried to achieve a percent solids in the biosolids greater than 50%.
3. Alternative 3. The following conditions are met:
 - a. The biosolids, before pathogen treatment and until the next monitoring event, have an enteric virus density less than one plaque-forming unit for four grams of total solids (dry-weight basis);
 - b. The biosolids, before pathogen treatment and until the next monitoring event, have a viable helminth ova density less than one for four grams of total solids (dry-weight basis); and
 - c. Once the density requirements in subsections (D)(3)(a) and (D)(3)(b) are consistently met after pathogen treatment and the values and ranges of the pathogen treatment process used are documented, the biosolids continue to be Class A with respect to enteric viruses and viable helminth ova when the values for the pathogen treatment process operating parameters are consistent with the previously documented values or ranges of values.
4. Alternative 4. The following requirements are met at the time the biosolids are used or disposed or at the time the biosolids are prepared for sale or given away in a bag or other container for application to the land:
 - a. The biosolids have an enteric virus density less than one plaque-forming unit for four grams of total solids (dry-weight basis), and
 - b. The biosolids have a viable helminth ova density less than one for four grams of total solids (dry-weight basis).
5. Alternative 5. Composting.
 - a. Use either the within-vessel or the static-aerated-pile composting method, maintaining the temperature of the biosolids at 55°C or higher for three days; or
 - b. Use the windrow composting method, maintaining the temperature of the biosolids at 55°C or higher for at least 15 days. The windrow shall be turned at least five times when the compost is maintained at 55°C or higher.
6. Alternative 6. Heat drying. The biosolids are dried by direct or indirect contact with hot gases to reduce the moisture content to 10% or lower by weight. During the process:
 - a. The temperature of the sewage sludge particles shall exceed 80°C, or
 - b. The wet bulb temperature of the gas as the biosolids leave the dryer shall exceed 80°C.
7. Alternative 7. Heat treatment. The quantity of liquid biosolids treated are heated to a temperature of 180°C or higher for at least 30 minutes.
8. Alternative 8. Thermophilic aerobic digestion. Liquid biosolids are agitated with air or oxygen to maintain aerobic conditions and the mean cell residence time of the biosolids is 10 days at 55° to 60°C.
9. Alternative 9. Beta ray irradiation. Biosolids are irradiated with beta rays from an accelerator at dosages of at least 1.0 megarad at room temperature (approximately 20°C).
10. Alternative 10. Gamma ray irradiation. Biosolids are irradiated with gamma rays from certain isotopes, such as ⁶⁰Cobalt and ¹³⁷Cesium at dosages of at least 1.0 megarad at room temperature (approximately 20°C).
11. Alternative 11. Pasteurization. The temperature of the biosolids is maintained at 70°C or higher for at least 30 minutes.
12. Alternative 12. The Director shall approve another process if the process is equivalent to a Process to Further Reduce Pathogens specified in subsections (D)(5) through (D)(11), as determined by the EPA Pathogen Equivalency Committee.

- E. Biosolids satisfy the Class B pathogen reduction requirements when the biosolids meet any one of the following options:
1. Alternative 1. The geometric mean of the density of fecal coliform in seven representative samples is 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);
 2. Alternative 2. Air drying. The biosolids are dried on sand beds or paved or unpaved basins for at least 3 three months. During at least two of the three months, the ambient average daily temperature is above 0°C;
 3. Alternative 3. Lime stabilization. Sufficient lime is added to the biosolids to raise the pH of the biosolids to 12 after at least two hours of contact;
 4. Alternative 4. Aerobic digestion. The biosolids are agitated with air or oxygen to maintain aerobic conditions for a specific mean cell residence time at a specific temperature between 40 days at 20°C and 60 days at 15°C;
 5. Alternative 5. Anaerobic digestion. The biosolids are treated in the absence of air for a specific mean cell residence time at a specific temperature between 15 days at 35°C to 55°C and 60 days at 20°C;
 6. Alternative 6. Composting. Using the within-vessel, static-aerated-pile or windrow composting methods, the temperature of the biosolids is raised to 40°C or higher for five consecutive days. For at least four hours during the five days, the temperature in the compost pile exceeds 55°C; or
 7. Alternative 7. The Director shall approve another process if it is equivalent to a Process to Significantly Reduce Pathogens specified in subsections (E)(2) through (E)(6), as determined by the EPA Pathogen Equivalency Committee.
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R18-9-1007. Management Practices and General Requirements

- A. An applicator of bulk biosolids that are not exceptional quality biosolids shall comply with the following management practices at each land application site, except a site where bulk biosolids are applied for reclamation. The applicator shall not:
1. Apply bulk biosolids to soil with a pH less than 6.5 at the time of the application, unless the biosolids are treated under one of the procedures in subsections R18-9-1006(D)(2), R18-9-1006(E)(3), or R18-9-1010(A)(6), or the soil and biosolids mixture has a pH of 6.5 or higher immediately after land application;
 2. Apply bulk biosolids to land with slopes greater than 6%, unless the site is operating under an AZPDES permit or a permit issued under section 402 of the Clean Water Act (33 U.S.C. 1342);
 3. Apply bulk biosolids to land under the following conditions:
 - a. Bulk biosolids with Class A pathogen reduction. If the depth to groundwater is five feet (1.52 meters) or less;
 - b. Bulk biosolids with Class B pathogen reduction.
 - i. If the depth to groundwater is 10 feet (3.04 meters) or less; or
 - ii. To gravel, coarse or medium sands, or sands with less than 15% coarse fragments, if the depth to groundwater is 40 feet (12.2 meters) or less from the point of application of biosolids;
 4. Apply bulk biosolids to land that is 32.8 feet (10 meters) or less from navigable waters;
 5. Store or apply bulk biosolids closer than 1000 feet (305 meters) from a public or semi-public drinking water supply well or no closer than 250 feet (76.2 meters) from any other water well;
 6. Store or apply bulk biosolids within 25 feet (7.62 meters) of a public right-of-way or private property line unless the applicator receives permission to apply bulk biosolids from the land owner or lessee of the adjoining property;
 7. Apply bulk biosolids at an application rate greater than the agronomic rate of the vegetation or crop grown on the site;
 8. Apply domestic septage or any other bulk biosolids with less than 10% solids at a rate that exceeds the annual application rate, calculated in gallons per acre for a 365-day period by dividing the amount of nitrogen needed by the crop or vegetation grown on the land, in pounds per acre per 365-day period, by 0.0026;
 9. Apply bulk biosolids to land that is flooded, frozen, or snow-covered, so that the bulk biosolids enter a wetland or other navigable waters, except as provided in an AZPDES permit or a permit issued under section 402 of the Clean Water Act (33 U.S.C. 1342);
 10. Apply any additional bulk biosolids before a crop is grown on the site if the site has received biosolids containing nitrogen at the equivalent of the agronomic rate appropriate for that crop;
 11. Exceed the irrigation needs of the crop of an application site;
 12. To minimize odors, apply bulk biosolids within 1000 feet (305 meters) of a dwelling unless the biosolids are injected or incorporated into the soil within 10 hours of being applied; or
 13. Store bulk biosolids within 1000 feet (305 meters) of a dwelling unless the applicator obtains permission from the dwelling owner or lessee to store the biosolids at a shorter distance from the dwelling. If the dwelling owner or lessee changes, the applicator shall obtain permission from the new dwelling owner or lessee to continue to store the bulk biosolids within 1000 feet of the dwelling or move the biosolids to a location at least 1000 feet from the dwelling.
- B. If biosolids are placed in a bag or other container, the person who prepares the biosolids shall distribute a label or information sheet to the person receiving the material. This label or information sheet shall, at a minimum, contain the following

information:

1. The identity and address of the person who prepared the biosolids;
2. Instructions on the proper use of the material, including agronomic rates and an annual application rate that ensures that the annual pollutant rates established in R18-9-1005 are not exceeded; and
3. A statement that application of biosolids to the land shall not exceed application rates described in the instructions on the label or information sheet.

Effective May 24, 2001; amended January 5, 2003

R18-9-1008. Management Practices, Application of Biosolids to Reclamation Sites

- A. An applicator of bulk biosolids that are not exceptional quality biosolids shall comply with the following management practices at each land application site where the bulk biosolids are applied for reclamation. The applicator shall not:
1. Apply bulk biosolids unless the soil and biosolids mixture has a pH of 5.0 or higher immediately after land application;
 2. Apply bulk biosolids to land with slopes greater than 6% unless:
 - a. The site is operating under an AZPDES permit or a permit issued under section 402 (33 U.S.C. 1342) or 404 (33 U.S.C. 1344) of the Clean Water Act;
 - b. The site is reclaimed as specified under A.R.S. Title 27, Chapter 5, and controls are in place to prevent runoff from leaving the application area; or
 - c. Runoff from the site does not reach navigable waters;
 3. Apply bulk biosolids to land under the following conditions:
 - a. Bulk biosolids with Class A pathogen reduction. To land if the depth to groundwater is 5 feet (1.52 meters) or less;
 - b. Bulk biosolids with Class B pathogen reduction.
 - i. To land if the depth to groundwater is 10 feet (3.04 meters) or less; and
 - ii. To gravel, coarse or medium sands, or sands with less than 15% coarse fragments if the depth to groundwater is 40 feet (12.2 meters) or less from the point of application of biosolids;
 4. Apply bulk biosolids to land that is 32.8 feet (10 meters) or less from navigable waters;
 5. Store or apply bulk biosolids closer than 1000 feet (305 meters) from a public or semi-public drinking water supply well, unless the applicator justifies and the Department approves a shorter distance, or apply bulk biosolids closer than 250 feet (76.2 meters) from any other water well;
 6. Store or apply bulk biosolids within 1000 feet (305 meters) of a public right-of-way or private property line unless the applicator receives permission to apply bulk biosolids from the land owner or lessee of the adjoining property;
 7. Exceed a total of 150 dry tons per acre to any portion of a reclamation site if bulk biosolids are applied;
 8. Apply bulk biosolids with less than 10% solids;
 9. Apply bulk biosolids to land that is flooded, frozen, or snow-covered so that the bulk biosolids enter a wetland or other navigable waters, except as provided in an AZPDES permit or a permit issued under section 402 (33 U.S.C. 1342) or 404 (33 U.S.C. 1344) of the Clean Water Act;
 10. Apply more water than necessary to control dust and establish vegetation; and
 11. Apply bulk biosolids within 1000 feet (305 meters) of a dwelling unless the biosolids are injected or incorporated into the soil within 10 hours of being applied.
 12. Store bulk biosolids within 1000 feet (305 meters) of a dwelling unless the applicator obtains permission from the dwelling owner or lessee to store the biosolids at a shorter distance from the dwelling. If the dwelling owner or lessee changes, the applicator shall obtain permission from the new dwelling owner or lessee to continue to store the bulk biosolids within 1000 feet of the dwelling or move the biosolids to a location at least 1000 feet from the dwelling.
- B. The requirements of R18-9-1007(B) apply if biosolids placed in a bag or other container are used to reclaim a site.

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R18-9-1009. Site Restrictions

- A. The following site restrictions apply to land where biosolids, which do not meet the Class A pathogen reduction requirements established in R18-9-1006, are land-applied.
1. A person shall not:
 - a. Harvest food crop parts that touch the biosolids, or biosolids and soil mixture, but otherwise grow above the land's surface for 14 months following application;
 - b. Harvest food crop parts growing in or below the land's surface for 20 months following application if the biosolids remain unincorporated on the land's surface for four months or more;
 - c. Harvest food crop parts growing in or below the land's surface for 38 months following application if the

- biosolids remain on the land's surface for less than four months before incorporation;
 - d. Harvest food, feed, and fiber crops for 30 days after application;
 - e. Graze animals on the land for 30 days after application; or
 - f. Harvest turf to be used at a public contact site or private residence for one year after application.
 - 2. A person shall restrict public access to:
 - a. Public contact sites for one year after application, and
 - b. Land with a low potential for public exposure for 30 days after application.
- B. If the vector attraction reduction requirement is met using the method:
 - 1. In R18-9-1010(C)(1) or R18-9-1010(C)(2), the requirements of subsection (A) apply to domestic septage applied to agricultural land, forests, or reclamation sites; or
 - 2. In R18-9-1010(C)(3), the requirements of subsection (A)(1)(a) through (A)(1)(d) apply to domestic septage applied to agricultural land, forests, or reclamation sites.
- C. Once application is completed at a site, the applicator shall, in writing, provide the land owner and lessee with the following information:
 - 1. The cumulative pollutant loading at the site if it is greater than or equal to 90% of the available site capacity established in Table 4 of R18-9-1005;
 - 2. Any restriction established in this Section that applies to the property and the nature of the restriction; and
 - 3. The signature of a responsible official of the applicator on this document that includes the following statement:
 "I certify under penalty of law, that the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for false representations, including fines and imprisonment."
- D. The land owner or lessee shall provide each applicator with a signature indicating receipt of the site restriction statement.

Effective May 24, 2001

R18-9-1010. Vector Attraction Reduction

- A. Except as provided in subsection (B), an applicator or person who prepares biosolids shall use one of the following vector attraction reduction procedures if biosolids are land-applied:
 - 1. Reducing the mass of volatile solids by a minimum of 38% using the calculation procedures established in "Environmental Regulations and Technology -- Control of Pathogens and Vector Attraction in Sewage Sludge," EPA/625/R-92-013, published by the U.S. Environmental Protection Agency, Cincinnati, Ohio 45268, 1999 edition. This material is incorporated by reference, does not include any later amendments or editions of the incorporated matter, and is on file with the Department and the Office of the Secretary of State;
 - 2. If the 38% volatile solids reduction cannot be met for anaerobically digested biosolids the reduction can be met by digesting a portion of the previously digested material anaerobically in a laboratory in a bench-scale unit for 40 additional days at a temperature between 30°C and 37°C. Vector attraction reduction is achieved if, at the end of the 40 days, the volatile solids in the material at the beginning of the period are reduced by less than 17%;
 - 3. If the 38% volatile solids reduction cannot be met for aerobically digested biosolids, the reduction can be met by digesting a portion of the previously digested material, which has a percent solids of 2% or less, aerobically in a laboratory in a bench-scale unit for 30 additional days at 20°C. Vector attraction reduction is achieved if, at the end of the 30 days, the volatile solids in the material at the beginning of the period are reduced by less than 15%;
 - 4. Treat the biosolids in an aerobic process during which the specific oxygen uptake rate (SOUR) is equal to or less than 1.5 milligrams of oxygen per hour per gram of total solids (dry-weight basis) at 20°C;
 - 5. Treat the biosolids in an aerobic process for 14 days or longer, during which the temperature of the biosolids is higher than 40°C and the average temperature of the biosolids is higher than 45°C;
 - 6. Raising the pH of the biosolids to 12 or higher by alkali addition and, without the addition of more alkali, remain at 12 or higher for two hours and at 11.5 or higher for an additional 22 hours;
 - 7. The percent solids of the biosolids that do not contain unstabilized solids generated in a primary wastewater treatment process is equal to or greater than 75% based on the moisture content and total solids before mixing with other materials;
 - 8. The percent solids of the biosolids containing unstabilized solids generated in a primary wastewater treatment process are equal to or greater than 90% based on the moisture content and total solids before mixing with other materials;
 - 9. Injecting the biosolids below the surface of the land so that no significant amount of biosolids is present on the land surface one hour after injection. If the biosolids meet Class A pathogen reduction, injection shall occur within eight hours after being discharged from a Class A pathogen treatment process; or
 - 10. Incorporating the biosolids into the soil within six hours after application. If the biosolids meet Class A pathogen reduction, application shall occur within eight hours after being discharged from a Class A pathogen treatment process.

- B. Biosolids that are sold or given away in a bag or other container, or are applied to a lawn or home garden, shall meet one of the vector attraction reduction alternatives established in subsections (A)(1) through (A)(8).
- C. For domestic septage, vector attraction reduction is met by one of the following methods:
 1. By injecting as specified in subsection (A)(9);
 2. By incorporating as specified in subsection (A)(10); or
 3. By raising the pH of the domestic septage to 12 or higher through the addition of alkali and, without the addition of more alkali, holding the pH at 12 or higher for at least 30 minutes.

Effective May 24, 2001

R18-9-1011. Transportation

- A. A transporter of bulk biosolids into and within Arizona shall use covered trucks, trailers, rail-cars, or other vehicles that are leakproof.
- B. A transporter of bulk biosolids in liquid or semisolid form, including domestic septage, into and within Arizona shall comply with the requirements in A.A.C. R18-8-612. A transporter of bulk biosolids in solid form into and within Arizona shall comply with the requirements in A.A.C. R18-13-310.
- C. A transporter of biosolids shall clean any truck, trailer, rail-car, or other vehicle used to transport biosolids to prevent odors or insect breeding. A transporter shall clean any tank vessel used to transport commercial or industrial septage or restaurant grease-trap wastes, that is also used to haul domestic septage, before loading the domestic septage to ensure that mixing of wastes does not occur.
- D. If bulk biosolids are spilled while being transported, the transporter shall:
 1. Immediately pick up any spillage, including any visibly discolored soil, unless otherwise determined by the Department on a case-by-case basis;
 2. Within 24 hours after the spill, notify the Department of the spill and submit written notification of the spill within seven days. The written notification shall include the location of the spill, the reason it occurred, the amount of biosolids spilled, and the steps taken to clean up the spill.

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R18-9-1012. Self-monitoring

- A. Except as provided in subsection (B) the person who prepares the biosolids shall conduct self-monitoring events at the frequency listed in Table 5 for the pollutants listed in R18-9-1005, the pathogen reduction in R18-9-1006 and the vector attraction reduction requirements in R18-9-1010.

Table 5. -- Frequency of Self-monitoring

Amount of biosolids prepared (tons/metric tons per 365-day period⁽¹⁾)	Frequency
Greater than zero but less than 319.6/290	Once per year
Equal to or greater than 319.6/290 but less than 1,653/1,500	Once per quarter (Four times per year)
Equal to or greater than 1,653/1,500 but less than 16,530/15,000	Once per 60 days (Six times per year)
Equal to or greater than 16,530/15,000	Once per month (12 times per year)

⁽¹⁾ The amount of biosolids prepared in a calendar year (dry-weight basis).

- B. If biosolids are stockpiled or lagooned, the person shall sample the biosolids for pathogen and vector attraction reduction before land application. A person shall sample in a manner that is representative of the entire stockpile or lagoon.
- C. A person who prepares biosolids shall submit additional or more frequent biosolids samples, collected and analyzed during the reporting period, to the Department with the regularly-scheduled data required in subsection (A).
- D. The Department may order the person who prepares biosolids or the applicator to collect and analyze additional samples to measure pollutants of concern other than those established in Table 1 of R18-9-1005.
- E. The applicator, person who prepares biosolids, or a person collecting samples for the applicator or preparer for analysis shall obtain the samples in a manner that does not compromise the integrity of the sample, sample method, or sampling instrument and shall be representative of the quality of the biosolids being applied during the reporting period.

- F. A person responsible for sampling the biosolids shall track biosolids samples using a chain-of-custody procedure that documents each person in control of the sample from the time it was collected through the time of analysis.
- G. The person who prepares biosolids or the applicator shall ensure that the biosolids samples are analyzed as specified by the analytical methods established in 40 CFR 503.8, July 1, 2001 edition, or by the wastewater sample methods and solid, liquid, and hazardous waste sample methods established in A.A.C. R9-14-612 and R9-14-613. The person who prepares the biosolids or the applicator shall ensure that the biosolids analyses are performed at a laboratory operating in compliance with A.R.S. § 36-495 et seq. The information in 40 CFR 503.8 is incorporated by reference, does not include any later amendments or editions of the incorporated matter and is on file with the Department and the Office of the Secretary of State.
- H. The person who prepares the biosolids or the applicator shall monitor pathogen and vector attraction reduction treatment operating parameters, such as time and temperature, on a continual basis.
- I. An applicator shall conduct and record monitoring of each site for the management practices established in R18-9-1007 and R18-9-1008.
- J. A person shall maintain, as specified in R18-9-1013, and report to the Department as specified in R18-9-1014, all compliance measurements, including the analysis of pollutant concentrations.

Effective May 24, 2001

R18-9-1013. Recordkeeping

- A. A person who prepares biosolids shall collect and retain the following information for at least five years:
 - 1. The date, time, and method used for each sampling activity and the identity of the person collecting the sample;
 - 2. The date, time, and method used for each sample analysis and the identity of the person conducting the analysis;
 - 3. The results of all analyses of pollutants regulated under R18-9-1005 and organic and ammonium nitrogen to comply with R18-9-1007(A)(7);
 - 4. The results of all pathogen density analyses and applicable descriptions of the methods used for pathogen treatment in R18-9-1006;
 - 5. A description of the methods used, if any, and the operating values and ranges observed in any pre-land application, vector attraction reduction activities required in R18-9-1010(A); and
 - 6. For the records described in subsections (A)(1) through (A)(5), the following certification statement signed by a responsible official of the person who prepares the biosolids:
 “I certify, under penalty of law, that the pollutant analyses and the description of pathogen treatment and vector attraction reduction activities have been made under my direction and supervision and under a system designed to ensure that qualified personnel properly gather and evaluate the information used to determine whether the applicable biosolids requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”
- B. An applicator of bulk biosolids, except exceptional quality biosolids, shall collect the following information for each land application site, and, except as indicated in subsection (B)(6), shall retain this information for at least five years:
 - 1. The location of each site, by either street address or latitude and longitude;
 - 2. The number of acres or hectares;
 - 3. The date and time the biosolids were applied;
 - 4. The amount of biosolids (in dry metric tons);
 - 5. The biosolids loading rates for domestic septage and other biosolids with less than 10 percent solids in tons or kilograms of biosolids per acre or hectare and in gallons per acre and the biosolids loading rates for other biosolids in tons or kilograms of biosolids per acre or hectare;
 - 6. The cumulative pollutant levels of each regulated pollutant (in tons or kilograms per acre or hectare). The applicator shall retain these records permanently;
 - 7. The results of all pathogen density analyses and applicable descriptions of the methods used for pathogen treatment in R18-9-1006;
 - 8. A description of the activities and measures used to ensure compliance with the management practices in R18-9-1007 and R18-9-1008, including information regarding the amount of nitrogen required for the crop grown on each site;
 - 9. If vector attraction reduction was not met by the person who prepares the biosolids, a description of the vector attraction reduction activities used by the applicator to ensure compliance with the requirements in R18-9-1010;
 - 10. A description of any applicable site restriction imposed by in R18-9-1009 if biosolids with Class B pathogen reduction have been applied and documentation that the applicator has notified the land owner and lessee of these restrictions;
 - 11. For the records described in subsections (B)(1) through (B)(8), the following certification statement signed by a responsible official of the applicator of the biosolids:
 “I certify, under penalty of law, that the information and descriptions, have been made under my direction and

supervision and under a system designed to ensure that qualified personnel properly gather and evaluate the information used to determine whether the applicable biosolids requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

12. The information in subsections (A)(1) through (A)(6) if the person who prepares the biosolids is not located in this state.
- C. All records required for retention under this Section are subject to periodic inspection and copying by the Department.
- D. If there is unresolved litigation, including enforcement, concerning the activities documented by the records required in this Section, the period of record retention shall be extended pending final resolution of the litigation.

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R18-9-1014. Reporting

- A. A person who prepares biosolids for application shall provide the applicator with the necessary information to comply with this Article including the concentration of pollutants listed in R18-9-1005 and the concentration of nitrogen in the biosolids.
- B. A transporter shall report spills to the Department under R18-9-1011(D).
- C. A bulk applicator of biosolids other than exceptional quality biosolids shall provide the land owner and lessee of land application sites with information on the concentrations of the pollutants listed in R18-9-1005 and loading rates of biosolids applied to that site, and any applicable site restrictions under R18-9-1009.
- D. A bulk applicator of biosolids other than exceptional quality biosolids shall report to the Department if 90% or more of any cumulative pollutant loading rate has been used at a site.
- E. On or before February 19 of each year, any person land-applying bulk biosolids that are not exceptional quality biosolids shall, by letter or on a form provided by the Department, report to the Department the following applicable information for the previous calendar year:
 1. The actual sites used; and
 2. For each site used, the following information:
 - a. The amount of biosolids applied (in tons or kilograms per acre or hectare);
 - b. The application loading rates (in tons or kilograms per acre or hectare, and gallons per acre for domestic septage);
 - c. The concentrations of the pollutants listed in R18-9-1005 (in milligrams per kilogram of biosolids on a dry-weight basis);
 - d. The pathogen treatment methodologies used during the year and the results; and
 - e. The vector attraction reduction methodologies used during the year and the results.
- F. On or before February 19 of each year, a person preparing biosolids in a Class I Sludge Management Facility, POTW with a design flow rate equal to or greater than one million gallons per day, or POTW that serves 10,000 people or more, that are applied to land, shall, by letter or on a form provided by the Department, report to the Department all the following applicable information regarding their activities during the previous calendar year:
 1. The amount of biosolids received if the preparer purchased or received the biosolids from another preparer or source;
 2. The amount of biosolids produced (tons or kilograms);
 3. The amount of biosolids distributed;
 4. The concentrations of the pollutants listed in R18-9-1005 (in milligrams per kilogram of biosolids on a dry-weight basis);
 5. The pathogen treatment methodologies used during the year, including the results; and
 6. The vector attraction reduction methodologies used during the year, including the results.
- G. All annual self-monitoring reports shall contain the following certification statement signed by a responsible official:

“I certify, under penalty of law, that the information and descriptions, have been made under my direction and supervision and under a system designed to ensure that qualified personnel properly gather and evaluate the information used to determine whether the applicable biosolids requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

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R18-9-1015. Inspection

A person subject to this Article shall allow, during reasonable times, a representative of the Department to enter property subject to this Article, to:

1. Inspect all biosolids pathogen and vector treatment facilities, transportation vehicles, and land application sites to determine compliance with this Article;
2. Inspect and copy records prepared in accordance with this Article; and
3. Sample biosolids quality.

Appendix A. Procedures to Determine Annual Biosolids Application Rates

The following procedure determines the annual biosolids application rate (ABAR) that ensures that the annual pollutant loading rates in Table 3 of R18-9-1005 are not exceeded.

1. The relationship between the annual pollutant loading rate (APLR) for a pollutant and the ABAR is shown in the following equation.

$$APLR = C \times ABAR \times 0.001$$

- APLR = Annual pollutant loading rate in kilograms of biosolids, per hectare, per 365-day period;
- C = Pollutant concentration in milligrams, per kilogram of total solids (dry-weight basis);
- ABAR = Annual biosolids application rate in metric tons, per hectare, per 365-day period (dry-weight basis); and
- 0.001 = A conversion factor.
- metric ton = 1.102 short tons
- hectare = 2.471 acres

2. The ABAR is calculated using the following procedure:
 - a. Analyze a biosolids sample to determine a concentration for each of the pollutants listed in Table 3 of R18-9-1005; and
 - b. Using each of the pollutant concentrations from subsection (2)(a) and the APLRs from Table 3 of R18-9-1005, calculate a separate ABAR for each pollutant using the following equation:

$$ABAR = \frac{APLR}{C \times 0.001}$$

- c. The ABAR for biosolids is the lowest value calculated in under subsection (2)(b) for any pollutant.