



Biosolids Regulations

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*Innovative Solutions for
Water and the Environment*

Outline

- Part 503 Rule Overview
- Land Application
 - Class A vs. Class B
 - Metals Reduction
 - Vector Attraction Reduction (VAR)
 - Pathogen Reduction
- Digester Control

Did You Know That Many Cities Have a Permit for Biosolids?



Part 503 – Regulating Biosolids for Their End Use

- Effective March 22, 1993, amended February 25, 1994
- Established Baseline Rules for Biosolids Management:
 - Land Application
 - Land Disposal
 - Incineration*
 - Landfill (by reference to 40 CFR 258)
- Includes general requirements, monitoring, pollutant limits, etc. for each management option
- Pollutant limits and BMPs result of extensive risk assessment

State Regulations

Part 503 is a baseline – States may pass more stringent regulations!!!

Land Disposal

- Monofills, dedicated disposal sites, lagoons, surface impoundments
- Biosolids remain on land for 2 years or longer
- No liner = limits for arsenic, chromium, and nickel
- Liner and leachate collection system – No metals limits
- Management practices: wetlands bans, runoff collection systems, protect groundwater, restrict public access
- Pathogen and vector attraction reduction

Incineration

- Defines sewage sludge fired in an incinerator as a *non-hazardous solid waste*
- Regulates multiple hearth and fluidized bed units
- Nine regulated pollutants
- Testing, monitoring, recordkeeping, and operator training requirements

Land Application Requirements

- Pollutant Limits
(nine regulated metals)
- Vector Attraction Reduction
- Pathogen Reduction

Land Application Has Strict Regulations to Protect Human Health



MA vs. EPA – Class B Biosolids

Metal	503 Metals Limit	MA DEP Limit	EU Mandatory Directive
Copper	4300	1000	1750
Lead	840	1000	1200
Mercury	57	10	25
Nickel	420	200	400
Zinc	7500	2500	4000

Dose Comparison

	Centrum	Biosolids	Compost
Copper	0.5 mg	0.15 mg	0.04 mg
Molybdenum	.045 mg	0.002 mg	0.001 mg
Zinc	11 mg	0.269 mg	0.089 mg
Selenium	0.055 mg	0.001 mg	0.0004 mg
Nickel	0.005 mg	0.011 mg	0.004 mg



Land Application – Pathogen Reduction

- Establishes Three “Classes” of Biosolids Quality:
 - » Class B
 - » Class A
 - » Class A Exceptional Quality (EQ)

Pathogen Reduction

- Class B:
 - Alternative 1: Monitor Indicator Organisms: Monthly geometric mean of Fecal Coliform $<2.0 \times 10^6$ MPN/dry g
 - Alternative 2: “Process to Significantly Reduce Pathogens”: Anaerobic Digestion with DT > 15 days & temp > 35 °C (95 °F)
 - **Site Restrictions to Protect Public Health**
- Class A:
 - Alternative 1: Use of One of Four Time-Temperature Regimens
 - Alternative 5: “Use of a Process to Further Reduce Pathogens” - e.g. composting, heat drying
 - All Alternatives: Fecal Coliform <1000 MPN/dry g OR Salmonella <3 MPN/4 dry g

Vector Attraction Reduction

- Want to verify stability prior to land application to reduce odors & vectors
- Need a 38% reduction in Volatile Solids during sewage sludge treatment – this happens during digestion
- Volatile solids are measured in digester feed and cake
- Typically, if process is stable, no problem meeting VSR

Options to Ensure Compliance

- Daily review of all digester temperatures & DT to ensure full compliance
- Annual Training on permit requirements for time and temperature
- Annual training on fecal coliform sampling
- Increase active volume through a program of regular digester cleaning
- Increase DT by ensuring digester contents in storage digesters are > 95 °F – effectively increases active volume
- Manage shutdowns to minimize over-pumping

Questions?

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