

What every operator should know about biosolids management for land application

Steve Wilson



Knowledge	Principles	Practical considerations
Regulatory requirements	Title 40, <i>Code of Federal Regulations</i> , Part 503 Various state and local rules	The 1993 40 <i>CFR</i> Part 503 Rule and technical support documents serve as the foundation of all regulatory policies. State or local jurisdictions can be more conservative in some cases, but never less stringent.
Terminology	<i>Biosolids</i> versus <i>sewage sludge</i>	<i>Biosolids</i> are the primarily organic solid product of wastewater treatment that can be beneficially used. <i>Sludge</i> or <i>sewage sludge</i> is unprocessed (<i>i.e.</i> , unstabilized) and generally unsuitable for beneficial use. The Part 503 rule does not use the term <i>biosolids</i> , but subsequent guidance and state-level policies have recognized the distinction between <i>sludge</i> and <i>biosolids</i> and use this terminology.
Product standards	Rules and guidance define acceptable (risk-based) chemical characteristics focusing on metals. Pathogen reduction and stabilization (vector attraction reduction) standards also are defined.	Metal (pollutant) limits are defined in the Part 503 rule. Metals rarely are limiting in beneficial use programs because pretreatment programs have been so effective. But operators always should check data for verification. Pathogen reduction will be to Class A or Class B standards depending on process technology. Class B product reuse has management practice limits to protect operator and public health. Stabilization standards, such as the minimum 38% volatile solids reduction through digestion, minimize odors during product handling and reuse and help minimize complaints.
Agronomic rates	Application rates are determined to match the amount of available nitrogen applied to the amount needed by crops.	Available nitrogen is calculated in units of pounds per dry ton. This value is converted to a wet (or as-applied) basis in either wet tons or gallons per acre in line with fertilizer recommendations for the crop being grown. Many guidance documents and even online spreadsheets are available to assist in making these calculations (see below). Spreader equipment then is calibrated to deliver this amount of material per unit of field.
Marketability	Class B biosolids generally are delivered at no cost or for a nominal fee; the land owner benefits from the fertilizer value. Class A products may be marketed more aggressively and sometimes are sold to offset production costs. Quality may be more important.	Product quality parameters include <ul style="list-style-type: none"> ■ meeting or exceeding all regulatory requirements, ■ lack of visible trash or foreign material, ■ low odor potential, ■ “soil-like” consistency (<i>i.e.</i>, manufactured topsoil or compost), and ■ dust-free product with uniform particle size (for dried products).



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Monitoring	Part 503 and state rules dictate sampling frequencies, parameters, and methodology.	<p>Testing generally includes Part 503 metals (arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, zinc), nutrients (total Kjeldahl nitrogen, ammonium–nitrogen, nitrate–nitrogen, and phosphorus), and percent-total and percent-volatile solids.</p> <p>For Class A products, additional testing is required to demonstrate pathogen reduction to minimal (1000 MPN/g dry solids) levels.</p>
Reporting	Agencies must report process control details (to verify pathogen and vector attraction reduction), biosolids quantities, pollutant concentrations, nutrient values, and biosolids disposition information on an annual basis.	<p>At a minimum, a biosolids “preparer” must submit an annual report to the U.S. Environmental Protection Agency (EPA) for the previous year by February 19. Where authority has been delegated to states, the report goes to the state regulatory agency. Dual reporting to both state and EPA is not uncommon.</p> <p>The preparer must certify that all regulatory requirements have been met. In some cases, a contract “applier” must submit a separate report certifying land application practices. The preparer always should verify that a separate applier has met all requirements.</p>
Resources	Comprehensive guidance and training is available readily from several sources.	<p>A short list of sources includes the following:</p> <ul style="list-style-type: none"> ■ The Water Environment Federation provides access to state regulatory contacts, technical resources, and other documents at www.wef.org/biosolidsnews. ■ EPA lists a wealth of links and information at http://water.epa.gov/polwaste/wastewater/treatment/biosolids. ■ EPA also posts the <i>Plain English Guide to the Part 503 Rule</i> at http://water.epa.gov/scitech/wastetech/biosolids/503pe_index.cfm.
Networking	Become active in your regional or local biosolids community.	Regional biosolids communities include the Northwest Biosolids Management Association (Seattle), the North East Biosolids Recycling Association (Tamworth, N.H.), the Mid-Atlantic Biosolids Association (Philadelphia), the California Association of Sanitation Agencies (Sacramento, Calif.), and WEF Member Association biosolids committees.
Promoting public support	Share information.	News releases about program successes benefit public understanding by sharing positive biosolids recycling news.
Potential for public opposition	Be aware.	An Internet search for “biosolids” reveals the extent of unsupported, unscientific, negative information that is out there for the uninformed to use as the basis for their first impression of biosolids recycling. It’s important to understand what kind of faulty information the public may be exposed to.
Research and emerging issues	Support research.	Questions about fundamental biosolids benefits and controls – not to mention emerging constituents, personal care products, and other microconstituents – abound. Consider funding research with local universities directly through your agency or as a regional association member.

Steve Wilson is a chief scientist in the Portland, Ore., office of Brown and Caldwell (Walnut Creek, Calif.).