

# Frequently Asked Questions

## 1) What are Biosolids?

Biosolids are NOT raw sewage. Biosolids are nutrient-rich organic materials derived from wastewater solids that have been treated and stabilized. When treated and processed, these residuals can be recycled and applied as fertilizer to improve and maintain productive soils and stimulate plant growth. Only those biosolids that meet strict quality standards for pollutants, pathogens and vector attraction may be land-applied for beneficial purposes. The quality of biosolids is assured through product testing and monitoring to verify that requirements are met.

## 2) Why do we have biosolids?

We have biosolids as a result of the wastewater treatment process. Water treatment technology has made our water safer for recreation and seafood harvesting. As recently as the early 1970s, thousands of American cities discharged their raw sewage directly into the nation's rivers, lakes, and bays. Local governments are now required to treat wastewater and to make the decision whether to recycle biosolids as fertilizer, incinerate it, or bury it in a landfill.

## 3) How are biosolids generated and processed?

Biosolids are created through the treatment of domestic wastewater generated from sewage treatment facilities. The treatment of biosolids can actually begin before wastewater reaches the sewage treatment plant. In many larger wastewater treatment systems, pre-treatment regulations require that industrial customers pre-treat their waste stream to remove or reduce hazardous contaminants and/or reduce wastewater strength before it is suitable for discharge to a wastewater collection system. Wastewater treatment facilities monitor incoming wastewater to ensure their recyclability and compatibility with the treatment plant process.

Once wastewater reaches the treatment plant, it goes through an assortment of physical, chemical and biological processes which remove solids and reclaim the liquid (water) fraction. Solids captured or generated during *wet-side* processing are further treated through a variety of additional processes to stabilize organic matter and reduce pathogenic organisms (bacteria, viruses and parasites). At the Renergy facility, locally generated animal manures, as well as solids from other municipal treatment facilities and feedstock sources, are trucked to the facility for anaerobic digestion and additional processing. The anaerobic digestion process used by Renergy produces biogas, which can be used to produce electricity or power vehicles. The leftover organic matter, nutrient rich biosolids can be beneficially used for a variety of purposes. More on Renergy's treatment process can be found at <http://renergy.com/about-us/> (*Confirmed 3/21/18*).

#### **4) How are biosolids used?**

After treatment and processing, biosolids can be recycled and applied as an organic soil amendment / fertilizer to improve and maintain productive soils and stimulate plant growth. Controlled land application of biosolids completes a natural cycle in the environment. By treating sewage sludge, it becomes biosolids which can be used as a valuable soil amendment, instead of taking up space in a landfill or other disposal facility.

#### **5) How are biosolids used for agriculture?**

Biosolids are used to fertilize fields for raising crops, thus reducing the need for chemical fertilizers. Biosolids that meet strict quality criteria and application rates, have been shown to produce significant improvements in crop growth and yield. Nutrients found in biosolids, such as nitrogen, phosphorus and potassium and numerous secondary and trace elements (including calcium, copper, iron, magnesium, manganese, sulfur and zinc) are necessary for crop production and growth. The use of biosolids reduces the farmer's production costs and replenishes soil organic matter.

The organic nitrogen and phosphorous found in biosolids are used very efficiently by crops due to slow release through the growing season. This enables the crop to uptake these nutrients as the plants grow. This efficiency reduces the likelihood of groundwater contamination relative to chemical fertilizer products.

#### **6) Do biosolids help soils and crops?**

In short, yes. The agricultural benefits of biosolids have been documented for many decades by numerous scientific studies and through the practical experience of thousands of farmers.

Organic matter in biosolids improves soil tilth, reduces compaction, increases water-holding capacity, and provides an energy source for necessary microbial activity. This results in decreased water runoff and soil erosion, increased water conservation and more resistance to drought. Biosolids that have been lime-stabilized help neutralize acidity in soils, just as is done by agricultural limestone, which helps maintain the proper soil pH for crop growth.

Chemically, biosolids increase the soil's cation exchange capacity (CEC), which is a measure of how well a soil retains certain plant nutrients. The organic matter in biosolids acts like a magnet that attracts and stores plant nutrients. This process retains plant nutrients in the root zone and prevents them from leaching.

More information about these studies can be found in MABA Biosolids Factsheet 3 at <https://static1.squarespace.com/static/579045432e69cf0f618c4cc3/t/5a8e086b9140b7d0a7b2ef88/1519257707528/MABA+Soil+Fact+Sheet+3.pdf> (*Confirmed 3/21/18*).

## **7) What percentage of biosolids are recycled and how many farms use biosolids?**

Based on research completed by the Northeast Biosolids and Residuals Recycling Association (NEBRA) completed in 2007, a total of over 7,000,000 dry tons of biosolids are generated each year. Nearly 50% of all biosolids in the US are being recycled to land. More info from NEBRA's report can be obtained here:

<https://static1.squarespace.com/static/54806478e4b0dc44e1698e88/t/5488541fe4b03c0a9b8ee09b/1418220575693/NtlBiosolidsReport-20July07.pdf> (*Confirmed 3/21/18*)

A report from the Water Environment Federation in 2017 indicates that approximately 55% of generated biosolids are applied to soil for agronomic, silviculture or land restoration purposes; the remaining 45% are disposed of in municipal solid waste landfills, surface disposal units, or incineration facilities (USEPA, 2010). The biosolids-amended land is ~ 0.12% of total harvestable acreage in the US (314,964,000 acres harvested according to the 2012 Agricultural Census). Thus, a very small proportion of cultivated land receives biosolids application annually. In addition, the majority of the biosolids are applied to forage and row crops used for animal feed or grains and a small amount is used for fertilizing horticultural or vegetable crops.

Ohio EPA reported that 30,930 dry tons (9.8%) of EQ biosolids were land applied or distributed in 2014. 91,862 dry tons (29.1%) of Class B biosolids were land applied. A total of 231 treatment facilities participated in these beneficial use programs. More info from Ohio EPA's report can be obtained here: <http://epa.ohio.gov/portals/35/sludge/2014-SDR.pdf> (*Confirmed 3/21/18*)

## **8) Are biosolids safe?**

The National Academy of Sciences has reviewed current practices, public health concerns and regulator standards, and has concluded that "the use of these materials in the production of crops for human consumption when practiced in accordance with existing federal guidelines and regulations, presents negligible risk to the consumer, to crop production and to the environment."

## **9) Do biosolids smell?**

Biosolids may have their own distinctive odor depending on the type of treatment it has been through. Some biosolids may have only a slight musty, ammonia odor. Others have a stronger odor that may be offensive to some people. Much of the odor is caused by the decomposition of organic matter and is largely composed of sulfur and nitrogen containing organic compounds.

**10) Can disease-causing organisms be spread through the air during biosolids land application?**

Scientific studies say no. Biosolids being applied on a farm, like any decomposing organic product (such as manure), will often emit odor, which is a mixture of volatile compounds resulting from organic matter decomposition. Unfamiliar odors sometimes trigger concern that disease-causing organisms may be spread through the air to humans or animals. Notably, there have not been any scientifically-documented cases of illnesses caused by biosolids recycled in compliance with regulatory standards. Moreover, there have been a number of scientific studies that demonstrate the difficulty of transmitting biosolids-related diseases through the air. More information about these studies can be found in MABA Biosolids Factsheet 1 at:

<https://static1.squarespace.com/static/579045432e69cf0f618c4cc3/t/5a8e07ecf9619a7edbbca9bb/1519257581037/MABA+Airborne+Fact+Sheet+1.pdf> (*Confirmed 3/21/18*)

**11) Are there regulations for the land application of biosolids?**

The federal biosolids rule is contained in USEPA 40 CFR, Part 503. Biosolids that are to be land applied must meet these strict regulations and quality standards. The Part 503 rule governing the use and disposal of biosolids via land application contain numerical limits for: metals; pathogen reduction standards; site restrictions; crop harvesting restrictions, and; monitoring, record keeping and reporting requirements. Part 503 also specifies requirements for biosolids that are surface disposed or incinerated. In Ohio, the Part 503 regulations and land application of biosolids on agricultural land is regulated by the Ohio EPA, which are at least as strict as the USEPA 40 CFR, Part 503 standards. More information on Ohio EPA's program can be found at: <http://www.epa.ohio.gov/dsw/sludge/biosolid.aspx> (*Confirmed 3/21/18*)

**12) Where can I find out more about the regulations?**

The biosolids rule is described in the USEPA publication, [A Plain English Guide to the EPA Part 503 Biosolids Rule](#). This guide states and interprets the Part 503 rule for the general reader. This guide is also available in hard copy. In addition to the Plain English Guide, USEPA has prepared [A Guide to the Biosolids Risk Assessments for the EPA Part 503 Rule](#) which shows the many steps employed to develop safe, scientifically defensible rules governing biosolids recycling today (also available from EPA in hard copy.)

**13) Are there rules about where biosolids can be applied?**

To determine whether biosolids can be applied to a particular farm site, an evaluation of the site's suitability is generally performed by the land applier. The evaluation examines water supplies, soil characteristics, slopes, vegetation, crop needs and the proximity to local surface and groundwater resources.

One of the purposes of the Part 503 regulations is to limit exposure to pathogens; either by reducing the numbers of pathogens to below detectable limits (exceptional quality biosolids) or preventing direct or indirect contact with any pathogens possibly present in the biosolids (Class B biosolids). Pathways for exposure were studied relative to pathogens, and limits were set resulting in technical standards for use of both exceptional quality and Class B biosolids. For example, Class B biosolids must comply with general requirements, prohibitions, isolation distance requirements, site specific requirements, and additional site restrictions and including crop harvesting restrictions as indicated in [Chapter 3745-40 of the Ohio Administrative Code](#).

Regulatory limits and nutrient management planning ensure that the appropriate quantity and quality of biosolids are land applied to farmland. Biosolids application is specifically limited to comply with the nitrogen uptake requirements of the particular crop. Nutrient management technicians work with the farm community to assure proper land application and nutrient control.

**14) Are there buffer requirements or restrictions on public access to sites with biosolids?**

In general, exceptional quality biosolids used in small quantities by general public have no buffer requirements, crop type, crop harvesting or site access restrictions. Exceptional Quality biosolids is the name given to treated residuals that contain low levels of metals and do not attract vectors. When used in bulk, exceptional biosolids are subject to certain buffer requirements, but not to crop harvesting restrictions. In general, there are buffer requirements, public access, and crop harvesting restrictions for virtually all forms of Class B biosolids.

**15) Is the use of biosolids at agricultural sites hazardous to my health?**

There have been NO documented adverse health effects due to the land application of biosolids confirmed by scientific investigation. Biosolids are treated to reduce or eliminate pathogens; Class B biosolids generally have lower pathogen levels than most untreated manure. By regulation, biosolids must be applied according to agronomic or otherwise approved rate, with setbacks (buffers) and other restrictions (i.e. limits on public access). Following those restrictions, USEPA and other researchers have concluded that biosolids applied to soils in accordance with regulations present minimal risks to human health and the environment.

**16) Do biosolids contain any consumer health care or pharmaceutical ingredients?**

Although ingredients such as alkylphenols have been measured in biosolids, there is little cause for concern about environmental impacts due to land application of biosolids. Due to the rapid rate of degradation in the natural soil environment, and the limited potential for alkylphenols to be transported off-site, biosolids are not likely to be a significant source of alkylphenol contamination to surface water. Additional information can be obtained at [https://static1.squarespace.com/static/579045432e69cf0f618c4cc3/t/57ae260c6b8f5be1f89e9978/1471030796483/AlkylphenolsFactSheet\\_Chrostowski2002.pdf](https://static1.squarespace.com/static/579045432e69cf0f618c4cc3/t/57ae260c6b8f5be1f89e9978/1471030796483/AlkylphenolsFactSheet_Chrostowski2002.pdf) (*Confirmed 3/21/18*)

**17) What are Endocrine Disrupting Compounds and should I be concerned about them in waterways?**

Endocrine Disrupting Compounds (EDCs) are substances that can affect the endocrine system of animals. These compounds are naturally produced by plants and animals and can come from chemical synthesis. In recent years, due to improvements in analytical methods, low levels of EDCs have been detected in the environment including waterways. No studies to date have linked these low concentrations of EDCs in wastewater to adverse effects in humans.

**18) Will spreading or incorporation of biosolids release airborne contaminants?**

A number of scientific studies report that the land application of biosolids does NOT result in airborne release of bacterial pathogens or biological agents. One study looking at human and animal health on farms concluded that the risks of respiratory or digestive illness, as well as general symptoms, were not significantly different between the farms receiving biosolids and farms not receiving biosolids. The absence of observed human or animal health effects involved controlled application practices in accordance with established USEPA requirements. (See also FAQ #10)

**19) Will land application of biosolids contaminate local surface water or pollute groundwater?**

Properly treated and managed biosolids products do not have a negative impact on surface water or groundwater quality. As with any fertilizer or soil amendment, best management practices must be followed to prevent impacts via surface water runoff or via leaching to groundwater. By law, biosolids recycling programs in the region must follow such best management practices; the same is generally not true for the use of manures and chemical fertilizers. The fact is, some biosolids recycling programs have caused improvements in the quality of surrounding water bodies. How? By enriching soils and helping vegetation grow more vigorously. This results in reduced soil erosion and immobilization of on-site contaminants that had previously contributed to stream and groundwater pollution. Increasingly, berms and other stormwater control systems use biosolids composts.

**20) Can biosolids harm our streams and groundwater?**

Federal and state regulations, industry and farming best management practices and nature provide multiple layers of protection for our streams and groundwater. Studies also show that biosolids actually help to reduce runoff into our streams and leaching into groundwater. More information about these studies can be found in MABA Biosolids Factsheet 2 at

<https://static1.squarespace.com/static/579045432e69cf0f618c4cc3/t/5a8e0804ec212d0e4dbc2a6d/1519257604995/MABA+Water+Fact+Sheet+2.pdf> (*Confirmed 3/21/18*).

**21) Will land application at this site affect my property value?**

No. Studies have shown that biosolids are beneficial. Indeed, by using biosolids, farmers and other landowners are managing the nutrients and processes on their properties more carefully and responsibly than the average landowner. In addition, those who use biosolids may be benefiting from a more efficient fertilizer alternative, thus helping their farm fields or other open lands to be more profitable. The more profitable their operations are, the more likely it is that farmers and other landowners will keep their properties green and open for the neighborhood to enjoy.

*These biosolids FAQ's have been assembled from the following sources:*

<https://www.mabiosolids.org> (Confirmed 3/21/18)

<http://www.epa.ohio.gov/dsw/sludge/biosolid.aspx> (Confirmed 3/21/18)

<http://renergy.com/about-us/> (Confirmed 3/21/18)

<https://www.epa.gov/biosolids/frequent-questions-about-biosolids> (Confirmed 3/21/18)

<https://www.nebiosolids.org/> (Confirmed 3/21/18)

<https://www.wef.org/globalassets/assets-wef/3---resources/topics/a-n/biosolids/technical-resources/wef-fact-sheet-microconstituents-v25-aug-2017.pdf> (Confirmed 3/21/18)