KUB Biosolids Beneficial Reuse Program
July 2009

Biosolids Overview

KUB has operated a Biosolids Beneficial Reuse Program to help protect our environment and benefit our community for more than 20 years. Biosolids are the nutrient-rich organic material produced by wastewater treatment and additional post-treatment processing.

Despite common misconceptions, biosolids are not untreated human or commercial waste. The wastewater that provides the organics for biosolids goes through the full biological treatment process required to meet strict regulations for release to receiving streams. Due to those strict regulations, the treated water KUB returns to the river is actually cleaner than the river itself.

Solids from the fully treated wastewater are further processed in digesters to reduce any remaining pathogens, such as bacteria, viruses, and parasites. All biosolids must also be tested for heavy metals and meet specific treatment requirements to ensure the safety of the final product before use.

Since 1993, the U.S. Environmental Protection Agency (EPA) has regulated biosolids under the Part 503 Rule. KUB, like all utilities with a Biosolids Reuse Program, must regularly submit monitoring results to the EPA to demonstrate that the product meets regulatory requirements. KUB also provides that same reporting information to the Tennessee Department of Environment and Conversation (TDEC).

Biosolids are classified under the EPA's Part 503 Rule by the amount of treatment they undergo to reduce or eliminate pathogens. KUB produces Class B biosolids. EPA regulations require reducing pathogens in Class B biosolids to levels that do not pose a risk to human health when managed and applied properly to land. Class A biosolids receive even more treatment to reduce pathogens, so they can be applied with fewer site restrictions or bagged for sale.

The EPA Guide to the Part 503 Rule states: "biosolids with either Class A or Class B pathogen status are protective of human health and the environment." Both types required frequent sampling and analysis for pathogens and heavy metals.

Wastewater treatment at KUB yields 30,000 wet tons of biosolids a year. Instead of incinerating biosolids or sending them to landfills, KUB recycles the treated and processed material through local farmers who use the biosolids as a greener alternative to chemical fertilizers.

Farm Use of Biosolids

Farmers have beneficially reused biosolids for decades, and the use of biosolids has increased significantly over the past 20 years. Land application of biosolids is beneficial to farmers, municipalities, and the community and takes place in all 50 states.

- Biosolids provide organic material that can improve yields over several harvests.
- Biosolids can be a cost-efficient complement or alternative to chemical fertilizers.
- KUB biosolids meet both strict quality control and safety requirements set by the EPA and
- TDEC guidelines. Regular monitoring verifies compliance.
- KUB biosolids are registered as a fertilizer with the Tennessee Department of Agriculture.

KUB nutrient-rich biosolids are a free, environmentally friendly alternative to chemical fertilizers. The biosolids contain guaranteed levels of nitrogen, phosphorous, and potassium. Here's an example of using chemical fertilizers versus biosolids on an orchard grass hay field: If you assume a chemical fertilizer such as Ammonium Nitrate, a farmer with 400 acres would need to apply 24 tons of commercial fertilizer per year at a cost of approximately $10,000. Biosolids have the advantage of being a slow-release low-level nitrogen fertilizer that will supply plant nutrients for three to five years at no cost to the farmer.

When a farmer applies for biosolids, KUB's biosolids management contractor, Synagro, sends a Technical Service Manager (TSM) to evaluate the suitability of the site and discuss the program with the farmer. Sites must be at least 50 acres and meet both TDEC and EPA requirements for land application.

The TSM samples the soil and records the physical features of each field on maps, along with any sensitive areas, like streams or ditches. The TSM also completes a permit application showing the site, loading rates, application area, non-application area, buffers from sensitive areas, crops to be grown, and operator/owner acknowledgement of the application. Synagro submits the application to TDEC for approval.

If the application is approved, Synagro delivers the biosolids to the field and applies them for the farmer. Synagro records biosolids application data for each field and enters it into a computer program for tracking and reporting.

After the application of Class B biosolids, the site is restricted for 30 days to allow environmental conditions to further reduce pathogens. The 30-day restriction prevents crop harvesting, animal grazing, and public access.

KUB Works to Ensure the Continued Safety of Biosolids

KUB biosolids meet all regulatory requirements to protect the public health and environment, and we continue to strive to ensure we use best management practices in our program. For example, KUB is voluntarily working with the National Biosolids Partnership (NBP) to develop an Environmental Management System (EMS) for our biosolids program.

Note: After a rigorous review process, the NBP awarded KUB's program certification in December 2011. KUB became one of only 34 organizations in the U.S. certified under the NBP and the second to be certified in Tennessee.

An EMS goes beyond environmental regulations to incorporate practices that support even higher standards for biosolids programs. The NBP helps utilities to improve the quality of biosolids management programs nationwide and to promote public acceptance of biosolids use and disposal practices.

The NBP is a not-for-profit alliance formed in 1997 to advance environmentally sound and accepted biosolids management practices. It partners with the National Association of Clean Water Agencies (NACWA), the Water Environment Federation (WEF), and the EPA. It also seeks input on policies and priorities from biosolids producers, regulatory agencies, universities, the farming community, and environmental organizations.

The goal of implementing an EMS is to help the biosolids program be efficient, responsive, and proactive. EMS participation provides a variety of assessment and planning tools to plant operators and managers to allow us to continue to improve. An EMS will help KUB protect our environment by ensuring consistent product quality. It will also help us continue to exceed increasingly strict regulatory requirements.

In addition to complying with applicable state and federal regulations, biosolids producers who implement an EMS commit to follow community-friendly practices. Community-friendly practices refer to control of odor, traffic, noise, and dust, as well as the management of nutrients. EMS facilities are also subject to impartial, independent third-party audits.

KUB staff are available to provide further information about the biosolids program on request. If you have questions, please contact John Gresham at 865-558-2790.

Informative Biosolids Web Sites

Water Environment Federation (WEF) - http://www.wef.org

National Association of Clean Water Agencies (NACWA) - http://www.nacwa.org

National Biosolids Partnership (NBP) – http://www.biosolids.org

Water Environment Research Foundation (WERF) - http://www.werf.org

U.S. EPA - http://www.epa.gov/owm/bio.htm

New England Biosolids & Residuals Association (NEBRA) - http://www.nebiosolids.org/

Northwest Biosolids Management Association (NBMA) - http://www.nwbiosolids.org/

Mid-Atlantic Biosolids Association (MABA) - http://www.mabiosolids.org/

Great Lakes By-products Management Association (GLBMA) – http://www.glbma.org/