



2012 Biosolids Performance Report

June 2013

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KUB Maintains NBP Platinum Certification

IN DECEMBER 2011, KUB’s BIOSOLIDS MANAGEMENT Program became one of only 34 nationwide and two in Tennessee to achieve National Biosolids Partnership (NBP) certification. (Chattanooga is the other Tennessee entity.) A 2012 Interim Audit by DEKRA Certification Inc. recommended KUB’s program stay at its original Platinum certification, which is the highest certification.

The NBP is operated by the Water Environment Federation. The National Association of Clean Water Agencies and the U.S. Environmental Protection Agency also provide support for the NBP.

Each year, KUB’s wastewater process produces nearly 30,000 tons of biosolids. Rather than send the material to landfills, KUB recycles its biosolids through local farmers.

Biosolids are the nutrient-rich organic material produced by wastewater treatment and additional post-treatment processing. KUB biosolids are registered as a fertilizer with the Tennessee Department of Agriculture.

For more information, go to www.kub.org, Hot Topics Index, and follow the Biosolids link.



KUB Wastewater Plants Win NACWA Awards For Outstanding Performance

THE NATIONAL ASSOCIATION OF CLEAN WATER Agencies (NACWA) recognized each of KUB’s wastewater plants for outstanding permit compliance in 2012. The association recognizes plants each year that had anywhere from no violations up to a maximum of five violations.

For the third year in a row, Eastbridge won a Platinum Award for having no violations for five years. That means Eastbridge has not had a violation since 2005. Loves Creek won its third consecutive Gold Award for having no violations.

Kuwahee and Fourth Creek each received a Silver Award for five or fewer violations. Each had one violation September 18, 2012, when they recorded over six inches of rainfall in a 24-hour period.

“We perform a variety of daily, weekly, and monthly compliance checks at each plant for a total of approximately 29,000 checks a year,” said KUB Chief Operating Officer Bill Elmore. “Each of those 29,000 checks is an opportunity for a violation, but we had only two violations in 2012. The plants have won a total of 40 service awards since 2000. Given the heavier than normal rain events in the last couple of years, that is a great achievement for Plant Operations employees.”



Eastbridge Wastewater Treatment Plant

Industrial Pretreatment Program

KUB MONITORS ALL PERMITTED INDUSTRIES REGULARLY to ensure compliance with the limits established in their Industrial Wastewater Discharge Permits. As part of the follow-up to certain violations, KUB educates industrial users about their impact to the biosolids produced by the wastewater treatment plant.



Grease interceptor

KUB also enforces a Grease Control Program to significantly reduce the amount of grease discharged to the wastewater treatment plant. In addition, KUB stopped accepting grease waste from waste haulers in January 2009. This effort greatly reduced maintenance issues and costs related to grease and also had a positive impact on the quality of our biosolids.

KUB reissued all Industrial Wastewater

Discharge Permits in 2011. In the development and review stages, we placed greater attention on each industry's potential to impact biosolids. We added Best Management Practices to several permits, such as submission of maintenance and cleaning documentation for equipment, Toxic Organic Management Plans, and reporting on disposal of pharmaceutical waste. The intent of the BMPs is to protect KUB and to gather more information about an industry's impact to our system.

We also made changes to our Waste Hauler Program. Haulers are now required to request permission to discharge any waste other than domestic. That gives us the opportunity to investigate and sample the waste, if necessary, to determine its compatibility with treatment. In addition, at the end of June 2012, KUB prohibited haulers from discharging car wash waste to prevent any petroleum contaminated waste from entering the treatment plant.

Application of KUB's Biosolids

KUB CONTRACTS WITH SYNAGRO Technologies for land application of its biosolids. Synagro is the nation's largest recycler of organic residuals for water and wastewater residuals management.

Synagro's highly trained staff ensures that the company's work maintains compliance with applicable federal, state, regional, and local regulatory requirements. Synagro works with the EPA, NBP, biosolids associations, and state and local regulatory agencies to stay abreast of federal, state, and local biosolids regula-

tions to be proactive in meeting regulatory requirements.

Forty-three farms, comprising 3,760 acres, are approved for free biosolids land application by the Tennessee Department of Environment and Conservation. In 2012, Synagro applied 31,982 wet tons (7,946 dry tons) of KUB biosolids to 2,097 acres on 30 farms. Synagro applied the biosolids in Grainger, Jefferson, Knox, Loudon, McMinn, Meigs, Monroe, Morgan, Sevier, and Roane counties.

Medication Collections



KUB IS A MEMBER OF THE Knox-Area Medication Collection Program. The program promotes education and activities

to prevent residential customers from putting unused medications down the drain or toilet. Other partners include the Knox County Health Department, the Tennessee Department of Environment and Conservation, the City and County Solid Waste departments, the Knoxville Police Department (KPD), and the Metropolitan Drug Coalition.

KUB publicizes quarterly collection events in our area on our website and in our customer newsletter. The events and education help keep medications from entering the wastewater system, which could potentially affect the quality of our biosolids. Since 2008, the program has taken in more than 9,000 pounds of unwanted medications.

What Are the Nutrients in KUB's Free Biosolids Worth?

KUB compared biosolids nutrients to three well known chemical fertilizers (Urea, Phosphate, and Potassium Nitrate).

The Annual Market Value of Those Nutrients

Nitrogen	\$301,309
Phosphorous	\$522,539
Potassium	\$76,047



2011–2012 Goals, Objectives, and Performance

THE KUB BIOSOLIDS ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) goals and objectives seek continual improvement and periodic review of programs, practices, and procedures. KUB established four EMS goals that are aligned with KUB's four corporate objectives.

1. Goal: Continually Improve Environmental Performance

Progress: KUB has researched the types of analyzers needed to provide methane content to operations and is reviewing methods of installing the equipment. After installation methods are finalized, KUB will procure and install the equipment. These online methane quality meters will help operations to determine if biogas production will reduce the methane contribution to the carbon footprint at the Kuwahee WWTP. KUB drafted a biogas utilization study that will help determine methods of using the flared methane from the digester processes.

2. Goal: Continually improve Biosolids Quality

Progress: Plant Operations examined the residual solids build up in the secondary digesters. It was determined that the digestion process and ultimately the Biosolids quality would benefit from the periodic cleaning of the digesters. Preventive Maintenance procedures were built into KUB's maintenance

management system so that a digester cleaning occurs every year. This will begin in fiscal year 14/15.

3. Goal: Maintain 100 percent regulatory compliance

Progress: KUB continued to produce a Class B Biosolids that was 100 percent beneficially reused. EPA regulations require reducing pathogens in Class B biosolids by 99 percent so that the biosolids do not pose a risk to human health when managed and applied properly to land.

KUB reregistered its biosolids as a fertilizer with the Tennessee Department of Agriculture. Plant Operations analyzed the future of Class B Biosolids in the region. Consultants and the KUB residuals management contractor, Synagro, agree that Class B Biosolids is a long-term solution to residuals management.

4. Goal: Maintain a safe and healthy workplace

Progress: In an effort to prepare for emergencies related to Biosolids, KUB conducted two emergency exercises. The exercises included a simulated spill during transportation and a full-scale spill exercise at Kuwahee.

KUB Contractor Performance Assessments

IN 2012, KUB CONTINUED TO COMPLETE a two-phase, quarterly contractor assessment. The object of the assessment is to ensure that the biosolids contractor is following the contractual requirements based on the five key outcomes:

- Regulatory Compliance
- Environmental Performance
- Quality Biosolids Management Practices
- Relations With Interested Parties
- Safety

In phase I, the Land Application Site Inspection helps ensure the biosolids contractor is following the appropriate guidelines and best management practices when applying biosolids.

KUB selects an active farm site and conducts an on-site assessment. The review ensures the required documents are at the site, such as a copy of the site permit map book and spill control plans. The inspector also checks for neatness,

any offensive odors, the Biosolids application rates at each field, and to see if the stock pile is in good shape.

If the owner of the property is available, the KUB inspector asks if there are any concerns with the contractor. If the owner is not available at the site, the inspector calls the owner later.

In Phase II of the assessment, the Contractual Obligation Inspection, KUB reviews the program requirements and standards as set by KUB and EPA in the 40 CFR Biosolids Guidelines. The KUB inspector reviews and ensures that all applicable permits and regulations are on file in the contractor's office, which includes truck reports, application rates, EPA Annual Reports, and documentation of any noncompliances. The inspector conducts a physical walkthrough of the

dewatering building to determine if it is kept clean and neat.

For the calendar year 2012, KUB completed contractor assessments every quarter. There have been no issues, and the contractor has done an excellent job. Synagro has been very cooperative and has continued to partner with KUB to ensure the constant improvement of the Biosolids program.



KUB conducts quarterly on-site assessments with biosolids contractors at active farm sites.

EMS/Biosolids Community Outreach

KUB strives to inform customers, the community, and interest groups about the KUB Biosolids Beneficial Reuse Program and EMS. The staff uses the following various resources and means of communications.

PACE 10 Partners Council

KUB's biosolids program uses the PACE 10 Partners Council as a source of feedback and input on the program. The council represents various interest groups across the community.

In 2012, KUB updated the council on achieving NBP certification and overall status of the biosolids program.

Customer Communications

KUB shares biosolids information with the public through its website. It provides an overview of the program, a whitepaper, goals and objectives.

Other means of public communication

include the KUB customer newsletter, a KUB biosolids brochure, and the KUB Customer Information Center.

Community Events

Biosolids staff and/or materials are available at various community events throughout the year. Staff members also make themselves available to speak at special events or meetings. Some of the events where information is available include EarthFest, WaterFest, and the Dogwood Arts House and Garden Show.



Fast Facts

100 percent of KUB's biosolids are beneficially reused.

KUB's biosolids are certified as a fertilizer by the Tennessee Department of Agriculture.

KUB nutrient-rich biosolids are a free, environmentally friendly alternative to chemical fertilizers.

KUB has operated a Biosolids Beneficial Reuse Program for over 20 years.

KUB provides approximately 30,000 wet tons of material to local farmers as a fertilizer and soil conditioner annually.

Land application of biosolids takes place in all 50 states.

Biosolids Monitoring Requirements

Biosolids produced in Tennessee are monitored for compliance based on the EPA Part 503 Biosolids Rule (40 CFR Part 503). KUB produces a Class B Biosolids. Pathogen requirements are met by anaerobic digestion and monitoring the density of indicator organisms. Vector attraction reduction requirements are met by meeting a reduction of at least 38 percent volatile solids reduction.

Monitoring Category	EPA Part 503 Monitoring Frequency	KUB Monitoring Frequency
Pathogen Requirements	Once every 60 days	Monthly
Vector Attraction Requirements	Once every 60 days	Monthly
Regulated pollutant limits (metals)	Once every 60 days	Monthly
Total solids, pH	N/A	Monthly
Nutrients	N/A	Monthly

Note: Based on Biosolids production of equal to or greater than 1,500 dry metric tons but less than 15,000 dry metric tons.



Biosolids moving from the centrifuge to a truck for transport.

KUB Biosolids Production Process

KUB PRODUCES BIOSOLIDS USING PRELIMINARY TREATMENT, primary sedimentation, an activated sludge process, and anaerobic digestion. Treatment and monitoring of biosolids can start before wastewater reaches the treatment plant. This ensures the recyclability and congruency with processes at the treatment plant.

KUB conditions anaerobically processed sludge with polymer before it enters the Flottweg centrifuges. The

centrifuges dewater the sludge, leaving a "cake" of approximately 27 percent solids. Soon after, contractor Synagro collects the biosolid material for later discharge into trailers for transportation. Synagro delivers biosolids to farm sites approved by the Tennessee Department of Environment and Conservation.

The primary use of biosolids is to amend, or recondition, soils. It is also an alternative to fertilizer in agriculture.