2015 Biosolids Performance Report
June 2016

National Biosolids Partnership Recertifies KUB Program at Platinum Level

KUB’s biosolids program first received NBP Platinum certification in December 2011 after a rigorous review process and third-party audit. To maintain certification, the program must continue to pass interim audits and meet the high standards required by the NBP. After a third-party audit in December 2015, NBP again gave KUB’s program its highest Platinum level certification.

KUB’s program is one of only 34 nationwide and two in Tennessee to achieve NBP certification. That recognition demonstrates a high level of commitment to industry best practices and rigorous quality control.

Biosolids are nutrient-rich organic matter produced by wastewater treatment. Annually, KUB produces nearly 30,000 tons of biosolids. Rather than send biosolids to landfills, KUB recycles 100 percent of the material through regional farmers as a fertilizer registered with the Tennessee Department of Agriculture.

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

KUB Plants Qualify for NACWA, WEA Awards

KUB’s wastewater treatment plants have a history of excellent performance with multiple awards from the National Association of Clean Water Agencies and the Kentucky-Tennessee Water Environment Association. KUB submitted 2015 performance data showing we meet the criteria for these awards:

KUB’s four plants had a total of 1 violation from approximately 17,824 compliance checks.

Eastbridge: 0 violations; 4,299 compliance checks; treats 0.526 million gallons a day (MGD). NACWA Platinum 10, WEA Operational Excellence [5 or fewer violations]

Eastbridge first qualified for Platinum (no violations for 5 successive years) in 2010 and has remained violation free ever since.

Loves Creek: 0 violations; 4,439 compliance checks; 2.45 MGD. NACWA Gold, WEA Operational Excellence

Kuwahee: 0 violations in 4,787 compliance checks; 28.17 MGD—three times total of other plants. NACWA Gold, WEA Operational Excellence

Fourth Creek: 1 violation; 4,299 compliance checks; 5.16 MGD. NACWA Silver, WEA Operational Excellence

Our Mission:
Our mission is to act as good stewards of our communities’ resources: utility assets, customer dollars, and the environment. We work to safeguard those resources and enhance their value for the people of the communities we serve and generations to come.
Better define the process for developing goals and objectives, with inputs and outputs.

Include appropriate preventive maintenance under process control points and operational controls.

The new process was added to the facility in 2014: gravity belt thickening (GBT). Operations further evaluated the process in 2015.

Completed a facility plan for long-range planning for the future.

What are the nutrients in KUB’s Biosolids? KUB compared the nutrients in our biosolids to three well-known chemical fertilizers. The list below shows the annual cost for fertilizer to match the nutrients in KUB’s free biosolids.

Nutrient (Fertilizer) | Annual Cost
--- | ---
Nitrogen (Urea) | $301,309
Phosphorous (Phosphate) | $522,359
Potassium (Potassium Nitrate) | $76,047

Application of KUB’s Biosolids

KUB contracts with Synagro Technologies for land application of its biosolids. Synagro is the largest recycler of organic residuals for water and wastewater systems. Synagro’s highly trained staff ensures that the company’s work maintains compliance with applicable federal, state, regional, and local regulatory requirements. In addition to working to meet current standards, Synagro works with the EPA, NBP, biosolids associations, and applicable regulatory agencies to be proactive in meeting changing regulatory requirements.

Sixty-one farms, comprising 5,352 acres, are approved for free biosolids land application by the Tennessee Department of Environment and Conservation. In 2015, Synagro applied 22,883 tons of KUB biosolids to 1,343 acres on 19 farms in Jefferson, Knox, and Sevier counties.

KUB’s Internal Audit Process


The processes reviewed in May 2015 included biosolids dewatering, biosolids land application, control of contractors, corrective and preventive action, document control and record keeping, and goals and objectives. This audit found that the biosolids dewatering, land application, and contractor control processes are effective. Other findings indicated that the CAPA system, document control, and goals and objective processes would benefit from more frequent reviews and updates.

The October 2015 audit included competency, awareness, and training; critical control points and operational controls; EMS documentation; internal EMS audits; and management involvement. This audit found that the EMS documentation, management involvement, and critical control points and operational controls processes are functioning effectively. The competency, awareness and training and internal EMS audit processes were also operating effectively, but several opportunities for improvement were identified.

KUB developed the Corrective and Preventive Action Process (CAPA) as a tracking mechanism for action items that result from internal audits, third party audits, management reviews, and root cause analyses. Appropriate action is decided and then tracked within the system. After the action item is completed, it is reviewed and closed by a third party, usually an employee outside of Plant Operations. Ultimately, the system exists as a way to continually improve BEMS related activities.

In summary, based on results from the internal audits, KUB is complying with its Biosolids Management Policy and the National Biosolids Partnership Code of Good Practice.
EMS/Biosolids Community Outreach

KUB uses these methods to inform customers, the community, and interest groups about the KUB Biosolids Beneficial Reuse Program and EMS:

Customer Communications

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

Other means of public communication include a biosolids brochure, a newsletter that mails to all customers, KUB’s semi-annual report to the City of Knoxville, an annual Environmental Report, and a general handout that KUB executive staff use at speaking engagements.

KUB’s Customer Information Center also is a resource for answering questions and providing materials to customers who call in.

Community Events

Biosolids staff and/or materials are available at various community events. Staff members also are available to speak at schools, special events or meetings. Some of the events where information was available in 2015 included EarthFest and WaterFest.

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 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 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.

<table>
<thead>
<tr>
<th>Monitoring Category</th>
<th>EPA Part 503 Monitoring Frequency</th>
<th>KUB Monitoring Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathogen Requirements</td>
<td>Once every 60 days</td>
<td>Monthly</td>
</tr>
<tr>
<td>Vector Attraction Requirements</td>
<td>Once every 60 days</td>
<td>Monthly</td>
</tr>
<tr>
<td>Regulated pollutant limits (metals)</td>
<td>Once every 60 days</td>
<td>Monthly</td>
</tr>
<tr>
<td>Total solids, pH</td>
<td>N/A</td>
<td>Monthly</td>
</tr>
<tr>
<td>Nutrients</td>
<td>N/A</td>
<td>Monthly</td>
</tr>
</tbody>
</table>

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

Knowledge Management Initiative

KUB has implemented a Knowledge Management Initiative (KMI) to establish documentation and resources to help Plant employees in their work, whether it is during normal working conditions or abnormal or emergency conditions.

“I think KMI is critical for our future success, particularly as we have folks retire and have need for knowledge transfer,” said Derwin Hagood, KUB’s VP of Operations.

“We have assigned operators to be ‘owners’ of specific process areas to be the resident expert and caretaker of their area.”

The goals of KMI are to gather information for each Plant process area, provide that information in an easily accessible location, and ensure the information provided is current and relevant. This includes identifying and updating work instruction documents, such as standard operating procedures, guides, checklists, and operation and maintenance manuals. It also includes the mapping of large assets within Plant properties in GIS and confirming Plant assets are assigned the appropriate preventative maintenance activities for optimal operation.