National Biosolids Partnership

BMP Audit Report

City of Chattanooga Moccasin Bend Wastewater Treatment Plant

Chattanooga, TN

2013 Internal/Interim Audit

Audit Dates:	January 28-31, 2013
Audit Conducted by:	City of Chattanooga ISS BMS Internal Audit Team
Auditors:	D. Benton, J. Miller, J. Sloan, E. Wellmann
Report Written by:	E. Wellmann (lead auditor)
Report Date:	April 23, 2013 (FINAL)
Technical Content Review by:	A. Cannella, Interim Director, MBWWTP, and M. Snyder, BMS Coordinator, MBWWTP

Water Environment Federation
the water quality people®

NATIONAL biosolids PARTNERSHIP

Working to ensure environmental excellence in biosolids management

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Matt Snyder, BMS Coordinator
Moccasin Bend Wastewater Treatment Plant
City of Chattanooga Dept. of Public Works
1250 Market Street
Chattanooga, TN 37402

May 31, 2013

Re: Continued BMS Platinum Level Certification

Dear Matt,

On behalf of the National Biosolids Partnership (NBP), we congratulate you and your staff of the City of Chattanooga Moccasin Bend Wastewater Treatment Plant on the successful completion of another annual audit of your Biosolids Management System (BMS).

You are hereby notified that your organization's NBP Tier 4 Platinum Level Certification is continued for another year. Well done!

This designation recognizes that your BMS meets the NBP program requirements and supports excellence in biosolids management practices, augments regulatory compliance, advances environmental performance, and provides meaningful opportunities for public participation.

We are aware of the amount of effort required to satisfy the NBP requirements. We also know that demonstrating and verifying excellence in biosolids management is good for the reputation of your organization, the local environment, and the well-being of your community.

Your program is viewed as a model by those water resource recovery facilities and other organizations following the path of Environmental Management Systems. We are pleased to have the City of Chattanooga Moccasin Bend Wastewater Treatment Plant as a part of this international program, demonstrating excellence and leadership in biosolids management.

Sincerely,

Catherine R. Gerali

Cathy Gerali
Chair, WEF NBP Steering Committee

Original verification audit date: February 12, 2009
Current audit (internal interim) date(s): January 28-31, 2013
Report date: April 23, 2013
Date report submitted to NBP: April 30, 2013
Audit report review: May 20, 2013, nb

EXECUTIVE SUMMARY

The City of Chattanooga Interceptor Sewer System BMS Internal Audit team conducted an internal audit of its Biosolids Management System in late January of 2013. The purposes of the audit were

- to determine if the Chattanooga ISS is complying with its Biosolids Management Policy, the NBP Code of Good Practice, and program requirements as found in the Chattanooga BMS Manual.
- to determine if the Chattanooga ISS is making satisfactory progress toward its BMS Goals and Objectives.
- to evaluate the effectiveness of the City of Chattanooga's Biosolids Management System by reviewing selected processes from within the Biosolids Value Chain.

This internal audit was conducted in place of the year 4 interim audit as permitted by the NBP for Platinum certified organizations. As such, a review of Management System Dynamics including Examination of Outcomes was also conducted to meet the standards of the third-party interim audit.

Audits were conducted for the following processes: Solids Storage & Transportation, Biosolids Use-Land Application-Tennessee, Communication (internal & external), Contractor Control, Critical Control Points & Operational Controls (identification), and Emergency Preparedness.

The process audits consisted of interviews with City of Chattanooga ISS staff members with responsibility in the processes covered by the audit, a review of applicable records, and, where required, direct observation of operations.

The BMS internal audit identified a number of strengths in the City of Chattanooga's program, one finding for which corrective action is required, and three opportunities for improvement, which are summarized below. Corrective and preventive action plans addressing nonconformances and findings from the previous third party interim audit and internal audit, respectively, were also reviewed and all but one, which requires further follow-up, were found to be adequate.

Based on the results of the internal audit, the City of Chattanooga ISS is complying with its Biosolids Management Policy and the National Biosolids Partnership Code of Good Practice, is making satisfactory progress toward achieving its biosolids program goals

and objectives, and its Biosolids Management System is working effectively.

SUMMARY OF AUDIT FINDINGS

BMP Strengths

- All legal requirements applicable to BMP activities continue to be adequately addressed by the established procedures. There were zero 40 CFR Part 503 or any other biosolids-related violations in 2012.
- Approval package to certify Filter Press biosolids as Class A (EQ) material is to be submitted to EPA in the Spring of 2013.
- Synagro continues to impress with their day to day operations and their involvement and representation in the biosolids program.
- Preventive Maintenance work order program continues to improve. All critical equipment associated with Critical Control Points have been entered into the PM system. Newly appointed Maintenance Manager and Maintenance Planner will continue to drive improvements to the system.
- Biosolids staff training has improved significantly thanks to the efforts of the BMS Coordinator, who has developed a computer based presentation that shift staff can avail themselves of as time permits.

Findings

- **Finding IAT/13-01** Element 11 requires review and evaluation of the effectiveness of emergency preparedness and response procedures, including communications systems, and revision as necessary. Section 3.4 A of the Chattanooga BMS Manual calls for the review of Emergency Preparedness and Response Plan documents at least annually as directed by the Occupational Safety Specialist and at other times as directed by the BMS Management Team. Section 6.0 of the Chattanooga Emergency Preparedness and Response Plan calls for the Occupational Safety Specialist to review the Plan at least annually, verifying that current and proper policies and procedures are incorporated. The last review of the Plan was January 17, 2012, with no definite time set for a review in the near future. Also, Appendix A of the Plan needs to be updated to reflect recent personnel changes.

- **Correction/Corrective Action:** TBD

Opportunities for Improvement

- Sections 4.1 and 4.2 of the BMS Manual could better specify the BMS Coordinator's communication roles and responsibilities.
- The controlled copy on the server of the Appendices to the BMS Manual could be organized as one file to help eliminate confusion with outdated versions and past revisions. We also recommend that the Appendices be labeled as they appear in the BMS Manual rather than according to Element number.
- Safety training exercises which require staff participation, such as fire drills, or other drills specific to the Emergency Preparedness and Response Plan, would be useful.

AUDIT SCOPE AND METHODOLOGY

The City of Chattanooga Interceptor Sewer System BMS Internal Audit team conducted an internal audit of the City's Biosolids Management System in late January of 2013. The purposes of the internal audit was to determine if the Chattanooga ISS was complying with its Biosolids Management Policy, the NBP Code of Good Practice, and program requirements as found in the Chattanooga BMS Manual, making progress toward its BMS Goals and Objectives, and to evaluate the effectiveness of the City of Chattanooga's Biosolids Management System by reviewing selected processes from within the Biosolids Value Chain. A review of Management System Dynamics including Examination of Outcomes was also conducted to meet the standards of the third-party interim audit.

The internal audit team consisted of four City of Chattanooga ISS staff members selected by the Plant Superintendent (who was also the BMS Coordinator at the time the internal audit staff was appointed), and approved by the Waste Resources Director and the staff members' respective supervisors. These individuals were chosen based on their knowledge of the organization's operations and their ability to objectively gather evidence. All received BMS audit training from Mrs. Trudy Johnston of Material Matters in July 2009, and this was the fifth consecutive year that the original members of the team have worked together to conduct the BMS Internal Audit.

The scope of the audit covered processes of the Chattanooga biosolids program

selected and agreed upon by the Management Review Team and the audit team, consistent with the previously agreed to internal and interim audit programs. Audits were conducted for the following processes: Solids Storage & Transportation, Biosolids Use-Land Application-Tennessee, Communication (internal & external), Contractor Control, Critical Control Points & Operational Controls (identification), and Emergency Preparedness. Progress toward resolving previous findings and nonconformances from the most recent internal and interim audits was also evaluated in this year's internal audit.

The process audits consisted of interviews with City of Chattanooga ISS staff members with responsibility in the processes covered by the audit, a review of applicable records, and, where required, direct observation of operations. Staff members interviewed were identified by the internal audit team, and along with documents reviewed are listed in the Appendix.

Conformance with City of Chattanooga's Biosolids Management Policy

1. Managing biosolids in an environmentally sound, sustainable, socially acceptable, cost-effective, and safe manner, in accordance with the ten principles of the NBP Code of Good Practice—Chattanooga beneficially reused virtually all of the biosolids generated in 2012, which were land applied on farm fields in Tennessee, which saves landfill space and costs of about $2 million per year and reduces the City's carbon footprint. Biosolids again met the EPA's criteria for Class B material. There continues to be a very high level of satisfaction with Chattanooga's product among end users attributable to the quality of the product and the fertilizer cost savings realized by the farmers in the program.

2. Complying with all applicable federal, state, and local laws and regulations pertaining to biosolids including management, transportation, storage, and beneficial use and disposal of biosolids—The City of Chattanooga and their contractors were not cited for any 503 violations (air, metals, TDOT, etc.) and did not receive any NOVs in 2012.

3. Requiring land appliers of biosolids to comply with the provisions of the NBP Manual of Good Practice as well as local, state, and federal laws, rules, regulations, and guidelines governing land application practices—The City's agreement with Synagro spells out the required conduct of the land application

contractor, and their compliance with those requirements continues to be outstanding. They provide TDEC with a site book for each land application location, and in collaboration with Material Matters, Inc., their application rates are derived with a long term view that allows for multiple applications over a period of several years. Safety factors are incorporated so that biosolids are applied on permitted land application sites at rates significantly lower than the specific agronomic loading rates prescribed by the University of Tennessee Agricultural Extension office for the specific crop being planted. There were no NOVs or violations of the federal 503 regulations in 2012.

4. Progressing toward producing Class A biosolids that meet or exceed the requirements in 40 CFR Part 503, through testing and subsequent implementation of those processes/methods determined to be technically feasible and cost-effective—EPA and TDEC have visited the Moccasin Bend plant site and reviewed the Filter Press process from which Class A (EQ) will be produced. A package for final approval for the Filter Press product to be certified as Class A (EQ) product was submitted to the EPA March 29, 2013. (EQ=Exceptional Quality)

5. Implementing a Biosolids Environmental Management System that conforms to the NBP BMS Program—this marks the fourth year of the first five year cycle since the City of Chattanooga's program was certified. The city remains the only biosolids producer in the state of Tennessee certified at the Platinum Level and the twenty-third in the nation to gain the NBP BMS Certification.

Conformance with the NBP Code of Good Practice

1. Compliance: To commit to compliance with all applicable federal, state, and local requirements regarding production at the wastewater treatment facility, and management, transportation, storage, and use or disposal of biosolids away from the facility—This commitment is contained in Chattanooga's Biosolids Management Policy. Chattanooga has suffered no violations of the federal 503 code and received no NOVs in 2012.

2. Product: To provide biosolids that meet the applicable standards for their intended use or disposal—The City of Chattanooga's biosolids product is well established as meeting Class B requirements for land application. Product generated from the Filter Press process generally meets Class A requirements,

and the city has progressed well down the path toward certification.

3. Environmental Management System: To develop an environmental management system for biosolids that includes a method of independent third-party verification to ensure effective ongoing biosolids operations—The latest (year 3) interim audit was completed in February 2012, and the last internal audit was completed in August 2012. All nonconformances and findings needing correction were addressed through Chattanooga's Corrective and Preventive Action procedure. The interim audit verified that Chattanooga's biosolids program met the expectations and requirements of the NBP and as a result, Chattanooga continues with the designation of their BMS at Platinum level.

4. Quality Monitoring: To enhance the monitoring of biosolids production and management practices—The City of Chattanooga continues to conduct analytical laboratory tests beyond requirements to ensure product quality; testing required for Class A (EQ) certification has been added into the program. A monthly check of the EPA and NPDES websites ensures awareness of any altered or updated requirements or regulations. The land application contractor, Synagro, continues to land apply biosolids at agronomic rates significantly below the allowable limits. The City conducts biweekly inspections of application sites to ensure quality land application and random inspections of land application contractor and subcontractor vehicles.

5. Quality Practices: To require good housekeeping practices for biosolids production, processing, transport, and storage, and during final use or disposal operations—Chattanooga has resurfaced the asphalt and installed a trench drain around the filter dumpsters to protect biosolids from contamination in the staging area at the plant. Procedures are in place to keep the biosolids staging area clean and free of debris. Physical layout, access, and traffic patterns have been upgraded to ensure biosolids quality while stored onsite.

6. Contingency and Emergency Response Plans: To develop response plans for unanticipated events such as inclement weather, spills, and equipment malfunctions—Chattanooga's BMS Emergency Preparedness and Response Plan, with emergency contact information in case of chemical release, fire, severe weather, or other unplanned event, was last updated effective January 17, 2012. Synagro personnel have been trained in the city's BMS EP&RP; they also have their own spill response plan. The plans were effectively implemented

in response to a couple of minor incidents which occurred at the plant site. See Audit Observations and Results below (pages 16 & 17) for more details.

7. Sustainable Management Practices and Operations: To enhance the environment by committing to sustainable, environmentally acceptable biosolids management practices and operations through an environmental management system—This commitment is contained in Chattanooga's Biosolids Management Policy, and has been reinforced with the addition of a full-time Biosolids Program Coordinator. Since mid-2005, virtually all biosolids generated at the Moccasin Bend Wastewater Treatment Plant were beneficially reused by land applying on farm fields. In addition, having been originally certified by a third party verification audit completed in February 2009, Chattanooga retained its BMS Platinum level certification by completing a third party interim audit in February 2012.

8. Preventive Maintenance: To prepare and implement a plan for preventive maintenance for equipment used to manage biosolids and wastewater solids—Chattanooga is continuing the process of implementing the Maintenance and Reliability program under a new Maintenance Manager, developing new preventive maintenance plans for all applicable equipment to ensure its operational reliability. Plant assets used for biosolids processing and treatment are managed through Chattanooga's Computerized Maintenance Management System (CMMS), Cityworks, which has been modified to improve the work order system. A significantly bolstered staff is working hard to improve workflows and organize preventive and corrective maintenance efforts.

9. Continual Improvement: To seek continual improvement in all aspects of biosolids management—Chattanooga is seeking to more effectively use the CAPA process by implementing problem-solving committees to address operational issues.

10. Communication: To provide methods of effective communication with gatekeepers, stakeholders, and interested citizens regarding the key elements of each environmental management system, including information relative to system performance—Chattanooga has implemented the following methods to maintain open channels of communications with interested parties in the community:

- The Sustainability Committee, comprised of farmers, environmental interest groups, regulatory agencies, MBWWTP management, land application contractor management and staff, industrial users, and other interested parties, receives all relevant correspondence from the Chattanooga EMS and is convened annually.
- Annual biosolids factsheet is published annually each February, and the annual newsletter is published each fall and distributed to all ISS department employees and interested parties. Both publications are also posted on the city's website.
- Annual Performance Report is published by March 1 each year, and is distributed to all employees, Sustainability Committee members, and other interested parties, and posted on the city website.
- Plant tours for classes from local schools are scheduled year-round, and a feedback questionnaire intended to solicit constructive criticism is provided to each school group leader.
- Exhibits are displayed at Miller Plaza and First Tennessee Pavilion/Farmers Market as part of Public Works week during the third week of May each year.
- Moccasin Bend Wastewater Treatment Plant management maintains an active media outreach, working with local television stations and newspapers on feature stories and other newsworthy instances.
- The verification and interim audit reports are posted on both the city website and the NBP website (biosolids.org); internal audit reports are also posted on the city website.

Progress Toward Biosolids Program Goals & Objectives

Chattanooga established four overarching goals that are aligned with the NBP's four key outcomes, with several key objectives related to each goal. Quantitative measures indicative of progress to date (Key Performance Measures) continue to be developed. Objectives and quantitative measures are revised at the beginning of each year; this will

take place for the 2013 calendar year at the next Management Team meeting. This summary reflects the progress achieved in 2012.

- **GOAL** Relations with Interested Parties.
- **OBJECTIVES & PROGRESS** Increase outreach attempts—all planned actions achieved except contact with area farm agency; Continue annual biosolids Sustainability Committee meetings—all planned actions achieved, action items to be modified going forward; Continue Moccasin Bend Wastewater Treatment Plant newsletter—planned action achieved, to be reviewed going forward.
- **GOAL** Biosolids Regulatory Compliance.
- **OBJECTIVE & PROGRESS** Achieve zero land application non-compliances—all planned actions achieved.
- **GOAL** Quality Management Practices in Biosolids
- **OBJECTIVE & PROGRESS** Achieve production of Class A (EQ) Biosolids by 2012—Objective on track to be achieved by Spring 2013.
- **GOAL** Environmental Performance
- **OBJECTIVE & PROGRESS** Reduction of carbon footprint & reduce energy use—digester gas used for boiler fuel 94.7% of measured days vs. target of 68.5%; low cost energy savings recommendations are being implemented, with evaluations of opportunities continuing and future projects planned and budgeted.

MANAGEMENT SYSTEM DYNAMICS & EFFECTIVENESS REVIEWS

Review of the management system dynamics and outcomes is intended to verify that the biosolids management system is functioning effectively and generating positive outcomes and that as the program matures it implements the changes brought about through the continuous improvement processes.

Significant Changes

Jerry Stewart, the Director of Waste Resources, retired at the end of 2012. Alice Cannella has been appointed Interim Wastewater Director. Brian Lessman has been appointed Interim Plant Superintendent.

Consideration is being given to combining the Moccasin Bend wastewater operations and the Chattanooga Department of Water Quality as the Moccasin Bend Clean Water Authority. A new City government administration takes office April 15, 2013 and will determine the final outcome of the Authority.

A Consent Decree has been negotiated by the USEPA and the City of Chattanooga which has been deemed satisfactory by all principles and interested third parties, and awaits only a judge's signature to be effectively in place and binding to all parties. The bulk of the project work required under the order has to do with SSES work in the most problematic sewer basins and reduction of I&I in the collection system, as well as capacity optimization of the treatment plant, which should have a minimal impact on the biosolids program going forward.

Revisions to the Management System and Related Documentation

No structurally significant revisions other than the personnel changes noted above have been made in the Chattanooga Biosolids Management system since the previous audits. Minor changes for clarification and specificity continue to be made in the Manual to correctly reflect the Chattanooga management system.

Examination of Outcomes

The Chattanooga biosolids management system strives for continuous improvement in how biosolids activities are conducted and how those activities promote the four key outcomes.

Environmental Performance

Digester gas is being used on a daily basis as an alternate energy source, reducing the plant's carbon footprint.

Quality Management Practices

Filter cake biosolids are on track to be certified as Class A (EQ) product in the spring of

2013.

Regulatory Compliance

Contingency procedures for product non-compliance are currently being drafted for submission to EPA in support of Class A product certification.

Interested Party Relations

Positive feedback regarding the user friendliness of the city's new website has been received; one farmer said that a field receiving land application of product looked like the "Garden of Eden" compared to other non-applied fields.

Correction of Nonconformances and Findings from Previous Audits

All nonconformances and findings from previous audits have been closed with one exception.

Finding IAT 12-04 Element 14 requires development of corrective action plans to address nonconformances identified during routine monitoring and measurement or interim or internal audits. The CAPA process appears to work reasonably well in addressing nonconformances and findings of interim and internal audits, respectively, but appears to be ineffective in addressing operational issues.

Correction/Corrective Action: A process for problem solving utilizing cause analysis is being introduced at Moccasin Bend to facilitate corrective and preventive actions in the future. A problem solving committee has been formed to address an operational CAPA regarding filter press drain lines. The committee has met several times and is approaching the point to where a final resolution can be implemented. At that point, the problem solving committee approach will be evaluated and the CAPA is expected to be closed.

The audit team considers this finding to have been effectively addressed, but will review during the next audit. We feel that the committee approach is an inclusive initiative that should have long term organizational benefits.

Biosolids Policy Commitments

The Chattanooga Biosolids Management Policy remains as approved in 2009. The Policy includes a commitment to follow the principles of the NBP Code of Good Practice. A summary of how the city has met the commitments made in the Policy is on

pages 5 and 6.

Effectiveness Reviews

Communications Program

The Communications Program is working effectively. For more details, see Audit Observations and Results, page 15, and item 10 under Conformance with the NBP Code of Good Practice, pages 8 and 9.

Biosolids Goals and Objectives Process

The Goals and Objectives Process is working effectively. Evaluation of progress against Goals and Objectives has been separated from quarterly Management Review meetings to stand-alone meetings, which has facilitated better review of the process. Measurability has improved significantly. For more details, see Progress Toward Biosolids Program Goals & Objectives, pages 9 and 10.

Goals and Objectives for the upcoming year (2013) will be reviewed and revised at the next Management Team meeting.

Corrective and Preventive Action Process

The Corrective and Preventive Action Process is used to effectively respond to nonconformances and findings from third party and internal audits, respectively. It is being used more proactively to address operational issues, using problem solving committees to define problem issues and work toward permanent solutions. We expect this initiative to bring long-term organizational benefits to the Moccasin Bend operation.

Management Review

The Chattanooga Management Review process has improved by conducting shorter, more frequent meetings with more specific agendas. Biosolids program performance review includes discussion around Key Performance Indicators for the current quarter and comparison of KPIs to the previous quarter's results. Biosolids activities that need improvement are identified and corrective actions are discussed, as are performance against both Policy commitments and NBP Code of Good Practice.

Interested Parties Interviews

Interested parties interviewed for the audit were Steve Clark and Rick Lowery of CLC

Cattle Co., Jim Studer, and Michael Pendergrass.

Messers. Clark and Lowery have benefitted from land application on their Williams Island lease, where they have experienced 'unprecedented improvement', and say that the fields that have been land applied look like the 'Garden of Eden' compared to other fields. Their only complaint is that they wish they could get more product.

Mr. Studer, from Sequatchie County, allows the city to store product on his land for future land application in the area. He said he has seen improvement in product application and that he is very happy with our people and our product.

Mr. Pendergrass operates several farms in Bledsoe County, and is in his fourth year with the program. He complimented our 'good product and good people', and said things had improved significantly when Synagro became our land application contractor, a sentiment that was also shared by the other gentlemen interviewed.

Audit Results – Management Program Dynamics & Effectiveness

Review of the dynamics of the Chattanooga Biosolids Management System confirmed that it is functioning effectively and generating positive outcomes.

AUDIT OBSERVATIONS AND RESULTS

Observations and results of individual process audits performed are described below. Findings and opportunities found during the audit are also included in the Summary on pages 3 and 4 of this report.

Solids Storage & Transportation

Biosolids prepared at the Moccasin Bend plant are transported to an onsite storage area by a contractor (Synagro) and then loaded on to trucks for transportation to application or storage sites in the field. Onsite storage pad drainage improvements have minimized the risk of contamination and facilitated proper housekeeping. Loads are weighed before departing the plant site and a daily activity report of all loads shipped is reconciled by the contractor. Trucks are washed before leaving the plant. Field storage sites are kept clean and accessible. All requirements are specified in the agreement between the City and Synagro.

Audit Result: The above process was found to be functioning effectively and meeting applicable NBP expectations and requirements.

Biosolids Use – Land Application – Tennessee

Biosolids are land applied on permitted farms by a contractor (Synagro), keeping extensive records of solids applied to each field. Field personnel keep logs of truckloads stored/spread which are reconciled against daily activity reports of loads shipped from the plant. Records are also kept of the amounts spread on each field, with strict adherence to prescribed agronomic loadings. Site inspections are regularly conducted by the City. An application site, the Holmes farm in Bledsoe County, inspected during this audit was observed to have setbacks properly marked and proper application of biosolids. A field storage site on the Studer property in Sequatchie County was well maintained and the stored biosolids easily accessible.

Audit Result: The above process was found to be functioning effectively and meeting applicable NBP expectations and requirements.

Communication (internal & external)

The Chattanooga Communications program includes proactive methods for communicating with interested parties, including regulators and the public. Communications occur through public and individual meetings, plant tours, mailings, the 311 Center, and through the city's website. Complaints from people involved with and peripheral to land application activities have been handled effectively. Internal communications occur through training, staff and contractor meetings, and biosolids information is now widely available through the posting of information stations at strategic locations in the Moccasin Bend facility.

Audit Result: The above process was found to be functioning effectively and meeting applicable NBP expectations and requirements.

Opportunities for Improvement

- Sections 4.1 and 4.2 of the BMS Manual could better specify the BMS Coordinator's communication roles and responsibilities.
- The controlled copy on the server of the Appendices to the BMS Manual could be organized as one file to help eliminate confusion with outdated versions and past revisions. We also recommend that the Appendices be labeled as they appear in the BMS Manual rather than according to Element number.

Contractor Control

A Service Agreement (contract) is in place defining responsibilities of contractor (Synagro) and MBWWTP. This Agreement includes responsibilities for conformance with Biosolids Management System requirements. Biosolids activities are also supported by Material Matters, Inc., who manage informational databases which contribute to regulatory reporting and land application regulatory compliance. Monthly meetings are conducted to plan and discuss ongoing matters.

Audit Result: The above process was found to be functioning effectively and meeting applicable NBP expectations and requirements.

Critical Control Points & Operational Controls (Identification)

The City of Chattanooga has identified critical control points used in developing operational controls for managing the four key outcomes. Establishment of standard operating procedures, work practices, instrumentation, monitoring programs, and other operational controls ensures that operations consistently meet applicable legal and other requirements, and eliminate or minimize negative environmental impacts while maximizing biosolid program benefits.

Interviews with plant and contractor personnel showed good awareness of the critical control points and operational controls for which they were responsible, and associated potential environmental and biosolid quality impacts within their areas. Section 3.3 of the BMS Manual details the process description and procedure for identifying critical control points, and Appendix D of the manual provides a listing of the critical control points, including those applicable to the contractor responsible for the land application of biosolids.

Audit result: The above process was found to be functioning effectively and meeting applicable NBP expectations and requirements.

Emergency Preparedness

A Biosolids Program Emergency Preparedness and Response Plan is in place for the City of Chattanooga Interceptor Sewer System, to be followed in case of chemical release, fire, severe weather, or other unplanned event. The Plan, which is Appendix E of the BMS Manual, was last updated on January 17, 2012. Synagro personnel have been trained in the city's BMS EP&RP; they also have their own spill response plan.

The plans were effectively implemented in response to a couple of minor incidents which occurred at the plant site.

Audit result: The above process was found to be functioning effectively and meeting applicable NBP expectations and requirements, except as noted below:

- **Finding IAT/13-01** Element 11 requires review and evaluation of the effectiveness of emergency preparedness and response procedures, including communications systems, and revision as necessary. Section 3.4 A of the Chattanooga BMS Manual calls for the review of Emergency Preparedness and Response Plan documents at least annually as directed by the Occupational Safety Specialist and at other times as directed by the BMS Management Team. Section 6.0 of the Chattanooga Emergency Preparedness and Response Plan calls for the Occupational Safety Specialist to review the Plan at least annually, verifying that current and proper policies and procedures are incorporated. The last review of the Plan was January 17, 2012, with no definite time set for a review in the near future. Also, Appendix A of the Plan needs to be updated to reflect recent personnel changes.

  Correction/Corrective Action: CAPA form IAT 13-01 has been drafted establishing a procedure to ensure annual review of the Emergency Preparedness and Response Plan.

  The internal audit team considers this finding to have been effectively addressed, but progress will be reviewed during the next audit.

Opportunity for Improvement

- Safety training exercises which require staff participation, such as fire drills, or other drills specific to the Emergency Preparedness and Response Plan, would be useful.

Appendix

Documents Reviewed

Synagro Daily Biosolids Haul Reports
Material Matters Biosolids Characteristics Reports
Synagro Biosolids Handling Logs
City of Chattanooga 2011 Biosolids Performance Report
Synagro Onsite Standard Operating Procedures and Spill Response Plan
City of Chattanooga Biosolids Newsletter, Vol. 3, September 2012
City of Chattanooga Biosolids Land Application Program Factsheet-Calendar Year 2012
Synagro Vehicle Analysis Report
City of Chattanooga Biosolids Weekly Activity Reports
Material Matters Notice and Necessary Information Reports
Synagro Contract Services Agreement
City of Chattanooga BMS Emergency Preparedness and Response Plan
Synagro Application Site Maps (various)
Land Owner Consent for Biosolids Application for Taylor Holmes farm
Synagro Field Storage and Application Logs
City of Chattanooga Solids Operations SOPs
Material Matters Scale Data Report
City of Chattanooga Corrective Action Plans and Logs of Previous CAPAs
City of Chattanooga Management Review Team Meeting Minutes for 2012
City of Chattanooga Application Site Inspection Reports
City of Chattanooga Biosolids Management Program Feedback Sheet
Various emails as supporting documentation

Reference Documents

City of Chattanooga BMS Manual and Appendices
City of Chattanooga Biosolids Management Policy Statement
TDEC Guidelines for the Land Application and Surface Disposal of Biosolids May 2010
NBP Biosolids EMS Guidance Manual
NBP Manual of Good Practice
NBP Code of Good Practice
NBP Third Party verification Auditor Guidance
Reports from previously conducted independent third-party and internal audits

List of Participants

Alice Cannella	Interim Wastewater Director-City of Chattanooga ISS
Matthew Snyder	BMS Coordinator-City of Chattanooga ISS
Gary Williams	Occupational Safety Specialist-City of Chattanooga ISS
Charles Thomas	Liquids Operations Supervisor-City of Chattanooga ISS
Billy Geren	IT Specialist-City of Chattanooga ISS
Allen Martin	Maintenance Planner-City of Chattanooga ISS
Bill Monday	Liquids Operator-City of Chattanooga ISS
Brandon Collier	Solids Operator 3-City of Chattanooga ISS
Chuck Blow	Solids Operator 2-City of Chattanooga ISS
David Taylor	Solids Operator 1-City of Chattanooga ISS
Doris Magouirk	Operations Supervisor-Synagro
Aaron Loyd	Technical Services Manager-Synagro
Chad Raines	Field Supervisor-Synagro
David Tate	Truck Driver-Synagro
Norman Robertson	Truck Driver-Synagro
Aaron Stephens	Material Matters
Steve Clark	CLC Cattle Co.
Rick Lowery	CLC Cattle Co.
Jim Studer	farmer, provides storage for wet weather staging
Michael Pendergrass	contract farm operator