



Biosolids EMS Internal Audit Report

Camden County Municipal Utilities Authority
Camden, New Jersey

Audit Report Date: November 17, 2011

Audit Conducted by:

Doug Burns, Chief Accountant, CCMUA
Wayne Planamento, Comptroller, CCMUA
Janet Miles, Consulting Engineer, DB/Guarino Engineers

Audit Dates: October 19, 26, 2011 and November 1, 2011

Audit Report Prepared by: Janet Miles, Doug Burns and Wayne Planamento

1. SUMMARY

An Environmental Management System Internal Audit was conducted at the Camden County Municipal Utilities Authority as required by National Biosolids Partnership EMS Element #16.

The purpose of this audit was to:

- Respond to the Major Nonconformance JS-11-06 found during the September 7-9, 2011 Biosolids EMS Interim Audit. CCMUA had not performed an internal audit in the past year as required by the NBP EMS Element #16 because it believed it was not required in the same year as a third party audit. This Internal Audit is to be considered the corrective action taken for this Major Nonconformance;
- Confirm that the CCMUA is consistent with the NBP Code of Good Practice; and,
- Review open Major (2) and Minor (4) Nonconformances identified in the Interim Audit and assess corrective actions taken to verify effectiveness. (Corrective actions on major nonconformances are required within 90 days of the Interim Audit).

A. Audit Scope and Methodology

The EMS Coordinator, Andrew Kricun, selected 3 individuals as Internal Auditors that are not directly involved in the day-to-day operation of the plant - two CCMUA staff members and a consulting engineer, DB/Guarino Engineers.

It was decided that the NBP Code of Good Practice should be the audit topic as this is the basis for the Environmental Management System. Additionally, as the auditors conducted the internal audit they would address the nonconformances found in the September 7-9, 2011 Biosolids EMS Interim Audit and present the status and corrective actions taken of the outstanding nonconformances.

The Auditors developed an internal audit worksheet based on the 10 principles of the NBP Code of Good Practice. The most qualified CCMUA staff member was interviewed for each of the 10 principles. There were occasions where 2 staff members were interviewed for the same principle to determine if the information was being communicated to all levels of staff. For the Communication principle, 3 operators were interviewed for the similar reasons, to assess if the EMS goals are understood or known throughout all levels of staff.

2. SUMMARY OF AUDIT RESULTS

The following summarizes the result of the audit. Details of the interviews are described in Section 3 of this report.

Principle from NBP Code of Good Practice	Status (November 4, 2011)	Nonconformance	Opportunities
1. Compliance – Is CCMUA in compliance with local, state and federal regulations for its effluent quality?	Conforms	None	Provide charts for EMS Reports/meetings demonstrating measurable performance.
2. Product – Do CCMUA's biosolids meet applicable federal and state regulations?	Conforms	None	Provide charts for EMS Reports/meetings demonstrating measurable performance.
3. Environmental Management System – Does the EMS include a method of 3 rd party verification? Is EMS certified? Is the system working and does it meet its goals and objectives?	Conforms	None	None
4. Quality Monitoring – Is quality being monitored to enhance production and management practices?	Conforms	None	None
5. Quality Practices – Evaluate status of housekeeping practices, ie, GBT area.	Conforms (Cited as minor nonconformance in Sept 2011 Interim Audit – Corrective Actions Taken)	None	Store equipment in locked inventory room and not in GBT area.
6. Contingency and Emergency Response – Does the ERP cover unanticipated events, i.e. fire, disaster? Is it approved? Are all the employees trained and aware of the plan's requirements?	Conforms	None	None
7. Sustainable Management Practices and Operations – Does the	Conforms	None	None

Principle from NBP Code of Good Practice	Status (November 4, 2011)	Nonconformance	Opportunities
Authority apply Plan, Do, Check? Does the Authority's training program reflect SOPs, new equipment etc?			
8. Preventive Maintenance – Discuss PM plan and percent completion; no. of work orders completed per month as compared to no. issues; what is ratio of corrective vs. preventive?	Conforms	None	Include the emergency generators in the Maximo system. Reduce corrective maintenance and emergency repairs to <10% of total maintenance.
9. Continual Improvement – What goals and objectives are set for this year and how well are they monitored?	Conforms	None	None
10. Communication – How are citizens, gatekeepers and stakeholders informed of EMS? Are plant staff informed of EMS and its goals and objectives?	Comforms	None	Improve internal communication of EMS goals and objectives.

3. DETAILED AUDIT RESULTS

A. NBP Code of Good Practice

1. *Compliance - Is CCMUA in compliance with local, state and federal regulations for its effluent quality?*

Audit Results

The CCMUA is in compliance with local, state and federal regulations for its effluent quality. A copy of the 2010 NJDEP Discharge Monitoring Reports were provided showing compliance with the monthly limits.

Nonconformances - None

Opportunities - Provide charts for EMS Reports/meetings showing performance, i.e., with monthly graph showing TSS and BOD performance.

2. *Product – Do CCMUA’s biosolids meet applicable federal and state regulations?*

Audit Results

The CCMUA’s biosolids meet the 503 Regulations where applicable and the NJ Sludge Quality Assurance Regulations (SQAR). CCMUA’s sludge is disposed of as a Class B product (dewatered and dried product). It is disposed in a landfill (cap only), incinerated, or mine reclamation.

Nonconformances - None

Opportunities - Provide charts for EMS Reports/meetings showing performance, i.e., with monthly graph showing percent solids.

3. *Environmental Management System – Does the EMS include a method of 3rd party verification? Is EMS certified? Is the system working and does it meet its goals and objectives?*

Audit Results

The EMS goes above and beyond the 2 tiers of verification. CCMUA has signed up for the NBP certification that is the most stringent and requires a yearly External Audit. Also, CCMUA has retained DB/Guarino Engineers on an ongoing basis to assist with identifying and implementing optimization and improvement efforts.

The CCMUA was EMS certified December 2010.

The system is working well in most respects. Although CCMUA had 2 major nonconformances in its most recent Interim Audit, it is still considered in the growing stages and there is room for improvement on follow through on action items.

The CCMUA and the EMS is meeting its goals and objectives, specifically:

1. CCMUA’s main goal to optimize water quality is consistently being achieved. The performance objective of <10 ppm TSS and <5 ppm BOD is over and above its permit limit of 30 ppm TSS and 25 ppm BOD.
2. CCMUA’s goal to optimize odor control performance is being met as evidence by its performance objective of reducing odor complaints to 0 complaints on a monthly basis.

3. CCMUA's third goal to minimize cost is demonstrated in CCMUA's ability to hold rates for the last 15 years.

Nonconformances - None

Opportunities - None

4. *Quality Monitoring – Is quality being monitored to enhance production and management practices?*

CCMUA is doing what they are required to do. Currently, CCMUA is in a transition period given the ongoing installation of the Sludge Dryer. Synagro, the outside contractor, is in the process of testing the dryer(s) and accepting 50% of the dewatered sludge.

Under the former biosolids operations, dewatering process, CCMUA complied with all the NJDEP reporting requirements (SQAR).

Under the new biosolids operations, drying dewatered sludge in the new sludge dryers, CCMUA is still in transition and will modify the EMS when the sludge dryer process is 100% operational.

One problem that has been resolved is that the sludge hauling trucks were being loaded over the maximum allowed weight of 80,000 lbs. Finance reported this safety and liability issues and it has been corrected and disciplinary action has been taken on the responsible party.

Nonconformances - None

Opportunities - None

5. *Quality Practices – Evaluate status of housekeeping practices, ie, GBT area.*

The Interim Audit cited a Minor Nonconformance JS 11-01 citing the Gravity Thickener area had spilled materials on the floor that have not been cleaned in several days or weeks, hoses not put away and doors on equipment left open (despite instructions to close).

The Internal Auditors visited the GBT area and noted that the hoses have been put away but the equipment doors were open, equipment was still stored in one area and a water supply hose was leaking on the floor.

The Executive Director was notified and the O&M Department was reminded to take corrective actions.

The Auditors were informed that in a November 9, 2011 CCMUA Staff Meeting, the O&M Department stated that corrective actions were taken and the GBT area is now in compliance.

Nonconformance – None.

Opportunities – Store equipment in locked inventory room rather than GBT area.

6. *Contingency and Emergency Response Plans – Does the ERP cover unanticipated events, fire, disaster, etc. Is the ERP approved? Are the operators aware of the plan and requirements? How often are the operators trained?*

The CCMUA has the following contingency and emergency plans:

1. Emergency Response Plan (ERP) which was written in 1995 and requires updating (to include sludge dryer and change from chemical scrubbing to biofilter).
2. Discharge Prevention, Containment and Countermeasure (DPCC) plan was recently updated and submitted to the NJDEP in June and is awaiting approval.
3. Wet Weather Operating Plan, June 2003 and submitted to NJDEP.

Training includes confined space, OSHA, chemical spill response and others. All O&M personnel participate in and receive training required to be a qualified maintenance personnel and certified as a wastewater operator. The Maintenance Department completed a 4 year apprenticeship training program with the County Vocational School. Now 15 CCMUA employees are certified millwrights.

Nonconformance – None

Opportunities – None

7. *Sustainable Management Practices and Operations – Does the Authority apply “Plan, Do, Check...i.e., are operational issues, problems followed up on in monthly EMS meetings/weekly meeting?*

The Minor Nonconformance JS 11-05 identified in the Interim Audit stated that nonconformances requiring corrective action are not documented and tracking progress in completing corrective actions during weekly meetings is informal and not recorded.

CCMUA responded to Interim Audit’s Minor Nonconformance by implementing the following corrective actions:

CCMUA added an EMS segment to its weekly executive staff meetings. CCMUA is now in compliance with the requirements of Element #14 by recording the

nonconformances requiring corrective actions in the meeting minutes and tracking progress in completing corrective actions.

The CCMUA applies the Plan, Do, Check methodology through their scheduled staff meetings. CCMUA has the following internal meetings as indicated below:

- a. O&M Division Heads “Morning Meetings” to discuss and coordinate planned activities for the day. They also discuss any outstanding operational issues/problems that have not been resolved. This meeting is for daily planning purposes and a general information session (i.e., notify staff if there will be a tour going through the plant, etc).
- b. Weekly Executive Staff Meetings led by the EMS Coordinator. These meetings are for managers to report on what they are doing and discussion of issues. Meeting minutes are generated and shared with staff.
- c. Bimonthly Middle Management Meetings led by the EMS Coordinator.

Nonconformance - None

Opportunities – None

8. *Preventive Maintenance – Does the Authority have a PM plan for equipment used to manage biosolids and wastewater solids? What is the percent completion of PM? How many preventive maintenance work orders issued per month compared to how many completed per month? What is the ratio of corrective versus preventive maintenance?*

The CCMUA has a computerized maintenance management system, Maximo, to assess O&M performance and to track maintenance on equipment. In 2011 (Jan – Sept) 14% of the work orders were corrective maintenance and 86% were preventive maintenance. The monthly work orders closed for the months of Jan-Sept ranged from 183 to 884. CCMUA completes 99% of the work orders issued. Those not completed are usually duplicates and are eventually removed from the system.

The Maximo system does not include vehicles or emergency generators. The CCMUA is planning to implement a county wide fleet software program which will act as a parts warehouse countywide.

Nonconformance - None

Opportunities - Include the emergency generators in the Maximo system and Reduce corrective maintenance and emergency repairs to <10% of total maintenance.

9. *Continual Improvement – What goals and objectives are set for this year and next year?*

The CCMUA goals and objectives for 2012 are as follows:

- a. Optimize effluent quality (5 ppm or better)
- b. Optimize odor control throughout the plant
- c. Process all dewatered sludge in Sludge Dryer by January 1, 2012
- d. Ensure that biosolids are never exposed to air
- e. Improve cost efficiencies
- f. Pursue green energy and green infrastructure
- g. Install 20 new rain gardens by December 2012 through the SMART program
- h. Establish a new park
- i. Complete solar panel project at the Delaware No. 1 plant by 2012
- j. Reduce corrective and emergency repairs to <10% of total maintenance.

Nonconformance - None

Opportunities – None

10. *Communication – How are citizens, gatekeepers and stakeholders informed of key elements of each EMS including system performance?*

The EMS is communicated through the following methods:

- a. Pipeline/EMS Newsletter issued to employees
- b. EMS Program Manager meets with community groups and citizen groups several times/month.
- c. Meet with NJDEP at least once/month
- d. Educational/public tours (approx. 2,000 people/yr)
- e. Host contingency from Former Soviet Republic
- f. NBP mentor to 3 utilities who are seeking certification
- g. CCMUA website (www.ccmua.org) includes EMS reports (Annual report, Internal Audit, External Interim Audits) and schedules including notification of upcoming meetings and Audits.

The Auditors also interviewed 3 plant operators to assess their knowledge of the EMS program. When interviewed, two out of 3 plant operators were very knowledgeable of the EMS goals and objectives (Improve effluent quality, reduce odors and cost).

Nonconformance - None

Opportunities – Improve internal communication of EMS goals and objectives.

B. Review of Open Nonconformances

The internal auditors reviewed corrective action take in response to the following nonconformances noted in the September 7, 2011 third party Biosolids Interim Audit by DEKRA.

Minor Nonconformance JS 11-01 CCMUA commits to follow the Code of Good Practices in their biosolids program. Gravity Thickener area has spilled materials on the floor that have not been cleaned in several days or weeks, hoses not put away and doors on equipment left open (despite instructions to close). This housekeeping is not consistent with principles in the Code of Good Practice.

Corrective Action taken: The Internal Auditors visited the GBT area and noted that the hoses have been put away but the equipment doors were open, equipment was still stored in one area and a water supply hose was leaking on the floor. The Executive Director was notified and the O&M Department was reminded to take corrective actions. The Auditors were informed that in a November 9, 2011 CCMUA Staff Meeting, the O&M Department stated that corrective actions were taken and the GBT area is now in compliance. Follow-up visit on November 17, 2011 to the GBT area confirmed compliance.

Major Nonconformance JS 11-02 NBP EMS Element #5 requires that biosolids program goals and objectives be measureable and that action plans be implemented to achieve these goals and objectives. Some of the biosolids “objectives” developed for 2011 do not have measureable targets or results (e.g. continue minimizing adverse impacts from odors....”) and action plans have not been developed for achieving biosolids objectives.

Corrective Action taken: The September 2011 EMS manual has been revised to conform to the requirements of EMS Element #5. See attached.

Minor Nonconformance JS 11-03 NBP EMS Element #6 requires public participation in plans for independent third-party audits. Except indirectly as part of Board Meetings, external interested parties were not advised of the current interim audit.

Corrective Action taken: The EMS Coordinator, Andrew Kricun stated that the CCMUA will post notification of upcoming NBP EMS Interim Audits on its website, www.ccmua.org. The website is accessible to all interested parties.

Minor Nonconformance JS 11-04 NBP EMS Element #7 requires that contractor roles and responsibilities be defined in Service Agreements. No “letter of

understanding” or similar agreement about EMS responsibilities is in place with one trucking contractor (Mount Construction).

Corrective Action will be taken within the next 30 days.

Minor Nonconformance JS 11-05 NBP EMS Element #14 requires documenting formal corrective action plans and tracking progress in completing these plans. Some nonconformances requiring corrective action are not documented and tracking progress in completing corrective actions during weekly meetings is informal and not recorded.

Corrective Action taken: CCMUA added an EMS segment to its weekly executive staff meetings. CCMUA complies with the requirements of Element #14 by recording the nonconformances requiring corrective actions in the meeting minutes and tracking progress in completing corrective actions.

Major Nonconformance JS 11-06 NBP EMS Element #16 requires that CCMUA maintain an internal audit program to periodically analyze its EMS. No internal audits have been performed in the past year, which is evidence that the internal audit program is not being maintained.

Correction Action taken: This Internal Audit is considered the corrective action to satisfy this nonconformance.

C. APPENDICES

List of Participants

The following persons participated in this audit.

Name	Position
Andrew Kricun	Executive Director
Robert Cornforth	Director of O&M
Gayle Pagano	Regulatory Compliance Officer
Tom Mount	Assistant Chief Operator
Woody Minner	Safety Director
Ron Massey	Operator
Dan Knighton	Operator
Anthony DeCarlo	Operator