National Biosolids Partnership

Biosolids EMS Interim Audit Report

District Of Columbia Water & Sewer Authority

Washington, DC

Audit Report Date: October 20, 2006

Audit Conducted By:

KEMA-Registered Quality, Inc. – Chalfont, PA

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Audit Dates: September 5 - 8, 2006

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Interim Audit #1, September 5 - 8, 2006

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1. SUMMARY

KEMA-Registered Quality Inc. (KEMA) conducted an independent audit of the environmental management system (EMS) being used by the District of Columbia Water & Sewer Authority (DCWASA) in managing its biosolids program. This audit was performed September 5 to 8, 2006 at the request of the National Biosolids Partnership and was interim audit #1 following verification of the DCWASA biosolids EMS in October 2004.

The purposes of this audit were to:

- Verify that the biosolids EMS being used by DCWASA conforms to requirements of the National Biosolids Partnership (NBP) *Environmental Management System for Biosolids*, comprised of 17 EMS Elements
- Confirm that the DCWASA biosolids EMS is functioning as intended, with practices and procedures being performed as documented.
- Determine if DCWASA is achieving desired outcomes through the use of their biosolids EMS.

A. Audit Scope and Methodology

The DCWASA Biosolids EMS encompasses pretreatment, biosolids stabilization, storage and transportation and end use / disposition, with special attention to practices and management activities that directly support biosolids-related operations, processes, and activities.

The scope of this audit included the following. This scope is consistent with NBP requirements for biosolids EMS interim audits and the overall audit program agreed to by KEMA and DCWASA.

1. Verification of open nonconformances from previous KEMA audits (October 2004)
2. Review of significant biosolids program changes
3. Audits of the following processes
   - Biosolids Policy
   - Biosolids Production - Solids Stabilization, Conditioning and Handling
   - Biosolids Storage & Transportation
   - Biosolids Use & Disposition – Agriculture (Synagro - MD)
   - Biosolids Use & Disposition – Tree Farming (ERCO-MD)
   - Communication
   - Corrective and Preventive Action
   - Critical Control Points (Identification)
   - EMS Planning & Public Participation
   - Goals & Objectives
   - Internal EMS Audits
   - Management Involvement & Review

4. Examination of EMS Outcomes (regulatory compliance, interested party relations, environmental performance, quality practices)

This audit was performed by qualified auditors following NBP Auditor Guidance (March 2006) and KEMA's Biosolids EMS Audit Planning Guide. Using sampling techniques, the auditor observed practices in place, interviewed key persons and reviewed pertinent documents and records to assess the systematic performance of each process audited. Representative interested parties were interviewed, as agreed and arranged by DCWASA.

B. Summary of Audit Findings

EMS Strengths

KEMA noted the following strengths in the DCWASA biosolids program.

- The DCWASA General Manager is aware of the benefits of using system management for the biosolids program and committed to wants to expand this approach throughout the Blue Plains plant
- Internal Auditors are aware of systems auditing purposes & methods
- Several active methods are used to identify need for corrective action and track completion of these actions

EMS Outcomes

DCWASA's overall biosolids program is improving through the use of their EMS approach to managing the program. Recent outcomes in the areas of regulatory compliance, environmental performance, relations with interested parties and biosolids quality practices are described in the "Detailed Audit Results" section of this report.

Nonconformances

During this audit, KEMA found nine (9) minor nonconformances with respect to the audit criteria. These nonconformances are described in the "Audit Results" section of this report.

Opportunities for Improvement

KEMA noted several opportunities for improvement in the DCWASA biosolids EMS. These are described in the detailed report for each audit (Audit Results).

C. Verification Statement

Based on the results of this audit, KEMA has verified the management system for DCWASA's biosolids program continues to meet the expectations and requirements of NBP's Biosolids EMS Program. Certification can continue.

D. Agreements

DCWASA has agreed to prepare written plans for correcting the nonconformances identified during this audit and to send these plans to KEMA's Lead Auditor by October 15, 2006. KEMA will review these plans for consistency with NBP requirements and, if acceptable, approve them for implementation in correcting the nonconformances. DCWASA will implement the approved plans in a timely manner and will review the corrections internally within 6 months. The effectiveness of actions taken to correct nonconformances will be reviewed during the next assigned third party audit. DCWASA and KEMA have agreed that interim audit #2 would be a third party audit. DCWASA will arrange for that interim audit to occur before September 30, 2007.

An audit plan for all 4 interim audits has been agreed upon by DCWASA and KEMA.

E. Appeals

The NBP provides an appeals process for biosolids organizations and interested parties that disagree with the findings of a third party EMS audit. The verification appeals process involves an Appeals Board; representing a balance of biosolids management interested parties, including an environmental advocacy group, and wastewater industry professionals. An appeal must be submitted within 30 days of the official verification decision or interim audit decision by the Audit Company. Anyone who may need help in understanding the appeals process should contact the National Biosolids Partnership staff, Mr. Eugene DeMichele at 703-684-2438, or send an e-mail to: edemichele@wef.org.

2. AUDIT DETAILS

A. Agency Details

Agency name, Location: District of Columbia Water & Sewer Authority, Washington DC

Biosolids production location(s): Blue Plains Wastewater Treatment Plant, Washington DC

Number of employees involved in biosolids activities: approximately 400

Wastewater treated: approximately 340 to 370 million gallons per day

Biosolids production: approximately 125,000 tons per year (dry basis)

Biosolids production location: Blue Plains Advanced Wastewater Treatment Plant, Washington DC

Biosolids use / Disposition Sites Audited

ERCO Tree Farm (Maryland)
Synagro Land Application site (Maryland)

Contractors Audited

ERCO, Synagro

Third Parties Interviewed During Audit

Mr. C. W. Williams (interested party)
Mr. Cal Sawyer (Virginia Dept Health)

Audit Team

The National Biosolids Partnership assigned KEMA-Registered Quality Inc. to perform this audit on their behalf. Mr. Jon Shaver and Mr. Michael Wardell performed the audit for KEMA.

KEMA asserts that the relationship that our firm and auditors have with the DCWASA is completely independent and meets criteria established by the National Biosolids Partnership for Third Party Audit Companies and Third Party Auditors.

B. Reference Materials

The following documents were used as references during this audit:

DCWASA EMS Manual
National Biosolids Partnership “EMS for Biosolids” standard (May 2002)
National Biosolids Partnership Biosolids EMS Auditor Guidance (March 2006)
National Biosolids Partnership Code of Good Practice
National Biosolids Partnership Manual of Good Practice

C. Definitions of Audit Findings & Required Corrective Action

Major Nonconformance – a serious omission from requirements and/or other departure that represents, or could cause, a systemic failure. Major nonconformances must be corrected within 90 days for verification to proceed.

Minor Nonconformance – an isolated departure from requirements that does not represent a systemic failure. Minor nonconformances require timely and effective correction and verification by the Third Party Auditor.

Opportunity (for improvement) – possible improvement in the EMS based on auditor observations. There is no obligation for action in response to these observations.

3. AUDIT RESULTS

A. EMS Changes

DCWASA identified several changes at the beginning of this audit that could affect their biosolids program and biosolids EMS.

KEMA determined that the following changes noted by DCWASA would be audited during this interim audit.

- The Biosolids EMS Manual has been re-written.
- Centrifuges have been added for biosolids stabilization
- Lime mixers have been added on all 4 trains, including infra-red temperature sensors
- A new direct loading unit has been installed (in use, but not fully commissioned)

KEMA determined that the following changes noted by DCWASA do not require special audits and can be included as part of the normal schedule of audits.

- One onsite contractor (KF Technology) previously has been removed due to the addition of centrifuges.

B. EMS Outcomes

KEMA examined the outcomes being achieved by DCWASA through the use of an environmental management system in managing their biosolids program. The results are summarized below. It is evident that many of these outcomes influence performance in more than one area.

<u>Regulatory Compliance</u>

A GIS tracking system has been implemented to enable tracking of biosolids application, resulting in improved recordkeeping, ability to analyze trends and easier reporting to interested parties.

<u>Environmental Performance</u>

Using University of Washington scorecard methods, reduction in greenhouse gas balance is being monitored for biosolids land applications. This is being used as a tool for communications and environmental performance monitoring, resulting in increased community understanding of the importance of recycling biosolids.

Communications efforts and biosolids quality control have resulted in 50% reduction in odor complaints in the past year.

<u>Biosolids Quality Practices</u>

In cooperation with several parties, technology is being considered for gasification and energy recovery of biosolids as an energy source.

New lime mixers have been added and overall lime usage has reduced by 50% without compromising quality or odor. This has also enabled longer storage of biosolids. Overall benefit estimated to be $1 million / year.

New truck loading silos and scale have been added, resulting in reduced truck loading time, cleaner loading, reduced personnel needs and enabling automating data. Overall benefit estimated to be more than $200K/year.

Belt filter presses have been replaced with 7 new centrifuges, resulting in water in biosolids, leading to 100 tons per day less wet production. Savings in transportation costs are estimated at $1.5 million / year.

Interested Party Relations

Public interest in DCWASA biosolids activities is increasing, as evidenced by the doubling of the requested interested party list in the past 2 years.

DCWASA is a charter member of the Virginia Biosolids Council established to communicate accurate biosolids information to the public. Regulators and contractors have encouraged continuation of this tool for communications and sharing of best practices.

C. Summary of Audit Results by EMS Element

The following summarizes the results of this audit related to the 17 EMS Elements. Details of the process audits are described in Section 4 of this report.

EMS Element	EMS Status (@ 9/8/06)	Nonconformances
1. Documentation of EMS for Biosolids	Minor Nonconformance	Minor Nonconformance 06-03 Procedures could be more clearly documented for identifying legal requirements and other requirements and for monitoring / measuring compliance.
2. Biosolids Management Policy	Minor Nonconformance	Minor Nonconformance 06-01 It is not clear what is meant by “commitment to the Code of Good Practice”.
3. Identification of Critical Control Points	Minor Nonconformance	Minor Nonconformance 06-02 It is not clear how the development of biosolids critical control points has considered the need to be consistent with the Manual of Good Practice, particularly in biosolids use / disposition areas.
4. Legal and Other Requirements	Conforms	None

EMS Element	EMS Status (@ 9/8/06)	Nonconformances
5. Goals and Objectives for Continual Improvement	Minor Nonconformance	Minor Nonconformance 06-05 Action plans for achieving the established biosolids objectives and milestones are not documented, leading to uncertainty about how these plans are described.
6. Public Participation in Planning	Conforms	None
7. Roles and Responsibilities	Conforms	None
8. Training	Conforms	None
9. Communication	Conforms	None
10. Operational Control of Critical Control Points	Conforms	None
11. Emergency Preparedness and Response	Conforms	None
12. EMS Documentation, Document Control and Recordkeeping	Minor Nonconformance	Minor Nonconformance 06-04 Some important documents (e.g. permits, operating procedures) were not available at the contractor site.
13. Monitoring and Measurement	Conforms	None
14. Nonconformances: Preventive and Corrective Action	Minor Nonconformance	Minor Nonconformance 06-06 Corrective actions for 3 (of 17) EMS nonconformances from the previous third party audit were not corrected in a timely manner.
15. Biosolids Program Periodic Performance Report	Conforms	None
16. Internal EMS Audits	Minor Nonconformance	Minor Nonconformance 06-07 Internal audits of the biosolids program were not scheduled by the EMS Coordinator or performed with the frequency stated in the EMS procedures.
17. Periodic Management Review of Performance	Minor Nonconformance	Minor Nonconformance 06-08 The documented management review process does not reference Cross Functional Team meetings, Board of Director meeting and other Biosolids Program reviews that are part of the process. Minor Nonconformance 06-09 The suitability, adequacy and effectiveness of the biosolids program are not summarized in management review records.

4. DETAILED AUDIT RESULTS

The NBP Auditor Guidance (March 2006) was used as a guide in performing each of the audits described below. The audits of each process covered all applicable requirements of the EMS Elements.

A. Review of EMS Changes

DCWASA has implemented the following changes related to the use of its biosolids EMS since the previous KEMA audit (September 2004).

- The top management organization structure with responsibility for the treatment plants and the biosolids program has changed, however the nature of responsibilities and authorities has not changed.
- The identity of the individual with EMS Coordinator responsibilities has changed. The responsibilities for the position have not changed.
- Some modifications were made for clarity in the DCWASA EMS Manual. These changes do not represent significant changes in EMS practices or procedures.

KEMA determined that the changes noted above do not require any audits beyond the scope of audits planned in the Audit Program agreed between DCWASA and KEMA.

Audit Results

A transaction test was performed to determine how the change in lime addition has been incorporated into the biosolids program. It was determined the applicable changes including legal requirements were discussed and planned at Cross Functional Team meetings, critical control points were modified, SOPs written and operators were aware of required parameters.

The EMS changes noted above were reviewed and found to conform to applicable requirements of the EMS for Biosolids standard and NBP expectations, except as noted below.

Minor Nonconformance 06-03 Procedures could be more clearly documented for identifying legal requirements and other requirements and for monitoring / measuring compliance.

B. Review of Open Nonconformances (performed September 8, 2006)

KEMA auditors reviewed corrective action taken in response to the following nonconformances that remained open from the third party Verification Audit conducted by KEMA in October 2004.

Minor Nonconformance 04-01 There is no specific reference to official approval for the DCWASA EMS Manual.

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that the Plant Manager has approved the EMS Manual. This nonconformance is now closed.

Minor Nonconformance 04-02 EMS training has not been extended to pertinent contractor personnel, indicating that EMS requirements and the Biosolids Policy have not been effectively communicated throughout contractor organizations.

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that contractors have been made aware of the DCWASA biosolids EMS and program requirements. This nonconformance is now closed.

Minor Nonconformance 04-03 Excluding wastewater treatment / solids collection from the EMS scope is inconsistent with the need to control environmental impacts throughout the biosolids value chain, particularly since no operational controls for key Clarifier parameters, such as sludge blanket thickness, are included.

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that wastewater treatment activities have now been considered in the value chain steps for developing critical control points and operational controls. This nonconformance is now closed.

Minor Nonconformance 04-05 The list used to identify applicable legal requirements (EMS Manual, Appx D) is incomplete since it only addresses those requirements associated with biosolids use options.

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that list of legal and other requirements has been expanded to include all applicable requirements. This nonconformance is now closed.

Minor Nonconformance 04-06 Other requirements and the procedure for identifying & tracking them are not identified in the EMS Manual.

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that no specific “other” requirements exist, however if they did they would be accessible. This nonconformance is now closed.

Minor Nonconformance 04-08 Some of the 25+ biosolids objectives are not sufficiently measurable.

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that objectives have been restated with metrics, including timing. This nonconformance is now closed.

Minor Nonconformance 04-09 Some emergency equipment (such as eye wash / safety showers) is not being inspected and is not functioning properly.

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that emergency equipment is being inspected regularly. This nonconformance is now closed.

Minor Nonconformance 04-12 At least one contractor uses an unstructured document control and recordkeeping system that does not enable sufficient control of documents and records.

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that contractors are controlling their documents and records. This nonconformance is now closed.

Minor Nonconformance 04-13 The process for tracking progress towards biosolids goals and objectives includes monitoring during internal audits and management reviews, however there is no reference to that tracking in the EMS procedures for those processes.

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that EMS Element 5 has been modified to include reference to monitoring progress toward goals and objectives. This nonconformance is now closed.

Minor Nonconformance 04-14 Corrective action plans for EMS nonconformances do not identify causes being addressed.

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that EMS Manual Element 14 includes requirements for cause analysis for nonconformances and that investigation of nonconformances includes review of causes. This nonconformance is now closed.

Minor Nonconformance 04-16 Involvement and responsibilities of the Cross Functional Team and the General Manager's Office in the Management Review process are not clearly documented and the documented procedure (EMS Manual) does not reflect the actual process (monthly CFT meetings).

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that EMS Manual Element 17 has been modified to note Cross Functional Team responsibilities within the management review process. This nonconformance is now closed.

Minor Nonconformance 04-17 Performance measures for assessing EMS suitability, adequacy and effectiveness (such as progress towards goals and objectives), required for the Management Review process, are not included in CFT meeting minutes or Board of Director meeting minutes.

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that Cross Functional Team meetings are discussing biosolids program performance measures. This nonconformance is now closed.

C. Review of Open Nonconformances (performed October 6, 2006)

KEMA's Lead Auditor conducted a follow-up audit on October 6, 2006 to review nonconformances from the 2004 Verification Audit that were not closed during the September audit and to verify that effective action plans were in place for the nonconformances found during the September interim audit. The results of this review are summarized below:

Minor Nonconformance 04-04 Identified critical control points are not consistent with the National Manual of Good Practice and the link is incomplete between operational controls for critical control points and legal and other requirements and environmental impacts other than odor.

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that the process for identifying critical control points now includes consideration of Manual of Good Practice and environmental impacts have been identified (and documented) for critical control points. The Cross Functional Team has considered MoGP, environmental impacts and legal and other requirements in establishing the critical control points. This nonconformance is now closed.

Minor Nonconformance 04-07 It is not clear in the EMS procedures or goal setting practices how biosolids goals and objectives are linked to Workplan Goals (or Strategic Plans), which are the sources for all DCWASA goals.

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that the process for determining biosolids objectives and milestones (targets) has been modified to ensure that Workplan Goals and Strategic Focus Areas are considered in developing the objectives and that these objectives are consistent with those site-wide goals. This nonconformance is now closed.

Minor Nonconformance 04-10 Emergency spill and response plans are not available on trucks transporting biosolids for at least 2 contractors, indicating that contractor emergency preparedness plans have not been sufficiently implemented.

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that DCWASA has prepared Emergency Plans and a biosolids information pamphlet to be kept in trucks used by contractors on trucks and require contractors to ensure these are available and understood by drivers. This nonconformance is now closed.

Minor Nonconformance 04-11 Document hierarchy described in EMS Manual, Element 12 is not being used in practice and several documents noted in the EMS Manual as requiring control are not identified, approved or dated.

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that the document control and recordkeeping procedures have been modified to reflect actual practices. This nonconformance is now closed.

Minor Nonconformance 04-15 Internal audits do not assess consistency with biosolids policy commitments or describe performance towards biosolids goals and objectives.

Corrective Action Review of corrective action taken by DCWASA to resolve this nonconformance determined that the internal audit conducted August 29 (now documented) included consideration of policy commitments and performance towards objectives. In addition, the internal audit program has been modified to ensure DCWASA and EMS requirements are considered during the audits. This nonconformance is now closed.

The above reviews have verified that all open nonconformances from the 2004 Verification Audit have been effectively corrected.

D. Audit – Biosolids Policy

Applicable EMS Elements – Conformance of DCWASA's biosolids program with applicable requirements of the NBP EMS Elements was assessed, particularly EMS Element 2.

Process Description

The Biosolids Policy was approved at a DCWASA Board Meeting in April 2004. It is documented in the EMS Manual and includes commitment to the NBP Code of Good Practice. The policy is communicated internally and to contractors through EMS training and the DCWASA website and externally to interested parties through the website, e-mails, monthly reports, biosolids information packets and annual performance reports. It is available to interested parties on the DCWASA website and from Biosolids Manager upon request.

Audit Results

This process was found to conform to applicable requirements of the EMS for Biosolids standard and NBP expectations, except as noted below:

> Minor Nonconformance 06-01 It is not clear what is meant by the wording "commitment to the Code of Good Practice" in the Biosolids Policy.

Opportunities

- Results of monitoring performance against policy commitments could be more apparent.

E. Audit – Biosolids Stabilization, Conditioning & Handling

Applicable EMS Elements – Conformance of DCWASA's biosolids program with applicable requirements of the NBP EMS Elements was assessed, including Elements 3, 7, 10 &13.

Process Description

Biosolids are dewatered using 14 high-speed centrifuges, 7 of which were recently installed. These replaced contract dewatering by KF Environmental. Dewatered biosolids are then conveyed to mixers, where quicklime is added to raise the pH to meet Class B standards. There are 3 new lime mixers installed since the last audit. There has also been the addition of loading silos and automatic truck scales in the Solids Stabilization area. Transaction testing determined that Operators are aware of the parameters and requirements for operating the equipment.

Audit Results

This process was found to conform to applicable requirements of the EMS for Biosolids standard and NBP expectations.

Opportunities

- A potential exists for noncompliance, poor quality and/or complaints due to the delay in repairing stabilization area conveyors.
- A potential lockout / tagout problem was observed at Centrifuge Conveyor #10 Control Panel.

F. Audit – Biosolids Storage & Transportation

Applicable EMS Elements – Conformance of DCWASA's biosolids program with applicable requirements of the NBP EMS Elements was assessed, including Elements 3, 7, 10 &13.

Process Description

A new biosolids storage (silo) and truck loading and weighing unit have been installed. Although not fully turned over to DCWASA from the construction contractor, the loading system is in full use and monitored by the DCWASA General Foreman. Trucks are coordinated and dispatched by a representative of each contractor (Synagro, Recyc / Duffield, Erco), who is responsible for ensuring timely loading. A loading time issue found by DCWASA in recent months was effectively handled, including communication of DCWASA requirements and interested party (police, regulators) input (transaction test).

Audit Results

This process was found to conform to applicable requirements of the EMS for Biosolids standard and NBP expectations.

Opportunities

- Random detailed inspections of trucks leaving the plant could help in avoiding equipment and/or driver problems.

G. Audit – Biosolids Use & Disposition – Agriculture (Synagro - MD)

Applicable EMS Elements – Conformance of DCWASA biosolids program with applicable requirements of the NBP EMS Elements was assessed, particularly Elements 3, 7, 10 and 13.

Process Description

An agricultural land application site utilized by a DCWASA contractor (Synagro) was visited. No land application was occurring during the site visit, but biosolids had been applied approximately 2 weeks prior to the site visit. The contractors utilize a detailed procedures manual specific to each farm site (Site/Permit Book). Application rates are based on crop needs, biosolids quality and previous applications of biosolids or manure. Site buffers are staked prior to application, and contract inspectors (MES) are present for the major of the application process.

Audit Results

This process was found to conform to applicable requirements of the EMS for Biosolids standard and NBP expectations.

Opportunities

None

H. Audit – Biosolids Use & Disposition – Tree Farming (ERCO-MD)

Applicable EMS Elements – Conformance of DCWASA's biosolids program with applicable requirements of the NBP EMS Elements was assessed, including Elements 7, 10 &15.

Process Description

DCWASA biosolids are applied to 100A by ERCO to grow poplar trees for chipping under permit from MDE (10 A per year). ERCO management maintains ongoing discussions with local residents and an annual report of activities at the Tree Farm is sent to MDE. A substantial buffer zone, including trees and some fencing surrounds the site. Signs noting biosolids application are not considered needed at the entrance. Personnel are aware of the DCWASA biosolids program and EMS requirements. Operations personnel follow procedures, including application requirements, prescribed in their operating permit and management plan. The site is monitored regularly by MES on behalf of DCWASA, including odor measurement and soil pH. A certified laboratory measures nutrient values in leaves.

Audit Results

This process was found to conform to applicable requirements of the EMS for Biosolids standard and NBP expectations, except as noted below.

> Minor Nonconformance 06-04 Some important documents (e.g. permits, operating procedures) were not available at the contractor site.

Opportunities

None

I. Audit – Communications Process

Applicable EMS Elements – Conformance of DCWASA biosolids program with applicable requirements of the NBP EMS Elements was assessed, particularly Elements 6, 9 and 15.

Process Description

DCWASA's communication and public outreach program includes communication with an interested party list and direct phone conversations and e-mails from the Biosolids Program Manager. Input from the public and other stakeholders is actively sought when applying for permits in new areas.

They have continued to engage citizens with complaints and concerns, and interviews with interested parties indicate success in improving stakeholder confidence in the biosolids management program. DCWASA continues to utilize contract services to monitor contractor land application activities, and these contractors provide input to the process and help to track citizen complaints. Monthly performance reports are issued to regulators and available to the public. A Biosolids Performance Report was issued in July. Performance reports contain graphical presentations of key performance data, including an interesting "greenhouse gas balance" scorecard.

During this audit, a member of the public (interested party) suggested that DCWASA (or contractors) should use an "800 telephone" number for receiving public inquiries in biosolids application areas.

Audit Results

This process was found to conform to applicable requirements of the EMS for Biosolids standard and NBP expectations.

Opportunities

- Posting measures used in demonstrating program performance (e.g. energy use) could help in creating internal discussion about the programs and opportunities for improvement.

J. Audit – Corrective and Preventive Action Process

Applicable EMS Elements – Conformance of DCWASA's biosolids program with applicable requirements of the NBP EMS Elements was assessed, including Element 14.

Process Description

Corrective action for nonconformances identified during internal and third party audits is discussed at Cross Functional Team meetings and monitored by the Biosolids Manager. All open nonconformances from the third party Verification Audit (October 2004) were effectively corrected, although some of these took 2 years to complete.

Audit Results

This process was found to conform to applicable requirements of the EMS for Biosolids standard and NBP expectations, except as noted below.

> Minor Nonconformance 06-06 Corrective actions for 3 (of 17) EMS nonconformances from the previous third party audit were not corrected in a timely manner.

Opportunities

- The corrective and Preventive Action Process could be helpful in analyzing and correcting problems in addition to nonconformances (such as emergency incidents, public complaints).

- Internal audit group personnel could be helpful in monitoring and verifying effective correction of nonconformances.
- It could be helpful to adopt a corrective action process that incorporates prioritization for identifying need for formal corrective action plans and analyzes cause of causes to develop preventive action.

K. Audit – Critical Control Points

Applicable EMS Elements – Conformance of DCWASA biosolids program with applicable requirements of the NBP EMS Elements was assessed, particularly Element 3.

Process Description

Critical Control Points have been identified throughout the biosolids value chain. At least one CCP has bee added based on the results of the verification audit. There remains inconsistencies with the Manual of Good Practice as regards CCP's for land application. DCWASA has a process to review CCP's on a regular basis and to make changes as necessary to protect the biosolids value chain. A review of field activities (contractors) indicated a knowledge of the need for CCP's and that appropriate controls were in place before and during land application activities.

Audit Results

This process was found to conform to applicable requirements of the EMS for Biosolids standard and NBP expectations, except as noted below.

> Minor Nonconformance 06-02 It is not clear how the development of biosolids critical control points has considered the need to be consistent with the Manual of Good Practice in biosolids use / disposition areas.

Opportunities

- The process for considering best practices in developing operational controls and ensuring legal and other requirements are incorporated into those controls should be documented for consistent application.
- The meaning of "critical control points" (or whatever they will be called) should be communicated to Operators.
- An explanation of why secondary clarifiers are considered as a stabilization critical control point instead of part of wastewater treatment could help in defining parts of the value chain that do / do not apply as part of the biosolids program.

L. Audit – EMS Planning& Public Participation Process

Applicable EMS Elements – Conformance of DCWASA's biosolids program with applicable requirements of the NBP EMS Elements was assessed, including Element 6.

Process Description

The Biosolids Manager continues to assume EMS Coordinator responsibilities.

DCWASA encourages public input about their biosolids program through their website, participating in public organizations (such as the Virginia Biosolids Council) and by attending community events. Contractors (Synagro) confer with local citizens and land owners in planning biosolids applications. As an example of response to public input, DCWASA voluntarily expanded the buffer zone in a land application area to avoid approaching a well. Internal stakeholders (such as partner agencies and contractors) are encouraged to attend biosolids Cross Functional Team meetings.

Audit Results

This process was found to conform to applicable requirements of the EMS for Biosolids standard and NBP expectations.

Opportunities

None

M. Audit – Goals & Objectives Process

Applicable EMS Elements – Conformance of DCWASA's biosolids program with applicable requirements of the NBP EMS Elements was assessed, including Elements 5 & 13.

Process Description

The process for establishing biosolids objectives and milestones (targets) includes consideration of Workplan Goals and Strategic Focus areas for the entire wastewater treatment plant. The Cross Functional Team develops these objectives considering the biosolids policy, environmental impacts, input from interested parties and other considerations that the Team feels are important and ensures that at least one objective applies to each outcome area. Each objective has milestones, timing and responsibilities. Progress in achieving the biosolids objectives is discussed in monthly meetings with the Biosolids Manager.

Audit Results

This process was found to conform to applicable requirements of the EMS for Biosolids standard and NBP expectations, except as noted below.

> Minor Nonconformance 06-05 Action plans for achieving the established biosolids objectives and milestones are not documented, leading to uncertainty about how these plans are described.

Opportunities

- The effectiveness of the goals and objectives process should be monitored (for instance, why were 6 objectives not achieved in 2005?).

- A definition of "goals", "objectives" and "targets" is necessary for clarification of what these are and the need for measurability.

N. Audit – Internal EMS Audit Process

Applicable EMS Elements – Conformance of DCWASA's biosolids program with applicable requirements of the NBP EMS Elements was assessed, including Elements 14 & 16.

Process Description

Internal audits have been conducted of the EMS, with the most recent completed 8/31/06. Internal audits are part of the yearly planning process for the Internal Audit office, and are scheduled by the Biosolids Manager. The draft audit report was not available for review, but audit scopes and schedules were reviewed. The internal auditors and the Biosolids Manager review audit results and the need for corrective actions. Audit results are also reported to the General Manager and the Board of Directors Audit Committee.

Audit Results

This process was found to conform to applicable requirements of the EMS for Biosolids standard and NBP expectations, except as noted below.

> Minor Nonconformance 06-07 Internal audits of the biosolids program were not scheduled by the EMS Coordinator or performed with the frequency stated in the EMS procedures.

Opportunities

None

O. Audit – Management Involvement & Review Process

Applicable EMS Elements – Conformance of DCWASA's biosolids program with applicable requirements of the NBP EMS Elements was assessed, including Elements 2, 5, 7 & 17.

Process Description

DCWASA has a multiple level management review process, which includes the monthly Cross Functional Team (CFT), monthly reports to the General Manager and review at the Board level. Information flows downward as well from the Board and General Manager to the Biosolids Program Manager related to setting of goals. General Manager is aware of the Biosolids Policy and the need to measure performance against this policy. Internal audit results are reviewed by management, although the first internal audit (since verification) has just been completed and the final report has not yet been approved.

Audit Results

This process was found to conform to applicable requirements of the EMS for Biosolids standard and NBP expectations, except as noted below.

Minor Nonconformance 06-08 The documented management review process does not reference Cross Functional Team meetings, Board of Director meeting and other Biosolids Program reviews that are part of the process.

Minor Nonconformance 06-09 The suitability, adequacy and effectiveness of the biosolids program are not summarized in management review records.

Opportunities

- Involving internal auditors in the management review process can help provide a perspective for assessing program performance.
- The "Management Representative" noted in the EMS Manual Element 17 should be identified and/or defined.

APPENDICES

List of Participants

The following persons participated in this audit. Other persons provided additional explanations, as necessary.

Name	Position	Organization
Mike Addison	Foreman	DCWASA
Walter Bailey	Blue Plains Plant Mgr	DCWASA
Fritz Calewarts	Operator	DCWASA
Russell Coats	Inspector	WSSC
John Dunn	Chief Engineer	DCWASA
Michael Hunter	Internal Audits Mgr	DCWASA
Jerry Johnson	General Manager	DCWASA
Eric Flamino	VP Operations	ERCO Tree Farm
Dennis Harris	Inspector	MES
Caroline Hemenway	Consultant	DCWASA
David Marshall	Driver	McLeod Trucking
James Owens	Dispatcher	Duffield Hauling
Michelle Patterson	Inspector	MES
Chris Peot	Biosolids Division Mgr	DCWASA
Al Razik	Field Manager	MES
Mark Ramirez	Biosolids Engineer	DCWASA
Jim Ritter	Biosolids General Foreman	DCWASA
Joey Ruber	Dispatcher	Synagro
Bob Sire	Inspector	WSSC
Petra Wesley	Internal Auditor	DCWASA
Lisa Williams,	Senior Tech Services Director	Synagro
Warner Williams	Driver	Duffield Trucking

<u>Interested Parties Interviewed</u>

Gayl Fowler	Interested Party	
C.W. Williams	Interested Party	
Cal Sawyer	Biosolids Program Manager	Virginia Dept Health
Nazeech Freij		Maryland Dept Environment

List of Documents & Records Reviewed

2004 Third party audit nonconformance action plan schedule & responsibility
Audit engagement assignment – review Biosolids EMS Program
Audit process entrance conference Corrective action plans from 2004 internal audit
Biosolids division guidance & procedures for communication & outreach (8/31/06)
Biosolids EMS Performance Report (2005)
Biosolids Management Operations Contract WAS06035AA-ND (ERCO)
Biosolids Policy Statement (12/10/04)
Centrifuge Daily Operating Log (09-06-06)
DCWASA Biosolids EMS Manual (2006)
DCWASA Board of Directors Audit Committee meeting agenda / minutes (10/28/04)
DCWASA Third Party Audit application to NBP
EMS procedures in EMS Manual (various)
ERCO biosolids application data (10 acre sections)
ERCO biosolids application data records
ERCO Biosolids Management Operations Contract (WAS 06035AA-ND)
ERCO records (various)
ERCO Third Year Report – MD Coorp Research Projects (12/31/04)
Incident reports May 9 05, June 6 05
Internal audit FY2004 (8/18/04)
Internal audit opening mtg presentation (P Wesley)
Internal audit report 8/29/06 (draft)
Internal auditor charter
Internal auditor independence statement (M Hunter 8/25/06)
IR Temperature chart (Aug 1 06)
J Johnson 2006 one-on-one meetings schedule for M Hunter
Lab test result (ERCO) June 1 04
Legal & Regulatory Update – CFT meeting minutes
List of critical control points & operational controls (8/14/06)
MDE permit S-01-16-809-1 (1/8/01)
Nitrification process report (Sept 6 06)
Nonconformance description & correction – review of biosolids mgmt program
Paper - Use of Deep Row biosolids application to grow forest trees (MD Coop Extension, undated)
PCS Operator checklist (not dated)
Permit application & approval PG190 fields 1-4
Semi-annual land application for Maryland, Delaware
SOP-secondary effluent pump station
Synagro calculation – application rate per field
Synagro nutrient management plan for PG190 flds 1-4 (May 8 06)
Synagro pre-operating checklist (8/24/06)
VA Biosolids Council Organization Development Positioning & Outreach (6/25/05)
VA Biosolids Council Paper – Organization Development positioning & outreach (6/25/05)
Various memos
Washington Post article Sept 6 06

END OF REPORT