National Biosolids Partnership

Biosolids EMS Verification Audit Report

District of Columbia Water and Sewer Authority

Washington, DC

Audit Performed By:
KEMA-Registered Quality, Inc., Chalfont, Pennsylvania

Audit Dates: September 1 to 18, 2004

Report Date: September 28, 2004

Author: Jon Shaver, Biosolids EMS Lead Auditor

Peer Reviewed By: Dale Scherger, Biosolids EMS Auditor

Approved by: H. Pierre Salle, President - KEMA-Registered Quality Inc.

Report Distribution List:

District of Columbia Water and Sewer Authority
National Biosolids Partnership
KEMA-Registered Quality Inc. file
Lead Auditor file, Auditor File (2)

TABLE OF CONTENTS:

EXECUTIVE SUMMARY....3
1. AUDIT DETAILS....4
2. DEFINITION OF TERMS AND GUIDELINES FOR CLOSURE OF FINDINGS....7
3. SUMMARY OF AUDIT RESULTS....8
4. EXAMINATION OF EMS OUTCOMES....11
5. AUDIT – DOCUMENTATION REVIEW....12
6. AUDIT - IDENTIFICATION OF CRITICAL CONTROL POINTS....14
7. AUDIT – MANAGEMENT INVOLVEMENT....15
8. AUDIT – BIOSOLIDS GOALS & OBJECTIVES PROCESS....16
9. AUDIT - COMPLIANCE WITH LEGAL & OTHER REQUIREMENTS....17
10. AUDIT - PUBLIC PARTICIPATION & COMMUNICATION....19
11. AUDIT - ROLES, RESPONSIBILITIES & TRAINING....21
12. AUDIT - PRETREATMENT & SOLIDS COLLECTION....23
13. AUDIT - BIOSOLIDS STABILIZATION....24
14. AUDIT - BIOSOLIDS STORAGE & TRANSPORTATION....25
15. AUDIT - MAINTENANCE....27
16. AUDIT - EMERGENCY PREPAREDNESS....27
17. AUDIT - SYNAGRO AGRICULTURAL USE....29
18. AUDIT - SYNAGRO SILVICULTURE & RECLAMATION....30
19. AUDIT - ERCO FORESTRY....31
20. AUDIT - RECYC SYSTEMS AGRICULTURAL USE....32
21. AUDIT – INTERNAL EMS AUDITS....34
22. AUDIT - CORRECTIVE & PREVENTIVE ACTION....35
23. AUDIT – DOCUMENT CONTROL AND RECORDKEEPING....36
24. PROMISES AND AGREEMENTS....37
25. AUDIT COMPANY STATEMENT....37

Total number of pages in this report = 37

EXECUTIVE SUMMARY

KEMA-Registered Quality Inc. (KEMA) conducted a Third Party Biosolids EMS Verification Audit at the District of Columbia Water and Sewer Authority (DCWASA) between September 1 and 18, 2004. The audit was performed at the request of the National Biosolids Partnership (NBP) in order to:

- Analyze the Environmental Management System (EMS) being used by DCWASA in managing their biosolids practices, and
- Verify that the EMS being used by DCWASA meets the requirements and expectations of the NBP Biosolids EMS Program, including requirements of the NBP EMS for Biosolids.

The audit included the development of an Audit Program, review of DCWASA's EMS Documentation, analysis of biosolids management practices being performed by DCWASA throughout the biosolids value chain for conformance with all 17 elements of the "EMS for Biosolids" standard, transaction testing to analyze the health of the DCWASA Biosolids EMS and examination of outcomes resulting from their environmental management system.

Based on results of our audit, KEMA-Registered Quality Inc. has concluded that the District of Columbia Water and Sewer Authority Biosolids EMS conforms with requirements and expectations of the National Biosolids Partnership's EMS for Biosolids and we are issuing the following verification statement concerning that EMS:

> *"The District of Columbia Water and Sewer Authority has been independently verified by KEMA-Registered Quality Inc. as having an effective biosolids environmental management system that supports continually improving environmental performance, meeting regulatory compliance obligations, utilizing good management practices, and creating meaningful opportunities for public participation and is in conformance with the requirements of the National Biosolids Partnership."*

This verification is being issued to the National Biosolids Partnership as a recommendation for Certification of the DCWASA Biosolids EMS. Continuing certification requires effective correction of nonconformances identified during the audit and continuing conformance with expectations and requirements of the EMS for Biosolids standard, to be determined through annual interim audits.

During the Verification Audit, KEMA auditors identified no major nonconformances and seventeen (17) minor nonconformances with NBP requirements. Our review of DCWASA's corrective action plans for the identified nonconformances determined that acceptable plans are in place for correcting these minor nonconformances.

The KEMA audit team noted several positive attributes in the management system being used by DCWASA in managing their biosolids activities, including:

- Several significant improvements in biosolids quality, environmental performance, interested party relations and regulatory compliance have occurred in recent years. In addition to improving relations with interested parties, these results represent approximately $2 million / year in reduced costs and other benefits to DCWASA.
- DCWASA is achieving their goal of developing diversified re-use options for their biosolids. Five major re-use options are now available, compared to only one in 1999, and an innovative research and development program is in place for continuing to develop these and other options.

- DCWASA management is aware of and involved in their Biosolids EMS Program and understands the benefits that using systems management can bring. An effective Cross Functional Team approach provides control and allows input from various sources.
- Extensive field inspections at re-use sites are helping to ensure continuing compliance. These inspectors offer an opportunity to expand inspections to include public interest issues (such as dragout) and EMS expectations (contractor controls).
- Internal EMS audits were well done and a valuable resource for developing the EMS. We believe that the internal audit program can become a useful resource for measuring EMS performance and effectiveness.
- An effective corrective and preventive action program is in place for investigating and correcting / preventing problems in several areas, such as incidents, progress towards goals and objectives, external issues and deficiencies found during management reviews.

In addition to the nonconformances described in this report, the audit also identified opportunities for improvement in the DCWASA biosolids management system, including:

- The DCWASA EMS Manual is somewhat complex in some areas (for instance, over 50 documents are identified as requiring control) and general in others (for instance, procedures do not describe how controls are "ensured'). A simplified, systemic approach may be easier to follow, especially in the early months of EMS maturity.
- While a proactive 2-way Communications Program does exist, expanding communication with concerned citizens groups (particularly in Virginia) could help in obtaining even more input for continually improving biosolids program performance.
- Information on bulletin boards and other communications about DCWASA's vision and mission could be helpful in also communicating information about commitments made in the Biosolids Policy.
- The Biosolids Manager is currently responsible for many EMS tasks. As the EMS matures, a broader resource base could help to continue to improve the EMS and its results.

1. AUDIT DETAILS

1.1 Agency Details

Organization: District of Columbia Water and Sewer Authority (DCWASA)

Address: 5000 Overlook Blvd SW, Washington DC

Number Employees: approximately 1200

Wastewater Treated: approximately 370 million gallons per day

Biosolids Production: approximately 125,000 dry tons per year

Biosolids Production Location(s):

Blue Plains Advanced Wastewater Treatment Plant, Washington DC

1.2 Identification of Audit Company and Auditors

KEMA-Registered Quality Inc. (KEMA) is an accredited Independent Third-Party Audit Company within the National Biosolids Partnership's Biosolids EMS Program. KEMA is also a RAB-accredited Registrar for ISO-14001 and several other management system certifications.

KEMA's Auditors participating in this audit included Mr. Jon Shaver (Biosolids EMS Lead Auditor) and Mr. Michael Wardell (Biosolids Auditor). These Auditors meet the qualification requirements established by the National Biosolids Partnership for their respective roles.

1.3 Audit Purpose and Scope

This audit was performed at the request of the National Biosolids Partnership and the District of Columbia Water and Sewer Authority to provide independent verification that the Biosolids EMS used by DCWASA in managing their biosolids practices:

a) Conforms with requirements of the 17 Elements of the National Biosolids Partnership's EMS for Biosolids (May 1, 2002), and

b) Meets National Biosolids Partnership expectations for effective EMS outcomes in the areas of environmental performance, regulatory compliance, public participation and quality biosolids practices.

The audit scope included

Activities performed by DCWASA in managing their biosolids throughout the biosolids value chain, including pretreatment, solids collection, solids stabilization, biosolids storage at the Blue Plains Treatment Plant and offsite biosolids use and disposition and transportation to these sites.

Discussions with interested parties, including federal, state and local regulators, inspectors and members of the public, as approved by DCWASA.

Biosolids management activities being performed by each contractor to DCWASA involved in the use / disposition of biosolids.

Biosolids management activities at the following sites where DCWASA biosolids are being used:

- Mine reclamation and silviculture sites in Dinwiddee County VA where biosolids are, or have been applied by Synagro under contract to DCWASA.
- Agriculture sites in Winchester VA and Frederick County MD, where biosolids are, or have been, applied by Synagro under contract to DCWASA.
- An agriculture site in Culpepper County VA, where biosolids material produced at Blue Plains by DCWASA is applied by Recyc Systems under contract to Washington Suburban Sanitation Commission (WSSC).
- A forestry site in Brandywine MD, where biosolids are applied by ERCO Tree Farming under contract to DCWASA.

Examination of outcomes being achieved by DCWASA by using their Biosolids EMS.

1.4 Audit Events

The primary events within this audit are listed below. A detailed schedule of audit events is available upon request.

EMS Documentation Review – completed September 1, 2004
Conformance Verification Audit EMS Documentation Review – September 13 to 18, 2004
Examination of EMS Outcomes – September 17, 2004

1.5 Audit Methodology

EMS Documentation Review was performed offsite by the KEMA Auditors. This included the DCWASA EMS Manual (dated 6/30/03), provided to us by the National Biosolids Partnership. The documentation was reviewed for conformance with requirements of the NBP EMS for Biosolids.

The onsite Verification Audit was performed to verify conformance of the DCWASA Biosolids EMS with procedures stipulated in their EMS Manual and all requirements of the 17 elements of the NBP EMS for Biosolids (May 2002). A process audit methodology was used to assess processes, programs and practices in place for conformance with applicable requirements. A cross-reference describing the applicability of EMS Elements to each process audited is available upon request.

Transaction tests were performed to verify that the interaction between EMS processes demonstrated that an effective and healthy management system is in place.

Examination of EMS outcomes was done to determine results being achieved by DCWASA through use of their Biosolids EMS.

The audit was performed using standard management system auditing practices, including interviews with key personnel, observation of a representative sample of practices in place and review of EMS records and other documentation to obtain objective evidence for the conclusions reached during the audit.

1.6 Reference Materials

The following reference materials were used during this audit:

- National Biosolids Partnership EMS for Biosolids (May, 2002)
- NBP Third Party Verification Auditor Guidance (November 2002)
- DCWASA EMS Manual (dated 6/30/03)
- KEMA Biosolids EMS Audit Planning Guide (proprietary)

1.7 Audit Participants

The audit was coordinated on behalf of DCWASA by Mr. Chris Peot, Biosolids Division Manager and EMS Coordinator.

The full audit was comprised 24 separate audits, sometimes in more than one location, with participation from approximately 45 DCWASA and contractor personnel and approximately 10 external interested parties. A full list of audit participants is available upon request. Where necessary, other persons provided additional explanations during each audit.

1.8 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. DEFINITION OF TERMS AND GUIDELINES FOR CLOSURE OF FINDINGS

Findings from a Biosolids EMS Audit can be “major nonconformances”, “minor nonconformances” and “additional comments”. “Corrective Action” is required for all nonconformances identified during the audit. These terms are defined as follows:

Major Nonconformance

A major nonconformance exists if a relevant EMS requirement has not been met or if repeated or numerous deficiencies exist for the same requirement. A major nonconformance represents:

- A systemic failure of the Environmental Management System.
- A situation that can result in an adverse effect to the biosolids policy.
- A condition that can cause an adverse effect on the environment.

Minor Nonconformance

A minor nonconformance exists if a relevant EMS requirement has not been fully met. A minor nonconformance represents:

- A non-systemic deficiency within the EMS (i.e. not likely to result in failure of the Environmental Management System).
- An isolated occurrence in which EMS requirements are not met.

Additional Comment

Where appropriate, the auditors may make additional comments concerning the EMS based on observations during the audit. These comments are offered for consideration by the organization being audited and do not represent nonconformances or require corrective action plans unless deemed necessary by the organization.

Corrective Action:

Corrective action must be completed in a timely manner for each nonconformance identified during the audit. Major nonconformances must be effectively corrected within 90 days of the audit for a verification recommendation to be issued. A Corrective Action Plan for each minor nonconformance must be prepared and approved by the Lead Auditor prior to issuing a verification recommendation and the effective implementation of that plan must be verified by the auditor prior to, or during, the next audit.

3. SUMMARY OF AUDIT RESULTS

Verification Recommendation

Based on the results of this audit (described below), KEMA-Is issuing the following verification statement concerning the DCWASA Biosolids EMS:

"The District of Columbia Water and Sewer Authority has been independently certified by KEMA-Registered Quality Inc. as having an effective biosolids environmental management system that supports continually improving environmental performance, meeting regulatory compliance obligations, utilizing good management practices, and creating meaningful opportunities for public participation and is in conformance with the requirements of the National Biosolids Partnership."

Conformance With Requirements - EMS Elements

Examination of DCWASA biosolids management practices confirmed the following status with respect to requirements of each of the 17 EMS Elements.

EMS Element	EMS Status (@ 9/18/04)	Nonconformances (corrective action plan approved for each nonconformance)
1. Documentation of EMS for Biosolids	Minor Nonconformance	Nonconformance 04-01 (minor) There is no specific reference to official approval for the DCWASA EMS Manual.
2. Biosolids Management Policy	Conforms	None
3. Identification of Critical Control Points	Minor Nonconformance (2)	Nonconformance 04-03 (minor) 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. Nonconformance 04-04 (minor) 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.

EMS Element	EMS Status (@ 9/18/04)	Nonconformances (corrective action plan approved for each nonconformance)
4. Legal and Other Requirements	Minor Nonconformance (2)	Nonconformance 04-05 (minor) 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. Nonconformance 04-06 (minor) Other requirements and the procedure for identifying & tracking them are not identified in the EMS Manual.
5. Goals and Objectives for Continual Improvement	Minor Nonconformance (2)	Nonconformance 04-07 (minor) 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. Nonconformance 04-08 (minor) Some of the 25+ biosolids objectives are not sufficiently measurable.
6. Public Participation in Planning	Conforms	None
7. Roles and Responsibilities	Minor Nonconformance	Nonconformance 04-02 (minor) 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.
8. Training	Conforms	None
9. Communication	Conforms	None
10. Operational Control of Critical Control Points	Conforms	None

EMS Element	EMS Status (@ 9/18/04)	Nonconformances (corrective action plan approved for each nonconformance)
11. Emergency Preparedness and Response	Minor Nonconformance (2)	Nonconformance 04-09 (minor) Some emergency equipment (such as eye wash / safety showers) is not being inspected and is not functioning properly. Nonconformance 04-10 (minor) 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.
12. EMS Documentation, Document Control and Recordkeeping	Minor Nonconformance (2)	Nonconformance 04-11 (minor) 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. Nonconformance 04-12 (minor) At least one contractor uses an unstructured document control and recordkeeping system that does not enable sufficient control of documents and records.
13. Monitoring and Measurement	Minor Nonconformance	Nonconformance 04-13 (minor) 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.
14. Nonconformances: Preventive and Corrective Action	Minor Nonconformance	Nonconformance 04-14 (minor) Corrective action plans for EMS nonconformances do not identify causes being addressed.
15. Biosolids Program Periodic Performance Report	Not Applicable	Performance report due during year following Third Party Audit (per NBP guidance)
16. Internal EMS Audits	Minor Nonconformance	Nonconformance 04-15 (minor) Internal audits do not assess consistency with biosolids policy commitments or describe performance towards biosolids goals and objectives.

EMS Element	EMS Status (@ 9/18/04)	Nonconformances (corrective action plan approved for each nonconformance)
17. Periodic Management Review of Performance	Minor Nonconformance	Nonconformance 04-16 (minor) 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). Nonconformance 04-17 (minor) 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.

4. EXAMINATION OF EMS OUTCOMES

Participants

The following personnel were involved in this audit:

Name	Position	Organization
Peot, Chris	Biosolids Division Manager	DCWASA
Wardell, Michael	Biosolids EMS Auditor	KEMA
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Outcomes Examined

Results of biosolids management practices, goals and objectives and programs were examined to determine outcomes from the management system being used over the past 2 – 3 years in the following areas:

- Regulatory compliance
- Environmental performance
- Relations with interested parties
- Biosolids quality practices

Audit Results

Regulatory compliance

- A proactive odor prediction/prevention model has been developed to provide relative odor measurement and address concerns of regulators.

Environmental performance

- In the past four years the reuse of biosolids has expanded from 1 major beneficial reuse option and 16% non-reuse to 4 major beneficial reuse options and less than 2% non-reuse.
- The diversification goal and program led to the use of biosolids for remediating a 300-acre site that prior to the remediation had serious acidic soil erosion and sedimentation problems.

Relations with interested parties

- Relations with concerned citizens and interested parties in Lancaster County, Virginia have moved from contentious to cooperative.
- The communications model has been changed to enable farmers to have direct line of communication to DCWASA.

Biosolids quality practices

- Use of improved lime mixing technology has resulted in a sustained 3-log reduction in fecal coliform.
- A project has begun to install egg-shaped digesters as a step towards Class A biosolids production, which will reduce the quantity of biosolids produced per ton of wastewater inflow, with resulting cost improvement.
- The commitment to preventive maintenance (Biosolids Policy) has led to planned upgrade in maintenance scheduling and recordkeeping (Maximo system), with resultant improvement in equipment integrity.

Analysis of the economic benefit associated with the above outcomes determined that their combined value to DCWASA is approximately $2 million / year in savings and/or revenue, excluding the indirect value from cost avoidance and interested party relations. Details of this analysis are available from DCWASA upon request.

5. AUDIT – DOCUMENTATION REVIEW

Participants

The following personnel participated in this audit:

Name	Position	Organization
Peot, Chris	Biosolids Div Manager	DCWASA
Wardell, Michael	Biosolids EMS Auditor	KEMA
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Process Description

DCWASA's Biosolids EMS is described in their EMS Manual. This manual is structured to correspond to the 17 elements of the NBP EMS for Biosolids and includes written descriptions of the DCWASA biosolids program and procedures and responsibilities for managing the EMS.

The EMS Manual includes the DCWASA Biosolids Policy and procedures required by the EMS Elements, references public participation, communications and emergency preparedness plans and describes procedures for complying with regulatory and other requirements and responsibilities assigned to contractors.

Documentation Reviewed

Third Party Audit Application (February 28, 2004)
DCWASA EMS Manual (6/30/03)
Internal Audit Results (March 2004, August 2004)

Audit Results

The DCWASA EMS Documentation meets requirements and expectations of the NBP EMS Elements, except as noted below.

Minor Nonconformance 04-01

There is no specific reference to "official" approval for the DCWASA EMS Manual.

Other nonconformances found in the documentation are described in the audit results for the related EMS process.

Additional Comments

The following additional comments are offered based on observations and review of this process.

1. During the onsite audit, Auditors determined that the Board of Directors approved the Biosolids Policy (confirming records available). This approval and subsequent approval requirements should be referenced in the EMS Manual for credibility.
2. The Communication Plan (DCWASA Element 9) includes reference to making required information available to interested parties, however the methods stated for doing this are broad. Without connection between required information and specific methods, it must be assumed that all methods are used for all information (an unnecessarily difficult task to satisfy).
3. Procedures for identifying applicable regulations are not stated in DCWASA EMS Element 4, however these legal requirements are listed in the EMS Manual appendices. During the onsite audit, Auditors noted a practice in place that should be documented in the EMS procedures. (see also Nonconformance 04-05)
4. Procedures for identifying, tracking or incorporating "other" requirements required by EMS Element 4 are not documented. During the onsite audit, Auditors noted that practice for this requirement is not in place (see Nonconformance 04-06.
5. The DCWASA "regulatory compliance program" noted in EMS Manual Element 13 should be described or referenced in more detail for clarification.
6. Reference to monitoring "key (operating) characteristics" in EMS Manual Element 13 requires elaboration, or a description of what procedures need to be used.

6. AUDIT - IDENTIFICATION OF CRITICAL CONTROL POINTS

Participants

The following personnel participated in this audit:

Name	Position	Organization
Peot, Chris	Biosolids Div Manager	DCWASA
Wardell, Michael	Biosolids EMS Auditor	KEMA
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Process Description

Critical control points are listed in Appendix B of the EMS Manual. This list includes the value chain category and associated critical control points (CCP) and describes SOPs (standard operating procedures), the location of each SOP, records and record location and environmental impacts associated with each CCP.

Those CCP noted in the National Manual of Good Practice that are not specifically identified in the DCWASA list of CCP are referenced in other documents, such as SOPs and contractor documents (and permits).

The Biosolids Value Chain steps considered in setting critical control points did not include Wastewater / Solids Collection since DCWASA felt at the time that biosolids quality and environmental impacts could adequately be controlled by the other steps. Management reviews have determined that new operating parameters (such as sludge blanket thickness) require the solids collection step (Clarifier) to now be included and the EMS scope and biosolids program are being upgraded (effective EMS transaction test).

Documentation Reviewed

EMS Manual, Appendix B (dated 6/30/03)
Pre-Operating Checklist – Maryland, Synagro Field Operations, Dated 4/11/01
Recyc Systems, Inc. O & M Manual, Land Application of Biosolids, VA DH (rev 01/01)
MDE Sewage Sludge Utilization Permit (#S-01-16-809-1) issued to ERCO Tree Farm Site 1/8/01
State of Maryland Sewage Sludge Utilization Permit (#S-99-10-4532-A) issued to Wheelabrator Technologies (now Synagro) 1/15/99

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements, except as noted below.

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 and no operational controls for key Clarifier parameters, such as sludge blanket thickness, are included.

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.

7. AUDIT – MANAGEMENT INVOLVEMENT

Participants

The following personnel participated in this audit:

Name	Position	Organization
Bailey, Walter	Director (+ Blue Plains Plant Manager)	DCWASA
Dunn, John	Interim Chief Engineer	DCWASA
Johnson, Jerry	General Manager	DCWASA
Peot, Chris	Biosolids Div Manager	DCWASA
Wardell, Michael	Biosolids EMS Auditor	KEMA
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Process Description

The General Manager confirmed that the Biosolids Division Manager has been authorized to develop and implement the Biosolids EMS and to report on its performance. All members of management interviewed are aware of the Biosolids EMS initiative and familiar with its purpose and scope. Goals are to effectively manage biosolids products, develop creative re-use options and be responsive to the public.

The Biosolids Policy was reviewed by the DCWASA Environmental Quality and Operations Committee and approved at a Board Meeting in April 2004. This policy is documented in the EMS Manual and includes commitment to the NBP Code of Good Practice. The DCWASA Vision and Mission Statements are communicated internally by posting throughout the plant. The policy is communicated internally (to including contractors) through EMS training / discussions and externally to interested parties through e-mails, monthly reports and biosolids information packets.

The DCWASA Strategic Plan covers a five-year period going forward and is reviewed at least every 3 years by the Board. From this Plan, Workplan goals and objectives are established annually, including overall DCWASA goals and Department Workplans that Dept Managers are authorized to set. Individuals within Departments are assigned responsibility for their part in action plans to achieve Dept. objectives.

A “Cross Functional Team” (CFT), led by the Biosolids Manager and including representatives from DCWASA Departments involved in biosolids management, WSSC and contractors, meets monthly to discuss EMS effectiveness and the need for potential changes based on audit results, public input and changing circumstances. Progress towards objectives is reviewed by the CFT at least quarterly. Results of these meetings are documented in meeting minutes.

At least annually (as scheduled by the Biosolids Division Manager), a report of EMS results is submitted to the General Manager and discussed at a Board of Directors meeting. The Board also discusses other environmental and quality issues, including those related to biosolids.

Documentation Reviewed

Cross Functional Team Meeting agenda, August 25, 2004
Minutes of CFT Meetings, July 28, 2004 & March 17, 2004
Summary of CFT Meetings, July 16, 2003 & September 17, 2003
Egg Shaped Digesters Facility Project Update, April 2004
DCWASA Board of Directors meeting minutes – April 2, 2004 & March 24, 2004

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements, except as noted below.

Nonconformance 04-16 (minor)

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).

Nonconformance 04-17 (minor)

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.

Additional Comments

The following additional comments are offered based on observations and review of this process.

1. Using a series of reviews at different levels to assess EMS performance can be an effective way to perform these reviews. The EMS procedure for this process should reflect this method.
2. Biosolids goals and objectives are also referred to in various documents (such as EMS Element 5) as "EMS goals and objectives". Consistency in nomenclature can help in clearly identifying these objectives.

8. AUDIT – BIOSOLIDS GOALS & OBJECTIVES PROCESS

Participants

The following personnel participated in this audit:

Name	Position	Organization
Johnson, Jerry	General Manager	DCWASA
Peot, Chris	Biosolids Div Manager	DCWASA
Wardell, Michael	Biosolids EMS Auditor	KEMA
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Process Description

The biosolids goals and objectives process is part of the DCWASA annual Workplan Goals process. The documented biosolids goals are consistent with the overall goals for the Biosolids Program noted by top management (see Management Involvement audit).

Biosolids Program goals and related objectives are prepared by the Biosolids Management Division and included in the annually Workplan Goals. Five goals and four to six related objectives were set for 2002 – 2003 and progress in achieving these objectives is noted in the annual Biosolids Program Goals and Objectives document. This document notes targets, responsibilities and action plans for each objective, including any changes needed in biosolids activities. The 2003-2004 goals, while similar to those for the preceding year, are stated differently and now relate to each of the four outcomes areas prescribed by the NBP Biosolids EMS Program.

Public input into EMS planning and the development of biosolids goals and objectives is obtained through CFT members who have regular contact with interested parties.

Documentation Reviewed

WASA 2002-2003 Biosolids Program Goals and Objectives and Action Plan document (undated)
WASA 2003-2004 Biosolids Program Goals and Objectives and Action Plan document (undated)
Cross Functional Team Meeting agenda, August 25, 2004
Minutes of CFT Meetings, July 28, 2004 & March 17, 2004
Summary of CFT Meetings, July 16, 2003 & September 17, 2003

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements, except as noted below.

Nonconformance 04-07 (minor)

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.

Nonconformance 04-08 (minor)

Some of the 25+ biosolids objectives are not sufficiently measurable.

Nonconformance 04-13 (minor)

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.

9. AUDIT - COMPLIANCE WITH LEGAL & OTHER REQUIREMENTS

Participants

The following personnel participated in this audit:

Name	Position	Organization

Ramirez, Mark	Biosolids Engineer	DCWASA
Forbes, Will	Inspector	MES
Kilgore, Pete	Inspector	MES
Tignor, Glen	Inspector	MES
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Process Description

The compliance program includes monitoring of daily operating data by the Biosolids Engineer and Biosolids Division Manager and continual monitoring of field activities by Maryland Environmental Services (contractor).

Responsibilities for tracking and incorporating regulatory requirements are described in the EMS Manual. Contractors maintain local permits at the application site. Employees understand to contact the Biosolids Management Division if they need detailed information about regulations and a website is being prepared to improve accessibility to those regulations. The Biosolids Division Manager (or delegate) communicates changes in regulatory requirements to persons affected by the change verbally or through e-mails.

Applicable regulatory requirements are noted in the DCWAS EMS Manual, Appendix D, including a description of EPA 503 regulations and applicable State regulations (Pennsylvania regulations not included, but not yet applicable). The need to comply with requirements noted in SOPs that are beyond regulatory requirements was noted as voluntary “other requirements” within the biosolids program.

The Biosolids Engineer and/or Biosolids Division Manager monitor daily operating data and lab analysis results to ensure compliance with compliance and SOP requirements in biosolids production. Maryland Environmental Services continually monitor field activities (primarily pH sampling) and reject any biosolids loads that do not meet requirements.

Any noncompliances identified during the monitoring & measurement activities noted above are subjected to immediate corrective action, including cessation of any application (see Corrective and Preventive Action audit).

Documentation Reviewed

DCWASA EMS Manual, Element 4 and Appendix D
Biosolids EMS Corrective and Preventative Action Plan (July 7, 2003)
Biosolids EMS Corrective and Preventative Action Plan (November 4, 2003)
WSSC DC DCWASA Biosolids Land Application Inspections Incident Report, To Chris Peot and Steve Gerwin, From Ed Taylor Re: Taylor Farm (July 7, 2003)
WSSC DC DCWASA Biosolids Land Application Inspections Incident Report, November 4, 2003
Memorandum, To Petra Fruehbis, President, K-F Environmental Technologies, From Dorian Tolbert, Supervisor, Solids Processing Section (DCWASA), Re Low pH issues on October 31, 2003 (dated November 20, 2003)
K-F Environmental Technologies Memorandum, To Dorian Tolbert, DCWASA, From Petra Fruehbis Re Memo of 11/20/03 on low pH issues (dated December 4, 2003)
Fecal Coliform Levels, DCWASA Mixer Output graph (undated)

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements, except as noted below.

Nonconformance 04-05 (minor)

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.

Nonconformance 04-06 (minor)

Other requirements and the procedure for identifying & tracking them are not identified in the EMS Manual.

10. AUDIT - PUBLIC PARTICIPATION & COMMUNICATION

Participants

The following personnel participated in this audit:

Name	Position	Organization
Carkhuff, Ann	Regional Biosolids Coordinator	USEPA
Peot, Chris	Biosolids Div Manager	DCWASA
Williams, C.W.	Interested Party (public)	
Hewitt, Greg	Interested Party (farmer)	Hewitt Farms
Haley, Scot	Biosolids Inspector	Virginia Dept Health
Sawyer, Cal	Biosolids Program Manager	Virginia Dept Health
Wardell, Michael	Biosolids EMS Auditor	KEMA
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Note – interviews with Ms. Carkhuff, Mr. Williams, Mr. Sawyer, Mr. Haley, Mr. Gerwin and Mr. Sims were by telephone

Process Description

DCWASA EMS programs for public participation and external communications are described in separate procedures (EMS Manual, Elements 6 and 9), however these practices are connected in actual practice. The internal communications process is described in EMS Manual Element 9. Continually improving relations with interested parties is a primary goal of the biosolids program.

A plan for external communications is written in the EMS Manual, Elements 6 and 9. This plan includes various communication methods such as written reports, public meetings, surveys, discussion with farmers and direct response to public inquiries. The Biosolids Division Manager keeps a list of interested parties that is updated when new parties are identified and/or ask to be included. A monthly report of biosolids activities is sent to these interested parties. A website is being prepared to provide public accessibility to information about biosolids program activities.

The DCWASA EMS was planned by the Biosolids Division based in part on input from a series of external workshops and with direct input from members of the Cross Functional Team (CFT) who

have regular contact with regulators, contractors and citizens. Additional input is obtained from Maryland Environmental Services (MES), who provides inspection of agricultural applications. The same process is used to consider interested party input when preparing biosolids goals and objectives. Interested parties are advised of planned third party audits in advance via e-mail. In practice (not stated in EMS procedures), DCWASA also receives information about public issues through the "BURAC Committee", which includes representatives from DCWASA, contractors, regulators, universities and concerned citizens.

Information about the DCWASA EMS, including the Biosolids Policy and contractor responsibilities is communicated to contractors through CFT meetings and contractor EMS requirements are prescribed in contract agreements with each contractor.

All regulators contacted are aware of the DCWASA biosolids EMS initiative and stated that DCWASA and their contractors are cooperative and responsive and that problems identified (such as truck dragout and cattle access to fields) are quickly investigated and addressed. VA regulator noted that EMS involvement has led to significant improvement in odor control at land application sites and improved contractor performance, although health-related complaints have increased. The EPA Regulator is aware of the DCWASA EMS effort, stated that no complaints about DCWASA biosolids have been received in Maryland in several years and felt that DCWASA is doing a good job of communicating with concerned citizens.

A concerned citizen interviewed stated that, despite good 2-way communications with DCWASA officials, problems with noise, driver rudeness and odor are continuing. The citizen cited a 1997 report by the University of Virginia Institute for Environmental Negotiations that references a study by WEF indicating "resistance to biosolids programs is correlated with several factors, including citizen education groups". The comment and reference was passed to DCWASA for response. The Auditors note DCWASA's stated position that "stakeholders are more likely to support the program if aware of its features and successes".

Another interested party (farmer) noted satisfaction with DCWASA performance in supplying acceptable materials and that communication has improved in recent years.

The Biosolids Division Manager issues a report describing biosolids activities and performance results approximately monthly internally and to identified interested parties. Internal communications about biosolids management activities and the EMS also occurs through training programs and discussion at plant "tailgate" meetings.

Documentation Reviewed

DCWASA EMS Manual, Elements 6 and 9
Blue Plains Biosolids EMS Interested Parties List (undated)
Copy of phone log (undated)
2004 Biosolids Outreach Prioritization Findings (undated)
Outreach Effort Undertaken by the Biosolids Management Program, Table of groups, meetings and dates (undated)
Various farmer surveys (Louisa County, VA September 1, 2003, Hanover County, VA September 5, 2003, Lancaster County, VA May 10 2004 & April 29, 2004)
Email from Chris Peot to interested parties list with May Monthly Blue Plains Biosolids Report (June 16, 2004)

Email from Chris Peot to interested parties list with July Monthly Blue Plains Biosolids Report (undated)
Various e-mails from Chris Peot to interested parties (January to August, 2004)
Various e-mails between Gayl Fowler (interested party) and Chris Peot (November 2003 through June 2004)
Various e-mails between CW Williams (interested party) and Chris Peot (August 2004)
Various biosolids information brochures
DCWASA's Biosolids Environmental Management System (EMS Power Point slide presentation to DCWASA management (undated)
DCWASA Biosolids EMS Presentation, Power Point slide presentation to DCWASA operators (undated)
Blue Plains Biosolids EMS Program Information Packet (undated)
Department of Wastewater Treatment, Solids Processing Section, Monthly Crew Tailgate Session Sign In Sheets (December 3, 2003)
Agenda of Cross Functional Team Meeting (CFT), August 25, 2004
Summary of CFT Meeting, March 17, 2004
Blue Plains Wastewater Treatment Operations Course Brochure & Sign in Sheet (August 19, 2004)

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements.

Additional Comments

The following additional comments are offered based on observations and review of this process.

1. Continuing communication with concerned citizens interviewed during this audit can be an effective way of understanding and addressing public concerns about biosolids, provided both parties want the process to work.
2. The BURAC Committee can provide an effective way to discuss and communicate about interested party concerns.
3. Auditors note that the DCWASA Public Affairs Office has little involvement in communications about the Biosolids Program. This group may be of help in continuing to improve that communication.
4. The required Biosolids Program Performance Report was considered to not apply at this point in the implementation of the DCWASA Biosolids EMS, per instructions to auditors from NBP.
5. If the monthly reports being issued to interested parties are to be used as periodic performance reports they need to include reports of contractor performance, summaries of compliance and progress towards achieving goals and objectives.

11. AUDIT - ROLES, RESPONSIBILITIES & TRAINING

Participants

The following personnel participated in this audit:

Name	Position	Organization
Peot, Chris	Biosolids Div Manager	DCWASA
Williams, Lisa	Senior Technical Services Director	Synagro
Gerwin, Steve	Biosolids Manager	WSSC
Wardell, Michael	Biosolids EMS Auditor	KEMA
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Process Description

Lines of authority for the DCWASA Biosolids Program, including roles and responsibilities are described in the DCWASA EMS Manual, Element 7. Element 8 describes training requirements and Appendix G describes EMS responsibilities in detail.

Roles and responsibilities for DCWASA personnel are described in job descriptions for those involved in biosolids management activities. The job descriptions include qualifications required for each job and these are being adhered to (some unqualified operators recently dismissed).

The Biosolids Division Manager has been assigned responsibility for ensuring that the biosolids program is implemented and maintained in accordance with requirements. The General Manager made this appointment verbally.

Contractor roles and responsibilities within the Biosolids Program are documented in contracts with each contractor and the Biosolids Division Manager periodically reviews performance with each contractor.

EMS awareness training is provided to DCWASA employees with biosolids responsibilities through annual training sessions and discussions at plant tailgate meetings. Other training programs included in the Biosolids Program are arranged through the Human Resources Department and Administrative Services Supervisor.

Contractors are made aware of their EMS requirements through CFT meetings and discussions with the Biosolids Division Manager and through an information packet that describes the EMS and policy commitments. Contractors are expected to train their personnel as needed.

Documentation Reviewed

Job Descriptions – Foremen 1 – Biosolids & Manager – Biosolids (11/2000)
DCWASA's Biosolids Environmental Management System (EMS Power Point slide presentation to DCWASA management (undated)
DCWASA Biosolids EMS Presentation, Power Point slide presentation to DCWASA operators (undated)
Blue Plains Biosolids EMS Program Information Packet – including Biosolids Policy (undated)
Department of Wastewater Treatment, Solids Processing Section, Monthly Crew Tail Gate Session Sign In Sheets (December 3, 2003)
Blue Plains Wastewater Treatment Operations Course Brochure & Sign in Sheet (August 19, 2004)
Blue Plains AWWTP Wastewater Operations Course, August 19, 2004

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements, except as noted below.

Nonconformance 04-02 (minor)

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.

Additional Comments

The following additional comments are offered based on observations and review of this process.

1. The DCWASA Biosolids Division Manager has extensive responsibilities within the biosolids program. These responsibilities may pose a burden, given his many other responsibilities, and delegation of some responsibilities may be helpful in continuing to expand EMS effectiveness as the EMS matures.
2. Formal approval of the Biosolids Division Manager's authority to manage and control the biosolids EMS should be recorded to ensure understanding and acceptance.
3. Contractor training to ensure job competency is not being reviewed by DCWASA. Reviewing this training could help in establishing consistent performance against EMS requirements.

12. AUDIT - PRETREATMENT & SOLIDS COLLECTION

Participants

The following personnel participated in this audit:

Name	Position	Organization
Bailey, Walter	Blue Plains Plant Manager	DCWASA
Peot, Chris	Biosolids Div Manager	DCWASA
Tesfaye, Aklile	Manager, Wastewater Division	DCWASA
Wilson, Elaine	Pretreatment Manager	DCWASA
Wardell, Michael	Biosolids EMS Auditor	KEMA

Process Description

Pretreatment is included in the EMS scope and critical control point categories. Solids collection (Clarifiers) is not currently included in the EMS scope.

The EMS scope does not now include critical control points for primary or secondary clarifier operations. This was justified during EMS preparation based on the ability to control biosolids quality and environmental impacts by upstream and downstream processes. An objective for odor prediction has caused this justification to be reviewed based on sludge blanket thickness control

The pretreatment step is controlled through permits (issued by counties or EPA) to industrial generators and through monitoring incoming flow from all incoming wastewater sources. Pretreatment practices follow written SOPs and meet best practice requirements, except for the lack of a residential program. This is not included since the combined sewer system is regulated by the District of Columbia Health Department.

Permitted dischargers are inspected and sampled by DCWASA yearly, with semi annual sampling by the permittee. Any sources that do not meet permit requirements are issued a NOV that is followed up by DCWASA Pretreatment to ensure correction.

Documentation Reviewed

EMS Manual, Appx B (list of critical control points)
DCWASA Pretreatment Program Operators Manual and Appendices (November 1998)

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements, except as noted below.

Nonconformance 04-03 (minor)

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 and no operational controls for Clarifier parameters, such as sludge blanket thickness, are included.

Additional Comments

The following additional comments are offered based on observations and review of this process.

1. Monitoring of all incoming flows could help in predicting downstream effects and subsequent biosolids quality and environmental impacts.

13. AUDIT - BIOSOLIDS STABILIZATION

Participants

The following personnel participated in this audit:

Name	Position	Organization
Bailey, Walter	Director & Blue Plains Plant Manager	DCWASA
Chesley, Patrick	Shift Supervisor	DCWASA
Newman, Lawrence	Operator	DCWASA
Pasteur, George	Biosolids General Foreman	DCWASA
Peot, Chris	Biosolids Div Manager	DCWASA
Sturdevant, Robert	Operator	DCWASA
Wardell, Michael	Biosolids EMS Auditor	KEMA

Note – audits conducted on day shift and evening shift.

Process Description

The biosolids stabilization process includes solids thickening, dewatering and lime stabilization at Blue Plains. Biosolids are thickened by gravity thickeners or dissolved air flotation and sent to blending tanks prior to dewatering by centrifuge. Chemicals are added at various points to improve dewatering. After dewatering, quicklime is added to raise the pH above 12.

DCWASA critical control points for this value chain step (EMS Manual, Appx B) are consistent with the National Manual of Good Practice, considering that responsibility for some control points has been transferred to contractors. Contractor O&M Manuals (or permits) reference the required CCPs, although the reference is sometimes indirect.

Stabilization practices follow documented SOPs, including sampling and testing of the biosolids and comparison with regulatory requirements. Operators understand the importance of controlling odors and how pH and lime dose relate to potential field problems and the need to meet regulatory requirements.

Discussions with operators on both shifts (day and evening) demonstrated knowledge of the EMS program and Biosolids Policy and confirmed that training of operators and shift supervisors has occurred. Operators feel that recordkeeping and communications have improved since the EMS program was established.

Biosolids are sampled and pH tested hourly by the operators and corrective actions taken if needed. Daily samples are also taken to the plant lab for 503 compliance testing, and composites taken regularly for metals testing.

Documentation Reviewed

Dry Polymer Unloading & Storage SOP (May 2004)
Topic: Biosolids – Where Does it Go? Solids Processing Section Impacts (November 21, 2003)
Operations Bureau – Wastewater Operations Division Daily Manual Report for Biosolids (August 24, 2004)
Completed pH logs for September 16, 2004
Fecal Coliform Levels, DCWASA Mixer Output, Undated graph

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements.

14. AUDIT - BIOSOLIDS STORAGE & TRANSPORTATION

Participants

The following personnel participated in this audit:

Name	Position	Organization
Bright, Jack	Field Manager	Recyc Systems
Chesley, Patrick	Shift Supervisor	DCWASA
Davis, Buzz	Dispatcher	Synagro
Forbes, Will	Inspector	MES
Neal, Andre	Truckdriver	Neal Trucking
Jackson, Sean	Truckdriver	Recyc Systems
Owens, Janet	Sludge Compost Operator	DCWASA
Pasteur, George	Biosolids General Foreman	DCWASA
Peot, Chris	Biosolids Div Manager	DCWASA
Rubin, Joey	Dispatcher	Synagro

Wardell, Michael	Biosolids EMS Auditor	KEMA
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Process Description

Arrangements for transporting biosolids materials to application / use sites are made by contractors. Synagro and Recyc Systems have dispatchers at the Blue Plains plant. Neal Trucking arrangements are made from near the ERCO Tree Farm site.

Critical control points for these value chain steps are consistent with the National Manual of Good Practice. Storage CCP are identified in DCWASA EMS Manual, Appx B. Transportation CCP are described in contractor operating manuals or permits.

Biosolids are stored at the Blue Plains plant pending transfer to trucks and at field locations (by contractors) during inclement weather. Field locations use permits as a means of control. Blue Plains control is through written SOPs.

Trucks are cleaned and inspected before loading, consistent with documented operational controls. Loading practices follow procedures, including weighing and final inspection. An overweight truck was observed to return to the loading station for correction. An effective tracking system for biosolids loads is in place, including weigh tickets and manifests.

Delivery schedules and routes are arranged between contractors and Blue Plains personnel and discussed with drivers before departure. Synagro and Recyc Systems have a Dispatcher at Blue Plains for doing this, ERCO communicates with drivers by telephone. Dispatchers are aware of DCWASA required biosolids transportation procedures. Synagro dispatchers are aware of the EMS program, although their knowledge of its requirements is sketchy. Training of subcontractors on loading and field procedures is mostly verbal, with some instructions posted on bulletin boards in dispatch trailers.

Discussions with truckdrivers demonstrated consistent understanding of transportation procedures, including need to clean trucks before departing from delivery areas. Several trucks were observed to be manually cleaned by the driver before leaving.

No formal spill response plans are provided to drivers, although drivers are supplied with contact numbers for Synagro and instructed to call if problems arise. Synagro stating the DOT makes the subcontracted driver responsible for securing load and knowing how to respond to problems.

Documentation Reviewed

Various weigh tickets
Memo (unsigned, uncontrolled) dated December 12, 2003 regarding Blue Plains Scale Ticket procedures
SOP for Automatic Scale System

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements.

<u>Additional Comments</u>

The following additional comments are offered based on observations and review of this process.

1. References to critical control points in contractor O&M Manuals are indirect (they are there but need to be searched for). A more obvious or direct reference to CCPs in contractor procedures could help in effectively extending the Biosolids EMS to contractors.

15. AUDIT - MAINTENANCE

Participants

The following personnel participated in this audit:

Name	Position	Organization
McHenry, Warren	Maintenance Systems Administrator	DCWASA
Ramirez, Mark	Biosolids Engineer	DCWASA
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Process Description

An asset management and maintenance work order system, including documented maintenance procedures, is in place at Blue Plains. The system categorizes maintenance work as “urgent” or “routine” for safety/housekeeping, preventive maintenance, reliability engineering, capital projects and operating resources. Recordkeeping and scheduling has been a problem in the past, however a new PM system (Maximo) is being implemented and is partially in place to address this. Maintenance personnel are aware of the EMS and commitment to preventive maintenance.

Documentation Reviewed

Electronic files – Maximo PM system (demonstration)

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements.

16. AUDIT - EMERGENCY PREPAREDNESS

Participants

The following personnel participated in this audit:

Name	Position	Organization
Bailey, Walter	Director & Blue Plains Plant Manager	DCWASA
Peot, Chris	Biosolids Div Manager	DCWASA
Ramirez, Mark	Biosolids Engineer	DCWASA
Tesfaye, Aklile	Manager, Wastewater Division	DCWASA
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Process Description

Emergency preparations for fire and security for the Blue Plains AWTP are documented in the Emergency Response Plan, which is available on the internal document system (PIERS). The Stormwater Pollution Prevention Plan is used to control onsite spills, including biosolids, and is reviewed quarterly (and updated if necessary) by the SWPPP Committee. Spills and other emergency incidents are reported on the "Spill Report Form", which includes investigation and provision for corrective action.

Security at the plant is active and effective in controlling contractor entrance and exit. Emergency fire drills are conducted at least annually and supervised by DCWASA Dept of Occupational Safety & Health (DOSH). Material Safety Data Sheets are available in plant operating areas, although they are not referenced in SOPs. Emergency equipment inspection is conducted by DOSH (or contractor), although some equipment was found to not be working properly and there was no evidence of this equipment being inspected.

Contractors are aware of their emergency preparedness requirements, however several trucks at contractor locations did not have emergency spill response plans or contact numbers.

Documentation Reviewed

Stormwater Pollution Prevention Plan (May 2003)
NPDES permit DC 021199
Blue Plains AWTP Emergency Response Plan (April 2003)
Spill Report & Incident Report (Sept 3, 2002)
Incident Report (Aug 29, 2002)
Spill Report (Feb 11, 2003)

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements, except as noted below.

<u>Nonconformance 04-09</u> (minor)

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

<u>Nonconformance 04-10</u> (minor)

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.

<u>Additional Comments</u>

The following additional comments are offered based on observations and review of this process.

1. Referencing MSDS in SOPs could be useful in establishing control of potential environmental impacts.
2. Recording observations and corrective action resulting from emergency drills could help in resolving any emergency plan deficiencies that may be identified.

17. AUDIT - SYNAGRO AGRICULTURAL USE

Participants

This audit included observation and review of practices at Synagro sites in Winchester VA and Frederick County MD. The following personnel participated in this audit:

Name	Position	Organization
Baker, Rob	Field Manager	Synagro
Forbes, Will	Inspector	MES
Gardner, Gary	Field Manager	Synagro
Hewitt, Greg	Farmer	Hewitt Farms
Love, Kelly	Regional Technical Services Manager	Synagro
Peot, Chris	Biosolids Div Manager	DCWASA
Ruben, Al	Regulator	USEPA
Shifflett, Laura	Biosolids Monitor	Frederick County (VA)
Williams, Lisa	Technical Services Director	Synagro
Wardell, Michael	Biosolids EMS Auditor	KEMA
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Process Description

Synagro has a proactive outreach program in place in locations where biosolids are being applied, including public forums. Warning signs are in place at the site entrance to advise that biosolids are being applied and to provide contact phone numbers for persons with questions. A farmer noted that Synagro is involved in the community and cooperative and responsive to requests for information.

Synagro apply biosolids for agricultural use based on contracts with DCWASA. Synagro obtains a local permit for each field application. Deliveries are arranged daily (subject to weather conditions) with DCWASA and onsite Field Managers monitor the offloading and spreading of the biosolids to meet regulatory and permit requirements. A Synagro Operations & Maintenance Manual includes documented procedures for preparing sites, handling biosolids and emergency plans. Observations confirmed that these procedures are being followed. A Site Book is kept at each site to describe site-specific conditions, such as maps, contact numbers and permits.

Each site where biosolids are applied is monitored (pH test and odor) by a contracted inspection firm (Maryland Environmental Services) such that no load is applied until approved by the inspector. Unacceptable loads are rejected and returned to DCWASA. Daily records are kept by the field manager concerning amounts applied and agronomic rates and are submitted monthly to DCWASA and State Biosolids Regulators.

Documentation Reviewed

Synagro O&M Manual (Virginia)
Hewitt Farms Site Book
Synagro O&M Manual (Maryland)
Frederick (MD) Site Book

Pre-Operating Checklist – Maryland, Synagro Field Operations, Dated 4/11/01
Memorandum to K-F Environmental Technologies, From Dorian Tolbert, Supervisor, Solids Processing Section (DCWASA), Re Low pH issues on October 31, 2003 (11/20/03)

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements.

Additional Comments

The following additional comments are offered based on observations and review of this process.

1. A more direct reference to critical control points in Synagro O&M Manuals could help in establishing consistency with DCWASA EMS requirements.
2. MES inspectors offer an opportunity for additional checking / inspection of concerns such as dragout and for ongoing EMS conformance.

18. AUDIT - SYNAGRO SILVICULTURE & RECLAMATION

Participants

This audit included observation and review of practices at the mine reclamation sites and silviculture sites managed by Synagro in Dinwiddie County VA. The following personnel participated in this audit:

Name	Position	Organization
Puryear, Marshall	Technical Services Manager Synagro	Synagro
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Process Description

Synagro apply DCWASA biosolids at the Iluka Resources sites in Dinwiddie County, Virginia under permit to reclaim the land after mining. Silviculture applications occur in various tree farming areas, as permitted by the Virginia Dept of Health. Since silviculture applications occur in winter months, the site (Abernathy site, Dinwiddie County) only was observed.

Verbal communications is maintained with local land owners. No problems have arisen and no complaints have been reported. Extensive communication on technical matters, such as application rates, occurs with University researchers. Synagro personnel were vaguely aware of the DCWASA EMS initiative, but have not received any training.

Biosolids are applied by sub-contractors and monitored continuously by Synagro Field Managers to ensure the application complies with consent agreements reached with land owners and permits approved by the Virginia Dept Health.

Each site where biosolids are applied is monitored continuously by Synagro personnel and checked periodically by Virginia Tech (University) Soils Dept personnel. Records are maintained and sent monthly to DCWASA and VDH.

Documentation Reviewed

Pre-Operating Checklist – Virginia, Synagro Field Operations
Wheelabrator Operating Plan & Site Book (March 2004)
Abernathy Forestry Site Plan, DN8 Field 1 (August 2003)

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements.

Additional Comments

The following additional comments are offered based on observations and review of this process.

1. The name on the Site Book for the mine reclamation site is "Wheelabrator…", indicating this plan is not being reviewed to ensure information is current.

19. AUDIT - ERCO FORESTRY

Participants

This audit included observation and review of practices at the ERCO Forestry site in Glen Burnie Maryland. The following personnel participated in this audit:

Name	Position	Organization
Flamino, Eric	VP Operations	ERCO
Flamino, Scott	Field Manager	ERCO
Neal, Andre	Truckdriver	Neal Trucking
Peot, Chris	Biosolids Div Manager	DCWASA
Kilgore, Pete	Inspector	MES
Wardell, Michael	Biosolids EMS Auditor	KEMA
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Process Description

The site, an abandoned gravel mine, is used to grow poplar trees for chipping. DCWASA biosolids are applied to 100A by ERCO under permit from MDE (10 A per year).

ERCO management maintains ongoing discussions with local residents, particularly those who live on the incoming road. 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 EMS, however there is not clear understanding of policy commitments.

ERCO operations personnel follow procedures, including application requirements, prescribed in their operating permit (issued 2001). Observation of these practices confirmed they are in place, however emergency plans are not kept on trucks and a truck was observed to depart without cleaning the back gate and wheels.

The site is monitored regularly by MES on behalf of DCWASA, including odor measurement (Nasal Ranger instrument) and soil pH. A VA certified laboratory analyzes perimeter monitoring samples and results are maintained by ERCO and reported monthly to DCWASA and MDE. An annual report of biosolids activities is submitted to MDE by ERCO.

Documentation Reviewed

MDE Sewage Sludge Utilization Permit #50116809I (1/8/01)
Groundwater analysis report to MDE (June 21, 2004)
ERCO Tree Farm Annual Report (Dec 2003)
Delivery weigh tickets (for 9/14/04)

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements.

Additional Comments

The following additional comments are offered based on observations and review of this process.

1. Documentation of ERCO operating and emergency procedures beyond just permit compliance could help in continuing to improve EMS effectiveness at this contractor.

20. AUDIT - RECYC SYSTEMS AGRICULTURAL USE

Participants

This audit was conducted at the Battlepark Farms application site in Culpeper County VA and biosolids storage site in Orange County VA. The following personnel participated in this audit. Interview with WSSC personnel confirmed details observed during this audit.

Name	Position	Organization
Bright, Jack	Field Manager	Recyc Systems
Gerwin, Steve	Biosolids Manager	WSSC
Jackson, Sean	Truckdriver	Recyc Systems
Peot, Chris	Biosolids Div Manager	DCWASA
Trumbo, Susan	VP – Technical Services	Recyc Systems
Wardell, Michael	Biosolids EMS Auditor	KEMA
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Interview with Mr. Gerwin was by telephone.

Process Description

Recyc Systems apply biosolids produced at Blue Plains at various sites under contract with WSSC. WSSC are a supplier and contractor to DCWASA.

Recyc Systems communication with interested parties is primarily with regulatory agencies. Proactive communication with neighbors has stopped since they felt it was not beneficial.

Community complaints are directed to the VP for response, however this apparently has not had any effect on continuing complaints from a neighbor near the storage site. Signs advising of biosolids application, with contact numbers, are placed at the entrance to application sites. Recyc personnel attend DCWASA CFT meetings, as invited. The VP has been informed of DCWASA EMS requirements, however site personnel are not aware of these.

Site selection is a priority and permits are pre-arranged with regulators. Biosolids applications follow procedures noted in the O&M Manual. The Manual includes descriptions of transportation and truck requirements, loading, unloading and spill management, agronomic rates and field operations that are consistent with best practices. Required documents and records are kept at the Recyc Systems offices and the VP said she maintains these manually, however sometimes out of date documents are used inadvertently.

When biosolids are stored (inclement weather) they are placed in permitted and relatively inaccessible areas (no signs) and removed on a LIFO inventory basis.

MES inspectors monitor each site daily and are authorized to reject loads of biosolids. Observation confirmed that biosolids are not applied until inspected. In addition, the Recyc Field Manager has authority to reject odorous materials. Evidence of rejected loads was observed (see Corrective and Preventive Action audit).

Documentation Reviewed

Recyc System O&M Manual – Land Application of Biosolids (VDH) (July 27, 1995)
Battlepark Farms Site Book (3/04)
WSSC / DCWASA Biosolids Land Application Inspections Incident Report, November 4, 2003

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements.

Additional Comments

The following additional comments are offered based on observations and review of this process.

1. The Recyc Systems O&M Manual is over 9 years old. More regular review / update of the procedures in the manual seems appropriate.
2. While it appears that biosolids at storage sites are being properly controlled, using a LIFO inventory control method could present unnecessary delays in long periods of inclement weather.
3. Proactive communication with neighbors near the storage site could help in resolving public perception problems.
4. Discarding trash in biosolids to be applied should be discouraged.

21. AUDIT – INTERNAL EMS AUDITS

Participants

The following personnel participated in this audit.

Name	Position	Organization
Hunter, Michael	Manager – Internal Audits	DCWASA
Poole, Nathaniel	Internal Auditor	DCWASA
Peot, Chris	Biosolids Div Manager	DCWASA
Wardell, Michael	Biosolids EMS Auditor	KEMA
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Process Description

Internal EMS audits are conducted by the DCWASA Internal Audit Dept by qualified auditors in accordance with procedures in the EMS Manual, Element 16, as scheduled by the Biosolids Division Manager.

Two internal audits of the DCWASA EMS have been conducted within the past 6 months, including a "desktop review" (Document Review) and onsite audit. The onsite audit used a "process audit" methodology based on the 4 outcome areas prescribed by NBP and included contractor performance. All elements of the DCWASA Biosolids EMS were audited for conformance with EMS Element requirements and reports were submitted to the Biosolids Division Manager for action. Corrective action plans were prepared and implemented for identified nonconformances. The audits did not cover performance relative to biosolids program goals, objectives and performance measures as prescribed in the EMS procedure.

Documentation Reviewed

Audit Engagement Memo (M. Hunter to J. Johnson) (August 5, 2004)
DCWASA "Review of Biosolids Management Program" (8/18/04)
DCWASA "Review of Biosolids Management Program, Desktop Review" (March, 2004)
DCWASA Internal Audit Nonconformance Corrective Action List (undated)

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements, except as noted below.

Nonconformance 04-15 (minor)

Internal audits do not assess consistency with biosolids policy commitments or describe performance towards biosolids goals and objectives.

Additional Comments

The following additional comments are offered based on observations and review of this process.

1. Using the Internal EMS Audit Program to assess conformance with EMS Elements does not fully utilize the skills of the internal auditors. Developing an audit program that uses Third Party

Audits to assess conformance and internal audits to assess EMS performance could help identify opportunities to continually improve that performance.

22. AUDIT - CORRECTIVE & PREVENTIVE ACTION

Participants

The following personnel participated in this audit.

Name	Position	Organization
Poole, Nathaniel	Internal Auditor	DCWASA
Peot, Chris	Biosolids Div Manager	DCWASA
Wardell, Michael	Biosolids EMS Auditor	KEMA
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Process Description

The DCWASA CAPA process (documented EMS Manual, Element 14) currently includes correction of nonconformances identified during EMS audits and noncompliances identified during routine monitoring and measurement. Actual practices observed confirmed this process is being followed.

Correction of nonconformances identified during EMS audits is tracked within the audit report, including EMS changes needed, however the cause of these deficiencies is not indicated. Correction of noncompliances is tracked using the Corrective and Preventive Action form, including investigation of cause. Records of corrective actions are kept electronically on the internal I-drive.

Documentation Reviewed

Biosolids EMS Corrective and Preventative Action Plan (July 7, 2003 & Nov 4, 2003))
WSSC DC DCWASA Biosolids Land Application Inspections Incident Report, To Chris Peot and Steve Gerwin, From Ed Taylor Re: Taylor Farm, July 7, 2003
WSSC DC DCWASA Biosolids Land Application Inspections Incident Report, November 4, 2003
Memorandum, To Petra Fruehbis, President, K-F Environmental Technologies, From Dorian Tolbert, K-F Environmental Technologies Memorandum, To Dorian Tolbert, DCWASA, From Petra Fruehbis Re Memo of 11/20/03 on low pH issues (December 4, 2003)
Supervisor, Solids Processing Section (DCWASA), Re Low pH issues on October 31, 2003, Memo dated November 20, 2003
DCWASA Internal Audit Nonconformance Corrective Action List (undated)

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements.

Nonconformance 04-14 (minor)

Corrective action plans for EMS nonconformances do not identify causes that are being addressed.

Additional Comments

The following additional comments are offered based on observations and review of this process.

1. Expanding the use of the EMS Corrective and Preventive Action process to include incidents in addition to noncompliances, external complaints, lack of progress towards goals and objectives, and changes resulting from management reviews could help in identifying causes of problems and simplifying their solution.

23. AUDIT – DOCUMENT CONTROL AND RECORDKEEPING

Document control and recordkeeping requirements were audited as part of each audit described above.

Participants

The following personnel participated in this audit.

Name	Position	Organization
Peot, Chris	Biosolids Div Manager	DCWASA
Wardell, Michael	Biosolids EMS Auditor	KEMA
Shaver, Jon	Biosolids EMS Lead Auditor	KEMA

Other participants noted in audits described above.

Process Description

Document control and recordkeeping requirements are described in EMS Manual, Element 12. Documents requiring control are listed in Appendix B of that Manual. Required records are noted in EMS procedures and in Appx B (although they are called “documents” in Appx B). The document control procedure describes a document hierarchy and control number for identifying controlled documents. The controlled document list identifies the location of the document (or record), review requirements (documents) and the person(s) responsible for control. Documents are stored electronically on the internal I-drive.

By extension of EMS requirements through contracts, contractors are required to develop and implement an effective document control and recordkeeping procedure.

Documentation Reviewed

EMS Manual, Element 12 & Appendix B
Various documents and records as noted in audits described above

Audit Results

This biosolids management process meets requirements and expectations of the NBP EMS Elements, except as noted below.

Nonconformance 04-11 (minor)

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.

Nonconformance 04-12 (minor)

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

Additional Comments

The following additional comments are offered based on observations and review of this process.

1. Document control and recordkeeping does not need to be as complex as described in the EMS procedures.
2. Identifying document and records requiring control separately can help in determining effective controls and simplifying this process.

24. PROMISES AND AGREEMENTS

DCWASA has promised to proceed with action plans to correct all nonconformances identified during this audit and to complete these actions in a timely manner. DCWASA has agreed to arrange for an interim audit to occur within 12 months of this verification audit (i.e. by September 2005), as prescribed by the National Biosolids Partnership Biosolids EMS program. The scope of that interim audit will include verification of all corrective actions taken to address nonconformances identified during the verification audit and other biosolids activities to be agreed upon.

25. AUDIT COMPANY STATEMENT

In issuing this report, KEMA-Registered Quality, Inc. and the Auditors who conducted this audit assert that we are qualified to perform the audit and that our relationship with the District of Columbia Water and Sewer Authority is completely independent. We further affirm that the results of this audit presented in this report represent a fair and unbiased analysis of the Biosolids EMS currently in place at the District of Columbia Water and Sewer Authority. No warranty otherwise is expressed or implied.

Report Prepared By: Jon A. Shaver / Biosolids EMS Lead Auditor (signature on file)

Date: September 28, 2004