2005 Annual Report

Biosolids Environmental Management System

District of Columbia Water and Sewer Authority



March 2006





District of Columbia Water and Sewer Authority Biosolids Environmental Management System 2005 Annual Report

Table of Contents

INT	ΓRC	ODUCTION	1
1.	PR	ROGRAM OVERVIEW AND ACCOMPLISHMENTS	2
1	.1	PROGRAM DESCRIPTION	2
1	1.2	ACCOMPLISHMENTS	4
1	.3	ENVIRONMENTAL MANAGEMENT SYSTEM	4
2.	PR	RODUCT AND PROCESS CONTROL	5
2	2.1	POLICY	5
2	2.2	CRITICAL CONTROL POINTS	5
2	2.3	Objectives and Targets	6
2	2.4	OPERATIONAL CONTROL OF CRITICAL CONTROL POINTS	7
		Improved Lime Mixing	7
		New Truck Scales Operation	7_
		Use of Process Data	
4	2.5	MONITORING AND MEASUREMENT	/
		Daily and Moninity Meetings	ð
		GIS Tracking System Improvements	9
		Inspections	9
		Reuse Options Review	
		Influent Monitoring	
2	2.6	EMS DOCUMENTATION AND DOCUMENT CONTROL	
3.	CC	OMPLIANCE AND PREPAREDNESS	
3	2 1	LEGAL AND OTHER REQUIREMENTS	11
1	3.2	EMERGENCY PREPAREDNESS AND RESPONSE	12
3	3.3	TRAINING	
4.	ST	TAKEHOLDER ACCEPTANCE	14
	11	PUBLIC PARTICIDATION IN PLANNING	14
	r. 1	Proactive Outreach	14
		Stakeholders	
		Challenges	
4	1.2	INTERNAL AND EXTERNAL COMMUNICATION	
4	1.3	BIOSOLIDS MANAGEMENT PROGRAM REPORT	17
5.	IM	IPROVEMENT	
5	5 1	Nonconformances: Preventive and Corrective Action	18
5	5.2	INTERNAL EMS AUDIT	
5	5.3	MANAGEMENT REVIEW	
6.	EN	NVIRONMENTAL OUTCOMES	
f	51	SUSTAINABILITY	10
e	5.2	END-USE OPTIONS	
		Hauling and Land Application	



	Mine Reclamation via Silviculture	20
	Airport Land Reclamation	20
6.3	CONSERVATION	21
	Greenhouse Gas Reduction	21
	Fertilizer Saved	22
6.4	LEADING-EDGE RESEARCH	26
	Nutrient Rebates	26
	Odor Research	26
	Phosphorus Research	27
	Metals Research	27

APPENDIX A	EPA Award Certficate
Appendix B	
Appendix C	
Appendix D	CFT MEETING AGENDA (EXAMPLE OF STANDARD AGENDA)
Appendix E	General Manager's Monthly ReporT (Example)
Appendix F	Incident Report (Example)
Appendix G	



Introduction

The Blue Plains Advanced Wastewater Treatment Plant (AWTP) has been a leader in environmental stewardship since it started operations in 1938, with continual upgrades responding to community needs. As the largest such facility in the world, it has been a pacesetter in restoring the Potomac River, the Chesapeake Bay, and their watersheds.

This annual report provides information about the biosolids division's efforts between January and December 2005 that have helped lead to the facility's record of excellence and drive for continual improvement.

The greatest benefit of our operations and management program is that the DC WASA biosolids program is largely proactive through public outreach, examination of critical control points, investigation of root causes, and implementation of findings for improvement. As a result, DC WASA continues to improve product quality and consistency – and acceptability. In the meantime, we

The biosolids program focuses on four outcomes:

- Consistent product quality
- Regulatory compliance
- Public acceptance

Environmental performance

have continued to meet or surpass all permit and other regulatory requirements.

A driving force in the program for improvement is the biosolids division's third-party certification to the National Biosolids Partnership's biosolids environmental management system (EMS) program in November 2004. Recommendations in the resulting audit report identified key areas for improvement that have been implemented. These recommendations include identifying where critical controls should be directly linked with operating procedures and monitoring and measurement mechanisms.

The year's successes also led to another achievement: In October 2005, DC WASA won the coveted US EPA 2005 National Clean Water Act Recognition Award for Exemplary Biosolids Management, Large Operating Projects (Appendix A).

This annual report provides a detailed account of biosolids operations over the last year, organized generally by program areas for ease of understanding.

It is important to note that monthly cross-functional team (CFT) meetings are a critical component of our success. At these meetings, attended by staff from various divisions, contractors, other agency representatives, and inspectors, issues raised during the month are discussed, decisions are made on how to address them, root causes are identified, and trends are tracked. Just about everything discussed in this report has been a topic or result of a CFT meeting.

Wastewater Treatment Program Goals

- Operate and mange the system efficiently, effectively, and economically
- Provide treatment capacity for current and future needs
- > Address community concerns
- Maintain infrastructure in sound condition replace aging facilities and improve system reliability
- Provide flexibility to adjust to evolving markets
- Reduce biosolids odors onsite and offsite
- Improve biosolids so they are easier and cheaper to manage and recycle
- Continue to achieve the goals of the Chesapeake Bay Agreement – reduce nutrient loads to the Chesapeake Bay



1. Program Overview and Accomplishments

1.1 Program Description

In 1996, the District of Columbia Water and Sewer Authority (DC WASA) assumed management of the plant from the Washington, DC government. Following are a few key facts about the Blue Plains AWTP:

- Serves more than two million Washington metro area customers in the District of Columbia, portions of Montgomery and Prince George's counties in Maryland, and portions of Fairfax and Loudoun counties in Virginia
- > Service area covers more than 725 square miles
- Capacity to treat 370 million gallons of wastewater a day (370 mgd), with a complete treatment peak flow of 740 mgd
- > Peak wet-weather capacity to treat 1.076 billion gallons a day
- More than 1,200 wet tons per day of Class B biosolids generated and beneficially used

DC WASA buys drinking water from the Washington Aqueduct Division of the US Army Corps of Engineers. To distribute water and support the distribution system, the agency

operates nearly 1,300 miles of pipes, five pumping stations, five reservoirs, four elevated water storage tanks, 36,000 valves and 8,700 hydrants.

Wastewater is collected by the DC sewer system and from the Maryland and Virginia suburbs and is delivered to the plant. The agency operates approximately 1,800 miles of sanitary and combined sewers, 22 flow-metering stations, nine off-site



wastewater pumping stations, and 16 stormwater pumping stations within the District of Columbia. Separate sanitary and stormwater sewers serve two-thirds of the city. In the older portion of the system, primarily in the downtown area, combined sewers are in service. Some 40 percent of Blue Plains biosolids can be attributed to Maryland's Washington Suburban Sanitary Commission.



Following is a process flow diagram of the solids-handling process:



The biosolids process at Blue Plains takes the solids – or sludge – from the primary sedimentation tanks to vats where gravity causes the dense sludge to settle to the bottom and thicken. Biological solids from the secondary and nitrification reactors are thickened separately using flotation thickeners. The thickened sludge is dewatered, lime is added to minimize pathogens, and the organic biosolids are land-applied or used in other ways.

The DC WASA biosolids management and reuse program improvements affect the entire 320 dry tons per day generated, and all enhancements are designed for implementation systemwide. Improvements to the lime mixing system have led to a reduction in lime use from 25 percent to 15 percent, for example, with a total savings of nearly \$1 million annually. The facility is designed to process 370 dry tons per day and is expected to reach that capacity in the next 10 years.

The biosolids quality meets Class B standards, but far surpasses the minimum requirements. At the end of the wastewater thickening and dewatering process, granular lime (CaO) is added to stabilize the solids, reduce pathogens, and produce biosolids. Since implementing improvements to the lime mixing system, the fecal coliform concentrations are now regularly below 1,000 cfu/g (Class A standard for fecals) (cfu = colony-forming units).

The stabilized biosolids are applied to agricultural land in more than 35 counties in Maryland and Virginia. DC WASA conducts a vigorous public outreach and education program to build and maintain support from the community. One focus is educating stakeholders about the difference between the settled solid residue from wastewater treatment (often called sludge) and solids that have been treated to reduce pathogens, organics, and odors, forming a reusable agricultural product (biosolids). The agency also conducts a leading-edge research program focusing on lime management, odor control, and beneficial reuse.

Plans are underway to construct egg-shaped digesters in lieu of lime-stabilization for stabilizing biosolids prior to end-use. Descriptions of existing and planned facilities and practices are provided in the *Solids Handling Facilities Plan for the Blue Plains Advanced Wastewater Treatment Plant* as well as brochures titled *Decision Science Workshop, Executive Summary,* and *DC WASA Biosolids Management Program.*



1.2 Accomplishments

In 1998, DC WASA adopted a 20-year master facilities plan and a 10-year, \$1.6 billion capital improvement plan. As part of these plans, in 2001 it launched an integrated, three-phase biosolids management program, or BMP, focusing on end-use options for biosolids, including odor control. We also are proud to participate in the voluntary NBP EMS program.

2004/2005 saw numerous improvements to biosolids management, attributed to the facility's biosolids management program, participation in the NBP EMS, continued support and resources provided by DC WASA management and staff, support by DC WASA contractors, and input from stakeholders. The box to right summarizes key improvements, which are discussed in the sections below.

Biosolids program improvements:

- A leading-edge research program
- Improved lime mixing process
- Diversification of reuse options
- Extensive outreach to interested parties
- Field inspector database and GIS tracking system
- Monthly biosolids cross-functional team (CFT) meetings
- Identifying, implementing, and tracking objectives and targets
- Training program
- Tracking legal and other requirements
- Continuing a nutrient rebate for research
- Public acceptance through inspector outreach
- Use of AWTP process data for predicting odors
- New or revised operations procedures
- Automated truck scales operation

1.3 Environmental Management System

DC WASA's biosolids EMS includes 17 individual management elements based on the guidelines established by the NBP (see table below). Each element contains a set of procedures, implemented to ensure a successful EMS. The procedures and other requirements of each element are developed and improved based on the existing biosolids program and on public participation sought throughout the year. DC WASA's biosolids division is responsible for implementing and maintaining the biosolids EMS. The EMS coordinator is responsible for managing the biosolids EMS.

Category	Element	Element Name
Policy	1 2	EMS Documentation Biosolids Management Policy
Planning	3 4 5 6	Critical Control Points Legal and Other Requirements Goals and Objectives for Continual Improvement Public Participation in Planning (some requirements addressed in Element 9)
Implementation	7 8 9 10 11 12	Roles and Responsibilities Training Communication: Internal (addresses some Element 12 requirements) External (includes some Element 6 requirements) Operational Control of Critical Control Points Emergency Preparedness and Response EMS Documentation, Document Control and Recordkeeping (some requirements addressed in Element 9)
Measurement and	13	Monitoring and Measurement
Corrective Action	14 15	Nonconformance: Preventive and Corrective Action (some requirements addressed in Element 16) Biosolids Management Program Report (documentation supporting the report addressed in Elements 6 and 12)
	16	Internal EMS Audit (some requirements addressed in Elements 6 and 14)
Management Review	17	Management Review of Performance

2. Product and Process Control

2.1 Policy

DC WASA has committed to the NBP *Code of Good Practice* as its biosolids policy as part of its EMS. This policy is promoted throughout the division and has helped operators be more aware of the importance of their jobs.

The policy emphasizes DC WASA's commitment to comply with the following:

- Legal and other requirements
- Prevention of pollution
- Promoting public acceptance
- Continual improvement

The biosolids division manager now gets reports from the centrifuge operations team, crane operators, truck drivers, field inspectors, and field operations crews whenever something seems out of the ordinary. If, for instance, there is a "fishy" odor, notice comes back to DC WASA so it can check on polymer dosing. The communication occurs so that odorous biosolids are not inadvertently placed in sensitive areas. Contractors realize that we take responsibility for the material and that we do not want them to place odorous material onto land in sensitive locations.

The text of this important policy is included in Appendix B.

2.2 Critical Control Points

DC WASA has identified the following value chain for its biosolids processes:



We established a procedure to identify and update critical control points (CCPs) affecting the entire biosolids value chain. Using a methodology that focuses on the end use of biosolids, we evaluate our unit process operations and management activities to identify and maintain an upto-date listing of CCPs. By monitoring key parameters related to the CCPs, we can better track our overall program on a routine basis and maintain relevant records. We also follow a procedure to review and update the list of CCPs and related operating procedures. These are included in the online EMS manual.

Several improvement projects have contributed to annual cost savings (lime mixing: \$1 million/yr., scale automation: \$200,000/yr). In addition, geographical and technological diversification efforts have kept land application of biosolids viable, and have allowed DC WASA to forgo implementing more-costly options at this time (drying, etc.). These are described in Section 6 on Environmental Outcomes.



A leading-edge research program has directed us to an understanding of how some biosolids processes have a dramatic effect on odor quality of the biosolids product. Details about some of this cutting-edge research are in Section 6 as well. Preliminary and final findings resulted in better product quality and fewer complaints. We now have a more consistent product for reuse from an odor and pathogen standpoint.

2.3 Objectives and Targets

The DC WASA Biosolids program begins with the end in mind.

Objectives and targets for the biosolids EMS and an associated action plan are established annually using a formal procedure corresponding to and in support of the overall Blue Plains AWTP budget development and approval process. They are key to our monitoring and measurement practices, as described in Section 2.5.

The DC WASA fiscal year runs from October 1 through September 30, but the EMS program runs on a calendar year. Progress toward EMS objectives and targets is monitored throughout the year on an informal basis and is formally reviewed as part of the internal audit / management review process.

The biosolids EMS goal-setting process is managed by the CFT under the direction of the biosolids EMS coordinator, who uses coordination meetings for input and review. Objectives must:

- > Be consistent with the program mission statement and policy
- Be linked to critical control points
- > Have input from employees and stakeholders, including the public
- Be measurable
- > Be achievable within a defined period of time

Following is a summary of our 2005 outcomes and objectives. We completed all the objectives associated with each outcome in almost every case and made progress in the remaining areas. A full report showing progress made in achieving outcomes, objectives, and targets for 2005 and objectives set for 2006 is included in Appendix C.

2005 Objectives and Targets

Outcome 1 – Regulatory Compliance

Objective 1.1 – Comply with all statutory and regulatory requirements (onsite and offsite operations).

Objective 1.2 – Comply with all local and state permitting and other requirements.

Outcome 2 – Quality Management

- Objective 2.1 Incorporate new technology and other improvements into operations.
- Objective 2.2 Provide and improve upon training.
- Objective 2.3 Improve inspections and audits.
- Objective 2.4 Improve oversight of contractors.

Outcome 3 – Relations with Interested Parties

Objective 3.1 – Foster open and effective communication among all program participants and interested parties.

Objective 3.2 – Engage in activities to keep abreast of and influence issues of public concern.

Outcome 4 – Biosolids Program Diversity

- Objective 4.1 Increase program reliability by using several management methods and contractor services
- Objective 4.2 Ensure long-term goals support program diversity.
- Objective 4.3 Promote and support biosolids-related research

Outcome 5 – Environmental Performance

Objective 5.1 – Reduce potential to pollute the environment.

2.4 Operational Control of Critical Control Points

Woven throughout this report are ways in which we maintain operational control of critical control points. CFT meetings provide a forum for reporting incidents and acting upon them. Our training program, frequent communication among division heads, and constant monitoring – both by computer and by personal inspection – keep systems functioning and allow for preventive measures. We also review and update standard procedures to ensure they are being followed and reflect reality. Following are key improvements in operational controls that resulted from these efforts.

Improved Lime Mixing

Lime mixing issues were discovered to be a root cause of odorous products, based on research. DC WASA improved quality control on lime deliveries, changed out mixers, and learned a great deal about the sensitivity of cake dryness to mixability. Infrared temperature sensors were added recently. These improvements resulted in more-consistent product quality, reduced odors, consistent fecal coliform results (< 1,000 mpn/g dry weight –



Class A standard for fecal coliforms; mpn = most probable number), and cost savings of nearly \$1 million annually. A photo of the new lime mixer is shown above right.

New Truck Scales Operation

Over the last four years, DC WASA put into place an automated scale system to track biosolids material and manage biosolids quantities and distribution. It will scan drivers' cards and requires inputs of material source, contractor, destination, etc. The data are used to evaluate process trends, map locations (using a GIS program), and police trucking activities. These scales paid for themselves in less than a year, in part by reducing costs through staff reductions. They also make trucking more efficient by



requiring only one stop at the plant and helping manage truck flow. In 2005, similar new scales were put in place under the newly built loading silos and were expected to be in operation in 2006 (photo above right).

Use of Process Data

To effectively predict when odorous biosolids will occur, we revised how we make use of treatment plant process data. This has resulted in ongoing proactive communication with contractors and avoiding nuisance situations.

2.5 Monitoring and Measurement

Through our monitoring and measurement process, potential problem areas are flagged and corrective and preventive actions are identified. DC WASA has in place all the standard monitoring and measurement requirements for a large advanced wastewater treatment plant. For example, we use both contracted and onsite laboratories to provide sample analyses to meet federal, state, and local permit and regulatory requirements In-house, we conduct more than 100,000 analyses a year.

DC WASA BIOSOLIDS ANNUAL REPORT - 2005



The chart on the right demonstrates the results of some of our 2005 monitoring, showing that DC WASA's effluent parameter levels have remained well below established limitations.

Our EMS goals and objectives (Appendix C), are key components of our monitoring and measurement systems, and are discussed above. Other routine monitoring and measurement activities include the following:

- Monitoring stabilization, quantities, and quality of biosolids, as specified in federal and state regulations.
- Maintaining routine activities including operations logs, inspection logs, and checklists designed to verify that procedures are followed, such as truck weigh scale tickets, Maryland Environmental Service (MES) inspection reports, and biosolids quality laboratory analytical reports.
- Reviewing and updating related monitoring, measurement, recordkeeping, permit, and other forms.
- ✓ Periodic management review of the entire program, in accordance with the EMS.

But this is only part of the picture. Below are other aspects of monitoring that showed significant results.

Daily and Monthly Meetings

Daily biosolids division team meetings are held to review past daily performance and expectations for the current day. Immediate problems are addressed and trends are tracked for review in the monthly CFT meetings. The standard agenda is in Appendix D.

These CFT meetings include review of incident reports, evaluation of GIS maps and other data, and reports from other divisions and stakeholders. Topics touch on almost every element of the EMS. The biosolids division invites other DC WASA

divisions, other biosolids producers, contractors, inspectors, silviculturists, and researchers, and also meets with them separately.

Reports generated from these meetings provide the foundation for continuous improvement of the EMS and have resulted in numerous proactive resolutions to problems.

For example, in FY 2004/2005, contractors agreed to work on better truck flow management at the scales, better training for truck drivers, and an updated communications flowchart for incident reporting. The dewatering division improved its system, reducing biosolids quantity and ensuring greater predictability in biosolids production. The liquid treatment division is working to improve grit and scum prevention and removal. And the IT department helped set up the automated scale system, installing the fiber optics, and making it possible for us to have a separate network for reliability.

CFT meeting minutes are sent to the General Manager in a monthly report and are available to DC WASA staff electronically and to stakeholders via e-mail from the biosolids division manager. This report includes regular information on production, quality, final destination, and program highlights. A recent report is included in Appendix E.

Parameter	EPA Permit Limit Mo/Avg (mg/L)	DC WASA Data 2005 Mo/Avg (<i>mg/L</i>)
Effluent Parameter		
Carbonaceous biochemical oxygen demand (CBOD)	5.00	2.87
Total suspended solids (TSS)	7.00	1.59
Total phosphorous (TP)	0.18	0.11
Total nitrogen	7.5 (goal)	5.29
Ammonia nitrogen (NH-3N)		0.87
Summer (May 1-Oct 31)	4.20	
Winter 1 (Nov 1-Feb 14)	11.10	
Winter 2 (Feb 15-Apr 30)	12.80	
Dissolved oxygen (DO) minimum daily	5.00	7.8
Dissolved oxygen (DO) minimum instantaneous	4.00	6.9
Total chlorine residual	0.02	0
pH (minimum)	6.0	6.3
pH (maximum)	8.5	7.1
Fecal coliform (#/100 ml)	200.0	9.51
Biosolids Parameter		
Fecal coliform (#/g – Class B)	2 million	<1,000
As (ppm)	41	1.97
Cd (ppm)	29	0.64
Cr (ppm)	No limit	26
Cu (ppm)	1,500	144
Pb (ppm)	300	29
Hg (ppm)	17	0.47
Mo (ppm)	No limit	10
NI (ppm)	420	10
Se (ppm)	2 800	1.55
zn (ppn)	∠,000	311



PCH (Process Control Historian)

This database houses all operational data and is used by the biosolids division management staff to predict and prevent odorous biosolids production.

GIS Tracking System Improvements

A system to track biosolids material distribution now generates maps to help track trends. This report helps us set objectives and targets, investigate complaints, map application sites, and report quantities to local jurisdictions. A The DC WASA plant intranet houses all standard procedures, transfers information, and keeps records. An area control center operator (top) is linked to the process control system in the central control room (rendering below), for redundant and automated monitoring.





recent map is included in Appendix E. This system also results in better truck and hauling management, resulting in fewer truck trips, saving energy, and reducing nuisances from dust and traffic.

Inspections

Inspectors are employed by DC WASA, and an independent inspection team from a nonprofit Maryland agency is used to monitor land application activities. Daily, each site receiving biosolids is visited by one of nine assigned inspectors who inspect the application of the biosolids to ensure compliance with buffers, application rates, and minimum pH. The inspectors serve as a link to the local community as well, reaching out to local politicians, neighbors, boards of health, and state regulators. The inspectors also gather odor data, which helps define the quality of the biosolids as well as helps us feed our database for research. Because the inspection team is employed by a nonprofit state agency, inspectors are obligated to be impartial and to help improve the WASA biosolids management program.

Reuse Options Review

Over the last five years, ongoing review of reuse options has resulted in biosolids reuse program diversification, changing from complete reliance on agricultural land application, incineration, and landfills to biosolids use in agriculture, silviculture, reclamation, and a poplar tree plantation on an abandoned gravel mine. Section 6 details these outcomes.

This review also resulted in a decision not to pelletize the biosolids using a drying process because it would cost some \$35 million a year, double our biosolids division's current \$17 million operating budget, including contractual services and research. Pelletizing would not require much public outreach, but would have increased rates. The entire operating budget for Blue Plains is \$60 million, so this was a significant issue.



Influent Monitoring

As required for any facility with an EPA-approved land application program, DC WASA has a robust industrial waste pre-treatment program. The program requires DC WASA to write permits for each discharger, conduct regular and unscheduled inspections, and sample for compliance. EPA gives DC WASA the authority to cap the sewers of a facility that is in violation of its discharge permit. As a consequence, the dischargers take the permit requirements quite seriously, because capping the sewers essentially shuts down a facility with any industrial discharge.

2.6 EMS Documentation and Document Control

Key documents, including procedures, are kept electronically or in a special file cabinet. New versions are authorized and controlled using revision dates and titles. A list of controlled documents is maintained electronically and updated by biosolids division staff.



3. Compliance and Preparedness

3.1 Legal and Other Requirements

Over the last year, the biosolids division has improved tracking of legal and other requirements and instituted a more proactive approach to informing elected officials about the benefits of biosolids reuse. For several years, DC WASA has retained Maryland Environmental Services (MES) to track evolving regulatory issues and opportunities for engaging with public officials. Nearly weekly contact with MES partners has resulted in cooperation from local officials, coordination with local health departments, and a higher level of confidence in view of the high level of attention paid by DC WASA to local concerns.

In addition, the EMS requires land appliers to keep track of local ordinances and make them available to the facility, which they have done.

DC WASA files all required regulatory reports on time and has had no permit violations for more than five years.

The inspection and sampling plan for industrial dischargers results in a biosolids product that is very low in pollutant concentrations. The influent to the plant is largely residential, with little industrial component. The analysis for metals, performed twice each month for Blue Plains biosolids, shows that metals levels are nearly an order of magnitude below regulatory limits in 40 CFR Part 503, Criteria for the Use and Disposal of Sewage Sludge (Part 503 regulation). We share these results in a monthly report to interested parties.

Below is a graph included in monthly reports comparing DC WASA metals levels with EPA limits, national averages, and proposed future EU limits. DC WASA is below all of these limits for all metals.



DC WASA's biosolids quality meets Class B standards, but far surpasses the minimum requirements. As note above, since implementing improvements to the lime mixing system, the fecal coliforms are now regularly below 1,000 mpn/g (Class A standard for fecals). See graph below.



Fecal Coliform Levels – DC WASA Mixer Output

3.2 Emergency Preparedness and Response

The Blue Plains *Stormwater Pollution Prevention Plan* (May 2000) includes response plans for spills of biosolids and materials other than biosolids, such as lime and polymer. The Blue Plains *Emergency Response Plan* addresses emergency responses to weather-related situations such as earthquakes, floods, and tornadoes. Prepared in 1995 and revised in 2003, it began another round of revisions in 2005.

In 2005, we began mapping the stormwater system to better control and manage it and convert it to GIS mapping. Most of the biosolids are managed in a containment area and are recycled back into the biosolids process flow

3.3 Training

The training program has been revised for operational staff to ensure they are aware of their roles in the EMS and to keep them up to date on procedures for certain equipment and processes, such as the new truck scales and lime operation. Training helped staff understand their roles in the larger community and has helped foster pride, ownership, and greater productivity. Training programs for inspectors and support for training by haulers have helped reduce incidents and made field data more consistent and useful.

As part of the process of identifying critical control points, a training matrix was developed and training modules were developed or modified to fill identified needs. The EMS requires that training records be retained.



All staff are now trained regarding their roles in the EMS, on equipment operations and related procedures when they are new, and for new equipment. In addition, presentations are given to upper management, including the board of directors, on the biosolids management program, its status and future requirements, and their roles in its success. Employees now all have a better understanding of the importance of their positions as they pertain to the quality of the biosolids and the impact on the receiving communities (odors).

All inspectors are trained in the use of field olfactometers (Nasal Rangers). Inspectors' noses are

calibrated, and the data they collect are used in odor modeling being performed by interns and graduate students. Inspectors also conduct training sessions for themselves and for local biosolids monitors. Resulting benefits include a database of more defensible odor data for the research projects, and a better awareness on the part of the inspectors of the importance of these data and of reporting issues to DC WASA. These olfactometers now provide consistent data about biosolids and field conditions. Combined with inspector training and oversight, several incidents a year are avoided when substandard biosolids loads are returned rather than land-applied.

Nasal Rangers, or olfactometers, like the one being used here by MES Inspector Forbes, provides objective data for measuring odor levels in the field.



Land application contractors also provide training to their staff related to our EMS, and include truck drivers. The contract employees now have a better understanding of the importance of reporting unusual circumstances, and there is a line of communication to DC WASA to do so.

While presentations to elected officials may not constitute training in the normal sense, by doing this, officials are in fact trained to understand the need for and benefits of biosolids recycling. For example, inspectors met with local officials in Northumberland County, leading to a good understanding of our commitment to doing things right. They established lines of communication, and soon after an incident originally attributed to biosolids, inspectors investigated and reported the facts to the officials, exonerating the biosolids and thereby avoiding a controversial situation.



4. Stakeholder Acceptance

4.1 Public Participation in Planning

The key to success of any biosolids program is public acceptance of biosolids end-use. Extensive outreach to interested parties through a monthly report (available via e-mail) includes contact with inspectors, survey forms, and meetings via telephone and in person. This outreach has resulted in increased public and regulator confidence and cooperative working relationships with several key members of the Virginia biosolids opposition.

We knew that if we did not maintain public acceptance of biosolids for use in land application and other activities, our costs could increase dramatically and the financial risks associated with biosolids could rise. Public acceptance would require ensuring that the quality of biosolids remained safe and consistent – thus also reducing any associated environmental risks.

In addition to distributing information about the biosolids program to the public, procedures are used continually to react and respond to questions, inquiries, and comments from outside parties, and to use information gained from the public in establishing plans for continual improvement. The EMS manual describes in detail how public input is included in biosolids management. CFT meetings are a key forum for this activity.

Proactive Outreach

DC WASA has a vigorous program to build and maintain support proactively, not just when there is a problem. Our approach is informational, educational, honest, responsive, and linked with goals and objectives as a means of gaining input to and building support for achieving those targets. Education and outreach methods are tailored to the intended audience. Experience has shown that stakeholders are more likely to support the program if they are aware of its features and successes.

The means by which this is accomplished are extensive and include brochures and fact sheets; a formal procedure for responding to customer queries and concerns; a biosolids monitoring program that tracks trends, available to the public; meetings directly with farmer and citizen groups; biosolids signs at land-application sites; display booths at conferences, fairs, and other venues; presentations to conferences, workgroups, fairs, etc., with productive Q&A sessions afterward; research products disseminated to interested parties; E-mail communications from biosolids manager to public health officials in counties where material is land-applied and to stakeholders; active membership among EMS managers and staff in professional organizations; discussion with local and federal regulatory authorities; personal meetings with stakeholders when they have concerns; and our website.

Among risks associated with biosolids is reduction in end-use options. Therefore, we aggressively pursue both research for better management and acceptance, and end-use diversity. These are highlighted in the Section 6 on Environmental Outcomes.

Stakeholders

Many of the biosolids division's stakeholders are actively and continuously involved in the biosolids management program, and some are involved periodically. Among their key areas of



involvement are in setting objectives and targets. Any input received throughout the year is reviewed during this process. Stakeholders include the following:

- > People who live and work near the plan
- People who live and work near sites where Blue Plains AWTP biosolids are used or otherwise managed, and along transportation routes
- Local government officials and those of neighboring jurisdictions where Blue Plains biosolids are taken
- Partner agencies with functions related to health, environment, and public safety
- Recipients and consumers of beneficial reuse of biosolids products (such as farmers, silviculture businesses, gardeners, and landscape groups)
- Local and regional community organizations, including environmental groups and civic organizations

- Federal and state officials, including regulators and enforcement officials
- Elected officials
- Field inspectors
- > Ratepayers
- > WASA customers
- Contractors, including MES and land application organizations
- Other wastewater treatment agencies
- ➤ WASA Board of Directors
- ➤ WASA employees
- Professional association members
- University researchers

We also work closely with other wastewater service providers. The Washington Suburban Sanitary Commission contributes 40 percent of the biosolids to output, and representatives attend several meetings a month at WASA and join us in industry meetings. The agencies coordinate on training, inspections, public outreach, and regulatory issues. DC WASA's involvement with the NBP puts it in communication with wastewater agencies across the country, with whom it shares experiences and from whom it gets implementable advice.

Challenges

DC WASA has permits to land-apply biosolids in 39 counties in two states. A typical month consists of land-applying biosolids in 10 to 20 different counties (see map below), making interaction with interested parties a challenge. Each county has a different political mindset, different local officials, different regulatory oversight, and different biosolids coordinators. To better communicate goals, program highlights, and product quality information, we send a copy of the General Manager's report to regulators, state and county officials, contractors, inspectors, and concerned citizens (Appendix E). Below is an example of the land application data we provide monthly.



In addition, we have provided information and training to local concerned politicians and citizens through meetings and training sessions. Our comprehensive inspection program has been instrumental in reducing tension and allaying concerns among citizens. The biosolids division has recorded dozens of cases of inspectors dispelling fears and myths through dissemination of factual information and quick response to queries.

What we have come to call the "cow incident" serves to illustrate the benefit of this pro-active public outreach program.

In summer of 2004 a lead inspector met with the Virginia county supervisor to discuss biosolids recycling and to provide a list of numbers for him to call in case of inquiries and emergencies. Soon afterwards, a storm blew a tree onto a cow and killed it. The tree was on a farm neighboring a biosolids application site and also downed the fence between the two properties. Cows wandered onto the application site through the break. By the time the County Supervisor caught wind of this, the story had become one of cows wandering onto a field filled with biosolids and dying. He immediately called the inspector, who went to investigate and responded with the truth of the matter to the supervisor within two hours. A major public relations crisis was averted. This succeeded simply because we had made ourselves available for problems and questions, and had established a relationship with a local official.

Technical obstacles such as lime mixing problems, truck scale problems, and odor problems, were overcome as well. For example, research on lime mixing, described in Section 6, resulted in discoveries of methods to improve the lime mixing, which, once implemented, led to a much more consistent product (reduced odors and fecal coliform destruction meeting Class A standards). Changes to truck scales resulted in greater efficiency, energy savings, cost savings, and better internal communication.



4.2 Internal and External Communication

The biosolids division has a robust and proactive communication program.

Among the ways we disseminate information to our internal stakeholders, thus promoting buyin for our management program and feedback for decisionmaking, are the following (besides those described in other sections):

Newsletters and posters – DC WASA Focus is an employee newsletter that publishes articles on biosolids projects, among other things. A monthly report to interested parties contains information on production, quality, final destination, and program highlights. We also have posters with our vision and mission throughout the facility (see photo to right).



Meetings – As noted earlier,

daily morning operational meetings are used to discuss process maintenance, optimization, and construction projects. Monthly CFT meetings discuss issues, incidents, and goals. And activities for the month are included in the General Manager's report.

A recent example where our approach resulted in immediate and positive outcomes for biosolids acceptance concerned a citizen who alerted us to perceived "drag-out" on local highways from fields. Inspectors from the county, state, and MES determined (independently) that the small amount of debris was caused by mud (not biosolids) sticking to the wheels of the trucks from the field road, which had been sprayed in an effort to minimized dust. The antidust agent made the soil sticky. In an effort to accommodate the individual, the contractor agreed to remove the small amount of debris with a street sweeper, and even had field crews out with shovels and brooms prior to its arrival. The state regulations require "minimization" of biosolids drag-out, and the contractor far surpassed this (because it was determined that the material was not biosolids).

Overtures to several other prominent leaders in Virginia opposed to biosolids have led to a better understanding and a decent working relationship with people to whom we previously did not communicate.

4.3 Biosolids Management Program Report

This Annual Report constitutes the periodic program report, fulfilling commitments in our EMS. It will be available on our website for interested parties to review.



5. Improvement

5.1 Nonconformances: Preventive and Corrective Action

In addition to the preventive and corrective actions identified throughout this report, we commonly use incident reporting to track problems and prevent negative incidents. These forms are filled out by inspectors, are used by staff and managers, and are available online. An example is in Appendix F. They are maintained by the biosolids division manager and can be reviewed by any interested party who requests them. Incidents reported also include many of the positive activities and events that have occurred over the year.

We also have implemented new or revised operations procedures that allow us to be more efficient and effective by having and using reference documents for incidents and training. The process of updating procedures helped foster a cultural change in the biosolids division. After it was determined that some procedures were not being followed or did not exist, procedures were created by employees and training ensued in many cases.

New lab procedures, for example, now provide consistent, high-quality, and ongoing data. We also are able to communicate potential problems to contractors and inspectors prior to sending biosolids to a field. Our online EMS manual contains a complete list of documents and procedures related to the biosolids program.

5.2 Internal EMS Audit

The DC WASA's biosolids program was certified to the NBP's Biosolids EMS in November 2004. A summary of the auditor's report is in Appendix G. The initial certification required us to conduct an interim audit within one year. We requested, along with other agencies, an extension to allow NBP the opportunity to address questions and concerns raised by the participating agencies. DC WASA was given an extension to March 2006, but there remained some unresolved issues.

After meeting with NBP in February 2006 to discuss solutions, we and others requested another extension. NBP representatives stated that interim audits must be completed before the two-year anniversary of certification, so we are working on an internal audit in preparation for the third-party interim audit in the summer of 2006. The third-party independent auditor certified that the internal audit process adhered to the NBP guidelines.

5.3 Management Review

As noted above, management involvement occurs through reports to the General Manager, also distributed to the DC WASA board of directors. The report contains production and recycling data (tons/contractor and average tons/day) for the previous month, metals data, biosolids program highlights, and a biosolids destination map showing tons per county and agricultural dollars per county represented by the value of the biosolids sent there. (See Appendix E and Section 6.)

Internal reviews are conducted in accordance with EMS procedures and internal review policies. These reviews include annual reports, procedures, progress toward objectives and targets, and EMS compliance audits.

6. Environmental Outcomes

The whole point of an EMS – and of our entire operation – is to ensure that our work produces positive and beneficial environmental outcomes for our extended community. Removing wastewater by itself is critical to the survival of any community, but processing it so it actually contributes to the welfare of the earth is even more desirable.

Below are several ways over the last year that we have put our environmental stewardship into action.

6.1 Sustainability

Our EMS requires us to continually improve the biosolids management system by implementing a "Plan-Do-Check-Act" model of management. The third-party certification we received from KEMA in September 2004 followed a rigorous process by which we proved that our management system and operations were systemic and sustainable.

To begin the EMS process, we enhanced our monthly biosolids meetings to create a CFT

involving staff from various divisions, contractors, and inspectors. Here, information is communicated; incidents are tracked; potential root causes are determined; goals and objectives for the biosolids program are established; and action items are assigned and followed. Reports generated from these meetings provide the foundation for continuous improvement of the EMS.

Our involvement in the NBP EMS program has helped change the DC WASA biosolids program from very reactive to a largely proactive through examination of critical control points, investigation of root causes, and implementation of findings for improvement.

The most telling evidence of our operational sustainability

is the fact that our biosolids program has continued to meet or surpass all permit and other regulatory requirements for the past five years. During the EMS implementation, our stabilization has improved to the point that it meets Class A standards for fecal coliform reduction.

6.2 End-Use Options

Following are the end-use options now in effect (and percent going to each option):

- > Agriculture (76%) 39 counties in two states
- Silviculture (15%) 30,000 acres permitted in eight Virginia counties









- Poplar plantation on gravel mine (3%)
- Reclamation projects (6%) three sites to date, and a 400-acre site in West Virginia pending permit

By contrast, in 1999, biosolids that did not go to farmland were incinerated or landfilled.

Below are some unique programs that address the key EMS requirements for public acceptance and good environmental outcomes.

Hauling and Land Application

Full-service contractors for hauling and land application obtain permits, apply material, and keep records of reuse. DC WASA reviews the contracts when they are up for renewal to ensure they are updated to include new EMS and other requirements. WSSC, a regional partner, procures separately for its share of biosolids. WSSC's operations staff work closely with DC WASA on these contracts. In addition, DC WASA uses an inspection service to visit each site daily and the service oversees contractor operations, as noted above.

Mine Reclamation via Silviculture

This is a promising long-term reuse option. DC WASA is working with ERCO, Inc., a Maryland firm that uses deep-row placement of biosolids to transform abandoned mines and other sterile land into lush stands of hybrid poplar trees that provide new wildlife habitat and wood resources, and return organic matter and nitrogen to formerly sterile soils. A brochure about this program, which DC WASA is working with ERCO to expand, is attached.

Airport Land Reclamation

This program proved highly successful in transforming 500 acres of highly acidic soil into a vegetation-filled oasis for the \$36 million Stafford Regional Airport. When the airport was constructed in 2001 to service the Washington, DC metro area, developers discovered it was impossible to grow any kind of vegetation. Local streams were in danger of acid runoff, and erosion was severe. The entire airport area was treated

in 2002 with lime-stabilized biosolids (80 to >150 mg/ha), straw mulch, and acid-tolerant grasses. Revegetation was successful and two years later the land is covered in grass. DC WASA continues to work with the airport staff to monitor continued soil improvement.



Tree-farming, or silviculture, provides an efficient and cost-effective way to reuse biosolids, capture energy from reusable resources, and provides beneficial nutrients to otherwise barren land. The top two pictures show DC WASA biosolids used to reclaim a gravel mine with planted hybrid poplar trees (top two photos). An airport in Stafford County, VA, remediated 300+ acres of acidic soil with biosolids (bottom).



6.3 Conservation

Our biosolids program is entirely focused on recycling organic matter – biosolids – in a safe and useful way. Almost 100 percent of our biosolids are beneficially reused through land application, silviculture, mine reclamation, or other projects. Very little goes to a landfill each year.

Our leading-edge internal research and continual support of external research activities is geared toward better nutrient management and odor control. The EMS has shown that dewatering is a critical control point, and upgrades in that area have dramatically reduced biosolids quantity.

Energy conservation is in the works via our facilities improvement plan. We expect to produce enough methane gas through our new anaerobic digester biogas program to provide as much as 75 percent of the plant's power needs. In addition, total biosolids volume is expected to be reduced by 50 percent. This program is in the design phase.

Other energy conservation derives mainly from better truck and hauling management, resulting in fewer truck trips and less idling time. This also results in less dust and traffic associated with biosolids hauling.

Greenhouse Gas Reduction

Research conducted in Washington state by the University of Washington (Sally Brown) for King County (Seattle) has shown that a biosolids recycling program can have a net positive effect on greenhouse gas emissions. This is accomplished by avoiding landfilling (releases greenhouse gas through decomposition), avoiding inorganic fertilizer use (requires energy/fossil fuels for production), and carbon sequestration in the soils.

DC WASA will track annually the greenhouse gas reductions resulting from the biosolids recycling program. The graph below shows the net benefit from land-applying the Blue Plains biosolids over the past 10 years. A second graph shows the potential negative impact from having landfilled the biosolids for the previous 10-year period.



Greenhouse Gas Balance for Biosolids Recycling





Fertilizer Saved

The three graphs below show the following

- 1) Total tons of biosolids applied in Virginia counties in 2005.
- 2) Total amount of dollars saved in nitrogen and lime provided by biosolids to farmers that they otherwise would have had to purchase in organic fertilizers, by county
- 3) Total tons of biosolids applied and dollar amount equivalent in fertilizer provided, in an ascending scale.



Total tons of biosolids applied in Virginia counties in 2005:



DC WASA BIOSOLIDS ANNUAL REPORT - 2005



Total dollars saved in nitrogen and lime provided by biosolids to farmers that they otherwise would have had to purchase in organic fertilizers, by county:





Total tons of biosolids applied and dollar amount equivalent in fertilizer provided, in an ascending scale:



W C



6.4 Leading-Edge Research

DC WASA is a leader in conducting biosolids-related research and is renowned worldwide for research on odor control. These research products are disseminated internally and to interested parties and are points of ongoing discussion and improvement.

Research is conducted with the Virginia Polytechnic Institute and State University (Virginia Tech), the University of Maryland, Bucknell University, Howard University, and the US Department of Agriculture on a variety of issues, including lime mixing, phosphorus availability, metals availability, mine reclamation, forestry issues, and odor prediction. The odor prediction research has allowed DC WASA to become proactive with respect to odors, keeping more-odorous materials on more remote sites.

Following are brief descriptions of recent research programs on odors, phosphorus, metals, plant growth hormones, fecal regrowth, and lime mixing funded by the nutrient rebate program and Blue Plains users.

Nutrient Rebates

Nutrient rebates are returned to DC WASA from contractors based on reuse contracts. This rebate, in the sum of \$1/wet ton, adds nearly \$250,000 annually. The contractors are obligated to rebate this amount, and DC WASA is contractually obligated to spend this rebate on research.

Odor Research

Building on previous work at Blue Plains, researchers wish to understand the potential sources of odors in lime-stabilized and anaerobically digested biosolids, the mechanisms for creation and destruction of odor-causing compounds, and the critical control points at which these processes could be impacted by management options. The researchers are measuring the impact of polymers and other dewatering agents on odor formation. They also are evaluating the effect of product characteristics, storage, reducing conditions, and temperature on odor formation, and are examining the potential for post-digestion processes such as intermittent and continuous post-aeration to improve odor characteristics.

Finally, researchers are developing a statistical model to use treatment process parameters to predict the odor characteristics of the biosolids product, allowing for proactive planning to minimize complaints.

Bad odors at biosolids application sites are thought to be the major cause of public – and ultimately political – opposition to the practice. They may also result in immediate increased costs if biosolids are diverted to a landfill to avoid exposure to the public. By trying to identify the causes of odors in the current solids handling process at Blue Plains, this project has already led to management recommendations to improve the odor characteristics of the biosolids being produced and may lead to further recommendations.

The research also may result in the development of a test or set of plant parameters that can indicate the potential for particular loads to cause problems in the field or during storage, allowing appropriate management action. By studying the cause of odors in digested biosolids, the project will help shape the design of the digestion process that Blue Plains intends to install during the next decade.

Research included the following:



- Characterization of Wastewater and Solids Odors Using Solids Phase Microextraction at a Large Wastewater Treatment Plant
- > Examination of Mechanisms for Odor Compound Generation During Lime Stabilization
- > Mechanisms for Odor Generation During Lime Stabilization and Digestion
- > Pre- and Post-Digestion Process Optimization for Odor Minimization
- > Dewatering Process Optimization to Minimize Odors
- Mechanisms for Generation and Control of Trimethylamine and Dimethyldisulfide from Lime-Stabilized Biosolids
- > Odor Mitigation from Lime-Stabilized Biosolids
- Characterization and Control of Reduced Sulfur Odors from Lime-Stabilized and Digested Biosolids
- > Evaluation of Odor Characteristics of Heat Dried Pellets
- > Evaluation of Inorganic Chemical Preconditioners for High Solids Centrifuge Dewatering

Generally, the process of discovery has led to a base of knowledge that indicates there are many things we can do during the treatment process that have a dramatic affect on the odor characteristics of the biosolids product. With this knowledge, we can, in a perfect world, prevent odorous biosolids production, and in a less-than-perfect world, predict the production and plan for it (remote sites). This is a paradigm shift for our industry.

Phosphorus Research

Researchers conducted surveys of wastewater treatment plants, laboratory and greenhouse trials, and field tests designed to develop phosphorus (P)-based nutrient management recommendations specifically for biosolids. The recommendations will be used to update the phosphorus site index being developed by agronomists and regulators in the mid-Atlantic region. The researchers also are developing a readily available lab method for quickly analyzing the phosphorus availability of particular biosolids.

Results showed that biosolids produced with biological nutrient removal process (BNR) caused the highest increases in extractable soil P. Alternatively, biosolids produced with iron only consistently had the lowest extractable P and caused the lowest increases in extractable soil P and runoff DRP when added to soils. Differences in soil and biosolids extractable P as well as P runoff were related to the inorganic P forms of the biosolids.

Metals Research

The researchers are studying soil and plant uptake amounts of heavy metals from a high cumulative loading biosolids application site, one that has experienced swings in soil pH levels since biosolids were originally applied. This project is designed to address the so-called "time bomb" hypothesis, which theorizes that heavy metals originally bound in the soil matrix become mobile as soil organic matter and pH decline.

Preliminary findings indicate that yields for grain (corn) and root (radishes) crops did not decrease with high metals loading. Also, uptake of metals either were not increased with heavy biosolids loading or increased slightly, but peaked well below the known toxic concentrations. No signs of toxicity or deficiency were shown in this year's crops of radishes or corn. In fact, radish root and shoot growth increased with zinc and copper loading. Lettuce yields increased with biosolids loading, and no toxicity or deficiencies were observed.

DC WASA's vision is to establish a self-sustaining, world-class regional biosolids management program that will carry the facility through the demands of this century.

The mission of the District of Columbia Water and Sewer Authority biosolids management program is to provide reliable, diversified, flexible, sustainable, environmentally sound, publicly acceptable, and cost-effective management of biosolids produced by the Blue Plains Advanced Wastewater Treatment Plant while helping preserve agriculture and protect the Chesapeake Bay.

District of Columbia Water and Sewer Authority

Serving the Public Protecting the Environment

> 5000 Overlook Avenue SW Washington, DC 20032 202-787-2000

e-mail: info@dcwasa.com www.dcwasa.com

> Glenn S. Gerstell Chairman of the Board

> Jerry N. Johnson General Manager



Appendix A

US Environmental Protection Agency 2005 National First Place Clean Water Act Recognition Award – Certificate

Environmental Protection Agency United States

Clean Water Act Recognition Award for Exemplary Biosolids Management National First Place Large Operating Projects

Presented to

DCWASA Biosolids Management Program Washington, D.C.



OCTOBER 31, 2005



Appendix B

DC WASA Biosolids Program Vision, Mission, and Policy

National Biosolids Partnership Code of Good Practice

Vision

DC WASA's vision is to establish a self-sustaining, world-class regional biosolids management program that will carry the facility through the demands of this century.

Mission

The mission of the District of Columbia Water and Sewer Authority biosolids management program is to provide reliable, diversified, flexible, sustainable, environmentally sound, publicly acceptable, and cost-effective management of biosolids produced by the Blue Plains Advanced Wastewater Treatment Plant while helping preserve agriculture and protect the Chesapeake Bay.

Policy

DC WASA has committed to the NBP Code of Good Practice as its biosolids policy.

The National Biosolids Partnership's *Code of Good Practice* 10 Principles of Good Conduct

The *Code of Good Practice* (the Code) is a broad framework of goals and commitments to guide the production, management, transportation, storage, and use or disposal of biosolids — in short, a comprehensive environmental management system (EMS) for biosolids. Those who embrace the Code and participate in the EMS commit to "do the right thing." Specifically, Code subscribers and EMS participants pledge to uphold the following principles of conduct:

1. Compliance: To commit to compliance with all applicable federal, state, and local requirements regarding production at the wastewater treatment facility, and management, transportation, storage, and use or disposal of biosolids away from the facility

2. Product: To provide biosolids that meet the applicable standards for their intended use or disposal

3. Environmental Management System: To develop an environmental management system for biosolids that includes a method of independent third-party verification to ensure effective ongoing biosolids operations

4. Quality Monitoring: To enhance the monitoring of biosolids production and management practices

5. Quality Practices: To require good housekeeping practices for biosolids production, processing, transport, and storage, and during use or disposal operations

6. Contingency and Emergency Response Plans: To develop response plans for unanticipated events such as inclement weather, spills, and equipment malfunctions

7. Sustainable Management Practices and Operations: To enhance the environment by committing to sustainable, environmentally acceptable biosolids management practices and operations through an environmental management system

8. Preventive Maintenance: To prepare and implement a plan for preventive maintenance of equipment used to manage biosolids and wastewater solids

9. Continual Improvement: To seek continual improvement in all aspects of biosolids management

10. Communications: To provide methods of effective communication with gatekeepers, stakeholders, and interested citizens regarding the key elements of each environmental management system, including information relative to system performance



Appendix C

DC WASA Biosolids Program Objectives and Targets

2005 Outcome Report And 2006 Action Plan



District of Columbia Water and Sewer Authority Biosolids Management Program 2005 Objectives and Targets -- Outcome Report

Version Date: 12/20/2005_v3 Approved

Approved: Chris Peot, Biosolids Division Manager

Out Object come ve	ti	Action Plan	Targets	Metrics	Location	Targeted Due Date	Responsible Party	Progress & Outcome
1 Regu 1 1	Latory Co Compl	ompliance y with all statutory and regulatory requirements						
1.1	(onsite	and offsite operations).						
	1.1.1	Achieve zero notices of permit violations related to management of biosolids.	N/A	Number of permit violations	BIO 01 file cabinet	Ongoing	All program staff and contractors	Achieved.
	1.1.2	Submit annual Part 503 regulation compliance report on time.	N/A	Report submitted	BIO 01 file cabinet	February each year	Biosolids process engineer	Achieved.
	1.1.3	Prepare and file on time annual and monthly reports that are required by states in which Blue Plains biosolids are managed.	Monthly and annual generator's report from MES	Reports submitted	BIO 01 file cabinet	Annual and monthly	Biosolids process engineer	Achieved.
	1.1.4	Keep up with and record regulatory and legislative requirements and changes.	Address in monthly CFT meetings	COG legislative summaries; VAMWA, BUAC reports	CFT minutes	Monthly and periodic	Biosolids program manager, COG	Achieved.
1.2	Compl require	y with all local and state permitting and other ements.						
	1.2.1	Maintain monthly contacts with state regulators in Virginia and Maryland to stay abreast of permitting changes, new policies, and problem areas.	Develop and implement procedure to get MES information with Chris; perhaps via a list with database submittals	Records of contacts	Biosolids Division I-Drive	Ongoing	MES field supervisors	Achieved. MES continues to maintain close contact with VDH and most local monitors in Virginia.
2 Quali	ty Manag	gement						
2.1	Incorp operat	orate new technology and other improvements into ions.						
	2.1.1	Full digestion, per the Solids Handling Facility Plan.	Facilities plan is up to date activities are on schedule	; Same as targets; full digestion implemented		2011	Department of Engineering and Technical Services	Design phase completed. First construction phase let for bids.
	2.1.2	Implement on-line access of inspection database.	Install full version of ARC GIS software	Software in place; functioning; in use			MES Project Manager/MES GIS Specialist	Ongoing. ArcPublisher maps based on inspection database being distributed monthly to CFT members. Started with May 2005's data.
	2.1.3	Reconcile tonnage and distribution databases so there are zero discrepancies in monthly reports.	Establish procedures for contractor, scale, and MES database management	Procedures in place; records reconciled				Progress ongoing. Data for a few months in 2005 reconciled, but discrepancies yet to be reconciled.
	2.1.4	Deploy revised inspection database in the field to reduce data entry errors by 50%.				31-Jul-05	MES project manager	Database errors reduced somewhat, but not by 50%.
2.2	Provid	e and improve upon training.						
	2.2.1	Implement a training tracking system.	Identify responsible party; establish procedure	Tracking system in place				Not achieved. Set as 2006 objective.
	2.2.2	Provide annual EMS training to new and existing staff members.	Identify training modules; develop modules	Training records		Annual and as needed on an ongoing basis	Biosolids program manager	Ongoing.
	2.2.3	Provide opportunities for and achieve 100% attendance of WASA biosolids staff in educational programs, such as seminars or conferences.	Provide at least one educational opportunity for each staff member each year; provide incentives to staff to attend programs	Training records r		Annual	All program staff; to be coordinated by biosolids program manager	Ongoing.

Out come	Objecti ve		Action Plan	Targets	Metrics	Location	Targeted Due Date	Responsible Party	Progress & Outcome
		2.2.4	Provide at least three in-house training sessions for field inspectors on topics such as 503 Rule, incident reporting, EMS procedures, etc.	Same as objective	Numbers of courses provided; numbers of attendees		Apr-06	MES Headquarters Staff/ MES Field Supervisors	Two thirds of goal met. Inspectors took two relevant in- house courses in 2005; pH workshop January 20, a class on measuring slope/clinometer use/
		2.2.5	Provide at least two external training opportunities for each field inspector on topics such as nutrient management, biosolids management, business writing, etc.	Same as objective	Numbers of courses provided; numbers of attendees		Apr-06	MES Field Supervisors /MES Headquarters Staff	Achieved All inspectors took three VDH sponsored courses with local monitors on the following topics:1) sampling class; 2) odors and pH; 3) changes to VDH regulations
		2.2.6	Provide training to field inspectors on olfactometers to ensure continued proper use and to assist with assessing their effectiveness.	Yearly training offered; types and numbers of promotion efforts to attract attendees	Numbers of training courses; numbers of inspectors attending		31-Jul-05	MES Project Manager/MES Headquarters Staff	Achieved. No new olfactometer training has been required. Odor monitoring standard procedure put in place in April 2005.
		2.2.7	Make WASA/MES inspector training activities available to local monitors.	Types and numbers of promotion efforts to attract attendees	Numbers of training courses; numbers of local monitors attending		Ongoing	MES Project Manager/MES Headquarters Staff	One offered; XXX attended.
	2.3	Improv	e inspections and audits.						
		2.3.1	Conduct a minimum of six field visits each year by biosolids program staff to ensure proper procedures are being used in the field by contractors.		Field visit reports given at CFT meetings; GM reports		Annual	All program staff; to be coordinated by biosolids program manager	Achieved
		2.3.2	On the day biosolids have been applied, inspect the field application site.		MES inspection reports		Ongoing – current contracting period of five years	Biosolids division manager/EMS coordinator	Ongoing and achieved. Now a standard procedure.
		2.3.3	Conduct interim audit of the EMS program.	Develop audit team and protocol; monitor EMS; prepare division for audit; set audit date	Number and composition of team; instances of preparatory work		Sep-05	Biosolids division manager/EMS coordinator	Ongoing – Postponed due to issues at NBP
		2.3.4	Establish and implement QC auditing procedures to reduce data errors in inspection database. Reduce errors to zero/month by end of goal period.	Same as objective.	Procedures implemented; number of errors per month		31-Dec-05	MES project manager/MES field supervisors	Not finished. Will strive to put a QC auditing procedure in place by the end of 2005.
		2.3.5	Formalize and implement guidelines concerning safe handling of biosolids during sampling and monitoring activities.	Same as objective.	Guidelines implemented; number of incidents per month		Ongoing	MES Field Supervisors /MES Headquarters Staff	Achieved in 2004. Safety guidelines being implemented on a regular basis.
	2.4	Improv	ve oversight of contractors.						
		2.4.1	Ensure that contractors are in compliance with all applicable nutrient management requirements for biosolids.	Contact contractors to determine compliance procedures	Numbers of violations		Ongoing	Contractors	Achieved. Contractors have management plans, application rate sheets and site manuals are available to MES; contractors are meeting requirements.

Out come	Object ve	Action Plan	Targets	Metrics	Location	Targeted Due Date	Responsible Party	Progress & Outcome
		2.4.2 Evaluate current contracts and make changes for next contract cycle based on biosolids program and EMS goals and objectives.	Identify upcoming contracts	Number of contracts redlined		Aug-05	Biosolids program manager	Achieved. Contracts coming up for renewal will be reviewed for new language.
3	Relation	ons with Interested Parties						
	3.1	Foster open and effective communication among all program participants and interested parties.						
		3.1.1 Within 24 hours, respond to inquiries and complaints reported by MES staff or received through other means.	Formalize feedback system from MES, contractors, and government; be involved in WERF protocol development for rapid response to health incidents	Feedback system in place; numbers of uses of system; numbers of WERF meetings attended; numbers of Werf tasks completed		Ongoing	MES and division program manager	Partly achieved and ongoing. Responses to inquiries and complaints conducted in accordance with MES standard procedure. Procedure for detailed odor surveys in response to complaints put in place on October 6, 2005.
		3.1.2 Conduct or assist with a minimum of six informational meetings/public hearings each year to receive input on the biosolids program from areas where Blue Plains biosolids are used.	Identify six to 10 venues and topics	Numbers of meetings; invitation lists; attendance records		Ongoing	All program staff, to be coordinated by biosolids program manager	Achieved.
		3.1.3 Develop joint public outreach efforts-in concert with other biosolids generators in the region.	Contact WSSC, ASA, and Arlington	Quantity of contacts; number of outreach efforts		Ongoing	COG staff, Division Manager	Achieved. Working with newly formed Virginia Blosolids Council.
		3.1.4 Interact with local health departments and biosolids monitors to address or identify geographic/geologic concerns.	Assess whether current efforts are sufficient	Numbers and nature of interactions	MES inspection Reports	Ongoing	MES field inspections staff	Partly achieved. In house training being conducted.
		3.1.5 Make information about biosolids program available to interested third parties, including WASA and MES monitoring information.	Post information on website; include information in billings or other mailings; respond to individual inquiries	Numbers and nature of disseminated information; numbers of responses to inquiries				Achieved – VBC web page live in November 2005.
	3.2	Engage in activities to keep abreast of and influence issues of public concern.						
		3.2.1 Involve two or more biosolids program staff on at least two local biosolids committees.	Identify biosolids committees; identify staff to be involved	Numbers of staff; numbers of committees		Annual	All program staff; to be coordinated by biosolids program manager	Achieved – MABA, CWEA, VWEA.
		3.2.5 Disseminate research reports to staff and the public.	Post new research reports on WASA's internet website	Numbers of postings	WASA website	Sep-05	Biosolids program manager/EMS coordinator	Achieved.
4	Divers	ity biosolids program to ensure long-term viability						
	4.1	Increase program reliability by using several management methods and contractor services						
		4.1.1 Land-apply biosolids in other geographic areas than those used in FY 2004/5.	Pursue options in Pennsylvania; pursue silviculture options	Numbers and intensity of efforts to work in PA; numbers of silviculture efforts		Ongoing	Biosolids program manager/EMS coordinator	Ongoing – close in WV, pursuing PA.
		4.1.2 Land-apply biosolids using other technologies	Identify viable optional technologies and asses for usefulness to WASA	Numbers of efforts		Ongoing		Ongoing – investigating composting, gasification.

Out come	Objecti ve		Action Plan	Targets	Metrics	Location	Targeted Due Date	Responsible Party	Progress & Outcome
		4.1.3	Review contracts to consider alternatives to current service providers in meeting biosolids EMS goals.	Examine hauler alternatives; examine lime suppliers	Efforts made to identify alternatives; numbers of alternatives identified		By six months before contract end	Biosolids program manager/EMS coordinator	Achieved.
	4.2	Ensure	long-term goals support program diversity.						
		4.2.1	Update Biosolids Master Plan on an annual basis to reflect potential changes in end-use options.	Conduct special meetings to reach objective; compile information needed for an effective update; make update in time to be used in EMS goals and objectives process	Numbers of meetings; meeting attendee information; numbers and dates of action items set and accomplished		Annually, by February 1		Unfinished. Unfeasible because not done annually.
	4.3	Promo	te and support biosolids-related research						
		4.3.1	Tailor research projects to support biosolids diversity and digesters.	Identify research projects and evaluate according to objective	Number of projects		Ongoing	Blue Plains Technical Committee	Achieved. Funding two projects.
		4.3.2	Fund a minimum of two odor reduction research projects in FY 2005 and FY 2006.	Same as objective	Numbers and focus of research projects		Annual	Biosolids division manager/EMS coordinator	Achieved.
		4.3.3	Fund a minimum of two non-odor-reduction research projects in FY 2005 and FY 2006.	Same as objective; evaulate composting	Numbers and focus of research projects		Annual	Biosolids program manager/EMS coordinator	Achieved.
5	Enviro	nmenta	I Performance						
	5.1	Reduce	e potential to pollute the environment.						
		5.1.1	Participate in WASA wastewater facility ISO 14001 implementation.	Take on and complete relevant action items	Numbers of efforts completed		Ongoing	Biosolids program manager/EMS coordinator	Ongoing.
		5.1.2	Evaluate at least one opportunity for source reduction of metals in biosolids.	Same as objective; examine ferric chloride	Numbers of opportunities evaluated		December 31 2005	Mark Ramirez/ Sudhir Murthy; Elaine Wilson	Not achieved. Other projects took priority, but discussion ongoing so will be in 2006
		5.1.3	Identify and pursue at least one opportunity for evaluating organic pollutants in biosolids.	Same as objective	Numbers of opportunities evaluated		December 31 2005		Achieved. USDA project underway.
		5.1.4	Evaluate use of onsite chemicals to be more efficient, effective, and environmentally responsible.	Coordinate with other departments	Numbers of interactions with others; numbers and nature of ideas for change developed		Sep-05	Biosolids program manager/EMS coordinator	Achieved.
6	Additi	onal A	ctivities Accomplished						
	6.1		Upgraded and improved biosolids information booth				2005		



Approved: Chris Peot, Biosolids Division Manager

Ou com	t Object ne ive	t	Action Plan	Targets	Metrics	Location	Targeted Due Date	Responsible Party	Progress & Outcome
1	Regu	latory Co	ompliance						
	1.1	Comply (onsite	y with all statutory and regulatory requirements and offsite operations).						
		1.1.1	Achieve zero notices of permit violations related to management of biosolids.	N/A	Number of permit violations	BIO 01 file cabinet	Ongoing	All program staff and contractors	
		1.1.2	Submit annual Part 503 regulation compliance report on time.	N/A	Report submitted	BIO 01 file cabinet	February each year	Biosolids process engineer	
		1.1.3	Prepare and file on time annual and monthly reports that are required by states in which Blue Plains biosolids are managed.	Monthly and annual generator's report from MES	Reports submitted	BIO 01 file cabinet	Annual and monthly	Biosolids process engineer	
		1.1.4	Keep up with and record regulatory and legislative requirements and changes.	Address in monthly CFT meetings	COG legislative summaries; VAMWA, BUAC reports	CFT minutes	Monthly and periodic	Biosolids program manager, COG	
	1.2	Comply require	y with all local and state permitting and other ments.						
		1.2.1	Improve process of documenting records of monthly contacts with state regulators in Virginia and Maryland to stay abreast of permitting changes, new policies, and problem areas.	Improve database submittals; improve process of receiving complaints so can respond in timely mannel	Records of contacts; time to respond	Biosolids Division I-Drive	Ongoing	MES field supervisors	
2	Qualit	ty Mana	rement						
_	2.1	Incorp	orate new technology and other improvements into ons.						
		2.1.1	Full digestion, per the Solids Handling Facility Plan.	Facilities plan is up to date; activities are on schedule	Same as targets; full digestion implemented		2011	Department of Engineering and Technical Services	
		2.1.2	Implement on-line access of inspection database.	Install full version of ARC GIS software	Software in place; functioning; in use		Dec-06	MES Project Manager/MES GIS Specialist	
		2.1.3	Reconcile tonnage and distribution databases so there are close to zero discrepancies in monthly reports.	Establish procedures for contractor, scale, and MES database	Procedures in place; records reconciled		Ongoing	MES Project Manager/MES GIS Specialist	
		2.1.4	Explore use of bar codes for inspection data.	Memo with data.			Jun-06	MES Project Manager/MES GIS Specialist	
	2.2	Provide	e and improve upon training.						
		2.2.1	Implement a training tracking system.	Identify responsible party; establish procedure	Tracking system in place		Dec-06	MES Headquarters Staff/ MES Field Supervisors	
		2.2.2	Provide opportunities for and achieve 100% attendance of WASA biosolids staff in educational programs, such as seminars or conferences.	Provide at least one educational opportunity for each staff member each year; provide incentives to staff to	Training records		Annual	All program staff; to be coordinated by biosolids program manager	

Out come	Object ive		Action Plan	Targets	Metrics	Location	Targeted Due Date	Responsible Party	Progress & Outcome
		2.2.3	Provide at least two in-house training sessions for field inspectors on topics such as 503 Rule, incident reporting, EMS procedures, etc.	Same as objective	Numbers of courses provided; numbers of attendees		Dec-06	MES Headquarters Staff/ MES Field Supervisors	
		2.2.4	Provide at least two external training opportunities for each field inspector on topics such as nutrient management, biosolids management, business writing, etc.	Same as objective	Numbers of courses provided; numbers of attendees		Dec-06	MES Field Supervisors /MES Headquarters Staff	
		2.2.5	Make WASA/MES inspector training activities available to local monitors and explore ways to get monitors to attend.	Types and numbers of promotion efforts to attract attendees	Numbers of training courses; numbers of local monitors attending		Ongoing	MES Project Manager/MES Headquarters Staff	
		2.2.6	Top management is fully aware of biosolids program objectives and targets.	Feedback loop in place.	Numbers and comprehensiveness of contacts; numbers and		Aug-06	Biosolids program manager	
		2.2.7	Create and disseminate biosolids information and incident and procedure brochure for truck drivers.	Brochure developed and disseminated			Dec-06	Biosolids program manager, MES	
	2.3	Improv	e inspections and audits.						
		2.3.1	Conduct a minimum of six field visits each year by biosolids program staff to ensure proper procedures are being used in the field by contractors.		Field visit reports given at CFT meetings; GM reports		Annual	All program staff; to be coordinated by biosolids program manager	
		2.3.2	Conduct interim audit of the EMS program.	Develop audit team and protocol; monitor EMS; prepare division for audit; set audit date	Number and composition of team; instances of preparatory work		Sep-05	Biosolids division manager/EMS coordinator	
		2.3.3	Establish and implement QC auditing procedures to reduce data errors in inspection database. Reduce errors to zero/month by end of goal period.	Same as objective.	Procedures implemented; number of errors per month		Dec-06	MES project manager/MES field supervisors	
	2.4	Improv	ve oversight of contractors.						
		2.4.1	Evaluate current contracts and make changes for next contract cycle based on biosolids program and EMS objectives and targets.	Identify new language upcoming contracts	Number of contracts redlined		Apr-06	Biosolids program manager	
3	Relati	ons with	n Interested Parties						
	3.1	Foster progra	open and effective communication among all m participants and interested parties.						
		3.1.1	Improve process for receiving information on actionable incidents from contractors and local government officials.	e Improve feedback system from contractors and government; help develop and implement WERF protocol for rapid response to health incidents	Numbers of uses of system; numbers of WERF meeting tasks completed; numbers of incident reports received and responded to within 24 hours		Dec-06	MES and division program manager	
		3.1.2	Conduct or assist with a minimum of six informational meetings/public hearings each year to receive input on the biosolids program from areas where Blue Plains biosolids are used.	Identify six to 10 venues and topics	Numbers of meetings; invitation lists; attendance records		Ongoing	All program staff, to be coordinated by biosolids program manager	
		3.1.3	Implement joint public outreach efforts-in concert with other biosolids generators in the region.	Work with Virginia Biosolids Council and others; develop contact with WSSC, ASA, and	Quantity of contacts; number of outreach efforts		Ongoing	COG staff, Division Manager	

Out come	Object ive		Action Plan	Targets	Metrics	Location	Targeted Due Date	Responsible Party	Progress & Outcome
		3.1.4	Improve biosolids information available on website	Post information in a timely manner	Numbers and nature of posted information		Dec-06	Biosolids program manager/EMS coordinator	
_		3.1.5	Develop a system to evaluate well discharge zones.	Explore and evaluate systems	Numbers of systems evaluated; system chosen		Dec-06	Biosolids program manager; MES	
	3.2	Engage of pub	e in activities to keep abreast of and influence issues lic concern.						
		3.2.2	Disseminate research reports to staff and the public.	Post new research reports on WASA's internet website	Numbers of postings	WASA website	Dec-06	Biosolids program manager/EMS coordinator	
4	Bioso	lids pro	gram diversity to ensure long-term viability						
	4.1	Increas	se program reliability by using several management ds and contractor services						
		4.1.1	Land-apply biosolids in other geographic areas than those used in FY 2004/5.	Pursue options in Pennsylvania; pursue silviculture options in Virginia for trenching	Numbers and intensity of efforts to work in PA; numbers of silviculture efforts		Ongoing	Biosolids program manager/EMS coordinator	
		4.1.2	Continue reviewing contracts to consider alternatives to current service providers in meeting biosolids EMS goals.	Examine hauler alternatives; examine lime suppliers; examine magnesium and	Efforts made to identify alternatives; numbers of alternatives identified		By six months before contract end	Biosolids program manager/EMS coordinator	
		4.1.3	Explore biodiesel and other options for biosolids reuse.	Identify several options; create pilot project; implement project at ERCO; identify a farm in VA or MD willing to implement larger pilot project	Numbers and extent of pilot programs		Dec-06	Biosolids program manager/EMS coordinator	
	4.2	Promo	te and support biosolids-related research	• •					
		4.2.1	Tailor research projects to support biosolids diversity and digesters.	Identify research projects and evaluate according to objective	Number of projects; number of report summaries to Biosolids Program Technical Committee.		Ongoing	Blue Plains Technical Committee	
		4.2.2	Fund a minimum of two odor reduction research projects in FY 2006 and FY 2007.	Same as objective	Numbers and focus of research projects		Annual	Biosolids division manager/EMS coordinator	
		4.2.3	Fund a minimum of two non-odor-reduction research projects in FY 2006 and FY 2007.	Same as objective; evaulate composting	Numbers and focus of research projects		Annual	Biosolids program manager/EMS coordinator	
		4.2.4	Fund at least one research effort related to polymer dosing, P-source coefficeints	Begin research.			Dec-06	Biosolids program manager/EMS coordinator	
		4.2.5	Fund at least one research effort related to P-source coefficients.	Begin research.			Dec-06	Biosolids program manager/EMS coordinator	

Out come	Object ive		Action Plan	Targets	Metrics	Location	Targeted Due Date	Responsible Party	Progress & Outcome
		4.2.6	Seek EPA Clean Water Act award for research.	Identify all relevant research projects; submit award			Aug-06	Biosolids program manager/EMS coordinator	
5	Envire	onmenta	al Performance						
	5.1	Reduc	e potential to pollute the environment.						
		5.1.1	Participate in WASA wastewater facility ISO 14001 implementation.	Take on and complete relevant action items	Numbers of efforts completed		Ongoing	Biosolids program manager/EMS coordinator	
		5.1.2	Evaluate at least one opportunity for source reduction of metals in biosolids.	Same as objective; examine ferric chloride	Numbers of opportunities evaluated		Dec-06	Mark Ramirez/ Sudhir Murthy; Elaine Wilson	
		5.1.3	Evaluate use of onsite chemicals to be more efficient, effective, and environmentally responsible.	Coordinate with other departments	Numbers of interactions with others; numbers and nature of ideas for change developed		Sep-05	Biosolids program manager/EMS coordinator	



Appendix D

DC WASA Biosolids Program Cross-Functional Team Meeting Agenda



1. Facilities Update (plant process) - EMS Elements 3, 5, 7, 10, 13, 14

- Blue Plains wastewater processes
- Blue Plains loading/storage
- WSSC plants

Identify critical control points under discussion, relate to goals and objectives, operational controls, monitoring and measurement needs, and preventive/corrective actions; bring up any role/responsibility issues or changes.

2. Field Operations Update- Elements 3, 6, 10, 13, 14

MES: inspections, field issues, odor complaints, county actions

Identify critical control points under discussion, relate to goals and objectives, operational controls, monitoring and measurement needs, preventive/corrective action, and public participation feedback loop.

3. EMS Update – Elements 1,2

- Interim audit
- 2006 Targets and Objectives discussion

Note any items from the previous discussion that relate to standards and metrics for the established EMS goals and objectives; make sure items are recorded either in CFT minutes or in other designated records.

4. Current Projects/Issues

5. Action Items- Element 14

- Action items from this meeting
- Action items from previous meeting (November) (Listed)
- Undiscussed action items from October meeting (Listed)
- Pending action items from past meetings (Listed)
- Recommendations or input to Blue Plains Regional/Technical Committees Report on status of action items from last month's meeting; identify action items from this meeting; make recommendations or input to Blue Plains Regional/Technical Committees; relate to EMS standards and metrics identified in earlier discussions

Other Agenda Items (as time permits)

- 6. Communications/Public Relations- Elements 6, 9, 12
 - Internal
 - External Outside stakeholder process

7. Research- Elements 5, 13

• Pursue study of P source coefficient for Blue Plains

8. Biosolids Management Contracts- Elements 4, 5

- List of potential changes for next contract
- Achieve monthly payment of Maryland generator fees
- 9. Legal/Regulatory Update Element 4

10.Emergency Preparedness and Response – Element 11

11.Training - Element 8

12. Other Business

Upcoming Biosolids Coordination Meeting Dates: (Jan. 18, 2006)

Distribution:

CH2M HILL: Tom Sadick Jackson & Tull Engineers: Caroline Hemenway DC-WASA: Walt Bailey, John Carr, George Shih, Chris Peot, Mark Ramirez, Elaine Wilson, Sudhir Murthy Fairfax County DPW: Ed Jones, Savita Schlesinger MES: Ellen Frketic, Al Razik, Ed Taylor Montgomery County DEP: David Lake

MWCOG: Karl Berger, Mukhtar Ibrahim, Ted Graham, Tanya Spano

Prince George's County DER: Beverly Warfield, Paivi Spoon Prince George's County Health Dept.: Manfred Reichwein WSSC: Steve Gerwin, Roland Steiner, Craig Fricke



Appendix E

DC WASA Biosolids Division Example Report to General Manager (10/2005)

The mission of the District of Columbia Water and Sewer Authority biosolids management program is to provide reliable, diversified, flexible, sustainable, environmentally sound, publicly acceptable, and cost-effective management of biosolids produced by the Blue Plains Advanced Wastewater Treatment Plant while helping preserve agriculture and protect the Chesapeake Bay.



October 2005

Biosolids Division Monthly Report

Submitted to: Glenn S. Gerstell Chairman of the Board

Submitted by: Chris Peot Biosolids Division Manager



District of Columbia Water and Sewer Authority

Biosolids Division 5000 Overlook Avenue SW Washington, DC 20032 202-787-4329; 202-787-4226 (fax) chris_peot@dcwasa.com

October 2005 Blue Plains AWTP Biosolids Report

In October, biosolids hauling averaged 1166 wet tons per day. The graph below shows the hauling by contractor for the month of October. A second graph shows the average daily production per month for the previous 24-month period.



Average Daily Hauling by Contractor for October, 2005



Average Daily Biosolids Production

The graphs below show the EPA regulated heavy metals in the Blue Plains biosolids for the month of September 2005. As can be seen in the graphs, the Blue Plains levels are considerably below the regulated exceptional quality limits, the AMSA average levels surveyed in 1996, and even the proposed 2025 European Union (EU) limits.



HIGHLIGHTS

Staff participated in a the ERCO Tree Farm annual Field Day, which invites interested parties to participate in a tour and to hear summaries of research conducted at the site. The day was well attended, including representatives of Maryland Department of the Environment and several other state agencies. The agenda included presentations on research findings in the morning and a site tour in the afternoon.

Staff was invited to speak at the annual EPA State Regulators conference, held this year at the Bolger Center just outside the Capitol Beltway in Maryland. Staff made a presentation summarizing progress and improvements, EMS status, and recent research findings to the biosolids coordinators for each of the 50 states. The discussion that followed resulted in several additional requests to speak and for research papers and results.

Staff met with the core group that has formed the Virginia Biosolids Council, a group formed to provide information at a grass roots level regarding biosolids recycling. The group discussed how best to disseminate information, including a web page (www. virginiabiosolids.com). The group will monitor local news stories and work with communities to provide a balanced view of the biosolids recycling story.

This year at the annual WEFTEC conference (10/30 - 11/2 in Washington, DC) EPA honored the DCWASA Blue Plains Biosolids Management Program with it's National First Place Clean Water Act Recognition Award for Exemplary Biosolids Management for Large Operating Projects. EPA awarded DCWASA for research, innovation, sustainability, and the EMS program.

Map of Blue Plains Biosolids Applications and Agricultural \$'s for September 2005





Appendix F

DC WASA Biosolids Program Example Incident Report (5/11/2005)

DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY

WASHINGTON SUBURBAN SANITARY COMMISSION

MES BIOSOLIDS INSPECTION PROGRAM

INCIDENT REPORT



Date Incident	Began		Date Incident E	Ended		
	5/10/2005	5		5/11/2005		
Inspector Name	Inspector Name Site Name					
Ed Taylor GILMAN FORESTRY SITE						
County		State	Contractor	Biosolids Source		
Spotsylvania		VA	SYNAGRO	BP		
Weather conditions at the	e time of the incid	ent (S=	Sunny, PC=Partly Cloudy	, C=Cloudy, P=Precipi	tation)	
			\$			
Wind	Speed (in mph) at	the tim	e of the incident (if known	<i>ı</i>)		
		3				
Wir	nd Direction at the	e time o	of the incident (if known)			
		SW				
Temperat	ure (in degrees F)) at the	time of the incident (if kn	own)		
		80/50)			
Site Location and Direction	15	Evit 120	Dto 2 West to Dto 610 Southon	at to Dto, 612 Couth to Dto, 6	12 Feet	
to Rte. 612 South	Inwest to 1-95 South to	EXIL 130,	Rie. 3 West to Rie. 610 Southea		IS East	
Describe the area where the	e subject site is lo	cated (r	r <mark>ural, urban, prominent</mark> si	te features etc.)		
Rural Forestry Site	Rural Forestry Site					
Nature of Incident						
Odor Complaint From Public						
Incident Type (Other, if no	t noted above)					
Referred from VDH						
Describe specifics of the in	cident in auestion					
Residents of Carriage Road a sma	Il subdivision that back	s up to th	ne site complained to the local He	alth Department and the VDH	lof	
odors. VDS requested we take some olfactometer readings around the site.						

DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY WASHINGTON SUBURBAN SANITARY COMMISSION MES BIOSOLIDS INSPECTION PROGRAM INCIDENT REPORT



	ANSWER QUESTIONS BELOW IF THIS IS AN ODOR RELATED INCIDENT					
	Odor Conc./Dilutions to Threshold/Field Olfactometer					
	2					
Odor Intensity (N=None, SL=Slight, M=Moderate, ST=Strong, etc.)						
SL						
Odor Descriptor						
Musty						
	Date odor noted by receptor (if known)?	Time odor noted by receptor (if known)?				
Hedonic Tone = -10 (very unpleasant) to +10 (pleasant); 0 is neutral						
	-2					
	Individual (s) Associated With this Incident	Affiliation				
cot	Haley	VDH				

Are or will there be	e reports generated by others involved in	this incident?	Check if Yes	

Describe the reports to be filed by others (if Yes)

Are there pictures or sketches available for this incident?Check if YesDescribe the pictures/sketches available for this incident (if Yes)

Was there press or media involved with this incident?	Check if Yes	
Describe the media coverage involved in this incident (if Yes)	_	

DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY

WASHINGTON SUBURBAN SANITARY COMMISSION

MES BIOSOLIDS INSPECTION PROGRAM



INCIDENT REPORT

Provide a description of actions already taken in response to this incident

Odor readings were taken at various points in and around the forestry site. No off site odors were detected and only 2dt readings were obtained at various places on site. Findings were reported to VDH.

Provide a description of follow-up actions to be taken in response to this incident

Will continue to monitor. Wind was blowing away from residents who complained on 05/11/05. Will return when wind is blowing in opposite direction or not blowing at all.

Provide any additional comments not noted above that may be needed to fully describe this incident

Various biosolids have been applied at this site including Blue Plains, Parkway, Seneca, Arlington, and Back river.

*While at the Gilman Forestry site, VDH asked that I check out a site down the road that had received odor complaints. I checked the site on Morris Road in Spotsylvania Co. Va. The farmer was spreading Pellets and I could detect no odors. There was a large "Synagro" sign at the end of the driveway placed there by the farmer to direct the trucks in.



Appendix G

Summary of National Biosolids Partnership Biosolids EMS Verification Audit Report (9/28/2004)



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)



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.



District of Columbia Water and Sewer Authority Biosolids EMS Verification Audit Report September 28, 2004

- 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.

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

Date: September 28, 2004