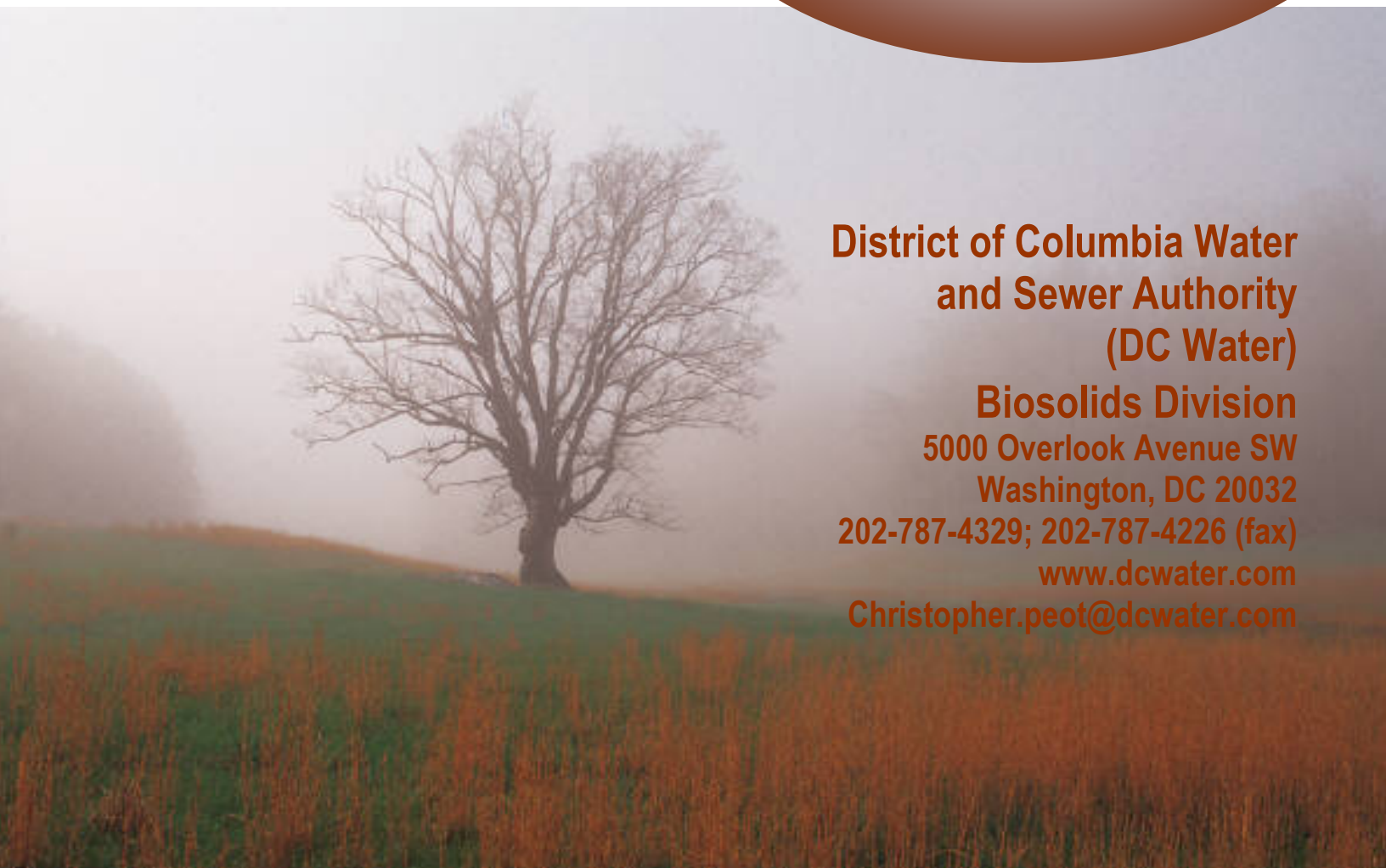
2009 Biosolids Management Program Annual Report

dc water is life



District of Columbia Water and Sewer Authority (DC Water)

Biosolids Division

5000 Overlook Avenue SW

Washington, DC 20032

202-787-4329; 202-787-4226 (fax)

www.dcwater.com

Christopher.peot@dcwater.com

INTRODUCTION

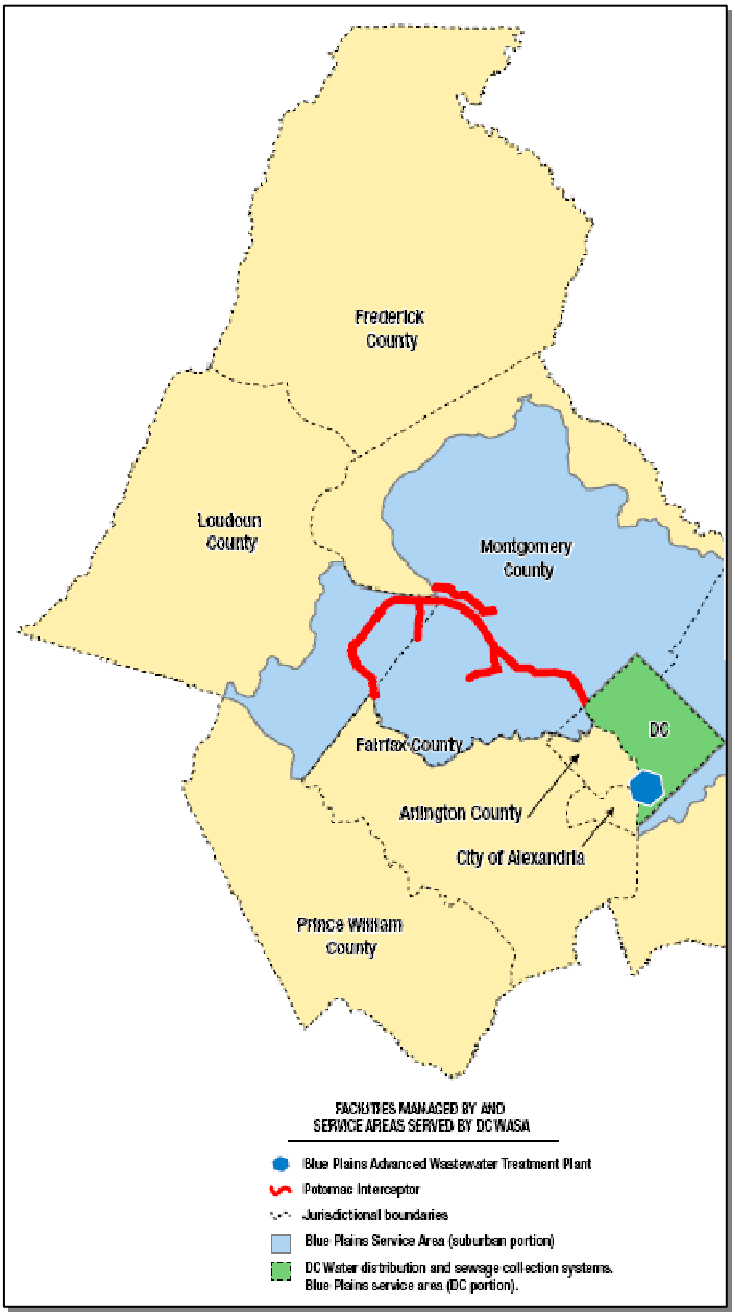
2009 marked the District of Columbia Water and Sewer Authority's 13th year as an independent agency of the District government. Serving more than two million regional customers, DC Water continued to make its vision a reality: to "provide world-class water and wastewater services as a leading steward of the environment."

During 2008, the Board of Directors revised the strategic plan that focused on consumer and customer services, organizational effectiveness, environmental quality and operations, and finance and budget, by adding measurable performance objectives.

The full annual report and 2008-2013 Strategic Plan is available at http://www.dcwater.com/news/strategic.cfm. This report highlights the way the biosolids management program contributed to meeting the critical success factor objectives outlined in the strategic plan in 2008 and 2009. The table starting on page 5 demonstrates how the program met specific goals it set for itself to support those objectives.

The biosolids management program ensures that the agency carries out the following tasks:

- Identifies potential environmental impacts and critical process points, and makes sure they are monitored and controlled
- Establishes procedures for meeting system requirements
- Identifies stakeholders, ensuring there is a communication loop
- Establishes a method to identify, track, fix, and prevent problems
- Maintains a constant upward improvement trend
- Requires continual management review to make sure the system works and policy commitments are met
- Is audited to make sure it meets requirements



STATE OF THE PROGRAM

DC Water's biosolids program was certified to the National Biosolids Partnership Environmental Management System (EMS) by a third-party auditor in October 2004. It has maintained third-party certification since then.

Audit Results

KEMA-Registered Quality Inc. conducted a third-party audit of DC Water's biosolids program October 27-30, 2009 and found that the program meets the expectations and requirements of the NBP environmental management system (EMS). It stated that the EMS:

- Is functioning effectively and following documented procedures.
- Is achieving improvement outcomes in the areas of regulatory compliance, environmental performance, quality practices, and relations with interested parties.

The KEMA auditor noted the following strengths in the program:

- There is a clear commitment from senior management (including Board of Directors) to having a sustainable biosolids program.
- Blue Plains Biosolids Workgroup (BWG) meetings continue to be an effective and improving method of communication internally and with contractors.
- A robust duty station training program for operators is used, including cross-training between different areas of the plant. Improved operator and supervisor training have resulted in better operator competency and productivity and consistency with regulatory requirements.
- Maryland Environmental Service, an independent contractor, continues to provide effective site inspections and control of day-to-day biosolids use.
- The auditor found that the DC Water biosolids program is improving through the use of its management system. The following improvement outcomes within the past two years were confirmed:
- DC Water has helped Virginia Department of Environmental Quality (VA DEQ) understand biosolids requirements and inspections.
- The pretreatment program has voluntary programs in place with the District of Columbia Department of Environment and local hospitals to reduce pharmaceuticals in wastewater influent.

DC Water Biosolids Management Program Policy

DC Water commits to achieving the following biosolids program outcomes:

- Legal and regulatory compliance
- Consistent product quality
- Ensuring public acceptance of biosolids
- Excellent environmental performance
- Continual improvement in processes, products, and services
- Implementing the National Biosolids Partnership Code of Good Practice and Principles of Good Conduct

- Contractors continue to increase their involvement in DC Water biosolids program with good attendance at Biosolids Workgroup meetings, fewer incidents, and better field information.
- DC Water continues to increase support of research and development into biosolids subjects, including dewatering studies relative to fecal coliform reactivation, drought resistance studies, carbon sequestration, and bio-fuel crops that lead to sustainable biosolids program.
- Biosolids total solids increased from an average of ~26 percent in 2008 to ~27 percent in 2009, lowering transportation costs by $1 million/year, reducing emissions and truck traffic.
- A DC Water-wide carbon footprint modeling study is underway for biosolids disposition. This will enable carbon credits to be generated.
- No material was sent to landfill in 2009. A storage site in Cumberland County, VA and compost end use has reduced need for landfill.

The auditor found five minor nonconformances related to management system documentation, environmental impact identification, evaluating critical control points, improving emergency plans, and tying management reviews to policy commitments. A corrective action plan was put in place to address these nonconformances.

NBP EMS Program

On May 1, 2000, the chief engineer of DC Water signed a letter of understanding with the National Biosolids Partnership (NBP) in which DC Water agreed to join the voluntary NBP EMS program. DC Water specifically committed to meeting the national requirements for an excellent biosolids program, committed to implementing an EMS, and committed to following NBP's National Code of Good Practice.

NBP is a not-for-profit alliance formed in 1997 with the National Association of Clean Water Agencies (NACWA) (formerly Association of Metropolitan Sewerage Agencies), Water Environment Federation (WEF), and U.S. Environmental Protection Agency (EPA). Its mission is to advance environmentally sound and accepted biosolids management practices.

Biosolids Management Review

Senior members of the Biosolids Workgroup annually review the Blue Plains biosolids management program to assess the program's effectiveness in implementing its policy commitments. The BWG is a team of representatives from DC Water divisions in the biosolids value chain, contractors responsible for inspections and legal and regulatory tracking, partner agencies, and land application contractors. It meets monthly to manage biosolids operations, assess conformance to policies and procedures, identify any needed preventive or corrective actions, and identify areas for improvement.

During the management review concluded in late 2009, which included an internal audit, the BWG team found, as did the auditor subsequently, that the biosolids management program and its environmental management system have been effective in carrying out policy commitments, and have provided a means of continuously improving operations and public feedback. The review highlighted that the program has been especially effective at the following:

- Helping establish priorities to ensure that critical control points remain well-managed and monitored
- Ensuring biosolids quality remains consistently high
- Research continues to be supported
- Cost-savings are identified and pursued
- DC Water continues to interact with stakeholders and support outreach efforts
- DC Water remains compliant with biosolids regulations
- Preventive and corrective actions are taken when nonconformances are found
- The program supports continuous improvement in all aspects of biosolids management.

Opportunities for improvement were identified in preventive maintenance, contractor expectations related to public participation and outreach, staffing levels that impose heavy workloads on individuals, improving public input to goals, establishing longer-term goals, and improving the incident tracking system.

The DC Water Board of Directors has oversight responsibilities for the entire agency, including review and approval of recommendations by the Office of General Manager for the biosolids program policy, vision, mission, and DC-Water-wide long-term goals. It also has responsibility for approving the required biosolids capital and operating expenses and reviewing progress toward long-term goals periodically. It is responsible for expenditures greater than $1 million. The GM and the board both support the biosolids management program with resources, staff, and travel authorization.

The Biosolids Workgroup is a formal workgroup of the Blue Plains Regional Committee (BPRC), and provides regular updates to the BPRC on program and regulatory activities that may affect the biosolids management program, as well as recommendations for BPRC-funded biosolids research projects.

The BPRC was established under the 1985 Blue Plains Intermunicipal Agreement (IMA). Under the terms of the IMA, the BPRC officially represents the agencies and jurisdictions participating in the IMA in coordinating and implementing the IMA itself, and provides a forum for in-depth discussion and development of consensus on a range of technical, policy, and financial issues identified within the IMA – including biosolids management issues.

The BPRC is composed of 12 members, with two from each of the following DC area municipal jurisdictions or agencies: Washington DC; Fairfax County, VA; Prince George's County, MD; Montgomery County, MD; the Washington Suburban Sanitary Commission, MD (WSSC); and DC Water. The BPRC members are appointed by the Blue Plains Leadership Committee, i.e., the chief administrative officers and general managers of the participating jurisdictions and agencies. The BPRC routinely communicates to and may provide formal recommendations to the DC Water Board of Directors and upper management, and provides overall guidance to the Biosolids Workgroup.

Progress Toward Goals

The Biosolids Division met or maintained progress toward all of its goals over 2008-2009. Following is a summary of outcomes.

Goal	Outcome
Sustained and Proactive Regulatory Compliance	
Maintain a cooperative relationship with Virginia Department of Environmental Quality (DEQ) and remain engaged in Maryland and Virginia regulatory processes.	Achieved. BWG members regularly meet with state regulators and administrators, and with county officials. They attend Virginia DEQ meetings, General Assembly technical advisory committee meetings, public hearings, and Maryland Department of Environment meetings. BWG members also review regulatory language and submit comments.

Goal	Outcome
Update and test emergency preparedness and response plan. Complete and implement SWPPP	In Progress. A substantive overhaul of the DC Water Emergency Response Plan was undertaken in late 2009 and was expected to be completed by the end of 2010. The Stormwater Pollution Prevention Plan was 95% complete and was delayed due to construction on the plant. Training in both areas is done every year.
Eliminate low-pH loads	In Progress. New infrared warning sensors were installed that set off alarms when low pH levels are detected and a protocol for using the new system was being developed.
Improved Biosolids Quality Management	
Improve efficiency of truck loading	Achieved. Silos are capable of self-loading operations and an SOP was being developed. Truck-loading schedules that balance workloads among contractors have significantly reduced truck idle time and improved loading efficiency. Next Steps: Some trucks contain GPS systems, and more were scheduled to come online in 2010.
Identify root causes of odors	In Progress. After thorough review, it was determined that changing emulsion polymer and dosing can affect biosolids quality and procedures were modified to eliminate polymer-associated issues. DC Water also installed and was testing new nitrogen-based odor detectors. Next Steps: Conducting modeling to determine nutrient levels and analyze other land-application-related information.
Maintain percent solids average of biosolids between 27 and 29%	Achieved. Monthly process control meetings address operations related to solids content and equipment, and address cyclical and seasonal fluctuations.
Implement a biosolids awareness training program	In Progress. Duty station training and tailgate sessions were being conducted regularly. A biosolids awareness module was developed and was being implemented as part of a cross-training initiative.
Complete SOPs and improve document control	In Progress. Most critical control point SOPs are maintained on the new electronic document management system and were being used in training. Remaining SOPs were identified for inclusion.
Establish consistency in databases among MES, DC Water, and contractors.	Achieved. A routine to reconcile data between MES, the contractors', and the scale ticket databases was substantially completed in 2009. A standard procedure for reconciling data was being developed.
Update pretreatment manual	In Progress. An updated draft Pretreatment Program Technical Guidance Manual was being reviewed and prepared for submission to the US EPA.

Goal	Outcome
Improve corrective and preventive action (CAPA) system	In Progress. Action plan items and CAPAs are addressed at each BWG meeting and incident reporting was being expanded to include more incident types and near misses to improve trend analysis.
Improve housekeeping	In Progress. DC Water was preparing to hire a new housekeeping manager.
Reduce field issues at sensitive sites to zero	Modified. Outreach to stakeholders was ongoing, through land application contractors and through the Virginia Biosolids Council (VBC). The VBC regularly analyzes complaint files to address concerns. Land application contractors have procedures for reaching out to communities in newly permitted areas, and for reviewing older permits to identify potential issues. Among mitigation steps taken, contractors attempt to determine whether community activities such as holidays or festivals, may preclude land application at particular sites. They establish wider buffers voluntarily to address site-specific concerns. New permitting language drafted by DEQ allows citizens to speak directly with officials and voice their concerns. There are opportunities at public meetings for information distribution as well.
Expanded Relations with Interested Parties	
Disseminate biosolids information to at least 12 stakeholders. Use VBC to strengthen relationship with stakeholders in Virginia. Reach out to media through at least four press releases.	Achieved. The VBC, funded in part by DC Water to conduct public outreach, regularly disseminates information about biosolids to many stakeholder communities, and issues press releases in response to events. One VBC newsletter was on the McGill composting site that included information on DC Water's contribution, and another was on bioactive substances. The VBC has substantive material on biosolids on its website, including reports on technologies and research, and an FAQ. The Biosolids Division Manager has provided information to stakeholders on the new digester project, including the benefits of producing up to 10MW power, reducing carbon footprint by third, and making renewable green energy.
Receive complaint info from DEQ within 30 days of incident	Achieved. Communication has been established with DEQ and it is aware of the need to pass on complaints; mechanisms for doing so were in discussion. In the meantime, MES is seeking this information from DEQ regularly and passing it on to DC Water.
Disseminate research results	Achieved. Research reports have been collected and are provided to stakeholders on request. Research is reported at workshops and conferences, including at WEFTEC.

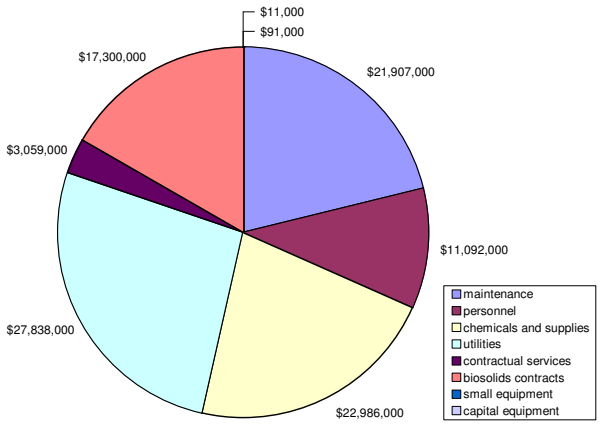
Goal	Outcome
Assist with efforts to increase local monitoring coverage in VA	Achieved. MES has provided training several opportunities for Virginia monitors. There are now over 20 monitors working for Virginia DEQ and counties.
Populate and update website	Achieved. The overall DC Water website was overhauled in 2009 to make it easier to navigate and new biosolids information was posted.
Improve participation of interested parties in the biosolids management system	Achieved. Different DC Water staff attends BWG meetings each month, or at minimum are invited. There is an open invitation to DEQ staff to attend and to tour the facility. Stakeholders are invited to every meeting through the monthly report that is sent to them.
Establish a group of key biosolids generators to promote accurate biosolids information	In Progress. DC Water's Biosolids Division Manager, Chris Peot, president of MABA, began promoting membership in the organization as a community of stakeholders in the future of biosolids. DC Water is active with the Water Environment Federation, which funds position papers and informational materials for use by groups of generators and their contractors.
Improved/Innovative Environmental Performance	
Fund and apply research. Assess trenching/tree farming viability.	Achieved. DC Water is funding or engaged in numerous research projects. These include forest application, nutrient dynamics, poplar plantations on mine sites, drought resistance, and bioactive substances and carbon sequestration (Virginia Tech) the fate and transport of PBDEs, and the fate and transport of triclosan (USDA); odor modeling, and energy modeling (University of Maryland). Virginia Tech research on plant hormones and drought resistance was productive. Research associated with odor issues and solids content has been applied as data are produced. DC Water's decision to develop a new thermophylic digester process and to implement enhanced nutrient removal facilities is the direct result of research it supported.
Complete the Blue Plains carbon footprint using the IPCC protocol. Include biosolids land application program in the assessment. Develop modeling spreadsheet to examine future options for reuse.	Achieved. DC Water greenhouse gas results were verified and data standardization was being conducted. Monthly reports contain GHG data and carbon footprint reductions from biosolids program activities. Dissemination is being done constantly; Biosolids Division Manager Chris Peot reported on the data at more than 60 venues in 2008-2009.
Achieve one new program diversification project	Achieved. In Virginia, the McGill Environmental Systems composting site was permitted and in use. Several new landfill permits were obtained. New sites, such as mine and forestry locations, are being considered on an ongoing basis.
Produce Class A compost and use at least 100 tons in the District of Columbia.	Achieved. Dr. Sally Brown was hired to help with the DC Water composting program. 100 tons of compost from the McGill Environmental Systems site was used on the DC Water Blue Plains plant to produce several kinds of vegetables in 2009. Next Steps: DC Water is developing a brand, data on content and greenhouse gas reductions, and other materials for a potential compost market.

Budget

The DC Water Board of Directors, general manager, and management leadership consistently support the mission and goals of the Biosolids Management Program by allocating appropriate budgets and personnel, and by articulating management support for the biosolids program to staff, the public, and other stakeholders. In 2008 the Board of Directors demonstrated its commitment to biosolids beneficial use by authorizing continued work on a new digestion and thermal hydrolysis process, set to be online by 2015.

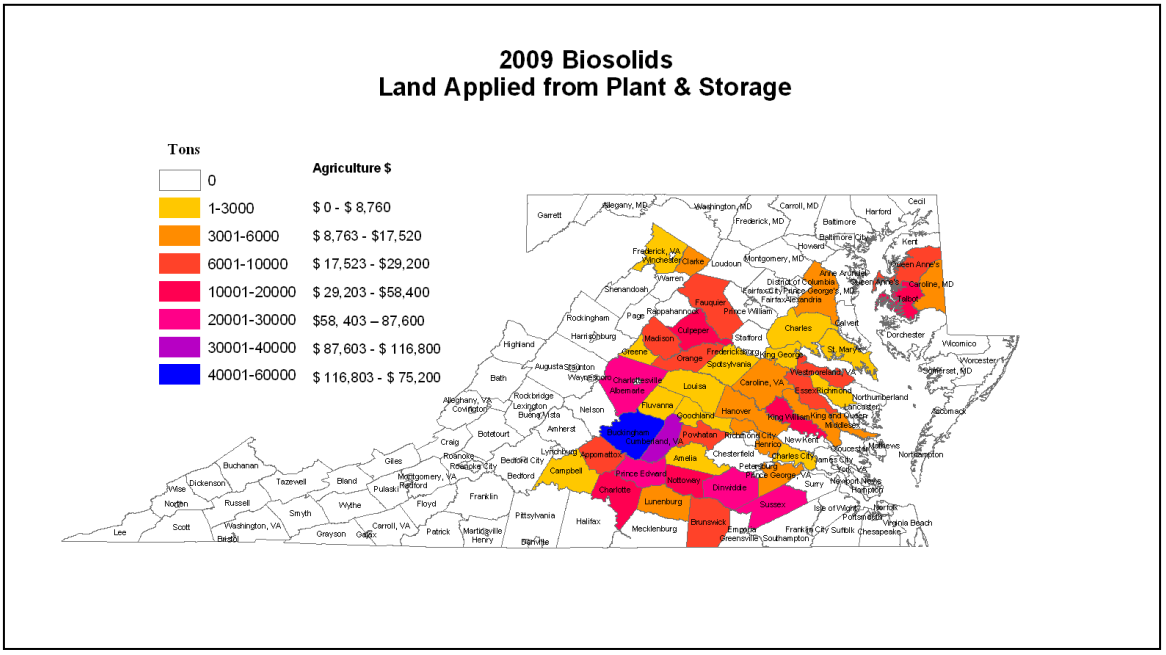
Biosolids Distribution

Environmental sustainability remains one of DC Water's overarching missions. By recycling biosolids, DC Water and farmers avoided releasing thousands of metric tons of carbon dioxide into the air.

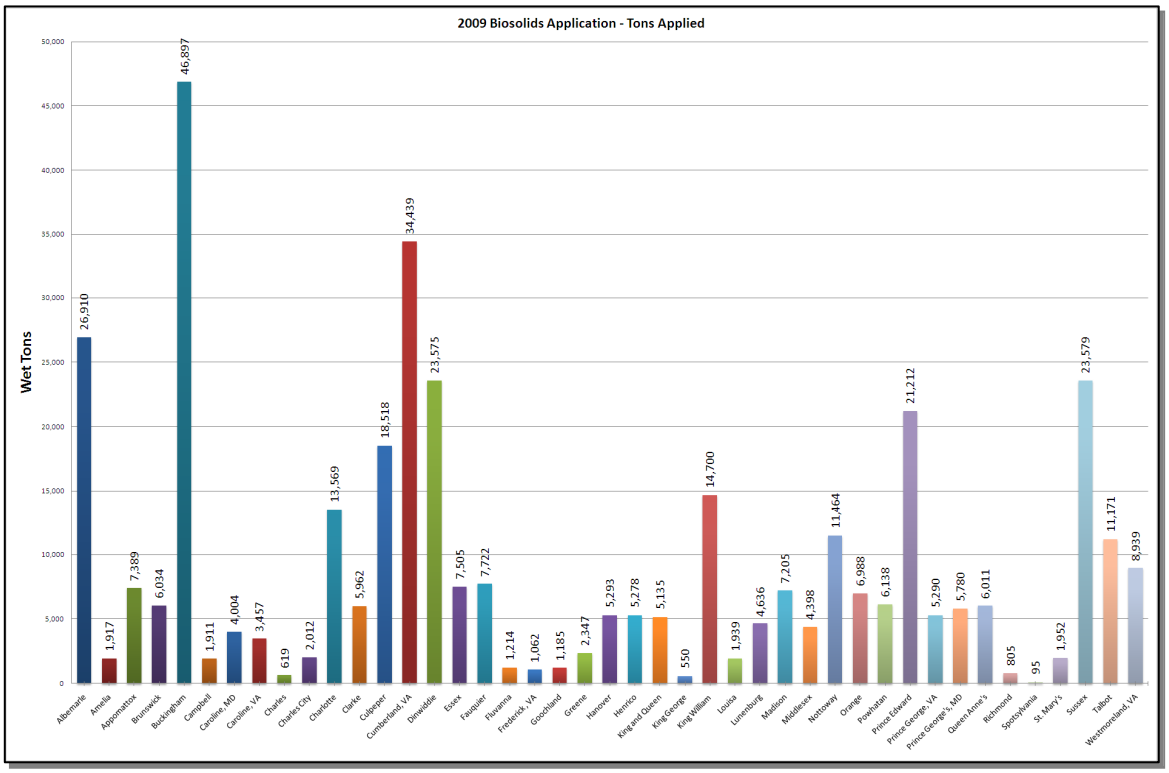


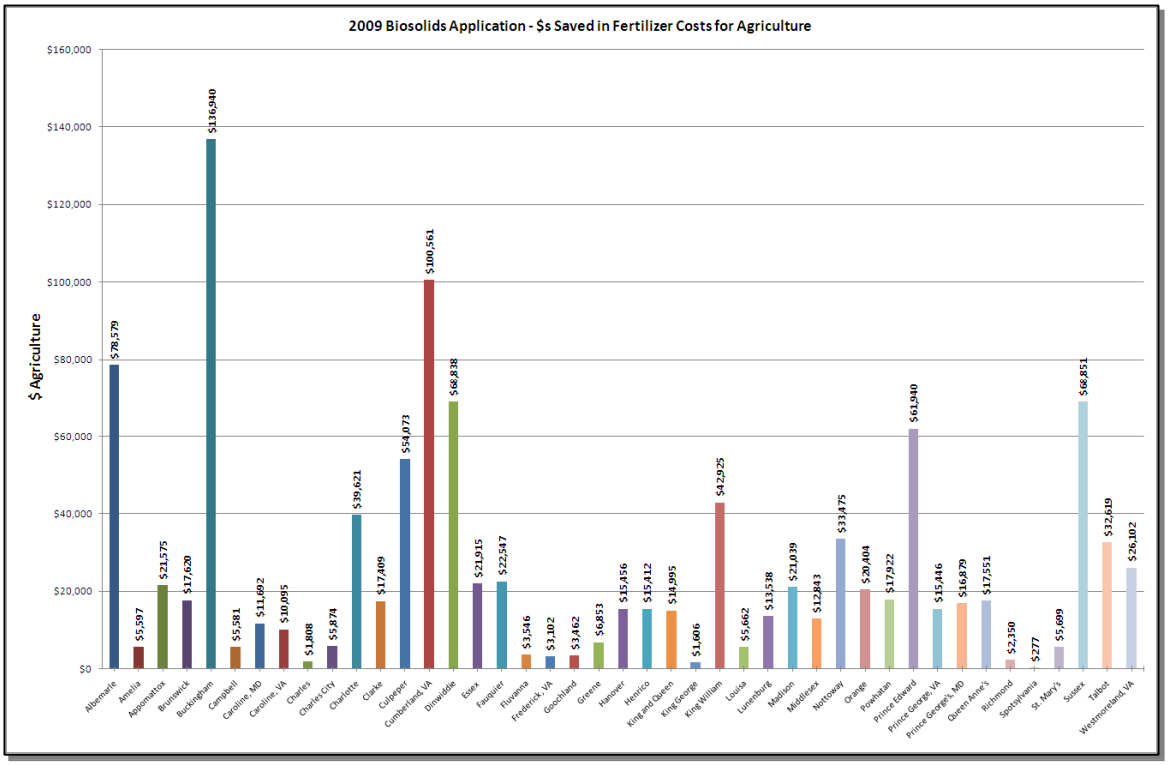
Each month, DC Water reports on biosolids land application by county, including quantities generated and end-use distribution by state. In 2009, DC Water contractors recycled 419,368 tons of biosolids directly from the plant (including 15,647 tons to composting); 134,842 tons into storage; 97,174 tons from storage to land application; and sent only 4,893 tons to a landfill.

By converting biosolids to greenhouse gas equivalents, the environmental value of biosolids application and the benefit of land use over landfill become evident. The total dollars saved in nitrogen and lime provided by biosolids to Virginia farmers that they otherwise would have had to purchase in organic fertilizers in 2009 exceeded $1.3 million.



The following charts show the tons applied per county in Virginia in 2009, and the dollars the biosolids were worth in terms of fertilizer costs.


2009 Biosolids Application - Tons Applied
Wet Tons
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
26,910
1,917
7,389
6,034
46,897
1,911
4,004
3,457
619
2,012
13,569
5,962
18,518
34,439
23,575
7,505
7,722
1,214
1,062
1,185
2,347
5,293
5,278
5,135
550
14,700
1,939
4,636
7,205
4,398
11,464
6,988
6,138
21,212
5,290
5,780
6,011
805
95
1,952
23,579
11,171
8,939
Albemarle
Amelia
Appomattox
Brunswick
Buckingham
Campbell
Caroline, MD
Caroline, VA
Charles
Charles City
Charlotte
Clarke
Culpeper
Cumberland, VA
Dinwiddie
Essex
Fauquier
Fluvanna
Frederick, VA
Goochland
Greene
Hanover
Henrico
King and Queen
King George
King William
Louisa
Lunenburg
Madison
Middlesex
Nottoway
Orange
Powhatan
Prince Edward
Prince George, VA
Prince George's, MD
Queen Anne's
Richmond
Spotsylvania
St. Mary's
Sussex
Talbot
Westmoreland, VA


2009 Biosolids Application - $s Saved in Fertilizer Costs for Agriculture
$ Agriculture
$0
$20,000
$40,000
$60,000
$80,000
$100,000
$120,000
$140,000
$160,000
$78,579
$5,597
$21,575
$17,620
$136,940
$5,581
$11,692
$10,095
$1,808
$5,874
$39,621
$17,409
$54,073
$100,561
$68,838
$21,915
$22,547
$3,546
$3,102
$3,462
$6,853
$15,456
$15,412
$14,995
$1,606
$42,925
$5,662
$13,538
$21,039
$12,843
$33,475
$20,404
$17,922
$61,940
$15,446
$16,879
$17,551
$2,350
$277
$5,699
$68,851
$32,619
$26,102
Albemarle
Amelia
Appomattox
Brunswick
Buckingham
Campbell
Caroline, MD
Caroline, VA
Charles
Charles City
Charlotte
Clarke
Culpeper
Cumberland, VA
Dinwiddie
Essex
Fauquier
Fluvanna
Frederick, VA
Goochland
Greene
Hanover
Henrico
King and Queen
King George
King William
Louisa
Lunenburg
Madison
Middlesex
Nottoway
Orange
Powhatan
Prince Edward
Prince George, VA
Prince George's, MD
Queen Anne's
Richmond
Spotsylvania
St. Mary's
Sussex
Talbot
Westmoreland, VA

ACCOMPLISHMENTS

Biosolids Parameters Stay Below EPA Limits

Exceptional biosolids quality continued to surpass EPA standards in 2008. Fecal coliform in the lime-stabilized biosolids remained substantially below limits. (See chart.)

Biosolids Parameter	EPA Permit Limit Mo/Avg *(mg/L) (maximum)*	DC Water Data 2009 Mo/Avg *(mg/L)*
As (ppm)	41	2.2
Cd (ppm)	29	1.3
Cr (ppm)	No limit	38
Cu (ppm)	1,500	129
Pb (ppm)	300	26
Hg (ppm)	17	0.28
Mo (ppm)	No limit	7.0
Ni (ppm)	420	14
Se (ppm)	100	2.83
Zn (ppm)	2,800	280

Odor Incidents Continue to Drop

A key indicator of improvements is the number of offsite significant incidents reported. In 2009, the Biosolids Workgroup identified more types of events as reportable incidents than in previous years so trends can be tracked, causes identified, and preventive measures taken. Direct comparisons could not be made except between odor-related incidents, which continued to trend downward. Incidents that are considered reportable include, but are not limited to biosolids, lime, or chemical spills; any incident that has potential to cause personal injury, disease or death, or property damage; stakeholder complaints, including odor and health-related complaints; field management problems, low biosolids pH, and equipment or contractor issues. Near misses were tracked as well.

The management review determined that improvements resulted from a combination of more consistent biosolids production practices, better biosolids quality monitoring onsite and offsite, and continuing good communication among land application contractors, regulators, and inspectors.

Year	Total Incidents	Odor-Related Incidents
2009	32	4
2008	36	3
2007	20	5
2006	26	7
2005	31	19

** Note: These data do not include routine requests for information, site visits from stakeholders, or routine visits from state and local officials.*

2009 Reported Offiste Incidents		
Type	**# incids.**	**Description / Comments**
Contractor issues	7	Miscommunication with regulators, zoning regulation issues, personnel not on-site when loads delivered, etc.
Field management problem	4	Application on wet fields, crop restriction conditions of permits, coordinating biosolids land application with other organic sources, etc.
Low biosolids ph	5	Material with low pH that was intercepted in field by inspectors
Odor complaints from the public	3	(Self-explanatory)
Biosolids quality/trash in material	2	Trash in material
Truck & equipment malfunctions/ overturned trailers/vehicle accidents	15	Missing turnbuckles, accidents on public roadways, leaking trailers, etc.
TOTAL	36	

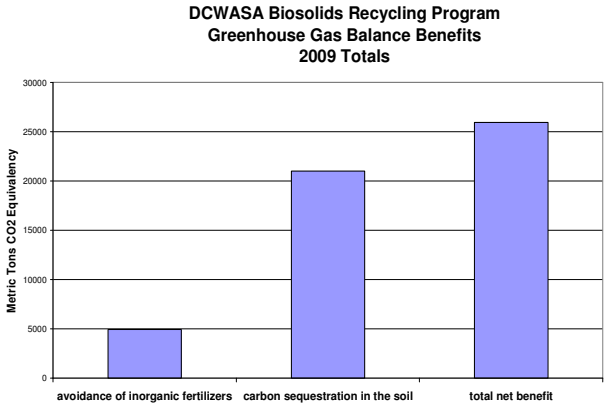
Greenhouse Gas Benefits Rise

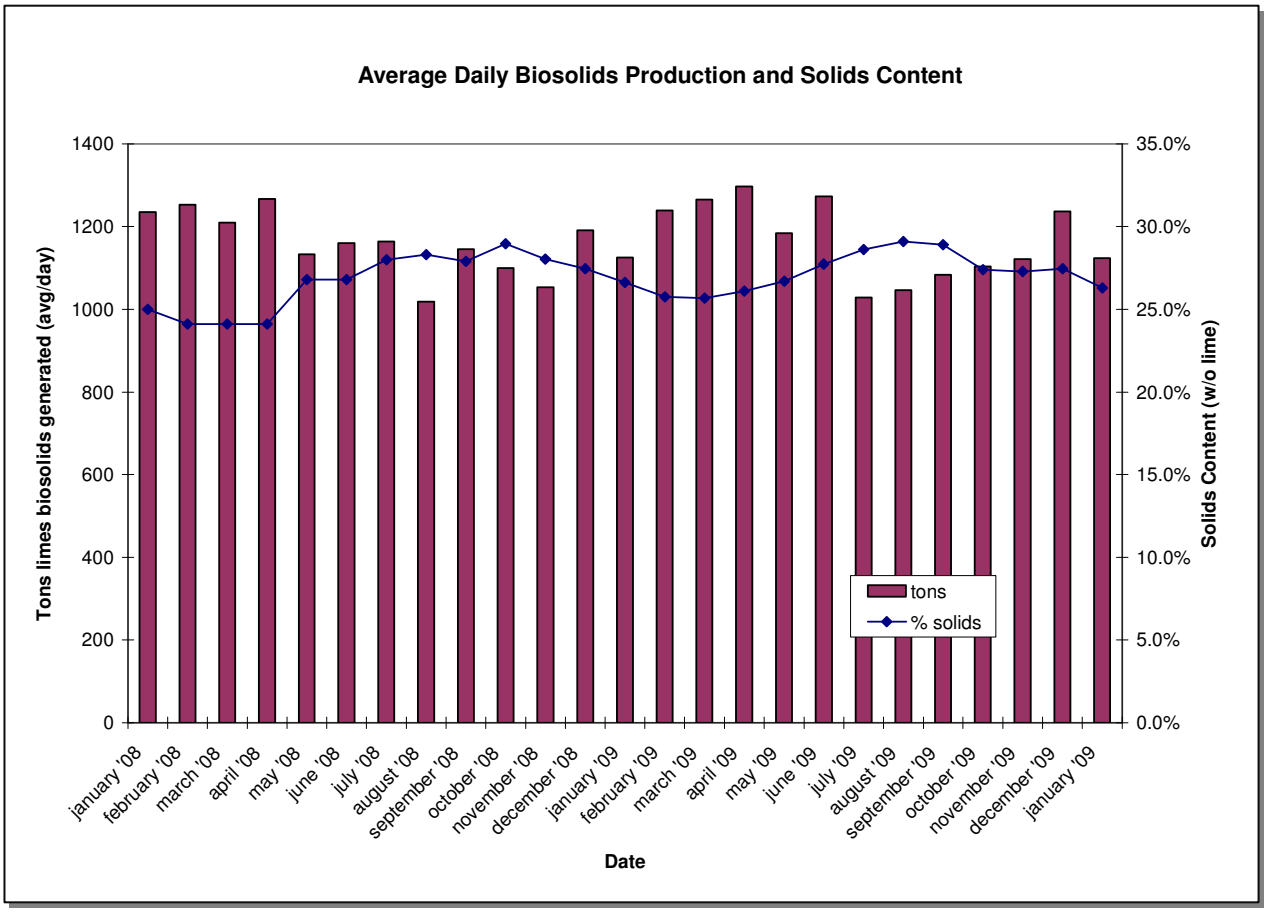
Several factors contributed to continued greenhouse gas (GHG) balance benefits in 2009.

Loading windows for trucks hauling biosolids continued producing efficiencies in truck idle time and lower fuel costs. This was estimated to reduce greenhouse gas emission by 2%, or 335 metric tons of CO_2 equivalent in 2009.

The average cake solids content in biosolids was raised to nearly 29% in 2009, reducing hauling tonnage, which in turn reduced truck emissions. DC Water saved about $1M in hauling costs and reduced GHG emissions by approximately 300 tons.

Biosolids use by farmers promotes carbon sequestration as well. As noted in the charts on this page, total carbon sequestration was approximately 21,000 tons. This combines with approximately 5000 tons from the avoidance of manufactured fertilizer (which requires energy for production) for a total of approximately 26,000 tons CO2 eq avoided emissions.





Operations Improve

Over 2009, the DC Water biosolids program continued to experience consistently high solids quality and improved equipment reliability, attributed in part to an increased partnership between the operations and maintenance staff. Following are some key improvements.

Conveyers – Speeding up one of the lift conveyers by 35 percent reduced adverse impacts on the upstream conveyers by reducing backup. New gear reducers expected to speed them up an additional 30 percent are scheduled for installation in early 2010.

Centrifuges – The Maintenance Department redeveloped the centrifuge dewatering systems to standardize operation and interface systems so all 14 centrifuges – seven Westphalia and seven Sharples – operate with the same controls. Training provided operations staff flexibility in managing the systems.

Lime addition – Supervisors were trained on lime management for consistent lime dosing when granular or emulsion lime is used.

Transportation Handbook – DC Water produced and distributed a biosolids transportation handbook that serves as a readily available reference for biosolids truck drivers, supplementing the training they receive from their companies.

Composting Produces Bounty

DC Water's continuing goal to ensure biosolids can be beneficially used in myriad ways initiated work in early 2008 to create a strong composting program. DC Water produced its first bag of low-odor compost early that year at a small-scale temporary in-vessel composing site at Blue Plains.

In July 2008, DC Water began transporting biosolids to the new McGill Composting Facility in Waverly, VA (Sussex County). This state-of-the-art facility in an enclosed building, with process air sent through a large (one-acre) biofilter for odor control. DC Water sends about 50 wet tons per day (two truckloads) for the facility to produce a Class A compost product.

In 2009, staff planted a demonstration vegetable garden at Blue Plains using DC Water biosolids compost from McGill (see photo below).

Small Scale On-site Composting

DC Water Demonstration Garden

Offsite Storage Ensures Beneficial Reuse Throughout the Year

The state-of-the-art enclosed storage facility in Cumberland VA, along with smaller on-farm storage pads, successfully allowed staff to avoid sending biosolids to the landfill during the winter season of 2009. These facilities, built via agreement by DC Water contractors, ensure that all the biosolids produced at Blue Plains are beneficially reused. The Cumberland facility holds some 30,000 tons of material, and is was near capacity coming out of the 2009 winter.

REGULATORY REPORT

Maryland

Land Application – About 40 percent of DC Water's biosolids come from the Washington Suburban Sanitary Commission (WSSC) and most are land-applied in Virginia. But because of the agency's close relationship with WSSC, and because it land-applies about five percent in Maryland, biosolids regulations in Maryland have potential significant consequences for the biosolids program. Public acceptance can be influenced regulatory actions, which may set a precedent for other states, and cutbacks in potential land application venues reduce end-use options.

Regulations – Through membership on the states' sewage sludge management task force, in 2009, DC Water and WSSC staff participated in the limited opportunities afforded to comment on draft revised regulations being developed by MDE The regulatory revision process as on hold at the end of 2009 and no final action was taken. The 209 pages of regulations have not been updated since 1986.

Legislation – DC Water and WSSC staff also tracked developments in the Maryland General Assembly, which considered legislation in the 2009 session that would have prohibited MDE from issuing a sewage sludge permit unless the application site met all zoning and land use requirements in the counties in which it was located.

Permits – A permit is now needed to haul biosolids from point to point, whereas before, a simple approval letter was needed and land appliers created a procedure for the process.

Virginia

Oversight Transition – In January 2008, as a result of legislation approved by Virginia's General Assembly, oversight of that state's biosolids regulatory program was transferred from the Department of Health (VDH) to the Department of Environmental Quality (DEQ). As part of the transfer, the fee the state charges generators of biosolids land applied in Virginia, increased from $2.50 to $7.50 a dry ton. The revenue was used to pay for up to 18 full-time staff positions DEQ uses to inspect application sites and process application permits.

Staff for DC Water was involved, directly or through the agency's membership on the Biosolids Workgroup of the Virginia Association of Municipal Wastewater Agencies (VAMWA), in communication with DEQ program managers regarding transition issues. These staff coordinated with DC Water's land application contractors to address issues such as processing new or renewed permits for land application in a timely manner

Regulations – During 2009, DEQ began action to formally revise its biosolids use regulations, which it had inherited on a temporary basis from VDH. A staff member from the Metropolitan Washington Council of Governments (MWCOG), which addresses biosolids issues for the Blue Plains Regional Committee, was selected to participate on DEQ's Technical Advisory Committee (TAC) for the regulatory revisions.

RESEARCH

DC Water participated in, directed, and/or funded 10 research projects in 2009. Following is a brief description of major efforts.

Protocols for Carbon Footprinting Launched

In July 2009 DC Water staff helped launch an industry-wide group to look at the protocols used for carbon footprinting at wastewater treatment utilities. This carbon task force expected to propose a standardization of methodology within the industry regarding assumptions used in carbon footprint models. There are several models in use, and there are some divergent views on some of the current assumptions (N2O emissions, biogenic carbon accounting, carbon sequestration, etc.). Group consensus was that the industry would be better served by collaborating on efforts and speaking with one voice on this important issue.

Drought Resistance Study

DC Water staff continued work with Dr. Erik Ervin and Dr. Greg Evanylo from Virginia Tech on research looking at the use of biosolids for drought resistance on agricultural crops. Dr. Ervin has conducted greenhouse trials showing the effect of naturally occurring auxins (essential plant hormones) present in biosolids from degradation of proteins. These auxins promote root growth and help make the plants much more efficient in their use of water, therefore helping crops through stressful conditions such as drought. DC Water supported field trials in 2009.

Antimicrobial and Flame Retardant Study

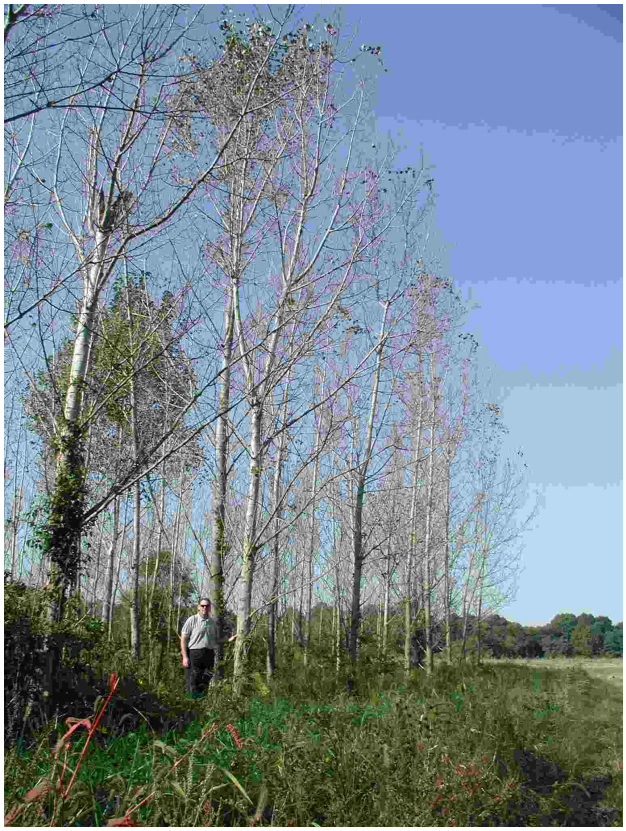
In 2009, staff and invited guests attended a presentation by University of Maryland and USDA researchers concerning progress on a project to examine the fate and transport of constituents of concern in the wastewater treatment process and in land applied biosolids. The DC Water-sponsored work looks at two families of compounds – antimicrobials (triclosan and triclocarban), and flame retardants (polybrominated diphenyl ethers

(PBDE's)). DC Water staff participated in a similar MWCOG conference in 2008.

Work through 2009 included sampling at the treatment plant, on farm fields, and at a demonstration application at the USDA Beltsville, MD farm. Researchers were expected to finish the first phase in of the research in 2009 and publish results in technical journals over the same period.

Tree Density Study

Deep row incorporation of biosolids in tree farm sites at rates of 171 to 294 dry tons per acre using hybrid poplar has been an operational technique on a 100-acre gravel spoil in Maryland since 1984. Developed by ERCO, Inc, this technique involves placing biosolids into trenches that are immediately covered with overburden, eliminating odor problems, and maintaining the biosolids in a fairly stable, anaerobic environment. The site is then planted with hybrid poplar trees, the roots of which provide a natural recycling system that utilizes the nutrients over a six-year period in most cases.



TECHNOLOGY

Planned Anaerobic Digesters Include Sustainable Processes

Anaerobic Digestion Facility

DC Water is preparing to construct a new anaerobic digestion facility at the Blue Plains plant. The digestion process will produce significant quantities of biogas with an estimated content of approximately 60% methane. In addition, the project will result in 180 dry tons per day (dtpd) of digested biosolids.

The plan calls for installing several thermal hydrolysis trains (heat and pressure), four digesters, new dewatering equipment, and a combined heat and power plant. The project is scheduled for completion in 2014.The process should produce power from digester gas to meet more than one third of DC Water's electric demand at Blue Plains and the digestion process will convert to gas nearly half of the biosolids through use of an innovative thermal hydrolysis process (high heat and increased pressure), resulting in lower reuse costs. DC Water may be able to market a substantial portion of the biosolids product as Class A compost, further reducing land application reuse costs.

In April 2009, DC Water staff presented a summary of progress on the DC Water Biosolids Management Plan improvements at the Chesapeake Water Environment Association (CWEA) annual spring meeting in Baltimore. The presentation summarized the status of the digester project

Staff also met with other firms that want to use Blue Plains biosolids as a fuel source for production of green energy. In each case, the firms needed raw and digested material. DC Water staff, interested in diversifying reuse options, said the agency would consider their technologies for a small portion of the material.

Technology Forum Identifies Biosolids-to-Energy Options

On September 17, 2008 DC Water staff, working with the Virginia Biosolids Council helped host a biosolids reuse technology forum in Richmond, VA. The meetings were the result of coordinated efforts to examine the viability of technologies for efficiently extracting energy from biosolids, or using the biosolids in a method other than the traditional agricultural use farmers depend so heavily upon. About 100 attendees at the full-day event heard presentations on gasification, e-fuel manufacturing, drying, incineration, mine reclamation, composting, forest application, sludge-to-oil processes, poplar plantations, and carbon footprinting.

The full summary report is available on the VBC website (http://www.virginiabiosolids.com/news/biosolids_forum.htm) was shared with the VA DEQ Biosolids Expert Panel to help address the task of looking at evaluating alternative technologies.

Sharing Results from Research on Emerging Compounds of Concern

In April 2009, DC Water staff and invited guests attended a presentation by U of Maryland and USDA researchers concerning progress on a DC Water sponsored project to examine the fate and transport of constituents of concern in the wastewater treatment process and in land applied biosolids. The DC Water sponsored work looks at two families of compounds – antimicrobials (triclosan and triclocarban), and flame retardants (polybrominated diphenyl ethers (PBDE's)). Work to date includes sampling at the treatment plant, on farm fields, and at a demonstration application at the USDA Beltsville farm. Researchers will finish the first phase in the next year and will publish results in technical journals over the same period.

PUBLIC ACCEPTANCE

Campbell County, VA

During 2009, land application continued without incident in Campbell County Virginia. On August 14, 2008, the first biosolids from Blue Plains were land-applied in Campbell County, VA. Campbell County farmers have long wanted biosolids, but a vocal minority in the county protested the permit approval process. DC Water staff attended several evening meetings since 1995, and opened a line of communication directly to the county officials, offering information and resources. Inspectors from Maryland Environmental Services (MES) were instrumental in building a level of trust and understanding with the county officials, having made visits to the county offices and taking officials to land application sites in adjoining counties. The first application was witnessed by four VA DEQ officials, four VA VDH officials, and four Campbell County staff, along with representatives of Nutriblend, DC Water, MES, Urban Service Systems, two print reporters, and a TV crew.

The stories that came out of the day were balanced and positive, such as this one: http://www.newsadvance.com/lna/news/local/article/campbell_countys_sludge_spread/7434/

2009 Ag Expo Shows Strong Biosolids Support

MES staff, which ran the DC Water booth, reported that there was 100% positive feedback, likely due to an improved biosolids with reduce odors, our contractors are doing a very good job, and the material worth approximately $300/acre to the farmers in reduced fertilizer costs.

Recyc Systems, one of DC Water's biosolids transportation and land-application contractors, participated in the 2009 Virginia Ag Expo, the largest annual field day event held in the state. The expo highlights science-based approaches to farming and includes test crop demonstrations. The Expo is a joint project of the Virginia Corn Growers Association, the Virginia Soybean Association, and the Virginia Cooperative Extension Service.

Armenian Delegation on Recycling Hosted

Staff hosted an Armenian delegation which came to DC to examine issues related to large scale recycling efforts. The League of Women Voters arranged for the delegation to visit Blue Plains for a tour and a presentation on the biosolids recycling program. The delegate group included public officials and municipal workers.

Contractor Training Continues

This past month, staff continued an effort to train the biosolids contractors on issues surrounding the biosolids program, with a stop at the Culpeper, VA offices of Recyc Systems. This training includes review of Environmental Management System (EMS) principles, research efforts, safety and efficiency initiatives, and goals. The contractors were given literature, along with items for daily use that will remind them of the program goals – preserving agriculture and protecting the Chesapeake Bay. The attendees included field, management, and office personnel.

Communication Protocol Begun

DC Water biosolids staff participated in a research conference call with the Water Environment Research Foundation (WERF) to discuss better ways to communicate the risks associated with land application of biosolids to the affected public. WERF was looking for a location to pilot-test a communications protocol and at the end of 2009, DC Water was considering using some of the sites it land applies to in Virginia as a location to test this pilot protocol.

Public Acceptance Program Presented at Conference

In 2009, DC Water staff presented a paper entitled *Biosolids in Virginia – Current Status: Why and How*, at the Northeast Biosolids Recycling Association (NEBRA)/ New England Water Environment Association (NEWEA) annual biosolids conference in North Haven, CT. The paper outlined the level of public acceptance in Virginia in about 2002, and compared it to the current status, which is significantly better. The presentation also covered DC Water's help in forming the Virginia Biosolids Council, and the effectiveness of the agency's EMS in building trust with the regulators and with the public.

NBP EMS Program Improvements Addressed

DC Water representatives participated in a Water Environment Federation (WEF) Environmental Management System (EMS) workgroup panel to discuss potential changes to the National Biosolids Partnership program, with the intent of helping form a more sustainable group that is able to encourage agencies toward certification in the future. The workgroup is made up of personnel from National Biosolids Partnership (NBP) certified agencies.

DC Water

Vision – Provide world-class water and wastewater services as a leading steward of the environment.

Mission – Serve all of its customers with outstanding service by providing reliable and cost-effective water and wastewater services in accordance with best practices.

Biosolids Management Program

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.