



National Biosolids Partnership

Biosolids Management Program

Interim Audit Report

**District of Columbia Water & Sewer Authority
Washington, DC**

Audit Dates: March 8 to 10, 2016

Audit Conducted By: DEKRA Certification, Inc. (North Wales, PA)

Audit Team: Mr. Jon Shaver, Biosolids EMS Lead Auditor

Report Written By: Mr. Jon Shaver, DEKRA Certification, Inc.

Report Date: Final report June 3, 2016

Reviewed By: Mr. Bill Brower, DCWater (June 2, 2016)

Report Approved By: Ms. Michelle Hunn, DEKRA Certification (June 6, 2016)

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1. EXECUTIVE SUMMARY

DEKRA Certification, Inc. (DEKRA) conducted an independent audit of the Biosolids Management Program (BMP) being used by the District of Columbia Water and Sewer Authority (DC Water) in Washington, DC. The audit was conducted at DC Water's request March 8 - 10, 2016, as part of DC Water's participation in the National Biosolids Partnership (NBP) Biosolids Management Program (BMP). The audit was an interim audit (#3-2), as required for continuing NBP Certification, following DEKRA's Verification of the DC Water BMP in November 2014.

Audit Purposes

The purposes of this audit were to verify the DC Water BMP:

- Is functioning effectively and generating desired outcomes
- Continues to meet NBP expectations and requirements, with practices and procedures being performed as documented.

The audit scope covered parts of DC Water's BMP, including activities within its biosolids value chain, consistent with NBP requirements and the agreed Interim Audits Program.

Audit Findings and Conclusions

The DC Water BMP is generating positive outcomes. Five nonconformances with respect to the audit criteria were found during this audit. DEKRA's Lead Auditor has approved corrective action plans for those nonconformances. All nonconformances from DEKRA's previous audit (November 2014) are now closed.

Based on the results of this audit, DEKRA has verified that the DC Water Biosolids Management Program is:

- Functioning as documented and meets NBP expectations and requirements with minor exceptions.
- Generating positive outcomes in the areas of regulatory compliance, environmental performance, quality practices, and relations with interested parties.

DEKRA recommends continuing NBP "Platinum Certification" of the DC Water Biosolids Management Program.

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2. AUDIT DETAILS

2A. Agency Information

Agency Detail

Agency Name: DC Water

Address: 5000 Overlook Avenue SW, Washington, DC

Biosolids Preparation Location: Blue Plains Advanced Resource Recovery Facility, Washington DC

Number of Employees (approximate): 450

Volume of Wastewater Treated (approximate): average flow 300 MGD (design 350 MGD)

Tons of Biosolids Produced (approximate): approx 500 tons per day (wet)

DC Water Biosolids Program

DC Water's biosolids program includes a series of processes used in managing biosolids quality, compliance with legal and other requirements, relations with interested parties, and environmental performance throughout its biosolids value chain. That value chain includes pretreatment, wastewater treatment, solids generation, and dewatering, plus transportation and various uses. Class A biosolids from the Blue Plains facility is transported to off-site use locations, including land application (agriculture), silviculture, forestry, land restoration, urban and alternate daily cover. Qualified contractors transport the product and apply it at the end use sites.

2B. DEKRA Audit Team

DEKRA Certification, Inc. conducted this audit. DEKRA is an accredited third party audit company within the NBP BMP. Mr. Jon Shaver led the audit on behalf of DEKRA. Mr. Shaver is certified by NBP as a Biosolids EMS Lead Auditor and Biosolids Auditor. DEKRA asserts that its firm and auditor each have an independent and impartial relationship with DC Water that meets NBP criteria for third party audit companies and auditors.

2C. Audit Criteria and Scope

Audit Criteria

Requirements stipulated in the NBP BMP Elements (July 2011) and the DC Water BMP Manual were used as criteria for this audit.

Audit Scope

The scope of this audit covered parts of the DC Water biosolids program, with special attention to practices and management activities that directly support biosolids-related operations, processes, and activities. The audit covered topics consistent with NBP requirements for interim audits, the interim audits program previously agreed to by DEKRA and DC Water, and the Scope of Work for this audit agreed by DC Water and DEKRA.

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1. Continuing Biosolids Management Dynamics
2. Process Audits:
 - BMP Planning Processes
 - Compliance (with legal & other requirements)
 - Critical Control Points & Operational Controls
 - Public Participation in Planning
 - BMP Checking & Improvement Processes
 - Corrective and Preventive Action
 - Internal Audits Program
 - Management Review
 - Biosolids Preparation Processes
 - Pretreatment
 - Biosolids Stabilization and Conditioning
 - Energy Management
 - Biosolids Use / Disposition Processes
 - Control of Contractors
3. Examination of Outcomes (compliance with legal requirements, environmental performance, quality practices, relations with interested parties)
4. Verify effective corrective action for nonconformances from previous DEKRA audits (November 2014)

2D. Audit Methodology

The audit was conducted by interviewing key personnel with biosolids responsibilities, observing practices in place, and reviewing pertinent documents and records. Interested parties were interviewed and transaction tests were performed to verify management system effectiveness. It was performed in a manner that is consistent with the NBP Auditor Guidance. Standard audit sampling techniques were used. This audit was conducted as a systems audit and is not a verification of compliance with any legal requirements applicable to practices performed by the agency or its contractors.

Interested Parties Interviewed

Ms. Kama Allen – public interested party
Mr. Buddy Fowler – member Virginia House of Delegates (55th District)
Ms. Kelly Johnson – auditor – RSMUS LLP

2E. Definitions of Audit Findings and Required Corrective Action

Major Nonconformance – a serious omission from requirements and/or other departure that represents, or could cause, a systemic failure, or the existence of multiple related minor nonconformances, or failure to effectively correct a nonconformance in a timely manner. For verification to proceed, correction of major nonconformances must be verified by a third party audit within 90 days.

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Minor Nonconformance – an isolated departure from requirements that does not represent a systemic failure. Minor nonconformances require timely and effective correction by the agency and verification by a third party auditor during the next third party audit.

Opportunity (for improvement) – a possible improvement in the organization’s program for managing biosolids based on auditor observations. There is no obligation for action in response to these observations.

2F. Reference Materials

The following documents were used as references during this audit:

- DC Water BMP Manual (current version)
- NBP “BMP Elements” (July 2011)
- NBP Third Party Auditor Guidance (August 2011)
- NBP Code of Good Practice
- NBP Manual of Good Practice

2G. Additional Information

Further information about this audit and/or the National Biosolids Partnership Biosolids Management Program can be obtained from DC Water. Contact Mr. Chris Peot, DC Water Director of Resource Recovery (e-mail: Christopher.Peot@dcwater.com).

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3. SUMMARY OF AUDIT RESULTS

As part of this audit, DEKRA reviewed the dynamics of the DC Water Biosolids Management Program (BMP) and audited representative processes for BMP Planning, Implementation, Checking and Improving and Biosolids Preparation. The DC Water BMP meets NBP expectations and requirements, with five minor nonconformances. Review of corrective action for nonconformances found in DEKRA's previous audit closed all previous nonconformances.

3A. Verification Conclusion

Based on the results of this audit, DEKRA has verified that the DC Water BMP continues to meet NBP expectations and requirements, with minor exceptions. We recommend continuing certification within the NBP Biosolids Management Program.

3B. Use of NBP Certification and DEKRA Verification

Use of and references to NBP Certificate and DEKRA Verifications were reviewed. There were no concerns.

3C. Appeals

The NBP provides an appeals process for biosolids organizations and interested parties that disagree with the findings of a third party BMP audit. The verification appeals process involves an Appeals Board; representing a balance of biosolids management interested parties, including an environmental advocacy group, and wastewater industry professionals. An appeal must be submitted within 30 days of the official verification decision or interim audit decision by the audit company. Information about the appeals process is available from NBP by contacting Ms. Lisa McFadden at lmcfadden@wef.org.

3D. Agreements

DC Water will prepare and implement approved Corrective Action Plans (including root cause & planned action) for each nonconformance. Dekra will verify the effectiveness of the completed corrective actions at the next Third Party Audit.

DC Water and DEKRA have agreed that the next interim audit of the DC Water BMP will occur in November 2016. That audit will be Interim Audit #2 in the current Certification Cycle. A Reverification Audit is due in 2019.

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4. DETAILED AUDIT RESULTS

The following outlines results of DEKRA's audit of the DC Water Biosolids Management Program and the level of conformance with applicable requirements of the NBP BMP Elements.

4A. Biosolids Management Dynamics Review

Review of the management system dynamics and outcomes is intended to verify that the biosolids management system is functioning effectively and generating positive outcomes (results) and that changes are being incorporated into the system. The following summarizes DEKRA's review of the dynamics of the DC Water Biosolids Management Program.

Significant Changes

The Thermal Hydrolysis process has been operating for about 1 year with excellent results (see "Outcomes").

A marketing program for DC Water biosolids focused on the "Bloom" trademark is working effectively. Biosolids use as Alternative Daily Cover in landfills has begun successfully.

The previous Asst General Manager retired and Aklile Testfaye has been promoted to Assist GM. A new COO has also been appointed.

BMP Documentation

The BMP Manual, top-level documentation and major processes within the Biosolids Management Program were reviewed. There were no structurally significant revisions. The manual is consistent with NBP requirements.

BMP Policy

The DC Water Biosolids Policy remains as approved by the Board of Directors in 2013. The policy continues to include a commitment to follow the principles of NBP's Code of Good Practice. Discussion of the suitability of the current Policy suggested that it could be revised to reflect new principles for the DC Water biosolids plans (see "Opportunities").

Communications Program

The Communications Program continues as a top priority, with several proactive communications to the public and opportunities for interested parties to provide input. The Communications Program is functioning effectively.

Goals and Objectives

Goals and objectives for the biosolids program are directly related to Strategic Focus areas for the District and are monitored through regular management meetings. All biosolids-related objectives were achieved in 2015. The Goals and Objectives process is functioning effectively, except as noted in Minor Nonconformance 16-04.

Internal Audits

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Internal audits were conducted in November 2014 and December 2015. Findings from these audits are addressed by the BMP Workgroup. The Internal Audit process is functioning effectively.

Corrective & Preventive Action

The Corrective and Preventive Action process is being used to address internal and external audit findings. The Corrective and Preventive Action process is functioning effectively.

Management Reviews

Workgroup meetings held monthly are used to monitor and evaluate ongoing BMP performance. Reports to the General Manager, at least quarterly, are used to assess overall BMP suitability and effectiveness. The Management Review process is functioning effectively.

4B. Process Audit Results

DEKRA audited the following processes that DC Water uses within its biosolids management program. The level of conformance of each process with NBP expectations and requirements is summarized in the following table. It should be noted that interim audits intentionally cover only parts of the DC Water Biosolids Management Program, as prescribed by NBP requirements.

Process	Key BMP Elements*	Conformance with Applicable BMP Elements
Biosolids Preparation	3, 8, 10, 13	Conforms
Compliance (with legal & other requirements)	4,14	Conforms
Control of Contractors	Applicable part of 1,2,3,7,8,9,10,11,12,16	Conforms
Corrective and Preventive Action	14	Conforms
Critical Control Points & Operational Controls	3,10	Conforms, except as noted in Nonconformance 16-02 & 16-03
Internal Audits	16, 14	Conforms
Management Review	17	Conforms, except as noted in Nonconformance 16-05
Pretreatment	3, 8, 10, 13	Conforms
BMP Planning (including Public Participation)	2,6,7	Conforms

* BMP Elements are shown to demonstrate which NBP BMP Elements were included in this audit.

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4C. Nonconformances

All nonconformances from previous DEKRA audits have been effectively corrected. During this audit, DEKRA found 5 nonconformances with respect to requirements of the audit criteria, as outlined below.

Minor Nonconformance JS/16-01/2 The DCWater BMP Manual (1.3) requires annual review of the Biosolids Policy by the Workgroup. There is no evidence that the Biosolids Policy has been reviewed in at least the past two years.

Minor Nonconformance JS/16-02/3 NBP BMP Element 3 requires the organization to identify and document critical control points of biosolids management activities throughout the biosolids value chain and identify environmental impacts at each critical control point. NBP's definition of critical control points says they are used to ensure biosolids activities meet legal, quality, and public acceptance requirements and do not have undesirable environmental impacts. The table DCWater uses to identify critical control points for biosolids activities (10/21/09 v5) does not clearly reference or address risks associated with environmental impacts, biosolids quality and public acceptance.

Minor Nonconformance JS/16-03/3 NBP BMP Element 3 requires identification of the organization's critical control points be kept up to date. The table identifying critical control points and related operational controls has not been updated to include digesters, thermal hydrolysis and dewatering operations added in the past year.

Minor Nonconformance JS/16-04/5 NBP BMP Element 5 requires the organization to establish and periodically review measurable biosolids program goals and objectives for its biosolids management activities. Five of eight biosolids "goals" (for improvement) for 2016 are not sufficiently measurable (e.g. "further develop Bloom brand name and web-page", "work with WEF to promote Resource Recovery").

Minor Nonconformance JS/16-05/17 NBP BMP Element 17 requires the organization's management review the BMP and its performance relative to policy commitments, goals, objectives, and established performance measures to ensure its continuing suitability, adequacy, and effectiveness and to document the management reviews. Management reviews are conducted as Workgroup meetings and discussions with the General Manager. Records are not available to demonstrate that policy, BMP performance, progress to goals & objectives are discussed as part of the review of BMP effectiveness.

4D. Review of Previous Nonconformances

DEKRA reviewed completed corrective actions for nonconformances found in previous third party audits. Four previous nonconformances remained open from DEKRA's audit in 2014. All of those nonconformances are now closed as described below.

Minor Nonconformance JS/14-01/12 NBP BMP Element 12 requires the organization to control its BMP documents. The BMP procedure for controlling documents states that controlling documents requires "periodic review" and approval by an "authorized person". There is no statement of what periodic review means for documents (e.g. SOPs) or who is authorized to approve specific documents.

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Corrective Action: DC Water determined that this nonconformance was caused by omission in the BMP Manual. As a result, DC Water modified the BMP Manual to include language defining “periodic review” and “authorized person. Evidence of completion of this action was reviewed and the action was found to have effectively corrected the problem and eliminated the cause of the nonconformance. This nonconformance is now closed.

Minor Nonconformance JS/14-02/14 NBP BMP Element 14 requires the organization to develop and implement a procedure to investigate any noncompliance with applicable regulatory requirements. A noncompliance in land application observed in 2012 (unpermitted field site) was not addressed using a BMP Corrective and Preventive Action procedure.

Corrective Action: DC Water determined that this nonconformance was caused by incomplete recordkeeping. As a result, DC Water developed a table to contain incidents, impact, actions, and resolution and recorded the incident noted. Evidence of completion of this action was reviewed and the action was found to have effectively corrected the problem and eliminated the cause of the nonconformance. This nonconformance is now closed.

Minor Nonconformance JS/14-03/14 NBP BMP Element 14 requires the organization to track progress in completing corrective actions for findings from third party audits. The newly developed corrective action tracking procedure was not used to track completion of corrective actions for minor nonconformance JS/13-02/16 from the third party audit in 2013.

Corrective Action: DC Water determined that this nonconformance was caused by lack of documentation for completed action. As a result, DC Water developed a table to contain incidents, impact, actions, and resolution. Evidence of completion of this action was reviewed and the action was found to have effectively corrected the problem and eliminated the cause of the nonconformance. This nonconformance is now closed.

Minor Nonconformance JS/14-04/16 NBP BMP Element 16 requires the organization to establish and maintain an internal audit program to periodically analyze its BMP and to have its audit schedule approved by the third-party auditor. An internal audit was conducted in November 2014, but prior to that an internal audit had not been conducted since October 2012. The internal audit process is not being used effectively to analyze the BMP and the third party auditor has not been involved in the internal audit schedule.

Corrective Action: DC Water determined that this nonconformance was caused by lack of resources. As a result, DC Water developed a system allow splitting internal audits into 4 quarters of the year, with a member of the BWG assigned to one of these quarters. Evidence of completion of this action was reviewed and the action was found to have effectively corrected the problem and eliminated the cause of the nonconformance. This nonconformance is now closed.

4E. Opportunities for Improvement

The following “opportunities” for improving the DC Water BMP were noted during the audit. Opportunities do not represent nonconformances and DC Water has no obligation to take any action in response to them.

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- The DCWater Mission, Vision and Values statements on the DCWater Strategic Plan Framework are different than those stated in the BMP Manual. Consider ensuring consistent documentation for these fundamental directions.
- The BMP Manual could more clearly reflect and discuss the management system approach to managing the biosolids program. Also, references to Wastewater Treatment plant in the BMP Manual could be updated to Resource Recovery.
- The Biosolids Policy is currently a reproduction of the NBP Code of Good Practice. Consider making this Policy more memorable and better reflect current DCWater intents so it can be better understood by employees, contractors and the public. Note – commitment to follow the Code of Good Practice still necessary.
- Consider 3X rule for determining carbon footprint for reducing electric energy from producers.
- A three year plan for internal audits of various processes within the BMP could be developed and used for improving the effectiveness of internal audits.
- Consider asking MES to perform regular audits of contractor performance in meeting EMS requirements and including these as part of internal audits.
- Corrective action records are fragmented and found in multiple locations. Using a single database for all CAPAs will make accessing the actions easier & allow for trend analysis.

4F. Examination of Outcomes

DC Water's management of its biosolids program is improving through the use of a systematic approach to managing their biosolids activities. The BMP has helped achieve the following improvement outcomes within the past two years:

Biosolids Quality

Class A biosolids produced at Blue Plains now certified for land application in Virginia and a draft certification is underway for distribution and marketing in Maryland.

Public Acceptance

Urban use of DC Water biosolids continues to increase. Product is now also used in school gardens, with "plenty of open information about the product" in advance.

Marketing of trademarked "Bloom" product in urban and suburban areas allows local use of biosolids, is estimated to generate revenue and/or saving cost of about \$1MM/year.

Environmental Impacts

Lime dosage on biosolids prepared at the Blue Plains plant has been eliminated, meaning lower costs and reduced risk of excessive lime on fields where biosolids are land applied.

The addition of thermal hydrolysis and anaerobic digesters has reduced requirements for external energy from the grid by approximately 10 megawatts.

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APPENDICES

List of Participants

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

DC Water Personnel

Cynthia Bland	OMAP Training Coordinator
Bill Bower	Manager, Biosolids Operations
Ayodele McClenney	Director - Department of Occupational Safety and Health
Chris Peot	Director, Resource Recovery
Mark Ramirez	Biosolids Engineer
Elaine Wilson	Pretreatment Manager

Contractors

None

Interested Parties

Ms. Kama Allen – public interested party
Mr. Buddy Fowler – member Virginia House of Delegates (55th District)
Ms. Kelly Johnson – auditor – RSMUS LLP

Documentation / Objective Evidence Reviewed

Biosolids Program Manual (May 2015)
BMP 5.5 – Management Review procedure
Cornerstone events management tool
Critical control point & operational controls table
E-mail exchanges with interested parties (various)
Incident report & corrective action 11/26/14
Internal audit report 10/10/12
Internal audit report November 2014
MDE audit report 3/25/15
MPT training plan 2/29/16
Operational CAPAs (various)
Resource Recovery presentation
Strategic Plan Framework
Workgroup goals 2016, 2015
Workgroup meeting records (monthly 2015)

END OF REPORT