



**National Biosolids Partnership
Biosolids Management Program
Interim Audit**

**City of Raleigh Public Utilities Department
Neuse River Resource Recovery Facility
Raleigh, North Carolina**

Audit Dates: January 26-29, 2016

Audit Conducted By: DEKRA Certification, Inc.

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

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

Report Date: March 31, 2016

Reviewed By: Emily Fentress & Marti Gibson, Neuse River Resource Recovery Facility

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1. EXECUTIVE SUMMARY

DEKRA Certification, Inc. (DEKRA) conducted an independent third party audit of the environmental management system (EMS) being used by the City of Raleigh Public Utilities Department (CORPUD) in managing its biosolids program. The audit was conducted at CORPUD's request January 26 to 29, 2016 as part of an integrated audit covering requirements of ISO-14001:2004 and the National Biosolids Partnership (NBP) BMP Elements. The audit was an Interim Audit within the NBP Biosolids Management Program for Certification by NBP.

Audit Purposes

This Interim Audit was conducted to:

- Confirm that the CORPUD biosolids management program is functioning effectively, with practices and procedures being performed as documented.
- Verify that the biosolids management program being used by CORPUD meets National Biosolids Partnership (NBP) expectations and conforms with requirements of the NBP BMP Elements.
- Examine outcomes CORPUD is achieving by using a systematic approach for managing its biosolids program.
- Verify the effectiveness of corrective action taken in response to open nonconformances from previous third party audits.

Summary of Audit Activities and Results

DEKRA reviewed CORPUD's Biosolids Management Program and audited that program for conformance with expectations and requirements of the NBP Biosolids Management Program Elements (audit criteria). The audit scope was consistent with NBP requirements, as stated in the NBP Auditor Guidance (2011).

No major nonconformances and two minor nonconformances with respect to the audit criteria were found during this audit. CORPUD has developed corrective action plans to address the nonconformance that have been approved by DEKRA's Lead Auditor. DEKRA will review the effectiveness of the completed corrective actions during the next third party audit.

Audit Conclusions

Based on the results of this audit, DEKRA has determined that:

- Use of a management system approach is generating positive outcomes for CORPUD's biosolids program in the areas of regulatory compliance, environmental performance, quality practices and relations with interested parties.
- CORPUD biosolids practices are consistent with NBP expectations and meet requirements of the NBP BMP Elements, with minor exceptions.
- All nonconformances from prior DEKRA audits have been effectively corrected.

This audit has verified that the CORPUD biosolids management program meets NBP expectations and requirements and we recommend continuing Certification within NBP Biosolids Management Program.

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2. AUDIT DETAILS

2A. Local Agency Details

Agency Name: City of Raleigh Public Utilities Department (referred to as CORPUD in this report)

Facility: Neuse River Resource Recovery Facility (NRRRF), Battle Bridge Road Raleigh NC

Number of Employees: 105

Volume of Wastewater Treated: 40 MGD (average); capacity 60 MGD

Biosolids Produced: 16,000 dry tons per year (total Class A + B)

Biosolids Use Options: agriculture land application (Class A and Class B), composting (dewatered sludge)

CORPUD Biosolids Program

CORPUD's Biosolids Program includes defined processes for Pretreatment, Wastewater Treatment, Solids Dewatering, Biosolids Storage and Transportation and Biosolids Use. CORPUD manages their biosolids program using a management system approach based on its Environmental Management System (EMS).

Contractors Participating in Audit

McGill Environmental

Interested Parties Interviewed

The following interested parties were interviewed to verify the effectiveness of the Communications, Public Participation and Compliance processes.

Tim Site - Chair, Southeast Citizens Advisory Committee

Rick Bolick – Assistant Supervisor NCDEQ, Division Wastewater Resources

Sean Fallon – Business Development Manager, McGill Environmental

Steve Cockman – EHS Manager, McGill Environmental

2B. Audit Criteria

The CORPUD biosolids program activities were assessed against requirement of the NBP BMP Elements (July 2011) and the CORPUD EMS.

2C. Audit Team

CORPUD authorized DEKRA Certification Inc. to conduct this Third Party Audit of their biosolids program. DEKRA is an accredited Third Party Audit Company within the NBP Biosolids Management Program. 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 and the auditor assigned to this audit have an independent relationship with CORPUD that meets NBP criteria for Third Party Auditors.

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2D. Audit Scope and Locations

The audit was consistent with NBP requirements for Interim Audits and the Scope of Work agreed by CORPUD and DEKRA. It was conducted as an integrated audit covering requirements of ISO-14001:2004 and the NBP BMP Elements (July 2011), with special attention to practices and management activities that directly support biosolids-related operations, processes and activities.

The audit scope included the following:

1. Continual Environmental Management Dynamics, including:
 - Significant changes affecting the EMS
 - Status of environmental aspects and objectives
 - Environmental and Biosolids Policy commitments
 - Effectiveness of corrective action, management review processes
 - Internal audits (and resulting corrective actions)
 - Examination of outcomes
2. Process Audits (ISO-14001 + BMP)
 - Biosolids Use – Compost
 - Communications (internal & external)
 - Competence, Awareness & Training
 - Emergency Preparedness
 - Hazardous Chemicals Storage, Handling & Distribution
 - Maintenance
 - Product & Process Design & Development
 - Wastewater Treatment & Effluent Discharge

Notes:

- Transactions were tested to verify the continuing health of the EMS
 - Interested party interviews were conducted to verify the effectiveness of the Communications Program and should include interviews with regulators and other persons who have expressed an interest (or complaints) about the biosolids program.
3. Examination of outcomes being achieved in the areas of regulatory compliance, interested party relations, environmental performance and quality practices.

2E. Audit Methodology

The audit was conducted by qualified auditors following guidelines stated in the NBP Auditor Guidance (August 2011). The auditor observed practices in place, interviewed key persons and reviewed pertinent documents and records using sampling techniques to assess the systematic performance of the process being audited and the consistency of biosolids management practices with written procedures. This audit is not a verification of compliance with any legal requirements applicable to biosolids practices performed by the agency or its contractors.

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2F. Reference Materials

The following documents were used as references during this audit:

- CORPUD EMS Manual (August 2011)
- National Biosolids Partnership “BMP Elements” (July 2011)
- National Biosolids Partnership Biosolids EMS Third Party Auditor Guidance (August 2011)
- National Biosolids Partnership Code of Good Practice
- National Biosolids Partnership Manual of Good Practice

2G. Definitions of Audit Findings & Required Corrective Action

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

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 the third party auditor during the next third party audit.

Opportunity (for improvement) – a possible improvement in the management system based on audit observations. There is no obligation for action in response to these observations.

2H. Additional Information

Further information about this audit and/or the National Biosolids Partnership BMP can be obtained from City of Raleigh Public Utilities Department by contacting Ms. Marti Gibson at Marti.Gibson@raleighnc.gov.

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3. SUMMARY OF AUDIT RESULTS

3A. Verification Conclusion

Based on results of this audit, DEKRA has verified that the CORPUD biosolids management system is functioning effectively and meets NBP expectations and requirements of the NBP BMP Elements, with minor exceptions. We recommend continued Certification within the NBP Biosolids Management Program.

3B. Strengths Observed

During this audit, DEKRA noted the following strengths in the CORPUD biosolids management system.

- Members of the EMS Team work well together and provide an excellent way to understand, communicate and improve the management system.

3C. Audit Findings – Nonconformances

The following minor nonconformance was identified during the audit. CORPUD has prepared corrective action plans for each nonconformance and those plans have been approved by the Lead Auditor. Verification of effective corrective action will occur during the next DEKRA audit at NRRRF. Numbering may not be consecutive since nonconformities that relate to ISO-14001 only are not included.

Minor Nonconformance 16-01 NBP Element 11 requires the organization to establish, implement and maintain a procedure(s) to identify potential emergency situations and potential accidents that can have an impact(s) on the environment and how it will respond to them. The NRRRF Emergency Response Plan (9/2015) addresses several emergency situations, but does not specifically discuss potential environmental impacts or response to them (e.g. effluent discharge, biosolids land application).

Minor Nonconformance 16-02 NBP BMP Element 14 requires the organization to establish procedure(s) for investigating nonconformities, determining their cause(s) and taking actions in order to avoid their recurrence. Corrective actions stated on the CAPA records dated 10/13/15 and 7/9/15 do not clearly state action that addresses the problem cause identified on the CAPA form.

3D. Opportunities for Improvement

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

- Consider ensuring the conclusions from internal audits are stated with a direct relationship to the stated purpose(s) of the audit.
- The problem that resulted in several loads of biosolids being sent to landfill (in conflict with beneficial reuse goal) could have been handled and recorded using the Corrective Action process to address management system improvements to avoid recurrence.

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- Recommendations for improvement determined during Management Reviews could include a defined action rather than only a suggestion and include responsibility and timing.
- Using a “Supplier Corrective Action Request” (SCAR) could help in encouraging and requiring contractors to correct and improve performance deficiencies.
- The “Environmental Policy Statement and Acknowledgement” used for communicating requirements to contractors could be less general about the EMS and more specific about requirements / expectations.
- Inspections of biosolids contractor operations could more specifically assess performance in meeting specific requirements for contractors noted in the NBP BMP Elements.

3E. Appeals

The NBP provides an appeals process for biosolids organizations and interested parties that disagree with the findings of a third party EMS audit. The 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 date of this audit report. Information about the appeals process is available from the National Biosolids Partnership. Contact Ms. Lisa McFadden at lmcfadden@wef.org.

3F. Agreements / Next Steps

CORPUD will 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.

The next DEKRA audit of the biosolids program at NRRRF will be a Reverification Audit in January 2017. It will be conducted as an integrated audit covering requirements of the NBP BMP Elements and ISO-14001:2015.

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4. DETAILED AUDIT RESULTS

The following outlines results of DEKRA's audit of processes used in managing the CORPUD biosolids 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 CORPUD Biosolids Management Program.

Significant Changes

No significant changes have occurred in the past year affecting the CORPUD biosolids program.

BMP Documentation

The EMS Manual, top-level documentation and major processes within the biosolids management system were reviewed. There were no structurally significant revisions. The manual is consistent with requirements of the NBP BMP Elements.

BMP Policy

The CORPUD Environmental Management Policy was updated in 2015 (11/12/15) to include ISO-14001 requirements that apply to the full site EMS. The Policy includes a commitment to follow the principles of the NBP Code of Good Practice. During this Interim Audit, DEKRA's Lead Auditor reviewed performance of CORPUD biosolids program and found biosolids activities to be consistent with commitments made in the Policy and the principles of NBP's Code of Good Practice.

External Communications and Outreach

CORPUD involved interested parties in its biosolids program through proactive external communication, including stakeholder meetings, customer appreciation day and timely response to inquiries. Interested parties interviewed during the audit confirmed the communication channels are in place and that CORPUD is responsive.

Effectiveness Review - Goals and Objectives Process

CORPUD achieved all 2015 objectives set for improving the performance of its biosolids program. Objectives were updated for 2016. The goals and objectives process is functioning effectively.

Internal Audits

Internal audits were conducted **8/7/15**, **4/27/15**. Findings were addressed using the corrective action process. The Internal Audit process is functioning effectively.

Corrective & Preventive Action

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

Management Reviews

The EMS Team meets as required to address biosolids program performance and to plan ongoing improvements. Informal discussions occur between team members related to environmental performance and operational improvements. The Management Review process is functioning effectively.

4B Examination of Outcomes

The CORPUD biosolids program is improving using their management system. The following outcomes within the past two years were confirmed.

Environmental Performance

Automated chemical dosing at 12 pump stations had led to 10% reduction in chemical use and improved odor & corrosion control (measurable decrease in sulfides & nitrates in downstream outfall manholes).

Electric energy consumption has decreased from \$196/MGD in 2013 to \$176/MGD in 2015.

Regulatory Compliance

Metal content in EQ biosolids continued below 25% of ceiling concentration following changes in LKD supply

Quality

Increased Class B % solids (from 5.8% to 6.3%) has improved transportation efficiency & reduced fuel use.

Interested Party Relations

Positive feedback received from NCDEQ/DWR for NRRRF help in improving biosolids contractor performance.

4C Process Audits

DEKRA audited the following processes that CORPUD uses within its biosolids management program. The level of conformance of each process with NBP expectations and requirements is summarized in the following table. See Section 3 of this report for detailed findings.

Process	Key BMP Elements*	Conformance with Applicable BMP Elements
Management System Dynamics – Significant changes affecting the EMS – Status of environmental aspects and objectives	2,3,6,9,14, 16,17	Conforms except as noted in Minor Nonconformance 16-02

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Process	Key BMP Elements*	Conformance with Applicable BMP Elements
<ul style="list-style-type: none"> – Biosolids Policy commitments – Effectiveness of corrective action process – Effectiveness of management review process – Internal audits (and resulting corrective actions) 		
Biosolids Use – Compost	3, 8, 10, 13	Conforms
Communications (internal & external)	6,9,15	Conforms
Competence, Awareness & Training	8	Conforms
Emergency Preparedness	11, 14	Conforms except as noted in Minor Nonconformance 16-01
Hazardous Chemicals Storage, Handling & Distribution	3, 8, 10, 13	Conforms
Maintenance	3, 8, 10, 13	Conforms
Product & Process Design & Development	3, 8, 10, 13	Conforms
Wastewater Treatment & Effluent Discharge	3, 8, 10, 13	Conforms

* BMP Elements are shown to demonstrate that all 17 Elements of the NBP BMP were included in this Interim Audit.

4D Review of Nonconformances from Prior Audits

All nonconformances from the previous DEKRA audit have been effectively corrected and are closed.

4E Use of NBP Certification and DEKRA Verification

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

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APPENDICES

List of Participants

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

CORPUD Personnel

Jeremy Blackmon - Residuals Distribution Coordinator
Aaron Brower – Assistant Public Utilities Director - Engineering(CORPUD)
Darrell Crews - Laboratory Supervisor
Marla Dalton - Reuse Coordinator
Emily Fentress – Process Control Training Officer / EMR
Ryan Faw - Industrial Pretreatment Coordinator
Brian Gay - Facility Manager (Little Creek WWTP)
John Gibson - Facility Manager
Marti Gibson - Environmental Coordinator
Nathan Howell - Operations Supervisor
TJ Lynch - Assistant Public Utilities Director
Robert Massengill - Public Utilities Director
Carlos Perez - Process Control Training Officer
Wade Shaw - Facility Manager (Smith Creek WWTP)
Barry Thornton - Maintenance Analyst / Planner
Mark Wessel - Maintenance Manager
Liz Wilcox - Senior Chemist
Tim Woody - Resource Recovery Director

List of Documents & Records Reviewed

Acknowledgement – Environmental Policy	Internal audit 8/7/15, 4/27/15
Biosolids Newsletter Jan 2015	KPI data (5 years)
CAPA tracking log (continuous)	KPI report 2015
CAPAs (various)	Management Review 12/9/15
Certificate of substantial completion 1/21/16	Objectives & targets 2015
Contractor inspection 7/22/15	Pretreatment newsletter Jan 2016
Contractor MOU July 2015	Request for services – odor control scrubber cleanout
EHS Policy Statement rev 2015 (11/12/15)	Significant aspects / impact analysis
Emergency operations plan (Feb 2015)	Strategic Plan 1/20/16
Emergency preparedness drill 10/22/15	Wastewater collection & treatment report 2014/15
EMS Manual 2015	Weekly Maintenance Meeting minutes, agenda
Granville farms NOV file + CAPA	WEMS awareness training
Hazardous materials inventory log	WEMS team meeting minutes 1/13/16
Hazen pre-construction agenda 1/28/16	
Intalex training records	

END OF REPORT