



Biosolids Management Program Verification Audit Report

Littleton Englewood Wastewater Treatment Plant Englewood, Colorado

Audit Dates: October 1 to 4, 2012 + December 27, 2012

Audit Conducted By:

DEKRA Certification, Inc. (Chalfont, PA)

Auditors: Mr. Jon Shaver, Biosolids EMS Lead Auditor

Report Written By: Jon Shaver, Biosolids EMS Lead Auditor

Report Date: January 3, 2013

Technical Content Review By: Jim Tallent, LEWWTP Division Manager (January 2, 2013)

Report Approved By: Pierre Salle, Managing Director - DEKRA Certification, Inc. (January 3, 2013)

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1. EXECUTIVE SUMMARY

DEKRA Certification Inc. (DEKRA) conducted an independent Verification Audit of the management system being used by Littleton Englewood Wastewater Treatment Plant (LEWWTP) in managing its biosolids program. The audit was performed at LEWWTP's request as part of LEWWTP participation in the NBP Biosolids Management Program (BMP).

The purposes of this Verification Audit were to:

- Verify that the management system being used by LEWWTP in managing its biosolids activities meets requirements of the National Biosolids Partnership's Biosolids Management Program, in particular the 17 BMP Elements (audit criteria).
- Confirm that LEWWTP is managing their biosolids program effectively and in a manner that meets NBP expectations, with practices and procedures being performed as documented.
- Examine outcomes that LEWWTP is achieving through the use of a systematic approach to managing their biosolids program.

The audit included a review of LEWWTP's Biosolids Management Program documentation, including their BMP Manual, internal audit records and management review records to confirm readiness for the onsite audit (reported August 1, 2012) and an onsite audit at LEWWTP biosolids preparation facilities and biosolids use sites conducted October 1 to 4, 2012, with a follow-up (Corrective Action) audit on December 27, 2012. The audit scope covered the complete LEWWTP biosolids program, including all activities within their biosolids value chain. DEKRA assessed the processes and activities used by LEWWTP in managing its biosolids program for conformance with NBP expectations and requirements of the NBP BMP Elements.

During the onsite audit conducted October 1 to 4, 2012, DEKRA found 2 major nonconformances and 4 minor nonconformances with respect to the audit criteria. LEWWTP developed corrective action plans and took corrective action for the nonconformances and DEKRA reviewed the effectiveness of these actions on December 27, 2012 and determined that the 2 major nonconformances and 2 minor nonconformances were effectively corrected, leaving two minor nonconformances open. DEKRA's Lead Auditor has approved corrective action plans for the open nonconformances and verification of effective corrective action will be included in the next third party audit, currently planned for October 2013.

Audit Conclusions

DEKRA has determined that:

- The LEWWTP biosolids management program is consistent with NBP expectations and meets requirements of the NBP BMP Elements.
- Use of a management system approach is generating positive outcomes for LEWWTP's biosolids program in the areas of regulatory compliance, environmental performance, quality practices and relations with interested parties.

Based on the results of this audit, DEKRA verifies that the Littleton Englewood Wastewater Treatment Plant biosolids management program meets NBP expectations and requirements of the NBP BMP Elements. We recommend certification of LEWWTP's biosolids management program within NBP's Biosolids Management Program.

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2. AUDIT DETAILS

2A. Agency Details and Biosolids Program

Agency Detail

Agency Name: Littleton Englewood Wastewater Treatment Plant (referred to as LEWWTP in this report)

Number of Employees = 76

Biosolids Production Sites: Littleton Englewood Wastewater Treatment Plant, Englewood Colorado

Volume of Wastewater Treated = 22 MGD (average 2011), with capacity 50 MGD

Biosolids Produced = currently 3,000 dry metric tons per year (100% Class B)

LEWWTP Biosolids Program

LEWWTP's Biosolids Program includes defined processes for Pretreatment, Wastewater Treatment, Solids Stabilization and Dewatering, Biosolids Storage and Transportation and Biosolids Use (including agriculture land application). Contractors are not used in processing, handling or using LEWWTP biosolids. 100% of LEWWTP biosolids are land applied as Class B on agricultural land.

LEWWTP manages their biosolids program using a management system approach based on the NBP BMP Elements. LEWWTP's Biosolids Management Policy provides commitment and direction for the program.

2B. Audit Dates

This Verification Audit included the following phases:

Phase 1 – Documentation Review – reported August 1, 2012

Phase 2 – Onsite Audit – conducted October 1 to 4, 2012 at LEWWTP and offsite biosolids storage and use sites

Follow-up / Corrective Action Audit – conducted offsite on December 27, 2012

2C. Audit Team

LEWWTP authorized DEKRA Certification Inc. to conduct this Third Party Audit of their biosolids program. Mr. Jon Shaver led the audit on behalf of DEKRA. Mr. Shaver is certified as a Biosolids EMS Lead Auditor and Biosolids Auditor by the National Biosolids Partnership. DEKRA asserts that both our firm and auditor each have an independent relationship with LEWWTP that meets criteria established by NBP for Third Party Audit Companies and Auditors.

2D. Audit Criteria, Scope and Methodology

Audit Criteria

Requirements stipulated in the National Biosolids Partnership (NBP) BMP Elements (July 2011) and NBP's Biosolids EMS Program were used as criteria for this audit.

Audit Scope

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The scope of the audit included all parts of the LEWWTP biosolids program, which encompasses pretreatment, wastewater treatment and solids generation, solids stabilization, handling and storage, biosolids transportation and biosolids land application, with special attention to practices and management activities that directly support biosolids-related operations, processes and activities.

The audit included the following topics, consistent with NBP requirements and the Scope of Work agreed by LEWWTP and DEKRA.

1. Review of LEWWTP's EMS Documentation describing the LEWWTP biosolids management program and its use.
2. Examination of outcomes being achieved in the areas of regulatory compliance, interested party relations, environmental performance and quality practices.
3. Process Audits (covering requirements of applicable EMS Elements and review of process effectiveness):
 - Biosolids Preparation (including Wastewater Treatment, Solids Stabilization)
 - Biosolids Storage & Transportation
 - Biosolids Program Goals & Objectives
 - Biosolids Use (Land Application)
 - Communication Program
 - Competency, Awareness & Training
 - Compliance (with legal & other requirements)
 - Corrective and Preventive Action
 - Critical Control Points & Operational Controls (Identification)
 - Document Control & Recordkeeping
 - Emergency Preparedness and Response
 - EMS Planning & Public Participation
 - Internal Audits
 - Maintenance
 - Management Involvement (including Policy, Roles and Responsibilities, Mgmt Review)
 - Pretreatment

Audit Methodology

This Verification audit was conducted at the Littleton Englewood Wastewater Treatment Plant in Englewood Colorado and at one offsite land application site and one biosolids storage site. Interested parties were interviewed, including federal and State biosolids regulators and a farmer who uses LEWWTP biosolids.

The audit was conducted by qualified auditors following guidelines in the NBP Auditor Guidance (August 2011). Using a process auditing approach and sampling techniques, auditors observed practices in place, interviewed key persons and reviewed pertinent documents and records to assess the systematic performance of the process being audited and the consistency of biosolids management practices with written procedures. Interested parties were interviewed and transaction tests were performed to verify the effectiveness of the management system. This audit was conducted as a systems audit and 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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2E. Reference Materials

The following documents were used as references during this audit:

- LEWWTP BMP Manual (current version)
- 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

2F. 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 failure of the management system. Major nonconformances must be corrected within 90 days for DEKRA's verification to be issued.

Minor Nonconformance – an isolated departure from requirements that does not represent a management system failure. Minor nonconformances require timely and effective corrective action. A certified DEKRA auditor must verify the effectiveness of the corrective action taken in order to maintain DEKRA's Verification.

Opportunity (for improvement) – possible improvement in the EMS based on auditor observations. There is no obligation for action in response to these observations.

2G. Appeals

The NBP provides an appeals process for biosolids organizations and interested parties that disagree with the findings of a third party EMS audit. The verification appeals process involves an Appeals Board; representing a balance of biosolids management interested parties, including an environmental advocacy group, and wastewater industry professionals. An appeal must be submitted within 30 days of the official verification decision or interim audit decision by the Audit Company. Information about the appeals process is available from the National Biosolids Partnership. Contact Mr. Jim Cox (703-684-2438, jcox@wef.org).

An appeal process is available to persons concerned about the methods and/or scope of this audit. Further information about this appeal process can be obtained from DEKRA (contact Pierre Salle, pierre.salle@DEKRA.com or Jon Shaver jon.shaver@DEKRA.com) or from NBP (contact Jim Cox, jcox@wef.org).

2H. Additional Information

Further information about this audit and/or the National Biosolids Partnership Biosolids Program can be obtained from Littleton Englewood Wastewater Treatment Plant. Contact Mr. Jim Tallent (telephone: 303 762-2610, jtallent@englewoodgov.org)

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3. SUMMARY OF AUDIT RESULTS

3A. Verification Conclusion

Based on results of this audit, DEKRA issues the following Verification Statement concerning the LEWWTP's biosolids management system.

“DEKRA Certification, Inc. has independently verified that the biosolids management program being used by the Littleton Englewood Wastewater Treatment Plant supports continual improvement in environmental performance, meeting regulatory compliance obligations, utilizing good management practices and creating meaningful opportunities for public participation and is in conformance with requirements of the National Biosolids Partnership Biosolids Management Program.”

3B. Strengths Observed

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

- Efforts to minimize odors have been very successful. Odors are low and well controlled.

3C. Outcomes

The LEWWTP biosolids program is improving through the use of a systematic approach to managing their biosolids program. The following improvement outcomes within the past two years were confirmed.

Environmental Performance

Truck emissions lower (new trucks)

Energy reduction projects – improved lighting, better pumping efficiency)

POGS program Pretreatment areas

FOG program – lower fog to plant

Biosolids Quality

Improved equipment reliability

Improved biosolids program emergency procedures

Regulatory Compliance

Better organized records (more reports, docs, accessibility)

Nitrified effluent return – recycling effluent from trickling filter

Interested Party Relations

Increased research for biosolids beneficial use (e.g. dry land farming, comparison commercial fertilizer vs biosolids)

Rcvd “Biosolids Management Merit” award from RMWEA

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3D. Audit Findings – Nonconformances Remaining Open

The following minor nonconformances identified during the audit have not been fully corrected. DEKRA's Lead Auditor has approved corrective action plans that LEWWTP has prepared for these nonconformances.

Minor Nonconformance JS 12-03/ 5 NBP EMS Element 5 requires the biosolids program goals and objectives to consider input from interested parties developed through proactive public participation.

An ad hoc process for obtaining and considering input from interested parties for developing biosolids goals and objectives is in place, however the process has not been formalized (procedure, responsibilities) so it is consistent.

Corrective Action: LEWWTP determined this nonconformance was caused by lack of a proactive process. In response LEWWTP developed a proactive procedure and an action plan for assessing the effectiveness of that procedure by 4/30/2013.

DEKRA's Lead Auditor reviewed records provided and determined that this corrective action has been effectively implemented. The effectiveness of the corrective action will be assessed during the next third party audit. The nonconformance remains open.

Minor Nonconformance JS 12-04/ 14 NBP EMS Element 14 requires the organization to investigate noncompliances, identify the cause and take action to prevent a recurrence.

An apparent noncompliance was observed for a contractor not following hot work permit and lockout/tagout requirements. The Corrective and Preventive Action Process was not used to determine cause and corrective action for this problem.

Corrective Action: LEWWTP determined this nonconformance was caused by lack of identification of the noncompliance. In response LEWWTP included investigations of contractor noncompliances within their Corrective Action process. The effectiveness of the corrective action will be assessed during the next third party audit. The nonconformance remains open.

3E. Audit Findings – Nonconformances Closed

During the initial onsite audit (October 1 to 4, 2012) DEKRA found system nonconformances in the LEWWTP biosolids management program. As a result, LEWWTP took corrective action and DEKRA reviewed the effectiveness of that corrective action offsite on December 27, 2012. The results of that review are noted below

Minor Nonconformance JS 12-01/ 4 NBP EMS Element 4 requires the organization to establish and maintain records of applicable legal and other requirements. The list used to identify applicable legal and other requirements (BMP Element 4) does not include Air Quality permits or DOT regulations and is not specific with respect to applicable other requirements.

Corrective Action: LEWWTP determined this nonconformance was caused by an oversight. In response LEWWTP added the Air Quality permit and DOT regulations to their list of legal requirements. DEKRA's Lead Auditor reviewed records provided and determined that this corrective action has been effectively implemented. The nonconformance is now closed.

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Major Nonconformance JS 12-02/ 5 NBP EMS Element 5 requires the organization to establish measurable goals and objectives to continually improve performance for biosolids management activities and to set these goals and objectives for each of the four NBP outcome areas. Biosolids objectives are presented as action steps, rather than improvement targets, many are not measurable and there is limited connection to quality and environmental performance improvement (2 of the outcome areas).

Corrective Action: LEWWTP determined this nonconformance was caused by incomplete understanding of the NBP best practice. In response LEWWTP developed measurable objectives with at least one objective for each of the four prescribed NBP outcome areas. DEKRA's Lead Auditor reviewed records provided and determined that this corrective action has been effectively implemented. The nonconformance is now closed.

Minor Nonconformance JS 12-05/ 16 NBP EMS Element 16 requires the organization to establish and maintain an internal audit program to determine whether it is effectively meeting its program goals and objectives. The internal audit conducted May 30 & 31, 2012 did not address progress towards goals and objectives except in a general way.

Corrective Action: LEWWTP determined this nonconformance was caused by misunderstood requirements. In response LEWWTP developed a procedure for assessing progress in achieving objectives as part of their internal audits process. DEKRA's Lead Auditor reviewed records provided and determined that this corrective action has been effectively implemented. The nonconformance is now closed.

Major Nonconformance JS 12-06/ 17 NBP EMS Element 17 requires the organization to review the BMP and its performance relative to policy commitments, goals, objectives, and established performance measures. The Management Review conducted 7/27/12 did not include review of policy or performance in achieving biosolids goals and objectives.

Corrective Action: LEWWTP determined this nonconformance was caused by misunderstood requirements. In response LEWWTP revised their Management Review process to include reviews of performance relative to policy commitments, goals, objectives, and established performance measures and conducted a review of these performances on 12/12/12. DEKRA's Lead Auditor reviewed records provided and determined that this corrective action has been effectively implemented. The nonconformance is now closed.

3F. Opportunities for Improvement

- In the LEWWTP biosolids value chain, "collection" activities are not part of the scope. The justification for this removal could be stated and references to collection could be removed from the BMP.
- The Communication Station (lunch room) could be used to communicate performance of the biosolids program (e.g. progress toward objectives).
- Consider how the "Process Control Point & Operational Controls" analysis could be used to determine skill requirements and need for operational controls.
- In the biosolids truck loading area, a "temporary loading procedure" was in use and a "truck filling" procedure in use was not dated or approved.

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- Consider using a tarp to cover loads in trucks transporting biosolids on public roads.
- The internal audit process could be simplified and focused on areas of concern rather than general conformance.
- Consider making Management Review a process that includes different levels and timing of performance reviews and recommendations for improvement.
- Use of the Corrective & Preventive Action process could be expanded to include events that require cause analysis and action to eliminate the cause

3G. Agreements

LEWWTP and DEKRA will develop an Interim Audits Program to cover audits of the LEWWTP Biosolids management program during the four years between Verification and Reverification Audits. These interim audits will be conducted to verify that LEWWTP's biosolids management program is functioning effectively and continues to conform with NBP expectations and requirements. Interim Audit #1 will be conducted in October 2013 as a third party audit, with exact dates to be determined. A full Reverification Audit is due in 2017.

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4. DETAILED AUDIT RESULTS

The following outlines results of DEKRA's audit of each process used within the LEWWTP biosolids management program and the level of conformance of the process with applicable requirements of the NBP EMS Elements.

4A BMP Documentation Review

DEKRA reviewed LEWWTP Biosolids Management Program Documentation (BMP Manual) during Phase 1 of this audit. That review resulted in 14 "observations" needing correction. LEWWTP corrected those observations prior to the onsite Phase 2 audit. DEKRA reviewed the corrections made and found the resulting BMP Documentation to meet NBP expectations and requirements.

4B Process Audits

As part of this audit DEKRA audited the following processes that LEWWTP uses within its biosolids management program and determined the level of conformance of each process with NBP expectations and requirements of the audit criteria.

| Process | Conformance with Applicable BMP Elements |
|--|---|
| Biosolids Preparation (incl wastewater treatment, biosolids stabilization) | Conforms |
| Biosolids Storage & Transportation | Conforms |
| Biosolids Use (Agriculture Land Application) | Conforms |
| Communication Program | Conforms |
| Competency, Training & Awareness | Conforms |
| Compliance (with legal & other requirements) | Conforms |
| Control of Contractors | Conforms |
| Corrective and Preventive Action | Conforms, except as noted below |
| Critical Control Points & Operational Controls | Conforms |
| Document Control & Recordkeeping | Conforms |
| Emergency Preparedness & Response | Conforms |
| EMS Documentation | Conforms |
| EMS Planning | Conforms |
| Goals & Objectives | Conforms, except as noted below |
| Internal Audits | Conforms |

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| Process | Conformance with Applicable BMP Elements |
|------------------------|--|
| Management involvement | Conforms |
| Maintenance | Conforms |
| Pretreatment | Conforms |

4C Audit Findings

Audit of the processes listed above determined that they are functioning effectively and meet requirements of the NBP EMS Elements, except as noted below.

Minor Nonconformance JS 12-03/ 5 NBP EMS Element 5 requires the biosolids program goals and objectives to consider input from interested parties developed through proactive public participation.

An ad hoc process for obtaining and considering input from interested parties for developing biosolids goals and objectives is in place, however the process has not been formalized (procedure, responsibilities) so it is consistent.

Minor Nonconformance JS 12-04/ 14 NBP EMS Element 14 requires the organization to investigate noncompliances, identify the cause and take action to prevent a recurrence.

An apparent noncompliance was observed for a contractor not following hot work permit and lockout/tagout requirements. The Corrective and Preventive Action Process was not used to determine cause and corrective action for this problem.

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APPENDICES

Appendix 1 List of Participants

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

| Name | | Organization | Position |
|------------|----------|--------------------------------|-------------------------------|
| Jon | Bridges | LEWWTP | Pretreatment Administrator |
| Mike | Cassidy | LEWWTP | Facilities Manager |
| E.W. (Stu) | Fonda | LEWWTP | Utility Manager |
| Mary | Gardner | LEWWTP | Environmental Manager |
| Cindy | Goodburn | LEWWTP | Business Services Manager |
| Dug | Graham | LEWWTP | Beneficial Use Supervisor |
| Kevin | Hill | LEWWTP | Operations Supervisor |
| Bobby | Lane | LEWWTP | HR Analyst |
| Steve | Mustain | LEWWTP | Chief Chemist |
| Karen | Olson | LEWWTP | Ind'l Pretreatment Specialist |
| Dennis | Price | LEWWTP | Plant Operator |
| Phil | Russell | LEWWTP | Environmental Service Manager |
| Dennis | Stowe | LEWWTP | Plant Manager |
| Jim | Tallent | LEWWTP | Treatment Division Manager |
| | | | |
| Bob | Brobst | USEPA Region 8 | Biosolids Coordinator |
| Tim | Larsen | Colorado Dept Public Health | Biosolids Specialist |
| Mark | Linnebur | Linnebur Farms | Interested Party - Farmer |
| Angel | Foster | Metro Wastewater | R R & R Coordinator |

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Appendix 2 Documentation / Objective Evidence Reviewed

Agronomic calculation worksheet
Apprentice plant operator program 8/09
Biosolids Management Policy 3/16/12
Biosolids Spill Prevention & Response 9/2012
BMP Manual
Budget 2013
Certificate of Registration - Colorado Dept Agriculture
Communication station
Connector Newsletter (various)
CPARs (various)
Emergency Response Plan
Emergency Response Plan 10/3/12 update (draft)
Emergency Response Plan 3/24/00
Employee CEU records (various)
Employee database
EPA inspection report 1/5/12
Facility inspection report - permit 02-62 (9/20/12)
FOG program brochure
Goals & Objectives
Identification characterization procedure 8/30/10
Inspection report 8/30/12
Internal audit report 6/12/12
Land application report CY2011 (2/19/12)
Letter to EPA - response to 1/5/12 inspection findings
LEWWTP Biosolids Emergency phone numbers 2012
LEWWTP Biosolids Policy Statement
List of critical control points and operational controls
List of legal & other requirements
Load manifest (various)
Management Review report 7/27/12, 12/12/12
Metal concentration in biosolids - Historical average 3/12
Mobile Washers Policy
MSDS (various)
Outreach documents (various)
POGS program brochure
Report to CO Water Quality Control 1/10/10
Scale loading procedures
SOPs (various)
Spill report 2/28/11
Tier 2 report 2/23/11
Training records (LEWWTP) (various)
Training records (various)
Truck loading procedure
Work Orders (various)

END OF REPORT