

**NATIONAL BIOSOLIDS PARTNERSHIP  
INTERIM AUDIT REPORT**

**Louisville and Jefferson County  
Metropolitan Sewer District**

**Louisville Green Management System**

**Louisville, Kentucky**

**Audit conducted by**

**NSF-International Strategic Registrations**

**William R. Hancuff, Lead Auditor**

**References:**

**National Biosolids Partnership (NBP) *BMP Elements*  
NBP *Third Party Verification Auditor Guidance – November 2001*  
*(Latest Revision August 2011)*  
NBP *Code of Good Practice*  
Louisville Green Management System Manual  
(Developed July 2006, Updated October 23, 2019)**

**FINAL INTERIM REPORT – December 2, 2019**

## **INTRODUCTION**

The purpose of the Biosolids Management Program (BMP) interim audits are to verify through regular reviews the system's health and effectiveness between verification audits. The third party on-site interim audits provide independent reviews and support credibility between re-verification audits. The goal of the audit is to collect and evaluate objective evidence related to a portion of the BMP such that over the course of the four interim audits conducted between verification audits all 17 elements are addressed.

The goal of this audit is to determine whether the Louisville and Jefferson County Metropolitan Sewer District (MSD) Louisville Green Management System (LGMS) is functioning as intended, that practices and procedures are conducted as documented, and that the BMP as implemented conforms to the NBP's Code of Good Practice and the BMP requirements of the National Biosolids Partnership (NBP) program objectives.

## **RECOMMENDATION**

The results of the LGMS eleventh interim audit and review of corrective action plan are positive, and it is the recommendation of the audit team that the Louisville and Jefferson County Metropolitan Sewer District LGMS maintain its Platinum Plus Level Recognition Certification status.

## **AUDIT SCOPE**

The (NSF-ISR) conducted a third party interim audit of the MSD's LGMS from November 4 through November 8, 2019. The on-site audit team consisted of Dr. William R. Hancuff, Lead Auditor.

The primary objective of the annual interim audit was to ensure the environmental management system health by reviewing:

- Progress toward goals and objectives,
- Corrective and preventive action requests and responses.
- Actions taken to correct minor non-conformances,
- Management review process, and
- EMS outcomes (environmental performance, regulatory compliance, interested party relations, and quality practices)

The first four items identified above involved reviewing procedures, activities, processes and products that have general requirements found in the NBP standard elements 5, 14, 15, 16 and 17. The fifth item, BMP outcomes, had the potential of involving other NBP standard elements, namely: 1, 2, 4, 6, 9, 10 and 13.

In addition to evaluation of the system as outlined above, the present interim audit scope included the review and verification of the maintenance and implementation of the LGMS relative to standard elements 2, 5, 6 and 9.

The physical biosolids facilities included in the audit and visited during the interim audit included the Morris Forman Water Quality Treatment Center, one Feni's Organic Fertilizer application site (sod farm – Clark County, Indiana). The physical biosolids facilities at the Morris Forman plant included in the audit and visited during the audit included the following biosolids value chain process area critical control points: preliminary/primary treatment, pure oxygen secondary treatment, digestion, digested solids dewatering, and solids heat drying, dried solids conveyor system, and truck loading facilities.

The following individuals were interviewed or otherwise participated in meetings as part of the audit process:

Wayne Brian Bingham	MSD Chief of Operations
Alex Novak	Director Treatment Facilities
Daymond M. Talley	Assistant Director Treatment Facilities
Robin Burch	Process Support Supervisor
John Kessel	Treatment Manager
Victor Dwyer	Operator, Process Technician III
Mike Scott	Operator, Process Technician III
Adrian Milan	Operator, Process Technician III
Sheryl Lauder	Communication Program Manager
Jennifer Garland-Waters	MSD Internal Auditor – staff auditor
Sharita Davis	MSD Internal Auditor – staff auditor II
Adriane Ritman	Regulatory Administrator – Pretreatment Manager
Tony Combs	Health and Safety Manager
Mitchell Jones	Health and Safety Supervisor
Clarke Fenimore	A-J, Inc. Marketer (Biosolids purchaser/contractor) - unavailable
Mike Hext	Waste Management (landfill contractor)
Jeff Uhl	Land owner & farmer – user of biosolids product
Rachel Hamilton (audit observer)	Assistant Director Louisville Metro Air Pollution Control District
Karen Thorne	Environmental Engineering Supervisor, Division of Air Quality
Robin Green	Supervisor, Kentucky Department of Environmental Protection, Division of Waste Management, Solid Waste

## **INTERIM AUDIT FINDINGS**

The interim audit included review of the latest versions of relevant LGMS manual element procedures and employed the most recent version of the NBP Third Party Verification Auditor Guidance dated August 2011. The audit found 3 positive

observations, no major non-conformances, 1 minor non-conformances and 8 opportunities for improvement.

The NBP Third Party Verification Auditor Guidance indicates that when the auditor has identified minor nonconformances during the on-site audit, the organization must resolve the nonconformances and provide documentation to the auditor within 30 days of the audit. NBP acknowledges that biosolids organizations may not be able to fully correct some minor nonconformances within 30 days, in which case NBP requires that the audited organization develop an action plan with time frames. The lead auditor must approve this plan and schedule for correcting minor nonconformances. Corrective action plans were prepared and submitted to the lead auditor, and the approach and time frame for implementation were approved. Field verification of the closure of all minor findings will be finalized during the next scheduled interim audit.

The following is a review of the positive observations made during the interim audit. The minor non-conformances and opportunities for improvement follow, and are listed by item number, which correspond to the element minimum conformance requirements found in the NBP Third Party Verification Auditor Guidance. These findings are presented in the sequence of the NBP standard elements.

### **Positive Observations**

The MSD management and all plant personnel involved in the biosolids environmental management system development should be recognized for their outstanding achievements, and the exceptional features of their Louisville Green Management System. The following is a summary of those positive observations made during the audit.

Element 1 – As has been the case in the past several audits it was again observed that the process support supervisor, Robin Burch, has developed outstanding support documentation for the Louisville Green Management System. Many of these documents should serve as a benchmark for other agencies to emulate.

Element 6 – LGMS continues to improve its public participation program to expand demographic coverage through a proactive approach using the news media, such as public radio; social media, such as Facebook, Twitter and Instagram, and public events, such as concerts.

Element 9 – The Communication Department does an excellent job in providing relevant information about the biosolids management activities to interested parties and the general public through its “Streamline” monthly publication, and to employees and contractors through its “Current” monthly publication.

Finally, the hard work and dedication of the Core BMP Team must be acknowledged. Attaining BMP Platinum Plus recognition is a major accomplishment that few other agencies have achieved. The hard work and dedication of Robin Burch and the direction of John Kessel to ensure continuous improvement must be recognized. Additionally, the

support, encouragement and active participation of the Director of Operations, Alex Novak, and the Assistant Director of Treatment Facilities, Daymond M. Talley, have guaranteed the programs continued success.

### **Minor Nonconformance**

Requirement 4.2 – The standard requires that records of applicable legal requirements be established and maintained. The contractor, Clarke Fennimore, supplies Louisville biosolids to South Carolina and Arkansas but there were no applicable biosolids regulations available for those States in either Appendix 4A or in the contractor documents.

### **Opportunities for Improvement**

Requirement 5.6 – Opportunity for improvement – Consider having the public relations personnel develop a goal and objective that directly relates to the “relations with interested parties” outcome area.

Requirement 5.6 – Opportunity for improvement – Consider developing a goal and objective for the pretreatment program that directly relates to the “regulatory compliance” outcome area, for example, the dental amalgam program.

Requirement 5.6 – Opportunity for improvement – Consider developing a goal and objective for improving performance of maintenance management, such as improving the ratio of planned preventive maintenance activities to unplanned work order generated activities.

Requirement 11.2 – Opportunity for improvement – Consider performing table top exercises to evaluate spill responses to various biosolids spills that have occurred in the past at Morris Foreman; additionally, consider having the emergency response team participate in responses to actual future biosolids spills at Morris Foreman.

Requirement 11.2 – Opportunity for improvement - While Louisville conducts training and field exercises to evaluate the effectiveness of emergency preparedness and response procedures they do not prepare written post action reports addressing corrective actions required and preventive actions proposed to eliminate recurrence of problems.

Requirement 11.3 – Opportunity for improvement – Currently the location of emergency response equipment is not identified (e.g. a map).

Requirement 14.4 – Opportunity for improvement – The standard requires formal corrective action plans be established to address nonconformities identified during routine monitoring and measurement. Consider editing procedure 14 to include using the Hansen Maintenance Management System work orders to correct deficiencies identified during operations and routine monitoring and measurement.

Requirement 16.1 – Opportunity for improvement – The Random Site Inspection Form and the Random Hauler Inspection Form are used to provide information as part of

the public participation in planning procedure. Consider using these forms to satisfy a part of the requirement to cover the internal audit of the biosolids management activities performed by contractors, and referencing them in procedure 16.

For the minor non-conformance, MSD personnel prepared a Corrective Action Plan, and will implement corrective actions according to their BMP procedures to provide continual improvements to their biosolids program. The proposed corrective action work plan was reviewed by the auditor and found to be acceptable and final closure will be verified during the next external third party audit. As a further measure to demonstrate continuous improvement the opportunities for improvement will be addressed to the maximum extent possible.

### ***METROPOLITAN SEWER DISTRICT COMMENTS***

*The Louisville Green Staff at The Louisville and Jefferson County MSD is very happy to continue its recognition at the Platinum Plus Level of certification. The Audit performed by Dr. Bill Hancuff continues to be a value added experience to the Louisville Green Biosolids Management System. The minor nonconformance finding during the audit was fair and accurate. -- Robin Burch MSD Process Support Supervisor.*

### **OUTCOMES MATTER**

The Policy of the Louisville Green Management System of the Louisville and Jefferson County Metropolitan Sewer District (MSD) is simply summarized as “MSD will produce Exceptional Quality (EQ) biosolids and promote beneficial use.” The “EQ” rating has generated a highly marketable biosolids product.

The LGMS completely reevaluated its goals and and revamped their program through establishing one main goal with supporting objectives to attain that goal. The goal is to “continually enhance the biosolids process to improve communication, efficiency, quality and sustainability through 2022.”

Presently there are four objectives focused on supporting and achieving this goal. The objectives were developed by the LGMS Core Team considering public input, and improved over time to more directly meet Specific, Measurable, Achievable, Relevant, and Time-bound (SMART) criteria. Each of the objectives were reviewed to determine their relevance to one or more of the four NBP required outcome areas below:

1. Environmental Performance,
2. Regulatory Compliance,
3. Relations with Interested Parties, and
4. Quality Biosolids Management Practices.

While it is not a requirement to fully attain all objectives, it is a critical component of the system to make progress towards accomplishing the overall goal. It should also be

recalled that attainment of objectives is not the only measure of continual improvement, but corrective actions play a vital role in that measure as well.

The LGMS performance relative to each of its 2019 objectives is addressed below and the outcome areas affected by the objective are found at the end of each discussion.

**Objective 1: Implement an improved Preliminary Treatment System at the Morris Forman Water Quality Treatment Center by June 30, 2018 to Reduce the Amount of Debris Sent to the Anaerobic Digesters by 500 Tons through Increasing the Amount of Screen and Grit Captured by 500 Tons with Data Collection Completed by June 30, 2020.**

The facility's digesters accumulate inert and inorganic materials sufficient to reduce the effectiveness of the digestion process and require the digesters to be frequently cleaned at a substantial cost. Improving the preliminary treatment through installing new bar screens with reduced openings will remove considerably more materials than has historically been collected thus eliminating a portion of the inert materials that otherwise would pass through into the digesters and have deleterious effects on pumps and other processes downstream. Additionally redesigning the headworks grit removal system will have a measurable impact on the amount of inorganic material prevented from entering the digesters and reducing their effective treatment volume.

The amount of debris removed through the preliminary treatment processes has been historically measured by the amount of material collected in the waste lugers measured in number of loads and wet tons. The baseline used for comparison of improvement will be the years 2012 – 2014, which was 4,039.6 tons per year.

The construction contract for the new headworks was initiated in the middle of 2015. Progress on construction has been delayed and completion originally scheduled for the end of 2016 has been moved to late 2018. By November 2018 everything was fully operational, however in February 2019 the west headworks lost grit capture and as of November 2019 was still out of service. The largest quantity of grit arriving at the plant is associated with storm events when the combined sewer diverts flow to the west headworks. The quantity of grit varies considerably on a seasonal basis and tracking will continue on a monthly basis.

Outcome Areas: Environmental Performance and Quality Biosolids Management Practices.

**Objective 2: Maintain a Solids Inventory of Less Than 1.3 Million Pounds at the Morris Forman Water Quality Treatment Center to Prevent the Number of Yearly Odor Complaints to No More Than 8 during 2019.**

It has been observed that the larger the inventory of biosolids at the Morris Forman Water Quality Treatment Center Facilities the greater the possibility for odor generation and public complaints.

The short term action plan is to eliminate the contribution of biosolids from Non-Morris Forman Facilities from processing at the Morris Forman plant. It is planned to expand the Hide Plant through addition of a second centrifuge and sending the cake to a landfill; to add more centrifuges at Derek R. Guthrie (D.R.G.) Water Quality Treatment Center to handle the solids generated at Cedar Creek, Floyd Creek and D.R.G. (note D.R.G. recently removed 1.2 million gallons of 0.5% solids from Morris Forman). A longer term action plan is to add another dryer train at the Morris Forman Plant and ultimately design and construct a combined heat and power (CHP) facility.

Currently, each day the MF Laboratory analyzes process samples for the treatment plant to determine quantities of solids, which can be input to a spreadsheet. The spreadsheet was modified in October 2018 for use with this objective. Since that date the monthly average quantity of biosolids in millions of pounds has varied from 1.5 to 2.7. The solids reduction objective has not been attained and the number of odor complaints in calendar year 2019 through September is 9. Efforts continue.

Outcome Areas: Environmental Performance, Regulatory Compliance, Relations with Interested Parties, and Quality Biosolids Management Practices.

**Objective 3: At the Morris Forman Water Quality Treatment Center Process 1900 Dry Metric Tons of Biosolids each Month During Calendar Year 2019.**

This objective is to be met through production of final solids product by either dewatering cake and sending to landfill or processing into Louisville Green for beneficial use, in order to meet secondary effluent permit conditions for TSS in calendar year 2019. Attaining this target has been a challenge since solids processing operations have been failing and need to be replaced. The monthly total solids production in 2019 exceeded 1900 dry tons in January and February but below 1900 tons in every month since then, with a low of 1440 for two months. Capital improvements are needed to meet this objective.

Outcome Areas: Environmental Performance, Regulatory Compliance, Relations with Interested Parties, and Quality Biosolids Management Practices.

**Objective 4: Implement a New Biosolids Process at Morris Forman Water Quality Treatment Facility by December 31, 2022 to Produce 70 Dry Tons per Day of Class A Biosolids.**

The driver behind this objective is the aging infrastructure associated with the heat treatment process of stabilizing biosolids to meet Class A product. The energy cost and high operation and maintenance costs along side the inability to consistently maintain a quality product has led the district to evaluate alternative innovated yet demonstrated technologies for processing biosolids to reliably increase production from 1300 tons per month (44 tons per day) to 70 dry tons per day. A variety of alternatives were evaluated and a new thermo hydrolysis process has been selected, which will allow abandonment of the antiquated failing heat drying system.



A short list of two design-build contractors has been made and after final selection it is projected that operation of the constructed facilities will commence by 22 December 2022.

Outcome Areas: Environmental Performance, Regulatory Compliance, Relations with Interested Parties, and Quality Biosolids Management Practices.

## **CONCLUSIONS AND RECOMMENDATIONS**

The results of the third party interim audit showed the Louisville and Jefferson County Metropolitan Sewer District has a strong mature Environmental Management System. The NSF lead auditor reviewed and approved the corrective action plan for the minor nonconformance associated with the audit. Therefore, it is the recommendation of the audit team that the Louisville Green Environmental Management System of Louisville, KY maintain its platinum plus level recognition certification status.

As was mentioned previously, a BMP is a continuously improving process, and retention of certification status is not the end. The results of this and future audits will provide value added to the system and should be viewed as an overall opportunity to improve. Every audit is a snapshot in time, and does not, or cannot, identify each and every area for improvement. And yet, while no single audit identifies all of the areas for improvement the results of each audit provide an additional incremental step in the overall system's improvement.

The scope of each interim audit must include a review of the organization's progress toward goals and objectives; BMP outcomes (environmental performance, regulatory compliance, interested party relations, and quality practices); actions taken to correct minor nonconformances; the management review process; and corrective and preventive action requests and responses. This review generally includes requirements found in elements 1, 2, 5, 6, 9, 14, 15, 16 and 17.

In order to address each element of the NBP standard over the four years of interim audits the following elements are scheduled over the period between verification audits:

Year 11 (completed) – Elements 2, 5, 6, and 9.

Year 12 (internal) – Elements 1, 4, and 8.

Year 13 (third party) – Elements 3, 10, and 13.

Year 14 (internal) – Elements 7, 11, and 12.

Year 15 (third party) – Re-Verification audit

## Attachment 1

### Documents and Other Objective Evidence Reviewed During the Interim Audit

#### Element 1. BMP Manual

- LGMS Manual Introduction, Rev 020, date: 8-22-19.
- LGMS Manual – Appendix G: Glossary of Terms, Rev 018, date: 5-4-19.
- LGMS Manual – Appendix H: Revision Log, Rev 026, date: 8-2-19.
- Interviews with Daymond M. Talley, Assistant Director Treatment Facilities; Robin Burch, Process Support Supervisor, and John Kessel, Treatment Manager.

#### Element 2. Biosolids Management Policy

- LGMS Manual – Element 2 – Biosolids Management Policy, Rev 021, date 8-22-19.
- LGMS Manual – Appendix A: Code of Good Practice, Rev 018, date 5-4-18.
- Interviews with Wayne Brian Bingham, MSD Chief of Operations; Alex Novak, Director Treatment Facilities and Daymond M. Talley, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Process Support Supervisor and John Kessel, Treatment Manager.

#### Element 3. Critical Control Points

- LGMS Manual – Element 3 – Critical Control Points, Rev 018, date: 5-4-18.
- LGMS Manual – Appendix 3A – List of Critical Control Points and Operational Controls, Rev 028, date 6-18-18.
- Interviews with Daymond M. Talley, Assistant Director Treatment Facilities; Robin Burch, Process Support Supervisor, and John Kessel, Treatment Manager.
- Interview with Mike Hext, Waste Management (landfill contractor).
- Interviews with Victor Dwyer, Operator, Process Technician III; Mike Scott, Operator, Process Technician III; and Adrian Milan, Operator, Process Technician III.
- Interview with Jeff Uhl, Land owner & farmer – biosolids product user
- Reviewed Morris Forman Water Quality Treatment Center Plant Flow Diagram and aerial view.

#### Element 4. Legal and Other Requirements

- LGMS Manual – Element 4 – Legal and Other Requirements, Rev 018, date: 5-4-18.
- LGMS Manual – Appendix 4A: List of Legal and Other Requirements, Rev 022, date: 3-21-18.

- Interviews with Daymond M. Talley, Assistant Director Treatment Facilities; Robin Burch, Process Support Supervisor, and John Kessel, Treatment Manager.
- Interview with Mike Hext, Waste Management (landfill contractor).
- Interview with Adriane Ritman, Regulatory Administrator – Pretreatment Manager.
- Interviews with regulators – Robin Green, Supervisor, Kentucky Department of Environmental Protection, Division of Waste Management, Solid Waste; Rachel Hamilton, Assistant Director Louisville Metro Air Pollution Control District, and Karen Thorne Environmental Engineering Supervisor, Division of Air Quality.
- Reviewed Biosolids Permit-By-Rule Permit Annual Report submitted to State of Kentucky on January 24, 2018.

#### Element 5. Goals and Objectives

- LGMS Manual – Element 5 – Goals and Objectives, Rev 020, date: 5-4-18.
- LGMS Manual – Appendix 5A: Goals and Objectives for 2019, Rev 019, date: 10-19-18.
- LGMS Manual – Appendix 5B: Goals and Objectives Action Plan and Tracking Spreadsheet for 2019 Objectives 1, 2, 3, and 4, dated: 10-8-19.
- Interviews with Wayne Brian Bingham, MSD Chief of Operations; Alex Novak, Director Treatment Facilities and Daymond M. Talley, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Process Support Supervisor and John Kessel, Treatment Manager.
- Reviewed progress on each goal and objective for 2019.
- Louisville Green Program Performance Report for 2018 dated 13 February 2019.

#### Element 6. Public Participation in Planning

- LGMS Manual – Element 6 – Public Participation in Planning, Rev 020, date: 8-22-19.
- LGMS Manual – Table 6.1 – Identification of Formal and Informal Participation Mechanisms.
- LGMS Manual – Appendix 6A: List of Interested Parties, Rev 013 – March 21, 2018.
- LGMS Manual – Appendix 6B: List of Activities (interested party notifications), Rev 000 – June 21, 2016.
- LGMS Manual – Element 9 – Communication, Rev 019 – May 4, 2018.
- Interested Parties letter notification: invitation to attend third party independent audit of MSD Biosolids Management Program audit for 2019, dated July 19, 2019.
- Random Hauler Inspection Form, Rev 002, date: 2-13-13.
- Random Site Inspection Form, Rev 001, date 6-27-18.
- Viewed <http://louisvillemsd.org/programs/louisvillegreen/documents>

- Interviews with Wayne Brian Bingham, MSD Chief of Operations; Alex Novak, Director Treatment Facilities and Daymond M. Talley, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Process Support Supervisor and John Kessel, Treatment Manager. Interview with Sheryl Lauder, Communication Program Manager.
- Interviews with regulators – Robin Green, Supervisor, Kentucky Department of Environmental Protection, Division of Waste Management, Solid Waste; Rachel Hamilton, Assistant Director Louisville Metro Air Pollution Control District, and Karen Thorne Environmental Engineering Supervisor, Division of Air Quality.
- MSD – Louisville Green Management System website ([http://www.msdlouky.org/programs/envir\\_man\\_sys.htm](http://www.msdlouky.org/programs/envir_man_sys.htm)).
- Multi-color single sheet presentation of MSD Policy and Code of Good Practice.
- Louisville Green Program Performance Report for 2018 dated 13 February 2019.

#### Element 7. Roles and Responsibilities

- LGMS Manual – Element 7 – Roles and Responsibilities, Rev 024, date: 8-22-19.
- Memorandum dated June 5, 2017 from Treatment Facilities Director assigning responsibility for the implementation and maintenance of the Louisville Green Management System.
- Interviews with Wayne Brian Bingham, MSD Chief of Operations; Alex Novak, Director Treatment Facilities and Daymond M. Talley, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Process Support Supervisor and John Kessel, Treatment Manager.
- Interviews with operations and maintenance personnel: Victor Dwyer, Operator, Process Technician III; Mike Scott, Operator, Process Technician III; and Adrian Milan, Operator, Process Technician III.
- Interview with Mike Hext, Waste Management (landfill contractor).

#### Element 8. Training

- LGMS Manual – Element 8 – Training, Rev 018, date: 5-4-19.
- LGMS Manual – Appendix E: Employee Training Program Guidelines, Rev 020, date 5-4-18.
- MSD Board Meeting Minutes held 30 September 2019 – LGMS Program Policy Training as required by NBP.
- Louisville Green Transportation Packet – Various procedures and instructions for biosolids haulers (including Emergency Plan) – 2014.
- Interviews with Daymond M. Talley, Assistant Director Treatment Facilities; Robin Burch, Process Support Supervisor, and John Kessel, Treatment Manager.
- Interviews with operations and maintenance personnel: Victor Dwyer, Operator, Process Technician III; Mike Scott, Operator, Process Technician III; and Adrian Milan, Operator, Process Technician III.
- Interview with Mike Hext, Waste Management (landfill contractor).

## Element 9. Communications

- LGMS Manual – Element 9 – Communication, Rev 019 – May 4, 2018.
- LGMS Manual – Element 6 – Public Participation in Planning, Rev 020, date: 8-22-19.
- LGMS Manual – Table 6.1 – Identification of Formal and Informal Participation Mechanisms.
- LGMS Manual – Appendix 6A: List of Interested Parties, Rev 013 – March 21, 2018.
- LGMS Manual – Appendix 6B: List of Activities (interested party notifications), Rev 000 – June 21, 2016.
- MSD Board Meeting Minutes held 30 September 2019 – LGMS Program Policy Training as required by NBP.
- Viewed <http://louisvillemsd.org/programs/louisvillegreen/documents>.
- Reviewed MSD “Current News” employee newsletter for January 24; February 22; March 5; March 20; May 7; May 21; June 20; August 7; August 20; September 12; and October 15, 2019.
- Reviewed MSD “Streamline” news and events of Louisville MSD external monthly newsletter for September and October 2019.
- Numerous single page MSD information sheets related to what to flush and what not to flush.
- Interviews with Wayne Brian Bingham, MSD Chief of Operations; Alex Novak, Director Treatment Facilities and Daymond M. Talley, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Process Support Supervisor and John Kessel, Treatment Manager. Interview with Sheryl Lauder, Communication Program Manager.
- Interviews with regulators – Robin Green, Supervisor, Kentucky Department of Environmental Protection, Division of Waste Management, Solid Waste; Rachel Hamilton, Assistant Director Louisville Metro Air Pollution Control District, and Karen Thorne Environmental Engineering Supervisor, Division of Air Quality.
- MSD – Louisville Green Management System website ([http://www.msdlouky.org/programs/envir\\_man\\_sys.htm](http://www.msdlouky.org/programs/envir_man_sys.htm)).
- Feni’s Organic Fertilizer – Ideal Uses - - 2 page folded flyer.
- Feni’s Organic Fertilizer – Class A EQ Biosolids – 5-2-0 Fertilizer - 1 page flyer.
- Interview with Mike Hext, Waste Management (landfill contractor).
- Louisville Green Program Performance Report for 2018 dated 13 February 2019.

## Element 10. Operational Control of Critical Control Points

- LGMS Manual – Element 10 – Operational Controls, Rev 019, date: 5-4-18.
- LGMS Manual – Element 3 – Critical Control Points, Rev 018, date: 5-4-18.
- LGMS Manual – Appendix 3A – List of Critical Control Points and Operational Controls, Rev 028, date 6-18-18.

- Louisville Green Transportation Packet – Various procedures and instructions for biosolids haulers (including Emergency Plan) – 2014.
- Site visit to sod farm application site of Jeff Uhl in Clark County, Indiana.
- Interviews with Daymond M. Talley, Assistant Director Treatment Facilities; Robin Burch, Process Support Supervisor, and John Kessel, Treatment Manager.
- Interviews with operations and maintenance personnel: Victor Dwyer, Operator, Process Technician III; Mike Scott, Operator, Process Technician III; and Adrian Milan, Operator, Process Technician III.
- Interview with Mike Hext, Waste Management (landfill contractor).

#### Element 11. Emergency Preparedness and Response

- LGMS Manual – Element 11 – Emergency Preparedness and Response, Rev 018, date: 5-4-18.
- Louisville Green Transportation Packet – Various procedures and instructions for biosolids haulers (including Emergency Plan) – 2014.
- Interviews with Tony Combs, Health and Safety Manager and Mitchell Jones, Health and Safety Supervisor.
- Interviews with Daymond M. Talley, Assistant Director Treatment Facilities; Robin Burch, Process Support Supervisor, and John Kessel, Treatment Manager.
- Interview with Mike Hext, Waste Management (landfill contractor).
- Discussed routine work orders for bi-weekly inspection of spill kits.

#### Element 12. BMP Documentation and Document Control

- LGMS Manual – Element 12 – Documentation, Document Control and Recordkeeping, Rev 019, date: 5-4-18.
- LGMS Manual – Appendix B: List of Controlled Documents, Rev 019 – August 22, 2019.
- LGMS Manual – Appendix D: List of External Records, Rev 019 – May 4, 2018.
- LGMS Manual – Appendix H: Revision Log, Rev 026 – August 2, 2019.
- Louisville Green Transportation Packet – Various procedures and instructions for biosolids haulers (including Emergency Plan) – 2014.
- Interviews with Daymond M. Talley, Assistant Director Treatment Facilities; Robin Burch, Process Support Supervisor, and John Kessel, Treatment Manager.
- Interview with Mike Hext, Waste Management (landfill contractor).

#### Element 13. Monitoring and Measurement

- LGMS Manual – Element 13 – Monitoring and Measurement, Rev 018, date 5-4-18.
- LGMS Manual – Element 3 – Critical Control Points, Rev 018, date: 5-4-18.
- LGMS Manual – Appendix 3A – List of Critical Control Points and Operational Controls, Rev 028, date 6-18-18.
- Random Hauler Inspection Form, Rev 002, date: 2-13-13.
- Random Site Inspection Form, Rev 001, date 6-27-18.

- Reviewed Biosolids Permit-By-Rule Permit Annual Report submitted to State of Kentucky on January 24, 2018.
- Site visit to sod farm application site of Jeff Uhl in Clark County, Indiana.
- Louisville Green Transportation Packet – Various procedures and instructions for biosolids haulers (including Emergency Plan) – 2014.
- Interviews with Daymond M. Talley, Assistant Director Treatment Facilities; Robin Burch, Process Support Supervisor, and John Kessel, Treatment Manager.
- Interviews with operations and maintenance personnel: Victor Dwyer, Operator, Process Technician III; Mike Scott, Operator, Process Technician III; and Adrian Milan, Operator, Process Technician III.
- Interview with Mike Hext, Waste Management (landfill contractor).

#### Element 14. Nonconformances: Preventive and Corrective Action

- LGMS Manual – Element 14 – Nonconformances - Preventive and Corrective Action, Rev 018, date: 5-4-18.
- Reviewed Nonconformance/Improvement Action/Feedback form for receiving input from operation or maintenance functions.
- Interviews with Daymond M. Talley, Assistant Director Treatment Facilities; Robin Burch, Process Support Supervisor, and John Kessel, Treatment Manager.
- Interview with regulators – Robin Green, Supervisor, Kentucky Department of Environmental Protection, Division of Waste Management, Solid Waste; Rachel Hamilton, Assistant Director Louisville Metro Air Pollution Control District, and Karen Thorne Environmental Engineering Supervisor, Division of Air Quality.
- Interviews with Jennifer Waters, MSD Internal Auditor – staff auditor and Sharita Davis, MSD Internal Auditor – staff auditor II.
- National Biosolids Partnership Louisville Green Management System Internal Audit Report dated December 14, 2018 for audit conducted December 12, 2018.

#### Element 15. Biosolids Management Program Report

- LGMS Manual – Element 15 – Biosolids Management Report, Rev 018, date: 5-4-18.
- Louisville Green Program Performance Report for 2018 dated 13 February 2019.
- Viewed <http://louisvillemsd.org/sites/default/files/inline-files/LG%20Program%20Performance%20Report%202018.pdf>
- Interviews with Wayne Brian Bingham, MSD Chief of Operations; Alex Novak, Director Treatment Facilities and Daymond M. Talley, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Process Support Supervisor and John Kessel, Treatment Manager.

#### Element 16. Internal BMP Audit

- LGMS Manual – Element 16 – Internal Audits, Rev 022, date: 8-22-19.

- LGMS Manual – Appendix 16B – Internal EMS Audit Checklist, Rev 003, date 1-21-14.
- Random Hauler Inspection Form, Rev 002, date: 2-13-13.
- Random Site Inspection Form, Rev 001, date 6-27-18.
- Interviews with Daymond M. Talley, Assistant Director Treatment Facilities; Robin Burch, Process Support Supervisor, and John Kessel, Treatment Manager.
- Interviews with Jennifer Garland-Waters, MSD Internal Auditor – staff auditor and Sharita Davis, MSD Internal Auditor – staff auditor II.
- Jennifer Garland-Waters; Auditor Certification by Institute for Internal Controls.
- National Biosolids Partnership Louisville Green Management System Internal Audit Report dated December 14, 2018 for audit conducted December 12, 2018.

#### Element 17. Management Review

- LGMS Manual – Element 17 – Management Review, Rev 018, date: 5-4-18.
- Reviewed Louisville Green Management Review Scope (agenda) held March 4, 2019 for calendar year 2018.
- Reviewed Minutes of Management Review Team Meeting held March 4, 2019.
- MSD Board Meeting Minutes held 30 September 2019 – LGMS Program Policy Training as required by NBP.
- Interviews with Wayne Brian Bingham, MSD Chief of Operations; Alex Novak, Director Treatment Facilities and Daymond M. Talley, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Process Support Supervisor and John Kessel, Treatment Manager.