



National Biosolids Partnership

Biosolids EMS Internal Audit Report

Internal Audit Date: February 25, 2020

Internal Audit Report Date: March 19, 2020

Internal Audit Team:

Brian Schoenecker – Wastewater Services Manager, Lead Auditor

Noah Czech – Stormwater Compliance Specialist, Lead Auditor

Chris Plautz – Wastewater Services Supervisor

Shay Thomas – Utilities Maintenance Mechanic

Wayne Ethen – Heavy Equipment Operator II

Emma Larson – Water Quality Coordinator

David Wallen – Wastewater Services Specialist

Rocio Durkot – Utilities Laboratory Technician

**Also in attendance: Shanna Czeck – EMS Coordinator*

Objectives

The City of St. Cloud, MN is at platinum level status for its Environmental Management System (EMS) for its Biosolids program at the Wastewater Treatment Facility (WWTF). The EMS covers the WWTF Biosolids value chain from pretreatment of wastewater through the end use via land application as a valued agricultural product.

The primary objective of the internal audit is to verify that the St. Cloud WWTF EMS is being used to manage its Biosolids program and conform to the requirements of the National Biosolids Partnership (NBP) *Environmental Management System for Biosolids* standards. Additional internal audit objectives are to:

- Evaluate the effectiveness of the Biosolids Management Program and the EMS;
- Evaluate progress towards goals and objectives;
- Review responses to non-conformances and seek opportunities to improve;
- Evaluate the effectiveness of the management review elements;
- Evaluate the success of public participation and communication;
- Evaluate progress towards NBP outcomes; and
- Ensure requirements of the platinum level program status are being met.

Audit Scope

The EMS team's lead auditors decided that EMS team members (except for the EMS Coordinator) will help conduct the Year 2 Internal Audit. The lead auditors created a detailed agenda outlining areas to be reviewed by select team members. The lead auditors provided oversight of the entire audit process. A detailed email was distributed by the lead auditors to the audit team prior to the internal audit. The email assigned element review teams, provided audit guidance, background information and information about where to gather audit materials.

Below is a summary of the internal audit agenda:

- First, the lead auditors reviewed with all members effective auditing practices.
- Progress towards NBP outcomes (Environmental Performance, Regulatory Compliance, Interested Parties Relations, Quality Practices) were reviewed by the entire team.
- Corrective and preventive actions were reviewed.
- Actions taken on minor non-conformances and opportunities for improvement were reviewed and the status of each was discussed.
- Progress toward Goals and Objectives were reviewed by team members. This included an update about the annual goal review and discussion that occurred prior to the audit.

The below elements were audited in teams of three. Teams took detailed notes, conducted interviews as needed and reviewed working forms and documents. Small teams presented findings to the entire audit team. The lead auditors guided a discussion and asked questions as each team of three provided their findings.

Element 1: Process Control Points (Wayne Ethen, Shay Thomas, Chris Plautz)

Element 8: Training (Wayne Ethen, Shay Thomas, Chris Plautz)

Element 15: Biosolids Management Report (Emma Larson, Rocio Durkot, David Wallen)

Element 17: Management Review (Emma Larson, Rocio Durkot, David Wallen)

Reference Materials

- St. Cloud WWTF Environmental Management System Manual (2019)
- National Biosolids Partnership "Third Party Verification Auditor Guidance" (2011)
- The National Biosolids Partnership "Code of Good Practice"
- The National Biosolids Partnership "Biosolids Management Program Guidance Manual"

Definitions of Audit Terms

Major Non-conformance - A serious omission from requirements and/or other departure that represents, or could cause, a systemic failure.

Minor Non-conformance - An isolated departure from requirements that does not represent a systemic failure.

Opportunity for Improvement - Possible improvement opportunity in the EMS based on auditor observations.

Annual Review Requirement Results

Progress towards Goals and Objectives

It was determined that 2019 goals and associated objectives have either been met, or are on schedule to be completed on time. The annual review of goals and objectives occurred in January. Two new goals were created. Current/open goals were reviewed during the internal audit and are summarized below.

Goal 7: Reduce purchased electricity by 100% by 2022: Goal #7 was reviewed and discussed during the internal audit. An objective summary is below and is further detailed in the Goal 7, summary sheet. The team agreed the objectives clearly met SMART criteria. It was not clear if notification has been provided yet to the third-party verification auditor about the second biofuel generator. This has been added as an opportunity for improvement.

- **Objective 7.1** High Strength Waste (HSW) utilization optimization completed by 2020 - High Strength Waste agreements were finalized in January 2019.
- **Objective 7.2** Biofuel Generator expansion – Generator ordered, installation, operation, and optimization to be completed by the end of 2020.
- **Objective 7.3** Increase digester gas production through increased primary digester capacity – Converting digester 4 to a primary by 2022.
- **Objective 7.4** Install a hydro turbine within the effluent piping from the NEW RF to the Mississippi River – In planning and design. Equipment Supplier Study Completed November 2018.

Goal 8: Reduce Phosphorus Concentration in St. Cloud's Biosolids Liquid Product by 2020:

Future Biosolids regulations may include phosphorous-limiting application rates which could reduce available land for recycling. Staff continues to understand and optimize the new biosolids equipment. This new goal was created from an objective in Goal 2. During the internal audit, objective 8.1 was discussed and is summarized below:

- **Objective 8.1** Reduce phosphorous concentration and volume in Biosolids Fertilizer Product to ensure regulatory compliance and to increase farmer interest in product by 2020.

As of January 2019, there is currently a 60% reduction in phosphorus concentrations in the liquid Biosolids product. Action steps in 2019 and 2020 were reviewed and include:

- 1) Continued monitoring of Biosolids phosphorous concentration throughout 2020 recycling seasons.
- 2) Review the phosphorus versus COD concentrations being received in HSW to determine which sources provide greatest gas production with least amount of phosphorus.
- 3) Review pilot studies completed in 2019 to determine next steps.
- 4) Optimize WASSTRIP process to remove maximum amount of phosphorus.

Goal 9: Optimize Polymer Consumption in Lystek Process. Polymer consumption is above designed engineered specifications resulting in a higher cost to operate the Lystek process. During the internal audit, Objective 9.1 was discussed in detail to ensure SMART criteria was met. After discussion, the audit team agreed that the goal and objective met SMART criteria.

- **Objective 9.1** Provide stable polymer feed to the Lystek process to reduce consumption rate.

- 1) Reduce polymer feed rate by 1 gallon/hour.
- 2) Install heat exchanger for feedwater system.
- 3) Continue to monitor polymer feed rates.
- 4) Research polymer aging tanks.

Goal 10: Ensure Long Term Program Sustainability by Reducing Recycling Expenditures.

Evaluate the potential for implementing fuel and/or application fees to achieve long term savings, allowing funds to be redistributed within the program and reduce potential rate increases. As an opportunity for improvement, the audit team suggested being more specific in the measurable section of objective 10.1.

- **Objective 10.1** Evaluate available options to reduce recycling expenditures.

- 1) Reach out to other Biosolids Recycling programs to gain insight and implementation strategies.
- 2) Host an Open House event on June 23, 2020.
- 3) Offer Market Survey with stakeholders.
- 4) Identify alternative uses for product.
- 5) Consider pursuing Class A, EQ designation (allows for more product uses).

Opportunities for Improvement – Goals & Objectives:

- 1) Ensure the third-party verification auditor has been notified about the second biofuel generator.
- 2) Review draft goal objective 10.1 to be more specific in the measurable section.

Progress Toward NBP Outcomes

Environmental Performance:

Staff continues to meet and exceed regulatory compliance. The program strives for greater environmental sustainability through the NR2 project with the completion of construction and ongoing optimization in 2020 (Biosolids upgrades plan).

Regulatory Compliance:

Staff has updated sampling and testing to ensure regulatory compliance was maintained during the construction of the NR2 Project. There was no Regulatory Non-Compliance noted for 2019.

Interested Party Relations:

Being near completion of the NR2 Project, avenues of communication and education are being extended to interested parties through Facility tours, presentations, and open house events.

In September 2019, the City of St. Cloud received a certificate of recognition as a "Water Resources Utility of the Future Today – Beneficial Biosolids Reuse."

Quality Practices:

Implementation of the EMS program continues to lead St. Cloud's Biosolids program to maintain a high-quality product, nutrient recovery, and energy production.

Actions Taken on Minor Non-Conformances

There were two minor non-conformances from the 2019 external audit and zero non-conformances to address from the 2019 internal audit. The EMS Coordinator, Shanna Czeck, created an excellent comprehensive corrective action plan tracking spreadsheet that was reviewed by the lead auditors with the audit team. Both external audit minor non-conformances were completed by their due date in 2019. The EMS team is commended for excellent work conducting a realistic, detailed spill drill to evaluate the effectiveness of emergency preparedness and response procedures.

Because it did not fit into another category, an opportunity for improvement was identified to update the comprehensive corrective action plan tracking spreadsheet to show only 2 minor-conformances and 2 opportunities for improvement from the 2019 external audit. Currently, 4 minor-conformances are shown.

Actions Taken on Opportunities for Improvement (OFI)

The internal audit team reviewed the 11 opportunities for improvement identified during the 2019 internal and external audits. 9 opportunities for improvement have been fully reviewed/addressed/completed. The OFI to "create new SOPs and EOSs for new equipment and processes" has been reviewed to determine what is needed and a list is being developed of required documents.

The OFI from the external audit to "consider having internal auditor(s) attend ISO 14001 lead auditor or auditor training as appropriate" has been considered but will not be occurring at this time. A status update to the spreadsheet is needed.

The EMS team continues to demonstrate great effort into continual improvement by addressing/completing opportunities for improvements. It is obvious the EMS team and WWTF staff are continuously looking to improve. The Biosolids Management Program continues to be stronger because of this.

Corrective and Preventive Actions

No required corrective/preventative actions were identified since the last internal audit.

Audit Report

Element 1: Biosolids Management Program Manual

Major or Minor Non-Conformances:

No major or minor non-conformances were found.

Element Audit Summary and Positive Observations:

Element 1 audit findings were presented by Chris Plautz and Wayne Ethen. The EMS audit team agreed the element meets all minimum requirements. Updates are needed to the personnel chart, and general updates on dates of importance and project information. The audit team agreed that continual improvement is the focus of the City's program as is evident in the goals and element 14.

Opportunities for Improvement:

- 1) Update the personnel chart, and complete general updates on dates of importance and project information to ensure the element is current.

Element 8: Training

Major or Minor Non-Conformances:

No major or minor non-conformances were found.

Element Audit Summary and Positive Observations:

Element 8 audit findings were presented by Chris Plautz and Wayne Ethen. The EMS audit team had a lot of discussion about training documentation and communication. The EMS program does a great job providing a diverse range of training opportunities. Communication about training opportunities also occurs in multiple ways. The spill drill in 2019 was a fantastic hands-on, realistic training opportunity. Routine meetings, electronic billboards, handouts and videos are used for training and communication. An example was

provided in how attachment 8.1 was used for new and re-assigned employee training about the biosolids program.

In reviewing Table 8.2 the audit team agreed it does a good job of tracking what training is needed for staff. The audit team agreed table 8.2 should be reviewed and updated as needed to ensure all applicable new processes, equipment and certification training needs are included in the table.

As the Biosolids EMS programs continues, more training may be required. Training documentation can be a challenge. The Audit team reviewed training documentation methods and agreed that training is properly documented, however, it is documented in multiple locations (e.g. Wastewater Services Supervisor, EMS Coordinator, Wastewater Treatment Facility Secretary) making it difficult to easily review and track what training was completed by staff. The City's Stormwater Division internal training tracking spreadsheet was reviewed as an option to help keep training documentation summarized in one location. This was identified as an opportunity for improvement.

Opportunities for Improvement:

- 1) Review training documentation methods for an opportunity to combine documentation into one summary location. Update element 8 procedure accordingly.

Element 15: Biosolids Management Program Annual Report

Major or Minor Non-Conformances:

No major or minor non-conformances were found.

Element Audit Summary and Positive Observations:

Element 15 audit findings were presented by Emma Larson and Rocio Durkot. The annual report is readily available and distributed to interested parties. The 2018 Biosolids Digester Report was reviewed in detail. The report provides an abundance of information about the program. Discussion occurred about including more cost information and reference to metals monitoring in the report.

Opportunities for Improvement:

- 1) Include in future biosolids annual reports information about total cost savings per procedure 1.h. from the element manual section.
- 2) Include monitoring information about metals in future biosolids annual reports.

Element 17: Management Review

Major or Minor Non-Conformances:

No major or minor non-conformances were found.

Element Audit Summary and Positive Observations:

Element 17 audit findings were presented by Emma Larson and Rocio Durkot. The management review process was easy to follow. Documentation was traceable and responsible parties are clearly identified. Informal reviews take place several times throughout the year at wastewater update meetings, monthly reports, and pre/post haul meetings. Scheduling the formal management review is on the Master Calendar. Discussion occurred about including NR2 monthly report information in the element procedure for informal reviews and clearly including monitoring data with the formal review.

Opportunities for Improvement:

- 1) Ensure the formal annual review clearly includes monitoring data/measurements, including metals.
- 2) Add NR2 monthly reports and chemical cost information as part of the informal reviews.

Audit Conclusions

We appreciate the opportunity to be lead auditors for the Biosolids EMS Internal Audit. It has been a pleasure to watch the program grow with new goals, facility changes, new processes and challenges while maintaining Platinum Level Certification. Staff continues to take great pride in the program and is focused on maintaining the Biosolids Management Program Code of Good Practice. It is evident that the WWTF EMS team is looking forward to new challenges and will continue to make St. Cloud's Biosolids Management Program second to none.

We recognize and commend the extra effort staff has put forth to maintain the Biosolids Program. We also thank the EMS team for recognizing how the internal audit is organized with different staff reviewing program elements each year. We feel new perspectives provide valuable input and opportunities for improvement that match the goals of this platinum level program and allow the WWTF to strive for continual improvement. No major or minor non-conformances and eight (8) opportunities for improvement were been identified during the 2020 internal audit.