

2009 Periodic Biosolids Program Performance Report

Issued: February 2010

Introduction

The Grand Rapids Wastewater Treatment Plant (GRWWTP), located in Grand Rapids, MI, provides wastewater collection and treatment for the City of Grand Rapids and 9 surrounding communities totaling approximately 270,000 customers within a 200 square mile geographical area. The wastewater plant has a design capacity of 61 MGD and currently has an average daily flow of 46 MGD. The facility was constructed in the 1920's and treatment consisted of primary clarification, anaerobic digestion, and drying beds. The Biosolids from the drying beds was bagged and sold to businesses and homeowners for fertilizer for many years. In the mid 1950's the plant was expanded to include secondary treatment capability utilizing activated sludge as the biological treatment process along with increased primary treatment capacity and disinfection. In the 1970's the facility was again expanded to increase flow capacity and solids handling processes. Solids handling converted from anaerobic digestion to thermal heat treatment using low pressure oxidation. In 2005 the plant converted from chlorine as a disinfectant to Ultra Violet disinfection.



The GRWWTP was part of a third round of agencies participating in the National Biosolids Partnership (NBP) Environmental Management System (EMS) for Biosolids. Development of our EMS program started in early 2005 with the creation of an internal EMS team. Team members attended four (4) NBP sponsored workshops which helped guide the development of our EMS. The GRWWTP Biosolids EMS was formally certified by the NBP in December 2006 and successfully completed our first annual interim audit in November 2007. During 2008 an internal audit was performed and the second interim audit was completed in the fall of 2009.

During July of 2009 the Joint Biosolids Management Project Agreement was approved by the City of Grand Rapids and City of Wyoming which finalized the creation of the Grand Valley Regional Biosolids Authority (GVRBA). On July 1, 2009 the GVRBA became responsible for processing 100% of the Biosolids from the City of Grand Rapids, Wastewater Plant and the City of Wyoming, Clean Water Plant.

Outcomes Matter

The NBP has identified key outcomes which serve as good indicators of successful and well managed Biosolids management practices. Efforts undertaken by GRWWTP during the past year in support of these outcomes are detailed below.

Quality Management Practices

- Began operation of a new storage and dewatering facility as part of the GVRBA.
- Completed a North Secondary study and began design on converting the North Plant to Biological Phosphorus removal.
- Tracked maintenance activities to better determine program effectiveness. By monitoring the ratio between corrective work and preventive work we are able to determine how effective our maintenance programs are.
- Began closely monitoring work orders and the related time spent on them and set a baseline of 100 hours each month per employee.
- The degree of compliance with our NPDES permit is an indicator of how effectively the facilities are being operated and managed. The plant maintained a compliance record of 100% for 2009 as related to Biosolids.



Randall Fisher, ESD Manager addresses interested parties and media during the GVRBA Biosolids Facilities Dedication Event.

Relations with Interested Parties

- During September a dedication event was held at the newly constructed GVRBA Biosolids dewatering and storage facilities. Employees of the City of

Wyoming Clean Water Plant and the City of Grand Rapids Environmental Services Department, Biosolids EMS interested parties, local politicians and media celebrated the completion of the new facilities.

- Several news paper articles announced the opening of the facilities most notably a story entitled “When a toilet flushes in Grand Rapids a light goes on in Zeeland”. The article explained how Biosolids are utilized in the generation of methane at the landfill and provides fuel to produce the electricity which is utilized to provide power in the community of Zeeland, Michigan.



Deputy City Manager Eric Delong speaks as the Dan Wolz family “turn the lights on in Zeeland” at the gala.

Regulatory Compliance

- Began modifications to the Primary Effluent Retention Basin for utilization as a flow equalization basin.
- Began the installation of an additional final effluent screw pump to lift effluent out of the plant during elevated river levels.
- Achieved 100% compliance with regulatory requirements as related to Biosolids.

Environmental Performance

- Completed installation of a rain garden to treat and manage stormwater runoff for a portion of the new GVRBA Biosolids facilities. All stormwater from these facilities is managed with no off-site migration.
- The GVRBA Biosolids Dewatering Facility is positioned to receive LEED certification.
- Maintaining an effective maintenance management program at the Wastewater Plant helps ensure reliable equipment and operations and helps to prevent accidental spills.
- A motivated staff striving to achieve 100% compliance with all regulatory requirements is focused on protecting the environment. The Grand Rapids staff operates the Wastewater Plant in a highly effective and professional manner and consistently achieves regulatory compliance in excess of 99.9%.
- In 2005, the City (including the Wastewater Plant) formed a “Renewable Energy Team” that began meeting with various community partners, companies, and energy experts in search of the best way to fulfill the 20% renewable energy goal set by Mayor George Heartwell. The City Commission approved a purchase that met the 20% goal in November, 2007. This purchase continues to significantly reduce Grand Rapids’ carbon footprint by offsetting the greenhouse gasses (carbon dioxide, sulfur dioxide and nitrogen oxide) produced using non-renewable sources and qualifies the City for this recognition by the EPA.
- Over the last 18 years the City of Grand Rapids has worked aggressively to reduce Combined Sewer Overflow volumes by 99.9% and is continuing work to remove the remaining 0.1%.

Biosolids Value Chain - Monitoring and Measurement Report and Progress

Monitoring and measurement provides critical input to the organization relative to the effectiveness of its operational controls. This information helps to identify any weaknesses or other areas in which the program can be improved.

Wastewater Collection and Pretreatment

- *Significant industrial users* – During 2009, staff worked with industries and regulators to insure compliance with local, state, and federal discharge laws and tracked industrial reports to insure accuracy and completeness.
- *Commercial user discharges* – Staff reviewed survey questionnaires sent to commercial users and monitored new commercial facilities. Significant industrial user permits were issued to those dischargers meeting the criteria of significant user.
- *Discharge authorizations* – Discharge requests which are typically short in duration are handled through this process. This allows staff to characterize the nature of the proposed discharge to determine any detrimental impacts that might occur if discharge was allowed to the wastewater plant.

- *Pollutant minimization* – Efforts in this area have historically focused on the discharge of toxic metals, including mercury, into the wastewater collection system. The State of Michigan recently adopted new regulations for the management of mercury for dentist offices. This restricts our ability to control mercury levels in wastewater. Wastewater plant influent mercury is still tracked to determine program effectiveness. Major trunk lines are also routinely monitored to help identify sources.

Wastewater Treatment and Solids Generation

- *Solids screening and grit collection* – Bar screens in the Wastewater plant head works continue to significantly reduce screening type debris in the Biosolids.
- *Scum* – This product consists of greases and oils which enter the Wastewater plant through the collection system. A proactive program to capture and remove grease and oil at lift stations has helped reduce grease and oils contained in the Biosolids. The captured grease and oil is collected and transported to local landfills for disposal.
- *Portable Toilet Waste* – Began receiving portable toilet waste from the service area.
- *Primary treatment* – Began fabrication of newer guards for the mechanisms and painting of the associated tunnel system.
- *Raw sludge storage* – Biosolids are held in new storage tanks prior to dewatering.
- *Secondary treatment* – BioP facilities started up in the South aeration plant have proven exceptionally effective. Began design of a project to convert the North Plant to BioP.
- *Changes in Flows* – Billed volume remain low due to the economic climate.

Solids Stabilization, Conditioning, and Handling

- *Centrifuge dewatering* – Centrifuge operation went smoothly during 2009. Final Performance Testing is anticipated for 2010.
- *Centrifuge thickening (WAS)* – The WAS centrifuges were utilized during the startup and testing of the new facilities.
- *Gravity belt thickener* – Was removed from site when the new facilities went on line.
- *Odor control* – Odor control system worked great all year. The wastewater plant did not experience any odor complaints related to the plant. Two main odor complaints related to the collection system. One was resolved by modification to the end of the forcemain of the Cascade Springs Lift Station. While the second has carbon canisters ordered for placement in problem manholes.

Solids Storage and Transportation

- *Truck loading* – The contractor maintains logsheets and inspects each truck before departure from the site to ensure that there is no leakage or tracking issues. However, there is a significant Hydrogen Sulfide release (>80 ppm)

during loading and work is underway to abate this serious health and safety issue.

- *Truck cover* – All trucks are covered during transport to the landfill site in accordance with State law.
- *Truck transport to landfill* – The contractor maintains records of dates, drivers, landfill sites for each load leaving the site. There were no spills in 2009.
- *Truck Washing Procedures* – The contractor maintains procedures to wash and inspect trucks to minimize odors and tracking issues.

Biosolids End Use or Disposal

- *Landfill* – The Contractor works with the landfill to properly incorporate the Biosolids into the municipal trash. This augments the decomposition process and maximizing the potential for methane gas which is recovered and beneficially used.

Annual Operational Controls Review

Internal Audit

An internal audit of the City's EMS was conducted during the first quarter of 2009. There were no non-conformances identified during the audit.

Third Party Verification Audit

In the fall 2009 the City underwent its second interim audit. The plant received some Commendations.

- There was an excellent discussion of progress made in improving operations of activities at each of the critical control points in the biosolids value chain in the 2007 and 2008 Periodic Biosolids Program Performance Report.
- Laboratory personnel demonstrated an exceptional knowledge of the biosolids EMS policy, mission statement, critical control points, operational procedures and goals and objectives and outcomes.
- The City maintains an exemplary Biosolids EMS manual that continuously improves through frequent updates and upgrades.
- The shift to using Share point has improved document control.
- And finally, the hard work and dedication of the EMS management team must be acknowledged. While maintaining the EMS verification goal is obviously a team effort, the effectiveness of guidance provided by the Assistant Director assured maintenance of this common goal.

There were also opportunities for improvement.

- Element 1.7 – Opportunity for improvement. Consider mentioning specifically in the Element 1 procedure those Biosolids management activities assigned to and performed by contractors, such as Biosolids loading and transportation.
- Element 10.1 – Opportunity for improvement. Consider preparing a schedule for completing all new SOPs associated with recently construction critical control points and the abandonment of all old SOPs that are no longer needed.

- Element 10.1 – Opportunity for improvement. The operational controls column in Table 3.1 – Critical control points, does not reference SOP 3209 – Primaries, taking tanks in and out of service.
- Element 10.1 – Opportunity for improvement. SOP 3609 – GVRBA Cake Silo and Load Out Operation does not clearly explain the details of high level loading.
- Element 10.5 – Opportunity for improvement. Cordes Trucking Company does not currently have an SOP for Vehicle Inspection, which references the inspection checklist form.
- Element 15.2 – Opportunity for improvement. In the Periodic Biosolids Program Performance Report when presenting the organization’s progress toward achieving its Biosolids program goals and objectives consider presenting them as they relate to each of the required outcome areas. Also, consider presenting other accomplishments not associated with goals and objectives separately in the report.
- Element 17.1 – Opportunity for improvement. When completing Table 17.1 – Periodic Management Review of Performance Report consider including a more complete description of the review of the progress on goals and objectives. If the Periodic Biosolids Program Performance Report is used in this review it is not currently referenced in the review summary as being employed to provide details on goals, objectives, and performance measures.

Two minor non-conformances were identified in the audit and can be found in the summary of non-conformances section near the end of the report.

Interested Parties Input/Participation

- During the last quarter of each year the City develops a list of goals and objectives for the next year. As part of this process we seek input from our interested parties regarding concerns and issues they may have. We did receive feedback from two (2) interested parties in 2009 and incorporated the comment into our goals and objectives.
- Held an annual meeting with industrial users to discuss new compliance inspection procedures. Industries impact on Biosolids quality was discussed as well as the City’s Biosolids EMS.
- The City will continue to keep interested parties apprised of our efforts to seek input as part of our continuous improvement process.
- The only valid request received from the web based form maintained for public comment was an agency requesting information regarding audit companies. Since 2006 there have been 2 valid entries and 15 spam entries. During 2010 the effectiveness of this approach will be re-evaluated.

Current Year Goals & Objectives

An important component of our Biosolids EMS is continual improvement. Annually goals are identified based on key outcomes, Biosolids value chain, or EMS improvements. During the past year staff determined the following goals would help us achieve these objectives.

Construction new Biosolids Storage Tanks

- Construction was started in 2007 and the tanks went on line during the 4th quarter of 2009.

Construction of a new Biosolids Dewatering Facility

- Construction was started in 2007 and the facility went on line during the 4th quarter of 2009.

Maintain a Minimum 75% ratio of PM Versus CM Workorders

- During 2008 staff achieved greater than 80% preventive maintenance (PM) versus corrective maintenance (CM). This indicates a well operated maintenance department which is operating in a highly proactive versus reactive mode.

Update Lab Chemical Hygiene Plans

- This goal was discontinued as it was identified as not being SMART compliant during the third party verification audit.

Complete electronic O & M manual

- During 2009 the plant was affected by layoffs, the position “Water Plant Supervisor – Operations” was eliminated. Those duties and responsibilities were redistributed and as a result this goal has lagged behind the anticipated schedule.

Improved maintenance managements practices

- During 2009 the maintenance staff set a goal of documenting 100 man hours per month for each worker on work orders.

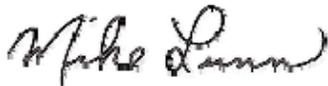
Summary of Non-Conformances

- 2009-1
 - During a review of critical controls points it was noted that the plant database does not contain scum volumes as stated in the EMS. Scum volumes (tons) were subsequently added to the plant database.
- 2009-2
 - A critical control point, “Portable Toilet Waste” was added and table 7.1 was not updated. It has since been updated.
- 2009-3
 - Annual report did not include summary of Operational Controls. The report was revised as a result.
- 2009-4

- Nonconformance was identified as part of the interim audit. Not all of the goals and objectives were developed using the SMART (Specific, Measureable, Achievable, Relevant and Time-bound) criteria. As a result a form that requires identifying SMART criteria before adopting the goal or objective was added to the review process.
- 2009-5
 - Nonconformance was identified as part of the interim audit. The training program providing general awareness of the EMS and how each employee's assigned roles and responsibilities relate to the entire Biosolids value chain is not fully effective. A more aggressive training program has been developed and work is underway to more fully incorporate the Biosolids EMS into the day to day operation.

Summary

Implementing a Biosolids EMS has proven to be a worthwhile effort. Success was achieved only through the hard work and dedication of staff and our contractors as well as support from administration and the National Biosolids Partnership. Continual improvement of our Biosolids management practices and EMS are an ongoing process which will only improve as new practices developed as part of the EMS are utilized and refined. Non-conformances which are identified assist in strengthening our management practices and improve the overall effectiveness of the Biosolids EMS. We have already identified new goals for 2010 which we feel will further improve our Biosolids quality and management practices.



Mike Lunn
EMS Coordinator