

BIOSOLIDS EMS MANUAL

ELEMENT 13.0

MONITORING & MEASUREMENT



REVISION	EFFECTIVE DATE	APPROVAL SIGNATURE
11	July 26, 2016	

PURPOSE

Element 13.0 outlines the systems that the City of Fort Worth has in place to assure compliance with applicable legal and self-imposed requirements to measure the biosolids program performance at Critical Control Points, track its progress toward achieving biosolids program goals and objectives per Element 5.0, and measure the effectiveness of the Environmental Management System (EMS) Element.

SCOPE

This element covers all Critical Control Points (CCP) in the Biosolids Value Chain as well as documenting the effectiveness of CCP, Operational Controls, Biosolids distribution and marketing, Public Outreach, and overall EMS efforts. This procedure applies to all the organization's biosolids management activities at all CCP throughout the biosolids value chain, including the pretreatment program, Village Creek Water Reclamation Facility (VCWRF) liquid and solids operations, biosolids beneficial reuse and the future marketing and sale of biosolids for beneficial reuse.

KEY WORDS

- Biosolids Value Chain
- Environmental Performance
- Measurement
- Monitoring
- Total Quality Management Principles

RESPONSIBILITY

The Biosolids EMS Manager, Biosolids EMS Coordinator, Water Systems Superintendent, Assistant Water Systems Superintendents (Operations and Maintenance), Pretreatment Manager, and Biosolids Manager (Contractor) are responsible for assuring all EMS aspects that require monitoring and measuring are followed and documented. Each employee (City and Contractor) working within the biosolids value chain is responsible for the professional quality work that they do.

PROCEDURE

Regulatory Monitoring

The minimum monitoring requirements for VCWRF (pretreatment standards, influent flow, effluent and discharge flow, downstream flow, sludge processing and quality, etc) are presented in its Texas Pollution Discharge Elimination System (TPDES) Permit, the Texas Administrative Code (TAC) and Code of Federal Regulations (CFR) referenced in Element 4.0—Legal and Other Requirements.

City

The City monitors and measures biosolids regulatory operations, treatment processes and activities throughout the biosolids value chain. As discussed in Element 4.0—Legal and Other Requirements, the City continually monitors changes in the legal regulations governing the biosolids processes and implements any new monitoring requirements when they become effective.

Contractor

The City also requires its contractors to monitor biosolids regulatory operations, processes and activities in addition to those specified by the permit in the contract documents. The EMS Master Table in Element 3.0—Critical Control Points, lists the monitoring and measurement activities and frequencies associated

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with the respective critical control points within the biosolids value chain. These activities are documented as discussed in Element 12.0—Documentation.

Internal Monitoring

The City is committed to the Total Quality Management Principles that the National Biosolids Partnership (NBP) Manual of Good Practice and the EMS program are based on. In order to maintain a working environment that has the ability to adapt, the City trains its employees, as discussed in Element 8.0—Training, to perform their tasks and monitor their work and the processes that they oversees throughout the biosolids value chain. The City also employs Quality Assurance/Quality Control Specialists that monitor both in house and contract laboratory procedures and sampling (Element 7.0—Roles and Responsibilities).

Process Monitoring

As discussed in Element 10.0—Operational Controls, the City and Contractor have established standard operating procedures (SOPs) for each critical control point within the biosolids value chain. These SOPs define the monitoring points and procedures in each process.

City

The City monitors and measures wastewater and biosolids treatment processes, operations and activities throughout the biosolids value chain. The City has established SOPs for process monitoring activities. Appendix 13.1 provides copies of monitoring forms or datasheets that are specific to the biosolids program. For SOPs regarding biosolids and sludge-only landfill monitoring, see SOPs 03.001, 05.001, 0.6.001, 08.001 and 09.001. Appendix 13.2 provides copies of the Daily Process Control Worksheets that VCWRF uses for monitoring and measurement of wastewater treatment processes within the plant.

Contractor

The City also requires its contractors to monitor biosolids operations, processes and activities in addition to those specified by the permit in the contract documents. The contractor is responsible for their own SOPs and ensuring they reflect requirements for the VCWRF TPDES permit, contract documents, and the Biosolids EMS.

Odor Control Plan

In accordance with sludge provisions found in the City's TPDES permit, both the City and its biosolids contractor are responsible for:

- Identifying nuisance odors
- Development of odor control options
- Evaluation and selection of odor control mechanisms
- Implementation of corrective actions

In addition, the City and its contractor will follow record keeping and notification requirements that include:

- Daily Odor Log
- Monthly Schedule of Planned Land Application Sites
- Site Schedules
- Complaints Records

Adverse Weather and Alternative Plan

The City's TPDES permit requires an Adverse Weather and Alternative Plan in the event that biosolids cannot be applied to land application sites due to adverse weather conditions. In the event of adverse weather, The City's biosolids contractor will notify VCWRF personnel of the intent to land apply at an alternative site and when the application will begin. If an unaffected site is not available, biosolids will be stored at the sludge only landfill (SOL).

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If there is less than 50% storage capacity available at the SOL, the biosolids contractor will send the material to the landfill.

Land Application Monitoring

The City and Contractor monitor and measure biosolids land application site operations and activities. The City conducts biosolids land application site inspections on a daily basis when land application is occurring. A Field Observation Report (Appendix 13.1) is completed for each site inspection. These reports include general information regarding the site, weather conditions, and truck and haul road conditions. Also, if any Class B land application setbacks are used they are noted on the report. A site close-out inspection is conducted by City staff shortly after the Contractor has moved to another land application site and a Close-Out Site Visit form is completed (Appendix 13.1). When investigating odors, an olfactometer is used and an Odor Monitoring-Field Data Sheet is completed. See SOPs BSLD 01.001, BSLD 01.002, and BSLD 07.002 for detailed procedures regarding land application monitoring and biosolids complaint investigation procedures. SOP BSLD 04.001 outlines procedures for land application that occurs at the Sludge Only Landfill.

Water Department Business Plan

Each quarter all City departments must complete and submit a “Business Plan Progress Tracking Form” to the City Manager’s Office for review. This form tracks each department’s progress toward attaining the City’s strategic goals and includes data showing progress made during the quarter. The Water Department uses the biosolids EMS goals and objectives to help improve some of the metrics that are included in the Business Plan Progress Tracking Form.

Goals and Objectives

The biosolids goals and objectives, which support the strategic goals, are presented annually in the EMS Performance Report (Element 15.0). Each year the EMS Management Team (Element 17.0) reviews the progress towards the biosolids goals and objectives. Furthermore, the Biosolids EMS Manager and Biosolids EMS Coordinator shall track progress of the goals and objectives once per quarter and update Element 5.0-Appendix 5a accordingly.

Management Review

The EMS Management Team meets annually to review the effectiveness of the biosolids goals and objectives, evaluate EMS performance, and formulate new biosolids goals and objectives prior to the next year’s budget sessions.

Audits

In addition to the annual management review of the biosolids program, the City undergoes internal and external (third-party) audits (Element 16.0) which verifies biosolids goals are in place and being tracked, environmental performance is being monitored, and the EMS is being utilized appropriately.

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REFERENCES

- BMP Guidance Manual , (NBP) <http://www.wef.org/Biosolids/page.aspx?id=7733>
- Code of Good Practice, (NBP): <http://www.wef.org/Biosolids/page.aspx?id=7733>
- VCWRF SOPs: VCWRF Administration Library

EMS Cross References

- Element 3.0 Critical Control Points
- Element 4.0 Legal and Other Requirements
- Element 5.0 Biosolids Goals and Objectives
- Element 7.0 Roles and Responsibilities
- Element 8.0 Training
- Element 10.0 Operational Control of Critical Control Points
- Element 12.0 Documentation and Document Control
- Element 15.0 Biosolids Program and EMS Performance Report
- Element 16.0 EMS Internal Audit
- Element 17.0 Periodic Management Review of Performance

ATTACHMENTS

Appendix 13.1

Appendix 13.2

REVISION HISTORY

Revision #	Date	Revision Description
11	07/26/2016	Reference to Odor Control Plan and Adverse Weather and Alternative Plan added, updates to procedures.
10	10/06/2014	Referenced biosolids SOPs in Process Monitoring and Land Application Monitoring sections
09	08/05/2013	Update references and procedure, added attachments list
08	04/18/2012	Update procedures
07	11/16/2010	Update responsibilities, references, and procedures for goals and objectives
06	07/20/2009	Updated (Appendix 13b) Daily Process Worksheets
05	05/15/2008	Audit (YR2) 2007
04	06/29/2007	Audit (YR1) 2006
03	07/08/2005	Revised Biosolids Goals tracking procedure per Phase II Audit
02	11/29/2004	2004 Issue
01	10/01/2004	Approval Draft
SR	01/30/2004	Issued for Status Review

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Field Observation Report
Close-Out Site Visit Form
Odor Monitoring-Field Data Sheet
Biosolids Percent Solids Data Sheet
SOL Daily Odor Monitoring Form
Biosolids Application at the Sludge Only Landfill Checklist
Land Application of Biosolids at the SOL-Monitoring Form

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APPENDIX 13.2: PLANT FORMS



Daily Process Control Worksheets