

**NATIONAL BIOSOLIDS PARTNERSHIP
VERIFICATION AUDIT REPORT**

**City of Waco Water Utilities Services
Waco Metropolitan Area Regional Sewer System (WMARSS)
Waco, Texas**

Audit conducted by

NSF-International Strategic Registrations

William R. Hancuff, Lead Auditor

References:

National Biosolids Partnership (NBP) EMS Elements
NBP Third Party Verification Auditor Guidance – November 2001
(Latest Revision August 2011)
NBP Code of Good Practice
WMARSS Biosolids Management System Manual
10 February 2014

Final Report – December 27, 2015

INTRODUCTION

The purpose of the Biosolids Environmental Management Program (BMP) Third Party Verification audit is to verify the Waco Metropolitan Area Regional Sewer System (WMARSS) Biosolids Management Program (BMP) conforms to National Biosolids Partnership (NBP) requirements. The goal of the Third Party Verification audit is to collect and evaluate objective evidence to determine whether the facility's BMP is functioning as intended, that practices and procedures are conducted as documented, and that the BMP as implemented conforms to the NBP's BMP Elements, the Code of Good Practice and the BMP program objectives.

RECOMMENDATION

The results of the WMARSS verification audit and review of corrective action plans are positive, and it is the recommendation of the audit team that the City of Waco Metropolitan Area Regional Sewer System BMP receive "Gold Recognition" status. This recognition is not the end, but rather the beginning of a continuously improving biosolids management program.

AUDIT SCOPE

In general terms, the scope of the Third Party Verification audit encompasses the entire biosolids value chain (pretreatment, collection and treatment, solids processing through final end use or disposal) with special attention on those practices and management activities that directly support solids and biosolids-related operations, processes, and activities within the wastewater treatment plant's biosolids value chain.

The NSF- International Strategic Registrations, Ltd. (NSF-ISR) conducted a comprehensive third party verification audit of the WMARSS BMP. The verification began with a document review desk audit combined with an on-site readiness review (ORR) conducted from 23 April 2013 to 25 April 2013. The results of this step of the audit were presented to Waco in a letter report on 25 April 2013. The process continued with a complete on-site verification audit conducted from 12 February 2014 to 15 February 2014. Due to turnover in staff corrective actions were not addressed in a timely manner and another on-site verification audit had to be conducted from 7 May 2015 to 8 May 2015. The ORR team and the verification audit team consisted of Dr. William R. Hancuff, Lead Auditor.

The physical biosolids facilities included in the audit and visited during the ORR and verification audits were located at the Waco Central Wastewater Treatment Plant and Bull Head Creek Wastewater Treatment Plant. The facilities included the Central Plant laboratory, headwork's, mechanical bar screens, vortex grit separator, primary clarifiers, activated sludge units, secondary clarifiers, solids drum thickener, industrial waste collection tank with biosolids storage, two-stage anaerobic digesters, digester solids dewatering units, solids dryer operations, sand filters, disinfection units (ultraviolet light and chlorine for reuse water), two potential land application farm sites (belonging to Ben

Hirsh and Mark Jackson) for stabilized lagoon solids adjacent to the Central Plant, Justin Young – farmer/rancher biosolids user. And Bull Creek wastewater plant – activated sludge and solids hauling operations (to Central Plant).

The following individuals were interviewed as part of the audit process:

- Lisa Tyer – Interim Utilities Director/WMARSS Manager
- Ricky Garrett – (former) Utilities Director/WMARSS Manager
- Joe Bernosky – (former) Assistant Utilities Director/Program Manager
- Tom Conry – (former) Program Manager
- Michael Jupe – Program Administrator
- Scott Espen – Technical Coordinator
- Jerry Whitehead – (former) Technical Coordinator
- Mistie Gonzales – Pretreatment Coordinator
- Leonard Leinfelder – (former) Operations Manager
- Christy Saunders – Staff Assistant
- Matthew Vaughn – Texas Commission on Environmental Quality – Region IX (Waco), Water Quality Section, Work Leader, Water Section Work Leader
- Dale Dennis – (former) Utilities Operator – Bull Hide Creek Treatment Plant, current Operations Supervisor
- Larry Ondrej – Utilities Operator
- Kenny Sells – Utilities Operator
- Delores Wells – Utilities Operator
- Shane Estrada – (former) Maintenance
- Ray Bettge – Maintenance, Technical Coordinator
- Steve Pustejovsky – Maintenance
- John Lenart – Maintenance
- Justin Young – farmer/rancher
- James Holder – Russell Brother’s industrial waste haulers

DOCUMENTATION REVIEW

Documentation review was conducted in two parts; the desk audit combined with the ORR, and the verification audits. During each of these activities various documents were reviewed to verify conformance with the National Biosolids Partnership (NBP) BMP Elements using the NBP Third Party Verification Auditor Guidance. Additionally interviews were conducted with various personnel to obtain supplemental objective evidence on the effectiveness of the implementation of the BMP. Attachment 1 summarizes the documents and other objective evidence associated with each element that was considered during the above-mentioned audits.

DESK AUDIT/OPERATIONAL READINESS REVIEW

A complete document review was performed as a desk audit. The principal focus was on the BMP Element procedures contained in the 2013 WMARSS BMP Manual. The ORR involved assessment of supplemental information such as cross referenced

procedures, monitoring and measurement records, background reference information, summary of goals and objectives related to outcomes, and various public outreach and communication materials. It also entailed an overview of the biosolids value chain critical control points.

The results of the desk audit/ORR provided a number of observations and opportunities for improvement. This initial effort resulted in 16 observations, 12 opportunities for improvement, and 1 positive finding. Detailed results from the desk audit/ORR are provided in Attachment 2.

Many of the observations identified during the desk audit/ORR were addressed by the time of the first verification audit. Significant improvements in the BMP were made as a result of these efforts but there were several minor findings that required CA plans before gold recognition could be recommended.

VERIFICATION AUDIT FINDINGS

The first verification audit supplemented the desk audit and ORR such that all elements of the standard were addressed in considerable detail. The verification audit included review of the latest version of the WMARSS Biosolids Environmental Management System Manual dated Feb 10, 2014 containing the current element procedures, and utilized the most recent version of the NBP Third Party Verification Auditor Guidance dated August 2011. The verification audit found no major non-conformance, 8 minor non-conformances and 18 opportunities for improvement, as well as 2 commendations or positive observations, the latter including the one observed during the initial phase of the audit.

Due to an inordinately high turnover in staff corrective actions could not be completed in a timely manner and a new verification audit had to be performed. This new audit included review of the same documents as the first verification audit referenced above. The most recent verification audit found 2 major non-conformances, 6 minor non-conformances, 8 opportunities for improvement and 1 commendation or positive observation.

The following is a presentation of the positive observations made during the audits. Minor non-conformances and opportunities for improvement follow and are presented in the sequence of the NBP standard elements listed by requirement number. These numbers, where appropriate, correspond to the Element minimum conformance requirements.

Positive Observation

Requirement 14.3 and 14.4 – WMARSS makes excellent use of their corrective action program to identify operational incidents so they could be tracked and analyzed to determine if there were common operational problems that can be grouped and addressed to implement preventive measures instead of simply correcting similar problems over and over again.

Major Non-conformances

Requirement 15.1 – Element 15: Biosolids Management Program Performance Report procedures require the performance report be completed by December 31st of each year. The report for 2014 was not completed.

Element 16 – The organization’s internal BMP audit procedure has a number of minor nonconformances and opportunities for improvement that together point to systemic breakdown. They are as follows:

- Internal BMP Audit procedure 1 incorrectly indicates that independent third party audits can be conducted in place of internal audits.
- The internal audit for 2014 was not completed by October 1 of that year as required by procedure 2 of Element 16: Internal BMP Audit procedure. (Note: the internal audit was not completed anytime in 2014).
- The internal audit team members have not received training from the NBP third party auditor guidance manual as required by procedure 4 of Element 16: Internal BMP Audit procedure.
- The internal audit report was not included in annual performance report or the management review report.
- The audit program did not include a description of the audit methodology, protocol, scope, and schedule.

Minor Non-conformances

Requirement 5.1 – Not all of the Goals and/or Objectives were measurable, i.e. they generally did not answer the questions how much or how many, or have an indicator that is quantifiable.

Requirement 5.1 and 13.1 – The Element 5: Goals and Objectives for Continual Improvement Procedure does not meet the intent of defining the frequency of periodically reviewing the progress on the biosolids program goals and objectives as generally described in item 9, which refers to the Master Calendar. Neither the procedure nor the calendar adequately meets the intention of reviewing progress on the goals and objectives. Similarly, Element 13: Monitoring and Measurement procedure does not adequately define the frequency of periodically reviewing the progress on the biosolids program goals and objectives.

Requirement 5.7 – Detailed action plans describing those activities used to achieve program goals and objectives including a breakdown of action items, schedules and milestones have not been prepared for all the goals and objectives.

Requirement 7.3 – The BMP Team includes the Program Administrator, Operations Supervisor, Pretreatment Coordinator, Technical Coordinator, Maintenance and Staff Assistance. The team does not presently include representatives from purchasing (finance), resource management, and legal, which impedes the comprehensive implementation of the program (including accomplishment of goals and objectives and corrective actions.) Representatives from these areas are needed to ensure the human, technical, and financial resources are available to execute the BMP. (Note: Also consider the extent to which a member of the City Council could be involved.)

Requirement 11.2 – There was no evidence available to demonstrate that the organization evaluated the effectiveness of emergency preparedness and response procedures (i.e. spill drills), including communication systems and revises them as necessary.

Requirement 17.1 – The organization has not yet conducted the annual management review of the biosolids management program. (Consider using an example of another certified agency’s BMP performance report as an example of the format for preparing the report that can be used for presentation at the management review.)

Opportunities for Improvement

Requirement 3.4 – Not all of the operational controls (i.e. the Standard Operating Procedures) for the critical control points are identified in Table 3.1. For example, the Dryer identifies the Permit as opposed to WMO D1, and the Lagoon influent and effluent generally refers to the permit as opposed to WMO SP1.

Requirement 5.7 – Consider converting Table 5.1: Goals and Objectives Tracking Report to an Appendix of the BMP Manual.

Requirement 12.2(d) – There is no indication in the procedure that printed versions of the SOPs, EMS Manual Elements, etc. are marked with a footer indicating that the current controlled version can be found on the “s” drive.

Requirement 12.2(e) – Procedure 5 of the WMARSS Element 12 Documentation, Document Control & Recordkeeping procedure indicates the version and revision history will be maintained for all controlled documents (Policy, BMP Manual and SOPs) however the header form described in procedure 3 of that element has not been implemented for the BMP manual. Also, there is no description of the WMARSS’ intention to have each element procedure of the BMP manual independently reviewed and revised as necessary.

Requirement 14.2 – Consider the value and accuracy of various subsections within procedures 3 & 4 and Tables 14.1 and 14.2 of Element 14: Nonconformance – Preventive & Corrective Action procedure.

Requirement 14.6 – Review the WMARSS readiness review “Audit Corrective Action Plan Tracking Report” form to improve the titles and content of the form and its column identifiers.

Requirement 14.6 – Consider developing a single corrective action worksheet for all corrective actions no matter what the source: audit (internal or external), operation or monitoring nonconformance, or regulatory nonconformance.

Requirement 15.1 – Consider preparing the annual Biosolids Management Program Performance report to emphasize the positive accomplishments and cost savings attributable to the successful completion of Goals and Objectives; and consider including an estimate of the total operation and maintenance cost of the critical control points through the biosolids value chain.

WACO METROPOLITAN AREA REGIONAL SEWER SYSTEM COMMENTS

WMARRS recognizes the importance and benefits from third party audits as a tool to continually improve our Bio-solids Management Program (BMP). WMARSS is committed in the implementation of corrective actions and need to correct the non-conformances and opportunities for improvement to improve the WMARSS BMP.

OUTCOMES MATTER

The WMARSS Biosolids Management Program initially established 10 goals and 19 objectives within those goals in 2011 and carried them over into 2012. Many of the first goals and objectives were associated with development of the BMP. The goals and objectives developed in 2013 and 2014, although still containing some actions related to development of the program, were more focused on the outcome areas. And the 2015 goals and objectives were directed at performance improvements. From 2013 through 2015 the BMP Team developed the goals and objectives and considered each of the four outcome areas of the NBP program as identified 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 attain all the objectives established, it is a critical component of the system to make progress towards accomplishing the overall goals. The 2015 goals were established to a much greater degree than earlier goals using Specific, Measurable, Achievable, Relevant, and Time Bound (SMART) criteria, but could have been better defined in terms of measurability. The 2015 goals and objectives were much more clearly defined as to how they fit into the NBP required outcome areas than earlier goals. The facility’s performance relative to each of the above outcome groups is addressed below.

In the Environmental Performance outcome area a long-term goal was initially established in 2011 to remove material from the inactive biosolids lagoons. The goal has continued from year to year through 2015. WMARSS currently has only one option for beneficial use of its biosolids product, i.e. the production of Class A pellets from the dryer operation (\$146/ton). During times when the dryer system is out of operation, the biosolids must be either diverted to the biosolids lagoons for storage (\$30/ton) or transported to a landfill at considerable expense (\$329/ton). Since the biosolids storage lagoons are completely full there is no other option for biosolids but to transport them to a landfill, which results in considerable cost and no beneficial use. The measurable goal is to remove and beneficially use 55,000,000 gallons of stabilized biosolids (Class A) from the previously used biosolids lagoons (lagoons 2 & 3) by land application to farms. The alternatives evaluated were: 1) land apply the solids to farm land immediately adjacent to the plant; 2) land application of the solids to farm land remote from the plant; and 3) contract with a spreading company to have the solids beneficially applied to land of their selection. The removal and use of biosolids from the lagoons provides an option of once again using the lagoons for emergency storage (and eventual beneficial use) in place of landfiling. The first option of distributing the material to adjacent farming land was determined to be the most cost effective. Implementation was initiated with the purchase of pumps, grinder, pipelines and various materials in late 2013. The current delays are associated with negotiation of agreements with neighboring landowners. The estimated time to complete is approximately four years, with contracts anticipated by September 2015.

The next environmental performance related goal for 2013, which was carried over into 2014, is the purchase and replace the auger system in the pellet storage building. The target of this improvement is to reduce the number of spills during product loading from 1 per week to fewer than 2 per year. This was carried over as an objective in 2015. Combined with this goal was the purchase and replacement of the pellet silo, as discussed below. A related goal and objective developed for 2015 was the minimization of pellet spillage while loading from ground storage. This is to be accomplished through minimizing the use of the front-end loader to load pellets from ground storage. Currently the loader is used for loading vehicles because of inefficiencies in the conveyance system. The measurable improvement is to reduce the current rate from 4 out of 5 trucks being loaded with the loader to 1 per month.

Similarly, another goal and objective was established in 2015 for other improvements in the dryer operations to include: purchase of dryer pre-separator and polycyclones by October 2015 and replacement of dryer effluent air duct 90 scheduled for November 2015.

Another facility improvement goal is the purchase and installation of a rock trap and waste grinder for the industrial receiving station. The rock trap will result in elimination of damages to pumps caused by rocks, gravel and sand being inadvertently added to the industrial waste storage tanks from hauler trucks. And the addition of the grinder will substantially reduce the number of preventable equipment failure incidents associated with the receiving station. The installation of this equipment was completed in January 2014 and tests on the effectiveness and optimization of operation were completed shortly

after that. A follow-on goal and objective established in 2015 is to improve the septic station debris removal. This is planned to be accomplished through the purchase and installation of a grinder for the septic receiving station. Completion of this project is scheduled for the end of November 2015. The measurable improvement is to reduce the number of times needed to clean the feed auger from daily to weekly. The maintenance requires 20 to 30 minutes per event and is a health and safety risk. The measurable benefit is total reduced labor hours for this task.

And finally, another new goal for 2015 is the purchase and installation of a new generator for using digester gas as an energy source. The existing generator has a capacity of 500 kW and the new generator has a capacity of 633 kW. The payback on this unit is 2.5 years. Purchase of this equipment is set for November 2015.

In the Regulatory Compliance outcome area, there was only one goal established for 2013 and 2014 that directly relates to regulatory compliance. It is preparation of the permit required "headworks analysis" for the next issuance of the WMARSS permit, which requires analysis of sampling points at various entry locations.

It should be noted however that there are several other goals and objectives that could have an impact on the regulatory compliance outcome area including the cleaning of lagoons to provide an additional option for production of Class A biosolids as discussed above. And the improvement in measurement of hauled industrial waste being added to the digesters as discussed below.

In the Relations with Interested Parties outcome area, there were three initial goals and objectives established for 2013 and 2014. The first objective was not effectively measurable but nonetheless beneficial and included the regular updating of the WMARSS website to include the most current information on the biosolids management program

The second goal and its objectives were to produce several new documents that could be used to provide information to the public. They included a pellet pamphlet, a WMARSS biosolids pamphlet, and an industrial pretreatment pamphlet. These three publications were produced, and the website was initially kept updated. The updating of the website was moved to be included as part of a routine requirement of the Communications and the Public Participation in Planning elements of the system.

A third goal related to interested parties was established to initiate a more proactive outreach to the farmers who use the Class A biosolids pellets. This goal included the creation of a customer survey form for use by those landowners who purchase the WMARSS final biosolids product. As part of this goal a spreadsheet was developed to track responses. The initial target was to obtain 50 responses; however the replies to the surveys were very limited so a new and/or modified approach to this goal was developed and relabeled as development of a proactive approach to providing meaningful opportunities for public input, which is a requirement of the standard.

A new goal added for 2015, which impacts relations with interested parties is the development of update of disposal permits for waste transporters (industrial and FOG haulers).

In the Quality Biosolids Management Practices outcomes area, one of the goals established in 2013 and before was associated with training staff on the BMP responsibilities at least quarterly. Initially there were 11 objectives associated with this goal covering a wide variety of biosolids management program components. By 2014 all of the training was completed; however the goal inadvertently was carried forward as opposed to accepting it as a standard practice to be included in the Training Element.

A second quality management related goal for 2013/2014 is the purchase and installation of septic, industrial and FOG receiving station scanners to increase the accuracy of hauler discharge measurements from the current method of estimating to an instrument measurement that includes a monitored record. The improvement will result in increasing the accuracy from the current value of 80% to the 95% level. This will result in a more reliable collection of hauler fees and documentation records. This goal and objective was modified in 2015 to include reducing labor required for load tracking and included the purchase and installation of all three scanners. The measureable improvement, in addition to more accurate billing, includes reduction of labor required to enter information from 20 to 30 tickets per day to verifying some occasionally every week or so.

The third goal is a highly significant and useful one developed for 2013 and 2014, which will result in substantial improvement in critical control point operations. It is the implementation of an incident tracking system that includes the identification of corrective action location and frequencies. The results will provide an opportunity to classify operational failures so that more meaningful preventive actions can be developed at those facilities identified as problem sites. Once this is accomplished it will result in generation of corrective/preventive actions and new goals and objectives, i.e. continual improvement of the system.

The final quality management goal for 2013 and 2014 is the purchase and replacement of the pellet silo in order to maintain product quality, as was discussed in the environmental performance outcome section.

CONCLUSIONS AND RECOMMENDATIONS (TO BE MADE)

The results of the verification audit show the WMARSS has a solidly established base for their Biosolids Management Program. Although it took several months for the Waco staff to accomplish (again because of staff turnover and significant operational problems), the NSF lead auditor reviewed and approved the implementation of the corrective actions for the major nonconformities identified during the verification audit. Additionally, he reviewed and approved the corrective action plans for each of the minor nonconformances. Therefore the “Gold Recognition” recommendation for the WMARSS Biosolids Management Program (BMP), Waco, Texas is made to the NBP. The full implementation of the corrective actions for the minor nonconformances will be accomplished according to the schedule proposed in the corrective action worksheets. It is expected that the opportunities for improvement will each be addressed although they do not require formal closure.

As was mentioned previously, a BMP is a continuous improvement process, and recognition is not the end -- it is the beginning. 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.

Each internal or interim audit will include a review of: the organization's progress toward goals and objectives; BMP outcomes (environmental performance; regulatory compliance; interested party relations; quality practices); actions taken to correct minor nonconformances; the management review process; corrective action requests and responses; and preventive actions. In addition to the above, all of the elements will be audited individually over the four-year interim period between verification audits, such that all elements are addressed.

To attain and maintain platinum status the following audit schedule includes an approach for ensuring all elements are audited as required by NBP:

Year 1 (third party) – Elements 5, 6, 9, 14, 16

Year 2 (third party) – Elements 1, 10, 12, 13

Year 3 (third party) – Elements 3, 8, 15, 17

Year 4 (third party) – Elements 2, 4, 7, 11

Year 5 (third party) – Re-verification – All elements

Attachment 1

Documents and Other Objective Evidence Reviewed During the Desk Audit/On-Site Readiness Review And Verification Audits

Element 1. BMP Manual

- Element 1: WMARSS BMP Manual dated February 3, 2014.
- WMARSS Master Control Document Signature Page.
- Interview with Michael Jupe, Program Administrator; Dale Dennis – Operations Supervisor, Scott Espen – Technical Coordinator; Jerry Whitehead – (former) Technical Coordinator, and Mistie Gonzales – Pretreatment Coordinator.
- Reviewed Biosolids Management Program (BMP) Manual including all element procedures – Version 2011-4 dated February 3, 2014.
- BMP manual elements approvals by Joseph Bernosky, Michael Jupe, Leonard Leinfelder, Mistie Gonzales, and Scott Espen.
- WMARSS Biosolids Annual Calendar.
- Element 2: Biosolids Management Policy established by the WMARSS Board.

Element 2. Biosolids Management Policy

- Element 2: Biosolids Management Policy dated February 3, 2014.
- Interviews with Lisa Tyer – Interim Utilities Director/WMARSS Manager; Ricky Garrett – (former) Utilities Director/WMARSS Manager, Joe Bernosky – (former) Assistant Utilities Director/Program Manager, and Tom Conry – (former) Program Manager
- Interview with Michael Jupe, Program Administrator; Dale Dennis – Operations Supervisor; Scott Espen – Technical Coordinator; Jerry Whitehead – (former) Technical Coordinator, and Mistie Gonzales – Pretreatment Coordinator.
- Interviews with Christy Saunders – Staff Assistant, Dale Dennis – Utilities Operator – Bull Hide Creek Treatment Plant; Larry Ondrej – Utilities Operator, Kenny Sells – Utilities Operator, Ray Bettge – Maintenance, Steve Pustejovsky – Maintenance, and Shane Estrada – (former) Maintenance.
- Memorandum of Minutes of Waco Metropolitan Area Regional Sewer System Work Session on October 21, 2011 containing a motion to approve the “Policy Statement.”
- Memorandum of Minutes of Waco Metropolitan Area Regional Sewer System Work Session on May 29, 2013 containing a motion to approve commitment to the “Code of Good Practice” in the Biosolids Management Program.

Element 3. Critical Control Points

- Element 3: Critical Control Points dated February 3, 2014.

- Table 3.1: Critical Control Points, Operational Controls, SOPs, Monitoring/Measurement and Environmental Impacts dated February 3, 2014.
- Interview with Michael Jupe, Program Administrator; Dale Dennis – Operations Supervisor; Scott Espen – Technical Coordinator; Jerry Whitehead – (former) Technical Coordinator, and Mistie Gonzales – Pretreatment Coordinator.
- Interviews with Christy Saunders – Staff Assistant, Dale Dennis – Utilities Operator – Bull Hide Creek Treatment Plant; Larry Ondrej – Utilities Operator, Kenny Sells – Utilities Operator, Ray Bettge – Maintenance, Steve Pustejovsky – Maintenance, and Shane Estrada – (former) Maintenance.
- WMARSS Central Plant Wastewater Treatment Facilities, Process Flow Diagram.
- Field observation of various Central Plant and Bull Hide Creek plant critical control points.
- Field observation of two potential land application farm sites (belonging to Ben Hirsh and Mark Jackson) for stabilized lagoon solids adjacent to the Central Plant.

Element 4. Legal and Other Requirements

- Element 4: Legal and Other Requirements dated February 3, 2014.
- Table 4.1a: Legal Requirements and Guidance Specific to WMARSS Biosolids Program dated February 3, 2014.
- Table 4.1b: Specific Regulatory and Legal Requirements from NPDES and TCEQ permits.
- Interviews with Joe Bernosky, Michael Jupe, Scott Espen, and Mistie Gonzales.
- WMARSS Industrial Pretreatment Program brochure.
- Interview with Matthew Vaughn – Texas Commission on Environmental Quality, Waco Regional Office, Water Section Work Leader.
- Interview with Justin Young – farmer/rancher – product user
- Interview with James Holder – Russell Brother’s industrial waste haulers
- Review of Industrial Waste Pretreatment program (28 permitted industrial users, mostly significant industrial users).
- Review Approval for Hauled Waste Disposal Form for Boise Paper & Packaging.
- Review Industrial inspection report for Coca-Cola April 23, 2013.

Element 5. Goals and Objectives

- Element 5: Goals and Objectives for Continual Improvement dated February 3, 2014.
- Review of Goals and Objectives for 2011, 2012, 2013 and 2014.
- Action Plan and Tracking Template (for goals and objectives).
- Goals and Objectives Tracking for 2013.
- Interviews with Lisa Tyer – Interim Utilities Director/WMARSS Manager; Ricky Garrett – (former) Utilities Director/WMARSS Manager, Joe Bernosky – (former) Assistant Utilities Director/Program Manager, and Tom Conry – (former) Program Manager

- Interview with Michael Jupe, Program Administrator; Dale Dennis – Operations Supervisor; Scott Espen – Technical Coordinator; Jerry Whitehead – (former) Technical Coordinator, and Mistie Gonzales – Pretreatment Coordinator.

Element 6. Public Participation in Planning

- Element 6: Public Participation in Planning dated February 3, 2014.
- Table 6.1 WMARSS Public Participation Mechanisms.
- Interested Parties Summary Table.
- WMARSS Plant Tour Summary Table.
- Interview with Lisa Tyer – Interim Utilities Director/WMARSS Manager; Joe Bernosky (former) – Assistant Utilities Director/Program Manager
- Interviews with Tom Conry – (former) Program Manager; Michael Jupe – Program Administrator; Dale Dennis – Operations Supervisor; Scott Espen – Technical Coordinator; Jerry Whitehead – (former) Technical Coordinator; Mistie Gonzales – Pretreatment Coordinator, and Christy Saunders – Staff Assistant.
- Interviews with Justin Young – farmer/rancher – product user and James Holder – Russell Brother’s industrial waste haulers.
- Interview with Matthew Vaughn – Texas Commission on Environmental Quality, Waco Regional Office, Water Section Work Leader.
- BMP Interested Parties Lists (Pellet Venders – purchasers of class A dried product).
- Reviewed Customer Satisfaction Survey form.
- Handout on “Free Crop Nutrient Supplement and Soil Conditioner.”
- WMARSS Biosolids Management System Information brochure.
- WMARSS Industrial Pretreatment Program brochure.
- NBP Pocket Edition of Biosolids Management Program.
- WMARSS website: <http://www.wmarss.com/>

Element 7. Roles and Responsibilities

- Element 7: Roles and Responsibilities dated February 3, 2014.
- Roles and Responsibilities Table.
- Interviews with Lisa Tyer – Interim Utilities Director/WMARSS Manager; Ricky Garrett – (former) Utilities Director/WMARSS Manager, Joe Bernosky – (former) Assistant Utilities Director/Program Manager, and Tom Conry – (former) Program Manager.
- Interview with Michael Jupe, Program Administrator; Dale Dennis – Operations Supervisor; Scott Espen – Technical Coordinator; Jerry Whitehead – (former) Technical Coordinator, and Mistie Gonzales – Pretreatment Coordinator.
- Interviews with Christy Saunders – Staff Assistant, Dale Dennis – Utilities Operator – Bull Hide Creek Treatment Plant; Larry Ondrej – Utilities Operator, Kenny Sells – Utilities Operator, Ray Bettge – Maintenance, Steve Pustejovsky – Maintenance, and Shane Estrada – (former) Maintenance.
- Reviewed Roles and responsibilities of BMP Team.

Element 8. Training

- Element 8: Training dated February 3, 2014.
- Interview with Michael Jupe, Program Administrator; Dale Dennis – Operations Supervisor; Scott Espen – Technical Coordinator; Jerry Whitehead – (former) Technical Coordinator, and Mistie Gonzales – Pretreatment Coordinator.
- Interviews with Christy Saunders – Staff Assistant, Dale Dennis – (former) Utilities Operator – Bull Hide Creek Treatment Plant; Larry Ondrej – Utilities Operator, Kenny Sells – Utilities Operator, Ray Bettge – Maintenance, Steve Pustejovsky – Maintenance, and Shane Estrada - (former) – Maintenance.

Element 9. Communications

- Element 9: Communication dated February 3, 2014.
- Interview with Lisa Tyer – Interim Utilities Director/WMARSS Manager; Joe Bernosky – (former) Assistant Utilities Director/Program Manager
- Interviews with Tom Conry – (former) Program Manager, Michael Jupe – Program Administrator, Dale Dennis – Operations Supervisor; Scott Espen – Technical Coordinator, Jerry Whitehead – (former) Technical Coordinator, Mistie Gonzales – Pretreatment Coordinator and Christy Saunders – Staff Assistant.
- Interviews with Justin Young – farmer/rancher – product user and James Holder – Russell Brother’s industrial waste haulers.
- Interview with Matthew Vaughn – Texas Commission on Environmental Quality, Waco Regional Office, Water Section Work Leader.
- WMARSS Plant Meeting Agenda – Feb 12, 2014.
- WMARSS website: <http://www.wmarss.com/>
- Reviewed Customer Satisfaction Survey form.
- WMARSS Biosolids Management System Information brochure.
- Handout on “Free Crop Nutrient Supplement and Soil Conditioner.
- WMARSS Industrial Pretreatment Program brochure.
- NBP Pocket Edition of Biosolids Management Program.
- BMP Interested Parties Lists (Pellet Venders – purchasers of class A dried product).
- Biosolids Management Program Performance/Management Review Report – Annual Report to the Board 2013.
- Biosolids Management Program Performance/Management Review Report – Annual Report to the Board 2014 – draft.

Element 10. Operational Control of Critical Control Points

- Element 10: Operational Controls dated February 3, 2014.
- Interview with Michael Jupe, Program Administrator; Scott Espen – Technical Coordinator; Jerry Whitehead – (former) Technical Coordinator, and Mistie Gonzales – Pretreatment Coordinator.
- Interviews with Christy Saunders – Staff Assistant, Dale Dennis – Utilities Operator (former) – Bull Hide Creek Treatment Plant; Larry Ondrej – Utilities

- Operator, Kenny Sells – Utilities Operator, Ray Bettge – Maintenance, Steve Pustejovsky – Maintenance, and Shane Estrada - (former) – Maintenance.
- Bull Hide Wastewater Treatment Facilities Operations and Maintenance Manual.
 - WMO D1 – SOP for Dryer Operations, version 2012-02.
 - WMO SP1 – SOP for Sludge Treatment Process, version 2012-02.
 - WMO SW 2 – SOP for Headworks Screening Receiving Station Cleaning, version 2012-01
 - WMO SW 3 – SOP for Industrial Sludge Receiving Station Cleaning, version 2012-01
 - WMO SW 4 – SOP for Pellet Loading Area, version 2012-01
 - WMO SP 5 – SOP for Septic Waste Receiving Process, version 2013-01
 - WMO SW 7 – SOP for Septic Receiving Station Cleaning, version 2012-01
 - WMO SW 8 – SOP for Solids Side Screening and Grit Receiving Station Cleaning, version 2012-01
 - WMO SW 9 – SOP for Vactor Receiving Station Cleaning, version 2012-01.

Element 11. Emergency Preparedness and Response

- Element 11: Emergency Preparedness & Response dated February 3, 2014.
- Interview with Michael Jupe, Program Administrator; Dale Dennis – Operations Supervisor; Scott Espen – Technical Coordinator; and Mistie Gonzales – Pretreatment Coordinator.
- WMO SP2 – SOP for Responding to a Sludge Spill, version 2012-01.
- Review emergency preparedness and response reported for September 2012.

Element 12. BMP Documentation and Document Control

- Element 12: Documentation, Document Control & Recordkeeping dated February 3, 2014.
- Standard Operating Procedures Document Controls Information title sheet format.
- BMP Procedures Document Control Information title sheet format.
- Interview with Michael Jupe, Program Administrator; Dale Dennis – Operations Supervisor; Scott Espen – Technical Coordinator; and Mistie Gonzales – Pretreatment Coordinator.
- Memorandum of Minutes of Waco Metropolitan Area Regional Sewer System Work Session on October 21, 2011 containing a motion to approve the “Policy Statement.”
- Memorandum of Minutes of Waco Metropolitan Area Regional Sewer System Work Session on May 29, 2013 containing a motion to approve commitment to the “Code of Good Practice” in the Biosolids Management Program.

Element 13. Monitoring and Measurement

- Element 13: Monitoring and Measurement dated February 3, 2014.
- Action Plan and Tracking Template (for goals and objectives).

- Interview with Michael Jupe, Program Administrator; Dale Dennis – Operations Supervisor; Scott Espen – Technical Coordinator; Jerry Whitehead – (former) Technical Coordinator, and Mistie Gonzales – Pretreatment Coordinator.
- Interviews with Christy Saunders – Staff Assistant, Dale Dennis – Utilities Operator (former) – Bull Hide Creek Treatment Plant; Larry Ondrej – Utilities Operator, Kenny Sells – Utilities Operator, Ray Bettge – Maintenance, Steve Pustejovsky – Maintenance, and Shane Estrada - (former) – Maintenance.
- Interview with Matthew Vaughn – Texas Commission on Environmental Quality, Waco Regional Office, Water Section Work Leader.
- Vendor tracking log of biosolids distribution to farmers (2013/14).
- Waste loads generated by Master Foods contributed to Industrial Waste Storage Tank (April – December 2006)
- Field observation of two potential land application farm sites (belonging to Ben Hirsh and Mark Jackson) for stabilized lagoon solids adjacent to the Central Plant.
- Bull Hide Wastewater Treatment Facilities Operations and Maintenance Manual.
- WMO D1 – SOP for Dryer Operations, version 2012-02.
- WMO SP1 – SOP for Sludge Treatment Process, version 2012-02.
- WMO SW 2 – SOP for Headworks Screening Receiving Station Cleaning, version 2012-01
- WMO SW 3 – SOP for Industrial Sludge Receiving Station Cleaning, version 2012-01
- WMO SW 4 – SOP for Pellet Loading Area, version 2012-01
- WMO SP 5 – SOP for Septic Waste Receiving Process, version 2013-01
- WMO SW 7 – SOP for Septic Receiving Station Cleaning, version 2012-01
- WMO SW 8 – SOP for Solids Side Screening and Grit Receiving Station Cleaning, version 2012-01
- WMO SW 9 – SOP for Vactor Receiving Station Cleaning, version 2012-01.

Element 14. Nonconformances: Preventive and Corrective Action

- Element 14: Nonconformance – Preventive & Corrective Action dated February 3, 2014.
- WMARSS Audit Corrective Action Worksheet template.
- WMARSS Audit Corrective Action Tracking/Summary Report template.
- WMARSS Readiness Review Audit Corrective Action Tracking Report.
- Completed WMARSS Audit Corrective Action Worksheets for ORR.
- WMARSS Incident and Corrective Action Tracking Report for 2013 and 2014.
- Interview with Michael Jupe, Program Administrator; Dale Dennis – Operations Supervisor; Jerry Whitehead – (former) Technical Coordinator, and Mistie Gonzales – Pretreatment Coordinator.
- Internal Audit Report for audit conducted on in November and December 2012.
- Review tracking log for internal audit results.

Element 15. Biosolids Management Program Report

- Element 15: Biosolids Management Program Performance Report dated February 3, 2014.
- Biosolids Management Program Performance/Management Review Report – Annual Report to the Board 2013.
- Biosolids Management Program Performance/Management Review Report – Annual Report to the Board 2014 – draft.
- Interview with Michael Jupe, Program Administrator; Dale Dennis – Operations Supervisor; Scott Espen – Technical Coordinator; and Mistie Gonzales – Pretreatment Coordinator.

Element 16. Internal BMP Audit

- Element 16: Internal BMP Audit dated February 3, 2014.
- Table 16.1 – WMARSS Audit Corrective Action Worksheet.
- Table 16.2 – WMARSS Corrective Action Tracking Summary Sheet.
- WMARSS BMP Internal Audit Report format template.
- Interview with Lisa Tyer – Interim Utilities Director/WMARSS Manager; Michael Jupe, Program Administrator; Dale Dennis – Operations Supervisor; Jerry Whitehead – (former) Technical Coordinator, and Mistie Gonzales – Pretreatment Coordinator.
- Internal Audit Report for audit conducted on in November and December 2012.
- Review tracking log for internal audit results.

Element 17. Management Review

- Element 17: Management Review dated February 3, 2014.
- Biosolids Management Program Performance/Management Review Report – Annual Report to the Board 2013.
- Biosolids Management Program Performance/Management Review Report – Annual Report to the Board 2014 – draft.
- Interviews with Lisa Tyer – Interim Utilities Director/WMARSS Manager; Ricky Garrett – (former) Utilities Director/WMARSS Manager; Joe Bernosky – (former) Assistant Utilities Director/Program Manager, and Tom Conry – (former) Program Manager.
- Interview with Michael Jupe, Program Administrator; Dale Dennis – Operations Supervisor; Scott Espen – Technical Coordinator, and Mistie Gonzales – Pretreatment Coordinator.

Attachment 2

Detailed Findings of the Desk Audit/On-site Readiness Review

Positive Findings

- Overall –The Biosolids Management Program has very strong top management support.

Observations

- Item 3.4 – Table 3.1, which identifies WMARSS critical control points, does not identify the corresponding operational controls (i.e. the Standard Operating Procedures) for each and every critical control point.
- Item 4.2 – In the legal and other requirements element Table 4.1 presents general broad regulations and a permits list. The information given does not clearly include or cross-reference what specific standards, limits, reports, records, etc. the City must meet in order to be in compliance; i.e. the system has not established a detailed record of applicable legal and other requirements.
- Item 5.1 – The Element 5: Goals and Objectives for Continual Improvement Procedure does not clearly establish or define the frequency of periodically reviewing the progress on the biosolids program goals and objectives as generally described in item 9 of that procedure.
- Item 5.3 – It is not clear in the procedure how the input from interested parties developed through proactive public participation is used in the development of goals and objectives.
- Item 5.5 – Not all of the Goals and/or Objectives were measureable. (Consider all SMART criteria).
- Item 5.7 – Detailed action plans describing those activities used to achieve program goals and objectives including a breakdown of action items, schedules and milestones have not been prepared for all goals and objectives.
- Item 7.1 – The Roles and Responsibilities Procedure does not currently identify the members of the BMP Team, and there is no description or summary of the roles and responsibilities of this team in performing biosolids management activities and functions.
- Item 10.2 – Not all legal requirements are incorporated into the operational controls of critical control points; for example WMO SP-1 Section 14 is missing a

reference to the metals testing requirement for landfill solids and WMO D1 does not include regulatory requirements or citations. Other SOPs may have the same shortcomings.

- Item 12.2(b) – The standard requires that documents be created following established document creation protocols, however, the WMARSS Element 12 Documentation, Document Control & Recordkeeping procedure does not clearly describe the method of initial document development, document review and change and document approval.
- Item 12.2(e) – Procedure 5 of the WMARSS Element 12 Documentation, Document Control & Recordkeeping procedure indicates the version and revision history will be maintained for all controlled documents (Policy, BMP Manual and SOPs) however the header described in procedure 3 of that element has not been implemented for the BMP manual. Also, the revision history which appears as the last item at the end of SOPs is not described in the WMARSS Element 12 procedure (Note: Table 4.2 related to version history appears to be a remnant of an older BMP manual.)
- Item 13.1 – The Element 13: Monitoring and Measurement procedure does not clearly establish or define the frequency of periodically reviewing the progress on the biosolids program goals and objectives.
- Element 14.1 – The Non-conformances – Preventive Action & Corrective Action procedure does not accurately reflect the procedure presently used to investigate any noncompliance with applicable regulatory requirements and/or nonconformances with BMP procedures identified during routine monitoring and measurement or periodic BMP audits.
- Item 14.6 – The Non-conformance – Preventive Action & Corrective Action Procedure does not presently address the tracking of progress of corrective action, and periodically update the status to reflect completion (i.e. WMARSS Incident & Corrective Action Tracking Report – Internal Audits.)
- Item 15.2 – The Element 15: Biosolids Management Program Report procedure specifies that the performance report will be available on the WMARSS website. The 2012 performance report had not been posted on the website.

- Item 16.3 – The Element 16: Internal Biosolids Management Program Audit procedure does not address how the documents and records related to the audit program will be maintained; specifically the audit methodology, protocol, scope and schedule; identification of the lead auditor, qualifications, and description of roles and responsibilities of auditors, management representatives, and others that may participate in the audit.
- Item 17.1 – There was no objective evidence available to demonstrate that the management review containing all of the required components was performed for 2012.

Opportunities for Improvement

- Overall – Consider developing a Biosolids Master Calendar, which identifies all of the planned BMP activities and expected dates of accomplishment.
- Item 3.1 – The details of some critical control points associated with transportation are not clearly defined.
- Item 3.2 – Consider more clearly identifying the potential or actual environmental impacts associated with each critical control point.
- Item 5.6 – Consider moving those BMP goals and objectives that have been accomplished or are otherwise no longer active into a separate folder or table.
- Item 5.7 – Consider referencing the Action Plan Form or Template in the Element 5: Goals and Objectives for Continual Improvement procedure.
- Element 6 – It is not clear how the blank tables at the end of the Element 6: Public Participation in Planning procedure will be used. (Note: In item 6 of this procedure a form to capture the name of interested parties is described, however no form was found.)
- Item 7.2 – The Element 7: Roles and Responsibilities procedure contains a note in item #2 that needs to be addressed and deleted.
- Element 12 – Review and revise, as appropriate, the items contained in the Element 12: Documentation, Document Control & Recordkeeping procedure.
- Element 14 – Consider streamlining the Element 14: Nonconformance – Preventive & Corrective Action procedure.
- Item 15.1 – Consider preparing the annual Biosolids Management Program Performance report to emphasize the positive accomplishments and cost savings attributable to the successful completion of Goals and Objectives; and consider

including an estimate of the total operation and maintenance cost of the critical control points through the biosolids value chain.

- Item 17.2 – The management review meeting agenda and management review minutes are not currently referenced in the Management Review Procedure.
- Element 17 – Consider having an executive summary presentation of the annual Biosolids Management Program Performance report made to the WMARSS Board.

Attachment 3

Detailed Findings of the Original Verification Audit

Positive Observations

Overall –The Biosolids Management Program has very strong top management support.

Requirement 14.3 and 14.4 - WMARSS has made excellent use of their corrective action program to identify operational incidents so they can be tracked and analyzed to determine if there are common operational problems, which can be grouped and addressed to implement preventive measures instead of simply correcting similar problems over and over.

Minor Non-conformances

Requirements 1.5 and 3.1 – All critical control points have not been clearly or adequately identified. The solids production operations and solids hauling associated with the Bull Hide wastewater treatment plant (biosolids processing, handling and transportation) are not identified as critical control points.

Requirement 3.4 – Not all of the operational controls (i.e. the Standard Operating Procedures) for the critical control points are identified in Table 3.1. For example, the Dryer identifies the Permit as opposed to WMO D1 and the Lagoon influent and effluent generally refers to the permit conditions as opposed to WMO SP1. Additionally no operational control SOPs have been identified for the critical control points associated with the Bull Hide Creek wastewater operations.

Requirement 5.1 – Not all of the Goals and/or Objectives were measureable, i.e. they generally did not answer the questions how much or how many, or have an indicator that is quantifiable. Additionally the individual goals and objectives were not linked or associated with each of the four NBP outcome areas: environmental performance, regulatory compliance, relations with interested parties, and quality biosolids management practices.

Requirement 5.1 and 13.1 – The Element 5: Goals and Objectives for Continual Improvement Procedure does not meet the intent of defining the frequency of periodically reviewing the progress on the biosolids program goals and objectives as generally described in item 9, which refers to the Master Calendar. Neither the procedure nor the calendar currently indicates the intention of reviewing progress on the goals and objectives at the biweekly plant meetings. Additionally, the Monitoring and Measurement Procedure does not clearly establish or define the frequency of periodically reviewing the progress on the biosolids program goals and objectives.

Requirement 5.7 – Detailed action plans describing those activities used to achieve program goals and objectives including a breakdown of action items, schedules and milestones have not been prepared for all the goals and objectives.

Requirement 6.1 – Table 6.1 – WMARSS Public Participation Mechanisms within the public participation in planning procedure identifies several approaches to address this need, but the organization has not implemented several of them. Also it is not clear what information will be included in the “purpose” and “interim status” columns in the Interested Parties and Plant Tours tables of the procedure.

Requirement 6.4 – The public participation in planning procedure does not include how the organization intends to notify interested parties about their intent to receive an independent third party audit and have a discussion with interested parties about approaches for observing that audit. Additionally, the City did not notify interested parties about their intent to receive an independent third party audit.

Requirement 14.6 – The Non-conformance – Preventive Action & Corrective Action Procedure does not clearly or adequately describe the WMARSS corrective action program, including addressing the tracking of progress of corrective actions, and periodically updating the status to reflect completion (i.e. WMARSS Incident & Corrective Action Tracking Report – Internal Audits.)

Opportunities for Improvement

Overall – Consider including more details in the Biosolids Master Calendar, which identifies all of the planned BMP activities and expected dates of accomplishment. Also consider including the scheduled activities in an automated reminder system. Also, explain the specific contents of the quarterly tracking meetings on the calendar.

Requirement 5.1 – There are several current goals and objectives that are activities/programs, which are existing requirements of the BMP elements and would be better identified in corrective action plans as opposed to listing as goals and objectives.

Requirement 5.1 – Consider establishing a bidding mechanism for the purchase of the class A biosolids product.

Requirement 5.6 – The Element 5 procedure does not describe that the BMP Team drafts the set of goals and objectives.

Requirement 5.7 – Consider referencing the Action Plan Form or Template in the Element 5: Goals and Objectives for Continual Improvement procedure.

Requirement 7.1 – Some of the information contained in the Roles and Responsibilities column of the table presented in this procedure are incomplete.

Element 9 – The communication procedure is not specific in its identification of “interested parties.” Also, it does not explain what the contact lists will be used for.

Requirement 10.2 – The specific legal details including regulatory citations are not included in the Dryer Operations SOP (WMO D1) in section 13 – Reporting Requirements.

Requirement 11.1 – Consider the value of Section 3.3 – Notification Not Required in the WMO SP2 procedure. Also determine if the Operations Supervisor and the City of Waco Utilities Department Safety Officer are the ones who need to determine the frequency of testing and training on biosolids emergency response procedures as stated in procedure 3.

Requirement 11.2 – Although a spill exercise was reported to have been conducted on September 26, 2012, no record of lessons learned or other results of testing and evaluating the Biosolids Emergency Response Plan were captured.

Requirements 11.3 – In WMO SP2 consider identifying the location and accessibility of all on-site emergency response equipment (HTH granular chlorine, spill kits, shovels, brooms, rubber gloves, dust masks, floor sweep, and disposal containers).

Requirement 12.1 – Consider simplifying the records retention portion of Element 12 Documentation, Document Control & Recordkeeping procedure.

Requirement 12.2(b) – The standard requires that documents be created following established document creation protocols, however, the WMARSS Element 12 Documentation, Document Control & Recordkeeping procedure does not clearly describe the method of initial document development.

Requirement 12.2(d) – There is no indication in the procedure that printed versions of the SOPs, EMS Manual Elements, etc. are marked with a footer indicating that any printed version of this procedure is uncontrolled and the current controlled version found on the intranet should be used.

Requirement 12.2(e) – Procedure 5 of the WMARSS Element 12 Documentation, Document Control & Recordkeeping procedure indicates the version and revision history will be maintained for all controlled documents (Policy, BMP Manual and SOPs) however the header form described in procedure 3 of that element has not been implemented for the BMP manual. Also, there is no description of the WMARSS’ intention to have each element procedure of the BMP manual independently reviewed and revised as necessary.

Requirement 14.2 – Consider the value and accuracy of various subsections within procedure 2 of Element 14: Nonconformance – Preventive & Corrective Action procedure.

Requirement 15.1 – Consider preparing the annual Biosolids Management Program Performance report to emphasize the positive accomplishments and cost savings attributable to the successful completion of Goals and Objectives; and consider including an estimate of the total operation and maintenance cost of the critical control points through the biosolids value chain.

Requirement 16.3 – The Element 16: Internal Biosolids Management Program Audit procedure does not address auditor qualifications and training.