



Encina Wastewater Authority

BIOSOLIDS EMS INTERNAL AUDIT REPORT

Audit Dates: March - May 2011

Audit Conducted by:

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Celeste Biles, Industrial Waste Control Inspector
Joel Camarillo, Associate Chemist
Doug Campbell, Laboratory Manager
Fran Deleonardis, Shift Supervisor
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Audit Report Date: July 20, 2011

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Encina Wastewater Authority

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I. EXECUTIVE SUMMARY

The Encina Wastewater Authority (EWA) conducted an internal audit of its Biosolids Environmental Management System (EMS) between March and May of 2011. The purpose of the audit was to determine if EWA is complying with its Biosolids Management Policy, the National Biosolids Partnership (NBP) Code of Good Practice, and program requirements as found in EWA's EMS Manual. The audit was conducted in accordance with protocol developed by EWA and covered the entire biosolids value chain including wastewater treatment, solids generation and stabilization, biosolids storage and transportation, beneficial reuse and pretreatment, as well as laboratory operations, information technology and management.

The audit identified three strengths in EWA's EMS program, five items needing correction, and eight opportunities for improvement. Corrective action plans have been developed for the items needing correction. The opportunities for improvement will be considered during the annual Management Review meeting.

Based on the results of the audit, EWA's EMS Coordinator finds that the agency's Biosolids EMS complies with its Biosolids Management Policy, the NBP Code of Good Practice and EWA's program requirements. EWA continues to make progress in accomplishing its goals and objectives, and is achieving positive outcomes in the areas of regulatory compliance, environmental performance, relations with interested parties and quality biosolids practices. The corrective and preventive action, and management review processes have been effective in helping EWA to continually improve its biosolids operations. As a result, EWA's Biosolids EMS is considered to be an effective program.

II. AUDIT SCOPE AND METHODOLOGY

The internal audit was conducted in accordance with protocol developed by EWA, which has been deemed a "best practice" by EWA's third-party auditor. The audit team consisted of eight staff members selected by EWA's EMS Coordinator. These individuals were chosen based on their knowledge of the organization and/or their ability to gather and analyze objective evidence.

The audit covered the elements of the biosolids value chain, as well as laboratory operations, information technology and management. Assignments were made so that no one audited biosolids activities within their workgroup. The following list identifies the areas audited and assigned auditors.

Area Audited	Audit Team Members
Wastewater Treatment/Solids Generation/ Solids Stabilization	Joel Camarillo/Leeann Warchol
Storage/Transportation	Nancy Avila
Beneficial Reuse	Fran Deleonardis/Justin Law
Pretreatment	Joel Camarillo/Garry Parker
Laboratory	Nancy Avila/Garry Parker

Area Audited	Audit Team Members
Information Technology	Celeste Biles/Fran Deleonardis
Management	Doug Campbell

The individual audits consisted of interviews with EWA staff members working in each area and a review of applicable records. Audit questions were developed by the EMS Coordinator to address EMS awareness, as well as department-specific issues, including areas of concern identified by the Management Review, third-party audit, or previous internal audits.

In addition to the aforementioned audits, EWA regularly inspects its biosolids contractors. During the last twelve months, EWA staff visited the CEMEX cement kiln that utilizes EWA's biosolids as a biofuel and two of Solid Solution's land application sites. The results of these inspections have been incorporated into the assessment of EWA's transportation and beneficial reuse processes.

III. SUMMARY OF AUDIT FINDINGS

The internal audit identified a number of strengths in EWA's Biosolids EMS program, five findings needing correction and eight opportunities for improvement, which are summarized below. Corrective action plans have been developed for the items needing correction. The opportunities for improvement will be evaluated during the annual Management Review meeting.

A. EMS Strengths

1. EWA continues to increase efficiency and hold the line on costs by closely monitoring energy and chemical usage, and by implementing a pit stop maintenance program for the heat dryer building.
2. In response to a major member agency-owned influent pipeline failure, EWA is working closely with its member agencies to clarify ownership and maintenance responsibilities for facilities that are not part of the Encina joint system.
3. EWA has incorporated the use of branding concepts in external communications to better convey the organization's value to its stakeholders.

B. Findings Needing Correction

1. EWA's Site Security Policy is not being followed with respect to having staff remain with chemical delivery drivers, biosolids haulers and vector truck drivers while on site.
2. Additional housekeeping efforts are needed in the heat dryer building to prevent the build-up of dust, which poses a safety concern.
3. Solid Solutions has not provided EWA with training records for all drivers that haul EWA's biosolids.
4. EWA's website does not contain the FY 2011 biosolids program goals.

5. EWA's Site Security Policy is not being followed with respect to changing door/gate codes at least every six months.

C. Opportunities for Improvement

1. The addition of an onsite weather station would provide more accurate information about weather impacts to help in investigating odor complaints.
2. Adding telephone numbers to the emergency phone list for back-up suppliers of regularly used chemicals would enable staff to respond more quickly in case the normal vendor cannot meet EWA's needs.
3. Identification of the cause for biosolids pellet heating could enable EWA to make changes that will allow for longer-term product storage and mitigate concerns by potential customers.
4. Increased communication with member agency staff could help identify industrial discharges of concern and minimize risks to the collection system and treatment plant.
5. Use of the Laboratory Information Management System to track maintenance of laboratory equipment would help ensure tasks are completed at the required frequency.
6. Consideration should be given to using Sharepoint for storing laboratory records, which would make them more readily accessible and prevent their loss in case of a fire.
7. Providing offsite storage for electronic data would prevent its loss in case the server room was destroyed.
8. Developing a name for EWA's biosolids pellets would be helpful in marketing the product.

IV. AUDIT DETAILS

A. Wastewater Treatment/Solids Generation/Solids Stabilization

This audit was conducted on March 21 and April 4, 2011 by Joel Camarillo and Leeann Warchol. EWA staff members interviewed were: Shift Supervisor Fran Deleonardis, Operator Joe Sallay, Maintenance Manager John Fetu, Maintenance Planner Kevin Smith and Systems Manager Garry Parker.

Records reviewed include:

- Odor complaint reports,
- Training records,
- Daily checksheets,
- Heat dryer checksheets,
- Agua Hedionda pump station checksheets,
- Spill reports,
- Emergency phone list,
- Operations department schedule,
- Unknown substance reports,

- Chemical delivery log,
- Biosolids hauling log,
- Fuel usage log for engines,
- Employee training records,
- Flow meter calibration records,
- pH meter calibration records,
- Thermocouple calibration records,
- Dissolved oxygen probe maintenance records,
- Cogen gas meter calibration records,
- Central vacuum maintenance records,
- CMMS scheduled maintenance tasks,
- SOP #2 – Odor complaints,
- SOP #18 – Bulk chemical handling procedure,
- SOP #19 – Biosolids guidelines reuse compliance
- SOP #36 – Agua Hedionda standard operating procedure, and
- SOP #44 – Spill reporting procedures.

The following operational controls were verified during the audit:

- Staff was knowledgeable of the requirements for biosolids to meet Class A standards. A review of heat dryer checksheets showed that the exit temperature averages >200°F, well above the minimum requirement of 176°F.
- SOP #2 contains procedures for investigating odor complaints. A review of the five complaint reports from 2010 showed that they were properly completed. The investigation procedure includes documentation of weather conditions. The addition of an onsite weather station would provide more accurate information about weather impacts. (See Section III.C.1. Opportunities for Improvement)
- SOP #18 contains procedures for dealing with chemical spills. An incident report is completed for such occurrences and an investigation is conducted to identify the cause(s) and ways to prevent a recurrence. In response to a recent mineral oil spill in the product load-out area caused by a bypass valve being left open: the mineral oil spray nozzles are cleaned weekly to ensure adequate chemical delivery; the bypass valve has been tagged out and requires that a supervisor be notified before it is opened; and employee training has been conducted.
- EWA has an SOP for operation and maintenance of each pump station that staff has responsibility for. A review of checksheets for the Agua Hedionda Pump Station showed that required activities are being completed.
- SOP #44 contains procedures for reporting spills. A review of completed spill reports, which are maintained on the O: drive, showed that they were being properly completed. A current list of emergency phone numbers is posted in the Operations control room. Employee training on spill reporting was conducted on 8/17/10.
- As required by the State of California, EWA's Chief Plant Operator holds a Grade V operator certification. EWA requires that Shift Supervisors have

- at least a Grade III certification. A review of the current schedule showed that there is always at least a Grade III operator onsite.
- The use of digester gas and natural gas is limited by EWA's air permits. This information is recorded in the operations daily logbook and transferred to the Flows & Monthly Reports spreadsheet. A review of sample data showed that information is being properly recorded.
 - Our contracts with chemical suppliers state that if they cannot provide a chemical delivery, they are responsible for paying any cost difference for us to get it from another supplier. Phone numbers for backup suppliers of polymer are included on EWA's emergency phone list, but not for ferric chloride and biodiesel. (See Section III.C.2. Opportunities for Improvement)
 - During May and June of 2010, EWA exceeded the six-month median chlorine residual performance goal at the outfall. This was attributed to replacement of a chlorine metering pump with a more efficient model without adjusting the dosing rate. The dosing was subsequently reduced to ensure compliance. To help prevent further such occurrences, operations staff records the effluent residual chlorine concentration three times a day in the logbook and conducts weekly testing for residual chlorine, which is recorded on the daily checksheet.
 - EWA's Site Security Policy requires that operations staff interface with chemical delivery drivers, biosolids haulers and vector truck drivers upon arrival, stay with them until they complete their business and log their departure. A review of records found that: a log is completed showing arrival and departure times for chemical deliveries; and biosolids haulers and vector truck drivers complete a manifest for each load. Staff does not accompany drivers for the whole time they are onsite. (See Section III.B.1. Findings Needing Correction)
 - A centralized vacuum system was installed in the heat dryer building due to concerns about dust explosivity. The Ruwac Vacuum Daily Usage Log indicates that the vacuum is only being used about once a week. An accumulation of dust was noted on horizontal surfaces in the heat dryer and product load-out buildings. (See Section III.B.2. Findings Needing Correction)
 - Operator certification expiration dates are recorded in the Computerized Maintenance Management System (CMMS) to ensure they are renewed on time. A review of the list showed that it was up-to-date.
 - The heat dryer outlet temperature is monitored by three thermocouples that send signals to a transmitter. The transmitter is calibrated annually and was last done on 7/19/10.
 - A review of records showed that all flow meters used to determine influent and effluent flow were calibrated in the last year.
 - EWA maintains a stock of spare parts that are deemed process critical components. As a result of a recent event where a burst disc in the recycle bin ruptured, funds have been budgeted for FY 2012 to add these parts to inventory.
 - Last October an SDG&E power outage caused EWA's cogeneration system to fail because it could not black start. Hawthorne Power Systems

subsequently corrected this problem by reprogramming the dead bus voltage relay. In FY 2012 the UPS circuits will be updated, which should eliminate any future black start problems.

- By April 1st of each year, EWA must submit a Greenhouse Gas Report to the California Air Resources Board for the prior year. The 2010 report was submitted on March 17, 2011. A review of the CMMS shows that this report has been added to the Environmental Calendar, which provides reminders of upcoming due-dates.
- During 2010, 4,865 work orders were completed by the General Services department. Of these, 66% were planned or preventive maintenance tasks.

B. Storage/Transportation

This audit was conducted on March 24, 2011 by Nancy Avila. Shift Supervisor James Mattern and Operator Chris Scibilia were interviewed.

Records reviewed include:

- Recycle Bin/Storage Silo checksheet,
- Trailer inspection checksheets,
- Biosolids hauling manifests,
- Biosolids hauling and trailer return reports,
- Solid Solutions' hauling contract with EWA,
- Driver training records,
- Employee respirator training and fit test records,
- Employee hearing conservation training and audiogram records,
- SOP #20 – Emergency Storage of Digested Sludge,
- SOP #64 – Biosolids Loading, and
- SOP #68 – Pellet Loading into Super Sacks.

The following operational controls were verified during the audit:

- EWA staff continues to deal with pellet heating issues. A recent thermal event resulted in development of an action plan to help prevent such occurrences. Actions to be taken include: increasing the frequency of inspecting and cleaning the recycle bin; taking routine measurements of air flow from the fugitive dust collection system headers; maintaining a minimum quantity of pellets for reseeded the recycle bin; and identifying easier ways to empty and reseed the recycle bin.
- Under optimal conditions, the storage silos can hold four days of biosolids pellet production; however, due to pellet heating issues, only two days of storage is available. EWA maintains two backup trailers onsite, which provide for additional pellet storage. In case of an emergency, an offline digester could also be used to store digested sludge. Staff is working with a consultant to better understand the cause for pellet heating and to identify mitigation measures. (See Section III.C.3. Opportunities for Improvement)

- SOP #64 contains procedures for loading biosolids into trailers. In response to last year's audit, this SOP was revised in July 2010 to incorporate procedures for loading biosolids cake.
- Operations staff conducts inspections of contractor's trailers prior to leaving the site to ensure they are in good condition, which is documented on checksheets. As recommended during last year's internal audit, the checksheets have been modified to address pod trailers that are used for transporting pellets.
- Personal protective equipment (PPE) requirements for biosolids handling include wearing hearing protection in the dryer building, and a Tyvek suit and respirator when loading biosolids. A review of records showed that all O&M staff has completed the required hearing/respirator training.
- Solid Solutions' contract requires that all biosolids hauling trucks carry a copy of their emergency response plan. During the audit, a copy of the plan was produced by both Apex's and Solid Solutions' drivers.
- EWA's contract with Solid Solutions requires them to provide driver training on emergency response procedures. A review of the hauling log showed drivers for which no training information has been provided. (See Section III.B.3. Findings Needing Correction)
- Non-hazardous material manifests are completed for each load of biosolids hauled. A review of records showed that completed manifests matched the weight on the invoice from Apex.

C. Beneficial Reuse

This audit was conducted at the EWPCF on May 3, 2011 by Fran Deleonardis and Justin Law, who interviewed EWA Resource Recovery Manager Chuck Bollinger. Also incorporated in this process audit were the findings of site visits to CEMEX and two of Solids Solutions' land application sites.

Records reviewed include:

- Heat dryer data sheet,
- Biosolids feedback information,
- 2010 Annual Biosolids Report
- Contractor inspection reports,
- Ostara pilot test report,
- Solid Solutions' monthly biosolids report,
- Lab data for biosolids cake and pellets,
- Biosolids hauling manifests,
- CEMEX invoices,
- Biosolids fertilizer label, and
- Solid Solutions insurance information.

The following operational controls were verified during the audit:

- EWA staff documents feedback from customers about use of its biosolids. Comments from CEMEX have been very positive. Initial feedback from a

fertilizer blender that took a load of pellets for product testing indicated that the pellets began smoldering prior to blending. They also said they received complaints from their customers about odor issues. (See Section III.C.4. Opportunities for Improvement)

- To help address increased maintenance efforts as a result of struvite formation on solids processing facilities, Ostaro conducted a pilot test at the EWPCF to recover phosphorous from the centrifuge centrate. Preliminary results were positive. EWA will be conducting a preliminary design during FY 2012 to determine the cost/benefit of this process.
- An inspection of CEMEX was conducted on September 14, 2010 as part of EWA's third-party EMS reverification audit. Housekeeping in the biosolids use area was satisfactory. Air permits and employee training records were reviewed and found to be in order. There were no records of public complaints. The third-party auditor cited EWA for a nonconformance with NBP standards as the contractual agreement with CEMEX did not incorporate requirements for controlling documents and records. EWA subsequently drafted a Letter of Understanding that was signed by CEMEX to address this deficiency.
- EWA staff conducted inspections at two of Solid Solutions' land application sites in Arizona (September 15, 2010 and April 27, 2011). Housekeeping practices and public communication records were found to be acceptable. Training records were not provided for all drivers. (See Section III.B.3. Findings Needing Correction)
- Solid Solutions provides reports to EWA for each month in which biosolids are land applied. These reports include: the amount of biosolids applied to each field, field maps, lab analysis data and cumulative pollutant loadings for each field. A review of this information verified that they are in compliance with allowable agronomic rates.
- EWA provides bimonthly biosolids testing results to Solid Solutions including percent solids, arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, total nitrogen, ammonia nitrogen, organic nitrogen and nitrate-nitrite nitrogen. A review of results show that metal levels in EWA's biosolids are well below the ceiling concentrations found in Table 1 of 40 CFR Part 503.13.
- Prior to being able to use biosolids as a fertilizer, the California Department of Food & Agriculture requires the material to be registered with the State. EWA completed this application and was issued a license on March 23, 2011.
- Solid Solutions' contract requires them to maintain general liability, automobile, worker's compensation, pollution liability and environmental impairment insurance. A review of documentation showed that current policies are in effect.

D. Pretreatment

This audit was conducted on April 6, 2011 by Joel Camarillo and Garry Parker. EWA Industrial Waste Control Inspectors Celeste Biles and Stacey Spangler were interviewed.

Records reviewed include:

- Pretreatment Ordinance,
- Significant Industrial User (SIU) permit,
- Industry records in LINKO database,
- Industry self-monitoring report,
- Best Management Practices (BMP) permit,
- Auto-sampler maintenance records,
- pH meter calibration records,
- SOP #34 – Auto-sampler Maintenance,
- Sample chain-of-custody documentation,
- Enforcement Response Plan, and
- Sample enforcement case.

The following operational controls were verified during the audit:

- EWA's Pretreatment Ordinance gives the agency authority to implement the Pretreatment Program throughout the service area. This was last updated in 2007 and can be found on EWA's website. The Ordinance will be updated following approval of EWA's revised local limits by the San Diego Regional Water Quality Control Board (RWQCB).
- EWA controls industrial discharges through the issuance of wastewater discharge permits. Permittees may be issued a Class I, II, or III permit depending on the nature of their discharge. Review of a sample permit showed that it contains information about the industry's operations, sampling and reporting requirements, discharge limits and sampling location.
- To verify compliance, EWA conducts annual inspections of permitted industries and quarterly wastewater monitoring of Significant Industrial Users (SIUs – those subject to federal categorical pretreatment standards or that discharge >25,000 gallons per day). More frequent inspections and sampling are conducted in response to violations. A review of the LINKO database confirmed that the minimum inspection and sampling frequency is being met.
- A chain of custody (COC) form is completed for all wastewater samples collected. Review of a typical COC form showed that it was properly completed.
- pH meters are calibrated each day they are used. Review of the calibration log showed that this is being done as required using standards with a pH of 4, 7 and 10.
- SOP #34 contains maintenance procedures for auto-samplers to help prevent contamination of wastewater samples. This includes specific cleaning procedures, semiannual QA/QC testing for seven metals, and replacement of bottles and tubing as necessary. Review of the maintenance log showed that these activities are being conducted in accordance with the SOP.
- In response to an industry violation, the first step is issuance of a Notice of Violation (NOV) which requires the industry to: investigate the cause for

the violation; take actions to prevent a recurrence; and submit a letter to EWA by a specific date describing their findings and resulting actions. A review of an industry file showed that they submitted their report by the due date shown in the NOV.

- EWA has an Enforcement Response Plan that describes actions that may be taken in response to noncompliance. Enforcement actions are escalated if violations continue. This document was last updated on February 2, 2011 and is available on EWA's website.
- Pretreatment Program staff conducted an investigation in response to a call from one of its member agencies about a sewer line break, which resulted in a sewage spill. Staff successfully traced the source to a business that had been discharging low pH wastewater. A higher level of communication with member agency staff could help prevent such occurrences and improve the investigation process. (See Section III.C.4. Opportunities for Improvement)
- Permitted industries must submit semiannual reports to EWA that contain lab data, a COC form, a Compliance Status Report cover sheet and certification statements. A sample report was reviewed, which showed that it contained all the required information. Review of data entered into the LINKO database was consistent with the industry report.
- EWA staff conducts public outreach at street fairs and other public events to reduce the discharge of pollutants from nonindustrial sources. Residents are encouraged not to flush unwanted medications, and instead to either take them to the San Diego County Sheriff's office or render them unusable and throw them in the trash.

E. Laboratory

This audit was conducted on March 15, 2011 by Nancy Avila and Garry Parker. EWA staff members interviewed were Chemists Justin Law and Therese Littlefeather.

Records reviewed include:

- Environmental Laboratory Accreditation Program (ELAP) certification,
- Lab proficiency testing results,
- EWA pellet log,
- Chain-of-custody documentation,
- Biosolids testing data,
- Balance calibration records,
- Glassware QC records,
- Thermometer calibration records,
- Bimonthly biosolids report (NANI – Notice and Necessary Information), and
- SOP #57 – Biosolids Sampling.

The following operational controls were verified during the audit:

- EWA's lab is certified by the State of California Department of Health Services ELAP. The current certificate was issued on 3/1/11 and expires 2/28/13.
- As part of the ELAP program, staff must analyze performance evaluation samples each year to demonstrate proficiency for each test method that the lab is certified to test for. EWA last participated in this study in June 2010 and passed 100% of the samples tested. Certified methods include fecal coliform and total solids, which are required to demonstrate biosolids meet Class A standards.
- Lab staff was knowledgeable on the requirements to demonstrate compliance with Class A biosolids standards including: total solids $\geq 90\%$; fecal coliform $< 1,000$ MPN per gram of total dry solids; and heat dryer exit temperature $> 176^{\circ}\text{F}$. A review of data confirmed EWA's biosolids meet Class A standards.
- SOP #57 documents procedures for sampling biosolids, as well as the sampling frequency and type of analysis required. Sampling is conducted by lab and operations staff. A log is completed for individual pellet samples that are used to generate a composite sample. Review of the log showed that the monthly composites are collected within the allowed 14 day period.
- Balances must be calibrated annually by a third-party and monthly in-house using validated weights. A review of calibration records showed this activity is being completed as required.
- Lab staff conducts QC checks on glassware and sample bottles to ensure there is no contamination. A review of records showed that this is being done monthly.
- Thermometers must be calibrated annually by a third-party. This was last done on March 6, 2011. In addition, staff also conducts semiannual calibrations.
- The Laboratory Information Management System (LIMS) has the capability to track equipment maintenance. Use of this function would help ensure maintenance tasks are completed as required. (See Section III.C.5. Opportunities for Improvement)
- The contract with CEMEX requires EWA to provide them with annual biosolids testing data for metals. This testing was last done in January 2011.
- EWA sends oil and grease samples offsite for analysis. These must be collected in a glass container, preserved to a pH of < 2 , kept chilled until analysis and shipped with a completed COC form. Review of a sample COC form confirmed that the samples were collected in the correct container type, properly preserved and shipped in a cooler.
- Oil and grease analysis results received from an outside lab are entered into the LIMS database. Review of sample data in the LIMS showed that it was correctly entered.
- EWA provides bimonthly NANI reports to Solid Solutions that include monthly biosolids testing data for metals, percent solids, and nitrogen. A

review of the report for November and December 2010 showed that EWA's biosolids contain metal concentrations well below the standards for Exceptional Quality (EQ) biosolids.

- Routine lab results are entered into an Excel spreadsheet on the O: drive for use by operators. In case of an exceedence, notifications are made in person after a second verification test has occurred.
- The lab maintains lots of paper records that are not always easily found and for which there is no back-up. (See Section III.C.6. Opportunities for Improvement)

F. Information Technology

This audit was conducted on April 11, 2011 by Celeste Biles and Fran Deleonardis. EWA staff members interviewed were Systems Technicians David Ummel and James Harris.

Records reviewed include:

- Biosolids Management Policy,
- 2010 Annual Biosolids Program Report,
- 2010 internal audit report,
- 2010 third-party audit report,
- EMS Manual,
- LIMS backup records,
- MIS Password Procedure, and
- EWA's Site Security Procedure.

The following operational controls were verified during the audit:

- EWA recently updated its website and incorporated the former stand-alone EMS website. Review of the website showed that it contains the Biosolids Management Policy, 2010 Annual Biosolids Program Report, 2010 internal audit report, 2010 third-party audit report and EMS Manual. The FY 2011 goals were not included. (See Section III.B.4. Findings Needing Correction)
- Laboratory data stored in the LIMS is incrementally backed up every 15 minutes. Full back-ups are done weekly and monthly. Proof of these activities was confirmed.
- EWA's MIS Password Procedure requires computer users to change their password at least quarterly. The system starts notifying users 15 days prior to the due date. After four months, users are locked out of the system if they do not modify their password.
- EWA's Site Security Procedure requires that door/gate codes be changed every six months and/or when an employee leaves EWA. A review of records showed that not all department codes have been changed in the last year. (See Section III.B.5. Findings Needing Correction)
- EWA's computers are protected against viruses by a layered approach which includes: a firewall, Intruder Prevention Sensor, iPrism Web Filter, Barracuda Spam Firewall and Symantec End Point Protection. In

- addition, SCADA computers do not have USB ports or a connection to the internet, and cannot be accessed remotely.
- The remote facilities are not controlled by the SCADA system, but SCADA does have a read-only ability to monitor the stations via the Programmable Logic Controller (PLC). Data is stored on the PLC and backed up on EWA servers. A review of data showed that this occurs every 15 minutes.
 - If the server room were destroyed in a fire, all electronic data would be lost. IT staff is in the process of obtaining a budget for a project that will provide back-up data storage. (See Section III.C.7. Opportunities for Improvement)
 - The IT group has developed and begun implementation of a plan to consolidate its servers. This change will benefit EWA through: reduced costs for hardware and support; lower energy costs; less heat output; reduced storage space; and improved disaster recovery time.
 - EWA's current Technology Master Plan was completed in 2003. Funds have been budgeted for FY 2012 to hire a consultant to assist in updating this plan.

G. Management

This audit was conducted on April 19, 2011 by Doug Campbell. EWA staff members interviewed were General Manager Kevin Hardy, Assistant General Manager Michael Steinlicht, Director of Environmental Compliance Debbie Biggs, Director of Operations John Jardin, and Engineering Manager Duane Larson.

The following operational controls were verified during the audit:

- EWA obtains public input about its biosolids program primarily from its Board of Directors and from biosolids users (CEMEX, Solid Solutions), which is considered in developing program goals and objectives. The general public has not shown a lot of interest. EWA is currently working with the University of California to develop a demonstration garden, which will help raise the level of interest by the local community.
- O&M staff has been impacted by continuing pressures to cut costs and increased maintenance efforts required to operate the new solids processing facilities. In response, staff has implemented changes to increase efficiency and control costs including: developing and using an energy model; closely monitoring chemical usage and dosing; utilizing staff to change out the RTO media; developing a pit stop maintenance program for the dryer building; incorporating lessons learned investigating dryer incidents; and starting an intern program. (See Section III.A.1. EMS Strengths)
- During 2010, EWA coordinated two emergency projects including protection of the ocean outfall and responding to the West Interceptor collapse. As a result, EWA is working with its member agencies to clearly delineate ownership and maintenance responsibilities for facilities that are not part of the joint system. In addition, the FY 2012 Comprehensive Asset Management Plan (CAMP) includes funds to conduct a condition

assessment of underground lines 12" or greater. (See Section III.A.2. EMS Strengths)

- In 2010 EWA started an Air Quality Committee that meets quarterly to address odor issues. Future planned improvements include: replacing primary tank covers; improving the grit handling system; installing louvers on the Administration Building to draw in fresh air from the west; and draining standing solids from the center column of the clarifiers when taken offline. EWA is also planning to work with its member agencies to jointly address odor/corrosion control issues related to the collection system.
- The Biosolids Management Plan identifies distribution of biosolids to local communities as a potential market. This could be bulk or bagged material. Before this takes place, EWA needs to develop a name for its product. (See Section III.C.8. Opportunities for Improvement)
- EWA is undergoing an organizational risk assessment to identify the top five to six risks the agency faces. Contingency plans will be developed for the identified risks and appropriate items incorporated into the Tactical Plan.
- EWA has been a member of the Branding Network for the last couple years. Participation has helped EWA to identify its "brand": protecting the Pacific Ocean; dedicated to resource recovery; and committed to fiscal responsibility. This brand is being incorporated into all external communication to clearly communicate the value we provide the community. (See Section III.A.3. EMS Strengths)
- State and federal greenhouse gas regulations are in a state of flux. These regulations were considered in developing the Energy and Emissions Strategic Plan. In addition, EWA has taken steps to ensure the accuracy of its gas meters so that accurate data is available for planning and reporting purposes.

H. EMS Awareness

All interviewees were asked the same questions to assess overall EMS awareness. The following observations were made:

- Employees understand that the purpose of the EMS Program is to establish standard practices that help ensure biosolids quality.
- Staff cited numerous benefits to EWA from implementation of the EMS including: improved documentation, increased awareness about biosolids and the role of different departments; identification of back-up plans; and national recognition.
- Specific changes that have been made as a result of the EMS include: adding the EMS to job descriptions; requiring a higher level of accountability for contractors; implementing additional security measures; and incorporating the EMS into public outreach activities.

V. AUDIT CONCLUSIONS

A. Conformance with EWA'S Biosolids Management Policy

EWA's biosolids practices conform with its Biosolids Management Policy as detailed below:

1. Pursue sustainable biosolids reuse options that protect human health and environmental quality, are fiscally responsible and provide flexibility with respect to end use. – In December 2008, EWA brought online a new heat drying facility that produces Class A biosolids pellets and provides more options for beneficial reuse. Due to the reduction in volume of biosolids produced, EWA's budget for biosolids disposal has been reduced from just over \$2 million dollars in FY 2008 to \$202,000 in FY 2012. In addition, over \$40,000 in revenue was generated during FY 2011 from selling the pellets for use as a biofuel. EWA is also working to develop other more lucrative markets and has provided pellets to two fertilizer blenders and a mushroom farmer for product testing.
2. Follow the Code of Good Practices for biosolids developed by the National Biosolids Partnership. – See Section B below.
3. Implement the Encina Wastewater Authority's Biosolids Management Plan. – EWA's Biosolids Management Plan, which was finalized in April 2008, establishes a long-term strategy for marketing EWA's biosolids. Plan goals include securing beneficial reuse outlets for 100% of the material within five years and disposal outlets for 200% of the material within two years. These goals have already been met. EWA currently has an agreement with CEMEX for utilizing the biosolids as a biofuel. When the CEMEX plant is down for maintenance, Solid Solutions hauls EWA's biosolids to Yuma, Arizona for land application. A backup agreement is in place with the Otay Landfill. EWA has obtained registration of its biosolids as a fertilizer and has provided samples to two fertilizer blenders and a mushroom farmer for product testing.

B. Conformance with NBP Code of Good Practice

EWA's biosolids practices conform with the NBP Code of Good Practice as detailed below:

1. Compliance: To commit to compliance with all applicable federal, state and local requirements regarding production at the wastewater treatment facility and management, transportation, storage, and use or disposal of biosolids away from the facility – This commitment is contained in EWA's Biosolids Management Policy. Implementation was verified through a review of:
 - Laboratory data,
 - SOPs,

- Operations' checksheets, and
 - Contractor site inspections and records review.
2. Product: To provide biosolids that meet the applicable standards for their intended use or disposal – This was confirmed through a review of:
 - Laboratory data (metals, total solids, fecal coliform), and
 - Heat dryer checksheets (dryer outlet temperature).
 3. Environmental Management System: To develop an EMS for biosolids that includes a method of independent third-party verification to ensure effective on-going biosolids operations. – A reverification audit of EWA's EMS was conducted in 2010 by KEMA-Registered Quality, Inc. No major nonconformances were found. All minor nonconformances identified were addressed through EWA's corrective action procedure. The audit verified that EWA's biosolids program meets the expectations and requirements of the NBP.
 4. Quality Monitoring: To enhance the monitoring of biosolids production and management practices – The heat dryer temperature is continuously monitored by EWA's SCADA system, which is equipped with alarms to notify operators if problems occur. Readings are also taken manually and recorded on checksheets every hour. Metal levels are monitored monthly, although 40 CFR Part 503 regulations only require bimonthly testing. Total solids and fecal coliform testing are performed monthly to confirm compliance with Class A requirements.
 5. Quality Practices: To require good housekeeping practices for biosolids production, processing, transport, and storage, and during final use or disposal options. – EWA has monthly checksheets for the digester and dewatering areas that require certain housekeeping activities. A centralized vacuum system was installed in the heat dryer building to help control dust. Housekeeping in this area needs improvement. (See Section III.B.2. Findings Needing Correction) Solid Solutions' contract requires that trucks be tarped to prevent the release of biosolids during transportation and then washed prior to being used again. Biosolids are transported to CEMEX in enclosed trailers. Routine inspections of EWA's land application sites and the CEMEX facility found general site conditions and housekeeping to be acceptable.
 6. Contingency & Emergency Response Plans: To develop response plans for unanticipated events such as inclement weather, spills, and equipment malfunctions – EWA has developed SOP #20 for emergency storage of digested sludge in case of an earthquake, severe weather or other unplanned event. Solid Solutions has a spill response plan that addresses what drivers should do in case of a spill, and contains notification and spill clean-up procedures.

7. Sustainable Management Practices and Operations: To enhance the environment by committing to sustainable, environmentally acceptable biosolids management practices and operations through an EMS – This commitment is contained in EWA’s Biosolids Management Policy. During 2010, over 99% of EWA’s biosolids were beneficially reused as a biofuel or for land application on farm fields in Arizona, and the rest was used for product testing. In addition, EWA maintained its EMS certification by completing a reverification audit in September 2010.
8. Preventive Maintenance: To prepare and implement a plan for preventive maintenance for equipment used to manage biosolids and wastewater solids – Plant assets used for biosolids processing and treatment are managed through EWA’s CMMS PMC2000. Preventive maintenance for each asset is regularly scheduled through the CMMS to ensure operational reliability of the biosolids processing system. In addition, Operations staff has the ability to generate maintenance service requests when they determine an asset needs additional attention. Approximately 66% of work orders completed are for planned and preventive maintenance.
9. Continual Improvement: To seek continual improvement in all aspects of biosolids management – This is demonstrated via EWA’s tactical planning process and progress on achieving its biosolids-related goals and objectives during fiscal year 2011. See Section C below.
10. Communications: To provide methods of effective communication with gatekeepers, stakeholders, and interested citizens regarding the key elements of each EMS, including information relative to system performance – EWA maintains a website where it posts internal and external audit reports, the Annual Biosolids Program Report, EWA’s Biosolids Management Policy and the EMS manual. Copies of audit reports and the Annual Biosolids Program Report are emailed to interested parties, as are notifications of upcoming third-party audits and the opportunity to provide input. EWA publishes an e-bulletin entitled RenEWABLE News that provides information about ongoing resource recovery projects, including biosolids reuse. Employees receive regular email communications containing annual reports, audit results, information about EWA awards, articles of interest or progress on tactical goals. Staff distributes packets of biosolids pellets and talks to people about EWA’s heat drying operations at various locations throughout the service area, including member agency offices and street fairs.

C. Achievement of Biosolids Program Goals & Objectives

EWA is making good progress in achieving its biosolids program goals. In FY 2011 EWA established the following seven objectives related to the biosolids program:

1. Maintain certification of Biosolids EMS by the NBP. – KEMA-Registered Quality, Inc. conducted a third-party reverification audit of EWA's EMS in September 2010 and verified that EWA's biosolids program meets the expectations and requirements of the NBP.
2. Complete appropriate labeling, licensing, registration and certification for Tier II biosolids use. – EWA developed a label and received a license for use of its biosolids as a fertilizer from the California Department of Food and Agriculture.
3. Initiate Tier II biosolids research and development projects. – EWA's biosolids were provided to two fertilizer blenders and a mushroom farmer for product testing.
4. Update Pretreatment Ordinance to incorporate revised technically based local limits that protect biosolids quality. – EWA's local limits study was submitted to the San Diego Regional Water Quality Control Board (RWQCB) for approval. Due to lack of funding, they will not be able to review it this fiscal year; thus, EWA will have to wait to implement its revised local limits.
5. Amend industrial user permits to incorporate revised local limits. – Delayed for reason described in item 4.
6. Partner with local school districts to develop age appropriate curriculum. – Last year a lot of staff time was spent responding to the West Interceptor failure and preparing the report for the RWQCB. As a result, work towards this goal was delayed. It is anticipated that this will be completed later this year.
7. Provide six press releases about EWA programs to local print media. – Press releases were provided to the local media about: EWA being recognized as a member of the EPA Green Power Leadership Club; EWA's Employee Recognition Program; EWA's Gold Awards ceremony recognizing industrial users that achieved perfect compliance with Source Control Program requirements during 2010; completion of EWA's Energy & Emissions Strategic Plan; as well as seven press releases regarding EWA's response to the west interceptor failure.

VI. EMS PROGRAM EFFECTIVENESS

A. Corrective and Preventive Action Process

A Corrective and Preventive Action Request form is completed for nonconformances identified by internal and external audits. This form describes the non-conformance, assesses what caused the problem, and identifies corrective actions to be taken to prevent a recurrence. This process effectively

corrected all eight nonconformances identified by the 2010 internal and third-party audits.

B. Goals and Objectives Process

EWA staff solicits input from the Board of Directors in developing its five-year Business Plan, which includes both short-term and long-term goals. Biosolids goals are incorporated in this planning process. Progress toward meeting annual Tactical Plan goals is monitored during weekly management meetings, with quarterly updates provided to the Board of Directors. EWA completed four of the seven biosolids goals established for FY 2011. Two are delayed until EWA receives approval for revision of its local limits from the RWQCB. The other should be completed later this year.

C. Management Review Process

Biosolids Program issues and progress on Tactical Plan goals are discussed during weekly manager's meetings. An annual Management Review meeting is held to assess the overall effectiveness of the Biosolids EMS Program. An Action Plan is developed to address items identified from this review process. All eleven of the action items identified last year have been completed.

D. EMS Outcomes

The NBP expects agencies that implement an EMS Program to have positive results in four outcome areas. During the last year, EWA achieved the accomplishments listed below, which demonstrate that its EMS Program is effective.

Regulatory Compliance

- Testing results demonstrated that EWA's biosolids meet Class A Exceptional Quality (EQ) requirements.
- EWA developed a label and obtained a fertilizer license for its biosolids pellets from the State of California Department of Food and Agriculture.

Environmental Performance

- Greater than 90% of EWA's biosolids were used as biofuel. This provides a use that is publically acceptable, while reducing greenhouse gas emissions associated with biosolids transportation and from the CEMEX facility.
- Product testing has begun on the use of EWA's biosolids as a soil amendment.
- EWA generated 62% of the energy needed to operate the plant through use of digester gas in its cogeneration facility.

Relations with Interested Parties

- Completion of the Phase V expansion, which will enable the EWPCF to treat projected wastewater flows through 2025, has increased public

- credibility in EWA's planning processes.
- EWA's Internal EMS Audit Program (recognized as a best practice by the National Biosolids Partnership's auditor) utilizes in-house staff, which provides employees with a greater appreciation for all aspects of EWA's biosolids program.
 - Information about the biosolids program was provided to local residents who visited the treatment plant (23 tour groups) or attended one of the community outreach events (9) in which EWA staff participated.
 - Senior staff made 19 presentations about EWA to various professional groups.
 - Development and certification of EWA's EMS is helping the marketability of its biosolids, particularly with private companies.

Quality Biosolids Practices

- EWA maintained certification of its Biosolids EMS after undergoing a third-party reverification audit.
- The SOP for contractor inspections was revised and an inspection form was developed for CEMEX.
- EWA's EMS manual was streamlined, thus producing a document that is easier to understand and implement.
- The disciplined, structured approach in the EMS, particularly corrective action methods, helped develop lessons learned from the heat dryer project.