



# Biosolids Management Program

**Littleton/Englewood  
Wastewater Treatment Plant**

**Performance Report  
2011-2012**



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## INTRODUCTION

Littleton/Englewood Wastewater Treatment Plant (L/E WWTP) was invited to participate in a National Biosolids Partnership (NBP) training program in July, 2011. The goal of this training program was for selected organizations to develop and implement a Biosolids Management Program (BMP), achieving successful third-party verification the summer of 2012.

The first internal audit of the newly created BMP was conducted May 30-31, 2012. Being the first time to conduct a Performance Review of a new program, this report is drafted to reflect current status of the (pre-internal audit and pre- third-party verification) BMP.

The purpose of this review is to summarize program progress as it pertains to changes to policy, goals and objectives, biosolids operations and other BMP elements based on internal audit results, third-party verification audit results, changing circumstances and L/E WWTP's commitment to continual improvement.

### Data Review

Data, measuring BMP performance, is collected according to regulatory requirements and established facility data collection procedures, following the biosolids value chain:

- 1) Wastewater Collection and Pretreatment
  - a) The wastewater collection system is owned, operated and maintained by each individual sanitation district (20) connected to L/E WWTP. Each district has preventive maintenance and response plans to address abnormal situations (i.e. blockage, preventive maintenance, etc.).
  - b) The L/E WWTP Industrial Pretreatment Division (Division) monitors 16 permitted facilities. Of the 16 permitted facilities, 5 do not discharge. The Division does not sample the non-discharging permittees, nor do they require them to sample.
  - c) There were 66 sampling events in 2011 and 33 so far in 2012.
  - d) The Division also performs sampling for local limits at four locations. There were 12 local limits sampling events in 2011 and 8 so far in 2012.
  - e) The Division requires permittees to report quarterly. There were 54 quarterly reports submitted in 2011 and 32 so far in 2012.
  - f) The Division performed 16 annual inspections. The Division also performs initial inspection of industries that are in question of needing permits. Approximately 100 initial inspections have been performed since January of 2011.
  - g) The Division also has sector control programs to control discharges from those industries that do not require permits. Sector control industries are inspected at least annually, some more frequently, depending on their compliance history.
  - h) Sector Control Programs:
    - i) Petroleum, Oil, Grease and Sand – approximately 250 industries
    - ii) Fats, Oil and Grease – approximately 400 industries
    - iii) Silver – approximately 140 industries

- i) Surveillance cameras document septic waste unloading station activity, monitoring permitted dischargers in order to follow-up on reported or observed behaviors (spills, messes left behind, etc.). It also serves as back-up documentation to verify undocumented discharge by permitted contributors.
- 2) Wastewater Treatment and Solids Generation  
Treatment process performance is measured by removal of Total Suspended Solids (TSS) and Carbonaceous Biological Oxygen Demand (CBOD). The L/E WWTP CDPS Discharge Permit establishes a minimum TSS and CBOD removal of 85% each and discharge limitations (30-day average) of 30 mg/l for TSS and 20 mg/l for CBOD. Below is a summary of 2011 process performance, as well as overall treatment performance:
  - a) Average monthly total influent – 42,708 lbs/day TSS
  - b) Average monthly total influent – 41,465 lbs CBOD
  - c) Average monthly primary treatment removal – 28,242 lbs TSS removed and 54.3% process removal efficiency
  - d) Average monthly primary treatment removal – 13,508 lbs CBOD removed and 35.5% process removal efficiency
  - e) Average monthly secondary treatment solids generation – 16,912 lbs TSS removed and 90.9% process removal efficiency
  - f) Average monthly secondary treatment solids generation – 24,145 lbs CBOD removed and 93.9% process removal efficiency
  - g) Average monthly total facility removal – 42,346 lbs TSS removed and 99.2% removal efficiency (2 mg/l monthly average discharge for TSS)
  - h) Average monthly total facility removal – 41,075 lbs CBOD removed and 99.1% removal efficiency (2 mg/l monthly average discharge for CBOD)

Side stream solids, generated from solids handling unit processes, as well as septage, have an impact on the liquid stream of a wastewater treatment facility and subsequent solids generation. All side stream solids are recycled to the headworks and co-treated with influent flows.

- 3) Solids Stabilization, Conditioning and Handling

Solids removed through the treatment process undergo anaerobic biological treatment to stabilize biodegradable portions of the solids. Stabilized solids must meet treatment requirements of the L/E WWTP biosolids application permit, for Class “B” biosolids, as issued by USEPA Region 8, prior to any reuse programs:

- a. The pathogen reduction requirement for Class “B” biosolids is met through a Process to Significantly Reduce Pathogens (PSRP). Minimum requirements for PSRP are that solids are anaerobically digested between 15 days at 35-55<sup>0</sup>C and 60 days at 20<sup>0</sup>C. In 2011, L/E WWTP biosolids were anaerobically digested for a monthly average of 33.8 days at 37.2<sup>0</sup>C.
- b. The vector attraction reduction requirement is met by volatile solids reduction through anaerobic digestion to greater than 38% (Option 1). The 2011 volatile solids reduction, at the L/E WWTP, averaged 64.9%. The minimum monthly volatile solids reduction was 62.3%.

*4) Biosolids Storage, Loading and Transportation*

Following anaerobic digestion, stabilized solids are held in a tank prior to dewatering (via centrifuge). Biosolids are dewatered to approximately 18% dry weight solids, using polymer as a dewatering aid. Trucks are loaded using a certified truck weighing scale to maximize vehicle loading (weight regulations and cost optimization) and to document solids transport data for annual reporting purposes. Below is a summary of storage, loading and transportation performance, by Objective:

- a) Objective 4.3: Operate an accident-free biosolids application program with zero (0) lost-time personal injuries. In 2011, one (1) personal injury was recorded, with no lost time.
- b) Objective 4.4: Operate an accident-free biosolids application program with zero (0) equipment damage, motor vehicle accidents or driving violations. In 2011, one (1) minor equipment damage report was recorded.
- c) Objective 4.9: Operate a cost optimized program at <\$250/dry ton applied. 2011 cost of program operation was \$187/dry ton.

*5) Biosolids End Use, Disposal or Beneficial Reuse*

Management practices were met in accordance with CFR Part 503 Regulations and the Colorado Department of Public Health and Environment Biosolids Regulations. All application is conducted at the correct agronomic rate for the soil type and the crop grown. The crops grown are typically dry-land wheat/corn. Biosolids are applied to a fallow field, while in stubble, to minimize the potential for runoff. Biosolids may be incorporated into the soil to further minimize runoff and vector attraction potential. However, incorporation is performed in accordance with the wishes of the farmer and his soil management practice. Public access is controlled through the siting of application parcels in very low population density farming areas. In addition, fenced sites are typically selected to further restrict public access. If there is a greater potential for public access, signs are posted.

- a) Objective 4.5: Operate a biosolids program to comply with Colorado Biosolids Regulation No. 64 and USEPA Region 8 General Biosolids Permit with zero (0) violations. In 2011, zero (0) compliance violations were recorded.
- b) Objective 4.7: Maintain biosolids quality below Exceptional Quality “EQ” biosolids pollution concentration limits established by EPA under 503 Federal

- Sludge Regulations. All biosolids produced by the L/E WWTP during 2011 tested below “EQ” limits.
- c) Objective 4.11: Maintain 100 percent distribution of Class “B” biosolids to agricultural use. The L/E WWTP biosolids production during 2011 was 3,008.4 metric tons (3,316.2 tons) dry weight solids. 100% of biosolids produced by the L/E WWTP were beneficially used in agronomic land application programs.
  - d) Objective 4.12: Replace lease expired over-the road tractors used to transport biosolids. New tractors were approved for purchase and ordered December, 2011. New over-the road tractors were delivered March 2012 and placed into service as required operating equipment was installed on them.

### **Biosolids Goals and Objectives Progress**

Goals and Objectives established during the preparation of the first version of the BMP are updated as progress or change is noted. Specific objectives met or completed are noted above, under Data Review.

### **Internal Audit Results**

An internal audit (first) was conducted May 30-31, 2012. From this audit the following was noted:

#### *Nonconformances*

The internal audit team found two (2) major nonconformances and seven (7) minor nonconformances, with respect to audit criteria.

#### *Opportunities for Improvement*

The internal audit team noted eleven (11) opportunities for improvement in the L/E WWTP BMP.

Details are found in the audit report dated June 12, 2012. Corrective actions identified are in progress, with many completed as of July 27, 2012. All will be addressed before the third-party verification audit is conducted October 1-4, 2012.

### **BMP Performance Review**

Overall, the current BMP has performed as expected. Since this is the first version for implementation, minor modifications (i.e. grammar, format, etc.) are being addressed as encountered. Individuals identified under Roles and Responsibilities have come together to write, evaluate and revise document text, as needed, to generate a documented, working program. New skills were developed (internal audit procedure, for example), as well as developing reporting schedules/formats to implement. One positive aspect of this effort is that program development/cost is being documented through our equipment asset management program. To date, approximately 280 hours have been documented in development of this BMP.

**Third-Party and/or Self Audit Results**

Initial third-party verification for the L/E WWTP BMP is scheduled for October 1-4, 2012. The BMP manual, internal audit report and nonconformance/opportunity documents were transmitted to our auditor on July 20, 2012, for review.

**Change Review to Support BMP and Biosolids Activities**

Review for change to this BMP will be conducted and specific items identified during our first third-party verification. Nonconformance/opportunity for improvement items, identified during the internal audit, are currently being addressed. Additional nonconformance/opportunity for improvement topics, identified since the internal audit, continue to be documented and scheduled for correction and/or implementation.