



# Compost



## Technology Brief

### EVALUATION OF COMPOST FACILITY RUNOFF MANAGEMENT AND BENEFICIAL END USE

#### Background

Compost runoff from the composting process itself, and from rainfall, is a disposal problem and a costly management burden. Different feedstocks and composting techniques generate varying levels of microbial activity, consume various amounts of water, and generate vastly different amounts of runoff. Runoff contains pathogens and potential other contaminants that could be problematic if allowed to mitigate offsite. Therefore, compost facilities capture and treat runoff. This project explored and evaluated methods to both minimize and beneficially recycle the runoff.

Soos Creek Organics (Kent, WA) was the demonstration site for evaluating runoff minimization techniques. Soos Creek is a medium-scale yard debris composter. The Woodland Park Zoo (Seattle, WA) provided the runoff samples for beneficial reuse evaluation. The Zoo's compost yard produces Zoo Doo from animal manure and bedding material, which has a strong market and public acceptance in Seattle. Both sites are on the west side of the Washington Cascades, and are inundated with rain in the fall, winter, and spring; neither site is under cover.

#### Soos Creek Runoff Management

Soos Creek's runoff data were used to create models estimating seasonal amounts of runoff and the impact of various changes to operating methods and site configuration. The models showed the quantity of runoff generated for a given storm from different compost technologies.

#### Key Words

<b>Materials:</b>	Process and non-process runoff.
<b>Technologies:</b>	Low tech heat treatment for pathogen control.
<b>Applications:</b>	Compost facilities – aerobic systems.
<b>Market Goals:</b>	Minimize management cost and create value for rainfall and process runoff from compost facilities.
<b>Abstract:</b>	Evaluating compost runoff management methods, process and non-process runoff, and beneficial end use.

Several methods of reducing, reusing, and recycling process and non-process runoff were evaluated and results show that modification of operational techniques and procedures can eliminate up to 90% of compost runoff, depending on the type of facility. These estimates are based on the energy and water needs of a system before and after optimizing the conditions for microbial growth. Optimization can be achieved by:

- Managing the process so moisture and heat release occur at the same place in the pile;
- Managing the process such that evaporated moisture is released to the atmosphere;
- When the pile is above the temperature set point; inducing air in quantities sufficient to evenly; distribute oxygen throughout the pile and remove heat through evaporation of the water;



Reducing pad space by changing pile configuration to extended pile instead of windrows;

Covering the compost process areas; and/or

Diverting rainfall pad water away from the active composting areas, preventing contamination.

Structural cover

Additional best management practice methods were evaluated at Soos Creek, including :

separation of process water and storm water in the composting pad

larger volume compost piles

larger volume piles with low rate aeration.

### **Woodland Park Zoo Runoff Recovery for Beneficial End Use**

This project shows that it is feasible to produce a product from the process runoff and leachate generated at a compost facility.

Nutrient content of the runoff (or compost tea) from the manure composting operation was analyzed and found to have good plan nutrient levels. Two pasteurization methods were successful in reducing pathogens in the liquid to acceptable levels per EPA regulations. The first method buried containers in the hot, static compost for a specified time period, and the second method heated the liquid runoff with a propane

burner. Pathogen re-growth did not occur within three weeks of pasteurization, indicating the product is marketable for public use.

A significant amount of this compost tea was pasteurized, labeled as "Zoo Broo", and distributed to representative users for evaluation. Survey reviews were resoundingly favorable.

### **Summary**

There are several methods of reducing, reusing, and recycling process and non-process runoff. Modification of operational techniques and procedures can eliminate up to 90% of the runoff generated from a facility. These estimates are based on the energy and water needs of a system before and after optimizing the conditions for microbial growth.

Runoff, a disposal problem and a costly management burden, can be treated with heat in order to achieve complete pathogen destruction. The two trial pasteurization tests generated results indicated that pathogens can be controlled using heat generated within the pile, and by heat generated from burning propane. The results also show that re-growth does not occur within the first three weeks. The product, from the standpoint of pathogens, is safe for consumers and generated significant consumer interest in the product.

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### ***For More Information***

For a copy of the report, *Evaluation and Prioritization of Compost Facility Runoff Management Methods (No. CM-00-2)*, visit the CWC Internet Website at [www.cwc.org](http://www.cwc.org).

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