



US Composting
Council®

USCC Position Paper: VOC Emissions from Composting

The types and volumes of VOCs emitted from properly operated commercial composting facilities are naturally occurring (biogenic) and do not pose significant risk to the formation of ground level ozone

When organic materials decompose, they release a number of compounds that collectively are considered Volatile Organic Compounds (VOCs). The term VOCs refers to a wide array of compounds, not all of which are released during composting. However, some regulatory agencies, notably in severely air quality-challenged California, have begun looking at regulating VOC emissions from the composting process itself as a way to meet their obligations under the Clean Air Act. The concern of these agencies is not VOCs, per se, but VOCs which, in the presence of oxides of nitrogen (NO_x), can form ozone. NO_x is a common byproduct of the burning of fuels such as gasoline and diesel. The US EPA sets standards for ozone levels, under which VOCs may be regulated as a “precursor” to ozone formation.

Research indicates that composting is not a significant contributor to ground level ozone.¹ Some of the most recent (and ongoing) research looks at understanding the specific forms of VOCs (which are after all a large family of compounds) emitted during composting.

VOC reaction with Nitrogen Oxide (NO_x) is necessary to form ground level ozone. Some VOCs are very reactive with NO_x and some are far less reactive. Unfortunately at this time, the Clean Air

¹ Green, Peter, “An Investigation of the Potential for Ground Level Ozone Formation Resulting from Compost Facility Emissions,” CalRecycle, December 2010.

Act does not recognize this “reactivity” factor. Although ongoing, research to date shows that the VOCs from green wastes are generally very low in reactivity, as referenced in a 2011 Water Environment Research Foundation and California Association of Sanitation Agencies (WERF/CASA) report². That report – developed from research initiated by CalRecycle and sponsored by several California composters and public agencies – notes that green waste composting emissions are more than 80% light alcohols, which are low-reactivity compounds.

The ozone-formation potential of the total composting VOC mix is thus low; it is similar to the potential from other biogenic sources, and lower than some natural VOC sources such as isoprene and terpenes from plants.³ In essence, composting VOCs are not significant ozone creators and may very well reduce the amount of VOCs that would be created from the source materials themselves if left to decompose in nature.

The 2011 WERF/CASA report concerns assessment of biosolids co-composting, which is the combined composting of 25% to 50% biosolids with 50% to 75% green waste. Because of the low, overall ozone-formation potential of the VOC emissions generated by green waste composting operations, it is expected that reducing biosolids co-composting pile emissions would similarly be unlikely to have a detectable impact on regional tropospheric ozone levels.

Based on the currently available body of work and ongoing research data by the United States Composting Council (USCC), the USCC’s position is that the types and volumes of VOCs emitted from properly operated commercial composting facilities are naturally occurring (biogenic) and do not pose significant risk to the formation of ground level ozone; these VOCs will be emitted from vegetation and other organic materials whether they are managed via composting or not. Emissions from composting facilities are “fugitive” emissions (from

² Green, Peter, “Biosolids Co-Composting VOC and Ozone Formation Study,” prepared for the Water Environment Research Foundation and the California Assoc. of Sanitation Agencies, June 1, 2011.

³ Buyuksonmez, Fatih and Jason Evans, “Biogenic Emissions from Green Waste and Comparison to the Emissions Resulting from Composting Part II: Volatile Organic Compounds (VOCs).” *Compost Science & Utilization*, (2007), Vol. 15, No. 3, 191-199.

area sources rather than from point sources, such as those from a smokestack). The USCC supports and encourages complete regulatory compliance by its members with applicable laws and regulations; however, these types of fugitive emissions are largely exempt from regulation under the Federal Clean Air Act.

There are some composting “best management practices” (BMPs) that can be implemented at composting facilities to reduce malodors which will also reduce VOCs. We support and promote the adoption of these practices where they make sense. An example of such a BMP would be covering compost piles with finished compost to absorb and remediate VOCs emitted from the pile. However, requiring expensive practices whose actual efficacy is questionable will increase composting costs and may have the unintended consequence of driving organic materials into landfills. This would increase overall greenhouse gas emissions, decrease solid waste diversion rates and deprive our landscaping and agriculture industries of valuable organic soil amendment products. Prohibitive rules would also mean job loss, as composting creates four times as many jobs as landfilling.⁴ Where practical and sustainable, BMPs should be encouraged in lieu of prohibitive and expensive regulations that will likely result in closing composting facilities.

Groups working to mitigate the creation of greenhouse gasses (GHGs) have recognized the benefits of composting. Note that the Climate Action Reserve (CAR) recently published its protocol for assessing carbon credits for composting based on reduced GHGs at landfills. A number of responsible public agencies have also recognized that composting is part of the solution to limiting GHG impacts, including CalRecycle, the California Air Resources Board, and others.

There is currently no evidence that, where they have been implemented, costly emission reduction requirements for composting operations have resulted in any improvement towards attaining Clean Air Act goals. Composting is in fact recognized by the EPA as an environmentally beneficial process, stating that the “composting process has been shown to absorb odors and treat

semivolatile and volatile organic compounds (VOCs).⁵

Compost manufacturing is an activity that mitigates pollution more than it creates pollution and thus should not be a target for regulation by air pollution control agencies. Implementing unnecessary, costly, and burdensome reporting or permitting requirements would not only restrict and negatively impact the composting industry, they would also not accomplish the goals for which they are intended: the reduction of greenhouse gases and/or ozone.

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About the USCC: The United States Composting Council (USCC) is a national not-for-profit organization dedicated to the development, expansion and promotion of the composting industry. For more information visit www.compostingcouncil.org

⁴ Platt, Brenda and David Ciptlet, Kate Bailey and Eric Lombardi, “Stop Trashing the Climate,” Institute for Local Self-Reliance, Washington, DC, June 2008.

⁵ Downloaded May 24, 2012 from <http://www.epa.gov/epawaste/conserve/rrr/composting/benefits.htm>.