STONE ENVIRONMENTAL INC

Evaluation of Composting Facility Impacts on Base Flood Elevations, Winooski River

Stone Environmental, Inc. was retained by Intervale Compost Products of Burlington, Vermont to address state regulators' concerns that the facility's large compost windrows, located in the Winooski River floodway would raise the level of the one percent annual chance flood event and contribute phosphorus and other pollutants to floodwaters. The windrows average more than 30 feet wide and 11 feet tall and would be flooded by as much as 6 feet of water according to the effective flood insurance study.

Stone demonstrated through hydraulic modeling in HEC-GeoRas that the windrows would raise flood levels imperceptibly (<0.03 feet). We also addressed concerns about pollutants leaching out of the windrows in a flood. Because contaminant diffusion is a function of geometry, we designed an experiment to test the compost at a comparable scale to field conditions in order to make reasonable predictions of potential pollutant release in a flood. A flask test would result in over-estimation of pollutant release and erroneous conclusions regarding the risk posed by the compost facility. Therefore we built a section of compost windrow in a storage bunker, flooded the bunker to a depth and for a duration simulating a 100-year flood, and collected water samples as the bunker drained. The experiment demonstrated that release of nutrients, metals, and biological oxygen demand from the compost would be negligible in comparison to watershed loads.

Sources: Orthophotography, EarthData International 2005; Elevation Contours and Compost Footprints, Cross Engineering, 2007