Animal Bedding Composting – Ann Emrick, MaryAnn Kershaw, William Chaloupka, Christopher Johnson, and Peter D. Pohlot

The BNL Medical Department houses rats and mice for preclinical research. The animal bedding material used to be disposed of by a grinder that was installed prior to the cage wash facility (see attached photograph #1). The material was dumped in to the grinder and a water slurry was produced, that was directed to sanitary wastewater disposal system. This was of value to the sewage treatment system since it provided needed biodegradable solids to help promote decay of wastes. This system worked well until the Brookhaven Medical Reactor was decommissioned. Prior to it's decommissioning, wastewater generation within the reactor facility maintained enough water floe through the sanitary system to flush the bedding material down the sanitary lines. Once the reactor was decommissioned, and water use diminished, the ground up bedding settled out in the sanitary lines and manholes, causing the system to back up. This back up necessitated entry into manholes to flush/dig out the lines, which caused safety concerns and a drain on manpower.

In addition, the animal bedding material contains corncob, which did not readily biodegrade at the Sewage Treatment Facility and would end up as undigested sewage sludge. Due to past operations and wastewater disposal practices, the sewage sludge at BNL accumulated low levels of radioactive materials consequently, the sludge had to be managed as Low Level Radioactive Waste (LLRW). The undigested animal bedding bulked up the sludge and added to the cost of disposal.

A committee comprised of Plant Engineering, Environmental, and Medical staff, was formed to come up with an alternative solution for the disposal of the bedding. A decision was made to look at what industries were using for comparable solutions. One local industry, which was somewhat equivalent, was the local duck farms. The duck farms had to move feed to the animals and bedding/waste materials for disposal. Review of their conveyance methods indicated that screw feed conveyors were the desired mode of product conveyance.

A local vendor (Jamaica Bearing) was called in and a preliminary design was drafted. Upon BNL review and some minor changes the final design was approved and funded with money from Medical, Plant Engineering and Pollution Prevention funds. The design consisted of a bedding dumping station (consisting of a laminar hood and hopper – Photograph #2) which feeds into a system screw feed conveyors that off-load into an enclosed dumpster (Photograph #3). The dumpster is then picked up and taken to the on-site stump dump for composting (Photograph #4).

The system went operational on April 5, 2006. During the 8-months of operation, approximately 50-cubic yards of bedding material have been composted. This has saved numerous man-hours of flushing out the sanitary lines and has reduced the sludge burden at the sewage treatment plant by approximately 25 cubic yards of sewerage sludge debris (assuming a 50% reduction rate). Based on a disposal cost of $280 per cubic foot for LLRW, this equates to a cost savings of $189,000

Photograph #1 – Animal cage wash facility with attached animal bedding grinder in the foreground.

Photograph #2 – Operator using the animal bedding dumping station Laminar flow hood

Photograph #3 – Animal bedding screw feed conveyor exiting building and emptying into the dumpster

Photograph #4 – Compost area, showing leaves (foreground), animal bedding material and soil, just prior to mixing.