



Waste Minimization: Increased Profits and Productivity

Charles H. Lilly Company

■ \$100,000 Investment;
Payback in 1 Year

■ Savings in 1) Energy
Use; 2) Staff Hours; and 3)
Disposal Costs

■ Changed RCRA
Generator Status from
Large Quantity to Small
Quantity

“The system paid for itself
within the first year, and has
continued to provide us a
boost every year since then.”

What is the Charles H. Lilly Company?

Charles H. Lilly Company, in Portland, OR, is a major batch formulator and distributor of herbicides, insecticides, and fungicides in the Pacific Northwest. Its main plant generates hazardous wastewater when batch formulation tanks and transfer lines are cleaned for product changeovers. Lilly's wastewater contains organic solvents, detergents, and pesticides.

What Did They Accomplish?

Lilly implemented an on-site wastewater reuse process involving waste segregation, solvent extraction, filtration, wastewater reuse, and minimal waste concentrate disposal. They now reuse approximately 95% of their wastewater and have cut waste concentrate disposal to about 5%. As a result of these efforts, Lilly is no longer considered a Large Quantity Generator (LQG) under the Resource Conservation and Recovery Act (RCRA).

Environmental Achievements

Prior to implementing the program, Lilly produced about 550 gallons of hazardous wastewater per month. Disposal was off-site

through evaporation, solidification, and incineration. They now generate about 30 gallons per month.

Since inception of the program in 1989, Lilly also has replaced toxic constituents (e.g., atrozenes and triozenes) with ingredients that are less toxic and achieve the same formulation requirements. Lilly also implemented a closed-loop system for non-hazardous wastes and strives to overcome the need for storage drums on site. Instead, Lilly uses items like round-trip containers, which reduce drum-washing needs, generate less waste, and lessen the handling of hazardous materials.

One additional achievement has been an increase in company pride and environmental stewardship among employees.

Regulatory Relief

As a result of its efforts, Lilly is no longer an LQG, and, therefore, is subject to fewer and less stringent reporting and recordkeeping requirements.

The Implementation Process

Four people were key to successful implementation: the facilities manager, the environmental manager, a chemist, and the equipment

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supplier. The system they put in place necessitated a change in employee behavior. In the past, approximately 80 hours per week were required to collect wastes in drums, and label and separate them for evaporation. With the newer system, liquids are simply transferred directly to influent holding tanks. A handling job that took 80-hours per week was reduced to 20-25 hours.

To monitor the effectiveness of the waste management process, Lilly used two tools:

- Chemical QA/QC to monitor system performance: Lilly sent influent and effluent samples to an off-site lab for analysis, and;
- Cost accounting: focused on savings in energy use and in disposal costs.

Once Lilly personnel decided to implement the process, the project took about six months to finish. Lilly continues to use the filtration system today.

Economics: Costs and Payback

Lilly paid for this project on its own. Funding faced competition from other projects within the company, resulting in implementation delays.

Lilly invested \$100,000 in the solvent recycling system. This included everything: the system itself, influent and effluent tanks, carbon filters, piping, monitoring, and certification for construction of the secondary containment system.

The initial investment for QA/QC monitoring involved sending samples to an off-site lab for influent and effluent analysis. Monitoring costs \$2,000 to \$3,000 up front and \$100 to \$200 per month.

Savings have occurred in three areas: energy use, staff hours, and savings from reduced disposal costs. During the first year, the waste management system accrued savings in these three areas totaling just under \$100,000. This made for a payback period of about one year.

Though Lilly continues to enjoy reduced costs and labor-hour requirements associated with hazardous waste handling, the savings resulting from avoided disposal costs has dropped from levels achieved during the inaugural year. This is due largely to the fact that other hazardous waste reductions lessen the need for the filtration system. The savings now are approximately \$30,000 to 45,000 per year in avoided disposal costs and materials recovered.

"The system paid for itself within the first year, and has continued to provide us a boost every year since then." - Nick Williams, Environmental Manager

Hurdles

Lilly experienced very few hurdles while implementing waste minimization. During construction, manufacturing was disrupted briefly. Once installed, the process required changes in employee behavior and functions. While operators faced a learning curve, there was no resistance from personnel.

In addition, there were no negative impacts on either the quality or quantity of products.

Words to the Wise

Brent Jorgenson, Lilly's former environmental manager who was instrumental to the success of this effort, asserts that companies hoping to initiate waste minimization projects should keep an open mind to all alternatives that might fit that facility. He claims that, "...while it may seem easier to take an "off-the-shelf" system and try to retrofit your facility, this is probably not the best approach. What companies should do is examine their processes closely and keep an open mind."

Jorgenson also recommends spending time and effort up front in getting management involved.

Both Jorgenson and Williams attribute much of their success to empowering and involving those people who work "in the trenches." They are closest to the work, can be a rich source of ideas, and can provide valuable input into design and implementation phases.

