Landfill Recycling

Primary reduction equipment helps pioneer a new path in landfill operations

Much like "silent scream" and "cafeteria food," "landfill recycling" seems contradictory, incongruous, and clearly the definition of an oxymoron. If you think about it, however, landfill operators are consistently concerned with maximizing space and extending landfill life—so why not recycle the landfill? This is exactly what Salem County Utilities Authority, NJ, (SCUA) did after being faced with a legal issue and dwindling landfill space. Primary reduction equipment played a key role in helping the Authority convert a temporary challenge into a long-term opportunity to improve landfill operations.

In February 2004, the Authority awarded a contract for construction of a new five-acre landfill cell. The award of the contract was immediately challenged in court, which started a lengthy litigation process. The plan was to begin construction in early April, with completion by the second week of November. The annual topographical survey in April projected that the landfill would be out of space on or before the first week in November—sooner than expected. The Authority quickly realized that the landfill would be out of capacity before the new cell could be completed.

To continue serving customers, a number of operational changes were immediately implemented, according to the Authority's executive director, Mike Chapman. First, primary volume reduction equipment was rented to densify the incoming construction and demolition debris (C&D). Second, tarping equipment was purchased, which eliminated the need for daily cover. And finally, the Authority began recycling the landfill by excavating existing side slopes back down to debris. This took advantage of increased settlement due to bio-reactor landfill activities and the generous use of cover material to grade and contour the side slopes.

Processing C&D

SCUA's annual landfill volume is about 120,000 tons, with about 50 percent of the volume being C&D. "By processing C&D and recycling the side slopes, we were able to divert incoming C&D from the working face of the landfill to the side slopes from May of 2004 until April of 2005," says Chapman. "This extended the landfill's life nearly six months and—more importantly—kept the landfill open."

When justifying the purchase and operation of primary volume reduction equipment, according to Chapman, "a mere 10 percent increase in total in-place density can result in an additional $3.44/cu yd of revenue during the life of one of our five-acre, 533,000-cu yd cells." The Authority's data shows its current stream of unprocessed C&D has a density averaging 325 lb/cu yd. A single pass through its reducer increases density to 647 lb/cu yd, and a double pass to 875 lb/cu yd. By doubling the density of the C&D portion of the waste stream before in-place compaction and settlement, it is easy to see how the equipment will more than pay for itself. "Not only are we generating more revenue per cell, but also we will be able to extend the life of the landfill," says Chapman.

After proving the viability of reduction, a competitive bid request was issued for the purchase of a permanent, track-mounted primary reducer to process up to 80 tons per hour of material. After a thorough evaluation process, the Authority selected SSI Shredding Systems' (www.ssiworld.com) PRI-MAX™ 4000T and has recently taken delivery of its permanent track-mounted unit after leasing one of SSI's 4000M units on wheels. "We selected SSI based on the lowest total cost of ownership," says Chapman. "Not only did we consider the purchase price, but we also factored in total operating and mainte-

In the face of legal issues and declining landfill space, the Salem County Utilities Authority in New Jersey elected to recycle its landfill using primary reduction equipment.

nance costs, as well as resale value."

In addition to helping recycle the landfill side slopes and extend life, SCUA's new PRI-MAX reducer will be helping the authority recycle in other ways. First, the discharge magnet is recovering so much metal that SCUA is in the process of acquiring an additional conveyor to move material away from the machine. "We have so much metal coming off the processing line that the pile builds up quickly enough to cause problems. This is a good problem," exclaims Chapman. In addition, Chapman will be going through an approval process to have the shredded C&D approved as alternate daily cover. Daily cover, in the form of dirt, uses 20 percent of the landfill space. "It would be great to use what is going to be landfilled as cover material," Chapman added.

What's in Your Airspace Arsenal?

Clearly, with the difficulty in siting, permitting, and constructing landfills today, more and more operators are recognizing that conservation of airspace can be a big payoff strategy. The strategic role the landfill plays in the broader solid waste collection system is also of paramount importance to haulers, rate payers, and regulators.

At most landfills, compaction ranks number one or two in terms of its potential to affect landfill airspace. Typically, airspace conservation is achieved by either accelerated decomposition through bio-reactive processes, greater compaction of both waste and cover, new approaches to filling, and/or utilizing alternative daily covers instead of just soil.

Two passes through the reducer more than doubles the density of the construction and demolition debris stream.

Chapman had to go above and beyond the conventional thinking to add value in the situation for Salem County. Primary reduction technology has long offered a number of advantages to recyclers and demolition contractors by optimizing transportation and productivity. But Chapman also found primary shredding useful in helping increase the effectiveness of operations at the landfill site.

It has been said, "Necessity is the Mother of Invention." If we need something, there are always a few creative individuals around to figure it out. In this case, the problem required creative efforts to come up with solutions, and goes to prove that recycling and landfills are not such strange bedfellows after all. GE