



Anderson Development Company

Monica Smylor, Sr. Chemical Engineering Student
University of Michigan
Project Title: Recovering Systems for a Hexane Waste Stream

Ms. Monica Smylor was assigned to Anderson Development Company, located in Adrian, Michigan. The company is a chemical manufacturing facility that produces resins, polyurethanes, styrene copolymers, and friction materials; they also custom manufacture chemicals for other companies.

Monica researched four options for recovering spent hexane based on environmental and economic measures to replace the current reclamation procedure that uses a methanol/caustic soda mixture to treat spent hexane. The intern examined the current system to determine if any changes could be made that would reduce the generation of the slurry that generates the hexane waste stream. The four options for the conversion included: (1) using a still that is available on-site; (2) purchasing a new still; (3) using a still on-site supplied by another company; or (4) toll recycling, which consists of contracting a distiller off-site to recover the hexane and return it to Anderson Development. The study suggested the purchase of a new still because of a clear advantage of producing a more superior quality of distillate since it would be designed to recover the hexane waste stream.

The P2 technology that will be used for the recovering of hexane will be a fractional distillation system because of the significant differences in the boiling points of the contaminants. The disadvantage of the process is the need for a variance if the reclaimed hexane is sold to another end user, as opposed to reclaiming the material for the reuse of the material on-site. A variance petition would also allow the waste to be shipped off-site as a non-hazardous waste. On-site distillation would lead to a reduction of at least 80 percent of the hexane waste. Currently, the cost of disposal is \$70,000 per year; the installation cost of a new still would range from \$500,000 to \$1,200,000 per year; the payback period would range from 1.5 to 4 years, with a \$300,000 per year cost savings after the payback period.

