

Vinyl Chloride Production

By: *Jeremy Dry, Bryce Lawson, Phuong Le, Israel Osisanya, Deepa Patel, Anecia Shelton*

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Executive Summary

This project presents the design of a vinyl chloride plant with a capacity of 6.4 billion pounds per year located in Taft, LA. The capacity of the plant is based on comparing several different capacities' return on investment and net present worth. Applying different trends to the historical demand data allowed for the prediction of the capacities. The vinyl chloride product is 99.8 mol% pure, this composition allows for polymer feedstock applications. The total capital investment for the plant is \$65.1 million. The plant produces a total net profit of \$27.5 million per year. Extensive Monte Carlo simulations show that a 6.4 billion pound capacity has a 68% chance of having a positive net present worth. A major focus of the design is to maximize safety and minimize environmental impact while maintaining profitability. The VCM plant produces a number of by-products resulting in eight waste streams. The Clean Air and Clean Water Acts, enforced by the Environmental Protection Agency, regulate the procedure by which we dispose of the different waste streams. An integrated waste treatment system utilizing incineration, absorption, caustic scrubbing and activated carbon adsorption is developed in order to avoid releasing any hazardous waste into the environment. The total capital investment of the waste treatment system is \$667,000. The increase in environmental awareness increases the total equipment cost from \$14.5 million to \$15.28 million, and decreases the total net profit per year to \$26.2 million.