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REPORT TO THE GEORGIA CONSORTIUM

FOR TECHNOLOGICAL COMPETITIVENESS IN PULP & PAPER

PROJECT PP97-EN4

"Bioreactor Treatment of Process Waters for MACT-Related Contaminants"

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July 1997

This report covers the Georgia Southern University (GSU) contribution to project PP97-EN4. This was the second year of the project. The first year work involved laboratory work directed toward putting a pilot unit in the field. As the second year of the project started, GSU's effort involved refining the movable bed biofilm reactor (MBBR) for a second trial at the mill.

Using a procedure similar to that reported in the '96 report, mixed liquor was obtained from the Statesboro treatment plant to develop a biofilm on the plastic carrier element media supplied by Purac. A second field test was coordinated with the investigators from IPST. In late July the carrier elements were taken to the mill and put in one of the columns of the reactor built to test the bead reactor developed by IPST. The oxygen supply system used for the IPST unit was also the air supply for the GSU MBBR. A nutrient feed system with a weeks supply was set up to feed nitrogen and phosphorous to the growth on the carrier elements. The test units were to run for a week with mill personnel checking on the system periodically. Upon returning the following week it was found that the growth on the elements had been totally destroyed. Apparently there was an erratic flow, which flooded the reactor area, and the temperatures of the condensate stream, as it passed through the pilot unit, was

higher than during the initial field test. It is speculated that the temperature was higher due to the overloading of the part of the pilot unit that acted as a heat exchanger by the erratic and high flows. As a result of the upset in the feed stream, there were no tangible results from this field test. Before leaving the mill samples of condensate water and activated sludge from the treatment lagoon at the mill were obtained for use in recharging the carrier elements with organisms.

Because of the variable condensate flow some thought was now given to the feasibility of continuing to use the carrier elements in an aerobic mode. The technical representative for the Purac (Kaldnes) process was contacted for additional information about Purac's experiences with this system at fluctuating flows with high temperatures. Their experience with successful operation of these Kaldnes systems at temperatures much above 120°F is limited. The tech rep sent some recommended charging/startup procedures that might lead to a successful system. The IPST team reevaluated their aerobic system at this time, too.

Before going back to the mill it was decided that additional tests with higher temperatures would be run in the lab using the procedures supplied by Purac and using the condensate and activated sludge brought back from the mill. At the higher temperatures this system did not develop a viable growth on the carrier elements. Several trials were attempted with no success. It appears that using this newly developed aerobic system to treat methanol in the condensate stream will not be a solution to

this problem. Although the project is not funded for a third year and was not able to produce a solution that could be used to project a cost analysis for a full scale solution, the GSU investigator is still looking for a method of treating methanol in a high temperature condensate stream.