Case Study: Champion International Corp.

Location:	Canton, NC (Haywood County)
Industry:	Paper Manufacture (SIC 2621)
Pollution Prevention Application:	Plant, Equipment and Process Modifications
Project Cost:	$300 million
Annual Savings:	Not Available
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Background

Champion International Corporation is a leading producer of paper and forest products. The company's Canton mill manufactures high-quality printing and writing paper and employs about 1,500 people.

Prior to 1989, the discharge from the mill caused the water in the Pigeon River to take on a brown color and emit odors typical of Kraft pulp mill wastewater. In response to new NPDES permit requirements and objections from the downstream neighbors in North Carolina and Tennessee, the company began a 3-year, $300 million modernization of the mill. The goal of the project was the installation of environmental technology designed to minimize the effluent and river color, significantly reduce water use, and eliminate molecular chlorine from the bleaching process. This last change further reduces dioxin formation.

Waste Reduction Activities

Water Recycling

- The existing mill water system was modified to reduce fresh water consumption and excess thermal loading on the river through water reuse. Computer monitoring of water consumption now ensures minimum usage whenever possible.
- Further water conservation is achieved through installation of a new 3-cell cooling tower and basin which, by receiving the water and reducing its temperature to 85^{o}F, enable reuse of all excess hot water generated by the pulp mill. Previously, this water was discharged into the river.
- Water conservation is also achieved on two fine-printing and writing paper machines via mesh filtration of process and cooling tower water. The water is then reused on the machines.

Effluent Color

- The modernization of a fiber line reduced fiber losses, effluent color, and water consumption. A cornerstone of the modifications is the new pulp bleaching process called "OD100"™ which utilizes an oxygen delignification step prior to the chlorine bleach step. Oxygen delignification significantly reduces the lignin content of the pulp prior to bleaching, thereby reducing chemical usage and effluent color.
- Molecular chlorine as a bleaching chemical has been eliminated and replaced with chlorine dioxide. A special design, the new 3-stage bleach plant uses only chlorine dioxide and caustic as bleaching chemicals in a chlorine dioxide-caustic extraction-chloride dioxide sequence. While dioxins had not been detected in the mill effluent for more than 4 years, this new sequence ensures that the formation of these toxic by-products of the bleaching process is even more unlikely. The mill was one of the first in the country to completely replace molecular chlorine in favor of chlorine dioxide as a bleaching agent.

- The installation of a non-condensable gas collection and incineration system allows the mill to capture and burn odorous sulfide gases formerly emitted to the atmosphere. Similarly, a new condensate stripper is removing odorous compounds from the mill wastewater discharge and, in the process, reduces the odor and BOD of the Pigeon River. Additionally, two sets of evaporators were rebuilt, and a third set was retired; these modifications reduced the materials used to cook wood chips

Waste Reduction

Many environmental benefits were realized from the project. Effluent color discharges to the Pigeon River have fallen by 75 percent. The facility now generates 57 pounds of effluent color per ton of pulp produced, down from 222 pounds at the start of the project in August 1990. Also, virtually all chloroform has been eliminated from the wastewater.

Water usage is down from 45 million gallons per day before the modifications to current usage of less than 29 million gallons per day, a 35-percent reduction. Also, by capturing gases in the condensable gas collection and incineration system and treating wastewater in the condensate stripper, the foul odors have been significantly reduced in both the Pigeon River and the air in the surrounding areas.

Annual Savings

Annual savings from these waste reduction activities have not yet been calculated.