

# West Coast Pulp Making

Evergreen Pulp becomes the industry's first Chinese-owned mill complex in the U.S.

– By John Yolton and Ken Patrick

**Ten months ago**, China-based Lee & Man Paper Co. acquired the shutdown Stockton Pacific Enterprises market pulp mill in Humboldt County, Calif., becoming the first Chinese company to own a pulp or paper complex in the U.S.

After investing several million dollars to repair and upgrade its infrastructure, Lee & Man restarted the facility this past spring as Evergreen Pulp Inc. During the past 40 years, the mill, originally commissioned in 1964 by Georgia-Pacific, passed through a series of owners who struggled (in most cases unsuccessfully) to keep it operating as a TCF (Totally Chlorine Free) bleached kraft pulp mill.

Having originally started up with a chlorine-based bleaching process, the mill, under ownership of Louisiana-Pacific (spun off from Georgia-Pacific in early 1973), switched to peroxide-based TCF in 1994 under mounting environmental complaints and pressures that had continued throughout the 1980s. However, neither LP nor the mill's subsequent owners were able to sustain a profitable operation, mainly because TCF pulp markets and pricing premiums never fully materialized as some had envisioned, and environmental pressures on the mill continued to grow.

Today, Lee & Man is producing unbleached pulp at the large kraft mill (600-plus metric tpd), all of it being shipped to Asia for captive use in the company's own paperboard mills there or to other clients on the open market. Evergreen has announced plans to add a new secondary waste treatment system as well as several other modernization projects, including a new DCS system.



All unbleached kraft pulp processed at Evergreen Pulp Co.'s Samoa, Calif., mill today is shipped to Asia for use in Lee & Man's paperboard mills and other clients on the open market there.

PaperAge recently met with senior management at Evergreen Pulp to discuss their plans for the mill and to gather information on its current and future operations. These discussions are summarized in the following report.

**Changing Paper Industry Landscape.** During the past eight years, total paper and paperboard production in North America has remained even (100,256,000 metric tons in 1996 and 100,280,000 metric tons in 2003), while production in Asia has increased 35% (82,081,000 metric tons in 1996 and 110,645,000 metric tons in 2003). Asia is now the world's largest paper and paperboard manufacturing region. Europe is second, followed by North America.

In recent years, the North American paper industry has been literally bombarded with daily doses of negative news—mill closures, much reduced capital expenditures, capacity rationalization generally preceded by acquisitions

and mergers, head count reductions, declining exports, increasing imports. The list goes on.

Nowhere is this trend more evident than in Humboldt County, Calif., the location of two market pulp mills built in 1964-65 as a value-add and disposal resources for fiber residue left over from the then extensive timber and sawmill operations on the west coast, in essence “recycling” what otherwise would be burned or landfilled.

In 1993, the former Simpson Pulp Co. closed its doors due to steadily reduced raw material supplies caused by sawmill closures and a mandated reduction of untreated effluent discharges. The mill’s structures were subsequently demolished. The other mill, now Evergreen Pulp Inc., like its former neighbor, is situated on a scenic sandbar protecting Humboldt Bay from the Pacific Ocean in northern California.

Under LP’s ownership the mill replaced its aging recovery boiler in 1989-90 to improve air quality emissions, along with its conversion to TCF bleaching to help comply with orders to reduce toxicity in its effluent discharges into the ocean and to eliminate the threat of chlorine release into the community.

LP sold the mill in the late 1990s to Samoa Pacific Cellulose, which found that market demand and prices for TCF pulp (compared with ECF – Elemental Chlorine Free) was not enough to offset the increased operating costs. In desperation, SPC focused on cost savings as profit margins dwindled in an ever increasingly competitive market. The lack of cash flow and profitability contributed to adverse relationships with local suppliers, vendors, and the local water supply district. As profitability declined, the assets were eventually sold to another operating group, Stockton Pacific Enterprises, and the saga continued.

During this troubled period it was not uncommon, for example, for the mill to exceed permitted air quality discharges and simply pay the fine, lacking the funding resources for taking a proactive approach to correct the air quality problems at their source. These actions were not well received by the air quality management district or local environmental advocacy groups. Ongoing deterioration of morale within the workforce compounded the situation.

Stockton Pacific Enterprises was forced to shutdown the mill in December 2004. This meant that a large, well-paid workforce was suddenly out of work in a community already burdened with high unemployment. It also meant that sawmills would have to seek other remedies for disposal



The 200,00-metric tpy mill at Samoa currently produces 10% of the world’s unbleached kraft market pulp, with a 600 (plus)-metric tpd continuous digester and a chemical recovery boiler and recovery island that was upgraded in 1990.

of their residual fiber. The whole episode left many in the community embittered.

**Enter Evergreen Pulp.** Taking possession of the mill in late January 2005, Lee & Man spent millions of dollars over the course of many weeks refurbishing what had been a sadly neglected infrastructure, while rehiring the bulk of the former employees and patching up relationships with local vendors, suppliers, agencies, and the workers’ union. The mill restarted production this past March.

Evergreen Pulp is operating as a wholly owned subsidiary of Lee & Man, a publicly listed (Hong Kong Exchange), China-based packaging paper (paperboard) producer with three mills on mainland China. When a new machine is brought online this year the company will have more than 1.6 million metric tons of paperboard production capacity.

Lee & Man had a total 2004 turnover (revenue) of HK\$2.7 billion (US\$350 million), up 63% over 2003, and a net profit of HK\$417 million (US\$52 million), up 47% over the prior year’s results.

Raymond Lee, CEO of Lee & Man, announced in a public statement that his company had acquired the 200,000-metric tpy Samoa mill in February 2005 to further reduce production costs. “The acquisition,” he noted “was an important part of the Group’s strategy to become a fully vertical integrated company.” He concluded by adding that the Samoa mill “gives us a competitive edge over our competi-



John Yolton of PaperAge meets with Evergreen Pulp's senior management (l-r): Jim Lund, VP of Manufacturing; David Tsang, CEO; Rod Ledbetter, Sales/Technical Services Manager; Russ Mengel, Logistics Manager, and Ed Crawford, VP Resource Management.

tors in China. I believe the pulp mill can bring extra income and profits to the Group as well as margins improvement.”

The good news is that the marginally profitable market pulp mill now has much “deeper pockets” from which to acquire funding for future needs and to help sustain its production, social, and environmental goals.

In the interview meeting with PaperAge, new management at the mill—David Tsang, CEO; Jim Lund, VP Manufacturing; Ed Crawford, VP Resource Management and Sam Wong, Purchasing Manager—were very optimistic and confident about the mill’s future. They have a strategy and have set goals, and say they have the full support of the parent company in China.

“We must still make a profit,” Tsang explains, “because we are a for-profit company. If we cannot operate, we cannot produce and generate the cash flow and profit necessary for sustainable good business. Our parent company and all of us at the mill are committed to the long term; otherwise, we would not have invested the millions of dollars into this venture. That commitment includes our social and environmental obligations (see sidebar on page 27).”

With internal transfers to Lee & Man’s Chinese mills accounting for much of Samoa’s production capacity, and with a strategic market focus on Asian customers for the remaining production (“almost 100%,” Tsang emphasizes), the mill is able to reduce its sales and administration costs by utilizing the parent company’s Asian-based sales force and reduce its manufacturing costs by minimizing grade changes

Whereas the former owners tried unsuccessfully to market some 10-plus grades to a wide range of customers, “Evergreen is focused on only three grades—all unbleached,” Tsang explains. “This mill’s 200,000-metric tpy capacity represents 10% of the world’s unbleached kraft market pulp production.”

**Pulp Making Process.** The mill purchases chips from local area sawmills, predominately Douglas fir, redwood, some pine, spruce, and occasionally hardwood (tan oak). On the average, 150 truck loads of chips are received at the mill each day, and 30-40 container loads of finished product are sent to Oakland, Calif., by truck daily for shipment to Asian ports. Ocean freighters are used occasionally with dock facilities at the old Simpson site.

The woodyard has several truck dumpers and the original chip feed system (circa 1964), including two turntables and a set of Rotex screens. Chip storage capacity is 30,000 units.

The single-vessel Kamyr continuous digester is a vintage 1964 design with an average production today of 600 metric tpd. The mill has achieved 673 metric tons for a 24-hr period. The digester does not have MCC or EMCC capability, but was retrofitted with Lo-Solids cooking several years ago. Pulp discharged from the digester goes through knotters, screening, and eight standard Impco vacuum drum-type brown stock washer units. The Hooper pressure screening system consists of three primary, one secondary, one tertiary, and one quaternary unit.

Washed pulp passes through the oxygen delignification stage of the mill’s peroxide-based bleach plant (OQP<sub>1</sub>P<sub>2</sub> (PO) sequence). The Q stage (chelant addition) is used only for washing on brown pulp production. Lund, however, points out that the mill could produce bleached pulp with the existing sequence if ever needed, depending on market demands.

The bleach plant has three washers on the “front end” and three on the “back end.” Lund explains that on brown pulp production, either of the three-washer lines can be used. This has a maintenance bonus in that one line can be shutdown for servicing by switching over to the other, and vice-versa.

Some 30 tpd of oxygen for the O<sub>2</sub> delig stage is produced onsite by an Air Liquide plant. Lund says that the mill’s “sweet spot” for bleaching would be 83–85 GE brightness, “but at this time, our focus is on meeting Lee & Man’s unbleached pulp needs in China and the needs of some

other clients they have been supplying in that country for some time now. We have no plans to make any bleached pulps at this time.”

When asked about the possibility of ever converting the bleach plant from a peroxide-based TCF operation to a chlorine dioxide (ECF) sequence, Lund says that capital costs, particularly for a ClO<sub>2</sub> generator system, would probably be prohibitive. “Environmental permitting would also be a challenge,” he says.

The mill has one vintage 180-in. trim Valley fourdrinier pulp drying machine with drum dryers and a Flakt airborne unit at the end. It is followed by a Lamb-Grays Harbor cutter-layboy and two hydraulic bale presses and Tennant Wire Tyers.

Pulp produced at Samoa, Lund points out, is of “excellent quality, with very low dirt counts.” Because of the O<sub>2</sub> delignification stage, he says, GE brightness ranges between 27 and 30, which is a somewhat brighter shade than traditional unbleached kraft pulps. “The strength properties are good,” he adds, “due to the redwood and various other fibers we use.”

**Effluent Stream.** Some filtrate from the bleach plant’s final stage washer is sent as effluent through the mill’s mile-long outfall line into the Pacific Ocean, together with some filtrate that flows out of the Q stage. The Q stage filtrate is the primary component of the mill’s effluent stream.

A “fair amount” of filtrate from the final stage bleach plant washer is fed back to the countercurrent brown stock washers and ends up in chemical recovery, Lund notes. Altogether, some 13-15 million gal/day of effluent leaves through the ocean outfall line, which generally matches the mill’s incoming water flows.

The pulp mill screen room is “pretty much closed,” he adds, so almost nothing leaves this area as effluent. Any discarded filtrates containing black liquor are recovered, along with condensates off of the evaporators in chemical recovery.

**Chemical Recovery.** The mill has an Ahlstrom recovery boiler installed in the 1989-90 recovery island modernization. It is capable of burning 3 million lb per day of dry black liquor solids. Also part of this upgrade were three falling film pre-evaporators and a high solids concentrator, all HPD units. An HPD condensate steam stripper system was added a few years later. The septuple-effect HPD evaporator was originally installed in 1964. The original green



**D**uring the 1980s, the Samoa mill was a target of environmentalists due to its discharges of chlorine-based bleach plant effluents into the Pacific Ocean. It converted to TCF bleaching in the mid-1990s, but is currently producing only unbleached pulps while proceeding with plans to install secondary waste treatment facilities. Recent environmental protests have focused on the mill’s air quality, but all air streams are now in compliance with its current permit.

liquor clarifier in the recausticizing area was also replaced with an Ahlstrom X-Filter.

A very large electrostatic precipitator on the recovery boiler was included in the 1989-90 upgrade. It is of adequate size and matched with the boiler rating to produce efficiencies the mill needs to meet California air quality opacity standards. “It does that very nicely,” Lund adds.

Currently, the 10-ft-dia x 250-ft-long original lime kiln is a bottleneck to increased production. The mill is investigating green liquor impregnator technology through a program co-sponsored by the Department of Energy and using the research resources at Georgia Tech and N.C. State.

Some 95% of the mill’s electrical needs (about a 16-MW load) are generated on site by a single-extraction, back-pressure turbine generator powered by steam from the recovery boiler. All process steam needs are met by the recovery boiler and a gas-fired incinerator used to dispose of the mill’s noncondensibles (NCGs) while generating 160-lb steam from an integral boiler.

**Waste Treatment.** Since it started up, the mill has used the ocean outfall system. However, it is currently planning to install secondary treatment of its effluent, Lund says, adding that the technology to accomplish this treatment has not yet been selected.

Lund explains that the mill is in discussions with the regional water board to develop specific plans for the new secondary waste treatment operation. Most likely, it will be an oxygen activated sludge system, he notes, because of space and other limitations. There probably would not be enough mill property available for an aerated lagoon setup.

Lund reports that preliminary engineering work on the waste treatment system has now been completed and that various technologies are being examined. In the meantime, mill management is following the California Environmental Quality Act (CEQA) Interactive Process.

The Evergreen mill is also investigating the replacement of its aging DCS as a future CAPEX. The new waste treatment plant and control system will be significant investments to fund, Lund points out.

**Resolving Old Issues.** The mill has a workforce of 171 full time employees (34 salaried), with additional temporary employees as needed. The hourly wage averages \$21, which is \$9 higher than the average wage in the surrounding area. The mill spends \$4 - \$5 million dollars per month locally and purchases 45% of the local water district's supply, thereby keeping residential water costs down. The local economy, already reeling from the losses of the timber and fishing industries and reduced funding from the state, is well aware of this mill's economic impact. One estimate suggests that for every job at the mill, four other jobs are created locally.

As stated earlier, because of previous owners actions, many contentious issues were left unresolved when Evergreen took ownership of the facility. Among these were loss of employment by 175 people, unpaid debts to local firms, an unpaid water bill to the local water district, and some concern by the local air quality board and area residents about the mill's compliance to the existing Title V air quality permits. While the new owners were not obligated to debts incurred by previous operators, they understood they had to negotiate terms and conditions with some of the same. This rebuilding of the trust process takes time and effort.

After startup, the various air streams were analyzed by a third party testing agency and all were reported to be in compliance. Later, through its own testing, the mill discovered that the smelt dissolver and lime kiln scrubbers were, in fact, out of compliance, and it immediately reported this to the air quality board, asking for and receiving a variance until adequate technology could be installed. The technology selected for the smelt dissolver scrubber, examined in use while visiting similar pulping facilities in British Columbia, is a micro mist scrubber utilizing weak wash as the scrubbing media. This installation is currently being tested for pending approval.

Recent protest activity by a few vocal local residents has focused on the mill's air quality. All of the air streams, except as noted, are in compliance with the current permit. These include TRS and particulates. Since restarting, the mill has hired four additional people within its EHS (Environment, Health and Safety) department, all graduates of the local Humboldt State University. Monthly and quarterly reports are generated for the various agencies from continuously monitored records kept on the DCS system. The safety incident rate has been decreasing from the high levels previous to ownership change.

**Good Business Model.** While the acquisition of this long-suffering pulp mill by a Chinese company may seem serendipitous, it is a blessing for the people of Humboldt County and may well serve as a model for other pulp and/or paper producing communities in North America threatened by global competitive pressures.

The Chinese paper market is growing and fiber is in short supply in some Asian regions. China already imports nearly 10 million metric tpy of recovered fiber, most of it from the U.S., and nearly 6 million metric tpy of virgin fiber. Therefore it makes good business sense for a Chinese paperboard manufacturer to own a supply of fiber and to ensure that supply is sustainable. Based on the actions of Evergreen Pulp thus far, that commitment to sustainability is a given. Overcoming the strained community relationships created by former owners, however, remains a challenge. ■

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