By **MONICA SHAW,** Editor

Building regulatory relationships

Regulatory relationships can be rocky roads, but Project XL has helped Weyerhaeuser's Flint River mill forge stronger ties with the EPA and Georgia Environmental Protection Department

In any relationship, the initial phase is full of expectation and promise, but hard work is necessary to attaining that early potential and making the effort worthwhile. Such is the case with Weyerhaeuser's involvement with the Environmental Protection Agency (EPA) through Project XL at the Flint River fluff pulp mill in Oglethorpe, Ga.

Much has changed both internally and externally for Weyerhaeuser since *Pulp & Paper* first reported on the Clinton Administration's pilot regulatory intervention program, Project XL (for excellence and leadership), in the August 1998 issue. Still, Weyerhaeuser's commitment to the 10-year project has survived past the "glow phase" of its relationship with the EPA and the Georgia Environmental Protection Department (EPD).

"I think regulators recognize that we are serious about our environmental commitments," says Anna Skrobecki, V.P. and mill manager at Flint River, shown here with Steve Ransom, environmental, health, and safety process owner for the mill.

"We set up this project with a great deal of energy, enthusiasm, and trust from all parties, and the first few years everything went as expected, but now we are running up against tougher issues as we strive to meet all the goals in a competitive marketplace," says Mark Johnson, area regulatory affairs manager for Weyerhaeuser. "But we remain very much committed, not just because of cost savings or publicity, but because it is a good project, and we see that from the benefits that occur as we strive for the remaining goals."

As is typical, the individual parties change throughout the course of the relationship, and both Weyerhaeuser and the EPA now have expanded horizons. For the EPA, Project XL was a precursor to the broader Performance Track program, which requires less regulatory effort for similar benefits. For Weyerhaeuser, a major merger and a growing emphasis on corporate citizenship that extends past environmental concerns alone are shaping the company. Still, according to the 2004 Project XL Annual Progress Report, Weyerhaeuser has met eight of the 10 project goals and continues to address the remaining two.

From one acronym to another

In 1992, Weyerhaeuser began advancing a concept called minimum impact manufacturing (MIM), a strategy aimed at reducing mill environmental impacts through preventive process improvements rather than corrective remedies, as well as better pollu-

tion control, environmental management systems, and technology. While MIM is no longer the corporate buzzword, it does exist in concept as part of broader corporate citizenship efforts that "encompass the environment, worker safety, and the community," says Johnson.

Since its startup in 1980 as one of the first North American mills to use oxygen delignification, the Flint River mill has had a history of environmental innovation, including the bleach plant's conversion to 100% chlorine dioxide substitution in 1989. By 1995, with MIM efforts in high gear, it became obvious that the new Project XL offered a way for the mill to leverage its environmental efforts.

No other pulp and paper companies were involved in Project XL at that time, but Weyerhaeuser saw that the program would allow it to choose cost effective and innovative pollution control prevention to meet EPA standards for pulp and paper mills, as well as to comply with the then impending Cluster Rules. It would also allow for consolidation of emissions into a single biennial report accessible to the public, along with a reduction in resources expended on the permitting process for certain modifications to sources of air pollutants.

In return, the mill would comply with specific environmental goals in 10 years, starting in 1996. Table 1 summarizes these goals, which originated with the MIM strategy and became the basis for Project XL.

Early success, recent achievements

The project started off with a bang as the Flint River mill modified its digester for isothermal cooking as part of its brownside optimization project (see *P&P*, June 1998). As Table 1 shows, other early accomplishments included an odor control system upgrade and timberland strategies that reduced pollutant runoff and enhanced wildlife conservation in Weyerhaeuser's Georgia timberlands. Also, in 2000 the mill's environmental management system (EMS) conformed to ISO 14001 standards, for which it was certified in 2002.

More recently, a new lime kiln was installed in 2004 to replace the mill's original calciner. The new lime kiln reduced the yearly solid waste destined for the landfill by more than 50%, from 404 lb per air dried tonne (admt) to 223 lb/admt — the lowest in mill history.

The new lime kiln also helped surpass the Project XL goal set at 310 lb/admt. According to Anna Skrobecki, V.P. and mill manager at Flint River, the solid waste reduction "continues to look very good, very sustainable."

From 2001 to 2003, the energy needed to produce one ton of finished product at the mill nearly met the Project XL goal of 20.0 Mlb steam/admt, helped along by a number of projects. For example, with the addition of hydrogen peroxide to the bleaching process in 2001, the mill's chlorine dioxide bleaching process became oversized. In late 2002, a chemical generation turndown project helped solve this problem, in part by installing new smaller steam nozzles in the chiller.

Also, in 2004, an energy conservation project was installed to recover additional heat from the bleach plant effluent stream, which is used to heat warm water, reducing the fresh steam required to heat water for the mill process. The overall result is lower steam usage in day-to-day operations. In 2004, the mill surpassed the Project XL steam usage goal for the first time, averaging 19.94 Mlb steam/admt (Figure 1).

The mill also reached its overall energy usage goal through energy conservation projects installed over the term of the agreement, like bleach plant effluent heat recovery, says Skrobecki. However, she describes this goal as one the mill "will likely struggle with from a sustainability standpoint," mostly due to fluctuating production levels. Additional energy

TABLE 1.

Weyerhaeuser has completed many of the MIM goals that formed the basis for Project XL.

Project XL/Minimum Impact Manufacturing Goals	Completion Date/Status
Isothermal cooking/brownside optimization	1996
Odor control system upgrade	1997
Timberland resource strategies	1997
ISO 14001 environmental management system (EMS)	2002 (2000 — EMS in place, 2002 — EMS certified)
Hazardous air pollutant (HAP) emission reductions	2001
Energy steam reductions	2004
Solid waste reduction	2004
Energy conservation	2004 and ongoing
Water use reduction	2000 and ongoing*
Bleach plant effluent reduction	Ongoing

* Tied to bleach plant effluent reduction

savings projects are being considered for future years.

Ongoing efforts hit snags

In addition to ongoing energy conservation efforts, the Flint River mill continues to address Project XL goals associated with water use and bleach plant effluent reduction.

These interrelated challenges marked the end of the "glow phase" when everything was easier because of up-front work that Weyerhaeuser had already completed, says Johnson, and the beginning of hard work for the mill and regulatory agencies.

"We do continue to look at ways to battle pitch in the final pulp sheet without increasing water use, but the challenge of efficiently using water to reduce bleach plant effluent is the most difficult, " says Ransom.

In 2004, the mill water usage decreased to a new record low average of 10.7 million gallons per day (mgd), and year-to-date in 2005, the mill is below the 10.18 mgd Project XL goal, according to Steve Ransom, environmental, health, and safety process owner at the Flint River mill, who is also in charge of compiling the Project XL annual project report. Efforts to reduce water use are not without impacts, he says.

"We do continue to look at ways to battle pitch in the final pulp sheet without increasing water use, but the challenge of efficiently using water to reduce bleach plant effluent is the most difficult," describes Ransom.

Since 1996, the mill's daily bleach plant effluent has averaged 20 m^3/admt; the Project XL goal was a 50% reduction or 10 m^3/admt. In 1998, Weyerhaeuser conducted a Bleach Plant Feasibility Study, which was updated in 2002. Although the study yielded indirect benefits, it did indicate that the XL goal was unrealistic from a business standpoint.

"We had to understand whether business conditions could support this goal, which is why we agreed to do the feasibility study," Ransom comments. "So far, we haven't seen pulp customers interested in paying higher prices for a closed-loop bleach plant."

Johnson agrees, but reiterates the company's commitment to continue forging ahead.

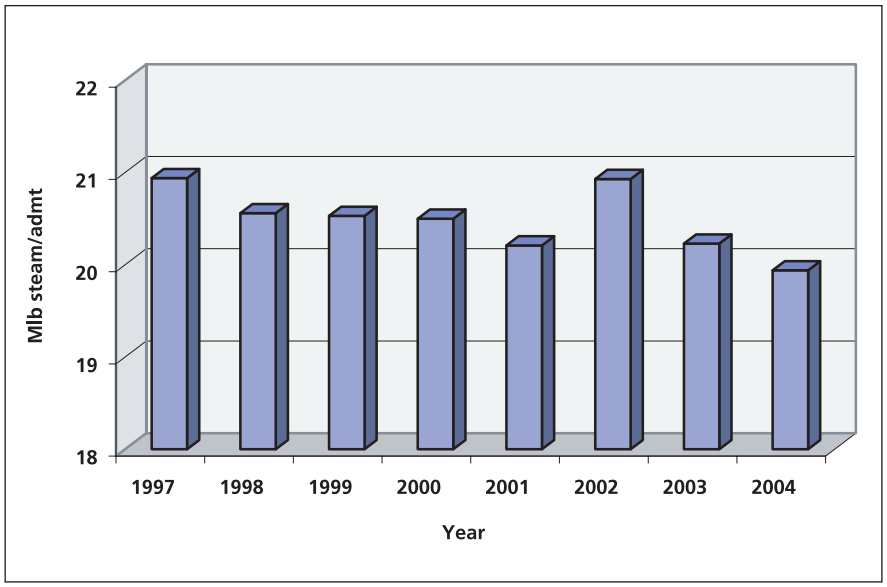
"We are still interested in finding ways to get there, but there are technology and market barriers at this point."

In 2002, Weyerhaeuser communicated these issues to the EPA, which agreed to look for additional options in achieving the bleach plant effluent goal. Weyerhaeuser confirmed its commitment, but also suggested additional reporting on wastewater and effluent parameters that might clarify the effluent situation.

"The 50% reduction goal is a bit fuzzy, because if the goal was volumetric flow from a water standpoint, we've met that because we met the water goal," Skrobecki proposes. "If it was a pollutant goal, it's also unclear, because it only addresses volume, and if the concentration of pollutants is assumed to

FIGURE 1.

The Flint River mill has surpassed the Project XL steam usage goal, averaging 19.94 Mlb steam/admt in 2004.



have stayed the same, it was never worded. We can show that we've driven towards part of that intent, and we certainly do have sustainable and improved [adsorbable organic halides] AOX emissions, dioxins, etc., but you can't meet those goals with a volumetric flow reduction."

The feasibility study did yield valuable spin-off projects with measurable environmental benefits related to reduced chlorides in the pulping process liquor loop, the use of oxidizers, and the value of lower Kappa numbers feeding the bleach plant:

- A split caustic system was installed so that membrane caustic, low in chlorides, is used in the utilities unit where it enters the liquor loop.
- Salt cake is dumped from the recovery boiler generator bank hoppers (high in chlorides) and low chloride sodium sesquisulfate is used as a replacement from the ClO_2 generator.
- Reducing the chlorides in the liquor loop allows the recovery boiler to run an entire year without having to shut down for a water wash. Eliminating water washes reduces liquor losses to the sewer with corresponding high biological oxygen demand (BOD) and color to the waste treatment system.
- Hydrogen peroxide is now used in the bleach plant, substituting for some of the ClO_2 and helping reduce effluent color, BOD, and AOX.

Table 2 demonstrates how environmental parameters have improved for the Flint River mill in the years since Project XL began.

TABLE 2.

Flint River environmental parameter comparison

Environmental Parameter	1996	2004
Water		
Raw water usage (mgd)	11.91	10.7
Final effluent volume (gal/admt)	11,704	9,099
Bleach plant effluent flow (m^3/admt)	20	20
Effluent Discharge to Flint River		
AOX (kg/admt)	0.10	0.07
Color (lb/admt)	115	82
Air		
HAP (tons/yr)	425	416
Solid Waste		
Solid waste generation (lb/admt)	505	223
Energy Conservation		
Steam Usage (Mlb Steam/admt)	22.44	19.94

In Hindsight and Going Forward

While the EPA is now more involved with its Performance Track program, the mill has built a stronger relationship with the Georgia EPD, Johnson says. The mill continues to address Project XL goals in anticipation of project completion and even improve on them, but he also notes that the future beyond XL is cloudy. "We took enforceable limits that were related to our air and wastewater permits as part of the XL agreement. The XL approach has raised challenges — the mill reported several permit compliance problems to the EPD — for remaining in compliance while moving forward with an innovative environmental strategy."

This is uncharted territory which creates a "now what?" situation, according to Johnson. "How do you get the changes at the mill through permitting and remain in compliance in the context of XL?" he questions. Still, Johnson sees the benefits as outweighing the challenges.

"In water conservation, for example, we're ahead of the game," Johnson explains." We hope that, instead of being forced to conserve water at some future point by a permit program or a drought, we would get recognition for our previous work if Georgia comes up with a new rule to force a conservation plan. The downside is if that is not recognized and we have to conserve further. That will be difficult. We don't want to have somebody come along in 2010 and say everyone must make a 10% improvement. The EPD has heard that from us and publicly acknowledged there should be recognition of where a particular entity is operating and its ability to do more."

Still, despite permitting issues and challenges with project goals such as bleach plant effluent, Skrobecki says regulatory relationships have improved.

"Even though we deal more with the EPD now, it opened communication with the EPA, and changed the relationship to a partnership," Skrobecki comments. "We are still accountable for permits, compliance, and reporting, and the expectations aren't relaxed because of our relationship through Project XL. However, I think regulators recognize that we are serious about our environmental commitments." P&P