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Project XL Preliminary Status Report

An Evaluation of Projects in Implementation

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Contents

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Executive Summary

On March 16, 1995, the Clinton Administration announced a portfolio of reinvention initiatives to be implemented by the U.S. Environmental Protection Agency (EPA) as a part of its efforts to achieve greater public health and environmental protection at a more reasonable cost. For one of these initiatives, Project XL–which stands for eXcellence and Leadership–EPA entered into a series of specific project agreements to produce data and experiences to help the Agency make improvements in the current system of environmental protection. The goal of Project XL is to test ways of producing superior environmental performance with improved economic efficiencies, while increasing public participation through active stakeholder processes. As of August 1998, there are 10 XL projects in the implementation phase and 20 XL projects under development. As the Agency works to streamline and improve current procedures for designing and implementing XL projects, a number of important lessons can be learned from XL projects in the implementation phase. A review of the projects in the implementation phase can offer EPA, industry, and stakeholders valuable insights into the development, implementation, and, ultimately, the transferability of XL projects.

This *Preliminary Status Report* examines three XL projects that implemented Final Project Agreements (FPAs) in January 1998: Weyerhaeuser-Flint River Operations, Oglethorpe, Georgia; Intel Corporation-Ocotillo Site, Chandler, Arizona; and Berry Corporation Facility, Labelle, Florida. This report covers the projects' progress in meeting FPA commitments, stakeholder participation outcomes, environmental performance, and lessons learned. This report also presents the data available on economic and environmental costs and benefits to the public and private sectors involved in the three XL projects. With this information, Agency senior management–as well as other XL project stakeholders–will gain a better understanding of the projects underway and how the Project XL process can be improved.

Environmental and Economic Performance

Gaining superior environmental performance and economic efficiency are major objectives for each XL project. The data for the projects indicate that, overall, the projects result in key benefits for the environment, the project sponsors, and stakeholders, such as:

For the Environment:

- Decreased waste, water, and air emissions.
- Eliminated hazardous waste streams and sources of odor problems.
- Increased recycling.

For Project Sponsors:

- Substantial cost savings on capital and process expenditures.
- Better stakeholder relationships.
- Improved ability to adapt processes and products due to changes in consumer demand.
- Improved environmental control programs with reduced costs in employees' environmental management training.

For Stakeholders:

- Improved availability of information from the companies.
- Environmental mentoring and educational activities for local students and community groups.

Although this report shows that all three project sponsors gained economic benefits as a result of participating in Project XL, at this time the projects do not have enough quantitative data available for indepth cost/benefit analysis, including:

- Assessing what the potential cost outlays and savings could be at a national level for an industry sector or sectors to implement specific regulatory innovations.
- Comparing the costs of operating under the XL projects' innovations with the costs of operating under the conventional programs for coregulators (e.g., federal, state, and local government).
- Understanding the economic costs and benefits of the XL innovations for local community representatives and national environmental nongovernmental organizations.

Innovation and System Change

The Weyerhaeuser, Intel, and Berry experiments provided EPA with demonstrations of site-specific stakeholder participation models and opportunities for close collaboration with state and local programs. These projects also have provided arenas for testing innovations such as:

- Allowing alternative ways to meet maximum achievable control technology standards required by the Clean Water Act.
- Using the Internet to give greater public access to environmental information and to end fragmented reporting to coregulating agencies.
- Employing methods that incorporate broad environmental management system approaches, Comprehensive Operating Permits (COPs), and flexible permitting requirements that allow facilities to reduce sources of air, water, or waste regardless of expansion or production changes.

As a result, these projects have lead agency to improve the federal Pulp and Paper Cluster Rules; cite the XL program in a *Federal Register* notice announcing EPA's intent to support and help promote the development and use of Environmental Management Systems; explore the use of the Internet reporting for facilities; and consider designing a "how to" process guide for completing a COP.

XL Project Development–Lessons Learned

An analysis of each project in this report reveals challenges experienced by those involved in the projects' development. As EPA makes progress toward its goal of 50 XL Projects in implementation or development by September 1999, the Agency will continue to work on improving the project development process and can draw on these lessons learned to do so. The individual projects' experiences, for example, demonstrate that clearly outlined goals are needed at the beginning of each XL project. Early identification and understanding of goals by the project sponsor, EPA, and other project participants allows for a smoother process of proposal and FPA development and helps to ensure project stakeholders move in the direction of a sound partnership.

Also, the individual projects' experiences clearly demonstrated that having Agency "champions" for specific projects at senior management and staff levels enhanced the quality of a project's development process and outcome. More specifically:

- Strong support from Agency management is critical. This support includes ensuring clear direction, empowering Agency staff that participate in negotiations, and providing travel resources for onsite visits.
- EPA must recognize and develop the organizational structure necessary for project decision-making.

Meaningful and organized participation on the part of community and national nongovernmental organization representatives has been recognized as a cornerstone of a successful XL project and is a criterion of the project selection process. This report documents valuable lessons in facilitating and attaining a meaningful stakeholder participation process, for example:

- Building trust is critical. Facilitated stakeholder processes, face-to-face meetings, and site visits are demonstrated mechanisms for building trust.
- Input needs to be obtained from local stakeholders early in the process. Resources should be made available to ensure local stakeholders have the resources to assess the technical and environmental issues.
- National nongovernmental organizations should be involved earlier in the negotiation process. When these organizations are not fully engaged in the stakeholder process in an early and direct way, their participation in the negotiation process is hampered.
- Clarity of the XL process and objectives is an essential criterion for stakeholder involvement and progress in developing the FPAs.

Next Steps for Evaluating the XL Program

Using this report as a starting-point, EPA plans to continue tracking and evaluating the progress of the XL program. The goals of evaluating XL include three areas: developing assessments of individual XL projects from the perspectives of the stakeholders, project sponsors, and regulatory entities; cataloging program contributions to testing innovations and developing "cleaner, cheaper, and smarter" alternatives to the current environmental regulatory system; and identifying areas where the XL program can be strengthened. Specifically, future evaluation efforts will include:

- Case studies of all projects implementing FPAs (on-going).
- Evaluations of XL stakeholder processes (in 1999 and 2000).
- A cost/benefit analysis framework that will allow EPA to quantify the economic and environmental impact of XL projects–from the perspective of project sponsors, regulators, and environmental and community stakeholders (1999).
- Annual reports of program progress (January 1999 and January 2000).
- Communicate evaluation results to the public via the Project XL home page (on-going) and other mechanisms.

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Project XL Preliminary Status Report

1.0 Introduction

The purpose of this report is to present information about the status and results of three XL–eXcellence and Leadership–projects as of January 1998: Weyerhaeuser-Flint River Operations, Olgethorpe, Georgia; Intel Corporation-Ocotillo Site, Chandler, Arizona; and Berry Corporation Facility, Labelle, Florida. For each XL project, this report describes the preliminary lessons learned as based on 1 year of the projects' implementation; the environmental performance of the projects; and the status of each project's commitments.

2.0 Data Collection Process

2.1 Focus Groups

The U.S. Environmental Protection Agency's (EPA's) Office of Reinvention Programs (OREP) conducted focus group conference calls with organizations responsible for reporting and carrying out activities in the Final Project Agreements (FPAs) for Weyerhaeuser, Intel, and Berry. These focus groups included company employees, state and local government representatives, and EPA Headquarters and regional staff.

Project-specific Focus Group Protocols were distributed to participants prior to each focus group conference call. The protocols included a brief overview of the focus group process; a conference call agenda; a list of general questions related to information on lessons learned; and exhibits summarizing FPA project commitments, outlining costs and benefits, and summarizing progress in achieving superior environmental performance. During the focus group conference calls participants reviewed the exhibits, described lessons they learned from negotiation and implementation of the XL project, and gave any available information on costs and benefits. Discussions about lessons learned focused on the negotiation and implementation of the projects' FPAs. Followup calls were made to individual contacts to obtain additional information.

2.2 Stakeholder Process Surveys

In developing overall lessons learned for this preliminary report, OREP also relied on some summary data from survey questionnaires returned by 36 participants in four XL stakeholder processes. The four XL projects surveyed included Weyerhaeuser, Intel, Merck, and Hadco. The respondents represented the companies, EPA, state and local governments, national environmental nongovernmental organizations (NGOs), and local community participants. Survey information for only the Weyerhaeuser and Intel projects is used in this report.

A detailed analysis of the XL stakeholder processes, including the results of respondents questionnaires, is available in the report, completed by Resolve, Inc., *Evaluation of Project XL Stakeholder Processes*.

2.3 Follow-Up Discussions With Key EPA Staff and Managers

In order to identify the impacts the Weyerhaeuser, Intel, and Berry XL projects had on EPA policy and program implementation, OREP staff spoke with key EPA staff and managers in Agency Headquarters and regional offices. These discussions took place in January 1998 as follow-up to the focus group conference calls. The results of these discussions are summarized below in Section 3.2 Promotion of Innovation and System Change.

3.0 Results (As of January 1998–Based on 1 Year of Projects Implementation)

3.1 Environmental and Economic Performance

Gaining superior environmental performance and economic efficiency are major objectives for each XL project. The data indicate that each project resulted in key benefits for the environment, the project sponsors, and stakeholders. These benefits are outlined below:

Weyerhaeuser Flint River Project Benefits

For the Environment:

- Voluntary effluent guidelines became enforceable permit requirements
- Three effluent discharges into Flint River decreased by 10 percent, biological oxygen demand (BOD); 30 percent, total suspended solids (TSS); and 32 percent, absorbable organic halides (AOX).
- Solid waste decreased by 40 percent and air emissions decreased by 13 percent.

For Stakeholders:

- High stakeholder satisfaction in the outcome.
- Improved availability of information from the company.

For Project Sponsors:

- Estimated savings of $176,000 in the first year.
- $10 million in future capital spending avoided.
- A reduced reporting burden.
- Flexibility in meeting air pollution technology requirements.

Intel Ocotillo Site Project Benefits

For the Environment:

- Large facility will stay a minor source of air pollution in a “serious nonattainment” district, regardless of expansion or production changes.
- Voluntary air pollution controls now enforceable under a permit.
- Better management of Arizona water resources.
- Increased recycling; decreased solid and hazardous waste.

For Stakeholders:

- Environmental reporting to the public via Internet, based on a community designed format.
- Environmental mentoring and educational activities for local students and community groups.

For Project Sponsor:

- Gained competitive advantages in a quick-to-market industry.

- Avoided millions of dollors worth of production delays by eliminating 30 to 50 permit reviews a year.

Berry Project Benefits

For the Environment:
- Elimination of an 88-acre spray field that caused odor problems.
- Elimination of some hazardous waste streams.
- Standardization of work procedures that lead to reduced releases.

For Project Sponsor:
- 50 percent savings in environmental control programs expected.
- Standardized work procedures have reduced chance of violations.
- Expected improvements in worker safety.
- Employee environmental management training costs will be reduced.

For Stakeholders:
- This was not evaluated for this project.

While all three companies reported significant benefits as a result of participation in Project XL, there is not enough data conduct an indepth cost/benefit analysis of specific innovations. There are not enough data, for example, to compare the costs of operating under an XL project with the costs or operating under conventional program approaches and to assess the potential cost outlays and savings required for an industry sector to implement specific regulatory changes at a national level.

Also, very little information is available on costs and benefits for federal, state, and local regulatory agencies. The information obtained currently indicates that for federal, state, and local agencies the costs of negotiating and monitoring the XL projects are not offset by the savings accrued under operating XL permitting programs. Future savings, however, might offset the up-front transaction costs.

In addition, little or no information is available on the economic costs and benefits to local community representatives and national NGOs. The available information clearly demonstrates that while these stakeholders need early access to technical assistance in order to participate in the process, they generally do not have adequate monetary resources to gain this access.

3.2 Promotion of Innovation and System Change

The Weyerhaeuser, Intel, and Berry projects provided EPA with demonstrations of site-specific stakeholder participation models and opportunities for close collaboration with state and local programs. These projects also gave EPA an opportunity to explore and implement regulatory flexibility in a protective way, for example:

- Weyerhaeuser effectively decreased effluent discharges by testing innovative ways to meet the Maximum Achievable Control Technology (MACT) requirements under the Clean Water Act.
- Intel became one of the first facilities with environmental reporting on the Internet:
  - "State of the art" format giving greater public access.
  - Ended fragmented reporting with information available quarterly.

- Intel developed a method to insure its facility stays a minor source of air pollution in a "serious nonattainment" district, regardless of expansion or production changes.
- Berry effectively implemented and demonstrated that an Environmental Management System approach with the use of a Comprehensive Operating Permit (COP) can produce superior environmental performance, reduce environmental control costs, and improve employee training.

As a result, these projects lead the Agency to initiate system changes, such as:

- Improvements to the MACT standard portions of the federal Pulp and Paper Cluster Rules, such as:
  - Alternative compliance schedules for companies participating in effluent guidelines voluntary incentive programs.
  - Increased flexibility of implementation of the Clean Condensate Alternative.
- An EPA *Federal Register* notice citation announcing EPA's intent to support and help promote the development and use of Environmental Management Systems.
- EPA exploring the use of Internet reporting as a template for improved public access to facilities' environmental results.
- EPA considering designing a "how to" process guide for completing a COP.

In addition to the innovations described above, the flexible permitting concept has been pioneered through XL and other special permitting projects. These projects used agreement to limit emissions of specific air pollutants in exchange for greater flexibility in plant operations and tested the use of advance approval for classes of plant or process changes. As a result of these projects, EPA's air program is:

- Developing a flexible permit approach to implement the pharmaceutical air toxics standard (due to promulgate shortly).
- Drafting a flexible permit policy that provides specific guidance and encouragement to states coregulators.
- Revising permit regulations under the Clean Air Act to better accommodate advance approvals.

3.3 XL Project Development–Lessons Learned

The analysis of each project in this report reveals challenges experienced by those involved in the projects' development. As EPA makes progress toward its goal of 50 XL projects in implementation, the Agency will continue to work on improving the project development process and can draw on the lessons learned below to do so:

Have Clear Project Objectives and Goals:

- Project sponsors must identify and clearly lay out the objective of the project and its goals so that subsequent discussions and meetings are focused.
- Project sponsors need clarity on what the Agency project guidelines are, and EPA must do a better job of providing this information.
- Project sponsors must clearly articulate the regulatory flexibility the project will test.

Build Trust and Open the Lines of Communication:

- Project sponsors and the Agency must work together to establish good communications–this includes using the same acronyms and avoiding excessive use of different types of technical jargon.
- Project participants should use the project site visits as a means to aiding trust-building and opening communications. Efforts should be made to allow for travel to the facilities.

Organize Effective Teams:

- Project sponsor should identify appropriate participants from the community, different levels of government, and national environmental organizations as early as possible in the process–potentially during the proposal development stage and definitely at the beginning of the FPA negotiation process.
- Issue teams should be organized to address specific items and report to the full team.
- Project teams should identify the key issues and prioritize them according to which should be addressed first.
- Project teams should build critique sessions into the negotiation process.
- Project team members must recognize the time commitment required of them. In particular, EPA management must be willing to allow the necessary time investment of its staff.

Minimize Team and Schedule Changes:

- Avoid making changes to team representatives.
- If team members change, make sure new members get up to speed before participating directly in project negotiations.
- Changing timelines impedes the negotiation process; keeping the project on schedule and meeting all deadlines helps to maintain trust.

Meaningful Stakeholder Participation Starts Early:

- Project sponsors should develop a stakeholder participation plan as early in the proposal development stage as possible.
- Facilities with good community relationships have a starting point for convening a sound stakeholder group that is well informed and comfortable with the project sponsor.
- Input from local stakeholders must be obtained and explored early in the process.
- National NGOs must be involved early on in the negotiations process to ensure all parties work with the same information and the FPA negotiation process is not hampered by late entrants in the process.

Process Clarity and Access to Information are Essential:

- Clarity of the XL process and objectives is essential for trust-building and empowerment of participants–and better facilitates progress in FPA negotiations.
- Clear and concise information must be shared with the stakeholders. Information sharing includes identifying resources to local representatives so they can assess the technical, financial, and environmental issues specific to the facility.

- Third party facilitators, face-to-face meetings, and site visits are demonstrated mechanisms for building trust.

Stakeholder Participation Continues After the FPA Is Signed:

- The stakeholder participation plan should incorporate goals for FPA implementation including stakeholders' role in data review and project decision-making.
- Future evaluation efforts must assess the economic and noneconomic costs and benefits to the local community and national NGOs.

4.0 Weyerhaeuser Preliminary Status Report (As of January 1998)

4.1 The Weyerhaeuser FPA

The Weyerhaeuser Flint River facility is a state-of-the-art mill producing 320,000 tons of fluff pulp per year. The mill, located in Oglethorpe, Georgia, opened in 1981. Minimum impact manufacturing has been part of Flint River's management philosophy for many years. For example, the facility voluntarily installed oxygen delignification technology in 1980 and 100 percent chlorine dioxide substitution bleaching in 1989.

The FPA for the XL pilot at the Weyerhaeuser facility was signed on January 17, 1997. Through a combination of enforceable requirements and voluntary goals, Weyerhaeuser Company committed to improving the health of the nearby Flint River and surrounding watersheds by:

- Cutting its bleach plant effluent by 50 percent over a 10-year period.
- Reducing water usage by 1 million gallons a day.
- Cutting solid waste generation in half over a 10-year period.
- Committing to reduce energy use.
- Reducing constituents of hazardous waste.
- Improving forest management practices in over 300,000 acres of timber land.
- Adopting ISO 14001, an international standard that defines the elements of an effective environmental management system.

As part of the agreement, EPA offered Weyerhaeuser the flexibility to consolidate routine reports into two reports per year and to use alternative means to meet the requirements of new air regulations that prescribe MACT. EPA also is waiving government review prior to certain physical modifications, provided that emissions do not exceed stipulated levels.

4.2 Weyerhaeuser Focus Group

Participants in the Weyerhaeuser focus group reviewed drafts of the three exhibits shown below: a summary FPA project commitments, an outline of costs and benefits, and a summary of progress in achieving superior environmental performance. The drafts of exhibits were based on information contained in:

- Weyerhaeuser Flint River Operations Final Project Agreement (January 1997).
- Weyerhaeuser Flint River Operations 1997 Midyear Progress Report (June 1997).
- Weyerhaeuser Flint River Operations Annual Report (January 1998).

During the focus group conference calls, participants also described lessons learned that focused on the negotiation and implementation of the projects FPAs. Questions about lessons learned included:

- What is the most important lesson learned from this project in your opinion?
- Did you encounter anything unexpectedly helpful during the process? If so, what was the major one?
- Did you encounter any unexpected barriers during the project? If so, what was the major one?
- Are there any unresolved issues or problems related to the project that have yet to be addressed? If so, what are they?
- Do you have any suggestions for improving the process of implementing similar projects in the future? If so, what are they?

- Are there lessons learned in your project that have not been mentioned yet? If so, what are they?

Focus group participants included:

Name	Organization
Gary Risner	Weyerhaeuser–DC
Russell Stevenson	Weyerhaeuser–Flint River
Mark Johnson	Weyerhaeuser–Atlanta
Allen Leake	GA–Environmental Protection Division (EPD)
Paul Crumpler	GA–Pollution Prevention Assistance Division (PPAD)
Michelle Glenn	EPA Region 4
Penny Lassiter	EPA (Office of Air and Radiation (OAR)
Nancy Birnbaum	EPA OREP
Katherine Dawes	EPA OREP

4.3 Weyerhaeuser Focus Group–Lessons Learned

Start the Process with Clear Goals:

- There needs to be an agreement up front on the goal of the project.
- The company needs to be clear on what it wants from the Agency and must do its homework on the project.
- The lack of focus at the beginning of the process was frustrating. The same discussions occurred over and over. When an agreement on clarity was made by EPA, this hurdle was overcome.
- There was a problem with participants using jargon and acronyms others were not familiar with. This hindered communications.

Provide Agency Management Support:

- EPA management support is crucial. The right EPA staff need to be involved, allowed to spend the time necessary to make the process work, and be empowered to speak for the Agency.
- Some EPA staff were not orginially empowered by their offices to make decisions and speak for their offices. For example, the region initially did not have an effective management structure in place. This contributed to having the wrong people placed on the team at the beginning of the process. When a new Deputy Regional Administrator (DRA) started to participate in the project, the necessary staff got involved and the process moved ahead.
- Management support was crucial. An EPA OAR senior manager, for example, always had an open door policy and empowered staff to make decisions.
- The Agency did not seem committed to assigning the right people. Up to a certain point, no one seemed to take the program seriously. The Office of Water, for example, did not seem very interested in participating because they thought they would get improvements in performance without having to grant regulatory flexibility (they perceived that OAR would).
- EPA's travel restrictions were a constraint, resulting in negotiations occurring in Washington, DC, rather than onsite in Oglethorpe, Georgia.

Organize Effective Teams:

- Effective teams should be organized at the start of the process. Smaller teams should be formed to address specific issues and report back to the full team.
- Identifying appropriate team members at the beginning of the negotiation process is critical. Understanding the commitment of time necessary is important at the beginning of the process and management must be willing to allow their representatives to devote adequate time to the project.
- There were a lot of unfocused meetings at the beginning. When people started to break out into smaller groups (i.e., 4 to 5 people) to address core issues, they were able to begin resolving issues. If the process is not compartmentalized, it will bog down.
- Building critique sessions into the negotiation process would have been helpful. Identifying and organizing the issues is important.

Minimize Changes:

- Making changes in timelines and team memberships should be minimized.
- Changing timelines impeded the negotiation process.
- Changing EPA team members late in the process held things up. If new members are brought into the process, an explicit effort should be made to bring them up to speed.

Build Trust:

- Building trust is crucial. Important mechanisms for building trust are to conduct extensive site visits for federal and state regulators and to keep on schedule.
- The negotiation process moved ahead much faster after a 3-day site visit to the mill. Federal and state employees looked through the mill in detail. This turned out to be very important for building trust. The company was a good host, which lead to a better understanding of specific site issues.
- Honesty and openness are important.
- Keeping the project on schedule and meeting all deadlines helps to establish trust.

Identify a Champion:

- A champion for the project was important. In this case, DRA Stan Meiburg became the champion and things went much more smoothly.

Work With Local Stakeholders:

- Local stakeholders gave input on what was important to them. Weyerhaeuser spent a lot of effort to keep local stakeholders informed. At the beginning of the project, Weyerhaeuser thought meetings twice per year would suffice, but more frequent meetings and activities were necessary. The company has a good neighbor policy and is comfortable working with local residents.
- Local stakeholders provide critical input on issues important to them. They should have adequate resources to help them understand the details of the project.

- An ombudsman for stakeholders would be helpful so they can understand the details of the project. The stakeholders wanted to be involved, but did not know what to expect.
- A dialog between EPA and the residents and stakeholders near the facility was important.

Directly Involve National NGOs:

- National NGO stakeholders should be directly involved in the project. The national NGOs critiqued the project from afar, without ongoing detailed involvement. They are influential with EPA; therefore, these NGOs should have more ongoing involvement.

Exhibit 1: Weyerhaeuser Project Commitments as of January 1998

Summary of Findings:

- Implementation of the Minimum Impact Manufacturing (MIM) Phase IV projects are on schedule.
- Certain feasibility studies for MIM Phase V projects have been initiated.
- Weyerhaeuser is working jointly with stakeholders and FPA signatories to incorporate FPA terms into the facility's environmental permits.

Table of Project Commitments:

The attached table summarizes progress in meeting commitments described in the XL FPA for Weyerhaeuser's Flint River Operations in Georgia. The table lists the commitments included in the FPA; provides dates for meeting the commitments; indicates whether the commitments have been achieved, are being achieved, or are being exceeded; and includes explanatory comments where needed.

Commitment	Date	Achieved, Being Achieved, or Exceeded
MIM Plans		
MIM Phase IV Implementation Schedule		
Isothermal Cooking (Brownside Optimization): Construction Complete Process Optimization Complete	 1996.4 1997.3	Achieved.
Odor Control System Upgrade: Construction Complete Process Optimization Complete	 1996.2 1996.4	Achieved.
Energy Steam Reductions: Construction Complete Process Optimization Complete	 1997.2 1997.4	Achieved.
Incorporate ISO 14001 Enforcement Management System (EMS) (nonenforceable): Begin ISO 14001 Documentation Complete ISO 14001 EMS Implement ISO 14001 EMS	1997.1 1997.4 1/1/1998	Being Achieved (target completion 6/1998).
MIM Phase V Feasibility Studies (Nonenforceable)		
Solid Waste Reductions' Feasibility Studies: Lime Mud Recovery (vertical/rotary kiln) By Product Use (composting/land application) Process Solid Waste Elimination Biannual Study	 2002.1 2004.1	On schedule. Conducting pilot-plant scale composting trial. Began land application feasibility studies.

Commitment	Date	Achieved, Being Achieved, or Exceeded
Energy Conservation Feasibility Study to Iidentify Potential Conservation Practices: Develop Study	10/1/1998	On schedule. Facility task team will be formed in next 6 months to develop an energy conservation plan.
Water Use Reductions Feasibility Studies: Reuse Excess Machine White Water Substitute Woodyard Flume Water Install Pump Seals Reuse Bearing Cooling Waters		On schedule. Initiated feasibility study to reuse excess machine water (expected to recover 1 million gallons per day [MGD]).
Bleach Pant Effluent Feasibility Studies: Mill Water Balance Water Reuse/Reduction Corrosion/Scaling Product Quality Characteristic Economic/Market Analysis Construct Project Elements Project Line	 1998.1 1999.1 2000.1 2002.1 2003.1 2004.1 2006.1	On schedule.
Hazardous Air Pollutant (HAP) emission reduction feasibility studies: Reduce Process Condensate Wash Water Reduce Bleach Plant HAP Emissions Reduce Oxygen Delignification HAP Emissions Reduce Cylinder Mould Decker and Cylinder Mould Filtrate Tank HAP Emissions Weak Gas Collection System for End-of-Pipe Control	TBD	On schedule. A preliminary investigation was conducted on the effects of the new isothermal cooking digester and impact on HAP emissions from brownstock washing, oxygen delignification, and bleaching processes.
Water		
Enforceable Implementation Mechanisms		
Reissue National Pollutant Discharge Elimination System (NPDES) Permit to Provide More Stringent Effluent Limits for BOD, TSS, and AOX	9/1/1997	Achieved 7/1997.
Revise NPDES Permit to Describe Streamlined NPDES Permit Renewal Process	1/1/1997	Achieved 7/1997.
Reissue NPDES Permit Without Fish Tissue Sampling Requirement	9/1/1997	Achieved 7/1997.
Revise NPDES Permit to Remove a Requirement for Additional Assimilative Capacity Study	9/1/1997	Achieved 719/97.
Revise NPDES Permit to Allow Annual Compliance Certification in Lieu of a NPDES Discharge Monitoring Report (DMR)	1/1/1997	Achieved 7/1997.
Modify a Surface-Water Withdrawal Permit to Reduce Daily Maximum Withdrawal Limits by 1.0 MGD	1/1/1998	Upon completion of 1998 water conservation projects, will modify permit for reduction.

Commitment	Date	Achieved, Being Achieved, or Exceeded
Enforceable Environmental Goals (Phase IV)		
Raw Water Usage Goal 11.50 MGD Effluent Discharges: BOD goal 3.80 lbs/Air Dried Metric Ton (ADMT) TSS goal 4.01 lbs/ADMT AOX goal 0.15 kg/ADMT		11.74 MGD (1/1998 report). 3.01 lbs/ADMT (1/1998 report). 3.13 lbs/ADMT (1/1998 report). 0.10 kg/ADMT (1/1998 report).
Bleach Plant Effluent Reductions (Phase V)		
Reduce Beach Plant Effluent Flow to 10 cubic Meters Per ADMT (nonenforceable)	2006	20 m^3/ADMT (1/1998 report).
Environmental goals: Reduce Water Use by 2 MGD 50% Reduction BOD 50% Reduction COD 50% Reduction Color 50% Reduction TSS 50% Reduction AOX 50% Reduction HAP emissions	2006	On schedule.
Solid Waste		
Enforceable Implementation Mechanisms		
Modify Solid Waste Permit to Allow Nonhazardous Industrial Wastes Containing Free Liquids Disposal Into Permitted Onsite Landfill	1/1/1997	Will submit for minor solid waste permit modification 1998.1.
Nonenforceable Implementation Mechanisms		
Reduce Solid Waste Generation From Baseline to 621 lbs/ADMT (Phase IV goal)	1/1/1998	409 ADMT (1/1998 report).
Reduce Solid Waste Generation From Baseline to 310 lbs/ADMT (Phase V goal)	1/1/2006	On schedule. Feasibility studies in progress for composting and land application.
Hazardous Waste		
Nonenforceable Implementation Mechanisms (Phase IV)		
Reduce hazardous waste generation to conditionally exempt small quantity generator (SQG) status	1/1/1998	Achieved conditionally exempt SQG status (1/1998 report).
Air		

Commitment	Date	Achieved, Being Achieved, or Exceeded
Enforceable Implementation Mechanisms		
Modify Air Quality Permit to Include Dual Emissions Caps That Will Reduce Allowable Emissions by 60%	1/1/1997	Achieved 12/1997.
Modify Air Quality Permit to Include Streamlined Construction and Operation Permit Renewal Process	1/1/1997	Achieved 12/1997.
Modify Air Quality Permit to Include Alternate Excess Emission Reporting Protocols	1/1/97	Achieved 12/1997.
Modify Air Quality Permit to Include Alternate Compliance Testing Protocol	1/1/97	Achieved 12/1997.
Modify Air Quality Permit to Include Experimental Trials' Protocol (Without Triggering Permitting)	1/1/97	Achieved 12/1997.
Draft Flint River's Title V Permit to Defer Permit Modifications for Activities Undertaken Pursuant to XL Project Until the Permit Comes up for Renewal	11/1/98	Achieved 12/1997.
Promulgate Site-Specific Rule (or Equivalent) to Provide Regulatory Flexibility to Meet or Surpass MACT Emissions Reductions Required	1/1/1998	Cluster rule signed 11/1997. Held preliminary meeting with EPA 12/1997 to establish a timeline for MACT site applicability review.
HAP Emission Reductions (Phase V)		
Conduct site MACT Applicability Assessment	TBD	Cluster rule signed 11/97. Held preliminary meeting with EPA 12/97 to establish a timeline for MACT site applicability review.
Timberland Resources		
Timberlands Resource Strategies (Phase V)		
Implement Resource Strategies on Timberlands Supplying Flint River Operations: Designate Forest Buffers Minimize Erosion Caused by Roads Improve Streamside Management Develop Water Bars to Stabilize Soils Safeguard Unique Habitats Implement Landscape Planning Establish Wildlife Corridors Protect Threatened and Endangered Species	TBD	Completed documentation of resource strategies into operating management practices. Rollout of EMS guidelines, employee training, and field deployment completed in fall 1997. Deployment ongoing.
Energy		

Commitment	Date	Achieved, Being Achieved, or Exceeded
Nonenforceable Implementation Mechanisms (Phase V)		
Establish Energy Reduction Goals	1/1/2006	On schedule.

Exhibit 2: Weyerhaeuser Environmental Performance as of January 1998

Flint River Baseline Performance and MIM Phase IV Goals to Be Included in Enforceable Permits (Table Two in FPA)

Environmental Parameter	Target Value and Date Under FPA	Pre-FPA Allowable	Baseline[1]	1995 Actual	1996 Actual	1997 Actual
Raw water usage in MGD	11.50 (1/1998)[2]	14.34	11.18	11.43	11.91	11.74 (1/1998)
Effluent discharged to Flint River in ADMT):						
BOD (lbs/ADMT						
TSS (lbs/ADMT)	3.80 (1/1998)	5.30/4.83[3]	4.32	4.15	3.52	3.01 (1/1998)
AOX (kg/ADMT)	4.09 (1/1998)	5.80/8.58[4]	4.65	5.14	3.58	3.13 (1/1998)
	0.15 (1/1998)[5]	N/A	0.11	0.10	0.10	0.10 (1/1998)

1 Baseline conditions are derived from average monthly values for calendar years 1993, 1994, and 1995.
2 The Surface Water Withdrawal Permit (09401191-01) monthly withdrawal limit will be reduced by 1.0 MGD: new limit is 11.5 MGD.
3 The BOD limit proposed in EPA's draft Cluster Rule, 4.83 lbs/ADMT is provided for purposes of comparison.
4 The TSS limit proposed in the draft Cluster Rule, 8.58 lbs/ADMT is provided for purposes of comparison.
5 The AOX limit proposed as an entry requirement for EPA's Tier 1 Incentives Program, 0.30 kg/kkg is provided purposes of comparison.

Flint River Baseline Performance and MIM Goals That Will Not Be Included in Enforceable Permits (Table Three in FPA)

Environmental Parameter	FPA Agreement MIM Phase IV	FPA Agreement MIM Phase V	Baseline[1]	1995 Actual	1996 Actual	1997 Actual
Solid waste generation (lbs/ADMT)	621 (1/1998)	310 (1/2006)	690	653	505	409 (1/1998)
Hazardous waste generation	Conditionally exempt SQG (1/1998)	Conditionally exempt SQG	SQG	SQG	SQG	Conditionally exempt SQG
Bleach Plant Flow (cubic meters/ADMT)	NA	10 (1/2006)	20	20	20	20
Environmental Management System	ISO 14001	ISO 14001	Flint River EMS	Flint River EMS	Flint River EMS	Flint River EMS
Energy Conservation		TBD after feasibility study				

Exhibit 3: Weyerhaeuser Costs and Benefits

The purpose of this exhibit is to present information on the costs and benefits of the Weyerhaeuser XL project. The table is divided into three parts: company, federal, and state cost.

Weyerhaeuser Costs and Benefits

The following information was provided during the Focus Group teleconference and in Weyerhaeuser's annual report:

- Weyerhaeuser spent 2.5 full-time equivalents (FTE) for 1 year and $100,000 for legal and other outside costs in negotiating the FPA.
- Weyerhaeuser estimates a cost savings of $176,000 during the first year of operation under the XL project as a result of the successful revision and reissue of the facility's air quality and NPDES waste-water discharge permits that incorporate the terms in the FPA.
- Weyerhaeuser noted they will receive addition intangible benefits such as improved perception of the company as a good neighbor, better environmental performance, and lowered risk of environmental violations.

Federal Government Costs and Benefits

The following information was provided by EPA's project manager in Region 4 (Michelle Glenn) following the focus group teleconference and represents time spent by EPA regional and Headquarters staff from the start of negotiations in January 1995, through the signing of the FPA in January 1996. These estimates have not been verified by EPA program offices, and no other EPA regional or Headquarters office provided estimates of their costs.

EPA Region 4 spent an estimated 413 days (1.6 FTEs) in development of the Weyerhaeuser FPA:

- Air division averaged 7 days a month for the year (84 days).
- Water division averaged 1 day a month for the year (12 days).
- Legal staff averaged 1-1/2 days a month for the year (18 days).
- Environmental assistance staff averaged 1 day a month for the year (12 days).
- DPA averaged 4 days a month starting in July 1996 (24 days).
- Miscellaneous additional participants spent approximately 1 month (22 days).
- Weyerhaeuser project manager spent approximately 24 pay periods (241 days).

EPA Headquarters spent an estimated 177 days (0.7 FTEs) in development of the Weyerhaeuser FPA:

- Office of Air Quality Planning and Standards: 2 months total (44 days).
- Office of General Counsel: 2 months total (44 days).
- Office of Water: 2½ weeks total (12 days).
- Office of Air and Radiation: 2 weeks total (10 days).
- Office of Solid Waste: 1 week total (5 days).
- Office of Policy, Planning and Evaluation: 3 months total (62 days).

Estimates on savings for EPA under the Weyerhaeuser XL project are not available.

State Government Costs and Benefits

Costs and benefits for the Georgia Environmental Protection Division (EPD) are not available. The following information on costs and benefits was provided by the Georgia Pollution Prevention Assistance Division (P^2AD).

(P^2AD) has the goal of reducing environmental degradation associated with manufacturing, business, and institutional operations within Georgia. P^2AD uses existing expertise within industry, business, and universities to develop useful and informative programs and technical information. Where possible, the most sound and cost-effective manufacturing technologies are described in case studies and technical bulletins in addition to being presentation topics during seminars.

The Weyerhaeuser XL project provides a source of sound and cost-effective techniques that are provided to other industries by P^2AD and other organizations. The project will have the potential benefit of improving the environmental performance of companies that use the information in their operations.

Project Costs

The cost to P^2AD in participating in the Project XL process was limited. A working relationship existed between Weyerhaeuser and P^2AD prior to the formal beginning of this project. Weyerhaeuser had previously allowed P^2AD staff to tour the Flint River facility, provided extremely detailed information about their processes and general pulp and paper processes, and participated in a research project conducted by P^2AD to identify pollution prevention opportunities and impediments within the Georgia pulp and paper industry. Because of this prior relationship, P^2AD was able to incur minimal costs during Project XL negotiations.

Estimation of Person-Hours Incurred During Project XL Negotiations

Management Time: 60 Hours
Engineering Time: 100 Hours

Benefits of Participation in Project XL

The benefits cannot be easily estimated on a dollar basis. Instead, a list of other direct and indirect benefits are listed below. It is anticipated that future Project XL milestones, such as completion of pollution prevention audits and feasibility studies on Weyerhaeuser's solid waste, waste water, energy, and air emissions, will provide a large amount of information that will be useful to P^2AD in meeting environmental goals.

- Weyerhaeuser participated in a pulp and paper seminar in September 1997. Weyerhaeuser presented information on solid waste minimization at the Flint River operation to an audience of other pulp mills both within and outside Georgia, consultants to the pulp industry, utility providers, and university personnel. The seminar was organized by the Georgia Environmental Partnership (i.e., P^2AD, Georgia Tech, and the University of Georgia) and supported by several pulp and paper business and research and government organizations. This seminar likely will be repeated with new information on a periodic basis. Georgia pulp and paper mills have requested

more Georgia-based seminars in the future. This will provide a mechanism for distributing Project XL data as it becomes available.

- Weyerhaeuser provided a written article on solid waste minimization published by P^2AD.

- Weyerhaeuser provided detailed technical information on a variety of topics useful in increasing the level of expertise within P^2AD on the pulp and paper industry.

- Other pulp and paper mills are aware of this XL project. As a result, more interaction between Georgia pulp and paper mills and P^2AD is taking place.

- Weyerhaeuser helped open lines of communication with other pulp and paper mills and other organizations by describing the services of P^2AD when presenting information on Project XL. In addition, information published by EPA on Project XL contains information on P^2AD. As a result, writers for technical publications, researchers in other parts of the United States, and others have contacted P^2AD for technical information.

- The P^2AD Internet Web site, which contains information on pulp and paper manufacturing and forest products, has been consulted more than P^2AD Web sites with information on other technologies. Project XL participation probably contributed to the higher level of interest.

5.0 Intel Preliminary Status Report (As of January 1998)

5.1 The Intel FPA

Intel, the world's largest semiconductor manufacturer, has operated the 720-acre Ocotillo site in Chandler, Arizona, a suburb of Phoenix in Maricopa County, for over 16 years. The largest facility on the site, FAB 12, is the company's newest Pentium chip fabrication facility and one of the largest such facilities in the world. Intel completed this plant in summer 1996. Intel's Project XL agreement applies to FAB 12 and would apply to a second fabrication plant at the site should the company decide to build it.

Intel's XL FPA has three major components:

- An air pollution permit allowing the company to operate FAB 12 and the potential second fabrication facility without seeking the permit modifications normally required whenever the company changes its manufacturing process.
- An industrial user permit governing some water treatment issues.
- A package of nonregulatory commitments, such as to conserve ground water, reduce waste, recycle materials, and maintain minimum building setbacks from the property line.

5.2 Intel Focus Group

Participants in the Intel focus group reviewed drafts of the two exhibits shown below: asummary FPA project commitments and a summary of progress in achieving superior environmental performance. During the focus group conference calls participants also described lessons learned that focused on the negotiation and implementation of the projects FPAs. Questions about lessons learned included:

- In your opinion, what has been the most important lesson learned from this project?
- Did you encounter anything unexpectedly helpful during the process? If so, what was the major one?
- Did you encounter any unexpected barriers during the project? If so, what was the major one?
- Are there any unresolved issues or problems related to the project that have yet to be addressed? If so, what are they?
- Do you have any suggestions for improving the process of implementing similar projects in the future? If so, what are they?
- Are there lessons learned in your project that have not yet been mentioned? If so, what are they?

Focus group participants included:

Name	Organization
Tim Mohin	Intel
Jim Larsen	Intel
Karen Heidel	Arizona Department of Environmental Quality (DEQ)
Jo Crumbaker	Maricopa County Bureau of Air Pollution Control
Colleen McKaughan	EPA Region 9
Katherine Dawes	EPA OREP
Christopher Knopes	EPA OREP

Gerardo Pascual, formerly of EPA, participated in a one-on-one interview with EPA staff.

5.3 Intel Focus Group–Lessons Learned

Creative Regulatory Approaches Can Help Industry to Stay Competitive and Efficient:

- Conventional regulatory practices slow down a dynamic (quick-to-market) industry.
- The capability to rapidly implement product changes is a basic requirement to keeping a company competitive and profitable. This is especially true for Intel, because it faces strong domestic and foreign competition in a rapidly changing market.
- Because Intel has a need for flexibility in responding to market changes, Intel felt the substantial time and effort they put into the project was worthwhile.
- The accomplishments of this project might have been achieved within existing regulatory programs; however, the XL program provided the impetus to pull all the pieces together.

The XL Process Provided New Insights for General Environmental Programs:

- Because the XL process requires intensive communications between companies and federal, state, and local regulatory agencies, the regulatory agencies developed a better understanding of industry operations. This understanding is useful in fashioning better regulatory programs, both conventional and innovative, in the future.
- Although the XL process is complex, it might be applicable to other sites in the same industry. It might, however, be difficult to apply to a large number of facilities, because many firms are not prepared to work through all of the complexities of a site-specific agreement.
- In the process of developing the agreement, Intel and the regulatory agencies developed a better understanding of stakeholder concerns. It would have been more helpful to have information about public concerns earlier in the process.

Start the Process With Clear Goals:

- There needs to be an agreement up front on the goal of the project. Stakeholders commented it was difficult to contribute to open ended discussions at the beginning of the process. If they had a set of options to discuss, the process would have been more productive.
- Participants should determine stakeholder goals early on and incorporate them into the planning process. Some important stakeholder concerns did not emerge until later in the negotiation process. Had they been understood earlier, the project could have been completed sooner.
- Education on environmental terminology and issues is needed to assist stakeholders in developing realistic goals.
- All stakeholders and regulators should be educated on the technical and business realities of the industry.

Work With Local Stakeholders:

- Local stakeholders gave input on what was important to them. Intel made an effort to keep local stakeholders informed, which including establishing a Web site devoted to the project.

- Some stakeholders had difficulty getting up to speed on the environmental terminology and issues. An education and training program for stakeholders would be helpful so they can understand the details of the project.
- A dialog between EPA, residents, and other stakeholders near the facility was important.
- Since the signing of the FPA, Intel has found it more expeditious to deal with the stakeholders through a community advisory panel that is empowered to represent the community.
- The national NGOs should be involved early so they thoroughly understand local concerns. Some NGOs did not take part in the detailed negotiations; however, they were critical of the final agreement.

Develop Ways to Measure the Outcome of the Program:

- It is difficult to estimate the benefits and costs of this program, primarily because the signatories do not know what the baseline regulatory requirements would have been.
- Company benefits, which primarily are improved efficiency and competitiveness and accelerated innovation, have not been quantified.

Develop Ways to Achieve Greater Consolidation of Permits:

- Although the XL process achieved significant consolidation of permitting, Intel's original ambition was to complete a greater degree of consolidation.
- It is difficult to coordinate the regulatory responsibilities of various local, state, and federal agencies to achieve complete consolidation of all permitting.

Exhibit 1: Intel Project Commitments as of January 1998

Summary of Findings

The Table below contains a list of the FPA provisions and indicates the status of implementation. The status data, which is cumulative data for the first nine months of operations under the agreement, are from Intel's third quarter 1997 XL report. Intel's annual report came out in April 1998.

According to these data, Intel has met or is meeting all of the commitments, except two of the nonregulatory provisions of the agreements: the use of treated city waste water for cooling tower makeup and landscaping, and the recycling of solid waste. Intel had technical difficulties in meeting these two goals. The company committed to recycle 100 percent of water for cooling tower makeup and landscaping from the city's waste-water reclamation facilities. Although the total for the first 9 months was 67 percent, the company reports it reached 95 percent in the fourth quarter. Based on a review of the system design, Intel determined that even with significant increases in operational costs (about $300,000 annually for phosphate treatment), it is not possible to achieve more than 95 percent annual reuse consistently. Intel also reported stakeholders believe achieving 95 percent waste-water reuse would be an outstanding achievement. The second provision with which Intel had difficulty is the commitment to recycle 40 percent of solid waste in 1997, which is supposed to increase to 60 percent in 2001. For the first 9 months of 1997 Intel recycled 33 percent of its solid waste, but has stated it expects to reach 40 percent in the fourth quarter.

During the first 9 months of operations under the agreement, Intel's releases of air and water pollutants are a fraction of the values included in the agreement. Intel had technical difficulties in meeting only two of these goals, as described above. The third quarter progress report indicates Intel is making substantial progress toward achieving these two goals.

Table of Project Commitments

This table details Intel's progress in meeting the commitments specified in the FPA for this facility. The table lists the commitments included in the FPA and provides dates for meeting the commitments. It also indicates whether the commitments have been achieved, are being achieved, or have been more than achieved. This draft status information is from the Intel's third quarter 1997 progress report.

Intel Project Commitments

FPA Commitment	Date	Status As of 9/30/1997
Plant Site Emission Limits (PSEL):	1997	(9-month total)
Volatile Organic Compounds (VOCs): 40 tons per year (TPY)		12.6 TPY
Nitrogen Oxide ($NO_{x)}$: 49 TPY		6.1 TPY
Carbon Monoxide (CO): 49 TPY		3.7 TPY
Particulate Matter [nominally 10m and less] (PM_{10}): 5 TPY		0.4 TPY
Sulphur Dioxide ($SO_{2)}$: 5 TPY		0.3 TPY
Aggregate combined organic HAP: 25 TPY		0.4 TPY
Aggregate combined inorganic HAP: 10 TPY		0.5 TPY
Phosphine: 5 TPY		ND*
Sulfuric acid: 9 TPY		ND
New chemical: 10 TPY		NA*
Maximum onsite concentration below 1-hour Arizona Ambient Air Quality Guidelines (AAAQG) at point of maximum concentration within property line.	1997	NA
Air Quality Evaluation and Management		NA
Screen modeling analysis in conjunction with a new chemical for which an AAAQG has been established.		
Consult with MCESD and the Arizona Department of Health Services in conjunction with new chemicals that are introduced and have not been evaluated.		
Evaluate maximum onsite modeled concentrations for chemicals modeled under the air permit.	1/1/1997	NA
Develop production and performance standards.		
Reporting of Air Emissions:	2-months after quarter	Achieved through third quarter
Quarterly report of actual air emissions of all pollutants subject to PSEL or limits otherwise identified.		
Annual summary of actual aggregate emissions of all pollutants subject to PSEL or limits otherwise identified.	April	NA
Annual summary of known actual emissions of individual HAPs emitted above 1,000 pounds per year.	April	NA
Annual list of known individual HAPs emitted in quantities $\leq$ 1,000 pounds per year.	April	NA
Annual report of VOCs and HAPs per unit of production	April	NA

FPA Commitment	Date	Status As of 9/30/1997
Water and Waste-Water Use:		
Pretreatment and discharge provisions of industrial waste water from a separate industrial user permit are attached to the FPA.	NA	Achieving
100% of water for cooling tower makeup and landscaping will be treated water from city (Chandler-Ocotillo) waste-water reclamation facilities.	1/1/1997	67%[1]
Manufacturing effluent will be treated for reuse or reinjection into the ground-water supply, according to the following timetable:		
45% of total fresh-water volume	1997	74%
55% of total fresh-water volume	1999	
65% of total fresh-water volume	2001	
Management of Waste:		9-month cumulative
Recycle solid waste generated at the site according to the following timetable:		
40% of solid waste generated	1997	
55% of solid waste generated	1999	33% [2]
60% of solid waste generated	2001	(Approaching achievement)
Recycle hazardous waste generated at the site according to the following timetable:		
60% of hazardous waste generated	1997	
50% of hazardous waste generated	1999	
40% of hazardous waste generated	2001	95% (Achieved)
(Intel plans to transfer some hazardous waste into the nonhazardous waste category.)		
Recycle nonhazardous chemical waste generated at the site according to the following timetable:		
25% of nonhazardous chemical waste	1997	
50% of nonhazardous chemical waste	1999	
70% of nonhazardous chemical waste	2001	57% (Achieved)
Management of Storm-Water: Use of secondary containment areas, best management practices and retention basins .	NA	Achieved
Intel Corporate Design for the Environment (DfE) Program: Implement the corporate DfE program, which seeks to develop environmentally compatible processes and products, at the facility.	NA	Being Achieved
Contingency Planning: Implement a single emergency plan for the facility that integrates all applicable environmental requirements as they relate to emergency planning	1/1/1997	Achieved
Reporting: Submit consolidated reports quarterly to signatory agencies and make available to the public.	2 months after quarter	3 quarters achieved
Annual summary report.	April 1	NA

FPA Commitment	Date	Status As of 9/30/1997
Implementation of Trip Reduction Program for Intel Employees	Ongoing	Rideshare program includes 231 registered carpool participants (9/1997)
Property Setback for the Site: Maintain a minimum setback of 1,000 feet from the closest manufacturing-related building structure to residential property, and use a contoured landscaping to add to the aesthetic appeal of the setback.	NA	Achieved
Education Programs on the Environment: Participate in environmental mentoring and educational activities targeted at various groups in the community.	Ongoing	Hosted Arizona State University (ASU) students on Project XL and environmental management; supported pollution prevention week, and recycling projects
Donation of Computers and Manufacturing Equipment: Donate new and used computers to schools and libraries, and used manufacturing equipment to universities.	Ongoing	Donated 125 computers during third quarter 1997

Notes:

Status information is from the 1997 third quarter report. Data for the entire year would be needed to directly compare performance to commitments.

* NA = not applicable and ND = no data available.

1. Intel reports that fourth quarter results were 95 percent; and that based on a review of the system design, it has determined that even with significant increases in operational costs (approximately $300,000 annually for phosphate treatment), it is not possible to achieve more than 95percent an nual reuse consistently. Intel also reports that stakeholders believe achieving 95percent wastewater reuse would be an outstanding achievement.
2. Although the average for the year did not reach the 40 percent goal, Intel expects the fourth quarter to reach this goal.

Exhibit 2: Intel Environmental Performance as of January 1998

This table compares environmental performance (e.g., releases of pollutants to the environment and volume of resources used and recycled) for the Intel site under a Project XL permit with performance under a conventional permitting scenario. The table lists the environmental performance measures included in the FPA and then compares them to values that would likely be specified in a conventional permitting scenario and to those that have actually been observed through September 1997.

Environmental Performance Measure	Baseline (Under Conventional Permit)	FPA Target Value	Actual Value (9 Months)[1]	Comments
Plant Site Emission Limits (PSEL):				
VOCs (TPY)	<50 TPY	40 TPY	12.6 TPY	
NO_x (TPY)	<50 TPY	49 TPY	6.1 TPY	
CO (TPY)	<100 TPY	49 TPY	3.7 TPY	
PM_{10} (TPY)	<70 TPY	5 TPY	0.4 TPY	
SO_2 (TPY)	<250 TPY	5 TPY	0.3 TPY	
Aggregated combined single HAP (TPY)	<25 TPY	10 TPY	0.9 TPY	
Phosphine (TPY)		5 TPY		
Sulfuric acid (TPY)		9 TPY		
Air Quality Evaluation and Management:				
Screen modeling analysis in conjunction with a new chemical for which an AAAQG has been established.	No previous regulatory requirement	Voluntary requirements as described in column 1	No new chemicals that require screen modeling	
Consult with MCESD and the Arizona Department of Health Services in conjunction with new chemicals that are introduced and have not been evaluated.	No previous regulatory requirement			
Evaluate maximum onsite modeled concentrations for chemicals modeled under the air permit.	No previous regulatory requirement			
Maximum on-site concentration below 1-hour AAAQG at point of concentration within property line.	No previous regulatory requirement			
Develop production and performance standards by 1/1/1997.	No previous regulatory requirement	Achieved		

Environmental Performance Measure	Baseline (Under Conventional Permit)	FPA Target Value	Actual Value (9 Months)[1]	Comments
Reporting of Air Emissions:				
Quarterly report of actual air emissions of all pollutants subject to PSEL or limits otherwise identified.	No previous regulatory requirement	2 months after quarter (voluntary)	3 quarters to date	
Annual summary of actual aggregate emissions of all pollutants subject to PSEL or limits otherwise identified.		April	NA	
Annual summary of known actual emissions of individual HAPs emitted above 1,000 lbs per year.		April	NA	
Annual list of known individual HAPs emitted in quantities $\leq$ 1,000 lbs per year.		April	NA	
Annual report of VOCs and HAPs per unit of production.		April	NA	
Water Use:				
Requirements for pretreatment and discharge of industrial waste water are in an attachment to the FPA.	Conventional water permit	Conventional water permit	Achieved	
100% of water for cooling tower makeup and landscaping will be treated water from city (Chandler-Ocotillo) waste-water reclamation facilities (% treated water).	No previous regulatory requirement	100% (voluntary)	67%[2]	
Manufacturing effluent will be treated for reuse or reinjection into the groundwater supply, according to the following timetable: 45% of total fresh-water volume in 1997 55% of total fresh-water volume in 1999 65% of total fresh-water volume in 2001	No previous regulatory requirement	45% (voluntary)	74%	

Environmental Performance Measure	Baseline (Under Conventional Permit)	FPA Target Value	Actual Value (9 Months)[1]	Comments
Management of Waste:		(voluntary)		
Recycle solid waste generated at the site according to the following timetable: 40% of solid waste generated in 1997 55% of solid waste generated in 1999 60% of solid waste generated in 2001	No previous regulatory requirement	40%	33% [3]	
Recycle hazardous waste generated at the site according to the following timetable: 60% of hazardous waste generated in 1997 50% of hazardous waste generated in 1999 40% of hazardous waste generated in 2001 (Intel plans to transfer some hazardous waste into the nonhazardous waste category.)	No previous regulatory requirement	60%	95%	
Recycle nonhazardous chemical waste generated at the site according to the following timetable: 25% of nonhazardous chemical waste in 1977 50% of nonhazardous chemical waste in 1999 70% nonhazardous. chemical waste in 2001	No previous regulatory requirement	25%	57%	
Management of Storm Water: Use of secondary containment areas, best management practices and retention basins.	No previous regulatory Requirement	As in described in column 1 (voluntary)	Implemented	
Intel Corporate DfE Program: Implement the corporate DfE program, which seeks to develop environmentally compatible processes and products, at the facility.	No previous regulatory. requirement	As in described in column 1 (voluntary)	Implemented	
Contingency Planning: Implement a single emergency plan for the facility that integrates all applicable environmental requirements as they relate to emergency planning by 1/1/1997.	No previous regulatory requirement	As in described in column 1 (voluntary)	Completed	

Environmental Performance Measure	Baseline (Under Conventional Permit)	FPA Target Value	Actual Value (9 Months)[1]	Comments
Reporting: Submit consolidated reports quarterly to signatory agencies and make available to the public 2 months after quarter. Annual summary report by April 1.		As described in Column 1 (voluntary) April	Three quarters completed NA	
Trip Reduction Program for Intel Employees	County trip reduction program	No specific value	Rideshare program includes 231 registered participants 9/1997	
Property Setback for the Site: Maintain a minimum setback of 1,000 feet from the closest manufacturing-related building structure to residential property, and use a contoured landscaping to add to the aesthetic appeal of the setback.	No previous regulatory requirement	1,000 feet (voluntary)	1,000 feet	
Education Programs on the Environment: Participate in environmental mentoring and educational activities targeted at various groups in the community.	No previous regulatory requirement	No specific target specified (voluntary)	Hosted ASU students on Project XL and environmental management; supported pollution prevention week, and recycling projects	
Donation of Computers and Manufacturing Equipment: Donate new and used computers to schools and libraries and used manufacturing equipment to universities	No previous regulatory requirement	No specific target (voluntary)	Donated 125 computers during third quarter 1997	

Notes:

- NA = not applicable.

1 Status information is from the third quarter 1997 quarterly report.

2 Intel reports that fourth quarter results were 95 percent; and that based on a review of the system design, it has determined that even with significant increases in operational costs (approximately $300,000 annually for phosphate treatment), it is not possible to achieve more than 95 percent annual reuse consistently. Intel also reports stakeholders believe achieving 95 percent waste-water reuse would be an outstanding achievement.

3 Although the average for the year did not reach the 40 percent goal, Intel expects the fourth quarter to reach this goal.

Exhibit 3: Intel Costs and Benefits

The costs for establishing this agreement were borne by Intel; federal, state, and local governments; local public interest groups; and national environmental interest groups. These costs took the form of transaction costs to support and conduct the negotiations. Although comprehensive data on these costs are not available, some information was obtained from reports by Resources for the Future, and the National Academy of Public Administration, and through statements of representatives attending the focus groups.

Background

Intel's interest in participating in the XL program stems from the nature of its business. The profitability, competitiveness, and growth of a microprocessor company are directly related to its ability to rapidly commercialize new technologies ahead of its domestic and foreign competitors. Intel has grown in the industry by affecting technical breakthroughs in microprocessor design and manufacturing technologies, which has led to an approximate doubling of the number of transistors on a single silicon wafer every 18 months. As the complexity of chips has increased, so has the complexity of the manufacturing facility. The cost of building a new microprocessor fabrication facility today is high. The need to earn a return on this investment, as well as the dynamic and competitive nature of the industry, makes it crucial for the company to obtain maximum efficiency in its operations.

There is no preset formula for manufacturing a new generation of chips. Each new generation requires continual experimentation and refinement of the process, which involves frequent changes in equipment and process chemicals. A modern chip plant involves over 300 manufacturing steps, millions of gallons of water daily, more than 90 different chemicals, and the maintenance of "clean rooms" for the most sensitive manufacturing processes. A typical Intel plant can involve 35 to 40 process chemical changes annually, and a complete new generation of chips every 18 to 30 months.

Given these operating characteristics, federal air permit requirements increase the potential for delays in producing existing products and developing new product lines. The potential to minimize these delays and provide more flexibility in its operations were the major incentives for Intel's decision to seek an XL permit.

Summary Points:

- Intel invested at least several hundred days of staff time plus other expenses, although they were unable to provide a total dollar cost.
- Data are not available to determine if Intel's abatement costs associated with the XL permit are more or less than they would have been under a conventional permitting scenario.
- If Intel builds another major semiconductor fabrication facility on this site, its costs to design and equip the new plant likely will be much higher than for FAB12.
- Intel representatives believe the site avoided millions of dollars worth of product delays by eliminating 30 to 50 permit reviews a year.
- State and federal costs are not available, although there is evidence that the federal government probably committed at least one staff-year.

6.0 Berry Preliminary Status Report (As of January 1998)

6.1 Berry FPA

Berry is a mid-sized juice-processing company. The company's facility in LaBelle, Florida, the site of the Project XL pilot, is located on Berry's largest grove, consisting of about 14,000 acres of orange and grapefruit trees. The FPA for the Project XL pilot at the Berry facility was signed on July 8, 1996. The project focuses on development of a facilitywide COP. The COP not only consolidates more than 20 federal, state, and local environmental permits and maintains all environmental standards contained in these permits, it also integrates all plant operating procedures into a single manual for use by employees day-to-day.

As part of the project agreement, Berry made a voluntary commitment to several additional environmental performance goals. These commitments included reducing air emissions of VOCs, SO_2, and No_x; reducing the number and types of solvents and lubricants used onsite and replacing them with environmentally friendly material; reducing water use through reuse and more efficient management practices and technologies; and reducing solid waste generation through increased recycling.

6.2 Berry Focus Group

Participants in the Berry focus group reviewed drafts of the three exhibits shown below: a summary of FPA project commitments, an outline of costs and benefits, and a summary of progress in achieving superior environmental performance. During the focus group, conference calls participants also described lessons learned that focused on the negotiation and implementation of the project's FPA. Questions about lessons learned included:

- How and why did your organization decide to get involved in an XL project?
- How were you involved in developing the Final Project Agreement and preparing the COP?
- What was the best thing about the project?
    A. Did you encounter anything unexpectedly helpful during development of the FPA? If so, what?
    B. Did you encounter anything unexpectedly helpful during preparation of the COP? If so, what?
- What was the most difficult thing about the project?
    A. Did you encounter any unexpected problems in developing the FPA or preparing the COP? If so, what?
    B. What steps did you take to address problems you encountered?
- Even though the COP has not yet been completed, do you believe the project has resulted in improvements in environmental performance? If so, can you explain?
- Did you have an idea at the beginning about what it would cost to accomplish the various parts of the project?
    A. Looking back over the project to date, have actual costs been:
        –Higher?
        –Lower?
        –About what you expected?
        –Can you give any examples to illustrate your answer?

- What has been the most significant lesson learned from this project in your opinion?
- Would you do it again, knowing what you know now? Why or why not?

- Would you recommend to someone else that they get involved in a future XL project? Why or why not?
- Do you have any suggestions for improving the process of implementing similar projects in the future? If so, what are they?
- Are there any other comments you would like to make?

Focus group participants included:

Name	Organization
Ernest Caldwell	Jack M. Berry, Inc.
Peggy Highsmith	Florida Department of Environmental Protection (DEP)
Pat Comer	Florida DEP
Marc Harris	Florida DEP
Michelle Glenn	EPA Region 4
Zylpha Pryor	EPA Region 4
Katherine Dawes	EPA Headquarters
Chad Carbone	EPA Headquarters
Chris Knopes	EPA Headquarters

Terrie Bates ot the South Florida Water Management District (SFWMD) and Jacki McGorty of Florida DEP, participated in one-on-one interviews with EPA staff.

6.3 Berry Focus Group–Lessons Learned

The Interconnectedness of Processes at the Plant Reinforces the Value of the COP Approach:

- A process change that affects one media will affect other media in some way. Berry found, for example, a way to change some cleaning supplies, and it resulted in reducing and eliminating waste streams. In each step of the process, the project team found cross-media, cross-program opportunities.
- The COP goes beyond simply consolidating permits and is more than an operating permit. It includes many other regulatory requirements and addresses every aspect of environmental law in the state.
- This project makes permit compliance rules part of a living document and part of the operating environment in the facility. Using the COP reduces fragmentation and increases the chances that compliance will be achieved. Creating the COP, however, was a challenge. To make it comprehensive, the project team had to look at everything. It was like remodeling an old house; each time the team opened one door they found new issues to address.
- It was a challenge to find a way of reconciling various requirements and authorities in a multiagency document, so that every organization got what it needed.
- The project offered an opportunity to explore a holistic approach, something different from the “blinders-on” approach regulators usually use.

The COP Makes Employees Major Players in Achieving Compliance:

- The COP makes compliance part of the daily operating routine at the plant. It gets employees involved and makes them major players in compliance.
- Employee training is a cost of compliance under a conventional permitting system. Often Berry employees have to attend seminars focusing on a specific regulatory program in which only 10 to 20 percent of the seminar content relates to their particular job. The standard operating procedures (SOPs) and work instructions being created in the COP will help Berry reduce the cost of training, because they will focus on how employees should perform their specific job responsibilities day-to-day in a way that will result in compliance.

- Writing the work instructions to be included in the COP was very difficult. It required determining the right balance of information to ensure compliance without sacrificing understandability.

The Trust-Building Process Can Be Successful:

- The state had to explore every facet of the facility in creating the COP, while maintaining its enforcement rights. This required building trust, which was not easy, but it worked.
- Berry was impressed that the project participants could work well together and that everyone remained committed to making the project work. The industry routinely looks at government as a threat. Berry employees often felt intimidated by government personnel, fearing they might give the wrong answer or cause a violation and lose their job. The project succeeded in eliminating this intimidation; employees are now comfortable talking with government personnel.
- No other company in the industry thought the Berry project could be done. As a result, Berry had a lot at stake in going forward with the project. The project, however, succeeded in proving teamwork is possible and makes sense.
- It is important to be open and flexible with people in order to build trust. The dynamics of people working together is very important in this kind of project.

Start With Clear Direction:

- The project needs to be more focused from the beginning. Each party needs to know from the outset what flexibility it wants, or will give, and what environmental performance it is offering or expecting.
- Berry feels EPA Headquarters should have provided clearer early direction on the FPA. The company does not feel EPA provided a good road map.
- The Berry representative pointed out, while he was in a position to make decisions and commitments for the company independently, the EPA personnel with whom he was meeting to discuss the FPA were not at the same level and were not able to make decisions and commitments for the Agency.
- Before the project begins, there must be clearly stated expectations, clearly defined roles and responsibilities, and a methodology for resolving issues and problems. Project participants encountered unanticipated issues and problems and had no clear method for addressing them. The FPA, for example, did not lay out the format for the COP; the team had to create it as they went.
- Language in the FPA was not specific enough in several areas. Since the FPA was signed, there have been turnovers in personnel at federal and state levels. Without specific guidance in the FPA, each new person had to develop his or her own interpretation of the FPA language in terms of his or her role and how to deal with specific issues encountered.

- It is very important to agree at the beginning of the project on a timeframe for accomplishing results and to invest dedicated resources to the effort. The participants in the Berry project could not do that, and the state feels the project dragged on as a result. If the team had been able to accomplish the process of preparing the COP in 6 months or a year, the state feels the level of effort would have been different and results would have been evident sooner.
- It is very important to clearly define baselines for performance measurement. SFWMD feels it would be better to use facility-specific rather than permit baselines in the future.
- The team encountered areas where there was a lack of coordination among EPA programs.
- Berry feels EPA needs to identify incentives for companies to participate in projects like XL. There must be more reason to participate than "it's a Presidential initiative." The company suggests changing the current system to set environmental goals based on units of production and measuring environmental efficiency per unit of production would provide more incentive for industry. Berry also encouraged EPA to find ways to reward good players as well as punish the bad ones.

The Project Provided New Insights:

- Having the project team working day-to-day at the plant gave the state a more indepth perspective on plant operations. Florida DEP staff saw more than they would normally in the course of inspections, even though their inspections are very thorough. Being at the plant helped the Florida DEP and the company recognize and deal with some compliance issues encountered. Florida DEP staff were able to make suggestions to help the company address compliance.
- Onsite tours of the Berry facility early in the process provided EPA regional personnel, who are not normally involved at the facility level, an appreciation for plant operations and the interconnectedness of plant processes.
- The project was an educational experience. One state participant indicated she learned a lot about permitting, in which she routinely has only limited involvement, from the day-to-day interaction with the district staff and other members of the project team. She said what she learned will be useful in other areas of her job.

The State Can Conduct Additional Project Without EPA's XL Program:

- Some Florida state staff feel strongly that they learned the state can do projects like Berry under state authorities–without federal participation–since most regulation is delegated to states. EPA's participation through Project XL was helpful, however, in bringing visibility to the project, which helped motivate others to participate.

Changes in Agency Programs:

- While Florida DEP representatives indicated they would like to make changes in their regulatory system based on the ideas from this project, some state staff indicated these changes might be too resource-intensive.
- EPA Region 4 indicated that more information with which to make decisions about potential changes should be available later in the year when Berry applies its resources to the project.

Exhibit 1: Berry Project Commitments as of January 1998

Progress in Meeting Commitments

Berry met 60 percent of its project commitments, even though work on the COP was put on hold.

Table of Project Commitments

Commitment	Date	Achieved, Being Achieved, or Exceeded	Comments
Develop COP	8/31/1997	Being Achieved	Substantial progress has been made, but work on the COP was put on hold in late 1997 pending negotiation and startup of a lease agreement with Berry for operation of the plant .
Reuse treated industrial waste water		Achieved 10/1997	
Water conservation		Not achieved	
Replace an existing peel dryer		Achieved 9/1996	
Prepare implementation strategy for reduction of SO_2, NO_X, and VOC emissions	COP effective date + 1 yr.	Not Achieved	
Abandon the spray site as an industrial waste-water disposal area and reuse treated water as irrigation water	COP effective date + 1 yr.	Achieved 10/1997	
Maintain present wetland treatment area	COP effective date + 1 yr.	Achieved	
Maintain wetland treatment ponds at or near present location	COP effective date + 1 yr.	Achieved	
Close or modify surge pond	COP effective date + 1 yr.	Being Achieved	Larger pumps, operating at lower levels, have been installed.
Reduce number and types of solvents and lubricants used on site	COP effective date + 1 yr.	Achieved 1997	
Recycle scrap metal	COP effective date + 1 yr.	Achieved 2/1997	
Recycle paper, metal, glass, plastic to the best extent possible		Achieved 2/1997	
Meet drinking water standards equal to half of Maximum Containment Limits (MCLs)		Not Achieved	Meet current MCLs, except for radionuclides, but not at half of MCLs.

Commitment	Date	Achieved, Being Achieved, or Exceeded	Comments
Institute ISO 14000 Environmental Management Program		Not Achieved	Work on this item has not begun; however, the SOPs and work instructions in the COP have been formatted to be compatible with ISO to expedite implementation.

Exhibit 2: Berry Environmental Performance as of January 1998

Since monitoring and formal reporting for most environmental performance commitments under the FPA for the XL project at the Berry plant are connected to the effective date of the COP, no measurement data is reported in this section. The project team reported, however, Berry succeeded in making environmental performance improvements in these and other areas, even though work on the COP was put on hold in 1997. Following are comments concerning these improvements:

- Florida DEP: The fact Berry has been able to meet a majority of the project commitments, even before the COP was finished, has resulted in environmental benefits.
- Florida DEP: Having the project team working day-to-day at the plant gave them a more in-depth perspective; they saw more than they would normally on inspections, even though their inspections are very thorough. Being there helped them and the company recognize and deal with some compliance issues that were encountered; Florida DEP staff were able to make suggestions to help the company address compliance.
- Florida DEP: As result of a detailed review, Berry was able to reduce and eliminate some hazardous waste streams; the character of waste changed and waste toxicity was changed.
- Florida DEP: Berry implemented self-audit process. The list of items needing attention got progressively shorter.
- Florida DEP: Berry was able to eliminate a spray field (88-acre field in operation since 1974) that had been set aside for waste-water disposal (not irrigation), because they no longer needed it as a backup. This dealt with the odor problem the field had caused.
- Berry: The state was able to help Berry clean up its air permits (old construction permits). Some no longer applied, some were contradictory, and some were duplicative.
- Berry: All three shifts at the plant now are performing their jobs in a standard way. Work instructions developed for the COP have helped standardize testing. Industrial waste-water tests, for example, are consistent with last tests or previous year's tests, instead of showing spikes, even though there is higher production at the plant. Now the quality of data is consistent.
- Berry: The level of compliance with regulations is much improved, and the chances of violations have been reduced significantly. This is very important for transferability of the program. This has happened as a result of the project, because people understand their jobs better and do not fear inspections.
- SFWMD: Qualitatively, working together has improved everyone's understanding and awareness of each other's needs.

Exhibit 3: Berry Costs and Benefits

The purpose of this exhibit is to record data that will allow a comparison of the costs of developing and implementing an XL permit agreement to those of a conventional permit program (reasonable anticipated future permits). The difference between the two costs is the savings (or extra costs) of operating under an XL permitting scenario as compared to a conventional permitting scenario. The table is divided into four parts, with similar questions for company, federal, state, and local costs.

1. Berry Costs:

A. Start-up costs for developing the FPA and preparing the COP up to the point at which work on the permit was put on hold were approximately $55,000, 45 percent lower than comparable for continuing a conventional permit program.
B. Operating costs for maintaining the COP were expected to be at least 50 percent less per year over 5 years than those for maintaining environmental control programs under a conventional permitting scenario for the same period of time.

Comments:

- Berry expects the COP to reduce production costs at the plant by increasing the efficiency of plant operations. These reductions, however, are not expected to be substantial enough to affect prices.
- The company anticipates the COP might change the value of the facility because increased plant efficiency would raise the comfort level of lenders.
- Berry does not expect the XL project to result in changes in the process by which the facility produces its products; however, the introduction under the COP of detailed work instructions, driven by regulatory compliance, is expected to reduce significantly the chances of process deviations that result in noncompliance.
- While these changes are not expected to affect the company's market position, they will assist in maintaining the company's competitiveness on the world market.

2. EPA Costs:

A. Start-up costs for developing the FPA for the XL project and the background preparation for the COP were approximately 420 labor hours and $4,000 in travel. Comparable costs for continuing a conventional permit program would have been 24 labor hours and $600 in travel per year over 5 years.
B. Operating costs for maintaining the COP were expected to be 24 labor hours and $600 in travel per year over 5 years–the same as for maintaining environmental control programs under a conventional permitting scenario for the same period of time.

3. Florida DEP Costs:

A. Start-up costs for developing the FPA for the XL project and for preparing the COP up to the point at which work on the permit was put on hold were approximately $60,000. Comparable

costs for continuing a conventional permit program would have been about $20,000 per year over 5 years.

B. Operating costs for maintaining the COP were expected to be $30,000 per year over 5 years. Comparable costs for maintaining environmental control programs under a conventional permitting scenario for the same period of time were expected to be $10,000 per year.

4. South Florida Water Management District Costs:

A. Start-up costs for developing the FPA for the XL project and for preparing the COP up to the point at which work on the permit was put on hold were approximately $5,800. Information on comparable costs for continuing a conventional permit program was not available.

B. Information on operating costs per year for maintaining the COP and comparable annual costs for maintaining environmental control programs under a conventional permitting scenario were not available.

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