Learning From Experiments

EPA's innovation initiatives aim to improve an already strong system of environmental protection while building commonsense, cost-effective ways to "identify important problems and fix them".[1] The United States has one of the strongest systems of environmental protection in the world, but it is neither perfect nor complete. Everyday, conditions are changing: new technology is entering the market, better information is becoming available, and environmental professionals are gaining more understanding and experience in managing their responsibilities. These and other developments mean the system must change too. By giving sponsors a chance to identify problems and potential solutions, Project XL is learning how to adapt environmental protection to the emerging **challenges of the new economy.**

New Challenges

In a development that could revolutionize computing, in Essex Junction, Vermont, IBM is testing a way to make computer chips with copper rather than aluminum—an approach that promises cheaper computers and faster calculations. The new process, which is approximately 30 to 40 percent more efficient than the previous one, enables IBM to deposit a layer of metal on its wafers much more efficiently, maximizing metal use in manufacturing and minimizing releases into the plant's wastewater system.

Project XL emphasizes more comprehensive, integrated approaches to environmental protection, helping to optimize environmental, community, and business outcomes by stepping back and considering all the issues affecting environmental quality. By looking at facilities, sectors, and communities as a whole, we are finding that a broader view often leads to better results. States are actively experimenting with new tools to improve the performance of industry sectors and promoting pollution prevention. Businesses increasingly view environmental management as a fundamental part of a smart business strategy. They recognize that they can realize a competitive advantage while addressing environmental problems. Project XL provides a forum for communities and businesses to step forward with innovations that have improved results, cut costs, and opened the door to fundamentally new ways of doing business—the **new tools of environmental protection**.

[1]Sparrow, Malcom, *The Regulatory Craft*, Washington, DC: Brookings, 2000

New Tools

Both self certification and self audit approaches for small businesses (Massachusetts Environmental Results Program) offer enhanced business accountability with enhanced compliance. Per unit of production emission limits (Andersen and Intel projects) provide an incentive to increase efficiency while maintaining flexibility; and the predictive emissions monitoring system (International Paper project) offers improved environmental performance with reduced capital expenditures.

EPA has embraced innovation as a way to facilitate environmental gains. But clearly, EPA is not alone in pursuing innovative environmental approaches—it has to happen through partnerships with others. Other government agencies, particularly the states, are active players, and local communities play an increasingly important role in environmental and human health protection. They are developing strategies that address their own priorities and concerns and that help sustain the baseline of environmental protection all our citizens have come to expect. These cleaner, cheaper, smarter ways of protecting the environment have challenged EPA to **diversify the role** it plays in environmental protection—from that of Federal command and control regulator to a co-regulator with states, a convener of public discourse, and partner with business and community in pollution prevention.

New Roles for the Agency

Project XL supports new roles for EPA as a co-regulator— supporting new local government water pretreatment operations in the Steele County project, and helping communities link their economic and environmental goals through the Atlantic Steel project.

The following section highlights some of the promising innovations achieved through Project XL to date. It shows preliminary results and takes on the broader task of Project XL—describing better approaches that are being adopted into our national system of environmental protection.

Providing More Flexible Air Permitting Methods

America's industrial sectors face new problems in today's economy. International competition generates continuously changing market demands, which means that companies who can design and develop new products quickly can be more strategic in the marketplace. Under the Clean Air Act, companies must obtain permit approvals from EPA or delegated state agencies when they install new equipment or change a manufacturing process. Each process or type of equipment may have its own permit requirements. Yet some industries, such as pharmaceutical or semiconductor manufacturers, must change their processes frequently to meet customer demands for new products. The paperwork and time required to obtain permit approvals are costly, both for the companies and the government agencies charged with permit review. At the same time, local communities also have an increased awareness and concerns with industry impacts on human health and the environment and are demanding a greater degree of access to facility information and government decision making about permit actions.

Some companies have developed projects under Project XL to make the permitting process more efficient and predictable for their quick-to-market manufacturing needs. These projects are based on facility-wide air emission caps, which prevent the facility from increasing its emissions, but allow process or equipment changes without regulatory approval. Under this approach, facilities must offset any emission increases with a reduction somewhere else within the facility. EPA generally sets the cap below the facility's regulatory threshold for compliance, thus ensuring that the project achieves better environmental results than would otherwise be achieved under current regulatory requirements. This allows the company *flexibility* (e.g., using pollution prevention instead of treatment when that is a better option) in meeting pollution goals. At the same time, it provides certainty to the public by creating an enforceable regulatory cap on total air emissions and to the regulated facility by telling them what they can emit, what they can change quickly, and what limited number of major changes will re-

quire new public review. These permit caps will provide *accountability* to the public by improving their ability to gain a overall picture of a facility's performance and ensuring that emissions will not exceed permitted levels without giving them a new chance to become involved.

EPA and the Arizona Department of Environmental Quality approved a facility-wide emissions cap for Intel Corporation's semiconductor manufacturing plant in Chandler, Arizona. The new limits allow Intel to make equipment and process changes and to expand production capacity, without regulatory reviews, as long as the total emissions stay below the specified cap. Since the project began, the company has remained well under its emission limits for all applicable pollutants. Intel also has avoided millions of dollars in production delays by eliminating 30 to 50 new source permit reviews a year. The company has found the emission caps so successful that it will invest $2 billion to build a new wafer fabrication facility (Fab 22) at the site. Under the existing cap, Intel can proceed with expansion without first going through regulatory review. In announcing this decision, Intel noted that "the new facility will help us maintain our leadership in the extremely competitive world of semiconductors. Fab 22 will give us more manufacturing capacity in order to help us better address our customers' growing need for high-performance microprocessors."

A significant part of Project XL's influence on system change comes from the combined impact of several projects tackling a problem area. New regulations and policy guidance for air permitting that have been heavily influenced by Project XL innovations are described in the following box.

National Clean Air Act Permitting Approaches Influenced by Project XL Innovations

Implementing Site Specific Caps for Determining Major New Source Review (PAL Rule): This forthcoming rule will establish plant-wide applicability limits (PALs) as a way for plants to establish capped limits on their total emissions, providing communities with certainty that emissions will not increase above permitted levels, in exchange for increased flexibility to add and subtract production units without having to go through new source review (NSR) and the associated permitting. Project XL has served as a test bed for several ideas of an alternative major NSR applicability system that allows PALs instead of traditional NSR netting for determining whether modifications are subject to major NSR. Projects that have included PALs as key innovations include Merck, Intel, Weyerhaeuser, Imation, and Andersen.

Part 70 Revisions (Permit Revision Process Rulemaking): This rule will provide industry with the flexibility to make quick operational changes while providing the public and EPA with more efficient and meaningful review of significant actions that could effect air quality. Instead of the current "one size fits all" process, which is paperwork intensive and time consuming for everyone involved, EPA will establish a new five-tiered system, which will provide increased flexibility for simple changes and increased accountability for important ones. The Part 70 changes will allow for an expedited review process for all facilities and will incorporate the flexibility used by the Intel project.

White Paper #3 Guidance: This guidance will provide guidance to states, tribes, and local governments on how to design flexible operating permits, within the scope of Title V of Clean Air Act and the operating permit regulations promulgated at 40 CFR Part 70. The White Paper focuses primarily on "advance approvals" since this is the most versatile and potentially useful approach. This guidance discusses the many considerations and factors relevant to designing a permit that allow for advance approvals of modifications or new emissions units so changes may be made without a permit revision. It also encourages pollution prevention, promotes active public participation, and the achievement of equal or better environmental protection. Projects supporting the development of flexible permitting approaches in White Paper #3 include Merck, Intel, and Imation.

Adding Options for Air Regulatory Compliance

Project XL is providing new ways for manufacturers to address existing compliance problems. At the facility level, manufacturers can find potential opportunities for improving environmental performance, yet these options may require that greater flexibility be added to federal regulations' technology requirements. In a move similar to that of the Intel project, EPA and the Virginia Department of Environmental Quality created a facility-wide emissions cap for Merck's Stonewall pharmaceutical manufacturing plant in Elkton, Virginia. Developed under a Clean Air Act permit that prevents significant deterioration of air quality, Merck's cap also eliminates regulatory review for equipment or process changes as long as the facility's emissions stay below the specified cap. With this approach, Merck is reducing the plant's total emissions of criteria air pollutants by 20 percent, sulfur dioxide emissions by 25 percent, and nitrogen oxides emissions by 10 percent, thus ensuring better environmental results. In addition, Merck will have flexibility under future regulations to lower its cap instead of implementing specific control technologies that might be required for other facilities. When a new criteria pollutant regulation is promulgated and becomes applicable to the site, or when an existing regulation becomes newly applicable to the equipment at the site, Merck has two options. (1) It can comply with the regulation(s) as written and install new control equipment. (2) Alternatively, it can adjust the facility's site-wide emissions cap(s) by the amount of emission reductions that would have resulted from direct compliance with the rule (e.g., reducing the cap by the amount of emissions reductions the new control equipment would have achieved, if it was installed at the site).

Project XL has also allowed manufacturers to use innovative approaches and a wider variety of technologies to control hazardous air pollutants (HAPs). The affect this has had on creating new regulatory options under HAP-related regulations is described below.

1. The 3M Hutchinson XL proposal did not reach final agreement, however, one of the flexibilities 3M requested in their proposal was incorporated in the mid-1999 direct final rule for HAP emissions from magnetic tape manufacturing operations. Based on the 3M proposal and other industry input, EPA determined that it would be useful to offer regulated entities an alternative compliance option for balancing HAP emissions from solvent storage tanks with emissions from other pieces of magnetic tape manufacturing equipment.

2. In 2001, EPA plans to promulgate National Emission Standards for HAPs (NESHAPs) for "miscellaneous organic processes." These standards are referred to as the miscellaneous organic NESHAPs or "the MON." Production activities at Crompton Sistersville, West Virginia, facility are classified as one type of these miscellaneous organic processes. It is expected that the MON will require a level of process vent controls similar to the level required for the vent incinerator installed by Crompton as part of its project. Thus, this project is providing some preliminary data for the MON on the effectiveness of this type of air pollution control technology in satisfying HAP compliance requirements.

3. Innovations being tested as part of the Weyerhaeuser project helped shape several compliance options in the Integrated Pulp and Paper NESHAP and Effluent Limitations Guidelines Rule promulgated in 1998. Three specific regulatory flexibilities undergoing testing include using: alternative compliance regimes for HAP emission reductions, advanced technologies to reduce effluent discharges, and pollution prevention technologies to reduce air emissions in kraft-pulping operations.

Increasing Alternatives for Safe Handling, Disposal and Recycling of Waste

Local communities and businesses are concerned with the impact that the handling and disposal of wastes can have on both quality of life for their citizens and the community's economy. Designing methods that increase safety and reduce costly hazardous waste generation are critical to these concerns. As described below, changes to Resource Conservation and Recovery Act (RCRA) policies are underway or under consideration as a result of information learned from Project XL.

- EPA is releasing a national RCRA policy determination that will allow the use of an alternative disposal technique for lead-based paint architectural debris from *residential* sources. Under Project XL, Lead Safe Boston (a Boston, Massachusetts, city government entity) is testing the use of a RCRA Household Hazardous Waste Provision exclusion that would allow the disposal of *residential-generated*, lead-based paint debris in RCRA-certified municipal waste landfills. Lead Safe Boston believes that lead-based paint debris can be safely managed in municipal solid waste landfills that meet RCRA requirements for landfill liners, leachate collection systems, groundwater monitoring, and corrective action provisions. It is expected that this decision will enhance the cleanup of more lead-contaminated sites within urban areas because of the lower costs associated with handling and disposal of non-hazardous designated wastes. In addition, it is expected to facilitate additional residential abatement, renovation and remodeling, and rehabilitation activities, thus protecting children from continued exposure to lead paint in homes and making residential dwellings lead safe for children and adults. Specifically, Lead Safe Boston expects to substantially reduce disposal costs, remove lead from more homes, and protect up to 30 more children from lead exposure. EPA has used data generated during the development of the Lead Safe Boston project and other sources to support its recent policy determination.

- Every day many products containing economically valuable metals are being disposed of as hazardous waste because few alternatives for resource recovery exist. The USFilter project proposes to eliminate or substantially reduce the need for electroplators (i.e., metal finishers, printed wiring board manufacturers) to treat and/or dispose of their F006 hazardous waste streams. USFilter proposes to offer "portable exchange deionization systems" (ion exchange canister) to electroplators in lieu of on-site physical-chemical treatment and off-site disposal requirements. Once their resins become spent, these canisters can be recharged by USFilter who regenerates the resins. The reclaimed metals then can be sold rather than land disposed. EPA is considering altering its RCRA manifest and waste treatment requirements for electroplators who elect to use ion exchange canisters for some or all of their F006 waste handling requirements.

- RCRA hazardous waste manifest and waste accumulation requirements often entail high transportation and collection costs associated with low volume waste disposal. The New York State Department of Environmental Conservation (NYSDEC) project is testing a solution to this problem by allowing utilities (primarily electric and gas companies) located in the state to consolidate their hazardous waste generated at remote locations at central collection facilities (utility owned) before the waste is sent to a commercial RCRA permitted treatment, storage, and disposal facility (TSDF). Currently, utility hazardous waste generators must have their wastes collected individually at remote sites and transported directly to a TSDF. In many instances, this results in a large number of vehicle trips to transport small waste loads. As a result of the data generated from this project, EPA is considering the modification of its RCRA waste accumulation and manifest

provisions for utilities to allow national adaptation of the New York-based system.[2]

- Municipal solid waste landfill capacity is dwindling in United States and there is a great deal of interest in how to design and manage landfills to extend their useful life. There are four project proposals currently being reviewed that explore various options for using leachate recirculation systems (bioreactors) to extend the life of existing sanitary landfills by speeding up the decomposition process of organic materials, thereby creating more space in the landfill and extending its life. Each project—Buncombe County, Virginia Landfills, Yolo County, and Anne Arundel County—will be exploring different aspects of a bioreactor system. Collectively, the various engineering and technical parameters being investigated among these projects will provide EPA with background data to determine if it is appropriate to modify existing RCRA municipal landfill design requirements.

Identifying New Procedures for Water Regulatory Compliance

In February 1999, the Administration unveiled a comprehensive Clean Water Action Plan, highlighting the public's concern for protecting the nations' waters. In a July 1999 proposed rule affecting the National Pretreatment Regulations, EPA sought to streamline the procedures for measuring pollutant loadings for industrial waste water dischargers. Under the proposed rules, publicly owned treatment works (POTWs) have the option of using mass-based limits in lieu of concentration limits for industrial users if these users meet certain criteria. The rule proposes that potential users (dischargers to the POTW) must install the best available technology (BAT) or have equivalent BAT installed, and they must use some form of water conservation methods that substantially reduce their water usage.

The Steele County project is referenced in the proposed Pretreatment rule as one example of a mass-based compliance experiment. Under Project XL, the POTW of Steele County, Minnesota, will allow participating industrial users to use mass-based limits in lieu of concentration limits for discharges to the wastewater treatment facility. These industrial users are primarily metal finishing facilities in Owatonna, Minnesota. Using a mass-based limit will allow industrial dischargers to minimize their water usage while maintaining compliance with their POTW requirements. Using a concentration limit would not allow this to occur. Steele County also is testing other alternative compliance approaches such as reduced monitoring for regulated pollutants not present and alternative significant noncompliance reporting. Collectively these approaches toward complying with pretreatment regulations can help establish a benchmark against which EPA and other regulators will determine whether these aspects of the regulations should be permanently modified.

[2]On October 7, 1999, the Atlantic States Legal Foundation and other parties filed a Petition for Review of EPA's final Project XL Rule for New York State Public Utilities in the U.S. Court of Appeals for the District of Columbia Circuit. EPA is currently exploring the option of settlement with these petitioners.