

**Learning from the
National Strategic Goals Program**

**Submitted by Anna Brown in partial requirements for the Degree of Bachelor of Arts, with
Honors, from the Center for the Environmental Studies Brown University, Providence,
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By Anna Brown

Submitted for partial requirement of a Bachelor of Arts Degree, with Honors, to the Brown University Center for Environmental Studies.

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Abstract

After three decades of top-down command-and-control environmental regulations, the EPA has started to spin out a number of new and innovative approaches to environmental regulation. Most of these non-regulatory "voluntary" initiatives are relatively new. As a result, there have not been very many systematic careful evaluations of whether these programs have "succeeded" in terms of reducing discharges/ releases to the environment, improving environmental quality, improving cost efficiency for governing agencies or for companies. Of the evaluations that have been conducted, some tend to overstate program successes.

This study profiles the National Strategic Goals Program, a voluntary compliance initiative that targets metal finishing companies, in order to assess what effects, if any, it has had on improving the environmental performance of participants. In order to examine the effectiveness of Strategic Goals Program on the ground, this study looks specifically at its implementation through the Narragansett Bay Commission (NBC), a Rhode Island Publicly Owned Treatment Works (POTW).

Given limitations to this study, it appears that the Strategic Goals Program, as played out with Rhode Island metal finishing companies, does not point strongly to improved environmental behavior among participating companies. This study does, however, offer a number of lessons that could be useful in future voluntary programs. For example, the partnership between the Narragansett Bay Commission and a local metal finishing trade association helped garner support for the program. The findings in this study also support the body of literature that indicates that regulatory flexibility and building relations with is an important incentive to participation. While companies feel only slightly satisfied with the Strategic Goals Program, it is possible that with greater incentives, such as reduced reporting requirements, participants would be more inclined to work toward the predefined goals laid out in the program.

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I. Introduction

As the world population continues to expand at alarming rates, so too does natural resource use and waste production. Materials use in the United States is completely unsustainable. To sustain the entire world at an American or Canadian level of resource use would demand the land of three Earths (Wackernagel and Rees, 1996). While individuals play a significant role in perpetuating the cycle of consumerism and resource exploitation, the impact of industrial practices on the environment is colossal.

Thirty years after the creation of the United States Environmental Protection Agency (EPA), the direction of environmental regulation has started to change. Traditionally, the EPA has used a top-down, command-and-control approach to regulation, whereby the agency establishes environmental standards and/or requirements that individuals and companies must follow, or face penalties. While almost everyone would agree that the system of command-and-control has given rise to dramatic improvements in environmental quality (Porter and van der Linde, 2000; Plater et al., 1998; Press and Mazmanian, 2000; Press and Mazmanian, 2000), others argue that it has failed to fully address problems such as inefficient and wasteful resource use (Porter and van der Linde, 2000; Plater et al., 1998; Press and Mazmanian, 2000; Andrews, 2000).¹ More recently, however, the United States government has invested in the development of other less prescriptive regulatory approaches, whereby companies take part in voluntary initiatives, which, for the most part, are not required by the government (Gibson, 1999). Proponents of voluntary initiatives claim that these approaches can provide a means to get at some of the issues overlooked by command-and-control, including global climate change, non-point source pollution, and the reduction of organic chemicals that traditionally fall outside the scope of existing regulations. It's argued that voluntary initiatives can provide a more efficient means to move American industry closer to zero-discharge and closed-looped systems, steps that go beyond what current regulations require (Porter and van der Linde, 2000, Press and Mazmanian, 2000, Andrews, 2000). Further, in the face of budget cuts experienced by many environmental agencies, voluntary initiative proponents argue that this type of approach offers a more economically efficient means to improve environmental quality than traditional regulatory approaches (Gibson, 1999).

In exchange for participation in voluntary initiatives, companies generally receive some form of reward. Incentives for participation range from public recognition and awards to regulatory flexibility. Other times, companies join voluntary initiatives as a way to forestall future regulations. If a company or sector of industry demonstrates a commitment to environmental quality then the belief is that it will help prevent the implementation of stricter regulations (Gibson, 1999).

Of late, the introduction of voluntary initiatives as a way to improve industrial environmental behavior and operations has sparked debate as to their effectiveness. The theory put forth by proponents of voluntary initiatives is that this type of approach should lead participants to improved environmental performance. That is, one might expect participants to measurably improve their record of environmental compliance or performance, demonstrate their commitment to pollution prevention activities, and properly and adequately train their employees by gaining incentives for taking these steps (Gibson, 1999). In actuality, there is, to date, a lack of conclusive evidence to incontrovertibly prove the effectiveness or ineffectiveness of voluntary programs. Many evaluations of existing or past initiatives have been either poor or incomprehensive, resulting in a tendency to overstate program successes (Gibson, 1999; Harrison, 2000). When the successes are overstated, it makes it more difficult to make informed decisions regarding the best uses of public (and private) money and resources to improve environmental quality and public health (Harrison, 2000).

Despite the large pockets of concern within the regulatory and environmental communities, the current political climate points toward a strong future for voluntary compliance initiatives. Both Republican and Democratic leaders have expressed favor of incorporating voluntary compliance programs into the regulatory framework. In letters written in response to a concerned citizen, former Vice President Gore and then Governor George W. Bush, both Presidential candidates, commented on the need to provide incentives for industry to improve its environmental behavior (Hasbrouck, 2000). Now, under the Bush Administration, with Christy Todd Whitman as the EPA Administrator and Gail Norton as the Secretary of Interior, the rate at which future voluntary compliance initiatives will be implemented is likely to increase (Benson, 2001).

¹ In addition to strong literature support, all interviewees in this study see the value that command-and-control mechanisms have had, in terms of environmental protection. Further, they see gaps in this regulatory approach.

Given the current interest in voluntary compliance approaches in the United States, studies to evaluate the effectiveness of existing programs are both timely and essential. While many voluntary initiatives are still too young to draw definitive conclusions regarding their success, or lack thereof, it's useful to begin to consider program strengths and weaknesses. In order to develop a better understanding of what role voluntary compliance can play in guiding companies to reduce their waste-stream and minimize their resource use, I chose to target my research on one program (**See Table 1.1 for examples of voluntary programs implemented in Rhode Island**). From the alphabet-soup of the voluntary compliance initiatives established by national, state, and local governments, as well as through non-government organizations, I selected one voluntary program, the National Strategic Goals Program, because it has been implemented in the Providence area (**See Appendix 1.1 for matrix comparing different voluntary programs**).

The National Strategic Goals Program (SGP), a sector-based voluntary initiative, aims to help improve the overall environmental performance of participating metal finishing companies. This program is generally implemented through a local control authority, such as a publicly owned treatment works (POTW). When companies join the SGP, they agree, in "good faith," to try to meet seven predefined goals by the year 2002, which focus on such measures as water and energy conservation, a reduction in metals discharged to the air and water, and a reduction in organic compound emissions

In Rhode Island, the Narragansett Bay Commission (NBC), a quasi-state corporation that manages, operates, and maintains two waste water treatment facilities in the greater Providence area, is the local control authority responsible for implementing the SGP (**See Figure 1.1 for map of NBC district**). The NBC has been an extremely proactive commission, with one of its treatment facilities awarded in 1995 through the EPA's National Excellence Award Program (Patenaude, 2000). In line with this proactivity, the NBC has already undertaken a number of voluntary compliance initiatives. The NBC, which is regulated by the Rhode Island Department of Environmental Management (RIDEM), has a vested interest in how well its users perform environmentally. Waste discharge violations by a number of NBC users could put the NBC in violation of RIDEM permits. In addition to the enforcement actions that can result from violations of its Rhode Island Pollution Discharge Elimination System (RIPDES) permit, excessive loadings to the NBC wastewater facilities can also disrupt the treatment process and equipment (McCaughey, no date). To prevent such added costs and burdens caused by

violations, the NBC has worked to improve their industrial pretreatment process in order to yield better environmental performance among their users.

Originally started as a regulatory quasi-state corporation in 1980, the NBC also established a Pollution Prevention Office in 1991 as a proactive way to promote waste reduction and good environmental behavior among users. The Pollution Prevention team provides technical assistance and support to companies and industries who seek to reduce their water use and pollutant discharge. Moreover, the Pollution Prevention program seeks to identify both regulatory and non-regulatory barriers to implementing pollution prevention activities and source reduction. The team also looks for ways to provide incentives to users who work to adopt pollution prevention techniques (UU1999 NBC Annual Report, 2000, pp. 137). The Pollution Prevention branch of the NBC is located in an office entirely separate from the Pretreatment program, the regulatory branch. As well, the users who call upon the assistance of NBC Pollution Prevention engineers do so with the understanding that they will have confidentiality. That is, unless the Pollution Prevention staff discovers a problem that presents a significant threat to human health or environmental quality, that company will not be reported to the NBC Pretreatment program. From 1981 to 1999, total metals discharged to the NBC's Field's Point facility dropped by over 900,000 pounds through the NBC Pretreatment and Pollution Prevention programs (2000 NBC Annual Report, 2001, pp. 139).

The National Strategic Goals Program, which targets metal finishing operations, is just one of several of the voluntary compliance initiatives implemented by the NBC. Out of NBC's approximately 1260 wastewater discharge permits, the metal finishing firms in this district hold over 100 of the permits. According to the 2000 NBC Annual Report, the metal finishing sector is primarily responsible for the toxic metals and cyanide that enter NBC facilities (pp. 47). I chose to focus on the SGP because unlike some other programs implemented by the NBC which are just starting up or only lasted for one year, the National Strategic Goals Program has spanned across three years, allowing for analysis of a couple of years of data.

I started my research set out to examine how, if at all, the SGP has guided participating companies to improve their environmental behavior. Largely due to limitations in quantitative data, I expand my study to include more qualitative analysis, seeking to explore what lessons can be learned from the SGP and its implementation through the NBC. Launched in 1998, this new program, while lacking longevity, offers a base of data, which illuminates our understanding about what factors are important to consider in the design and implementation voluntary initiatives. With recent attention on the development of innovative approaches to regulations, this

study offers insight into the strengths and shortcomings of the SGP, with an eye toward recommendations for future voluntary programs.

Based on my research, I have found that it's difficult to conclude that the Strategic Goals Program, specifically, has guided companies to improve their environmental behavior, partially because some companies have taken part in other programs. Further, among profiled companies, trends in reduction in water use and metals and cyanide loadings do not seem to correlate to the point after which a company joined the SGP. This study shows the importance of the partnership between the NBC and the local metal finishing trade association in developing support for the SGP. Further, the NBC's role in filling out paperwork makes the program more attractive. The program seems to lack incentives for involving a larger number of company participants, and encouraging them to reach beyond compliance.

In the Background section of this thesis, I provide a backdrop to understanding voluntary programs and what has led to their proliferation in recent years. In this section, I also outline the SGP and its implementation in Rhode Island. After presenting the Methodology I used in this study, and the limitations and delimitations to my research, I move to present the Results of my research. I then make Conclusions that the results seem to indicate, and lastly, I offer Recommendations and opportunities for Further Study.

II. Background

In the 1970s, American consciousness began to shift. Besides recognizing "hot spots" of environmental crisis, such as a fish kill below a factory discharge site, public awareness grew to recognize broader health issues associated with environmental quality (Plater et al., 1998). Burgeoning public interest in environmental protection, connected to the social activism of the counter-cultural movement, focused national attention on the environment. Until the 1970s, environmental protection was left largely up to individual states and municipalities (Vig and Kraft, 2000).

With the 1970s came the first generation of federal environmental laws, which relied heavily on command-and-control techniques. This approach to regulation signaled the sincerity of the federal government to improve environmental quality, and helped to establish a level playing field among regulated entities (Kraft and Vig, 2000; Jaffe et al., 2000). Statutes like the Clean Water Act (CWA), passed initially in 1972, for example, established permissible levels of

discharge for various industry categories. Performance standards were based on the best available technology (BAT). The CWA as it plays out in Rhode Island means that the Department of Environmental Management (RIDEM) issues Rhode Island Pollution Discharge Elimination System (RIPDES) permits (based on the federal permitting system, the National Pollution Discharge Elimination System, NPDES) to wastewater treatment facilities like those of the NBC. The permits are based both on federal standards, and local ambient water quality requirements (Plater et al., 1998). The NBC and other wastewater treatment facilities, are then responsible for issuing Wastewater Discharge Permits to its users. Violations of NPDES or RIPDES permits result in state and federal enforcement, generally in the form of fines.

Command-and-control measures have been credited for significant improvements to environmental quality in the United States (Kraft and Vig, 2000; Kraft, 2000; Press and Mazmanian, 2000; Gibson, 1999). Between 1970, which marked the passage of the Clean Air Act, and 1996, the EPA indicates a 32 percent reduction in total emissions of six principal pollutants. This reduction came while the population of the United States increased by 29 percent, and the Gross Domestic Product rose by 104 percent (Kraft and Vig, 2000, pp. 20). Additional environmental improvements are visible in water quality, protection of natural resources, and improved means of dealing with toxic and hazardous waste (Kraft and Vig, 2000; Breyer, 1993; Press and Mazmanian, 2000; Gibson, 1999)

Although command-and-control regulatory systems have played an essential role in bringing about dramatic improvements to environmental quality, this approach has also been criticized as:

- Inefficient for both regulators and industry, in that laws and regulations were written for the general case, despite differences in industrial operations (Rosenbaum, 2000, Plater et al, 1998).
- Focusing on "end of pipe" measures, that is, what leaves an industrial facility, rather than preventing pollution in the first place (Rosenbaum, 2000, Porter and van der Linde, 2000). Pollution prevention emphasizes removing hazardous substances, pollutants, contaminants from the waste stream altogether, with the intent of increasing efficiency in use of raw materials, energy, water, and other resources (Roy and Jehassi, 1997).
- Often resulting in antagonism between regulators and industry, which requires time and resource intensive lawsuits (Todd, 2/16/01, Moffet and Bregha, 2000)

- Stifling innovation on the part of business and industry, and providing no incentives for companies to improve their facilities and operations beyond current requirements (Plater et al., 1998).

Some argue that many of the "low-hanging fruits" of improved environmental performance have been picked, making the next steps for industry to continue to reduce their environmental impact more costly than the initial efforts (Breyer, 1993). In Breaking the Vicious Cycle by Stephen Breyer, U.S. Supreme Court Justice, he says, for example, "About 95 percent of...toxic material could be removed from waste sites in a few months, but years are spent trying to remove the last little bit" using risk-based standards (pp. 11). While in this example, Breyer speaks about waste clean-up, and not about pollution prevention, small companies, which often characterize metal finishing operations, often don't have the economic capacity to invest in new technologies that would allow them to further improve their operations.

The NBC has already made a tremendous dent in reducing metals discharges from its users. A graph of the NBC Field's Point Wastewater Treatment Facility of total influent loading points to the issue of diminishing returns (**See Chart 2.1 for graph of NBC Field's Point total metals influent loading**). Between 1981 and 1999, the Field's Point facility saw a dramatic decrease in pounds of total metals entering this facility (2000 NBC Annual Report, 2001). Within the last decade, however, the rate of decrease has slowed, as the big alterations required of many companies have already been implemented. In 1991, the Pollution Prevention program was started to try to combine efforts with the NBC's enforcement side. (2000 NBC Annual Report, 2001). Given that the majority of these metal loadings have already been removed from the waste stream, the NBC looks for ways to remove the last bits of pollutants while also recognizing the economic challenges that their small metal finishing companies face.

Voluntary Initiatives Gain Support

In response to the shortcomings of the traditional regulatory model, efforts have gone toward developing new approaches to the problems that persist in terms of environmental quality. Voluntary initiatives have come into existence as a way in which to account for some of the problems that command-and-control fails to address.

In the last several years, the EPA has created a range of voluntary initiatives. Some programs, such as CLEAN P2, aim to help companies that have struggled to comply with existing standards to improve their environmental performance. Others, like StarTrack of the Region I

EPA and Performance Track of the USEPA, are designed to help companies go beyond compliance in their operations. Under the Clinton Administration a series of voluntary initiatives were designed to tie industrial and environmental performance together. One of these programs, Project XL (eXcellence and Leadership), as it will play out in Rhode Island, will offer regulatory flexibility to selected companies that demonstrate that their operations go above and beyond compliance. Many of the voluntary initiatives that came out of the Clinton Administration were part of a campaign to "reinvent government," largely sponsored by Vice President Gore. This "reinvention" sought to "restore trust in government" and make government "work better, cost less, and get results Americans care about" (Rosenbaum, 2000, pp. 176-178).

Out of the reinvention campaign came the Common Sense Initiative, launched by the EPA in 1994. The Common Sense Initiative (CSI) represented a coming together of regulatory agencies and industry to promote "cleaner, cheaper, and smarter" ways to improve environmental quality, as well as strengthen economic growth. The EPA uses the CSI to develop voluntary agreements with industry sectors, focusing particularly on six industry sectors, including

SGP goals to be met by 2002:

1. 50% water reduction
2. 25% Energy reduction
3. 50% reduction in land disposal of hazardous sludges and an overall reduction in sludge generation
4. 50% reduction in metals emissions to air and water
5. 98% metals utilization
6. 90% reduction in organic TRI emissions
7. Reduction in human exposure to toxic materials in the facility and the surrounding community

source: <http://www.strategicgoals.org>

automotive manufacturing, iron and steel, and metal finishing, to take part in the initiative (Davies and Mazurek, 1996, Mazurek, 1999). Out of the six selected industries for the Common Sense Initiative, the metal finishing sector has made the biggest attempts to meet the goals laid out in the Common Sense Initiative (Davies and Mazurek, 1996; "Narragansett Bay Commission Pollution Prevention Activity Outline," 2000).

Historically, the metal finishing industry has been one of the more heavily regulated industrial sectors. Before 1980, there were no federal regulations covering the discharge or disposal of metal finishing wastes. Often, these wastes were directly disposed of in landfills, or discharged into sewers or surface waters

Figure 2.1: SGP Goals

(www.nmfrc.org/pdf/fo06fin.pdf, accessed 11/27/00). In 1980, the EPA issued hazardous waste management regulations which listed sludge from electroplating and metal finishing wastewater treatment as a hazardous waste (F006) and set standards with requirements for its storage, treatment, and disposal (www.nmfrc.org/pdf/fo06fin.pdf, accessed 11/27/00). At the same time, the EPA developed other regulations that required metal finishers to significantly reduce or eliminate their pollutants discharged to publicly owned treatment works (POTWs).

Given the history of regulatory requirements, the metal finishing sector, more than other sectors selected in the CSI, worked to develop a program that companies could join on a voluntary basis, to try to improve their environmental performance. In 1998, after a nine-month stakeholder process involving representatives from the metal finishing industry, the EPA, local POTWs, as well as some members from citizens groups and the environmental NGO community, the National Strategic Goals Program (SGP) was launched as the program to target the metal finishing industry sector ("Narragansett Bay Commission Pollution Prevention Activity Outline," 2000; [http://www.epa.gov/sectors/onepages/a\(5\)sgp.htm](http://www.epa.gov/sectors/onepages/a(5)sgp.htm), accessed 11/27/00).

Strategic Goals Program and its Components

Companies that sign on to the SGP agree, in "good faith," to try to meet the seven program goals by the year 2002 (**See Figure 2.1 for SGP goals**). In Rhode Island, upon joining the program, which is implemented by the NBC, metal finishing companies receive data sheets from the National Metal Finishing Resource Center (NMFRC) in Virginia. While the forms come from the NMFRC, the NBC helps companies to enter the data. The information collected includes data on production, waste generation, resource use, and the use of employee education programs to minimize waste. In addition to annual data collection, each company is also required to send in data from a baseline year, preferably 1992, though a more recent year is also acceptable. The NMFRC, independent from the EPA, calculates the degree to which companies have met each of the established goals, measured against 1992 performance levels. Using a code number, companies can view their progress reports on the SGP web site. While the public can also view this information, they cannot see reports linked to specific company names, in order to maintain confidentiality. This is to say that company data is not transparent to the public. To date, Rhode Island has 15 companies actively participating in the SGP, though five others have recently signed on to the program (SGP web site: <http://www.strategicgoals.org>, accessed 5/10/01; Wenskowicz, 3/30/01). Nationwide, there are 431 firms participating in the program.

Benefits for Rhode Island Companies to Join the SGP:

The SGP lays out a framework for program incentives, but it is up to states and local authorities to tailor the program to meet their needs. It should be noted that, unlike Project XL, in no way does the SGP have the regulatory authority to preempt federal laws and regulations. In Rhode Island, the benefits that are presented to companies seeking to join the SGP include:

- Free on-site technical assistance from the Narragansett Bay Commission
- Potential to develop better working relations with regulators
- Opportunities for "benchmarking," that is, comparing environmental performance of industrial operations to those of other companies of comparable size and operations
- Potential cost savings from pollution prevention
- Assistance with data worksheets from NBC, to ease the burden of additional paperwork

Benefits to the Narragansett Bay Commission

One of the primary benefits of the SGP to the NBC is that it provides the NBC with data about environmental performance. With such data, the NBC hopes to be able to provide companies with more tailored assistance. Also, with a greater understanding of performance among companies of different sizes and operations, the NBC sees this data as giving them benchmarking information to help provide direction to users on the quantities of resources like water a company should be using. Further, it provides participants with a structure to help them voluntarily work toward predetermined goals ("An Update of Rhode Island's Strategic Goals Program," 2001). These goals offer companies a framework through which they can voluntarily reach beyond existing compliance standards (2000 NBC Annual Report, 2001). This is valuable since the NBC is continuously looking for ways in which to reduce the wastes that enter their treatment facilities, in order to prevent disruptions to their systems and permit violations.

Although not discussed at great length in this study, the NBC has received approval to implement a federal Project XL (eXcellence and Leadership), as of September, 2000. Project XL will provide tailored assistance to ten metal finishers who have demonstrated superior environmental performance, as well as ten other metal finishers. One of the goals of Project XL is to allow the NBC to shift their resources away from heavy regulation of the "good environmental actors," so to speak, and instead go after the "bad actors" with greater regulatory oversight. In order to do this, ten companies selected as "top performers" will receive regulatory

flexibility, according to their degree of environmental performance. The other ten companies, on the other hand, will receive greater regulatory oversight (2000 NBC Annual Report, 2001).

III. Methodology

It is difficult to establish a causal relationship between participation in a voluntary program and improved environmental behavior. Industrial operations are influenced by a number of different factors in any given year. In an attempt to account for some of these challenges, and determine how, if at all, participation in the SGP has influenced companies to improve their environmental performance, I took a few different approaches to data collection and analysis. First, I profiled three companies participating in the SGP, and three companies not participating in the SGP to get a closer look at the environmental behavior of a few specific companies. Second, I reviewed SGP materials, including company progress reports, which describe the degree to which companies have met each of the goals established in the SGP. I relied on these methods to gain empirical information regarding how companies behave environmentally. I also relied heavily on qualitative data, especially since quantitative data is limited to the two years since the SGP started, and much of this data is laden with confounding factors. For my last two research approaches, using qualitative approaches, I tried to get a sense of how companies perceive the SGP, in hopes of determining what led companies to take part in the program, and how, if at all, participation has moved them to reduce their impact on the environment. I conducted a number of informal interviews, acquiring input from members of the metal finishing industry (including, but not limited to, the six profiled companies), government representatives, and members of the environmental non-profit arena. Finally, I mailed a questionnaire to all companies participating in the SGP to get feedback on how they view the program. Out of the 15 questionnaires that were mailed out, I received 11 back.

Company Profiles

While the SGP web site offers graphs and reports regarding metals discharge trends, the years between the baseline year (generally 1992) and 1998 are left out of the analysis, as no data have been submitted for these years (**See Appendix 3.1 for example of SGP progress report**).

The data from the six profiled companies, however, show company discharge and water use from 1993 through 1998, allowing for more of an opportunity to see trends in metals effluent.

In order to develop an understanding of how specific companies implement the components of SGP into their operations, practices and procedures, I selected three companies participating in the SGP to profile. I also selected three companies that are not taking part in the program. Using these companies as "case studies," I initially looked at NBC data for water use, and metal discharges, air emissions data from the RIDEM, and hazardous sludge generation data (F006) from both the RIDEM, and the NBC Pretreatment Program. Due to incomplete data sets, however, I focused only on trends in company water use and discharges to the NBC. Since the SGP recognizes 1992 as the baseline year² against which to measure a company's progress, I chose to focus on data available from this year forward. Since the metal finishing operations vary, I have crafted a brief summary of each of the companies that I profiled, based on interviews and data from the RIDEM and the NBC Pretreatment files (**See Appendix 3.2 for company summaries**).

Given that there are some 100 metal finishing companies just within the NBC wastewater treatment district, each with different types and sizes of operation, I looked to the NBC for help in choosing which companies to profile. I don't believe that the involvement of the NBC with company selection would skew my results, especially since they provided me with a small list of potential companies from which I selected firms to profile. The companies I ended up choosing were generally based on my ability to contact the owner/ environmental manager. Without their help, I would have encountered many more stumbling blocks. I used the following criteria in company selection (**See Table 3.1 for company characteristics, based on criteria**).

IX. Tier level

- Type of metal finishing operation
- Company size

Tier level: The EPA uses a "tiered system" in many of its newer voluntary compliance initiatives as a way to categorize firms based on how well they perform environmentally.³

² In the design of SGP, 1992 was established as the baseline year, however, companies may also select a baseline year that is more recent than 1992.

³ EPA Tier definitions: **Tier 1:** "Firms are consistently in compliance with regulatory requirements and are proactive in making environmental improvements to move beyond compliance."; **Tier 2:** "Represents the largest industry segment. The primary environmental objective of these firms is to be in compliance

Though not a factor in the NBC implementation of the SGP, tiering does play a role in many other voluntary programs, including other examples of the SGP around the country. Further, the tier system plays a concrete role in the NBC's recent unveiling of the federal Project XL program, where a participating firm's tier level determines what benefits that company will enjoy.

Although I recognize that one cannot draw conclusions based on comparisons made between only six case studies, I opted to use the tier system as a way to match up companies that are in the SGP with those that are not, according to roughly comparable environmental performance records.⁴ In designing this study, I saw the tier system as a way to do this.⁵

With the help of the NBC, I chose one "Tier I" firm participating in the SGP (SGP A), and one "Tier I" company that is not a participant (non-SGP A). I also selected one participating "Tier II" company (SGP C1 and C2), and another "Tier II" firm not participating (non-SGP C). The remaining two companies that I profiled included one SGP company, considered by the NBC as between "Tier I" and "Tier II," (SGP B) and one company not participating in the SGP (non-SGP B), which the NBC also considers between the first and second Tiers.⁶ I selected "in between" companies to see how they compare with the "Tier I" and "Tier II" companies. The NBC bases their classification of companies on number of compliance violations and the degree to which a company has made proactive progress toward pollution prevention (personal contact, 4/16/01).

with regulatory requirements. Most firms in this tier are consistently in compliance, but lack the incentives, and/or resources to move to Tier I. A subset of these firms have difficulty maintaining compliance.”; **Tier 3:** “Firms include old and outdated shops that are not sufficiently profitable to invest in new technology and may want to transition out of business, but cannot do so because of clean-up and/or financial liabilities.”; **Tier 4:** “Firms are ‘renegade’ shops that are routinely out of compliance, make no attempt to improve, and often escape enforcement attention. These firms pull down the reputation of the industry and compete with higher tier firms by avoiding costs of compliance.” (<http://www.epa.gov/sustainableindustry/images/tiers.gif>, accessed 1/27/01)

⁴ It should also be noted that some people don't find a tier system useful for categorizing companies. In an interview with Tom Uva, who manages NBC's Pretreatment Program, he said that from a regulator's standpoint, they only care if a company is in compliance or not. He commented that a "tier I" company might still have a serious violation down the road, even if it's considered a superior actor (Interview, 1/5/01).

⁵ Since the initial crafting of this study, representatives at the NBC have informed me that generally there is a wide-scope in terms of environmental performance among tier II companies (Personal contact, April 16, 2001).

⁶ Though "Tier III" and "Tier IV" firms are not restricted from participating in the SGP, this program is designed to help companies go "above and beyond" compliance. If companies are not even operating at a level that is close to compliance standards, they have little reason to take part in a voluntary compliance initiative such as SGP, especially if they are struggling financially, as many are. As a result, I chose not to address companies that operate at these lower levels of environmental performance.

Type of operation: Within the metal finishing sector, the two primary types of production are job shops, defined as owning "less than 50% of the products processed on site on an annual area basis," and captive shops, which own fifty percent or more of the products processed annually on site (Surface Finishing web site, accessed 11/17/00). In contrast to captive shops, which more or less manufacture products from beginning to end, job shops function on a contract basis, resulting in varied operations that tend to be less specialized. Job shops, on the whole, tend to yield a greater environmental impact than captive shops since a company regularly shifts its processes and operations to meet the needs of vendors. Captive shops, on the other hand, have more of an opportunity to fine-tune the plating procedures to reduce waste production because the company, more or less, always carries out the same processes (Surface Finishing web site, accessed 11/17/00).

When selecting companies to profile, I attempted to match up firms participating in the SGP with those not in the SGP according to whether or not they were categorized as a job shop or a captive shop. Again, I looked to the NBC for this information. In the case of the SGP A and non-SGP A companies, the latter firm operates a job shop, by definition. In terms of operation, however, this company does not tend to experience much variation in processes, and therefore has a fair degree of fine-tuning, as compared to most job shops.

Company Size: Size often influences a firm's ability to improve environmental performance. Additionally, the challenges that confront a small company may not necessarily be the same as for a larger company, and vice-versa. Economies of scale often makes it easier for larger companies to invest in technology or resources that could improve environmental performance. Further, larger firms often enjoy a greater economic cushion in their ability to deal with environmental problems that arise in their operations.

Given the apparent importance of size, I chose to roughly match profiled companies according to the number of people employed at each operation. In the initial selection process, the NBC provided me with data from the Rhode Island Economic Development Corporation that cited the number of employees working at each company. Later in my study I referred to RIDEM files, NBC Pretreatment files, and direct company contact to obtain more accurate employment figures.

Strategic Goals Materials

Along with the development of the SGP came the creation of a comprehensive web site that includes information ranging from the evolution of the program to reports for individual

companies regarding their progress toward meeting the specific program goals. I looked to this web site not only for background materials on the development and implementation of the SGP, but also specifically to see how Rhode Island companies have progressed during the time in which they have participated in the program. Since data on the web site is confidential, one can only view specific company progress reports with an access code. In some cases, companies were willing to give me their code number in order to allow me to view their progress, but in other cases, the company owners or environmental managers did not know their firm's identification code, so I couldn't look at individual firm data.

Questionnaire

In early February, I mailed a questionnaire to all of the companies participating in the SGP within NBC's district (**See Appendix 3.3 for further detail on questionnaire distribution**).⁷ Prior to sending out this survey, I received comments and suggestions from the NBC, as well as from the National Coordinator of the SGP at the EPA. I looked to this tool for insight into how companies view their participation in the Strategic Goals Program, in addition to providing information about companies' environmental behavior and the factors that influence it (**See Appendix 3.4 for questionnaire**).

Informal Interviews and Facility Tours

To gain further qualitative insight into how different stakeholders view the SGP and voluntary compliance initiatives, I set up a number of informal interviews and conversations. When possible, I tried to conduct these interviews in person, but did also rely on phone interviews in some instances. On the occasions when I visited companies, I often received a tour of the plant operations (**See Appendix 3.5 for a list of interviewees**). I conducted interviews with a representative from each of the six profiled companies. I also met with four other company owners and environmental managers. The companies that I ended up conversing with were those that 1) I was able to contact, and 2) could spare a few moments to talk with me.

⁷ I referred to a World Bank survey, developed by Stone (no date) and Stone and Levy (1993) for guidance in questionnaire design.

LIMITATIONS AND DELIMITATIONS OF STUDY

Many of the challenges arose in this study due to the lack of data. Of the data that were available, I encountered a number of factors that limited their applicability and usefulness, including conflicting figures and data in which I had little confidence. For this reason, as well as my own lack of previous experience in conducting program evaluations, this study represents a first-cut. In order to more conclusively determine the impacts that the SGP has had on company environmental behavior, as well as the role it has played with the local POTW, this research would need to further expansion.

Problems with data availability

A significant challenge illustrated in my Results section is that of limited quantitative data. Although I had intended to include in my SGP study a multi-media analysis of the program, including air emissions and hazardous sludge generation (F006) data, I encountered a number of challenges in data collection. The RIDEM air emissions data that I had hoped to examine is only available through 1998, the year in which the SGP began. In the case of the F006 data, the sources I used showed a number of inconsistencies and gaps, leaving me with little confidence in the figures. For F006 data, at the suggestion of Mark Dennen at the RIDEM Waste Management Department, I looked to the Biannual Reporting System and the EPA's Right to Know web site. I also looked through company manifests in the NBC Pretreatment annual inspection files. In a conversation with Mark Dennen, he noted that the RIDEM manifest data from 1994 through part of 1996 is essentially not available due to challenges encountered when a contractor attempted to create new hazardous waste generation reporting forms, but did not follow through as expected.⁸ Although the NBC F006 data appear to be more complete,⁹ I still encountered problems with legibility and readability in these files, since manifests are hand-written on carbon copy forms.¹⁰

In addition to the problems with the F006 data, when transferring air quality data from RIDEM files into a computer database, I found that many companies had left out information regarding quantities of chemicals use, and/ or released to the air or water. Further, some

⁸ The contractor who was responsible for creating a new, on-line worksheet "dropped the ball" and thus a couple of years worth of data did not make it into the computer system.

⁹ When compared with RIDEM data, in several cases, the NBC files showed manifests for waste shipped that the RIDEM hadn't accounted for in their totals.

¹⁰ The F006 manifest forms at the NBC are carbon-copies, which are often difficult/ impossible to read. Often, the company owners/ shippers failed to push down hard enough with their pen when completing shipping forms. The resulting copy in the NBC files is consequently left blank.

companies appeared to report data from the previous years, as numbers were often repeated, sometimes over a stretch of about seven years. In a couple of instances, companies listed the compounds or metals used in their operation, but left out all information regarding the quantity used. Other times, companies listed only one or two compounds or metals, which though potentially accurate, gave me little confidence.

Despite my efforts to account for company size, in later research I found that the figures from the Rhode Island Economic Development Corporation (RIEDC) did not give me a picture of the size of the metal finishing procedures within a company, especially for the larger firms. My own lack of experience and background meant that I didn't ask the right questions early enough in the study. For example, both SGP A and non-SGP A are large operations, each with more than 250 employees, according to the RIDEM and the RIEDC. I did not learn that the metal finishing operations of each of these companies represents only one department out of several others until later in my research. As a result, the SGP company has only about 10 employees actually involved in the plating process, whereas the non-SGP company has roughly 75 metal finishing employees.

Another persistent problem was that of production indicators. In attempt to account for differences between companies, as well as variations in amount of production from year to year, I sought to normalize the water discharge data, metals and cyanide loading data, VOC emissions, and sludge generation data to production. Ideally, one would normalize the data to a couple of production indicators (e.g. gross annual sales, number of employees, labor hours, etc.) and compare to see if the trend is the same for each set of normalized data. Obtaining such information, however, proved difficult. The most consistently available measure of productivity was number of employees and hours of operation, from which I could calculate the number of labor hours per company per year. I obtained this data from the RIDEM, the RIEDC, and the NBC Pretreatment files. In interviews, I found discrepancies between employee figures cited in these RIDEM and RIEDC files and what company owners and environmental managers said. In RIDEM files, for example, I often found no changes listed in numbers of employees from 1992 to 1998, but after talking with a company owner, I would learn that indeed, the firm had undergone changes in firm size.

Although I attempted to match SGP and non-SGP companies to see if there are differences or similarities between the two groups, there were too many factors to try to control for in the selection process. Further, due to time restrictions, I only profiled six companies, which provides a very limited picture of the SGP, and an even smaller picture of the industry at-large.

Such a small group of profiled companies made it difficult to draw conclusions, based on the available data.

The NBC played an invaluable role in helping me to select companies and design this study. Based on the findings, however, it appears that I could have used the NBC company recommendations more as the beginning of a screening process. At the start of the study, I had not understood that the "tier II" category included such a range of environmental performance. Further, since the NBC tends to work more with some metal finishers than others because companies must first seek out their assistance, they have a clearer understanding of some company operations than others. As a result, I neither looked into compliance violation history on specific companies nor conducted pre-interviews to make a further attempt to more precisely match SGP companies with non-SGP companies.

IV. Results

The different research methods employed in this study have uncovered themes that, when taken together, sometimes support one another, and other times raise questions. Included in this section are the findings and discussion of this study, grouped into themes, as presented below:

- The Role of Command-and-Control
- Environmental Performance
- Perception of the SGP from Different Stakeholders
- Company Rationale for Joining the SGP
- Company Satisfaction with the SGP
- Cost Savings
- The Role of the Internet as a SGP Tool
- Confusion about the SGP
- Getting Participation

These findings point to importance of command-and-control as a means to improve environmental behavior. Participants in this study, however, believe that this traditional model is limited. Findings related to environmental performance do not point to clear trends, though most companies report that they have decreased amount of wastes that they release into the environment over the last ten years. Stakeholders at the national, state, and local levels have different views of the SGP.

Some company perceive that the SGP has played in helping them to improve their environmental behavior, while others strongly feel that the changes that they have made in their

operations were not due to participation in the SGP. Most companies joined the SGP to support the local metal finishing trade association, as well as the effort of the NBC to implement voluntary programs. Other factors that are important to companies include regulatory flexibility, though they recognized that this was not likely to be granted, and improving relations with regulators. Overall, companies feel only slightly satisfied with their participation. Most of the findings relating to cost savings indicate that companies have not necessarily conducted cost-analyses regarding pollution prevention, but they perceive pollution prevention as expensive. The web site has been valuable to the NBC, but has not been used by company participants. Though not a point that came up much with participants, one owner had difficulty deciphering the SGP from the other NBC voluntary programs that target metal finishers. Lastly, the partnership between the SGP and the NBC has been important in getting companies to join the program

THE ROLE OF COMMAND-AND-CONTROL

Command-and-control viewed as essential

In interviews, companies acknowledged that there have been dramatic changes in the regulation of their industry over the past couple of decades. While this has resulted in the need for changes in operations-- sometimes dramatic changes-- across the board, all company owners and environmental managers participating in this study acknowledged the value of the command-and-control regulatory approach. The owner of the profiled SGP B company expressed the belief that there are some unrealistic regulatory requirements. Nevertheless, this interviewee acknowledged the need for command-and-control, saying, "we're probably stricter than other states because of the ocean...and the salt ponds..." He went on to say that regulations have "no doubt" affected business negatively, but "it was the right thing to do." Indeed, the NBC does have standards that are more stringent than federal requirements, in terms of permissible limits of heavy metals and cyanide discharge. The non-SGP C profiled company owner also acknowledged the impact that regulations have had on metal finishing companies. While he commented that "this is sad," that a large number of companies have gone out of business, he believes that "it's been a good thing." Not only have the federal, state, and local regulations helped to protect the environment, but he also noted that since many of the firms with very poor environmental records have gone out of business, he has benefited because he faces less competition from companies that don't take steps to internalize environmental damage.

In addition to the many companies that acknowledged that command-and-control has had an historical importance in terms of environmental protection, some also spoke to the need for a continued enforcement presence. The environmental manager for the profiled non-SGP company noted that "business has to pay attention to [command-and-control]." Without this approach, she explained, it can be more difficult to get managerial support to take steps, which would yield improved environmental quality. This is especially true since there are not always clear cost-savings from these steps (Company Environmental Manager, 1/31/01).

As one would expect, companies were not the only groups to recognize the importance of command-and-control. In all of my other interviews, as well, command-and-control was underlined as essential for bringing about improvement to environmental quality. As Joel Ann Todd, a consultant at the Scientific Consulting Group who has been working on an evaluation of the SGP at the national level, said, "without the enforcement side, the voluntary stuff wouldn't work." Kendra Beaver, of Save the Bay, one of Rhode Island's prominent environmental organizations that has a particular interest in water quality, stated simply, "the stick has to be bigger than the carrot," when looking to improve environmental behavior (Beaver, 1/30/01). That is, without regulatory enforcement of standards, companies have little incentive to try to decrease their environmental impact.

Command-and-control viewed as limited

Given the unanimous support of traditional regulatory systems, there is also widespread agreement among my interviewees that the current regulatory system does not prove sufficient in addressing many of the current environmental problems. "Command-and-control has accomplished a heck of a lot," said Robert Benson, Director of the EPA's Sector Strategies Division in the Office of Policy, Economics, and Innovation, "but we're nearing the margins" of its effectiveness (Benson, 2/15/01). Mindy Gampel, also of the EPA, noted, "I don't discount the [more traditional] regulatory approach...There should be regulation and hard-core enforcement...but [you] have to have other tools at your disposal" (Gampel, 2/13/01). To Benson and other regulators involved in the SGP, this program represents another tool.

ENVIRONMENTAL PERFORMANCE

NBC SGP participants tend to be active in the metal finishing community

All of the profiled companies participating in the SGP have taken part in other voluntary compliance programs, including those sponsored by the NBC (**See Table 3.1 for characteristics of company profiles**). These companies have also attended workshops and trainings, as well as other meetings that offered opportunities to voice their views to regulators. The profiled SGP B company owner, for example, considers himself a "spear-header of what's going on," noting that he never hears about developments in the metal finishing community second hand (Company owner, 1/23/01).

Metals and cyanide loadings data from profiled SGP companies do not draw clear trends¹¹

The SGP A firm shows very low releases of metals and cyanide discharge to the NBC wastewater treatment facility (**See Chart 4.1a for company metals and cyanide discharges**). More importantly, however, this company shows an overall decreasing trend of releases from 1992 to 2000.

The SGP B company does not show such a continuous downward trend in terms of metals and cyanide discharge, but instead this company's releases remain more constant, hovering around the one pound per 1000 labor hours level from 1992 to 2000 (**See Chart 4.2a for company metals and cyanide discharges**). In 1999, the total loading spiked up above the National SGP average discharge level (also normalized to labor hours), but dropped down below 1998 levels in the following year.

Metals and cyanide loading data from the SGP C1 and C2 company are much more erratic. In the SGP C1 facility, the metals and cyanide loadings appear to decrease for a couple of years and then increase for a couple of years (**See Chart 4.3a for company metals and cyanide discharges**). Although arguably there is not enough data to determine if a trend exists within this firm, it does appear that on the years when metals and cyanide discharges decrease, these loadings drop more than the low points of previous years. That is, in the year 2000, the amount of discharge per 1000 labor hours is less than in 1998, another low year. Further, 1998 discharges are less still than 1994, which is less than 1993.

The SGP C2 facility, on the other hand, appears to be on an increasing, though also erratic trend in terms of metals and cyanide discharge per 1000 labor hours (**See Chart 4.3aa for**

¹¹ Metals and cyanide discharge data for all of the profiled companies are normalized to labor hours, unless otherwise stated. Although I would have liked to normalize the data to surface area plated or gross annual sales, but these data were not available to me. It is very difficult to obtain data regarding how much surface area a company plates because most firms do not keep track of such information. With this in mind, data

company metals and cyanide discharges). Not only does this facility show increasing loadings, but the total amount of discharge is substantially higher than the other profiled companies, and indeed, much higher than the National SGP average loadings per 1000 labor hours. In an interview with the owner of the SGP C company, he talked about the challenges in operating two facilities. He explained that because of this challenge, he has been focusing more on the C1 facility (Company Owner, 12/4/00). Indeed, the C1 facility does show lower levels of metals and cyanide discharge per 1000 labor hours than in the C2 plant.

Metals and cyanide loadings data from profiled non-SGP companies do not draw clear trends¹²

Among the non-SGP companies profiled in this study, it's difficult to establish trends as well, again partly because of the small sample size. The non-SGP A firm shows somewhat erratic metals and cyanide loadings per 1000 labor hours (**See Chart 4.4a for company metals and cyanide discharges**). From 1992 to 1999, however, there has been an overall increase in discharge per 1000 labor hours. In 1994 and again in 1999, this firm shows a significant increase in metals and cyanide loadings. In 1995 and 2000, respectively, this firm shows a sizeable drop in discharge per 1000 labor hours. I don't have an explanation for this, but it occurs among other companies as well. It is possible that when a firm sees a spike up in metals and cyanide discharge in one year, it signals the need to focus greater efforts on improvement in the coming year.

The non-SGP B company also shows an overall increasing trend in metals and cyanide discharges (**See Chart 4.5a for company metals and cyanide discharges**). After a particularly high year, relative to years previous, in 1999 and 2000, this company significantly drops its levels of discharge per 1000 labor hours. In the SGP C firm, after increasing metals and cyanide loadings per 1000 labor hours from 1992 to 1994, the company discharge drops in 1995 (**See Chart 4.6a for company metals and cyanide discharges**). Since 1996, however, metals and cyanide discharges have increased.

Water use does not show clear trends in SGP companies¹³

concerning labor hours is much more readily available. In cases where companies are highly automated, this normalizing factor does not serve as a very precise proxy to an indicator like surface area plated.

¹² *ibid* note 10.

¹³ Water use data for all of the profiled companies are normalized to labor hours, unless otherwise stated. Although I would have liked to normalize the data to surface area plated or gross annual sales, but these data were not available to me. It is very difficult to obtain data regarding how much surface area a company plates because most firms do not keep track of such information. With this in mind, data

Like the metals and cyanide loadings data, water-use data from the profiled SGP does not point to clear trends. The SGP A company does show an overall decrease in water use, normalized to labor hours, from 1992 to 2000 (**See Chart 4.1b for company water use**). While there are a couple of peaks where water use per 1000 labor hours did increase, these also seem to fall in line with the decreasing trend. That is, the 1998 peak is lower than the 1994 peak.

In contrast to the somewhat constant levels of metals and cyanide discharge from the SGP B firm, this company's water use increased between 1992 and 2000 (**See Chart 4.2b for company water use**). In an interview with the company owner, he said that his water use had dropped substantially since the 1980s. He remarked that it's very hard for him to reduce his water use any further without expending large quantities of money (Company Owner, 1/23/01).

The two SGP C facilities show significant differences in water use normalized to labor hours. In SGP C1, this facility shows a dramatic drop in the use of water from 1992 to 2000 (**See Chart 4.3b for company water use**). Most of this drop came between 1992 and 1996. Since then, the rate of decrease has been much smaller, potentially as a result of diminishing returns. In the SGP C2, on the other hand, water use dropped from 1992 through 1994, but since then, has more or less increased through 2000 (**See Chart 4.3bb for company water use**). Again, the owner of this firm noted in an interview that he has been putting more time into his C1 facility.

Water use does not show clear trends in non-SGP companies¹⁴

Like the profiled data from the SGP companies, it's difficult to draw trends from the non-SGP water data. The non-SGP A firm shows a relatively continuous increase in water use, again normalized to labor hours, from 1992 through 2000 (**See Chart 4.4b for company water use**). The non-SGP B company, on the other hand, has generally decreased water use per labor hour since 1992 (**See Chart 4.5b for company water use**). Lastly, the non-SGP C company shows an overall decrease in water use, normalized to labor hours, from 1992 to 2000 (**See Chart 4.6b for company water use**). Since 1996, however, water use has increased through the year 2000.

There don't appear to be clear across-the-board trends marking either reductions or increases in water use or metals and cyanide loadings among company profiles. From just three SGP companies and three non-SGP companies, and further from looking at only a couple of

concerning labor hours is much more readily available. In cases where companies are highly automated, this normalizing factor does not serve as a very precise proxy to an indicator like surface area plated.

¹⁴ *ibid* note 13.

indicators of environmental performance, it's difficult to draw conclusions regarding company behavior in relationship to the SGP. A recent internal assessment done by the NBC suggests the need for further study in order to determine if SGP companies show greater improvements than non-participating companies. The NBC assessment included data from a greater number of non-SGP firms than included in this study. To date, the results are too preliminary to include in this study (personal contact, 5/14/01).

Lack of participation in the SGP does not imply poor environmental performance

While the SGP companies have all participated in other voluntary initiatives, the non-SGP firms profiled in this study have not taken part in environmental programs outside of their facilities.¹⁵ Most companies not in the SGP, as well as those in the SGP show low levels of metal discharge per labor hour.

A number of questions arise based on the water use and metals and cyanide loading data from the profiled companies. Some of the non-SGP companies appear to be doing quite well. Although it makes sense that some good performing companies would not necessarily participate in a program like the SGP, it sparks a number of questions, including, why aren't more "good performers" joining the program, or even taking part in meetings and workshops. Perhaps more importantly, what steps have these companies taken to position themselves as good environmental actors? If, indeed, a number of other companies exist that aren't as active in meetings and voluntary programs but have good environmental practices, is there a way to incorporate them as role models for poorer actors? This may play out as a NBC marketing scheme that establishes beyond compliance behavior as a norm. Social research points to the importance of social norms as a way to foster more sustainable behavior (McKenzie-Mohr and Smith, 1999). Studies have shown that modeling an approach or new technique is far more effective than relying upon pamphlets that often end up buried beneath piles of papers or tossed in the trash (McKenzie-Mohr and Smith, 1999). The Rhode Island Council of Electroplaters' endorsement of the SGP is an effective start to building a base of support for the program, as is evidenced by companies who joined the program as a way to "support" the trade association and the NBC (to be addressed later in this section).

¹⁵ The most closely that any of the non-SGP companies is involved in voluntary initiatives is the "Tier I." This firm is currently working to develop an Environmental Management System (EMS), but does not have one in place.

Another consideration that stems from looking at the company profile data is does it matter that more "top" environmental performers haven't joined the program? This is a question that has been brought up in academic literature (Crow, 2000). It may matter if the "top" environmental actors are seen as models for good behavior and garner greater support for the program. In terms of direct improvements to environmental quality, however, it seems that the bulk of progress toward improved environmental behavior will happen at the "tier II" level. Therefore, perhaps top performers needn't take part in the SGP. This question of who should participate in the SGP is especially relevant given that the SGP does not formally provide a structure to redistribute regulatory resources. In Project XL, which does include such a framework, the NBC will select ten "tier I" performers to receive less regulatory oversight in order to offer more tailored assistance to ten other firms with poorer environmental records. In this system, participation from "top" performers is essential to redistribute regulatory resources.

Additional questions relate to how the NBC perceives non-SGP companies. Although non-SGP companies don't show across the board reductions in total metals and cyanide loadings or water use, one of the three releases smaller quantities of metals to the NBC than other SGP companies. These findings were surprising at the NBC Pollution Prevention Program because the NBC had viewed this company as "tier II." Although metals and cyanide loadings represents only one indicator of environmental performance, that the NBC didn't expect this result at least raises a question of whether there might be discrepancies between firms perceived as "poorer" actors, and companies that actually demonstrate poorer environmental behavior. Additionally, this potentially points to the impact that relationship building with regulators can have for companies. It seems that the companies who are more active in pollution prevention efforts and who have a relatively good history of environmental behavior may be perceived by regulators as better actors, even perhaps when they don't match up as well with other "less active" firms.

In the past ten years, the rate of waste reduction has decreased

Though one might expect that companies participating in the SGP would report higher rates of waste reduction in the past three years (the time since the SGP has been in place), as compared with the past ten years, the opposite proved true in the questionnaire data. Most survey respondents (7/11) report that over the past ten years, the amount of wastes that they have released into the air, water, land, and general environment has decreased by "a lot." In contrast, the rate of decrease of wastes released into the environment has slowed over the past three years. Since the SGP was launched, most companies (7/11) report that they have reduced their wastes by

"a little." This finding potentially reflects the factor of diminishing returns. The metal finishing and electroplating sector is historically one of the most heavily regulated industry sectors in the United States (<http://www.surfacefinishing.com/content/news/>, accessed 11/17/00), which means that many companies have already implemented significant changes to their operations to improve environmental performance. While theoretically technology is constantly expanding, making continuous improvements to environmental performance possible, most metal finishing shops in Rhode Island are small. Such investments in new technology are not considered economically feasible for these small companies. As a result, the changes companies have made in recent years have potentially yielded smaller reductions in wastes. One company owner who has already made significant changes to his operations spoke of diminishing returns by making an analogy to eating a bowl of Rice Krispies. "At the beginning of the bowl," he said, "you can scoop out big spoonfuls of Rice Krispies." But after a while, "you have to chase around" for the last few bits of cereal. This owner's response seems to correlate with the NBC graph of metal loadings to Field's Point (See **Figure 2.1 for graph of NBC Field's Point total metals influent loading**).

Aggregate compliance record for SGP companies does not improve from 1992 to 1999

Based on the questionnaire, in both 1992 and in 1999, the number of companies that reported compliance violations of one or more did not change (6/11, in both years). The absolute number of violations reported went up in 1999 from 1992 (with 16 and 9 violations, respectively).

Given these findings on compliance levels among SGP participants, a couple of factors must be considered. In the early and mid-1990s, enforcement efforts were stepped up at the NBC (1999 NBC Annual Report, 2000) potentially resulting in an increase in compliance violations. With the advent of more stringent regulations in recent years, it is significant that four companies have reduced the number of environmental violations to zero since 1992.

Another important consideration is that since this compliance information comes from a questionnaire, and not the NBC files, I am relying on the memory capacity of company owners. It's entirely possible that an owner would more easily recall recent compliance violations, as opposed to violations from eight years ago, in 1992. I also did not look at the compliance record of non-SGP companies as compared to that of the SGP companies. Such a study that might have shed light on whether all metal finishing companies have had more violations, or if, truly, SGP companies have had higher incidences of compliance violation.

Most companies consider compliance difficult

Out of eleven questionnaire respondents, seven believe, in varying degrees, that it's difficult to operate in environmental compliance all of the time. In the questionnaire, companies cited a number of challenges to operating in compliance all of the time. One respondent from a smaller company wrote, "You almost need a full-time staff person" to make sure that the company stays in compliance. Another few companies reported employee mistakes and equipment failure as problematic, while others commented that it's difficult to "[stay] on top of modern advances in the field." A few companies seemed to express frustration at existing regulations. One company owner cited "nonsensical demands by the local POTW," and referred to a violation that he faced because a water fountain in his shop was connected to his process wastewater tank, and threatened to dilute metals concentrations. Along the same vein, another company owner commented that there are "too many regulations regulating the same thing."

Although a number of companies view compliance as difficult, it's possible that in some cases, staying in compliance is easier for larger companies. In an interview with the SGP A, the environmental manager felt that operating in compliance is not very difficult at all. In another interview, the non-SGP A environmental manager first said that for a metal finisher, it's hard to operate in compliance, but then paused and changed her mind, saying "no, it's definitely doable." Both of these companies are significantly a larger relative to most Rhode Island metal finishing shops. In contrast, both the SGP B and non-SGP B, as well as the SGP C1 and SGP C2 felt that compliance is difficult.

Companies have made changes to improve environmental performance, since joining the SGP

More than half of the companies responding to the questionnaire reported that since they joined the SGP (7/11), they have implemented changes in their procedures, processes and/ or operations to improve their environmental performance. In interviews, and in questionnaire responses, the changes cited included a range from adding more ion exchange columns, in order to move toward a closed loop system, to reducing volatile organic compounds and sludge generation, to taking water conservation measures.

PERCEPTION OF THE SGP FROM DIFFERENT STAKEHOLDERS

While according to the questionnaire data, more than half of the companies report making changes in their operations since joining the SGP. It remains less clear if these changes are attributable to the SGP. In some cases companies do believe that the program played a role in shifting their operations. In other cases, however, firm owners and managers didn't see these changes are a result of their participation. In this section, I outline how different stakeholders view the program and the purpose they see it filling.

Company Perception of SGP Influence

Some companies credit environmental improvements to SGP, others do not

Many companies cite changes made to their systems since joining SGP, to improve their environmental performance. Not all companies attribute these modifications to participation in this voluntary compliance initiative, however. In the questionnaire, many companies responded strongly that the SGP did not guide their firm to make changes in their operations in order to improve their environmental performance (**See Chart 4.7a**). Showing consistency in responses, many of these same companies further noted that they would be making these changes even if the program didn't exist (**See Chart 4.7b**). In an interview with the SGP A participant, the company environmental manager spoke at length about changes he has implemented to improve energy efficiency, and water conservation. He was slow to connect these modifications to the SGP, however, especially since he had just started to work at this company within the last year. Given his relatively new position at this company, he showed little knowledge of the program (Company Environmental Manager, 1/15/01).

A number of firms did, however, connect their improvements to the SGP (**See Chart 4.7c**). In an interview, the SGP C participant noted that he "wouldn't have set goals [for specific improvements in environmental performance]" were it not for the program. He went on to say that by joining the SGP, "it's on the record," which makes him more likely to try to achieve the goals (Company owner, 12/4/00). Another two company owners echoed this sentiment, saying that by signing the commitment form, it reminds them to try to meet the program goals. The SGP C company shows a history of high and erratic levels of metals and cyanide discharge per labor hour, as compared to other profiled companies. In the SGP C1, this facility has significantly dropped water use from about 260 gallons per labor hour to a little over 50 gallons per labor hour between 1992 and 2000. The SGP C2 shop, as illustrated earlier, uses far more water and resource.

Although it's difficult to draw conclusions from such a small sample size, it's significant that the SGP A environmental manager didn't strongly credit the SGP for his company's good environmental performance, and the SGP C owner did see the program as influencing his decisions. The profile data show that SGP A discharges low quantities of metals and cyanide to the NBC and further that water use has decreased, overall, since 1992. In contrast, the SGP C data are much more erratic. Compared to the SGP A company, a "tier I" company, SGP C, of "tier II" classification, has a long way to go in terms of reducing metals and cyanide discharge.

Regulators' Perception of the SGP

Sector approach seen as valuable

At the EPA, the sector approach is seen as valuable because it recognizes the challenges that different industries face, rather than trying to use a "one-size-fits-all" approach (Benson, 2/15/01). Benson sees the SGP as knowledge-driven, due to the involvement of stakeholders in the program development. That is, the EPA and other program designers sought to understand the characteristics of the industry to create better strategies for solving environmental problems. The EPA sees this sector-specific focus as a way to also prevent future environmental problems (<http://www.epa.gov/emergingstrategies/sector.html>, accessed 2/17/01).

When asked if the SGP is more of a tool to measure improved behavior, or a means to push for improved environmental performance, regulators at the federal level viewed it as filling both roles (Benson, 2/15/01; Gampel, 2/13/01).

Challenges of data collection echoed in interviews with some program designers and implementers

Officials at the EPA largely responsible for the design and implementation of the SGP acknowledge the challenges associated with trying to prove causality between changed behavior and participation in the SGP. Mindy Gampel, the National Coordinator of the SGP called it when she said that the data is the "biggest headache." One of the problems that most voluntary compliance initiatives face is that there is not a lot of quantitative data. (Gampel, 2/13/01). Mindy Gampel noted that they can't say with confidence that companies are making changes because of the program, but, as Robert Benson said, if numbers are downward tending, then the EPA will take the credit for it. (Benson, 2/15/01).

Skepticism at state level

Interviewees at the RIDEM were not familiar specifically with the SGP, but questioned the effectiveness of voluntary initiatives, in general. Richard Enander, the Pollution Prevention Manager at the RIDEM, asked for proof that the program has led to improved environmental quality and health (3/28/01). In general, the skepticism expressed seemed to be more directed at the EPA than the NBC, with comments referring to the large number of EPA programs that have been introduced over the last decade or so. Mr. Enander is currently working with Ronald Gagnon and others at the RIDEM to implement a program modeled after Massachusetts' Environmental Results Program. This program, unlike the SGP, is not voluntary, though it is industry specific, targeting automotive companies. The Environmental Results Program (ERP) that is in the design phase in Rhode Island would require all automotive shops to routinely go over a check-list, as a form of self-audit, to insure that they are carrying out pollution prevention practices. Instead of a permit for operation, the ERP would require certification of shop owners and operators. Although the ERP and the SGP are different in design, both employ innovative techniques to get companies to reduce the negative impact that they exert on the environment (Enander, 3/28/01; Gagnon, 3/28/01).

Data from the SGP valuable to the NBC

Jim McCaughey and Barry Wenskowicz of the NBC Pollution Prevention Program emphasize the value of the SGP as a measurement tool in that it provides a source of data on company environmental performance that was previously unavailable, or in a less user-friendly form. With more data, the NBC can potentially get a better sense of how to best tailor their assistance to metal finishers in their district. Moreover, the NBC will have more information to be able to determine how much water, for example, a given company should use in its daily operations. With this knowledge, the NBC can work with companies to help them achieve these levels. Although the NBC acknowledges that greater participation in the SGP would give them more of a comprehensive understanding of what to expect in terms of resource use, the information they have gained is valuable (McCaughey, 4/30/01). Moreover, in recent years there has been a push for accountability among pollution prevention departments. The NBC sees the performance measurements as a way to better quantify the changes that companies have made (McCaughey and Wenskowicz, 11/2/00).

According to the 2000 NBC Annual Report, the SGP provides companies with goals that they can voluntarily strive toward, in order to reach "beyond compliance" (pp. 166). These predefined goals create a structure that firms can follow in effort to improve their environmental behavior. Because goals are percentages relative to each company, they provide a framework specific to each participant.

Stakeholders have different goals for the SGP

While given that the initial step to joining the National SGP is to agree, "in good faith," to meet the goals of the SGP, which will help guide companies to reach beyond compliance, the program allows for flexibility in terms of implementation. Interviewees reflected these differences in discussing their views of the SGP.

Program designers at the EPA see the SGP as a tool to move companies above and beyond compliance (Benson, 2/15/01; Gampel, 2/13/01). One of the overarching program goals, according to Mr. Benson, is to shift the bell curve of environmental performance upwards, pushing companies to go beyond compliance. To the NBC, the SGP provides companies with a structure to work toward predetermined goals, but also the SGP is valued as a measurement tool, as addressed earlier in this section (**See Table 4.1 for summary of Stakeholder views of the SGP**). Similar to the NBC perspective, Judith Hanratty, of Rhode Island Council of Electroplaters (RICE), a key party involved in pitching the SGP to companies, sees the SGP in its implementation more as a way to measure changes than to bring about shifts in the metal finishing sector (Hanratty, 1/12/2001).

Table 4.1 Stakeholder goals of the SGP	
	Goals of the SGP
EPA	To engage companies to voluntarily work to pursue a set of performance goals in order to improve environmental quality
NBC	To measure environmental performance; provide a structure of goals which companies can use to reach beyond compliance
RICE	To help measure the improvements that metal finishers are making to improve environmental quality; to give companies goals to work toward

Coordination within and between regulatory agencies

One of the challenges that the NBC has encountered relates to conflicting views between different regulatory agencies. One view expressed by the NBC is that the EPA sometimes calls

for innovative programs, but then “ties the hands” of the NBC, not allowing them to provide the incentives that they see as necessary to reach a larger number of companies (Interview, 3/19/01). Robert Benson at the EPA echoed this perspective, stating that the "media-specific" approach lends itself to limited dialogue between different agency departments (Benson, 2/15/01). At the NBC Pollution Prevention program, it's recognized that the SGP doesn't give companies many incentives to participate in the program and fewer still to go above and beyond compliance. It is hoped that the decision to implement Project XL, which EPA approved in September, 2000 will give participating firms incentives according to their level of environmental performance, and will help companies to improve their environmental behavior (Wenskowicz, 12/13/00; McCaughey, 3/19/01).

In an interview with the SGP B owner, he complained that "one arm of government [is] saying one thing...and the other says another thing" (Company owner, 1/23/01). While he felt that his relations with both the DEM and the NBC are good, he said, "DEM just don't care," saying that this state agency "wants to put people out of business." In contrast to his views of RIDEM, he remarked that "NBC is tuned in." While this owner was the only company representative to express frustration at what he perceives as a lack of communication and coordination between agencies, his response was strong.

COMPANY RATIONALE FOR JOINING SGP

In order to further explore what influence, if any, the SGP has had on company environmental behavior, it is necessary to understand why companies joined the program in the first place. In this section, the findings point to the fact that firms joined the SGP with the hope for regulatory flexibility, but most companies didn't fully expect to see such flexibility. Another prominent reason that companies signed on to the SGP was to show support for the trade association. Further, companies expressed the importance of participating in the SGP as a way to develop relations with regulators.

Companies seek regulatory flexibility

In the questionnaire, companies were asked to note the factors that led them to join the SGP, based on a predefined list. The primary reason for joining was "potential for regulatory flexibility" (7/11). In interviews, companies were asked open-ended questions about what they were looking for in the SGP. Corresponding to questionnaire responses regarding incentives, many firms spoke about the desire for some form of regulatory flexibility. In one interview, the

company owner responded to a question about how the SGP is useful to him with, "[it's] only useful if I could get regulatory relief." He cited that one potentially valuable form of regulatory flexibility would require him to test only for chemicals and metals that his company does, in fact, use (Company owner, 12/6/00). Other examples of flexibility include reduced self-monitoring requirements, and the waiving of requirements for prior written approval to implement new plans to operations. A report that came out of a voluntary compliance initiative that preceded the SGP revealed similar desires, that regulatory flexibility is sought after among Rhode Island metal finishing companies (USEPA web site, accessed 12/13/00). Although companies hope for regulatory flexibility, they were not promised this as a reward for participation. Regulatory flexibility was presented in the context of the new Metal Products and Machinery (MP&M) ruling that will, when released, decrease the allowable discharge limits of certain metals and cyanide. The ruling does, however, contain a clause that would provide firms that have demonstrated a commitment to pollution prevention the opportunity to adhere to current standards. Participation in the SGP and progress toward the goals is one way that companies can potentially waive the new MP& M limits.

Companies don't expect to see regulatory flexibility

Despite the hope for increased flexibility, many firms recognized that they would not see these benefits in the SGP. Expressed succinctly by one environmental manager, "[I] don't see that [regulatory relief] is forthcoming..." (Company Environmental Manager, 12/21/00). The profiled SGP C company owner commented that "there probably won't be regulatory benefits," but he hoped that the SGP might be able to combine with Project XL so he wouldn't have to monitor as frequently (Company owner, 12/4/00).¹⁶

Companies join the SGP to show support

For some firms who have hoped for regulatory flexibility, but didn't necessarily expect that they would see these results, joining the SGP was a way to "show support" for both the program, and for the metal finishing trade associations who have been proponents of the SGP (Company Environmental Manager, 12/21/00; Company owner, 2/28/01). As expressed by one company owner, "well, [the trade association] needed companies to participate," and that's why

¹⁶ The NBC just signed the Final Project Agreement with the USEPA on September 25, 2000 regarding the implementation of Project XL that will grant "Tier I" company participants regulatory flexibility in exchange for proven high levels of environmental performance that go beyond existing standards.

he joined the SGP (2/28/01). Those respondents who sought to "support" the SGP tended to view themselves as active within the metal finishing community, citing their participation in trade association meetings, as well as attendance of workshops and meetings sponsored by local, and state regulators. Another company owner spoke about his involvement with the RIDEM, the NBC, as well as with the trade association, and declared, "I joined as a courtesy because they needed people to sign up," but feels that the program offers no benefits (2/28/02). Judith Hanratty, from the Rhode Island Council of Electroplaters (RICE) explained that companies join the program "to be seen as an industry that can self-regulate." She went on to say that companies, "want to change the old image of being polluters to" show that they are environmentally responsible (Hanratty, 1/12/01).

Not only did company owners and environmental managers speak to the desire to support the efforts of the trade association, but they also spoke highly of the NBC. In fact, most companies feel that their relations with the local authority are better than their relations with state and federal environmental officials. In the questionnaire, 8/10 companies described their relationship with the NBC as "very good." In contrast, 6/10 companies described their relations with the RIDEM as "very good," and only 3/10 considered their relationship with the USEPA as "very good." Interviews with company representatives support this high regard for the NBC. In a number of instances, company owners commented specifically about their positive experience with Mr. Wenskowicz and Mr. McCaughey, the two primary contacts at the NBC for the SGP.

Companies seek better relations with regulators

One of the most important reasons for why companies joined the SGP was in seeking recognition from regulators. In the questionnaire, "recognition from regulators" was the second most cited reason for company participation (5/11). Interview responses illuminated why firms value such recognition and the opportunity to build relations. When asked why he joined the program, one owner said, for example, "because it's my livelihood... We're the foot soldiers, trying to play out the regulations..." (Company owner, 1/23/01). This owner takes part in voluntary programs, and is an active member of the industry because it allows him to ask questions and provide feedback. He sees participation in voluntary programs as a way to help shape the direction of regulations.

Officials from the RIDEM's Office of Technical and Customer Assistance, and from the EPA Sectors Strategies Division back this company's desire for contact between regulators and regulatees, commenting that many people in the regulatory field have had little contact with the

group of actors that they seek to control and have never visited an industrial operation (Enander, 3/38/01; Gagnon, 3/28/01; Benson, 2/15/01). Despite their skepticism toward the effectiveness of voluntary compliance initiatives like the SGP, Ronald Gagnon and Richard Enander, of the RIDEM, noted that this sort of program could be helpful in building better relations between companies and regulatory agencies (Gagnon 2/28/01; Enander, 3/28/01). Mr. Enander qualified this statement by saying that the quality of relations depends on a company's environmental manager. In some cases, when a manager moves on, and likewise when a regulator leaves, the relationship that had developed sometimes dissolves.

COMPANY SATISFACTION WITH SGP

While most company respondents cited feeling only slightly satisfied with the SGP, in interviews, a number of company representatives said that the program has value. If the program were to offer regulatory flexibility, companies might feel more strongly satisfied with the SGP. As it stands, some companies express strong desire to continue to participate, while others aren't as certain about future participation.

Companies not fully satisfied with the SGP, though some wish to continue to participate

Closely related to what drives companies to take part in the SGP is the degree to which the program has met the hopes and needs of its participants. In the questionnaire, most respondents expressed only limited satisfaction with the program, with six out of ten companies reporting that they felt that the SGP only "slightly" provided them with the benefits that they had desired. Only one company owner responded with great enthusiasm that the program had "fully" met all of his desires and expectations.

That more than half of the questionnaire respondents feel only "slightly satisfied" with the program potentially relates to the discrepancy between what companies seek in the SGP, and what benefits they actually enjoy. The response of the company owner, "[it's] only useful if I get regulatory relief," hits the nail on the head. Unless companies feel the benefits that they deem important, then they are simply acting "out of courtesy" to the regulators and industry trade associations. If the SGP offered some regulatory flexibility to companies who demonstrate significant efforts to meet the SGP goals, then more firms would likely express greater satisfaction. This is not to say that yielding entirely to company desires is wise, but it points to the challenge presented by voluntary programs.

An additional indicator of company satisfaction is the amount of interest respondents have in continued participation in the SGP. When asked in the survey how long companies would like to continue to take part in a program such as the SGP, the responses were split. Some respondents (4/11) indicated strong favor of the program, saying that they would like to continue for the next ten years (on a scale from zero years to ten years, including a “don’t know” option.) The other significant number of responses fell in the “don’t know” category (5/11). Since companies don't know what benefits the SGP might offer down the line, they feel ill-equipped to determine how long they will continue to take part in the program in the future. This is likely a reason that a significant proportion of respondents expressed uncertainty as to future participation.

Companies favor the efforts to bring industry and regulators together

Although few companies expressed strong satisfaction with the NBC SGP in the questionnaire, a number of companies in interviews offered freely, often without probing, that the SGP is a "good program." It contrasts with traditional command-and-control approach to regulation, which many companies believe fails to recognize their needs. The SGP, both in its development and in its implementation, represents a coming together of industry and government agencies. The desire to "support" the SGP possibly represents not only a commitment to the trade association, but also interest in establishing a dialogue between industry and regulators. The profiled SGP B participant highlighted this issue, expressing dissatisfaction with many regulatory efforts that exclude the voice of industry. This company owner noted with emotion, "you can't have a person regulating without understanding what you're regulating" (Company Owner, 1/23/01). Another SGP environmental manager said, "there's a lot of value in the program," largely because it is implemented locally (12/21/00).

COST-SAVINGS

Most company respondents believe that in order to meet the goals of the SGP, it will impose a cost on their operations. At the same time, a number of firms reported saving some money through participation in the SGP. This study indicates that while pollution prevention is perceived as expensive, most companies have not actually carried out a cost-benefit analysis or tracked efficiency to determine whether or not their perceptions hold true. While not examined in

depth in this study, it is not clear whether or not the SGP provides the NBC with economic benefits.

Companies express mixed views on cost-savings

When asked in the questionnaire whether firms perceived that taking steps to meet the specific goals of the SGP would require expenditures or would save money, most reported that it would cost them money, even over a long period of time (7/10). Only 3/11 companies cited having actually tracked efficiency. One of these companies has looked at energy use. Another has tracked labor hours to sales, and the third company has looked at quality of product. Of the eight other companies who did not report that they have tracked efficiency, only one respondent has plans to look at efficiency in the future. Given this low number of firms that have conducted cost-savings analyses, most responses to whether companies will save money by implementing the SGP are based on perception. Depending on what steps a company has already taken to improve environmental performance, the perception of costs may or may not align with actual pollution prevention implementation costs. Nonetheless, even if actual costs are relatively low, or will produce long-term savings, companies are unlikely to invest in these changes, if they perceive these costs as high. In this way, company perceptions of cost-savings are important. In line with survey responses, the academic literature has demonstrated that many businesses believe that pollution prevention is expensive. In "Understanding the Transition to a Sustainable Economy," written by Daniel Press and Daniel Mazmanian, these authors note that within industry, pollution prevention measures are often viewed as an extension of burdensome regulatory programs. Further, investment into pollution prevention equipment and processes competes with other demands on often-limited capital (Press and Mazmanian, 2000; Moffet and Bregha, 1999). In an informal interview, one company owner responded with saliency that the SGP could not offer his company cost-savings, but noted that his firm has already taken a number of steps to decrease their waste-stream, thus making further improvements more costly (Company owner, 2/21/00).

In other interviews, however, several companies did remark that pollution prevention activities could save their firm money. Further, in the questionnaire, 3/10 companies perceived that they would save money, over a long period of time, specifically by working to meet the goals. Two of these three who anticipated savings have tracked some form of efficiency in their operations. The owner of the SGP C company profiled in this study anticipated in an interview that he "can save a substantial amount of money, if [he] reduce[s] [his] water by half." Since he

hasn't implemented these changes as of yet, he went on to say that "hopefully...[using] less materials cuts costs (12/4/00)." Again, as illustrated in the metal and cyanide discharge data, SGP C has room for improvement, as compared with the other profiled companies. It's not therefore surprising that this owner sees an opportunity for improvement and cost-savings through the SGP.

Seemingly in conflict with the significant number of respondents who, according to the questionnaire, believe that meeting the goals established by the SGP would cost money, almost half of the companies reported that they have saved money through participation in the program (5/11). Other company owners echoed this belief, saying that by using less water in the first place, or reducing the amount of chemicals used in plating operations, it would translate to lower costs in purchasing these materials, and lower disposal fees, as well. Another four companies "don't know" whether or not they have saved money.

That most respondents view pollution prevention measures as expensive is significant because one of the benefits that the SGP, and other voluntary compliance initiatives offer is potential cost-savings by cutting resource use. If the SGP seeks to offer this as a benefit, it might more effectively do so by targeting the companies that do not have a lengthy history of implementing pollution prevention, such as SGP C. These companies would get more "bang for their buck," and the benefits to the NBC would be higher.

Companies don't have enough incentives to reduce materials use

Some companies noted in interviews that there are no incentives for the source reduction of certain metals. In an interview with the SGP C owner, he noted that virgin zinc, for example, can be obtained more cheaply than by refining the waste product. Precious metals like gold and silver, on the other hand, can be refined for significant savings. As Robert Gibson states in Voluntary Initiatives, "While the proliferation of success stories certainly shows that environmental improvements can be profitable, it does not establish that they are typically profitable, or that the profitable ones will provide sufficient environmental gains" (pp. 6). At the same time, this lack of evidence doesn't prove the opposite. To create a market for zinc is outside the scope of the NBC. In general, the SGP C owner's comment regarding the cost of virgin zinc reflects a greater problem that exists not on the NBC level, but on the national, even global scale, whereby the cost of resources doesn't reflect actual costs, including the environmental and social implications in obtaining the resource.

Unclear if the SGP offers regulators cost savings

The development of the SGP required intensive meetings and planning at the national level, translating to high expenditures of money (Gampel, 2/13/01). As implemented locally, the NBC takes on the role of helping SGP companies to complete data sheets, a job that requires time and resources. While Project XL, more than the SGP, was designed with an emphasis on redistributing regulatory resources, in theory the benefits gained from the SGP should off-set the costs imposed on the NBC from running the program. To date, there is not clear evidence as to whether the SGP has offered the NBC cost-savings, though the lack of evidence does not necessarily mean that the program has not provided savings. If the NBC anticipates that the performance data gained from the SGP will help them to better provide assistance to its users, then this is a potential pay-off from the program. After only three years with the SGP in place, it may be too early to determine whether the NBC has experienced cost-savings.

THE ROLE OF THE INTERNET AS AN SGP TOOL

The Strategic Goals Program maintains and operates a web site (<http://www.strategicgoals.org>), which contains a wide range of materials. In addition to providing a wealth of background information regarding the development of the SGP and how the program works, the site also houses all of the data which shows the degree to which participants have met each of the program goals. The site is maintained regularly with relevant notices and updates on program happenings. According to Jakob Nielson, author of Designing Web Usability, a dynamic web site is much more likely to bring users to the site on multiple occasions, and even at regular intervals. The web site has tools that have the potential to allow participants to calculate how they compare, environmentally, to other firms with similar operations and of roughly equal size. This could be valuable to helping companies to gain a competitive edge through marketing and also by pointing out operations that are particularly wasteful and in need of improvement.

The SGP web site gets few hits from company participants

Despite its potential, on the whole, the SGP web site has been almost completely unutilized by companies. Based on the questionnaire, of the nine companies with internet access,

eight view the web site zero times each month.¹⁷ One company representative noted that he didn't know that the site exists. On the whole, the very low use of the site cannot be attributed to a lack of access to computers or the internet, since the majority of reporting companies have internet access (9/10).

That the site isn't used by the company participants raises the question of what target audience the site aims to reach. If the goal of the web site is to provide companies with tools to improve their behavior, the marketing of the site has proved unsuccessful. On the other hand, the NBC Pollution Prevention program, and potentially other government authorities implementing the SGP, value the web site as a resource. It provides information regarding company progress toward SGP goals, as well as notices on SGP developments and updates and potential legislative changes. An additional consideration is one of cost-effectiveness. To maximize the costs put into the site, and help companies strive to meet the goals of the SGP, it seems that companies need to begin to draw on this resource, using it for benchmarking and for ideas on how to change operations to yield more progress toward the seven predefined goals.

CONFUSION ABOUT THE SGP

The SGP is one out of many voluntary programs

Some companies had difficulty in distinguishing the different voluntary programs implemented through the Narragansett Bay Commission. While most firms could recognize the SGP by name, and could offer perspective on it, one interviewee lumped the SGP with the other two voluntary programs which specifically target metal finishing companies (Company owner, 1/23/01). This owner's comments tended to blend together Metal Finishing 2000, the SGP, and Project XL.

In interviews at the RIDEM, the Pollution Prevention Program manager, and the Chief of the Office of Technical and Customer Assistance questioned whether all of these programs have been an effective use of resources (Enander, 3/28/01; Gagnon, 3/28/01). Though they didn't have knowledge specific to the SGP, they expressed a general skepticism at the large number of different programs introduced by the EPA.

¹⁷ Since the question on the survey asked how frequently companies view the web site each month, I cannot assume that those respondents who answered "zero" have never visited the site, although this is certainly not out of the question.

GETTING PARTICIPANTS

Most companies participating in the SGP hear about the program through the NBC and/ or metal finishing trade organizations like RICE.

Although the NBC sends mailings to all of the companies to inform them of the SGP and other pollution prevention programs, the NBC and RICE approach individual companies to provide them with more information about the program and to ask for their participation. Although the NBC doesn't explicitly seek out companies that have taken part in other programs, it seems that many companies who sign on have expressed past interest in voluntary programs or have played a role in stakeholder meetings between industry and regulators. The NBC also tries to involve companies that have room for improvement within their operations and processes. Related to past participation in voluntary initiatives, it's significant that all of the profiled companies participating in the SGP have also taken part in other voluntary programs, including those sponsored by the NBC. Additionally, these SGP companies have also attended many workshops and trainings. In contrast, the profiled companies not participating in the SGP have not taken part in environmental voluntary compliance initiatives.¹⁸ Although the NBC sends out information about the Pollution Prevention program to all of the metal finishers in their district, frequently the same companies take part in the activities, programs and training opportunities. The SGP C firm is an example of a company that joined the program with potential room for improvements in operations. In fact, according to the NBC, the EPA urged this company to join the program due to a number of violations and operational problems.

It's possible that the companies who have a fairly good environmental record don't see a need to take part in the SGP because they don't expect to see any improvements to their operations. In many ways, it makes sense that the better performing companies don't take part in a program like the SGP. To most efficiently improve environmental quality, the SGP might seek out the companies that are "mid-level" performers (Crow, 2000).

Challenge of getting companies to internalize SGP

¹⁸ The one exception is the "tier I" company not participating in the SGP. This company is beginning to look at adopting an Environmental Management System (EMS), as in ISO 14000. Although each of the non-SGP company owners/ managers cited involvement, to some capacity, with pollution prevention education, this non-SGP set of companies has not had as much contact with the NBC trainings and workshops, nor do these firms have an history of participation in voluntary programs.

In terms of getting more active participation from the companies already involved in the SGP, there appears to be a catch-22 situation. Regulators respect that companies don't want to be burdened with more paperwork, and therefore assist firms in completing forms and data sheets. The challenge is then to make the SGP a program that holds some weight for companies who have already agreed to take part. Company owners only have to complete forms one time each year. In most cases, the NBC does the bulk of this work by helping to pull together all of the data from different sources. Some companies noted in interviews that by providing predefined goals, it gives them a concrete structure to try to work toward. If companies are only required to fill out paperwork one time a year, and even then another entity completes that work, it seems that it would be a challenge to make the goals of the program ones that companies think about on daily basis. This is not to advocate for more work for the companies, or to undermine the role that the NBC plays in compiling company data. Clearly, this relationship has given some companies the impetus to join when they otherwise might not have signed on to the SGP. More, I raise this as a way to think about creative ways to keep the SGP on companies' radar screen. The web site holds potential, but it's currently not seen as a resource to companies. It's possible that more frequent reminders, in some capacity, would help instill the program goals in the minds of company owners and environmental managers. Right now, there is not clear evidence that the program has enough incentives to push companies to work toward the established goals. In an interview, one company owner could not distinguish the SGP from other programs. One way to help companies to view the SGP as having more weight would be to provide rewards to the firms that demonstrate improvements.

V. Conclusions

After considering the confounding factors related to data collection and analysis, I return to the central question of this study: in what ways, if at all, has the Strategic Goals Program influenced participating companies to improve their environmental behavior? And, what lessons are available from implementation of the SGP? The answer to the first question is not clear-cut. It appears that the SGP has guided some companies to reduce their impact on the environment, but the program has had a limited effect on other companies. While almost all of the companies report that they have reduced the amount of wastes that they release into the environment

between 1990 and 1999, only some of these firms link such changes to the SGP. In addition to the results related to the SGP's role in improving environmental performance, this study points to lessons to take away from the implementation of the SGP in the NBC district.

Summary of Findings:

- X. Based on company data between 1992 and 2000, there is not a clear-cut trend that points to improvements in environmental performance among the three profiled companies participating in the SGP. This study only focused on water use and metals and cyanide loadings
- XI. Many of the SGP participants cite making changes to their processes/ operations, making them better environmental performers. It remains less clear, however, if these improvements can be attributable to the SGP. Some company profile data point to decreasing trends in metals and water use since 1992, but these reductions could relate to introduction of more stringent standards through the regulatory branch of the NBC. Further, some companies have taken part in a number of voluntary programs since the early 1990s.
- XII. Since the NBC does run a few different programs that target metal finishing companies (Metal Finishing 2000, SGP, and Project XL), it's possible that the entire gamut of programs could be effective in improving company behavior. Given that it's extremely difficult to tease out what changes were a result of the SGP as opposed to other factors, it may be that the cumulative effect of these different, but complementary programs has been, and perhaps will be what drives changed behavior.
- XIII. Incentives don't seem strong enough to capture a larger group of participants. Further, although the NBC has developed Project XL with the intent to more strongly push companies to improve their environmental performance, the SGP does not seem to provide incentives to companies for them to voluntarily reach beyond compliance.
- XIV. The NBC is well-regarded among metal finishers, a factor which has helped to garner support for the SGP.
- XV. The partnership between the NBC and the RICE proved an effective way to get companies to participate.
- XVI. The NBC's role in completing SGP paperwork for companies makes the SGP seem less burdensome to companies
- XVII. Mid-performers, or companies "tier II" or between "tier I" and "tier II" have a longer way to go in terms of improving environmental behavior, as is illustrated in the SGP C facilities. It may, therefore, make sense to focus efforts on getting these firms involved in the SGP (Crow, 2000).
- XVIII. By and large, company participants have not made use of the SGP web site, though it contains many resources. This reduces the benefits that companies can enjoy from the

XIX. According to interviews with metal finishers, representatives from the EPA, the RIDEM, the NBC, as well as non-profits, command-and-control plays an essential role in protecting environmental quality. This traditional model can have a leveraging affect in that as laws get stricter, it makes voluntary programs more attractive to companies seeking to avoid enforcement actions.

To date, Rhode Island metal finishing firms have had few strong incentives to take part in the SGP, and fewer still to actively try to meet the seven established goals of the program. That said, the NBC has nonetheless recruited more than 15 companies, to date, to take part in the SGP. The decision to partner with RICE was wise, as it gave the NBC a "foot-in-the-door" (Freedman and Fraser, 1966) with metal finishing companies. Although most companies in the SGP felt that their relations with the NBC are "very good," and many owners and environmental managers spoke highly of the Pollution Prevention team, RICE's support of and advocacy for the SGP gave the firms greater reason to sign-on and trust the program, especially with few incentives available.

Although companies spoke highly of the NBC, the program did not offer participants the incentives that they were hoping to get. This, in consideration of the relatively low turn-out rate, raises questions of whether the program would have involved more companies if the incentives were larger. Regulatory flexibility, the prized benefit to companies, is not available to companies in the SGP. While many companies joined the SGP to support this type of voluntary program, with about 15 out of 100 firms in the SGP, the participation level has been low. Further, the companies involved in the SGP have also taken part in other voluntary programs. Although I did not collect data from non-SGP companies to know what would give them reason to participate in the program, academic literature suggests that hard incentives, those that have a direct economic value are more attractive to industrial participation (Crow, 2000, Beardsley, 1996). For companies that have not been as actively involved with the NBC Pollution Prevention program or the RICE, they likely have less allegiance to these entities. As a result, incentives like faster permitting and reduced permitting fees would more likely capture their participation.

When leveraged with more stringent regulations, programs like the SGP might increase in effectiveness. The adoption of the new Metals Products and Machinery (MP&M) Rule might spark greater support for the SGP. If the MP&M Rule gets approved and the permissible levels of several heavy metals and cyanide drop significantly, then the clause that would allow some companies to use current discharge levels, if they can demonstrate clear involvement with pollution prevention activities would create a stronger incentive to participation. Active

participation in the SGP is one step that companies can take to begin to qualify for waiving certain new limits under the MP&M.

When considering the uncertainty around program effectiveness at the local level, it raises the question if perhaps the successes of the SGP have been overstated at the national level. In an EPA report, for example, it is implied that the SGP has led to 380 million gallons of water conservation (MF SGP Executive Summary, accessed 2/20/01). It remains unclear, however, if the SGP is at the root of these changes since company progress is measured against a baseline year, generally 1992, and the program didn't start until 1998. This presents challenges when trying to determine the degree to which changes in environmental behavior can be attributed to the SGP. A number of problems arise when trying to measure the effectiveness of the SGP, given the lack of sufficient data, a short period of program existence, and the number of other factors which influence company decisions. The result of these uncertainties, and the newness of voluntary programs, creates a double bind in terms of evaluating voluntary initiatives. Since voluntary programs are relatively new, and are often questioned by proponents of a more traditional approach, those responsible for the design and implementation of newer programs need to justify program existence to ensure future support. Given the uncertainty in the data regarding the relationship between participation in the program and improved environmental behavior, there is a tendency to take credit for improved company performance when other factors have likely come into play (Rosenbaum, 2000). Despite this need for justification, comprehensive evaluation is essential to formulate appropriate modifications that could give rise to a more effective program or move to a new approach. Given the problems with data availability and even data accuracy, however, it's unclear how to go about conducting such a comprehensive program analysis. Although the SGP, more than many other voluntary programs, did incorporate a system of measurement with the aim of determining program success, there are still gaps. In the design of future voluntary programs, as well as in the data collection systems of the enforcement side of regulatory agencies, greater emphasis should be placed on creating more precise systems of data collection. The SGP provides a useful jumping off point in terms of designing measurement tools since a considerable amount of time went into the crafting of the measurement framework.

The SGP is one of the first performance-based programs that targets a specific industry-sector. Voluntary initiatives are young, and the SGP is younger still. While the NBC's SGP provides excellent insights into the implementation of voluntary compliance initiatives, for example, the value in a partnership with the local metal finishing trade association, there is also a

need to examine more closely what role the SGP seeks to fill for the NBC. As a measurement tool, the program provides the NBC with easy-to-use data that be used to get a better sense of company performance. With relatively low participation rates, however, it is more difficult for the NBC to determine the trends that relate to different types of metal finishing operations to provide more tailored assistance to users. While the data could likely be useful to companies as well, it seems that they are not making use of this resource given that most companies don't look to the SGP web site, which provides resources like benchmarking tools.

Just as the program itself needs further tweaking, it does not exist in a vacuum. To put the SGP into a broader context, the effectiveness of the program and other voluntary initiatives depends also on the strength of existing regulations and enforcement. In light of recent Bush Administration decisions to weaken existing arsenic standards, to fail to regulate carbon dioxide emissions from power plants, and to abandon the Kyoto protocol, American citizens as well as policy makers must be wary of the motives behind the adoption of voluntary compliance initiatives. The SGP came out of efforts to try to help companies voluntarily reach beyond compliance, but the current Administration has provided reason to believe that future development and voluntary approaches might stem more from a desire to lessen the burden on industry. In order for programs like the SGP to work, as expressed in academic literature and among interviewees, there will always be a need for command-and-control. In the face of a nation driven by consumerism, and a rapidly expanding world market, the sustainable limits of natural systems have been stretched, in many instances, beyond repair (Brown, 2000). Such pressures on the Earth make it essential that voluntary compliance not be used to ease the regulatory oversight of industry when it will result in poorer environmental performance. Instead, this approach should aim to develop innovative ways to effectively and efficiently move industry to go above and beyond compliance.

With modifications, the SGP has potential to more significantly change individual operations to improve environmental quality, as well as act as a measurement tool to help guide the NBC to provide more tailored assistance to users. With increasing pressure on world resources, and continued environmental degradation, however, the SGP is only a first step. Gary Gardner and Payal Sampat of the World Watch Institute write, "...an extraterrestrial observer might conclude that conversion of raw materials to wastes is a major purpose of human economic activity" (pp. 6). With the creation of such waste and destruction, we must ask if our current political and economic structures allow for the types of changes needed to address the problems of our day. The existing systems do not account for the real costs of environmental degradation,

and until these costs are factored into the exploitation, production, and manufacture processes, industry and business will continue to operate in a way that either negatively impacts the environment, or only slowly moves toward improvement. Today, there is a need for systems thinking that draws on creativity in problem solving.

VI. Recommendations and Further Study

The SGP has only been in existence for a couple of years, hardly enough time to draw concrete conclusions. Nevertheless, this study points to some areas where the program could be improved upon to potentially increase its successes. I have outlined a number of recommendations that the NBC Pollution Prevention program may wish to consider, though some also apply to the RIDEM and the USEPA as well. It should be noted that in many cases, the NBC has already taken steps to address some of the same issues that I raise. Additionally, the NBC will address some of the suggestions that I make through its implementation of Project XL.

XX. Boslter incentives to actively participate

Several company representatives remarked that they would value workshops and seminars that offer more specific insight into how to improve their operations, practices, and procedures. One environmental manager spoke highly of a hands-on workshop that addressed the issue of reducing "drag-out" in the plating process (12/21/00). This training took place at a company facility, allowing participants to see first-hand how modified processes can greatly reduce the amount of resources required in operation.

The design of the SGP at the national level incorporates a "performance ladder." Under this system, as companies improve their performance, their benefits increase. NBC does not draw upon the "performance ladder," to date, though it plans to incorporate this model in Project XL. If the NBC does wish to broaden participation in the SGP, regulatory flexibility might provide more incentive. To reduce bureaucratic delays in gaining approval for regulatory flexibility, the NBC might grant flexibility to state and local standards. As suggested in this study, and widely supported in literature, regulatory flexibility is one of the more valued

incentives to metal finishing companies (Beardsley, 1996; Davies and Mazurek, 1996; Mazurek, 1999). Potential areas for increased flexibility, which could be adopted with caution, are based on academic literature, discussions with the NBC, and conversations with company owners and managers. They include:

- Eliminating the requirement of monitoring for chemicals and metals that companies don't use in their operations.¹⁹
- Reduce self-monitoring requirements
- Requiring fewer inspections
- Reducing permitting fees
- Allowing for faster permitting

- **Formalize benefits to companies**

In addition to increasing the incentives for companies, these benefits need to be clearly outlined for companies (Moffet and Bregha, 1999). When deciding whether or not to participate, company owners and managers need to know what to expect.

- **Design and implement ways to redistribute regulatory resources**

In theory, many voluntary compliance initiatives offer a way for regulatory agencies to focus less on the “good actors,” and instead target those firms that struggle to meet compliance standards. As Curt Spalding of Save the Bay said, “it’s a joke to focus equally on everyone...[we need to] look at firms that are a greater risk...” (Interview, 1/25/01). Spalding points to the need for increased enforcement attention directed toward the worst environmental actors combined with less regulatory oversight of companies already in compliance and practicing pollution prevention. In order to actualize this goal of redistributed resources, the NBC would benefit from a concrete plan of action, which includes a prioritized list of the companies that present the greatest risk to environmental quality and human health. Since the NBC has a commitment to maintain company confidentiality and not share information with the NBC Pretreatment program, the SGP does not have the capacity to coordinate efforts between the NBC Pollution Prevention and the NBC Pretreatment programs to redistribute regulatory resources. The NBC has wisely decided to move to more concretely redistribute regulatory resources through Project XL. In doing so, a question arises as to whether there is a responsibility to provide transparency to the public in terms of company performance. In the SGP, it's likely that the participation

rates would have been even lower had the NBC or the EPA required company names to be attached to progress reports. Indeed, public transparency does not seem as necessary to the NBC's SGP, given that participating firms do not receive any reduction in regulatory oversight. In programs where companies do receive regulatory flexibility, however, such as Project XL, the importance of transparency in company performance increases since firms will not follow the standard battery of regulations.

- **Incorporate evaluative methods into program design**

While the SGP does contain measurement tools for determining the degree to which companies have met each of the established goals, in the form of progress reports, it's difficult to determine if the changes that firms make are attributable to the SGP (Mazurek, 1999, Gibson, 1999; Harrison, 2000). One way to address this issue and reduce at least some of the uncertainty would be to show progress made toward each of the SGP goals on an annual basis. That is, instead of citing cumulative progress in each annual report, show the baseline year and the degree to which the goals are met in the sign-up year, as well as in each subsequent year. Such a system would at least take into consideration progress made in the years between the baseline year and the sign-on year, generally 1998.

- **Conduct a cost-effectiveness analysis for the NBC**

Closely related to the need for strong and effective evaluative methods is the need for an evaluation of cost effectiveness for the NBC participation in the SGP (Freeman III, 2000). While the NBC needn't devote extensive resources to a comprehensive cost-analysis of the effects of the SGP (since such a process could gobble up resources, all the while trying to use them more efficiently), some form of analysis seems appropriate. Further, periodic program review makes sense, as it points out areas of weakness and inefficiency that could be improved. The goals of a voluntary program are bound to change as it gets implemented. In order to be certain that the evolution falls in line with the direction of the organization, it's important to continuously ask if what the program offers meets the needs and expectations of the entity responsible for implementation.

- **Examine the impacts of stakeholder processes on building effective programs**

One of the touted benefits to bringing industry, regulatory, and environmental stakeholders together, as was done in the SGP development, is that it potentially reduces the amount of

¹⁹ While it makes sense to implement this type of flexibility, it might make sense to require infrequent monitoring to "spot check" company operations. This is especially relevant for companies that run job shops, since these processes are more likely to change with greater frequency.

costly litigation that arises at the introduction of new/ modified rulings or legislation (Todd, 2/16/01). Although rule making engages stakeholders as well, program development involves more stakeholders in the planning process, rather than in reaction to legislation. It has been reported that four out of five EPA decisions get challenged in court (Porter and van der Linde, 2000). A potential area for study, more for academic purposes than for the NBC, would be a look at the federal history of litigation between the metal finishing industry and regulators, as compared with other industry sectors that have been slower to form partnerships with regulatory agencies. Such a study would be especially timely for the EPA, given the potential changes made through Metal Products and Machinery Rule (MP&M) Federal Rule, which is currently in the public comment period.

XXI. Use command-and-control to make active participation in voluntary programs attractive

Voluntary compliance initiatives gain their strength from the presence of command-and-control. Without the traditional regulatory model, companies would have fewer incentives to try to improve their environmental behavior. Command-and-control regulations should be viewed not as static, but as dynamic responses to environmental problems. Command-and-control should continually raise the bar of environmental performance to create the climate for constant improvement. While on the whole companies and industries today have dramatically improved their operations to reduce their impact on the environment, there is still a long way to go. The spirit of America is so deeply rooted in independence and freedom, ideals that carry over to business and industry practices, that people often do what's best for themselves in the short-run and not what would benefit the larger society in a longer time-frame. Unfortunately, the result is often environmental degradation and poor resource use. Command-and-control provides an important way to address the bigger picture, and protect intergenerational equity. As world population sky-rockets, the need for command-and-control regulations increases as well. Voluntary initiatives offer a way to incorporate a mind-set of change and continuous improvement within the industrial and corporate culture.

• **Incorporate data collection of production indicators into NBC Pretreatment form**

While by and large the data available from the NBC was easily accessed and clear, a valuable addition to the NBC Pretreatment annual inspection form would be the inclusion of the number of employees at each given firm, as well as hours of operation. This information is available on a user's permit, but permits are not issued annually. In some cases, inspectors at the Pretreatment program do diligently collect employee information and hours of operation,

but it is not required. By formalizing the collection of this information, it will be easier to normalize data according to number of employees and labor hours. Ideally information regarding gross annual sales would also be available, but it's not lawful to require disclosure of this information.

XXII. Provide data in a more user-friendly format

Related to data collection and measurement, the SGP provides data that are more complete and easy to read, in contrast to some of the other sources of information collection. If data are not available or decipherable, then they are not fully transparent to the public. Since rules, regulations, and legislation have been designed to protect public health and safety, it makes sense to compile data in a readable and understandable format, to make them accessible to a wider public.

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VIII. Appendices

Appendix 1.1: Partial Matrix Comparing Sample Voluntary Programs

Program	<p>Narragansett Bay Commission Pretreatment Program: Project XL</p> <p>source: “Draft Final Project Agreement of Narragansett Bay Commission Pretreatment Program XL Project.” August 11, 2000</p> <p>Participants:</p>	<p><u>EPA Region 1 Star Track</u></p> <p>source: http://www.epa.gov/region01/steward/track/overview.html</p> <p>local participants: Texas Instruments, Attleboro, MA; Toray Plastics, North Kingstown, RI</p>	<p>National Performance Track</p> <p>source: http://www.epa.gov/performance-track/</p>
<p>Program Goals/ Purpose</p>	<p>NBC’s Project XL will run as a pilot project to test innovative approaches to environmental protection. This initiative seeks to test how effective regulatory flexibility, and other innovative environmental approaches, can be to achieve both superior environmental performance and reduced economic and administrative burdens.</p>	<p>“To expand and reward the use of compliance audits and EMSs in order to protect the environment, increase public understanding of a company’s environmental performance and achieve more efficient use of public and private resources.”</p>	<p>Performance Track is designed to recognize and encourage those who go beyond regulatory compliance to attain high levels of environmental performance and management that benefits the environment, communities and people. Performance Track is a two tiered program, with Achievement Track and the lower tier, and Stewardship Track as the upper tier.</p>

Environmental Compliance	<p>-Environmental Compliance: participants must demonstrate “an exceptional environmental compliance record” with local, state and federal environmental and OSHA regulations. If problems have occurred, participant must demonstrate “good-faith” in returning to compliance. Demonstration of environmental compliance may be achieved through: disclosure of all non-compliance issues that have arisen in past 3 years; the response to these issues; description of response to actions to prevent future non-compliance.</p>	<p>-Comprehensive compliance audit of all aspects of compliance with local, state and federal environmental regulations. This audit requires the identification of all areas of non-compliance, as well as the creation of an Action Plan, including a schedule of implementation of corrections, and preventative actions, where necessary.</p>	<p>-A record of sustained compliance with environmental requirements, certification of current compliance, and commitment to maintain compliance.</p>
Environmental Management System		<p>-Environmental Management System (EMS) audit, based on ISO 14000. This audit would identify areas for improvement and develop a prioritize Implementation Plan, to address areas for improvement.</p>	<p>-Implementation of an Environmental Management System (EMS), for at least one complete cycle that includes a self or third party audit (one complete cycle is generally defined as one year, I think). The EMS must include: policy, planning, implementation and operations, checking corrective action, and</p>

			management review.
Pollution Prevention Efforts	<p>Pollution Prevention efforts: must be able to prove commitment to and use of pollution prevention (P2) policies and procedures as part of their waste management practices (as seen in National Pollution Prevention Act of 1990). Applicant must also demonstrate use of P2 policies/ procedure through use of a combination of the following: use of a P2 Facility Management Plan; Demonstration of reduction in waste generation trends through documentation (applicant must demonstrate that reduced wastes didn't originate from decreased production); work with implementation of suggestions made by P2 tech. assistance program; water reduction; involvement with an industrial community based on environmental or P2 program/ committee</p>		
Audit		-Independent third party	

		<p>review of audits and audit findings by qualified auditors. An independent assessment would be carried out, with recommendations for improvement in environmental management, compliance, and pollution prevention, as needed</p>	
Public Disclosure		<p>-Environmental Performance Report to be prepared by the company and made available to the public. This report documents the company's efforts, providing a record and communication tool for the public, employees, and regulators, regarding the company's environmental programs and performance.</p>	<p>-Past evidence and future commitments of public outreach, including identification and response to community concerns, and performance reporting</p>

Education	Employee environmental education: applicants are required to have established an ed. system that trains employees in proper environmental management practices/ procedures, and encourages employees to come up with innovative solutions to pollution reduction.		
Improved Performance	Improved environmental performance: each applicant must define what type and extent of regulatory flexibility desired, and further show how such flexibility will lead to improved environmental performance. Flexibility will only be granted to Tier 1 companies.		Past evidence and future commitments of specific, measurable environmental improvements
Tiered Program	NBC's XL is comprised of a 2-tiered program with "top" performers in the first tier. Tier 2 companies are those who don't have such a stellar record of compliance or who have not yet taken steps to improve their operations. Tier 1 companies are more likely to gain regulatory flexibility than those in tier 2	Star Track is not a tiered program	Performance Track is a 2-tiered program, with the Stewardship Track as the upper level tier for companies that demonstrate extremely good performance. As of right now Stewardship Track has not been fully developed, so no companies are participating at this level. The second tier, which all selected companies will participate in is Achievement Track. NOTE: criteria for participation in Stewardship Track is

			not included as the program is still under development.
Confidentiality	Many companies participating in this XL program wish to remain anonymous so as to maintain a competitive advantage.		

Appendix 3.2: Profiled Companies Summaries

SGP A:

This company has a relatively small metal finishing department, as compared to the total size of the company. Within the last year, the company has brought on a new environmental manager who has little familiarity with the SGP. The new environmental manager didn't get the sense that the SGP played a strong role in the daily operations of the company, so he has not made the program a priority.

Metal and cyanide effluent from this company has generally decreased from 1992 through 1997. In 1998, the loadings spike up a little, then trend more or less, downward in subsequent years. Overall, this company discharges small quantities of metals and cyanide to the NBC. The total loading dropped from 1998 to 1999, and then increased slightly in 2000. This company has also decreased overall water use since 1994. After increased water use in 1997, this firm shows a further drop in water use.

Non-SGP A:

While this company involves more employees in the metal finishing process, this company makes use of automated systems.

Effluent from this company shows a general upward trend from 1992 through 1997. After a brief drop in discharges in 1998, metals and cyanide loadings spike up again in 1999, before dropping significantly in 2000. Water use in this company's operations also shows a steady increase from 1993 through 1997, after which point trends point downward.

SGP B:

The owner of this company has been involved with the local trade association, and has been involved in many of the meetings and which the state and local regulatory agencies have organized. These meetings have been designed to bring industry representatives together with regulators, as well as to provide assistance in order to help them improve their environmental performance. This owner mentioned that he has been in business for a long time, since 1974. While he would like to retire sometime in the near future, he doesn't see this as possible because he doesn't have anyone to take over his operation. He noted that when a metal finishing company goes out of business, it's very costly because of the heavy quantities of chemicals and toxic materials. This shop has downsized significantly since the early 1990s (by more than half).

Effluent from this company has remained relatively stable since 1992, with small increases and decreases. In 1999, this company experienced a spike in total metals and cyanide loadings to the NBC, but the figures dropped again in 2000. Water use trends upward, and the rate of increase steepens in 1998.

Non-SGP B:

This company owner has made efforts to install a couple of closed-loop plating baths, which reduces the amount of effluent that leaves his facility.

Metal and cyanide discharge from this company appears consistently less than the effluent from the SGP B company. From 1992 through 1996, this company shows a trend toward a slight increase in effluent. From 1996 through 2000, the discharge shifts toward a downward trend, with significant upward spike in 1998. From 1997, to 1998, this firm shows a drop in water use, where it remains relatively stable until the year 2000. Like the low levels of effluent, as compared with other profiled companies, water use in this company is also considerably lower than many other companies.

SGP C1:

This company operates two facilities, both of which draw upon "barrel plating," as one of the primary modes of operation. In this process, the product (e.g. screws, nuts, bolts) is placed in a "barrel," or a grated container. The entire barrel is subsequently dipped into the various plating baths. The products in the barrel don't drain as well when dipped into the different plating baths, because the container catches and hold the solution. As a result, the plating baths, which contain metals in solution, need to be changed more frequently due to contamination from "drag out"

from previous baths.²⁰ This operation, in comparison to “rack plating,” which many of the other companies use, requires more water and more metals in the operation.

The effluent from this facility drops from 1992 to 1993 before moving on an increasing trend through 1996. From 1997, the metals and cyanide loadings drop significantly, with an upward spike in 1999. Overall, this facility, as well as the other facility operated by this company, discharges higher quantities of metals and cyanide to the NBC, as compared with the other profiled companies. From 1995 on, this firm shows a dramatic drop in water use.

SGP C2:

The effluent loadings for this facility do not show the same trend toward decreasing, as seen with the other plant. Instead, Facility 2 shows a general and often significant increase in metals and cyanide discharge from 1994 through 1999. In 2000, there is slight drop in effluent. Falling in trend with the increasing levels of metals loading from this facility, water use climbs generally upward from 1994 forward.

Non-SGP C:

Metals and cyanide loadings from this firm tend upward in the early 1990s, then drop from 1994 through 1996. After 1996, this company shows a relatively slow, but steady increase in total metals and cyanide. Water use trends fall roughly in line with the effluent levels, again showing an increase from 1996 through the year 2000.

²⁰ “Drag out” is the solution that doesn’t fully drain from the plating barrel, and subsequently contaminates the plating baths as the barrel moves down the line.

Appendix 3.3: Description of Questionnaire Distribution

In order to ensure a high return rate, I phoned each company before mailing the survey, requesting their participation. In many cases, I had previously spoken to the company owner or environmental manager, thus giving me a greater probability of receiving a completed form back.²¹ I also offered to pick up the completed forms from companies, to provide further insurance that the questionnaires would make it back to my hands.

²¹ Freedman, Jonathan and Scott Fraser, "Compliance Without Pressure: The Foot in the Door Technique," *Journal of Personality and Social Psychology*, 4(2): 195-202.

14. How did you hear about the *Strategic Goals Program*? _____

15. Why did you join the *Strategic Goals Program* (check all that apply)

Technical assistance ___ Potential for regulatory flexibility ___ To save money ___
Recognition from buyers ___ Recognition from regulators ___ Other ___ (please specify) _____

16. To what extent has the *Strategic Goals Program* provided you with the benefits that you had desired (circle one)?

Fully Mostly Slightly Not very much Barely Not at all

17. Have you changed any of your operating procedures/ practices/ or processes to improve your firm's environmental performance since you signed on to the *Strategic Goals Program* (circle one)?

NO YES If yes, please give an example _____

18. Has your firm ever calculated production savings/ costs (in dollars) that resulted from activities such as: reduction in pollutant discharge, minimization of hazardous waste, or pollution prevention (circle one)? YES NO DON'T KNOW

19. Has your firm saved money, or do you anticipate that your firm will save money, due to improvements you have made in your facility based on the *Strategic Goals Program* (circle one)? NO YES DON'T KNOW

20. Would you like to continue to participate in the *Strategic Goals Program*, or a similar program over the next (circle one):

0 years 1 year 2 years 5 years 10 years Don't know

21. Does your firm have access to the Internet (circle one)? YES NO

If yes, how many times do you view the *Strategic Goals Program* web site each month (circle one)?

0 times 1 to 2 times 3 to 5 times 6+ times Didn't know about it

22. What changes, if any, would you make to improve the *Strategic Goals Program*? _____

Using a scale of 1 to 6, where 1= fully agree and 6= fully disagree, to what extent do you agree with the following statements (circle one)?

23. "In the last 3 years, the *Strategic Goals Program* guided our firm to make improvements in environmental performance that we wouldn't have otherwise made in that time period."

1 2 3 4 5 6

24. "I attribute all of my firm's improvements in environmental performance made in the last 3 years to the *Strategic Goals Program*."

1 2 3 4 5 6

25. "In general, the technical assistance I need to participate in the *Strategic Goals Program* is accessible and helpful."

1 2 3 4 5 6

26. "Our firm would be taking steps to go above and beyond environmental compliance, even without the *Strategic Goals Program*."

1 2 3 4 5 6

27. The changes that I would need to make to meet the goals set in the *Strategic Goals Program* (check one):

will cost my firm a lot of money, even over a period of several years ___

will cost my firm some money, even over a period of several years ___

Appendix 3.5: Interviewees

Industry Representation

XXIII. 11 company interviews (3 non-SGP firms, and 8 SGP firms)

- Judith Hanratty, of Rhode Island Council of Electroplaters

NBC Representation

- Tom Uva, NBC Pretreatment Program, Manager
- James Kelly, NBC Industrial Wastewater Control Engineer: I accompanied Mr. Kelly on several inspection visits, including some non-metal finishing operations.
- Barry Wenskowicz, NBC Pollution Prevention, Engineer
- Jim McCaughey, NBC Pollution Prevention, Manager

RIDEM Representation

- Carolyn Weymouth,
- Richard Enander, RIDEM Pollution Prevention, Manager
- Ronald Gagnon, RIDEM Office of Technical and Customer assistance, Chief

EPA/ National SGP Representation

- Mindy Gampel, National SGP Coordinator
- Robert Benson, EPA Sectors Strategies Division, Director
- Carl Koch, SGP Performance Measurement

Environmental NGO Representation

- Curt Spalding, Save the Bay
- Kendra Beaver, Save the Bay

Consultant

XXIV. Joel Ann Todd, the Scientific Consulting Group, Inc