POLLUTION PREVENTION PLANNING

A VOLUNTARY INITIATIVE FOR MAJOR INDUSTRIAL SITES

IN BRITISH COLUMBIA

by

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ABSTRACT

Both nationally and internationally, governments are considering alternatives to the traditional command and control approach to environmental management. Consistent with this trend, British Columbia's Ministry of Environment, Lands and Parks (MELP) recently developed and piloted a pollution prevention (P2) planning process for major industrial operations in BC, testing the process with seven volunteer companies. This paper examines the experiences of government, industry, and public stakeholders in this demonstration project, reporting on opinions, concerns, and suggestions of project participants.

Questionnaires and interviews with project participants were used to solicit answers to the following two study questions:

- *Why would industry voluntarily participate in BC's P2 planning process?*

Based on the experiences of the participating companies, the most important reasons are better public relations with the local community, better relations and communication with MELP, and the possibility of changes to existing regulatory requirements.

- *Does the P2 planning process developed to date include design elements suggested in the literature for successful voluntary initiatives?*

These design elements are summarized as: sufficient advantages of participation; participant commitment to initiative; well defined ground rules; credibility; and flexibility and innovation. A sixth design element, supportive policy framework, was identified but not considered in this study because of the preliminary nature of the demonstration project. Respondents to study questionnaires generally agreed to some extent that the P2 planning process to date included many of these elements, and that these design elements were important. However, areas were identified where the process could be further refined to more fully incorporate the design elements, especially with regard to participant commitment, dispute resolution mechanisms, legal implications of participation, the need for third party verification of reporting, and the inclusion of external stakeholders.

The paper concludes by providing six recommendations regarding the further implementation of P2 planning in British Columbia. These include to further incorporate the design elements identified, to carefully consider the supporting policy framework, to design for transparency, to include external stakeholders in the implementation committee, to further develop the role of the public advisory committees, and to ensure the necessary resources are available and committed to P2 planning.

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ABBREVIATIONS

ADt	Air dry tonne of pulp
AOX	Halogenated organic compounds
BC	British Columbia
BOD	Biochemical oxygen demand
CCPA	Canadian Chemical Producers' Association
EMS	Environmental management system
ISO	International Organization for Standardization
MELP	Ministry of Environment, Lands and Parks
mg/L	milligrams per Litre
MOU	Memorandum of understanding
P2	Pollution prevention
VNRI	voluntary nonregulatory initiatives

Chapter 1 INTRODUCTION

Over the last century, society has developed an increasingly complex understanding of the problems posed by pollution. From a complete lack of awareness of such problems, society first came to recognize pollution as a local issue, with local causes and effects. Today, pollution is recognized as a global issue, with global sources and implications. As society's understanding of pollution has gradually evolved, so too has society's approach to managing pollution and protecting the environment. It is changes to this approach with which this paper is concerned.

Society's efforts to manage pollution can be traced back to the close of the nineteenth century, when human health concerns related to untreated sewage made pollution an issue. An awareness of the spread of disease, notably typhoid, via untreated sewage spurred efforts to make the collection and treatment of sewage mandatory. In the 1950s and 1960s, the public became increasingly aware of further human health concerns related to air pollution, radioactive fallout, and pesticide spraying (Macdonald 1991, 87). Public concern was further heightened in 1962 by Rachel Carson's book, *Silent Spring,* describing a season where nature failed to awaken because of widespread toxic pollution. The concern created by this book and the warnings of other environmental scientists lead to huge public rallies and demonstrations, demanding that governments DO something to protect the environment.

And DO something, governments did. North American governments typically reacted by introducing environmental legislation and supporting regulations to control pollution. This legislation often applied to major industrial operations, an obvious source of pollution. As new, critical environmental issues arose each year, governments reacted by introducing additional, reactive legislation to address these issues. Not surprisingly, this resulted in an explosion of regulations driven by the constant discovery of new environmental problems (Sindling, Anex, and Sharfman 1998, 3). In the United States,

the Environmental Protection Agency (EPA) is estimated to have introduced more than 11,000 pages of regulations since its founding in 1970 (Higgins 1995, 65).

These regulations typically reflect a "command and control" management approach to environmental protection. Governments **command** industry through environmental laws, defining exactly what is required for environmental protection. Governments then **control** industry, ensuring that laws are adhered to by enforcing requirements through strict liability in criminal courts. These command and control regulations frequently define what performance standards must be met (quantity and quality of discharge at the end-of-pipe), what pollution control technologies must be used, and what design standards must be met. In Canada, governments have been more likely than their American counterparts to negotiate compliance agreements with offending companies rather than impose sanctions (Labatt and Maclaren 1998, 194). Nonetheless, the underlying approach to environmental protection has been the same.

This command and control management approach has been used to date in North America with limited success. Where pollution has been obvious, acute and widespread, command and control has provided a means of forcibly reacting to the most obvious and easily detected sources of pollution. It has provided "soot-free skies and phosphate-free lakes" (Wylynko 1999, 161). However, in addressing the more subtle, more complex and more poorly understood sources of pollution, this approach is proving to be increasingly unwieldy. Criticisms of command and control as it has been applied to major industrial operations have been voiced by government, industry, and other stakeholders.

A common criticism of the command and control approach is that it is not a practical nor cost effective means of addressing the growing myriad of environmental issues. Government's hands-on approach to date of defining allowable contaminant discharges, best management practices, and best available technologies is increasingly onerous as the range of industries and the number of contaminants of concern continues to rise. Furthermore, new environmental regulations are costly and time consuming to develop,

and subject to much debate and criticism because of the uncertainty of environmental science. As new scientific information comes to light, these regulations are not easily changed. The enforcement of regulations in criminal courts is often very costly and difficult as violations must be proven beyond a reasonable doubt. Sufficient evidence for such prosecutions is not easily nor cheaply collected. Critics argue that government resources are expended on paperwork and litigious debates while industry resources are spent on government requirements that are not cost effective. These resources could be spent to much greater environmental effect.

The command and control approach is also said to provide no incentives for industry to perform beyond compliance with existing environmental requirements. Companies that exceed compliance are not recognized, while those that risk trying new environmental technologies are threatened with prosecution should the experiments fail. Desirable innovation and business transformation are effectively discouraged by the inflexible nature of environmental regulations.

Furthermore, the command and control approach has been criticized for fostering an adversarial relationship between government and industry, that of polluter and police. This adversarial relationship discourages the exchange of information relevant for efficient and effective environmental protection. Innovation and business transformation are further discouraged by this adversarial relationship.

The publics[1] are also demanding a greater role in environmental management. Where environmental issues have traditionally been negotiated between government and industry behind closed doors, the publics are demanding greater transparency.

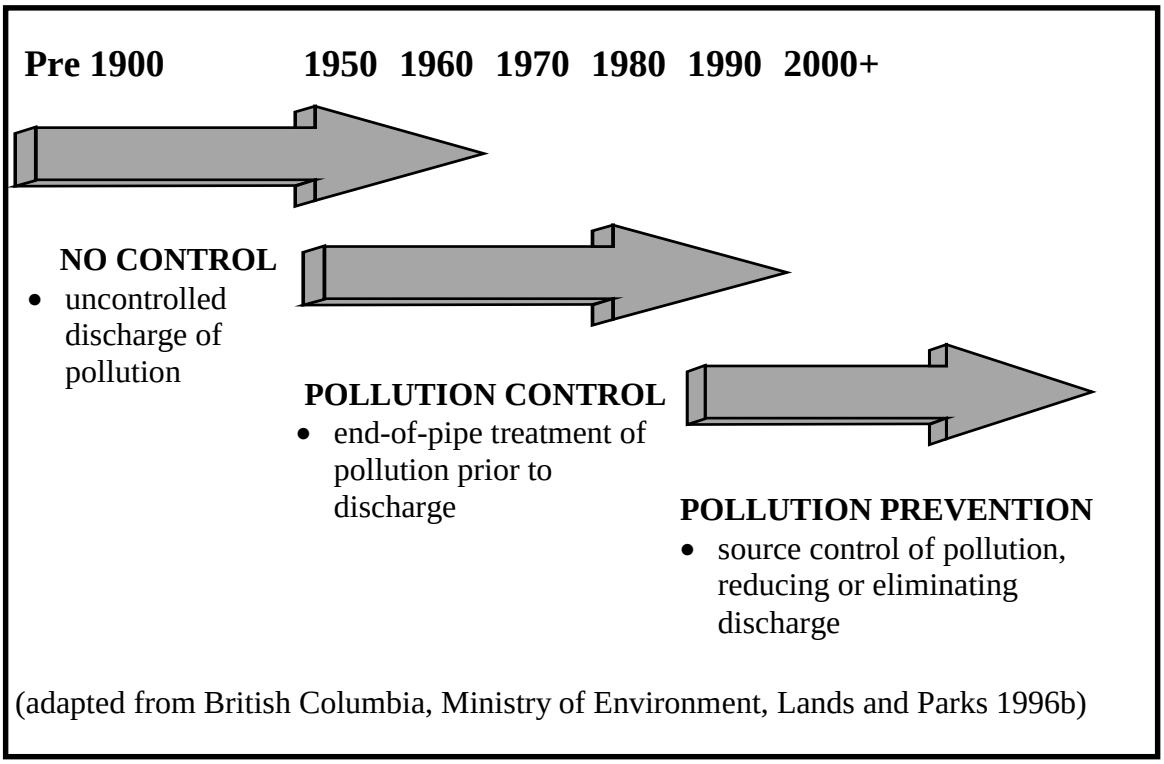
Given these criticisms of the command and control approach, government, industry, and the publics are interested in considering new management approaches for environmental

[1] The plural of public, that is publics, is intentionally used to reflect the wide range of interests and concerns found in the general population.

protection. Such approaches should not only address the shortcomings of the existing system, but also bring society closer to achieving the overarching goal of sustainability. Sustainability has been defined as meeting the needs of the present generation without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development 1987, 43). In order to achieve sustainability, the current institutional, social and economic arrangements are subject to change.

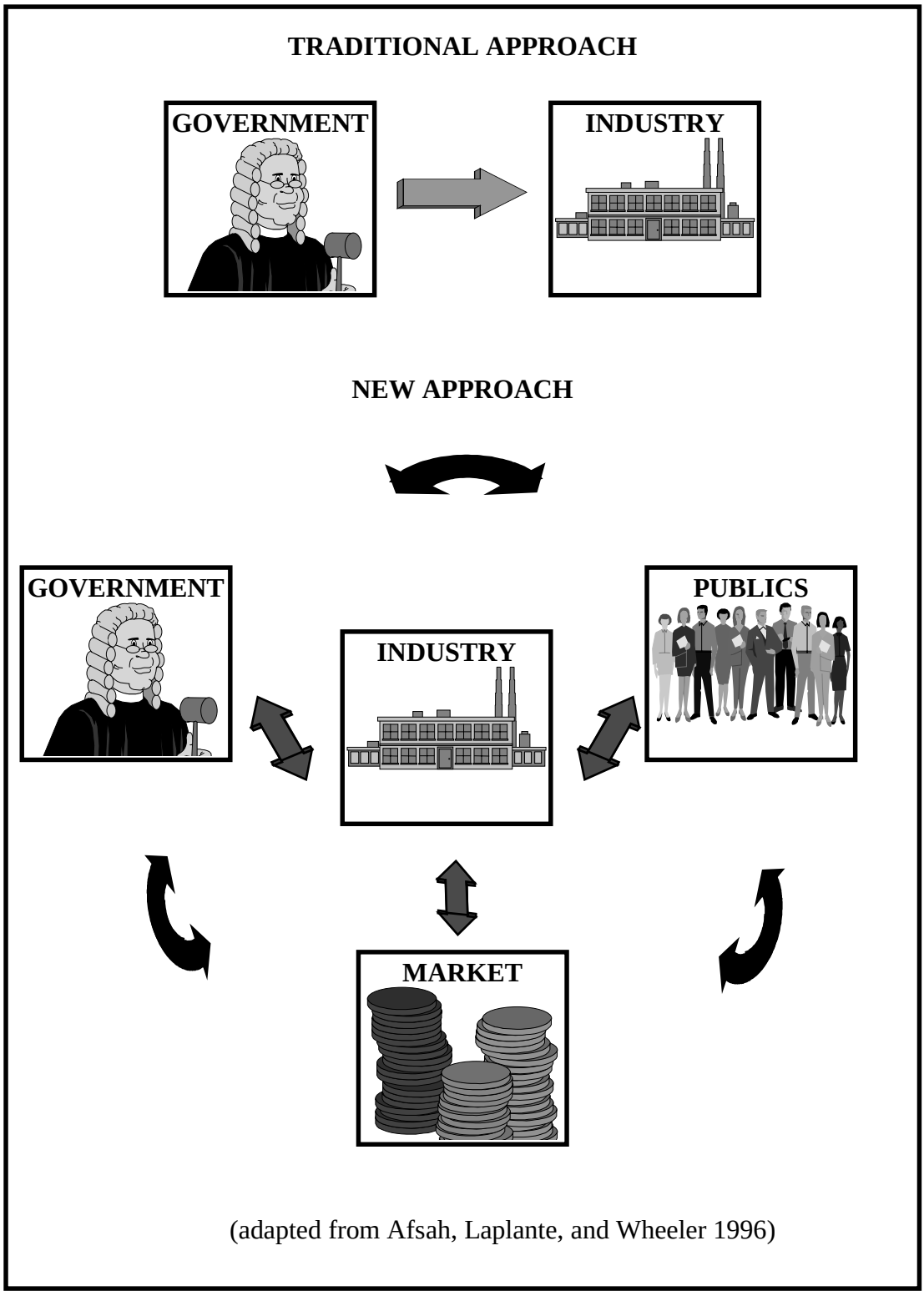
Toward achieving this goal of sustainability, new approaches to environmental protection are emerging. Many of these new approaches encourage a basic change in thinking about how pollution is managed. Traditionally, pollution has been regarded as the inevitable by-product of industry, something that can only be managed once it has been created. Pollution has been managed at the point of discharge, the end-of-pipe: environmental regulations define what can be discharged at the end-of-pipe; treatment technologies focus on applying end-of-pipe solutions. In contrast, new approaches consider the possibility of preventing pollution before it is even created, regarding pollution as an indicator of a wasteful, inefficient process. This new thinking moves up the pipe to the source of pollution, shifting the focus to preventing pollution in the first place. This evolution in thinking is a far cry from the original approach to pollution, with no control at all. Figure 1 reflects this change in approach over the last century.

Figure 1 Approaches to pollution



In moving toward sustainability, the roles and relationships between stakeholders can also be reconsidered. In the traditional approach, government unilaterally decides what measures should be taken for environmental protection, industry reluctantly complies with most requirements, and the publics observe through the media, commenting only outside of the process. Conversely, new approaches often try to integrate these different sectors of society in developing a shared responsibility for environmental protection (ten Brink 1998, 1). As illustrated in figure 2, the narrow view of government and industry interacting only through regulations could be replaced by a broader model including the publics and market as major players in environmental protection (Afsah, Laplante, and Wheeler 1996).

Figure 2 Changing relationships between stakeholders



(adapted from Afsah, Laplante, and Wheeler 1996)

In this new model, government and industry can work together toward achieving more effective and efficient means of environmental protection, including the publics as stakeholders in the development and implementation of these new means. Market forces can also be brought to bear on polluters to change their approach to environmental protection. With greater public involvement, greater market pressures, and the opportunity to contribute to the development of environmental management measures, industry has greater incentives to improve environmental performance.

These changes in thinking regarding how environmental issues should be managed is reflected in a variety of policy instruments, developed as alternatives or compliments to traditional command and control based regulations. Governments now employ a range of financial incentives, education and training measures, market instruments, and voluntary initiatives toward achieving the goal of sustainability. This paper considers the use of one such instrument, a voluntary initiative, in the context of British Columbia's historically command and control based approach to environmental protection. More specifically, this study considers the use of BC's Ministry of Environment, Lands and Parks' pollution prevention (P2) planning process as a voluntary initiative for major industrial sites.

In the following chapter, the concept of voluntary initiatives is discussed, as well as some possible incentives for industry to participate in such initiatives. This chapter also considers some of the arguments for and against the use of voluntary initiatives, identifying six design elements commonly considered important for successful voluntary initiatives. Chapter 3 considers the history of environmental protection in British Columbia and events leading up to the introduction of P2 planning as a possible voluntary initiative. This chapter also describes the demonstration project where the P2 planning process was tried with seven volunteer companies. Chapter 4 introduces the study itself, the two main study questions, and the methodology used to investigate these questions. Chapter 5 presents the results of the study, discussing comments made by respondents. Finally, in Chapter 6, conclusions are drawn regarding the answers to the

study questions. Recommendations for the future of the P2 planning process are also made.

Chapter 2 VOLUNTARY INITIATIVES

2.1 Introduction

The term "voluntary initiatives" is used to refer to a wide range of measures to improve corporate environmental performance. By definition, such measures are not explicitly required by law. Instead they encourage companies to go beyond what is required to comply with existing environmental laws.

Voluntary initiatives can be developed exclusively by industry, by government, by public groups, or any combination thereof. Voluntary initiatives can be formal, documented programs with clearly defined starting points and participation requirements. Alternatively, they can be informal programs where companies are challenged to do what they can towards achieving a general goal without any specific requirements. Voluntary initiatives can include some mandatory elements for companies that voluntarily agree to participate, or be entirely voluntary in nature. The general term voluntary initiative is often used to refer to private codes, voluntary agreements, covenants, codes of conduct, challenges, and voluntary nonregulatory initiatives (VNRI).

2.2 Voluntary initiatives in Canada

Although voluntary initiatives are a relatively new concept, there are many examples of this approach to environmental protection in practice. The Canadian Chemical Producers' Association (CCPA) was one of the first industry associations to develop a voluntary initiative in 1985. Its Responsible Care program requires that all participants adhere to six codes of practice and a set of guiding principles[2]. Compliance with the Responsible Care requirements is a condition of membership in CCPA. All member companies are evaluated every three years by industry and nonindustry representatives to ensure that they meet the standard (Overholt and Godsoe 1996, 1). In Canada and the

[2] These codes of practice and guiding principles address community awareness, emergency response, research and development, manufacturing, transportation, distribution and hazardous waste management (Labatt and Maclaren 1998, 194).

United States, where a similar Responsible Care program was adopted by the equivalent national association, the Chemical Manufacturers Association, over 90 percent of the basic chemical production is in facilities that meet the Responsible Care standard (Nash and Ehrenfeld 1996, 19). This is an example of a voluntary initiative developed independently by industry.

Governments also develop voluntary initiatives. For example, the Ontario Ministry of Environment and Energy recently introduced a Pollution Prevention Pledge Program. In this program, facilities that voluntarily commit to, plan for, and achieve pollution prevention measures greater than those required by law can be publicly recognized for their achievements and eligible for environmental awards. In order to encourage companies to reduce the release of chemicals into the environment, the use of toxic chemicals, and the generation or disposal of hazardous or liquid industrial wastes, the ministry proposes to reward companies that improve process design or operation and maintenance, eliminate or substitute polluting raw materials, or reformulate their products. In addition to this pledge program, the ministry also challenges industry to reduce the release of some of the most persistent, toxic, and bioaccumulative chemicals as listed on the Candidate Substances list for Bans and Phaseouts 50% by 1995 and 90% by 2000 (Ontario, Ministry of Environment and Energy undated). As of December 1996, 195 sites had enrolled in the early stages of the pledge program (Ontario, Ministry of Environment and Energy 1997). This is an example of a voluntary initiative developed independently by government.

Voluntary initiatives can also be developed by government and industry in conjunction. For example, the Ontario Ministry of Environment and Energy has signed memorandums of understanding (MOU's) with five business sectors for reduction in the production, use, release, and generation of 43 priority toxic substances and pollutants by the year 2000. The MOU's outline the goals and purpose of the agreement and the intent to meet these goals (Labatt and Maclaren 1998, 195). Since signing the MOU, the motor vehicles manufacturing sector, with 29 participating facilities, has achieved a cumulative

reduction of 332,870 tonnes of pollutants discharged (Ontario, Ministry of Environment 1999).

The three preceding examples illustrate the use of voluntary initiatives in Canada. There is an even greater use of voluntary initiatives internationally, for example in Europe, Australia, and the United States.

2.3 Voluntary initiatives internationally

In Europe, over 300 environmental agreements between industry and national governments had voluntarily been signed as of 1996 (ten Brink 199??, 1). The Netherlands has been one of Europe's leading countries in the application of voluntary initiatives. In 1989, the Netherlands' government set national goals for emission reductions of 50-70% by the year 2000 and 70-90% by the year 2010 compared to 1985 levels. The government invited industry to codevelop a means of achieving these goals. After much discussion, the government and industry associations signed a number of covenants which outlined the means by which these goals would be achieved. These covenants, being the legal equivalent of a contract under Dutch civil law, were entered into voluntarily by industry associations. This voluntary, cooperative approach to achieving environmental goals was more preferable to industry than leaving government to develop stringent environmental laws independent of industry's input (Parker 1996, 113).

In Australia, the Environmental Protection Authority (EPA) of the State of Victoria has introduced an Accredited Licensee Program. This program offers an alternative to the traditional permitting process, giving companies the opportunity to operate under a single permit as opposed to multiple permits, to fast-track through the 'work approval' process, and to report less frequently to the Victoria EPA. These advantages of voluntary participation are realized in return for the voluntary development of an environmental management system, an audit program, and an improvement plan. Although entry to the

program is entirely voluntary, the terms of participation are mandatory once voluntarily agreed to (ICF Kaiser 1998, 16).

The Environmental Protection Agency (EPA) of the United States has introduced a number of voluntary initiatives in the last decade. One such initiative is Project XL (e**X**cellence and **L**eadership). It offers regulatory flexibility for companies willing to voluntarily achieve environmental protection superior to that required under the existing regulatory system, including stakeholders in the process. For example, at its facility in Arizona, the Intel Corporation offered to reduce air emissions to below current standards, to recycle 65% of freshwater used, and to reduce 60% of the solid waste generated and 70% of the non-hazardous chemical wastes generated by the year 2000. In return, EPA replaced Intel's multiple permits with a single permit which defined a facility-wide cap on air emissions. This gave Intel the flexibility to make operational changes without having to apply for permit amendments first. Furthermore, Intel's reporting requirements were simplified from multiple submissions for different agencies to a single report for a state agency (United States, Environmental Protection Agency 1997, 5). These simplified regulatory requirements and operational flexibility translated into operational cost savings for Intel.

Additional EPA voluntary initiatives include the 33/50 program, to reduce the generation of 17 chemicals by 33% and 50% by 1992 and 1995 respectively. Its Green Lights program encouraged the use of energy efficient lighting. Under the Water Alliances for Voluntary Efficiency (WAVE) program, hotels, commercial buildings, and institutions are encouraged to retrofit facilities with water-efficient fixtures (Higgins 1995, 24).

There are many more examples of voluntary initiatives being used in Canada, North America, and around the world. There is a wide variation within and between countries in the range of parties developing the initiatives, the companies participating in the initiatives, the involvement of stakeholder groups, and the conditions of participation.

However, the overall concept is essentially the same, that of corporate environmental performance voluntarily improved beyond what is required by law.

2.4 Incentives for industry to participate

Why would industry voluntarily improve its environmental performance if it is not required by law? There are many incentives suggested in the literature. The most commonly cited incentives are:

- cost savings
- public image and market differentiation
- peer pressure
- due diligence concerns
- desire to avoid regulation

2.4.1 Cost savings

Cost savings can arise from improving process efficiencies while concurrently addressing environmental protection. When raw materials are used more efficiently, more product is made, and fewer waste products, often a source of pollution, are generated. For example, the 3M Company estimates that its "Pollution Prevention Pays" program has saved $750 million since 1975 in waste generation, eliminating 590,000 tons of pollutants (British Columbia, Ministry of Environment, Lands and Parks 1996b, 5).

Cost savings can also be realized by avoiding expensive regulatory measures imposed by government. Under the traditional command and control approach, industry must comply with defined environmental performance standards and protocols, regardless of cost. With voluntary initiatives, industry has the opportunity to develop more cost effective solutions based on industry's intimate knowledge of its own processes and materials (Overholt and Godsoe 1996, 4). Industry has more flexibility in determining how environmental objectives can be met.

2.4.2 **Public image and market differentiation**

By voluntarily improving their environmental performance through participation in a voluntary initiative, firms can differentiate themselves from their competitors and improve their public image, both locally and internationally. The importance of this incentive was recently illustrated in EPA's 33/50 program. Companies with higher advertising expenditures were significantly more likely to participate than those with lower advertising expenditures (Arora and Cason 1996, 431).

Even companies that meet all the required environmental standards may wish to improve their public relations by participating in a voluntary initiative. For example, Du Pont Corporation was listed as the largest polluter when the EPA released the first Toxic Release Inventory (TRI) information in 1988, even though all the discharges were permitted under existing regulations. This stain on Du Pont's public image stimulated a more proactive attitude within the company (Labatt and MacLaren 1998, 200).

2.4.3 **Peer pressure**

Industry sectors concerned with public image may apply significant pressure on individual companies to comply with a sector-wide code in order to improve the public image of the industry as a whole. For example, the Canadian Chemical Producers' Association's Responsible Care initiative was developed shortly after the Union Carbide accident in Bhopal, India, where 2,000 people were killed and thousands permanently injured from a toxic gas leak at a pesticide plant (Macdonald 1991, 116). Following this incident, public trust of the chemical producers' industry was extremely low. Now, all members of both the American and Canadian Chemical Producers' Associations must meet the Responsible Care standard (Nash and Ehrenfeld 1996, 19).

2.4.4 **Due diligence concerns**

Financial institutions, insurance companies, and the law courts increasingly require that companies be able to demonstrate due diligence in environmental protection[3]. Participation in a voluntary initiative can add to a company's due diligence defence in the case of environmental based litigation; in fact, voluntary initiatives may even contribute to the establishment of what comprises an appropriate legal standard of care. Companies that do not meet this standard are more vulnerable to costly environmental liabilities. Financial institutions and insurance companies are also likely to charge higher rates, or refuse to do business at all, with companies that do not meet an industry standard of care.

2.4.5 **Desire to avoid regulation**

Industry is often interested in developing voluntary initiatives if, for no other reason, than to avoid the tougher enforcement of existing regulations or the introduction of additional regulation. When government indicates that it is considering toughening the environmental protection regulations, industry would rather develop cost effective measures with some flexibility rather than have standards externally imposed by government that may be more costly and less effective (Canada, Industry Canada, Office of Consumer Affairs and Treasury Board Secretariat, Regulatory Affairs Division 1998). Companies that voluntarily develop such initiatives also benefit from better relations with regulators, facilitating future dealings and avoiding costly adversarial situations.

2.5 Arguments for and against voluntary initiatives

There are many arguments for and against the use of voluntary initiatives. Because voluntary initiatives are such a new approach, there is inadequate empirical evidence to

[3] A company demonstrating due diligence can be said to have taken every reasonable action to avoid an environmental offence. Current industry standards often define what constitutes reasonable action or reasonable care (Webb 1999, 33).

firmly support either viewpoint. However, the theory and limited experience to date do identify some of the important issues. These issues are:

- cost savings
- effectiveness
- cooperation
- innovation
- competition
- due diligence
- public involvement

2.5.1 Cost Savings

Voluntary initiatives could result in reduced government expenses for the costly development and approval of new regulations. In light of new information, standards set by the initiatives could be changed more quickly and cheaply than by altering existing regulation. Voluntary initiatives could have lower associated administration and implementation costs, with no enforcement costs (Labatt and MacLaren 1998, 202). Industry could have more flexibility to introduce more cost effective solutions to environmental problems. Both government and industry could save expensive litigation costs when further refining or enforcing existing environmental regulations (Arora and Cason 1996, 414).

Critics of voluntary initiatives argue that the negotiation and implementation of such initiatives could be very time consuming for government and industry, and not necessarily cheaper than developing new regulations. Once such initiatives are developed, they might only apply only to some sectors of industry, of which only some members participate. If not widely adopted, government may have to develop new regulation anyway to replace the voluntary initiative (Clark 1995, 19).[4] Furthermore, the flexibility of such initiatives introduces legal uncertainty which could lead to costly legal

[4] For example, Canada's previous Environment Minister, Christine Stewart recently added 18 chemicals to the Canadian Environmental Protection Act (CEPA) after voluntary measures failed to demonstrate adequate reductions in toxic releases (Vancouver Sun, March 20, 1999).

debates, offsetting any cost savings realized. In any case, cost savings alone are not always an adequate incentive to ensure industry adopts pollution control measures.[5] Even if a company decides to implement cost effective measures, voluntary initiatives may not provide adequate incentives for continual improvement (Labatt and MacLaren 1998, 203).

2.5.2 Effectiveness

Environmentally responsible companies could take the opportunity afforded by voluntary initiatives to make real changes in their own operations, freeing up government resources for more irresponsible companies, with the overall result of more effective environmental protection. Furthermore, as participating companies meet their voluntary goals, great environmental protection could be effected than might otherwise have been achieved[6].

However, even where participation in voluntary initiatives is high, the actual effectiveness of such initiatives will depend on the conditions of participation, the level of challenge in the targets set, and the level of compliance with the initiative (Labatt and Maclaren 1998, 203). Furthermore, because voluntary initiatives take place in the context of other laws and incentives, 'successes' of voluntary initiatives may not necessarily be attributable to the initiative itself[7]. In a recent review of five US EPA voluntary initiatives, researchers concluded that voluntary initiatives are ". . . doing little to improve the environment or regulatory system . . ." (Resources for the Future 1996).

[5] For instance, Dow Chemical identified a number of pollution prevention options what would have saved the company over $1 million per year and eliminated 500,000 pounds if waste, allowing the company to shut down a hazardous-waste incinerator. However, the benefits of this project did not outweigh those of other options for capital investment and the project was not implemented (Natural Life 1998, 10).

[6] For example, participants in the Responsible Care initiative realized a 50% reduction in total emission between 1992 and 1996 (Canadian Chemical Producers' Association 1996, 5). The US EPA's 33/50 program achieved its goal of a 50% reduction in the release of 17 toxic chemicals (based on 1988 levels) by 1994, one year ahead of schedule (Labatt and MacLaren 1998, 202).

[7] For example, the US EPA's 33/50 program proposed to reduce the release of 17 toxic chemicals 50% by the year 1995 based on 1988 levels. Although this goal was reached ahead of schedule in 1994, releases of these chemicals had already dropped by 30% from 1988 levels when the program was introduced in 1991 (Labatt and Maclaren 1998, 204).

2.5.3 Cooperation

Voluntary initiatives could develop a more cooperative approach to environmental protection than traditional adversarial approach of command and control. This could lead to better information exchange between government and industry, possibly resulting in more informed decisions. Industry could take on a greater leadership role in environmental protection, have some ownership of environmental successes. This leadership mindset would differ from the more traditional attitude where industry only did what was explicitly required.

However, in their efforts to negotiate these new standards, governments could be outnegotiated or captured by industry. When governments assist in developing or promoting voluntary initiatives, some would argue there are implication that industries involved will not be regulated further. If voluntary initiative proves to be unsuccessful, the cooperative goodwill established between government and industry could be lost when government resorts to introducing regulation. Some critics even argue that voluntary initiatives give industry the opportunity to write their own standards, become judges in their own cases (Overholt and Godsoe 1996, 5).

2.5.4 Innovation

Innovation and investment in new technologies could be stimulated by the flexibility of voluntary initiatives. The diffusion of such technologies and best management practices could be encouraged within industry by increased communication (Canada, Industry Canada, Office of Consumer Affairs and Treasury Board Secretariat, Regulatory Affairs Division 1998).

However, innovation may not necessarily be stimulated; in fact, voluntary initiatives may result in less innovation as there is no urgent, legal need for new technologies. The right kind of regulation could actually drive competitiveness and innovation, not suppress it (Porter and van der Linde 1995).

2.5.5 Competition

Companies that participate in voluntary initiatives could have a competitive edge over other companies as a result of more efficient operations and better public image. Voluntary initiatives could lead to a more competitive economic climate, encouraging effective and efficient operations (International Institute for Sustainable Development and Canadian Environmental Technology Advancement Corporation - West 1998, xv).

However, there is a concern that some voluntary initiatives could be anti-competitive, in violation of the *Competition Act.* Such initiatives should not be used in a way "that substantially reduces competition, prevents non-participating firms from entering the market or negatively affects consumers by significantly raising prices, reducing service or limiting product choice" (Canada, Industry Canada, Office of Consumer Affairs and Treasury Board Secretariat, Regulatory Affairs Division 1998).

2.5.6 Due diligence

Voluntary initiatives could assist in developing the standard for due diligence (Canada, Industry Canada, Office of Consumer Affairs and Treasury Board Secretariat, Regulatory Affairs Division 1998). However, the level of due diligence provided by participation in a voluntary initiative may be misleading, giving industry a false sense of security, and possibly resulting to unexpected liabilities (Clark 1995, 21).

2.5.7 Public involvement

Voluntary initiatives provide an opportunity for greater public involvement, for improved communication between government, industry and the publics. Public involvement in the development, implementation and monitoring of voluntary initiatives can add credibility to an initiative that might otherwise be considered a coconspiracy between government and industry.

However, not all voluntary initiatives include public involvement; of those that do, not all involvement is actually meaningful. Where the publics are not included in the initiative, the public credibility of that initiative can be called into question and an opportunity for public trust lost (Lukasik 1999, 145).

2.6 Elements of a successful voluntary initiative

There is no clear consensus on whether voluntary initiatives are an improvement on, or an important addition to, more traditional command and control approaches. This is partially because voluntary initiatives are a new concept; there is not much evidence to support statements either for or against them. The current ambiguity can also be attributed to the fact that so many different kinds of voluntary initiatives have been introduced. Some well conceived and designed initiatives have been a success, attracting widespread participation and earning public credibility. An example of such an initiative is the CCPA's Responsible Care program (Moffet and Bregha 1999, 85). Others have failed to attract much participation or public credibility, leaving observers either nonplussed or critical of voluntary initiatives in general. The Canadian Industry Packaging Stewardship Initiative is such an initiative (Chang, Macdonald and Wolfson 1999, 125).

Nonetheless, there is much momentum behind this new approach to environmental protection. A number of parties from many stakeholder groups are taking an increasing interest in voluntary initiatives. Recognizing the growing role of voluntary initiatives, these stakeholders have presented arguments for and against their use, and proposed design elements necessary for effective, efficient, and credible voluntary initiatives.

In this study, the elements proposed by a wide range of stakeholders were reviewed. This group included nongovernment organizations such as ToBI and the Canadian Institute for Environmental Law & Policy, business organizations such as the BC Business Council

and New Directions Group (an informal forum of business and environmental organizations), government offices such as Industry Canada and the Commission to the Council and the European Parliament on Environmental Agreements, as well as a number of independent authors, academic and otherwise. In reviewing this literature, it becomes apparent that a number of similar elements have been proposed by most interested stakeholders. As such, a sort of consensus seemed to emerge as to what are the most important elements of a voluntary initiative. These elements are summarized in the following table. A discussion of each element follows.

Table 1. Elements of a successful voluntary initiative

1. SUFFICIENT ADVANTAGES OF PARTICIPATION.
• There should be sufficient advantages of participation to ensure broad participation and long-term compliance. These advantages can be inherent to the initiative, such as cost savings, or external to the initiative, such as subsidies. • Free riders should be discouraged.
2. PARTICIPANT COMMITMENT TO INITIATIVE.
• Participants should be committed to the initiative, agreeing that it is an appropriate means of meeting environmental objectives. • Participants demonstrate commitment through explicit statements and regular involvement of senior leaders, dissemination of the principles of the initiative internally throughout the organization staff and externally to suppliers and clients, the allocation of adequate resources to the initiative, and the integration of the initiative in the policies, procedures, and measured indicators of success.
3. GROUND RULES.
• Clear goals, objectives, targets, and timeframes should be established prior to beginning an initiative. • Roles and responsibilities of all participants should be clearly defined. • There should a clear understanding of the legal implications of participation. • A transparent and effective dispute resolution mechanism should be established. • Rewards and sanctions, or lack thereof, should be specified prior to beginning an initiative.
4. CREDIBILITY.
• External stakeholders should be able to meaningfully participate in the development, implementation, and monitoring of an initiative. • The design and operation of an initiative should be transparent, that is, open to interested parties. • Initiatives should include adequate monitoring of appropriate performance indicators with third party verification, where appropriate, and regular, public reporting of results.
5. FLEXIBILITY AND INNOVATION.
• Initiatives should enable and encourage flexibility and innovation.
6. SUPPORTIVE POLICY FRAMEWORK.
• Initiatives should be positioned within an overall policy framework as a substitute for, or compliment to, other policy tools.

2.6.1 **Sufficient advantages of participation**

In order to attract companies to an initiative, encourage its adoption by those companies, and ensure long term participation and compliance with an initiative, there must be sufficient advantages of participation. These advantages can be inherent to the process, such as cost savings, improved process efficiencies, and better public relations. Advantages can also be external to an initiative. Such external incentives can be "carrots," such as subsidies, tax breaks, or some form of regulatory relief. External incentives can also be "sticks," such as the threat of tougher environmental regulation (ten Brink 1998). In many cases, the credible threat of regulation is said to drive voluntary action (Riordan 1997). The advantages of participation should encourage continual improvement not only at the beginning of an initiative, but in the long term as well (New Directions Group 1997).

Where voluntary initiatives apply specifically to a certain industry sector, free riders should be discouraged; there should be negative repercussions for failing to join or comply with an initiative (Canada, Industry Canada, Office of Consumer Affairs and Treasury Board Secretariat, Regulatory Affairs Division 1998). Free riders are companies that benefit from a voluntary initiative, such as enjoying overall improved industry sector public relations, without actually making any or much effort to contribute to the initiative.

2.6.2 **Participant commitment to process**

In order for a voluntary initiative to be effective, participants should commit to an initiative, should "buy in" to the process (Canada, Industry Canada, Office of Consumer Affairs and Treasury Board Secretariat, Regulatory Affairs Division 1998). In order to achieve this level of commitment, participants should agree that an initiative is an appropriate means of meeting the overall environmental objectives (New Directions Group 1997).

Participants can demonstrate commitment through explicit statements and regular involvement of senior leaders (Resources Futures International 1996). The principles of an initiative should be disseminated internally throughout the organization staff as well as externally to suppliers and clients (ten Brink 1998). The objective of an initiative should be integrated into the policies and procedures of a company, as well as the choice of success indicators (ToBI 1999). Adequate resources, especially people, time, and money, should be allocated to an initiative (New Directions Group 1997).

2.6.3 **Ground rules**

In order for all stakeholders to have a common understanding of what a given voluntary initiative entails, ground rules for participation must be clearly defined. Easily measurable, clear goals, objectives, targets, and timeframes should be established prior to beginning an initiative (New Directions Group 1997). In this way, the expectations of participants are transparent. External stakeholders can check on the progress and performance of participants compared to the program objectives. The targets set should be update-able so that they represent more than just business as usual, that is, targets that would have been met even without the initiative (ten Brink 1998).

Similarly, the roles and responsibilities of all participants, be they government, industry or public representatives, should be clearly defined (New Directions Group 1997). In this manner, effective communication and common expectations can be more clearly established.

A clear understanding of the legal implications of participation should be established prior to beginning an initiative. Although an initiative may be entered into voluntarily, there may be legal implications arising from information disclosed, for example unknown spills, or legal responsibilities, such as previously unreported discharge sites. In order for industry participants to have a clear understanding of what participation entails, such

legal uncertainties should be addressed before beginning an initiative. This is also important for common expectations among other stakeholders.

A transparent and effective dispute resolution mechanism should be established prior to beginning an initiative (Canada, Industry Canada, Office of Consumer Affairs and Treasury Board Secretariat, Regulatory Affairs Division 1998). Should any disagreement arise regarding the expectations of participants, a dispute resolution mechanism, commonly agreed upon prior to beginning an initiative, could be critical in resolving the dispute. Such mechanisms could be not only for complaints related to industry's efforts in the voluntary initiative, but could also address concerns about the commitment of government and public stakeholders to the process.

Rewards and sanctions for a certain level of achievement should be specified prior to beginning an initiative (New Directions Group 1998). For example, rewards could include public recognition programs, reduced regulatory administrative requirements, or reduced regulatory fees. Where the rewards for participation are only those inherent to a program, such as better public relations or improved process efficiency, it is important there is a common understanding that no additional awards will be made.

Similarly, expectations regarding sanctions for not meeting a certain level of achievement should be clearly understood. Such sanctions could include fines, warnings, or a mandatory withdrawal from a program. Sanctions are important in defining what participation in a given program actually entails, gives meaning and credibility to participation; without sanctions, participation in a program could imply great commitment and effort or no effort at all. In some circumstances, program developers may determine that formal sanctions are not appropriate for a program's objectives. In this case, the absence of sanctions should be acknowledged, while any implied, informal sanctions understood.

2.6.4 Credibility

External stakeholders should be able to meaningfully participate in the development, implementation, and monitoring of an initiative. External stakeholders are persons affected in some manner by an initiative who are not industry or government representatives directly involved in developing a voluntary initiative. For example, external stakeholders could include any other levels of government not already involved, nongovernment organizations, and members of the public at large. Such stakeholders should be included to voice concerns, provide suggestions, and observe the process. Without such external stakeholder participation, voluntary initiatives devised between government and industry alone may have little credibility; external stakeholders might suspect that a government agency was "captured" by industry.

Not all external stakeholders will necessarily be interested or able to participate in the development, implementation, and monitoring of an initiative. Nonetheless, information about an initiative should be easily available for such stakeholders. The process should be transparent, that is, information necessarily to ensure the credibility of a program and its participants should be publicly available.

The adequate monitoring of appropriate performance indicators should be required. Appropriate performance indicators should be chosen as a means of measuring progress of program objectives and targets. Adequate monitoring of these indicators is necessary to clearly identify any progress or lack thereof in achieving program objectives and targets against their respective timelines. Where appropriate, there should be third party verification of these monitoring results, a party qualified to comment without bias on the monitoring procedures and results (Lynes and Gibson 1998, 19). This can be important to ensure credibility of results.

Regular, public reporting of results should be part of an initiative (ToBI 1999). What will be reported and how often should be determined prior to beginning an initiative and required as part of participation. Regular reporting of results, as opposed to intermittent

reporting, is important so that all participants have a common understanding and expectation as to what information will be made available and how often.

2.6.5 **Flexibility and innovation**

A key advantage of voluntary initiatives is the flexibility they can allow, a defining difference from the command and control approach. Flexibility enables participants, industry and government alike, to consider new alternatives and creative solutions. Programs should be designed with adequate flexibility to enable and encourage innovation. Such innovation could be in process, operations, management, or administration.

2.6.6 **Supportive policy framework**

A voluntary initiative does not exist in isolation. There are often many other government policy tools, such as regulations, as well as other incentive structures, such as those related to corporate public image, that influence the effectiveness of a voluntary initiative. The initiative should be designed in light of these other factors and positioned within a supportive policy framework (New Directions Group 1998). A voluntary initiative can be used as a substitute for or a compliment to other policy initiatives (ten Brink 1998). Other complimentary regulatory and civil mechanisms should be used to achieve the policy objectives where an initiative falls short (ToBI 1999).

2.7 Case study

Voluntary initiatives are an interesting alternative to or compliment of more traditional command and control, regulatory approaches to environmental protection. These initiatives are increasingly attracting the attention of governments, industry, nongovernment organizations, and publics around the world.

Locally, the Ministry of Environment, Lands and Parks in British Columbia is considering alternatives to the existing command and control based regulatory structure.

Although the future of any such alternatives is as yet uncertain, voluntary initiatives may have an important role to play in such changes.

The following chapter considers the history of command and control in British Columbia and the proposed changes to this approach. A new process, recently tested with seven industrial companies, is also described. This process is significant at it may be introduced as a voluntary initiative for industrial companies throughout British Columbia.

Chapter 3 BRITISH COLUMBIA

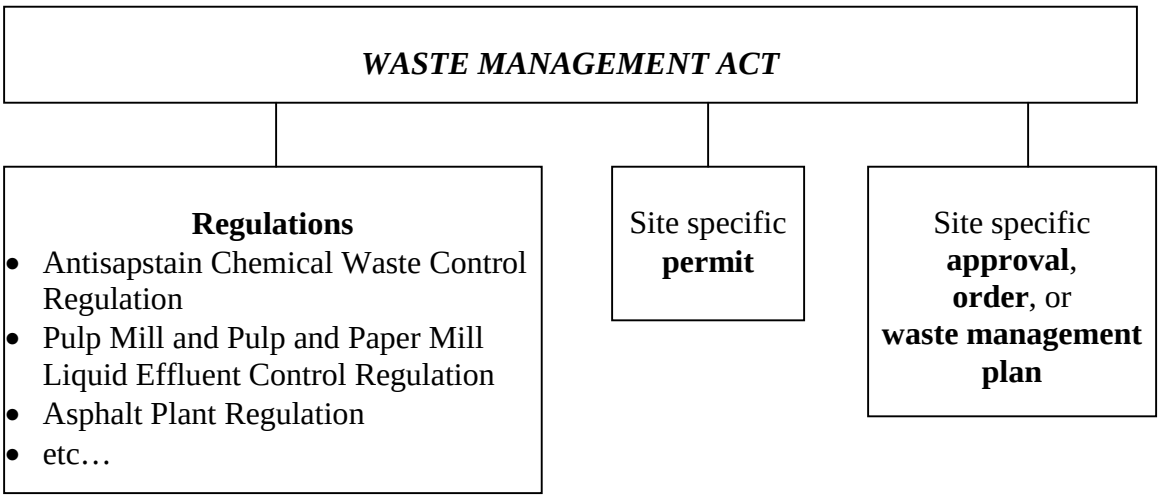
In British Columbia, the Ministry of Environment, Lands and Parks (MELP) has the mandate for environmental protection in the province. Specifically, "The Ministry of Environment, Lands and Parks is responsible for the management, protection, and enhancement of British Columbia's environment. This includes the protection, conservation and management of provincial fish, wildlife, water, land and air resources; . . ." (British Columbia, Ministry of Environment, Lands and Parks 1995).

3.1 Current environmental protection approach for major industrial facilities

With regard to major industrial facilities, MELP has primarily used legislation based tools to fulfil its mandate, the most important of which is the *Waste Management Act*. This act prohibits almost all discharges of waste to the environment except "(5)(a) the disposition of waste in compliance with a valid and subsisting permit, approval, order or regulation, or with a waste management plan approved by the Minister". As such, the *Waste Management Act* is the overarching legislation for environmental protection.

There are over 30 regulations pursuant to the *Waste Management Act*. For example, the *Antisapstain Chemical Waste Control Regulation* and the *Pulp Mill and Pulp and Paper Mill Liquid Effluent Control Regulation* are both pursuant to the *Waste Management Act.* Such regulations apply to all relevant industries in British Columbia, whether or not individual companies are specifically named. In contrast permits, approvals, orders, or waste management plans apply only to the company and facility site named. Industry can discharge waste either as allowed by a regulation, or in accordance with an approved site-specific permit, approval, order, or waste management plan. The various authorizations to discharge waste under the *Waste Management Act* are shown in figure 3. For major industrial sites in BC, wastes are primarily discharged under the authorization of a permit or a regulation.

Figure 3 Authorization to discharge waste



Permits must be renewed periodically. They are typically media specific so that a single facility will have separate permits for air, water, and land waste discharges. Permits usually apply to the point of discharge, or the "end-of-pipe." Each permit requires the facility to periodically monitor the wastes discharged and to report the monitoring results to MELP.

Permits usually define performance-based standards, such as what contaminants can be discharged, at what concentrations and rates. For example, a wastewater discharge permit might allow the discharge of a wastewater with a BOD (biochemical oxygen demand) no greater than 100 mg/L and AOX (halogenated organic compounds) no greater than 1.5 kg/ADt (air dry tonne of pulp product). In some cases, the standards set by government correspond to a specific technology, so that the performance-based standards are, in effect, design-based standards. For example, in order to achieve the performance-based standard of 1.5 kg AOX/ADt, a company might have to install the specific equipment that has been proven to meet this standard.

This current approach to environmental protection for major industrial sites in British Columbia is often referred to as one of command and control. The ministry defines the standards that industry must meet, and can enforce these standards in a criminal court

when companies violate their authorized discharges. In practice, BC's approach to environmental protection may be better described as negotiation and bargaining. Permits are more often developed and enforced through negotiation and bargaining between government and industry, rather than government unilaterally defining and enforcing standards. Permit standards are set and enforced by regional managers who may be subject to significant public and political pressure not to jeopardize a local industry. Shrinking government resources limit the number of site inspections and sampling that the ministry can afford; much sampling of discharges is carried out and paid for by permitted companies, not government agents. A review of Canadian environmental regulation concluded ". . . the norms of conduct are the subject of negotiation and renegotiation between the regulator and the regulated right down to the moment of compliance or non-compliance" (Thompson 1980, 33). Nonetheless, the formal institutional arrangements for setting discharge standards and enforcing those standards are founded on a command and control approach.

3.2 A call for change in British Columbia

In 1992, MELP published a white-paper considering new approaches to environmental protection in British Columbia. This paper referred to the *Waste Management Act* as an "outdated 'end-of-pipe' regulatory approach" (British Columbia, Ministry of Environment, Lands and Parks 1992a, 3). The existing system was criticized for focusing on waste management, not on waste prevention, and for limiting the ministry in its ability to find creative solutions for pollution abatement. With respect to the performance of existing environmental protection measures, the paper remarks that "despite enormous expenditures and good will, our efforts to abate pollution have not been successful" (British Columbia, Ministry of Environment, Lands and Parks 1992a ,16).

This paper called for a shift of emphasis from pollution control to pollution prevention. As one of its recommendations, this paper suggested that a comprehensive pollution prevention strategy be established, and that the ministry's activities no longer be

restricted to waste management. Voluntary stewardship and partnerships with others should be included in this new approach, maintaining the ministry's authority to make regulations as necessary (British Columbia, Ministry of Environment, Lands and Parks 1992a, 19).

That same year, MELP's Environmental Protection Program announced a 5 year action plan (British Columbia, Ministry of Environment, Lands and Parks, 1992b). Two of the strategic actions for the private sector included the following:

- "require individual companies and industry sectors to develop 5-year plans for pollution prevention and the 5R's" (***r**educe, **r**euse, **r**ecycle, **r**ecover useful materials and energy, and **r**esidual waste management*);
- "develop partnerships with industry to find solutions including nonregulatory solutions to pollution prevention and the 5R's"

In 1995, the ministry contracted a management consulting firm, KPMG, to conduct an evaluation of its waste management permit system and provide recommendations for change (KPMG 1995). This report identified a number of strengths and weaknesses of the existing permit system. Although the existing system could be changed to address some of its shortcomings, KPMG noted that it would still be resource intensive and have some logical inconsistencies. Instead, a new "hybrid" model was suggested to replace the existing system.

With this hybrid model, organizations would be classified according to their complexity, uniqueness, and the quantity and quality of their discharges. For small and medium sized organizations, a depermitting approach would be taken. Permits for these facilities would be dissolved and replaced by industry-wide regulations. For larger, more complex organizations, a combination of discharge standards, pollution prevention plans, and operations certificates would be used (KPMG 1995, 8).

3.3 BC's pollution prevention planning initiative

The ministry set out to develop a new approach to environmental protection that incorporated the objectives identified in the five-year plan, addressed the identified shortcomings of the existing system, and took into consideration recommendations of the KPMG study. As a result of these efforts, MELP announced a new industrial pollution prevention (P2) program in March of 1996, developed in conjunction with several industry representatives (British Columbia, Ministry of Environment, Lands and Parks 1996a). The new program is described in MELP's *An Introduction to Pollution Prevention Planning for Major Industrial Operations in British Columbia* (British Columbia, Ministry of Environment, Lands and Parks 1996b). Pollution prevention is described in this document as "avoiding, eliminating and reducing pollution at source rather than treating or containing it after it has been created."

In this initiative, industry participants are to develop a plan for realizing pollution prevention at their specific facility according to a P2 planning process. The P2 planning process as initially defined consists of five components. These five components are described in figure 4. Input for each plan from the public is acquired through a public advisory committee (PAC).

Figure 4 BC's P2 planning process

1. Initiate P2 planning process

- Establish terms of reference
- Form coordinating committee (facility staff only)
- Form public advisory committee (PAC)

2. Environmental Review

- Assess state of receiving environment, management and operational systems of industrial site to identify opportunities to prevent pollution.
- Assess options for environmental, technical and financial merits.
- Prioritize options for future action.

3. P2 Plan

Develop and document a P2 plan identifying options to be implemented and corresponding timeframes.

4. Authorization

- Submit plan to MELP
- MELP considers consistency, comprehensiveness and thoroughness of plan.
- One approved, authorization replaces previously granted permits and approvals.

5. Monitor and Evaluate

- Monitor and evaluate progress of plan.
- Report on progress, making report available to public. Report is subject to verification by ministry.

(adapted from British Columbia, Ministry of Environment, Lands and Parks 1996b, 1997)

The P2 planning process was designed to be one of continual improvement, not just a single iteration process. Once an initial P2 plan is developed, implemented, and evaluated, the lessons from this process are to be incorporated into the next cycle of the process, where further options for pollution prevention are identified.

In introducing P2 planning, MELP acknowledged the need for a more flexible regulatory system, a system that improves environmental protection while reducing the administrative costs of the existing 'end-of-pipe' permit system. Pollution prevention planning was proposed as part of the solution to the shortcomings of the existing system. "End-of-pipe" permits were to be replaced ultimately by regulations and pollution prevention plans (British Columbia, Ministry of Environment, Lands and Parks 1996a, 7).

P2 planning offers many potential advantages over the existing end-of-pipe permitting system. P2 planning is not limited in scope to end-of-pipe performance standards or technology-specific design standards. P2 is about all possible sources of pollution, not just point sources, and all possible options for addressing pollution, not just government approved technologies. Pollution prevention is inherently proactive through its emphasis on prevention, not reactive in managing pollution once it has already been created. Furthermore, pollution prevention involves a comprehensive, facility-wide approach to environmental protection. As such, it avoids the inconsistencies that can arise when managing discharges to air, water, and land separately.

In considering pollution prevention as an alternative or compliment to the existing command and control approach, government and industry have the opportunity to work together to seek solutions. The historic adversarial relationship between these stakeholders could be transformed into a more cooperative relationship. With a more open exchange of information, more efficient and effective measures for environmental protection could be achieved.

More public involvement is also incorporated into the P2 planning process through public advisory committee's. This gives the publics an opportunity to participate in the development of environmental protection measures, not just react to measures once they have been implemented. Furthermore, a more open communication between the publics, government, and industry could lead to a better understanding of priorities, limitations, and possibilities.

3.4 The P2 planning demonstration project

When introducing the P2 planning process in 1996, MELP concurrently launched a P2 planning demonstration project with five volunteer industry companies. These companies had been working with MELP since 1993, actively discussing such an initiative. Both industry and government agreed that "there could be mutual benefit in a system that would encourage the prevention of pollution, broaden the scope of environmental management, reduce the costs of, or offer alternatives to, the permitting process and be more sensitive to community interests" (British Columbia, Pollution Prevention Demonstration Project Steering Committee 1997, 1).

The purpose and objectives of the British Columbia P2 demonstration project were described in a memorandum of understanding (MOU). The main goal of the parties was "to determine whether P2 planning could contribute to achieving a better standard of environmental protection while accommodating social and economic concerns and priorities" (British Columbia, Pollution Prevention Demonstration Project Steering Committee 1999, 3). The original signatories of the MOU were MELP, Cominco Ltd., Fletcher Challenge Canada Ltd., Tilbury Cement Ltd., Westcoast Energy Inc., the Canadian Chemical Producers' Association (CCPA), and a CCPA member, FMC of Canada Ltd. Alcan Smelters and Chemicals Ltd. joined the MOU in 1996. Riverside forest products, although never formally becoming a signatory to the MOU, also participated in the demonstration project. In total, seven companies participated in this demonstration project.

As part of the demonstration project, each company agreed to conduct a pilot project at one or more test sites in BC. The test sites for the demonstration project are listed in table 2.

Table 2. Test sites for P2 planning demonstration project

Company	Pilot project site
Alcan Smelters and Chemicals Ltd.	Kitimat aluminum smelter (total site)
Canadian Chemical Producers Association (CCPA) with representative member, FMC of Canada Ltd.	Prince George hydrogen peroxide manufacturing plant (total site)
Cominco Ltd.	Trail fertilizer operation (part of Trail site)
Fletcher Challenge Canada Ltd.	Elk Falls pulp and paper mill (total site)
Riverside Forest Products Ltd.	Lumby mill (total site) Armstrong mill (total site) Kelowna mill (total site)
Tilbury Cement Ltd.	Delta cement plant (total site)
Westcoast Energy Inc.	Fort Nelson natural gas processing plant (total site)

A steering committee consisting of MOU signatories from both government and industry was formed to guide the P2 pilot projects and provide a forum to exchange experiences. This group met periodically to discuss developments, occasionally inviting other stakeholders to contribute. This steering group reported on their experiences in an *Interim Report* and a *Final Report* (British Columbia, Pollution Prevention Demonstration Project Steering Committee 1997, 1999).

As of July 1999, four of the seven participating companies had completed P2 plans according to BC's P2 planning process (Alcan, FMC, Riverside Forest Products, and Westcoast Energy). One company was nearing completion (Tilbury Cement). The two remaining companies had started P2 planning, but determined during the process that a different approach was more suitable for their facilities (Cominco, Fletcher Challenge). Cominco decided that for the Trail fertilizer operation, "the ISO-EMS *(environmental management system)* approach is best suited to the Trail situation" (Cominco Ltd. 1999, 1). Fletcher Challenge, following a ten-month labor dispute and dramatic management restructuring, decided to implement a "Waste Reduction Initiative" instead of pursuing BC's P2 planning process (Easton 1999). Both companies are of the opinion that the process followed was not necessarily BC's P2 planning process, but the overall objective of pollution prevention was met nonetheless.

Although P2 planning was intended to eventually replace permits and regulations as a mandatory authorization for major industrial sites (step 4 of figure 4), entry into the demonstration project was voluntary. Parties were free to withdraw from the MOU and the project at any time. During the course of the demonstration project, the issue of whether P2 planning should be mandatory or voluntary was considered. In the final report, the steering committee concluded that "After much discussion, a general consensus was reached that entry into the process should be voluntary" (British Columbia, Pollution Prevention Demonstration Project Steering Committee 1999, 4). It was felt that little could be gained by forcing companies to develop P2 plans. A comprehensive P2 plan, the beneficial effects of long-term planning through a detailed facility review, and the rethinking of old assumptions were unlikely to be achieved by unwilling participants. In its final recommendations, the steering committee suggested that the permitting regulatory regime be maintained "either as an alternative to or to complement P2 planning" (British Columbia, Pollution Prevention Demonstration Project Steering Committee 1999, 24).

3.5 Future of P2 planning in BC

Based on these developments over the last ten years, there is clearly an interest in changing MELP's traditional approach to environmental protection for major industrial operations. The P2 planning initiative is a manifestation of this interest. Following the completion of the P2 planning demonstration project, MELP is currently developing an implementation committee to further consider how P2 planning should or could be incorporated into the existing policy framework and made available to companies throughout BC (Fast 1999).

At the conclusion of the P2 planning demonstration project, the suggestion was made that the process be considered as a voluntary initiative in British Columbia. The possibility of P2 planning as a voluntary initiative for major industrial operations is the focus of this study. The following chapter describes the questions asked and the methodology used in studying this possibility.

Chapter 4 STUDY QUESTIONS AND METHODOLOGY

The future role of BC's P2 planning process is as yet unclear in the overall policy framework for environmental protection at major industrial sites. It seems possible that P2 planning could become a voluntary measure for companies interested in investigating the benefits of pollution prevention and improving their environmental performance beyond the minimum standard defined by regulations and permits. Although the process was originally intended to replace the existing permitting and regulatory system, P2 planning may instead become a compliance plus, voluntary option for companies. If this is indeed the case, P2 planning will essentially become a voluntary initiative.

This study considers the possibility of P2 planning as a voluntary initiative in BC, looking at two key issues: why companies would participate in such a voluntary initiative and whether the planning process as developed to date includes design elements considered important for a successful voluntary initiative. Many opinions are voiced in the literature regarding these aspects of voluntary initiatives. Furthermore, some direct experience in these areas has now been gained by the voluntary participants of the demonstration project. Using the following two questions, this study tries to better understand these two key issues in a BC context and provide some insights into the P2 planning process.

4.1 Study question #1

Why would industry voluntarily participate in BC's P2 planning process?

How important were the incentives described in the literature to the participation of BC companies in the P2 planning demonstration project? If P2 planning becomes a voluntary initiative in BC, why would companies agree to participate? The fact that seven companies in BC already volunteered a total of nine facilities to try the P2 planning

process suggests that there at least are some perceived advantages of participation. This study question endeavors to find out what these advantages are.

4.2 Study question #2

Does the P2 planning process developed to date include design elements suggested in the literature for successful voluntary initiatives?

As summarized in table 1, section 2.6, *Elements of a successful voluntary initiative*, there are six design elements commonly recommended in the literature for voluntary initiatives. If P2 planning is to become a successful voluntary initiative in BC, it could be useful to consider the experiences of the demonstration project participants in light of these elements.

This study evaluated the process in light of the first five elements: sufficient advantages of participation; participant commitment to initiative; ground rules; credibility; and flexibility and innovation. However, the sixth element, a supportive policy framework, was not considered. Given the preliminary nature of the P2 planning demonstration project, and the fact that this was a pilot and not the final incarnation of the P2 planning process, it seemed inappropriate to evaluate this aspect of the process. Although a supportive policy framework is an extremely important element to consider, this demonstration project was primarily concerned with the more preliminary step of developing the P2 planning process.

4.3 Methodology

Questionnaires and interviews with the P2 planning demonstration project participants were used to find answers to both study questions. An introduction to this study and the questionnaires was given to all potential questionnaire respondents. This introduction is reproduced in appendix A.

4.3.1 **Study question #1**

For question #1, inquiries were made of industry participants only. The questionnaire used to answer study question #1, *Questionnaire A*, is attached in appendix B. This questionnaire asked about a company's incentives and disincentives prior to participating in P2 planning, about the advantages and disadvantages experienced as part of participation, about the companies' interest in similar initiatives, and whether or not the company would participate in the P2 planning process again.

A representative for each of the seven participating industrial companies was asked to complete the questionnaire. The questionnaire respondent was ideally to be the company representative who committed the company to the demonstration project by signing the MOU, as well as the person who oversaw the company's involvement in the P2 planning process. However, an individual with such characteristics was not always available because of varying responsibility allocation within the companies and staff turnover. Where no one such individual was available, the company representative who best fit the description was asked to complete the questionnaire. General titles of respondents included vice presidents of environmental affairs, environmental superintendents and supervisors, and plant managers.

In addition to the seven participating industrial companies, a Canadian Chemical Producers' Association (CCPA) representative was also asked to complete the questionnaire. CCPA helped develop the P2 planning process, was a signatory to the original MOU, and an active participant in the demonstration project steering committee. Because of the CCPA's detailed involvement and experience with BC's P2 planning process, it was decided that the association's input to this survey would be valuable.

The sample group did not include all industry representatives involved in P2 planning. In each company, several to many additional individuals were involved in developing the individual P2 plan. Only one or two of these individuals answered this questionnaire.

4.3.2 **Study question #2**

For question #2, inquiries were made of industry, government and public participants in the P2 planning demonstration project. The questionnaire used to answer study question #2, *Questionnaire B*, is attached in appendix C. This questionnaire inquired as to the participants' opinions regarding a number of aspects of the BC P2 planning process. Respondents were asked whether they agreed or disagreed that the first five design elements listed in table 1, section 2.6, were included in the P2 planning process. Respondents were also asked whether or not they thought those elements were important. This question regarding the importance of various elements was included to differentiate between what was commonly recommended in the literature and what participants thought was relevant. Respondents from all three stakeholder groups, industry, government, and the public, were asked to answer the same questionnaire.

Representatives of the seven industrial companies participating in the demonstration project answered the questions as industrial stakeholders. In most cases, the same individual answered both the questionnaire for question #1 and for question #2. However, in several cases, a different individual was recommended by the company to answer the second questionnaire. This second individual was typically someone who was more involved with workings of the P2 planning process than the more senior manager who had answered the first questionnaire. A representative from the CCPA was also asked to complete this second questionnaire as an industry spokesperson.

Government stakeholders were represented by MELP employees. Representatives of the MELP head office in Victoria, where the P2 planning process was initiated and promoted, as well as regional MELP office representatives who had been involved with individual P2 plans in their regions, were invited to answer the questionnaire. Government respondents were identified in discussion with several MELP employees from the head office.

Members of public advisory committees (PAC's) were asked to represent public stakeholders. In order to identify PAC members, the industrial company representatives were asked to provide a number of contact names of members of their PAC's[8]. A member of each PAC was randomly chosen from the names provided and contacted. These PAC members were asked if they had attended most of the PAC meetings and whether they felt they could comment in an informed manner on the PAC experience. In all cases, the respondents agreed that they met these criteria. These seven PAC members, one from each industry PAC, were also asked to complete the questionnaire.

The sample group did not include every industry, government, or PAC member involved in P2 planning. For each of these stakeholder groups, many more individuals were involved. Only a subgroup of the total population involved responded to the questionnaires.

4.3.3 **Questionnaire design and application**

In order to encourage participation in this study, it was desirable to design a questionnaire for which it would be easy for respondents to provide answers. The ease with which responses could be coded and represented in the final report was also considered. As such, a primarily close-ended question style was chosen, presenting respondents with a choice of answers from an ordered list (Salant and Dillman 1987). In almost every case, the questionnaire made a statement. Respondents were then asked to what degree they agreed or disagreed with the statement, or how important or unimportant they thought was the design element referred to in the statement.

One open-ended question was used in *Questionnaire B.* This question asked what advantages the respondents felt would be most effective in encouraging participation in the P2 planning process. Several examples were given of possible incentives such as

[8] MELP was originally asked for a PAC member contact list. MELP directed this inquiry to the individual participating companies.

public recognition programs. The inquiry was made in this manner in order to solicit strong opinions and ideas from all three stakeholder groups.

Based on conversations with many program participants and the literature regarding voluntary initiatives, a draft questionnaire for each of the two study questions was developed. This first questionnaire, designed for industry participants only, was pretested by an industry participant and a representative of CCPA. The second questionnaire, designed for all three stakeholder groups, was pretested by a representative of each stakeholder group as well as a representative of CCPA. Extremely useful comments regarding the questionnaire design and statements were received as a result of this pretesting. After considering these comments and reconsidering some aspects of the analytical framework, the final questionnaires were developed.

Because only a subgroup of all stakeholders involved in P2 planning was identified as potential respondents, it was important that as many as possible of those identified actually responded to the questionnaires. Given the busy schedule of so many of the participants, a questionnaire delivered and returned by mail was unlikely to receive a high response rate. Instead, respondents were sent copies of the questionnaire(s) by email, fax, or mail. Potential respondents could then consider the questionnaire(s) at their convenience, and decide whether or not they wanted to participate in the study. Following distribution of the questionnaire(s), follow-up telephone calls were made to determine who was interested in participating, and, where appropriate, to arrange a time to record responses over the telephone at a convenient time. With this approach, it was quickly evident who was interested in participating in the study, and possible to collect responses shortly after distributing the questionnaire. The telephone conversations also afforded respondents the opportunity to voice opinions or comments relevant to issues raised in the questionnaire.

Industry respondents received *Questionnaires A* and *B* (appendices B and C), while government and PAC representatives received *Questionnaire B* only. Most respondents'

replies to the questionnaires were collected during telephone interviews. These interviews were typically one half to an hour long, depending on the amount of discussion the respondent was interested in pursuing in addition to answering the questionnaire. Two government and two industry respondents preferred to respond to the questionnaires via fax or email instead of telephone. Additional comments from these respondents were included in their returned questionnaires.

The questionnaires were distributed at the beginning of June, 1999. Responses were collected during June and July of 1999. These responses were tabulated on a spreadsheet and summarized in table format. Additional comments made by respondents in answering the questionnaire were compiled. The results collected in this study, and a discussion of these results, follow.

Chapter 5 RESULTS AND DISCUSSION

BC's P2 planning process was recently tried by seven industrial companies at a total of nine test facilities. This pilot was voluntarily entered into by the participating companies, in addition to their existing regulatory environmental requirements. Based on the results of this pilot, P2 planning is currently being considered as a voluntary initiative for industrial sites throughout British Columbia. In light of this potentially important role of P2 planning, this study investigated two key questions.

1: Why would industry voluntarily participate in BC's P2 planning process?

2: Does the P2 planning process developed to date include design elements suggested in the literature for successful voluntary initiatives?

This chapter discusses answers to these questions based on comments received from government, industry, and public participants in the P2 planning demonstration project. Questionnaires were the instrument used primarily to answer these questions. An introduction to the questionnaires given to all respondents is reproduced in appendix A.

The answers to the two study questions are considered separately. For each, the relevant questionnaire statements and responses are first reported in table format. These responses are then discussed in the following text. In these discussions, items quoted from the questionnaires are written in **boldface** print.

5.1 Why would industry voluntarily participate in BC's P2 planning process?

In order to answer this question, this study considered the experience of the demonstration project companies. Without any prior experience with BC's P2 planning process, and little knowledge of what was to come, these seven companies voluntarily committed to pilot the process. What incentive did these companies have to go beyond what was required for compliance with existing laws?

Before considering the answer to this question, it is important to note that P2 planning was not originally designed to be a voluntary initiative. Although entry into the demonstration project was entirely voluntary, authorized individual P2 plans were intended to eventually replace the existing permits and regulatory framework for major industrial operations.

Furthermore, the P2 planning process is still evolving and is by no means complete. In fact one of the purposes of the demonstration project, as outlined in the MOU, was "to design an innovative and effective process for developing and implementing Pollution Prevention Plans . . ." (British Columbia, Pollution Prevention Demonstration Project Steering Committee 1997, 5). Nonetheless, the seven demonstration project companies tried to develop P2 plans based on the draft process developed to date. Experiences from this draft process could be useful in informing further revisions of the P2 planning process.

Questionnaire A, reproduced in appendix B, was used to answer this first study question. Eight industry representatives answered this questionnaire, that is, a representative from each of the seven participating companies, and a CCPA representative.

5.1.1 **Incentives**

In considering why industry would voluntarily participate in BC's P2 planning process, companies that had voluntarily participated in the demonstration project were asked about their incentives for participation. The following table summarizes their responses.

Table 3. Industry incentives for participating in P2 planning demonstration project

1a. When your company first committed to participation in BC's P2 planning process, how important was each of the following possible incentives?
1b. Please rank the three most important incentives by selecting a letter from the list above (a, b, c, etc.) or by describing an incentive not listed.

INCENTIVE	IMPORTANCE[9]					Number of times ranked:		
	VI	SI	N	SU	VU	1st	2nd	3rd
a) possible net cost savings	3	2	3			1		1
b) better relations with BC Environment[10]	5	3				4	2	1
c) better public relations with local community	7	1				1	4	3
d) improved market differentiation (i.e., favorably separate your company from the competitors)		3	3	2				1
e) pressure from financial institutions			2	3	3			
f) pressure from insurance companies			2	3	3			
g) peer pressure from other industry companies		1	3	1	3			
h) concerns about legal due diligence	1	4	2			1		
i) desire to avoid threat of tougher enforcement of existing permits and regulations	1	3	2	1	1			
j) desire to avoid threat of further environmental regulation	1	5	1					1

[9] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant.

[10] BC Environment refers to the Ministry of Environment, Lands and Parks.

Table 3. Industry incentives, continued

INCENTIVE	IMPORTANCE[11]					Number of times ranked:		
	VI	SI	N	SU	VU	1st	2nd	3rd
k) other	see below							
Additional incentives: • to be involved in planning proposed regulations (most important incentive once) • to build trust and cooperation between all stakeholders (most important incentive once) • to respond to community concerns (second most important incentive once) • to improve environmental performance (second most important incentive once) • to demonstrate industry leadership (third most important incentive once) • to build consensus among all stakeholders on common priorities for environmental actions (third most important incentive once)								

When asked to identify their three most important incentives for participating, the volunteer companies most commonly cited **(c) better public relations with local community** (8, 100%) and **(b) better relations with BC Environment** (7, 88%).

The finding that **(c) better public relations with the local community** was an important incentive is supported by the fact that at least three of the seven participating companies already had some type of public consultation forum prior to joining the P2 planning project.

With regard to **(b) better relations with BC Environment** (MELP), the participating industries seemed to want MELP to understand their industrial processes better. Such understanding would hopefully better inform government permitting and regulatory activities. This could be realized through simply more effective permit writing and enforcement, or even through a fundamental change in government's management of environmental protection issues arising from industry. This interest is further evidenced

[11] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant.

in that the **(j) desire to avoid the threat of further environmental regulation** and the opportunity **(k) to be involved in planning proposed regulations** were each identified once as one of the three most important incentives for participation. Responses of very or somewhat important were also given by half the respondents (4, 50%) for the **(i) desire to avoid threat of tougher enforcement of existing permits and regulations**.

Some critics might argue that industry is essentially interested in better relations with MELP so that it can more effectively "capture" government, have a greater influence over government policy to ensure it does not interfere with corporate gain. However, this opinion assumes that industry and government are natural adversaries, and that cooperation between the two can only be, ultimately, in industry's interest. Although industry may hope to influence government policy through this demonstration project, this is not necessarily a bad thing. Industry has the potential to make an important contribution to government policy. It is possible that both government's goals of environmental protection, a healthy economy, and high levels of employment are in many ways compatible with industry's desire to remain profitable, enjoy good public relations and avoid environmental liability. The two parties do not necessarily have to be cast as adversaries. There are many opportunities available for cooperation resulting in a much more effective and efficient environmental protection when compared to the inefficiencies of a more adversarial approach.

Should P2 planning be made available to industries throughout BC, the incentive of **(c) better public relations with the local community** could be as important to additional participating companies as it has proven to be for the pilot companies. However, the same can not necessarily be said for the incentive of **(b) better relations with BC Environment**. The companies in the demonstration project had a unique opportunity to forge better relations with BC Environment given the close working relationship of the pilot project. These better relations included the possibility of industry being able to contribute to future environmental policy and regulation initiatives. In the future, if the process were made available throughout BC as a more defined, formal policy instrument,

this possibility of influencing future environmental policy would be significantly diminished. Nonetheless, participating industries would still benefit from a better relationship with BC Environment than is typically the case with basic permit enforcement because of greater communication and information exchange.

Several additional incentives were also identified as respondents' three most important incentives:

- **(a) possible net cost savings** (2, 25%)[12]
- **(d) improved market differentiation** (1, 13%)[13]
- **(h) concerns about legal due diligence** (1, 13%)

Several incentives commonly cited in the literature, such as **(e) pressure from financial institutions, (f) insurance companies,** and **(g) peer pressure,** were of little or no importance to these BC companies.

Based on these results, incentives for voluntary industry participation in the P2 planning process are almost as varied as the participating companies themselves. Nonetheless, **better public relations with the local community** and **better relations with BC Environment** were clearly important to all participants.

[12] Many respondents commented that P2 planning was promoted by MELP as a cost saving measure, emphasizing the concept that "pollution prevention pays." However, only two respondents (25%) listed this as an important incentive; apparently industry was not significantly motivated by the possibility of cost savings prior to participation.

[13] Many respondents commented that a more internationally recognized program, such as ISO 14001 or Responsible Care, would be much better suited to impressing international clients of the demonstration project companies. Local recognition of a BC developed initiative was likely to have little impact on international market differentiation.

5.1.2 **Disincentives**

The following table summarizes industries responses when asked about disincentives.

Table 4. Industry disincentives for participating in P2 planning demonstration project

2. When your company first committed to participation in BC's P2 planning process, how important was each of the following possible disincentives?

DISINCENTIVE	IMPORTANCE[14]				
	VI	SI	N	SU	VU
a) discovery of noncompliance	1		3	2	2
b) enforcement action by government resulting from discovery of noncompliance	2	1	3		2
c) voicing of local community concerns in public advisory committee that could not easily be addressed		4	1	1	2
d) cost of participation		2	3	1	2
e) uncertainty about legal implications of participation	2	3	1		2
f) other One respondent raised the concern that this demonstration project would result in a further layer of prescriptive regulation in the old command and control style instead of the desired cooperation.					

Industry responses regarding disincentives prior to participation were varied with little clear consensus. The three more important disincentives seemed to be **(e) uncertainty regarding the legal implications of participation** (5, 63%), **(c) voicing of local community concerns in public advisory committee that could not easily be addressed** (4, 50%), and **(b) enforcement action by government resulting from discovery of noncompliance** (3, 38%).

[14] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant.

5.1.3 **Similar initiatives**

When considering the incentives for companies to voluntarily participate in P2 planning, it was relevant to know if the participating companies had implemented, or were considering implementing, any other measures beyond what was required to meet the existing legal requirements. For example, were there adequate incentives for the companies to be implementing an environmental management system such as that defined by the ISO 14001[15] standard, independent of MELP's P2 planning initiative?

Two of the seven companies (29%) had in place some comprehensive environmental management system prior to the initiative, and four (57%) were already seriously considering implementing such a system. At the time of writing, five of the seven companies (71%) are implementing or have implemented environmental management measures in addition to P2 planning. The interest of these companies in initiatives other than P2 planning could be an indication that incentives for measures such as P2 planning do exist. Even without BC's P2 planning initiative, companies are voluntarily pursuing environmental measures not required by their permits. However, this may also suggest that the advantages of P2 planning might not be a sufficient draw for voluntary industry participation in this particular program. Just as the incentives for voluntary initiatives exist independent of P2 planning, programs other than P2 planning may address those incentives more effectively.

Two participants (29%) volunteered the information that they started to work toward ISO 14001 registration after having developed a P2 plan. These participants commented that the P2 planning process was a useful step towards achieving ISO registration, that P2 planning incorporates elements of public participation and operations review that are not required by the ISO standard. These participants felt that these components were a

[15] The International Organization for Standardization (ISO) introduced the ISO 14001 standard for environmental management systems (EMS) in 1996. An ISO EMS is made of five elements: environmental policy; planning; implementation and operation; checking and corrective action (measurement and evaluation); and management review (review and improvement). Companies can voluntarily register to the ISO 14001 standard, and can then advertise themselves as "ISO 14001 certified" (Parto 1999, 185).

valuable part of P2 planning. One participant commented that P2 planning had a lot to contribute even after meeting the Responsible Care standard.

5.1.4 **Advantages and disadvantages**

In addition to their incentives for participation prior to joining the demonstration project, companies were also asked about the advantages and disadvantages realized once they had actually participated in the project. The following table summarizes their responses.

Table 5. Advantages and disadvantages of participation in P2 planning demonstration project

4a. Your company now has several years of experience with P2 planning. Based on this experience, please indicate the extent to which you agree or disagree with each of the following statements.
4b. Please rank the three most important advantages by selecting a letter from the list above (a, b, etc.) or by describing a result not listed.

P2 planning has resulted . . . in:	Level of agreement[16]					Advantages, number of times ranked:		
	SA	MA	N	MD	SD	1st	2nd	3rd
a) net cost savings	1	5	1	1		1		1
b) a net cost in the short term (12-24 months)	4	2	2					
c) a net cost in the long term (>12-24 months)	1	1	3	2	1		2	
d) better relations with MELP	4	3	1			4	1	
e) the possibility of changes to existing regulations and requirements (e.g., multi-media permit)	4	1	2		1	1	3	
f) better public relations with local community	6	1		1		1	1	3

[16] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

Table 5. Advantages and disadvantages of participation in P2 planning demonstration project, continued

P2 planning has resulted . . . in:	Level of agreement[17]					Advantages, number of times ranked:		
	SA	MA	N	MD	SD	1st	2nd	3rd
g) useful input from public advisory committees (PACs)	3	4	1					2
h) the raising of local community concerns in the PAC that could not be easily addressed		2	2	3	1			
i) education of PAC members that was too time consuming for the benefits realized			4	1	3			
j) improved communication within the company	1	2	5					1
k) the valuable experience of comprehensive review and long-range planning that might otherwise not have been done	1	5	1	1		1	1	
l) improved market differentiation (i.e., favorably separate your company from competitors)			3	2	2			
m) better communication with other industry companies	2	4	1					
n) the alleviation of financial institutions' concerns		1	3	2	2			
o) the alleviation of legal due diligence concerns	1	2	2	1	2			
p) greater legal certainty than before P2 planning		1	5	2				
q) increased legal responsibility through disclosure of previously unknown sources of pollution to government		1	3	3	1			

[17] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

Table 5. Advantages and disadvantages of participation in P2 planning demonstration project, continued

r) other

- "the ability of both government and companies to think in terms of efficiency and effectiveness and adapt to business process change needs, i.e., change."
- as a result of P2 planning, the facility staff got to know each other much better, and collectively they got to know the MELP staff better as well. Prior to P2 planning, contact with MELP staff had only been brief and formal during periodic inspections.
- P2 planning had lead to a better understanding by government and the public of the industrial operations at the test facility.

4c. Please rank the three most important disadvantages by selecting a letter from the list above (a, b, etc.) or by describing a result not listed.

Respondents chose not to select or rank any disadvantages of P2 planning from the list above. Instead, they made general comments:

- Four respondents (50%) commented that the process was very time consuming and resource intensive. However, one of these respondents commented that "that's what it takes."
- Three respondents (38%) were concerned that voluntary measures would be made mandatory, that permits would be made more stringent as a result of P2 planning.

Individual respondents also identified the following disadvantages:

- The process entails significant short term costs with uncertain long term benefits.
- The environmental review involves an onerous level of detail.
- There is a persistent concern that regulations will be introduced ignoring P2 planning efforts.
- Issues raised by the PAC might not always be addressed by the company for any number of reasons. If the PAC was not satisfied with these reasons, how would such a situation be resolved?
- The local regional district might not recognize P2 planning efforts. Without approval from this second regulatory body, approval from MELP for P2 planning would result in little benefit for the participating facility in terms of simplifying regulatory efforts.

Table 5. Advantages and disadvantages of participation in P2 planning demonstration project, continued

• The concept behind the demonstration project, as understood by one respondent, had not been fully grasped by all participants. This concept is that when a company has a good environmental management system in place and strong corporate governance and due diligence in place, the level of government oversight normally thought necessary was not needed. It would be more effective for such companies to deal directly with the public and environmental issues rather than through a government proxy.

Of the results indicated by industry as the three most important advantages, **(f) better public relations with the local community** (5, 63%), **(d) better relations with MELP** (5, 63%), and **(e) possible changes to the existing regulations and requirements** (4, 50%) were the most commonly identified.

Most respondents (7, 88%) were impressed with the **(f) better public relations with the local community**. Industries that had been hesitant to include public stakeholders in the P2 planning process were pleasantly surprised by the benefits of this measure. In fact, one industry representative seemed disappointed that the public had not participated more fully in the process. No industry respondent indicated that opening the doors somewhat to the public had been a bad experience.

Respondents in general commented they felt MELP had a better understanding of their industry, its operations and limitations, and as such better communications. This was an improvement from the previous, more formal and less meaningful communication based primarily on permit compliance and noncompliance. These improved relations were hoped to better inform MELP's approach to environmental protection, resulting in more effective and efficient measures.

Many companies (5, 63%) are hoping for some **(e) possible change to the existing environmental regulatory structure** for either their own company or province-wide as a result of the demonstration project. Such companies are still waiting to see how P2

planning will be incorporated into MELP's existing environmental policy framework. As such, some future advantages of participation are still anticipated. However, one respondent commented that participating in P2 planning should not, necessarily, result in possible changes to regulatory requirements. P2 planning should be done for reasons other than regulatory change.

Several additional advantages were also identified by respondents as part of the three most important advantages. **Net cost savings (a)** was an advantage identified as applicable by many participants (6, 75%). One respondent commented that "the cost and efficiency savings alone make it a worth while effort for industry." However, as many respondents (6, 75%) agreed that there was a **(b) net cost in the short term (12-24 months)**, and two respondents (25%) agreed that there was a **(c) net cost in the long term (>12-24 months)**. Several respondents (2, 25%) commented that it was too early to say with any degree of certainty what the net costs or cost savings would be.

Most respondents (7, 88%) agreed that there had been **(g) useful input from public advisory committees (PAC's).** Their fresh perspective on some problems gave industry new insights. Several respondents (3, 38%) also commented that the **(j) improved communication within the company** resulted in a wealth of ideas. One respondent commented that "It has been our . . . experience that the people who operate and maintain the equipment will probably have the best ideas as to how to make it run better, discharge less, and use energy and chemicals in a more efficient manner. It is this resource that needs to be tapped." The **(k) valuable experience of comprehensive review and long-range planning that might otherwise not have been done** was recognized by six respondents (75%).

It is interesting to compare the incentives for industry's participation in P2 planning with the advantages realized. There seems to be a fairly good correlation between the two. The most important advantages were **better public relations with the local community**, **better relations with MELP**, and **possible changes to the existing regulations and**

requirements. The incentives for participation were essentially the same. This correlation between incentives for participation and advantages realized may be accurate. Alternatively, it may the result of having asked about the two at the completion of the project, when incentives and realized advantages were both known. Nonetheless, most major incentives for participation were addressed with the exception of the hope that industry still bears for future changes to regulations and requirements.

Comments regarding the disadvantages of participation were varied. However, most comments were related to one of two issues. The first issue was the amount of effort required by all stakeholders to develop a P2 plan. Without exception, all respondents felt that P2 planning took more time and resources than anticipated. Some respondents (2, 25%) commented that the process was too detailed and should be simplified. Others (4, 50%) volunteered that in order to really identify pollution prevention options, and go through the necessary learning, that the level of effort expended is what is required.

The second issue was the continuing uncertainty regarding the future of environmental regulation in BC. Again, many participants (5, 63%) seem to be anticipating some form of regulatory change in recognition for their efforts, for example, multimedia permits or a combined permit from both the province and the regional district with jurisdiction over a single facility. Some do not expect any regulatory change soon, and yet are concerned that their P2 planning efforts to date may be ignored when existing standards are enforced. Industry is awaiting with great interest the suggestions and actions arising from the implementation committee for the next phase of P2 planning.

5.1.5 Repeat participation

Industry respondents were asked if, **given a chance to reconsider their initial decision to participate in BC's P2 planning process, they would voluntarily participate again**. Five of the seven companies (71%) strongly agreed that they would, one mildly agreed, and one neither agreed nor disagreed. Of the five companies that strongly agreed they

would participate again, one did not complete the P2 planning process at the demonstration facility. The respondent was, nonetheless, satisfied with the benefits of having been involved in the process.

When asked if they would **voluntarily commit additional facilities to the P2 planning process**, four of the seven participating companies (57%) agreed that they would, one strongly and three mildly agreeing. The company that strongly agreed did not complete the P2 planning process at the test facility but was still very interested in future applications of P2 planning at other facilities. Of the remaining three companies, two indicated that they neither agreed nor disagreed, and one mildly disagreed that they would voluntarily commit additional facilities.

From these results, it would appear that industry is fairly satisfied with how the demonstration project developed. However, uncertainty regarding the long-term benefits of P2 planning, the government's long-term environmental policy for major industrial sites, and the anticipated revised structure of P2 planning temper industry's enthusiasm for further participation in the process.

5.2 Does the P2 planning process developed to date include design elements suggested in the literature for successful voluntary initiatives?

P2 planning is being considered as a voluntary initiative, a compliance plus measure in addition to existing regulatory requirements. It has already been tried as such in the P2 planning demonstration project. This study question considers whether the process as developed to date includes design elements suggested in the literature for a successful voluntary initiative. The design elements considered are (see section 2.6, table 1):

- Sufficient advantages of participation
- Participant commitment to initiative
- Ground rules
- Credibility
- Flexibility and innovation

The sixth design element, a supportive policy framework, is not being considered in this study (see section 4.3.2).

Questionnaire B, reproduced in appendix C, was used to answer the second study question. Eight industry representatives responded, that is, representatives of the seven participating companies, as well as one CCPA representative. Nine government representatives responded, from both head office and involved regional offices. Two additional government representatives declined to respond to the questionnaire[18]. Seven public advisory committee (PAC) members also responded, one from each PAC. The responses to *Questionnaire B,* separated according to stakeholder group – industry, government, and publics, are summarized in appendix D.

[18] Their joint reason for declining was that "insofar as the P2 Planning Demonstration Project has only been a pilot project it would be premature for us to have firm positions/answers to many of the questions contained in the questionnaire."

Before considering the answers to the second study question, it is important to again place the P2 planning process in context. P2 planning was not originally designed to be a voluntary initiative. Although entry into the demonstration project was entirely voluntary, authorized individual P2 plans were intended to replace the existing permits and regulatory framework for major industrial operations. It is only recently, based on the experience of the demonstration project, that P2 planning is being considered as a voluntary initiative. The identification of any areas where the process does not contain the suggested elements should not necessarily be considered a criticism of the process. Suggested elements may not be included for any number of reasons, including because the process was not designed as a voluntary initiative, because it was only a pilot project and as such intentionally incomplete, and because such elements were not considered important in a BC context.

Furthermore, the P2 planning process is still evolving and by no means complete. One purpose of the demonstration project was to design a process for developing and implementing pollution prevention plans. Nonetheless, the seven demonstration project companies tried to develop P2 plans based on the draft process developed to date; experiences from this draft process could be useful in informing further revisions of the P2 planning process.

With these considerations in mind, a reporting and discussion of the questionnaire responses follows. Each of the five design elements is considered separately.

5.2.1 **Sufficient advantages of participation**

In *Questionnaire B*, respondents were asked about the advantages of participation. The responses are summarized in the following table.

Table 6. Element #1 -- Advantages of participation

Questionnaire statements.	Number of responses				
	SA[19]	MA	N	MD	SD
A1. There are sufficient advantages of participation for companies with major industrial operations to voluntarily participate in BC's P2 planning process.	11	8	2	2	1
A2. The advantages of participation in BC's P2 planning process encourage long term participation, i.e., greater than 5 years after developing a P2 plan.	11	7	2	3	1
A3. What advantages do you think would be most effective in encouraging participation in BC's P2 planning process? (e.g. 10% lower permit fees, fees linked to performance, public recognition program, increased certainty about future environmental regulation and enforcement) *Responses, summarized according to sector:*					
<u>Industry suggestions</u> (total of 8 respondents) • Lower permit fees or permit fees ties to performance (3, 38%) • P2 planning as a lower cost alternative to permits (1, 13%) • the inherent benefits of P2 planning, such as better relationships with government and the public, as well as improved process efficiency (2, 25%) • public recognition programs for program participants (1, 13%) • the ability to be part of developing further regulations (3, 38%) • greater flexibility in the event of a permit noncompliance, recognizing the efforts made by industry (1, 13%) • greater certainty regarding future environmental requirements and policy (2, 25%) • the development of an five year agreement on environmental priorities for a given facility, providing some certainty with regard to future government policy (1,13%) • one regulatory window for facilities operating under more than one level of government authorization, e.g. regional districts and MELP (1, 13%)					

[19] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

Table 6. Element #1 -- Advantages of participation, continued

Government suggestions (total of 9 respondents)

- public recognition, local and/or international (5, 56%)
- permit fees reduced or linked to performance. (4, 44%)
- greater understanding about the correlation between good economic and good environmental performance; these two goals are not diametrically opposed. Economic proof of process efficiency success stories needs to be developed and disseminated to "spread the word." (3, 33%)
- P2 planning should be promoted as a means of ensuring due diligence (2, 22%)
- Increased flexibility in meeting environmental objectives (1, 11%)
- Improved relations with government and the public (1, 11%)
- Increased pride in the workforce (1, 11%)

PAC member suggestions (total of 7 respondents)

- Participating companies should have greater flexibility and freedom in meeting environmental objectives (2, 28%)
- Public recognition (2, 28%)
- Permit fees linked to performance (1, 14%)
- Promote a business relationship between government and industry (1, 14%)
- Where companies are obviously trying to address and environmental problem, they should not be automatically prosecuted for permit violations. There should be some recognition for efforts being made (1, 14%).
- Promote the benefits of improved process efficiencies (1, 14%)
- Promote pride in workforce resulting from P2 planning (1, 14%)
- Increased certainty regarding future regulations so that companies can engage in long-term planning (1, 14%).

	VI[20]	SI	N	SU	VU
A4. How important do you think it is to ensure sufficient advantages of voluntary participation in the P2 planning process?	17	6			1

The majority of respondents (19, 79%) either strongly or mildly agreed that **there are sufficient advantages of participation in P2 planning for companies with major industrial operations**. Respondents who did not agree (3, 13%) were exclusively PAC

[20] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant.

members. With regard to **long-term participation**, the majority of respondents (18, 75%) either strongly or mildly agreed that P2 planning encouraged such participation. Those who did not (4, 17%) were from all three stakeholder groups, i.e. industry, government and PAC's.

Suggested advantages as to what would be **most effective in encouraging participation in BC's P2 planning process** varied widely across all three stakeholder groups. No clear consensus supporting any one particular advantage emerged from either the individual stakeholders groups -- industry, government and PAC members -- or from the respondents as a whole. Each of the following advantages was suggested by at least two of the stakeholders groups:

- reduction of fees (either a percentage reduction or fees based on performance) (8, 33%) [21, 22]
- public recognition through awards and improved public relations (8, 33%)[22]
- increased certainty regarding future regulations (4, 17%)[22]
- increased flexibility in MELP's requirements of industry regarding environmental protection (5, 21%)
- promotion, education and documentation of the benefits of P2 planning such as cost savings (4, 17%), improved relations with public and government (4, 17%), and pride in the workforce (2, 8%)

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[21] Permit fees are paid annually based on anticipated discharge levels for the following year. If a company discharges less than the permitted amount, there is no refund for excess fees paid. The company can apply for lower discharge levels in their permit for the following year in order to reduce permit fees. However, companies typically do not pursue this avenue as the reduction in permit fees is not worth risk of violating a more stringent permit requirement.

[22] The first three advantages shown here were listed on the questionnaire as examples of possible advantages that might promote participation. Respondents may have been more likely to select these three responses in answering the questionnaire rather than suggest different advantages. As such, the number of respondents identifying these advantages may be artificially high.

Only industry respondents suggested the possibility of contributing to future regulations as an advantage of participation (3, 13%). Only government respondents suggested promoting P2 planning as a due diligence measure (2, 8%).

In general, suggestions seemed to revolve around three central themes. The first theme is advantages related to business's bottom line – reduced permit costs, process efficiencies, and the economic benefits of P2 planning. The second theme is regulatory structure – increased flexibility, certainty about future regulations, developing a due diligence defence, and creating one regulatory window for industry where more than one government body has authority. The third theme for advantages suggested is relationships – better relationships with government, with the local public, public recognition, and workers' pride in industry.

Although most industry participants (5, 71%) mildly or strongly agreed that there were adequate advantages of participation in P2 planning, only five of the seven participating companies actually completed BC's P2 planning process. The other two participants (29%) chose to pursue different methods of improving environmental management, such as an ISO 14001 environmental management system[23]. The fact that two of the seven demonstration companies chose not to complete a P2 plan suggests that there may not be adequate advantages of participation, even though one of these companies is still interested in future applications of P2 planning at other facilities.

Of the five companies (71%) that have, or have almost, completed the planning process, four strongly agree and one mildly agrees that they would participate in the demonstration project again given a chance. However, only four companies mildly agreed that they would be willing to volunteer additional facilities for future P2 plans; the one company that strongly agrees did not complete a P2 plan at the demonstration site. This seems to indicate that there is adequate satisfaction with the demonstration project to

[23] These participants feel they have met the objectives of BC's P2 planning process, that is pollution prevention, without necessarily having followed the process defined by MELP.

date, but that the P2 planning process itself is something the companies are still hesitant to commit to.

The issue of free riders was not considered in this study as the project participants represented a wide range of industries. Free riders more typically occur when an initiative is focused on a single industry sector. However, it is possible that P2 planning could attract free riders; if major industrial sites in BC were to avoid new strict environmental regulations because of the voluntary efforts of many, those few not making the voluntary effort would constitute free riders.

When asked how important it was to ensure sufficient advantages, all respondents except one (23, 96%) either strongly or mildly agreed that it was important. One government respondent indicated that it was very unimportant. He commented that industry must recognize the benefits of P2 planning for themselves; government does not have to ensure any additional advantages other than those inherent to the process.

5.2.2 **Participant commitment to initiative**

Respondents were also asked about the second design element, participant commitment to the initiative. The responses were as described in the following table.

Table 7. Element #2 -- Participant commitment

Questionnaire statement	Number of responses				
B1. To date, industry has demonstrated a high level of commitment to BC's P2 planning process as evidenced by:	SA[24]	MA	N	MD	SD
a) adequate allocation of recourses (people and money)	15	7		1	1
b) explicit commitment of senior leaders	15	6	2		
c) regular involvement of senior leaders	10	9	3	1	1
d) number and comprehensiveness of options identified in P2 plan	15	5	2		1
e) training and involvement of company staff other than those immediately involved.	6	4	7	5	2
f) consistently making an effort throughout the process (at the beginning, during and at the completion of writing P2 plans)	12	10	1		1
B2. To date, the head office of the Ministry of Environment, Lands and Parks (in Victoria) has demonstrated a high level of commitment to BC's P2 planning process as evidenced by:	SA	MA	N	MD	SD
a) adequate allocation of recourses (people and money)	7	7	1	7	2
b) explicit commitment of senior leaders	12	6	5	1	
c) regular involvement of senior leaders	9	6	5	3	1
d) training and involvement of government staff other than those immediately involved.	3	3	9	3	5
e) consistently making an effort throughout the process.	8	8	3	4	1

[24] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

Table 7. Element #2 -- Participant commitment, continued

B3. To date, the regional office of the Ministry of Environment, Lands and Parks (locally) has demonstrated a high level of commitment to BC's P2 planning process as evidenced by:	SA	MA	N	MD	SD
a) adequate allocation of recourses (people and money)	11	6		4	3
b) explicit commitment of senior leaders	9	7	3	3	2
c) regular involvement of senior leaders	8	5	3	5	3
d) training and involvement of government staff other than those immediately involved.	3	3	10	3	5
e) consistently making an effort throughout the process.	10	7	3	2	2
B4. To date, public advisory committee (PAC) members have demonstrated a high level of commitment to BC's P2 planning process by:	SA	MA	N	MD	SD
a) regular attendance at PAC meetings	10	10	1	2	1
b) voicing concerns to government and industry	11	8	2	2	1
c) offering constructive advice to industry and government	13	5	3	2	1
B5. How important do you think it is to ensure a high level of commitment from these participants for success of BC's P2 planning process?	VI[25]	SI	N	SU	VU
	22		1	1	

For most of the indicators in the questionnaire, the majority of respondents either strongly or mildly agreed that **industry** had demonstrated a high level of commitment. These indicators included adequate allocation of resources (22, 92%), explicit commitment of senior leaders (21, 88%), regular involvement of senior leaders (19, 79%), number and comprehensiveness of options identified in P2 plan (20, 83%), and consistently making an effort throughout the process (22, 92%). Disagreement that these indicators had been met was voiced primarily by respondents involved with one of the abandoned P2 plans. Respondents were less certain that industry had demonstrated training and involvement of company staff other than those immediately involved, with only ten respondents

[25] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant.

agreeing (42%). One government respondent commented that industry should commit certain people to the process in the beginning, and maintain those people throughout the process, reducing planning team turnover.

With regard to the level of commitment demonstrated to the process by **MELP's head office**, responses were generally mixed across all three stakeholder groups. Typically more respondents agreed than disagreed that the head office had demonstrated commitment based on most indicators in the questionnaire. The indicators included adequate allocation of resources (14 agreeing, 58%), explicit commitment of senior leaders (18, 75%), regular involvement of senior leaders (15, 63%), and consistently making an effort throughout the process (16, 67%). However, respondents were divided as to whether head office had demonstrated training and involvement of government staff other than those immediately involved, with six (25%) agreeing, eight (33%) disagreeing, and nine (38%) neither agreeing nor disagreeing[26].

Respondents from all three stakeholder groups commented on the dramatic staff cut-backs in the head office of MELP. Several commented that although the initial enthusiasm had been very high, it seemed to have "dwindled to zero." One government respondent commented that "it seems like the end of the initiative with all the cutbacks." One PAC respondent felt that the head office was making an effort, but that "their hands are tied politically. They have the will but there's a lot of red tape to get changes to legislation." Several government respondents raised concerns about inadequate training and support from head office for personnel in regional offices. One industry representative commented that government should demonstrate its commitment to industry by following through with some form of approval or recognition once a P2 plan is completed.

With regard to the **regional MELP offices**' level of commitment to the process, responses were generally mixed across all three respondent groups, although industry was

[26] One respondent (4%) declined to comment.

generally supportive of the regional office's efforts. The indicators included adequate allocation of resources (17 agreeing, 71%), explicit commitment of senior leaders (16, 67%), regular involvement of senior leaders (13, 54%), and consistently making an effort throughout the process (17, 71%). However, respondents were divided as to whether the regional offices had demonstrated training and involvement of government staff other than those immediately involved, with six (25%) agreeing, eight (33%) disagreeing, and ten (42%) neither agreeing nor disagreeing.

One industry representative commented that "regional office permit writers seemed at times to be diametrically opposed to what Victoria was saying. The Ministry needs to speak with a common voice." Two of the seven PAC respondents (29%) commented that although the regional offices seemed to make an effort, they did not have enough resources or direction from head office.

In general, most respondents either strongly or mildly agreed that **PAC members** had demonstrated a high level of commitment to the process. Indicators included regular attendance at PAC meetings (20 agreeing, 83%), voicing concerns to government and industry (19, 79%), and offering constructive advice to industry and government (18, 75%). Interestingly enough, many of those that disagreed with these indicators were PAC respondents (5 of 9 disagreeing respondents, 56%).

Respondents often commented that there was a small core of committed people who always attended meetings, but aside from this group there was not much interest. Several respondents commented that the PAC members were very passive, listening to what was said and offering little comment or suggestion. Several PAC members commented that there was an overwhelming amount of material to absorb, a "terrible learning curve," that limited their ability to contribute and dampened their enthusiasm to commit to the process.

In general, many respondents (18, 75%) felt that a high level of commitment from all participants was very important. One PAC member commented that although it was important for industry and government to demonstrate commitment, it was somewhat unimportant for the public to do the same. One government respondent felt it was somewhat unimportant to have a high level of commitment to the process. His comment was that although individual people involved with P2 planning might change over time, the process itself would endure because of the inherent benefits.

5.2.3 Ground rules

In asking respondents about the third design element, ground rules, five areas were considered:

- goals, objectives, targets, and timeframes
- roles and responsibilities
- legal implications
- dispute resolution
- rewards and sanctions

5.2.3.1 Goals, objectives, targets and timeframes

Respondents were asked to what extent they agreed or disagreed with the following statements regarding goals, objectives, targets and timeframes.

Table 8. Element #3 -- Goals, objectives, targets, and timeframes

Questionnaire statement	Number of responses				
	SA[27]	MA	N	MD	SD
C1. BC's P2 planning process in general has clear goals, objectives, and targets.	6	10	2	3	3
C2. Each individual P2 plan has clear goals, objectives, and targets.	5	10	4	5	
C3. Clear timeframes [*have*] been defined in which to meet any goals, objectives, and targets that have been set.	3	12	4	4	1
	VI[28]	SI	N	SU	VU
C4. How important do you think it is to set clear goals, objectives, targets, and timeframes?	19	5			

Responses were mixed, although a majority (16, 67%) agreed to some extent that clear **goals, objectives, and targets** were present. Most of those who disagreed were representatives from either government or PAC's. Many respondents (9, 38%) commented that the demonstration project was a pilot, and as a result, these components were understandably somewhat uncertain and unclear. One respondent, when asked, did not necessarily feel that the goals, objective, targets and timeframes were any clearer at the conclusion of the demonstration project. Another respondent commented that although timeframes are important, they should be flexible in order to adapt to changing situations. One PAC respondent commented that timeframes had been identified and then abandoned without consequence. It seems that the P2 planning process itself has few specific goals, but that such specifics were determined for each individual P2 plan by the steering committee with input from the PAC.

All participants (24, 100%) agreed that it is either very or somewhat important to set clear goals, objectives, targets, and timeframes.

[27] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[28] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant.

5.2.3.2 Roles and responsibilities

Respondents were asked to what extent they agreed or disagreed with the following statements regarding roles and responsibilities.

Table 9. Element #3 -- Roles and responsibilities of participants

Questionnaire statement	Number of responses				
	SA[29]	MA	N	MD	SD
D1. Roles and responsibilities of industry participants during the P2 planning process were clear.	10	10	3	1	
D2. Roles and responsibilities of staff from the Ministry of Environment, Lands and Parks during the P2 planning process were clear.	9	8	5	2	
D3. Roles and responsibilities of the public participants on public advisory committees during the P2 planning process were clear.	6	13	1	4	
D4. How important do you think it is to have clear roles and responsibilities for each of the following?	VI[30]	SI	N	SU	VU
a) Ministry of Environment, Lands and Parks	21	2	1		
b) industry participants	22	1	1		
c) public participants on public advisory committees	18	4	2		

Most respondents agreed to some extent that the **roles and responsibilities** of industry (20, 83%), government (17, 71%), and PAC members (19, 79%) were clear. Those that disagreed were primarily PAC representatives. Several respondents commented that the roles of all stakeholders were not necessarily clear at the beginning of the pilot, but evolved into something more concrete during the process. Again, respondents emphasized that the process was a pilot, and as such, uncertainties were to be expected.

[29] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[30] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

One government respondent commented that roles and responsibilities, although not necessarily clearly defined for the process in general, were made clear in the terms of reference for each individual P2 plan. Several industry and government representatives commented that the distribution of government's roles and responsibilities between the head office and the regional offices was a source of confusion.

One industry respondent commented that the change from permits to P2 planning would require a change in the overall roles of government and industry. With the permit system, government representatives are usually technical people who administer permits from an office, while industry representatives communicate with MELP regarding permit issues through mail. "In the future the MOE Pollution Prevention officers will need to have less technical skill but will need to have good facilitation and people skills." As the communication between industry, government, and the public increases, the stakeholders will need the skills to facilitate this communication.

Three government and one PAC representatives (17%) commented that the roles and responsibilities of the PAC's remained uncertain. Three of the seven PAC respondents (43%) mildly disagreed that the roles and responsibilities of the PAC's were clear. One PAC member was concerned that a PAC not be made responsible for the actions of the company in question. A PAC makes recommendations based on the information available; whether industry chooses to follow these recommendations or not should not be a PAC's responsibility. Another PAC representative commented that, in his experience, the PAC was mostly a forum for informing the public. He felt that the role of a PAC should also include more opportunities for the public to provide input.

Most respondents agreed to some extent that it is important to have clear roles and responsibilities for MELP (23, 96%), industry (23, 96%), and PAC's (22, 92%).

5.2.3.3 Legal implications

Respondents were asked to what extent they agreed with the following statement regarding legal implications:

Table 10. Element #3 -- Legal implications

Questionnaire statement	Number of responses				
	SA[31]	MA	N	MD	SD
H1. A clear understanding of the legal implications of participation in P2 planning was established prior to beginning the initiative.	4	2	6	7	5
	VI[32]	SI	N	SU	VU
H2. How important do you think it is to establish a clear understanding of the legal implications of participation prior to beginning the initiative?	17	3	3	1	

Responses were mixed as to whether or not a clear understanding of the **legal implications** of participation in the P2 planning process had been established. Industry and government respondents tended to disagree, with seven of eight industry respondents (88%) and seven of nine government respondents (78%) disagreeing. Four of seven PAC members (57%) indicated that they neither agreed nor disagreed. The lack of consensus in responses would indicate that there was not a clear understanding of the legal implications.

The lack of clarity regarding legal implications was an issue several times during the demonstration project. In one instance, a regional office considered including a company's recently developed P2 plan in an existing permit during the process of renewing that permit. The company objected as this action would make the P2 plan

[31] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[32] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

legally enforceable; the company's participation in the demonstration project had been on a voluntary basis. The situation was resolved when the regional office decided against incorporating the P2 plan in the permit. In this case, there was no common, clear legal understanding of the role of the P2 plan.

Concerns were also raised as to how MELP would handle the discovery of a noncompliance with existing requirements discovered in the process of developing a P2 plan. Would MELP use the information discovered in developing the P2 plan to prosecute any of the demonstration project companies? A general understanding seems to have been reached such that where MELP is satisfied with a company's efforts to address noncompliance, no formal government sanctions will be initiated.

One PAC respondent raised the issue of legal uncertainty where both a regional district and MELP have jurisdiction in one facility. Would a P2 plan have any impact on a regional district's environmental requirements of a facility?

One PAC respondent commented that he did not want industry's permits dissolved. It was important for members of the publics to know that there is a minimum standard that industry must legally meet.

One industry respondent commented that the legal implications, especially the implications of a P2 plan "authorization" by government, were still evolving.

Almost all respondents agreed that a clear understanding of legal implications was important to some degree (21, 88%). One government respondent thought it was slightly unimportant because the process was entirely voluntary, that is, there was no need for further legal clarification.

5.2.3.4 Dispute resolution

Respondents were asked to what extent they agreed with the following statement regarding a dispute resolution mechanism.

Table 11. Element #3 -- Dispute resolution

Questionnaire statement	Number of responses				
	SA[33]	MA	N	MD	SD
I1. A mechanism for dispute resolution was developed prior to beginning this initiative.	1	2	8	4	9
	VI[34]	SI	N	SU	VU
I2. How important to you think it is to provide for transparent and effective dispute resolution prior to beginning this initiative?	10	9	3	1	1

Most respondents either disagreed (13, 54%) or neither agreed nor disagreed (8, 33%) that a mechanism for **dispute resolution** was developed prior to beginning the initiative. Only industry representatives agreed to any extent with this statement (3, 38%), commenting that the steering committee of government and industry representatives acted as a *de facto* dispute resolution mechanism. However, few participants believed this was an adequate arrangement to address all disputes.

With regard to disputes in a PAC, one industry representative commented that his facility's PAC operated on consensus where possible. When necessary, PAC members had agreed to disagree and dissenting voices were recorded. A PAC respondent commented on the importance of having a good facilitator for PAC meetings. Someone "who lets everyone talk, who crystallizes what has been said, finds some consensus and can move the PAC past the sticky issues" is critical in avoiding disputes as much as possible. Several other PAC members (2, 29%) commented that a dispute resolution

[33] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[34] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

mechanism might not be necessary where there is adequate transparency in the P2 planning process. Where industry and government are publicly more accountable for their actions, disputes may be less likely to arise. In the words of one PAC respondent, "The community should smell a rat if there's a rat to be smelt."

The majority of respondents (19, 79%) agreed that a transparent and effective dispute resolution mechanism was important to some degree. Only two government respondents (22%) commented that is was somewhat or very unimportant. These respondents felt that the process was entirely voluntary, so there would be no disputes to resolve; anything industry did or did not do voluntarily, albeit publicly, was its own affair.

5.2.3.5 Rewards and sanctions

Respondents were asked about rewards and sanctions in the P2 planning process.

Table 12. Element #3 -- Rewards and sanctions

Questionnaire statement	Number of responses				
	SA[35]	MA	N	MD	SD
G1. Rewards for a certain level of achievement in P2 planning were specified prior to companies committing to the process.	2	5	3	5	8
G2. Sanctions for failing to meet a certain level of achievement in P2 planning were specified prior to companies committing to the process.		1	4	4	14
	VI[36]	SI	N	SU	VU
G3. How important do you think it is to specify rewards for a predefined level of achievement in BC's P2 planning process?	5	10	4	3	2
G4. How important do you think it is to specify sanctions failing to meet a certain level of achievement in BC's P2 planning process?	4	3	4	6	7

Many respondents (13, 54%) disagreed to some extent that **rewards** had been specified prior to companies committing to the P2 planning process. Respondents who agreed to some extent (7, 29%) commented that the rewards referred to were inherent to the process, such as better relations with government and the local community, cost savings, and a more efficient process. One industry respondent commented that the real reward was "government backing off with the big stick." One PAC respondent commented that one of the companies may be have been granted more flexibility with other environmental regulations in recognition of its efforts in P2 planning. No respondents felt that additional, explicit rewards had been specified.

[35] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[36] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

Many respondents (15, 63%) thought that specifying rewards was important. Rewards were necessary, otherwise, why would industry voluntarily participate? One respondent commented that even if P2 planning pays, industry would still need a carrot, an incentive, to arouse its curiosity. Success stories of other industries will not necessarily be enough to convince new industries to participate.

Several respondents (5, 21%) felt that rewards were not important. One industry representative commented that specifying rewards sent out the "wrong message, would attract the wrong people." Those interested in the P2 planning process should be interested in more than just saving a few dollars. A government respondent was reluctant to reward industry for "what they should be doing anyway."

Many respondents (18, 75%) disagreed that **sanctions** for failing to meet a certain level of performance had been specified prior to companies committing to the process. One PAC respondent mildly agreed that sanctions had been specified, commenting that industries obviously would look foolish to their PAC's if they failed to meet many of their objectives.

Just over half of respondents (13, 54%) thought that specifying sanctions was unimportant to some extent; seven respondents (29%) thought it was important to some extent. Those that thought sanctions were unimportant said that such measures would decrease flexibility, such an important component of P2 planning. Two industry respondents commented that if industry was several hours late in reporting on monitoring, or decided to pursue a different P2 option from that originally planned in light of new information, sanctions would not be appropriate. Sanctions would also threaten the communication and trust built between stakeholders in P2 planning; what was needed was consensus, not a "heavy handed" approach.

Stakeholders from industry, government, and PACs commented that sanctions were in some way inherent in the process. With adequate transparency of industry's P2 plans,

industry's public relations, credibility, and government relations would tarnished should industry fail to make an adequate effort toward reaching set goals.

PAC respondents accounted for four of the seven responses indicating that it was very or slightly important to specify sanctions for failing to meet a certain level of achievement. Several commented that if an industry did not do what it said it was going to do, it would be wasting everyone's time. One government respondent commented that there should be some consequences for abandoning the P2 planning process.

Four respondents (17%) commented that the final role of P2 planning would determine the need for sanctions. If P2 planning continues as a completely voluntary initiative, then sanctions would be inappropriate and discourage participation. If P2 planning becomes a form of authorization replacing permits, sanctions would be more appropriate. Such sanctions would have to maintain a certain degree of flexibility compared to the existing command and control approach. Some respondents commented that if adequate transparency was built into the process, sanctions would not be so important. The efforts of industry's participating in P2 planning would be publicly evident.

5.2.4 Credibility

In asking respondents about the four design element, credibility, three areas were considered:

- external stakeholders
- transparency
- monitoring and reporting measurable progress

5.2.4.1 External stakeholders

Respondents were asked to what extent they agreed or disagreed with the following statements regarding external stakeholders.

Table 13. Element #4 -- External stakeholders

Questionnaire statement	Number of responses				
	SA[37]	MA	N	MD	SD
J1. Members of public advisory committee's (PACs) were able to meaningfully participate in the development of individual P2 plans.	9	8	2	3	2
J2. External stakeholders, such as local interest groups and other interested organizations not necessarily based locally, were adequately represented in the development of the P2 planning process.	3	8	5	7	1
	VI[38]	SI	N	SU	VU
J3. How important do you think it is that PAC members can meaningfully participate in the development of individual P2 plans?	13	9	2		
J4. How important do you think it is to enable the representation of external stakeholders, such as local interest groups and other interested organizations not necessarily based locally, in the development of the P2 planning process?	5	14	3	2	

The first questionnaire statement addressed the participation of external stakeholders in the individual PAC's. Many respondents (17, 71%) agreed to some extent that **PAC members were able to meaningfully participate in the development of individual P2 plans**. Those that disagreed to some extent (5, 21%) were from all three stakeholder groups -- industry, government and PAC's.

Three of the seven PAC members (43%) commented that the learning curve and long-term time commitment required of PAC members were almost inhibitory, especially for those interested in joining after a process had already started. As a result, these PAC members

[37] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[38] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

felt they had not really been able to contribute to the process, only follow along as best they could. A further PAC member commented that informed nongovernment organizations could play an important role in bridging the information gap between industry and the public as a third party.

Three of the seven PAC members (43%) commented that although the PAC was meant to be a forum where public concerns and questions could be raised, this was not always realized. These members were not in any way critical of how industry had worked with the PAC; in fact, PAC members were generally very impressed with industry's efforts to include them and explain complicated processes so that they could meaningfully participate. However, the very nature of the social setting within which the PAC met, specifically in areas where the industry in question was the primary employer, was not always conducive to frank discussion. One PAC respondent commented that "In this town, you don't say anything bad about (*the company*). They're God." Another PAC respondent commented that it was very important for government to be present in PAC meetings as a third party, making industry accountable for what they tell the public.

Two respondents, one government and one industry, were surprised at the nature of the concerns raised by PAC members. These concerns were more about aesthetic issues and office recycling rather than the discharge of contaminant to the environment. These respondents commented that PAC members were typically more comfortable talking about things they understood and could relate to; the complex area of environmental pollution was rarely such a topic.

Nine respondents volunteered opinions regarding whether stakeholders from beyond the local community should be included in PAC's. Five of these (21%) felt that where the environmental effects reached further than the local community, then external stakeholders had a right to be included. The other four (17%) felt that such external stakeholders were adequately represented by government.

Even within the local community, volunteered opinions were divided as to who should be able to join a PAC. Three respondents (13%) commented that only those who represented a group, such as a local interest group, should be allowed to attend. Conversely, two respondents (8%) commented that any interested party should be allowed the opportunity to participate. All PAC's were concerned about avoiding individuals with private agendas who could derail the P2 plan discussions, a "lone wolf with an axe to grind." No respondents complained that this actually occurred. Nor did any respondent feel that anyone with a concern to voice had been refused entry to a PAC.

The second questionnaire statement addressed the inclusion of external stakeholders in the development of the P2 planning process, not just the individual P2 plans. Responses were mixed as to whether **external stakeholders, such as local interest groups and other interested organizations not necessarily based locally, were adequately represented in the development of the P2 planning process**, with eleven respondents agreeing (46%), eight respondents disagreeing (33%), and five respondents neither agreeing nor disagreeing (21%).

It seems that the P2 planning process had been developed primarily by government, with input from industry. The steering committee for the demonstration project consisted of industry and government representatives only. External stakeholders were able to attend some of the steering committee meetings, but none were part of the committee. One representative commented that the committee was intentionally designed this way so that industry and government could have frank communications. Such candid conversations would not have been possible during this pilot phase had additional external stakeholders been present. However, this same representative commented that it might now be appropriate to include external stakeholders in the further development of P2 planning in BC.

Almost all stakeholders agreed to some extent it was important that **PAC members meaningfully participate in the development of P2 plans** (22, 92%) and that **external**

stakeholders be represented in the development of the P2 planning process (19, 79%). Two respondents observed that "meaningful" could mean many things to different people.

5.2.4.2 Transparency

Respondents were asked to what extent they agreed or disagreed with the following statements regarding the transparency of the P2 planning process.

Table 14. Element #4 -- Transparency

Questionnaire statement	Number of responses				
	SA[39]	MA	N	MD	SD
K1. The development, implementation and monitoring of BC's P2 planning process as a whole is adequately transparent, that is, information is readily available to all stakeholders and external parties.	12	8	1	3	
K2. The development, implementation and monitoring of the individual P2 plans is adequately transparent.	11	9	1	3	
	VI[40]	SI	N	SU	VU
K3. How important do you think it is to ensure that BC's P2 planning process as a whole is transparent?	16	6	2		
K4. How important do you think it is that the development, implementation and monitoring of the individual P2 plans is transparent?	14	8	2		

[39] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[40] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

Most respondents agreed that the **P2 planning process as a whole** (20, 83%), and the **individual P2 plans** (20, 83%)**, were adequately transparent**. Respondents that disagreed with these statements (3, 13%) were government and PAC representatives only.

One government and one PAC representative both volunteered that there were practical limitations to the amount of information that should be made available to the public. The PAC respondent commented that "companies should provide the information we need to know, make available the information we would like to know, and keep a record of detailed technical information that only the experts would understand." Generally, PAC respondents seemed very satisfied with the amount of information made available to them by industry. One PAC respondent commented that any time information was requested, it was either made available immediately or at the next PAC meeting.

Two government respondents commented that more effort could have been expended to ensure that the information presented to PAC's was accessible to lay people's understanding. Transparency did not really exist if information was available but few people could decipher it.

Three government and two PAC respondents also commented that companies should be able to keep proprietary information private. There was no expectation for companies to share all aspects of their private operations. One PAC respondent raised the concern that some companies might want to be part of their competitors' PAC's, thereby gaining detailed information about their competitors' operations. This would constitute an abuse of the transparency promoted in the P2 planning process.

Almost all respondents thought it was important that the P2 planning process as a whole (22, 92%) and the development, implementation and monitoring of individual P2 plans (22, 92%) was transparent.

5.2.4.3 Monitoring and reporting measurable progress

Respondents were asked to what extent they agreed or disagreed with the following statements regarding monitoring and reporting.

Table 15. Element #4 -- Monitoring and reporting

Questionnaire statement	Number of responses				
	SA[41]	MA	N	MD	SD
E1. Appropriate performance indicators have been chosen to assess progress.	5	10	6	2	1
E2. Sufficient monitoring of performance indicators is part of the P2 planning process.	12	8	3	1	
E3. Independent third party verification of monitoring and reporting is part of the P2 planning process.	3	3	8	4	6
E4. Regular, public reporting of results is part of the P2 planning process	8	9	4	2	
E5. How important do you think it is to include each of the following in the P2 planning process?	VI[42]	SI	N	SU	VU
a) the use of appropriate performance indicators	21	2	1		
b) sufficient monitoring	18	5	1		
c) independent third-party verification of monitoring and reporting	6	6	3	6	3
d) regular, public reporting of results	10	9	4	1	

Many respondents (15, 63%) agreed that **appropriate performance indicators had been chosen**. Similarly, most respondents (20, 83%) agreed that there was **sufficient monitoring** of these performance indicators. Almost all respondents found it important to some extent to **chose appropriate performance indicators** (23, 96%), and to ensure **sufficient monitoring** of those indicators (23, 96%).

[41] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[42] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

Responses were mixed as to whether there was **third-party verification** of monitoring and reporting. No industry representatives agreed that there was third-party monitoring. Several government and PAC respondents (6, 25%) were of the opinion that the PAC or a consulting engineering company working with the industry to develop a P2 plan constituted third-party monitoring.

Responses were mixed regarding the importance of third-party verification. For industry, three of eight respondents (38%) thought it was important to some extent, while five thought it unimportant to some extent (62%). Conversely, five of seven PAC respondents (71%) found it important to some extent, while only one found it unimportant (14%). Government responses were almost evenly distributed across the range of possible responses.

One PAC respondent commented that "they (*industry*) could cheat so easily." However, another PAC respondent commented that industry had the in house expertise and experience to do adequate monitoring; it would be a waste of money and imply a lack of trust to require third-party monitoring.

Several respondents commented that third-party verification would be very important if P2 planning were developed as a quasi-replacement of the permitting system. If P2 planning were to be entirely voluntary with the existing permits still intact, then third-party verification would not be as important. One PAC respondent commented that he considered third-party verification an additional cost that would not be necessary where adequate trust and transparency had been developed.

Many respondents (17, 71%) agreed that there was **regular, public reporting of results as part of the P2 planning process.** Although few companies actually provided annual environmental reports, information was made publicly available PAC meetings and published in local papers. Several government and industry respondents commented that the permit monitoring results reported to MELP were also publicly available.

Most respondents (19, 79%) indicated that **regular, public reporting of results** was important to some extent. Two PAC members commented that some reporting was important, but that the public was not terribly interested in environmental reports that were "overkill." Two PAC members also commented too much environmental reporting might not be a good thing for industry. "A little knowledge can be a dangerous thing" and "Companies should neither walk too tall nor talk too wise."

5.2.5 Flexibility and innovation

Respondents were asked to what extent they agreed or disagreed with the following statements regarding the fifth design elements, flexibility and innovation.

Table 16. Element #5 -- Flexibility and innovation

Questionnaire statement	Number of responses				
	SA[43]	MA	N	MD	SD
F1. P2 planning is flexible enough to enable innovation, such as technical, management, and process innovation.	16	6	1	1	
F2. P2 planning encourages innovation.	13	10	1		
	VI[44]	SI	N	SU	VU
F3. How important do you think it is to enable and encourage innovation?	19	5			

Almost all respondents either strongly or mildly agreed that **P2 planning was flexible enough to enable innovation** (22, 92%), while many agreed that it **encourages innovation** (13, 54%). Several respondents commented that P2 planning provided new forums for original thinking, "shaking up" the way people have been thinking for years.

[43] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[44] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

Many ideas not previously thought of were generated in the process. One PAC respondent commented that it was an "exciting change from the way permits have been managed."

One government respondent felt that the process was too bureaucratic to be adequately flexible. Conversely, another government respondent felt that the process was too flexible.

All respondents (24, 100%) thought flexibility and innovation were either very or somewhat important.

Chapter 6 CONCLUSIONS AND RECOMMENDATIONS

Both nationally and internationally, there is an increasing trend toward the use of voluntary initiatives as either compliments to or replacements of more traditional regulatory instruments in achieving environmental protection policy objectives. Although the command and control approach of traditional environmental regulations has achieved much of the environmental protection to date, the limitations of this approach are becoming increasingly onerous given the growing complexity of environmental issues. Voluntary initiatives as an alternative approach potentially offer greater flexibility, cost effectiveness, stakeholder involvement, innovation, cooperation, and communication.

In British Columbia, a desire to change the existing end-of-pipe, command and control based approach for major industrial operations has been expressed. In response, the pollution prevention (P2) planning process was developed by the Ministry of Environment, Lands and Parks (MELP) as a potential alternative to existing permits and regulations. Originally, this process was designed to replace the existing authorization provided by permits and regulations. However, based on the experience in a demonstration project, the P2 planning process is being alternatively considered as a voluntary initiative.

The demonstration project was brought to a close in April 1999. In its final report, the steering committee for the demonstration project recommended that MELP establish "an evaluation, development and implementation process, which would include representatives of industry (including the pilot companies) and possibly other stakeholders" (British Columbia Pollution Prevention Demonstration Project Steering Committee 1999, 26). MELP intends to follow this recommendation; it is now deciding who should be included in the planned implementation committee (Fast 1999). This implementation committee will consider how the P2 planning process could be applied

throughout the province either as a voluntary or mandatory measure, or some combination thereof.

In this study, the possibility of P2 planning as a voluntary initiative for major industrial operations in British Columbia is considered. It must be noted that P2 planning was not originally designed to be a voluntary initiative, but a replacement of existing permits and regulations. Based on the experience of the demonstration project, an alternative application of P2 planning is now being considered -- P2 plans as voluntary compliance plans in a context where historical permits are replaced by either multimedia, single-site permits or by multimedia, sector-based regulations (Driedger 1999). Furthermore, it should also be noted that the P2 planning process is still evolving and not necessarily complete. Nonetheless, a better understanding of the experiences of the seven major industrial companies who voluntarily participated in the demonstration project could be informative for the planned implementation committee when considering introducing P2 planning throughout BC.

6.1 Conclusions

6.1.1 Study question #1

– Why would industry voluntarily participate in BC's P2 planning process?

In the first study question, reasons as to why industry would voluntarily participate in BC's P2 planning process were considered. To answer this question, inquiries were made as to the incentives and realized advantages of companies that had already voluntarily participated in the P2 planning demonstration project. For these seven companies, the three most important incentives prior to participation and advantages realized were **better public relations with the local community**, **better relations and communication with MELP**, and the **possibility of changes to existing regulatory requirements.** In contrast to what is suggested in the literature, pressure from financial

institutions, insurance companies, and peer pressure were not important incentives for participation.

The existence of incentives for companies to voluntarily exceed regulatory requirements is further supported by the fact that five of these seven companies are implementing, or have already implemented, environmental management measures such as ISO 14001 in addition to P2 planning.

A corollary of this first study question is why would industry not voluntarily participate in P2 planning? For the companies in the demonstration project, the disincentives of **uncertainty regarding legal implications,** the **voicing of local community concerns that could not easily be addressed,** and the possibility of **enforcement actions by government resulting from discovery of noncompliance** were important prior to participation. Furthermore, a number of disadvantages following participation were identified. These disadvantages seemed to revolve around two central issues: the extensive resources, that is, people, time, and money, required by the process; and the continuing uncertainty regarding the role of P2 planning in the overall policy and regulatory framework. The disincentive regarding the voicing of local community concerns did not materialize as a disadvantage of participation.

Perhaps two of the most telling indicators for the existence of industry's incentives for and advantages of participation are the commitment shown by companies to the demonstration project thus far, and their enthusiasm to repeat the process. Of the seven companies that began the P2 planning process, five actually completed or have almost completed a P2 plan. The other two companies decided that a different approach, such as ISO 14001, better suited their test facilities. When asked if, in retrospect, they would participate in the demonstration project again, five of the seven companies strongly agreed, one mildly agreed, and one neither agreed nor disagreed. Of the five that strongly agreed, one was a company that chose not to complete a P2 plan at its test facility during the demonstration project. When asked if they would commit additional facilities to the

P2 planning process, four of seven participating companies agreed that they would, one strongly and three mildly. Of those companies that agreed, again one was a company that chose not to complete a P2 plan at its test facility. Of the remaining three companies, two indicated that they neither agreed nor disagreed, and on mildly disagreed that they would voluntarily commit additional facilities.

These results suggest that there are several reasons why industry might voluntarily participate in P2 planning, namely **better public relations with the local community** and **better relations and communication with MELP.** The incentive of possible **changes to existing regulatory requirements** was probably unique to the demonstration project, and does not really inform the potential application of P2 planning across BC.

Industry participants in P2 planning seem, for the most part, satisfied with their experience in the demonstration project. However, there is still much anticipation and trepidation regarding how P2 planning will be incorporated into the existing environmental policy. Industry's interest in further participation in P2 planning as a voluntary initiative seems, for some, dependent on the final P2 planning process and supporting policy framework.

It is important to emphasize that the reasons for voluntary participation in P2 planning suggested by this study were solicited from the seven industrial companies in the demonstration project only. How applicable these reasons would be for other industrial companies in BC is unknown, although it seems reasonable to assume some level of correlation. Why these particular seven companies were chosen for this demonstration project was not considered in this study, but this might have significant bearing on the applicability of these study results to industry in general in BC.

6.1.2 Study question #2

> – Does the P2 planning process developed to date include design elements suggested in the literature for successful voluntary initiatives?

The second study question considers the P2 planning process in light of design elements suggested in the literature for a successful voluntary initiative. The six design elements identified were: **sufficient advantages of participation; participant commitment to initiative; ground rules; credibility; flexibility and innovation;** and a **supportive policy framework**. Only the first five elements were used when considering the P2 planning process; considering the sixth element was not appropriate at the time of the study given the preliminary nature of the pilot project. Opinions about the P2 planning process with regard to the first five design elements were solicited from industry, government and public advisory committee (PAC) stakeholders. These design elements are considered separately.

According to questionnaire respondents, there are, for the most part, **sufficient advantages of participation** in the P2 planning process (19 of 24 respondents agreeing to some degree, 79%) and these advantages encourage **long-term participation** (18, 75%). However, these responses should be considered in conjunction with the commitment shown by companies to the demonstration project thus far, and their enthusiasm to repeat the process, as discussed in the previous section.

Respondents provided a multitude of suggestions as to what advantages or incentives would promote participation in P2 planning. Some of these advantages were inherent to the process, and should be promoted to encourage participation. Many of the suggested advantages were in addition to those inherent advantages, and could be implemented in the future. Suggested advantages seemed to revolve around three central themes:

- **business's bottom line** – reduced permit costs, process efficiencies, economic benefits of P2 planning

- **regulatory structure** – increased flexibility, certainty about future regulations, developing a due diligence defence, creating one regulatory window for industry where more than one government body has authority
- **relationships** – better relationships with government, with the local public, public recognition, and workers' pride in industry

Based on these results, the inherent benefits of P2 planning should be promoted, and further incentives and advantages seriously considered, in order to ensure sufficient advantages of participation.

With regard to the second design element, **participant commitment to the process**, respondents felt there was a range of commitment shown by the various stakeholders. Most respondents were satisfied with industry's commitment and efforts in the process with minor exceptions for the two companies who chose to vary from the P2 planning framework. Respondents were less convinced of government's commitment; they felt that the government staff involved had worked hard, but that inadequate resources and political will supported their efforts. There were also some concerns raised about communication between the head and regional offices that further effected government's commitment. Most respondents were satisfied with the commitment demonstrated by the PAC members. However, there was some disappointment at the overall lack of interest demonstrated by the publics for participating in the process.

The third suggested design element is **ground rules**. In this regard, goals, objectives, targets, and timeframes were set to some extent for individual P2 plans, however few such ground rules were defined for the process overall. Roles and responsibilities for industry and government were fairly well understood by participants, but several comments were made reflecting confusion regarding the role of PAC's. The legal implications of participation were not very clear for many respondents; several legal issues arose and were addressed during the demonstration project. Nonetheless, legal questions still remain. There was no clearly defined dispute resolution mechanism other

than the *de facto* mechanism of the steering committee, a forum for discussion. Almost all respondents thought these four aspects were important to the P2 planning process.

A fifth aspect of ground rules is rewards and sanctions. No rewards or sanctions other than those inherent to the process were specified prior to the initiative. Many respondents (15, 63%) felt there should be some rewards but opinions were divided as to the need for sanctions, with thirteen respondents saying it was important (54%) and seven saying it was unimportant (25%). Respondents generally commented that if P2 planning is to be a purely voluntary initiative, sanctions are not as important. However, if it in any way replaces a form of authorization, sanctions would be very important.

The fourth design element is **credibility**. By including meaningful participation of external stakeholders in the individual P2 plans through PAC's, the plans seemed to have achieved a level of credibility. However, this was tempered by the level to which PAC members felt they were able to participate in the sometimes very technical and time-consuming process. External stakeholders were not included in the design of the overall process itself. Almost all respondents thought it was important to include external stakeholders in both the individual plans and the overall planning process design.

A further aspect of **credibility** is process transparency**.** Respondents thought for the most part that the process and individual plans were adequately transparent, although there were concerns about communicating complicated technical information to nontechnical PAC members. Almost all respondents thought it was important to ensure transparency.

The third aspect of **credibility** considered was monitoring and reporting measurable progress. Respondents thought that appropriate **performance indicators** had been chosen (15, 63%) and that these indicators were being sufficiently **monitored** (20, 83%). Opinions were mixed as to whether **third party verification** of monitoring was being done and how important this element was. Again, if P2 planning is to be a purely voluntary initiative, third party verification would not generally be considered important.

If P2 planning is to become some form of authorization, third party verification would be very important. Respondents were generally satisfied with the level of **public reporting** of results (17, 71%), although few companies formally published these results other than making them generally available to the PAC members. Most respondents thought that regular public reporting of general environmental performance information was important, but several commented that detailed reporting was not necessary.

The fifth design element is **flexibility and innovation**. Almost all respondents were satisfied that the P2 planning process enables (22, 92%) innovation, and some (13, 54%) that it encourages innovation. All respondents thought this design elements was important.

In summary, the P2 planning process as developed to date includes, at least to some extent, many of the design elements suggested in the literature for a successful voluntary initiative. However, a need for further clarification and development of most elements was identified. Respondents generally agreed that the design elements suggested were important with regard to P2 planning.

In many ways, the P2 planning demonstration project can be considered a success. MELP had an opportunity to learn more about the P2 planning process, how it could be applied, what issues and questions were raised in its application, and what kind of resources would be required to implement the process. MELP also developed a much better understanding of the demonstration project industries and the publics' concerns. Industry had a unique opportunity to communicate with MELP and the local communities regarding environmental management and protection issues, resulting in a more positive relationship between all these stakeholders. Industry also benefited from a much better understanding of their own processes, achieving improved process efficiencies and, in some cases, cost savings. The publics had an opportunity to participate in P2 planning, acquiring a greater understanding of MELP's and industry's issues, and voicing local community concerns about the environment.

6.2 Recommendations

P2 planning is now slated to be further developed by an implementation committee. This committee will consider if P2 planning should be adopted province-wide, and if so, how. From this study, several recommendations regarding the further use of P2 planning in BC emerge.

1. Carefully consider the supporting policy framework.

A supporting policy framework was the sixth design element recommended for successful voluntary initiatives. Although this study did not directly consider the policy framework for P2 planning, this issue nevertheless impinged upon many aspects of the study. Participants opinions regarding many aspects of the process, such as the need for third party monitoring, sanctions, and public reporting, hinge upon this framework. Industry's present enthusiasm for P2 planning is also dependent on the future role of P2 planning in the overall environmental policy. The incentive structures for participation should be carefully considered in light of the overall policy. The possibility remains that P2 planning as a voluntary initiative is not the best policy tool to achieve overall environmental protection goals.

2. Design for transparency.

A second major theme to emerge from this study is the need for transparency. All three stakeholder groups agree that transparency is important; it lends the process credibility. The level of transparency affects the need for third party monitoring, rewards and sanctions, dispute resolution mechanisms, and makes the commitment of various participants evident to all stakeholders. Although most respondents in this study were fairly satisfied with the transparency of the individual P2 plans and the planning process as a whole, the implementation committee should ensure that the process is adequately transparent for all external stakeholders, including those other than in the local communities.

3. Include external stakeholders in the implementation committee.

The steering committee for the P2 planning demonstration project consisted of industry and government representatives only. Although additional stakeholders were occasionally invited to contribute to meetings, the steering committee was essentially closed. This was likely a necessary and important factor in building the improved communication channels between industry and government during this pilot project. Having established these improved communication channels, further development of the process should include external stakeholders to afford the P2 planning process credibility.

4. Further develop the role of the public advisory committees in the overall process.

Most respondents agreed that the public advisory committees (PAC's) were a positive and important part of the P2 planning process. However, the role of the PAC in the P2 planning process was not well enough defined and, as such, was a source of confusion for some participants. As a minimum, several issues need resolution:

- Who is to be included in the PAC's? Who decides?
- Must members be local stakeholders only?
- Must members represent a specific interest group, or can they be independent?
- How are PAC meetings are to be facilitated? By whom?
- How is technical information to be effectively communicated to nontechnical people?
- How are disputes in PAC meetings to be resolved?

The PAC's present an excellent opportunity for public input, new ideas, public accountability and credibility, and long-term pressure to meet commitments. However, if not carefully planned and managed, PAC's could be a source of frustration, confusion, mistrust, and confrontation. This aspect of future applications of P2 planning should be very carefully considered.

5. Further define the P2 planning process to fully incorporate suggested design elements.

The P2 planning process included most of the recommended design elements discussed in table 1, Elements of a successful voluntary initiative, to some extent. However, further clarification of many aspects of the process could improve the stakeholders' understanding and communication as well as the overall process effectiveness and credibility. For the most part, respondents in this study agreed that these design elements are important.

6. Ensure that the necessary resources are available and committed to P2 planning.

All project participants agreed that P2 planning was a resource intensive process, although most agreed that it was a worthwhile effort. If P2 planning is to be implemented throughout BC, it will require significant leadership and commitment from MELP, and coordination between the head and regional offices. In the long term, P2 planning may result in greater environmental protection and require fewer government resources. But in the short term, the process will likely require significant staff involvement and resources. The process should be carefully designed and defined with adequate resources committed to support the process before it is introduced throughout BC. Similarly, mechanisms should be implemented to ensure that industry participants are aware and willing to commit the resources necessary for P2 planning.

6.3 Closing comment

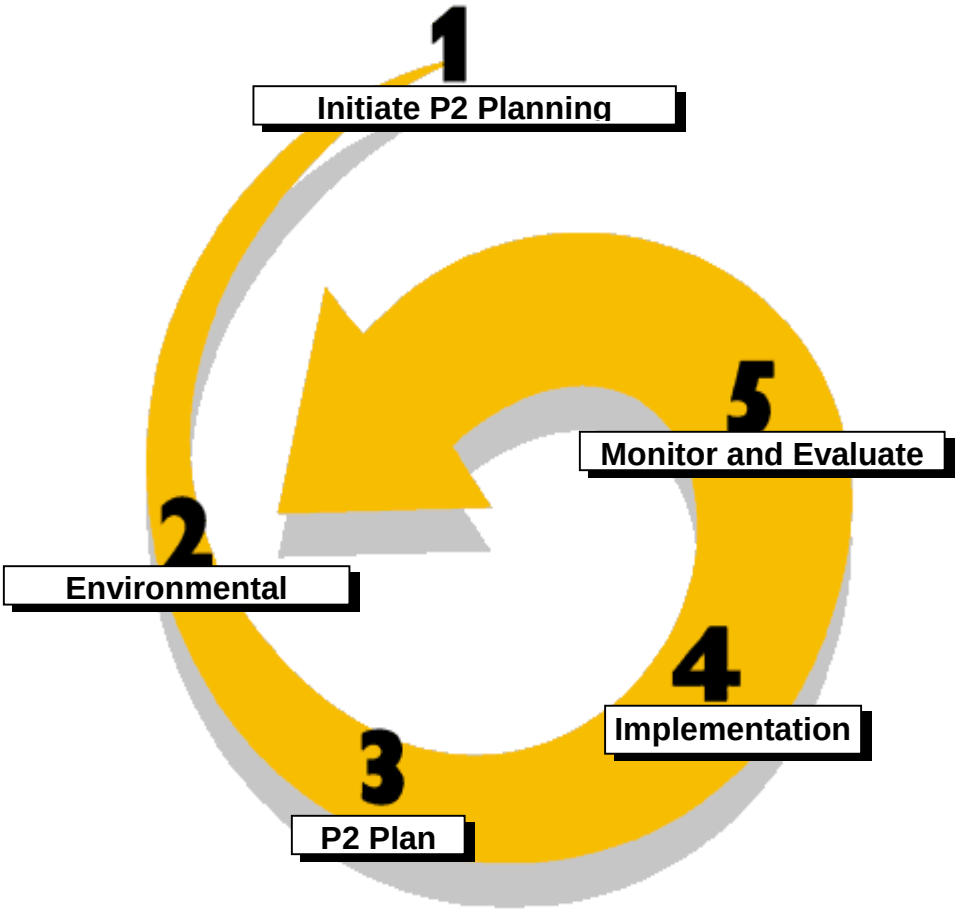
BC's P2 planning process and recent demonstration project signify several new developments in BC's management approach to environmental protection with regard to major industrial operations. P2 planning shifts the focus from end-of-pipe thinking to source control, preventing pollution before it is even created. In this way, P2 planning is **proactive, not reactive**. P2 planning also reflects a potential change in institutional arrangements to include greater shared responsibility and accountability for environmental protection, including government, industry and the publics. In this

manner, P2 planning is about **collaboration, not confrontation**. Compared to the existing environmental management approach, P2 planning is a **more transparent and inclusive** process. It affords the publics an opportunity to participate meaningfully in the province's approach to environmental management.

P2 planning may be considered by some to offer a lower cost alternative to the existing command and control based management approach for major industrial operations. This may well prove to be the case in the long term. However, if P2 planning as a voluntary initiative is to be well designed and implemented, this will unlikely be the case in the short term. Nonetheless, the important ideas behind the P2 planning initiative could be influential as British Columbia attempts to develop a sustainable society. In a sustainable society, BC will need, among other things, sustainable forms of governance and environmental management. P2 planning and other voluntary initiatives, such as the ISO 14001 standard, reflect important steps toward this overarching goal of sustainability.

Appendix A
Introduction to questionnaire(s)

POLLUTION PREVENTION PLANNING AS A VOLUNTARY INITIATIVE FOR MAJOR INDUSTRIAL OPERATIONS: A BC CASE STUDY



Catherine Ponsford, Master's student,
School of Resource and Environmental Management,
Simon Fraser University, Burnaby, BC

Graphic adapted from *"An Introduction to Pollution Prevention Planning for Major Industrial Operations in British Columbia"*
BC Ministry of Environment, Lands and Parks, 1996

Introduction

Having received this questionnaire, you have probably already invested many hours and much effort towards pollution prevention (P2) planning. Whether you are with government, with industry, or represent the public, you have gained a lot of experience with BC's P2 planning process. I am very interested in this new process, and hope you will take some time to share your learning by participating in this study.

Who am I? I am Catherine Ponsford, a Master's student in the School of Resource and Environmental Management at Simon Fraser University, Burnaby, BC. I am conducting this research in order to fulfil the research project requirements for a Masters in Resource Management (MRM).

Project description

In this research, I am specifically interested in the **process** of P2 planning, that is, what it entails, who is involved, how it is carried out, and why people might participate. I understand that there is no one, specific and detailed P2 planning process for BC, that people's experiences with P2 planning have been different, and that the process is still evolving. What I am interested in is <u>your</u> experience with P2 planning to date. With regards to this process, I am asking two research questions:

Part A Why would industry voluntarily participate in BC's P2 planning process?

Part B Does the P2 planning process developed to date include design elements suggested in the literature for successful voluntary initiatives?

A separate questionnaire will be used to answer each question. Only industry participants will be asked to answer the questionnaire related to Part A (Questionnaire A). For Part B, selected government, industry, and public advisory committee (PAC) participants will be asked to respond to the second questionnaire (Questionnaire B). The appropriate questionnaire(s) for you is attached.

You will have received this information by mail, fax, or email. Upon receipt, I ask that

you review this material and consider your answers, marking the form with questions or comments as you wish. Shortly after you receive this material, I will contact you to arrange a time to go over the questionnaire by telephone. During this prearranged telephone meeting, I will record your responses to the questionnaire, as well as welcome any additional comments you may wish to make regarding issues raised in the questionnaire. You DO NOT have to return this questionnaire to me following the telephone interview.

Estimated time required

Based on the experience of several pre-tests, I estimate that it will take you 20-30 minutes to review each questionnaire and consider your answers. Our telephone conversation should last approximately 30 minutes, depending on the amount of discussion you are interested in pursuing.

Consent and confidentiality

Having reviewed this information, I hope you will participate in the study. On the following consent form, you can indicate whether or not you require that the information you provide be kept confidential. **I DO need to have a copy of the signed consent form returned. Please return this form. I cannot record your responses to the questionnaires before receiving this signed consent form.**

I appreciate the opportunity to research this project; thank you for your cooperation in providing the information necessary to make this project possible. If you have any questions or concerns, please contact me, Catherine Ponsford, at:

Telephone: 604-254-3032
Fax: 604-291-4968
email: chp@sfu.ca

Thank you.

CONFIDENTIALITY AND CONSENT

(RESPONDENT'S COPY)

The university and those conducting this project subscribe to the ethical conduct of research and to the protection at all times of the interests, comfort, and safety of subjects. This form and the information it contains are given to you for your own protection and full understanding of the research procedures. Your signature on this form will signify that you have received a project description which describes the procedures, that you have received an adequate opportunity to consider the information in this document, and that you voluntarily agree to participate in the project.

- - - - -

Having been asked by Catherine Ponsford of the School of Resource and Environmental Management at Simon Fraser University to participate in a research project, I have read the procedures specified in the project description.

I understand the procedures to be used in the research. I understand that I may withdraw my participation at any time.

I also understand that I may register any complaint I might have about the experiment with the researcher, Catherine Ponsford, or with Dr. Peter Williams, Director of the School of Resource and Environmental Management of Simon Fraser University (tel: 604-291-3103 or email: peterw@sfu.ca).

I may obtain copies of the results of this study, upon its completion, by contacting Ms. Catherine Ponsford (tel: 604-254-3032 or email: chp@sfu.ca).

I understand that my supervisor or employer may require me to obtain his or her permission prior to my participation in a study such as this.

I DO / DO NOT (*circle one)* require that the information provided in this questionnaire and all interviews be kept confidential.

When citing information collected from me in this questionnaire and any subsequent discussions, I wish to be referred to as (*check one*):

__ a representative of my company, where the company is named
__ a government OR industry OR public advisory committee respondent
__ a respondent

NAME (please print legibly):

_____

Address:

_____

_____

email: _____ Phone: _____

fax: _____ Date: _____

Signature: _____ Witness: _____

Please return the RESEARCHERS COPY
of the **CONFIDENTIALITY AND CONSENT** form

to Catherine Ponsford

via mail or fax.

Mail: Catherine Ponsford
School of Resource and Environmental Management
Simon Fraser University
8888 University Drive
Burnaby, BC
V5A 1S6

Fax: (604) 291-4968
Tel: (604) 254-3032

Appendix B
Questionnaire A

QUESTIONNAIRE A

1a. When your company first committed to participation in BC's P2 planning process, how important was each of the following possible incentives? Please circle one response per statement.

VI very important
SI somewhat important
N neither important nor unimportant
SU somewhat unimportant
VU very unimportant

a) possible net cost savings	VI	SI	N	SU	VU
b) better relations with BC Environment	VI	SI	N	SU	VU
c) better public relations with local community	VI	SI	N	SU	VU
d) improved market differentiation (i.e., favorably separate your company from the competitors)	VI	SI	N	SU	VU
e) pressure from financial institutions	VI	SI	N	SU	VU
f) pressure from insurance companies	VI	SI	N	SU	VU
g) peer pressure from other industry companies	VI	SI	N	SU	VU
h) concerns about legal due diligence	VI	SI	N	SU	VU
i) desire to avoid threat of tougher enforcement of existing permits and regulations	VI	SI	N	SU	VU
j) desire to avoid threat of further environmental regulation	VI	SI	N	SU	VU
k) other *(please describe)*					

1b. Please rank the three most important incentives by selecting a letter from the list above (a b, c, etc.) or by describing an incentive not listed.

1st:

2nd:

3rd:

QUESTIONNAIRE A

2. When your company first committed to participation in BC's P2 planning process, how important was each of the following possible disincentives? Please circle one response per statement.

VI very important
SI somewhat important
N neither important nor unimportant
SU somewhat unimportant
VU very unimportant

a) discovery of non-compliance	VI	SI	N	SU	VU
b) enforcement action by government resulting from discovery of non-compliance	VI	SI	N	SU	VU
c) voicing of local community concerns in public advisory committee that could not easily be addressed	VI	SI	N	SU	VU
d) cost of participation	VI	SI	N	SU	VU
e) uncertainty about legal implications of participation	VI	SI	N	SU	VU
f) other *(please describe)*					

3. Prior to participating in BC's P2 planning process, was your company already seriously considering or actually implementing a formal, proactive environmental management approach such as ISO 14000 registration or Responsible Care?

(open ended question, to be discussed during telephone conversation)

QUESTIONNAIRE A

4a. Your company now has several years of experience with P2 planning. Based on this experience, please indicate the extent to which you agree or disagree with each of the following statements.

SA strongly agree
MA mildly agree
N neither agree nor disagree
MD mildly disagree
SD strongly disagree

P2 Planning has resulted . . . in:

a) net cost savings	SA	MA	N	MD	SD
b) a net cost in the short term (<12-24 months)	SA	MA	N	MD	SD
c) a net cost in the long term (>12-24 months)	SA	MA	N	MD	SD
d) better relations with MELP	SA	MA	N	MD	SD
e) the possibility of changes to existing regulations and requirements (e.g., multi-media permit)	SA	MA	N	MD	SD
f) better public relations with local community	SA	MA	N	MD	SD
g) useful input from public advisory committees (PACs)	SA	MA	N	MD	SD
h) the raising of local community concerns in the PAC that could not be easily addressed	SA	MA	N	MD	SD
i) education of PAC members that was too time consuming for the benefits realized	SA	MA	N	MD	SD
j) improved communication within the company	SA	MA	N	MD	SD
k) the valuable experience of comprehensive review and long-range planning that might otherwise not have been done	SA	MA	N	MD	SD
l) improved market differentiation (i.e., favorably separate your company from the competitors)	SA	MA	N	MD	SD
m) better communication with other industry companies	SA	MA	N	MD	SD
n) the alleviation of financial institutions' concerns	SA	MA	N	MD	SD
o) the alleviation of legal due diligence concerns	SA	MA	N	MD	SD
p) greater legal certainty than before P2 planning	SA	MA	N	MD	SD
q) increased legal responsibility through disclosure of previously unknown sources of pollution to government	SA	MA	N	MD	SD

QUESTIONNAIRE A

4a. (continued)

P2 Planning has resulted . . . in:

r) other *(please describe)*

4b. Please rank the three most important advantages by selecting a letter from the list above (a, b, etc.) or by describing a result not listed.

1st:
2nd:
3rd:

4c. Please rank the three most important disadvantages by selecting a letter from the list above (a, b, etc.) or by describing a result not listed.

1st:
2nd:
3rd:

5. Please indicate the extent to which you agree or disagree with the following statements.

SA	strongly agree
MA	mildly agree
N	neither agree nor disagree
MD	mildly disagree
SD	strongly disagree

5a. Given a chance to reconsider your initial decision to participate in BC's P2 planning process, you would voluntarily participate again.

SA MA N MD SD

5b. Based on your experience with BC's P2 planning process, you would voluntarily commit additional facilities from your company to BC's P2 planning process.

SA MA N MD SD

QUESTIONNAIRE A

NOTES:

Please use this space to note any additional comments you may have about issues addressed in this questionnaire or other comments.

Thank you for taking the time to consider this questionnaire.
I will contact you to record your responses to these questions.
You do **not** have to return this questionnaire to me.
If you have any questions, please contact me at:
tel: 604-254-3032 or chp@sfu.ca.

Appendix C
Questionnaire B

QUESTIONNAIRE B

This questionnaire is for those involved with the P2 Planning demonstration project, namely industry participants, Ministry of Environment, Lands and Parks staff, and members of the public advisory committees.

This questionnaire asks about your experience with the P2 planning process, as well as about your opinion regarding the importance of certain elements of the process. The first question(s) of every section pertains to your **experience** with the P2 planning process. You will be asked if you agree or disagree with certain statements about the process. The last question(s) of each section asks for your **opinion** regarding the importance of certain elements of the process. You will be asked to indicate how important you think these elements are.

For many of the following questions, you will be asked to chose from the following scale:

SA **strongly agree**
MA **mildly agree**
N **neither agree nor disagree**
MD **mildly disagree**
SD **strongly disagree**

If you have no opinion, are unsure of your opinion, or feel you don't know enough about the issue to comment, please mark N (neither agree nor disagree) as your response.

If you have any questions, please do not hesitate to contact me, Catherine Ponsford,

tel: (604) 254-3032
email: chp@sfu.ca

Thank you for taking the time to complete this questionnaire.

QUESTIONNAIRE B

A. Advantages of participation.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

SA *strongly agree*
MA *mildly agree*
N *neither agree nor disagree*
MD *mildly disagree*
SD *strongly disagree*

A1. There are sufficient advantages of participation for companies with major industrial operations to voluntarily participate in BC's P2 planning process.

Circle one of: **SA MA N MD SD**

A2. The advantages of participation in BC's P2 planning process encourage long term participation, i.e., greater than 5 years after developing a P2 plan.

Circle one of: **SA MA N MD SD**

A3. What advantages do you think would be most effective in encouraging participation in BC's P2 planning process? (e.g. 10% lower permit fees, fees linked to performance, public recognition program, increased certainty about future environmental regulation and enforcement)

(open ended question, to be discussed during telephone conversation)

A4. How important do you think it is to ensure sufficient advantages of voluntary participation in the P2 planning process? Please circle one response from the following selection.

VI *very important*
SI *somewhat important*
N *neither important nor unimportant*
SU *somewhat unimportant*
VU *very unimportant*

Circle one of: **VI SI N SU VU**

QUESTIONNAIRE B

B. Participant commitment.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

SA *strongly agree*
MA *mildly agree*
N *neither agree nor disagree*
MD *mildly disagree*
SD *strongly disagree*

B1. To date, industry has demonstrated a high level of commitment to BC's P2 planning process as evidenced by:

a) adequate allocation of resources (people and/or money)	**SA**	**MA**	**N**	**MD**	**SD**
b) explicit commitment of senior leaders	**SA**	**MA**	**N**	**MD**	**SD**
c) regular involvement of senior leaders	**SA**	**MA**	**N**	**MD**	**SD**
d) number and comprehensiveness of options identified in P2 plan	**SA**	**MA**	**N**	**MD**	**SD**
e) training and involvement of company staff other than those immediately involved.	**SA**	**MA**	**N**	**MD**	**SD**
f) consistently making an effort throughout the process (at the beginning, during, and at the completion of writing P2 plans)	**SA**	**MA**	**N**	**MD**	**SD**

B2. To date, the head office of the Ministry of Environment, Lands and Parks (in Victoria) has demonstrated a high level of commitment to BC's P2 planning process as evidenced by:

a) adequate allocation of resources (people and/or money)	**SA**	**MA**	**N**	**MD**	**SD**
b) explicit commitment of senior leaders	**SA**	**MA**	**N**	**MD**	**SD**
c) regular involvement of senior leaders	**SA**	**MA**	**N**	**MD**	**SD**
d) training and involvement of government staff other than those immediately involved.	**SA**	**MA**	**N**	**MD**	**SD**
e) consistently making an effort throughout the process	**SA**	**MA**	**N**	**MD**	**SD**

QUESTIONNAIRE B

B3. To date, the regional office of the Ministry of Environment, Lands and Parks (locally) has demonstrated a high level of commitment to BC's P2 planning process as evidenced by:

a) adequate allocation of resources (people and/or money)	**SA**	**MA**	**N**	**MD**	**SD**
b) explicit commitment of senior leaders	**SA**	**MA**	**N**	**MD**	**SD**
c) regular involvement of senior leaders	**SA**	**MA**	**N**	**MD**	**SD**
d) training and involvement of government staff other than those immediately involved.	**SA**	**MA**	**N**	**MD**	**SD**
e) consistently making an effort throughout the process	**SA**	**MA**	**N**	**MD**	**SD**

B4. To date, public advisory committee (PAC) members have demonstrated a high level of commitment to BC's P2 planning process as evidenced by:

a) regular attendance at PAC meetings	**SA**	**MA**	**N**	**MD**	**SD**
b) voicing concerns to government and industry	**SA**	**MA**	**N**	**MD**	**SD**
c) offering constructive advice to industry and government	**SA**	**MA**	**N**	**MD**	**SD**

B5. How important do you think it is to ensure a high level of commitment from these participants for success of BC's P2 planning process? Please circle one response from the following selection.

VI *very important*
SI *somewhat important*
N *neither important nor unimportant*
SU *somewhat unimportant*
VU *very unimportant*

VI SI N SU VU

QUESTIONNAIRE B

C. Goals, objectives, targets and timeframes.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

SA *strongly agree*
MA *mildly agree*
N *neither agree nor disagree*
MD *mildly disagree*
SD *strongly disagree*

C1. BC's P2 planning process in general has clear goals, objectives, and targets. **SA MA N MD SD**

C2. Each individual P2 Plan has clear goals, objectives, and targets. **SA MA N MD SD**

C3. Clear timeframes been defined in which to meet any goals, objectives, and targets that have been set. **SA MA N MD SD**

C4. How important do you think it is to set clear goals, objectives, targets, and timeframes?
Please circle one of the following.

VI *very important*
SI *somewhat important*
N *neither important nor unimportant*
SU *somewhat unimportant*
VU *very unimportant*

VI SI N SU VU

QUESTIONNAIRE B

D. Roles and responsibilities of participants.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

SA *strongly agree*
MA *mildly agree*
N *neither agree nor disagree*
MD *mildly disagree*
SD *strongly disagree*

D1. Roles and responsibilities of industry participants during the P2 planning process were clear. **SA MA N MD SD**

D2. Roles and responsibilities of staff from the Ministry of Environment, Lands and Parks during the P2 planning process were clear. **SA MA N MD SD**

D3. Roles and responsibilities of the public participants on public advisory committees during the P2 planning process were clear. **SA MA N MD SD**

D4. How important do you think it is to have clear roles and responsibilities for each of the following? Please circle one response for each.

VI *very important*
SI *somewhat important*
N *neither important nor unimportant*
SU *somewhat unimportant*
VU *very unimportant*

a) Ministry of Environment, Lands and Parks staff **VI SI N SU VU**
b) industry participants **VI SI N SU VU**
c) public participants on public advisory committees **VI SI N SU VU**

QUESTIONNAIRE B

E. Monitoring of performance indicators, third party verification, and reporting of results.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

SA *strongly agree*
MA *mildly agree*
N *neither agree nor disagree*
MD *mildly disagree*
SD *strongly disagree*

E1. Appropriate performance indicators have been chosen to assess progress. **SA MA N MD SD**

E2. Sufficient monitoring of performance indicators is part of the P2 planning process. **SA MA N MD SD**

E3. Independent third party verification of monitoring and reporting is part of the P2 planning process. **SA MA N MD SD**

E4. Regular, public reporting of results is part of the P2 planning process. **SA MA N MD SD**

E5. How important do you think it is to include each of the following in the P2 planning process? Please circle one response for each.

VI *very important*
SI *somewhat important*
N *neither important nor unimportant*
SU *somewhat unimportant*
VU *very unimportant*

a) the use of appropriate performance indicators **VI SI N SU VU**
b) sufficient monitoring **VI SI N SU VU**
c) independent third-party verification of monitoring and reporting **VI SI N SU VU**
d) regular, public reporting of results **VI SI N SU VU**

QUESTIONNAIRE B

F. Flexibility and innovation.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

SA *strongly agree*
MA *mildly agree*
N *neither agree nor disagree*
MD *mildly disagree*
SD *strongly disagree*

F1. P2 planning is flexible enough to enable innovation, such as technical, management, and process innovation. **SA MA N MD SD**

F2. P2 planning encourages innovation. **SA MA N MD SD**

F3. How important do you think it is to enable and encourage innovation? Please circle one of the following.

VI *very important*
SI *somewhat important*
N *neither important nor unimportant*
SU *somewhat unimportant*
VU *very unimportant*

VI SI N SU VU

QUESTIONNAIRE B

G. Rewards and sanctions.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

SA *strongly agree*
MA *mildly agree*
N *neither agree nor disagree*
MD *mildly disagree*
SD *strongly disagree*

G1. Rewards for a certain level of achievement in P2 planning were specified prior to companies committing to the process. **SA MA N MD SD**

G2. Sanctions for failing to meet a certain level of achievement in P2 planning were specified prior to companies committing to the process. **SA MA N MD SD**

Please circle one response for each of the following.

VI *very important*
SI *somewhat important*
N *neither important nor unimportant*
SU *somewhat unimportant*
VU *very unimportant*

G3. How important do you think it is to specify rewards for a predefined level of achievement in BC's P2 planning process? **VI SI N SU VU**

G4. How important do you think it is to specify sanctions for failing to meet a certain level of achievement in BC's P2 planning process? **VI SI N SU VU**

QUESTIONNAIRE B

H. Legal implications.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

SA *strongly agree*
MA *mildly agree*
N *neither agree nor disagree*
MD *mildly disagree*
SD *strongly disagree*

H1. A clear understanding of the legal implications of participation in P2 planning was established prior to beginning the initiative. **SA MA N MD SD**

H2. How important do you think it is to establish a clear understanding of the legal implications of participation prior to beginning the initiative? Please circle one of the following.

VI *very important*
SI *somewhat important*
N *neither important nor unimportant*
SU *somewhat unimportant*
VU *very unimportant*

VI SI N SU VU

QUESTIONNAIRE B

I. Dispute resolution.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

SA *strongly agree*
MA *mildly agree*
N *neither agree nor disagree*
MD *mildly disagree*
SD *strongly disagree*

I1. A mechanism for dispute resolution was developed prior to beginning this initiative. **SA MA N MD SD**

I2. How important do you think it is to provide for transparent and effective dispute resolution prior to beginning this initiative? Please circle one of the following.

VI *very important*
SI *somewhat important*
N *neither important nor unimportant*
SU *somewhat unimportant*
VU *very unimportant*

VI SI N SU VU

QUESTIONNAIRE B

J. External stakeholders.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

SA *strongly agree*
MA *mildly agree*
N *neither agree nor disagree*
MD *mildly disagree*
SD *strongly disagree*

J1. Members of the public advisory committee's (PACs) were able to meaningfully participate in the development of individual P2 plans. **SA MA N MD SD**

J2. External stakeholders, such as local interest groups and other interested organizations not necessarily based locally, were adequately represented in the development of the P2 planning process. **SA MA N MD SD**

Please circle one response for each of the following.

VI *very important*
SI *somewhat important*
N *neither important nor unimportant*
SU *somewhat unimportant*
VU *very unimportant*

J3. How important do you think it is that PAC members can meaningfully participate in the development of individual P2 plans? **VI SI N SU VU**

J4. How important do you think it is to enable the representation of external stakeholders, such as local interest groups and other interested organizations not necessarily based locally, in the development of the P2 planning process? **VI SI N SU VU**

QUESTIONNAIRE B

K. Transparency.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

SA *strongly agree*
MA *mildly agree*
N *neither agree nor disagree*
MD *mildly disagree*
SD *strongly disagree*

K1. The development, implementation and monitoring of BC's P2 planning process as a whole is adequately transparent, that is, information is readily available to all stakeholders and external parties. **SA MA N MD SD**

K2. The development, implementation and monitoring of the individual P2 plans is adequately transparent. **SA MA N MD SD**

Please circle one response for each of the following.

VI *very important*
SI *somewhat important*
N *neither important nor unimportant*
SU *somewhat unimportant*
VU *very unimportant*

K3. How important do you think it is to ensure that BC's P2 planning process as a whole is transparent? **VI SI N SU VU**

K4. How important do you think it is that the development, implementation and monitoring of the individual P2 plans is transparent? **VI SI N SU VU**

QUESTIONNAIRE B

NOTES

Please use this space to note any additional comments you may have about issues addressed in this questionnaire or other comments.

Thank you for taking the time to consider this questionnaire.
I will contact you to record your responses to these questions.
You do **not** have to return this questionnaire to me.
If you have any questions, please contact me at:
tel: 604-254-3032 or chp@sfu.ca.

Appendix D
Responses to questionnaires

Appendix D
Summary of questionnaire B responses

		INDUSTRY					GOVERNMENT					PUBLICS					ALL RESPONDENTS						
		SA/VI	MA/SI	N	MD/SU	SD/VU	SA/VI	MA/SI	N	MD/SU	SD/VU	SA/VI	MA/SI	N	MD/SU	SD/VU	SA/VI	MA/SI	N	MD/SU	SD/VU		
AI		5	1	2			3	6				3	1		2	1	11	8	2	2	1	AI	
A2		5	2		1		2	4	2	1		4	1		1	1	11	7	2	3	1	A2	
A3																						A3	
A4		6	2				4	4			1	7					17	6			1	A4	
B1	A	6	1		1		4	5				5	1			1	15	7		1	1	B1	A
	B	6		2			4	5				5	1			1	15	6	2		1		B
	C	5		2	1			8	1			5	1			1	10	9	3	1	1		C
	D	6	2				6	1	2			3	2			1	15	5	2		1		D
	E	2	2	1	2	1	2		3	3	1	2	2	3			6	4	7	5	2		E
	F	5	2			1	5	3	1			2	5				12	10	1		1		F
B2	A	4	1		3		1	4	1	2	1	2	2		2	1	7	7	1	7	2	B2	A
	B	5	2	1			6	2	1			1	2	3	1		12	6	5	1			B
	C	5	1	2			2	4	2	1		2	1	1	2	1	9	6	5	3	1		C
	D	2	1	3	2		1	2	1	1	4			5	1	1	3	3	9	4	5		D
	E	4	3			1	3	2	1	3		1	3	2	1		8	8	3	4	1		E
B3	A	4	2		2		3	3		1	2	4	1		1	1	11	6		4	3	B3	A
	B	3	2	1	1	1	5	2		2		1	3	2		1	9	7	3	3	2		B
	C	4	1	1	1	1	2	2	1	3	1	2	2	1	1	1	8	5	3	5	3		C
	D	2		4	1	1		3	2	1	3	1		4	1	1	3	3	10	3	5		D
	E	3	2	1	1	1	5	3	1			2	2	1	1	1	10	7	3	2	2		E
B4	A	5	1	1	1		4	5				1	4		1	1	10	10	1	2	1	B4	A
	B	4	2	1		1	4	4	1			3	2		2		11	8	2	2	1		B
	C	5	1	1		1	4	3	1	1		4	1	1	1		13	5	3	2	1		C
B5		8					7		1	1		7					22		1	1		B5	
C1		3	4			1	1	4	1	2	1	2	2	1	1	1	6	10	2	3	3	C1	
C2		2	3	2	1			6	1	2		3	1	1	2		5	10	4	5		C2	
C3		1	4	1	2			5	2	2		2	3	1		1	3	12	4	4	1	C3	
C4		5	3				7	2				7					19	5				C4	

SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree
VI: very important; SI: somewhat important; N: neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

Appendix D, cont.
Summary of questionnaire B responses

		INDUSTRY					GOVERNMENT					PUBLICS					ALL RESPONDENTS						
		SA/VI	MA/SI	N	MD/SU	SD/VU	SA/VI	MA/SI	N	MD/SU	SD/VU	SA/VI	MA/SI	N	MD/SU	SD/VU	SA/VI	MA/SI	N	MD/SU	SD/VU		
D1		5	1	2			2	6	1			3	3		1		10	10	3	1		D1	
D2		3	2	3			4	3	2			2	3		2		9	8	5	2		D2	
D3		2	5	1			2	6		1		2	2		3		6	13	1	4		D3	
D4	A	7		1			7	2				7					21	2	1			D4	A
	B	7		1			8	1				7					22	1	1				B
	C	5	2	1			7	2				6		1			18	4	2				C
E1		3	2	3				4	3	2		2	4			1	5	10	6	2	1	E1	
E2		4	3	1			5	2	2			3	3		1		12	8	3	1		E2	
E3				4	2	2	3	1	1	2	2		2	3		2	3	3	8	4	6	E3	
E4		2	4			1	5	3	1			1	2	3		1	8	9	4		2	E4	
E5	A	6	1	1			8	1				7					21	2	1			E5	A
	B	5	2	1			8	1				5	2				18	5	1				B
	C	1	2		4	1	2	2	2	2	1	3	2	1		1	6	6	3	6	3		C
	D	3	1	4			4	5				3	3		1		10	9	4	1			D
F1		6	1	1			5	3		1		5	2				16	6	1	1		F1	
F2		5	3				4	4	1			4	3				13	10	1			F2	
F3		7	1				6	3				6	1				19	5				F3	
G1		2	1		2	2		2	1	3	3		2	2		3	2	5	3	5	8	G1	
G2				1	2	4				2	7		1	3		3		1	4	4	14	G2	
G3		1	4	2		1	1	3	2	3		3	3			1	5	10	4	3	2	G3	
G4		1		1	3	3		2	2	2	3	3	1	1	1	1	4	3	4	6	7	G4	
H1		3		1	2	2		1	1	5	2	1	1	4		1	4	2	6	7	5	H1	
H2		5	2	1			6	1	1	1		6		1			17	3	3	1		H2	
I1		1	2	2	1	2			3	1	5			3	2	2	1	2	8	4	9	I1	
I2		4	3	1			2	5		1	1	4	1	2			10	9	3	1	1	I2	
J1		4	2	1	1		2	4	1	2		3	2			2	9	8	2	3	2	J1	
J2		1	2	2	3		1	2	3	3		1	4		1	1	3	8	5	7	1	J2	
J3		5	2	1			6	2	1			2	5				13	9	2			J3	
J4		2	4	1	1		1	6	1	1		2	4	1			5	14	3	2		J4	
K1		6	2				3	4		2		3	2	1	1		12	8	1	3		K1	
K2		6	2				2	5		2		3	2	1	1		11	9	1	3		K2	
K3		6	2				5	3	1			5	1	1			16	6	2			K3	
K4		6	2				3	5	1			5	1	1			14	8	2			K4	

SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree
VI: very important; SI: somewhat important; N: neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

Reference list

Afsah, Shakeb, Benoit Laplante, and David Wheeler. 1996. *Controlling industrial pollution: a new paradigm.* World Bank, Policy Research Department, Environment, Infrastructure, and Agriculture Division. http://www.worldband.org/nipr/work_paper/1672/index.html (visited April 3, 1998).

Air and Waste Management Association (AWMA). Ontario Section. undated. *Approaches to environmental protection - reality and results.* http://www.ebtech.net/c2p2/awma.html (visited April 13, 1999).

Arora, Seema and Timothy C. Cason. 1996. Why do firms volunteer to exceed environmental regulations? Understanding participation in EPA's 33/50 program. *Land economics* 72 (4) : 413-432.

British Columbia. *Waste Management Act*, R.S.B.C. 1996, c.482.

British Columbia. Ministry of Environment, Lands and Parks. 1991. *Environment 2001, strategic directions for British Columbia.* Victoria: Ministry of Environment, Lands and Parks.

_____. 1992a. *New approaches to environmental protection in British Columbia: a legislation discussion paper.* Victoria: Ministry of Environment, Lands and Parks.

_____. 1992b. *New directions in environmental protection, 5 year action plan 1992-1997.* Victoria: Ministry of Environment, Lands and Parks.

_____. 1992c. *Revising British Columbia's waste discharge permit fee system: a discussion paper.* Victoria: Ministry of Environment, Lands and Parks.

_____. 1995. *Ministry mandate.* http://www.elp.gov.bc.ca:80/main/melp_overview/vision.html (visited March 1, 1999).

_____. 1996a. *Industry joins province to prevent pollution.* News release, March 27, Ministry of Environment, Lands and Parks. 330-20:ELP95/96-114.

_____. 1996b. *An introduction to pollution prevention planning for major industrial operations in British Columbia.* Victoria: Ministry of Environment, Lands and Parks.

_____. 1996c. *A policy and procedure for authorizing pollution prevention plans in British Columbia: compliance plus, background report.* Unpublished.

_____. 1997. *The pollution prevention planning guide for major industrial operation in British Columbia, Draft 3.* Unpublished.

British Columbia. Pollution Prevention Demonstration Project Steering Committee. 1997. *Interim report.*

_____. 1999. *Final report.*

Canada. Industry Canada. Office of Consumer Affairs and Treasury Board Secretariat. Regulatory Affairs Division. 1998. *Voluntary codes: a guide for their development and use.* http://strategis.ic.gc.ca/SSG/ca00963e.html (visited April 16, 1999).

Chang, Elfreda, Doug Macdonald, and Joanne Wolfson. 1998. Who killed the Canadian Industry Packaging Stewardship Initiative (CIPSI)? *Alternatives Journal* 24, no. 2: 21-25.

Clark, Karen. 1995. *The use of voluntary pollution prevention agreements in Canada: an analysis and commentary.* Canadian Institute for Environmental Law and Policy.

Cominco Ltd. n.d. *Environmental protection, balancing environmental, social and economic goals.*

_____. 1999. *Pollution prevention (P2) demonstration project at the Cominco Trail fertilizer operation: final report, conclusions and recommendations.* Trail, BC.

Cotton, Roger. 1996. Voluntary initiatives improve on use of compliance measures. *Environmental Policy & Law* 7, no. 3: 389.

Doern, Bruce G. 1990. *Getting it green: case studies in Canadian environmental regulation.* Ottawa: Renouf Publishing Company Ltd.

Dovetail Consulting Inc. 1997. *Summary report, pollution prevention demonstration project workshop.* Vancouver, BC.

Driedger, Ron, Director, Pollution Prevention and Remediation, Environment and Resource Management, British Columbia Ministry of Environment, Lands and Parks Headquarters Division. 1999. Correspondence with author, 25 November 1999.

Easton, Chuck, Environmental Supervisor, Elk Falls mill, Fletcher Challenge. 1999. Telephone interview by author, 10 June 1999.

Fast, Don, British Columbia's Assistant Deputy Minister of Environment, Lands and Parks Headquarters Division. 1999. Telephone interview by author, 23 June 1999.

Higgins, Thomas E., ed. 1995. *Pollution prevention handbook.* Boca Raton: CRC Press, Inc.

Hillyer, Ann. 1996. *Moving from permitting pollution to preventing pollution: What does the environment need from a permit? A public interest perspective.* West Coast Environmental Law Association. http://www.vcn.bc.ca/wcel/wcelpub/1996/11704.html (visited April 1, 1998).

ICF Kaiser Canada. 1998. *Pollution prevention planning in other jurisdictions.*

International Energy Agency. 1997. *Voluntary actions for energy-related CO_2 abatement.* Paris: Organisation for Economic and Co-operation and Development.

International Institute for Sustainable Development and Canadian Environmental Technology Advancement Corporation - West. 1998. *Beyond regulation: exporters and voluntary environmental measures.* Winnipeg, Manitoba.

KPMG Environmental Services Inc. 1995. *Evaluation of the waste management permit system.* Victoria: Ministry of Environment, Lands and Parks.

Krahn, Peter K. 1998. *Enforcement vs. voluntary compliance: an examination of the strategic enforcement initiatives implemented by the Pacific and Yukon regional office of Environment Canada 1983-1998.* Regional program report 98-02. Vancouver, BC.

Labatt, S. and V. W. Maclaren. 1998. Voluntary corporate environmental initiatives: a typology and preliminary investigtion. *Environment and planning C: Government and policy* 16: 191-209.

Lober, Douglas J. 1998. Pollution prevention as corporate entrepreneurship. *Journal of organizational change management* 11, issue 1. http://www.europe.emerald-library.com/brev/02311ab1.html (visited March 3, 1999).

Lukasik, Lynda. 1999. The Dofasco deal. In *Voluntary initiatives: the new politics of corporate greening,* ed. Robert Gibson, 141-148. Peterborough: Broadview Press.

Lynes, Jennifer and Robert Gibson. 1998. Voluntary corporate initiatives for environmental improvement. *Alternatives Journal* 24, no. 2 : 18-19.

Macdonald, Doug. 1991. *The politics of pollution, why Canadians are failing their environment.* Toronto: McClelland & Stewart Inc..

Nash, Jennifer and John Ehrenfeld. 1996. Code green. *Environment* (January/February 1996): 16-45.

Natural Life. 1998. Laws motivate pollution prevention. *Natural Life* 59 (February 1998): 10.

New Directions Group. 1997. *Criteria and principles for the use of voluntary and non-regulatory policy objectives to achieve environmental policy objectives.* http://www.expertcanmore.net/Pgriss/English.html (visited April 16, 1999).

Ontario. Environmental Commissioner. 1996. *Round table: self regulation, voluntary compliance and environmental protection.* http://www.eos.uoguelph.ca/webfiles/awma/rtable.htm (visited June 21, 1999).

Ontario. Ministry of Environment and Energy. n.d. *Pollution prevention pledge program.*

_____. 1997. *Ontario's progress in pollution prevention.*

_____. 1999. *Pollution prevention in Ontario.*

Organisation for Economic and Co-operation and Development. 1998. *Voluntary agreements with industry.* OECD Working papers VI, no. 68.

Overholt D. H. and P. C. Godsoe. 1996. Voluntary environmental initiatives - are they here to stay? *Policy Perspectives* 3, no. 2: 1-6.

Parker, David R. 1996. Beyond command and control: do voluntary initiatives hold promise for enhanced environmental protection? M. L. thesis, University of British Columbia.

Parto, Saeed. 1999. Aiming Low. In *Voluntary initiatives: the new politics of corporate greening,* ed. Robert Gibson, 182-198. Peterborough: Broadview Press.

Porter, Michael E. 1991. America's green strategy. *Scientific American* (April 1991): 168.

Porter, Michael E. and Claas van der Linde. 1995. Green and competitive: ending the stalemate. *Harvard business review* (September/October 1995): 120-134.

Rabe, Barry G. 1997. The politics of sustainable development: impediments to pollution prevention and policy integration in Canada. *Canadian public administration* 40, no.3: 415-435.

Resource Futures International. 1996. *Voluntary environmental measures: What are they? What makes them work?* http://www.eos.uoguelph.ca/webfiles/awma/vem.htm (visited June 21, 1999).

Resources for the Future. 1997. Voluntary initiatives are no shortcut to pollution abatement. *Resources* 126 (Winter 1997): 18.

Riordan, James. 1997. *Instruments for advancing pollution prevention and cleaner production: the Canadian experience.* http://c2p2.sarnia.com/hot/across-…ederal/leadership/instruments.html (visited April 3, 1998).

Salant, Priscilla and Don A. Dillman. 1994. *How to conduct your own survey.*

Segerson, Kathleen and Thomas J. Miceli. 1998. Voluntary environmental agreements: good or bad news for environmental protection? *Journal of environmental economics and management* 36: 109-130.

Sinding, Knud, Robert Anex, and Mark Sharfman. 1998. "Environmental uncertainty, corporate strategy and public policy." Paper presented at the Greening of Industry conference, Rome, Italy, November 15-18, 1998.

ten Brink, Patrick, Vicky Pollard and James Medhurst. 1998. "Environmental agreements: environmental effectiveness for potential future use." Paper presented at the Greening of Industry conference, Rome, Italy, November 15-18, 1998.

Thompson, Andrew R. 1980. *Environmental regulation in Canada.* Vancouver: Westwater Research Centre, University of British Columbia. New York: Wiley.

ToBI. 1999a. *Proposed NGO criteria for assessing effectiveness of voluntary initiatives.* http://www.coopamerica.org/isf/tobi/vol-init/Criteria.htm (visited June 21, 1999).

_____. 1999b. *Responsible action or public relations? An NGO perspective on voluntary initiatives.* http://www.coopamerica.org/isf/tobi/vol-init/NGOperspectives.html (visited June 21, 1999).

United Nations. 1996. *Self-regulation of environmental management, an analysis of guidelines set by work industry associations for their member firms.* New York: United Nations.

United States. Environmental Protection Agency. 1997. *New directions, a report on regulatory reinvention* (February 1997).

VanNijnatten, Debora. 1998. The day the NGOs walked out. *Alternatives* 24, no. 2: 10-15.

Voorhees, John and Robert A. Woellner. 1998. *International environmental risk management.* Boca Raton: CRC Press LLC.

Wallace, David. 1995. *Environmental policy and industrial innovation*. London: Earthscan Publications Ltd.

Webb, Kernaghan. 1999. Voluntary initiatives and the law. In *Voluntary initiatives: the new politics of corporate greening*, ed. Robert Gibson, 32-50. Peterborough: Broadview Press.

World Commission on Environment and Development. 1987. *Our common future*. New York: Oxford University Press.

Wylynko, Bradley. 1999. Beyond command and control. In *Voluntary initiatives: the new politics of corporate greening*, ed. Robert Gibson, 161-175. Peterborough: Broadview Press.