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## **ABSTRACT**

### **ENVIRONMENTAL COMMUNICATION: THEORY AND PRACTICE**

by

**Mary McCarney McManus**

The present study examines the relationship between environmental communication theory and practice. The focus of the case study is to examine the formal elements of an environmental document--the Industrial Pollution Prevention Planning guidelines published by the New Jersey Department of Environmental Protection (NJDEP)--and the process by which this document was created. This study of product and process allows a methodology to be developed by which the complexities of environmental communication may be better understood.

**ENVIRONMENTAL COMMUNICATION:  
THEORY AND PRACTICE**

by  
**Mary McCarney McManus**

**A Thesis  
Submitted to the Faculty of  
New Jersey Institute of Technology  
in Partial Fulfillment of the Requirements for the Degree of  
Master of Science in Professional and Technical Communication**

**Department of Humanities and Social Sciences**

**May 1996**

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**APPROVAL PAGE**

**ENVIRONMENTAL COMMUNICATION:  
THEORY AND PRACTICE**

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To my beloved family:  
Past, present, and future.



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## CHAPTER 1

### INTRODUCTION TO THE CASE STUDY

#### 1.1 Background

Environmental communication is a new genre in the study of discourse. With the complex environmental problems the world is awakening to today, society is starting to look at the way in which we communicate about the environment.

From Aristotle to Aldo Leopold, there have been many theories about nature and the environment and how we as a society need to respect nature and the environment. None of these theories, however, gives a practical guide to environmental communication. Effective environmental communication, I believe, can be achieved by taking a closer look at the different environmental discourse communities that exist today and create new ways to improve their communication. As researchers, we must learn all there is to know about each group; only then can we begin to communicate about the environment and bring about change. As James Cantrill states, “Most of our efforts to understand how we communicate about the environment have not focused upon what people can *do* to improve their abilities to advocate a particular approach to the environment” (“Communication and Our Environment: Categorizing Research in Environmental Advocacy,” 67). We need to find practical applications that show examples of effective environmental communication.

To explicate the complexities of environmental communication, four established theorists were chosen: Niklas Luhmann, M. Jimmie Killingsworth, Jaqueline S. Palmer,

and James G. Cantrill. To study the implications of these theorists, I used pollution prevention because of the important pollution prevention regulations that were passed by the New Jersey Department of Environmental Protection (NJDEP) in October of 1991. The document that was chosen for examination is the NJDEP Industrial Pollution Prevention Planning guidelines. The document is used by a wide industrial audience in the state of New Jersey.

The 1991 pollution prevention regulations emphasized prevention techniques over “end-of-pipe” environmental management. In other words, the concept of pollution prevention advocates changing industrial processes and inventing new ways to prevent pollution before the manufacturing process begins. Also, this goal can be reached by changing the chemical raw material usage. In following the regulations, companies will reduce the amount of chemical use and generation. Less hazardous chemicals will be used in the industrial process; therefore, less generation of hazardous waste will result. Companies will find even more positive effects from this regulation which will include a reduction in cost for raw materials, liability, regulatory compliance, disposal, and treatment. Due to the 1991 pollution prevention regulations, companies must examine the location and amount of chemicals being used and create a Pollution Prevention Reduction Plan for their New Jersey facilities.

In the past, environmental communication between government agencies and industry has been complex. Perhaps a sense of tension has been created because the government has control over industry and industry must obey their laws. This tension prevents the effective flow of communication among environmental groups.

Government documents have always been overly prescriptive and hard to follow. However, the government seems to have wanted to express a new and improved approach with the Industrial Pollution Planning guidelines. This new guideline approach is encouraging because it displays a new vision that may break down the communication barriers that have been built up between the government and industry. Hopefully, government and industry will begin to understand the important role that communication may play in making a new awareness possible. Presenting a well written document may be the first step to successful communication within environmental groups, but there are many other tacit communication issues present here. The goals for the pollution prevention guidance document were to give the user background on the regulatory requirements, to provide companies with a cost effective positive planning approach, to recommend guidance, and to do this in an engaging way. Were these goals reached with this guidance document? With this case study I hope to find the answer.

Until now little research has been performed on the practical applications associated with environmental communication. That is, little formal research has addressed the communication process as it has developed in response to legislation. The type of research employed in this thesis is a case study. Case studies are most appropriate in new areas of research in that the case study method will allow the generation of variables in an area of research about which little is known. In Composition Research, Janice M. Lauer and J. William Asher define a case study as descriptive research. This type of descriptive research is a typical way in which researchers tend to examine topics that have not been previously researched and where no data is available.



### **1.1.1 Product**

The pollution prevention document--the NJDEP Industrial Pollution Prevention Planning guidance document--was first examined for effectiveness. Using a combination of the goals of effective composition defined by Glenn J. Broadhead and Richard C. Freed, I examined the document for the presence and effectiveness of these variables of composition. For instance, the writers of the document employ a number of graphic (cohesive) devices to aid document flow. Did this use of graphics help the reader to understand the difficult concepts presented in the document?

### **1.1.2 Process**

The second examination of the pollution prevention document was an investigation of the theories of environmental communication. The purpose was to look at established environmental theories to see if these theories helped us to understand more about the process of effective environmental communication. For example, the person who commissioned the document had become involved in the writing process itself and did not allow the writers to accomplish this task on their own. Did the concept of a self-reflective system--Luhmann's theory of autopoiesis--enable us to more clearly understand what the commissioner of the document had done?

To test the established theories I decided to choose a panel of four experts and asked them to volunteer their time and expertise to help in the research. The experts chosen were the commissioner of the NJDEP pollution prevention document, a member of the writing consultant group, and two industrial users of the pollution prevention document.

The commissioner of the document was the director of the Office of Pollution Prevention and had a strong background in environmental. The writer had years of experience and knowledge in the pollution prevention area. User #1 was an engineer in the environmental department of a large corporation; user #2 was also an engineer but represented a small corporation. Two users were solicited to ensure that we were receiving an overall transactional view of the communication circle. Throughout this thesis the panel of experts are referred to separately as, commissioner, writer, user #1, and user #2.

## **1.2 Theories of Environmental Communication**

### **1.2.1 Niklas Luhmann**

Niklas Luhmann's theories are based on his interpretation of the concept of ecology. To Luhmann, ecology is nothing more than a name for the analysis of connections between social systems and the surrounding environment (Luhmann, 2). Social constructs impact our view of the environment.

Luhmann's theory contains four parts. For the purposes of this thesis I decided that the fourth part of Luhmann's theory--autopoietic understanding of system-organization--was the most relevant and useful for my case study.

Luhmann tells us that autopoiesis refers to systems that reproduce all the elementary components out of which they arise, by means of a network of the elements themselves and in this way distinguish themselves from an environment--whether this takes the form of life, consciousness or (in the case of social systems) *communication*.

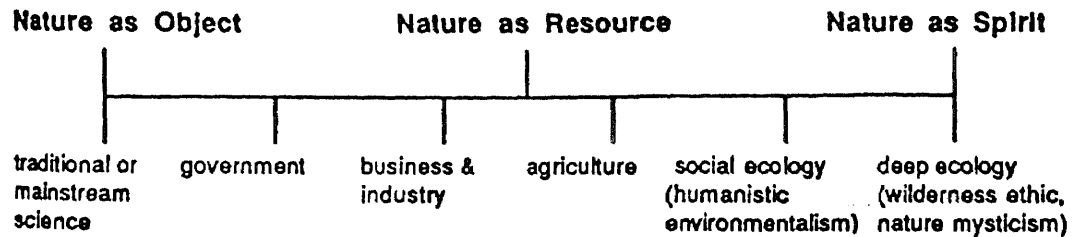
Autopoiesis is the mode of reproduction of these systems. In other words, an autopoietic system is self-reflective because the system can not expand to incorporate new and different views, communication between groups begins to break down. A self-reflective system is a closed system where everything that functions as an element in the system is itself a product of the system. Autopoiesis exists in social systems only through communicative acts, not through persons, roles, subjects, etc. Social systems constitute themselves self-referentially (Luhmann, xi).

Luhmann has shown us a way to recognize self-reflective systems so that we ourselves can change and break down the barriers between different discourse communities to allow better communication. Unfortunately, however, Luhmann gives no practical solutions to environmental problems or to the poor communication between environmental groups.

### **1.2.2 M. Jimmie Killingsworth and Jaqueline S. Palmer**

A less theoretical and more detailed theory of environmental communication is found in M. Jimmie Killingsworth and Jaqueline S. Palmer's transactional theory of rhetoric; this theory examines the ways in which groups communicate with each other. Killingsworth and Palmer have created a graphical representation of all the environmental discourse communities and how they interact and communicate with each other. This theory is easily understood and extremely useful because of the concrete images obtained from the graphical representation.

Over one hundred years ago the views of nature and the environment were not as complex as they are today. Killingsworth and Palmer diagram these older perspectives. Figure 1 below displays the continuum of perspectives toward the natural world a century ago.



**Figure 1.** Continuum of Perspectives on the Environment

The three separate views of nature across the top--Nature as Object, Nature as Resource, and Nature as Spirit--are shown in a straight continuum. Those who view nature as an object to be studied are the traditional scientists. Traditional scientists have an opposing view of nature to the deep ecologists who are shown at the opposite end of the continuum. Killingsworth and Palmer suggest that any person can experience all of these perspectives on nature at one time or another, but for each person one perspective will always seem to dominate all the others.

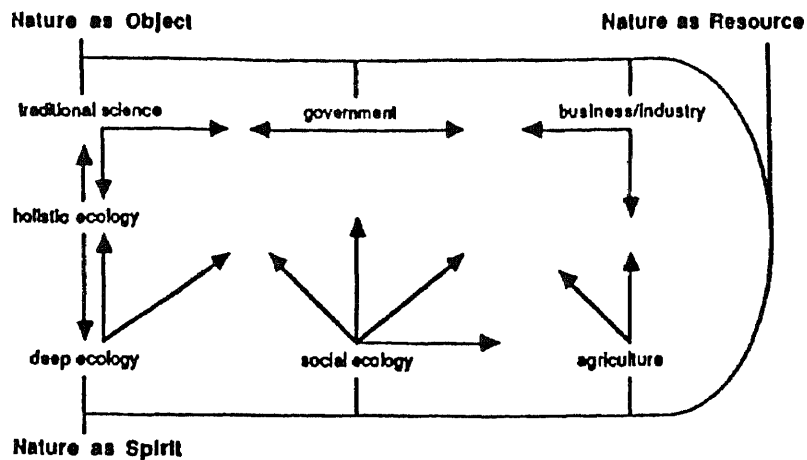
Business and industry view nature as a resource to be used for the benefit and profit of the corporation or company. Viewing nature as a resource does not mean that a person can not view nature as an object or as spirit, but eventually one view will be stronger than another.

On the continuum, the government is lodged between science and business and industry. This depiction shows that the government can never be totally on the side of science or totally on the side of business and industry. If governmental agencies were to side with science or business and industry, it would certainly not be strategic for the future of the government. Figure 1 shows the dramatic differences in environmental discourse communities; the differences in perception between groups and an overall polarity between nature as object and nature as spirit. The different discourse communities are not encouraged to communicate with each other when displayed on a continuum.

As the environmental “revolution” gained in popularity during the twentieth century, this continuum of perspectives has changed. Killingsworth and Palmer have, therefore, created a second configuration in which all discourse communities have access to each other within society. In this more current perspective, individuals and groups can communicate and try to move forward to open their minds to the environmental values and ideas of the other functioning groups in society.

Killingsworth and Palmer have created a configuration that encompasses all functional environmental discourse communities and the means by which they interact

and communicate. Figure 2 below is their horseshoe configuration of perspectives.



**Figure 2.** Horseshoe Configuration of Perspectives

The horseshoe configuration is an excellent representation of various discourse communities in environmental communication today. The diagram is set up to show the interactions between industry, government, traditional science, social ecology, and deep ecology. We can begin to view environmental perspectives holistically and not as three individual groups with three different value systems. By means of Killingsworth and Palmer's depiction, we can now view society as a huge system with various values, methods, and reasons for communicating.

This diagram of perspectives illustrates four concepts: hegemony, opposition, tension, and direction of appeal. The three discourse communities on the top axis--traditional science, government, and business/industry--are those groups that have the most power and the most public support or hegemony.

The three discourse communities on the bottom axis--deep ecology, social ecology, and agriculture--are those communities with the least power and public support. They can be threatening to those powerful groups on the top axis because they lack power and also have nothing to lose. Years ago the most powerful leaders on the top axis (i.e. business/industry) did not have strong environmental values. Now there seems to be a shift in attitude, however.

Theoretically this horseshoe perspective is promising, but can it help us in practicality? Killingsworth and Palmer argue that in order for a change in attitude to gravitate through these communities, discursive links must be built between groups. This change will depend on effective communication and new ways of doing business.

The arrows on the horseshoe represent four types of interaction among the discourse communities shown on the horseshoe diagram. These interactions are hegemony, opposition, tension, and direction of appeals. The arrows point in the direction of appeals. Arrows pointing at each other represent tension. Arrows pointing away represent opposition. The first concept, hegemony, is easy to understand when examining the power struggle between the government, business/industry, and traditional science. All three of these communities struggle with differing values and differing monetary needs; all communities seek to unify power.

The second concept mentioned is opposition. Opposition is represented on the horseshoe perspective by the distance both vertically and horizontally of all the discourse communities from each other. Government is located at the center of the horseshoe configuration because it is the object of appeals from all communities on the figure.

The third concept, tension, is also represented by vertical and horizontal distance between the environmental discourse communities. There is not only opposition among the groups but also tension. The groups that are closest to each other and have many of the same environmental views can also have great tension between them. For example, social ecology and deep ecology both share the same feelings about environmental protection; but when it comes to their view of nature, their opinions differ. Social ecologists are committed to preserving a relationship between nature and human culture. Deep ecologists are committed to understanding the spiritual presence of god in nature. Tension among the groups is created because of competition and dependence. Science and industry are dependent on the government for monetary and public actions. They want government involvement, but at the same time they would like to be free of government restrictions.

The fourth concept is direction of appeals and this concept is also represented by the arrows on the horseshoe. The arrows indicate the direction of rhetorical appeals that each discourse community reaches for in time of need. The government receives the most appeals from all communities. The arrows show where bonds between individuals could be made or broken depending on the political action that takes place.

All four concepts exist in the actual relationships among environmental discourse communities. Hegemony exists in governmental agencies because they have the power and control. The government creates legislation and passes laws that directly affect business, industry, agriculture, and ecology. The less powerful groups on the diagram must obey the laws even if the laws do not help them. Therefore, if socially irresponsible



legislation is passed, there is not much these smaller, less powerful groups can do. There is great tension and opposition between the government and business/industry. The government is always the target of monetary appeals for all of the communities on the horseshoe diagram. The government has power and money, therefore the government is in control.

### **1.2.3 James G. Cantrill**

James G. Cantrill is an environmental advocate who writes about the obstacles to effective environmental advocacy. He wonders why the environmental advocates with the least knowledge of environmental problems are the one's who seem to be the most vocal. The people with the most knowledge about environmental problems remain quiet.

His theory reveals that these advocates must apply a cognitive process to the environmental messages that they send to the public. If they do not gather all the environmental knowledge necessary to be an effective advocate for the environment, they will only throw the public into anxiety and fear about environmental problems.

Cantrill knows that a better way must be found to promote effective environmental advocacy. He urges researchers to investigate the cognitive and social foundations of effective environmental advocacy. He feels that if we look at ways to improve communication and cognitive processes among environmental advocates, the environmental messages will become clear.

Cantrill writes that our understanding of environmental advocacy is influenced by belief subsystems that are based on our exposure to environmental concerns. These belief

subsystems influence the reception and production of environmental advocacy. These subsystems include the following: sociocultural beliefs, demographic factors, cultural factors, informational bases experience, interpersonal networks, personal relations, education, mass media, strategic-actional concerns, reasoning patterns and motivation (“Communication and Our Environment: Categorizing Research in Environmental Advocacy,” 71). All of these factors affect a person’s environmental view and value system.

Cantrill’s theory for presenting effective advocacy is that all messages sent to the public from environmental advocates must be grounded in a deep understanding of how these factors have affected all individuals. Each discourse community is a stakeholder in environmental concerns. Each group has its own stake or concern for the environment. Advocates must understand the various stakeholders and the importance of their concerns.

## CHAPTER 2

### STUDY DESIGN

#### 2.1 Textual Analysis (The Product)

The elements that were chosen to examine the environmental communication of the document, Industrial Pollution Prevention Planning, were extracted from The Variables of Composition, Process and Product in a Business Setting, by Glenn J. Broadhead and Richard C. Freed. The following are the independent variables or elements from Broadhead and Freed:

The *first* variable is the idea that informs the document. That is, the writer must be accurate, thorough, relevant, and coherent. This unity of idea is a central element of effective communication. If the writer fails to achieve accuracy of, for example, scientific information, then the document will fail on the most fundamental level.

The *second* variable is cohesion throughout the document. The paragraphs must have correct and relevant cohesive ties, punctuation, graphics, syntax, and references. If the document lacks relevant cohesive ties, the document will not be effective.

The *third* variable is style. The writer must present the text in a form that is properly segmented and concise. The writer must avoid weak repetition and attempt to make the document read smoothly. The type of writing style that the writer chooses is the basic rhythm of a document. If the style of the writing is condescending to the reader, the document will not be effective. Sentence length is also important to the writing style of the document. If sentences become too long, the reader will become bored. Sentence length must vary from sentence to sentence with an even rhythm.

The *fourth* variable is usage. The writer must spell correctly, avoid idiom or careless phrasing, capitalize correctly, observe usage, punctuate conventionally, and achieve agreement. If the writer does not obey simple grammatical rules such as punctuation, the reader will be lost or perhaps mis-informed.

The *fifth* variable is high affect. The writer must avoid a threat, avoid an insult, and bond with the audience. If the writer does not avoid a threat or insult to the reader, for example, assuming that the reader has prior knowledge (threat) or assuming the reader does not have any knowledge of the subject when it is obvious that the reader does (insult), this could have a negative affect on the document's effectiveness.

Although these elements are not associated specifically with environmental communication, they provide a good heuristic for the examination of document effectiveness.

Richard A. Lanham in his book Revising Business Prose offers an analysis of effective business writing; in addition, he shows the reader several methodologies for examining writing techniques. Hence, I have included the element of sentence length, as described by Lanham, within the Broadhead and Freed variables. Lanham tells us that the following paragraph is not effective:

*It is important to bring forth the problems and other obstacles that are hindering our performance and growth. To be successful we must grow and to grow we must identify our problems and deal with them. Time will be allowed for discussions after each presentation to focus on the problems and potential solutions.*

This paragraph is not effective because the sentence length does not vary. The reader will become bored by the time he or she reaches the third sentence.

The effective revision of this paragraph is as follows:

*What problems hinder our performance and growth? To succeed we must grow and to grow we must identify these problems and deal with them. After each presentation, we will discuss both problems and possible solutions.*

This paragraph is much more effective because there is a varied pattern of sentence length.

## **2.2 Structured Interviews (The Process)**

### **2.2.1 The Panel of Experts**

In order to obtain information regarding the process of designing, composing, and using the document, I set up structured interviews with a panel of experts. These experts were chosen because of their involvement with the creation of the pollution prevention document.

As I mentioned in the introduction, the experts chosen were the commissioner of the NJDEP pollution prevention document, a member of the writing consultant group, and two industrial users of the pollution prevention document.

The commissioner of the document is the Director of the NJDEP Office of Pollution Prevention with over ten years experience in New Jersey environmental and governmental positions. The commissioner's educational experience consists of a bachelor's degree in environmental science and a master's degree in journalism.

The writer holds a bachelor's, master's, and doctorate in chemistry. The writer is the president of the writing consulting company that was hired by the commissioner.

With over 15 years experience in the environmental field and nineteen publications on environmental topics, the writer's experience is solid.

User #1 is a chemical engineer with twenty years of chemical process experience, an MBA and a PE license. The present title of user #1 is Senior Environmental Regulatory Compliance Advisor for a large (6000-employee) pharmaceutical corporation. User #1's responsibility includes overseeing and preparing the pollution prevention plan for the facility.

User #2 is a chemical engineer with over thirty years experience in the chemical industry. Presently the manager of environmental services at a smaller (1600-employee) pharmaceutical company, user #2 serves on many environmental committees. User #2 is responsible for the pollution prevention plan but has been assisted by a graduate student.

### **2.2.2 Preparing for the Interviews**

There are various types of interviews that can be performed. My interviews were information-gathering interviews using a direct approach. Interviewing Practices for Technical Writers by Earl E. McDowell was a helpful reference in structuring the interviews. L. Keltner has suggested that the interviewer do the following to play an effective role in the interview: anticipate the personality of the interviewee; anticipate the interviewee's perception of the interview; determine the degree of psychological proximity with the interviewee that will be most appropriate for the specific interview occasion; focus the direction of the communication process toward the specific purpose; create a trusting relationship to maximize self-disclosure; understand emotional stress and

pressure; develop skill in timing of questions and providing transitions; listen carefully; and use feedback frequently and effectively (Keltner, 280-282).

The interviewee also plays an important role and must do the following to produce an effective interview: be willing to communicate; be willing to deal with specific as well as general ideas; avoid discussing information that is not relevant to the interview; provide clear and specific responses; and correct apparent misunderstandings on the part of the interviewer and request feedback in order to be sure that messages are interpreted accurately.

I followed the preparatory process described above before the interviews. I felt it was important to remain on the subject at hand and I was concerned that the interviews could possibly get off track. I sent a cover letter to each of the members on the expert panel requesting their resumes. From the resumes I gathered more information from the experts about their education and work experience. With this knowledge I then went into each interview with a strategic plan of how to handle each expert and where his or her interests would be significant to my case study. My questions were prepared differently for each type of expert. The questions for each expert contained the same information gathering probes but I asked the questions in different ways to ensure tactfulness and appropriate responses.

### **2.2.3 The Interview Structure**

A structured interview has a defined beginning, middle, and end. My beginning, or opening, contained an introduction of my background, an explanation of my research

work, and why I had asked the experts to sit for the interview. I referred to their resumes, and I asked them to state their job title and explain their involvement with the pollution prevention document.

The middle of my interview contained the structured interview questions that I had prepared previously which were devised in such a way as to extract information from the experts and compare their answers with the theories I was examining. I then proceeded to ask them the questions and I taped their answers so that I would not miss any valuable information.

The type of closing that I prepared was a clearinghouse question with a statement of appreciation for the opportunity to meet with them. I asked them if there was anything else they wanted to share with me (the clearinghouse question) and I briefly stated my appreciation for their assistance.

Throughout the interviews I looked for non-verbal clues that would aid in my understanding of the individual's personalities (e.g., clues such as good eye contact or nervousness). Two of the interviews, (the commissioner and the writer) were conducted via telephone; the other interviews were conducted in person.

I created an interview guide and an interview schedule that I referred to when I was conducting the interviews.



### 2.2.4 The Interview Guide

The Interview Guide, shown in Figure 3 below, was a simple outline of the order in which I would gather the information; and it specified the general information that I would ask from the expert panel.

<b>INTERVIEW GUIDE</b>	
<b>Beginning</b>	
I.	Educational and employment background
a.	Resume received
b.	Job responsibilities
II.	Introduction to the case study
a.	Brief introduction
b.	Document introduction
c.	Importance of their feedback
d.	Connection between the document and their job
<b>Middle</b>	
III.	Interview questions
a.	Autopoietic Theory
b.	Transactional Theory
c.	Stakeholders Theory
<b>End</b>	
IV.	Closing
a.	Clearinghouse question
b.	Statement of appreciation

**Figure 3.** The Interview Guide

### 2.2.5 The Interview Schedule

The Interview Schedule shown below in Figure 4 is an expanded version of the Interview Guide; it included the specific questions that I would ask from the expert panel.

<b>INTERVIEW SCHEDULE</b>	
<b>Beginning</b>	
I.	Educational and employment background
a.	I have received your most recent resume, so I have your background.
b.	What are your specific job responsibilities in relation to pollution prevention?
II.	Introduction to the case study
a.	As you know, my thesis is on environmental communication theory and practice.
b.	This is the document we will be discussing.
c.	Your answers and feedback are important to my thesis report, so feel free to say what you think and feel.
d.	Was it your job to prepare the pollution prevention plan for your company?
<b>Middle</b>	
III.	Interview questions
a.	Questions based on a self-reflective system.
b.	Questions based on communication between the different discourse communities.
c.	Questions based on stakeholder values that must be advanced.
<b>End</b>	
IV.	Closing
a.	Is there additional information that you would like to add? Have I missed anything that you can think of?
b.	Thank you for taking the time out of your busy schedule to meet with me. I really do appreciate it.

**Figure 4.** The Interview Schedule

## 2.2.6 Interview Questions

The interview questions were created from the three environmental communication theories. I structured the questions carefully to elicit answers that would tell me if these environmental communication theories were apparent in the creation of the pollution prevention document. Questions for the commissioner of the document are shown in Figure 5 below. Questions for the writer are shown in Figure 6. Questions for the users are shown in Figure 7.

<u>Commissioner</u>		
1.	<b>o/r</b>	<b>What were your goals when commissioning this document?</b>
2.	<b>c/r</b>	<b>Why did you commission the document and not write it in-house?</b>
3.	<b>c/a</b>	<b>What level of employee did you intend this to be written for?</b>
4.	<b>c</b>	<b>Was it written for a large corporation, a small company, or both?</b>
5.	<b>cyn/a</b>	<b>Were there any focus groups formed with members from industry?</b>
6.	<b>o/r</b>	<b>Why did you choose the particular writing group that you did?</b>
7.	<b>o/i</b>	<b>How do you feel about the way in which the document was written?</b>
8.	<b>o</b>	<b>What do you think are the best features in the document?</b>
9.	<b>cyn/s</b>	<b>Can you point out any features that could be improved upon in a second edition?</b>
10.	<b>cyn/i</b>	<b>Did you like the tone of the document?</b>
11.	<b>o</b>	<b>How do think the graphics, color, etc. enhanced the effectiveness of the document?</b>
12.	<b>c/r</b>	<b>Do you know why the wallpaper example was created?</b>
13.	<b>o</b>	<b>Can you please give me some examples of how this document was effective?</b>
14.	<b>o</b>	<b>Describe how the document was field-tested.</b>
15.	<b>c</b>	<b>What criteria did you use to select people to participate in the field test?</b>
16.	<b>c</b>	<b>How many men/women participated in the field-testing?</b>
17.	<b>cyn</b>	<b>Did you pay the people who participated in the field-test?</b>
18.	<b>cyn/s</b>	<b>Do you feel there was adequate time to field test the document fully?</b>
19.	<b>cyn</b>	<b>Did the writers meet with members of industry on a regular basis? Did you attend?</b>
20.	<b>o/i</b>	<b>What did you anticipate that the user's response to this document would be?</b>
21.	<b>o</b>	<b>How did you envision your audience using this document?</b>
22.	<b>o</b>	<b>Describe how you interfaced with the writers.</b>
23.	<b>o</b>	<b>Do you see any advantage or benefit in writing a document for Pollution Prevention that consists solely of a good example of a pollution prevention plan?</b>
24.	<b>c/s</b>	<b>Did State procurement regulations have any effect on your choice of writers?</b>
25.	<b>c/i</b>	<b>How long did it take to complete this project?</b>
26.	<b>c/s</b>	<b>What was the aim of this document?</b>
27.	<b>rp</b>	<b>Did you try to place a goal statement in the document? If yes, please show me where.</b>

Figure 5. Interview Questions for the Commissioner

Figure 5. (con't)

28.	o/r	Why do you think Pollution Prevention is necessary?
29.	cyn/i	Is your job constructed in a way that helps you do your job in a sound environmental manner or do other factors emerge that keep you from this?
30.	cyn	Within the constraints of this project, do you think this document effectively communicates the full value of Pollution Prevention?
31.	o/a	Who do you feel gains the most from a Pollution Prevention Plan?
33.	cyn/r	Was the letter included because of an expectation or a desire for the document to receive the highest level of attention?
34.	cp	Is there additional information that you would like to add? Have I missed anything that you can think of?
35.	c	Can you tell me how much it cost to do this?
36.	np	You can give me an estimate?
37.	c	Can you send me the second edition?

Figure 5. Interview Questions for the Commissioner

<u>Writer</u>		
1.	o	What were the goals of the NJDEP when commissioning this document and how were the communicated to you?
2.	c/a	What level of employee was this written for?
3.	c	Was it written for a large corporation, a small company or both?
4.	o	What do you think are the best features of this document?
5.	o/s	In a possible second edition, can you think of anything you would change?
6.	o/r	How did you decide on the tone of the document?
7.	cyn	Did you participate in the selection of the graphics and color?
8.	c/r	Why was the wallpaper example used? What did you hope to achieve with this example?
9.	c/a	How much research of the New Jersey Regulations was required to complete this project? How much research did you have to do on your own?
10.	c/r	Why was a 12 step approach used instead of chapters? Was there any significance behind this choice?
11.	cyn	Within the constraints of this project, do you think this document effectively communicates the full value of Pollution Prevention?
12.	o	What steps were taken to ensure that the necessary industrial perspective was included in this document? How much time was spent with members from industry?
13.	cyn	Sometimes documents like this are field tested. Did you feel it was necessary to field test this document? If so, how was this done?
14.	c	What criteria did you use to select people to participate in the field test?
15.	c	How many men/women participated in the field-testing?
16.	cyn	Did the people who participated in the field-test get paid?
17.	cyn	Do you feel that there was adequate time to field test the document fully?
18.	c/s	How long did it take to complete this document?
19.	hp	Did you consider a shorter document or a one page summary version of the document?

Figure 6. Interview Questions for the Writer

Figure 6. (con't)

20.	o/a	What similar documents have you worked on in the past?
21.	hp	Do you see any advantage or benefit in writing a document for Pollution Prevention that consists of a good example of a pollution prevention plan, only?
22.	cyn	Was the project a collaborative effort? If so, what was the nature of the collaboration?
23.	o/a	Describe the relationships between the writers.
24.	o	How did you envision your audience using this document?
25.	c	What were the most significant problems that the writers faced in creating this document, if any?
26.	o	Describe the ways in which you collaborated with other writers.
27.	c	Describe the document production process, if you know it?
28.	c	What was the aim of this document?
29.	o/s	Describe the relationship between the NJDEP and the writers.
30.	c	What specific guidelines and instructions did you receive from the NJDEP?
31.	c	What constraints if any, did the NJDEP place on your work?
32.	o	What was your approach to this document? Describe your role in the document production process. What sections did you write?
33.	cyn	Does your agency work exclusively for governmental agencies?
34.	c	What was the dollar value of the contract?
35.	cp	Is there additional information that you would like to add? Have I missed anything that you can think of?

Figure 6. Interview Questions for the Writer

<u>Users #1 and #2</u>		
1.	o	What do you think the NJDEPs goals were for this document?
2.	cyn/u	Do you feel that this document helped you prepare and write your pollution prevention plan? Why or why not?
3.	c/a	What level of employee do you think this document was written for?
4.	c/a	Do you think it was written for a large corporation, a small company, or both?
5.	rp/r	How do you feel about the way this document was written? Why?
6.	o	What are the worst features of this document? Can you point them out to me?
7.	o	What are the best features of this document? Can you point them out to me?
8.	cyn	Do you like the tone of this document?
	o	Can you describe the tone of this document?
9.	hp	If you had a chance to write this document how would you write it?
10.	rp	How do you feel about the graphics, color etc.?
11.	cyn	Do they make this document more effective? Where? If not, Where?
12.	cyn	Do you like the 12-step approach instead of chapters?
13.	o/np/rp	Was the wallpaper example effective? Why or why not?
14.	cyn/a/r	Overall, do you think this document was effective? Why?
15.	cyn	Were you asked to meet with the writers of this document to voice your opinion and to add your input? If not, do you know who was?
16.	hp	If you were asked to be in a focus group what would you have said?

Figure 7. Interview Questions for the Users

Figure 7. (con't)

17.	cyn	Do you think there were any misunderstandings or miscommunications between the writers, the DEP, or the users of this document? If so, can you tell me what you think they were?
18.	cyn/rp	Have you ever had any disagreements with anyone from the Office of Pollution Prevention? If so, were they based on miscommunication, misunderstandings, or personality differences? How were the disagreements resolved?
19.	cyn	Was there a fee charged for the submission of your Pollution Prevention Plan?
20.	c	Can you estimate a total cost, to your company, in preparing a Pollution Prevention Plan?(include time, data gathering, equipment, etc.)
	o/s	How do you feel about the money that was spent?
21.	o/a	Why do you think Pollution Prevention is necessary?
22.	cyn	Do you think that the Pollution Prevention approach advocated by the Office of Pollution Prevention is effective?
23.	cyn	Writing a Pollution Prevention Plan <u>was</u> mandatory for your company, correct? Did your company put the plan into effect?
24.	rp	Is your job constructed in a way that helps you do your job in a sound environmental manner or do other factors emerge that keep you from this?
25.	o/rep	Who do you feel gains the most from a Pollution Prevention Plan?
26.	rp/s	How do you feel about the Governor's letter at the beginning of the document?
27.	rp/s	How do you feel about the NJDEP mission statement at the beginning of the document?
28.	cp	Is there additional information that you would like to add? Have I missed anything that you can think of?

Figure 7. Interview Questions for the Users

Below I separate the questions into the three theoretical categories (1) Luhmann's autopoietic theory (2) Killingsworth and Palmer's transactional theory and (3) Cantrill's stakeholder theory and I show which questions for each expert relate to those theories.

#### (1) Luhmann's Theory

The commissioner	Questions:	1, 3, 4, 11, 12, 20, 21, 26, 27
The writer	Questions:	1, 2, 3, 6-10, 19-21, 24, 27, 28
The users	Questions:	1-8, 10-14

#### (2) Killingsworth and Palmer's Theory

The commissioner	Questions:	2, 5, 6, 13-19, 22-24
The writer	Questions:	1, 12-17, 22, 23, 25, 26, 29, 30, 31
The users	Questions:	15-19, 22

(3) Cantrill's Theory

The commissioner	Questions:	7-10, 25, 28-33
The writer	Questions:	4, 5, 11, 18, 32-34
The users	Questions:	9, 20, 21, 23-27

**2.2.7 Coding the Questions**

I coded the questions with the quintamimensional design sequence described by George Gallup in 1947, as well as other identifying question type codes (McDowell, 39).

The codes are as follows:

Question Type Codes

a	awareness
u	uninfluenced attitude
s	specific attitude
r	reason why
i	intensity of attitude
o	open
cc	closed classification
cyn	closed yes-no
rep	reflective probe
c	closed
hp	hypothetical probe
rp	reactive probe
np	nudging probe
cp	clearinghouse probe
mp	mirror probe

### **2.3 Summary of the Research Design**

The design I have described above would, I hoped, allow me to generate the variables of a very complex communication situation. If my design was effective, it would yield a more in-depth understanding of the theories of environmental communication. The coded questions were helpful and informative during the interviews. While asking the interview questions, I was able to anticipate the attitudes and responses of the experts by glancing at the type codes.



## CHAPTER 3

### RESULTS OF THE STUDY

#### 3.1 Textual Analysis

In any case study, conclusions are reached tentatively. In this case, only four experts responded to a single document. We must, therefore, remember that the goal of this case study is to generate the variables of environmental communication and to establish a research methodology that will enable investigators to look more carefully at the products and processes of environmental communication. As Lauer and Asher propose, case studies are performed when very little information is known about a subject (Lauer, 15). As more information is collected over a period of time, and more case studies are created, more measurements will be taken, more data will be collected and experimental research will begin.

Result of the product analysis: The Industrial Pollution Prevention Planning document incorporates only some of the variables of effective communication.

#### *Idea*

The pollution prevention document sets for itself a very complex and difficult task: to bring to industrial consciousness pollution prevention philosophy. This goal of raising industrial awareness is established in the commissioner's interview.

Our goals were to spell out for companies what their regulatory requirements were. A second was to go beyond the regulatory requirements and provide companies with recommended guidance on what we feel and felt was a cost-effective and a very positive approach to pollution prevention which assumed their regulatory requirements, our regulatory requirements. And then the third goal was to do it in a way that was interesting, I guess, and not just a standard kind of boring regulatory document. We wanted to write something that was truly a guidance document.

More evidence of the desire to heighten industrial consciousness was revealed in the goal interview questions asked of the writer. “The hope was to create a document that was very readable, helpful, clear, help people get oriented toward pollution prevention that would comply with the law but which would be something that would be helpful and a useful guide for a company doing pollution prevention.” Both the commissioner and the writer explained the aim of the document which was consistent in both interviews.

Was the document accurate throughout? User #1, as the interview suggests, was most critical of this aspect of effective communication. The document did not embody the accuracy that user # 1 would have liked and the interview response revealed a few points where the writer was not accurate in the information that was presented. On page 50 of the pollution prevention document there was a formula that user #1 feels is incorrect. User #1 stated, “I feel [the formula] is completely incorrect because it should be normalized based on production, because with varying production using an absolute number doesn’t do anything.”

Another alleged inaccuracy was on page 69 of the pollution prevention document. User #1 stated that the paragraph at the top of the page is misleading, “According to what the law says, it says that if the team has found an opportunity that is obviously worthwhile

which it plans to implement it is not necessary to do a detailed feasibility analysis, I disagree.”

Yet another inaccurate statement on page 73. The second full paragraph of the pollution document user #1 explained, “The statement is contrary to the fact that the site is a JIT (Just In Time) facility. Again further down the fifth paragraph it’s obvious that the author doesn’t understand what JIT is.”

Although there were some inaccuracies in the document, it achieved its aim. The rules and regulations of the Pollution Prevention Act were covered in the text, and the ideas continued in the document were easily understood.

### *Cohesion*

The document made good use of cohesive ties. The graphic elements that were employed in the text were helpful and also created cohesion within the text. Both user #1 and user #2 stated that the small NJ Rule boxes shown in the text which summarized the regulations were nicely done and helpful. User #1 stated that these NJ Rule boxes were one of the best features in the document: “I kind of like the little summaries of the rules. They do help to tell you why they are doing things; These little boxes that say NJ Rule on them are actually helpful.”

The color and the graphics in the document were effective in creating a cohesive document. When asked about the best features of the document, user #2 stated, “The order in which the twelve steps were presented and clarified; the tabulations were useful.” The bulleted text, the underlined words, and the different typefaces and font sizes all

added cohesion to the document. The punctuation and syntax were effective; however, I did find a few sentences that were confusing because of missing commas. The references in the document were easily followed and flowed continuously throughout the document.

No doubt, in some cases the writing could have been more cohesive and a better use of graphics could have been employed. The green-colored rectangles in each step did not convey the graphical interpretation of the reader's location. For example, when I was reading the sixth step, I noticed the small green rectangles, and I was confused about what they represented. The writer wanted the reader to recognize that this was Step 6 by means of this graphical representation. In this case the graphical representation was not as effective as it might have been.

### *Style*

The writing style of the document was clear and concise. The commissioner's response to the style of the text was positive: "I think it's clearly written, I can understand it, and I'm not an engineer. And that was something that we had definitely wanted to achieve."

However, the writing style of the pollution prevention document was described by user #1 as "too elementary." User #2 seemed to be happy with the style of the document. I feel that the writer should have spent more time editing the document in order to gain a document that would be pleasing to read. I realize from the interview responses of the commissioner and the writer that time was of the essence and the document had to be

printed. I think that both parties should have taken more time to ensure a better sounding document.

Sentence length was also an important element of style. The sentences in the pollution prevention document did vary, but most of the sentences were so long that the document became ineffective. Table 1 below is a matrix of the sentence length analysis performed on the first page of each step.

STEP	PAGE	PARAGRAPH	LENGTH (number of words)
1	9	1	15, 27, 13
1	9	2	21, 28, 29
1	9	3	31, 27
1	9	4	13, 14, 14+
2	15	1	8, 22, 41
2	15	2	12, 15, 18, 13, 11
2	15	3	17, 18
3	19	1	12, 17, 9
3	19	2	27, 8
3	19	3	23, 19, 23, 15
3	19	4	20, 33
4	23	1	19, 16, 39
4	23	2	22, 19, 32, 20
4	23	3	24, 30
4	23	4	18, 22, 12
5	33	1	28
5	33	2	15, 15, 18, 25, 10, 27
5	33	3	23, 20, 18
5	33	4	15, 13, 16, 15, 20
6	39	1	24, 18, 16, 12, 21, 18, 25, 15
6	39	2	20, 27, 13, 16, 18, 22, 11, 27, 17
7	55	1	18, 22, 6, 13, 34
7	55	2	23, 18, 15, 19, 28, 12
7	55	3	25, 19, 26
7	55	4	31, 15, 22, 25
8	59	1	22, 31, 10, 15
8	59	2	13, 15, 25, 27
8	59	3	14, 30, 22, 17
8	59	4	16, 15, 27
9	75	1	16, 22, 17, 24
9	75	2	19, 10, 17, 15, 24
9	75	3	37, 28, 12, 30
10	83	1	31, 23, 10
10	83	2	20, 29, 17, 19
10	83	3	12, 45, 37, 21, 30, 39
11	87	1	35, 19, 20
11	87	2	3, 12, 25, 8, 17, 20, 33, 32, 18
11	87	3	21, 24, 15+
12	91	1	11, 17
12	91	2	6, 6, 29, 12
12	91	3	15, 14, 10
12	91	4	20, 16, 12

**Table 1.** Sentence Length Results

As demonstrated in Table 1, sentence length did vary with an acceptable rhythm. The number of words in the majority of the sentences, however, were often burdensome to the reader.

*The Department will provide covered facilities with Plan Summary forms to complete. The Plan Summary consist of information that your team uncovered when it analyzed pollution prevention options (Part II of the Plan):the pollution prevention methods selected, the schedule for doing them, and the five-year reduction goals for use and non-product output both at the process and the facility level. To put this information in context, Plan Summaries include ranges for reporting the amounts of hazardous substances used in the targeted processes, and generic descriptions of all the covered production processes and targeted sources at the facility. This information presents a picture of the business conducted at the facility, but can do so without giving away confidential information (Industrial Pollution Prevention Planning, 83).*

Such lengthy sentences inhibit readability.

### *Usage*

The writer's language was effective throughout the document. Words were correctly spelled and the capitalization of words was correct and consistent throughout. The writer did observe the proper usage of verb tense and the idiom, and the phrasing of the sentences was acceptable. The punctuation throughout the document was conventional and effective.

### *High Affect*

There is little evidence that the writer wanted to establish a bond with the audience. The color and graphics were the most obvious display of "stroking" the audience and they created an unthreatening atmosphere within the text. The style and tone of the document were not threatening to the reader.

The writing, indeed, was almost too simple. User #1 seemed to be offended at the tone in which the document was written and described it as “too elementary.” Material should have been provided about the importance of the industrial role in pollution prevention and how industry should be proud of its input.

### *Significance of the Textual Analysis*

Analysis of the text revealed that it was unified. The text achieved cohesion; the style was easily understood and not overly legalistic; and the word and sentence length was acceptable. The document, however, did not achieve very high affect because the writer did not bond with the audience.

The text could have been strengthened had the commissioner and writer fully known their audience. This problem caused the alleged factual problems noticed by user #1. In addition, more could have been done to achieve a bond between the industrial user and the document. Another way to bond with the industrial audience would be to choose relevant examples. Both user #1 and user #2 stated that the features that could be changed in the document were the examples. The wallpaper example used in the pollution prevention document was not relevant to most of the businesses in New Jersey.

Thus, the textual analysis revealed a competent document that could have been strengthened by a more detailed knowledge of its users. The nature of that more detailed knowledge that will now be provided.

### 3.2 Structured Interviews

Result of the process analysis: The theories of Niklas Luhmann, M. Jimmie Killingsworth and Jaqueline S. Palmer, and James G. Cantrill allowed the formulation of questions that provide a wealth of information about the process of composing the document.
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#### *Views of the commissioner*

The field testing of the document was extremely limited. The interview revealed that the commissioner of the document existed in the closed autopoietic community described by Luhmann. “It was a very small team of people, at that point, so that was hard; that was frustrating, but I don’t think we could have done it any other way.” Based on this statement, the conclusion can be made that this group was autopoietic. When I asked the commissioner about the interface with the writers, the commissioner stated that “we literally sat in my office everyday for hours writing rules and writing the guidance document. We had our consultant literally sit in the office at the computer with us writing things out.” The goal of the commissioner was to “write something that was truly a guidance document.” But was it an effective guide for the users?

The interview with the commissioner revealed how the interactions between governmental agencies and business/industry work. The consultant writing team and the NJDEP writing team worked closely. The writing interaction between commissioner and writer can be related directly to the theory of Killingsworth and Palmer. The horseshoe configuration of environmental views displays the proximity of the governmental agency and business/industry. There seemed to be little business/industry involvement in the



writing of the pollution prevention document and because of this there was tension between the two environmental discourse communities.

The commissioner seems to have understood little about the advocacy positions of the users. User #1 was interested in a regulatory compliance perspective, explicit engineering material balances, accountability, and cost-benefit analysis. These elements were user #1's environmental stake or concern. According to Cantrill, understanding the stake that the user has is the key to effective communication. When asked about the wallpaper example in the pollution prevention document, user #1 stated, "Well if you're talking about it being applicable to my plant, no it's not because I'm not an adhesive and wallpaper type outfit; I'm a synthetic chemical manufacturer; I'm not a SOCMA source but a synthetic chemical manufacturer, so I'm dealing with reactors and stills and things like that."

#### *Views of the writer*

The interview with the writer also revealed the usefulness of Luhmann's autopoietic theory. The writer did not request input from industry but gathered information through the commissioner. "A lot of interaction with industry, but it would be improper for us to get involved with industry. It was not our role as a contractor. We did it because of their lack of staff and our expertise in pollution prevention and they valued our opinions [NJDEP]." The writer was responsible for writing an effective document. This can only be accomplished by understanding the views of the audience.

Why was it improper for the writer to get involved with industry? It appears that issues of propriety had impeded effective communication.

The usefulness of the transactional theory of Killingsworth and Palmer was also revealed in the interview responses. The writer spoke about the mistrust that exists between government and industry. When the writer researched pollution prevention techniques and was trying to create the most logical way in which to implement pollution prevention, mistrust was evident between the government and industry. There was also mistrust found inside industry between environmental departments and operation departments.

We found that there was a lot to do with pollution prevention to save money. We found that you didn't need a government to do it. All this work was being done by environmental departments who had no power over operations. You need to know your sources before you can take action, and we found that companies didn't know their sources. Can the state require plans, to get pollution prevention to happen? The context of this is that the state can not require pollution prevention, and New Jersey was going to see if policy could require this, then companies would do pollution prevention plans. You can lead a horse to water. Could you get these plans instated into the companies' normal operations? NJ had to implement the law the way it was written, and the law was a compromise between outside interests who were mistrustful of industry and wanted a lot more specificity in the law, and those who wanted more flexibility in the interest of hopefully having it fit into companies' own operations. So, the people at the NJDEP were always weighing those two kind of different threads because some of them were mistrustful of, whether you didn't require people to do a good plan you might not get a good plan.

According to Cantrill, to be an effective advocate for the environment one must concentrate on the best ways to communicate and express the views to the audience. I feel that the writer did in fact research pollution prevention and the proper ways to implement the plans into industry. However, the writer had little idea about the actual users because there was a second party interaction through the commissioner. "Our view

was to get the production/operation side of things. What the document seeks is a team, a team of functions; at a small company one person might do all functions.” Neither user #1 or user #2 were from the production/operation side of industry. They were both working in environmental departments.

#### *Views of user #1*

The interview response of user #1 suggested that the document was written within an autopoietic group, as Luhmann has described it. “It seems to be written for a maintenance department or something like that, not necessarily for people with an engineering background.” User #1 feels that the pollution prevention document was not written effectively for someone with an engineering background, which is what user #1 would have like to have seen.

When asked if user #1 had any disagreements with the Office of Pollution Prevention, user #1 stated,

I’ve had nothing but disagreements with people from the Office of Pollution Prevention. When we were trying to negotiate the regulations, I put together a number of arguments that I got a deaf ear turned to, and I suppose if you’re being strictly regulatory, they were saying well we are going strictly by the letter of the law; my point was OK, fine, I understand what the statute says; I’ve read the statute; on the other hand the statute doesn’t say that you should be penalizing me if I decide to do something that doesn’t exactly fit your definition, and that’s what they put in the regulation. I’ve always felt it [pollution prevention] should be done from a site perspective not a process perspective, and I’ve also disagreed with strictly what RCRA calls end of pipe definition because there are some legitimate things people can do but if they’re not going to get credit for them simply because they don’t have the in-process capability to store them; it’s a little bit ridiculous to say if you have off-spec product and you put it in drums it’s a waste, which is basically what the regulations say.

There was obvious tension and opposition displayed in this response between government and industry which revealed the transactional theory of Killingsworth and Palmer. There were transactional complexities shown here which need to be resolved to gain effective communication. There was also a display of direction of appeals. User #1 was passionately appealing to the government, yet the industrial voice was falling on deaf ears. Tension also existed between user #1 and the NJDEP over the NJDEP definition of pollution prevention. "I've always disagreed with the definition of pollution prevention." When I asked user #1 how the disagreements were resolved user #1 stated, "It was resolved by them telling me what I should use and me using them, even though I don't agree with them."

Cantrill's theory of advocacy was helpful to us in understanding user #1's interview response. The problem with the document was the writer did not fully gain the knowledge that was needed to effectively communicate with the audience. User #1 stated the following:

There is one thing that they turn away here which just seems out of line with me; where they came up with a good idea that didn't fit the definition that would have been recycling used ink and they just decided not to do it because it didn't fit the definition, and that's just totally out of line. They [facilities] looked at it and they said well this is really a recycle so it's not pollution prevention, so they set it aside and didn't do it. And that's ridiculous; if it's a good idea you should do it anyway.

#### *Views of user #2*

User #2 did not actually use the pollution prevention document to develop the pollution prevention plan. "The document itself I didn't use, directly, all the principles in it I did, and I've read it through, and it's an excellent summary of what should be done,

and there were other sources of information that were available before I had this.” Luhmann’s theory was revealed here in the way that user #2 made a new path to writing the pollution prevention plan. User #2 was in the industrial autopoietic community trying to survive and obey the regulations. User #2 did not look to the government for guidance; instead user #2 became informed through various other sources.

When I asked user #2 about disagreements with the Office of Pollution Prevention, the response was as follows:

Yes, and that was when our plan was inspected and reviewed, and the reviewer came up with a number of concerns that were, lets say, things that he thought were wrong with the plan, and we felt we followed the instructions correctly, and we wrote to the DEP such, and they came back and agreed that the reviewer had erred in his statements. It was fixed, yeah, and we were all right; our plan was good. It was his misinterpretation or misunderstanding; I’m not sure.

It seems that there was tension between the NJDEP and user #2, but the differences were reconciled.

User #2 was very knowledgeable about the pollution prevention regulations and literature. The writer could have used user #2’s valuable industrial insights to create an effective document. User #2 had been working on a pollution prevention awareness and education program: “We’ve been trying to institute a pollution prevention awareness education program within our R & D group so that this process that is saving so much money, that is already on the books, it was one of the processes that was considered for putting it into production; they picked the one that produces 21 times the waste that this new process does.” User #2 also talked about the EPA involvement in the program. User

#2 is acting as an advocate, as Cantrill's theory explained, trying to provide paths of effective communication between the different discourse communities.

## CHAPTER 4

### CONCLUSIONS AND DIRECTION FOR FURTHER STUDY

#### 4.1 Usefulness of Product Analysis

Examining the formal (textual) elements of a document enables us to judge its potential effectiveness. In this case study the textual analysis helped to conclude whether or not the document was effective. However, textual analysis is not enough. The researcher must know how the document is received by its users in a specific discourse community. We can not fully conclude that the document was effective unless the document is field-tested.

#### 4.2 Usefulness of Process Research

Luhmann's autopoietic theory was useful in conveying the element of a closed environmental communication system. His theory enables us to realize that when writing a document, the writer's mind must be open to all ideas, especially those of the audience.

Killingsworth and Palmer's theory of transaction among environmental groups helped us to recognize, in this case study, the interactions that took place between the NJDEP and business/industry. Without Killingsworth and Palmer's continuum of perspectives and the horseshoe figure of environmental communication, I could not have understood the impact that these groups have on each other. The tension between the NJDEP and business/industry is now defined for me and has become clear. Studying the

two figures allows the researcher to move into any area of environmental communication to probe for new ways to communicate more effectively.

Cantrill's theory of environmental advocacy was effective for this case study in that it allowed me to find areas in the environmental communication spectrum where effective environmental advocacy was nonexistent. In this case study it was found that the Writer and the Commissioner did not fully examine the advocacy of the Users.

### **4.3 Summary of Conclusions**

In conclusion, the methods used in this case study were effective. By focusing on pollution prevention, I have been able to generate a number of variables that afford analysis of the products and processes of environmental communication. These variables can be used to generate future case studies.

On one level, the pollution prevention document was successful in that it did encourage compliance. It was an attempt at changing the past process of communication that caused so much tension. The document encouraged facilities to rethink their current philosophies of pollution prevention as a whole. However well intentioned the attempt was, I conclude that the interview evidence strongly suggests that tension still exists. The government is still perceived as directive and unresponsive. Indeed, 48% of all the companies that submitted a pollution prevention plan stated that they were not going to implement their plan. If the overall approach of this guidance document was to reduce the tensions between the government and industry, then according to this case study the goal was not accomplished.



#### **4.4 Directions for Further Study**

An immediate opportunity for further research would be to compare the forthcoming second edition of the pollution prevention document to the present edition. Research could be designed to find out where the changes were made and why they were made. More broadly, further study could include analyzing other environmentally-related documents from other governmental agencies. It would be interesting to study how the product and process variables identified in the present study shift in importance and definition, as other documents are studied.

**APPENDIX**  
**INTERVIEW RESPONSES**

Commissioner

**1. o/r What were your goals when commissioning this document?**

“All right, in terms of goals I think we had three basic goals. First, as background, our law doesn’t direct us to do a guidance document but says we can do a guidance document to that extent sort of suggests it, I guess. So our goals were to spell out for companies what their regulatory requirements were. A second, was to go beyond the regulatory requirements and provide companies with recommended guidance on what we feel and felt was a cost effective and a very positive planning approach to pollution prevention (PP) which assumed their regulatory requirements, our regulatory requirements. And then the third goal was to do it in a way that was interesting I guess, and not just a standard kind of boring regulatory document. We wanted to write something that was truly a guidance document, so I guess we had three goals.”

**2. c/r Why did you commission the document and not write it in-house?**

“We actually..., it was a very collaborative process between us and the contractor. I mean we literally had one of our staff members down in the contractor offices for a period of time. A large reason that we did it was because at that point our staff hadn’t been, we hadn’t done all our hiring yet and I’d say 80% of our time was going to writing rules and we knew that we were going to quickly need the guidance document, after the finalization of the rules, and we just didn’t have the resources to do both so that’s a large reason why we contracted it out. I’d say it’s the primary reason why we contracted it out.”

**3. c/a What level of employee did you intend this to be written for?**

“We intended it to be, our hope was to write it for, we assumed that facilities would end up identifying a person probably an environmental manager or someone, a staff person in the environmental management program if it’s a larger facility who is going to get dumped on to be the person to do the PP work. So it would be a middle level manager or a staff person and the idea was to try to some extent empower that person to sort of see the planning process as something more than just a regulatory requirement and to also see the planning process as something that could provide that person with an opportunity to do some innovative stuff in terms of working with other parts of their facility, including the

production staff, perhaps even the product design staff and to try to sort of empower that individual.”

**4. c Was it written for a large corporation, a small company, or both?**

“So it was written for large as well as small companies and we had a relatively good sense of who our companies are because we had a specific list of their industrial classification codes that we were responding to, so we had a good idea of what are companies were both in terms of type of business as well as size of business because they had to meet a certain threshold to be covered under the law; So it was specifically geared towards those companies. And we also hoped that we could write it in a way where companies that had multiple facilities in the state could use the document in a way to sort of think about their overall operations and not just sort of nit pick individual facilities. And actually we’ve had a couple of companies who have facilities even outside the state and they have used the planning document for their non-NJ companies which is kind of nice.”

**5. cyn/a Were there any focus groups formed with members from industry?**

“We didn’t have formal focus groups, what we did do was one of our staff members had been working pretty closely with paint companies and wallpaper companies, which was where the case study came from, so to some extent it’s a real life case study based on a company, we tried to fictionalize it. We also did end up having, I mean we had since the development of the guidance document was to some extent parallel to the development of the rules, we had probably an unprecedented public participation process during the course of our rule making. We issued two pre-proposals and a real proposal and we had interactive public meetings and formal public meetings. We had a task force on confidentiality and a task force on small business assistance. And so to a large extent, I sort of see the input we got from those companies as part of the input that we factored into the development of the guidance document. In the end we did have a set of companies read through the guidance document for us, as a draft, as readers, and we also had a set of companies fill out our forms for us because we had to do that at the same time because we wanted to put a copy of them in the guidance document; Fill out forms for us to test the forms, to test the instructions, to the forms so that was all part of the guidance document development too.”

**6. o/r Why did you choose the particular writing group that you did?**

“Did you mean that consultant? OK. The consultant we had under contract; Well I had personally worked with this group for quite some time they had done some earlier work for the department back in the early 80’s before the PP Program was developed so they are very well versed with PP. They tracked the development of the law just because they were interested. They tracked the development of the rule. They are very well versed in our process and I guess not to sort of sound

egocentric but we felt our process, that the planning approach we were advocating is very specific it's a materials accounting based planning approach, it has cost requirements in there, it's a very, to us it's a clear methodology and we felt we needed somebody who understood that methodology and quite frankly not many people did, and still not many people do, both in industrial facilities and in the consulting world. The state of MA is the only state that has a similar approach to PP planning, so anyhow this group had a good understanding of what that methodology was. Second, we worked with them in the past and we knew we had a good relationship with them and they are just well versed in what the NJ program was about because we didn't feel like we had too much time to burn, we couldn't quite have someone who had to go on a long learning curve."

**7. o/i How do you feel about the way in which the document was written?**

"Are you asking me how I feel about the document or how do I feel about the process of writing it?" **The process.** "It was incredibly frustrating. A large reason that it was frustrating is because again it was being written parallel to the development of the rules and we were crunching because we knew that we needed to have this guidance document and we had to build in lead time for graphics and printing and things like that in order to be able to get it out and give the companies the most amount of time they could before they were going to have to meet their requirements. We had also planned a relatively aggressive outreach program. We were going to be doing training and on-site visits and the guidance document was going to be the core of all that. So we had to write it in parallel with the rules, but at that point we had many, many strategy sessions on the development of the rules where one day we were going to do A and then, you know, three days later after we argued about it we figured B would be a better way to go. So the folks who were working on the rules were always talking to the people who were working on the guidance document and to a large extent we were all the same people. It was a very small team of people, at that point, so that was hard, that was frustrating, but I don't think we could have done it any other way. I think to some extent we could have written this document ourselves. We definitely could have written it ourselves, whether we should or shouldn't have again it's a management issue if we could have swung doing the rules at the same time and doing the guidance document ourselves and hiring a staff and being on a first year budget and locating our office and responding to lots of companies, you know, there was a lot going on before we actually hired our staff. It would have been nice to have been able to do it ourselves because I think it would have been more efficient. Because as much as the consultant was very familiar with the program, there were times of back and forth, no do it this way, no do it that way, I think if we could have managed it differently it would have been nice to have done it in-house but again, I don't know if we could have, just based on where the program was at that point."

**8. o What do you think are the best features in the document?**

“I think some of the best features in the document are: that I think it’s clearly written, I can understand it, and I’m not an engineer. And that was something that we had definitely wanted to try to achieve. I think the other thing that I really like about it is that we really wanted to try to convey a stepwise approach to planning and I’d like to think that comes across, you know, that there is step one, there is step two, there is step three. We had seen lots and lots of companies jump ahead, to even in just discussions and planning the program, jump ahead to just sort of willy nilly brainstorming PP options as opposed to systematically going through and looking at the processes, to kind of, and we thought that if we did the latter, if you systematically look at your processes which is what the planning process is about you would then build a sort of heritage for PP because you would have data that you would need to sort of look at it overall. A TQM approach, you would be able to build it in as part of your operations as opposed to, Oh, we thought of two PP things to do and maybe next year we’ll if we have the time, we’ll think of three more. So I like that it’s very stepwise; I think it looks nice, everyone refers to the black book. So I think it looks nice. I think it’s well laid out. So I guess those are the things I like about it.”

**9. cyn/s Can you point out any features that could be improved upon in a second edition?**

“There are definitely some things that we would improve. We did actually go to a 2nd edition about a year ago but quite frankly we did not have the time to do major revisions. We really just went in to update it, based on companies who would be reporting in the next round of reporting and we fixed some typos, took out Governor Florio’s letter. So we did go through that kind of clean up revision. Yeah, there’s definitely things we would like to change. Substantively, the one thing we’d like to change, well I think two things substantively we somehow like to change. Although the second might be handled better in separate guidance but let me explain that.

And the first is one of the first things, first the company develops a team and develops a policy and philosophy and stuff but when you start to get to some of the more technical work one of the first things they do is they have to define their production processes. They draw their black boxes and then from there they decide if they want to group them or not and then they decide if they’re going to target them and they do their materials accounting and stuff like that. What we have found in having implemented the program and practicing using the guidance document defining production processes become an extremely important issue for the quality of a companies PP plan. So that’s the first thing we found, is that it’s important, more important than we thought when we wrote it.

And then the second thing is that most companies, not most, but a lot of companies don’t seem to do it well. That the biggest error seems to be companies defining their production processes too broadly. I make coffee cups I only have

one production process at my facility, you know as opposed to really breaking it down into discrete units, breaking it down to discrete units lets you then identify, lets you do your materials accounting on a more specific level so you can identify sources of use and non-product output. There's no incentive for companies, really, I mean the incentive for companies to do more specific process definition is because they'll identify more PP and hopefully they save more money. The disincentive is when they have to do their public reporting; They report on a process level and if you have ten that means you have to fill out ten forms as opposed to one form, if you only have one production process. So somehow or another if we were rewriting the guidance document, which I'm sure we will do at some point in our life, I think we will pay more attention to the importance of good process definition and also trying to better explain why good process definition helps PP and why it's better for the company, that's definitely one area.

The second area is, I think when we wrote the guidance document we expected a different level of sophistication in terms of the companies ability to do environmental cost accounting and we found that that's not the case, that companies aren't as far along the learning curve as we thought they would be and so to that extent I think either in a revision of the guidance document, or again might be better separately as separate guidance some more a primer on cost accounting and pricing essentially that tries to accommodate some environmental costs. So those are two things that have really jumped out in terms of what we've learned over the last couple of years that need to have some more emphasis so those are the two substantive areas I would touch on again and might be just separate guidance on the second one or it would probably affect some discussion in the actual guidance document so those are two substantive things.

We've gotten some comments from companies about trying to have instead of the wallpaper case study is having multiple case studies that represent different types of operations in the state, so that would be something for us to think about. It might be hard in a guidance document unless you want it to be two thousand pages. It would be something to think about. The other thing which we were very reluctant to do in the guidance document and did a little bit in one of the appendices, a lot of the companies said they'd really like to be able to have a check list. So the reason we were reluctant to do that was because we were trying to get them through a planning process as opposed to just here's a list of everything you have to do, so go do it. So, I think it's something that we would think about and those last two comments are feedback that we've gotten as part of a project, where we've been doing what I call program evaluation. We've gone out and we've talked to over one hundred companies about planning in general and have looked at their plans and done site visits and then part of that we implement a questionnaire where one of the questions is: Did you use the guidance document? What do you think about the guidance document?

So that's some of the feedback that we've gotten. So those are two things I would think about the first two are things I would definitely address; The second two are things I would think about. I think to some extent I would certainly go through an edit, I mean there are certainly some spots that are a little wordy and

we'd certainly go through that. I still like the overall look and I don't think I would touch that too much. I would still keep it to be a step wise approach. So I guess those are the changes I would at least look to."

**10. cyn/i Did you like the tone of the document?**

"Yes, obviously I do."

**11. o How do think the graphics, color, etc. enhanced the effectiveness of the document?**

"We tried to use the graphics in a way to stress the steps in the process by having those little boxes based on each step. I think we could probably be a little more blatant in the use of graphics to push the step approach and you know when you work in government you can't, I mean it would have been nice for the document to be even more jazzy and even more glossy but you kind of can't do that because of the perception that you're spending a lot of money, and because of the reality that your spending more money. So yeah, it would be great to be able to have, what do we have three colors, I think we'd be hard pressed to justify it when the department is facing a 285 body RIF right now."

**12. c/r Do you know why the wallpaper example was created?**

"The wallpaper example was created because we thought that it was kind of representative of the kinds of companies that would be complying with the law particularly in the first round in 1994. It's a batch operation. It uses, I can't remember how many chemicals the company uses, but it was about the average that NJ companies use. It had a mix, a relatively representative size of NJ companies. So lots of different reasons, we thought that it was a good example of the kinds of companies that would be reporting in the first round."

**13. o Can you please give me some examples of how this document was effective?**

"Well I mean a couple of companies have sent it to their facilities outside of NJ, made me really happy. Lots of those states are using it now in terms of a template for writing their own guidance. It's been the corner stone of any of our outreach, both in terms of going on site, I mean we'll literally open it up and say OK now lets turn to page 49. Also, in terms of our training. It's explained to a large extent to upper management what the madness behind our method had been and it's ...(looking for program evaluations). In terms of our program evaluation a relatively large number of our facilities reported using the guidance document as opposed to the rules, what they used to develop their PPPs."

**14. o Describe how the document was field-tested.**

“So like I said the case study was based on a company that a member of my staff was working closely with developing a PPP. Second, we had prior to even the enactment of the law, we had three companies volunteer for the facility wide permit program. The first thing a company does for a facility wide permit is a PPP. So at the point that we were developing the rules and writing the guidance document, we had already gotten our fingers pretty deep into three companies’ operations in terms of trying to think about, OK, here’s three companies we’ve gotten to know them really well, let’s think about, they were sort of our reality check in terms of the rule and as such, they were also our reality check in terms of the guidance document since the guidance document sort of carries out the rule. So that helped us a lot, to have three actual companies that were sort of field testing things. And then the third was, that when we actually had a draft we had companies read the guidance document and took their comments as well as our reporting forms and instructions.”

**15. c What criteria did you use to select people to participate in the field-test?**

“Volunteers in terms of companies reading and then the wall paper company was just a representative, like I said, of companies in the state and they just had a real interest in having us work with them and then the three companies volunteered for facility wide permitting, so I guess the criteria was pretty wishy washy at that point.”

**16. c How many men/women participated in the field-testing?**

“I can’t remember I’m guessing I think we had about ten companies actually read the draft and then one on wallpaper and then three on facility wide permitting.”

**17. cyn Did you pay the people who participated in the field-test?**

“No.”

**18. cyn/s Do you feel there was adequate time to field test the document fully?**

“If we had more time I don’t think it would have changed much anyhow, so yeah, I guess we did.”



19. **cyn Did the writers meet with members of industry on a regular basis? Did you attend?**

“Yes as a result of rule making we met with companies constantly as a result of these facility wide permit companies, as a result our relationship with the wallpaper company, yes. Did I attend the meetings? Yes.”

20. **o/i What did you anticipate that the user’s response to this document would be?**

“Well we assumed that the users would say, Oh my god, look at how big it is, they didn’t give us a checklist, where’s the checklist. So we really tortured ourselves and to some extent we even had disputes on our own staff about well should we just succumb and give them the checklist, you know, what should we do! What should we do! And we did to some extent compromise a little. In the back in one of the appendices where we actually put in, here’s the fundamentals so to some extent I guess we tried to bury it, so but we also, did (App E) which is really a regurgitation of the rule. We did expect a positive response because we really thought that it was a great document. We still think it’s a great document. I think it’s really well written. I think it’s clear. I think it’s totally relevant. So we did expect a positive response.”

21. **o How did you envision your audience using this document?**

“We envisioned companies using it as a way, you know, we really hoped that the person who got dumped with complying with the PP act would sort of use it as a way to sit down, educate themselves and then use it as what I think a guidance document is. OK here’s some ideas on how to do this let’s think about what makes sense for a company, not to use it as a bible but to use it as a way to get started and to give them some definition.”

22. **o Describe how you interfaced with the writers.**

“How I interfaced with the writers? I’m mean at this point we probably had six people on our staff, including myself, we literally sat in my office everyday for hours writing rules and writing the guidance document. We had our consultant literally sit in the office at the computer with us writing things out. All six of us read every page of the guidance document, as it was developed, and argued about. We all read the rules. We looked for consistency. We had one or two staff members whose job specifically was to make sure of the consistency between the rule and the guidance document, so it was truly a team effort.”

23. o **Do you see any advantage or benefit in writing a document for Pollution Prevention that consists of a good example of a pollution prevention plan, only?**

“No, because they’re so different, they are so individual to each company and I would be afraid. The companies really respond to prescription and I’d be really worried that they would do that one plan. I think if the world was different and we weren’t facing budgetary cuts and I had some money to spend I’d rework the guidance document based on those couple changes that I told you about. And I’d hire six more people and their job would be getting in the door of companies and saying let me hold your hand and walk you through this guidance document. And then I’d also work with companies to provide additional guidance on top of it, because it’s a different audience at the company in terms of environmental cost accounting. So, and all of it would settle on a planning process as opposed to here’s a prescription of how to do your own plan.”

24. c/s **Did State procurement regulations have any effect on your choice of writers?**

“Yes of course they did, the state has to follow regs for everything. Having an effect, we had to go through a competitive bid process and so the effect was that we had to justify why we wanted to hire the company that we wanted to hire and yes, of course it did.”

25. c/i **How long did it take to complete this project?**

“A year, it was a year of hell.”

26. c/s **What was the aim of this document?**

“I think for me the aim is the same as the goal.”

27. rp **Did you try to place a goal statement in the document? If yes, please show me where.**

“No, I mean not in terms of what our goals were.”

28. o/r **Why do you think Pollution Prevention is necessary?**

“I think that no companies could go on and do work without necessarily having institutional PP programs. I don’t think it would be smart. We have certainly seen a lot of companies benefit both environmentally and economically from the planning process. It’s a cultural issue. It’s an institutional issue as opposed to technological issue. So no, I don’t think it’s necessary if I was running a company I would think it was necessary. I think it’s incredibly important. I think it’s

necessary in terms of trying to achieve a different level of environmental quality. I mean I guess it's necessary in making American businesses competitive so necessary, in that I would say yes. Inevitable maybe no I don't know."

29. **cyn/i Is your job constructed in a way that helps you do your job in a sound environmental manner or do other factors emerge that keep you from this?**

"Well yeah sure, of course anybody's job particularly in government. The fact is that everybody's going to get hit with this RIF whether through losing staff or having staff bumped. Those things are stressful in terms of any kind of job setting. I think overall our program has been extremely fortunate in terms of having the latitude, I guess me having the latitude to bring on a staff that's extremely hard working and especially bright and diverse. So I'm not exactly sure why that is but that certainly lead to the development of a much better guidance document both in terms of the technical aspects of the document but also, in terms of the program's desire to do things differently. To write a guidance document that was truly guidance, to write a guidance document that sort of went to the heart of the bottom dollar for corporations, as opposed to just environmental compliance, I mean it's a very different way of thinking and a large part of that is because my job has been constructed in a way where I had a lot of latitude in terms of the type of people who work for me, so I think that's really important."

30. **cyn Within the constraints of this project, do you think this document effectively communicates the full value of Pollution Prevention?**

"Yeah, I do think it's a really good document and we have gotten very positive feedback and our program evaluation does point to it as being really a sound document in terms of being a template for a company. You know, for a company who's motivated, who really does want to do some PPP it can actually serve as a very good template for the company to be able to tailor their program within this stepwise process in the guidance document. For a company who's not, well no it doesn't give them a clear checklist of just meet minimum requirements. It's a very different type of document than companies typically use, that are developed by this agency."

31. **o/a Who do you feel gains the most from a Pollution Prevention Plan?**

"Lots of people gain most and that's the nice thing about PP. The company certainly gains because our work shows that for every dollar a company has invested in developing their PPP they save five to eight dollars. So the company certainly gains. I think that the citizens of the state of NJ gain, because I honestly believe that an ounce of prevention is worth a pound of cure. And that to a large extent PP is, it gets squishy because it's based on a completely different ethic than Pollution Control; Pollution Control to some extent we've had many, many

discussions and arguments about why prevention why does it have to be prevention. If you get to the same environmental standards what does it matter if you slap on a piece of technology, who cares. And because to a large extent prevention is based on an ethic that those standards, as much as they've been researched and based on technology or whatever they're based on, are not fully protective or they could have faults or you know 25 years from now we'll learn something new that indicates that the standard wasn't as protective as it could be. But prevention is based on a very different ethic and the ethic is that it's just better to have less. And fortunately it certainly appears to be cost effective to have less. So to that extent, I think that the general public gains because it's just a more protective approach and I think that overall having less means less involved in accidents, less exposure to workers, just less in general."

**32. cyn Was the governors letter in the beginning of the document standard practice for NJDEP?**

"I mean it happens a lot so it's not standard practice but it certainly happens a lot. And we also knew that the Florio Administration felt especially strong about the Pollution Prevention Act and that the governor personally would want to have his stamp in there, so we knew that. So we certainly initiated it. But the governor's office definitely appreciated that we initiated it and definitely wanted to have it in there when we suggested it. So, it was not standard practice but it was certainly something that everybody wanted."

**33. cyn/r Was the letter included because of an expectation or a desire for the document to receive the highest level of attention?**

"Yeah we wanted; the thing that lots of PPPrograms nationally have found, including us, is that for PP to work both within agencies and within companies you need two things. You need top level commitment and you need an advocate down on the bottom. So we were trying to convey that, I guess by having certainly the topest levelest commitment, by having the governor's letter there. And to hopefully convey that the company should seek their top level commitment too, which is why the law requires a mucky muck to sign off on a companies PPSummary; To show that they've seen it and seen the Plan. I haven't gotten any feedback as to whether the governor's letter made a difference for anybody or not."

"I had two people on my staff who were specifically assigned to actual writing, The writing consultant and I were counterparts, he had two people on his staff who were the people sitting at the computer writing. The writing consultant reviewed everything. I reviewed everything. When there were problems he and I talked particularly in process, you know, you're taking too long, you're not giving me enough turnaround. But the writing consultant and I had to act as go between and second role was personnel management. It was an extremely frustrating

project too, so encouraging staff through the whole thing was quite a challenge. And so I'd say that was the second role. A third role for me, I sat and wrote some parts. I certainly read every single word and commented and edited and actually my own background was in communication, so I had some strong feelings on how to say things and was involved in decisions as to how do we set this thing up as well as which word to use. The fourth role is that I have to sign off all cost issues and money so I get to do that, so I'm sort of the budget officer for the project. Yes, I would definitely say we were a team faxing, modeming, staying in hotels. Saying to the writing consultant, you write this part, we'll write this part. Or we just can't get a grip on this we need someone to read this who is removed from it. I guess the difference is in the end the writing consultant and I had to manage the project. So it was a team.

34. cp **Is there additional information that you would like to add? Have I missed anything that you can think of?**

"You should know that as part of this program evaluation, when we've gone on site to look at companies plans, we did build in an evaluation of the guidance document.

Did you use the guidance document?

To what extent did you use the guidance document vs. the rule to develop you plan?

What do you think ?

What are you comments?

Those are the kinds of questions that we asked and that those will certainly drive any future revisions of the guidance document, if that happens. So I think that's really important, that there's a built in evaluation of it as well."

35. c **Can you tell me how much it cost to do this?**

"Not off the top of my head but I could look it up if I had to. I'd have to pull out the file. The contract with the consultant group involved other work too, so I would have to find out how many checks went to the guidance document as well as how much."

36. np **You can give me an estimate?**

I'll check.

37. c **Can you send me the second edition?**

"Yeah. I mean mostly it's a clean up. It's an update on dates, and it doesn't include the governor's letter but quite frankly that was mostly logistics than anything else we didn't have time to get it through. There were a couple of style

things, I mean, a couple of words here and there that were screwy. From the first day we got the document done. We didn't have the time for a revision and it didn't make sense because the companies that are going to be complying in 1996 had to meet the same regulatory requirements as the companies that complied in 1994 so we couldn't make any wholesale changes at that point. But I expect that there will be a revision after we finish the program evaluation and do a report to the legislature. And I think that depending on our personal work load I think we'll definitely do what we can to develop additional guidance on cost issues it's clearly needed."

About 500 companies complied in 1994 and about 200 will comply in 1996 based on SIC Code.

### Writer

"Before we begin I'd like to clear some things up. We are an extension of the state and we do their bidding. A lot of interaction with industry but it was by the DEP but basically it was their document and we did it to their specifications it would be improper for us to get involved with industry. It was not our role as a contractor. We did it because of their lack of staff and our expertise in Pollution Prevention and they valued our opinions. So the interaction was us with them and them with industry. The lead staff person that worked on this project is no longer with us."

**1. o What were the goals of the NJDEP when commissioning this document and how were the communicated to you?**

"We worked closely with the NJDEP. We were frequently in Trenton, one of their employees came down to work with us for a week. They wanted, wait (two minute pollution prevention background). They have done numerous industry case studies spoke with many members of industry to see what they were doing and what they were not doing in fact we won an EPA Administrators award for our pollution prevention (PP) research. We found that there was a lot to do with PP to save money. We found that you didn't need a government to do it. All this work was being done by environmental departments who had no power over operations. You need to know your sources before you can take action and we found that companies didn't know their sources. Can the state require plans, to get PP to happen? The context of this is that the state can not require PP and NJ was going to see if policy could require this, than companies would do PP plans. You can lead a horse to water... Could become a paper drill, paperwork. Could you get these plans instated into the companies normal operations? NJ had to implement the law the way it was written, and the law was a compromise between outside interests who were mistrustful of industry and wanted a lot more

specificity in the law, and those who wanted more flexibility in the interest of hopefully having it fit into company's own operations. So, the people at the NJDEP were always weighing those two kind of different threads because some of them were mistrustful of, whether you didn't require people to do a good plan you might not get a good plan. Inconsistent terminology in PP; the hope was to create a document that was very readable, helpful, clear, help people get oriented toward PP that would comply with the law but which would be something that would be helpful and a useful guide for a company doing PP, whether they were covered by the law or not. The challenge was to get the concepts across, make sure it was consistent with the law without being overly bureaucratic, prescriptive but to try and make it something which would convey ideas, as well as steps that a company could pick up and do in a manner that would be consistent with their own decision making and management of their operations. Walking a tight rope. Certain companies are much more sophisticated than others. This is really a technical support document but we didn't want the managers and the lawyers there trying to sift through it, we didn't want to make it a compliance drill."

**2. c/a What level of employee was this written for?**

"It was written for the people who will do plans in the company. Our view was to get the production/operation side of things. What the document seeks is a team, a team of functions, at a small company one person might do all functions."

**3. c Was it written for a large corporation, a small company or both?**

"Both"

**4. o What do you think are the best features of this document?**

"The most important feature I think is that it really probably did effectively convey what we're talking about; what source reduction is; what PP is. I think that it did do that. We have been involved in evaluating the effectiveness of some of the planning and have visited more than 50 plants. It is clear now that people are talking about the same thing and using the same terminology than 5 years ago. I think it was effective in reorienting people to what PP really is."

**5. o/s In a possible second edition, can you think of anything you would change?**

"Yeah. In our evaluation, one of the questions we ask is, did you use the guidance, was it helpful....and it was helpful, but one of the things companies ask for more than once is more examples. Different types of examples because the one in the document didn't match their own operations."

6. **o/r How did you decide on the tone of the document?**

“We and the state are both familiar with the types of people, we knew who the audience was. We wanted it to be a non-prescriptive tone. We didn’t want it to be overly legalistic. We didn’t want it to be intimidating. We wanted it to have a helpful kind of a tone. The legal boxes, we did that intentionally to set apart the law from the ideas in the book, so someone in another state could use it and we tried to put the greatest degree of NJ specificity just in those boxes so you could separate the legal requirements of the state from that which is a good idea. Our hope was that this particular document would be good for a starting point for any state that was going to do a PP Plan. What are the logical steps in the planning.”

7. **cyn Did you participate in the selection of the graphics and color?**

“I didn’t, but our staff did. I took the picture on the front cover. The picture is a paper mill.”

8. **c/r Why was the wallpaper example used? What did you hope to achieve with this example?**

“That was suggested by one of the NJDEP staff, they sort of worked that up. That was not ours.”

9. **c/a How much research of the New Jersey Regulations was required to complete this project? How much research did you have to do on your own?**

“We were well familiar with the law and we sat in on the hearings, so we were well familiar with regs on the whole thing. That’s hard to answer. It required a lot of knowledge of the regulations but that was happening in the course of things.”

10. **c/r Why was a 12 step approach used instead of chapters? Any significance behind this choice?**

“The effort was to make it more simple, and some of the steps are short, we had an odd number so twelve is good, we don’t want to have eleven. We didn’t want to have to write a full chapter, if the step was short we wanted to get on to the next step. We weren’t going to make it a twelve chapter book.”

11. **cyn Within the constraints of this project, do you think this document effectively communicates the full value of Pollution Prevention?**

“I think it does a good job of conveying what PP is and I don’t know if anything yet has communicated the value of PP.”



12. o **What steps were taken to ensure that the necessary industrial perspective was included in this document? How much time was spent with members from industry?**

“Again we’ve done a tremendous amount of research and industrial case studies in PP, separate from this particular project and a bunch of it was in NJ, although not exclusively, so we were bringing a lot to the table. NJ was the one interacting with industry on the rules and their thoughts about the planning process overall, and they were sharing ideas with industry and I’m pretty sure they put our report out in draft for comment, and it certainly was mentioned at the hearings so anybody who wanted to receive a copy for comment and participate, so they were doing quite a lot. But I must say industry was far more concerned about the requirements and the rule than the document. The folks they were interacting with were the ones who knew what the rule and requirements were.”

13. cyn **Sometimes documents like this are field tested. Did you feel it was necessary to field test this document? If so, how was this done?**

“We are field testing the program. I think that to a certain extent the whole enterprise is a field test the planning requirements, the forming of the regs the whole package is a field test, and I think the legislature viewed it that way. I think PP is what they wanted the state to pursue. Most people thought that it was as good a shot at it at the time but they weren’t overly confident that they did it right. I think people view the program as a field test and in fact the law calls for an evaluation and for the state to reconsider and re-tune the program after 5 years. The proof is in the progress. You want to see if you’re getting planning and whether planning is leading to PP.”

14. c **What criteria did you use to select people to participate in the field-test?**

N/A

15. c **How many men/women participated in the field-testing?**

N/A

16. cyn **Did the people who participated in the field-test get paid?**

N/A

17. cyn **Do you feel that there was adequate time to field test the document fully?**

N/A

**18. c/s How long did it take to complete this document?**

“The thing needed to be out in a timely fashion for the planning to begin, so it had a definitive end date. Step by step.....6 months to a year but not intensive. It became intensive once the dye was cast. Printing.”

**19. hp Did you consider a shorter document or a one page summary version of the document?**

“Nope. I don’t think that could achieve the purposes.”

**20. o/a What similar documents have you worked on in the past?**

“Well this is the first PP planning guide that I think existed. So the answer is none exactly like this but we have done a lot of research and we have written a number of books on pollution prevention. We wrote a couple for Inform, EPA’s Pollution Prevention National Report, so we have written a number of large documents and smaller reports for not a terribly different audience. They were certainly not technical audiences.”

**21. hp Do you see any advantage or benefit in writing a document for Pollution Prevention that consists of a good example of a pollution prevention plan, only?**

“Nope. I think one of the most important things the document does is get the concepts across and an example wouldn’t do all that. The multi-disciplinary philosophy of this plan, the desirability of drawing in different types of folks into a team on this. It’s not required by the rules but that’s in the document to show people how procurement, design, operation, and environmental go together.”

**22. cyn Was the project a collaborative effort? If so, what was the nature of the collaboration?**

“Certainly with us and the NJDEP.”

**23. o/a Describe the relationships between the writers.**

“Well there are probably three of us and one of theirs who came down to work with us, and then they had one engineer working on the wallpaper example, a separate person. Maybe five all together. We had a good relationship and a trusting relationship.”

24. o **How did you envision your audience using this document?**

“Well our part was, a number of people are going to find out that they fall under the categories being covered by the planning and requirements and rather than sit down with the rule and their attorney saying what do we have to do, Joe. Hopefully this document would orient them to what this is all about and how might they go about this in a way that would work for them, separating that which is good ideas from that which is required. Hopefully, it would be something that people would look through relatively quickly, they would use it afterwards as a resource, but they would basically take the ideas and fit them into their own setting. We were not trying to be prescriptive in a way that would force people to do things in a way that was foreign to their company. That was our hope. And companies that weren’t covered by the NJ requirements, either in the state or outside the state, would pick it up and find it to be helpful.”

25. c **What were the most significant problems that the writers faced in creating this document, if any?**

“It’s walking the line between what was required in the regulation and the law, and trying not to be overly prescriptive in the document, because I think that we were convinced that the lighter the hand, the more effective it would be.”

26. o **Describe the ways in which you collaborated with other writers.**

“I’m the head of our organization and I have been mostly involved with this issue for the longest period of time, so to a certain extent I am an authority in this particular field. So my involvement was to be involved but to be a resource and to impart certain conceptual approaches and I had a certain amount of say, for example, I think the 12 step thing, I think was my idea and I was involved in writing the conceptual front ends. We had a lead senior engineer who was our chief person offering it and we had another person working in support of her and we bounced drafts and ideas back and forth with NJDEP. And they had one person who was a pretty good writer who was not that technical and the thought was to get somebody who was a good communicator but a more lay audience to make sure that things were communicated effectively, but somebody who wasn’t already familiar with the field. We worked together as a team. We are a small operation, we interact very closely together.”

27. c **Describe the document production process, if you know it?**

N/A

28. c **What was the aim of this document?**

N/A

29. o/s **Describe the relationship between the NJDEP and the writers.**

“Close, we view ourselves as an extension of them.”

30. c **What specific guidelines and instructions did you receive from the NJDEP?**

“We received many comments, many times, I mean the document is theirs but we would go up and come up with our ideas and our outline and they would share those ideas and ultimately they would make the decision and if we thought they were off the mark we would very candidly tell them they were off the mark. We were close enough to have a very candid relationship with them, unlike some contractors who listen to what the customer wants and just say yes sir, yes ma’am and go ahead and does it. We would tell them if we thought this isn’t wise and they had enough respect for our opinion to give it a full airing before deciding.”

31. c **What constraints if any, did the NJDEP place on your work?**

“In the end they were the final decision maker. We had to respect our role and that was a sort of a given, it wasn’t like they said you have to respect your role.”

32. o **What was your approach to this document? Describe your role in the document production process. What sections did you yourself write?**

“Yeah, although we operated in a team, so any of my words would have been massaged by others but yeah, the first two or three steps.”

33. cyn **Does your agency work exclusively for governmental agencies?**

“The answer is no we do not work exclusively for government agencies but we basically do not work for the regulated industry. We work for scientific organizations, international organizations, state and federal entities but we generally do not work as a matter of policy for regulated entities. In a consulted way, one of the things we do is sell risk assessment software and of course we would sell that to everybody and anybody and industry is a very large client of that but we are not a consultant to them. We would not consult for industry but we sell products, information, and data. We would supply that to anybody but as far as writing a study and reports like this, we just want to avoid conflict of interest and we want to be viewed as a independent technical entity.”

34. c **What was the dollar value of the contract?**

“I don’t know what the policy is so I can’t say. Ask the NJDEP.”

35. **cp** **Is there additional information that you would like to add? Have I missed anything that you can think of?**

“No I don’t think so. Have you talked to the NJDEP yet? I hope their recollections conform with mine because it has been a period of time now. I’m trying to think, well did they circulate it to all the companies, I think they did.”

User #1

1. **o** **What do you think the NJDEPs goals were for this document?**

“That’s an interesting question. It seems to be an explanation of a pollution prevention plan for someone without an engineering background and an attempt to explain how you are going to do it. It seems to be a guidance document for someone who does not have any background in engineering or environmental.”

2. **cyn/u** **Do you feel that this document helped you prepare and write your pollution prevention plan? Why or why not?**

“Not at all. It’s not far enough along. I’ve worked with pollution prevention from the time the statute was written and did a lot of negotiation with the state over the regs. I’m an experienced process engineer so it really wasn’t of any help to me.”

3. **c/a** **What level of employee do you think this document was written for?**

“It seems to be written for a maintenance department or something like that, not necessarily for people with an engineering background.”

4. **c/a** **Do you think it was written for a large corporation, a small company, or both?**

“I don’t feel it was written for a large corporation since in all likelihood the people who would be working on it, in a large company, would be either an engineering or regulatory compliance group. It’s definitely not written from a regulatory compliance perspective. Yes, for a small company.”

5. **rp/r** **How do you feel about the way this document was written? Why?**

“I don’t like the document. I feel that although it is true to the regulations it seems to be leading people in the wrong direction. OK- specifics along that, they have some ideas which would have been useful to look at from the standpoint of efficiency which is what pollution prevention is all about, and they literally set

them aside because they didn't fit EPA's narrow definition. I similarly had things that I found in my own plant which with a broader definition would have worked better and yet eventually because of the internal workings of the company and how you get funding etc. were just kind of dismissed because they were things that I couldn't really justify saying this was why I wanted money for them. How feasible they were, well, we didn't evaluate them because they fell outside of the definition and even though I discussed this particular application *ad nauseum* with DEP they kept coming back and telling me it didn't fit their definition so, I didn't know what I was talking about and as an experienced process engineer that burns my butt."

6. o **What are the worst features of this document?  
Can you point them out to me?**

"This particular one on page 50, they have a formula they give there that I feel is completely incorrect because it should be normalized based on production, because with varying production using an absolute number doesn't do anything. There is a statement here on page 69 which is misleading, according to what the law says, it says that if the team has found an opportunity that is obviously worthwhile which it plans to implement it is not necessary to do a detailed feasibility analysis, I disagree."

**o/r Why do you feel this way?** "Just from the way the text of the law is written, I specifically said the law not the regulations." They have some things in here that are contrary to the way the plant runs. On page 73 the second full paragraph they make a statement which is contrary to the fact that the site is a JIT (Just In Time) facility. Again further down the fifth paragraph it's obvious that the author doesn't understand what JIT is. Page 82 is one of these ones that just kind of cracks me up. Where they talk about MIBK being part of the glue that's on the product. And I feel that they totally missed the boat with this, they should have realized that as part of our litigious society we're shipping that glue that has MIBK in it we probably shouldn't be doing that we should be looking at our glue formulation and they just basically say well it's part of the product so it's OK, Page 82 top of the page. I felt that it is very much going in the wrong direction since one of our primary strategies, if you're developing new products, should be to look away from things like that."

7. o **What are the best features of this document?  
Can you point them out to me?**

"I kind of like the little summaries of the rules. They do help to tell you why they are doing things; These little boxes that say NJ RULE on them are actually helpful."

8. **cyn** **Do you like the tone of this document?**  
**o** **Can you describe the tone of this document?**

“The tone of the document is too elementary for me.”

9. **hp** **If you had a chance to write this document how would you write it?**

“That’s an interesting question because there are so many things that I disagree with, the way the law and the regulations were written, that I don’t know if I could write the document. There is one thing that they turn away here which just seems out of line with me, where they came up with a good idea that didn’t fit the definition that would have been recycling used ink and they just decided not to do it because it didn’t fit the definition and that’s just totally out of line. I would not have found myself saying basically set it aside and don’t do it which is what the people in this facility did. They looked at it and they said well this is really a recycle so it’s not pollution prevention so they set it aside and didn’t do it. And that’s ridiculous if it’s a good idea you should do it anyway.”

10. **rp** **How do you feel about the graphics, color etc.?**

“The graphics really don’t impress me. It’s all basically decorative, I can do without the decorative and I really don’t care if that’s their corporate logo or not” (referring to the little wallpaper factory picture). “I’m not overly impressed with color, I could read a text book.”

11. **cyn** **Do they make this document more effective? Where? If not, where?**

“No, and again I’m not impressed by color or pictures or anything like that.”

12. **cyn** **Do you like the 12-step approach instead of chapters?**

“The 12 step approach as far as I’m concerned are chapters so I don’t see any difference.” **As the steps go up the steps get darker...** “I didn’t even notice it.”

13. **o/np/rp** **Was the wallpaper example effective? Why or why not?**

“Well if you’re talking about it being applicable to my plant, no it’s not because I’m not an adhesive and wallpaper type outfit, I’m a synthetic chemical manufacturer, I’m not a SOCMA source but a synthetic chemical manufacturer so I’m dealing with reactors and stills and things like that. I understand how graphic arts and printing presses and stuff like that work but it’s really not applicable to the kind of industry that my background is in.”

**Do you think it was applicable for NJ?** “I suppose given the target for it might be I would guess the assumption of putting the book together is that big companies who have chemical plants will have people who have been looking at

regulations and stuff and know what's going on, and it might have been aimed at the less usual, less typical type of operations, that's my guess."

**Should they have targeted the most major industry in NJ?** "Well they've got a picture of , I think that's EXXON Bayway, it's an oil refinery somewhere."

**14. cyn/a/r Overall, do you think this document was effective? Why?**

"I really don't feel it was. The reason that I don't feel it was, was that it didn't seem to focus on the kind of things that a major corporation would make you look at. There is not really a lot of information here on the financial and they seem to indicate that somebody did this on the back of an existing spreadsheet. I tied up a financial analyst for several months here on this and if you want to get money from an overseas company this is the kind of thing that you do, and also since the state of NJ made such an issue over total cost analysis which I got the regulations changed from capital letters to small letters so that I wouldn't have to keep two sets of books. They didn't do that in here that I remember and it would have been an opportunity for them to do that since that's supposed to be the latest and the greatest, and since they supposedly had software available to do it, it would have been a good chance for them to publicize that, and its been awhile since I've looked at it but I don't recall seeing any of that in here."

**15. cyn Were you asked to meet with the writers of this document to voice your opinion and to add your input? If not, do you know who was?**

"No. I've never heard of anyone who had any input."

**16. hp If you were asked to be in a focus group what would you have said?**

"I think I probably would have told them that they should have focused more on material balances and accountability; I don't remember exactly how they did it in here. That was the primary method they used here. I looked at material uses and then I went out and looked at the plant and the one big project that we came up with was proposed within the first week I worked on the project. I looked at their consumption and I looked at what was there and I said unless there is something going on here that I don't know about, we can do a lot better job than this and there were some things I didn't know about but we still got a grand slam home run out of it even with the stuff that I didn't know about, but that's my process engineering background."

**17. cyn Do you think there were any misunderstandings or miscommunications between the writers, the DEP, or the users of this document? If so, can you tell me what you think they were?**

"Material balance won't work for a reactive system. I felt that the approach on page 50 with so called hazardous substance use was done on the wrong basis than



the same one I said should be done on a unit of material. Here's the one I was telling you about page 67, the results of brainstorming, save the ink that you were throwing away and you literally crossed it off, that's kind of ridiculous if that's not considered pollution prevention, I'm sorry. A lot of my objections here are not to this particular document here they are to the way the regulations were written."

18. **cyn/rp Have you ever had any disagreements with anyone from the Office of Pollution Prevention? If so, were they based on miscommunication, misunderstandings, or personality differences? How were the disagreements resolved?**

"I've had nothing but disagreements with people from the Office Of Pollution Prevention. When we were trying to negotiate the regulations I put together a number of arguments that I got a deaf ear turned to, and I suppose if you're being strictly regulatory, they were saying well we are going strictly by the letter of the law, my point was OK, fine, I understand what the statute says, I've read the statute, on the other hand the statute doesn't say that you should be penalizing me if I decide to do something that doesn't exactly fit your definition and that's what they put in the regulation. So I had a big disagreement with them on that and I've always disagreed with the definition of pollution prevention. I've always felt it should be done from a site perspective not a process perspective, and I've also disagreed with strictly what RCRA calls end of pipe definition because there are some legitimate things people can do but if they're not going to get credit for them simply because they don't have the in process capacity to store them, it's a little bit ridiculous to say if you have off-spec product and you put it in drums it's a waste, which is basically what the regulations say. So it's easier to do it on a plant-wide basis? Well there are opportunities there I want to stress that you may not find if you restrict it to a process basis, the example that I use here we never really evaluated and the specifics aren't going to be as easy as I make it out to be because of other regulations but basically what we have is a process that produces a certain amount of waste acid. Unusual about this process is that it does recycle acid, it recycles about 65% per pass but eventually you end up with a somewhat diluted acid stream that the process can't use anymore so it has to be bled off and that stream is being neutralized by our Waste Water (WW) treatment plant. And after talking to the WW treatment plant people I found out that the WW treatment plant was being controlled by that stream. And after thinking it over I said, well, I can't really reuse it in the process but I'm buying sulfuric acid to run the WW treatment plant so why don't I just take this stuff that I'm neutralizing....."

"Material balance formula they did not agree. It was resolved by them telling me what I should use and me using them, even though I don't agree with them."

19. cyn **Was there a fee charged for the submission of your Pollution Prevention Plan?**

“No.”

20. c **Can you estimate a total cost, to your company, in preparing a Pollution Prevention Plan?(include time, data gathering, equipment, etc.)**

o/s **How do you feel about the money that was spent?**

“Including implementation three quarters of a million dollars. The implementation part I feel pretty good about because it’s going to pay itself back pretty quick. Time spent on investigation and paperwork I don’t feel was money well spent. Four hundred and fifty to five hundred of that was implementation, the two big plans worked, well, 20% better than I had thought. We did get results.”

21. o/a **Why do you think Pollution Prevention is necessary?**

“Making more effective use of your materials is great it’s the micro-managing that I don’t like. Being against pollution prevention is like saying your against solar energy, what’s there to be against, but if we start mandating that every plant do a solar energy balance and paperwork, than solar energy will become real unpopular.”

22. cyn **Do you think that the Pollution Prevention approach advocated by the Office of Pollution Prevention is effective?**

“No I don’t, because I feel that it is too limited in scope.”

23. cyn **Writing a Pollution Prevention Plan was mandatory for your company, correct? Did your company put the plan into effect?**

“Yes, Yes we did 3 projects we proposed. Two were implemented. We did do 90% of what we said we would do, maybe even more.”

24. rp **Is your job constructed in a way that helps you do your job in a sound environmental manner or do other factors emerge that keep you from this?**

“Regulation gets in the way but that’s what my job is.”

**25. o/rep Who do you feel gains the most from a Pollution Prevention Plan?**

“Implementing the plans that we have was good and it could have been done with less paperwork. Everybody has won. My disagreement is with the micro-managing and paper work not the concept.”

**26. rp/s How do you feel about the Governor’s letter at the beginning of the document?**

“Never even noticed it, I’m not impressed. When you work in regulatory you get used to seeing the rubber stamp it doesn’t impress or dis-impress me.”

**27. rp/s How do you feel about the NJDEP mission statement at the beginning of the document?**

“Again, propaganda.”

**28. cp Is there additional information that you would like to add? Have I missed anything that you can think of?**

“The plan was started in 1991.”

User #2

**1. o What do you think the NJDEPs goals were for this document?**

“I believe they were to make it as clear as possible what the regulation meant and what had to be done to fulfill the intention of the regulation.”

**2. cyn/u Do you feel that this document helped you prepare and write your pollution prevention plan? Why or why not?**

“The document itself I didn’t use directly, all the principles in it I did and I’ve read it through and it’s an excellent summary of what should be done and there were other sources of information that were available before I had this. I think we may have even referred to it but we didn’t use it exclusively. The guys at NJIT used it? Yes I believe they had a copy.”

**3. c/a What level of employee do you think this document was written for?**

“I would say middle management.”

4. **c/a Do you think it was written for a large corporation, a small company, or both?**

“I think that both could use it, it’s pretty clear.”

5. **rp/r How do you feel about the way this document was written? Why?**

“I’d say it was well written, easy to follow, quite thorough.”

6. **o What are the worst features of this document?  
Can you point them out to me?**

“That’s hard to say. I say probably the least value not the worst feature but the least value to us would be the examples they gave may give you some idea but think there were other sources of examples that were better.”

7. **o What are the best features of this document?  
Can you point them out to me?**

“I think that its the way it was put together; The order in which the twelve steps were presented and clarified; the tabulations were useful; also the guidance for developing a company policy statement.”

8. **cyn Do you like the tone of this document?  
o Can you describe the tone of this document?**

“Yes, it read very well. It was not condescending. It approached things on a practical, down to earth scale. It was not too technical. Overall I think there was a good balance of words in it, use of words.”

9. **hp If you had a chance to write this document how would you write it?**

“I really can’t answer that. I don’t write documents but I said it was a good document so I would write it the same way.”

10. **rp How do you feel about the graphics, color etc.?**

“I think they were very useful and made it easier reading; Broke up your eye lines.” **Do you think there could have been more color?** “No I think it’s a good balance.”

11. **cyn Do they make this document more effective? Where? If not, where?**

“Yes it did, certainly. I’d say there were a number of places where relatively difficult topics were covered quite well. I like the idea too, of putting part of the

NJ rule on each page where it tells you what to do so you can refer right to it without having to flip through pages, that was a good idea.”

**12. cyn Do you like the 12-step approach instead of chapters?**

“Yes. In a sense they are chapters but it was different.”

**13. o Was the wallpaper example effective? Why or why not?**

“Not that much. I think we, as probably many other industries, have our own unique situations which we have to use general guidelines for and develop specific approaches and it gives you some idea but what it really comes down to is that you have to get in there and build your own example.”

**14. cyn/a/r Overall, do you think this document was effective? Why?**

“Yes. Very effective, very well done.”

**15. cyn Were you asked to meet with the writers of this document to voice your opinion and to add your input? If not, do you know who was?**

“No. I don’t know of anyone. I did, not that it was particularly connected with the book, but I was a member of an advisory group of industries to the Office of Pollution Prevention that assisted or gave our opinions as the guidelines, regulations were being developed but not on the book itself.” **They didn’t give you a draft to read?** “No.”

**16. hp If you were asked to be in a focus group what would you have said?**

“Well, we particularly deal with solvents and we use solvents in our industry in making the drug active substances. We would like to see out of process recycling included. That’s a significant factor and under the present regulations we don’t do that. It was suggested in Assembly Bill 809 was it the one that has now failed to pass the Senate in reference to the regulations. Amendments to the PP regulations, one of the things was to include out of process recycling. That is particularly apropos to the batch chemical industry because it’s not a continuous operation you have to keep opening the vessel and closing it, pulling things out and putting things in.”

**17. cyn Do you think there were any misunderstandings or miscommunications between the writers, the DEP, or the users of this document? If so, can you tell me what you think they were?**

“I would say overall no. That one exception that I just mentioned.”

18. **cyn/rp Have you ever had any disagreements with anyone from the Office of Pollution Prevention? If so, were they based on miscommunication, misunderstandings, or personality differences? How were the disagreements resolved?**

“Yes, and that was when our plan was inspected and reviewed and the reviewer came up with a number of concerns that were, lets say things that he thought were wrong with the plan, and we felt we followed the instructions correctly and we wrote to the DEP such and they came back and agreed that the reviewer had erred in his statements. It was fixed yeah, and we were all right our plan was good. It was his misinterpretation or misunderstanding, I’m not sure. And I must say I’m very appreciative of the DEP willing to accept that an error was made; a good working relationship.”

19. **cyn Was there a fee charged for the submission of your Pollution Prevention Plan?**

“No.”

20. **c Can you estimate a total cost, to your company, in preparing a Pollution Prevention Plan? (include time, data gathering, equipment, etc.)**  
**o/s How do you feel about the money that was spent?**

“I’d say probably about 250 thousand dollars.” **And you feel it was well spent?**  
 “Yes, what it allowed us to do is to go through and make an ordered survey of our site for PP opportunities. It also allowed us to see where we had already done a number of things before the regulations came out, such as substituting water for organic solvent in a number of our processes. What it’s going to end up doing is saving us much more money than 250 thousand dollars. I’m talking about multiple of that savings per year in fact with one product. We found another process where we were able to decrease the amount of solvent usage by about 90%, the energy usage was decreased by 60% and process time was decreased by 80% and overall it’s going to come to about 2 million dollars a year in savings for the one product. Still waiting on the FDA...”

21. **o/a Why do you think Pollution Prevention is necessary?**

“I think it makes good economic sense and besides obviously complying with the regulation, although it is voluntary, but the big thing is the savings. And then of course less exposure of employees to hazardous materials; The environment.”

22. cyn **Do you think that the Pollution Prevention approach advocated by the Office of Pollution Prevention is effective?**

Already answered.

23. cyn **Writing a Pollution Prevention Plan was mandatory for your company, correct? Did your company put the plan into effect?**

“That’s correct. We have put parts of the plan into effect. We have reduced our solvent usage by 15%. Our goal is over a three year period to reduce by 53% the generation of Hazardous Waste. We’ve achieved in the first year 15% and a.....turn off for confidentiality.”

24. rp **Is your job constructed in a way that helps you do your job in a sound environmental manner or do other factors emerge that keep you from this?**

“I’d say overall I have pretty much of a free hand in what I’m doing and how I’m doing it. Right now what’s hurting us are budgetary conditions and that we don’t have the size budget that we had before.”

25. o/rep **Who do you feel gains the most from a Pollution Prevention Plan?**

“I think everybody comes out on top. The reason that I say that is that obviously there are savings for the companies but it provides a cleaner environment and it’s good for the workers and it’s good for the politicians too.”

26. rp/s **How do you feel about the Governor’s letter at the beginning of the document?**

“I think it was a good statement - it presented a good statement.”

27. rp/s **How do you feel about the NJDEP mission statement at the beginning of the document?**

“I think it’s fine.”

28. cp **Is there additional information that you would like to add? Have I missed anything that you can think of?**

“We’ve been trying to institute a PP awareness and education program within our R & D group so that this process that is saving so much money, that is already on the books, it was one of the processes that was considered for putting it into production they picked the one that produces 21 times the waste that this new process does. I think if R & D is aware of that as far up front as possible you

don't want to start to slow the drug discovery process but still at a certain stage in the development of the drug active substance there should be an awareness and an education so that chemists can start choosing better routes with PP and consideration. And it's not a new thought but yet it's not a much utilized thought and as PP in other places there's a lot of inertia to work against. NJIT and we are working together on an internal program. In fact the EPA Paul Anastos who is chief of the industrial chemistry branch of the EPA is interested in participating in the program because he wants a model for US industry and there are also some publications out, Benign By Design, coedited by Paul Anastos. Waste Minimization, Pollution Prevention and Benign By Design.” **There is a lot of information out there?** “Yeah and people have to start becoming aware of it.”



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