

Canadian Environmental Protection Act

**Strategic Options for the Management
of
CEPA-Toxic Substances
from the
Wood Preservation Sector**

Volume I

Final Report from the Issue Table

July 1, 1999

**VOLUME I: STRATEGIC OPTIONS FOR THE MANAGEMENT OF TOXIC
SUBSTANCES FROM THE WOOD PRESERVATIONS SECTOR REPORT
OF THE ISSUE TABLE**

Table of Contents

Executive Summary	iv
Glossary of Terms	xvi
1.0 Introduction	1
1.1 Context	
1.2 Strategic Options Process (SOP)	
1.2.1 The Goals of an SOP	
1.3 Rationale for a Wood Preservation Sector SOP	
1.4 Canadian Wood Preservation Industry: Regulatory Regime	
1.5 Scope of the SOP for the Wood Preservation Sector	
1.6 Path to Recommendations	
2.0 The Wood Preservation Sector.	7
2.1 The Wood Preservation Industry	
2.2 The Economic Significance of the Industry	
2.3 Markets and Products	
2.4 Supply of Wood and Preservatives	
2.5 Production and Consumption Trends	
3.0 CEPA-Toxic Substances Release Estimates	12
3.1 Basis for Release Calculation	
3.2 Release Points	
3.3 Release Calculation Methodology	
3.3.1 Arsenicals	
3.3.2 Creosote	
3.3.3 Pentachlorophenol	
4.0 Environmental Control Status in the Wood Preservation Sector	30
5.0 Recommendation Selection Process.	38
5.1 Establishing Criteria and Objectives for Recommendations	
5.2 Summary of Recommendation Options	
5.2.1 Manufacturing and Treating Stages of the Lifecycle	
5.2.2 Use and Post Use Stages of the Lifecycle	
6.0 Final Stakeholder Recommendations	44
6.1 General Recommendations	

6.2	Recommendations for Chemical Manufacturing and Wood Treatment in the Wood Preservation Sector	
6.2.1	Implementation Plan and Estimated Costs for Manufacturer/ Treater Recommendations	
6.3	Recommendations for Consumer Treated Wood Products	
6.3.1	Implementation Plan and Estimated Costs for Consumer Treated Wood Products	
6.4	Recommendations for Industrial In-Service Use and Post -Use of Treated Wood	
6.4.1	Implementation Plan and Estimated Costs for Industrial Users Recommendations	
6.5	Minority Views	
6.5.1	Canadian Environmental Network	
7.0	References	59
8.0	Appendices	60
Appendix 1	List of SOP Issue Table Members List of Working Group Members	
Appendix 2	List of Meetings	
Appendix 3	List of Wood Preservation Plants	
Appendix 4	Proposed Steering Committees Terms of Reference	
Appendix 5	References	
Appendix 6	Wood Preservation SOP Scoping Document	

VOLUME II: TECHNICAL SUPPORT DOCUMENTS

Table of Contents

1.0	Introduction	
2.0	Recommendations for the Design and Operation of Wood Preservation Facilities (TRD)	
3.0	Draft Industrial Treated Wood Users Guidance Document (UGD)	

VOLUME III: REFERENCE DOCUMENTS

Table of Contents

1.0	Introduction	
2.0	Status of Environmental Controls at Use in the Wood Preservation Sector	
3.0	Socioeconomic Studies	
3.1	Wood Preservation SOP - Socioeconomic Background Study	

- 3.2 Socioeconomic Analysis of Environmental Management and Waste Disposal Options for the Canadian Wood Preservation Industry
- 3.3 Lifecycle Analysis
- 3.4 Waste Disposal Option Analysis
- 4.0 Commentary on Emissions from Creosote used in Wood Preservation
- 5.0 Report on Inventory of Releases of Arsenic and Hexavalent Chromium
- 6.0 Summary (I) *In Situ* Impacts of CCA Treated Wood in service and (II) Waste Management of Spent CCA/ACA Treated Wood
- 7.0 Aquatic BMPs
- 8.0 Report to the Wood Preservation SOP Working Group on Dioxin/ Furans and Hexachlorobenzene
- 9.0 Volatilization of Micro-contaminants from Pentachlorophenol-Treated Utility Poles

Executive Summary

Environment Canada and Health Canada have developed a process for managing environmental contaminants under the Canadian Environmental Protection Act (CEPA) which includes the following stages:

- identification of potentially toxic chemicals;
- assessment of the risk to the Canadian Environment and population; and
- identification and review of the options available to reduce environmental and/or public health risk posed by toxic chemicals.

The process has involved establishing a Priority Substances List, performing an assessment of toxicity, and developing a risk management strategy through a Strategic Options Process (SOP). In the SOP, recommendations for the most effective options for reducing exposure to toxic substances are developed by various stakeholders.

This report presents the stakeholder recommendations and implementation proposals of the SOP undertaken for the Wood Preservation sector. An Issue Table was convened with representation from the federal government, preservative manufacturers, wood treaters, industrial users of treated wood products and environmental groups. The provinces were invited to participate with the result that some participated as corresponding members only. The future participation of all provinces is essential to the effective implementation of the recommendations of this Strategic Options Report (SOR).

The Issue Table has met as a whole and in various working group sessions over the past four years to determine chemical release data and the criteria for determining priority areas for investigation before arriving at recommendations for the most effective options, for reducing exposure to toxic substances.

The Wood Preservation Industry

The Canadian wood preservation industry has existed since 1910. The industry treats wood with heavy duty waterborne and oil borne preservatives for both industrial and residential market applications. The wood preservation sector in Canada comprises the preservative chemical manufacturers, the wood treating plants and the users of both industrial and consumer products. In 1995, 64 wood treating plants were reported as operational (Stephens et al, 1994).

The wood treating plants are spread across the country. The number of plants in each province are given below.

Atlantic Region (NS, NB, NF)	4
Quebec Region (QC)	11
Ontario Region (ON)	18
Prairie and Northern region (AB, SK, MB)	14
Pacific and Yukon Region (BC)	17
Total	64

By applying preservatives the industry extends the productive life of wood, thereby reducing the stress on forest resources. In addition, the industry creates substantial direct and indirect employment at the various stages in the life cycle of treated wood and generates significant amounts of revenue in both domestic and export markets

Wood Preservation Sector Strategic Option Process

The wood preservation sector covers a wide range of areas related to the manufacture and use of the heavy-duty wood preservatives: chromated copper arsenate, ammoniacal copper arsenate, creosote and pentachlorophenol. Activities included under the sector definition are: wood preservative manufacture, application of preservative to the wood, the use of treated wood products, the management of used treated wood, the transportation of both preservative chemicals and treated products and the contamination of sites. It was determined that the following CEPA-toxic substances may be released to the environment from the above areas of activity: **inorganic arsenic compounds, chromium VI, polycyclic aromatic hydrocarbons (PAH), creosote-impregnated wastes, polychlorinated dibenzodioxins (dioxins), polychlorinated dibenzofurans (furans) and hexachlorobenzene (HCB).** The Wood Preservation Sector SOP developed recommendations for those activities which cause the release of these CEPA-toxic substances.

Scope of Wood Preservation Strategic Option Process

In order to clarify the scope of this SOP, two critical issues had to be clearly delineated and addressed. The first issue was that of legislative authority and jurisdictional responsibility. The second was the more technical issue of addressing releases to the environment of CEPA-toxic substances from those stages of the life cycle identified as relevant to the SOP.

The Issue Table agreed that the focus of the recommendations should be to prevent further releases. For this reason the following activities were excluded from the scope of the discussions:

- the manufacture, application and use of wood preservatives as they are covered by the Pest Control Products Act (PCPA);
- the transportation of wood preservatives because it is covered by the Transportation of Dangerous Goods Act (TDGA);
- contaminated sites because they are primarily covered by Provincial legislation and Provincial representatives were not present at Issue Table meetings.

Wood preservatives are pesticides and as such fall under the jurisdiction of the PCPA and the Pest Management Regulatory Agency (PMRA). It was important to specify those activities within the sector which fall under the direct authority of the PCPA. As the PMRA is conducting a comprehensive re-evaluation of all heavy duty wood preservatives, it was agreed that the SOP would not develop recommendations related to the manufacture and use of wood preservative

products. However, related information or concerns identified during the SOP, would be referred to the PMRA for consideration during the re-evaluation process. The Issue Table recognized that the re-evaluation of wood preservatives may have a significant impact on the release of CEPA-toxic substances from all activities within the sector.

The SOP Issue Table prepared an estimated release inventory for the entire sector. CEPA-toxic substances are released in measurable quantities from all activities within the sector. The SOP recommendations were therefore developed to address releases from the following activities: chemical manufacturing; wood treating, use of treated wood and the waste management of post - use treated wood.

The Goals of the Strategic Options Process

It was decided that the approach to the management of CEPA- toxic substances to be used in the SOP should be consistent with:

- a. the concept of pollution prevention, defined as the use of processes, practices, materials, products or energy that avoid or minimize the creation of pollutants and waste and reduce overall risk to the environment or human health;
- b. the concept of sustainable development, defined as development which meets the needs of the present without compromising the ability of future generations to meet their own needs; and
- c. the federal *Toxic Substances Management Policy (TSMP)*, which provides a framework for managing toxic substances.

The TSMP defines two separate management approaches as indicated in the chart below.

Track	Substance Criteria	TSMP Goal
1	CEPA-toxic or equivalent, predominantly anthropogenic, bioaccumulative and persistent	Virtual elimination from the environment
2	Not all Track 1 criteria met	Full lifecycle management to prevent or minimize release into the environment

Practical application of the concept of virtual elimination was considered at length during the deliberations of the Issue Table. Uncertainty about how to achieve virtual elimination prompted the Issue Table to develop recommendations that would strive for release reductions through an extended program of continuous improvement and best management practices.

Three of the seven substances, namely dioxins, furans and hexachlorobenzene, are Track 1 substances under the TSMP. The remainder - inorganic arsenic, chromium VI , PAH and creosote-impregnated wastes - are classified as Track 2. Inorganic arsenic, chromium VI, PAH,

hexachlorobenzene, dioxins and furans were declared toxic to human health and are classified as non-threshold carcinogens, for which the risk management goal is to reduce human exposure to the extent practicable.

It should also be realized that the pesticide registration and re-evaluation process will reflect the goals of the TSMP regarding the management of CEPA-toxic substances (The PMRA's Proposed Strategy for Implementing the Toxic Substance Management Policy, September 1998).

For the purposes of the Wood Preservation SOP it was recognized that :

1. Wood preservation products which do not contain Track 1 or Track 2 substances are not readily available from an economic and/or commercial perspective, and are not universally applicable;
2. Track 1 and Track 2 substances are components of wood preservatives that have been used for decades;
3. There is an on-going responsibility to manage both Track 1 and Track 2 substance releases.

Based on these considerations, the objectives of the stakeholder recommendations were set to reduce all CEPA toxic substance releases through a continuous improvement program. A continuous improvement program is consistent with the TSMP goal of virtual elimination for Track 1 substances, which for this sector will be achieved over an extended time frame; and the TSMP goal for Track 2 substances of effective lifecycle management, which for this sector will occur relatively quickly for both Track 1 and Track 2 substances.

Stakeholder Recommendations

The following summarizes the stakeholder recommendations which have been developed by the SOP Issue Table. Implementation of this recommended program has been planned to June 2006. Costs for implementation are estimated to be well in excess of \$ 33 million during this time period. Most of the cost that will be incurred by the industrial user community during the implementation of the recommendations are in fact not included in this figure. It is expected that the program will continue beyond 2006. Given the value of the treated wood industry to the domestic economy from the manufacture, treatment and use of the products, as well as its value in terms of the export market, the Issue Table was cognizant of the fact that recommendations arising from the SOP may have an impact on the industry's competitiveness in the North American or global market. However, the Issue Table did not analyze the competitive impact of any of the recommendations proposed in this report.

The recommendations are broken down into four sections:

- A) General Recommendations;
- B) Manufacturer and Treater recommendations;
- C) Consumer Treated Wood Product Recommendations; and
- D) Industrial Treated Wood User Recommendations.

While these recommendations reflect a consensus of the Issue Table members, there was one issue related to pentachlorophenol (micro-contaminants dioxin, furan and hexachlorobenzene) where consensus was not reached. The environmental non-government organizations have therefore submitted an additional recommendation for inclusion in the SOR. This recommendation is found in Section 6.5 Minority Views.

The general recommendations address the role that the PMRA and the provinces might play in the implementation of the entire recommendation package. The stakeholder recommendations are intended to be implemented initially as a voluntary, integrated program.

For the wood preservative manufacturers and wood treaters the program consists of :

- mandatory reporting of CEPA-toxic releases through the National Pollutant Release Inventory (NPRI);
- the voluntary implementation of soon to be published Best Management Practices for the operation of treating plants and the Technical Recommendation Documents (TRDs) for the Design and Operation of Wood Preservation Facilities (*Environment Canada & Canadian Institute of Treated Wood (CITW), 1999*). It was acknowledged that wood preservative manufacturing plants already have adequate management systems in place;
- the program implementation will be overseen by a multi-stakeholder steering committee that will recommend mandatory implementation of the TRDs should the voluntary approach be unsuccessful;
- evaluation of the success of the program will be conducted by the steering committee twice within the five years following the program commencement;
- the TRD implementation program will continue beyond the 5 year evaluation program.

The treated wood users, both industrial and consumer, will develop a national strategy for the management of post-use treated wood. Industrial users have committed to reducing the amount of post-use treated wood being sent to landfill by 20% by 2005, based on 1990 or more current baseline data. Industrial users have committed to developing and implementing best management practices for the use of treated wood. Information dissemination to consumers of residential lumber will be achieved through improved retailing practices to be implemented by the manufacturer /treater steering committee. A second multi-stakeholder steering committee will oversee the progress made by the industrial users in the implementation of their program.

The following are the stakeholder recommendations as developed by the Wood Preservation SOP Issue Table.

A. General Recommendations

The following two recommendations have been developed by the Wood Preservation SOP Issue Table to recognize the contribution that could be made by the Pest Management Regulatory Agency and the Provinces to the overall implementation of all the recommendations in this report.

- A1. The Issue Table recommends that the PMRA consider the recommendations of the SOR as they conduct the re-evaluation process for wood preservatives. These recommendations, which include continuous improvement initiatives, provide a program of comprehensive risk mitigation measures that are relevant to the PMRA re-evaluation..
- A2. The Issue Table recommends that the federal government ensures that the SOR is understood and accepted by the provinces. It is absolutely essential that the provinces participate on the Steering Committee in order to address and facilitate:
 - a. the development of a waste management strategy for treated wood; and
 - b. the implementation of the recommendations of the SOR.

Both the provinces and the PMRA will be invited to participate on the Steering Committees as outlined in the recommendations below. It is recognized that the provinces should play a significant role in the development of the waste management strategies for post-use treated wood and in the implementation of best management practices. In particular, it is recognized that the PMRA's expertise and contribution will be mutually beneficial to the implementation of these recommendations in the following areas:

- *the development of a waste management strategy for treated wood products;*
- *the development and/or updating of the Consumer Information Sheets;*
- *the development and/or updating of the Industrial Users Environmental Management System Guidance; and*
- *the consideration of alternative products as part of a pest management strategy for treated wood products.*

B. Recommendations for Chemical Manufacturing and Wood Treatment in the Wood Preservation Sector.

The following set of 10 recommendations has been developed by the Wood Preservation SOP Issue Table as a comprehensive program for the chemical manufacturing and wood treating components of the Wood Preservation Sector. Each recommendation is an integral part of the program which is necessary for ensuring CEPA-toxic substance release reductions. The program initially is a balanced combination of both regulatory and voluntary initiatives. However, should the voluntary component of the program be unsuccessful, the recommendations allow for mandatory components to be developed and implemented. The timelines recommended

are conditional upon the timely acceptance of these recommendations by the Ministers of Health and Environment and the publication of the Technical Recommendation Documents by April 1999. If necessary the Steering Committee will review and adjust the timelines at the beginning of the program.

Steering Committee

B1. The implementation of these recommendations will be overseen by a steering committee made up of representatives from industry, environmental group(s), Environment Canada, Health Canada and other key people. The steering committee will be responsible for annually reviewing the progress made by both the manufacturing and treating plants in meeting the commitments outlined. The steering committee will identify and facilitate modifications to the implementation program should the need arise. In addition it will be the responsibility of the steering committee to ensure that the Technical Recommendation Documents are kept up-to-date with the best available environmental management practices and technology, through the use of groups such as the Task Force for TRDs. The terms of reference for the Steering Committee are attached.

Acceptance of the TRDS

B2. It is recommended that the TRDs be recognized as a comprehensive approach to managing all releases and wastes from wood treating facilities. All provinces should implement the objectives of the TRDs in a uniform and consistent manner.

Annual Reporting for All Plants

B3. It is recommended that all wood treating facilities and wood preservative chemical manufacturers report their emissions of the CEPA-toxic substances listed below to the National Pollutant Release Inventory (NPRI). Reporting will commence in 2001 to cover year 2000 releases. The NPRI list will be expanded for the wood preservation sector to include dioxins, furans, PAHs specific to the sector, and hexachlorobenzene. The industry will also report on chromium and its compounds, arsenic and its compounds, naphthalene and anthracene which are already listed on NPRI. The reporting method will ensure that duplicative and inconsistent reporting does not occur. Moreover, release data generated by the sector which are above and beyond normal NPRI requirements are to be compiled separately and will not be combined with NPRI data from other industries. The implementation of the reporting program is contingent upon the outcome of the current Environment Canada review of NPRI.

Existing Chemical Manufacturing Plants

B4. It is recommended that the manufacturers of creosote and chromated copper arsenate (CCA) continue their existing efforts to reduce emissions of CEPA-toxic substances (PAH, creosoted waste material, chromium(VI) and arsenic) from their Canadian chemical manufacturing plants, consistent with existing regulations and reporting requirements and the use of environmental management systems.

Existing Wood Treating Plants

B5.0 Voluntary Program

It is recommended that all existing wood treating plants meet the objectives of the TRDs through a voluntary, continuous improvement program. It is recommended that as a condition of the voluntary program the treaters will participate in an assessment program and submit a TRD Implementation Plan. The program will continue on a five year cycle as deemed appropriate by the steering committee.

B5.1 Assessment Program

Treating plants will participate in an Environmental Assessment Program. The program will measure the level of compliance with the TRDs. The baseline assessment will be conducted in the year 2000 and will be followed by another assessment in 2005. The assessments will be completed by third party auditors. The assessment program will be jointly funded by the Government of Canada and industry for those companies meeting the conditions of the voluntary program.

B5.2 Implementation Plan Submission

It is recommended that TRD implementation plans be prepared by each wood treating plant based upon the baseline assessment and submitted to Environment Canada by end of 2001. These implementation plans will describe the program that the plant will follow to meet the TRD objectives. Plans will take into account the age of the plant, the wood preservatives being used and other specific issues related to the plant. The initial plan will cover the period 2001 to 2005. A progress report will be submitted annually to the Steering Committee for review. Should reporting to NPRI not occur as outlined in recommendation B3, release data, beginning in the year 2000, will be required as part of both the initial and annual implementation plan submissions, in accordance with recommendation B3 above.

B6. Outreach

It is recommended that outreach programs to inform and assist treaters in meeting the objectives of the TRDs, preparing the implementation plan and reporting to the NPRI be made available. Such programs will be delivered in the year 2000 jointly by industry and Environment Canada. All treaters will be given reasonable access to the outreach programs.

B7. Mandatory Program

It is recommended that the steering committee review and measure the success of the voluntary program twice within the five years following its commencement. Following these reviews the steering committee will be required to decide whether to continue with the program on a voluntary basis or to implement a mandatory program.

B7.1 Mandatory Implementation Plans

Treating plants which are not participating in the voluntary program by January 2002, must submit an implementation plan, based on an approved assessment, at their own expense, for the end of 2002.

B7.2 Mandatory TRD Implementation

In 2005, the success of the above program (recommendation 5) will be reviewed to determine:

- a. individual plant progress towards meeting the commitments in their TRD implementation plans for 2001 to 2005; and
- b. the overall progress made by the industry towards meeting the objectives of the TRDs.

Should a level of success, as defined by the Steering Committee be met, the assessment program will continue on a five year cycle. If the defined level of success is not met, a guideline, regulation or mandatory requirement under CEPA or other legislation will be implemented.

B8. Evaluation

It is recommended that the Steering Committee evaluate the effectiveness of the TRDs in reducing CEPA-toxic substance releases at the end of the first 5 year cycle.

New and/or Expanding Chemical Manufacturing Plants

- B9. It is recommended that all new and/or expanding facilities associated with wood preservative manufacturing meet a level of performance equivalent to existing plants through an effective environmental management system.

New and/or Expanding Wood Preservation Plants

- B10. It is recommended that newly constructed wood preservation plants, or plant additions, meet all objectives of the TRDs on start up.

C. Recommendations for Consumer Treated Wood Products

The implementation of the following 4 recommendations will be overseen by the Chemical Manufacturing and Treating Steering Committee.

Consumer Information Sheets

- C1. It is recommended that all treating plants provide distributors of consumer pressure treated wood products with Consumer Information Sheets which will be made available to purchasers at the point of sale of these products.

Education Program

- C2. It is recommended that all distributors of consumer treated wood products be informed through an education program about the Consumer Information Sheets, relevant purchasing specifications and recommended storage, handling and disposal practices for these products.

Update of Consumer Information Sheets

- C3. It is recommended that the Consumer Information Sheets be updated with relevant information on best management practices for treated wood products.

Recycling of Consumer Products

- C4. It is recommended that a strategy and process be developed for dealing with the volume of waste consumer lumber that will arise in the future. The strategy will include:

- technology,
- education,
- research and development, and
- logistics and delivery mechanisms.

As a first step an evaluation of the current status of collection and recycling opportunities in Canada for consumer lumber will be completed in approximately 2 years.

D. Recommendations for In-Service Use and Post-Use of Industrial Treated Wood

These recommendations have been developed to address the release of CEPA-toxic substances from industrial treated wood products while in service and when taken out of service. Industrial users include the railways, electricity industry, telecommunications industry and government highway and roads departments. This set of recommendations describes a comprehensive continuous improvement program designed to reduce the releases of the CEPA-toxic substances used by the wood preservation industry. An immediate benefit of these recommendations is the achievement of a consistent approach to the management of industrial treated wood both in-service and when taken out of service. The goal for the future is for users to continue to use treated wood in a manner which is better for the environment while actively seeking alternative products and assessing their impact on the environment throughout their entire lifecycle (production to disposal). A draft guidance document for developing an environmental management system for industrial treated wood was compiled by the Issue Table (Volume II: Technical Support Document - Chapter 3), however; the Issue Table intends to complete a more comprehensive review of the document before it is published for use by the industry.

Steering Committee

D1. It is recommended that a steering committee composed of representatives from industry, federal and provincial governments, non-government environmental group(s), and other key stakeholders be convened to oversee the implementation of these recommendations. The steering committee will meet at least annually and will be responsible for assigning priorities for studies and programs, accessing funds and support from other parties and implementing the recommendations as outlined. The steering committee will ensure that implementation costs are equitably shared amongst responsible stakeholders. The terms of reference for the steering committee have been drafted and are appended to this document.

Steering Committee Role

D2. It is recommended that the steering committee undertake the following:

(a) Facilitate the development of guidance with respect to:

- industrial user treated wood management system
- auditing procedures
- evaluation tools

(b) Identify and organize work required to fill data gaps. For example the following needs were identified by the SOP Issue Table:

- creosote rail tie impact assessment (fate and effect of released PAH); and
- fate and impact of arsenic releases from treated wood
(note: the Issue Table concluded that sufficient information was available on dioxin/furan and hexachlorobenzene released from poles)

(c) Facilitate the development of technical guidance. For example the Issue Table identified the following requirements:

- development of guidelines for siting, design, management, operation, and monitoring of treated wood storage facilities.
 - compilation of existing guidelines for specifying treated wood products which will reference appropriate specifications such as the CSA Standards, aquatic BMPs and TRDs.
 - development of Lifecycle Analysis Methodology for treated wood products and their alternatives; and
 - providing information to users to allow responsible decision making for treated wood application selection, lifecycle analysis comparisons, siting recommendations, impact mitigation or monitoring requirements.
- (d) Develop and deliver an outreach program. This program will outline the process, describe the guidance available to industrial users and solicit commitment from individual companies.
- (e) Review and evaluate the progress of the program in 2006 based on the percentage of industry participation and compliance and the trends observed.
- (f) Publication of a report in 2006 describing the progress made by industrial users and summarizing the overall effectiveness of the program. The report will also make recommendations for the continued management of treated wood.

Environment Management System

D3. It is recommended that individual industrial user companies undertake the following:

- (a) develop a treated wood management system by the end of 2000;
- (b) implement the management system by the end of 2002;
- (c) conduct a first self audit and complete an interim progress report by end of 2003;
- (d) conduct a third-party audit and public report by end of 2005;
- (e) continue to evaluate alternatives which minimize the release of toxic substances to the environment.

Public reporting should outline the progress made towards implementing an environmental management system for treated wood including the track one and track two substances in treated wood (As, Cr (VI), PAHs, PCDD, PCDF and hexachlorobenzene) that are:

- purchased annually, and
 - removed from service annually;
- and including
- estimated releases from in-service treated wood during the reporting year, and
 - tracking and documenting out of service treated wood material (% to landfill, % to reuse, % to recycle, etc.).

The form of the public reporting can be via corporate annual and environmental reports, industry sector reports or Internet sites.

Alternative Wood Preservatives and Materials

D4. It is recommended that the Steering Committee facilitate the exchange of information and the building of partnerships for lifecycle assessment and analysis of alternative materials and wood preservative chemicals.

Waste Management Strategy

D5. It is recommended that the steering committee facilitate the development of an Industrial Treated Wood Waste Management Strategy and make recommendations regarding its implementation, including:

- establishment of a waste management hierarchy for treated wood which includes recycling, recovery and landfill;
- review of technical options;
- identification of problems and discussion of potential solutions related to various issues, including:
 - regulatory;
 - geographical;
 - public perception;
 - economics;
 - cross-border issues(provincial/federal); and
 - technology.

In the interim it is recommended that industrial treated wood users, as a group, commit to reducing the volume of material going to landfill by 20% by the end of 2005, based on baseline data from 1990. More recent data may be used if 1990 data are not available. Future targets will be developed as part of the wood waste management strategy.

Glossary Of Terms

ACA	Ammoniacal Copper Arsenate
As	Arsenic
BMP	Best Management Practices
CCA	Chromated Copper Arsenate
CCA-PEG	CCA with Polyethylene glycol
CEN	Canadian Environmental Network
CEPA	Canadian Environmental Protection Act
CIS	Consumer Information Sheets
Cr(VI)	Chromium (VI)
Dioxins	Polychlorinated Dibenzodioxins
FST	Full Service Treatment
Furans	Polychlorinated Dibenzofurans
HCB	Hexachlorobenzene
IT	Issue Table
MOU	Memoranda of Understanding
NPRI	National Pollutant Release Inventory
PAH	Polyaromatic Hydrocarbons
PCDD	Polychlorinated Dibenzodioxins
PCDF	Polychlorinated Dibenzofurans
PCP	Pentachlorophenol
PCPA	Pest Control Products Act
PMRA	Pest Management Regulatory Agency
PSL	Priority Substance List
PWF	Permanent/ Preserved Wood Foundations
SOP	Strategic Options Process
SOR	Strategic Options Report
TEQ	Toxic Equivalent Quantity (as 2,3,7,8 TCDD)
TDGA	Transportation of Dangerous Goods Act
TRD	Technical Recommendation Documents
TSMP	Toxic Substance Management Policy
TSO	Treating Service Only
UGD	Draft Industrial Treated Wood Users Guidance Document

1.0 INTRODUCTION

1.1 Context

The *Canadian Environmental Protection Act* (CEPA)¹ requires the Minister of the Environment and the Minister of Health to prepare and publish a Priority Substances List (PSL) which identifies substances which may be harmful to the environment or constitute a danger to human life or health in Canada. CEPA then requires both Ministers to assess the substances on this list and determine whether they are toxic as defined by section 11 of the CEPA.

Section 11 states:

A substance is toxic if it is entering or may enter the environment in a quantity or concentration or under conditions:

- (a) having or that may have an immediate or long-term harmful effect on the environment,*
- (b) constituting or that may constitute a danger to the environment on which human life depends, or*
- (c) constituting or that may constitute a danger in Canada to human life or health.*

The first CEPA PSL, which was published in 1989, identified 44 substances for priority assessment. Assessment of these substances was completed in 1994, with 25 substances being declared toxic, as defined by CEPA s.11. Once a substance is declared toxic under CEPA the Minister of the Environment must publish a summary of the assessment report in the Canada Gazette. An additional responsibility under the Act requires that the Ministers establish and apply controls to prevent harm to human health and the environment for those substances found to be toxic under one or more parts of Section 11.

1.2 Strategic Options Process (SOP)

The process initiated to establish and apply controls as required under the Act is referred to as the Strategic Options Process (SOP). This process allows a multi-stakeholder committee or Issue Table with members from industry, federal, provincial and municipal governments, and non-government organizations to develop recommendations for the management of CEPA-toxic substances. An SOP Issue Table may be established to manage substances within a sector or to bring together stakeholders for a specific substance.

The SOP generally consists of two phases – information gathering and options identification. The first phase involves collection of technical and socio-economic background information. The second phase involves using the collected information to make recommendations for the management of CEPA-toxic substance releases to the environment. The management of CEPA-toxic substances is guided by the *Toxic Substance Management Policy (TSMP)*². The final report of the Issue Table, the Strategic Options Report (SOR), presents stakeholder recommendations for the management of CEPA-toxic substances to the Ministers concerned.

¹ Canadian Environmental Protection Act (CEPA). Assented to June 28, 1988, c.22

² Toxic Substance Management Policy. Government of Canada. June 1995

1.2.1 The Goals of an SOP

The approach to the management of CEPA- toxic substances within the SOP should be consistent with:

- a. the concept of pollution prevention, defined as the use of processes, practices, materials, products or energy which avoid or minimize the creation of pollutants and waste and reduce the overall risk to the environment or human health;³
- b. the concept of sustainable development, defined as development which meets the needs of present generations without compromising the ability of future generations to meet their needs; and
- c. the federal *Toxic Substances Management Policy (TSMP)*, which provides a framework for managing toxic substances.

The TSMP defines two separate management approaches based on science and risk – virtual elimination or life cycle management - as indicated in the chart below.

Track	Substance criteria	TSMP goal
1	CEPA- toxic or equivalent, predominantly anthropogenic, bioaccumulative, and persistent	Virtual elimination from the environment
2	Not all Track 1 criteria met	Life cycle management to prevent or minimize release into the environment

Practical application of the concept of virtual elimination was considered at length during the deliberations of the Issue Table. Uncertainty about how to achieve virtual elimination prompted the Issue Table to develop recommendations aimed at reducing releases through an extended program of continuous improvement and best management practices.

1.3 Rationale for a Wood Preservation Sector SOP

The CEPA PSL assessment process concluded that the following substances, which may be released by the wood preservation industry, are CEPA-toxic: **inorganic arsenic compounds, chromium (VI), polycyclic aromatic hydrocarbons (PAH), creosote-impregnated wastes, polychlorinated dibenzodioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and hexachlorobenzene(HCB)**. Three of the seven substances, namely PCDDs, PCDFs and HCB, are Track 1 substances under the TSMP. The remainder namely inorganic arsenic, chromium VI , PAH and creosote-impregnated wastes are classified as Track 2.

³ Pollution Prevention: A Federal Strategy for Action. Environment Canada. June 1995

Inorganic arsenic, chromium VI, HCB, PAH, PCDDs and PCDFs were declared toxic to human health and were classified as non-threshold carcinogens. The risk management goal for these substances is to reduce human exposure to the extent practicable (Health Canada, 1994). These substances are used in a variety of industrial sectors and some occur naturally. The wood preservation industry was identified in the PSL assessment as one source of their release into the environment. Therefore, the Ministers of Health and Environment decided a Strategic Option Process for the wood preservation sector would be launched.

1.4 Canadian Wood Preservation Industry: Regulatory Regime

Wood preservatives are pesticides. The registration and use of pesticides in Canada is regulated under the authority of the *Pest Control Products Act* (PCPA), administered by Health Canada through the *Pest Management Regulatory Agency* (PMRA).

Other federal legislation affecting preserved wood includes the *Transportation of Dangerous Goods Act* which covers the movement of regulated quantities of chemicals, hazardous products and wastes, and the *Fisheries Act* which covers impacts of environmental contaminants on fish and fish habitat.

In addition, the application of pesticides is regulated through some provincial regimes. Provinces can enforce some aspects of federal legislation or can issue regulations, covering various points in the life cycle of treated wood which meet or exceed federal requirements. Provinces have significant jurisdiction over the remediation of contaminated sites and are responsible for most waste management and recycling programs and incentives.

CEPA can add a new dimension to this regulatory framework for wood preservatives, because certain components of wood preservatives are deemed CEPA-toxic as per s.11 of the Act, as the following chart summarizes:

CEPA-Toxic Substance	Wood Preservative
Chromium VI, Inorganic arsenic	Chromated Copper Arsenate
Inorganic arsenic	Ammoniacal Copper Arsenate
Creosote-impregnated waste materials, Polycyclic Aromatic Hydrocarbons	Creosote
Polychlorinated dibenzodioxins, Polychlorinated dibenzofurans, Hexachlorobenzene (micro-contaminants)	Pentachlorophenol

1.5 Scope of the SOP for the Wood Preservation Sector

In order to clarify the scope for this SOP, two issues were critical. The first issue was that of legislative authority and jurisdictional responsibility. The second was the more technical issue

of management of the releases to the environment of CEPA-toxic substances from those stages of the life cycle identified as relevant to the SOP.

The *Pest Control Products Act (PCPA)* has jurisdiction over all activities related to the registration of pesticides used as wood preservatives. Therefore, it was important to define those stages of the life cycle which fall under the direct authority of the PCPA and as a result have already been addressed by regulation. As the PMRA is currently conducting a comprehensive re-evaluation of all heavy duty wood preservatives, the Issue Table agreed that any concerns related to releases from points in the life cycle under the direct authority of the PCPA would be referred to the PMRA for consideration during the re-evaluation process.⁴

For the purposes of the Wood Preservation SOP it was recognized that:

1. Manufacture, use and application of pesticide products are under the purview of the PCPA administered by the Pest Management Regulatory Agency (PMRA) and therefore are not within the scope of this SOP.
2. Releases of CEPA-toxic substances from the manufacture, treatment and use of treated wood and the disposal of treated products are within the scope of this SOP.
3. Contaminated sites with the exception of federal facilities are mainly under provincial jurisdiction. However, because provincial representatives were not present at Issue Table meetings and because the Issue Table has developed a forward looking preventive program, contaminated sites were not considered to be part of the SOP.
4. Issues related to transportation would not be part of the SOP since they are covered by the Transportation of Dangerous Goods Act (TDGA).
5. Track 1 and Track 2 substances are components of wood preservatives that have been used for decades.
6. There is an on-going responsibility to manage both Track 1 and Track 2 substance releases.
7. Wood preservation products and other alternative materials which do not contain Track 1 or Track 2 substances are not readily available from an economic and/or commercial perspective, and are not universally applicable.

For each wood preserving chemical under consideration, the Issue Table agreed that recommendations would be developed for CEPA-toxic substances released during preservative manufacture, wood treatment and the use and disposal of treated wood products.

In order to address the potential human health and environmental impacts from the release of CEPA-toxic substances from all points in the life-cycle of wood preservatives, a variety of

⁴ Strategic Options Process for the Canadian Wood Preservation Industrial Sector Scoping Document. April 1997.

mechanisms will be required, either under several Acts or through a range of measures such as Memoranda of Understanding (MOUs), environmental agreements, or voluntary actions on the part of industry. A high degree of cooperation and co-ordination among all the stakeholders will continue to be important to attain the goals of the SOP while avoiding unnecessary duplication of effort.

1.6 Path to Recommendations

The Issue Table developed the recommendations presented in this report by:

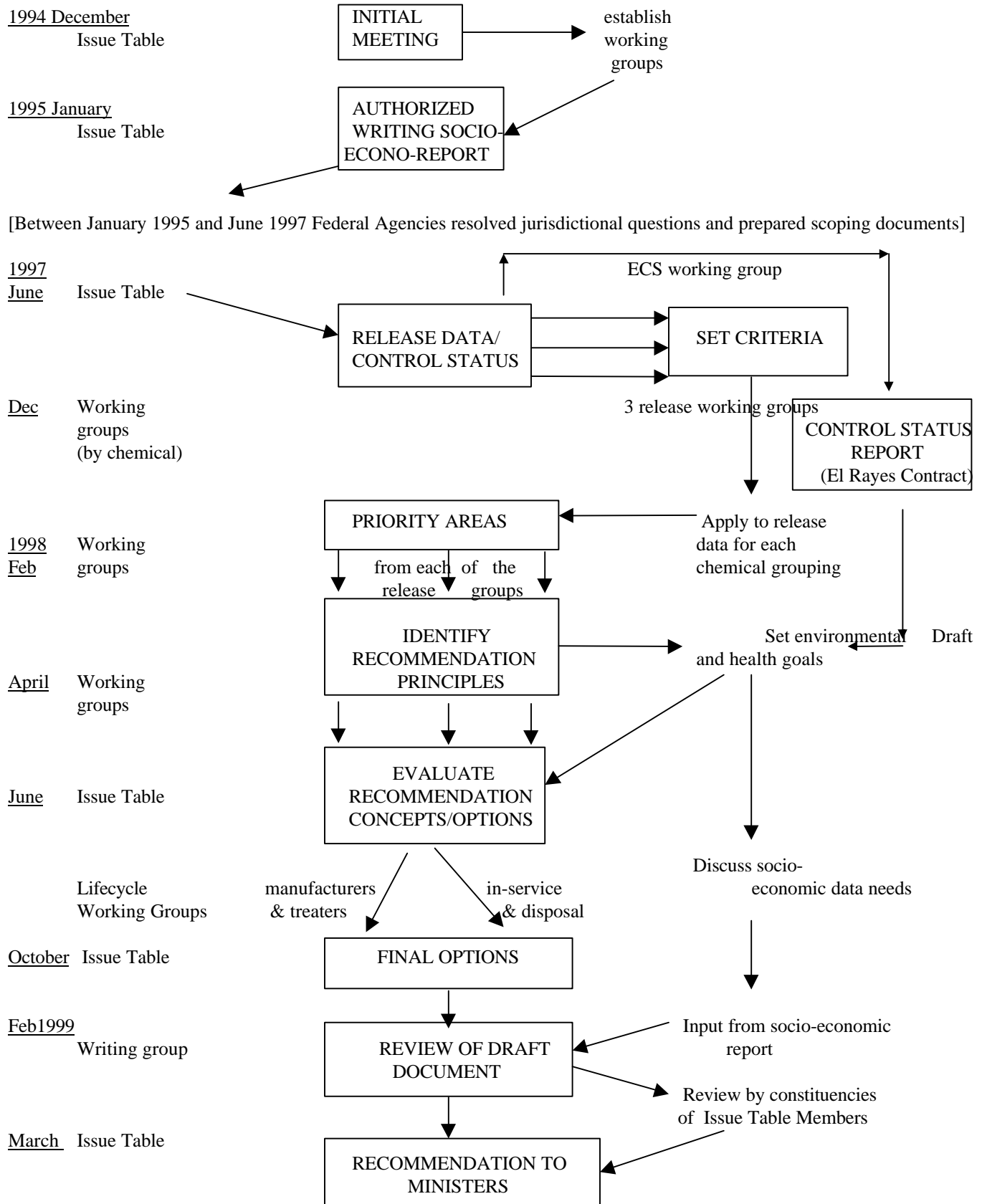
- i identifying all sources and quantities of CEPA-toxic substances associated with the wood preservation sector;
- ii determining whether the estimated releases are significant enough to warrant the development of control options,
- iii assessing ongoing programs for managing releases,
- iv identifying options to prevent or manage releases, and
- v performing a socio-economic assessment of the selected options.

Volume I of this report summarizes the discussions and conclusions that were reached by the Issue Table. Volume 2: Technical Support Materials, provides the best management practices on which the recommendations have been based and Volume 3: Reference Documents, provides the reference material that was used during the Issue Table discussions. The material contained in Volume 2 is recognized by the Issue Table members as the best available information on management practices for the Wood Preservation sector. Documents contained in Volume 3 were used by the Issue Table and do not necessarily reflect the views of all the members. Many of the documents contained in Volume 3 were generated specifically for use by the Issue Table.

The process of developing the recommendations contained in this report is illustrated on the following page.

STRATEGIC OPTIONS PROCESS

Path to the Recommendations



2.0 THE WOOD PRESERVATION SECTOR

2.1 The Wood Preservation Industry

The Canadian wood preserving industry has existed since 1910. The industry treats wood with heavy duty waterborne and oil borne preservatives for both industrial and residential market applications. The wood preservation sector in Canada is comprised of preservative chemical manufacturers, wood treating facilities and users of both industrial and consumer products. In 1992 there were 60 operational wood preserving plants compared to 64 plants in 1995 (Stephens et al, 1994 Table 2.1).

2.2 The Economic Significance of the Industry

Canada plays a prominent role in treated wood production, being second only to the USA on the world scale. The industry enjoys a fairly good level of competitive advantage and significantly contributes to the national economy.

The industry treats both industrial and consumer products. In 1995, the industry produced an estimated volume of 69.3 million cubic feet of treated wood, which had a total value of \$ 700 million dollars. The total installed volume of treated wood products (railway ties, poles, residential lumber, etc.) in 1992 was estimated as 1,134 million cubic feet valued at \$10 billion. The Canadian wood preservation industry provides direct employment for approximately 1,500 people at various stages in the life cycle of the wood treatment process including manufacturing of preservatives, treatment, in-use or service and out-of-service or disposal of treated wood. The indirect and induced employment created by the industry is approximately 5000.

Canadian wood treating plants by process and preservative used in 1992 and 1995 are given in Table 2.1

Wood treating plants are spread across the country. The number of plants in each province in 1995 is given below.

Atlantic Region (NS, NB, NF)	4
Quebec Region (QC)	11
Ontario Region (ON)	18
Prairie and Northern region (AB, SK, MB)	14
Pacific and Yukon Region (BC)	17
Total	64

By using preservative chemicals, the industry extends the productive life of wood thereby reducing the stress on forest resources. Furthermore, it generates a significant amount of revenue from both domestic and export markets.

2.3 Markets and Products

Canadian wood treating plants supply a wide variety of products to both industrial and residential markets. While industrial products are supplied directly to the actual end-user, consumer products for the residential market have a more complex distribution system involving wholesalers, retail buying groups, retail outlets, contractors and homeowners.

The industrial market includes products such as railway ties, distribution and transmission poles, construction lumber and timbers, posts and wood foundation components. Residential market products or consumer products include patio and deck components, landscaping and fencing products, outdoor furniture, posts and construction lumber. In 1995, the industrial market and residential markets each accounted for 50% of Canadian consumption (Stephens et al, 1996 Table 2.2).

In 1995 consumer lumber was the single major use (48.7%) of treated wood, followed by utility poles (18%), industrial lumber and timber (14%) and railway ties (10%) (see Table 2.2). With respect to the structure of utilization, 97% of the 33 million cubic feet of consumer lumber produced in Canada was consumed domestically. Of the 36.3 million cubic feet of industrial products produced in Canada in 1995 and the 2.4 million cubic feet that were imported, 85% was used domestically. Exports mounted to 10% of total production in 1995, with utility poles representing 71% of export volume. (see Table 2.3)

2.4 Supply of Wood and Preservatives

Canadian wood treating plants service the residential market in two different ways: i) treating services only (TSO); and ii) full service treatment (FST). TSO customers are wholesalers, brokers and retail lumber yards who are responsible for the supply of the whitewood and the sale and distribution of the treated product. TSO applies to production where the plant is only responsible for treating the wood supplied by their customers to the level of preservative retention and penetration specified. In the case of FST, the plant buys lumber from a sawmill, a broker or a wholesaler and services the market by selling treated products directly to wholesalers or retailers.

The supply of wood for the industrial market is acquired through timber licenses owned by treating companies, independent sawmills, independent wood suppliers, logging contractors, TSO (railway ties), integrated forest products companies, brokers and imports.

There are ten suppliers of commercial heavy-duty wood preservatives to the Canadian wood preserving industry. Among these suppliers, only three are in Canada while the rest are in the USA. Canadian treating companies purchase their preservative requirements directly from the chemical manufacturers.

2.5 Production and Consumption Trends

Based on 1992 data, the wood preserving industry produced 70.1 million cu.ft. of treated wood with a revenue value of \$547.4 million. Of this production 80% and 20% of the wood was

treated with water and oil borne preservatives respectively. All the oil borne treated products (12.27 million cu.ft.) were industrial products, such as railway ties, utility poles, industrial construction lumber and timbers, and pilings. Approximately 66.8% of the waterborne treated products were residential lumber products, such as decking, fencing, etc.

Of this total production, exports accounted for 5.8 million cubic ft., or 8.3% of total production, with a revenue value of \$46.4 million. Most of the exports were to the Middle East, Asia and Central America while exports to the USA were less than 20%. During the same period, imports originating almost exclusively from the USA totaled 2.1 million cu.ft..

Canadian consumption of treated wood products in 1992, taking into account exports and imports, totaled 66.4 million cubic ft. Canadian consumption of pressure treated wood peaked in 1990 at 70.3 million cubic feet and then decreased to 64.9 million cubic feet in 1995.

Production forecasts for treated wood show a small increase for 2005 compared to the 1994/95 level (see Figure 1). The consumption of pressure treated wood is anticipated to increase to its 1992 level by 2005 (see Figure 1). Similarly, exports and imports of treated wood are expected to return to the 1994/95 level by the year 2005. The forecasted Canadian consumption of pressure treated wood is based on survey results and other economic indicators such as housing starts, softwood lumber consumption and industrial production forecasts (Stephens et al., 1994).

The value of treated wood shipments in 1995 constant dollars, is expected to increase at an accelerated rate (Figure 2). The forecast of shipment indicates an increase of about 40% compared to the 1994 level by the year 2010. The number of employees and plants are expected to increase by about 15% and 40% respectively in 2010 compared to 1994. (See Figure 2).

Table 2.1: Canadian Wood Preserving Plants By Category

Category	1992 60 Plants	1995 64 Plants	Change
<u>Process:</u>			
• Pressure only	57	61	+4
• Thermal only	2	2	0
• Pressure and thermal	1	1	0
Total	60	64	
<u>Preservative:</u>			
• CCA (including CCA-PEG)	45	49	+4
• Creosote and creosote/oil	1	1	
• PCP		1	+1
• CCA and PCP	9	7	-2
• CCA, creosote and PCP	4	5	+1
• CCA, creosote, PCP and ACA	1	1	0

Total	60	64	+4
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Table 2.2 Consumption of Consumer and Industrial Products, 1995

	Consumption (Million Cubic Feet)	% of Total
Consumer Products		
Consumer Lumber	31.6	48.7
PWF Lumber	0.2	0.3
Other (Shingle, etc.)	0.2	0.3
PWF Plywood	0.1	0.2
Total Consumer Products	32.1	49.5
Industrial Products		
Utility Poles	11.6	17.9
Industrial Lumber and Timber	9.2	14.2
Railway Ties	6.6	10.1
Round Posts	4.6	7.1
Pilings	0.8	1.2
Total Industrial Products	32.8	50.5
Total Canadian Consumption	64.9	100

**Table 2.3 Structure of Utilization of Pressure Treated Wood for 1995
(million cubic feet)**

	Production	Exports	Imports	Consumption
Consumer Products				
Consumer Lumber	32.5	1	0.1	31.6
PWF Lumber	0.2	-	-	0.2
Other (Shingle, Etc.)	0.2	-	-	0.2
PWF Plywood	0.1	-	-	0.1
Total Consumer Products	33	1	0.1	32.1
Industrial Products				
Utility Poles	15.8	4.9	0.7	11.6
Industrial Lumber & Timber	9.3	0.4	0.3	9.2
Railway Ties	5.2	-	1.4	6.6
Round Posts	5.2	0.6	-	4.6
Pilings	0.8	-	-	0.8
Total Industrial Products	36.3	5.9	2.4	32.8
Total Canadian	69.3	6.9	2.5	64.9
Percent of Canadian Production	-	10.00%	3.60%	93.60%

Source: Estimates by CHI

Figure 1. Actual and Forecasted Pressure Treated Wood (in millions of cubic feet)

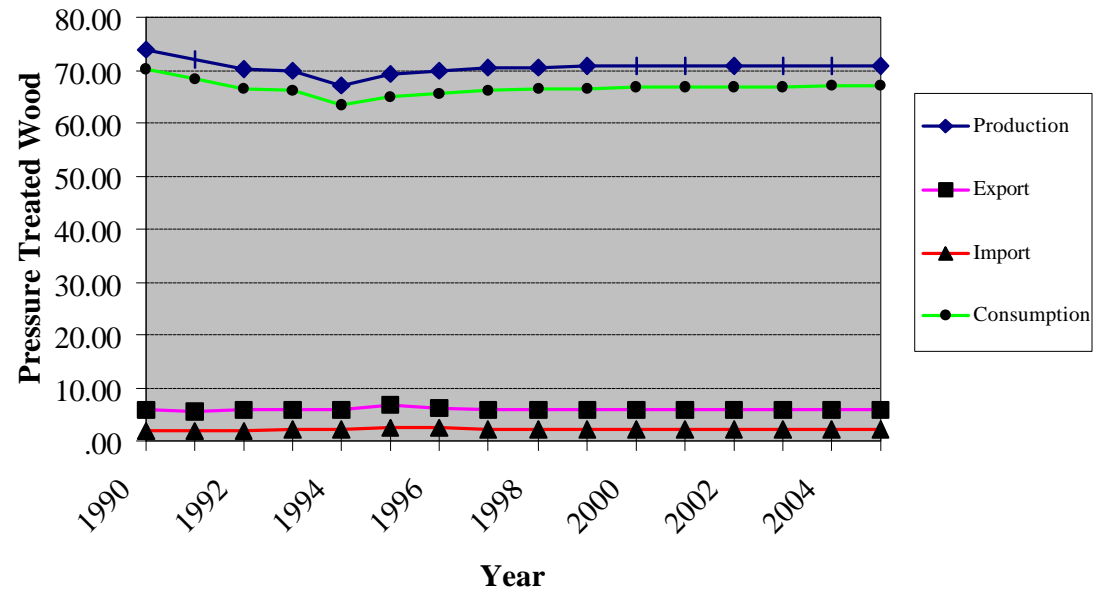
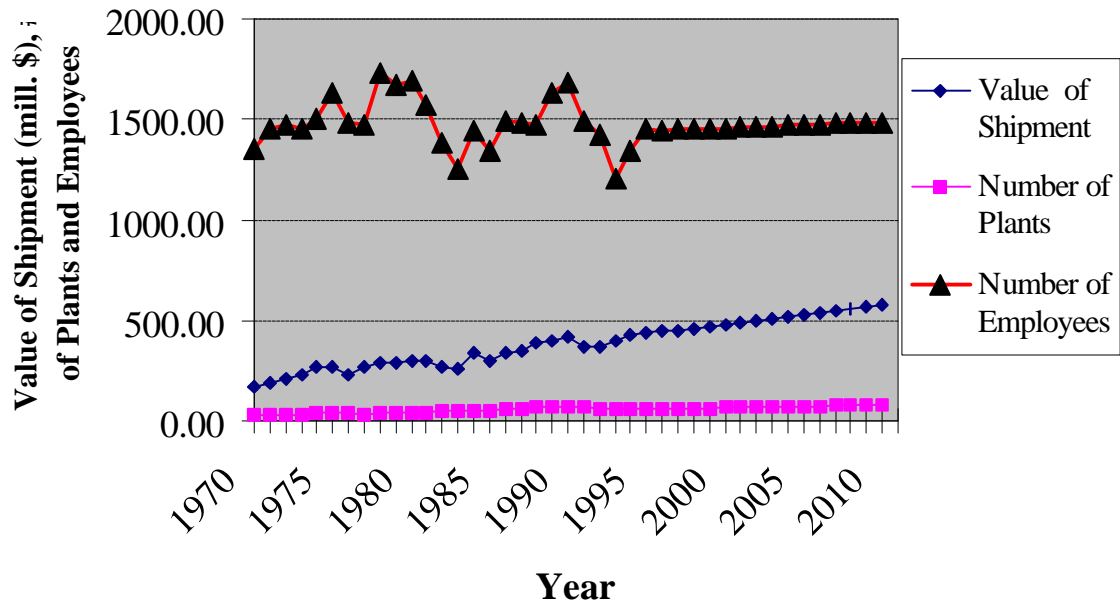


Figure 2. Actual and Forecasted Value of Manufactured Goods Shipped (in millions of 1995 constant \$), Number of Plants and Employees



3.0 CEPA -TOXIC SUBSTANCES RELEASE ESTIMATES

The Issue Table agreed that in order to consider environmental control recommendations for the wood preservation sector they would need to better understand the quantity of CEPA-toxic substances being released, the type of releases occurring and the fate of these releases. The Issue Table recognized that actual release data for the CEPA-toxic substances from all stages of the wood preservative lifecycle would likely not be available thus making it necessary to extrapolate release estimates from basic production and use information. The Issue Table therefore completed a socioeconomic background study of the wood preservation sector in March 1996 (Stephens et al, 1996-Hatch, March 1996). The following summary was compiled using this study.

3.1 Basis for Release Calculation

The wood preservation sector in Canada is comprised of wood preservative chemical manufacturers, wood treating facilities and users of products in both industrial and residential products.

Four wood preservative chemicals containing CEPA-toxic substances are used in Canada. These are: ammoniacal copper arsenate (ACA), chromated copper arsenate (CCA), creosote and pentachlorophenol(PCP). Of the three Canadian wood preservative chemical suppliers, two manufacture in Canada. Timber Specialties, Campbellville, Ontario manufactures CCA and VFT Inc. of Hamilton, Ontario manufactures creosote. The third Canadian chemical supplier, Hickson Building Products Ltd., Mississauga, Ontario supplies CCA. ACA is formulated at wood treatment facilities from its base components, ammonia, copper and arsenic acid. In addition, there are a number of US based suppliers of preservative chemicals to the Canadian market including:

CSI	CCA
Koppers Industries Inc.	Creosote
Vulcan Chemicals Co. PCP	
KMG-Bernuth Inc.	PCP

As previously reported, there are currently 64 wood treating plants in Canada. Many of these plants use two or more chemicals and many have more than one treating cylinder per chemical. For example, 1 plant uses ACA; 60 plants utilize CCA, six plants utilize creosote and 12 plants utilize PCP. There are over 100 treating cylinders in use in Canada. A complete list of wood treating plants, their locations and the preservatives used is presented in Appendix 3.

The following trends in the production and consumption of wood preservatives in Canada were taken into account during the SOP deliberations.

1. Creosote is no longer used to any significant extent to preserve utility poles for use in Canada. Creosote treatment of poles for export to other countries has continued.

2. PCP treated railway ties are no longer used in Canada and have not been installed since 1993. Some PCP railway ties installed prior to 1993 are still in use.
3. Continued substitution of waterborne preservatives for oil-borne preservatives particularly for utility poles and marine piling will occur. It is estimated that PCP usage in Canada has dropped by more than 50% since 1990. Waterborne production volumes have substantially increased from 1992.

3.2 Release Points

In order to make release estimates of the CEPA-toxic substances, the Wood Preservation Sector was broken down into five wood preservative lifecycle steps:

1. chemical manufacturing;
2. wood treating;
3. in-service wood use;
4. out-of-service wood use;
5. contaminated sites.

The release points considered under each lifecycle step are described below:

1. Chemical Manufacturing

- Releases from operating wood preservative chemical manufacturing or formulating facilities. These include creosote, CCA, ACA, or pentachlorophenol producers.
- Releases entering the environment directly as contaminated water, air, and/or solid wastes and sludges, as a result of the manufacture or formulation of wood preservative chemicals.
- Releases to treating plant sites as a result of spills.

2. Wood Treating

- Releases from operating wood treating facilities using creosote, CCA, ACA, or pentachlorophenol.
- Releases entering the environment directly as a result of operations at a wood treating facility. These include air releases, water discharges, contained or captured treated wood run-off, leachate from storage yards, solid wastes and/or sludges.
- Releases to the treating plant as a result of spills and leachate from treated wood products.

3. In-service Wood Use

- Releases from treated wood in-service including direct release to the air as a result of vaporization/volatilization, to the ground or surface water as a result of desorption, gravitational mechanisms and/or leaching.
- Releases to the environment caused by the use of wood preservatives as remedial treatments containing CEPA-toxic substances *in situ*.
- Contamination of soil as a result of treated wood use.

4. Out-of-Service Wood Use

- Release estimates from sites used to manage treated wood not in service or taken out of service. Such sites would include storage sites, retail yards, landfill sites, incinerators, energy recovery units and treated wood recycling plants.
- Releases include any quantity of CEPA-toxic substance released directly to the environment, including water discharge, air emissions, wood residues from recycling plants and solid wastes such as incinerator ash.
- Releases to treating plant sites are also included

5. Contaminated Sites

Contaminated sites include operational and non-operational chemical manufacturing plants, treating plants and storage yards for treated wood products. Although contaminated sites have a defined distinct boundary they may be releasing CEPA-toxic substances to a broader environment. Releases will include CEPA-toxic substances moving beyond the defined boundaries of the contaminated site to adjacent soil, groundwater or surface water and also those discharged to the atmosphere.

3.3 Release Calculation Methodology

The Issue Table agreed that releases of the relevant CEPA-toxic substances from the five lifecycle steps would be best calculated by preservative chemical. Three working groups, Arsenicals, Creosote, and PCP were established. The members of these groups are listed in Appendix 1. Each group was tasked with providing the Issue Table with release data. The groups used different calculation methodologies based on the available data. The following provides a summary of the data obtained and the methodologies used.

3.3.1 Arsenicals

The Arsenicals Working Group developed release data for Arsenic (As) and Chromium (VI) (Cr(VI)) associated with the manufacture and use of CCA and ACA. Arsenic and chromium are active ingredients in CCA and arsenic is an active ingredient in ACA. The calculated release

estimates are presented in Table 3.1. The facts and assumptions used to generate these data are outlined below (Banks et al., December 1997).

1. Chemical Manufacturing

The chemical manufacturing process for CCA is a contained mixing process involving liquid Cr(VI) and arsenic and a solid form of copper and water. There is only one plant producing CCA in Canada. Air releases do not occur at the plant and any spills that may occur are contained within the plant. The waste estimates are based on measured data from the plant. It should be noted that the Cr(VI) in the waste will be reduced to Cr (III) prior to sending the waste off-site.

ACA is formulated at the treating plant. The ACA is made by a simple mixing process which generates very few releases. Releases of As from this process will be integrated with the releases from the treating operation.

2. Wood Treating

There are 60 plants in Canada with 94 treating retorts. Air releases were calculated at the opening of the retort and from the vacuum pump. The CCA/ ACA treating process is a closed system, therefore there is no process water discharged. Stormwater contamination due to drippage from freshly treated wood was calculated based on data from one plant (Vancouver). Many treatment plants have enhanced fixation and lumber wrapping facilities and it is expected that releases to stormwater will be much lower than those presented in Table 3.1. Solid waste estimates have been calculated based on an average generation rate of six 227 kg drums per year. The Cr(VI) component is reduced to Cr(III) prior to sending the waste off-site.

3. In-service Wood Use

Estimated releases from different wood products in-service are presented in Table 3.2. The sum of these releases is presented in Table 3.1 as the in-service releases of As. No detectable air emissions have been measured from CCA treated wood in-service (Mortimer, June 1994). Cr(VI) reduces rapidly to Cr(III), therefore releases of Cr(VI) from in-service wood will not occur. Average As loss over a 20 year lifetime is estimated to be 10% for all products except Permanent Wood Foundations (PWF). As loss from PWF has been found to be negligible. Volumes of wood in-service were calculated by Cooper, P.A., November 1997. It should be noted that the volume of CCA is increasing.

4. Out-of-Service

Quantities of As in treated wood removed from service were calculated by Cooper, November 1997. Detailed disposal estimates by product are given in Table 3.3. The sum of these estimates was used in the estimate for Table 3.1. It was assumed that 90% of the original arsenic loading is in the treated wood at the time of disposal. Cr(VI), because of its tendency

to reduce to Cr(III) over a relatively short period, will not be present in the treated wood to any significant extent, at the time of disposal.

5. Contaminated Sites

Data for As and Cr(VI) contaminated sites could not be obtained by the working group.

3.3.2 Creosote

The Creosote Working Group developed release data for PAHs for the five lifecycle stages. While some data for the chemical manufacturing and wood treating stages was available, the working group found little recorded PAH data for the in-service, out-of-service and contaminated site stages. Releases have been primarily based on the estimated quantities of creosote used for the treatment of wood. It was assumed throughout the calculation that creosote contained approximately 75% PAHs. PAHs are active ingredients in the wood preservative and a creosote composition is provided in Table 3.4. The working group recommend that a consistent list of relevant PAHs for the wood preservation sector be developed for any future release monitoring activities. Estimated releases of PAHs from the sector are presented in Tables 3.5 through 3.9. It is cautioned that this inventory was intended for use by the SOP only and that comparison of these data with other sectors would not be appropriate as the PAHs included in the estimate have not been explicitly defined. The approach taken to calculate the releases was extremely rudimentary and does not take into account the fact that natural degradation processes account for some loss of PAHs at all stages of the lifecycle.

1. Chemical Manufacturing

Creosote manufacturing release estimates were obtained directly from VFT Inc. This estimate is consistent with PAH data reported by the company to ARET (Accelerated Reduction and Elimination of Toxics); NERM (National Emission Release Monitoring, Canadian Chemical Producers Association) and NPRI (National Pollutant Release Inventory, Environment Canada). PAH estimates from VFT Inc. were prorated to reflect that only 5% of the total product volume produced at the plant is creosote. Remedial product manufacturing releases have been based on losses predicted at the manufacturing step (Stephens et al, 1996) and quantities of creosote sold (VFT Inc., November 1997). Data are presented in Table 3.5.

2. Wood Treating

It is assumed that creosote contains 75% PAHs. The PAH releases to air, water and waste from the six wood treatment plants utilizing creosote are based on percent loss predictions from creosote treating plants (Stephens et al, 1996). Data are presented in Table 3.6.

3. In-Service

No recorded data for PAH releases were available. Estimates have been based on the assumption that only new wood loses appreciable quantities of creosote, that the quantity of

new wood put into service over the last 10 years has been relatively consistent and that PAH losses of 20 to 50% occur over the first 10 years of service. All losses are assumed to be due to leaching or gravitational forces. Although biological and photo-degradation of PAHs is possible, this has not been taken into account. The working group considered rail ties, utility poles, marine and fresh water pilings, land timbers and pilings as uses for creosote-treated wood. Small numbers of new creosoted utility poles (approximately 100 butt treated poles /year) are used in Canada; however a significant number still remains in service. CN, CP and Bell Canada provided data on the number of ties and utility poles put into service each year. Data for marine and fresh water pilings and land timbers and pilings were taken from Stephens et al, 1996. The initial loading of creosote was estimated as follows:

rail ties	5.6 kg/tie
butt treated poles	9.4 kg/pole
full treated pole	125 kg/pole
marine piling	320 kg/m ³
land timbers, piling	120 kg/m ³

Loss of PAHs to the environment due to remedial treatment was not calculated. Data are presented in Table 3.7.

4. Out-of-Service

Removal rates of treated wood used as ties and utility poles were provided by CN,CP and Bell Canada. It was assumed that 50 to 80% of the original PAH loading remained in the wood when it was removed from service. Most creosoted treated wood currently goes to landfills; a small amount is taken to the US for incineration or energy co-generation. Cement St. Laurent in Montreal has been approved to burn treated wood in its cement kiln but this disposal route is not currently being used. Data are presented in Table 3.8.

5. Contaminated Sites

Available data on the 38 known creosote contaminated sites was used to calculate a possible range of PAH quantities located at these sites (PSL Assessment). Data are presented in Table 3.9.

3.3.3 Pentachlorophenol

The PCP Working Group developed release estimates for polychlorinated dibenzodioxins (dioxins), polychlorinated dibenzofurans (furans) and hexachlorobenzene(HCB). Pentachlorophenol contains trace quantities of these CEPA-toxic substances. These substances are contaminants within the pentachlorophenol product and are not active ingredients of the wood preservative. In calculating the release of these substances it was necessary to assume average concentrations in the PCP product. Table 3.10 summarizes the concentrations for these substances that were used throughout the report. Dioxins and furans are reported as total equivalent quantities (TEQ). The TEQs were calculated on the basis of equivalent toxicity to 2,3,7,8 tetrachloro-dibenzodioxin using 1997 World Health Organization - Europe (WHO-Euro) toxic equivalent factors (TEF) for the various isomers of dioxin and furans in the PCP. It is important to note that the average concentration of dioxin and furan in PCP was reduced significantly in 1990. The release estimates have been calculated and reported to reflect this reduction. HCB has remained at a consistent concentration in the PCP product over the time period. Tables 3.11, 3.12 and 3.13 summarize the release emissions calculated by the working group (Estreicher, December 1997 and February 1999). The following summarizes the methodology used.

1. Chemical Manufacturing

Pentachlorophenol is not manufactured in Canada. Release estimates were not calculated.

2. Wood Treating

Vulcan Chemicals provided the 1996 PCP usage rate for Canada. The 12 PCP wood treating plants currently operating in Canada were contacted directly by a representative of the working group to obtain information on releases. Actual process water discharge volumes and pentachlorophenol concentrations were obtained. Dioxin and furan quantities in these streams were estimated based on these data. It should be noted that 8 of the 12 plants do not have process water discharges as they recycle all their water. Air emissions were calculated using U.S. emission factors and PCP usage rates for dioxin and furans. HCB was estimated from the dioxin and furan estimate based on its relative concentration in the PCP product. An average annual solid waste generation rate of twenty 227 kg/barrels per site, with an estimated 3% PCP concentration, was calculated based on information obtained directly from the 12 treaters. Data are presented in Table 3.11.

3. In-service

Pentachlorophenol is used in Canada exclusively for the treatment of utility poles. It was used in the past for the treatment of rail ties, construction lumber and timber. The working group estimated releases from utility poles and railway ties only and these data are presented in Table 3.12.

Release rates of dioxin, furan and HCB from poles were calculated using a combination of empirical data and mathematical modeling. Using a limited measured data set for dioxin, furan and HCB for 8 poles (Lapointe, 1997), the release rate of dioxins, furans and HCB to the soil surrounding the poles was estimated, using a Monte Carlo analysis (mass balance and statistical analysis). In addition, using the same data set, a mathematical model was used to calculate volatilization losses for HCB, dioxin and furan. The model was calibrated using a much larger U.S. EPA. data set for PCP in poles.

PCP railway ties in-service were assumed to have been treated with older penta formulations. Quantities of PCP treated ties still in service were obtained from CN Rail (Masterton, R, September 1997) and the number was rounded up slightly to account for smaller rail companies which may use penta treated ties. CN has never used penta ties except for experimental purposes(1000-2000ties) in the early 1970s. It was assumed that ties would release dioxins, furans and HCB to the same extent as poles (i.e. 1% dioxin and furan and 9.2% HCB over the 35 year lifetime of the tie). It was assumed that all the release would be to the soil under the ballast surrounding the tie.

4. Out-of-service

Data are presented in Table 3.13. Based on the available data from three older poles, the total loss due to leaching and volatilization from utility poles throughout their lifetime was estimated to range between 0.4 to 2.4% for dioxin and furan and 19.3 to 20.2% for HCB. This estimate was used to calculate the quantity of dioxin, furan and HCB in poles taken out of service and

sent to landfill. It was determined that only 4% of the poles taken out of service were landfilled and that the majority of poles were reutilized. For railway ties it was assumed that the loss of contaminants to the environment throughout the ties lifetime was the same as for poles since dioxin, furan and HCB data for ties was not available. An initial loading of 3.8 kg penta / m³ was used for the calculation.

5. Contaminated Sites

The working group did not collect data on contaminated sites.

Table 3.1: Estimated Releases* of As and Cr(VI) from the Arsenical Wood Preservation Sector

	Cr(VI) (Kg/year)	As (Kg/year)
Manufacturing		
Air	~	~
Water	0	0
Waste	150	106
Treating Plants		
Air	Negligible	Negligible
Water - Direct	0	0
- Indirect (Stormwater)	<956	638
Waste	16	4220
In-Service		
Air	~	~
Soil/Water	0	64600
Out-of-Service		
Landfilled	0	82385
Recycled/Reused	0	87780
Contaminated Sites	-	-

~ Levels are insignificant or cannot be measured

* Based on best available data to date

Table 3.2 Estimated Annual Losses* of Cr(VI) and As from In-Service Treated Wood

Product	Wood in Use (x 10 ⁶ m ³)	Chemical Initially in Wood ('000 Kg)		Chemical Losses to Soil/Water/Sediments ('000 Kg/ year)	
		Cr (VI)	As	Cr(VI)	As
Residential Construction	19.00	0	9595	0	48.0
Poles	1.91	0	3700	0	12.4
PWF **	0.76	0	1430	0	negligible
Marine Piling	0.02	0	183	0	0.4
Other Products	0.88	0	1140	0	3.8
Total	22.57	0	16048	0	64.6

* Based on best available data to date

** Permanent Wood Foundations

Table 3.3 Estimated Annual Quantities* of Treated Wood Disposal

Product	Wood Removed 1995 (x 10³ m³)	Chemical in Wood Removed (Kg/year)		Landfilled (Kg/year)		Recycled/ Reused (Kg/year)	
		Cr(VI)	As	Cr(VI)	As	Cr(VI)	As
Residential Construction	102	0	46360	0	46360	0	0
Poles	54	0	94245	0	6425	0	84820
Commercial/ Industrial	11.3	0	13150	0	11835	0	1315
Posts	11.3	0	13150	0	11835	0	1315
Other Products	2.8	0	3260	0	2930	0	330
Total	181.4	0	170765	0	82385	0	87780

* Based on best available data

Table 3.4 Average Creosote Composition used for Release Estimate Calculations

Compound	% Average Concentration **
Benzene	0.01
Toluene	0.03
Ethylbenzene	0.00
m-Xylene	0.01
p-Xylene	0.00
o-Xylene	0.00
Isopropylbenzene	0.00
1,3,5-Trimethylbenzene	0.00
2-Ethyltoluene	0.00
1,3,5-Trimethylbenzene	0.01
Naphthalene *	9.53
Quinoline	0.97
2-Methylnaphthalene *	3.21
1-Methylnaphthalene *	1.36
Biphenyl	1.57
Acenaphthalene *	0.10
Acenaphthalene *	5.57
Dibenzofuran	5.09
Fluorene *	6.30
Phenanthrene *	14.26
Anthracene *	2.43
Carbozole	1.06
Fluoranthene *	5.76
Pyrene *	3.44
Benzo(a)anthracene *	0.89
Chrysene *	1.02
Benzo(b)anthracene *	0.52
Benzo(k)anthracene *	0.00
Benzo(a)pyrene *	0.17
Benzo(b)pyrene *	0.27
Indeno(1,2,3-cd)pyrene *	0.04
Dibenzo(a,h)anthracene *	0.00
Benzo(g,h,i)perylene *	0.04
Unknown (may include PAH)	35.98
% Composition Identified	63.66
Total	99.64
% Identified PAHs*	63.59

* Included in identified PAH sum

** GC Analysis from VtT Inc. (formerly Carbochem)
1991 based on 13 batches of creosote

**Table 3.5 Estimated PAH Release Estimates through the
Manufacture of Creosote**

Chemical Manufacturing	PAH Produced (10⁶ kg)	PAH Releases (10⁶ kg/year)	PAH In Solid Waste (10⁶ kg/year)
Creosote Manufacturing			
Vft Inc., Hamilton, Ont. *	6.6	0.0016	0
Total Remedial Products		<0.0001	0.0003
Total	6.6.	0.0016	0.0003

* Data for 1996

**Table 3.6 Estimated PAH Release Estimates through the Treatment
of Wood with Creosote**

Wood Treatment	PAH Applied (10⁶ kg/year)	PAH Releases (10⁶ kg/year)	PAH in Waste (10⁶ kg/year)
Total for 6 plants	23	0.5	0.02

Table 3.7 Estimated PAH Release Estimates from Creosote Treated Wood in Service

In-Service Use	Wood in Service (m³)	Total PAH in Use (10⁶ kg) **	PAH Releases (10⁶ kg/year) **
Railway Ties - in service	10,500,000	210-336	
- new (annually)	147,000		1.2 - 3.0
Utility Poles-full treat	630,000	33 - 52	
- in service			
- new (annually)	0		0
- butt treat - in service	1,080,000 [#]	4.0 - 6.4	
- new (annually)	90 [#]		<0.0002
Timbers- marine - in service	1200000	141 - 226	
- new (annually)	14480		0.7 - 1.7
- land/ bridge - in service	425000	20 - 32	
- new (annually)	20160		0.36 - 0.9
Remedial Treatment			
Total		408 - 652	2.3 - 5.6
	Data not available		

** Based on range of estimated lifetime loss of 20-50% of initial creosote loading

Treated Volume is 8 to 10% of pole volume

Table 3.8 Estimated Annual Quantities of PAH associated with Creosote Treated Wood Landfilled and Recycled

Disposal	Wood Removed (m³)	PAH Removed (10⁶ kg/year) **	PAH Landfilled (10⁶ kg/year) **	PAH Recycled/ (10⁶ kg/year) **
Rail Ties	147000	2.9 - 4.6	1.2 - 1.9	1.7 - 2.7
Poles	11115	0.3 - 0.5	0.19 - 0.3	0.11 - 0.18
Timbers - marine	2830	0.42 - 0.68	0.31 - 0.50	0.11 - 0.18
- land	7930	0.36 - 0.58	0.27 - 0.43	0.09 - 0.14
Total		4.0 - 6.4	2.0 - 3.1	2.0 - 3.2

** Based on range of estimated lifetime loss of 20-50% of initial creosote loading

Table 3.9 Estimated PAH Quantities Associated with Soil/ Sediment at Contaminated Sites

Contaminated Sites	# Sites	Sed/ Soil	PAH in
		Volume	Soil/ Sed
		(m³)	(10⁶ kg)
All Sites	37		
Soil Contaminated Sites	36	306-38300	0.22-6.8
Sediment Contaminated Sites	33	67,000	<0.0003-29

** Based on range of estimated lifetime loss of 20-50% of initial creosote loading

Table 3.10 Average Concentrations of Dioxin/Furan and HCB in Pentachlorophenol Wood Preservative used for Release Calculations

Compound	TEF ^a	1997 Concentration ^b		Prior to 1987 Concentration ^c	
		(ppm)	TEQ (ppm)	(ppm)	TEQ (ppm)
Hexachlorobenzene	-	50		50	
TCDD (2,3,7,8)	1.0				
PCDD (2,3,7,8 isomer)	1.0				
HxCDD		1.51		10.1	
2,3,7,8 - HxCDD isomers (59%)	0.1	0.891	0.0891	5.96	0.596
HpCDD		61.3		296	
2,3,7,8 - HpCDD isomers (76%)	0.01	46.6	0.466	225	2.25
OCDD	0.0001	1420	0.142	1386	0.139
TCDF	0.1				
PCDF	0.5	0.005	0.0025	1.4	0.7
(assumes 100% 2,3,7,8 isomer)					
HxCDF		2.29		9.9	
2,3,7,8 - HxCDF isomers (13%)	0.1	0.298	0.0298	1.29	0.129
HpCDF		31.2		88	
2,3,7,8 - HpCDF isomers (27%)	0.01	8.42	0.0842	23.8	0.0238
OCDF	0.0001	303	0.0303	43	0.0043
Total Dioxin/ Furan			0.84		4.05

- a. World Health Organization - Europe 1997 Toxic Equivalent Factors (TEF). Note in particular revised OCDD and OCDF factors. These factors were reiterated in 1998.
- b.c. Dioxin/ Furan and hexachlorobenzene data was derived using: Weinberg Group. Volatilization of Microcontaminants from Pentachlorophenol treated Utility Poles. May 28,1998. Report prepared for the Penta Task Force.
- b. The arithmetic mean from Table 3 of above referenced report was used. This is based on analysis conducted on Penta samples taken between 1989 and 1997. The actual range of D/F TEQ concentration measured was 0.22 to 6.26 ppm.
- c. Technical grade (composite sample from Monsanto, Reichhold Chemicals, and Vulcan) concentrations were used from Table 2 (above reference) for samples analyzed prior to

1987. It was assumed that the concentrations of 2,3,7,8 isomers were found in similar proportion to the 1997 penta formulation.

Table 3.11 Estimated Release of Dioxin/Furan and HCB from Wood Treatment Plants Utilizing Pentachlorophenol

Reference Information	Activity	Release to Air (g/year)				Release to Water (g/year)				Waste Generation (g/year)			
		HCB		D/F TEQ		HCB		D/F TEQ		HCB		D/F TEQ	
		Per Site	Total	Per Site	Total	Per Site	Total	Per Site	Total	Per Site	Total	Per Site	Total
Wood Preservation Plants	12 Plants	2.76	33.1	0.147	1.76	0.006	0.076	1.1×10^{-4}	0.0013	9	108	0.15	1.8

Notes on Estimate Calculation Methodology:

Air emissions based on US emissions data; water release data based on effluent volumes and known penta concentration in the effluent; Solid waste estimates based on 20 barrels/per year/per site with average PCP content of 3%. Solid waste is sent to incineration at Swan Hills or Laidlaw or to secure landfill at Thurso or Sarnia.

Table 3.12 Estimated Annual Dioxin/Furan and Hexachlorobenzene Releases to Air and Soil from Penta Treated Wood In-service

Product	Year Produced	Release to Air (g/year)				Release to Soil (g/year)			
		HCB		D/F TEQ		HCB		D/F TEQ	
		Per pole/tie	Total	Per Pole/Tie	Total	Per Pole/Tie	Total	Per Pole/Tie	Total
Utility Poles (6.8 million)	Post 1987 (20%)	3.3×10^{-4}	446	7.8×10^{-9}	0.01	1.5×10^{-5}	100	1.3×10^{-6}	9.0
	Pre- 1987 (80%)	3.3×10^{-4}	1784	3.5×10^{-7}	1.89	1.5×10^{-5}		1.3×10^{-6}	
Railway Ties (70,000 m ³)	Pre 1987 (100%)	Data not available; Modeling could not be performed				5×10^{-5}	35.1	4.4×10^{-7}	0.31

Notes on Estimate Calculation Methodology:

Utility Poles: Volatilization estimates based on Jury Model (Weinberg Group, May 1998); leaching estimates based on Monto Carlo analysis of Gurprasad and Lapointe data on concentration of contaminants surrounding poles.

Railway Ties: Assumes most PCP treated ties in service are treated with older penta formulation. Initial loading of 3.8 kg/m³ of wood was used. It was assumed that ties have similar release rates of HCB and D/F to soil as do poles. For utility poles losses were 9.2% of HCB and 1.0% of D/F over the lifetime of the pole. Assuming ties have a lifetime of 35 years this translates to a loss of 0.26%/year and 0.029%/year of HCB and D/F respectively. Railway ties for use in Canada have not been treated with pentachlorophenol since 1992.

Table 3.13 Estimated Annual Quantities of Dioxin/Furan and HCB Landfilled with Penta Treated Wood

Out-of Service Wood	Quantity	Contaminant Concentration in Landfilled Wood (g/year)	
		HCB	D/F TEQ
Landfilled Poles	4994 Poles	589	31.4
Landfilled Ties	287 m ³	54.5	4.4

Notes on Estimate Calculation Methodology:

Landfilled Poles: Approximately 1.9% of in-service poles removed from service annually; 53% are PCP treated poles and 4% of these are landfilled. Assumes 20% of poles were originally treated with new penta formulation; 80% of poles were treated originally with older penta formulation.

Landfilled Ties: Again initial loading of 3.8 kg/m³ of wood was used. Assumes 41% of the ties taken out of service are landfilled and that 2% of 50% of ties taken out of service are landfilled as only CN used penta treated ties and only for 1% of their tie service in eastern Canada and 2% of their tie service in the west. Figures have been rounded up to account for the possibility that smaller rail companies may have used penta treated ties in the past as well.

4.0 ENVIRONMENTAL CONTROL STATUS IN THE WOOD PRESERVATION SECTOR

The SOP Issue Table struck an Environmental Control Status (ECS) Working Group to determine what processes, practices and procedures to control the release of CEPA-toxic substances were in place at each stage of the Canadian wood preservation sector. The ECS working group membership is listed in Appendix 1. A consultant was hired by the working group to assist in completing this work. Using telephone surveys and questionnaires the consultant prepared a report (El Rayes, July 1998) summarizing the controls in place in Canada, the US and other parts of the world. A comparison of control technologies, management practices, and regulatory framework was conducted by the consultant for plants within Canada and against plants in other countries. Tables 4.1 to 4.5 summarize the information collected by the consultant. These tables were used to determine if further management practices should be considered.

1. Chemical Manufacturing

Based on the consultant's report, the ECS working group concluded that environmental control technologies and the management practices in place at the two wood preservative manufacturing plants in Canada were adequate and effective. Enhanced environmental performance will be achieved through implementation of existing plans and environmental management systems. Current legislation exists in Ontario and Canada, similar in scope to regulatory frameworks in other countries, to address process emissions at the plants. Releases of PAHs, Cr and As from chemical manufacturing facilities do not have to be reported to the National Pollutant Release Inventory (NPRI), because reporting triggers are high and relevant substances are not listed. This issue was identified by the ECS working group as a possible area to address through the SOP recommendations.

2. Wood Treating

Wood treating plant operations and discharges in Canada are governed for the most part by provincial legislation. Provinces have different mechanisms for regulating plant discharges, operating practices and solid waste handling. It was discovered that treating plants are not handled equivalently across the country in terms of regulatory requirements. Discharge and release reporting is covered by the NPRI. However because of the low reporting triggers many plants are exempt from reporting. In addition, dioxin, furan, hexachlorobenzene and a broader list of PAHs are not currently listed on the NPRI. The working group identified that release reporting should be considered in the SOP recommendations.

In 1988, Environment Canada, in co-operation with the CITW, published documents entitled "Recommendations for the Design and Operation of Wood Preservation Facilities" (TRDs). There were similar documents made available for each of five wood preservative chemicals. These documents were recently updated and combined into one document. The updated document has not yet been made available to treaters. The updated TRD was found to be very comprehensive and it was concluded that its implementation would result in superior

environmental performance for treating plants. The TRDs provide an excellent basis for an environmental performance improvement program for wood treating facilities.

To date, implementation of the recommendations contained in the TRDs has been voluntary. The consultant estimated that between 50-75% of the plants have fully or partially implemented the 1988 TRDs. In B.C. where intensive promotion of the TRDs has occurred it is estimated that 89% of the TRDs are implemented at 100% of the plants. The working group concluded that to improve control of CEPA-toxic substances from wood preservation plants the TRDs should be implemented uniformly across the country and recommendations to address the implementation issue should be developed.

3. Wood In-Service

The release of CEPA-toxic substance from treated wood in-service is dependent on a number of variables including the type and the age of the treated wood, the quality of the preservative treatment, the quantity of preservative applied, the location of use and the application. Treating plants supply treated wood to quality standards specified by their customer. Quality standards do take into account the environmental performance of the treated wood and include CSA standards, CITW aquatic BMPs and customer specific standards. Actual monitoring data which can be used to predict leaching, volatilization, degradation and other losses of preservative chemicals to the environment is generally limited. A better understanding of the fate of CEPA-toxic substances is needed before release control options can be developed.

Industrial users commonly have quality standards which must be met by their suppliers. Furthermore many companies have their own set of guidelines and management procedures for the handling, installation and storage of treated wood. There does not appear to be any standard set of guidelines for the environmental management of treated wood for industrial users. Residential consumers buy treated wood from retailers. Unlike the US, there are no requirements in Canada for retailers to provide information on the proper use of treated wood. In addition, retailers purchase treated wood of varying quality. Consumer products are not stamped or otherwise marked with preservative information.

The PMRA registers wood preservatives for use in Canada. The registration document specifies the type of applications that are covered by the registration process. While a condition of the registration of a wood preservative requires information regarding safe application of the preservative to the wood to be made available to treating plants, there is not a similar requirement for information regarding safe use of the treated product to be passed onto treated wood users. Only two provinces (NB, NF) ban the use of oil-borne treated wood in water supplies and/or surface waters.

Industrial users report extensive recycling of their treated wood. It is unlikely that consumer lumber is recycled to any appreciable extent. Industrial users indicate that they have and do use alternative products for their applications that may reduce the release of CEPA-toxic substances. For example concrete and steel have been used as utility poles and concrete has been used for railway ties. Pole and tie materials are selected on the basis of cost, service life, aesthetics, fire

resistance, installation and maintenance requirements, technical viability, salvage value and disposal options. Industrial users are interested in developing, demonstrating and evaluating alternatives from a business viability perspective. The working group suggested that recommendations which provided some means of consolidating these alternative development activities may be appropriate.

4. Out-of-Service

The management of out-of-service treated wood in Canada is clearly an issue of concern from a volume standpoint. Currently few alternatives to disposal in landfills exist. Recommendations addressing the issue of providing alternative means of treated wood disposal including reuse, recycle and recovery should be considered.

5. Contaminated Sites

The contaminated site issue is addressed at least in part from a regulatory perspective. Two issues that may not be addressed adequately are:

- 1) reporting to the public on the status of contaminated sites
- 2) clean-up of contaminated sites is costly and economics often dictate whether the site is cleaned up.

The working group suggests that prevention of contamination should be given more attention than the contaminated site issue.

Table 4.1: CCA & Creosote Manufacturing Recommendation Option

Option	Used in Canada	Effectiveness	Legislation Governing	Reasons not in Place
BMPs Creosote CCA	100% 100%	High High	Regs (Prov)	NA NA
Discharge Technology Creosote -water -waste -air CCA -water -waste -air	100% 100% 100% NA 100% NA	Adequate Adequate Adequate Adequate	Provincial Regs "	NA NA NA NA
Monitoring/Reporting Creosote - NPRI CCA - NPRI	100% No	PAHs not covered Plant is exempt from reporting	Federal Reg	NPRI not designed to meet specific needs of SOP

Table 4.2 Wood Treatment Facilities

Option	Used in Canada	Effectiveness	Legislation Governing	Reasons not in Place
BMPs TRDs	20% not using TRD 40% partially applied	Comprehensive Document Implementation Program - medium effectiveness	TRD (AB, NB)	Cost Voluntary Level implementation - pushed differently across country
Discharge Controls Wastes	100%	Adequate	Provincial, Federal and Municipal Regs	NA
Process water	Oilborne Only Req'd	Adequate	"	NA
Air Emissions	CCA - NA Oilborne - 60%	GAP	Provincial Leg.	Cost Lack of Concern Lack of Knowledge
Stormwater	≥ 26% of plants have control/ program	Covered in TRDs - medium effectiveness	Provincial, Federal Municipal Regs	No pressure from authorities
Monitoring/ Reporting NPRI (release inventory)		Medium effectiveness	Federal Requirement	Thresholds too high(both employees & substance release) Substance list not adequate to address the sector Treaters are unaware of requirement Enforcement activity minimal
Discharge Points	Yes, variable extent	Unknown	Provincial Requirement	No standard
Waste	Yes	High	Provincial Requirement	NA
Groundwater, Stormwater	GAP	Unknown	Provincial Requirement	No standard

Table 4.3

In-Service Use of Treated Wood

Option	Used in Canada	Effectiveness	Legislation Governing	Reasons not in Place
BMPs				
Managed treatment	Yes, medium coverage	Industrial Coverage - Aquatic BMPs, CSA, TRDs - high effectiveness Consumer - low effectiveness		Just in time delivery Cost of meeting CSA/TRDs Consumer Awareness
Managed Use (storage)	yes (a few companies) consumer -unknown	Following some undocumented practices Commercial consumer may be poor		No standard BMP for rail or utilities Diffuse nature of users (consumer residential)
Alternative Preservatives	limited use		PCPA	Application Limitation Cost of Registration (data requirements) Efficacy Not registered in Canada Canada's market too small
Alternative Materials/ Approach				
Concrete Steel Plastics Composites Buried Lines	yes, where appropriate	Limited applications and effectiveness		Costs Technical
Monitoring/ Reporting	very limited	low		Has not been a concern Perceived Costs Reactive to complaints Research only

Table 4.4 Post-Use Treated Wood Management

Option	Used in Canada	Effectiveness	Legislation Governing	Reasons not in Place
Reuse/ Recycle	Yes, Commercially No, consumer	High if management systems in place		Market limitations (e.g.. ties in Ontario) Limited Access (i.e. New Westminster (cedar) & LPB only) Costs/ financing start-up
Extend Life of Wood In-service Remedial Treatments Enhanced Inspection Programs	Yes; commercially more Some	Not sure		Costs of application Extend life - more research/ not proven Cost/time labour intensive
Energy Recovery	Yes, Cement St.Laurent Boilers Sent to U.S.	High if done under controlled conditions Limited for CCA treated wood		Regulatory framework Shredding Facilities costly - \$2M Higher cost to user Public Reluctance / Perception
Fibre Recovery Pulp and Paper	Experimental in US only			Not ready for commercial use
Waste Destruction Incineration Biological	limited availability not in use	If proper controls in place can be effective Potential application in saw dust treatment		Regulatory Framework Cost
Landfill	Majority of treated wood disposed of this way	Accepted mode of Disposal Volume is issue - concentrates risk		NA

Table 4.5 Contaminated Sites

Option	Used in Canada	Effectiveness	Legislation Governing	Reasons not in Place
Inventory of Sites	No	Limited use - Can not identify wood preservation sites		Reluctance to identify
Clean-up Options many	yes	Adequate	Provincial	Costs No pressure to address
Containment	yes, not at all sites		Provincial	Cost No pressure

5.0 RECOMMENDATION SELECTION PROCESS

5.1 Establishing Criteria And Objectives For Recommendations

The compilation of the release data by each chemical group provided some insight as to the complexity, magnitude and range of releases. In an attempt to ensure a logical flow of discussion the Issue Table decided to set priority criteria to focus discussion on those lifecycle components with the most significant releases and the highest potential for effective reductions in releases. This task became difficult because of the paucity of release data, unknown toxicity factors and fate of the chemicals. Therefore, the criteria developed by the Issue Table were not used.

The Issue Table then reviewed current release control methodologies across Canada as described in section 4 of this report by lifecycle stage. Data were not available to make connections between achievable release reductions and control technology and/or practices. The working groups suggested that recommendations should be developed to provide the data for making these connections. Using an effectiveness analysis (Tables 4.1 - 4.5), to address current gaps in environmental management practices in the industry, the Issue Table developed additional recommendation options for consideration. These options would be consistent with the practical management of CEPA-toxic chemicals throughout the lifecycle and also would be consistent with a continuous improvement process. A list of 8 objectives was established which capture the intent of the Issue Table in developing recommendations for the sector. These objectives are summarized in Table 5.1. The ultimate goal however is to reduce releases of CEPA-toxic substances.

The Issue Table decided at this point that recommendations should be consistent for all four wood preservative chemicals. The Treaters and Manufacturers Working Group and the Users Working Group were formed to further consider the objectives together with the relevant options put forward by the Issue Table. The working group members are listed in Appendix 1.

Table 5.1 Objectives Of The Issue Table For Management Of Releases

Objective #1	<p>A comprehensive approach is required</p> <p>To be covered:</p> <p>All aspects of wood preservative lifecycle</p> <p>All aspects of Reuse/Recycle/Recovery (of Fibre and Energy) of treated wood products</p> <p>All aspects of Disposal Practices</p> <p>Storage of Post-Use Products</p> <p>Disposal and/or de-contamination of residuals (e.g. off-cuts, shavings, soils, etc.)</p>
Objective #2	<p>Standardization of reporting systems</p> <p>Make reporting standard common to all across the sector. Consistency is needed with appropriate reporting mechanisms to ensure standardization.</p>
Objective #3	<p>Include all stages of the lifecycle</p> <p>This Strategic Options Process for Wood Preservation has determined its recommendations for this report on a lifecycle basis. In doing so it recognizes that there are those working in other parts of the lifecycle who have a major bearing on the manufacturers', treaters' and users' ability to undertake the release reductions proposed in this SOR.</p>
Objective #4	<p>Pollution Prevention</p> <p>Address regulatory barriers by the development and implementation of guidance documents. (TRDs for the manufacturing and treaters, and UGD for the users - a national waste strategy to be developed for post use).</p> <p>Eliminate all unsafe practices related to the management of post use treated wood, including uncontained burning, inappropriate and/or unsafe storage and non-informed secondary re-use.</p>
Objective #5	<p>Continuous improvement</p> <p>The recommendations are to ensure there is a process for continuous improvement with the consequences of non-improvement clearly identified.</p> <p>Continuous improvement includes the promotion of pollution prevention and release restriction, the promotion of energy recovery options, the promotion of reuse/recycle options, the provision of funding support for demonstration projects involving collection and processing of treated wood, building codes, research support for alternative uses for the wood.</p>
Objective #6	<p>Access to the continuous improvement program</p>

It is recommended that an implementation program be developed to include:

- both user and regulator training
- compliance promotion and monitoring activities;
- code updating schedules.

Objective #7	<p>Verification and Accountability</p> <p>Since there will be a program for continuous improvement a mechanism for verifying the extent and scope of improvement is needed. The Issue table proposes the establishment of Steering Committee(s) of all sectors to provide this verification mechanism.</p>
Objective #8	<p>Voluntary and compulsory</p> <p>Voluntary participation in national assessment, monitoring, training and a continuous improvement program is the initial objective. For treaters, if this fails the program will become compulsory.</p> <p>Mechanisms to assist this program include a tax incentive to participate (cover cost of initial assessment), seeking provincial buy-in, the need for authorities to focus on those companies not participating, third party audit for bench marking, or possible certification based on guidance document knowledge.</p>

5.2 Summary Of Recommendation Options

The Status of Environmental Controls report commissioned by the Issue Table, reviewed best processes, practices and procedures for controlling the CEPA-toxic substances found in the wood preservation industry in Canada, the United States and other countries.

Using this review, the Environmental Controls working group developed a list of strategic control options that could be applicable to the situation in Canada. These options are tabulated in Table 5.2. This table details all of the options considered at each stage of the life cycle for all chemicals under consideration.

In the case of the manufacturing and treating stages, several options were discarded and some kept, while for the users stage, all options were kept. In some cases socioeconomic data were used to assist in making decisions regarding the option selected. Given the value of the treated wood industry to the domestic economy, as well as its value in terms of the export market, the Issue Table was cognizant of the fact that recommendations arising from the SOP may have an impact on the industry's competitiveness in the North American or global market. However, the Issue Table did not analyze the competitive impact of any of the recommendations presented in this report.

5.2.1 Manufacturing and treating stages of the life cycle

Recommendations options considered were both voluntary and regulatory. A socioeconomic study was conducted which assisted the working group and the Issue Table in selecting the appropriate approach for the implementation of both a monitoring/ reporting program and a best management practice/ environment management system for all plants across the country. The working group decided the best approach would be to build on already existing programs such as the voluntary implementation of the TRDs for all treaters and mandatory reporting to the already existing NPRI program.

Also, to ensure progress, the formation of a steering group was recommended. This group would oversee the implementation of the proposed voluntary program. At key times the Steering Committee would review progress and determine if a more stringent approach would be required.

TRDs already exist and have some momentum although they are not used in all cases. They form the basis of many of the recommendations laid out in Chapter 6. The Issue Table also opted to use the NPRI data collection system more comprehensively to improve available data in the future. Also, in an effort to create a level playing field, the NPRI could be modified to ensure the development of a standardized reporting system.

5.2.2 Use and post-use stages of the lifecycle

Users come from a number of industries and indeed include residential consumers. The recommendations selected need to apply to this wide range of users. It was agreed that consumer products would be handled separately with their own set of recommendations.

The choice of options presented in the Environmental Controls Study was limited, so the Issue Table elected to implement them all. To provide the basis for managing and controlling the release of CEPA-toxic substances at the user stage of the lifecycle, a management guideline document was investigated and drafted.

A draft Industrial Treated Wood User Guidance Document (UGD) is appended (Volume 2), which proposes an environmental management system for industrial wood users. The UGD is in its infancy and more time is required for its refinement and implementation which will be overseen by the Steering Committee. Its success will be closely monitored by a comprehensive auditing program. As the results of that program will be assessed to determine whether further actions will be necessary the Issue Table felt it was premature to propose a mandatory back up program.

The working group had discussions on the use of alternative chemicals, materials, and practices to the treated wood products currently available. The industrial users indicated that development and demonstration of alternatives was a practice which they would continue. It was agreed that the steering committee might create opportunities for users to exchange information on alternatives. In addition, to make better decisions on alternatives, a full cost lifecycle assessment (LCA) methodology would be developed. The working group attempted to develop LCA methodology but determined it would be a longer term project. The results of the work completed by the working group is appended (Volume 3).

At the post-use stage of the life cycle, the Issue Table decided that the volume of treated wood requiring disposal was an issue that needed to be addressed regardless of the associated quantity of CEPA-toxic substances. Targets for diversion of waste from landfills were agreed upon. The target is intended to provide interim improvement in the absence of better data. The target will be modified as more data become available. The final recommendations in section 6 reflect this decision.

The Issue Table determined that a national strategy for the disposal of all treated wood products needs to be developed. This strategy would take into account an agreed to waste management hierarchy and the advancement of the best available disposal technologies. The recommendations outline this need and how it might be accomplished.

Table 5.2 Recommendation options at the four stages of the lifecycle related to the objectives

OBJECTIVE	MANUFACTURING	TREATING	IN USE	POST USE
standardization of reporting system	NPRI - need to be modified to include PAHs and lower threshold to capture CCA plants ARET, NERM, Provincial reporting systems	NPRI - PAHs not covered Implement national standard/guideline	public report consumer sheets	
pollution prevention	adequate use of BMPs & EMS	structured voluntary program Priority component regulation (e.g. drip-pad, fix) P2 Planning regulation Provincial inclusion in permits Certification program Purchaser requirements Fiscal/financial incentives CCME code based on TRDs	implementation of UGDs PMRA require CSA on registration (i.e. fixation) Increase comprehensiveness of CSA residential and construction requirements retail yard controls BMP, UGD expansion or improvements increase R and D for treatment reduction	environmental management of transfers regulation - technical criteria for reuse financial incentives collection infrastructure for consumer waste
continuous improvement	CCPA - like voluntary system	P2 Planning; EMS	environmental management systems	do not want to promote incineration continued research for the extension of life of wood in service
access and outreach	no options	no options	increase consumer awareness enhance information delivery	
verification and accountability		NPRI release inventory NPRI thresholds are too high (both employees and release) substance list not adequate	better inventory of treated wood needed (type, age, preservatives) impact studies (pathway analysis) risk analysis - development of acceptable standards	increased competitiveness of other options to landfills More research needed on fibre and energy recovery Need reduction in wood to landfill
voluntary compliance	through BMPs & EMS	through BMPs Voluntary reporting (e.g NPRI or other ARET, NERM or Province)		

6.0 FINAL STAKEHOLDER RECOMMENDATIONS

6.1 General Recommendations

The following two recommendations have been developed by the Wood Preservation SOP Issue Table to recognize the contribution that could be made by the Pest Management Regulatory Agency and the Provinces to the overall implementation of all the recommendations in this report.

- A1. The IT recommends that the PMRA considers the recommendations of the SOR as they conduct the re-evaluation process of wood preservatives (chromated copper arsenate, ammoniacal copper arsenate, creosote and pentachlorophenol). These recommendations, which include efforts at continuous improvement, provide a program of comprehensive risk mitigation measures that are relevant to the PMRA re-evaluation..
- A2. The IT recommends that the federal government take the SOR forward to its provincial counterparts. In particular, it is essential the provinces participate on the Steering Committee in order to address and facilitate:
 - a. the development of a waste management strategy for treated wood;
 - b. the implementation of the recommendations of the SOR.

Both the provinces and the PMRA will be invited to participate in the steering committees as outlined in the recommendations below. It is recognized that the provinces should play a significant role in the development of the waste management strategies for post-use treated wood and in the implementation of best management practices. In particular, it is recognized that the PMRA's expertise and contribution might be mutually beneficial to the implementation of these recommendations in the following areas:

- *the development of a waste management strategy for treated wood products (commercial/ industrial and residential lumber);*
- *the development/ updating of the Consumer Information Sheets;*
- *the development/ updating of the Industrial Users Environmental Management System Guidance; and*
- *in the consideration of alternative products as part of a pest management strategy for treated wood products.*

6.2 Recommendations for Chemical Manufacturing and Wood Treatment in the Wood Preservation Sector

The following set of 10 recommendations have been developed by the Wood Preservation SOP Issue Table as a comprehensive program for the chemical manufacturing and wood treating components of the Wood Preservation Sector. Each recommendation is an integral part of the program and is necessary for ensuring CEPA-toxic substance release reductions from these components of the sector and are not intended to stand alone. The program initially is a balanced combination of both regulatory and voluntary initiatives; however, should the

voluntary component of the program be unsuccessful the program as set out in these recommendations allows for mandatory components to be developed and implemented. The timelines recommended are conditional upon the timely acceptance of these recommendations by the Ministers of Health and Environment and the publication of the Technical Recommendation Documents by April 1999. The Steering Committee will review and shift (if appropriate) the timelines at the beginning of the program.

Steering Committee

- B1. The implementation of these recommendations will be overseen by a steering committee made up of representatives from industry, environmental group(s), Environment Canada, Health Canada and other key people. The steering committee will be responsible for annually reviewing the progress, made by both the manufacturing and treatment plants in meeting the commitments outlined. The steering committee will identify and facilitate modifications to the implementation program should the need arise. In addition it will be the responsibility of the steering committee to ensure that the Technical Recommendation Documents are kept up-to-date with the best available environmental management practices and technology, (through the use of groups such as the Task Force for TRDs). The terms of reference for the Steering Committee are attached.

Acceptance of the TRDS

- B2. It is recommended that the TRDs be recognized as a comprehensive approach to managing all releases and wastes from wood treatment facilities. All the provinces should implement the objectives of the TRD equally.

Annual Reporting for All Plants

- B3. It is recommended that all wood preservation treatment facilities and wood preservative chemical manufacturers report their emissions of CEPA-toxic substances as listed below to the National Pollutant Release Inventory (NPRI) beginning in 2001 (this will cover the year 2000 releases). The NPRI list will be expanded for the wood preservation sector to include dioxins, furans, PAHs (a list specific to the wood preservation sector), and hexachlorobenzene. The industry will also report on chromium (and its compounds), arsenic (and its compounds), naphthalene and anthracene which are already listed on NPRI. The reporting requirements will be developed to ensure duplicative and inconsistent reporting will not occur. Moreover, release data generated above and beyond the normal NPRI requirements by the sector are to be compiled separately from other NPRI data and not aggregated with data from other industries. This reporting program implementation is contingent upon the outcome of the current Environment Canada review of NPRI.

Existing Chemical Manufacturing Plants

- B4. It is recommended that the manufacturers of creosote and chromated copper arsenate (CCA) continue existing efforts to reduce emissions of the CEPA-toxic substances (PAH, creosoted waste material, chromium(VI) and arsenic) from their Canadian chemical manufacturing plants consistent with existing regulations and reporting requirements and the use of environmental management systems.

Existing Wood Preservation Plants

B5. Voluntary Program

It is recommended that all existing wood preservation treatment plants will meet the objectives of Technical Recommendation Documents through a voluntary continuous improvement program. It is recommended that as a condition of the voluntary program the treaters will:

- participate in an assessment program; and
- submit a TRD Implementation Plan.

The program will continue on a 5-year cycle as deemed appropriate by the steering committee.

B5.1 Assessment Program

Treating Plants will participate in an Environmental Assessment Program. The assessment will measure the level of compliance with the TRDs. The baseline assessment will be conducted in the year 2000 and will be followed by another assessment in 2005. The assessments will be completed by third party auditors. The assessment program will be jointly funded by the Government of Canada and industry for those companies meeting the conditions of the voluntary program.

B5.2 Implementation Plan Submission

It is recommended that TRD implementation plans be prepared by each wood preservation plant based upon the baseline assessment conducted for recommendation 5.1 (in the year 2000) and submitted to Environment Canada by end of 2001. These implementation plans will describe the program that the plant will follow to meet the TRD objectives. Plans will take into account the age, the wood preservatives being used and other specific issues related to the plant. The initial plan will cover the period 2001 to 2005. A progress report will be submitted annually to the Steering Committee for review. Should reporting to NPRI not occur, release data (beginning in the year 2000) will be required as part of both the initial and annual implementation plan submissions in accordance with recommendation 3 above.

B6. Outreach

It is recommended that outreach programs to inform and assist treaters in meeting the objectives of the TRDs, preparing the implementation plan and reporting to the NPRI be made available. Such programs will be delivered in the year 2000 jointly by industry and Environment Canada. All treaters will be given reasonable access to the outreach programs.

B7. Mandatory Program

It is recommended that the steering committee review and measure the success of the voluntary program as described at two critical times. At these times the steering committee will be required to make the decision on whether to continue with the program on a voluntary basis or to move to a mandatory program.

B7.1 Mandatory Implementation Plans

In January 2002, should participation of the industry (on a number of plants basis) in the assessment and implementation plan submission program, be less than 100%, the submission of an implementation plan based on an approved/acceptable assessment by those plants not already participating in the voluntary program will become mandatory at the treaters expense for the end of 2002.

B7.2 Mandatory TRD Implementation

In 2005, the success of the above program (recommendation 5) will be reviewed to take into account individual plant successes towards:

- a. meeting their commitments in the TRD implementation plan between 2001-2005; and
- b. the overall extent of participation of the industry as a whole in meeting the objectives of the TRDs.

Should a level of success (as defined by the Steering Committee) be met, the assessment program will continue on a five year cycle. Should a level of success not be met, a , guideline, regulation or other mandatory requirement under CEPA or other legislation will be developed.

B8. Evaluation

It is recommended that the Steering Committee evaluate the effectiveness of the TRDs in reducing CEPA-toxic substance releases at the end of the first 5 year cycle.

New and/or Expanding Chemical Manufacturing Plants

- B9. It is recommended that all new and/or expanding facilities associated with wood preservative manufacturing meet an equivalent level of performance to existing plants that is achieved through an effective environmental management system.

New and/or Expanding Wood Preservation Plants

- B10. It is recommended that newly constructed wood preservation plants or plant additions will meet all objectives of the TRDs on start up.

6.2.1 Implementation Plan and Estimated Costs for Manufacturer/Treater Recommendations

Related Recommendation	Action/ Task	Responsibility/ Initiative Lead	Expected Completion Date	Estimated Cost (\$K)
B1	Steering Committee Formation First Meeting Develop Schedule of Meetings Agree on SC Terms of Reference Review Information/ Technical Program Needs Establish Working Groups (WG)for Recommendations B5.1,B5.2,B6	EC EC SC SC SC SC	June 1999 June 1999 June 1999 June 1999 Annually June 1999	75 (+ individual labour/travel costs)
B2.	Negotiate Harmonization Accord/ Working Arrangement with the provinces re wood preservation chemical Mfg. and treatment facilities	EC/ provinces	December 2000	50
B3	Establish Reporting WP Requirements for NPRI Publish Mandatory Requirement in Gazette Treater/ Mfg begin reporting to NPRI Prepare summary report based on NPRI for SC Review	EC EC All Treaters/ Mfgs EC	June 2000 December 2000 June 2001 Annually starting Dec 2001	20 10 1600 ^a 50
B4	Continue emission reduction activities	VFT, Timber	Ongoing	Ongoing
B5	Implementation of TRDs (a 10 year implementation plan has been assumed for costing)	All Treatment Plants	Schedule to be determined by individual plants	28200 ^b

B5.1	TRDs Published French/English	EC	April 1999	10
	Establish Assessment Program (i.e. select assessors/ protocols, etc.)	WG	December 1999	30
	Perform Baseline Assessments	WG	December 2000	275
	Prepare Summary of Baseline Assessment results for SC	WG	December 2000	25
	Perform 2005 Assessments	WG	December 2005	275
	Prepare Summary of 2005 Assessment Results for SC	WG	December 2005	25

Related Recommendation	Action/ Task	Responsibility/ Initiative Lead	Expected Completion Date	Estimated Costs (\$K)
B5.2	Develop Implementation Plan Table of Contents	SC	June 1999	25
	Submission of initial IP	All Treaters	December 2001	1600 ^c
	Annual IP Updates/ Changes Submissions	All Treaters	Annually December	30
	Collate/ Summarize IP Submissions for SC Review	EC	January 2002	25
B6	Communication of TRD Program Commitments to Treaters	CITW, EC	June 1999	20
	Establish Training/ Outreach Program Requirements	WG	June 1999	10
	Deliver Training/ Outreach Programs	WG	June 2000	100
B7.1	Evaluate Participation in Assessment/ IP program	SC	January 2002	5
	Develop Mandatory IP Submission Program	EC	December 2001	30
	Promulgate Mandatory Program (if necessary)	EC	June 2002	↓
	Mandatory Submission IP and Assessment Results (if necessary)	Remaining Treaters	December 2002	
B7.2	Develop Success Criteria	SC	June 2002	10
	Evaluate Success of TRD implementation using developed criteria	SC	January 2006	10
	Develop Mandatory TRD Implementation Program (if necessary)	EC	January 2006	30
	Promulgate Mandatory Program (if necessary)	EC	June 2006	↓
B8.	Evaluate Effectiveness of TRDs implementation in Reducing Toxic Substance Releases	SC	June 2006	25
B9.	Develop New Wood Preservation Chemical Manufacturing Facility Guidelines (under CCME?) based on existing level of performance	SC/EC/Provinces	June 2005	30
B10.	Develop New Treating Facility Guidelines (under CCME?) based on TRDS	EC/ provinces	June 2001	30

	Total Costs		June 1999-2006	
	Reporting/ Administration	Shared		4425+
	TRD Implementation	Treaters		28200

See legend next page

LEGEND

SC: Steering Committee

EC: Environment Canada

CITW: Canadian Institute of Treated Wood

Timber: Timber Specialties Ltd.

VFT: VFT Inc.

WG: Working Groups to be defined by the SC

TRD: Technical Recommendation Documents: “Recommendations for the Design and Operation of Wood Preservation Facilities”

^a Assumes \$5K/yr per plant for 64 plants from June 2001- June 2006 (i.e. 5 reports) and that a standardized calculation methodology is developed by the SC. Monitoring costs are included in the TRD implementation costs.

^b Allows a 10 year implementation plan with 5 years costs reported here. Annual Implementation costs estimated by: Carroll-Hatch; “Socioeconomic Analysis of Environmental Management and Waste Disposal Options for the Canadian Wood Preservation Industry, August 1998”

^c Assumes a \$25K one-time cost for the each of 64 plants for the development of an implementation plan.

6.3 Recommendations for Consumer Treated Wood Products

The implementation of the following 4 recommendations will be overseen by the Chemical Manufacturing and Treating Steering Committee.

Consumer Information Sheets

- C1. It is recommended that all treatment facilities provide distributors of consumer pressure treated wood products with Consumer Information Sheets for distribution with subsequent sale of these products.

Outreach/Education Program

- C2. It is recommended that distributors (retail, wholesale) of consumer pressure treated wood products be informed through an outreach/education program, delivered jointly by CITW and Environment Canada, about the consumer information sheets, purchasing (specifications such as CSA, CITW Aquatic BMPs, etc.), storage/handling and disposal of these products.

Improve Update Consumer Information Sheets

- C3. It is recommended that the Consumer Information Sheets (CIS) be updated to include pertinent best management practice information such as CSA standards, BMPs, etc.

Recycling of Consumer Products

- C4. It is recommended that a strategy/process be developed for dealing with the volume of consumer lumber that may arise in the future. The strategy will include (but not limited to):
technology,
education,
research and development, and
logistics and delivery mechanism.

As a first step:

An evaluation of the current status for collection and recycling opportunities in Canada for Consumer lumber will be completed in approximately 2 years.

6.3.1 Implementation Plan and Estimated Costs for Consumer Treated Wood Products

Related Recommendation	Action/Task	Responsibility/ Initiative Lead	Expected Completion Date	Estimated Costs (\$K)
B1	See Manufacturers Treathers Steering Committee Start-up (Section 6.2.1)	SC	June 1999	
	Develop Costs for Consumer Lumber Program	SC	June 1999	
C1	Consumer Information Sheets Distribution	Retailers	January 2001	TBD
C2	Develop Outreach Program	CITW/EC	December 2000	TBD
	Deliver Outreach Program		December 2001	
C3	Review US Material Safety Sheets	SC	June 2000	TBD
	Review Health Canada Issue Sheets			
	Update Prepare Consumer Information Sheets			
C4	Study Collection/ Recycling Opportunities	SC	June 2000	TBD
	Develop National Waste Consumer Lumber Strategy (coordinate with Industrial Users)	SC	June 2001	

Legend:

- TBD To be determined
- CITW Canadian Institute of Treated Wood
- EC Environment Canada
- SC Manufacturer/ Treater Steering Committee (Recommendation B1)

6.4 Recommendations for Industrial In-service Use and Post-use of Treated Wood

These recommendations have been developed to address the release of CEPA-toxic substances from industrial treated wood while in service and when taken out of service. Industrial users include the railways, electricity industry, telecommunications industry and government highway and roads departments. This set of recommendations describe a comprehensive continuous improvement program anticipated to result in reductions of releases of CEPA-toxic substances: arsenic, chromium (VI), polychlorinated dioxins and furans, hexachlorobenzene, polyaromatic hydrocarbons and creosote impregnated waste material. An immediate benefit of implementing the recommendations is the implementation of a consistent approach to the management of industrial treated wood both in-service and when taken out of service. The goal for the future ensures the users will continue to use treated wood in a manner that is better for the environment. The industrial users will continue to actively seek alternative products and to assess their impact on the environment throughout their entire lifecycle (production to disposal). While a draft guidance document for developing an environmental management system for industrial treated wood was compiled by the Issue Table, it was the Issue Table's intent that a comprehensive review of the document be conducted before publication and use by the industry

Steering Committee

D1. It is recommended that a steering committee made up of representatives from industry, federal and provincial governments, non-government environmental group(s), and other key stakeholders be convened to oversee the implementation of these recommendations. The steering committee will meet at least annually and will be responsible for assigning priorities for studies and programs, accessing funds and support from other appropriate parties and implementing the recommendations as outlined. The steering committee will ensure that implementation costs are equitably shared amongst responsible stakeholders. The terms of reference for the steering committee have been drafted and are appended to this document.

Steering Committee Role

D2. It is recommended that the steering committee undertake the following:

(a) Facilitate the development of guidance with respect to:

- Industrial User Treated Wood Management System (UGD)
- Auditing Procedures
- Evaluation Tools

(b) Identify and work to fill data gaps. For example the following were identified by the SOP Issue Table:

- Creosote rail tie impact assessment (fate/effect of released/lost PAHs)
 - Fate and Impact of arsenic releases from treated wood
- (note: the Issue Table concluded that sufficient information was available on dioxin/furan and hexachlorobenzene released from poles)

- (c) Facilitate the development of technical guidance. For example the Issue Table identified the following requirements:
- Development of guidelines for Siting, Design, Management, Operation, and Monitoring of Treated Wood Storage Facilities;
 - Compiling the existing guidelines for specifying treated wood products (will reference appropriate specifications including the CSA Standards, aquatic BMPs and TRDs);
 - Development of Lifecycle Analysis Methodology for treated wood products and their alternatives;
 - Providing information to users that would allow responsible decision making for treated wood application selection, lifecycle analysis comparisons, siting recommendations, impact mitigation or monitoring requirements.
- (d) Develop and deliver an outreach program. The outreach program will serve to outline the program and describe available guidance to industrial users and will solicit commitment from individual companies.
- (e) Review and evaluate progress of the program in 2006; taking into consideration percent of industry participating (implementation and reporting), percent of “compliance” attained and the trends observed.
- (f) Publication of a report in 2006 summarizing the progress made by the industrial users and the effectiveness of the program. The report will also make recommendations for the continued management of treated wood.

Environment Management System

D3. It is recommended that individual industrial user companies undertake the following:

- (a) Develop a treated wood management system by the end of 2000;
- (b) Implement the management system by the end of 2002;
- (c) Conduct a first self audit and interim progress report by end of 2003;
- (d) Conduct a third-party audit and public report by end of 2005;
- (e) Continue to evaluate alternatives that minimize the impact on the environment (i.e. release of toxic substances).

Public reporting should outline the progress made towards implementing an environmental management system for treated wood including the track one and track two substances in treated wood (As, Cr (VI), PAHs, PCDD, PCDF and hexachlorobenzene) that are:

- purchased annually, and
- removed from service annually;

and including

- estimated releases from in-service treated wood during the reporting year, and
- tracking and documenting out of service treated wood material (% to landfill, % to reuse, % to recycle, etc.).

The form of the public reporting can be via company annual reports, company environmental reports, industry sector reports or posted on company Internet sites.

Alternative Wood Preservatives and Materials

D4. It is recommended that the Steering Committee facilitate the exchange of information and the building of partnerships for lifecycle assessment and analysis of alternative materials and wood preservative chemicals.

Waste Management Strategy

D5. It is recommended that the steering committee facilitate the development of an Industrial Treated Wood Waste Management Strategy and make recommendations regarding its implementation to include:

- Establishment of a waste management hierarchy for treated wood (including: recycle, reuse, energy recovery, landfill);
- A review of technical options;
- Identification of obstacles as well as means to address those obstacles including (but not limited to);
 - regulatory;
 - geographical;
 - public perception;
 - economics;
 - cross-border issues(provincial/federal);
 - technology

In the interim it is recommended that industrial treated wood users as a group commit to reducing the volume of material going to landfill by 20% by the end of 2005 (based on baseline data from 1990 if available; more recent data should be used if 1990 data are not available). Future targets will be developed as part of the wood waste management strategy.

6.4.1 Implementation Plan and Estimated Costs for Industrial User Recommendations

Related Recommendation	Action/ Task	Responsibility	Expected Completion Date	Estimated Costs
D1	Steering Committee Formation	EC	June 1999	\$75K (facilitation) + Individual Travel Costs
	First Meeting	EC	June 1999	
	Develop Schedule of Meetings	SC	June 1999	
	Agree on SC Terms of Reference	SC	June 1999	
	Review Recommendation Implementation	SC	Annually to 2006	
	Assign Activities per Recommendation 2	SC	As required	
	Updating UGD	SC	As required	
	Identifying needs	SC	As required	
	Prioritizing/ Scheduling Activities	SC	As required	
	Coordination of Funding	SC	As required	
D2 (a)	Finalize Industrial Treated Wood Management System Guideline (UGD)	SC	January 2000	\$50K
	Develop Auditing Procedures	SC	January 2003	
	Develop Evaluation Tools	SC	January 2003	
D2 (b)	Creosote Rail Tie Impact Assessment	CN/CP/EC	June 2003	\$200K
	Arsenic Release Impact Assessment	CEA/ Bell/EC	June 2005	
D2 (c)	Guidelines for Storage Facilities	SC	December 2000	\$200K
	Guidelines for Specifying Treated Wood Products	SC	December 2000	
	Lifecycle Analysis Methodology Development/Guideline	SC	December 2001	
D2 (d)	Distribute (UGD)	SC	March 2000	\$50K
	Training Programs / Outreach		October 2000	
D2(e)	Review & Evaluate Progress	SC	March 2006	\$15K
D2(f)	Publish report summarizing progress	SC	March 2006	\$5K

Related Recommendation	Action/ Task	Responsibility	Expected Completion Date	Estimated Cost
D3(a)	Develop Treated Wood Management System	All companies	December 2000	
D3 (b)	Implement Management System	All companies	December 2002	\$3.00/ tie \$23/pole
D3 (c)	First Self Audit Progress Report to SC	All companies All companies	December 2003 December 2003	
D3(d)	Third Party Audit Public Report	All companies All companies	December 2005 December 2005	
D3(e)	Continue to evaluate alternatives	All companies	ongoing	
D4.	Forum for information exchange on alternative materials/ chemicals	SC	June 2003	\$20K
D5.	Establish Waste Management Hierarchy Review Technical Options Identifications of Barriers National Waste Management Strategy Development	SC SC SC SC	December 1999 June 2000 June 2000 June 2001	\$200K
	Total Time Frame		June 1999- March 2006	\$715K+

UGD: Industrial Treated Wood Users Management System Guidance Document

SC: Steering Committee

EC: Environment Canada

CN: Canadian National

CP: Canadian Pacific

CEA: Canadian Electricity Association

Bell: Bell Canada

Telecompanies: All telecommunications companies currently utilizing treated wood in Canada including Bell Canada
Rail Companies: All Rail operators in Canada including CN and CP.

6.5 Minority Views

6.5.1 Canadian Environmental Network

The Canadian Environmental Organizations member of the CEN toxic caucus believes that the best way to prevent further contamination of the environment with dioxins, furans and hexachlorobenzene is to stop the use of the chemicals and the practices responsible for the contamination. Therefore we cannot agree with the recommendations provided in this report regarding the use of pentachlorophenol and pentachlorophenol treated wood. Here is the rationale and the recommendation provided by the Environmental Organizations concerning the use of pentachlorophenol in Canada.

Pentachlorophenol and dioxins, furans and hexachlorobenzene:

>

WHEREAS pentachlorophenol is a major source (175 g TEQ without any data on releases to water) of dioxin, furans and hexachlorobenzene

>

WHEREAS there is a large body of evidence regarding the negative impacts of pentachlorophenol on the environment and human health

>

WHEREAS dioxins, furans and hexachlorobenzene have been identified by the Canadian Toxic Substance Management Policy as Track 1 substances and therefore need to be virtually eliminated from the Canadian environment.

>

WHEREAS penta treated products and penta treatment plants are known sources of dioxins, furans and hexachlorobenzene into the Canadian environment (more than 175g TEQ).

>

WHEREAS it is not feasible from a technical or economical point of view to control and contain dioxins, furans and hexachlorobenzene emissions from treatment plants and treated wood poles.

>

WHEREAS the only realistic way to achieve zero discharge for the Canadian penta treated wood industry is to stop the use, distribution and sale of pentachlorophenol in Canada.

>

WHEREAS pentachlorophenol is banned or severely restricted in at least 26 countries around the world.

>

WHEREAS there are readily available alternatives to the use of penta treated wood (recycled steel, fiberglass, cement made without burning waste)

>

WHEREAS we cannot use risk mitigation measures to reduce the human health and environmental impacts of the use of pentachlorophenol because of the persistent and bio-accumulative nature of the micro-contaminants (dioxins, furans, hexachlorobenzene).

>

THEREFORE we are recommending to the Canadian Government to de-register pentachlorophenol curtailing its sale and use and ensuring that the relevant federal and

provincial agencies require appropriate decommissioning of in-service use of penta treated wood as a means to prevent and stop the releases of dioxins, furans and hexachlorobenzene.

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8.0 APPENDICES

Appendix 1 List of SOP Issue Table Members
List of Working Group Members

Appendix 2 List of Meetings

Appendix 3 List of Wood Preservation Plants

Appendix 4 Manufacturers/ Treaters Steering Committee Terms of Reference
Industrial Treated Wood Users Steering Committee Terms of Reference

Appendix 5 References
Reference List - Arsenicals
Reference List - Creosote
Reference List - Pentachlorophenol

Appendix 6 Wood Preservation SOP Scoping Document

Appendix 1: List of SOP Issue Table Members

Heather Amys/ Ken Montgomery

Toxic and International Issues
Environmental Affairs
Industry Canada

Nigel Banks

Hickson Building Products

John Burrows

Communications & Business Development
Canadian Wood Council

Gilles Castonguay

Ontario Ministry of Environment and Energy
Waste Management Branch

Paul Cooper

Faculty of Forestry
University of Toronto

Wayne Cooper

Cooperative Safety & Environment
BC Tel

Paul Dandy

Hickson Building Products

Michael deGrood

TransAlta Utilities Corporation

Tim Egan

Government Relations
Canadian Electrical Association

Felicity Edwards

The CSE Group
SOP Facilitator

Herbert Estreicher

Covington & Burling
The Pentachlorophenol Task Force

Ed Garay

Bell Co. Ltd.

Gord H. Gilmet

VfT Inc.

Stephane Gingras

Great Lakes United
CEN Toxic Caucus Representative

Julia Langer

World Wildlife Fund

Marc Lapointe

Services Environnementaux
Bell Canada

Ben Lucas

Western Division
Stella-Jones Wood Preserving

Brenda MacDonald

Environmental Policy and Programs,
Nova Scotia Power

Pauline Macura Brown

Prairie & Northern Region
Environment Canada

Bob Mann

Manitoba Hydro
Forestry Section

Thomas Marr

Engineering & Environmental Services, Osmose
Wood Preserving Division

Rick Masterton

CN North America
CN Headquarters

Yohannes Miriam / Linda Urquhart

Environmental Protection, Environment Canada
Regulatory & Economic Affairs Division

Barry Munson

Prairie & Northern Region
Environment Canada

Don Murray

Industrial Programs Section, DOE
New Brunswick

John O'Neill

Municipal Electric Association

Jennifer Rae

Health Protection Branch,
Environmental Substances Division,
Health Canada

Jackie Scott

Office of Environmental Affairs
Corporate Services Sector,
Natural Resources Canada

Don Smith

Civil Engineering, Atlantic Region
Public Works & Government Services Canada

Gus Staats

Environmental Services,
Osmose
Wood Preserving Division

Anne Tennier

Environmental Affairs,
Canadian Pacific Railway

Henry Walthert

Canadian Institute of Treated Wood

John Wilkinson

Vulcan Chemicals

Craig Wilson

Timber Specialties Ltd.

List of Working Group Members

1. Arsenicals

Pauline Macura Brown,
Environment Canada
Nigel Banks, Hickson
Craig Wilson, Timbers
Henry Walthert*, CITW
Marc Lapointe, Bell Canada
Paul Cooper, UofNB/UofT
Stephane Gingras, CEN
Jennifer Rae, Health Canada
Tom Marr, Osmose
Yohannes Miriam,
Environment Canada
Tim Egan, CEA
Ed Garay, Bell Pole

2. Creosote

Pauline Macura Brown,
Environment Canada
Gord Gilmet, VFT
Henry Walthert*, CITW
Ben Lucas, Stella Jones
Anne Tennier, CP
Paul Cooper, Uof NB/UofT
Rick Masterton, CN
Stephane Gingras, CEN
Jennifer Rae, Health Canada
Yohannes Miriam,
Environment Canada

3. Pentachlorophenol

Pauline Macura Brown,
Environment Canada
Herb Estreicher, Vulcan
Ed Garay, Bell Pole
Henry Walthert*, CITW
Marc Lapointe, Bell Canada
Paul Cooper, UofNB/UofT
Jennifer Rae, Health Canada
Stephane Gingras, CEN
Tim Egan, CEA
Yohannes Miriam,
Environment Canada

4. Environmental Control Status

Pauline Macura Brown*,
Environment Canada
Bob Mann,
Manitoba Hydro
Rick Masterton, CN
Anne Tennier, CP Rail
John Burrows,
Canadian Wood Council
Ed Garay,
Bell Pole Co.Ltd
Henry Walthert, CITW
Craig Wilson,
Timber Specialties
Yohannes Miriam,
Environment Canada
Gus Staats, Osmose
Herb Estreicher,
Covington & Burling
Paul Cooper, UofNB/UofT

5. Manufacturing & Treating

Henry Walthert*,
CITW
Craig Wilson,
Timber Specialties
Nigel Banks, Hickson
Paul Dandy, Hickson
Herb Estreicher,
Covington & Burling
Paul Cooper,
Uof NB/ UofT
Gord Gilmet, Vft Inc.
Tom Marr,
Osmose
Yohannes Miriam,
Environment Canada
Stephane Gingras, CEN
Pauline Macura Brown,
Environment Canada
Jennifer Rae, Health Canada
Paul Cooper, UofNB/UofT
John Wilkinson,
Vulcan Chemicals

6. Industrial Users

Brenda MacDonald*,
Nova Scotia Power
Bob Mann,
Manitoba Hydro
Anne Tennier, CP Rail
Rick Masterton, CN
Gus Staats,
Osmose
Herb Estreicher,
Covington & Burling
Marc Lapointe, Bell Canada
Stephane Gingras,
CEN
Yohannes Miriam,
Environment Canada
Jennifer Rae, Health Canada
Pauline Macura Brown,
Environment Canada
Paul Cooper, UofNB/UofT

7. Writing

Pauline Macura Brown*,
Environment Canada
Henry Walthert, CITW

Yohannes Miriam,
Environment Canada

Tim Egan, CEA

Brenda MacDonald

Nova Scotia Power

Felicity Edwards, CSA Group

8. Socioeconomic

Yohannes Miriam,*

Environment Canada

Linda Urquhart, *

Environment Canada[@]

Rick Masterton, CN

Jacques Gagnon, NRC[@]

Jackie Scott, NRC

Miles Constable,

Environment Canada[@]

Pauline Macura Brown,

Environment Canada

Paul Cooper, UofNB/UofT

Henry Walthert, CITW

Marc Lapointe, Bell Canada

Herb Estreicher,

Covington & Burling

Stephane Gingras, CEN

Ken Montgomery,

Industry Canada

* Chair

[@] For first socioeconomic study only

Appendix 2: List of Meetings

Issue Table Meetings

December 1994	Toronto
January 1995	Toronto
June 16/17, 1997	Toronto
December 14/15, 1997	Calgary
June 11/12, 1998	Toronto
October 15/16, 1998	Toronto
March 3-5, 1999	Vancouver

Working Group Meetings/ Teleconferences

1. Arsenicals Working Group

July 2, 1997	Telecon
September 22, 1997	Toronto
November 13, 1997	Montreal
December 8, 1997	Telecon
February 10, 1998	Toronto
March 10, 1998	Telecon
April 6, 1998	Montreal
May 4, 1998	Telecon
June 5, 1998	Telecon

2. Creosote Working Group

July 3, 1997	Telecon
August 28, 1997	Telecon
September 23, 1997	Toronto
November 12, 1997	Montreal
November 28, 1997	Telecon
January 19, 1998	Telecon
February 11, 1998	Toronto
March 16, 1998	Telecon
April 7, 1998	Montreal
April 30, 1998	Telecon
June 2, 1998	Telecon

3. Penta Working Group

July 3, 1997	Telecon
September 22, 1997	Telecon
October 30, 1997	Telecon
November 13, 1997	Montreal
December 8, 1997	Telecon
January 27, 1998	Telecon
February 9, 1998	Toronto
March 9, 1998	Telecon
April 8, 1998	Montreal
May 6, 1998	Telecon
May 12, 1998	Toronto
June 5, 1998	Telecon

4. Environmental Control Status W.G.

August 1997	RFP
Review	
September 30, 1997	Proposal Review
October 10, 1997	Telecon
November 12, 1997	Montreal
January 28, 1998	Vancouver
May 4, 1998	Telecon
May 13, 1998	Toronto

5. Manufacturing & Treaters

September 29, 1998	Toronto
November 23, 1998	Toronto
January 5, 1999	Telecon

6. Industrial Users

September 9, 1998	Telecon
November 24, 1998	Toronto
December 16, 1998	Telecon

7. Writing Group

8. Socioeconomic Group

January 22, 1999	Telecon	July 6,1998	Telecon
February 1,1999	Telecon	July 23,1998	Telecon
March 22, 1999	Review	September 22,1998	Telecon
		September 23,1998	Telecon
		October 7,1998	Telecon
		October 13,1998	Telecon

Appendix 3: List of Wood Preservation Plants

	Company	Location	CCA	CCA/ PEG	ACA	Creo	Creo/ Oil	PCP/ Oil
1	Atlantic Pressure Treating	Fredericton, NB	X					
2	Marwood Ltd.	Truro, NS	X					
3	Newfoundland Hardwoods Ltd.	Clarendville, Nfld.	X					
4	Stella-Jones Inc.	Truro, NS	X			X	X	X
5	BOIS KMS (GMI)ltd.	L'Annonciation, PQ	X					X
6	Deniso Lebel Inc.	Riviere-de-Loup, PQ	X					
7	Goodfellow Inc.	Delson, PQ	X					
8	Le Bois Traitel Ltd.	Riviere-de-Loup, PQ	X					
9	Les Enterprise Gifai	South Durham, PQ	X					
10	Les Industries de Preservation du Bois Ltd.	Mascouche, PQ	X			X	X	X
11	Les Produits Louchel Inc.	Maskinonge, PQ	X					
12	LPB Poles Inc.	Masson-Angers, PQ	X	X				
13	Stella-Jones Inc.	Delson, PQ	X			X	X	X
14	Traitment Sous Pression L.D. Ltd.	St-Raymond, PQ	X					X
15	Goodfellow Inc.	St-Andre Est, PQ	X					X
16	Brandon Forest Products	Scarborough, ON	X					
17	Coventry Forest Products Inc.	Bolton, ON	X					
18	Great West Timber Ltd.	Thunder Bay, ON	X					
19	Guelph Utility Pole Co. Ltd.	Guelph, ON	X	X				X
20	Hilan Wood Preservers	Kemptville, ON	X					
21	Jan Woodlands Ltd.	L'Amable, ON	X					
22	J.A. Briewer (Canada) Ltd.	Cambridge, ON	X					
23	Northern Pressure Treated Wood Ltd.	Kirkland Lake, ON	X					
24	Northern Wood Preservers Inc.	Thunder Bay, ON	X			X	X	X
25	Pastway Planning Ltd.	Combermere, ON	X					
26	RAM Forest products Inc.	Vandorf, ON	X					
27	R. Fryer Forest Products Inc.	Monetville, ON	X					
28	Shelborne Wood Preservation	Shelborne, ON	X					
29	Shamwood Treating Ltd.,	North Bay, ON	X					
30	South River Forest Products Ltd.	South River, ON	X					
31	Total Forest Industries, Ltd.	Aston, ON	X					
32	Trent Timber Treating	Peterborough, ON	X					
33	Trilake Timber Company (1992) Ltd.,	Keewatin, ON	X					
34	Aallcann Wood Supplies Inc.	Prince Albert, SK	X					
35	Armour Wood Products	Edmonton, AB	X					
36	Bell Pole Co. Ltd.	Carseland, AB	X					X
37	Dunmore Wood Preservers Ltd.	Medicine Hat, AB	X					
38	Kootenay Wood Preservers Ltd.	Spruce Grove, AB	X					
39	L&M Wood Products (1985) Ltd.	Glaslyn, SK	X					

	Company	Location	CCA	CCA/ PEG	ACA	Creo	Creo/ Oil	PCP/ Oil
40	Lehner Wood Preservers	Prince Albert, SK	X					
41	Natal Forest Products	Coleman, AB	X					
42	Prendiville Wood Preservers Ltd.	Winnipeg, MB	X					
43	Roblin Forest Products Ltd.	Roblin, AB	X					
44	Rocky Wood Preservers Ltd.	Rocky Mtn House, AB	X					
45	Spray lakes Sawmills Ltd.	Cochrane, AB	X					
46	Sunpine Forest Products Ltd.	Sundre, AB	X					
47	Vermett Wood Preservers	Spruce Home, SK	X					
48	A&A Post and Pail Ltd.	Kamloops, BC	X					
49	Ashcroft Treating Ltd.	Ashcroft, BC				X	X	
50	Brisco Wood Preservers Ltd.	Brisco, BC	X					
51	Western Pacific Wood Preservers Ltd.	Surrey, BC	X					
52	Canada Cedar Pole Preservers Ltd.	Galloway, BC						X
53	Decker Lake Forest Products Ltd.	Burns Lake, AB	X					
54	Goode Industriess	Monte Lake, BC	X					
55	Kootenay Wood Preservers Ltd.	Cranbrook, BC	X					
56	North American Wood Treating Co. Ltd.	Mission, BC	X					
57	Paxton Pacific	Kamloops, BC	X					
58	Princeton Wood Preservers Ltd.	Princeton, BC	X					
59	Rustad Bros. & Co. Ltd.	Prince George, BC	X					
60	Stella-Jones Inc.	Prince George, BC	X				X	X
61	Stella-Jones Inc.	New Westminster, BC	X		X	X	X	X
62	Taiga Forest Products Ltd.	New Westminster, BC	X					
63	Western Pacific Wood Preservers Ltd.	Surrey, BC	X					
64	Western Wood Preservers Ltd.	Aldergrove, BC	X					

Appendix 4:
Proposed Steering Committees Terms of Reference

MANUFACTURERS/TREATERS STEERING COMMITTEE PROPOSED TERMS OF REFERENCE

MANDATE

The mandate of the Steering Committee has been given by the Wood Preservation Sector Issue Table. This Steering Committee is to provide a coordinated and ongoing role in the implementation of the Manufacturing and Treater Recommendations and the Consumer Product Recommendations from the Wood Preservation Sector Strategic Options process as laid out in the Strategic Options report.

WORK PLAN

The work plan is summarized in the implementation plan appended to this document.

OPERATING GUIDELINES

The purpose of these guidelines is to specify the expectations and responsibilities of the parties regarding the work of the Steering Committee. It is recognized that they can and should be amended as needed and that they are intended to provide a guide for the process.

A. Membership

1. The parties represented and the maximum number of members from each party will be as follows:

<u>Party</u>	<u>Maximum Number</u>
Wood Preservative Chemical Manufacturers	4
Canadian Wood Preservation Plants	3
Canadian Institute of Treated Wood	1
Public Interest Groups (eg. non-government environmental groups, academia)	3
Provincial governments	3
<u>Government of Canada</u>	<u>3</u>
Maximum Number of Members	17

The following specific parties will be given the right to first refusal for one seat on the committee:

<u>Organization</u>	<u>Representing</u>
Canadian Environmental Network	Public Interest
Environment Canada	Government of Canada
Health Canada	Government of Canada
Hickson Building Products	Manufacturer
Timber Specialties Ltd.	Manufacturer
Vft Inc	Manufacturer
The Penta Task Force	Manufacturer
Pest Management Regulatory Agency	Government of Canada

3. The steering committee will be facilitated and chaired by a representative of Environment Canada

B. Purpose and Scope of the Steering Committee

4. The purpose of the work of the Steering Committee is to provide an ongoing review function to the chemical manufacturing and treater and consumer products recommendations as presented in the SOR for the Wood Preservation Sector.

C. Timetable and Duration

5. It is anticipated that the steering committee will be in effect until June 2006 at which time the committee will agree on the basis by which it will continue.
6. The Committee members will begin by developing a detailed schedule of work and preparation of necessary technical studies and documents using the attached implementation plan as a guide. If necessary the time periods specified in the implementation plan may be revised by mutual agreement.

D. Structure of the Committee

7. Additional members may be added to the Committee upon the concurrence of the existing members.
8. Working groups may be formed by concurrence of the Committee members to address specific tasks or issues.
 - a) composition of such working groups will be by concurrence of the Committee members.
 - b) the scope of work of the working group will be established by concurrence of the Committee members.
 - c) by concurrence of the Committee, working groups may include persons not part of the Committee.
 - d) except by concurrence of the Committee, working groups will not be authorized to make decisions which bind the Committee.
 - e) all Committee members will be informed of working group meetings
 - f) the working group will report back to the Committee.

E. Scheduling, Agendas and Meeting Notes

9. The parties will establish a schedule of meetings.
10. Agendas will be developed for each session and distributed at least 20 working days before the session.
11. Committee and working group sessions will not be recorded verbatim by electronic or other means.
12. Meeting Notes will be distributed which will summarize the topics under discussion and tasks to be undertaken between sessions.

F. Agreements

13. Agreement shall be reached only upon concurrence of all members.
14. Issues of disagreement will be resolved by vote. Decisions will be reached upon achieving 2/3 majority votes of members present provided that a quorum of 50% of the members are present.

INDUSTRIAL TREATED WOOD USERS STEERING COMMITTEE PROPOSED TERMS OF REFERENCE

MANDATE

The mandate of the Steering Committee has been given by the Wood Preservation Sector Issue Table. This Steering Committee is to provide a coordinated and ongoing role in the implementation of the recommendations from the Wood Preservation Sector Strategic Options process as laid out in the Strategic Options report. In particular this steering committee will oversee those recommendations that apply to industrial treated wood users.

WORK PLAN

The work plan is summarized in the implementation plan appended to this document.

OPERATING GUIDELINES

The following guidelines regarding the work of the Steering Committee are intended to provide a guide for the process without constraining its inherent flexibility.

A. Membership

1. The stakeholders groups represented are the following six: electricity industry, the telecommunications industry, the railways, public interest and environmental groups, provincial governments and the government of Canada.
2. Each stakeholder group will be represented by a maximum of 3 persons. The following organizations will be given the right to first refusal on one seat on the committee:

Bell Canada	(telecommunications)
Canadian Electricity Association	(electricity)
Canadian Environmental Network	(public interest)
Canadian National Railway	(railways)
Canadian Pacific Railway	(railways)
Environment Canada	(government of Canada)
Health Canada	(government of Canada)
3. The steering committee will be facilitated and chaired by a representative of Environment Canada.
4. Additional stakeholders may be added to or removed from the Committee upon the concurrence of the existing members.
5. The wood treating industry will be given observer status at the meetings.

B. Timetable and Duration

6. The Steering Committee will be in effect until at least December 2006 at which time the committee will agree on the basis by which it will continue.

7. The Steering Committee members first task will be the development of a detailed schedule of work

C. Working Groups

8. Working groups may be formed by the Steering Committee to address specific tasks or issues.
9. Membership of such working groups will be by concurrence of the Committee members.
10. The scope of work for the working group will be determined by the Steering Committee.
11. Working groups may include persons not part of the Steering Committee.
12. Working groups will not be authorized to make decisions which bind the Steering Committee.

D. Scheduling, Agendas and Meeting Notes

13. The parties will establish a schedule of meetings.
14. Agendas will be developed for each Steering Committee meeting and distributed at least 20 working days before the meetings.
15. Committee and working group meetings will not be recorded verbatim by electronic or other means.
16. Meeting Notes will be distributed which will summarize the topics discussed and tasks which have been agreed to be undertaken between meetings.
17. Every effort will be made to hold the meetings at equitably distributed locations across the country.

E. Agreements/Decisions

18. Every effort will be made to reach agreement by consensus. In the absence of agreement, the Steering Committee members will vote. Decisions will be made based on a 2/3 majority vote of a quorum of members present at the meeting with an opportunity for the minority to express their views in writing. A quorum will be deemed to exist when each stakeholder group is represented.

F. Reporting

19. Annually the Steering Committee will make a brief report to the Ministers of Environment and Health regarding the progress made with respect to the work plan.

G. Funding

20. The Steering Committee will co-ordinate funding for its activities.

Appendix 5: References

Reference List - Arsenicals

1. **Cooper, P.A.** Leaching of CCA: Is it a Problem? Paper presented at a meeting on Environmental Considerations in the Use of Pressure Treated Wood Products sponsored by the Carolinas-Chesapeake Section of the Forest Products Society and Virginia Tech, Richmond Virginia, May 13, 1993.
2. **Cooper, P.A., et.al.** Relating Degree of Fixation to Leaching from CCA Treated Products. American Wood Preservation Association, 1996.
3. **Evans, Fred G.** Leaching from CCA-Impregnated wood to food, drinking water and silage. Paper prepared for the Eighteenth Annual Meeting International Working Group on Wood Preservation, Honey Harbour, Ontario, May 1987.
4. **Mortimer, W.P. and Cooper, P.A.** Health and Environmental Effects of Treated Wood During the "in-Service" Phase of the Life-Cycle. Paper presented at the CITW and Natural Resources Canada sponsored Life Cycle Workshop, Ottawa, Ontario. June, 1994.
5. **Cooper, P.A. and Ung, Y.T.** Effect of Vegetable Compost on Leaching of CCA Components from Treated Wood - An Update. Paper Presented at the 26th Annual Meeting International Research Group on Wood Preservation, Helsingør, Denmark. June 1995.
6. **Cooper, P.A. et al.** Plant Uptake of CCA Components from Contaminated Soils. Paper presented at the 26th Annual Meeting of the International Research on Wood Preservation, Helsingør, Denmark. June, 1995.
7. **Cooper, P.A. and Ung, Y.T.** Leaching of CCA-C from Jack Pine Sapwood in Compost. Technical Note, Forest Product Journal, Vol.42 No.9. 1992
8. **Cooper, Paul A.** Leaching of CCA from Treated Wood: Ph effects. Forest Product Journal, Vol.41, No. 1. 1991
9. **Cooper, P.A. and McVicar, R.** Effect of Water Repellents on Leaching from CCA Treated Wood. Paper presented at the 26th Annual Meeting of the International Research Group on Wood Preservation, Helsingør, Denmark. June 1995.
10. **Cooper, P.A. et al.** Effect of Water Repellents on leaching of CCA from Treated Fence and Deck Units - An update. Paper presented for the 28th Annual Meeting of the International Research Group on Wood Preservation, Whistler, Canada. May 1997.
11. **Brudermann, G.E. et al.** Management Practices for Treated Wood Poles in North America. Report prepared for Bell Canada. November, 1996.

12. **Brooks, Kenneth M.** Literature Review and Assessment of the Environmental Risks Associated with the Use of Treated Wood Products in Aquatic Environments. Paper presented at the Workshop Treated Wood in the Aquatic Environment. July 1993.
13. **Baldwin, William, J.** Arsenically Treated Wood and its Performance in the Aquatic Environment. Paper presented at the Workshop Treated Wood in the Aquatic Environment. July 1993.
14. **Baldwin, William, J.** Sediment Toxicity Study of CCA-C Treated Marine Piles. Presented at the 90th Annual Meeting of the American Wood Preservers Association. May 1994.
15. **Wendt, Priscilla et al.** A Study of Wood Preservative Leachates from Docks in an Estuarine Environment. Marine resources Division, South Carolina Department of Natural resources. Post March 1994.
16. **Connell, M. and Nicholson, J.** A review of Fifty-five years of Usage of Copper-Chrome-Arsenate (CCA) and CCA-treated Timber. Report prepared for Hickson Timber Products Ltd. 1990.
17. Various Authors. Wolmanized its Good for Life. Brochure compiled and published by Hickson Corporation. No date.
18. Why You Should Have Confidence. The 60 Year Record of Safety, Effectiveness and Conservation Behind Wolmanized Wood Products. Hickson Corporation. No date.
19. Label Wolmanac Concentrate 50%. Registration Number 14502 Pest Control Products Act.
20. Label Wolmanac Concentrate 60%. Registration Number 21226 Pest Control Products Act.
21. **Comfort, Michael.** Environmental and Occupational Health Aspects of Using CCA treated Timber for Walking Track Construction in the Tasmanian Wilderness World Heritage Area. Tasmanian Parks and Wildlife Service, Reproduced and Provided by Hickson Corporation, November 1993.
22. **Stephens, R.W. et al.** Value Assessment of the Canadian Pressure Treated Wood Industry. Canadian Forest Service, Dept. of Natural resources. April 1994.
23. **Millette, Louise.** Les problématiques associées au bois traité chez Bell Canada. Paper presented at the Life-cycle Workshop sponsored by CITW and Natural Resources Canada. June 1994.
24. **Pasel, Eugene.** Treatment of CCA Waste Streams for Recycling Uses. Paper presented at the Life-cycle Workshop sponsored by CITW and Natural Resources Canada. June 1994.
25. **Coomarasay, Coom and Cooper Paul.** Reuse and Recycling of Utility Poles in Highway Applications. Paper presented at the Life-cycle Workshop sponsored by CITW and Natural Resources Canada. June 1994.

26. **Bernadin, Gilles.** *St. Lawrence Cement*. Paper presented at the Life-cycle Workshop sponsored by CITW and Natural Resources Canada. June 1994.
27. **Webb, David and Davies, Donald E.** *Spent Treated Wood Products - Alternatives and their Reuse/Recycle*. Paper presented at the Life-cycle Workshop sponsored by CITW and Natural Resources Canada. June 1994.
28. **Ruddick, John N.R.** *Disposal of Treated Wood Waste*. Paper presented at the Life-cycle Workshop sponsored by CITW and Natural Resources Canada. June 1994.
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32. **Cooper, P.A.** Environmental Impact of CCA/PEG Poles In Service. Report prepared for Bell Canada. December 1994.
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35. Personal Communication **Nigel Banks** to Pauline Brown. Includes Wood Treatment Plant Air Emission data and Summary of Usage History of CCA. August 1997.
36. Label for Hickson Arsenic Acid 75%. Registration Number 24245 Pest Control Products Act.
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44. **Duchesne Marc et al.** *Programme de gestion intégrée du bois traité - Rapport de la Phase I: Recyclage des poteaux traités au pentachlorophénol.* Prepared for St. Lawrence Cement, Les poteaux LPB, Bell Canada, Hydro-Quebec, Canadian National Rail, Canadien Pacifique Rail, Environment Canada. November 1996.
45. **Duchesne Marc et al.** *Programme de gestion intégrée du bois traité - Rapport de la Phase 2: Valorization énergetiques des poteaux traité au pentachlorophénol et des traverses traitées à la créosote.* Prepared for St. Lawrence Cement, Les poteaux LPB, Bell Canada, Hydro-Quebec, Canadian National Rail, Canadien Pacifique Rail, Environment Canada. April 1997.
46. Correspondence from **Craig Wilson**, Timber Specialties to Pauline Macura Brown dated July 28,1997 re: Comments on SOP Socioeconomic Study.

Reference List Creosote

1. **Cooper, Paul A. et al.** *Investigation of the Residual Creosote Content and Leaching of Creosote Components from Creosote Treated Ties Removed from Service.* Report for Environment Canada, June 1994.
2. **Environment Canada & Health Canada.** *Creosote Impregnated Waste Materials Background Technical Report. Priority Substance List Assessment Report. CEPA.* 1993.
3. **Stephens, R.W. et al.** *Wood Preservation SOP Socioeconomic Background Study.* Prepared for Environment Canada, March 1996. (With Comments from the Issue Table memo from Lynda Urquhart dated August 14,1997).
4. **Masterton, R.** (CN Rail) *Correspondence* to P. Macura Brown (Environment Canada) August 1997.
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October 28, 1997.

Appendix 6:
Wood Preservation SOP Scoping Document

Strategic Options Process For The
Wood Preservation Industrial Sector
SCOPING DOCUMENT

1.0 INTRODUCTION

The government of Canada has developed a three stage process to identify potentially toxic chemicals, to assess their hazard to the Canadian environment and population, and to identify and review the options available to reduce the environmental and/or public health hazard posed by the chemicals. This approach consists of establishing: the Priority Substances List (PSL) and performing an assessment for toxicity, establishing the Strategic Options Process (SOP), in which recommendations on the most effective options for reducing exposure to toxic substances are developed and presented to the Ministers of Environment and Health, and finally, establishing and the Options Implementation and Monitoring process, in which the Ministers make decisions on the recommended application and reach agreement with other government departments, provinces and industry on the development, implementation and monitoring of the tool(s) to be used to manage the release of CEPA-toxic substances.

2.0 STRATEGIC OPTIONS PROCESS

The Ministers of Environment Canada and Health Canada are responsible for providing direction for the management of substances which were assessed as being CEPA-toxic under the first Priority Substances List assessment process. To develop and provide this direction, within the context of pollution prevention and sustainable development, Environment Canada and Health Canada have implemented a multi-stakeholder process called the Strategic Options Process (SOP).

The SOP is an open, transparent and consultative process from which a list of recommended options to control or eliminate the release of CEPA-toxic substances to the environment will be developed. To implement the SOP, an Issue Table will be established with members representing all interested/affected stakeholders. Issue Table members will participate in all phases of the process which will culminate in a Strategic Options Report which will encompass the recommendations of the Issue Table for the options to control the releases of toxic substances. This report will be submitted to the Ministers of Health and Environment for implementation and action. Because the SOP is a consultative process, Issue Table members are free to bring any relevant issues to the table for discussion, however, it must be recognized that the scope of the discussion and resulting analysis may be restricted because of overlap with other ongoing legislative initiatives.

The SOP consists of two phases: an Information Gathering phase and an Options Identification and Evaluation phase.

Information Gathering

This phase will produce two products:

- a socio-economic background study, which provides a social and economic profile for an industrial sector or commercial product, and;
- a technical background study, which identifies and assesses the source of the toxic substance(s), identifies the potential environmental and health risks posed by any release, identifies available processes or abatement technologies to mitigate the environmental/health issue, and identifies all current programs which are addressing any aspects of control or mitigation.

Options Identification and Evaluation

The information gathered during the first phase of the SOP will be used to determine the environmental goals and targets and to identify and assess options for meeting them (see Sections 4 and 5). The SOP will identify and evaluate, with key stakeholders, a wide range of tools to prevent or reduce the release of CEPA-toxic substances, including:

- command and control tools (i.e. licenses, quantity controls, performance standards, technology controls);
- market-based tools (i.e. pollution credit trading programs, taxes and charges, financial incentives, environmental liability and deposit/refund systems);
- voluntary tools (i.e. guidelines and stakeholder protocols; environmental quality objectives, informal voluntary reduction plans);
- information provision tools (i.e. environmental/industrial use labeling, technology development and transfer, government reports/inventories, public awareness programs).

After a preliminary screening, the costs and benefits of the most feasible options will be evaluated. Alternatively, a recommendation of no further action may be proposed if other initiatives are adequately addressing the identified environmental and/or health issues. This analysis, along with the recommendations of the Issue Table, will form the basis of the Strategic Options Report (SOR) .

3.0 PRINCIPLES

The following operating principles will guide all SOPs.

1. *Open, Transparent, Inclusive*

At every step the SOP will be open to all partners and stakeholders. It is expected that partners and stakeholders will assume the responsibility for networking with their constituencies. A Public File will be established to ensure access by any interested party to all material generated by the Issue Table. Corporate confidential information, protected under the Access to Information Act, will not be part of this File.

2. ***Timely/Disciplined***

This process will normally be completed in 18 months. At the conclusion of the process an SOR containing recommendations will be sent to the Ministers for decisions on implementation and action.

3. ***Cost-effective***

Cost-effectiveness will be a key consideration when assessing the management tool(s) to be recommended to the Ministers.

4. ***Flexible***

The SOP will be flexible in order to take into account differing environmental/socio-economic conditions and regional differences and in exploring instruments beyond traditional command and control regulations.

5. ***Harmonization***

The process is designed to identify opportunities and to co-ordinate actions for management of toxic substances in the context of federal/provincial harmonization.

6. ***Cross-sectoral Equity***

Through the SOP, the responsibility for toxics control will be allocated across all sectors contributing to the problem. Management tools will be assessed in terms of environmental-effectiveness, cost-effectiveness, competitiveness and other criteria. Therefore, the tool(s) recommended to Ministers may differ within sectors and/or across sectors.

7. ***Defensible/Predictable***

All recommendations will be fully supported by documentation and will follow from established government environmental and health policies. All recommendations to the Ministers will be discussed with stakeholders prior to the submission of the final report to the ministers.

8. ***Life Cycle Management***

All SOPs will implement the concept of lifecycle management of substances. This means that all aspects of a substance's lifecycle, from development and manufacture, through ultimate disposal/destruction, are considered when developing means to control the release of toxic substances to the environment. This approach is also referred to as cradle-to-grave management and is consistent with the concept of pollution prevention, whereby the prevention of releases from industrial activities is preferred to remedial action after the damage has occurred.

4.0 GOAL OF THE SOP

The following generic goal has been established by Environment Canada and Health Canada for SOPs:

The long term goal pursued for the management of toxic substances and addressed by the Strategic Options Process, is consistent with *Sustainable Development* and with the *Toxic Substances Management Policy*.

Sustainable Development:

The definition used by the Government of Canada is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (*Our Common Future*, 1987). Furthermore, sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are made consistent with future as well as present needs. (*Managing for Sustainable Development: A Federal Framework*, May 1995).

Toxic Substances Management Policy:

The Government of Canada has introduced a Toxic Substances Management Policy (TSMP). This policy establishes a precautionary, proactive and accountable framework for dealing with toxic substances. It will be applied to all areas of federal responsibility and will serve as the centrepiece of the Government of Canada's position for seeking to deal forcefully with toxic substances from domestic and foreign sources. The policy calls for virtual elimination from the environment of toxic substances that result from human activity and that are persistent and bioaccumulative. The policy calls for cradle-to-grave management for all other substances of concern that are released to the environment (*Toxic Substances Management Policy*, 1995).

For definitions of terms such as a virtual elimination, "Track 1" and "Track 2", please refer to the *Toxic Substances Management Policy* and its companion documents *Toxic Substances Management Policy-Persistence and Criteria*, and *Toxic Substances Management Policy-Implementation Strategy for Existing Substances*.

With respect to the SOP, the goals will be:

- to pursue virtual elimination from the environment for substances managed under Track 1, and;
- to minimize environmental and health risks, by reducing exposure to, and/or the release of substances managed under Track 2.

Key Highlights of the Goals:

- For substances managed under Track 1, socio-economic factors will help determine their management strategies and implementation timelines but not the goal of virtual elimination.

For substances managed under Track 2, socio-economic factors will help determine the goal and the appropriate management strategies and implementation timelines.

- The goal is consistent with Health Protection Branch's approach as stated in the document *Carcinogen Assessment* (Health & Welfare Canada, 1991). Furthermore, for those substances which were declared human carcinogens or probable human carcinogens, it was recommended in the assessment reports that exposure should be reduced to the extent possible. Details of Health Canada's approach to risk management and acceptable risk are given in the document *Health Risk Determination*, 1993.
- The goal will promote pollution prevention and continuous improvement in the environment.
- The goal provides an appropriate basis for the risk management of substances that exhibit threshold and non-threshold effects.
- The goal recognizes the balance between health, scientific, technical and socio-economic realities of today, in a manner consistent with sustainable development.
- The goal implies that after action resulting from Issue Table recommendations has been taken, monitoring and assessment will be necessary to determine if the desired reductions in the exposure to, and/or release of, toxic substances, have been attained.

5.0 TARGETS

The Issue Table will develop targets and schedules for action that will be measurable steps along the path to the goal. In developing targets, the Issue Table will take into account the following:

- The targets will be quantifiable as they will deal with release reductions and/or appropriate measures, such as a reduction in risk achieved via a reduction in the levels of human exposure.
- The targets will be time-limited as they will be used as milestones for measuring and monitoring progress towards achieving the goal.
- The targets will be "science based".
- In developing targets, Issue Tables will be practicable as they will take into account technical, scientific, health and environmental quality objectives and guidelines, and socio-economic considerations.
- The recommendations, pertaining to regulatory or non-regulatory tools, made by the Issue Table to the Ministers will also set out the targets.

6.0 WOOD PRESERVATION INDUSTRY SECTOR

6.1 Background

Wood preservatives are pesticides used to extend the life of wood used in situations where it is exposed to the elements. The use of wood preservatives has reduced the need for lumber in the utility, telephone, transportation and domestic construction sectors, which in turn reduces the cost of doing business and conserves a natural resource. The pressure treating industry in Canada is a \$547 million industry treating 13% of Canada's lumber consumption. Depending on the preservative and its application, preserved wood can last 5 to 10 times longer than unpreserved wood. These benefits are substantial if the estimated costs of replacing structural members are taken into account.

The environmental and health impacts resulting from the use of heavy duty wood preservatives are associated with site contamination at wood treating facilities, leaching from the storage of treated wood, leaching during the life of the treated product while in service and from the improper use and disposal of out-of-service treated wood.

6.2 Wood Preservatives and the Priority Substances List Assessments

The registration and use of pesticides in Canada are regulated under the authority of the Pest Control Products Act (PCPA), administered by Health Canada through the Pest Management Regulatory Agency (PMRA). As such, pesticides, including wood preservatives, were not assessed under the CEPA Priority Substances List. However, two substances declared toxic under Section 11 of CEPA, have uses as wood preservatives. These substances are inorganic arsenic and chromium (VI). In addition, creosote impregnated waste materials, as well as PAHs which are major components of creosote were declared toxic, as were a number of substances which are unavoidable contaminants in some wood preservatives. These include hexachlorobenzene (HCB), polychlorinated dibenzo-*p*-dioxins (PCDDs), and polychlorinated dibenzofurans (PCDFs).

In all PSL assessments, the wood preservation industry was identified as a significant source of release into the environment of these substances. As a result of these findings, in November 1994, the Ministers of Environment and Health announced that the federal government would initiate an SOP for the wood preservation industrial sector.

6.3 The Toxic Substances Management Policy (TSMP) and the Wood Preservation SOP

By applying the TSMP and its criteria to the wood preservation sector, it has been determined that most of the CEPA-toxic substances under consideration from this sector are candidates for management under Track 2 (Lifecycle Management). However, the wood preservation industry, through both its activities and its products, is a source of release of HCB, PCDDs and PCDFs and these substances have been identified as Track 1 substances with a goal of virtual elimination from the environment.

6.4 Scope of the SOP

In order to clarify the scope for this SOP, two issues must be clearly delineated and addressed. The first critical issue is that of legislative authority and jurisdictional responsibility. Flowing from that is the more technical issue of specifically addressing the releases to the environment of *CEPA*-toxic substances from those areas of the life-cycle identified as subject to a detailed consideration by the SOP.

6.4.1 Legislative Authority

The SOP is mandated to address the complete life-cycle of substances used in the wood preservation industry that were determined to be toxic as defined by Section 11 of *CEPA*. However, as noted earlier, the PCPA has jurisdiction over all activities related to the registration of wood preservatives. Therefore, it is important to delineate specifically those areas of the life cycle which fall under the direct authority of the PCPA and which are thus considered beyond the scope of this SOP. As the PMRA is currently conducting a comprehensive re-evaluation of all heavy duty wood preservatives, any concerns, identified by the SOP, with those releases from life-cycle components under the direct authority of the PCPA, will be referred to the PMRA for consideration during the re-evaluation process.

Wood preservatives, as pesticides, present some unique challenges in terms of their registration and control. Wood preservatives are not applied directly to the environment to achieve their designed action. They are applied to wood, and the wood product is then placed into the environment. Under the authority of the PCPA, the PMRA must assess whether a pesticide product can be used safely, both in terms of human health and environmental impacts. Such an assessment includes consideration of the composition of the product, including by-products, breakdown products, contaminants and proposed use-patterns.

While the PCPA does not regulate and direct all applications of treated wood, the assessment of the potential human health and environmental impacts of the releases from the treated wood in-service, is an integral part of the use-pattern assessment. The assessment of the potential releases from maintenance, reuse and disposal of treated wood is not controlled under the PCPA, as these components of the life-cycle are not currently an integral part of the use-pattern assessment.

In summary, to address the potential human health and environmental impacts from the release of *CEPA*-toxic substances from all components of the life-cycle of wood preservatives, a variety of mechanisms will be required, potentially under several Acts or through voluntary actions on the part of industry. This will require a high degree of cooperation and co-ordination between all the stakeholders to avoid unnecessary duplication of effort.

One aspect of the jurisdictional component of the scope that requires additional clarification is the issue of PCDDs, PCDFs, and HCB, in some wood preservatives. Under the provisions of the TSMP, the management objective for these three Track 1 substances is “virtual elimination from the environment”. As these three substances are contaminants in pentachlorophenol, the question arises as to how this management objective will be addressed through the SOP and the re-evaluation (PCPA) process. Pentachlorophenol, as a compound, was not assessed under the PSL assessment process, and therefore is not within the scope of the SOP. The three Track 1 substances, which were assessed as toxic under the PSL assessment process, are unavoidable contaminants in PCP. The responsibility for the management of these substances in the registered pesticide, consistent with the direction provided by the TSMP, resides with the PMRA. However, clearly these same substances are a major concern under the life-cycle components which are to be examined under the SOP.

With respect to the SOP, full consideration will be given to releases from those life-cycle components within the purview of the SOP. (see Section 6.4.2) The management objective of virtual elimination from the environment would then be considered only with respect to preventing or controlling releases into the environment of those Track 1 substances in emissions and effluents, in treated wood and in contaminated sites. While clearly reducing the levels in the wood preservative product itself would be the preferred option for preventing future environmental releases from treated wood, there remains the problem of releases from the application of the product, from the treated wood currently in the environment, or which will be placed into the environment, as well as from contaminated sites. It is these aspects of the life-cycle that the SOP will address in applying the management objective of virtual elimination of Track 1 substances from the environment that are the result of wood preservation activities and uses.

See Appendix 3 for a brief description of the various legislative instruments which control wood preservatives in Canada.

6.4.2 Life -Cycle components for consideration under the SOP.

Applying the principle of life cycle management to the wood preservation sector, and recognizing the jurisdictional issues discussed above, the scope of the SOP will include a detailed examination of the sources of release to the environment (air, soil, surface and groundwater) of CEPA-toxic substances originating from the following components of this sector:

- chemical manufacture: during the manufacture, storage and transportation of wood preserving chemicals;
- wood treatment process: resulting from the process of treating wood with preservatives and the disposal of waste/excess wood preservative;

- storage of treated wood products: including storage at the treatment facility and all subsequent storage of treated wood products;
- transportation: all transportation of treated wood products throughout their life-cycle;
- in-service use and maintenance: leachates from treated wood throughout its service life, placement of the treated product and *in situ* remediation of the treated wood to extend its service life;
- disposal of treated wood: including all aspects of removal from service, reuse/recycle, remediation and disposal;
- contaminated sites: remediation of currently active contaminated sites including treatment and storage facilities and abandoned sites.

To address the principle of life cycle management, the following five step process will be applied to each of the above components:

- Step 1: identify all sources and quantities of CEPA-toxic substances released from each component;
- Step 2: determine if the identified releases from the wood preservation sector are significant enough to warrant the development and implementation of control options;
- Step 3: identify and assess ongoing programs for their ability to prevent or manage the releases;
- Step 4: identify areas requiring additional attention and develop options to prevent or manage the releases, including setting of targets and use of alternatives;
- Step 5: perform an economic assessment of options and develop final recommendations.

Steps 1 to 3 will occur during the data gathering phase of the SOP while Steps 4 and 5 will occur during the options identification and evaluation phase.

7.0 CURRENT STATUS

The wood preservation sector Issue Table has been established and two meetings have occurred, one in December, 1994 and one in January 1995. These meetings introduced the members of the Issue Table to one another and to the SOP. During the second meeting, two working groups were established (socio-economic and technical) to prepare the two background reports. The terms of reference, membership for the working groups and draft table of contents for the two background reports are in Appendix 1. Appendix 2 is a revised outline of the workplan for the Wood Preservation SOP. Appendix 3 is a table outlining the various responsibilities of federal and provincial legislation in the control of the wood preservation sector.

Formal meetings of the Issue Table were suspended until a series of issues related to the scope of the SOP were resolved between the federal departments of Health and Environment. In the interim, the socio-economic working group completed its task and the socio-economic Background Report is Appendix 4 of this scoping document. The technical working group required input from the whole Issue Table, therefore, other than some preliminary data collection, this working group has suspended further activities until the next meeting of the entire Issue Table, where the members can provide it with the direction that it required.

APPENDIX 1

TERMS OF REFERENCE: TECHNICAL WORKING GROUP

1. Membership

Composed of Members and Corresponding Members with detailed technical knowledge of an area of the wood preservation industry.

2. Tasks

The Technical Working Group will be tasked with identifying, collecting and summarizing information on how, where, and how much the wood preservation industry contributes to the release of the toxic chemicals identified required by the Issue Table to evaluate the options available to reduce the release of toxic substances from the wood preservation industry and uses of wood preservatives. The identification of information will also involve the identification of data gaps.

3. Deliverable

The end result will be a report summarizing information on how, where, and to what extent the wood preservation industry contributes to the release of the toxic chemicals identified, and a list of technical recommendations on how to reduce releases of toxic chemicals from the use of wood preservatives.

4. Interaction with Issue Table

All Terms of Reference and draft final reports will be vetted by the Issue Table before being accepted by the working group. Interim reports will be provided to the Issue Table as requested.

The Technical Working Group will report back to the Issue Table on their progress at each meeting.

The Technical Working Group will also collate Issue Table comments on issues such as the CCME Hazardous Waste Task Force report on the disposal of treated wood, and the updating of Environment Canada's Technical Recommendation Documents.

Outline of the Technical Background Report

A. Scope of Report

1. Chemicals and Compounds of Interest

Chemicals used as, or which are contaminants in, wood preservatives and found to be toxic through the Priority Substances List toxicity assessments.

Table 1. Wood Preservatives Containing PSL Toxic Substances

Wood Preservative	PSL Toxic Substance
Chromated Copper Arsenate	Chromium VI, Inorganic arsenic
Ammoniacal Copper Arsenate	Inorganic arsenic
Creosote	Creosote-impregnated waste materials (contaminated sites), Polynuclear Aromatic Hydrocarbons (major components of creosote)
Pentachlorophenol	Polychlorinated dibenzo-p-dioxins, Polychlorinated dibenzofurans, Hexachlorobenzene (all are contaminants in pentachlorophenol)

2. Intent

The basic intent of this report is to answer the following questions:

- How much of each wood preservative is being released in Canada each year?
- Which aspect of the sector is responsible for these releases?
- Where do most of the releases occur?
- Are these releases significant for the environment or humans?
- How can these releases be reduced to non-significant levels?

The socio-economic report will address the issue of the economics associated with the various technological and societal approaches that can be taken to reduce releases.

B. Sector Description

1. Scope of the Wood Preservation Sector

Activities included in this sector

- transportation, treating, storage, industrial and domestic uses, re-uses, maintenance of in-service wood, site remediation, disposal/destruction of treated wood, soil and preservative.

2. Process Description

(a) Treating/Manufacturing Process Diagram

Block diagram showing life cycle of preservatives including extraction, main process steps, products, byproducts, intermediates and typical operating conditions, uses, re-uses, disposal/destruction.

(b) Detailed estimations with diagrams indicating the major sources of releases from the sector to air, water, soil and as waste.

(c) Uses and Users of Substances

- Principal Uses
- creosote, ACA, CCA, pentachlorophenol

- Principal Users/Manufacturers/Handlers
- railways, utility companies, telephone companies, aqueduct fabricators, marina operators, Public Works Canada, Fisheries and Oceans Canada, Transport Canada, Ports Authorities, retail lumber outlets, domestic users, chemical manufacturers, treaters, transportation companies, disposal companies and remediation companies.

C. Sector Emission Profile

1. Wood Preservatives or Contaminants

- (a) Sector releases
 - Locations, processes and operations contributing to releases
 - Estimated quantities released
 - Method of release (spill, leaching, fugitive emission, etc.)
 - Percent distribution to air, water, soil and waste
 - Percent of total quantity released
 - Canadian NPRI data
 - Impacts of releases
- (b) Provinces in which releases from sector occur
 - Chemical
 - Quantity released
 - Percent of total released

D. Summary of Relevant Properties, Fate and Effects, and Hazard Thresholds

1. Wood Preservative or Contaminant "X"

Include the most important elements from previous assessments that cause this substance to be considered toxic.

- Physical and chemical properties
- Environmental fate (distribution/fugacity, degradation, uptake)
- Human health related effects from active ingredient/contaminant
- Environment/ecosystem related effects from active ingredient/contaminant
- Conclusion of PSL assessment
- Evidence on significance of preservative releases to environment and humans
- Hazard thresholds for preservatives/contaminants

E. Technology and Material Review

- (a) Review of technology, practices, alternative chemicals and materials currently available and easily available to reduce releases from specific areas of the sector.
 - chemical manufacturers
 - treaters
 - power and telephone industry
 - miscellaneous industrial users
 - railway industry
 - government users
 - domestic uses
 - recycling and re-use of treated products
 - disposal/destruction of treated wood, contaminated soil and preservative

F. Current Approaches Being Taken to Reduce Releases

1. Wood Preservative or Contaminant "X"

(a) Regulatory

Federal

- Description of legislation
 - Canadian Environmental Protection Act
 - Fisheries Act
 - Pest Control Products Act
 - Transportation of Dangerous Goods Act

Provincial

- Description of legislation, waste management and licensing requirements for treaters, waste handling, disposal, recycling

USA

- Description of legislation (FIFRA, RCRA, SARA)

Other jurisdictions

- Description of relevant legislation from the EU, Australia, New Zealand

(b) Voluntary

Industrial/User initiatives to reduce releases

- treaters
- power and telephone industry
- railway industry
- government users

2. Existing Sectoral Approaches/Programs and Strategies

(a) Regulatory

- Federal

- Description of programs

- Accelerated Reduction of Environmentally Toxic Substances
- National Pollutant Release Inventory
- Priority Substances List toxicity assessments
- Toxic Substances Management Policy
- Pesticide Evaluation and Re-evaluation
- Development of Environmental Quality Guidelines (water, soil and sediment) for environmental protection and site remediation
- follow-up program for the National Contaminated Sites Remediation Program
- Development and Demonstration of Site Remediation Technology program
- CCME Hazardous Waste Taskgroup - Development of the Code of Good Practice for the Disposal of Treated Wood

- Provincial
 - Description of programs
 - Alberta Help End Landfill Pollution program
 - follow-up programs for the National Contaminated Sites Remediation Program
 - Ontario's MISA program
 - CCME Hazardous Waste Taskgroup - Development of the Code of Good Practice for the Disposal of Treated Wood
 - USA
 - Description of programs under FIFRA, RCRA, SARA
 - Other Jurisdictions
 - Description of programs
- (b) Voluntary
- Industrial/User initiatives to reduce releases

G. Areas of Potential Concern for Sector

The intent here is not to address the concern in detail but rather to table it for further consideration and discussion. Concerns for all involved in the process should be listed. In that way the SOP will be more likely to address all of the concerns tabled. Concerns may include a particular risk for a particular population or region, a specific use or a particular industrial practice. For example, the Department of Fisheries and Oceans may have concerns that the use of creosoted timbers in Pacific waters are having a negative impact on salmon fisheries, and the utility pole users have concerns that PCP may be removed from the market when the alternatives (either chemicals or materials) have not been proved to their satisfaction. All concerns should be expressed in cogent and specific terms and be related to one or more targeted substances or substances of concern.

Concerns associated with the following aspects of the industry

- Manufacturers of chemicals
- Consumers
- Workers
- Environmental/Health Non-government Organizations
- Industrial Users
- Governments - federal and provincial

H. List of Data Gaps

- There is a general lack of information on the environmental/human health impacts of treated wood in service for a variety of uses i.e. marine pilings, utility poles, wood basements.
- The PSL assessments of creosote-impregnated waste materials, arsenic, chromium, PAHs, dioxins, furans and hexachlorobenzene did not, or could not due to the lack of data, address the environmental problems related to treated wood removed from service.
- There was no information on impacts of wood preservatives either spilled or leached from wood on soil-dwelling organisms.

- There was no information on the potential environmental or human health impacts of reusing treated wood for purposes other than the original use.
- There was no information on the amounts of wood preservatives likely to leach from wood sent for disposal.
- The question remains whether creosote treated wood removed from service constitutes a hazardous waste and therefore, requires special treatment.
- There is much interest in developing a system, or set of systems, for removing wood preservatives from contaminated soils, either on-site or at a disposal facility.
- No information was collected or assessed on the environmental and human health effects of PCP. There is a large database on the toxic effects of PCP to aquatic organisms, and recent research has indicated widespread contamination of humans with PCP in the USA and Canada.

TERMS OF REFERENCE: SOCIO-ECONOMIC WORKING GROUP

1. Membership: Any Issue Table Members or Corresponding Members with knowledge of the wood preservation industry, the users of preserved wood or the manufacture or import of wood preservatives. The Environment Canada Scientist and Economist will belong to the Working Group.

2. Tasks:

- To identify, collect, and summarize market and other socio-economic information on the wood preservation industry and its upstream and downstream linkages to other sectors.
- To identify any gaps in background socio-economic information
- To assist in directing any socio-economic studies carried out by consultants for the working group.
- To work together with the technical working group to evaluate the costs and benefits of technologies, materials, and management options.

3 Deliverables:

- Socio-economic Background Study - basic information on the wood preservation industry and its upstream and downstream linkages to other sectors.
- Strategic Options Report - Describing the options considered, the reasons for rejection and recommended course of action

4. Interaction with Issue Table

- All terms of reference and draft final reports will be vetted by the full Issue Table before being accepted by the working group. Interim reports will be provided to the Issue Table as requested.

WOOD PRESERVATION SOP SOCIOECONOMIC BACKGROUND STUDY: TO FILL INFORMATION GAPS

Background

The federal government is leading a Strategic Options Process (SOP) for the Wood Preservation Sector. The objective of this SOP is to develop recommendations for the Ministers of Environment and Health and for responsible provincial/territorial ministers on actions to prevent pollution from the wood preservation industry in Canada. This study represents a preliminary step leading up to the formulation of recommendations. Proposals are hereby requested to conduct a background socioeconomic study on this sector.

Scope

The scope of this work is confined to the sectors of the economy dealing with the following heavy duty wood preservatives: creosote, pentachlorophenol (PCP), chromated copper arsenate (CCA), and ammoniacal copper arsenate (ACA).

Objective

To collect, analyze, and report background socioeconomic information on the heavy-duty wood preservation industry.

Statement of Work

The contractor will provide a written report following this outline:

1. Description of wood preservation industry structure
 - a. Describe the linkages of the wood preservation plants to upstream industries such as wood harvesting and chemical manufacturing.
 - b. Describe the linkages of wood preservation plants to downstream industries such as wholesalers and retailers of treated wood.
 - c. As an example of the industry structure, provide a life cycle schematic diagram for a piece of creosote-treated wood. Indicate where environmental releases might occur.
 - d. Working from the Carroll Hatch report, compare the current situation to 1992.
 - i. How many wood treatment plants are now in operation?
 - ii. How many new plants opened? How many have closed since 1992?
2. Production and Consumption trends
 - a. Describe the major industry trends, such as the movement from oil borne to waterborne preservatives; and the shift in demand, from industrial to consumer lumber markets.
 - b. Does level of economic activity in the wood preservation sector follow the business cycle? (Show correlation of supply, demand, prices, and exports with business cycle on graphs)
 - c. Assess the potential for technological change in wood treatment technology, including:

- i. Raw materials -- preservatives and wood
- ii. Developments in treatment plant design
- iii. New methods for installation and maintenance of treated wood
- iv. Disposal techniques

3. Treated Wood Presently In-Service

Estimate the quantities of treated wood currently in-service:

- a. Consumer Lumber
- b. Industrial Construction and Lumber
- c. PWF Lumber
- d. PWF Plywood
- e. Utility Poles
- f. Railway Ties
- g. Land/Fresh Water Piling
- h. Marine Piling
- i. Round Poles
- j. Other

4. Waste Disposal

- a. In addition to the forecast by Carroll-Hatch in the report entitled *A Provincial Code of Practice for the Management of Post-Treated Wood*, of the volumes of wood coming out of service, how much wood is now in storage, waiting for disposal?
- b. Estimate the costs for each method of disposal, for post-treated wood, pesticide containers, and other waste products.
- c. Assess the environmental effectiveness of each type of disposal method

5. Case Studies of Contaminated Sites

Investigate 3 contaminated sites that were cleaned up under the National Contaminated Sites Remediation Program. The choice of the sites must be approved by the Steering Committee. For each site, provide the following information:

- a. General description of site.
- b. How did this site become contaminated?
- c. Which clean-up method was chosen?
- d. How long did the clean-up take?
- e. How much did it cost?
- f. How effective was the clean-up?
- g. What should have been done to prevent this contamination from occurring?

6. Competitiveness of Canadian heavy-duty wood treatment industry

- a. Canadian industry share of world market for treated wood
- b. Comparative production costs and productivity of labour and capital of Canadian industry relative to United States
- c. Key government policies which affect Canadian industry competitiveness (taxes, subsidies, regulations)
- d. Other factors impacting on competitiveness (access to capital, availability of skilled labour & management, infrastructure, etc.)
- e. Which are the key variables that will impact future production, markets, and competitiveness?

Methodology

To be determined by the contractor. The methodology should be described in detail in the project proposal. It may involve literature review, expert interviews, focus groups, or other techniques.

References

In conducting the study, the contractor should consult the relevant literature including, but not limited to, the following reports:

1. Carroll-Hatch (International) Ltd., *Provincial Code of Practice for the Management of Post-Treated Wood*, February 28, 1995.
2. Carroll-Hatch (International) Ltd., *Value Assessment of the Canadian Pressure Treated Wood Industry*, April 1994, mimeo.
3. Frido Consulting, *Update of the Wood Preservation TRDs*, April 1995, mimeo.
4. Forest Products Society, *Environmental Considerations in the Manufacturing, Use and Disposal of Preservative-Treated Wood*, 1994.
5. Canadian Council of Ministers of the Environment, *The National Contaminated Sites Remediation Program: 1993-94 Annual Report*

[Issue Table members may suggest that other studies be added to the list.]

Project Management

The project will be managed and directed by the Socioeconomic Working Group for the Strategic Options Process, Wood Preservation Sector. All communications between the consultant and the working group will be coordinated by the Chair of the Socioeconomic Working Group.

Milestones

- A Progress Report will be submitted to the Scientific Authority at the beginning of each month.
- The Draft Final Report will be submitted 4 months after commencement of the project. The Steering Committee will provide comments on the draft report in writing.

- 20 copies of the Final Report will be submitted 1 month after the receipt of comments from the Steering Committee.

Deliverables

- Progress Report, Draft final report, Final report (20 paper copies plus electronic copy in software compatible with WordPerfect for Windows)

APPENDIX 2

DRAFT WORK PLAN

September, 1995	IT Meeting, review progress of working groups and discuss contents of reports
October, 1995	First draft Technical Background Report
November, 1995	First draft Socio-economic Background Report
January, 1996	IT Meeting - Review and discuss options reports
April, 1996	IT Meeting - Discuss Options Draft Report
June, 1996	IT Meeting - Discuss Final Options and final review of reports
July, 1996	Consultation on recommendations
August, 1996	Submission of the SOP Report to the senior managers in EC and HC

APPENDIX 3
THE SCOPE OF VARIOUS ACTS WITHIN THE STRATEGIC OPTIONS PROCESS FOR THE WOOD PRESERVATION INDUSTRY

CHEMICAL MANUFACTURE	PCP ACT COVERS	CEP ACT COVERS	TDG ACT COVERS	FISHERIES ACT COVERS	PROVINCIAL REGULATIONS COVER
Solid Waste - soil and off spec product Storage - point of release of chemicals Process Stacks Loading/Unloading Facilities Fugitive Emissions Transport of Product	Chemical Specifications Types and concentrations of micro-contaminants	Impacts on non-target organisms and ecosystems from the release of toxic substances on Schedule I.	Quantities and types of compounds, methods to move quantities of chemicals.	Impacts on fish or fish-bearing waters from facility releases.	Some provinces enforce the fisheries Act and the TDGA. Some provinces have licenses that regulate process stack, loading facility and air emissions.
TREATERS	PCP ACT COVERS	CEP ACT COVERS	TDG ACT COVERS	FISHERIES ACT COVERS	PROVINCIAL REGULATIONS COVER
Operating Procedures Storage on-site of chemicals Decommissioning of Facilities Design Standards Best Management Practices - handling - waste management Permitting and Licensing	Application rates Species of wood to be treated with what chemical Storage of products Labeling - limitations of use for the products Labeling - Conditions of use, personal protection for facility workers Disposal of surplus product and containers	Technical Recommendation Documents for methods of design and operation to minimize release of contaminants.		Impacts on fish or fish-bearing waters from facility releases.	This area of the wood preservation industry is tightly controlled by some provinces, others have no licensing requirements and do not regulate the treating industry. Others have requirements on the handling, disposal, transportation and storage of wastes.

IN SERVICE USES	PCP ACT COVERS	CEP ACT COVERS	TDG ACT COVERS	FISHERIES ACT COVERS	PROVINCIAL REGULATIONS COVER
Effectiveness of Uses Vegetation Uptake (Soil contamination) Leachates Aesthetics Degradation of product - biological & chemical Life of wood and contribution of releases Maintenance Application Standards - User specifications Compatibility with hardware Occupational Exposure of Users In-service remedial treatment Releases to environment - soil & water Incidental Contact	Information on leaching to determine release rates and safety of the products Dislodgeable residues to determine potential problems with contact	Impacts on non-target organisms, plants and ecosystems. Contamination of water supplies (water quality guidelines for specific compounds).		Impacts on fish or fish-bearing waters from treated structures.	Site specific uses for treated wood is within the mandate of the provinces to regulate. The provinces can regulate the use of pesticides over and above the PCPA.
DISPOSAL	PCP ACT COVERS	CEP ACT COVERS	TDG COVERS	FISHERIES ACT COVERS	PROVINCIAL REGULATIONS COVER
How to dispose of treated wood removed from service, waste soil, and operating wastes Chemical recovery. Economical disposal options. Options available across Canada. Permanent disposal solutions. Landfill criteria for wood preservatives in wood, soil, etc. Problems with and potentials for common processes for destruction/disposal. Emerging technologies.	Directions on label to dispose of production wastes in an environmentally safe manner.	Disposal of hazardous wastes Development of Codes and Guidelines Development of disposal technologies	Transportation of wastes - quantities and types.		Transportation of wastes, allowable disposal options, storage of wastes. Provinces can develop landfill criteria. Control of solid waste disposal facilities, treatment facilities and landfill management.

RE-USE OF TREATED PRODUCTS	PCP ACT COVERS	CEP ACT COVERS	TDG COVERS	FISHERIES ACT COVERS	PROVINCIAL REGULATIONS COVER
Nationally acceptable options for re-using treated wood removed from service. Market acceptance. Who should do the recycling. Problems associated with the transportation of potentially hazardous waste. Impacts on health and environment. Retreatment of a product and cross contamination. Emerging technologies.	Retreatment of preserved wood with a registered pesticide. Evaluation of new formulations or products.		Transportation of hazardous products and wastes -quantities, types and methods.		Provinces are responsible for most waste management, recycling incentives and programs. Provinces enforce TDGA. Provinces could specify re-use conditions for treated wood.
TRANSPORTATION	PCP ACT COVERS	CEP ACT COVERS	TDG COVERS	FISHERIES ACT COVERS	PROVINCIAL REGULATIONS COVER
Transportation rules for concentrated chemicals, treated products, and wastes. Transportation of wastes based on environmental hazard of the chemical that is leachable or releasable.			Transportation of hazardous products and wastes - quantities, types and methods.		Provinces enforce TDGA.
CONTAMINATED SITES REMEDIATION	PCP ACT COVERS	CEP ACT COVERS	TDG COVERS	FISHERIES ACT COVERS	PROVINCIAL REGULATIONS COVER
Clean up of abandoned sites across the country. Equal application of rules to remediate contaminated areas at facilities. Standards to identify contaminated sites and for remediation criteria. Available technology to clean sites. Federal/Provincial harmonization to clean up sites.		Management of hazardous wastes with a national approach. Development of national standards for identification and remediation criteria (through CCME). DSERT program designed to assist in the development of new technologies.			Provinces have sole jurisdiction for the remediation of contaminated sites. Provinces involved in the remediation of many contaminated wood preservation facility sites. Many done at provincial expense, many done via control orders on industry, some done with cooperative arrangements with industry, some orphan sites done with aid from the federal government.

STORAGE OF TREATED PRODUCTS	PCP ACT COVERS	CEP ACT COVERS	TDG COVERS	FISHERIES ACT COVERS	PROVINCIAL REGULATIONS COVER
Storage procedures to avoid contaminating sites. Clean up of storage sites. Clean up methodologies for storage areas based on chemicals.					Some provinces have developed facility licenses that cover storage and handling of chemicals. Waste regulations can ensure that spills are cleaned up.
MAINTENANCE	PCP ACT COVERS	CEP ACT COVERS	TDG COVERS	FISHERIES ACT COVERS	PROVINCIAL REGULATIONS COVER
Re-treatment with wood preservatives. Mixing of wood preservatives may cause disposal problems. Handling practices. Worker health concerns.	Registration of wood preservatives for remedial treatment of wood				Some provinces have developed facility licenses that cover handling practices for treated wood.