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BEST MANAGEMENT PRACTICES FOR WOOD TREATMENT FACILITIES

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Summary

In 2000, Environment Canada, in cooperation with the wood preservation industry, initiated a voluntary process to have all wood treatment facilities in Canada implement a guideline *Recommendations for the Design and Operation of Wood Preservation Facilities* (commonly referred to as the "TRDs"). This paper covers the details of the voluntary program to date including the current status of the program and implementation by the facilities. A baseline assessment conducted in 2000 determined that average compliance with the TRDs ranged from 65 percent to 78 percent depending on preservative. Current compliance with the TRDs is approximately 87 percent.

1. History of Program

Chemicals have been utilized in the preservation of wood for many, many years. Over time the preferred preservatives have changed but the basic principle has remained the same; in order to effectively preserve wood, the chemicals utilized must be toxic to the organisms that deteriorate wood. Given the toxicity of wood preservatives, it has been recognized that facilities must work to reduce or eliminate releases and minimize exposure to workers. The legacy of contaminated sites across the country resulting from early wood preservation activities attests to the need to implement pollution prevention practices at current wood preservation facilities. In 1984, Environment Canada initiated a steering committee of wood preservation stakeholders in order to develop a guideline for wood preservation facilities.

In 1988, the first guidelines for wood preservation facilities were published. The guidelines consisted of five documents (referred to at the technical recommendation documents or TRDs) that covered the preservatives used at that time: Chromated Copper Arsenate (CCA), Ammoniacal Copper Arsenate (ACA), Pentachlorophenol (PCP), Pentachlorophenol Thermal (PCPT), and Creosote. Although a set of comprehensive guidelines for wood preservation facilities existed, no formal program for implementation of the guidelines was established. The objective of the steering committee was to have the guidelines applied to all new wood preservation facilities, and that existing facilities would voluntarily adopt the guidelines. This approach resulted in implementation of the guidelines by relatively few facilities.

As experience in the application of the TRDs was gained, new technologies became available, and regulations changed, it became necessary to update the original TRDs. In

1995, that process was initiated. The outcome of this process was a consolidated document that contained all the TRDs in one binder. A new layout was also developed with a general section that covered principles and practices that were common to all preservatives. This section was then followed by preservative specific sections covering the five original preservatives: Chromated Copper Arsenate (CCA), Ammoniacal Copper Arsenate (ACA), Pentachlorophenol (PCP), Pentachlorophenol Thermal (PCPT), and Creosote. Also included was a brief Legislative Summary as an Appendix. The intention was to have all facilities voluntarily implement the TRDs, and a more structured program established.

2. Implementation Program

Concurrent with the development of the TRDs, a process called the Wood Preservation Strategic Options Process (SOP) was underway. Under the Canadian Environmental Protection Act (CEPA 1988) the following substances were declared to be CEPA Toxics: Chromium VI, Inorganic arsenic compounds, (PAHs), Creosote-impregnated waste materials, Dioxins, Furans, Hexachlorobenzene. These substances are found in the following wood preservatives:

Table 1: Toxic Substances Found in Wood Preservatives

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

Any substance that is deemed a CEPA toxic substances must then go through a risk management process to ensure the risk is minimized. This risk management can be done via a sector approach, a substance approach, or a combination of the two. Although the toxic substances in Table 1 are released to the environment from many sources, it was recognized a portion of the risk could be managed by working with the wood preservation sector. Thus began the wood preservation strategic options process (SOP).

The first step in the SOP was stakeholder consultation. The consultation process included the collection of additional data, the discussion of potential management approaches and the establishment of a recommendations guide for the risk management of these toxic substances. This culminated in the publication of the *Strategic Options for the Management of CEPA-Toxic Substances - Wood Preservation Sector, Report of Stakeholder Consultations* (Environment Canada 1999). This document outlined 52 recommendations that addressed: general issues related to cooperation with the Pest Management Regulatory Agency (PMRA) and the provinces; releases associated with

wood preservative manufacturing; releases related to wood preservation facilities; Treated wood use (industrial & consumer-based) and the management of treated wood waste.

The recommendations related to releases from wood preservation facilities thus lead to the more structured, albeit voluntary, TRD implementation program mentioned earlier. Although participation in the program was deemed voluntary, it was clearly indicated to all stakeholders that failure to effectively manage releases of toxic substances from wood treatment plants could result in the imposition of a regulatory control under the CEPA 1999.

In February 2000, the TRD implementation program was initiated with a series of information sessions for wood preservation facilities taking place across the country. During these sessions, the requirements of the implementation program were clearly outlined:

1. Assessment of all facilities across Canada against a TRD auditing protocol in the year 2000.
2. Development and submission by Dec. 31, 2001 of implementation plans by the facilities to address all deficiencies outlined in their 2000 assessment.
3. Annual reporting by Dec. 31 of each subsequent year to indicate progress towards implementation of the TRDs.
4. Random audits of a portion of the facilities each year to verify progress.
5. Full implementation of the TRDs at each facility by Dec. 31, 2005 including a final audit.

In order to maintain a level playing field, and to ensure full participation in the voluntary program, it was decided that any facility that missed a step would be subjected to the pollution prevention provisions of CEPA 1999.

Upon completion of the information sessions, the baseline assessment of compliance with the TRDs was conducted. A total of 66 plants with 135 treatment cylinders were assessed by an independent third party. The results of each assessment were kept confidential and facilities received a copy of their individual results outlining which deficiencies must be addressed. Overall, the national average was 66 deficiencies per plant. The key highlight from the assessment process is summarized in the following statement from the summary report: “Fundamental to the improvement of the status of the industry is the need for increased knowledge by many management and/or operating personnel…”. Following the assessment process, facilities also indicated that they need more detailed technical information. An additional guidance document *Technical Guidance Document for the Development of TRD Implementation Plans for the Wood Preservation Sector – May 2001* was produced.

Table 2 contains the consolidated results of the assessment program by preservative. From this we can see that the minimum score was 26 percent compliance in the practices section for CCA while the maximum score was 95 percent in the design section for PCP. We can also see that the overall scores ranged from 65 percent for CCA to 78 percent for PCPT.

Table 2: Average National TRD Conformance Levels by Preservative Facility

Preservative Facility	Average National TRD Conformance Levels (%)								
	Design Sections			Practices Sections			All Sections		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
CCA	91	37	66	92	26	63	90	32	65
Creosote	73	42	65	89	55	74	79	60	69
PCP	95	43	66	92	27	69	93	36	68
PCPT	-	-	78	-	-	79	-	-	78

Looking at the distribution of facilities by total score, as found in Table 3, we see that there were six facilities that scored in the 31 to 40 percent conformance range and only one facility that scored in the 91 to 100 percent range.

Table 3: Distribution of Facilities by TRD Conformance Level

Preservative Facility	Number of Facilities by 10% Increment of Conformance for All Sections of the Assessment Protocol							
	20-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
CCA/ACZA	-	5	6	15	12	12	14	-
CREO	-	-	-	2	2	3	-	-
PCP	-	1	1	3	2	3	3	1
PCPT	-	-	-	-	-	2	1	-
Total Industry	-	6	7	20	16	20	18	1

The next step in the process was for the facilities to then develop implementation plans to address the deficiencies at their facility. These plans had to be submitted by all the facilities by Dec. 31, 2001. Only one facility did not complete this step and they were informed that they would be subjected to the pollution prevention (P2) provisions of the CEPA 1999. The implementation plans were analyzed by the independent third party to determine if the facilities had a sufficient plan to address their deficiencies. This was a complex task and required follow-up with most facilities to clarify certain issues in their report. Some reports were very detailed showing true commitment to the voluntary

program while others lacked detail. Of the 65 implementation plans that were received, 62 were deemed acceptable while three required extra work. Significant dialogue with these three facilities was undertaken to address outstanding concerns. The overall results of the implementation plans indicated that the facilities would move from an average compliance of 65 percent in 2000 to an average of approximately 85 percent by the end of 2002.

Now that the path towards conformance with the TRDs was now established, the facilities were required to put their plans into action. To ensure that this occurred, the facilities were required to submit annual reports by December 31 of each year. The results from a review of the 2002 annual reports indicated that:

- 2 plants had shut down.
- 7 plants would be replaced by new ones.
- 11 plants showed insufficient progress and needed further encouragement.
- 9 plants were compliant with the requirements or very close to it.
- Projected progress was 85 percent but actual was 80 percent.

Although progress was continuing to be made at all facilities, the April 3, 2002 announcement concerning the registration of CCA in Canada had a major impact on the TRD implementation program. This announcement made by the PMRA stated "The manufacturers of wood treatment chemicals have agreed to make a transition away from the use of Chromated Copper Arsenate (CCA) in treated lumber destined for the non-industrial market by December 31, 2003" (PMRA 2002). This meant that a large portion of treated wood production in Canada would need to switch from CCA to the newly registered alternative preservatives alkaline copper quaternary (ACQ) or copper azole (CA-B).

The effect of this announcement had both negative and positive implications on the TRD implementation program. Although many items were delayed or changed, facilities were able to go a lot farther and move a lot quicker because of major changes required to switch preservatives. By the summer of 2003 it was estimated that 60 percent of CCA treatment capacity had been converted to one of the new alternatives.

To ensure that the voluntary program continued to meet the intended goal of having all facilities compliant with the TRDs by Dec. 31, 2005, a random site visit program was also undertaken. During the summer of 2003, nine facilities were visited. These visits allowed the independent third party to determine if changes that had been made at facilities met the TRD requirements. It also provided an opportunity to provide advice and coaching to poorer facilities. These visits were well received by the facilities who indicated their intent to continue to participate in the voluntary program.

By 2003, significant changes in the wood preservation industry were clearly evident. The 2003 annual reports found that:

- 63 facilities were now in program.
- 2 facilities had not made sufficient progress would be subjected to P2 provisions.
- 4 facilities had closed/consolidated.
- Compliance was somewhat polarized with:

- 10 plants significantly behind on their implementation plans
- 12 plants compliant or very close

This polarization in the industry suggests that there will likely be additional facilities subjected to P2 provisions in 2004. However, although some facilities continue to lag, overall compliance was determined to be about 87 percent. This is a significant change over the 2000 compliance levels.

3. New TRDs

As mentioned above, the April 3, 2003 announcement concerning the future use of CCA in Canada resulted in major changes to the industry. To facilitate the transition to the new preservatives, as well as to continue to ensure the implementation of best management practices by wood preservation facilities, the TRDs were again updated in 2004. The same format as 1999 TRDs was still used and only a few, relatively minor changes to existing sections were made. The main changes were the additions of sections governing the use of ACQ, CA-B and Borates. A CD with an electronic version of the "Technical Guidance Documents" was also provided to ensure that all facilities had ready access to the detailed technical information contained therein. Finally, sections for pesticide labels and other information were also included so that facilities could store all relevant operating information in one handy place. The 2004 version thus contains comprehensive information on the best management practices for wood preservation facilities in Canada.

The TRD implementation program continues to play itself out based on this newly updated material. The completion of the program will culminate in final audits of every facility through 2005 and 2006. Although most facilities will likely be found to be compliant with the TRDs during these audits, it is also likely that several more facilities will need to be subjected to the pollution prevention provisions of the CEPA 1999. It should also be noted that the final audits will not be the end of the TRDs. The wood preservation industry has embraced the best management practices established by the TRDs and is moving forward with a certification program. This certification program will continue to ensure wood preservation facilities operate with a high level of diligence towards human health and environmental protection.

4. Conclusions

The history of wood preservation in Canada has resulted in a legacy of contaminated sites across the country and a reputation of very poor operating practices at wood preservation facilities. Part of this legacy can likely be blamed on a lack of knowledge. Although the publication of the first guidance document in 1988 had the potential to address this deficiency there was little application of it until a program was implemented. Since the voluntary TRD implementation program was established in 1999, the wood preservation industry has spent considerable time and money to meet current pollution prevention

standards. The wood preservation industry should be commended for its efforts. Although implementation of these guidelines can't guarantee the creation of new contaminated sites, it should maximize environmental and human health protection.

The voluntary TRD implementation program has demonstrated how industry and government can work together through a cooperative, non-regulatory process to make significant improvements within a sector. However, in order for a voluntary program to be successful several key components are required including:

1. A communications program
2. Specific timelines and goals for facilities to meet
3. Annual reporting to ensure that progress is ongoing
4. Audits of facilities to enhance understanding, ensure changes meet requirements and reaffirm the requirements to participate in the program
5. A regulatory backup to ensure commitment to a voluntary program and create a level playing field for those facilities who decide to not participate in a voluntary process.

Although it may be argued that voluntary programs aren’t effective, this program has demonstrated that a well-designed one can achieve the same goals as a regulatory one.