Proposed Re-evaluation Decision PRVD2010-03

Heavy Duty Wood Preservatives:
Creosote, Pentachlorophenol, Chromated Copper Arsenate (CCA) and Ammoniacal Copper Zinc Arsenate (ACZA)

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Overview

Proposed Re-evaluation Decision for Creosote, Pentachlorophenol, Chromated Copper Arsenate and Ammoniacal Copper Zinc Arsenate

An evaluation of available scientific information was conducted jointly by Health Canada's Pest Management Regulatory Agency (PMRA) and the United States Environmental Protection Agency. After a thorough re-evaluation of the heavy duty wood preservatives creosote, pentachlorophenol, chromated copper arsenate and ammoniacal copper zinc arsenate, Health Canada's Pest Management Regulatory Agency, under the authority of the *Pest Control Products Act*, is proposing continued registration for the sale and use of creosote, pentachlorophenol, chromated copper arsenate and ammoniacal copper zinc arsenate products in Canada.

During the course of this re-evaluation, the Canadian wood treatment industry has been actively developing and implementing a program of best management practices. These practices are contained in *Recommendations for the design and operation of wood preservation facilities – technical recommendations document (Environment Canada, 2004)* and are designed to minimize environmental and human health effects potentially associated with wood treatment. Since no similar, industry-wide program is in place within the United States, the United States Environmental Protection Agency has imposed specific mitigation measures relating to the operation of wood treatment facilities within the United States. Certain of these measures duplicate what has already been implemented by industry in Canada. For that reason, the approaches to risk mitigation and risk management proposed in this document differ from those required by the United States Environmental Protection Agency.

Risks identified in this re-evaluation were based on the best available information. However, this information generally predated the widespread adoption of best management practices within the Canadian industry. Therefore the re-evaluation assessment is expected to overestimate actual risks to Canadian workers.

As a result of this evaluation the PMRA found that, under the proposed conditions of use, creosote, pentachlorophenol, chromated copper arsenate and ammoniacal copper zinc arsenate products are acceptable for continued registration. At this time, these products are critical to the wood preservation industry because there are considerable limitations with respect to registered alternatives.

Occupational risks of concern were identified for certain occupational exposures during this evaluation. Therefore as a condition of the continued registration of these products, new risk-reduction measures must be included on the labels of certain products. In additional, the PMRA is proposing the development of a risk management plan, in conjunction with Canadian stakeholders, to further address risks of concern associated with occupational exposure.

The PMRA's pesticide re-evaluation program considers potential risks as well as the value of pesticide products to ensure they meet modern standards established to protect human health and the environment. Re-evaluation draws on data from registrants, published scientific reports, information from other regulatory agencies and any other relevant information available.

This proposal affects all end-use products containing creosote, pentachlorophenol, chromated copper arsenate and ammoniacal copper zinc arsenate registered in Canada. Once the final re-evaluation decision is made, registrants will be instructed on how to address any new requirements.

This Proposed Re-evaluation (PRVD) summarizes the science evaluation for creosote, pentachlorophenol, chromated copper arsenate and ammoniacal copper zinc arsenate and presents the reasons for the proposed re-evaluation decision. It also proposes additional risk-reduction measures to further protect human health and the environment. Though the PRVD is a consultation document,[1] consultation has already taken place on the science evaluation and risk assessment component of these re-evaluations. These consultations were announced, and occurred after the publication of the preliminary and revised risk assessments for the heavy duty wood preservatives. These publications were as follows:

- Re-evaluation Note REV2003-09, *Update on the Re-evaluation of Heavy Duty Wood Preservative Creosote*;
- Re-evaluation Note REV2004-01, *Update on the Re-evaluation of CCA Heavy Duty Wood Preservative*;
- Re-evaluation Note REV2004-04,*Update on the Re-evaluation of Pentachlorophenol Heavy Duty Wood Preservatives*;
- Re-evaluation Note REV2005-03,*Update on the Re-evaluation of the Heavy Duty Wood Preservative Pentachlorophenol*;
- Re-evaluation Note REV2008-08, *Update on the Re-evaluation of the Heavy Duty Wood Preservatives Creosote, Pentachlorophenol and CCA*.

No modifications to the underlying risk assessments were made as a result of the most recent consultation period on the revised risk assessments. Therefore, current consultations are primarily focussed on the proposed decision component of the re-evaluation, which outlines additional risk reduction and risk management measures to further protect human health and the environment.

The information is presented in two parts: i) the Overview describes the regulatory process and key points of the evaluation (i.e. the Science Evaluation summary); ii) while the full Science Evaluation provides detailed technical information on the human health, environmental and value assessments of creosote, pentachlorophenol, chromated copper arsenate and ammoniacal copper zinc arsenate.

[1] "Consultation statement" as required by subsection 28(2) of the *Pest Control Products Act*

The PMRA will accept written comments on this proposal up to 60 days from the date of publication of this document. Please forward all comments to PMRA Publications (please see contact information on the cover page of this document).

What Does Health Canada Consider When Making a Re-evaluation Decision?

The key objective of the *Pest Control Products Act* is to prevent unacceptable risks to people and the environment from the use of pest control products. Health or environmental risk is considered acceptable if there is reasonable certainty that no harm to human health, future generations or the environment will result from use or exposure to the product under its conditions or proposed conditions of registration.[2] The Act also requires that products have value[3] when used according to the label directions. Conditions of registration may include special precautionary measures on the product label to further reduce risk.

To reach its decisions, the PMRA applies hazard and risk assessment methods as well as policies that are rigorous and modern. These methods consider the unique characteristics of sensitive subpopulations in both humans (such as children) and organisms in the environment (for example, those most sensitive to environmental contaminants). These methods and policies also consider the nature of the effects observed and the uncertainties present when predicting the impact of pesticides. For more information on how the PMRA regulates pesticides, the assessment process and risk-reduction programs, please visit the Pesticides and Pest Management portion of Health Canada's website at www.healthcanada.gc.ca/pmra.

Before making a re-evaluation decision on creosote, pentachlorophenol, chromated copper arsenate and ammoniacal copper zinc arsenate, the PMRA will consider all comments received from the public in response to this consultation document.

The PMRA will then publish a Re-evaluation Decision[4] on creosote, pentachlorophenol, chromated copper arsenate and ammoniacal copper zinc arsenate, which will include the decision, the reasons for it, a summary of comments received on the proposed registration decision and the PMRA's response to these comments.

For more details on the information presented in this Overview, please refer to the Science Evaluation of this consultation document.

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2 "Acceptable risks" as defined by subsection 2(2) of the *Pest Control Products Act*

3 "Value" as defined by subsection 2(1) of the *Pest Control Products Act*: "the product's actual or potential contribution to pest management, taking into account its conditions or proposed conditions of registration, and includes the product's (*a*) efficacy; (*b*) effect on host organisms in connection with which it is intended to be used; and (*c*) health, safety and environmental benefits and social and economic impact".

4 "Decision statement" as required by subsection 28(5) of the *Pest Control Products Act*

What are Creosote, Pentachlorophenol, Chromated Copper Arsenate and Ammoniacal Copper Zinc Arsenate

Creosote, pentachlorophenol, chromated copper arsenate and ammoniacal copper zinc arsenate, are heavy duty wood preservatives applied through high pressure impregnation in a treatment cylinder, or retort, at treatment facilities. This process imparts chemicals into wood to a depth that provides long-term control of fungi, insects and marine borers.

Creosote is a distillate of coal tar and consists of liquid and solid polycyclic aromatic hydrocarbons, other heterocyclic aromatic substances and some tar acids and bases. It is used primarily in the treatment of railroad ties, utility poles, marine pilings and industrial construction timbers. In Canada, a non-pressure treatment brush-on creosote formulation is also registered as a commercial class product for application to cut ends and drill holes of pressure-treated wood product.

Pentachlorophenol is produced by reacting chlorine with phenol at high temperatures in the presence of a catalyst. Contaminants including hexachlorobenzene, dioxins and furans are produced in the production process. These contaminants, however, are regulated to the lowest achievable levels, as per the Government of Canada's Toxic Substances Management Policy. Pentachlorophenol is used primarily to treat electrical utility poles and crossarms. It is also used on posts and industrial construction timbers. In addition to pressure treatment application, pentachlorophenol is also applied by thermal treatment.

Chromated copper arsenate is a mixture of copper oxide, and chromic and arsenic acids. Chromated copper arsenate was widely used in residential applications (for example, play-structures, decks, picnic tables, residential fencing, etc.) prior to the voluntary withdrawal of such uses by registrants in 2004. These changes were detailed in Re-evaluation Note REV 2002-03, *Chromated Copper Arsenate (CCA)*, and Re-evaluation Note REV 2006-07, *Label Guidance for Use of Chromated Copper Arsenate (CCA)*. Chromated copper arsenate is currently used for industrial wood applications such as utility poles, construction timbers and marine structures.

Ammoniacal copper zinc arsenate is prepared by mixing and oxidizing arsenic acid, copper oxide, zinc oxide, ammonium hydroxide, ammonium bicarbonate and water. Ammoniacal copper zinc arsenate is used for industrial applications such as construction timbers, marine structures and utility poles. Although presently registered (under the *Pest Control Products Act*), ammoniacal copper zinc arsenate was not being used in Canada at the time of publication of this document.

Science Evaluation Summary

Creosote, pentachlorophenol, chromated copper arsenate and ammoniacal copper zinc arsenate were jointly re-evaluated by Health Canada's Pest Management Regulatory Agency and the United States Environmental Protection Agency. For this reason, readers are referred to the United States Environmental Protection Agency Reregistration Eligibility Decision documents and related material for a detailed summary of the science evaluations. These documents can be found at www.epa.gov/pesticides/reregistration/status.htm

Elements of the science evaluation that are specific to Canadian regulations, or Canadian product registrations, are presented in the Science Evaluation section of this document.

Overview of Existing Risk Management Actions

Recommendations for the Design and Operation of Wood Preservation Facilities: Technical Recommendations Document (Environment Canada, 2004)

The wood preservation industry, in conjunction with Environment Canada, has developed and implemented best management practices within the vast majority of wood treatment facilities. These standards were developed in consultation with other stakeholders, including the PMRA. These practices are contained in *Recommendations for the design and operation of wood preservation facilities – technical recommendations document (Environment Canada, 2004).*

These voluntary standards establish benchmarks for design and operation of wood preservation facilities, to minimize environmental and human health effects potentially associated with heavy duty wood preservation facilities. These objectives are consistent with PMRA's mission to protect human health and the environment by minimizing the risks associated with pest control products.

At the time of publication, 93% of wood treatment facilities were certified as being in conformance with the technical recommendations. Though these best management practices are voluntary industry standards, Environment Canada continues to regulate this sector under the *Canadian Environmental Protection Act* and has taken regulatory action against specific facilities where required.

Disposal of out-of-use treated wood and treated wood waste

Environment Canada, in consultation with the wood preservation sector, published a guidance document entitled *Industrial Treated Wood Users Guidance Document,* in 2004. This document lists recommendations designed to promote environmentally responsible management of the purchase, use, storage and disposal of wood treated with heavy duty wood preservatives.

Various other aspects of wood treatment facilities are also regulated by the PMRA, provincial ministries of the environment, transport, occupational health and safety authorities as well as municipal governments.

International Activities: UN Convention on Long-range Transboundary Air Pollution (LRTAP)

In 2008, pentachlorophenol was nominated as a Persistence Organic Pollutant (POP) under LRTAP by the European Community. If designated a POP, pentachlorophenol could be subject to elimination of production and use by Parties to the Convention, which include Canada. In December 2009, the Convention's Executive Body concluded that pentachlorophenol itself does not meet all the POPs criteria; however, the listing of pentachlorophenol as a POP is still under consideration since its transformation product, pentachloroanisol, is found in the Arctic and has persistent, bioaccumulative and toxic properties. Currently, pentachloroanisol is under review by LRTAP. It is not known to what extent the presence of pentachloroanisol in remote areas is a result of the degradation of organochlorines already present in those areas, versus a result of the long range transport of pentachlorophenol. The Government of Canada (Health Canada Pest Management Regulatory Agency and Environment Canada) is actively participating in this international process, at both the scientific and negotiating levels, and will keep the Canadian public informed regarding future LRTAP decisions.

Measures to Minimize Risk

Registered pesticide product labels include specific instructions for use. Directions include risk-reduction measures to protect human and environmental health. These directions must be followed by law.

Risk-reduction measures are being proposed to address potential risks identified in this assessment. These measures, in addition to those already identified on HDWP product labels, are designed to further protect human health and the environment. The following additional key risk-reduction measures are being proposed.

Additional Key Risk-Reduction Measures

- Human Health
- Requiring protective equipment, engineering controls and protective practices as per *Recommendations for the design and operation of wood preservation facilities – technical recommendations document (Environment Canada)* to protect treatment plant workers.

- Environment
- Update "environmental hazards" and "directions for use" sections of product labels to address potential contamination via runoff and improper disposal.

- Risk Management Plan
- To further address risks of concern associated with occupational exposure, the PMRA is proposing the development and implementation of a heavy duty wood preservative risk management plan. This would occur in consultation with stakeholders, and the plan would be periodically evaluated for effectiveness after implementation. In conjunction with this PRVD, a separate document, Re-evaluation Note REV2010-05, *Call for Risk Management Proposals for Heavy Duty Wood Preservatives Creosote, Pentachlorophenol Chromated Copper Arsenate and Ammoniacal Copper Zinc Arsenate)* is being published to solicit stakeholder input on risk management options.

What Additional Scientific Information is Being Requested?

Additional data requirements for creosote, pentachlorophenol, chromated copper arsenate and ammoniacal copper zinc arsenate are described in the United States Environmental Protection Agency Reregistration Eligibility Decision documents. This additional confirmatory scientific information is being requested from Canadian registrants as per the United States Environmental Protection Agency Reregistration Eligibility Decision documents.

Additional Canadian specific data requirements relating to chemistry are described in the Science Evaluation.

Next Steps

Before making a re-evaluation decision on creosote pentachlorophenol, chromated copper arsenate and ammoniacal copper zinc arsenate, the PMRA will consider all comments received from the public in response to the proposed decision portion of this consultation document. The PMRA will then publish a Re-evaluation Decision, which will include the decision, the reasons for it, a summary of comments received on the proposed decision and the PMRA's response to these comments.

Other Information

Test data on which the decision is based will be available for public inspection, upon application, in the PMRA's Reading Room (located in Ottawa) or on the United States federal Public Docket at www.regulations.gov at the following docket numbers:

- EPA-HQ-OPP-2003-0248 (Creosote)
- EPA-HQ-OPP-2004-0402 (Pentachlorophenol)
- EPA-HQ-OPP-2003-0250 (CCA, ACZA)

Science Evaluation

Creosote, Pentachlorophenol, Chromated Copper Arsenate and Ammoniacal Copper Zinc Arsenate

1.0 Introduction

Creosote, Pentachlorophenol, chromated copper arsenate (CCA) and ammoniacal copper zinc arsenate (ACZA) were jointly re-evaluated by Health Canada's Pest Management Regulatory Agency (PMRA) and the United States Environmental Protection Agency (USEPA). For this reason, readers are referred to the following USEPA Reregistration Eligibility Decision (RED) documents and related materials for a detailed summary of the science evaluations for these Heavy Duty Wood Preservatives (HDWPs):

Creosote
- *Reregistration Eligibility Decision for Creosote*, September 25, 2008

Pentachlorophenol
- *Reregistration Eligibility Decision for Pentachlorophenol*, September 25, 2008

CCA, ACZA
- *Reregistration Eligibility Decision for Chromated Arsenicals*, September 25, 2008

These documents can be accessed through the USEPA's *Pesticide Reregistration Status* web page at www.epa.gov/pesticides/reregistration/status.htm. Other related documents are also available at this site. The final risk assessment/ science evaluation documents, related addenda, and public comments not included in the RED documents, are available in the United States (US) federal Public Docket at http://www.regulations.gov at the following docket numbers:

Creosote
- EPA-HQ-OPP-2003-0248

Pentachlorophenol
- EPA-HQ-OPP-2004-0402

CCA, ACZA
- EPA-HQ-OPP-2003-0250

The Canadian specific elements of the science evaluation addressed in this document are as follows:

- Registered products and their uses.
- Value assessments.
- An assessment in relation to the federal government's *Toxic Substances Management Policy* (TSMP).
- A risk assessment of a brush-on formulation of creosote.
- Canadian specific risk mitigation and risk management measures.
- Labelling and data requirements.

2.0 The Technical Grade Active Ingredients, Their Properties and Uses

Please refer to the USEPA REDs (as per the Section 1.0 of the Science Evaluation portion of this document) for a description of the technical grade active ingredients and their properties.[5]

2.1 Description of Registered Heavy Duty Wood Preservative Uses

Appendix I, lists all creosote, pentachlorophenol, CCA and ACZA products that are registered as of 1 April 2009 under the authority of the *Pest Control Products Act*. All of the uses of creosote, pentachlorophenol, CCA and ACZA belong to the following use-site category: wood.

With the exception of the brush on creosote formulation, and thermal butt treatment of poles with pentachlorophenol, these Heavy Duty Wood Preservatives (HDWPs) are all used in a similar manner to treat wood commodities by a pressure treatment process and to impregnate the wood with active ingredient. This significantly prolongs the service life of the wood member, which left untreated would decay, or be degraded by termites or marine borers in a much shorter period of time. The wood commodities that are treated by creosote, pentachlorophenol, CCA and ACZA, tend to be for heavy-duty, industrial uses. Wood treated with creosote and pentachlorophenol are not permitted for use in residential construction.

In residential applications, CCA-treated wood is not approved for use where frequent exposure may occur (e.g. decks, play structures, picnic tables, residential fencing). Current approved uses of CCA-treated wood in residential settings are limited to applications where the likelihood of exposure is remote (e.g. permanent wood foundations, shakes and shingle).[6]

All uses supported by the registrant during the re-evaluation were considered in the health and environmental risk assessments.

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[5] The PMRA notes the following change to the information presented in the USEPA RED for Pentachlorophenol: Pentachlorophenol pKa = 4.71. The PMRA notes the following addition to the information presented in the USEPA Creosote RED: Both the P1/P3 and the P2 formulations of creosote have high solubility (>99%) in both toluene and acetone.

[6] A complete description of permitted uses for CCA is detailed in the Re-evaluation Note REV2006-07, *Label Guidance for Use of Chromated Copper Arsenate (CCA)*.

3.0 Impact on Human Health

It is important to note that though risks have been identified based on the best information available, this information generally pre-dated the widespread adoption of recent risk reduction measures[7] within the Canadian wood preservation industry. Therefore the re-evaluation assessment is expected to overestimate actual risks to Canadian workers.

Potential risks of concern associated with the continued use of creosote, pentachlorophenol, CCA are identified as follows:

Creosote

- Occupational cancer and non-cancer risk from inhalation exposure to creosote.
- Occupational cancer and non-cancer risk from dermal exposure to creosote.

Pentachlorophenol

- Occupational cancer and non-cancer risk from dermal exposure to pentachlorophenol.
- Occupational cancer risks from dermal exposure to dioxin/furan resulting from pentachlorophenol use.*****

**** Note:*** *Dioxin/furan levels in Canadian registered products are significantly lower than the levels that were used to estimate potential risk in the USEPA RED for pentachlorophenol.*

CCA

- Occupational cancer and non-cancer risk from inhalation exposure to arsenic and chromium.
- Occupational cancer and non-cancer risk from dermal exposure to arsenic.

ACZA

A quantitative risk assessment for exposure to arsenic from ACZA use was not conducted, though potential risks are considered to be covered by the arsenic risk assessment for CCA. Occupational cancer and non-cancer risk from dermal and inhalation exposure to arsenic may occur, however, arsenic concentrations in ACZA are less than 7% of the arsenic concentration in CCA. Therefore mitigation measures and risk management measures applied to CCA, will be considered to be adequate for ACZA as well.

At the time of publication, though registered under the *Pest Control Products Act*, ACZA was not being used in Canada.

[7] Namely, implementation of *Recommendations for the design and operation of wood preservation facilities – technical recommendations.*

With respect to CCA, arsenic and chromium are the primary drivers in the health risk assessment of these products. With ACZA, arsenic alone is the primary risk driver. Therefore detailed health risk assessments are not presented for the copper and zinc components of ACZA and CCA. Furthermore, proposed mitigation measures resulting from human exposure to the arsenic and chromium risk assessments are considered to be protective for exposures to copper and zinc.

For a complete summary of the impact of the HDWPs on human health, please refer to the USEPA REDs and related material described in Section 1.0 (Introduction) of this document.

3.1 Summary of Occupational Exposure and Risk from Brush-on Creosote

The use of brush-on creosote is a preferred field treatment for creosote-treated marine piling installations. Since such installations require various field cuts to be made, the freshly exposed wood structures need to be treated appropriately to preserve the wood structure.

Brush-on creosote is no longer sold as a domestic class product and is no longer intended for use by the general public. The only users would be contracted installers, a professional group contracted to do installations following specified procedures covering safe product handling methods, personal protection for workers, and measures to protect the environment.

Exposure will occur primarily by the dermal and inhalation routes. Exposure estimates were based on workers applying brush-on treatments while wearing coveralls over long pants and long sleeved shirt and chemical-resistant gloves. Since the personal protection equipment identified on the label for Brushing Grade Creosote includes coveralls over long pants and long sleeved shirt and chemical-resistant gloves, chemical-resistant boots, headgear, goggles, and an impermeable apron, the exposure and risk calculations above are expected to overestimate actual exposures. The lifetime cancer risk for a worker applying creosote brush-on treatments is considered acceptable. No additional mitigation is required for brush-on creosote.

4.0 Impact on the Environment

The assessment of the environmental risk of the use of the four HDWPs has shown that in general, ground-based structures made from pressure-treated wood that is properly treated and fixed or stabilized, are unlikely to cause any major environmental hazard. The potential risk is greater from treated wood that is submerged in water. However, as the leached components remain mainly adsorbed in sediment at the base of the treated structure, the risk to organisms in the water column is below the level of concern.

A summary of available water monitoring data is included in Appendix II.

Creosote

The re-evaluation of the use of creosote as a wood preservative has shown that the risk to birds and terrestrial mammals is minimal, due to lack of exposure. Risk to terrestrial plants is also considered minimal due to lack of exposure. Exposure to fish and aquatic invertebrates is minimal because of limited movement of leached creosote components (polycyclic aromatic hydrocarbons (PAHs)) as these are mainly found in sediment at the base of the treated submerged wood structure. In view of the limited exposure, creosote when used as a wood preservative, e.g., in railway ties or pilings, does not exceed the level of concern for acute toxicity to organisms in the water column such as fish and aquatic invertebrates or for chronic toxicity to freshwater fish.

Pentachlorophenol

The use of pentachlorophenol as a wood preservative is not expected to pose an acute or chronic risk to birds and mammals. Due to limited exposure, the use of pentachlorophenol treated wood in service, such as utility poles, is not likely to result in long lasting impacts to the aquatic ecosystem, including aquatic invertebrates and fish. No aquatic acute or chronic levels of concern are exceeded for freshwater invertebrates and fish or for estuarine/marine fish from application to utility poles. The application of pentachlorophenol to utility poles is not expected to pose an acute risk to estuarine invertebrates. No chronic estuarine/marine aquatic invertebrate studies were available for pentachlorophenol. However, based on data from a freshwater invertebrate chronic study, no chronic aquatic levels of concern are exceeded for estuarine invertebrates from application to utility poles. Acute levels of concern are not exceeded for vascular and non-vascular aquatic plants from application to utility poles.

Contaminants in pentachlorophenol

The risk assessment found it is unlikely that the levels of hexachlorobenzene (HCB), dioxins and furans from the use of pentachlorophenol pose an immediate risk to wildlife or aquatic organisms. Acute and chronic risks to aquatic organisms are unlikely to occur from runoff of chlorinated dibenzodioxins (CDDs)/chlorinated dibenzofurans (CDFs) and HCB from pentachlorophenol-treated wood. However, in the long term, the potential environmental risk from exposure to dioxin/furan resulting from pentachlorophenol use is of concern. Due to uptake of these compounds by sediment, coupled with the persistence and bioaccumulation of CDDs/CDFs and HCB, they may eventually reach toxic levels and pose risks to aquatic organisms through the food web. These contaminants are toxic, persist, and bioaccumulate, potentially causing long-term environmental damage to fish, birds and mammals from exposure through the food chain. For this reason, these contaminants were identified as toxic under the Canadian Environmental Protection Act in 1999 and are managed through Canada's Toxic Substances Management Policy, designed to minimize continued introduction of these substances into the environment. Pentachlorophenol is only one of many sources of these contaminants in the environment.

CCA and ACZA

The potential risk from CCA and ACZA, when used as wood preservatives, to the terrestrial non-target organisms, birds, mammals and plants, is limited in view of the minimal exposure to these organisms. The potential risk to aquatic organisms depends on the amount of CCA and ACZA being leached from treated wood into the aquatic ecosystem, directly or indirectly. The exposure is limited to fish and aquatic invertebrates because of reduced movement of leached CCA components (copper, chromium and arsenic) and ACZA components (copper, zinc and arsenic), as these are mainly found adsorbed in sediment at the bases of the treated submerged wood structures. Thus, the potential risk to fish and aquatic invertebrates in the water column is below the level of concern. The impact is limited to benthic organisms that occur near CCA-treated or ACZA-treated structures such as docks and bulkheads and the "fouling" community, which grows in direct contact with treated structures.

For a complete summary of the impact of the HDWPs on the environment, please refer to the USEPA REDs and related material as described in Section 1.0 (Introduction) of this document.

5.0 Value

5.1 Value of Creosote, Pentachlorophenol, Copper Chromated Arsenate and Ammoniacal Copper Zinc Arsenate

Decay fungi, marine borers and termites are serious pests of wood that can severely weaken wooden structures. The value of wood preservatives is in their ability to control these pests of wood, and thus prolong the useful life of a number of wood commodities. If a structure built out of treated wood lasts twice as long as an untreated structure, the cost of replacement of the wood and of rebuilding the structure are saved. In many cases the service life of wood treated with creosote, pentachlorophenol or CCA is several times greater than the untreated wood, and the economic savings can be significant, as well as the environmental benefits of cutting down fewer trees to satisfy wood demand. In the case of critical infrastructures, such as bridges or utility poles, there is often a very high cost if the wood decays and the structures collapse. The degree to which decay fungi are a hazard to wood depends on a number of environmental factors such as the climate and whether the wood is in contact with the ground or not. Creosote, pentachlorophenol and CCA are HDWPs used in the most severe decay environments in Canada, and their efficacy has been proven over several decades of use.

As alternatives to CCA, ACZA, creosote or PCP wood preservatives, there are other chemical wood preservatives registered in Canada. These include ammoniacal copper quaternary (ACQ), copper azole, zinc naphthenate, copper naphthenate and copper-8-quinolinoate. However, many of these preservatives are not suitable for the uses for which CCA, ACZA, creosote and PCP are registered. Certain of these preservatives either are not effective enough for long-term protection of critical infrastructures, such as bridges and utility poles, or do not have performance data of a sufficiently long period with Canadian wood species, under Canadian conditions, to support these uses. Some of the critical infrastructure uses, such as railway ties are dependant upon the change in physical properties that the preservative imparts to the wood. There are non-wood

alternatives for a number of these critical infrastructures, which precludes the use of wood preservatives. For example concrete and steel are alternative materials for utility poles. However, there are environmental and economic considerations regarding the use of these materials over that of treated wood.

6.0 Toxic Substances Management Policy Considerations

The Toxic Substances Management Policy (TSMP) is a federal government policy developed to provide direction on the management of substances of concern that are released into the environment. The TSMP calls for the virtual elimination of Track 1 substances (those that meet all four criteria outlined in the policy, i.e., persistent (in air, soil, water and/or sediment), bio-accumulative, primarily a result of human activity and toxic as defined by the *Canadian Environmental Protection Act).*

During the review process, creosote, pentachlorophenol, CCA, ACZA and their transformation products were assessed in accordance with the PMRA Regulatory Directive DIR99-03[8] and evaluated against the Track 1 criteria.

Contaminants in the technical grade active ingredient and formulants and contaminants in the end-use products are also assessed during the review process. These are compared against the *List of Pest Control Product Formulants and Contaminants of Health or Environmental Concern* maintained in the *Canada Gazette*[9]**.** The list is used as described in the PMRA Notice of Intent NOI2005-01[10] and is based on existing policies and regulations including: Regulatory Directives DIR99-03; and DIR2006-02[11], and taking into consideration the Ozone-depleting Substance Regulations, 1998, of the *Canadian Environmental Protection Act* (substances designated under the Montreal Protocol).

The use of formulants in registered pest control products is assessed on an ongoing basis through PMRA formulant initiatives and Regulatory Directive DIR2006-02[12]. The PMRA has the follow comments with regards to the TSMP status of the active ingredient and contaminants.

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8 Regulatory Directive DIR99-03, *The Pest Management Regulatory Agency's Strategy for Implementing the Toxic Substances Management Policy*

9 *Canada Gazette*, Part II, Volume 139, Number 24, SI/2005-114 (2005-11-30) pages 2641–2643: *List of Pest Control Product Formulants and Contaminants of Health or Environmental Concern* and in the order amending this list in the *Canada Gazette*, Part II, Volume 142, Number 13, SI/2008-67 (2008-06-25) pages 1611-1613. *Part 1 Formulants of Health or Environmental Concern, Part 2 Formulants of Health or Environmental Concern that are Allergens Known to Cause Anaphylactic-Type Reactions and Part 3 Contaminants of Health or Environmental Concern.*

10 Notice of Intent NOI2005-01, *List of Pest Control Product Formulants and Contaminants of Health or Environmental Concern under the New Pest Control Products Act*.

11 Regulatory Directive DIR2006-02, *PMRA Formulants Policy*.

12 Regulatory Directive DIR2006-02, *PMRA Formulants Policy*.

6.1 Creosote

Creosote is a heterogeneous mixture of mainly PAHs, along with phenolic and heterocyclic compounds. The PMRA has reached the following conclusions:

- Although some of the component PAHs and their transformation products meet Track-1 criteria, the industry has adopted a best management practice which limits the environmental exposure during treatment and disposal and the risks have been found to be acceptable at this time. See Appendix IIIA for comparison with Track 1 criteria.

- Based on the manufacturing process used, substances of health and environmental concern that are identified in the Canada Gazette that are expected to be present in creosote include naphthalene and other PAHs, as well as aniline and substituted anilines. These compounds constitute part of the active components in the product, and are not considered as contaminants or impurities. Creosote does not contain any other contaminants of health or environmental concern.

6.2 Pentachlorophenol

The PMRA has reached the following conclusions:

- Pentachlorophenol does not meet all Track 1 criteria, and is not considered a Track 1 substance. See Appendix 3B for comparison with Track 1 criteria.
- Pentachlorophenol does not form any transformation products that meet all Track 1 criteria. The PMRA is currently participating in the UN Convention on Long-range Transboundary Air Pollution (LRTAP) process to gather additional information on pentachloroanisole, a transformation product of pentachlorophenol.
- Technical grade active ingredient pentachlorophenol contains the following Track 1 contaminants:
  Hexachlorobenzene
  Chlorinated dibenzodioxins
  Chlorinated dibenzofurans

The above Track 1 contaminants which are identified in the Canada Gazette were found as a result of the analysis of batches produced in 2006. The analytical data indicated that the Track 1 contaminants identified in pentachlorophenol have been significantly reduced from the values reported in the EPA product chemistry assessment (1997/1998 productions). Levels of the most toxic dioxins, previously below the method detection limit (1 ppb), are now detected as the levels of detection (LODs) have been significantly lowered. In addition, to the substances identified above, the Track 1 contaminants pentachlorobenzene and terachlorobenzenes are expected to be present in the material.

The wood preservation industry continues to be a source of dioxins and furans into the Canadian environment, however, a reduction in the amount of pentachlorophenol used in wood

preservation due to the availability of alternatives for some uses and the measures taken by the technical grade active ingredient registrant to reduce levels of Track 1 contaminants in its technical product is a step towards the TSMP goal of the virtual elimination of Track-1 substances. Additionally, wood treatment plants have adopted best management practices (i.e. Recommendations for the design and operation of wood preservation facilities – technical recommendations document) which reduce environmental releases of pentachlorophenol and associated contaminants.

The registrant is requested to submit batch analysis data on pentachlorobenzene and tetrachlorobenzenes as well as a revised specification sheet to confirm that the change in manufacturing process has been implemented at the commercial level.

6.3 Copper Chromated Arsenate

CCA is a mixture of three metals which are the active ingredients in this wood preservative and the metals exist in the form of: pentavalent arsenic oxide, divalent copper oxide, and hexavalent chromium oxide.

The PMRA has reached the following conclusions:

- CCA does not meet all Track 1 criteria, and is not considered a Track 1 substance. Metals are naturally occurring elements and are not candidates for Track 1. See Appendix IIIC for comparison with Track 1 criteria.

- CCA does not form any transformation products that meet all Track 1 criteria.

- Technical grade CCA and the CCA Type C end-use products do not contain any contaminants of health or environmental concern identified in the Canada Gazette.

6.4 Ammoniacal Copper Zinc Arsenate

ACZA is a mixture of three metals which are the active ingredients in this wood preservative and the metals are in the form of: arsenic pentoxide, cuprous oxide, and zinc oxide.

The PMRA has reached the following conclusions:

- ACZA does not meet all Track 1 criteria, and is not considered a Track 1 substance. Metals are naturally occurring elements and are not candidates for Track 1. See Appendix IIID for comparison with Track 1 criteria.

- ACZA does not form any transformation products that meet all Track 1 criteria.

- Technical grade ACZA and the ACZA end-use products do not contain any contaminants of health or environmental concern identified in the Canada Gazette.

7.0 Summary

Occupational risks of concern were identified for certain occupational exposures during this evaluation. These risks were identified based on the best available information, however, this information generally pre-dated the widespread adoption of recent risk reduction measures within the Canadian wood preservation industry and therefore this assessment is expected to overestimate actual risks to Canadian workers.

Environmental risk estimates for HDWPs were below levels of concern. However, long-term environmental risk from dioxin/furan contaminants in pentachlorophenol is identified as a concern to be managed via Canada's Toxic Substance Management Policy.

From a value perspective, creosote, pentachlorophenol, CCA and ACZA, are acceptable for continued registration.

8.0 Existing Risk Management Activities and Proposed Risk Management Plan

To further address risks of concern identified in this re-evaluation, the PMRA is proposing the development and implementation of a HDWP risk management plan as part of the re-evaluation decision. This plan would be developed by the PMRA in conjunction with Canadian stakeholders. The feasibility of such a plan will depend on the continued involvement and engagement of registrants and the wood preservation sector. The PMRA does, however, note the significant achievements that have been made within the Canadian industry to date, via the development and implementation of *Recommendations for the design and operation of wood preservation facilities — technical recommendations document* (Environment Canada, 2004) (TRD). In developing a risk management plan, the PMRA will endeavour to work within the framework of the TRD and build on these existing efforts where possible.

8.1 Existing Canadian Risk Management

8.1.1 Recommendations for the Design and Operation of Wood Preservation Facilities

The wood preservation industry, in conjunction with Environment Canada, has developed and implemented best management practices within the vast majority of wood treatment facilities. These best management practices are detailed in the guidance manual entitled, *Recommendations for the design and operation of wood preservation facilities – technical recommendations document* (Environment Canada, 2004) (TRD), the most recent version of which was published in 2004. The TRD is summarized as follows:

> "*Recommendations for the design and operation of wood preservation facilities, 2004: technical recommendation document* …establishes best management practices for the design and operation of heavy duty wood preservation facilities. Its primary purpose is to

establish benchmarks for design and operation that wood preservation facilities should strive to achieve. The recommendations…are consistent with good pollution prevention practices and environmentally sound management. Conformance with the manual should minimize the environmental and human health effects potentially associated with heavy duty wood preservation facilities."

The development of the TRD was initiated by Environment Canada in 1984,

> "as part of a federal strategy to protect human health from potentially toxic commercial chemicals. The objectives were to develop recommendations that would outline practices to:
> - Reduce or eliminate the release of wood preservative chemicals to the environment; and
> - Minimize the exposure of workers to wood preservative chemicals".[13]

These objectives are consistent with PMRA's mission to protect human health and the environment by minimizing the risks associated with pest control products.

Stakeholders from federal and provincial government agencies, the wood preservation industry, forest industry labour unions and workers' compensation boards were involved in the initial development of the TRD. Subsequent revisions were initiated by Environment Canada in conjunction with the Canadian Institute for Treated Wood (CITW)[14] and involved consultation with the PMRA.

Presently, industry adoption of, and conformance with the TRD is overseen by Wood Preservation Canada[15] (WPC), through their Canadian Wood Preservation Certification Authority (CWPCA). This process involves periodic self audits by individual facilities as well as regular inspections by external auditors. This program has resulted in the widespread application of best management practices to new wood treatment facilities, and through the upgrading of existing facilities. At the time of publication, 93% of wood treatment facilities were certified by the CWPCA as being compliant with the TRD, while the majority of the remaining facilities were expected to achieve compliance in the near future.

Though the TRD is a voluntary industry standard, Environment Canada has the authority to regulate this sector under the Canadian Environmental Protection Act (CEPA). Environment Canada has taken action against several facilities that have not conformed to the TRD. In these instances facilities were required to implement pollution prevention plans to achieve equivalence with the best management practices outlined in the TRD.

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13 From *Recommendations for the design and operation of wood preservation facilities: technical recommendations document (2004), Environment Canada.*

14 Currently known as Wood Preservation Canada (WPC).

15 Formerly CITW.

Various aspects of wood treatment facilities are also regulated by the PMRA, provincial ministries of the environment, transport, occupational health and safety authorities, as well as municipal governments.

8.1.2 Disposal of Out-of-Use Treated Wood and Treated Wood Waste

Health Canada's PMRA does not regulate the disposal of pressure treated wood, regardless of the preservative used. Environment Canada, another federal government department, in conjunction with provincial and municipal governments regulate the disposal of waste materials. The management of the out of service wood treated with a chemical wood preservative falls under the mandate of the *Canadian Environmental Protection Act* (CEPA). Under CEPA, a risk management strategy has been developed through a Strategic Options Process (SOP). In the SOP, stakeholder recommendations for the Wood Preservation Sector for the most effective options for reducing exposure to toxic substances (including creosote, pentachlorophenol, CCA and ACZA) were presented and accepted by the Departments of Environment and Health. In response to the recommendations from the SOP, a guidance document entitled "Industrial Treated Wood Users Guidance Document" was developed and published by Environment Canada in 2004. The document lists the recommendations and is designed to promote environmentally responsible management of the purchase, use, storage and disposal of wood treated with HDWPs. For advice on disposal, the provincial regulatory agency and/or Environment Canada should be contacted.

8.2 Proposed Risk Management Plan

8.2.1 Risk Management Plan Objective

The objective of a HDWP risk management plan, is to further address risks of concern associated with occupational exposure to HDWPs. This would include making all reasonable efforts to limit worker exposure levels to the lowest practical levels.

8.2.2 Risk Management Plan – Development and Implementation

In conjunction with this PRVD, a separate document, Re-evaluation Note REV2010-05, *Call for Risk Management Proposals for Heavy Duty Wood Preservatives (Creosote, Pentachlorophenol, Chromated Copper Arsenate and Ammoniacal Copper Zinc Arsenate)*, will be published to solicit stakeholder input on risk management options that will serve as possible elements of a risk management plan. Following a 60-day consultation period, PMRA will consider all stakeholder feedback and draft a Proposed Risk Management Plan for HDWPs. This proposed plan will be published for final consultation. Consideration will be given to comments received and a finalized Risk Management Plan for HDWPs will be published and implemented.

8.2.3 Proposed Elements of Risk Management

Possible elements of a risk management plan are presented in the Re-evaluation Note REV2010-05, *Call for Risk Management Proposals for Heavy Duty Wood Preservatives*

(Creosote, Pentachlorophenol, Chromated Copper Arsenate and Ammoniacal Copper Zinc Arsenate).

9.0 Proposed Regulatory Decision

After a thorough re-evaluation of the creosote pentachlorophenol, CCA and ACZA, Health Canada's PMRA, under the authority of the *Pest Control Products Act,* is proposing continued registration with the implementation of the risk-reduction measures proposed in this document. These measures are required to further protect human health and the environment. The labels of Canadian end-use products must be amended to include the label statements listed in Appendix IV. A submission to implement label revisions will be required within 90 days of the finalization of the re-evaluation decision.

As a condition of continued registration data requirements described in this document (see Section 9.2) must be submitted to the PMRA.

9.1 Proposed Regulatory Actions

9.1.1 Proposed Regulatory Action Related to Human Health

The PMRA has identified occupational risks of concern for certain occupational job descriptions during this evaluation. Therefore as a condition of the continued registration for these products, the mitigation measures listed in this section must be implemented. It is important to note that risks were identified based on the best available information, however, this information generally pre-dated the widespread adoption of recent risk reduction measures (namely, the implementation of the TRD) within the Canadian wood preservation industry. Therefore the re-evaluation assessment may overestimate actual risks to Canadian workers.

9.1.1.1 Toxicological Information and First Aid

The First Aid sections of all labels are to be harmonized to be consistent across products and consistent with PMRA's Regulatory Directive DIR2007-01, *First Aid Labelling Statements*. Amendments will also be required to incorporate first aid information from the TRDs. It is the registrants' responsibility to determine if the generic statements in this DIR2007-01 are medically appropriate for CCA and ACZA, and to provide a rationale to the PMRA where statements differ from those presented in the directive.

9.1.1.2 Proposed Mitigation for Mixer, Loader and Applicator Exposure

The following mitigation measures are proposed to further mitigate identified risks of concern in worker populations:

- Personnel must wear personal protective equipment (PPE) as identified in the TRD. A summary of these requirements is in Appendix IV (*Label Amendments for HDWPs*).

- Addition of precautionary label statements regarding safety requirements as identified in the TRD and disposal of PPE. See Appendix IV (*Label Amendments for HDWPs*) for more information.
- Current PPE requirements on brush-on the creosote product label are adequate to protect workers. No additional mitigation measures are required for brush-on creosote products.

9.1.1.3 Proposed Mitigation Measure for Post Application Exposure

Mitigation measures proposed to minimize exposure to workers handling treated wood in and around wood preservation facilities are as identified in the TRD. A summary of these requirements is in Appendix IV (*Label Amendments for HDWPs*).

PPE requirements currently on brush-on creosote products label(s) are adequate to protect workers. No additional mitigation measures are required for brush-on creosote products.

Individuals working with treated wood product (construction workers, utility linemen etc.) are directed to follow applicable provincial workplace health and safety regulations, as well as available consumer information on the safe use of treated wood.

9.1.2 Proposed Regulatory Action Related to Environment

The risk assessment has indicated potential partitioning of the three wood preservatives to sediments in the aquatic environment. In order to reduce the contamination and resulting potential adverse effects to non-target organisms, mitigation in the form of observing best management practices are required. Environmental mitigation statements are listed in Appendix IV (*Label Amendments for HDWPs*).

9.1.3 Proposed Regulatory Action Related to Value

There are currently no dilution rates (i.e. wood preservative solution concentration prior to treatment) or retention rates (i.e. relative amount of active ingredient in the wood following treatment) on the labels for the CCA, ACZA, creosote, and pentachlorophenol products. Instead there is a statement referring to an outside standard, the Canadian Standards Associations (CSA O80) Standards for treatment parameters. These references to CSA O80 standards will have to be replaced with dilution rates and target retention rates.[16]

9.1.4 Proposed Risk Management Plan

To further address risks of concern identified in this re-evaluation, the PMRA is proposing that a HDWP risk management plan be required as described in Section 8.0.

[16] For wood treatment and regulatory purposes the PMRA defines “target retention rate” as the amount of preservative per volume of wood intended to be achieved and not a specific or absolute maximum concentration. This recognizes the inherent variability within wood which may prevent the actual target from being achieved.

9.1.5 Other Proposed Regulatory Actions

Label amendments involving target retention rates, achieving adequate stabilization and fixation of preservatives within treated wood, adherence to most recent version of *Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations document ,* as well as other label improvements are listed in Appendix IV (*Label Amendments for HDWPs*). Additionally brush on creosote labels require update to the Product Limitations section.

9.2 Additional Data Requirements[17]

9.2.1 Data Requirements Related to Chemistry

The PMRA currently requires that all label guarantees be expressed as nominal guarantees. As a result of this re-evaluation, the technical grade active ingredient product labels must be revised to indicate the nominal guarantee value. A Statement of Product Specification Form (SPSF) and analytical data from recent batches must be submitted to support the nominal guarantee. Specifications and supporting analytical batch data for the TSMP Track 1 contaminants pentachlorobenzene and tetrachlorobenzenes must also be provided.

9.2.2 Data Requirements Related to Occupational Exposure Assessment

- Occupational exposure data requirements are the same as identified in the USEPA HDWP REDs.

9.2.3 Data Requirements Related to Environmental Risks

- Environmental data requirements are the same as identified in the USEPA HDWP REDs.

[17] Registrants will be notified by the PMRA regarding specific timelines and procedures for submitting these data to the PMRA.

List of Abbreviations

µg	micrograms
ADI	acceptable daily intake
a.i.	active ingredient
ARfD	acute reference dose
atm	atmospheres
bw	body weight
CFIA	Canadian Food Inspection Agency
cm	centimetre(s)
DEEM®	Dietary Exposure Evaluation Model
DER	Data Evaluation Report
DFR	dislodgeable foliar residue
DT_{50}	dissipation time to 50% (the dose required to observe a 50% decline in the test population)
DWLOC	drinking water level of comparison
DNA	deoxyribonucleic acid
EChE	erythrocyte cholinesterase
EEC	expected environmental concentration
EXAMS	Exposure Analysis Modeling System
F_0	parental animals
F_1	first filial generation
g	gram(s)
GAP	good agricultural practice
GC-FPD	Gas Chromatography-Flame Photometric Detector
GC-MSD	Gas Chromatography-Mass Selective detector
GC-NPD	Gas Chromatography-Nitrogen Phosphorous Detector
ha	hectare(s)
Hg	mercury
IRED	Interim Reregistration Eligibility Decision (USEPA Document)
K_d	adsorption coefficient
kg	kilogram(s)
K_{oc}	organic carbon partition coefficient
K_{ow}	octanol–water partition coefficient
LC_{50}	lethal concentration to 50% (a concentration causing 50% mortality in the test population
LD_{50}	lethal dose to 50% (a dose causing 50% mortality in the test population)
L	litre(s)
LOAEL	lowest observed adverse effect level
LOD	limit of detection
LOEC	lowest observed effect concentration
m	metre(s)
m^3	metre(s) cubed
mg	milligram(s)
mm	millimetre(s)
MOE	margin of exposure
NOAEL	no observed adverse effect level

NOEC	no observed effect concentration
PChE	plasma cholinesterase
PDP	Pesticide Data Program (United States data)
PHI	preharvest interval
pH	-log10 hydrogen ion concentration
PHED	Pesticide Handlers Exposure Database
PMRA	Pest Management Regulatory Agency
PPE	personal protective equipment
ppm	parts per million
PRZM	Pesticide Root Zone Model
PSI	pre-slaughter interval
Q_1*	cancer potency factor
REI	restricted entry interval
TC	transfer coefficient
TPM	triophanate-methyl
TSMP	Toxic Substances Management Policy
USEPA	United States Environmental Protection Agency

Appendix I

A. Registered Products Containing Creosote as of March 2010 [a]

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee
28074	Commercial	Ruetgers Canada Inc.	Coal Tar Creosote (P1/P13) Wood Preservative	Liquid	100
28075	Commercial	Ruetgers Canada Inc.	Coal Tar Creosote (P2) Wood Preservative	Liquid	100
28076	Commercial	Ruetgers Canada Inc.	Brushing Grade Creosote Wood Preservative	Liquid	100
19214	Technical	Ruetgers Canada Inc.	Brushing Grade Creosote Wood Preservative	Liquid	100
19860	Technical	Ruetgers Canada Inc.	Coal Tar Creosote (P2) Wood Preservative	Liquid	100
19861	Technical	Ruetgers Canada Inc.	Coal Tar Creosote (P1/P13) Wood Preservative	Liquid	100

a excluding discontinued products or products with a submission for discontinuation

B. Registered Products Containing Pentachlorophenol as of March 2010 [a]

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee
26110	Commercial	KMG-Bernuth Inc.	Dura Treat 40	Solution	36.19
28838	Commercial	KMG-Bernuth Inc.	KMG Penta Blocks	Solid	98
28839	Commercial	KMG-Bernuth Inc.	KMG Penta Flakes	Solid	98
21785	Technical	KMG-Bernuth Inc.	KMG Technical penta flakes	Solid	98
22024	Technical	KMG-Bernuth Inc.	KMG Technical penta blocks	Solid	98

a excluding discontinued products or products with a submission for discontinuation

C. Registered Products Containing CCA as of March 2010 [a]

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee (%)[b]		
					ARP	CUO	CRO
19612	Commercial	Timber Specialties Co.	Timber Specialties K-33 (C-60) Wood Preservative	Solution	20.0	10.5	29.5
21226	Commercial	Arch Wood Protection Canada Corp.	Wolmanac 60% Industrial Concentrate	Solution	20.4	11.1	28.5
27368	Commercial	Chemical Specialties Inc.	CCA type-C (60%) wood preservative	Solution	20.1	11.4	28.5
21589	Technical	Chemical Specialties Inc.	CCA type-C wood preservative	Solution	20.1	11.4	28.5
24245	Technical	Arch Wood Protection Canada Corp.	Arsenic Acid 75%	Solution	75	-	-

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee (%)[b]		
					ARP	CUO	CRO
24586	Technical	Timber Specialties Co.	Arsenic Acid 75%	Solution	75	-	-
24893	Technical	Chemical Specialties Inc.	CSI Arsenic Acid 75%	Solution	75	-	-
24741	Technical	ADCHEM (Australia) Pty Ltd.	Cupric Oxide Technical Grade	Powder	-	97.5	-
26826	Technical	Peninsula Copper Industries Inc.	Cupric Oxide	Powder	-	78.8	-
27122	Technical	Arch Wood Protection Canada Corp.	Arch Copper Oxide	Solid	-	77.5	-
27562	Technical	Timber Specialties Co.	Chromic Acid	Granular	-	-	99.9

a excluding discontinued products or products with a submission for discontinuation
b ARP = arsenic pentoxide; CUO = cupric oxide; and CRO = chromic acid

D. Registered Products Containing ACZA as of March 2010 [a]

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee (%)[b]		
					ARP	ZNO	CUP
25809	Commercial	Arch Wood Protection Canada Corp.	Chemonite Wood Preservative	Solution	1.3	2.5	5.7
25468	Manufacturing Concentrate	J.H Baxter & Co.	CHEMONITE PART "A" ARSENIC ACID 75%	Solution	75		

a excluding discontinued products or products with a submission for discontinuation
b ARP = arsenic pentoxide; ZNO = zinc oxide; and CUP = cuprous oxide

Appendix II Monitoring Data

A search for water monitoring data on heavy duty wood preservatives (HDWPs) in Canada showed that the information was limited. There were some detections of pentachlorophenol in Manitoba and of arsenic, chromium and copper in PEI and in B.C., but no information was provided to link the detections to the use of the HDWPs. Water was usually sampled as part of general, year round screening for a number of different items such as, nutrients, bacteria, metals, and organic contaminants. The aim was to determine the effects of agricultural and urban non-point source pollution on aquatic ecosystems. There was no information that indicated that the detections were associated with the registered uses of HDWPs. Although zinc is present in natural waters at low concentrations, the main anthropogenic sources are industrial and the use of ACZA would be a minor source in comparison (PMRA # 1765657). Water monitoring data related specifically to ACZA were not available. Similarly, there was no information on water monitoring data on PAHs in water that could be related to the use of creosote.

Appendix III Toxic Substances Management Policy Considerations for Heavy Duty Wood Preservatives – Comparison to TSMP Track 1 Criteria

A. Creosote

TSMP Track 1 Criteria	TSMP Track 1 Criterion value		Endpoints of some PAHs in Creosote
CEPA toxic or CEPA toxic equivalent[1]	Yes		Yes
Predominantly anthropogenic[2]	Yes		PAHs are not predominantly anthropogenic
Persistence[3]:	Soil	Half-life ≥ 182 days	Half-life: Naphthalene: 2 mos Anthracene: 8 mos Benz[a]anthracene: 2 yrs Benzo[k]flouranthene: 2 yrs Benzo[a]pyrene: 2 yrs
	Water	Half-life ≥ 182 days	Half-life: Naphthalene: 1 wk Anthracene: 3 wks Benz[a]anthracene: 2 mos Benzo[k]flouranthene: 2 mos Benzo[a]pyrene: 2 mos
	Sediment	Half-life ≥ 365 days	Half-life: Naphthalene: 8 mos Anthracene: 2 yrs Benz[a]anthracene: ~ 6 yrs Benzo[k]flouranthene: ~ 6 yrs Benzo[a]pyrene: ~ 6 yrs
	Air	Half-life ≥ 2 days or evidence of long range transport	Value: Naphthalene: 1 day Anthracene: 2 days Benz[a]anthracene: 1 wk Benzo[k]flouranthene: 1 wk Benzo[a]pyrene: 1 wk

TSMP Track 1 Criteria	TSMP Track 1 Criterion value	Endpoints of some PAHs in Creosote
Bioaccumulation[4]	Log $K_{ow} \geq 5$	Value: Naphthalene: 3.37 Anthracene: 4.54 Benz[a]anthracene: 5.91 Benzo[k]flouranthene: 6.00 Benzo[a]pyrene: 6.04
	BCF ≥ 5000	Value or not available: Naphthalene: NA Anthracene: 1016 – 7260 in fish Benz[a]anthracene: NA Benzo[k]flouranthene: NA Benzo[a]pyrene: NA
	BAF ≥ 5000	Values not available
Is the chemical a TSMP Track 1 substance (all four criteria must be met)?		No, does not meet TSMP Track 1 criteria.

1 All pesticides will be considered CEPA-toxic or CEPA toxic equivalent for the purpose of initially assessing a pesticide against the TSMP criteria. Assessment of the CEPA toxicity criteria may be refined if required (i.e., all other TSMP criteria are met).

2 The policy considers a substance "predominantly anthropogenic" if, based on expert judgement, its concentration in the environment medium is largely due to human activity, rather than to natural sources or releases.

3 If the pesticide and/or the transformation product(s) meet one persistence criterion identified for one media (soil, water, sediment or air) than the criterion for persistence is considered to be met.

4 Field data (e.g., BAFs) are preferred over laboratory data (e.g., BCFs) which, in turn, are preferred over chemical properties (e.g., log K_{ow}).

B. Pentachlorophenol

TSMP Track 1 Criteria	TSMP Track 1 Criterion value		Pentachlorophenol Endpoints
CEPA toxic or CEPA toxic equivalent[1]	Yes		Yes
Predominantly anthropogenic[2]	Yes		Yes
Persistence[3]:	Soil	Half-life ≥ 182 days	Half-life = 63 days
	Water	Half-life ≥ 182 days	Half-life in water/sediment = 30–60 days
	Sediment	Half-life ≥ 365 days	Half-life not available
	Air	Half-life ≥ 2 days or evidence of long range transport	Pentachlorophenol is subject to long-range transport

TSMP Track 1 Criteria	TSMP Track 1 Criterion value	Pentachlorophenol Endpoints
Bioaccumulation[4]	Log $K_{ow} \geq 5$	5.05
	BCF ≥ 5000	490 in bluegill sunfish
	BAF ≥ 5000	Value not available
Is the chemical a TSMP Track 1 substance (all four criteria must be met)?		No, does not meet TSMP Track 1 criteria.

[1] All pesticides will be considered CEPA-toxic or CEPA toxic equivalent for the purpose of initially assessing a pesticide against the TSMP criteria. Assessment of the CEPA toxicity criteria may be refined if required (i.e., all other TSMP criteria are met).

[2] The policy considers a substance "predominantly anthropogenic" if, based on expert judgement, its concentration in the environment medium is largely due to human activity, rather than to natural sources or releases.

[3] If the pesticide and/or the transformation product(s) meet one persistence criterion identified for one media (soil, water, sediment or air) than the criterion for persistence is considered to be met.

[4] Field data (e.g., BAFs) are preferred over laboratory data (e.g., BCFs) which, in turn, are preferred over chemical properties (e.g., log K_{ow}).

C. Copper Chromated Arsenate

TSMP Track 1 Criteria	TSMP Track 1 Criterion value		CCA (copper, chromium, arsenic) Endpoints
CEPA toxic or CEPA toxic equivalent[1]	Yes		Yes
Predominantly anthropogenic[2]	Yes		Metals are naturally occurring elements and are not candidates for Track 1
Persistence[3]:	Soil	Half-life ≥ 182 days	Persistent (metals)
	Water	Half-life ≥ 182 days	Persistent (metals)
	Sediment	Half-life ≥ 365 days	Persistent (metals)
	Air	Half-life ≥ 2 days or evidence of long range transport	Half-life or volatilisation is not an important route of dissipation and long-range atmospheric transport is unlikely to occur as the three actives are inorganic oxides.
Bioaccumulation[4]	Log $K_{ow} \geq 5$		Not Applicable - Inorganic oxide
Copper	BCF ≥ 5000		2400 in algae (*Chlorella sp.*) 30,000 in mollusc 667 in fish
	BAF ≥ 5000		Not available

TSMP Track 1 Criteria	TSMP Track 1 Criterion value	CCA (copper, chromium, arsenic) Endpoints
Bioaccumulation[4] **Arsenic**	Log $K_{ow} \geq 5$	Not Applicable - Inorganic oxide
	BCF ≥ 5000	333 in fish 6000 in freshwater plants
	BAF ≥ 5000	Not available
Bioaccumulation[4] **Chromium**	Log $K_{ow} \geq 5$	Not Applicable - Inorganic oxide
	BCF ≥ 5000	400 in fish 4000 in freshwater plants
	BAF ≥ 5000	Not available
Is the chemical a TSMP Track 1 substance (all four criteria must be met)?		No, does not meet TSMP Track 1 criteria.

[1] All pesticides will be considered CEPA-toxic or CEPA toxic equivalent for the purpose of initially assessing a pesticide against the TSMP criteria. Assessment of the CEPA toxicity criteria may be refined if required (i.e., all other TSMP criteria are met).

[2] The policy considers a substance "predominantly anthropogenic" if, based on expert judgement, its concentration in the environment medium is largely due to human activity, rather than to natural sources or releases.

[3] If the pesticide and/or the transformation product(s) meet one persistence criterion identified for one media (soil, water, sediment or air) than the criterion for persistence is considered to be met.

[4] Field data (e.g., BAFs) are preferred over laboratory data (e.g., BCFs) which, in turn, are preferred over chemical properties (e.g., log K_{ow}).

D. Ammoniacal Copper Zinc Arsenate

TSMP Track 1 Criteria	TSMP Track 1 Criterion value		ACZA (copper, zinc, arsenic) Endpoints
CEPA toxic or CEPA toxic equivalent[1]	Yes		Yes.
Predominantly anthropogenic[2]	Yes		Metals are naturally occurring elements and are not candidates for Track 1
Persistence[3]:	Soil	Half-life ≥ 182 days	Persistent (metals)
	Water	Half-life ≥ 182 days	Persistent (metals)
	Sediment	Half-life ≥ 365 days	Persistent (metals)
	Air	Half-life ≥ 2 days or evidence of long range transport	Half-life or volatilisation is not an important route of dissipation and long-range atmospheric transport is unlikely to occur as the three actives are inorganic oxides.

TSMP Track 1 Criteria	TSMP Track 1 Criterion value	ACZA (copper, zinc, arsenic) Endpoints
Bioaccumulation[4] **Copper**	Log $K_{ow} \geq 5$	Not Applicable - Inorganic oxide
	BCF ≥ 5000	2400 in algae (*Chlorella sp.*) 30,000 in mollusc 667 in fish
	BAF ≥ 5000	Not available
Bioaccumulation[4] **Arsenic**	Log $K_{ow} \geq 5$	Not Applicable - Inorganic oxide
	BCF ≥ 5000	333 in fish 6000 in freshwater plants
	BAF ≥ 5000	Not available
Bioaccumulation[4] **Zinc**	Log $K_{ow} \geq 5$	Not Applicable - Inorganic oxide
	BCF ≥ 5000	Value not available
	BAF ≥ 5000	Value not available
Is the chemical a TSMP Track 1 substance (all four criteria must be met)?		No, does not meet TSMP Track 1 criteria.

[1] All pesticides will be considered CEPA-toxic or CEPA toxic equivalent for the purpose of initially assessing a pesticide against the TSMP criteria. Assessment of the CEPA toxicity criteria may be refined if required (i.e., all other TSMP criteria are met).

[2] The policy considers a substance "predominantly anthropogenic" if, based on expert judgement, its concentration in the environment medium is largely due to human activity, rather than to natural sources or releases.

[3] If the pesticide and/or the transformation product(s) meet one persistence criterion identified for one media (soil, water, sediment or air) than the criterion for persistence is considered to be met.

[4] Field data (e.g., BAFs) are preferred over laboratory data (e.g., BCFs) which, in turn, are preferred over chemical properties (e.g., log K_{ow})

Appendix IV Label Amendments for Heavy Duty Wood Preservatives

A1. Label Amendments for Commercial Class Products Containing Creosote (Pressure Treatment Applications)

The label amendments presented below do not include all label requirements for individual end-use products, such as first aid statements, disposal statements, precautionary statements and supplementary protective equipment. Additional information on the labels of currently registered products should not be removed unless it contradicts the label statements given below.

A submission to request label revisions will be required within 90 days of finalization of the re-evaluation decision.

The labels of end-use products in Canada must be amended to include the following statements to further protect the environment.

COMMON NAME: Creosote
CHEMICAL NAME: Coal Tar; Coal Tar Creosote

FORMULATION TYPES: Liquid

USE-SITE CATEGORIES: Wood

GUARANTEE

Label guarantees to be expressed as nominal guarantees – supporting data to be provided.

GENERAL LIMITATIONS

"DO NOT discharge effluent containing this product into sewer systems, lakes, streams, ponds, estuaries, oceans or other waters."

FIRST AID / TOXICOLOGICAL INFORMATION:

Note: First Aid and Toxicological information sections are to be harmonized to be consistent across products and consistent with PMRA's Regulatory Directive DIR2007-01, *First Aid Labelling Statements. The proposed first aid label statements below are based on the first aid information in: i)Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations Document (Environment Canada, 2004); ii) the current product labels; and iii) DIR2007-01. It is the registrant's responsibility to determine if the generic statements in DIR2007-01 are medically appropriate and to provide a rationale to the PMRA where statements differ from those presented in the directive.*

"If swallowed: Get medical attention or call a poison control centre immediately for treatment advice. Give conscious victim water or milk to drink. Then give 30-60 mL of Fleet's Phospho-Soda diluted 1:4 in water. Do not induce vomiting unless told to do so by a poison control centre or doctor."

"If on skin or clothing: Immediately remove soaked clothing or articles in contact with the skin. Immediately wash contaminated skin thoroughly with soap or mild detergent and water. Call a poison control centre or doctor for treatment advice. Get prompt medical attention if the skin becomes inflamed (redness, itchiness or pain)."

"If inhaled: Immediately move the affected person to fresh air. If person is not breathing, call 911 or an ambulance then give artificial respiration. Keep affected person warm and quiet."

"If in eyes: Immediately flush eyes with flowing water, occasionally lifting the upper and lower lids. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Flush eyes for at least 15 minutes. Get medical attention or call a poison control centre for treatment advice."

"Chronic symptoms requiring medical referral: Skin irritation, sensitivity; skin lesions."

"Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention."

PRECAUTIONARY STATEMENTS

"Required precautionary measurements are as identified in *Recommendations for the Design and Operations of Wood Preservation Facilities – Technical recommendations document (Environment Canada)*. A summary of these requirements is as follows:"

"Do not carry, store or consume food or drink in working areas (e.g. areas where preservatives are stored or used, or where freshly treated wood is stored)."

"Do not carry or smoke cigarettes in working areas."

"Wash hands thoroughly before leaving working areas and before eating, drinking, smoking or using the toilet facilities."

"Do not expose cuts or abrasions to preservatives."

"Wash skin immediately if contact with preservative solutions occurs"

"Get immediate first aid if skin or eyes contact preservative solutions. Even small contact exposures should receive immediate cleaning and treatment."

"Change outer clothing immediately if splashed with preservative solutions. Change clothing daily if any incidental contact with the treatment chemical occurs. Wash contaminated clothing separately from other clothing."

"Wear impermeable footwear in all working areas. Preservative solutions may penetrate leather shoes and apparel."

"Shower daily immediately after work."

"All work clothing and boots must be left at the plant."

"Discard clothing and other absorbent material that have been drenched or heavily contaminated with the product's concentrate. Do not reuse them."

PROTECTIVE CLOTHING AND EQUIPMENT:

"Personal protective equipment requirements are as identified in *Recommendations for the Design and Operations of Wood Preservation Facilities – Technical recommendations document (Environment Canada)*. A summary of these requirements is as follows:

Activity	Personal Protective Equipment
Retort Opening / Charge Removal / Handling treated lumber	• Wear approved respirator if air concentrations are unknown or at or above TLVs • Wear a rain suit, rubber boots, creosote-impermeable gauntlets, face shield or goggles when opening cylinder doors and removing and unloading charges • Wear creosote-impermeable gauntlets, apron and boots if handling treated wood manually • Wear a respirator if treated wood is handled in enclosed areas (e.g. box cars)
Load Jams	Cylinder Entry • If retort TLV levels are exceeded or concentration is unknown, wear self-contained full-face respirator mask, impermeable coveralls, boots and creosote-impermeable gauntlets • If TLV levels are below regulatory limits; wear NIOSH-approved respirator, impermeable coveralls, boots and creosote-impermeable gauntlets
Equipment Maintenance	Welding Contaminated Equipment: • Wear an approved respirator

Activity	Personal Protective Equipment
Unloading or Handling Creosote	• Wear goggles or face shield, creosote-impermeable gauntlets, coveralls, impermeable aprons and impermeable shoes or boots • Wear approved respirator if air concentrations are unknown or at or above TLVs
Sampling procedures	• Wear eye protection and gauntlets impermeable to creosote when sampling creosote solutions. Non-routine sampling efforts, such as through cover ports, may necessitate more stringent precautions • Wear creosote-impermeable gauntlets when taking borings from freshly-treated wood
Cleaning cylinders or storage tanks	• Wear NIOSH-approved respirators (or breathing apparatus), creosote-impermeable gauntlets, outer clothing and boots during all vessel entries • Wear self-contained breathing apparatus with full facepiece operated in pressure-demand or other positive pressure mode. • Wear combination respirator that includes Type C-supplied air respirator and full facepiece operated in pressure-demand or other positive pressure or continuous-flow mode and auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode.
Handling and maintaining contaminated equipment	• Wear creosote impermeable apron, gauntlets and boots

Refer to *Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations Document (Environment Canada)* for a complete listing of precautions, handling instructions and personal hygiene."

ENVIRONMENTAL HAZARDS section

"Toxic to aquatic organisms."

DIRECTIONS FOR USE section

References to CSA standards and other standards to be removed.

"Treat the wood using the pressure treatment procedures consistent with the equipment being used and standard treatment practices. Treatment conditions must be calibrated to yield the target retention levels found in the following table:"

Decay Susceptibility	Commodity	Target Retention (kg/m^3)
Ground contact	Railway ties	96–128
Above Ground	sawn products	80–128
Ground/Freshwater contact	sawn products	96–192
	Pilings and Posts	96–272
	Poles	120–320
Salt Water (marine) Contact	Pilings, sawn products	290–400

"Store treated lumber on a roofed drip pad until dripping has ceased. Slope lumber on the drip pad to expedite drainage and to ensure that no puddles remain on the surface of the wood. Manage drippage and other related wastes to prevent release in the environment."

"Drip aprons must be roofed, paved and drained to prevent dilution and loss of treatment solution."

"DO NOT expose treated lumber to rains immediately after treatment."

"Conditions MUST be provided to minimize leaching/bleeding of preservative from treated wood."

"For further information on storage, handling and disposal of treated wood, contact the manufacturer of this product or the provincial regulatory agency."

"All operational procedures must be consistent with the Environment Canada document *Recommendations for the Design and Operations of Wood Preservation Facilities –Technical Recommendations Document*."

Disposal section

For Non-Bulk Containers

"1. Triple- or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank.

2. Follow provincial instruction for any required additional cleaning of the container prior to its disposal.

3. Make the empty container unsuitable for further use.

4. Dispose of the container in accordance with provincial requirements.

   For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean-up of spills."

A2. Label Amendments for Commercial Class Products Containing Creosote (Brush On Applications)

The label amendments presented below do not include all label requirements for individual end-use products, such as first aid statements, disposal statements, precautionary statements and supplementary protective equipment. Additional information on the labels of currently registered products should not be removed unless it contradicts the label statements given below.

A submission to request label revisions will be required within 90 days of finalization of the re-evaluation decision.

The labels of end-use products in Canada must be amended to include the following statements to further protect the environment.

COMMON NAME: Creosote
CHEMICAL NAME: Coal Tar; Coal Tar Creosote

FORMULATION TYPES: Liquid

USE-SITE CATEGORIES: Wood

GUARANTEE

Label guarantees to be expressed as nominal guarantees – supporting data to be provided.

GENERAL LIMITATIONS

"DO NOT discharge effluent containing this product into sewer systems, lakes, streams, ponds, estuaries, oceans or other waters."

PRODUCT LIMITATIONS

"For use ONLY on newly cut surfaces and drill holes of pressure-treated creosote timbers and lumber."

FIRST AID / TOXICOLOGICAL INFORMATION:

Note: First Aid and Toxicological information sections are to be harmonized to be consistent across products and consistent with PMRA's Regulatory Directive DIR2007-01, *First Aid Labelling Statements. The proposed first aid label statements below are based on the first aid information in: i)Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations Document (Environment Canada, 2004); ii) the current product labels; and iii) DIR2007-01. It is the registrant's responsibility to determine if the generic statements in DIR2007-01 are medically appropriate and to provide a rationale to the PMRA where statements differ from those presented in the directive.*

"If swallowed: Get medical attention or call a poison control centre immediately for treatment advice. Give conscious victim water or milk to drink. Then give 30-60 mL of Fleet's Phospho-Soda diluted 1:4 in water. Do not induce vomiting unless told to do so by a poison control centre or doctor."

"If on skin or clothing: Immediately remove soaked clothing or articles in contact with the skin. Immediately wash contaminated skin thoroughly with soap or mild detergent and water. Call a poison control centre or doctor for treatment advice. Get prompt medical attention if the skin becomes inflamed (redness, itchiness or pain)."

"If inhaled: Immediately move the affected person to fresh air. If person is not breathing, call 911 or an ambulance then give artificial respiration. Keep affected person warm and quiet."

"If in eyes: Immediately flush eyes with flowing water, occasionally lifting the upper and lower lids. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Flush eyes for at least 15 minutes. Get medical attention or call a poison control centre for treatment advice."

"Chronic symptoms requiring medical referral: Skin irritation, sensitivity; skin lesions."

"Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention."

ENVIRONMENTAL HAZARDS section

"Toxic to aquatic organisms."

DIRECTIONS FOR USE section

> "For further information on storage, handling and disposal of treated wood, contact the manufacturer of this product or the provincial regulatory agency."

B. Label Amendments for Commercial Class Products Containing Pentachlorophenol

The label amendments presented below do not include all label requirements for individual end-use products, such as first aid statements, disposal statements, precautionary statements and supplementary protective equipment. Additional information on the labels of currently registered products should not be removed unless it contradicts the label statements given below.

A submission to request label revisions will be required within 90 days of finalization of the re-evaluation decision.

The labels of end-use products in Canada must be amended to include the following statements to further protect the environment.

COMMON NAME: Pentachlorophenol

CHEMICAL NAME: Pentachlorophenol Plus Related Active Chlorophenols

FORMULATION TYPES: Solution, Solid

USE-SITE CATEGORIES: Wood

GUARANTEE

> Label guarantees to be expressed as nominal guarantees – supporting data to be provided.

GENERAL LIMITATIONS

> "DO NOT discharge effluent containing this product into sewer systems, lakes, streams, ponds, estuaries, oceans or other waters."

FIRST AID / TOXICOLOGICAL INFORMATION:

Note: First Aid and Toxicological information sections are to be harmonized to be consistent across products and consistent with PMRA's Regulatory Directive DIR2007-01, *First Aid Labelling Statements. The proposed first aid label statements below are based on the first aid information in: i)Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations Document (Environment Canada,2004); ii) the current product labels; and iii) DIR2007-01. It is the registrant's responsibility to determine if the generic statements in DIR2007-01 are medically appropriate and to provide a rationale to the PMRA where statements differ from those presented in the directive.*

For PCP solids:

"If swallowed: Get medical attention or call a poison control centre immediately for treatment advice. If the victim is conscious, have that person immediately drink large quantities of water. Do not induce vomiting unless told to do so by a poison control centre or doctor."

For PCP in oil:

"If swallowed: Get medical attention or call a poison control centre immediately for treatment advice. Do not induce vomiting."

"If on skin or clothing: Immediately remove soaked clothing or articles in contact with the skin. Immediately wash contaminated skin thoroughly with soap or mild detergent and water. Call a poison control centre or doctor for treatment advice. Get prompt medical attention if the skin becomes inflamed (redness, itchiness or pain)."

"If inhaled: Immediately remove the exposed person to fresh air. (Coughing and sneezing occur almost immediately after excessive inhalation of chlorophenols.) If person is not breathing, call 911 or an ambulance then apply artificial respiration. Keep the affected person comfortable and quiet. PCP can cause excessive body temperature. Get medical attention or call a poison control centre or doctor for treatment advice."

"If in eyes: Immediately flush eyes with flowing water, occasionally lifting the upper and lower lids. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Flush eyes for at least 15 minutes. Use boric acid solution and cortisone ophthalmic drops. Get medical attention or call a poison control centre for treatment advice."

"Chronic symptoms requiring medical referral: Dermatitis, headaches, nausea; hyperthermia, fever, sweating, weight loss; chloracne."

"Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention."

PRECAUTIONARY STATEMENTS

"Required precautionary measurements are as identified in *Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations Document (Environment Canada)*. A summary of these requirements is as follows: "

"Do not carry, store or consume food or drink in working areas (e.g. areas where preservatives are stored or used, or where freshly treated wood is stored)."

"Do not carry or smoke cigarettes in working areas."

"Wash hands thoroughly before leaving working areas and before eating, drinking, smoking or using the toilet facilities."

"Do not expose cuts or abrasions to preservatives."

"Wash skin immediately if contact with preservative solutions occurs"

"Get immediate first aid if skin or eyes contact preservative solutions. Even small contact exposures should receive immediate cleaning and treatment."

"Change outer clothing immediately if splashed with preservative solutions. Change clothing daily if any incidental contact with the treatment chemical occurs. Wash contaminated clothing separately from other clothing."

"Wear impermeable footwear in all working areas. Preservative solutions may penetrate leather shoes and apparel."

"Shower daily immediately after work."

"All work clothing and boots must be left at the plant."

"Discard clothing and other absorbent material that have been drenched or heavily contaminated with the product's concentrate. Do not reuse them."

PROTECTIVE CLOTHING AND EQUIPMENT:

"Personal protective equipment requirements are as identified in *Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations Document (Environment Canada)*. A summary of these requirements is as follows:

Activity	Personal Protective Equipment
Retort Opening / Charge Removal / Handling treated lumber	• Wear approved respirator if air concentrations are unknown or at or above TLVs • Wear rain suit, rubber boots, impermeable gauntlets, face shield or goggles when opening cylinder doors and removing and unloading charges • Wear impermeable gauntlets, apron and boots if handling treated wood manually • Wear a respirator if treated wood is handled in enclosed areas
Load Jams	Cylinder Entry • If retort TLV levels are exceeded or concentration is unknown, wear self-contained full-face respirator mask, impermeable coveralls, boots and gauntlets • If TLV levels are below regulatory limits; wear NIOSH-approved respirator, impermeable coveralls, boots and gauntlets
Equipment Maintenance	Welding Contaminated Equipment: • Wear an approved respirator
Unloading PCP Solids	• Wear goggles or face shield, impermeable gauntlets, coveralls, impermeable aprons and impermeable shoes or boots • Wear approved respirator whenever exposure to dust can occur
Preparing PCP Work Solutions	• Wear full face protection, organic solvent impermeable gauntlets, coveralls, aprons and shoes or boots for all operations involving handling of PCP solids • Wear an approved full facepiece respirator whenever dust conditions occur. Respirator cartridges must be NIOSH-rated for protection from "pesticides and organic vapours and dusts"
Sampling procedures	• Wear eye protection and gauntlets impermeable to organic solvents when sampling PCP solutions. • Wear impermeable gauntlets when taking borings from freshly-treated wood
Cleaning cylinders or storage tanks	• Wear NIOSH-approved respirators (or breathing apparatus), organic solvent impermeable gauntlets, outer clothing and boots during all vessel entries
Handling and maintaining contaminated equipment	• Wear impermeable apron, gauntlets and boots

Refer to *Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations Document* (Environment Canada) for a complete listing of precautions, handling instructions and personal hygiene."

ENVIRONMENTAL HAZARDS section

"Toxic to aquatic organisms."

DIRECTIONS FOR USE section

References to CSA standards and other standards to be removed.

"Dilute with appropriate hydrocarbon solvent to achieve a treating solution of 5 – 10% pentachlorophenol"

"Treat the wood using the pressure treatment procedures consistent with the equipment being used and standard treatment practices. Treatment conditions must be calibrated to yield the target retention levels found in the following table:"

Decay Susceptibility	Commodity	Target Retention (kg/m^3)
Ground contact	Railway ties	3.4–3.8
Above Ground	sawn products, plywood	4.8–6.4
Ground/Freshwater contact	sawn products, plywood	6.4–8.0
	Posts and Poles	6.1–12.8
	Pilings	12
	Poles (thermal butt treatment)	16

"Store treated lumber on a roofed drip pad until dripping has ceased. Slope lumber on the drip pad to expedite drainage and to ensure that no puddles remain on the surface of the wood. Manage drippage and other related wastes to prevent release in the environment."

"Drip aprons must be roofed, paved and drained to prevent dilution and loss of treatment solution."

"DO NOT expose treated lumber to rains immediately after treatment."

"Conditions MUST be provided to minimize leaching/bleeding of preservative from treated wood."

"For further information on storage, handling and disposal of treated wood, contact the manufacturer of this product or the provincial regulatory agency."

"All operational procedures must be consistent with the Environment Canada document: Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations Document."

For Non-Bulk Containers

"1. Triple- or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank.

2. Follow provincial instruction for any required additional cleaning of the container prior to its disposal.

3. Make the empty container unsuitable for further use.

4. Dispose of the container in accordance with provincial requirements.

For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean-up of spills."

C. Label Amendments for Commercial Class Products Containing CCA

The label amendments presented below do not include all label requirements for individual end-use products, such as first aid statements, disposal statements, precautionary statements and supplementary protective equipment. Additional information on the labels of currently registered products should not be removed unless it contradicts the label statements given below.

A submission to request label revisions will be required within 90 days of finalization of the re-evaluation decision.

The labels of end-use products in Canada must be amended to include the following statements to further protect the environment.

COMMON NAME: CCA

CHEMICAL NAME: chromated copper arsenate: hexavalent chromium oxide, divalent copper oxide, and pentavalent arsenic oxide

FORMULATION TYPES: Solution, Powder, Solid, Granular

USE-SITE CATEGORIES: Wood

GUARANTEE
Label guarantees to be expressed as nominal guarantees – supporting data to be provided.

GENERAL LIMITATIONS

"DO NOT discharge effluent containing this product into sewer systems, lakes, streams, ponds, estuaries, oceans or other waters."

FIRST AID / TOXICOLOGICAL INFORMATION:

Note: First Aid and Toxicological information sections are to be harmonized to be consistent across products and consistent with PMRA's Regulatory Directive DIR2007-01, *First Aid Labelling Statements. The proposed first aid label statements below are based on the first aid information in: i)Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations Document (Environment Canada, 2004); ii) the current product labels; and iii) DIR2007-01. It is the registrant's responsibility to determine if the generic statements in DIR2007-01 are medically appropriate and to provide a rationale to the PMRA where statements differ from those presented in the directive.*

"If swallowed: Promptly have the exposed person drink a large quantity of milk, egg whites, gelatin solution or water if the aforementioned are unavailable. Never give liquids to an unconscious person. Do not induce vomiting. Get medical attention or call poison control centre immediately for subsequent advice. (Stomach pumping by medical personnel is desirable.)"

"If on skin or clothing: Flush contaminated area immediately with flowing water. Subsequently remove contaminated clothing. Continue to flush contaminated skin for at least 15 minutes. Call a poison control centre or doctor for treatment advice. Get prompt medical attention if the skin becomes inflamed (redness, itchiness or pain)."

"If inhaled: Immediately remove the exposed person to fresh air. If breathing has stopped call 911 or an ambulance then apply artificial respiration. Keep the affected person warm and quiet. Get immediate medical attention or call a poison control centre for treatment advice."

"If in eyes: Immediately flush eyes with flowing water, occasionally lifting the upper
and lower lids. Flush eyes for at least 15 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Use boric acid solution and cortisone ophthalmic drops. Get medical attention or call a poison control centre for treatment advice."

"Chronic symptoms requiring medical referral: ulceration of the skin or mucous membrane (breaks in the skin, disintegration of tissue, pus formation); abdominal pains and other persistent symptoms of illness."

"Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention."

PRECAUTIONARY STATEMENTS

"Required precautionary measurements are as identified in *Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations (Environment Canada)*. A summary of these requirements is as follows: "

> "Do not carry, store or consume food or drink in working areas (e.g. areas where preservatives are stored or used, or where freshly treated wood is stored)."
>
> "Do not carry or smoke cigarettes in working areas."
>
> "Wash hands thoroughly before leaving working areas and before eating, drinking, smoking or using the toilet facilities."
>
> "Do not expose cuts or abrasions to preservatives."
>
> "Wash skin immediately if contact with preservative solutions occurs"
>
> "Get immediate first aid if skin or eyes contact preservative solutions. Even small contact exposures should receive immediate cleaning and treatment."
>
> "Change outer clothing immediately if splashed with preservative solutions. Change clothing daily if any incidental contact with the treatment chemical occurs. Wash contaminated clothing separately from other clothing."
>
> "Wear impermeable footwear in all working areas. Preservative solutions may penetrate leather shoes and apparel."
>
> "Shower daily immediately after work."
>
> "All work clothing and boots must be left at the plant."
>
> "Discard clothing and other absorbent material that have been drenched or heavily contaminated with the product's concentrate. Do not reuse them."

PROTECTIVE CLOTHING AND EQUIPMENT:

"Personal protective equipment requirements are as identified in *Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations Document (Environment Canada)*. A summary of these requirements is as follows:

Activity	Personal Protective Equipment
Retort Opening / Charge Removal / Handling treated lumber	• Wear approved respirator if air concentrations are unknown or at or above TLVs • Wear rain suit, rubber boots, impermeable gauntlets, face shield or goggles when opening retort doors and removing and unloading charges • Wear impermeable gauntlets when handling freshly treated wood • Wear impermeable gloves, aprons and boots if there is potential for getting wet by CCA solution
Load Jams	Cylinder Entry • If retort TLV levels are exceeded or concentration is unknown, wear self-contained full-face respirator mask, impermeable coveralls, boots and impermeable gauntlets • If TLV levels are below regulatory limits; wear NIOSH-approved respirator, impermeable coveralls, boots and gauntlets
Equipment Maintenance	Welding Contaminated Equipment: • Wear an approved respirator
Unloading Bulk CCA Concentrate	• Wear chemical goggles or face shield, impermeable gauntlets, coveralls, impermeable aprons and impermeable shoes or boots
Preparing CCA work solutions	• Wear full face protection, impermeable gauntlets, coveralls, impermeable aprons and impermeable shoes or boots for all operations involving direct exposure to CCA concentrates
Sampling procedures	• Wear eye protection and impermeable gauntlets when sampling CCA solutions (including full face protection with CCA concentrates) • Wear impermeable gloves when taking borings from freshly treated wood
Cleaning cylinders, fixation chambers or storage tanks	• Wear NIOSH-approved respirators (or breathing apparatus), impermeable gauntlets, apron (rubber or polyethylene coated) and rubber boots during all vessel entries
Handling and maintaining contaminated equipment	• Wear impermeable apron, gauntlets and boots if there is potential for getting wet by CCA solution

Refer to *Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations Document (Environment Canada)* for a complete listing of precautions, handling instructions and personal hygiene."

ENVIRONMENTAL HAZARDS section

"Toxic to aquatic organisms."

DIRECTIONS FOR USE section

References to CSA standards and other standards to be removed.

"Dilute with water to achieve a treating solution of 0.5 – 10% active ingredients"

"Treat the wood using the pressure treatment procedures consistent with the equipment being used and standard treatment practices. Treatment conditions must be calibrated to yield the target retention levels found in the following table:"

Decay Susceptibility	Commodity	Target Retention (kg/m^3)
Above Ground	sawn products, plywood, laminations	4.0
Ground/Freshwater contact	sawn products, plywood, laminations, posts	6.4
	sawn products (in extreme decay conditions)	8.0
	plywood, poles & posts (extreme decay conditions)	9.6
	pilings	12.0
Salt Water (Marine) contact	pilings, sawn products	24.0

"Store treated lumber on a roofed drip pad until dripping has ceased. Slope lumber on the drip pad to expedite drainage and to ensure that no puddles remain on the surface of the wood. Manage drippage and other related wastes to prevent release in the environment."

"Drip aprons must be roofed, paved and drained to prevent dilution and loss of treatment solution."

"DO NOT expose treated lumber to rains immediately after treatment."

"Conditions MUST be provided whereby the wood can undergo FIXATION"

"Fixation MUST be achieved prior to the treated wood being shipped."

"For further information on storage, handling and disposal of treated wood, contact the manufacturer of this product or the provincial regulatory agency."

"All operational procedures must be consistent with the Environment Canada document: *Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations Document*."

For Non-Bulk Containers

"1. Triple- or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank.

2. Follow provincial instruction for any required additional cleaning of the container prior to its disposal.

3. Make the empty container unsuitable for further use.

4. Dispose of the container in accordance with provincial requirements.

For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean-up of spills."

"DO NOT BURN CCA-TREATED WOOD EXCEPT IN FACILITIES AUTHORIZED FOR DISPOSAL OF SUCH PRODUCTS. DO NOT USE CCA-TREATED WOOD AS A COMPOST OR MULCH."

D. Label Amendments for Commercial Class Products Containing ACZA

The label amendments presented below do not include all label requirements for individual end-use products, such as first aid statements, disposal statements, precautionary statements and supplementary protective equipment. Additional information on the labels of currently registered products should not be removed unless it contradicts the label statements given below.

A submission to request label revisions will be required within 90 days of finalization of the re-evaluation decision.

The labels of end-use products in Canada must be amended to include the following statements to further protect the environment.

COMMON NAME: ACZA

CHEMICAL NAME: ammoniacal copper zinc arsenate: arsenic pentoxide, cuprous oxide, and zinc oxide

FORMULATION TYPES: Solution

USE-SITE CATEGORIES: Wood

GUARANTEE
Label guarantees to be expressed as nominal guarantees – supporting data to be provided.

GENERAL LIMITATIONS

"Not for residential use"

"DO NOT discharge effluent containing this product into sewer systems, lakes, streams, ponds, estuaries, oceans or other waters."

FIRST AID / TOXICOLOGICAL INFORMATION:

Note: First Aid and Toxicological information sections are to be harmonized to be consistent across products and consistent with PMRA's Regulatory Directive DIR2007-01, *First Aid Labelling Statements. The proposed first aid label statements below are based on the first aid information in: i)Recommendations for the Design and Operations of Wood Preservation Facilities – Technical recommendations document (Environment Canada, 2004); ii) the current product labels; and iii) DIR2007-01. It is the registrant's responsibility to determine if the generic statements in DIR2007-01 are medically appropriate and to provide a rationale to the PMRA where statements differ from those presented in the directive.*

"If swallowed: Give conscious victim a large quantity of water or milk. Never give liquids to an unconscious person. Do not induce vomiting unless told to do so by a poison control centre or doctor. Get immediate medical attention or call a poison control centre for further treatment advice. (Stomach pumping by medical personnel is desirable.)"

"If on skin or clothing: Flush contaminated area immediately with flowing water, while removing soaked clothing or articles in contact with the skin. Continue to flush contaminated skin for at least 15 minutes. Call a poison control centre or doctor for treatment advice. Get prompt medical attention if the skin becomes inflamed (redness, itchiness or pain)."

"If inhaled: Immediately remove the person to fresh air (coughing and sneezing occur almost immediately after excessive inhalation of ammonia fumes. If breathing has stopped call 911 or an ambulance then apply artificial respiration. Keep the affected person warm and quiet. Get immediate medical attention or call a poison control centre for further treatment advice."

"If in eyes: Immediately flush eyes with flowing water, occasionally lifting the upper and lower lids. Flush eyes for at least 30 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Get medical attention or call a poison control centre for treatment advice."

"Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention."

PRECAUTIONARY STATEMENTS

"Required precautionary measurements are as identified in *Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations Document (Environment Canada)*. A summary of these requirements is as follows:"

"Do not carry, store or consume food or drink in working areas (e.g. areas where preservatives are stored or used, or where freshly treated wood is stored)."

"Do not carry or smoke cigarettes in working areas."

"Wash hands thoroughly before leaving working areas and before eating, drinking, smoking or using the toilet facilities."

"Do not expose cuts or abrasions to preservatives."

"Wash skin immediately if contact with preservative solutions occurs"

"Get immediate first aid if skin or eyes contact preservative solutions. Even small contact exposures should receive immediate cleaning and treatment."

"Change outer clothing immediately if splashed with preservative solutions. Change clothing daily if any incidental contact with the treatment chemical occurs. Wash contaminated clothing separately from other clothing."

"Wear impermeable footwear in all working areas. Preservative solutions may penetrate leather shoes and apparel."

"Shower daily immediately after work."

"All work clothing and boots must be left at the plant."

"Discard clothing and other absorbent material that have been drenched or heavily contaminated with the product's concentrate. Do not reuse them."

PROTECTIVE CLOTHING AND EQUIPMENT:

"Personal protective equipment requirements are as identified in *Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations Document (Environment Canada)*. A summary of these requirements is as follows:

Activity*	Personal Protective Equipment
Retort Opening / Charge Removal / Handling treated lumber	• Wear approved respirator if air concentrations are unknown or at or above TLVs • Wear rain suit, rubber boots, impermeable gauntlets, face shield or goggles when opening cylinder doors and removing and unloading charges. • Wear impermeable gauntlets when handling freshly treated charges • Wear impermeable gauntlets, aprons and boots if there is potential for getting wet by ACZA solution
Load Jams	Cylinder Entry • If retort TLV levels are exceeded or concentration is unknown, wear self-contained full-face respirator mask, impermeable coveralls, boots and gauntlets • If TLV levels are below regulatory limits; wear NIOSH-approved respirator, impermeable coveralls, boots and impermeable gauntlets
Equipment Maintenance	Welding Contaminated Equipment: • Wear an approved respirator
Unloading Bulk Ammonium Hydroxide	• Wear face shield, impermeable gauntlets, coveralls, impermeable aprons and impermeable shoes or boots
Unloading Drums of Arsenic Acid	• Wear goggles, impermeable gauntlets, full-length impermeable apron/suit
Preparing ACZA work solutions	• Wear full face protection mask with ammonia canister, impermeable gauntlets, coveralls, impermeable aprons and impermeable shoes or boots for all operations involving direct exposure to ACZA solutions and chemical ingredients
Sampling procedures	• Wear eye protection and impermeable gauntlets when sampling ACZA solutions (including full face protection with ACZA solutions) • Wear impermeable gauntlets when taking borings from freshly-treated wood
Cleaning cylinders, fixation chambers or storage tanks	• Wear NIOSH-approved respirators (or breathing apparatus), impermeable gauntlets, apron (rubber or polyethylene coated) and rubber boots during all vessel entries
Handling and maintaining contaminated equipment	• Wear impermeable apron, gauntlets and boots if there is potential for getting wet by ACZA solution

Refer to *Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations* (Environment Canada) for a complete listing of precautions, handling instructions and personal hygiene."

ENVIRONMENTAL HAZARDS section

"Toxic to aquatic organisms."

DIRECTIONS FOR USE section

References to CSA standards and other standards to be removed.

"Dilute with water to achieve a treating solution of 0.5–10% active ingredients"

"Treat the wood using the pressure treatment procedures consistent with the equipment being used and standard treatment practices. Treatment conditions must be calibrated to yield the target retention levels found in the following table:"

Decay Susceptibility	Commodity	Target Retention (kg/m^3)
Above Ground	sawn products, plywood, laminations	4.0
Ground/Freshwater contact	sawn products, plywood, laminations, posts	6.4
	sawn products (in extreme decay conditions)	8.0
	plywood, poles & posts (extreme decay conditions)	9.6
	pilings	12.0
Salt Water (Marine) contact	pilings, sawn products	30.0

"Store treated lumber on a roofed drip pad until dripping has ceased. Slope lumber on the drip pad to expedite drainage and to ensure that no puddles remain on the surface of the wood. Manage drippage and other related wastes to prevent release in the environment."

"Drip aprons must be roofed, paved and drained to prevent dilution and loss of treatment solution."

"DO NOT expose treated lumber to rains immediately after treatment."

"Conditions MUST be provided whereby the wood can undergo stabilization."

"For further information on storage, handling and disposal of treated wood, contact the manufacturer of this product or the provincial regulatory agency."

"All operational procedures must be consistent with the Environment Canada document *Recommendations for the Design and Operations of Wood Preservation Facilities – Technical Recommendations Document*."

For Non-Bulk Containers

"1. Triple- or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank.

2. Follow provincial instruction for any required additional cleaning of the container prior to its disposal.

3. Make the empty container unsuitable for further use.

4. Dispose of the container in accordance with provincial requirements.

For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean-up of spills."

"DO NOT BURN ACZA-TREATED WOOD EXCEPT IN FACILITIES AUTHORIZED FOR DISPOSAL OF SUCH PRODUCTS. DO NOT USE ACZA-TREATED WOOD AS A COMPOST OR MULCH."

References

Recommendations for the design and operation of wood preservation facilities, 2004 – technical recommendations document. Report EPS 2/WP/6. Prepared for Environment Canada National Office of Pollution Prevention by GE Brudermann, Frido Consulting.

Reregistration Eligibility Decision for Creosote, EPA 739-R-08-007 September 2008.

Reregistration Eligibility Decision for Pentachlorophenol, EPA 739-R-08-008 Sept. 25 2008.

Reregistration Eligibility Decision for Chromated Arsenicals, EPA 739-R-08-006 September 2008.

Studies Considered in Chemistry Assessment

A. Creosote

PMRA # 1499011 Technical Chemistry file CRT-CBM-5, DACO: 2.99 CBI

Product Chemistry Science Chapter on Creosote, EPA document # EPA-HQ-OPP-2003-0248-0005 2003-11-26

PMRA # 1332126 1998, Product Chemistry for North American CTM Creosote P2, 70C-6939-001, DACO: 2.14.1, 2.14.11, 2.14.13, 2.14.14, 2.14.3, 2.14.7, 2.14.8, 2.14.9, 2.16 CBI

PMRA # 1332127 1998, Product Chemistry for North American CTM Creosote P1/P13, 70C-6939-001, DACO: 2.14.1, 2.14.11, 2.14.13, 2.14.14, 2.14.3, 2.14.7, 2.14.8, 2.14.9, 2.16 CBI

PMRA # 1332145 1999, Product Chemistry for North American CTM Creosote P1/P13 Long Term Storage Stability and Corrosion Characteristics, 70C-6939/7674, DACO: 2.14.14, 2.16 CBI

PMRA # 1332146 1999, Product Chemistry for North American CTM Creosote P2 Long Term Storage Stability and Corrosion Characteristics, 70C-6939/7674, DACO: 2.14.14, 2.16 CBI

B. Pentachlorophenol:

The e-Pesticide Manual v.3.1, CDS Tomlin, ed., British Crop Protection Council, 2004, entry for Pentachlorophenol

EPA Reregistration Eligibility Decision for Pentachlorophenol, EPA 739-R-08-008 Sept. 25 2008

PCP: Product Chemistry EPA document ID: HQ-OPP-2004-0402-0005[1], dated 11/19/2004

PMRA # 1452653 Information migrated from TGAI Chemistry paper files ("Brown" Files) PCP-PDO-2, DACO: 2.99

PMRA # 1465430 Vulcan Chemicals Pentachlorophenol. Volume 3. Product Chemistry. PCP-VUN-1 February 10, 1983, DACO: 0.9, 2.1, 2.10, 2.11, 2.12, 2.13, 2.14, 2.16, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9

PMRA # 1402158 2006, Analysis of PCDD/Fs, P7060, MRID: N/A, DACO: 2.16

PMRA # 1402160 2007, Analysis of PCDD/Fs and HxCBz, P7395, MRID: N/A, DACO: 2.16

C. CCA

PMRA # 1465643 Technical Chemistry file CUO-OLE-1 - Cupric Oxide, DACO: 2.99

PMRA # 1560457 Technical Chemistry file CUO-ADH-1. Compliance information for Agriculture Canada Trade Memorandum T-1-238 for Copper Oxide, Specifications and Analytical Methodology, Analytical Methods Cupric Oxide and Material Safety Data Sheet, DACO: 0.9, 2.1, 2.11.1, 2.

PMRA # 1415693 Technical Chemistry File: CUO-PCP-1., N/S, MRID: N/S, DACO: 2.99

PMRA # 1542727 Product Identification, none, DACO: 2.1, 2.14.1, 2.14.10, 2.14.11, 2.14.12, 2.14.13, 2.14.14, 2.14.2, 2.14.3, 2.14.4, 2.14.5, 2.14.6, 2.14.7, 2.14.8, 2.14.9, 2.2, 2.3, 2.3.1, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9 (PCP # 27122)

PMRA # 1415693 Technical Chemistry File: CUO-PCP-1., N/S, MRID: N/S, DACO: 2.99

PMRA # 1542727 Product Identification, none, DACO: 2.1, 2.14.1, 2.14.10, 2.14.11, 2.14.12, 2.14.13, 2.14.14, 2.14.2, 2.14.3, 2.14.4, 2.14.5, 2.14.6, 2.14.7, 2.14.8, 2.14.9, 2.2, 2.3, 2.3.1, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9

PMRA # 1415693 Technical Chemistry File: CUO-PCP-1., N/S, MRID: N/S, DACO: 2.99

D. ACZA

PMRA # 1537301 1995, Technical Chemistry File, Zinc Oxide. DACO: 2.1, 2.10, 2.11, 2.12, 2.13, 2.14, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9