Preservative Treated Timber in Australia: Products, Treatments and Trends

September 2007

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Executive Summary

This report examines what preservative treated timber and wood products are being consumed in Australia, the preservatives that are being used and historical and current trends.

Based on this information the report makes several findings regarding how to identify treated timber in the waste stream and key intervention points for the identification for suitable disposal of preservative treated timber and/or recycling of end-of-life timber.

The report found that the majority of treated timber products are used in a relatively small number of applications. The major applications are in products used in:

- agriculture,
- urban fencing & landscaping; and
- outdoor building & construction applications (decks, pergolas, etc)
- termite resistant house framing

The main products in agricultural applications are vineyard sticks and fencing rounds.

The principal products in urban environments are fencing (palings and posts), landscaping and a variety of garden setting products such as garden edging, retaining walls and sleepers.

The key products used in outdoor building and construction applications are decks, pergolas, handrails, cladding and fascias.

The remainder is mostly used for internal structural framing for termite resistance construction.

It is estimated that there is 1.4 million cubic metres of treated timber consumed in Australia each year. Imports of treated product constitute about 20% of this consumption. The foremost importing country of treated timber is New Zealand with a number of other countries supply relatively small volumes of treated timber products.

Total treated timber volumes are currently raising as a proportion of total solid wood consumption. This is driven by greater demand for treated ‘blue-pine’ internal framing treated with synthetic pyrethroids, permethrin or bifenthrin.

The timber preservatives used to treat timber and wood products are becoming more diverse due to regulatory drivers and market demands. The largest proportion of timber is treated with the preservative Copper Chromium Arsenate (CCA).

From this analysis it was concluded that the majority of treated timber products currently consumed in Australia are readily visually identifiable from non-treated timber by multiple factors. These include:

- branding (compulsory in NSW and Queensland)
- shape (round / sawn)
• wood type (hardwood/softwood)
• colour and colour markings (green tinge, yellow, blue or red dye)
• locality of use (indoor / outdoor)
• application (decking / fencing / landscape / utility poles)
• species (borer susceptible species or natural durable, not needing treatments)

Currently, approximately 38% of all treated timber is roundwood, 58% sawnwood and 4% engineered wood products.

The investigation found that there were groupings of products and users of these products that provided an opportunity for targeted education to the users to reduce the amount of treated timber finding its way into the reuse applications.

For the urban environment it was found to be predominantly fencing, landscaping and outdoor construction applications used by builder and house renovators. Targeted education to these users of these products on the appropriate disposal would increase recovery of non-treated timber.

For treated timber occurring in rural areas it would be best to target those undertaking renewal of agricultural fencing and vineyard sticks.

For smaller quantities of treated timber that may be finding their way into garden organics recycling from DIY, garden clean-ups and council parks and gardens activities, targeting local councils with advice for staff and residents on separation of treated timber would be appropriate.
1 Study Outline

1.1 Introduction

This report examines the range of preservative treated products currently available in Australia and quantifies the total volumes of treated timber produced in Australia and imported from overseas. The report also describes the range of preservative treated products and discusses trends in the types of treatments, government regulation and innovation.

The aim of this report is to assist in better understanding what products are being treated, where they are being used and at what hazard level.

1.2 Background

In 2003 the NSW Government listed treated timber as a ‘waste of concern’ under their Extended Producer Responsibility (EPR) program. One of the major reasons cited for the listing of treated timber was a perception that the presence of treated timber in the waste stream inhibits recovery of all waste timber.

As a response to this listing, in early 2006, the timber industry formed the Treated Timber Product Stewardship Group (TTPSG), with the TDA providing project management services to the TTPSG. The activities of the TTPSG have recently been incorporated into a National Timber Stewardship Group (NTSG).

Since 2006 research by A3P and TDA (on behalf of the TTPSG) has so far:

- determined that timber is a key target material in a number of jurisdictions for increased recovery and diversion from landfill
- identified key stakeholders and undertaken literature reviews on international experiences of EPR as it relates to waste timber
- identified key points of intervention to divert increased quantities of waste timber from landfill
- quantified waste timber generation and recovery
- undertaken interviews with timber recovery and landfill operators nationally
- identified that all timber pallets and packaging imported into Australia must be treated in a number of way (by heat or non-residual or permanent preservatives) to prevent the importation of pests and diseases in the timber
- found that large quantities of waste timber are generated by the demolition of buildings and from disposal of timber packaging and pallets, and these two waste streams have quite distinct supply chains and collection points.
- identified that there is little information about the major preservative treated timber products and quantities produced in and imported into Australia.
The final finding above provided the basis upon which this treated timber study was commissioned by A3P and TDA.

1.3 Scope of Work

The scope of work for this project involves qualifying and, where appropriate, broadly quantifying the current market for treated timber. This includes treated timber produced within Australia as well as imported treated products.

This report does not cover the use of fumigants commonly referred to as treatments in the quarantine field. These fumigants include heat treatment and fumigation with chemicals such as methyl bromide.

1.4 Methodology

The methodology followed in this investigation was to firstly conduct a literature review of web-based and other published information on treated timber.

From this base, interviews were then carried out with industry experts, industry associations, government agencies and companies from across the supply chain for treated timber processing and distribution.

An advanced draft was sent to applicable members of the National Timber Stewardship Group for comment.
2 General Product Categories

There is a broad range of preservative treated wood products used in Australia. A number of applications are confined to very small volumes and may not be addressed in this report.

The following general categories represent the vast majority of uses for preservative treated timber in Australia:

- **Agricultural**: Farm uses including vineyard posts, stakes and farm fencing.
- **Landscaping and fencing**: Includes landscaping sleepers, retaining walls, fencing and lattice.
- **Building - Internal structural**: Includes flooring, framing timber, and bracing. This expanding category is mainly comprised of the relatively new ‘Blue-pine’ category of envelope treated framing timber and treated engineered timber products such as flooring, plywood, LVL and I-beams.
- **Building - Outside structural**: Deck components including handrails, posts, joists and bearers as well as pergolas and the like.
- **Building - Outside non-structural**: Includes cladding, window frames, fascias and the like.
- **Civil - Utility poles**: Includes telecommunications and electricity supply poles.
- **Civil - Heavy engineering**: Includes piling for residential and non-residential construction and timber for road and rail bridges and cooling towers.
- **Civil – Marine**: Includes decking, wharves and jetties in marine environments.

3 Hazard Levels

Hazard levels or “H” levels are used to describe the service situation that the intended treated timber products will be used. The hazard levels used in Australia are defined in Australian Standard AS1604 Specification for Preservative Treatment. A lower H level indicates a lower environmental hazard. Hazards may include fungal and decay attack as well as termites and borers. Therefore timber only intended for interior use that may be susceptible to insects other than termites (such as the lyctid or anobiid borers) need only be treated to H1 level. Interior timber which may be subjected to termites or borer attack would need to be treated to H2 level. H6 the highest hazard level, is reserved for marine use where the timber be subject to prolonged immersion in sea water and needs to resist marine organisms, borers and rot.

A detailed explanation of the different hazard levels and examples of the products treated in each hazard level are illustrated in Appendix 1.
Only relatively small volumes of timber are treated in hazard level H1, H5 and H6. The majority of treated timber is treated to H3 and H4 level although the quantity of timber treated to H2 level has grown significantly over the last four years. The relative volumes of treated wood in each hazard class in 2003 are illustrated in Figure 1 below.

In general, the higher the hazard level the greater the requirement for penetration depth of active chemical within the sapwood and/or heartwood. Not all chemical compositions are able to be used for all hazard situations. The hazard level and chemical type used will therefore be a guide to the volumes of chemicals in the timber.

![Figure 1: Relative proportion of timber treated by hazard class. Source: Carruthers 2003](image)

H2 and H3 hazard level have subset levels with different retention rates depending on application and location of use. For example H2F (framing timber) an envelope treatment is sufficient for South of the Tropic of Capricorn but full sapwood penetration is required for timber treated to H2F level north of the Tropic.

The preservative does not usually penetrate all the timber. For example, for H1 treatment of hardwood flooring, only 10% of hardwood flooring may be sapwood. Thus, only a maximum 10% of the timber could contain the preservative.

At the other extreme, softwood may be all sapwood and, particularly if the wood is of small dimension, it may achieve 100% penetration with preservative.

4 **Current Types of Preservative Treatments**

The preservative treatments used in Australia can be broadly grouped into a number of types based on the carrier of the active preservative used. These are generally water-borne such as Copper Chromium Arsenate (CCA), alkaline copper quaternary (ACQ) and boron compounds, oil-based formulations such
as creosote and pigment emulsified creosote (PEC) or solvent-borne formulations carrying metal and/or organic active preservatives such as synthetic pyrethroids or azoles. The synthetic pyrethroids can be applied using water or light organic solvent preservative (LOSP) carriers.

The broad categories of treatments used in Australia include:

- Water-borne
- Oil-borne
- LOSP

### 4.1 Waterborne

This group of preservatives is composed of preservative materials carried in a solution of water. The main water-borne preservative used is Copper Chromium Arsenate or Chromated Copper Arsenate (commonly known as CCA) which is a very common preservative used in Australia and New Zealand.

Other copper based waterborne preservatives are alkaline copper quaternary (ACQ) and copper azole (Cu Az). ACQ is made up of copper, a fungicide, and quaternary ammonium compound (quat) is the co-biocide providing additional protection from insects as well as copper tolerant fungi. The primary active ingredients in Cu Az are copper and tebuconazole which provides additional protection from fungi. Both ACQ and Cu Az contain higher levels of copper than CCA.

Boron compounds, also waterborne, are usually applied to Lyctid borer susceptible hardwood flooring (to H1 hazard level) but can also be applied to timber for H2 applications.

The synthetic pyrethroid bifenthrin is used as a waterborne H2 envelope treatment for house framing and truss timber.

### 4.2 Oil-Borne

Timber treated with oil-borne preservatives is used to treat small quantities of timber primarily for heavy duty construction and in the marine environment. The most common oil-borne preservatives are creosote and pigment emulsified creosote (PEC). Oil-borne treated products include vineyard sticks, utility poles, rail sleepers and marine piles.

### 4.3 Light Organic Solvent Preservatives

Light Organic Solvent Preservatives (LOSP) are preservatives carried by a light hydrocarbon such as white spirit or linseed oil and therefore describe the treatment process rather than the preservative used.

Timber products treated with the LOSP process include house framing and truss timber, high value joinery and similar products. LOSP treated products are treated generally in their final form and shape and currently are approved only for use in above ground applications (H1-H3).
LOSP active ingredients include the synthetic pyrethroids; permethrin, deltamethrin, bifenthrin, and cypermethrin with permethrin being the sole insecticide currently used. Other LOSP treatments use the azoles - tebuconazole and propiconazole and metal preservatives such as tributyl tin napthenate (TBTN) or copper napthenate.

The active ingredients in LOSP can be used singularly or in combination to treat products for higher hazard level applications. Common combinations include TBTN + permethrin and tebuconazole + propiconazole + permethrin.

### 4.4 Relative Use of Preservatives

The chart in Figure 2 below provides an estimation of the relative proportion of the timber preservatives used in 2003. As can be seen the higher hazard classes H3-H6 are dominated by CCA preservative, H1 by borates and H2 by LOSP preservatives.

![Figure 2: Relative proportion of treated wood products by preservative type in hazard classes. Source Carruthers 2003](image)

### 5 Current Markets for Preservative Treated Products

Preservative treatment is applied to a wide range of timber products made in Australia as well as timber products imported from overseas, particularly New Zealand, which has a large treated timber industry. Australia produces approximately 80% of its preservative treated solid timber needs. Australia continues as one of New Zealand’s major treated timber export markets.

The vast bulk of treated timbers are solid wood products. Small quantities of engineered wood products – particleboard, plywood, laminated veneer lumber (LVL) and oriented strand boards (OSB) are also treated with preservative.

#### 5.1 Solid Wood

**Hardwood**

Certain timber types, generally hardwoods, exhibit good natural durability of the “heartwood” or older centre part of the log. The timber outside the heartwood is called the “sapwood” which is generally smaller in volume and
much less durable. It is important to note that in hardwoods, the sapwood can be much more successfully treated. A little heartwood penetration of hardwoods is possible but is dependant on the species. This is important when considering the physical distribution and volumes of chemicals that may be contained within preservative treated product (see Figure 3 below).

It is estimated that less than 20% of treated timber consumed in Australia each year was hardwood in 2003 (Carruthers 2003) with this proportion falling.

![Figure 3: The various sapwood–heartwood configurations that can be found in roundwood and sawn timber. Source: Department of Primary Industries and Fisheries, Queensland](image)

**Softwood**

Softwoods, generally characterized commercially in Australia by members of the Pinus species\(^1\), have relatively low natural durability of the heartwood and sapwood and it is these species that make up the majority of the treated wood used in Australia. The sapwood readily takes up chemical treatments, particularly using the pressure treated methods traditionally used. The heartwood of pine is hard to treat and as such the requirement is usually to get an envelope penetration in the heartwood if the heart content is greater than 20% of the cross section. It is important to note that the sapwood forms a much larger proportion of the softwood log than is the case for hardwoods. In excess of 80% of preservative is applied to softwood (see figure 1 above).

**5.1.1 Roundwood**

Roundwood products are wood products that are largely used in their original form. This includes firewood, posts, poles, pulpwood and similar products. A lot of suitable roundwood, particularly softwood, is sold as preservative logs. These preservation logs are used “in-the-round” for: fence posts, rails, strainer posts, vineyard poles, house building and power transmission poles (James 2001).

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\(^1\) Pine is a generic term that refers to a number of Pinus species grown in commercial plantations in Australia. *Pinus radiata*, *Pinus elliottii* and *Pinus caribaea* are typical examples. The characteristics of a number of other species such as Cypress and Hoop Pine are sufficiently different to be excluded from this generic definition.
The vast majority of softwood roundwood is treated as it is used outside and in-ground and most softwood are not durable species when exposed to the elements (Francis & Norton 2006).

5.2.2 Sawnwood

H1
Products treated to H1 are mainly hardwood flooring but also a quantity of hardwood house framing, furniture timber, moldings and minor quantities of hardwood tool handles. If a species with lyctid borer susceptible sapwood is selected, any sapwood present, if the timber is to be sold in Queensland or NSW, must be preservative treated (NSW Government 2005).

In 2000 it was estimated that 33,000 cubic metres of hardwood flooring was treated to H1 level (Gardiner et al in press). It has been assumed that the quantities of flooring consumed have remained steady if not fallen since 2000.

Boron is the dominant preservative used here but ACQ and permethrin are increasingly being used as facilities find that these preservatives offer processing advantages. CCA is used by a number of treatment facilities in Australia and overseas however the total volumes are minor.

H2
Timber products treated to this hazard level are mostly interior structural framing, roof timber and wood products. The most common types of preservatives used are the synthetic pyrethroids in LOSP or water-based carrier.

H3
This hazard class includes the high volume fencing category, pergola and deck structural timber and window joinery. Window joinery is predominantly treated with LOSP process preservatives while fencing as well as pergola and deck framing timber is predominantly treated with CCA.

Domestic deck boards, handrails and a number of other H3 treated products are no longer treated with CCA so other preservatives are now used.³

H4
The largest category of treated timber includes in-ground use such as fence posts, garden walls, construction of greenhouses and general in-ground landscaping work. CCA preservative is the predominant preservative used in this category with ACQ increasingly being used.

² The exceptions being species such as highly durable celery top pine and cypress and durable western red cedar
³ Timber is no longer allowed to be treated with CCA for domestic decking boards, handrails, children’s play equipment, garden furniture, picnic tables or external seating following a review by the Australian Pesticides and Veterinary Medicines Authority (APVMA). Use will continue to be permitted where frequent and intimate contact with people does not occur. The full review is available at http://www.apvma.gov.au/chemrev/arsenic.shtml
H5
Similar products as for H5 but used in more critical applications such as structural retaining walls, piling, house stumps, building poles and cooling towers. CCA preservative is predominantly used.

H6
Products for marine applications such as wharf piling, handrails and decking. Predominantly CCA preservatives and sometimes combined with creosote preservatives if produced for use in northern waters.

Other
Other products that are preservative treated include decking, handrails and cladding. Decking and handrails are no longer treated with CCA for domestic applications while cladding is usually treated with the LOSP process.

5.2 Engineered Wood Products
Engineered wood products are particleboard, medium density fibreboard (MDF), hardboard, plywood, laminated veneer lumber (LVL), glue laminated beams (Glulam), oriented strand board (OSB) and I-beams.

A number of particleboard flooring is treated with preservatives and the preservative currently used is the synthetic pyrethroid permethrin. Based on industry advice it is assumed only 20% of particleboard consumption is produced for flooring and 20% of this is treated against termite attack.

MDF and hardboard is not treated with preservatives.

Plywood and LVL products are largely untreated with preservatives. The small volumes that are treated are mainly treated with the synthetic pyrethroids. A portion of LVL treated to H2 using a glue line additive as the treatment method.

The organic preservatives propiconazole and tebuconazole or ACQ/CA is also used. Very small quantities of plywood are treated with CCA. The plywood that is treated with CCA is used in most cases for roadside noise barriers and train carriage construction.

Oriented strand board (OSB) is now being imported into the country in small quantities. Some of this OSB is treated for H2 level hazards at overseas facilities with synthetic pyrethroids for use in structural applications such as frame bracing or in I-beams.

5.3 Total Volume Estimates
The total volume of preservative treated products sold in Australia is estimated at between 1.3 and 1.4 million cubic metres per year. This includes imported products.

Table 1 below provided by the Timber Preservers Association of Australia (TPAA) provides an estimation of the volumes of treated solid wood based on the preservative carrier and wood type.
Table 1: Estimated Solid Wood Treated Timber Volumes Based on Carrier and Wood Type – 2006 (Source: TPAA)

<table>
<thead>
<tr>
<th>Solid Wood Type</th>
<th>Unit</th>
<th>Water Borne CCA, Cu Az, ACQ</th>
<th>Oil Borne Creosote, PEC</th>
<th>Solvent Borne LOSP</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round Softwood</td>
<td>'000 m³</td>
<td>380</td>
<td>30</td>
<td>Nil</td>
<td>410</td>
</tr>
<tr>
<td>Sawn Softwood</td>
<td>'000 m³</td>
<td>550</td>
<td>10</td>
<td>200²</td>
<td>760</td>
</tr>
<tr>
<td>Round Hardwood</td>
<td>'000 m³</td>
<td>70</td>
<td>14</td>
<td>Nil</td>
<td>84</td>
</tr>
<tr>
<td>Sawn Hardwood</td>
<td>'000 m³</td>
<td>80</td>
<td>10</td>
<td>3</td>
<td>93</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>'000 m³</td>
<td>1,080</td>
<td>64</td>
<td>203</td>
<td>1,347</td>
</tr>
</tbody>
</table>

² includes imports from New Zealand

Table 1: Estimated Solid Wood Treated Timber Volumes Based on Carrier and Wood Type – 2006 (Source: TPAA)

To give a number or sense of the current proportion of treated wood to total wood consumption, Table 2 is provided below with the Australian Bureau of Agricultural and Resource Economics (ABARE) statistics for the apparent annual consumption of sawnwood and wood based panels in 2005-2006. From these tables it is estimated that 19.5% of sawn softwood and 6.6% of sawn hardwood are respectively are currently treated with preservatives.

<table>
<thead>
<tr>
<th>Engineered Wood Products (wood based panels)</th>
<th>Unit</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sawn - Softwood</td>
<td>'000 m³</td>
<td>3,888</td>
</tr>
<tr>
<td>Sawn - Hardwood</td>
<td>'000 m³</td>
<td>1,278</td>
</tr>
<tr>
<td>Plywood</td>
<td>'000 m³</td>
<td>345</td>
</tr>
<tr>
<td>Particleboard</td>
<td>'000 m³</td>
<td>1,025</td>
</tr>
<tr>
<td>MDF</td>
<td>'000 m³</td>
<td>497</td>
</tr>
</tbody>
</table>

Table 2: Apparent consumption – Sawnwood and wood based panels 2005-06. Source ABARE 2006

There are no equivalent consumption statistics for roundwood. However, as most round softwood is used in outside applications such as rural fencing, vineyard sticks, piles, posts and landscaping, it is fair to assume that the vast majority of round softwood is preservative treated.

It is unclear what proportion of round hardwood is treated as this is related to the particular species of hardwood.⁴

Approximately 6% of plywood and 3% of particleboard is treated with preservatives.

³ Details of lyctus susceptible species (hardwood and non-hardwood) can be found at http://www2.dpi.qld.gov.au/forestry/17062.html

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>TOTAL VOLUME ( m^3 )</th>
<th>Hazard Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ROUNDWOOD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grape Sticks (CCA)</td>
<td>240,000</td>
<td>H4</td>
</tr>
<tr>
<td>Grape Sticks (Creosote)</td>
<td>30,000</td>
<td>H4</td>
</tr>
<tr>
<td>Landscape and Fencing Rounds (CCA)</td>
<td>200,000</td>
<td>H4</td>
</tr>
<tr>
<td>Landscape and Fencing Rounds (creosote)</td>
<td>15,000</td>
<td>H4</td>
</tr>
<tr>
<td>Poles and Piles (CCA &amp; Creosote)</td>
<td>70,000</td>
<td>H5 &amp; H6</td>
</tr>
<tr>
<td><strong>SAWNWOOD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fencing and Landscaping</td>
<td>235,000</td>
<td></td>
</tr>
<tr>
<td>Fence Posts and General Landscape</td>
<td>140,000</td>
<td>H4</td>
</tr>
<tr>
<td>Palings and Pickets</td>
<td>80,000</td>
<td>H3</td>
</tr>
<tr>
<td>Sleepers</td>
<td>15,000</td>
<td>H4</td>
</tr>
<tr>
<td><strong>Structural</strong></td>
<td><strong>550,000</strong></td>
<td></td>
</tr>
<tr>
<td>H1</td>
<td>30,000</td>
<td>H1</td>
</tr>
<tr>
<td>H2</td>
<td>70,000</td>
<td>H2</td>
</tr>
<tr>
<td>H2F (framing)</td>
<td>250,000</td>
<td>H2</td>
</tr>
<tr>
<td>H3</td>
<td>160,000</td>
<td>H3</td>
</tr>
<tr>
<td>H4</td>
<td>30,000</td>
<td>H4</td>
</tr>
<tr>
<td>H5</td>
<td>10,000</td>
<td>H5</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td><strong>59,000</strong></td>
<td></td>
</tr>
<tr>
<td>Decking</td>
<td>50,000</td>
<td>H3</td>
</tr>
<tr>
<td>Handrails etc</td>
<td>3,000</td>
<td>H3</td>
</tr>
<tr>
<td>Cladding</td>
<td>6,000</td>
<td>H3</td>
</tr>
<tr>
<td><strong>ENGINEERED WOOD PRODUCTS</strong></td>
<td><strong>60,000</strong></td>
<td></td>
</tr>
<tr>
<td>Particleboard flooring *</td>
<td>30,000</td>
<td>H2</td>
</tr>
<tr>
<td>Plywood*</td>
<td>10,000</td>
<td>H2</td>
</tr>
<tr>
<td>LVL &amp; I-Beams *</td>
<td>20,000</td>
<td>H2</td>
</tr>
<tr>
<td>Orientated Strand Board*</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL VOLUME</strong></td>
<td><strong>1,454,000</strong></td>
<td></td>
</tr>
</tbody>
</table>

* glue treatment
6 Trends in Preservative Treated Timber Products

Preservative treatment of timber has been of critical importance to the timber industry around the world in extending the utility of timber based products in a wide variety of applications. With the diminishing availability of naturally durable species, the application of preservatives to softwoods, and particularly the Pinus species, has allowed these products to be used in applications where their natural durability would have resulted in severely limited product utility. This has been important in the establishment of a plantation resource in Australia and the cost-effective use of softwood products in horticultural, landscaping, outdoor structures and framing in termite prone areas.

6.1 Historical Use of Timber Preservatives

Early application of wood preservatives in Australia appear to have been pioneered in Western Australia where the life of less durable species such as Karri (used in sleepers) was extended using formulations such as molasses or sodium fluoride with arsenic trioxide. More widely creosote was used to treat poles and posts. By the 1930’s, however, the growing scarcity of the more durable hardwood species made the preservation of non-durable timber and the sapwood of hardwoods a focus of the newly established Division of Forest Products of the Council for Scientific and Industrial Research (CSIR) as well as a number of state government forestry organisations.

Pressure impregnation was not introduced until the late 1950’s and by the 1960’s with the increasing supply of plantation grown pine, pressure impregnation plants using CCA and creosote were being built around Australia. By 1961 there were 36 plants operating and today there are around 150 plants.

Plantation pine species were particularly suited to the application of preservative treatment chemicals to extend the life of the timber to match in most circumstances the life of durable hardwoods.

Although introduced in the late 1960’s, LOSP (Light Organic Solvent Preservative) formulations have only become popular much more recently because of the ability to treat sawn timber components without dimensional change. LOSP treatment is applied to cut prefabricated components, window components as well as engineered timber products.

A number of LOSP preservatives have been used over the years such copper and zinc naphthenates, tributyltin oxide, pentachlorophenol, dieldrin and aldrin. Use of organochlorine insecticides, such as dieldrin, was discontinued in 1995 and pentachlorophenol is no longer used either. The LOSP industry has switched largely to the synthetic pyrethroids with permethrin most widely used today. Synthetic pyrethroids first appeared in the Australian Standard AS1604 - Timber-Preservative Treated-Sawn and Round in 1993.

Production of treated timber in Australia in 2000 was estimated to be 1,104,631 cubic metres by Gardiner et al (in press). 89% of timber was treated with CCA.

5 Now the Commonwealth Scientific and Industrial Research Organisation (CSIRO)
6.2 Recent Trends

Today there are around 150 plants treating wood products in Australia. In addition, a large number of treatment facilities in New Zealand treat wood products for export to Australia. There are also a small number of businesses in other countries\(^6\) registered with NSW and Queensland Departments of Primary Industries to import treated timber into Australia. A list of the registered brands for treated timber currently approved for sale in New South Wales and Queensland is included in Appendix C.

The most obvious trend is the increase in relative proportion of softwood treated and a decrease in the proportion of hardwood species treated. This reflects an overall trend of increasing usage of softwood species in construction and a decrease in the use of hardwoods (ABARE 2006).

![Figure 4: Relative proportion of treated wood product types and trends. Source Carruthers 2003](image)

In recent times, restrictions and changing acceptance of the use of particular treatment types in Australia means that the relative volumes of these products have reduced in recent years. In particular, the public concern over the use of CCA treated products in playground equipment and the like led to the examination and review of the use of arsenic based treatments by the federal regulator, the Australian Pesticides and Veterinary Medicines Authority (APVMA). This review led to the restriction in 2006 of CCA treated products in play equipment, picnic tables, outside garden furniture as well as domestic decks and handrails. Nevertheless, CCA treated timber remains a major component of the treated timber industry.

CCA treated timber has been replaced in the restricted applications mainly by the copper based alternatives ACQ, copper azole and a number of LOSP formulations.

While LOSP formulations remain popular, there is a number of concern regarding the use of white spirits based formulation at the point of treatment as

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\(^6\) These other countries are Chile, Malaysia, Vanuatu, Germany, Papua New Guinea, USA, Czech Republic, Philippines, Latvia, Finland, Fiji, Singapore and Indonesia.
well as in secondary manufacturing such as frame and truss plants due to occupational health and safety (OH&S) issues. These concerns have seen a number of treatment facilities switching to waterborne synthetic pyrethroids preservatives.

A major driver in the developments of new treatment chemicals and processes is undoubtedly increased or more stringent regulatory authority involvement at development, plant, distribution and market end. In broad terms, the industry that develops and distributes the chemicals for timber treatments would ideally produce formulations that would be have no adverse environmental impact at manufacture, transport, use and end of life. The treated timber industry has been progressing to this aim by moving away from a number of the traditional metallic components and developing new synthetic active ingredients such as pyrethroids, azole and quaternary compounds. Copper still often forms part of many timber preservative compositions but the increasing cost of copper and the higher proportions of copper in ACQ and CA compared to CCA formulations has the potential to drive development of non-copper alternatives.

Another trend is to more accurately understand and match the end use, hazard level and expected life of the component to the amount of active ingredient used. This is evidenced by the recent division of AS1604 hazard class 2 and 3 (H2 and H3) into ‘sub-levels’ which usually require less active chemical or are intended to have supplementary protection (eg., painting).

The H2 class has been split into H2F (framing envelope treatment) and H2S for use south of the Tropic of Capricorn) while a sub-class has been created in H3 for vertical exposed applications (eg., fascias, fence pickets) which are intended to have a supplementary protection system such as paint.

This is particularly beneficial in providing adequate protection while a very competitive market drives down costs and ensures least chemical use. Preservative formulations that use solvent bases such as LOSP formulations are moving towards using less active solution in the treated timber. The
volatility of the solvent base is also being reduced or replaced by water-based carriers.

Creosote and modified products such as PEC (Pigment Emulsified Creosote) are still favoured in a number of limited applications in agricultural usage and marine environments. In South Australia restrictions on disposal of CCA treated vineyard sticks are resulting in increasing production of creosote treated sticks.

Boron based processes appear to be having a resurgence in use in Australia after a long recent history of use in New Zealand. Boron and metallic compounds in “stick” form are used in remedial treatments of hardwood utility poles and are recognized as being particularly effective in extending the life of this important asset.

6.2.1 Framing Timber

Possibly the most visible change in the products offered by the treated timber industry in the last few years has been the development and implementation of “envelope” treated framing products for houses and similar structures. These products are an example of the moves towards minimal chemical use and the use of more benign formulations. Prior to this development, pressure treated LOSP and CCA treated framing products were offered and had developed a market in high termite risk areas around Australia. With the recent development of envelope systems generically marketed as “BluePine” H2 framing, a lower cost alternative has been available.

Blue Pine framing is available in two processes, one oil/solvent-based and applied by dip immersion and the other water-based and applied by spray. In each case the treatment results in an envelope that varies from approximately 2 mm to around 5 mm in depth. The active ingredient in each case is a member of the synthetic pyrethroid family - permethrin in the oil system and bifenthrin in the water system. These systems have the major advantages of being applied “in-line” in the timber mill and being significantly lower in cost. A
limitation of relatively small commercial impact is that the timber must only be used below the Tropic of Capricorn.

In northern Australia above the Tropic of Capricorn full pressure treatments are used to allow full sapwood penetration with preservative and this treated timber is dyed red.

Although a number of the LOSP treated framing products have been displaced, the uptake of the ‘Blue Pine’ (red in tropical areas) framing products has been remarkable with industry estimating that around 23% of the structural pine timber framing market is now “Blue Pine”.

Take up of preservative treated H2 framing and other engineered wood products have been higher in more termite prone areas such as Queensland as well as regional Victoria and regional NSW.

7 Product Life

Different treated timber products may have a product life defined by application, standards and codes and warranties and guarantees on the products. Actual product life may be difficult to determine and will vary in response to the hazards that the treated product is exposed to as well as the design of the structure, water ponding and the degree of maintenance.

An ongoing Forest & Wood Products Research & Development Corporation (FWPRDC) funded project is attempting to provide designers with a design tool to enable the estimation of the durability of timber components in building to enable their correct design and specification.

In the case of houses there have is an implied expected design of 50 years for the purposes of the loads used in structural design, however, this has not been made a requirement of Australian building standards. In the case of structural house framing it would be a reasonable expectation that the life of the treated timber would be a minimum of 50 years even though the real life of the framing may exceed this value by a large margin.

Actual service life is dependent on a range of factors.

- Natural durability of the timber
- Treatment (quality and level)
- Hazard exposure
- Design detailing (e.g. water shedding, connections)
- Fashion / renewal due to weathering
- Degree of maintenance
- Economic circumstances
- Weather, including drought and storms
- Mechanical breakage

The Australian Greenhouse Office has allocated harvested wood products certain life spans to ascertain how much carbon is stored in timber products.
Various timber products have been subdivided into different ‘pools’ based on estimated product decay rates.

Estimates for preservative treated timber were obtained by the Australian Greenhouse Office from the Timber Preservers Association of Australia and are included in Table 4 below.

<table>
<thead>
<tr>
<th>Pool</th>
<th>Treated product</th>
<th>Expected Product Life (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pool 1 &amp; 2</td>
<td>Not applicable</td>
<td>Young</td>
</tr>
<tr>
<td>Pool 3</td>
<td>Sawn softwood – fencing and landscaping e.g. decking, handrails and fence palings</td>
<td>10</td>
</tr>
<tr>
<td>Pool 4</td>
<td>Engineered wood products - plywood - e.g., noise barriers</td>
<td>20</td>
</tr>
<tr>
<td>Pool 5</td>
<td>Sawn softwood and hardwood - structural timber - e.g. flooring, framing, trusses incl. structural</td>
<td>30</td>
</tr>
<tr>
<td>Pool 5</td>
<td>Sawnwood – non-structural – e.g. cladding</td>
<td></td>
</tr>
<tr>
<td>Pool 5</td>
<td>Engineered wood products – particleboard, eg., particleboard flooring, plywood and OSB</td>
<td></td>
</tr>
<tr>
<td>Pool 5</td>
<td>bracing</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Assumed life span pools for treated wood products. Source: Australian Greenhouse Office 2006

8 Identification of End-of-Life Treated Timber and Intervention Points

8.1.1 Identification

The majority of treated timber products currently consumed in Australia are readily visually identifiable from non-treated timber by multiple factors. These include:

- branding and labeling
- shape
- wood type
- colour
- location used/application
- species
AS 1604 requires that all timber claiming to conform to the standard must be labeled on one end with the treatment plant number, the preservative code number and the hazard class. Small dimension products are exempt from individual marking. See figure 7 below for the labeling requirement.

There are additional marking requirements for CCA treated products, whether they claim to meet AS1604 or not. Large CCA treated products must be individually and legibly marked with the words “Treated with copper chrome arsenate” to first point of use.

Small CCA treated products don’t have to be individually marked however; the pack must be legibly marked with the words “Treated with copper chrome arsenate” to first point of use. Small CCA treated products are:

- Fence palings, battens and droppers
- Timber with a cross section of 1500 mm$^2$ and less
- Timber less than 15 mm thick

![BRAND NAME]

Treatment Plant Number
Preservative Code Number
Hazard Class Number

Figure 7: Marking requirement of AS 1604

This labeling requirement is a clear identification of structural treated timber and a large proportion of CCA treated timber.

Roundwood and semi-roundwood products such as poles, piling and landscaping rounds are very readily identifiable at end-of-life from sawnwood products.

Hardwood species, which are less likely to be treated, are generally very easy to distinguish from common treated softwoods.

Timber treated to H3 or greater hazard level with copper based preservatives commonly has a green tinge. This is because timber treated to these hazard levels contains larger amounts of copper. As wood treated with these

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7 Additionally, in Queensland all CCA treated timber over 50mm or 16mm tick must be branded while in NSW all decking must be branded or labeled irrespective of minimum dimension.
preservatives dries and reacts to the sun’s ultraviolet rays, the wood turns a greenish colour. This is caused by a chemical reaction – part of the fixation process that binds the preservative in to the wood.

Treated framing for framing (H2) is now dyed blue (or red in tropical areas). While the dye is intended to be visible only for a short-term, it lasts long enough to distinguish treated from non-treated timber during the construction phase.

The location and application of the timber is another good indicator of whether a timber is treated or not. If used in outside areas and it is a non-durable species such as pine, it is extremely likely to have been treated. For example, softwood pine used as fencing, landscaping, lattice or garden edging is treated.

While more difficult for the non-trained person, a number of hardwood species are readily distinguishable from each other. For example, common hardwood species such as spotted gum with sapwood is lyctid susceptible and therefore must be treated (in NSW and Queensland) is readily distinguishable from turpentine; the sapwood of which is not lyctid susceptible so does not need to be treated.

8.1.2 Intervention Points

The main groups involved in the handling of end-of-life treated roundwood products are viticulturalists, farmers and utilities operating in rural areas. In urban areas it is landscapers and utilities operating in urban areas.

The main people involved in the demolition of non-farm fencing are professional fencers. Smaller quantities of fencing are done by landscapers, builders, demolishers, civil contractors, DIY and rubbish removers.

Small quantities of structural timber will be handled by builders as offcuts from the building process.

The main people involved in the demolition of landscape timber are professional landscapers. Smaller quantities of landscape replacement are done by builders, demolishers, civil contractors, DIY and rubbish removers.

Therefore significant quantities will be collected and disposed of by fencing contractors and landscapers. Many of these companies self-haul waste to transfer stations and landfills or use skip companies to cart material away.

A demolition timber study by Forsyth Consulting (Forsyth Consulting 2007) has details on appropriate intervention points in the demolition timber. This report identified that people installing, demolishing timber structures or accepting wood waste for recycling are the appropriate intervention points.

Small quantities may end up in council garden waste collections where councils offer this service. This is evidenced by a number of local councils and companies processing garden waste which advice that treated timber should not be mixed with garden organics which are being recycled. See Appendix C for a number of examples.
9  Treated Timber Waste Disposal Quantities

The literature review found a number of estimates of the quantities of treated timber disposed of in Australia.

One of these estimates was based on consumption figures, breakage and service life projections. A study has predicted the volumes of treated timber likely to be disposed of in coming years in South Australia (Sinclair Knight Mertz 1999). This study identified treated vineyards poles as a future very large contributor to treated timber waste in that state.

The South Australian Environment Protection Agency subsequently restricted disposal of commercial quantities of CCA treated timber to landfill. The wine industry has undertaken a number of surveys of winegrowers to estimate the stockpiling of redundant treated vineyard poles. Stockpiles of redundant vineyard sticks have not been as high as predicted mainly due to reduced breakages and increased reuse by local farmers for fencing (Peter Llewellyn pers comm. 15 June 2007).

A report of an audit by Department of Environment and Conservation NSW in 2004 (DEC NSW 2004) visually estimated the quantity of treated timber in the commercial and industrial (C&I) waste stream. The report defines wood treated as solid wood with visible signs of chemical treatment. This report estimated that 15% (by weight) of the waste timber was treated. Advice from staff participating in the audit that timber packaging visually assessed to be imported was included in this category as it was understood at the time that all imported timber packaging was treated with chemicals.

The literature review found one example of an audit of landfills in Australia that conducted chemical analysis of a large number of samples of waste timber in the construction and demolition (C&D) waste stream (DECC 2007). The audit was done by the Department of Environment and Climate Change (DECC) at a number of facilities in Sydney that accepted C&D waste. This report estimated that a small proportion of the samples taken (~4%) had very high levels of copper, chromium and arsenic. These elevated levels are attributed to CCA treatment of the wood samples. Higher levels were more prevalent in the softwood samples taken from wood generated by new construction activities. Though not specified in the report, it is presumed that levels would have been lower from hardwood and softwood resulting from demolition activities. It is not stated whether the testing was conducted on the outside of the timber samples as this would result in a higher reading than if multiple testing was done across the whole cross section of timber.

The report quantifies this 4% as a percentage of the estimated 60,000-120,000 tonnes of timber from construction and demolition disposed to landfill. This equates to 2,400-4,800 tonnes of CCA treated timber disposed of to landfills as C&D waste in the Sydney Metropolitan Area in that year.

10  General Discussion

Approximately 1,400,000 m$^3$ of timber and wood products are currently consumed in Australia each year. Based on the most recent sawnwood
production data (2005-2006), approximately 19.5% of all sawn softwood and 6.6% of sawn hardwood is preservative treated.

Volumes of timber and wood products that are preservative treated have increased since 2000, mainly due to a large increase in consumption of pine framing treated with the synthetic pyrethroids permethrin and bifenthrin.

It is difficult to predict with any certainty, the quantities of treated timber that are and will be presenting at landfills due to the large variety of factors other than designed service life. Several attempts have been made to predict volumes of treated timber waste based on consumption and predicted service life or visual audits and one published example of chemical testing of a large number of samples for CCA treated timber.

The diversity of preservatives is increasing as regulations and the market have driven a shift from the dominant preservative CCA in H1, H2 and H3 hazard classes to other approved preservatives. Also alternative products are substituting for treated timber, particularly in the urban fencing market.

There is a poor understanding of the quantities of treated timber actually being disposed of to landfills around Australia. Though methods and knowledge are improving the focus has been almost exclusively on CCA treated products.

11 Conclusions

The volume of preservative treated timber is approximately 15% of all timber products currently sold in Australia excluding furniture and imported packaging.

This proportion of preservative treated timber is growing as structural products are increasingly being treated and softwoods share of the construction market grows compared to hardwoods. A number of product segments are predominantly product that is treated with preservative. CCA is the most common wood preservative used in Australia.

The actual service life for many products is highly variable and difficult to predict due to the large number of variables. Small volumes are reported as coming through the construction and demolition waste stream.

Most treated product is readily identifiable by the branding, shape (round / sawn), wood type (softwood / hardwood), colour (green tinge / blue pine), product application and location (outside / fencing / landscape/ deck / pergola) and even species.

The vast majority of treated timber produced and imported into Australia and used in urban areas is used in construction and landscaping applications and, at end-of-life, most of this should end up in the construction and demolition waste stream.

Smaller quantities of treated timber waste could be expected to be disposed of in the municipal waste stream from residents in hard waste collections, in household garden organics/green waste stream (council collected and self-hauled) and by councils from their parks and garden operations. As a lot of this timber is from outside applications, it could be expected that a large proportion of this timber could be treated with preservatives
Intervention points identified include those undertaking fencing, landscaping, construction and demolition activities and those smaller numbers of companies receiving timber for recycling from these activities; farmers and viticulturalists in grape growing areas and irrigation districts and local recyclers/landfills; and local council guidelines advising residents to keep treated timber out of garden waste recycling.
References


Appendix A

Contacted Organisations

Arch Wood Protection (formerly Koppers Arch Wood Protection)
Australian Plantation Products and Paper Industry Council (A3P)
Australian Wood Panels Association
Australian Timber Flooring Association
Boral Timber
Carter Holt Harvey
Department of Environment and Climate Change (NSW)
Department of Primary Industry & Fisheries (QLD)
Engineered Wood Products Association
Koppers Wood Products
New Zealand Trade and Enterprise
NSW Forest Products Association
Department of Primary Industries (NSW) – Forests NSW
Osmose Australia
Timber Development Association (NSW)
Timber Preservers Association of Australia
TimTech Chemicals
Appendix B

Hazard Levels and Common Uses

H1 INSIDE, ABOVE GROUND
CONDITIONS: Completely protected from the weather and well-ventilated.
BIOLOGICAL HAZARD: Lyctus bores.
EXAMPLES: Susceptible framing, flooring, furniture and interior joinery.

H2 INSIDE, ABOVE GROUND
CONDITIONS: Protected from wetting.
BIOLOGICAL HAZARD: Bores including termites.
EXAMPLES: Framing, flooring and similar, used in dry situations.

H2F Conditions and Biological hazard as for H2 although approved for use South of the Tropic of Capricorn only.
EXAMPLE: Framing (wood preservation).

H2S Conditions and Biological hazard as for H2 although approved for use South of the Tropic of Capricorn only.
EXAMPLE: Plywood (tine-line treatment).

H3 OUTSIDE, ABOVE GROUND
CONDITIONS: Subject to periodic moderate wetting.
BIOLOGICAL HAZARD: Moderate decay fungi, bores and termites.
EXAMPLES: Weatherboard, fascia, pergolas (above ground), window joinery, fencing, decking and laminated verandah posts.

H3A++ OUTSIDE, ABOVE GROUND
CONDITIONS: Products predominantly in vertical exposed situations and intended to have the supplementary paint coat system that is regularly maintained.
BIOLOGICAL HAZARD: Moderate decay fungi, bores and termites.
EXAMPLES: Fasico, barge boards, exterior cladding, window joinery, door joinery and non-terminated verandah posts.

H4 OUTSIDE, IN-GROUND
CONDITIONS: Subject to severe wetting.
BIOLOGICAL HAZARD: Severe decay fungi, bores and termites.
EXAMPLES: Fence posts, garden walls less than five high, greenhouses, posts and landscaping timbers.

H5 OUTSIDE, IN-GROUND OR IN FRESH WATER
CONDITIONS: Subject to extreme wetting and/or where the critical use requires a higher degree of protection.
BIOLOGICAL HAZARD: Very severe decay fungi, bores and termites.
EXAMPLES: Retaining walls, piling, house stumps, building poles and cooling tower fill.

H6 MARINE WATERS
CONDITIONS: Subject to prolonged immersion in sea water.
BIOLOGICAL HAZARD: Marine wood borers and decay fungi.
EXAMPLES: Boat hulls, marine pilings, jetty cross-b Ging, landing steps and similar.

Hazard classes, uses and examples of applications. Source: Osmose Australia
### Appendix C

**List of Registered Brands for Treated Timber Approved for Sale in NSW – August 2007**

<table>
<thead>
<tr>
<th>Preservative code number</th>
<th>Preservative</th>
<th>NSW</th>
<th>QLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>CCA oxide type C</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>02</td>
<td>CCA salt type C</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>11</td>
<td>Boron compounds for H1 (Celbor, Diffusol, 3010, Timbor, Solubor, Immutan DP)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>15*</td>
<td>Celcure AP (CCA)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>15*</td>
<td>Celcure AP (CCA)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>20</td>
<td>Creosote</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>31*</td>
<td>Tanalith C (CCA)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>32*</td>
<td>Tanalith C(P) (CCA)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>34*</td>
<td>Tanalith NCA (CCA)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>38*</td>
<td>Sarmix 3 (CCA)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>43*</td>
<td>BTB type C (Chemica, Impretect C) (CCA)</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>45</td>
<td>Pigment emulsified creosote (PEC)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>54</td>
<td>CCA oxide type C + PEC</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>57</td>
<td>Copper napthenate + permethrin (Protim 70 WR(PD), Vascol green)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>58</td>
<td>Copper azole (Tanalith E)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>59</td>
<td>Imidacloprid</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>62</td>
<td>TBTN + permethrin (Protim Frameplus, Vascol PAWRX, Framecoat Blue)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>64</td>
<td>Propiconazole + tebuconazole + permethrin (Protim optimum, Vascol azure)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>70</td>
<td>Permethrin (perigen 500, Perigen, Protim L0WR(P), Vascol T)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>73</td>
<td>Bifenthrin (Bistar, Determite)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>74</td>
<td>Permethrin for H2F (Tanalith T)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>75</td>
<td>Bifenthrin for H2F</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>90</td>
<td>Alkaline copper quarternary (ACQ 2100)</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

* these CCA preservatives are the same type as 02, for analytical purposes

**Source:** NSW Department of Primary Industries and QLD Department of Primary Industries and Fisheries
Appendix D

Examples of Garden Organics / Green Waste Advisory

Bega Valley Council (New South Wales)

What CAN’T go in the garden organics bin?

- Treated timber
- Painted timber
- Copper (Kopper) logs
- General waste
- Soil/ dirt
- Plastic bags
- Gardening equipment
- Hose
- Food Scraps
  (these can go in a worm farm or home compost system)
- Oyster Sticks


WSN Environmental Solutions (New South Wales)

Examples of Garden Organics

- Lawn clippings;
- Tree and shrub prunings;
- Dead flowers and discarded plants;
  - Weeds;
  - Leaf debris;
- Small branches; and
- Untreated timber*

“Untreated timber includes unpainted timber palings, pallets and logs. Treated timber includes painted timber palings and logs and products that have been treated with chemicals to discourage termites, such as treated pine. It cannot be used for composting or mulching. Contact your council to find out what to do with any waste timber you may have.”

**Boroondara Council (Victoria)**

You can put in your green waste bin:
- Lawn clippings and weeds
- Leaves
- Light pruning

You can’t put in your green waste bin:
- Recyclables and household waste
- Ash, soil, stones, hard waste and fencing
- Plastic bags and cardboard boxes
- Painted, treated or wire contaminated timber, laminex, plywood or chipboard

Green waste that is contaminated by these items cannot be collected.


**Adelaide City Council (South Australia)**

The following Items are NOT collected in your Kerbside Garden/Organic Service(s):
- Painted, Stained or Chemically Treated Timber
- Pot plant containers
- Food/Vegetable Scraps
- Plastic
- Bricks

Appendix E

**Hazard Classes for Preservative Treated Timber Applications**

<table>
<thead>
<tr>
<th>Timber product application</th>
<th>Hazard class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battens</td>
<td>H1, H2, H2 F</td>
</tr>
<tr>
<td>Interior</td>
<td>H1, H2, H2 F</td>
</tr>
<tr>
<td>Exterior</td>
<td>H3, H3 A</td>
</tr>
<tr>
<td>Structural</td>
<td>H3</td>
</tr>
<tr>
<td>Non-structural</td>
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<td>Beams laminated interior</td>
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Source: AS 1604.1-2005