TREATED WOOD WASTE

Implementation of Senate Bill 162 (2015)

California Department of Toxic Substances Control

March 2019

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ACRONYMS AND ABBREVIATONS

AB	Assembly Bill
AMS	Alternative Management Standards
Cal/OSHA	California Department of Industrial Relations, Division of Occupational Safety and Health
CUPA	Certified Unified Program Agency
DTSC	Department of Toxic Substances Control
ERP	Enforcement Response Policy
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
HHWCF	Household Hazardous Waste Collection Facility
RCRA	Resource Conservation and Recovery Act
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SW Facility	Solid waste transfer stations and load check program facilities
TWW	treated wood waste

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EXECUTIVE SUMMARY

Senate Bill 162 (2015) requires the Department of Toxic Substances Control (DTSC) to prepare a comprehensive report on rates of compliance with the Alternative Management Standards (AMS) for Treated Wood Waste (TWW). To meet this requirement, the DTSC conducted 126 compliance inspections of TWW generators and disposal facilities in California. In addition, responses to treated wood waste surveys from Household Hazardous Waste Collection Facilities (HHWCF), Certified Unified Program Agencies (CUPA), Solid Waste Transfer Stations and Load Check Program Facilities (SW Facility) were evaluated. DTSC's evaluation and conclusions on rates of compliance with the AMS for TWW are discussed in this report.

Section 1
INTRODUCTION

Wood treated with a chemical preservative for protection against pests and environmental conditions is called treated wood. Typically, treated wood is used where ground or water contact is likely. Examples of treated wood include: fence posts, railroad ties, utility poles, landscape timbers, pilings, docks, piers, guardrails, and decking. The intended use of a treated wood product is a key factor in determining the type of chemical preservatives to be used for wood treatment. Common treated wood preservatives include one or more of the following constituents: arsenic, chromium, copper, pentachlorophenol, and creosote.

TWW is defined in regulation and regulated by the Alternative Management Standards (AMS, Appendix A) for TWW (California Code of Regulations (Cal. Code Regs.), Title 22, Division 4.5, Chapter 34, Section 67386.1 et seq.; see 33 A). TWW is defined by the regulations as wood waste that meets all of the following:

1. *a hazardous waste;*
2. *a hazardous waste solely due to the presence of a preservative that is registered in accordance with the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA; 7 U.S.C. §136 et seq.) for use as a wood preservative; and*
3. *is not subject to regulation under the federal Resource Conservation and Recovery Act (RCRA).*

When preservative-treated wood has reached the end of its service life, it is considered TWW. If TWW is not properly disposed, the chemicals it contains can leach out of the wood and contaminate surface water and groundwater. This can pose a potential risk to human health and the environment.

Not all wood that is treated with a preservative and discarded is hazardous waste. If, by knowledge or testing, a generator concludes that treated wood is a hazardous waste, it is the generator's responsibility to classify it as TWW and to manage it either under full hazardous waste management requirements or under the AMS. This report addresses only TWW that is managed under the AMS.

1.1 Senate Bill 162

Senate Bill 162 (SB 162, 2015; see Appendix B) requires DTSC to conduct a comprehensive evaluation of compliance with the standards adopted and to submit a report to the Legislature on its findings by January 1, 2018. In addition, DTSC is required to post this report on its website, and to provide a copy to the appropriate policy committees of the Legislature.

Senate Bill 839 (2016) extended the date for DTSC to prepare and post the report on its website and provide it to the appropriate policy committees of the Legislature to July 1, 2018. On July 1, 2016, DTSC received the appropriation to start the project with scoping and information collection beginning in December 2016.

1.2 Regulatory History

Below is a brief history of TWW-related variances, statutes, and regulations.

Variances

TWW that fails a toxicity characteristic has always been required to be managed as a hazardous waste. Dating back to 1981, DTSC and its predecessors issued variances for the management of TWW to multiple companies. During the 1980s and 1990s, DTSC identified various issues with the variances, including:

- Variances were granted without expiration dates.
- Companies used variances inappropriately by extending variance conditions to customers.
- Variances potentially conflicted with federal and state laws for TWW that exhibited a RCRA toxicity characteristic.
- Some variances were rendered invalid due to a utility exemption enacted in 1996 (Health and Safety Code §25143.1.5).

In 2003, DTSC issued termination letters to all the companies that were issued variances for TWW management.

Statutes

Health and Safety Code Section 25143.1.5 was enacted in 1995 (Assembly Bill [AB] 1965). This section exempts TWW removed from electric, gas, or telephone service from hazardous waste requirements if it is not a hazardous waste under RCRA and is disposed of in an approved landfill.

Health and Safety Code, sections 25150.7 and 25150.8 were enacted in 2004 (AB 1353). These sections require TWW to be managed as hazardous waste in California due to the chemicals used as preservatives to treat the wood. Section 25150.7 included a set of interim management standards that governed the management and disposal of TWW.

When enacted in 2004, these statutes required DTSC to prepare a report regarding compliance with, and implementation of, the TWW statute, and to publish its report in June 2011 (Treated Wood Waste Management in California, AB 1353 Implementation Report, June 2011). That report was based on information available after the AMS regulations were adopted in 2007, as well as compliance information gathered from a very limited number of TWW facility inspections conducted.

Regulations

Based on AB 1353 (2004) requirements, DTSC adopted the final regulations to establish an alternative regulatory structure for the management and disposal of TWW. DTSC adopted AMS regulations on July 1, 2007. Without the AMS, TWW was required to be managed as hazardous waste, placing an increased burden on the regulated business community and public.

Under AB 1353, TWW may be disposed of in a hazardous waste landfill or in a composite-lined portion of a solid waste landfill approved by a state Regional Water Quality Control Board (RWQCB). The AMS regulations require TWW facilities, including approved TWW landfills and transfer stations, to electronically submit semiannual reports to DTSC. The reports are due January 30 and July 30 of each year. On July 1, 2007, DTSC launched the Treated Wood Waste Tracking System (Tracking System) to receive these reports.

1.3 Project Approach

DTSC was appropriated funds in July 2016 to carry out the requirements of SB 162. In December 2016, this project was transferred to the Enforcement and Emergency Response Division. Four Environmental Scientists were hired in February and March of 2017 to work on this project. This staff consisted of three Environmental Scientists and one Senior Environmental Scientist (Specialist). DTSC started inspections on July 1, 2017 and prior to that, completed the following tasks:

- Completed all field work certification requirements.
- Developed an Inspection Checklist (see Appendix C).
- Hosted a webinar on the requirements of SB 162 where representatives of the Western Wood Preservers Institute presented an overview of treated wood manufacturing, treatment, uses, codes, appearances, and the benefits of treated wood.
- Evaluated the TWW Tracking System database, which organizes TWW facility semiannual reports and TWW handler reports.
- Reviewed RWQCB orders and waste discharge requirements issued to approved landfills.
- Used 2016 data from the TWW Tracking System as a baseline for determining the universe of TWW facilities and TWW generators (25 percent of facilities and generators were selected for inspection as required by SB 162).
- Identified a TWW universe of 44 TWW facilities and 444 TWW generators based on 2016 Tracking System data (the 25 percent inspection requirement in SB 162 equated to inspecting 11 TWW facilities and 111 TWW generators).
- Used 2017 semiannual reports to select individual sites for inspection.
- Completed five TWW inspections from May to July 2017.
- Identified two environmental justice-related inspections for inclusion in the TWW inspection schedule.

Differences between initial inspection goals and final inspection numbers

Prior to beginning inspections, DTSC relied on the semiannual reports to identify TWW generators for inclusion in this project. DTSC initially planned to inspect 12 TWW facilities and 111 TWW generators, for a total of 123 inspections. DTSC began TWW inspections in May 2017. During initial inspections, it was found that data in the Tracking System did not accurately identify the original generator of TWW shipments.

The following scenarios were encountered during initial TWW generator inspections:

a) some TWW generators were actually transporters, contractors or subcontractors to the original generator;
b) in some cases, the TWW generator address identified in the Tracking System turned out to be residential or not an active TWW management site.

Due to these inconsistencies in the TWW Tracking System, DTSC conducted more TWW facility inspections. TWW inspections were completed in February 2018. The team ultimately inspected 36 TWW facilities and 90 TWW generators/non-facilities (sites that were thought to be TWW generators, but instead were either transporters or contractors to the original generator), for a total of 126 inspections.

In response to increased facility inspections, TWW inspectors enforced AMS regulations to ensure that facilities entered accurate TWW generator information into the TWW Tracking System. This enforcement resulted in TWW facilities providing more accurate TWW generator information which will improve current data, future evaluation of data and proper identification of TWW facilities for future inspections.

Section 2
RATES OF COMPLIANCE

2.1 Inspections and Enforcement

DTSC developed a TWW Inspection Checklist (TWW Checklist; see Appendix C) for documenting compliance and violations resulting from inspections. A copy of the TWW Checklist was provided to site owners or operators at the conclusion of each inspection. The TWW Checklist organized the AMS by listing each applicable section of regulation. DTSC staff categorized violations under the following AMS sections:

- Section 67386.3 – Prohibited Activities
- Section 67386.5 – Labelling
- Section 67386.6 – Accumulation
- Section 67386.7 – Offsite Shipments
- Section 67386.8 – Tracking Shipments
- Section 67386.9 – Notification
- Section 67386.10 – Treatment
- Section 67386.11 – Disposal
- Section 67386.12 – Training

Sections 67386.1, 67386.2, and 67386.4, titled Scope, Applicability, and Definitions respectively, were not included because these sections outline the scope of jurisdiction over TWW and the applicable definitions.

TWW inspections were conducted throughout the state. Figures 1 and 2 show the inspection locations for TWW facilities and TWW generators/non-facilities, respectively.

DTSC has the following two policies that guide inspections and enforcement of hazardous waste statutes and regulations: DTSC Policy for Conducting Inspections (DTSC-OP-0005) and DTSC Enforcement Response Policy ([ERP] DTSC-OP-0006).

DTSC chooses the appropriate enforcement options based upon the circumstances of each case and the potential of the selected option to promote compliance. A brief definition of the statutory classes of violations is provided below:

Class I: A deviation from the requirements of this chapter (HSC Chapter 6.5, Division 20), or any regulation, standard, or requirement that represents a significant threat to human health or safety or the environment because of the volume of the waste, the relative hazardousness of the waste, or the proximity of the population at risk. Class I violation examples are provided in the ERP.

Class II: A deviation of this chapter (HSC Chapter 6.5, Division 20) that is not a class I violation. Examples of class II violations are provided in the ERP.

Minor: A subset of class II violations.

The definitions above have been kept brief and simple and are intended to provide a general reference to DTSC enforcement-related terms found in this report.

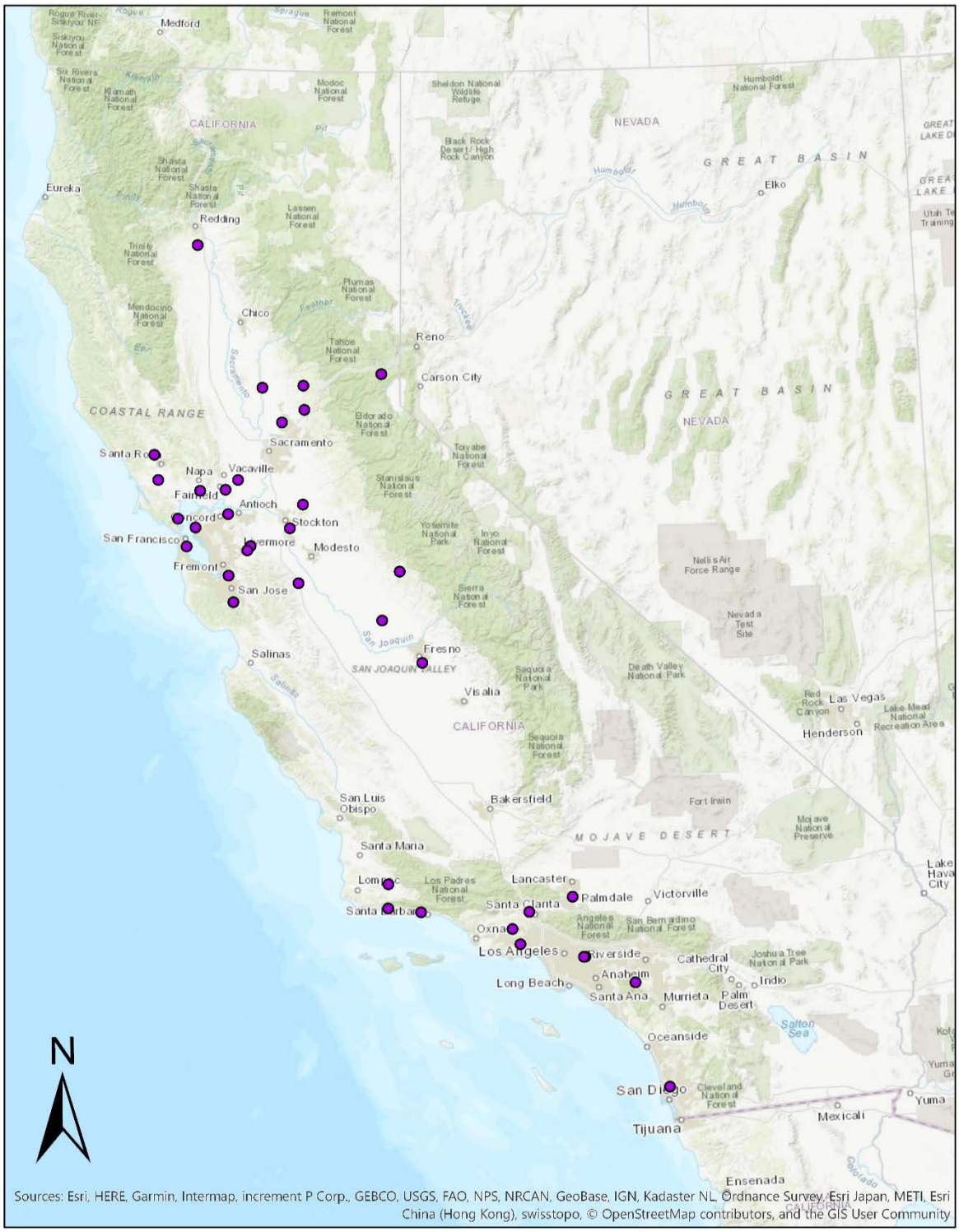

Figure 1: TWW facility inspection locations

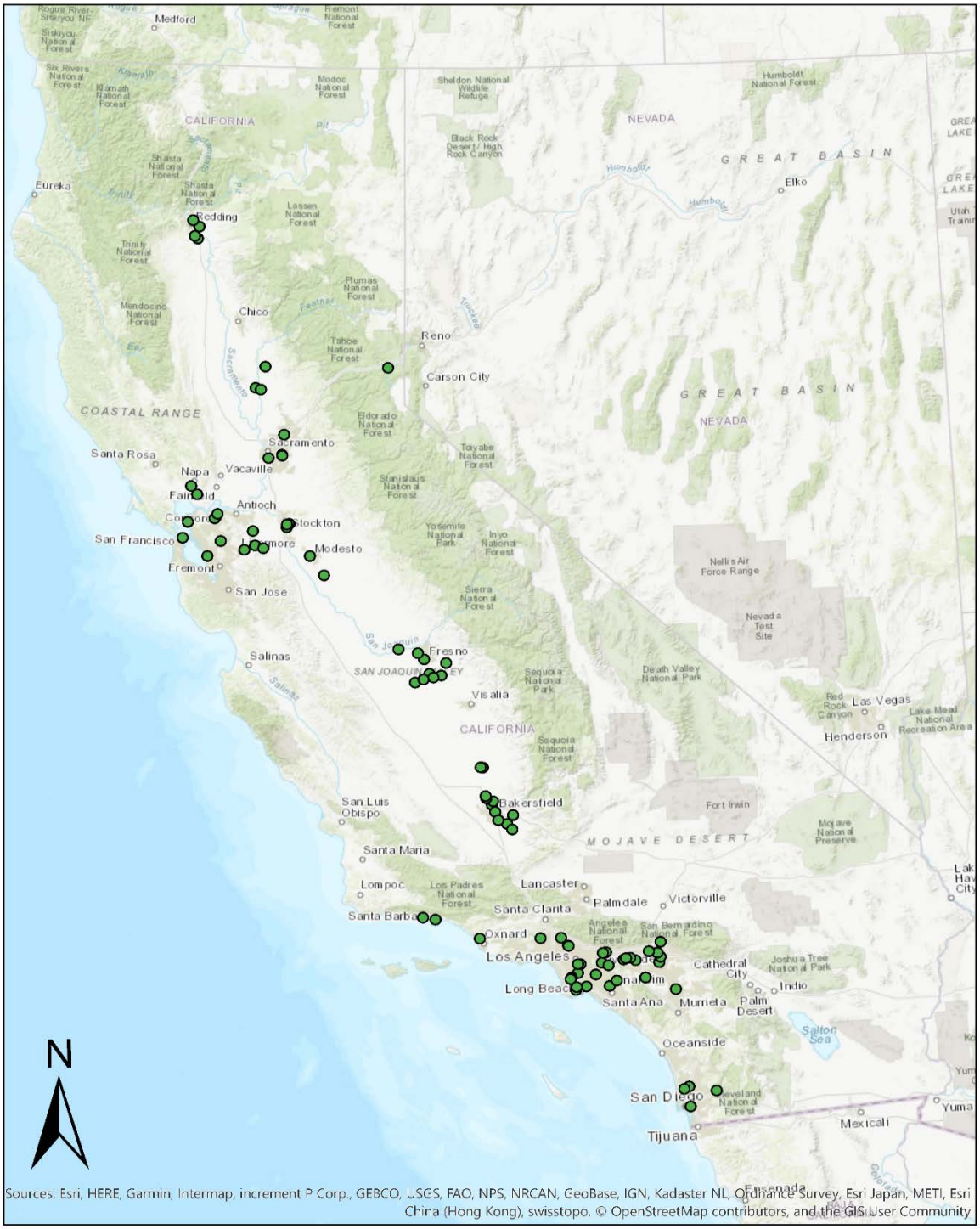

Figure 2: TWW generator/non-facility inspection locations

2.2 Compliance

2.2.1 Facilities

TWW facilities include approved landfills, transfer stations, and load check programs. Figures 3, 4, and 5 show the following: overall compliance; violations by class (i.e., I, II and minor); and violations by regulation section.

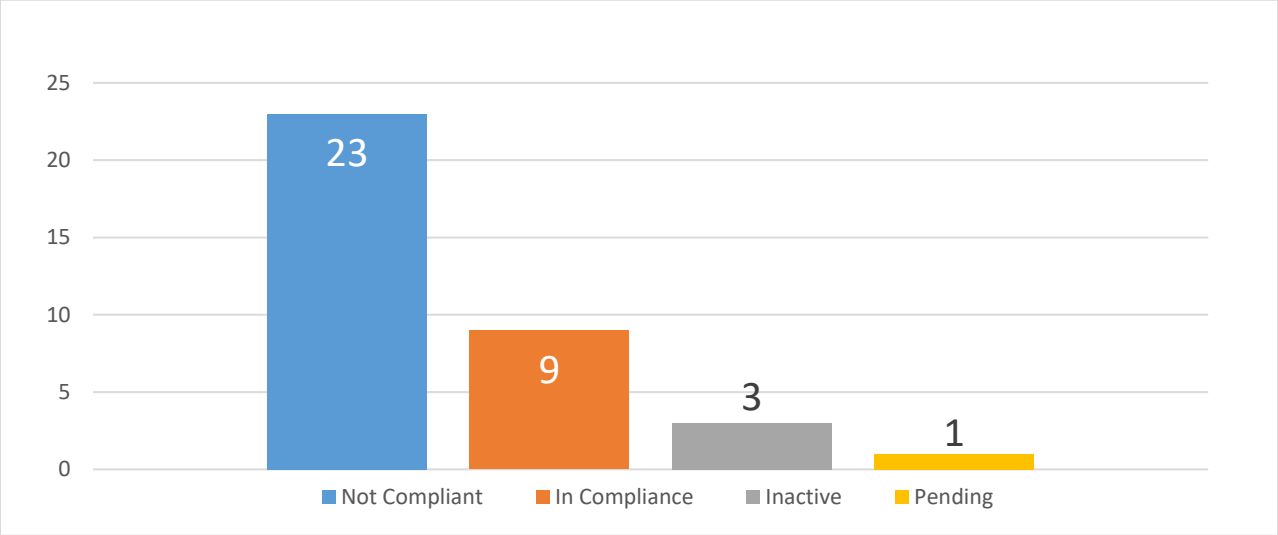

Figure 3: Facilities – overall compliance status as of February 28, 2018

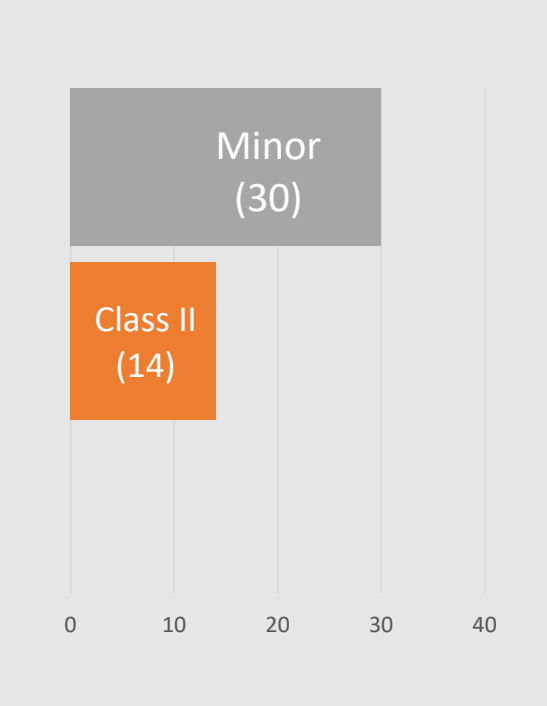

Figure 4: Facilities – violations by class (Note: No class I violations were detected)

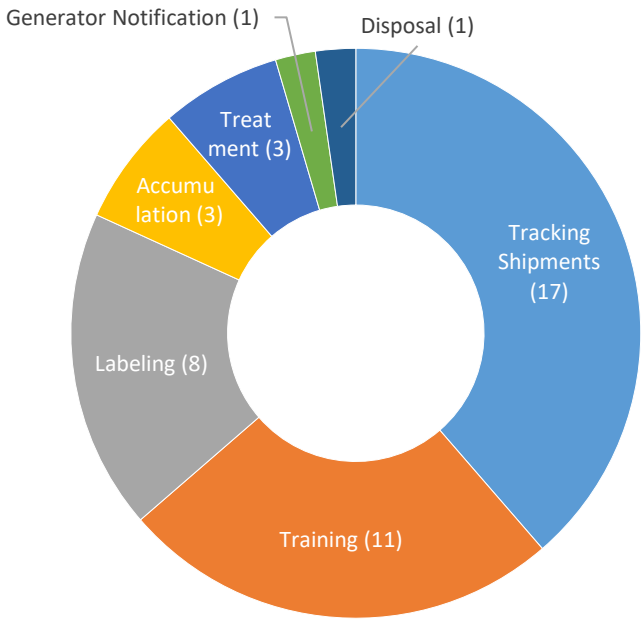

Figure 5: Facilities – violations by regulation section (Note: No prohibited activity or offsite shipment violations were detected)

2.2.2 Generators/Non-Facilities

Figures 6, 7, and 8 show the following statistics for generators/non-facilities: overall compliance; violations by class; and violations by regulation section. (As discussed previously, the term "non-facilities" is used in this report to refer to inspection sites that were thought to be TWW generators, but instead were either transporters or contractors to the original generator.)

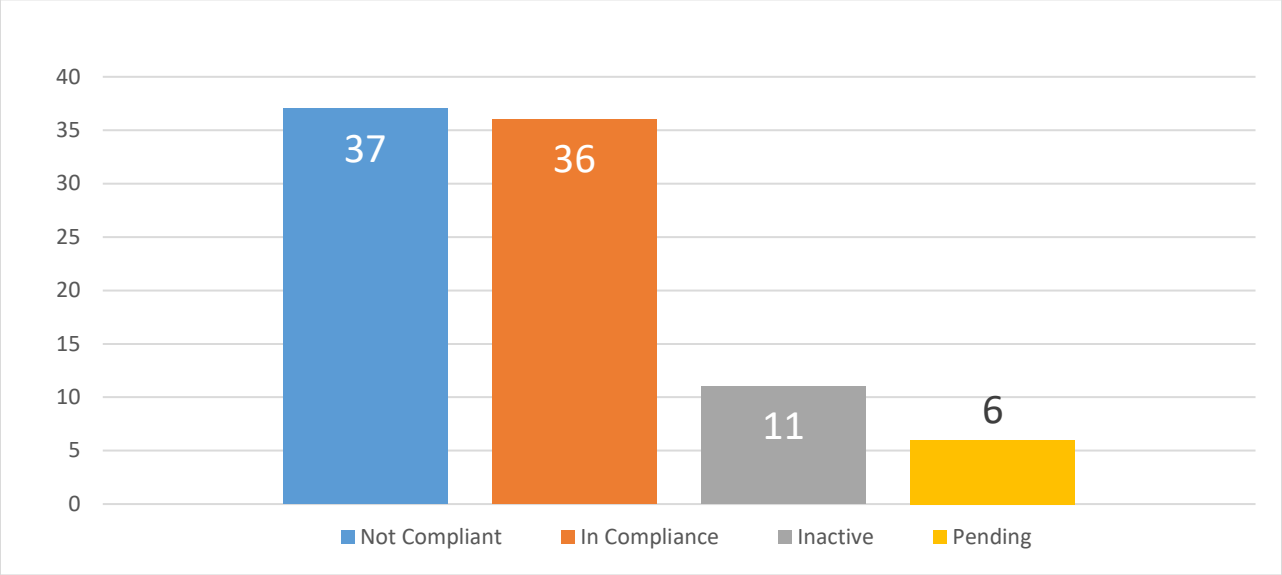

Figure 6: Generators/non-facilities: Overall compliance status as of February 28, 2018

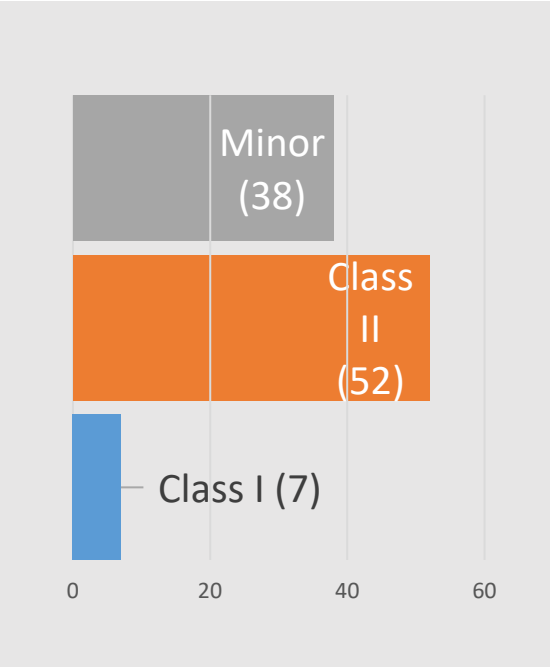

Figure 7: Generators/non-facilities: Violations by class

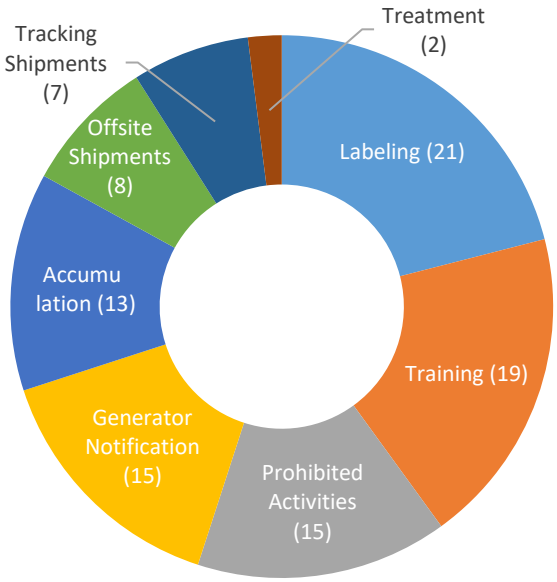

Figure 8: Generators/non-facilities: Violations by regulation section

2.2.3 Consolidated Data

Figures 9, 10, and 11 consolidate the previous sets of data for both TWW facilities and generators/non-facilities, showing rates of overall compliance, violations by class, and violations by regulation section.

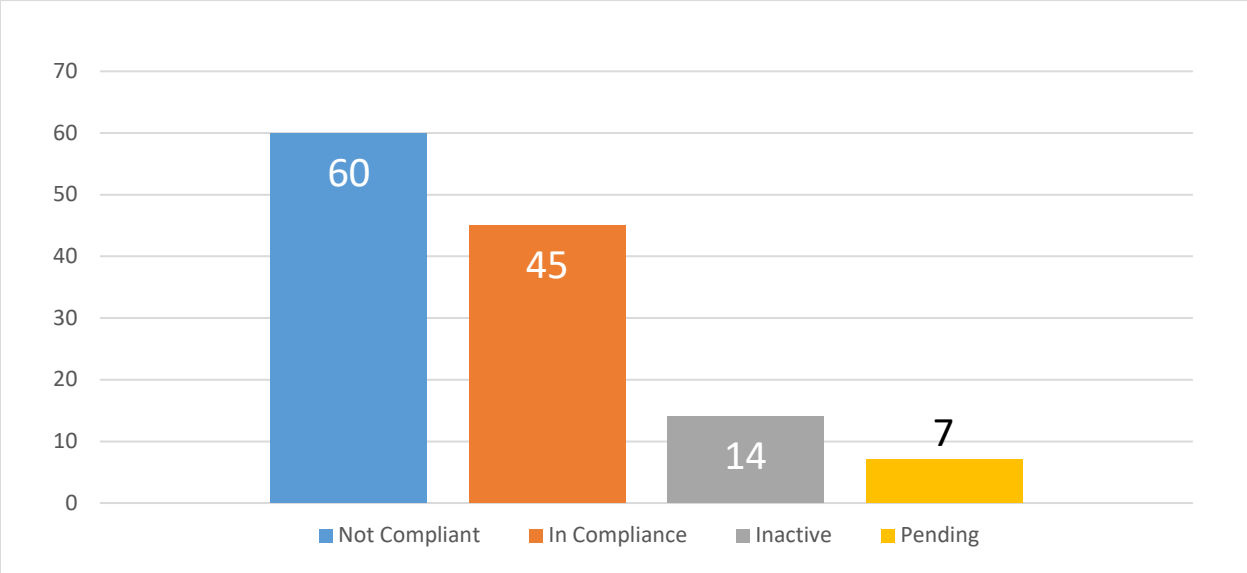

Figure 9: Overall compliance status as of February 28, 2018

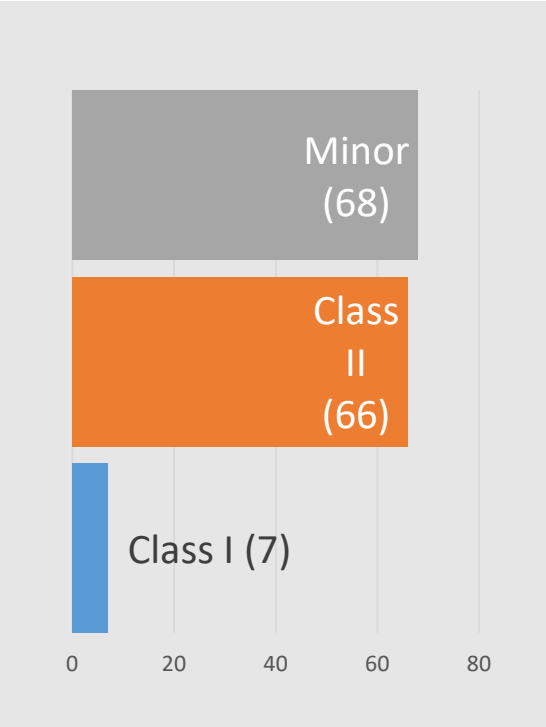

Figure 10: All violations by class

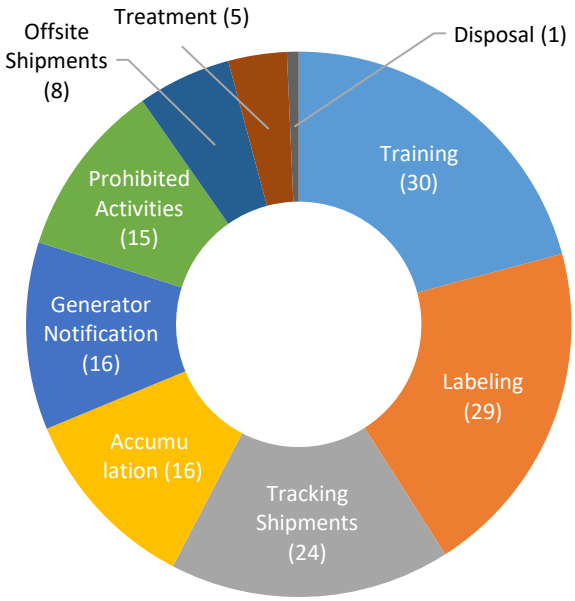

Figure 11: All violations by regulation section

2.3 Evaluation of Compliance Rates

DTSC found a high noncompliance rate with the AMS. The most frequently cited violations were: lack of personnel training specific to TWW handling; inadequate accumulation area labeling; failure to submit generator notifications; providing incomplete or incorrect information in semiannual reports; and allowing TWW to come in contact with the ground.

The most commonly cited violation was the lack of personnel training specific to TWW handling. This violation was due to failure to include specific TWW training in a health and safety plan or injury and illness prevention plan.

Labeling violations primarily were due to TWW accumulation areas "not clearly defined" with a label identifying the area. In cases where the designated area was labeled, the label frequently did not include an accumulation date, as required by the AMS.

Many TWW generators were unaware of the written notification required for generating 10,000 pounds or more of TWW in a calendar year. In some of those cases, generators that routinely exceeded the notification limit failed to submit notifications over a course of multiple years. In other cases, some TWW generators that infrequently exceeded the notification limit failed to submit the notification for an isolated year.

Deficiencies in semiannual reports were a common occurrence at TWW facilities. TWW-approved landfills often submitted incomplete or incorrect semiannual reports because they did not include the originating TWW generator's information or mistakenly provided another TWW handler's information.

Storing TWW in contact with the ground violates multiple sections of the AMS. TWW handlers often indicated that, because the preserved wood's intended use was to be in contact with the ground (e.g., railroad ties and agricultural stakes), the TWW could be stored in contact with the ground prior to disposal.

Based on discussions with TWW handlers during inspections, DTSC believes that most of these noncompliance issues are due to lack of:

- regular inspections
- enforcement
- training or outreach

Although handlers failed to meet the TWW management requirements mentioned above, they were generally aware of the overall intent of the AMS. For example, inspectors cited few violations involving the prohibited treatment of TWW because handlers generally understood that incineration and grinding of TWW is prohibited. In addition, handlers typically knew that TWW could only be disposed at either a Class I Hazardous Waste Landfill or a composite-lined portion of a solid waste landfill. TWW-approved solid waste landfill operators were aware of the waste discharge requirements authorized by their respective RWQCB. These landfills actively promoted their approved status and handlers were generally aware of these destinations and complied with disposal requirements. Overall, it appears that TWW is being disposed of in approved landfills.

An area of concern identified during some of the TWW inspections is the issue of used railroad ties and their resale or reuse as landscaping material. In order to qualify for resale or reuse, TWW generators must use their best knowledge to determine whether the railroad ties are hazardous waste. Without knowledge, TWW generators must conduct testing of the waste to make a hazardous waste determination.

To determine if railroad ties consistently qualified as a hazardous waste, DTSC's Environmental Chemistry Laboratory completed its own sampling effort and reported on the hazardous characteristics of treated wood lumber and out-of-service railroad ties in 2008 (Environmental Chemistry Laboratory Report; see Appendix E). Based on this limited analytical data, the ECL Report indicated that lumber treated with ammonium copper quaternary or copper azole failed the California (i.e., non-RCRA) hazardous characteristic of toxicity for total metals, soluble metals, and aquatic fish bioassay. The ECL Report also identified railroad ties preserved with creosote and made from Douglas fir as failing the characteristic of toxicity (making them hazardous waste), but ties preserved with creosote and made of oak did not fail the characteristic of toxicity.

Variables that can complicate making a TWW hazardous waste determination include: length of service life; exposures to diverse environmental conditions; chemical constituent concentrations; and stage of wood decomposition. Acceptable sampling methods and sampling frequencies for TWW generators need to be established. The absence of a hazardous waste determination and acceptable or approved sampling methods makes it difficult to support potential violations.

Rates of Injuries

SB 162 requires this report to include the rate of compliance and injuries associated with handling TWW based on departmental inspections of TWW generator sites and TWW disposal facilities. During TWW inspections, DTSC staff inquired about injuries and none of the TWW handlers identified TWW-related injuries. At the beginning of this project, DTSC researched its own statutory and regulatory authority regarding the reporting of injuries related to hazardous waste in general, and specifically to TWW. DTSC noted that CCR, Title 22, Section 67386.12 requires personnel training, but not the reporting of injuries related to hazardous waste. DTSC consulted with its Industrial Hygienists and with an Associate Safety Engineer at California's Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA). DTSC concluded that injury reporting requirements are under the jurisdiction of Cal/OSHA. For this reason, was not qualified to acquire data on injuries related to TWW.

Section 3
HOUSEHOLD TWW SURVEYS

3.1 Survey Approach and Responses

Pursuant to SB 162, DTSC was tasked with assessing how households are currently handling, transporting, and disposing of TWW. To collect this information, DTSC created three surveys. The surveys were sent out to: 1) Household Hazardous Waste Collection Facilities (HHWCFs); 2) Certified Unified Program Agencies (CUPAs); and 3) Solid Waste Transfer Stations and Load Check Program Facilities (SW Facilities).

DTSC sent surveys specific to each of the above identified entities. To promote the overall response rate, each survey was designed to be completed within five to 10 minutes. The cover emails, surveys, and responses are available for review in Appendix D. Surveys were submitted to recipients by email and responses were collected over a two-week period. The number of recipients, survey responses, and the percentage of responses, are summarized in the table below:

Surveys	Number of Recipients	Number of Responses	Percent Response
HHWCFs	31	25	80
CUPAs	86	32	37
SW Facilities	732*	134	18

** This number includes all California Department of Resources Recycling and Recovery-permitted SW Facilities; many of these facilities do not include solid waste transfer facilities and solid waste load check programs.*

3.2 Survey Conclusions

Summarized below are the responses provided by survey recipients:

HHWCF: Survey responses indicated that a majority (72 percent) of responders do not accept TWW at their respective collection facility. Of the collection facilities that do not accept TWW, 43 percent indicated that the nearest facility that accepts TWW is located more than 10 miles away, and 13 percent indicated that the nearest facility that accepts TWW is located more than 50 miles away.

CUPAs: CUPAs were surveyed on the frequency that households are observed improperly disposing of TWW. Feedback largely indicated that observed illegal disposal by households was infrequent, occurring less than once a month in approximately 88 percent of responses. However, the other 12 percent stated that households were observed improperly disposing of TWW more than five times a month. Many CUPAs reported that they do not regulate households in their jurisdictions. DTSC will review the survey results and may gather additional information to determine whether there is a discernable trend or commonality to the household disposals.

SW Facilities: Survey responses indicated that a majority (76 percent) of responders do not accept TWW at their facilities. Of these facilities that do not accept TWW, 50 percent indicated that the nearest facility that accepts TWW is located more than 10 miles away, and 9 percent indicated that the nearest facility that accepts TWW is located more than 50 miles away.

Conclusions

Some of the responses from all three survey groups included written comments. These written comments predominantly identified a need for more:

- public awareness of TWW regulations
- disposal options (i.e., approved landfills and transfer stations)

Particular to the need for more disposal options, DTSC suggests that this concern is supported by the high percentage of HHWCF and SW Facility survey responders that do not accept TWW, and by the distances (greater than 10 miles) to travel to the nearest facility that accepts TWW.

Section 4
CONCLUSIONS

The following section identifies conclusions specific to TWW-related statutes identified by the TWW team, which are hyperlinked for reference to the specific text.

4.1 Statutes

Health and Safety Code Section 25143.1.5: This section exempts wood waste (such as poles, pilings, fence posts, support timbers, and other lumber treated with a preservative and used in electric, gas, or telephone service) from the requirements of this chapter (HSC Chapter 6.5). This exemption is available if certain conditions are met, which include disposal to an approved landfill.

Conclusion: This exemption was provided to minimize or eliminate the cost of generator fees and disposal costs for TWW generated by utility companies. The exempted TWW is still required to be disposed of in an approved landfill, so there are no cost savings on disposal fees; however, the utilities are not required to pay generator fees. This statutory exemption potentially allows for TWW to be stored in contact with the ground, exposed to precipitation and run-on and run-off, and reused for unintended purposes. An equitable regulatory approach would be to apply the AMS to all TWW generators, irrespective of industry.

4.2 Compliance Summary

From May 2017 to February 2018, 126 inspections of TWW facilities and generators conducted throughout the state indicate a high noncompliance rate with the AMS for TWW. Approximately 60 percent of the inspections conducted resulted in citations of one or more violations (seven class I, 68 class II, and 69 minor).

The most frequently cited violations were: lack of personnel training specific to TWW handling, inadequate accumulation area labeling, failure to submit generator notifications, providing incomplete or incorrect information in semiannual reports, and allowing TWW to come in contact with the ground.

Based on discussions with TWW handlers during inspections, most noncompliance issues appear to be due to the lack of regular inspections, enforcement, and training or outreach. During inspections, DTSC inspectors inquired about TWW-related injuries but ultimately, DTSC does not have the jurisdiction to inquire about workplace injuries.

Although handlers failed to meet the TWW management requirements identified above, handlers were generally aware of the overall intent of the AMS. TWW handlers typically knew that TWW could only be disposed at either a Class I Hazardous Waste Landfill or a composite-lined portion of a solid waste landfill. These landfills actively promoted their approved status and handlers were generally aware of these destinations and complied with disposal requirements. Overall, it appears that TWW is being disposed of in approved landfills.

Household TWW Survey results indicate the need for increased public awareness and more authorized disposal sites. This is supported by the high percentage of HHWCF and SW Facility survey responders that do not accept TWW, and by the distances (more than 10 miles) to travel to the nearest facility that accepts TWW.

REFERENCES

Assembly Bill 1353, Treated Wood Waste: Disposal 2005

California Code of Regulations, Title 22 Social Security, Division 4.5. Environmental Health Standards for the Management of Hazardous Waste

California Health and Safety Code, Division 20, Chapter 6.5

Department of Toxic Substances Control. DTSC-OP-005, DTSC Policy for Conducting Inspections

Department of Toxic Substances Control. DTSC-OP-006, DTSC Enforcement Response Policy

Department of Toxic Substances Control. Treated Wood Waste Management in California, AB 1353 Implementation Report, June 2011

Resource Conservation and Recovery Act of 1976, Subtitle C – Hazardous Waste Management

Senate Bill 839, Committee on Budget and Fiscal Review, 2016

APPENDICES

APPENDIX A

Treated Wood Waste
Alternative Management Standards

TEXT OF FINAL REGULATIONS

Alternative Management Standards for Treated Wood Waste – R-2005-04

§66261.9.5. Requirements for Treated Wood Waste

Treated wood waste as defined in section 67386.4 when managed as specified in chapter 34 is exempt from the management requirements of chapter 12 through 20.

NOTE: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Section 25150.7, Health and Safety Code.

Appendix XII of the California Code of Regulations title 22, division 4.5, chapter 11.

Amended Appendix XII and inserted the new California Waste Code for Treated Wood Waste. California Waste code 614 has been inserted both in numerical and alphabetical order within the existing section.

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(b) List of California Hazardous Waste Codes arranged in numerical order:

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614 Treated wood waste

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(c) List of California Hazardous Waste Codes arranged alphabetically within each numbered category in this subdivision:

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614 Treated wood waste

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NOTE: Authority cited: Sections 25150 and 58012, Health and Safety Code. Reference: Sections 25117.9, 25122.7, and 25150, Health and Safety Code.

Chapter 34. Alternative Management Standards for Treated Wood Waste

§ 67386.1 Scope

(a) This chapter provides an alternative set of management standards in lieu of the requirements for hazardous waste pursuant to articles 6, 6.5, and 9, chapter 6.5, division 20, Health and Safety Code, and chapters 12, 13, 14, 15, 16, 18, and 20 of this division for a person managing treated wood waste (TWW). All other chapters of this division, and section 66264.101, chapter 14, division 4.5, title 22, apply to persons managing TWW.

(b) Nothing in this chapter is a limitation on the power of this or any other governmental agency to adopt or enforce additional requirements related to the management of TWW.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7, Health and Safety Code.

§ 67386.2 Applicability

(a) The alternative management standards of this chapter apply only to wood waste that meets all of the following:

(1) is a hazardous waste pursuant to chapter 11 of this division;
(2) is a hazardous waste solely due to the presence of a preservative in or on the wood that is registered in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) for use as a wood preservative; and
(3) is not subject to regulation as a hazardous waste under the federal Resource Conservation and Recovery Act (RCRA).

(b) The alternative management standards of this chapter do not apply to wood waste exempted from hazardous waste management standards pursuant to Health and Safety Code section 25143.1.5.

(c) The following wood wastes are not eligible for the alternative management standards of this chapter:

(1) wood waste that is hazardous due to the presence of coatings, paint, or other treatments that are not registered in accordance with FIFRA for use as a wood preservative; or
(2) wood waste when designated to be burned.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25143.1.5, 25150.7 and 25150.8, Health and Safety Code.

§ 67386.3 Prohibited Activities

(a) TWW managed in accordance with the alternative management standards of this chapter shall not be:
(1) burned;
(2) scavenged;
(3) commingled with other waste prior to disposal, if previously segregated;
(4) stored in contact with the ground;
(5) recycled, with or without treatment, except as provided for in subsection (c)
(6) treated except in compliance with section 67386.10; and
(7) disposed to land except in compliance with section 67386.11.

(b) Any label or mark that identifies the wood waste as TWW shall not be intentionally removed, obliterated, defaced, or destroyed prior to disposal in a landfill.

(c) TWW may be recycled only by reuse pursuant to conditions specified in (1) – (3) of this subsection. During reuse, the TWW is not subject to sections 67386.5 through 67386.11. TWW may only be reused when all of the following apply:
(1) reuse is onsite;
(2) at the time of reuse, reuse is consistent with a FIFRA approved use of the preservative with which the TWW has been treated; and
(3) prior to reuse, the TWW is handled in compliance with all applicable management standards of this chapter.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

§ 67386.4 Definitions

The definitions set forth in section 66260.10 of this division shall apply unless otherwise defined. The following definitions shall apply to the terms used in this chapter:

“Agent” means a person hired by a generator for the removal, collection, or transportation of TWW.

“Class 1 hazardous waste landfill” means a landfill as defined in section 66260.10, which is also authorized as part of a permitted facility as defined in section 66260.10.

"Composting Facility" means a facility that produces compost as defined in Public Resources Code, section 40116 and is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Gasification Facility" means a facility that utilizes a gasification process as defined in Public Resources Code, section 40117 and is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Limited Volume Transfer Operation" means an operation that receives less than 60 cubic yards, or 15 tons of solid waste per operating day for the purpose of storing the waste prior to transferring the waste to another solid waste operation or facility and which does not conduct processing activities, but may conduct limited salvaging activities and volume reduction by the operator and is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

“Resizing” means the minimal cutting, breaking, or sawing, but does not include planing, grinding, chipping, sanding, shredding, mulching, or other mechanical handling or any other treatment.

"Small Volume Construction and Demolition/Inert (CDI) Debris Processing Operation" means a site that receives less than 25 tons of any combination of construction and demolition debris and Type A inert debris per operating day for the purposes of storage, handling, transfer, or processing that is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Solid Waste Landfill" means a facility as defined in Public Resources Code, section 40195.1 that is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Transfer or Processing Station" means a facility as defined in Public Resources Code, section 40200 that is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Transformation Facility" means a facility that utilizes a transformation process as defined in Public Resources Code, section 40201 and is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

‘‘Treated wood’’ means wood that has been treated with a chemical preservative for purposes of protecting the wood against attacks from insects, microorganisms, fungi, and other environmental conditions that can lead to decay of the wood and the chemical preservative is registered pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. § 136 and following).

“Treated Wood Waste” means a waste that meets the requirements of section 67386.2(a).

“TWW” means “Treated Wood Waste.”

“TWW approved landfill” means either a class 1 hazardous waste landfill, or a composite-lined portion of a solid waste landfill unit that meets all requirements

applicable to disposal of municipal solid waste in California after October 9, 1993, and that is regulated by waste discharge requirements issued pursuant to division 7 (commencing with § 13000) of the Water Code for discharges of designated waste, as defined in section 13173 of the Water Code, or treated wood waste and that is in compliance with this chapter.

"TWW facility" means either:

(a) a solid waste landfill, as defined in this section, that is in compliance with this chapter; or
(b) a transfer or processing station, as defined in this section, that is in compliance with this chapter; or
(c) a gasification facility, as defined in this section, that is in compliance with this chapter; or
(d) a TWW approved landfill, as defined in this section, that is in compliance with this chapter; or
(e) a class 1 hazardous waste landfill; or
(f) Small Volume Construction and Demolition/Inert (CDI) Debris Processing Operation, as defined in this section, that is in compliance with this chapter; or
(g) Limited Volume Transfer Operation, as defined in this section, that is in compliance with this chapter.

TWW Facility shall not include composting facilities, or transformation facilities.

"TWW handler" means a person who generates, handles, collects, processes, accumulates, stores, transfers, transports, treats, recycles, or disposes of TWW.

"Unit" means a pile, stack, container, bundle, or other discernable aggregation of TWW for purposes of this chapter.

"Wood waste" means all waste timber products and failed timber products including solid sawn lumber and engineered wood products, offcuts, shavings and sawdust that meet the definition of "waste" pursuant to Health and Safety Code section 25124. "Wood Waste" does not mean forest residues, green waste, or garden waste materials such as branches, bushes and tree stumps.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code; Sections 40116, 40117, 40195.1, 40200, and 40201, Public Resources Code; and Section 13173 Water Code.

§ 67386.5 Labeling

(a) TWW generated, accumulated, stored, or transported within California shall be clearly marked and visible for inspection. The person managing the TWW shall ensure that each unit and/or area designated for accumulation of TWW is labeled. The area

designated for accumulation of TWW shall be clearly identified and used solely for the accumulation of TWW.

(b) In order to clearly identify the nature of the waste to the receiving party and/or any observer, the TWW shall be labeled or marked with the following:

> "TREATED WOOD WASTE –Do not burn or scavenge.
>
> TWW Handler Name and Address: _____
>
> _____ _____
>
> Accumulation Date: _____".

(c) The TWW handler shall ensure that labels are maintained in compliance with the requirements of subsections (a) and (b) during transport.

(d) TWW accumulated for a period not to exceed thirty (30) days by a household at the site of generation in compliance with the requirements of section 67386.6 is exempt from the labeling requirements of this section.

(e) TWW, generated by a household, while being self-transported to an approved TWW facility is exempt from the labeling requirements of this section if the TWW is identified to the TWW facility as TWW.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

§ 67386.6 Accumulation

(a) TWW shall be maintained in a manner that prevents unauthorized access and minimizes release to the environment.

(1) Unauthorized access shall be prevented by means of visual control or a physical barrier when not under the direct control of the person responsible for the TWW.

(2) The TWW shall be accumulated in a manner that is protected from run-on and run-off, and placed on a surface sufficiently impervious to prevent, to the extent practical, contact with and leaching to soil or water, which may be accomplished by one of the following:

(A) Block and Tarp:

The TWW may be accumulated when all the following requirements are met;

1. TWW is elevated to prevent contact with the soil and to protect from reasonably foreseeable run-on;
2. TWW is covered to protect from precipitation; and

3. TWW is accumulated no longer than 90 days from the date the TWW is generated or received from another handler.

(B) Containerize:

The TWW may be accumulated in containers no longer than one year from the date the TWW is generated or received from another handler. The containers shall be;

1. designed, constructed, maintained, filled, its contents so limited, and closed, so that under conditions normally incidental to handling, there will be no identifiable release of TWW materials or its constituents to the environment;
2. water-resistant if exposed to precipitation, run-on or run-off under reasonably foreseeable conditions; and
3. transported to a TWW facility within 90 days of being filled to capacity.

(C) Storage Building:

The TWW shall be accumulated no longer than one year from the date the TWW is generated or received from another handler in a structurally sound building with a water-resistant floor designed to prevent the movement of water into or out of the building.

(D) Containment Pad:

The TWW may be accumulated no longer than 180 days from the date the TWW is generated or received from another handler on a containment surface and all the following requirements are met;

1. TWW does not contact soil;
2. TWW is protected from reasonably foreseeable run-on;
3. TWW is covered to protect from precipitation; and
4. TWW managed in accordance with this subsection may be accumulated uncovered if the containment surface is designed and operated to contain all precipitation and the resulting water is managed in accordance with all applicable laws and regulations.

(E) Other:

The TWW may be accumulated no longer than 90 days from the date the TWW is generated or received from another handler in any other manner in which the TWW handler can clearly demonstrate that the TWW is protected from run-on and run-off, and placed on a surface sufficiently impervious to prevent, to the extent practical, contact with and leaching to soil or water.

(b) Except as provided in subsection (c), in no case shall TWW be accumulated for more than one year from the date of generation or the date received from another handler.

(c) A handler may accumulate TWW for longer than one year from the date the TWW is generated or received from another handler, if the accumulation is solely for the purpose of accumulation of quantities of TWW necessary to facilitate disposal pursuant to section 67386.11. However, the handler bears the burden of proving that the

accumulation was solely for the purpose of accumulation of quantities of TWW necessary to facilitate proper disposal.

(d) A person who accumulates TWW shall be able to demonstrate the length of time the TWW has been accumulated from the date it becomes a waste or is received.

(e) TWW generated incidental to the maintenance of a household and accumulated by the resident of the household at the site of generation is exempt from the accumulation requirements of this section if all of the following requirements are met;

(1) TWW is not physically altered except as provided in section 67386.10; and
(2) TWW is accumulated no longer than thirty (30) days.

(f) TWW generated incidental to the operation of a business accumulated at the site of generation for a period not to exceed thirty (30) days is exempt from the accumulation requirements of this section if:

(1) TWW is not physically altered except as provided in section 67386.10; and
(2) the business accumulates no more than 1,000 pounds of TWW.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

§ 67386.7 Offsite Shipments

(a) Except as provided in subsection (c), a TWW handler is prohibited from sending or taking TWW to a place other than a TWW facility, or a TWW approved landfill.

(b) Prior to sending a shipment of TWW to another TWW handler, the originating handler shall ensure that the receiving handler agrees to receive the shipment.

(c) A TWW handler who initially collects TWW at a remote site may transport that TWW to a consolidation site operated by the generator if all the following conditions are met;

(1) the TWW is transported by the generator, employees of the generator or by the generator's agent;
(2) a shipping document containing all of the following information accompanies the TWW while in transport;
    (A) the quantity, by weight or volume, of TWW being transported;
    (B) the location of the remote site where the TWW was initially collected;
    (C) the date that the generator first began to accumulate the TWW at the remote site, the date that the shipment leaves the remote site, and the date that the shipment arrives at the consolidation site;
    (D) the name, address, and telephone number of the generator, and, if different, the address and telephone number of the consolidation site to which the TWW is being transported; and

(E) the name of the individual or individuals who transport the TWW from the remote site to the consolidation site; and

(3) the TWW handler shall retain the shipping document described in subsection (c)(2) of this section for at least three years from the date the TWW leaves the TWW consolidation site.

(d) TWW shall be shipped and/or transported in a manner that prevents unauthorized access; protects the TWW from precipitation; and prevents loss, dispersion, and leaching of TWW constituents.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

§ 67386.8 Tracking Shipments

(a) Shipments off-site. A TWW handler shall keep a record of each shipment of TWW sent from the handler to TWW facilities. The record may take the form of a log, invoice, manifest, bill of lading, shipping document, or receipt from a TWW facility. The record for each shipment of TWW shall include the following information:

(1) name and address of the TWW facility to which the TWW was sent;

(2) weight of TWW, the estimated weight of TWW, or the weight of the TWW as measured by the receiving TWW facility (An estimated weight may be used when a scale is unavailable or weighing is impractical. Assumptions required for weight estimates shall be recorded in the shipment records.); and

(3) date the shipment of TWW left the handler.

(b) Receipt of shipments. A TWW handler shall keep a record of each shipment of TWW received at the facility. The record may take the form of a log, invoice, manifest, bill of lading, or other shipping document. The record for each shipment of TWW received shall include the following information:

(1) name and address of the originating TWW generator from whom the TWW was sent;

(2) weight of TWW or the estimated weight of TWW (An estimated weight may be used when a scale is unavailable or weighing is impractical. Assumptions required for weight estimates shall be recorded in the shipment records.); and

(3) date of receipt of the shipment of TWW.

(c) Reporting receipt of shipments. A TWW facility or a TWW approved landfill that receives TWW shall submit, to the department, semi annual reports for the periods ending June 30 and December 31 of each year. Reports shall be required beginning December 31, 2007 and shall be submitted in an electronic format provided by the department within 30 days of the end of each reporting period. Each semi annual report shall include the following information:

(1) reporting facility information;

1. Facility name, location address, contact person's name, and telephone number; and
2. Identification Number.

(2) for all TWW shipments received, other than those reported under subsections (3), (4), and (5) the TWW facility shall report the following information;

1. generator's Identification Number, or, if the generator does not have an Identification Number, the name, address, contact person's name, mailing address, and telephone number of the generator;
2. dates of shipments; and
3. weight of TWW per shipment.

(3) TWW household information;

1. weight summary of all TWW quantities received that were generated by households.

(4) TWW load check information;

1. Weight summary of all TWW quantities discovered and separated from solid waste as part of an on-site load checking program.

(5) for shipments received from another TWW facility the following information shall be reported by the receiving TWW facility;

1. TWW facility's Identification Number or the name, address, contact person's name, mailing address, and telephone number of the TWW facility;
2. dates of shipments; and
3. weight of TWW per shipment.

(d) The department shall make all of the information in the semi annual reports submitted pursuant to this subdivision available to the public, through its usual means of disclosure, except the department shall not disclose the association between any specific TWW handlers and specific facilities. The list of TWW handlers served by a facility shall be deemed to be a trade secret and confidential business information for purposes of Health and Safety Code section 25173 and section 66260.2 of title 22 of the California Code of Regulations.

(e) Record retention.

(1) a TWW handler shall retain the records described in subsection (a) of this section for at least three years from the date the shipment left the handler; and
(2) a TWW facility shall retain the records described in subsection (b) of this section for at least three years from the date of receipt of a shipment.

(f) Households are exempt from the recordkeeping requirements of this section when the TWW is generated incidental to that household.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7, 25150.8 and 25173, Health and Safety Code.

§ 67386.9 Notification

(a) In any calendar year that a TWW handler generates more than 10,000 pounds of TWW, the TWW handler shall obtain or maintain an Identification Number within 30 days of exceeding the weight threshold.

(b) In any calendar year that a TWW handler generates more than 10,000 pounds of TWW the handler shall send written notification to the Department within 30 days of exceeding the 10,000 pound limit.

(c) The notification shall include;

(1) TWW handler's name and mailing address;
(2) generator's Identification Number;
(3) name and business telephone number of the person at the TWW handler's site who should be contacted regarding TWW management activities;
(4) address or physical location of the TWW management activities;
(5) date the TWW handler exceeded the 10,000 pound limit; and
(6) a statement indicating that the handler is generating more than 10,000 pounds of TWW per calendar year.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

§ 67386.10 Treatment

(a) Treatment, as defined in Health and Safety Code section 25123.5, of treated wood waste managed in accordance with the alternative management standards of this chapter is prohibited except as provided in subsections (b) and (c).

(b) Resizing is exempt from the permitting requirements of this division when resized to facilitate transport or reuse and the following requirements are met;

(1) TWW shall be handled in a manner that prevents the uncontrolled release of hazardous constituents to the environment; and
(2) if size reduction of the TWW results in sawdust, particles, or other material smaller than one cubic inch, the material shall be captured and managed as TWW.

(c) Sorting and segregating are both exempt from the permitting requirements of this division. The TWW shall be handled in a manner that prevents the uncontrolled release of hazardous constituents to the environment.

(d) An employer resizing, sorting, or segregating TWW shall provide training for all employees handling TWW and all employees that may reasonably be expected to contact TWW. A record of the training shall be maintained for a period of three years and available for review. The training shall include:

(1) all applicable requirements of the California Occupational Safety and Health Act of 1973 (ch. 1, part 1, div. 5 (commencing with § 6300) of the Labor Code), including all rules, regulations, and orders relating to hazardous waste;
(2) procedures for identifying and segregating TWW;
(3) safe handling practices;
(4) requirements of the alternative management standards; and
(5) proper disposal methods.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

§ 67386.11 Disposal

(a) When disposed to land, TWW shall be disposed in either a Class I hazardous waste landfill, or in a composite-lined portion of a solid waste landfill unit that meets all requirements applicable to disposal of municipal solid waste in California after October 9, 1993, and that is regulated by waste discharge requirements issued pursuant to division 7 (commencing with § 13000) of the Water Code for discharges of designated waste, as defined in section 13173 of the Water Code, or TWW.

(b) A solid waste landfill that accepts TWW shall:

(1) comply with the prohibitions in section 67386.3 for handling TWW;
(2) ensure that any management of the TWW at the solid waste landfill prior to disposal complies with the applicable requirements of this chapter;
(3) monitor the composite-lined portion of a landfill unit at which TWW has been disposed. When a release is verified, cease discharge of TWW to that landfill unit until corrective action results in cessation of the release. The landfill shall notify the department that TWW is no longer being discharged to that landfill unit and when corrective action results in cessation of the release; and
(4) handle TWW in a manner consistent with all applicable requirements of the California Occupational Safety and Health Act of 1973 (ch. 1, part 1, div. 5 (commencing with § 6300) of the Labor Code), including all rules, regulations, and orders relating to hazardous waste.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code; and Section 13173 Water Code.

§ 67386.12 Training

(a) An employer managing TWW shall provide training for all employees handling TWW and all employees that may reasonably be expected to contact TWW. A record of the training shall be maintained for a period of three years and available for review. The training shall include:

(1) all applicable requirements of the California Occupational Safety and Health Act of 1973 (ch. 1, part 1, div. 5 (commencing with § 6300) of the Labor Code), including all rules, regulations, and orders relating to hazardous waste;
(2) procedures for identifying and segregating TWW;
(3) safe handling practices;
(4) requirements of the alternative management standards; and
(5) proper disposal methods.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

APPENDIX B

Senate Bill 162

Senate Bill No. 162

CHAPTER 351

An act to amend Section 25150.7 of the Health and Safety Code, relating to hazardous waste.

[Approved by Governor September 28, 2015. Filed with Secretary of State September 28, 2015.]

legislative counsel's digest

SB 162, Galgiani. Treated wood waste.

(1) Existing law requires the wood preserving industry to provide certain information relating to the potential danger of treated wood to wholesalers and retailers of treated wood and wood-like products. Existing law requires these wholesalers and retailers to conspicuously post the information at or near the point of display or customer selection of treated wood and wood-like products, as specified.

This bill would update the information required to be posted by wholesalers and retailers of treated wood and treated wood-like products.

(2) Existing law requires the Department of Toxic Substances Control to adopt, and revise as necessary, regulations establishing management standards for treated wood waste, subject to specified limitations. Existing law makes these, and other requirements regarding treated wood waste, inoperative on June 1, 2017, but provides that a regulation adopted pursuant to these provisions on or before June 1, 2012, continues in force and effect until repealed or revised. A violation of the state's hazardous waste control laws is a crime.

This bill would remove those limitations for treated wood waste regulations adopted by the department, would extend the operation of these provisions regarding treated wood waste to December 31, 2020, and would repeal the language concerning the continued operation of treated wood waste regulations. By extending the operation of a crime, the bill would impose a state-mandated local program. The bill would require, on or before January 1, 2018, the department to prepare, post on its Internet Web site, and provide to the appropriate policy committees of the Legislature, a comprehensive report with specified content on the compliance with, and implementation of, these laws relating to treated wood waste.

(3) The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that no reimbursement is required by this act for a specified reason.

The people of the State of California do enact as follows:

SECTION 1. Section 25150.7 of the Health and Safety Code is amended to read:

25150.7. (a) The Legislature finds and declares that this section is intended to address the unique circumstances associated with the generation and management of treated wood waste. The Legislature further declares that this section does not set a precedent applicable to the management, including disposal, of other hazardous wastes.

(b) For purposes of this section, the following definitions shall apply:

(1) "Treated wood" means wood that has been treated with a chemical preservative for purposes of protecting the wood against attacks from insects, microorganisms, fungi, and other environmental conditions that can lead to decay of the wood, and the chemical preservative is registered pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. Sec. 136 et seq.).

(2) "Wood preserving industry" means business concerns, other than retailers, that manufacture or sell treated wood products in the state.

(c) This section applies only to treated wood waste that, solely due to the presence of a preservative in the wood, is a hazardous waste and to which both of the following requirements apply:

(1) The treated wood waste is not subject to regulation as a hazardous waste under the federal act.

(2) Section 25143.1.5 does not apply to the treated wood waste.

(d) (1) Notwithstanding Sections 25189.5 and 25201, treated wood waste shall be disposed of in either a class I hazardous waste landfill, or in a composite-lined portion of a solid waste landfill unit that meets all requirements applicable to disposal of municipal solid waste in California after October 9, 1993, and that is regulated by waste discharge requirements issued pursuant to Division 7 (commencing with Section 13000) of the Water Code for discharges of designated waste, as defined in Section 13173 of the Water Code, or treated wood waste.

(2) A solid waste landfill that accepts treated wood waste shall comply with all of the following requirements:

(A) Manage the treated wood waste to prevent scavenging.

(B) Ensure that any management of the treated wood waste at the solid waste landfill before disposal, or in lieu of disposal, complies with the applicable requirements of this chapter, except as otherwise provided by regulations adopted pursuant to subdivision (f).

(C) If monitoring at the composite-lined portion of a landfill unit at which treated wood waste has been disposed of indicates a verified release, then treated wood waste shall not be discharged to that landfill unit until corrective action results in cessation of the release.

(e) (1) Each wholesaler and retailer of treated wood and treated wood-like products in this state shall conspicuously post information at or near the point of display or customer selection of treated wood and treated wood-like products used for fencing, decking, retaining walls, landscaping, outdoor

structures, and similar uses. The information shall be provided to wholesalers and retailers by the wood preserving industry in 22-point type, or larger, and contain the following message:

Warning—Potential Danger

These products are treated with wood preservatives registered with the United States Environmental Protection Agency and the California Department of Pesticide Regulation and should only be used in compliance with the product labels.

This wood may contain chemicals classified by the State of California as hazardous and should be handled and disposed of with care. Check product label for specific preservative information and Proposition 65 warnings concerning presence of chemicals known to the State of California to cause cancer or birth defects.

Anyone working with treated wood, and anyone removing old treated wood, needs to take precautions to minimize exposure to themselves, children, pets, or wildlife, including:

□ Avoid contact with skin. Wear gloves and long sleeved shirts when working with treated wood. Wash exposed areas thoroughly with mild soap and water after working with treated wood.

□ Wear a dust mask when machining any wood to reduce the inhalation of wood dusts. Avoid frequent or prolonged inhalation of sawdust from treated wood. Machining operations should be performed outdoors whenever possible to avoid indoor accumulations of airborne sawdust.

□ Wear appropriate eye protection to reduce the potential for eye injury from wood particles and flying debris during machining.

□ If preservative or sawdust accumulates on clothes, launder before reuse. Wash work clothes separately from other household clothing.

□ Promptly clean up and remove all sawdust and scraps and dispose of appropriately.

□ Do not use treated wood under circumstances where the preservative may become a component of food or animal feed.

□ Only use treated wood that's visibly clean and free from surface residue for patios, decks, or walkways.

□ Do not use treated wood where it may come in direct or indirect contact with public drinking water, except for uses involving incidental contact such as docks and bridges.

□ Do not use treated wood for mulch.

□ Do not burn treated wood. Preserved wood should not be burned in open fires, stoves, or fireplaces.

For further information, go to the Internet Web site http://www.preservedwood.org and download the free Treated Wood Guide mobile application.

In addition to the above listed precautions, treated wood waste shall be managed in compliance with applicable hazardous waste control laws.

(2) On or before July 1, 2005, the wood preserving industry shall, jointly and in consultation with the department, make information available to generators of treated wood waste, including fencing, decking, and landscape contractors, solid waste landfills, and transporters, that describes how to best handle, dispose of, and otherwise manage treated wood waste, through the use either of a toll-free telephone number, Internet Web site, information labeled on the treated wood, information accompanying the sale of the treated wood, or by mailing if the department determines that mailing is feasible and other methods of communication would not be as effective. A treated wood manufacturer or supplier to a wholesaler or retailer shall also provide the information with each shipment of treated wood products to a wholesaler or retailer, and the wood preserving industry shall provide it to fencing, decking, and landscaping contractors, by mail, using the Contractors' State License Board's available listings, and license application packages. The department may provide guidance to the wood preserving industry, to the extent resources permit.

(f) (1) On or before January 1, 2007, the department, in consultation with the Department of Resources Recycling and Recovery, the State Water Resources Control Board, and the Office of Environmental Health Hazard Assessment, and after consideration of any known health hazards associated with treated wood waste, shall adopt and may subsequently revise as necessary, regulations establishing management standards for treated wood waste as an alternative to the requirements specified in this chapter and the regulations adopted pursuant to this chapter.

(2) The regulations adopted pursuant to this subdivision shall, at a minimum, ensure all of the following:

(A) Treated wood waste is properly stored, treated, transported, tracked, disposed of, and otherwise managed to prevent, to the extent practical, releases of hazardous constituents to the environment, prevent scavenging, and prevent harmful exposure of people, including workers and children, aquatic life, and animals to hazardous chemical constituents of the treated wood waste.

(B) Treated wood waste is not reused, with or without treatment, except for a purpose that is consistent with the approved use of the preservative with which the wood has been treated. For purposes of this subparagraph,

"approved uses" means a use approved at the time the treated wood waste is reused.

(C) Treated wood waste is managed in accordance with all applicable laws.

(D) Any size reduction of treated wood waste is conducted in a manner that prevents the uncontrolled release of hazardous constituents to the environment, and that conforms to applicable worker health and safety requirements.

(E) All sawdust and other particles generated during size reduction are captured and managed as treated wood waste.

(F) All employees involved in the acceptance, storage, transport, and other management of treated wood waste are trained in the safe and legal management of treated wood waste, including, but not limited to, procedures for identifying and segregating treated wood waste.

(g) (1) A person managing treated wood waste who is subject to a requirement of this chapter, including a regulation adopted pursuant to this chapter, shall comply with either the alternative standard specified in the regulations adopted pursuant to subdivision (f) or with the requirements of this chapter.

(2) A person who is in compliance with the alternative standard specified in the regulations adopted pursuant to subdivision (f) is deemed to be in compliance with the requirement of this chapter for which the regulation is identified as being an alternative, and the department and any other entity authorized to enforce this chapter shall consider that person to be in compliance with that requirement of this chapter.

(h) On January 1, 2005, all variances granted by the department before January 1, 2005, governing the management of treated wood waste are inoperative and have no further effect.

(i) This section does not limit the authority or responsibility of the department to adopt regulations under any other law.

(j) (1) On or before January 1, 2018, the department shall prepare, post on its Internet Web site, and provide to the appropriate policy committees of the Legislature, a comprehensive report on the compliance with, and implementation of, this section. The report shall include, but not be limited to, all of the following:

(A) Data, and evaluation of that data, on the rates of compliance with this section and injuries associated with handling treated wood waste based on department inspections of treated wood waste generator sites and treated wood waste disposal facilities. To gather data to perform the required evaluation, the department shall do all of the following:

(i) The department shall inspect representative treated wood waste generator sites and treated wood waste disposal facilities, which shall not to be less than 25 percent of each.

(ii) The department shall survey and otherwise seek information on how households are currently handling, transporting, and disposing of treated wood waste, including available information from household hazardous

waste collection facilities, solid waste transfer facilities, solid waste disposal facility load check programs, and CUPAs.

(iii) The department shall, by survey or otherwise, seek data to determine whether sufficient information and convenient collection and disposal options are available to household generators of treated wood waste.

(B) An evaluation of the adequacy of protective measures taken in tracking, handling, and disposing of treated wood waste.

(C) Data regarding the unauthorized disposal of treated wood waste at disposal facilities that have not been approved for that disposal.

(D) Conclusions regarding the handling of treated wood waste.

(E) Recommendations for changes to the handling of treated wood waste to ensure the protection of public health and the environment.

(2) The requirement for submitting a report imposed under this subdivision is inoperative on January 1, 2022, pursuant to Section 10231.5 of the Government Code.

(k) This section shall become inoperative on December 31, 2020, and, as of January 1, 2021, is repealed, unless a later enacted statute, that becomes operative on or before January 1, 2021, deletes or extends the dates on which it becomes inoperative and is repealed.

SEC. 2. No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because the only costs that may be incurred by a local agency or school district will be incurred because this act creates a new crime or infraction, eliminates a crime or infraction, or changes the penalty for a crime or infraction, within the meaning of Section 17556 of the Government Code, or changes the definition of a crime within the meaning of Section 6 of Article XIII B of the California Constitution.

O

APPENDIX C

Treated Wood Waste Inspection Checklist

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
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Edmund G. Brown Jr.
Governor

TREATED WOOD WASTE INSPECTION CHECKLIST

DTSC oversees the regulation and management of treated wood waste (TWW) in California. The regulations for TWW management in California can be found in the California Code of Regulations, Title 22, Chapter 34, and are commonly referred to as the Alternative Management Standards (AMS).

Inspection Date: _____

Facility Name: _____

TWW Facility Type:

Generator Site: ☐ Disposal Facility: ☐ Transfer Station/Load-Check: ☐

EPA ID # or State HW ID #:_____

Site Address: _____

Owner/Operator Name: _____

Facility Telephone Number: _____

Inspector Name: _____ Title:_____

Inspector Name: _____ Title:_____

Other Facility Representative(s) Present: _____

CONSENT TO INSPECT: Inspections may involve obtaining photographs, reviewing and copying records, sampling, and interviewing employees.

Consent Granted By:_____ Title: _____

Date(s): _____ Time In: _____ Time Out: _____

DISCLAIMER
This checklist is intended to provide guidance only. This checklist does not replace or supersede relevant statutes and regulations. The information contained in this checklist is based upon the statutes and regulations in effect as of the date the checklist was signed. Interested parties are advised to keep apprised of subsequent changes to relevant statutes and regulations. Additional violations may be cited upon further review of documentation in the course of this inspection.

TREATED WOOD WASTE INSPECTION OBSERVATIONS

	Y	N	N/A	HAZARDOUS WASTE REQUIREMENTS FOR TWW
Labeling				
1				Each unit and/or area of TWW is clearly marked and visible for inspection [California Code of Regulations, Title 22 [CCR] 67386.5(a)]
2				Each area designated for accumulation of TWW is used solely for the accumulation of TWW [CCR 67386.5(a)]
3				TWW is labeled or marked with the following: "Treated Wood Waste—Do not burn or scavenge" TWW Handler Name and Address _____ Accumulation Date _____ [CCR 67386.5(b)]
4				No label or mark that identifies the wood as TWW shall be intentionally removed or defaced prior to disposal. [CCR 67386.3(b)]
5				Facility can demonstrate the length of time that the TWW has been accumulated from the date it is received or generated [CCR 67386.6(d)]
6				Unauthorized access is prevented by visual controls or a physical barrier when not under the direct control of the person responsible for the TWW [CCR 67386.6(a)(1)]
7				TWW is elevated to prevent contact with the soil and run-on [CCR 67386.6(a)(2)(A)1]
8				TWW is covered to protect from precipitation [CCR 67386.6(a)(2)(A)2]
9				TWW is accumulated no longer than **90 days** from the date generated or received from another handler [CCR 67386.6(a)(2)(A)3]
10				The container is designed, constructed, maintained, and closed to prevent releases [CCR 67386.6(a)(2)(B)1]
11				The container is water resistant if exposed to precipitation, run-on, and/or run-off [CCR 67386.6(a)(2)(B)2]
12				The container is transported to a TWW facility within 90 days of being filled to capacity [CCR 67386.6(a)(2)(B)3]
13				TWW is accumulated in containers no longer than **one year** from the date that it is generated or received from another handler [CCR 67386.6(a)(2)(B)]
14				TWW is not in contact with soil [CCR 67386.6(a)(2)(D)1]
15				TWW is protected from run-on and precipitation [CCR 67386.6(a)(2)(D)2 and 67386.6(a)(2)(D)3]
16				TWW is accumulated no longer than **180 days** from the date the TWW is generated or received from another handler [CCR 67386.6(a)(2)(D)]

Y = Compliance; N = Not in Compliance; N/A = Not Applicable

TREATED WOOD WASTE INSPECTION OBSERVATIONS

	Y	N	N/A	HAZARDOUS WASTE REQUIREMENTS FOR TWW
17				Storage building is structurally sound [CCR 67386.6(a)(2)(C)]
18				Storage building has a water-resistant floor designed to prevent the movement of water into or out of the building [CCR 67386.6(a)(2)(C)]
19				TWW is accumulated in containers no longer than **one year** from the date the it is generated or received from another handler [CCR 67386.6(a)(2)(C)]
Other				
20				TWW is protected from run-on and run-off [CCR 67386.6(a)(2)(E)]
21				TWW is placed on impervious surface to prevent contact with and leaching to soil or water [CCR 67386.6(a)(2)(E)]
22				TWW is accumulated no longer than **90 days** from the date generated or received from another handler [CCR 67386.6(a)(2)(E)]
A handler may accumulate TWW for longer than one year from the date the TWW is generated or received from another handler, if the accumulation is solely for the purpose of accumulation of quantities of TWW necessary to facilitate disposal pursuant to section 67386.11. However, the handler bears the burden of proving that the accumulation was solely for the purpose of accumulation of quantities of TWW necessary to facilitate proper disposal. [CCR 67386.6(c)]				
TWW generated which is incidental to the operation of a business and accumulated at the site of generation for a period not to exceed 30 days is exempt from the accumulation requirements of Section 67386.6 so long as the TWW is not physically altered, except as provided in section 67386.10, and the business accumulates no more than 1,000 pounds of TWW [CCR 67386.6(f)]				
Disposal				
23				TWW is being disposed in either a Class I hazardous waste landfill or in an approved composite-lined portion of a solid waste landfill [CCR 67386.11(a)]
24				A solid waste landfill that accepts TWW shall monitor the composite-lined portion of the landfill unit where the TWW is disposed [CCR 67386.11(b)(3)]
25				If a release is verified at a solid waste landfill that accepts TWW, the department is notified that TWW is no longer being discharged to that landfill unit and notified again when corrective action results in cessation of the release [CCR 67386.11(b)(3)]
26				A solid waste landfill that accepts TWW shall handle TWW pursuant to Cal OSHA requirements relating to hazardous waste [CCR 67386.11(b)(4)]
Treatment				
27				TWW treatment is prohibited except for resizing (to facilitate transport or reuse), sorting, and segregating [CCR 67386.10(a)]
28				Resizing, sorting, and segregating TWW is conducted in a manner that prevents releases to the environment [CCR 67386.10(b)(1) and 67386.10(c)]
29				Any sawdust, particles, or other materials less than one cubic inch are being captured and managed as TWW [CCR 67386.10(b)(2)]
Prohibited Activities				
30				TWW shall not be burned [CCR 67386.3(a)(1)]
31				TWW shall not be scavenged [CCR 67386.3(a)(2)]
32				TWW shall not be commingled with other waste prior to disposal, if previously segregated [CCR 67386.3(a)(3)]

Y = Compliance; N = Not in Compliance; N/A = Not Applicable

TREATED WOOD WASTE INSPECTION OBSERVATIONS

	Y	N	N/A	HAZARDOUS WASTE REQUIREMENTS FOR TWW
33				TWW shall not be stored in contact with the ground [CCR 67386.3(a)(4)]
34				TWW shall not be recycled, with or without treatment, except for reuse onsite in accordance with CCR 67386.3(c) [CCR 67386.3(a)(5)]
Receipt of Shipments				
35				Record Retention: TWW handlers and facilities shall retain the records of all shipments and receipts for three years [CCR 67386.8(e)(2)]
36				Records of TWW received at the facility contain the name and address of the originating TWW generator [CCR 67386.8(b)(1)]
37				Records of TWW sent to a facility contain the name and address of the TWW facility to which the TWW was sent [CCR 67386.8(a)(1)]
38				Records contain the weight of TWW or the estimated weight if scale is unavailable [CCR 67386.8(b)(2)] or [CCR 67386.8(a)(2)]
39				Records contain the date the shipments were sent or received [CCR 67386.8(b)(3)] or [CCR 67386.8(a)(3)]
Reporting Receipt of Shipments				
40				The facility submits semi-annual reports to DTSC for the periods ending June 30 and December 31 of each year [CCR 67386.8(c)]
41				The reports are submitted in an electronic format within 30 days of the end of each reporting period [CCR 67386.8(c)]
42				The reports include the facility name, location address, contact person's name, phone number, and identification number [CCR 67386.8(c)(1)1 and 67386.8(c)(1)2]
43				If the shipment is received from a generator of TWW the report includes the generator's ID number, dates of shipments, and the weight of the TWW per shipment. If generator does not have an ID number the name, address, contact person's name, mailing address, and phone number for the generator is included [CCR 67386.8(c)(2)]
44				If the shipment is received from another TWW facility the report includes the facility's ID number, dates of shipments, and the weight of the TWW per shipment. If facility does not have an ID number the name, address, contact person's name, mailing address, and phone number for the facility is included [CCR 67386.8(c)(5)]
45				The report includes the weight summary of all TWW generated by households [CCR 67386.8(c)(3)]
46				The report includes weight summary of all TWW found in load checks [CCR 67386.8(c)(4)]
Offsite Shipments				
47				Handler only ships TWW to TWW facility, TWW approved landfill or to a consolidation site (if TWW is generated at remote site) [CCR 67386.7(a)]
48				TWW is transported in a manner that prevents unauthorized access, exposure to precipitation, and releases [CCR 67386.7(d)]
Satellite Accumulation				
49				The TWW is being transported by the generator, employees of the generator or by the generator's agent if the TWW is generated at a remote site [CCR 67386.7(c)(1)]

Y = Compliance; N = Not in Compliance; N/A = Not Applicable

TREATED WOOD WASTE INSPECTION OBSERVATIONS

	Y	N	N/A	HAZARDOUS WASTE REQUIREMENTS FOR TWW
50				A shipping document accompanies the TWW while in transport to the consolidation site [CCR 67386.7(c)(2)]
The shipping document contains all of the following:				
51				The quantity, by weight or volume, of TWW being transported. [CCR 67386.7(c)(2)(A)]
52				The location of the remote site where the TWW was initially collected [CCR 67386.7(c)(2)(B)]
53				The date that the generator first began to accumulate the TWW at the remote site, the date that the shipment leaves the remote site, and the date that the shipment arrives at the consolidation site [CCR 67386.7(c)(2)(C)]
54				The name, address, and telephone number of the generator, and, if different, the address and telephone number of the consolidation site to which the TWW is being transported [CCR 67386.7(c)(2)(D)]
55				The name of the individual or individuals who transport the TWW from the remote site to the consolidation site [CCR 67386.7(c)(2)(E)]
Notification				
56				In any calendar year that a TWW handler generates more than 10,000 pounds of TWW, the handler shall obtain or maintain an Identification Number within 30 days of exceeding the weight threshold [CCR 67386.9 (a)]
57				In any calendar year that a TWW handler generates more than 10,000 pounds of TWW, the handler shall send written notification to the Department within 30 days of exceeding the 10,000 pound limit [CCR 67386.9 (b)]
The notification shall include:				
58				TWW handler's name and mailing address [CCR 67386.9 (c)(1)]
59				generator’s Identification Number[CCR 67386.9 (c)(2)]
60				name and business telephone number of the person at the TWW handler's site who should be contacted regarding TWW management activities [CCR 67386.9 (c)(3)]
61				address or physical location of the TWW management activities [CCR 67386.9 (c)(4)]
62				date the TWW handler exceeded the 10,000 pound limit [CCR 67386.9 (c)(5)]
63				a statement indicating that the handler is generating more than 10,000 pounds of TWW per calendar year [CCR 67386.9 (c)(6)]
Training				
64				All employees that handle and/or treat TWW or may come into contact with TWW receive training [CCR 67386.12(a) and 67386.10(d)]
The training shall include the following:				
65				All applicable requirements of Cal-OSHA rules, regulations and orders relating to hazardous waste [CCR 67386.12(a)(1) and 67386.10(d)(1)]
66				Procedures for identifying and segregating TWW [CCR 67386.12(a)(2) and 67386.10(d)(2)]
67				Safe handling practices [CCR 67386.12(a)(2) and 67386.10(d)(3)]
68				Requirements of the alternative management standards [CCR 67386.12(a)(2) and 67386.10(d)(4)]
69				Proper disposal methods [67386.12(a)(2) and 67386.10(d)(5)]

Y = Compliance; N = Not in Compliance; N/A = Not Applicable

TREATED WOOD WASTE INSPECTION OBSERVATIONS

Observations:

Company Representative Accepting Summary		**DTSC Representative**	
Name:		Name:	
Signature:		Signature:	
Title:		Title:	
Date:		Date:	

APPENDIX D

Household TWW Surveys

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Solid Waste Transfer Facilities and Load Check Programs

Survey Results

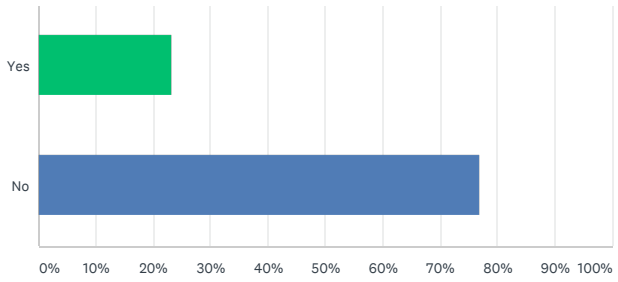
QUESTION SUMMARIES DATA TRENDS INDIVIDUAL RESPONSES

Add a comment

Q1

Do you accept shipments of TWW from households? Please check one:

Answered: 134 Skipped: 0

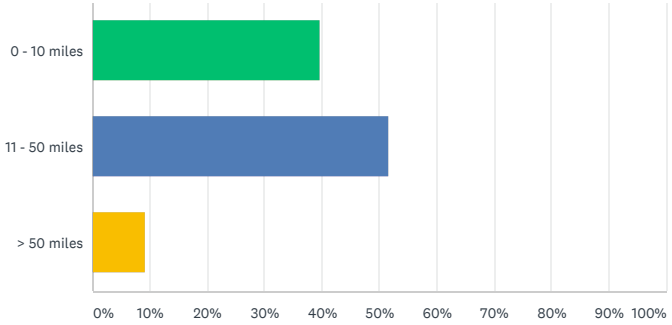


ANSWER CHOICES	RESPONSES	
Yes	23.13%	31
No	76.87%	103
TOTAL		134

Q2

If no, how far is in nearest facility located for households to dispose of TWW?

Answered: 109 Skipped: 25



ANSWER CHOICES	RESPONSES	
0 - 10 miles	39.45%	43
11 - 50 miles	51.38%	56
> 50 miles	9.17%	10
TOTAL		109

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134 responses

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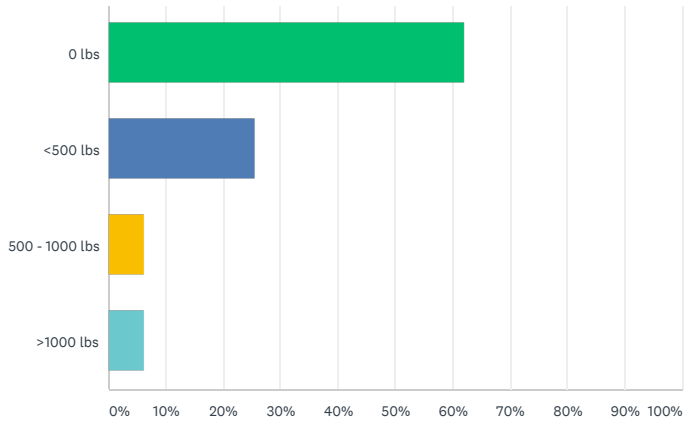
Q3

What is the estimated quantity of TWW-specific (i.e. only TWW) shipments brought to your location by households on a monthly basis:

Answered: 129 Skipped: 5

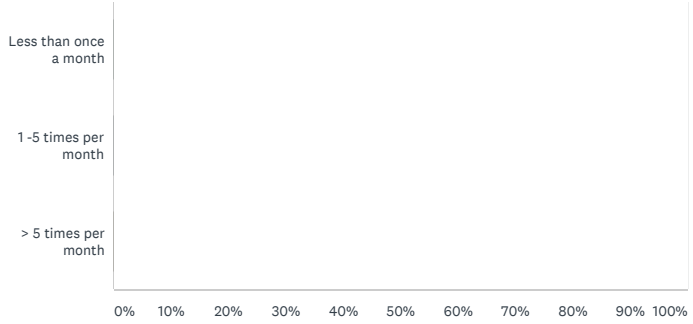


ANSWER CHOICES	RESPONSES	
0 lbs	62.02%	80
<500 lbs	25.58%	33
500 - 1000 lbs	6.20%	8
>1000 lbs	6.20%	8
TOTAL		**129**

Q4

How frequently do households bring TWW to your location, including if you don't accept TWW?

Answered: 122 Skipped: 12



ANSWER CHOICES	RESPONSES	
Less than once a month	61.48%	75
1 -5 times per month	26.23%	32
> 5 times per month	12.30%	15
TOTAL		**122**

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134 responses

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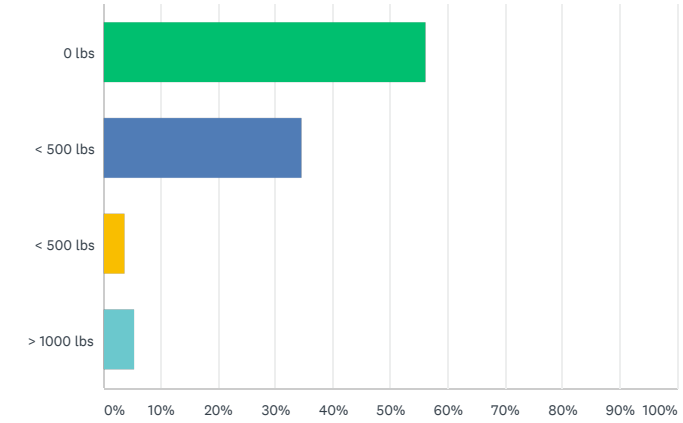
Q5

What is the estimated quantity of TWW found in load checks on a monthly basis?

Answered: 130 Skipped: 4

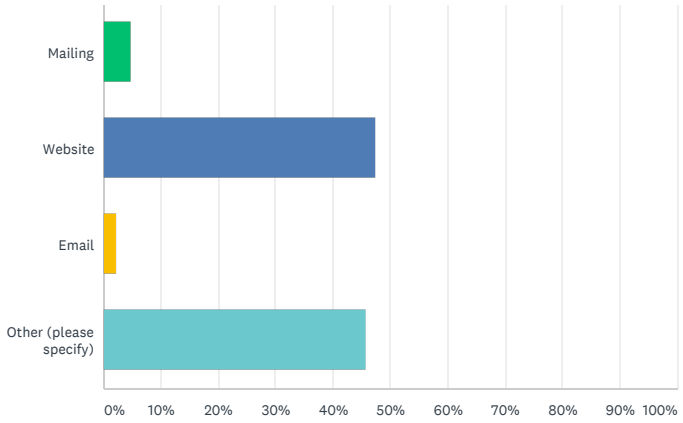


ANSWER CHOICES	RESPONSES	
0 lbs	56.15%	73
< 500 lbs	34.62%	45
< 500 lbs	3.85%	5
> 1000 lbs	5.38%	7
TOTAL		130

Q6

Which of the following methods do you use to inform households of the types of hazardous wastes accepted at your location? Check all that apply:

Answered: 125 Skipped: 9



ANSWER CHOICES	RESPONSES	
Mailing	4.80%	6
Website	47.20%	59
Email	2.40%	3
Other (please specify)	45.60%	57
TOTAL		125

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Q7

Do you have any suggestions or recommendations regarding the management of household TWW?

Answered: 67 Skipped: 67

no

1/5/2018 7:21 AM

no

1/5/2018 7:12 AM

None at this time

1/4/2018 4:57 PM

None

1/4/2018 2:41 PM

NONE

1/4/2018 1:42 PM

N.A.

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134 responses

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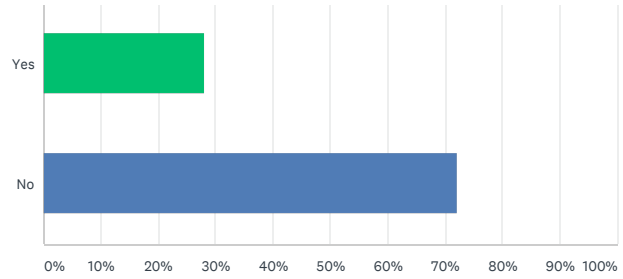
Household Hazardous Waste Collection Facilities (HHWCF)

QUESTION SUMMARIES DATA TRENDS INDIVIDUAL RESPONSES

Q1

Do you accept TWW?

Answered: 25 Skipped: 0



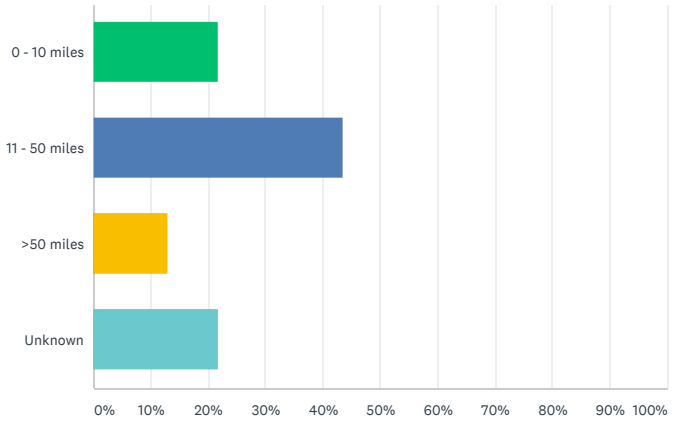
ANSWER CHOICES	RESPONSES	
Yes	28.00%	7
No	72.00%	18
TOTAL		25

Add a comment

Q2

If TWW is not accepted at your facility, how far is the nearest facility located for households to dispose of TWW?

Answered: 23 Skipped: 2



ANSWER CHOICES	RESPONSES	
0 - 10 miles	21.74%	5
11 - 50 miles	43.48%	10
>50 miles	13.04%	3
TOTAL		23

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25 responses

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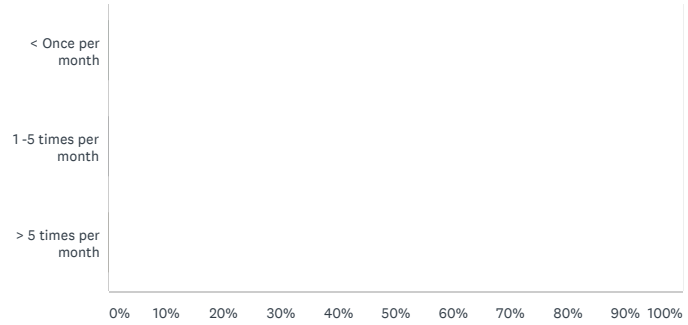
ANSWER CHOICES	RESPONSES	
Unknown	21.74%	5
TOTAL		23

Q3

How frequently do households bring TWW to your location? Check one:

Answered: 25 Skipped: 0



ANSWER CHOICES	RESPONSES	
< Once per month	48.00%	12
1 -5 times per month	24.00%	6
> 5 times per month	28.00%	7
TOTAL		25

Q4

What is the estimated quantity of TWW brought to your location, on a monthly basis:

Answered: 25 Skipped: 0

ANSWER CHOICES	RESPONSES	
0 lbs	48.00%	12
< 500 lbs	28.00%	7
500 - 1000 lbs	12.00%	3
TOTAL		25

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25 responses

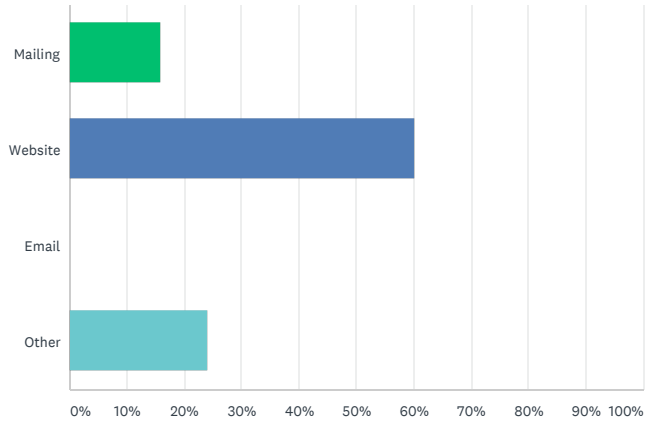
SIGN UP

ANSWER CHOICES	RESPONSES	
> 1000 lbs	12.00%	3
TOTAL		25

Q5

Which of the following methods do you use to inform households of the types of hazardous wastes accepted at your location? Check all that apply:

Answered: 25 Skipped: 0



ANSWER CHOICES	RESPONSES	
Mailing	16.00%	4
Website	60.00%	15
Email	0.00%	0
Other	24.00%	6
TOTAL		25

Q6

Do you have any suggestions or recommendations regarding the management of household TWW?

Answered: 17 Skipped: 8

The transfer station I formerly worked at wanted to accept TWW. However, TS scale/billing systems are not adaptable to the kind of recordkeeping needed to manage TWW per DTSC requirements. Moreover, TS contracts can make it hard to get compensation for extra overhead costs associated with documentation of TWW handling. Working with area TSs could be a route to increasing the cost effective options for residents and businesses to dispose of TWW.

1/4/2018 4:48 PM

Treated wood waste is accepted in general household trash and should be segregated from other materials when brought into the transfer station.

1/3/2018 1:07 PM

It would be beneficial for all if more facilities were able to accept TWW.

1/3/2018 8:07 AM

Allow for the disposal of TWW at less regulated facilities, properly designed, constructed and permitted to accept such wastes.

1/2/2018 3:39 PM

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25 responses

25 responses

SIGN UP

Certified Unified Program Agencies (CUPAs)

Survey Results

QUESTION SUMMARIES DATA TRENDS INDIVIDUAL RESPONSES

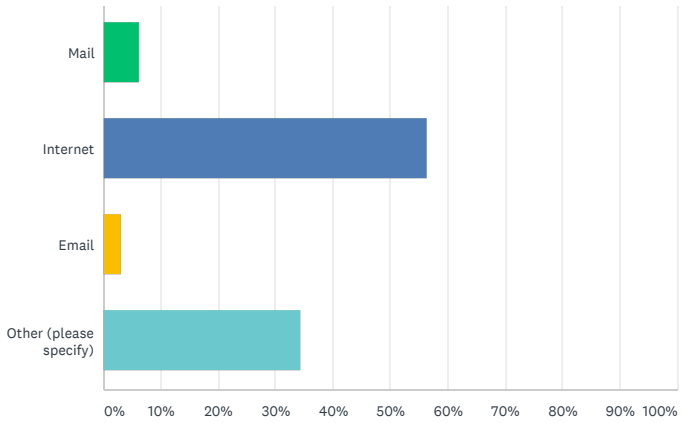
All Pages

Q1

How are households informed of the types of hazardous wastes accepted in your CUPA jurisdiction?

Add a comment

Answered: 32 Skipped: 0



ANSWER CHOICES		RESPONSES	
Mail		6.25%	2
Internet		56.25%	18
Email		3.13%	1
Other (please specify)	Responses	34.38%	11
TOTAL			32

Q2

How frequently are households found improperly disposing TWW? Check one:

Answered: 26 Skipped: 6

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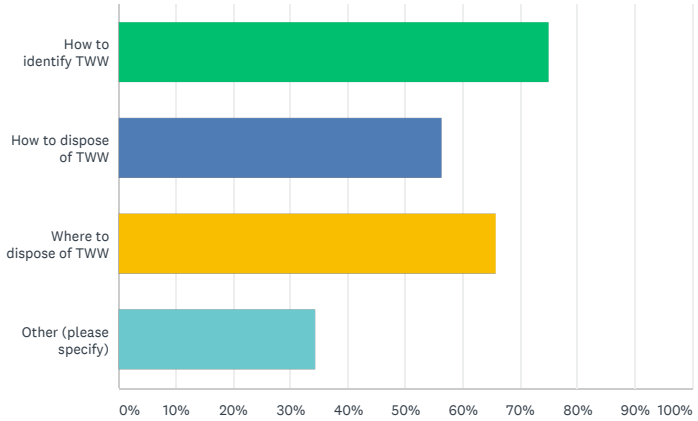
ANSWER CHOICES	RESPONSES	
< Once per month	88.46%	23
1-5 times per month	0.00%	0
> 5 times per month	11.54%	3
TOTAL		**26**

Q3

What obstacles or issues prevent households from being informed of how to properly dispose of TWW? Check all that apply.

Answered: 32 Skipped: 0

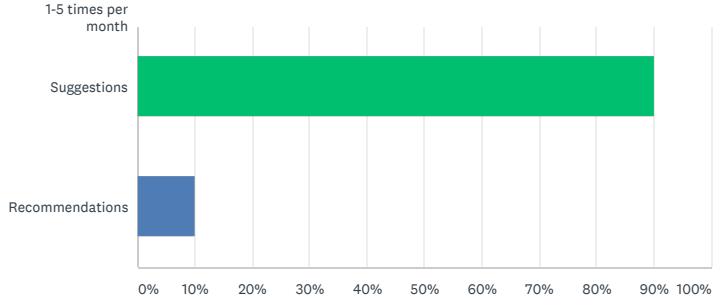


ANSWER CHOICES		RESPONSES	
How to identify TWW		75.00%	24
How to dispose of TWW		56.25%	18
Where to dispose of TWW		65.63%	21
Other (please specify)	Responses	34.38%	11
Total Respondents: 32			

Q4

Do you have any suggestions or recommendations regarding the management of household TWW?

Answered: 10 Skipped: 22



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SIGN UP

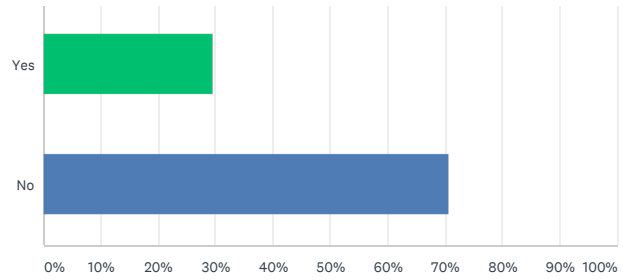
ANSWER CHOICES	RESPONSES	
Suggestions	90.00%	9
Recommendations	10.00%	1
Total Respondents: 10		

Comments (13)

Q5

1. Do you accept TWW?

Answered: 17 Skipped: 15

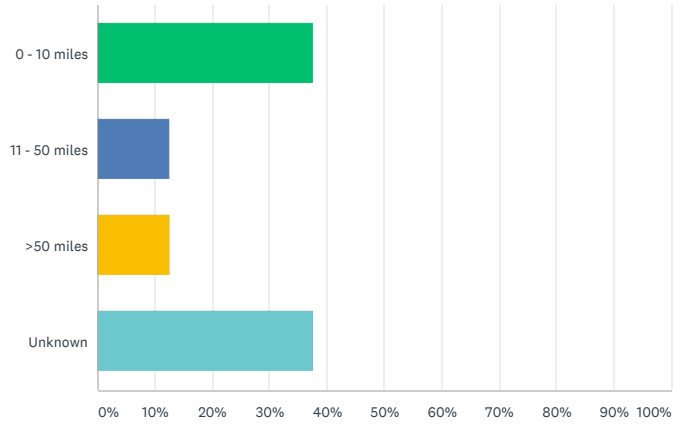


ANSWER CHOICES	RESPONSES	
Yes	29.41%	5
No	70.59%	12
TOTAL		**17**

Q6

1. If TWW is not accepted at your facility, how far is in nearest facility located for households to dispose of TWW?

Answered: 16 Skipped: 16



ANSWER CHOICES	RESPONSES	
0 - 10 miles	37.50%	6
11 - 50 miles	12.50%	2
>50 miles	12.50%	2
Unknown	37.50%	6
TOTAL		**16**

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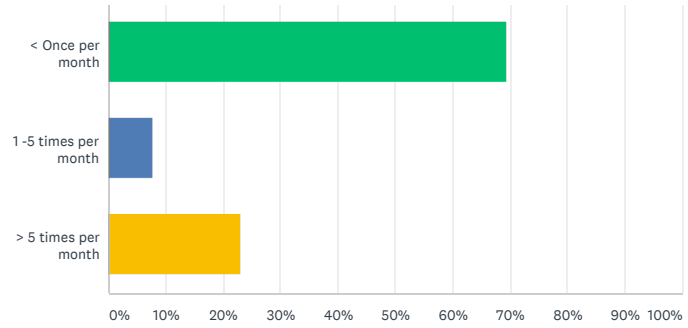
32 responses

SIGN UP

Q7

1. How frequently do households bring TWW to your location? Check one:

Answered: 13 Skipped: 19

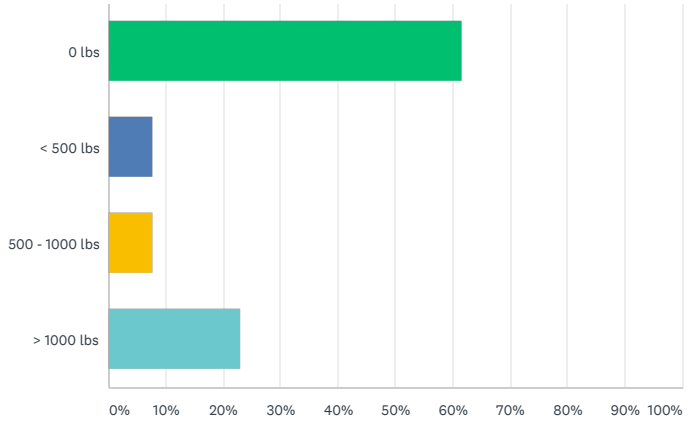


ANSWER CHOICES	RESPONSES	
< Once per month	69.23%	9
1 -5 times per month	7.69%	1
> 5 times per month	23.08%	3
TOTAL		13

Q8

What is the estimated quantity of TWW brought to your location, on a monthly basis:

Answered: 13 Skipped: 19



ANSWER CHOICES	RESPONSES	
0 lbs	61.54%	8
< 500 lbs	7.69%	1
500 - 1000 lbs	7.69%	1
> 1000 lbs	23.08%	3
TOTAL		13

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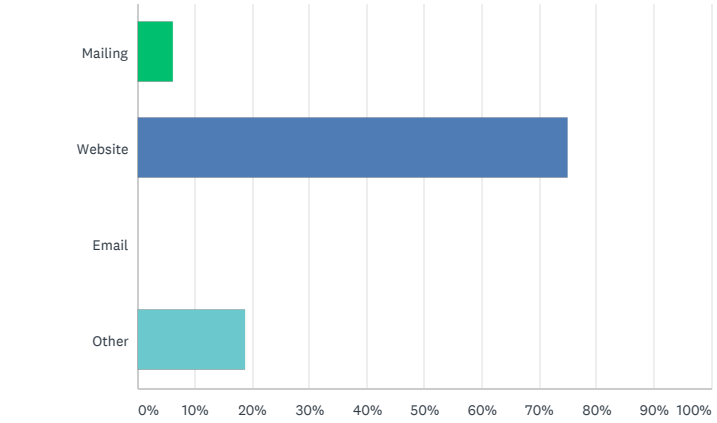
32 responses

SIGN UP

Q9

Which of the following methods do you use to inform households of the types of hazardous wastes accepted at your location? Check all that apply:

Answered: 16 Skipped: 16

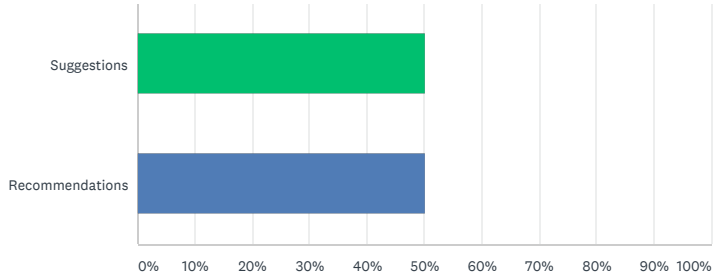


ANSWER CHOICES	RESPONSES	
Mailing	6.25%	1
Website	75.00%	12
Email	0.00%	0
Other	18.75%	3
TOTAL		**16**

Q10

Do you have any suggestions or recommendations regarding the management of household TWW?

Answered: 4 Skipped: 28



ANSWER CHOICES	RESPONSES	
Suggestions	50.00%	2
Recommendations	50.00%	2

Total Respondents: 4

Comments (8)

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APPENDIX E

Environmental Chemistry Laboratory Report 2008

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

ENVIRONMENTAL CHEMISTRY LABORATORY

Hazardous Waste Analysis of Copper Azole, Alkaline Copper Quaternary, and Creosote Preserved Wood

ECL Report Number 2008-04

November 2008

Environmental Chemistry Laboratory Report

Hazardous Waste Analysis of Copper Azole, Alkaline Copper Quaternary, and Creosote Preserved Wood

Prepared By

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Chief
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Department of Toxic Substances Control

2/11/09
Date

ECL Report 2008-04 Page 2 of 27

EXECUTIVE SUMMARY

Pressure-treated lumber is widely used in construction and landscaping. Toxicity concerns have led to arsenic-based wood preservatives being replaced by copper-based treatments, such as Copper Azole (CA) and Alkaline Copper Quaternary (ACQ).

Creosote, a coal-tar derivative, is another wood preservative, commonly used on utility poles and railroad ties. Creosote is a complex mixture of organic compounds, including toxic polyaromatic hydrocarbons (PAHs) and cresols (methyl phenols). These materials may be classified as hazardous waste under the California Waste Control Law (Title 22 CCR, Section 66261.24, Characteristic of Toxicity) because of their total or leachable copper or phenolic content, or because of their aquatic toxicity. Currently, however, these preservative-treated wood wastes are regulated by the State of California under Alternative Management Standards (AMS), which, if certain conditions are met, do not require they be managed as hazardous waste.

This study evaluated the toxicity characteristics of CA, ACQ, and creosote-treated wood, using laboratory methods prescribed in Title 22 for waste classification. Representative samples of new CA- and ACQ-treated lumber and untreated controls were collected statewide. Used creosote-treated railroad ties were selected from a collection site in Nevada. Random sub-samples sawn from this wood were then composited and analyzed by the laboratory methods prescribed in Title 22.

Copper-treated wood was milled to a 2 mm particle size, and subject to the California Waste Extraction Test (WET); the WET extracts and the milled wood were analyzed for metals. The creosote-treated wood was cubed and milled. The cubes were extracted using the Toxicity Characteristic Leaching Procedure (TCLP); the TCLP extracts and the milled wood were analyzed for semivolatile organic compounds, including phenols and PAHs. The 96-hr aquatic screening bioassay was done on milled CA, ACQ, and creosote-treated wood. Untreated wood samples were analyzed as controls.

All of the copper-treated wood exceeded the STLC and TTLC toxicity criteria. (The CA-Douglas Fir (DF) mean total Cu was 2480 mg/Kg; however, the confidence interval of the mean was above the 2500 mg/Kg regulatory level.) No copper was detected in the control wood. Only the CA-Hemlock-fir lumber, which had the highest total and soluble copper levels, had an aquatic bioassay LC_{50} below the 500 mg/L regulatory level.

No TTLC-regulated compounds were detected in the creosote-treated oak and DF rail-road ties; however, the pentachlorophenol quantitation limit was slightly above the 17 mg/Kg regulatory level. Other phenolic compounds and PAHs were found. The only TC-regulated compounds detected in TCLP extracts were cresols, but at concentrations well below the 200 mg/L regulatory level. The three creosote-treated DF samples had an LC_{50} below 500 mg/L; the oak-creosote sample and the untreated controls did not.

Based on this study, the CA-DF, ACQ-DF, and CA-Hem.-fir lumber, and creosote-DF RR ties would be classified as California hazardous waste; the creosote-oak would not.

TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS

ACQ	Alkaline (Amine or Ammoniacal) Copper Quaternary
AMS	DTSC Alternative Management Standards for hazardous waste
ARF	Analysis Request Form, used to initiate sample analysis at ECL
AWPA	American Wood Protection Association, an industry group that sets standards for treating wood with preservatives
CA	Copper Azole
CA-B	Copper Azole, Type B (the type used in this study)
CCA	Chromated Copper Arsenate
Cu	Copper
CuO	Copper oxide
DF	Douglas fir, a softwood commonly used in construction in California
DTSC	California Department of Toxic Substances Control
ECL	DTSC's Environmental Chemistry Laboratories in Berkeley and Los Angeles
g	gram
GC-MSD	Gas chromatography with a mass-spectrometer detector, a laboratory instrumental technique used for trace organics analysis
GF/F	Glass fiber filter used to filter TCLP extracts prior to analysis
HW	Hardwood (oak in this study); also, hazardous waste, as defined in U.S. and California statute and regulations
kg	kilogram
ICP-AES	Inductively coupled plasma-atomic emission spectrometry, a laboratory instrumental technique used for trace metals analysis
LC_{50}	Concentration lethal to 50 percent of the bioassay test organisms

LCS	Laboratory control sample, a QC sample with a known concentration of anayte(s) of interest
Matrix spike and Matrix spike duplicate	QC samples made by adding a known quantity of analyte(s) of interest to sample replicates
Method 8270C	SW-846 Method 8270C, Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry, Revision 3, Dec. 1996
Method blank	A QC sample containing no added analyte(s) of interest
mg	milligram
PAH	Polyaromatic hydrocarbon, also referred to as polynuclear aromatic
PCF	Pounds (of preservative) per cubic foot of treated lumber, an AWPA standard for retention based on species and end use of lumber
PFTE	Poly(tetrafluorethylene), a fluorine-containing polymer
QA/QC	Quality assurance/quality control, laboratory system and protocols used to assess accuracy, precision, and other data quality criteria
STLC	Soluble Threshold Limit Concentration (Title 22, Div. 4.5)
SW-846	"Test Methods for Evaluating Solid Waste," U.S. EPA Office of Solid Waste and Emergency Response, Washington, D.C., Nov. 1986, Third Ediiton and Updates
SVOC	Semi-volatile organic compounds, a class of organic compounds that can be volatilized when heated, as in a GC/MSD instrument
TC	Toxicity Characteristic, a hazardous waste regulatory level
TCLP	Toxicity Characteristic Leaching Procedure, SW-846 Method 1311
Title 22 CCR	California Code of Regulations, Title 22
TTLC	Total Threshold Limit Concentration (Title 22, Div. 4.5)
TWW	Treated Wood Waste
U.S. EPA	United States Environmental Protection Agency
WF	White fir, a member of the Hemlock-fir (HF) species group

ACKNOWLEDGEMENTS

(All DTSC except where noted)

Project planning and management: Myrto Petreas, Corey Yep, Steve Quarles (U.C. Cooperative Extension, Richmond, CA), Martin Snider, Ed Nieto, Li Tang, Sonia Low, Sherri Lehman

Field sample collection and preparation: Steve Quarles

Sample management: Gurmail Sivia, Caiyun Xu, Barbara Bush

Sample milling: Martin Snider, Caiyun Xu

TCLP extraction: Martin Snider

Metals ICP-AES analysis and WET: Jarnail Garcha (data review), Merlyn deGuzman, Zenaida Odion, Dinesh Chand

Semivolatiles GC-MS analysis: Rustum Chin (data review), Ken Sinn, Yue-Dong Men

Aquatic bioassay: Quang Phan (Associated Laboratories, Orange, CA)

TABLES AND FIGURES

INTRODUCTION

Arsenic-based wood preservatives, such as Chromated Copper Arsenate (CCA), have been phased out because of concerns over the toxicity of arsenic (1), although significant amounts are still in service. Alternative waterborne pressure-treatment preservatives include Copper Azole Type B (CA-B) and Alkaline Copper Quaternary (ACQ) (2). The U.S. EPA has not established a federal regulatory level for copper, the primary biocide in these preservatives. Copper, however, is regulated by the State of California as a Persistent and Bioaccumulative Toxic Substance (Title 22 California Code of Regulations, Division 4.5, Chapter 11, Section 66261.24). Wastes exceeding the Title 22 Soluble Threshold Limit Concentration (STLC) or Total Threshold Limit Concentration (TTLC) regulatory levels for soluble (extractable) or total or copper must be managed in accordance with the California Hazardous Waste Control Act (Health and Safety Code, Division 20, Chapter 6.5).

Railroad ties are typically preserved with creosote, a complex mixture of organic compounds (3), including polyaromatic hydrocarbons (PAHs) and cresols (methyl phenols), derived from coal-tar distillate. Cresols, trichlorophenol, and pentachlorophenol have regulatory levels based on the U.S. EPA Toxicity Characteristic Leaching Procedure (TCLP) (22CCR, Section 66261.24(a) (1)).

The Department of Toxic Substances Control (DTSC) has adopted Alternative Management Standards (AMS) for certain treated wood wastes (22CCR, Division 4.5, Chapter 34) that are deemed protective of human health and the environment, but exempt these materials from hazardous waste requirements. So that DTSC can evaluate and develop its standards for the management of treated wood wastes, it asked its Environmental Chemistry Laboratory (ECL) to characterize CA-B, ACQ, and creosote treated wood using laboratory methods for hazardous waste testing specified by the California Code of Regulations, Title 22, Sec. 66261.24, “Characteristic of Toxicity.”

To evaluate CA-B and ACQ wood wastes, new preserved and untreated lumber was analyzed for total copper and other metals using U.S. EPA methods for acid digestion and analysis. Soluble metals were determined using the Title 22 California Waste Extraction Test (WET), a 48-hour citrate buffer extraction. Results from these tests were compared to the Title 22 TTLC and STLC, respectively, for copper.

Used creosote-treated railroad ties were tested for total semivolatile organic compounds (SVOC) using U.S. EPA solvent extraction and analysis methods. Soluble SVOCs were determined using the federal Toxicity Characteristic Leaching Procedure (TCLP), a 16-hour extraction with acetate buffer. The total and leachable SVOC results were compared to the regulatory levels for target analyte compounds, specifically the cresols and chlorophenols.

The Title 22 mandated 96-hour acute aquatic bioassay was also done, at a contract laboratory, on the CA, ACQ, and creosote preserved wood and untreated controls.

Wood samples were collected and processed under a contract by the University of California Cooperative Extension, and according to a sampling plan (Appendix I) developed by U. C. and DTSC. Wood samples were cut, randomly sampled, and put in containers at the U.C. Richmond Field Station (RFS) in Richmond, California. The samples were then taken to ECL in Berkeley for further processing and analysis.

Part I: Copper Azole (CA) and Alkaline Copper Quaternary (ACQ) Treated Lumber

BACKGROUND

Douglas fir and Hemlock fir lumber is stacked, then pressure-treated in a cylinder (retort). The lumber is first incised to aid penetration into the interior of the board by the preservative. The industry specification (4) for DF and HF penetration is 10 mm (0.4 in) and 90 percent of the sapwood, but no more than one-half the width or thickness of the board. The specified ground-contact retention (or preservative loading) for CA-B is 0.21 pounds per cubic foot (pcf), including 0.16 pcf as Cu and 0.0066 pcf as the azole co-biocide. For ACQ, the specified retention is 0.40 pcf, including 0.21 pcf as CuO (0.17 pcf as Cu) and 0.11 pcf as the quaternary ammonium co-biocide. (Preserved lumber for above-ground use has lower specified retention; only ground-contact lumber was considered in this study.) The retention specifications are based on the preservative concentration in the “assay zone”; for the dimensional lumber used in this study, the assay zone is 15 mm (0.6 in) from the treated surface toward the center of the cross section of the board.

FIELD INFORMATION

As described in the Sampling Report, CA Type B CA-B and ACQ treated 2”x8”x8’ boards were purchased at home centers and lumberyards throughout California. Twenty boards were obtained for each of three species-treatment combinations: Douglas fir (DF)-CA, DF-ACQ, and Hem-fir (HF)-CA. In California, White fir (WF) is the typical species in the Hemlock-Fir (HF) species group; these terms are used here interchangeably. No HF-ACQ was collected. For quality assurance controls, untreated DF 2x8s and WF 2x4 mill end-cuts were obtained (untreated WF boards are not commonly available).

For each of the four composite replicates, 0.25 in. slices were taken from three locations in the interior of 20 boards (two and four feet from the ends). To facilitate processing in the laboratory, the slices were quartered. For each replicate, one quartered specimen, randomly allocated, from each of the 20 boards was aggregated to make a composite sample. Four composite samples were prepared for each species-treatment combination. These were put into sample jars provided by ECL, and labeled accordingly: CADF1…CADF4, CAHF1…CAHF4, and ACQDF1…ACQDF4. The untreated control wood was similarly cut into small pieces. Sufficient untreated Douglas

fir was provided for mill (equipment) blanks, and for replicate control composite samples prepared in the laboratory.

The samples were transported to ECL by ECL staff. After additional preparation (grinding and sub-sampling), the wood samples were logged-in and assigned ECL sample numbers. The samples were then distributed to the ECL Inorganic section and the contract laboratory for analysis. Sample management was documented with the ECL Authorization Request Form (ARF) and the Sample Analysis Request (SAR) form. The SAR also serves as the ECL chain of custody document.

ANALYTICAL PROCEDURES

Particle Size Reduction

The lumber samples were reduced in size to the dimensions specified in the hazardous waste testing regulations and applicable laboratory methods. Title 22 CCR, Chapter 11, App. II, Section (c)(1) states that for total and extractable regulated inorganic elements (i.e. for which TTLCs and STLCs exist) a "millable solid…shall be milled to pass through a No. 10 (two millimeter) standard sieve before it is analyzed."

Regarding the aquatic bioassay, Title 22 CCR, Ch. 11, Sec. 66261.24(a)(6) says to use "…test sample prepared or meeting conditions for testing as prescribed in subdivisions (c) and (d) of Appendix II." Thus, the 2 mm particle size was deemed appropriate for the WET (STLC), total metals (TTLC), and the 96-hr LC50 aquatic bioassay procedures.

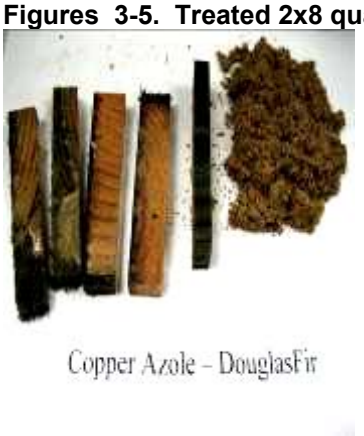
The lumber samples were ground with a laboratory mill (Thomas-Wiley Model 4, Thomas Scientific) (Figure 1), fitted with a 2 mm sieve at the outlet. Before use, and after each composite replicate was processed, the mill was cleaned using brushes, laboratory spatulas, and compressed air. Once clean of particulate matter, the mill was wiped with acetone using cotton swaps and laboratory wipes. To check for analyte carry-over between replicates, approximately 50 g DF (from the same sources as the control DF) was milled, then discarded. For the CA-DF replicates, another 50 g DF was milled and retained as a mill blank (MB). One MB was prepared before the first sample, and after each treatment replicate. The composite samples were milled in this order: DF control, CA-DF, ACQ-DF, CA-HF, and WF control. Four DF, but only one WF, control replicates were prepared.

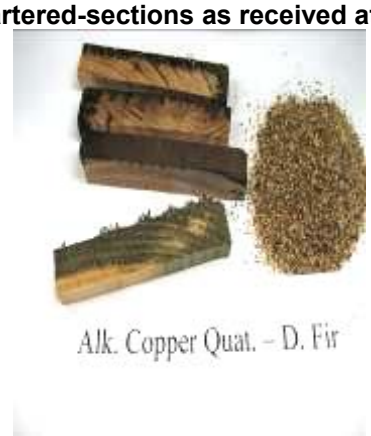
The quartered wood sections were fed into the mill in small handfuls (Figure 2). The milled wood (about 700-800 g for each composite replicate) was mixed in an aluminum pan using a plastic scoop until the sample appeared homogenous, as indicated by a uniform distribution of the light colored, untreated core wood and the darker colored treated exterior wood (Figures 3-7). About one-half of each of the composited samples was transferred to large and small pre-cleaned sample jars (Figure 8) that were distributed for analysis. The remaining sample was retained in sealed polyethylene bags.

Figure 1. Laboratory mill, with 2mm sieve

Figure 2. Milling wood pieces

Figures 3-5. Treated 2x8 quartered-sections as received at laboratory and after milling





Figures 6-7. Untreated Douglas fir and Hem. fir controls

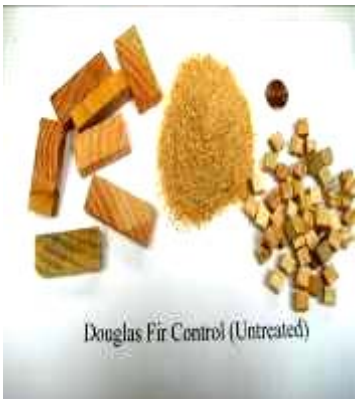


Figure 8. Composited milled samples, ready for analysis

Sample Analysis

Total metals and WET analyses were done by the ECL-Berkeley Inorganic Section. For metals analysis, the wood samples were acid-digested using U.S. EPA Method 3050B and analyzed using Method 6010B, Inductively Coupled Plasma-Atomic Absorption Spectrometry (ICP-AES).

WET analysis was done using ECL SOP 910, California Waste Extraction Test, with 10 g sample and 100 mL pH 5 citrate buffer. Extraction was for 48 hr with constant agitation, followed by filtration though a 0.45 micron filter. The WET filtrate was analyzed by Method 6010B for metals; the filtrate was not digested, but was diluted (1:10) with water because of the high salt content of the extractant. The treatment composites were extracted and analyzed separately, as submitted, but the four Douglas fir control composites were further composited by the Inorganic Section to yield one sample for the WET. Only one Hemlock-fir control sample was milled, extracted, and analyzed.

Aquatic bioassays (5) were done at Associated Laboratories (Orange, CA) using fathead minnows (*Pimephales promelas*) as the test organism. The bioassays were of the screening type, at three concentrations: 250 mg/L, 750 mg/L, and 500 mg/L (the California 96-hr LC_{50} toxicity characteristic level). A subsample of the milled wood samples (e.g. 5.0 g to give a final concentration of 500 mg/L in a 10 L aquarium) was mixed with 300 mL of the same water used in the aquaria and shaken for six hours (6). This suspension was added to the aquarium water, which was then made up to 10 L. The 500 mg/L concentration was run in duplicate. An undosed control aquarium was also run. During the 48-hr test period, dissolved oxygen, temperature, pH, and fish survival were monitored. A slow air bubble stream was introduced to maintain dissolved oxygen levels.

Quality Control and Quality Assurance

Sampling Quality Control

Quality control during sample collection and processing are described in the Sampling Plan (Appendix I) and the Study Report (Appendix II). Treated lumber and untreated DF boards were purchased from different outlets throughout the state, to ensure a representative sample. To prevent cross-contamination, a new cross-cut saw blade was used for each species-treatment combination (i.e. after 20 boards were processed), and the blades were wiped with alcohol between boards. The locations on the board of the 0.25” sections that made up each of the four composite replicates for each species-treatment were randomly allocated. A new band saw blade was used for each composite replicate (four per species-treatment) to quarter the pieces for laboratory preparation. The samples were then put into clean quart jars provided by ECL. As described above, the laboratory mill was thoroughly cleaned before each composite replicate was processed, and equipment (mill) blanks were milled between replicates to check for cross-contamination. All 13 mill blanks were analyzed for total metals; one composite made of the 13 was subjected to the WET. The milled wood was thoroughly mixed to ensure a homogenous and representative sample, and sub-sampled into labeled jars for analysis.

Analytical Quality Control
Standard U.S. EPA SW-846 and ECL quality control procedures were followed for the metals analysis and the WET. Method blanks, a solid laboratory QC sample (LCS), matrix spikes (MS) and matrix spike duplicates (MSD) were analyzed. Triplicate extractions and analyses were done on two of the treated wood composites for both the WET and total metals. Matrix spikes for the WET were done after extraction and dilution, and before instrumental analysis. Daily multi-point ICP-AES calibration standards and a reagent blank were run to establish response linearity, and calibration verification standards were analyzed after every ten samples.

RESULTS AND DISCUSSION

Laboratory results for the total copper and copper by WET are shown in Figures 9 and 10, and in Table 1. All three species-preservative combinations exceeded the California Toxicity Characteristic regulatory levels for total and soluble copper. The extraction efficiency of copper by the WET (WET/total Cu) was over 87 percent. Copper was not detected in the untreated control samples.

The 96-hr acute aquatic bioassay results are shown in Table 1. Only the copper azole-treated Hemlock - fir composites, which had the highest total and soluble copper, had a 96-hr acute aquatic bioassay LC50 concentration less than the 500 mg/L toxicity characteristic level. The LC50 results were >750 mg/L for the CA and ACQ treated Douglas fir, and the control Douglas fir and Hemlock-fir; all the fish survived those trials.

Figure 9.

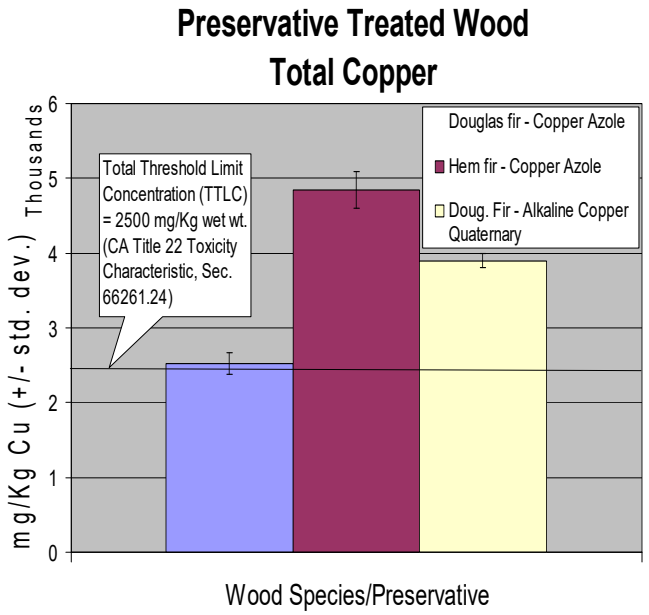


Figure 10.

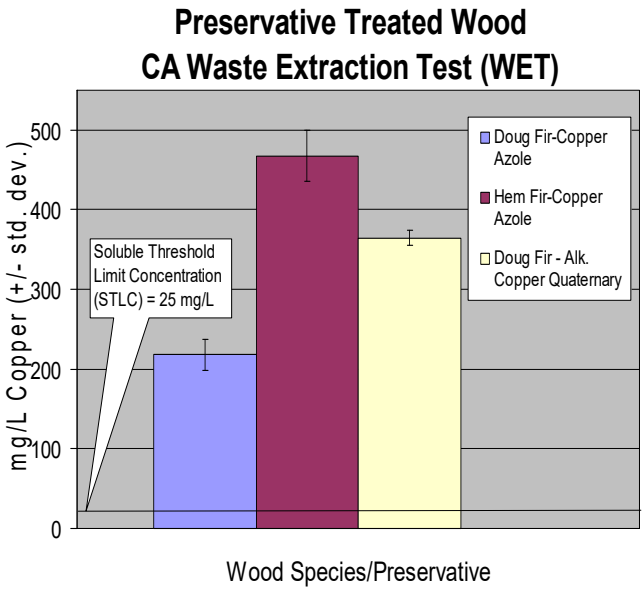


Table 1. **Hazardous Waste Analysis of CA and ACQ Treated Lumber**

		Total Copper TTLC		Cu-WET STLC		(10x WET) (Tot. Cu)	96-hr Aquatic Bioassay LC50
Regulatory Level:		2500 mg/Kg		25 mg/L			500 mg/L
Sample	ECL No.	Cu mg/Kg	MDL	Cu mg/L	MDL	percent	LC50 mg/L
DFCTRL-COMP1	AQ01168	ND	0.1	ND	0.1		> 750
DFCTRL-COMP2	AQ01169	ND	0.1	ND	0.1		"
DFCTRL-COMP3	AQ01170	ND	0.1	ND	0.1		"
DFCTRL-COMP4	AQ01171	ND	0.1	ND	0.1		"
CADF-COMP1	AQ00172	2480	0.1	213	0.1		> 750
CADF-COMP2	AQ00173	2420	0.1	198	0.1		"
CADF-COMP3	AQ00174	2730	0.1	245	0.1		"
CADF-COMP4	AQ00175	2440	0.1	216	0.1		"
CADF mean (%rsd)		**2518 (5.7)**		**218 (9.0)**		87.9	
ACQDF-COMP1	AQ01176	3980	0.1	364	0.1		> 750
ACQDF-COMP2	AQ01177	3790	0.1	356	0.1		"
ACQDF-COMP3	AQ01178	3860	0.1	360	0.1		"
ACQDF-COMP4	AQ01179	3970	0.1	378	0.1		"
ACQDF mean (%rsd)		**3900 (2.3)**		**364 (2.6)**		93.4	
CAHF-COMP1	AQ01180	4890	0.1	447	0.1		< 250
CAHF-COMP2	AQ01181	4680	0.1	457	0.1		"
CAHF-COMP3	AQ01182	4630	0.1	452	0.1		"
CAHF-COMP4	AQ01183	5170	0.1	515	0.1		"
CAHF mean (%rsd)		**4842 (5.1)**		**468 (6.8)**		96.7	
MB-DF0	AQ01184	ND	0.1	*	0.1		not done
MB-CADF1	AQ01185	26.4	0.1	*	0.1		"
MB-CADF2	AQ01186	ND	0.1	*	0.1		"
MB-CADF3	AQ01187	6.10	0.1	*	0.1		"
MB-CADF4	AQ01188	6.22	0.1	*	0.1		"
MB-ACQDF1	AQ01189	6.22	0.1	*	0.1		not done
MB-ACQDF2	AQ01190	7.05	0.1	*	0.1		"
MB-ACQDF3	AQ01191	16.8	0.1	*	0.1		"
MB-ACQDF4	AQ01192	45.6	0.1	*	0.1		"
							"
MB-CAHF1	AQ01193	13.0	0.1	*	0.1		not done
MB-CAHF2	AQ01194	ND	0.1	*	0.1		"
MB-CAHF3	AQ01195	ND	0.1	*	0.1		"
MB-CAHF4	AQ01196	ND	0.1	*	0.1		"
* MB-comp. of 13 (ECL No. AQ01184 to QC01196)				ND	0.1		"
HFCTRL-COMP	AQ02186	ND	0.1	ND	0.1		> 750

ND = not detected CA = copper azole DF = Douglas fir COMP = composite
MB = mill blank ACQ = alk.copper quant. HF = Hemlock-fir CTRL = control

Although the industry retention specifications (4) for ground-contact use for CA-B and ACQ are nearly the same (0.16 as Cu for CA; 0.21 as CuO = 0.17 as Cu, for ACQ), the experimental concentrations of the three species-treatments were very different: The CA Hem.-fir Cu concentration was 95 percent greater than CA-DF. The ACQ mean Cu value was between the two CA means. The methodology used for this study, however, was different than the AWPA procedure for measuring preservative retention in the 15 mm (0.6 in) deep assay zone using core samples. The goals of this study did not include determining if the sampled lumber met specifications for preservative retention, although visually it appeared that some of the cross-sections did not have the required 10 mm (0.4 in) penetration by the preservative.

Low concentrations (< 6 mg/L WET; < 50 mg/Kg total) of barium and zinc were found in all the wood samples. Presumably, these are naturally occurring trace elements.

All the QC results for accuracy (percent recovery) and precision (relative percent difference and relative standard deviation) were within the established control limits for the determinative methods (Appendix 4).The relative standard deviations for the treatment–species composite replicates were less than 10 percent for total and TCLP copper.

Part II: Creosote Treated Railroad Ties

BACKGROUND

According to the American Wood Protection Association (AWPA) 2005 Standards (4), creosote-treated railroad ties have a specified retention of 8.0 pcf or refusal for Douglas-fir and 7.0 pcf or refusal for oak. A Swiss study (7) estimated that during the 20-30 yr service life of railroad ties, 5 Kg creosote, 0.5 Kg PAHs, and 10 g phenolic compounds are emitted. When taken out of service, one disposal option is as a fuel source in co-generation plants. The treated ties used in this study were from this waste stream.

FIELD INFORMATION

Railroad tie samples were collected at a collection yard in Flannigan, NV, 60 mi north of Reno (Appendix III). Bundles of ties were randomly selected from open railcars used to transport the out-of-service ties. Sixty-two softwood (Douglas fir) and 18 hardwood (oak) ties were sampled; this reflected the distribution of ties in the yard. Using a chain-saw, two sections were sawn from each tie; each cross-cut section was approximately 3 in. thick (Figure 11). One section from each tie was retained at RFS; the other was further sawn at RFS, and became part of three DF and one oak composite sample that were submitted to ECL for analysis. The prepared and retained samples were randomly allocated. Eighteen oak tie sections were used for the oak composite, 19 DF tie

sections were used for DF replicate 1; 20 DF tie sections each were used for DF composite replicates 2 and 3.

Composite samples were prepared in two ways, for two types of laboratory analyses. First, the tie sections were sawn into representative sub-sections. Then, with a band-saw, the sub-sections were reduced in size for milling at ECL (as with the CA and AQC lumber) or were cut into 0.9 cm cubes for TCLP. In order to expose a fresh wood surface, a thin section was removed from each section prior to cutting them for milling or TCLP. Composites were prepared of both types of sub-samples; approximately one-half of each section went into the milling composite for that replicate; the other half was used for the TCLP cubes for that same numbered replicate.

Oak control wood was cut from twenty 1" board cut-offs from a Berkeley lumber yard. The DF-creosote controls came from the same source as the DF-CA and DF-ACQ controls.

The processed wood samples were put into jars provided by ECL, and labeled: DF Creosote 1, DF Creosote 2, DF Creosote 3, and HW Creosote. The samples were transported to ECL by laboratory staff, where they were prepared and distributed for analysis.

ANALYTICAL PROCEDURES

Particle Size Reduction

Composite samples for semi-volatile organic analysis and aquatic bioassay were milled as described in Sec. 4.1 for CA- and ACQ-treated lumber. For TTLC compliance for organic compounds, Title 22, Chapter 11, Appendix II, states that particle size should be < 1 mm. The sample extraction Method 3540 for semi-volatile organic compounds in solid samples (by Soxhlet extraction) also calls for 1 mm particle size.

However, the 2 mm sieve was used for grinding the creosote samples (Figures 12, 13). When milling the control oak, some charring was noticed. Grinding the samples further, to < 1mm, may have degraded the sample and likely would not have yielded better extraction efficiency. The extraction Method 3540 says that for fibrous samples, particle size reduction should be sufficient to ensure contact with the solvent. Title 22, Chapter 11, Appendix III states that SW-846 should be consulted on appropriate methods for each "specific sample analysis situation." It was therefore determined that the 2 mm sieve size used for the CA and ACQ lumber was also appropriate for the creosote-treated wood sample preparation.

The mill was again cleaned between replicates with scrapers, brushes, compressed air, and acetone. Approximately 50 g DF control wood was then milled and discarded, but no mill blanks were analyzed.

Samples that were to be subject to the TCLP (U.S. EPA SW-846 Method 1311) were sawn into 0.9 cm cubes at the RFS, and did not require further size reduction. Scheduling was coordinated so that samples could be extracted in the laboratory within 14 days of being cubed, in keeping with the method hold time.

Figure 11. Railroad tie section, field-sawn

Figure 12. RR ties as rec'd by lab and after milling

Figure 13. Cubes are for TCLP

Toxicity Characteristic Leaching Procedure (TCLP)

Approximately 100 g cubed DF and oak controls, and creosote-treated DF and oak were extracted with 2 L (20:1 ratio) buffer solution. Based upon the preliminary evaluation of the pH of a mixture of the milled sample and water, TCLP extraction fluid #1 was used. This is an acetate buffer at pH 4.93 +/- 0.05. The sample and extractant were put into PFTE bottles, which were put into the TCLP rotary agitation device (Associated Design and Manufacturing, Alexandria, VA) (Fig. 13). After 18 hrs, the samples were filtered using a pressure filtration device (Millipore, Inc., Bedford, MA) and GF/F glass fiber filters (Figs. 14, 15). The filtrates (light brown for the controls, and dark amber for the creosote samples) were transferred to labeled bottles, and then sent, packed in ice, by overnight courier to ECL - Los Angeles for analysis.

Figure 13. The TCLP rotator and fluoropolymer bottles

Figure 14. Pressure filtration

Figure 15. Control wood after TCLP filtration

Sample Extraction and Analysis

The aqueous TCLP extracts were extracted within the seven days specified by Method 1311, using Method 3510, separatory funnel liquid-liquid extraction. The milled wood samples were extracted with Method 3540, Soxhlet extraction. The wood extracts were subjected to Method 3640, a gel permeation column cleanup to remove interferences.

The TCLP and wood extracts were analyzed by gas chromatography with a mass selective detector (GC-MSD) using Method 8270C. Although the initial study design only considered organic compounds for which a Toxicity Characteristic (TC) or a Total Threshold Limit Concentration (TTLC) regulatory level have been set, the decision was made to report and quantify, if possible, all compounds on the Method 8270C target list.

The toxicity of creosote-contaminated water has been attributed to several classes of compounds, such as phenols, PAHs, and N-heterocyclic aromatics (8). PAHs and N-heterocyclics have also been found in laboratory leachates of creosote-treated wood, using deionized water, pH 4.7 buffer, and humic acid solutions (9). Therefore, it was considered worthwhile to indentify and quantify compounds in creosote-treated wood and their TCLP leachates that were of interest as environmental contaminants, but for which regulatory levels had not been established under the Characteristics of Toxicity (Title 22, Section 66261.24).

Quality Assurance and Quality Control

Sampling Quality Control

Quality control during sample collection and processing, in the field and at RFS, are described in the Sampling Plan and the Sampling Report. Eighty ties were selected from various bundles from different railcars at the Flanigan, NV yard. Two cross-sections of each tie were removed using a chain saw, and one of those, randomly allocated, was further sawn at RFS. The 80 ties resulted in four composite samples, one oak and three Douglas fir, each representing approximately 20 ties.

Treated and control (untreated) wood was processed with the same equipment, at both RFS and ECL. Representative specimens of each tie cross-section were sawn and cubed. As with the copper-preserved lumber, saw blades were changed or cleaned with alcohol to minimize carryover between samples. In the laboratory, the mill used for grinding the wood was cleaned between replicates.

Representative composites were made by thoroughly blending the milled wood by hand. Representative sub-samples of the cubed wood containing dark, treated and light, untreated wood were used for the TCLP extractions. Duplicates, reagent (extraction solution) blanks, and cubed oak and DF controls were carried through the TCLP.

Analytical Quality Control

For the solvent extraction and GC-MS analysis, standard ECL and SW-846 QC practices were followed. Method blanks, method standards, surrogates, matrix spikes and matrix spike duplicates were analyzed to assess bias (accuracy) and precision. For quantitation, multi-point calibrations were done using commercially available reference

mixtures. Response factors were verified by continuing check standards. Analyte identification is by comparison of the unknown and reference compound spectra, using characteristic ions.

For the aquatic bioassay, the contract laboratory used three sample dilutions; one dilution was run in duplicate. A control was run for each batch using unspiked waste. In accordance with the California Dept. of Fish and Game procedure, the milled wood sample was shaken for 6 hr with water (50 g: 50 mL) to disperse the sample before an aliquot was taken and added to the aquarium water.

RESULTS AND DISCUSSION

Toxicity Characteristic Leaching Procedure

The complete TCLP-creosote GC/MS laboratory reports are in Appendix 2. The results for TC analytes in the TCLP extracts are in Table 2; all analytes are in Table 3. The oak-creosote composite and one of the Douglas fir composite replicates had 0.42 mg/L and 1.4 mg/L methyl phenols (cresols), respectively, well below the toxicity characteristic regulatory level of 200 mg/L. No other TC compounds were detected above the 0.04 mg/L quantitation limit (0.50 mg/L for pentachlorophenol and three nitro-phenols). Trace amounts of 2- and 3-ring polyaromatic hydrocarbons (PAHs) were found in all treated wood samples. Phenols and two heterocyclic compounds, carbazole and dibenzofuran, were reported in the oak and one DF composite sample.

Table 2 TCLP Creosote-Treated Wood Semivolatile Organics

ECL No.:	AQ-02065	AQ-02066	AQ-02068	AQ-02216	AQ-02217	AQ-02218	AR-0065	AR-00066	AR-00067	AR-00068	AR-00069
Sample:	TCLP blank	oak control	HW (oak) creosote	TCLP blank	Doug. fir control	DF creo-sote-1	TCLP blank	DF creo-sote-2A	DF creo-sote-2B	DF creo-sote-3A	DF creo-sote-3B
TC Analyte	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1, 4-diclorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
nitrobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,5-dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-methylphenol	ND	ND	0.11	ND	ND	0.46	ND	ND	ND	ND	ND
4-&/or3-methylphenol	ND	ND	0.31	ND	ND	0.94	ND	ND	ND	ND	ND
Total methylphenols	ND	ND	0.42	ND	ND	1.4	ND	ND	ND	ND	ND
2,4,5-trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pyridine	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

ND = not detected

NR = not reported

Sample: 1,2,3 = composite replicate ; A,B = TCLP replicate

Table 3 **Toxicity Characteristic Leaching Procedure**
Creosote Treated Wood Semivolatile Organics Method 8270C GC/MS Results

ECL No.:	AQ02065	AQ02066	AQ02068	AQ02216	AQ02217	AQ02218	AR00065	AR00066	AR00067	AR00068	AR00069
Sample:	TCLP blank	oak control	HW (oak) creosote	TCLP blank	Doug. fir control	DF creo-sote-1	TCLP ext. blank	DF creo-sote-2A	DF creo-sote-2B	DF creo-sote-3A	DF creo-sote-3B
Analyte	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1,3-dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis (2-chlorethyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1, 4-diclorobenzene (7.5)	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2 dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
hexachloroethane (3.0)	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
bis (2-chloroisopropyl ether)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-nitroso-di-N-propylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
nitrobenzene (2.0)	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
isophorone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
hexachlorobutadiene (0.5)	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
hexachlorcyclopentadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-chloronapthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
dimethylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,5-dinitrotoluene (0.13)	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-nirtosodiphenylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
hexachlorobenzene (0.13)	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
di-N-butyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,3-dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
di-N-octyl-phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
napthalene	ND	ND	2.3*	ND	ND	2.5	ND	3.7*	3.0*	4.1*	3.3*
acenapthalene	ND	ND	0.32	ND	ND	ND	ND	ND	ND	ND	ND
acenapthene	ND	ND	ND	ND	ND	0.26	ND	0.39	0.23	0.29	0.27
fluorene	ND	ND	0.14	ND	ND	0.12	ND	0.16	0.11	0.13	0.13
phenanthrene	ND	ND	0.20	ND	ND	0.16	ND	0.20	0.14	0.17	0.18
anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
chrysene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ideno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
dibenz(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
benzo(ghi)perylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
phenol	ND	ND	0.21	ND	ND	0.70	ND	ND	ND	ND	ND
2-nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-dimethyl phenol	ND	ND	0.08	ND	ND	0.40	ND	ND	ND	ND	ND
2,4-dichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-chloro-3-methyl-phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-trichlorophenol (2.0)	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
2,4-dinitrophenol**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-methyl-4,6-dinitrophenol**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-nitrophenol**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pentachlorophenol(100)**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
benzyl alcohol	ND	ND	ND	ND	ND	0.04	ND	ND	ND	ND	ND
2-methylphenol (200)	**ND**	**ND**	**0.11**	**ND**	**ND**	**0.46**	**ND**	**ND**	**ND**	**ND**	**ND**
4-&/or3-methylphenol (200)	**ND**	**ND**	**0.31**	**ND**	**ND**	**0.94**	**ND**	**ND**	**ND**	**ND**	**ND**
carbazole	ND	ND	0.20	ND	ND	0.19	ND	ND	ND	ND	ND
4-chlorananline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-methyl napthalene	ND	ND	0.31	ND	ND	0.23	ND	ND	ND	ND	ND
2,4,5-trichlorophenol (400)	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
2-nitroanaline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
dibenzofuran	ND	ND	0.14	ND	ND	0.11	ND	ND	ND	ND	ND
3-nitroanaline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-nitroanaline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pyridine	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**

*Estimate **Quant. Limit = 0.5 mg/L; all other analytes = 0.04 mg/L
Sample: 1,2,3 = composite sample replicates; A,B = TCLP duplicates

yellow = PAH blue = phenolic
bold = TC rule compound (reg. level mg/L)
orange = heterocyclic aromatic

Aquatic Bioassay of Creosote Treated Wood

As indicated in Table 4, the oak control composite sample was non-hazardous (LC 50 > 500 mg/L), as were the four Douglas fir control composites tested with the CA and ACQ treatments. All three Douglas fir-creosote composite samples had LC_{50} values below the 500 mg/L regulatory level. The hardwood (oak) creosote-treated composite sample had an LC_{50} above the regulatory level. Fish survival, however, was 60 and 70 percent for the duplicates, indicating some toxic effect at concentrations below the regulatory threshold.

Table 4 **96-hour Acute Aquatic Bioassay Creosote-Treated Railroad Ties**

ECL No.:	AR-00115	AQ-00116	AQ-01168-'01171	AR-00117	AR-00118	AR-00119
Sample:	oak control	HW (oak) creosote	Doug. fir controls*	DF creosote Comp-1	DF creosote Comp-2	DF creosote Comp-3
LC50 (mg/L)	> 750	> 500	> 750	< 250	< 250	< 250
percent survival at 500 mg/L, 96-hrs (duplicates)	100,100	60, 70	100,100	20,10	10, 20	10, 0

* same for all DF controls

Total Semivolatile Organics in Creosote Railroad Ties

The results for creosote treated wood and controls semivolatile organic compounds by SW-846 Method 8270C are summarized in Table 6. The complete laboratory reports are in Appendix IV. Pentachlorophenol (TTLC=17/mg/Kg) was not detected. Other phenols (primarily cresols), PAHs, carbazole (dibenzopyrrole), and dibenzofuran were reported in all treatment samples, but not in the controls.

The PAHs included 4- and 5-ring compounds not in the TCLP extracts: anthracene, fluoranthene, pyrene, crysene and benzo (b) fluoranthene. The ratio of total to TCLP concentrations (Table 5) demonstrates the low aqueous solubility of the tricyclic PAHs compounds (aceanapthene, florene and phenanthrene) and the relativively higher solubility of naphthalene.

Table 5. **Total vs. soluble (TCLP) PAHs in Creosote-Treated RR Ties**

PAH:	**naphthalene**	**acenapthene**	**fluorene**	**phenanathrene**
Total (mg/Kg mean, n=4):	2400	1600	675	3100
TCLP (mg/L mean, n=6):	3.2	0.27	0.13	0.18
Total/TCLP	750	5300	5100	17000

Table 6. **Creosote Treated Wood SVOCs by GC/MS Method 8270C**

ECL No.:	AQ02212	AQ02213	AQ02214	AQ02215	AR00070	AR00071
Sample:	oak control	Doug. fir control	HW (oak) creosote	DFcreo-sote-1	DFcreo-sote-2	DFcreo-sote-3
Analyte	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
1,3-dichlorobenzene	ND	ND	ND	ND	ND	ND
bis (2-chlorethyl)ether	ND	ND	ND	ND	ND	ND
1, 4-diclorobenzene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2 dichlorobenzene	ND	ND	ND	ND	ND	ND
hexachloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
bis (2-chloroisopropyl ether)	ND	ND	ND	ND	ND	ND
N-nitroso-di-N-propylamine	ND	ND	ND	ND	ND	ND
nitrobenzene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
isophorone	ND	ND	ND	ND	ND	ND
1,2,4-trichlorobenzene	ND	ND	ND	ND	ND	ND
bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND
hexachlorobutadiene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
hexachlorcyclopentadiene	ND	ND	ND	ND	ND	ND
2-chloronapthalene	ND	ND	ND	ND	ND	ND
dimethylphthalate	ND	ND	ND	ND	ND	ND
2,5-dinitrotoluene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
diethyl phthalate	ND	ND	ND	ND	ND	ND
N-nirtosodiphenylamine	ND	ND	ND	ND	ND	ND
4-bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND
hexachlorobenzene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
di-N-butyl phthalate	ND	ND	ND	ND	ND	ND
butyl benzyl phthalate	ND	ND	ND	ND	25	ND
bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND
3,3-dichlorobenzidine	ND	ND	ND	ND	ND	ND
napthalene	ND	ND	1200	2000	3100	3200
acenapthalene	ND	ND	ND	ND	83	49
acenapthene	ND	ND	700	1000	1800	1600
fluorene	ND	ND	580	700	1400	1300
phenanthrene	ND	ND	2400	2800	3900	3300
anthracene	ND	ND	500	640	1200	1200
fluoranthene	ND	ND	1300	1800	2500	2100
pyrene	ND	ND	900	1500	2000	1700
benzo(a)anthracene	ND	ND	ND	330	620	ND
chrysene	ND	ND	ND	ND	660	510
benzo(b)fluoranthene	ND	ND	ND	250*	490	360
benzo(k)fluoranthene	ND	ND	38	ND	ND	ND
benzo(a)pyrene	ND	ND	130*	200*	ND	ND
ideno(1,2,3-cd)pyrene	ND	ND	ND	ND	92	66
dibenz(a,h)anthracene	ND	ND	ND	ND	ND	ND
benzo(ghi)perylene	ND	ND	ND	ND	83	83
2-chlorophenol	ND	ND	ND	ND	ND	ND
phenol	ND	ND	ND	34	53	69
2-nitrophenol	ND	ND	ND	ND	ND	ND
2,4-dimethyl phenol	ND	ND	ND	ND	70	74
2,4-dichlorophenol	ND	ND	ND	ND	ND	ND
4-chloro-3-methyl-phenol	ND	ND	ND	ND	ND	ND
2,4,6-trichlorophenol	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
2,4-dinitrophenol	ND	ND	ND	ND	ND	ND
2-methyl-4,6-dinitrophenol	ND	ND	ND	ND	ND	ND
4-nitrophenol	ND	ND	ND	ND	ND	ND
pentachlorophenol	**ND (10)**	**ND (10)**	**ND (10)**	**ND (10)**	**ND (10)**	**ND (10)**
benzyl alcohol	ND	ND	ND	**ND**	ND	ND
2-methylphenol	**ND**	**ND**	**10**	**17**	**32**	**32**
4-&/or3-methylphenol	**ND**	**ND**	**33**	**52**	**91**	**100**
carbazole	ND	ND	220	220	480	460
4-chlorananline	ND	ND	ND	ND	ND	ND
2-methyl napthalene	ND	ND	400	610	1400	1400
2,4,5-trichlorophenol	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
2-nitroanaline	ND	ND	ND	ND	ND	ND
dibenzofuran	ND	ND	460	530	1200	1000
3-nitroanaline	ND	ND	ND	ND	ND	ND
4-nitroanaline	ND	ND	ND	ND	48	46
pyridine	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**

ND = non-detect NR = not reported Pentachlorophenol (QL, mg/Kg) TTLC = 17mg/Kg

bold = TCLP-regulated compound blue = phenolic yellow = PAH

orange = heterocyclic aromatic

CONCLUSIONS

The copper azole (CA-B) and alkaline copper quaternary (ACQ) treated new 2x8s exceeded the California Title 22 hazardous waste Toxicity Characteristic STLC and TTLC levels for soluble (WET) and total copper. The Douglas fir CA-B and ACQ lumber had a 96-hour acute aquatic bioassay LC_{50} > 500 mg/L; CA-B treated Hemlock fir had a LC_{50} < 500 mg/L, which is below the Toxicity Characteristic level. The CA-B Hemlock fir had the highest total and soluble copper levels; this may account for the higher aquatic toxicity in these samples.

Low concentrations of PAHs, heterocyclic aromatics, and phenols were measured in used creosote-treated railroad ties and their TCLP extracts. The TCLP concentrations for cresols were well below the Title 22 Toxicity Characteristic regulatory level. Pentachlorophenol was not detected in the railroad ties or the TCLP extracts. The oak railroad ties had a 96-hour acute aquatic bioassay LC_{50} > 500 mg/L; however, fish survival was 60 and 70 percent at the 500 mg/L concentration, indicating a toxic effect below the regulatory threshold. Douglas fir ties had a LC_{50} < 500 mg/L, below the Toxicity Characteristic level.

The untreated oak, Douglas fir, and hemlock fir control samples did not exhibit aquatic toxicity, or have detectable concentrations of regulated elements or compounds in the wood or their WET and TCLP extracts.

The methods and findings described in this report were incorporated into the department's Draft Report: Sampling and Analysis Study on Treated Wood, and presented at a DTSC public workshop on Sept. 11, 2008. The draft report, workshop presentations, laboratory reports, and other material related to this study and the regulation of treated wood wastes are on the DTSC website under the Emerging Issues tab at:

http://www.dtsc.ca.gov/HazardousWaste/Treated_Wood_Waste.cfm

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APPENDICES

Appendix 1: Sampling plan (Stephen Quarles)

Appendix 2: Laboratory Reports with Table of Contents