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SUPERFUND TECHNICAL ASSISTANCE RESPONSE TEAM (START)

WOOD PRESERVING SITE WORKSHOP SUMMARY

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Research and Development
Cincinnati, Ohio 45268

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WOOD PRESERVING SITE WORKSHOP SUMMARY

Hosted by:
EPA Risk Reduction Engineering Laboratory's
Superfund Technical Assistance Response Team

Outline

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WOOD PRESERVING SITE WORKSHOP SUMMARY

I. Workshop Overview

The Wood Preserving Site Workshop (WPSW) was held on August 3 and 4, 1993 in Cincinnati, Ohio. The WPSW was hosted by the U.S. Environmental Protection Agency (EPA) Risk Reduction Engineering Laboratory's (RREL) Superfund Technical Assistance Response Team (START). The workshop provided information on treatment technologies for cleanup at wood preserving Superfund sites through lectures, case studies, and a panel discussion.

An audience of 66 included 12 remedial project managers (RPM), 3 regional representatives, 14 state project managers, 2 on-scene coordinators (OSC), 20 technical experts, 5 contractors, and 10 state Resource Conservation Recovery Act (RCRA) investigators. The final roster is included as Attachment A.

The final workshop agenda is included as Attachment B.

II. Presentation Summaries

The following summaries provide highlights from each presentation. Most presenters distributed handouts to supplement their presentations. For additional information, contact Terry Lyons or the individual presenter.

Review of "Contaminants and Remedial Options at Wood Preserving Sites" - Mary Stinson

This document assists in selecting remedial options for sites contaminated with wood-preserving chemicals. The main topics of the report, each contained in a separate section, are contaminant characterization and remedy selection. Both sections provide a "second order" of technical information which is supported with an extensive list of references. The document does not address any policy, cleanup levels, or remedial investigation/feasibility (RI/FS) issues.

The characterization section describes wood preserving processes, wastes generated, contaminants commonly found, and their migration patterns. Typical contaminants are: pentachlorophenol (PCP), polynuclear aromatic hydrocarbons (PAHs), and compounds of arsenic, chromium, copper, and zinc. Contaminants are found in a variety of matrixes, such as soil, sediments, sludges, and groundwater. Organic contaminants often form nonaqueous phase liquids (NAPLs) that either float on groundwater surface or sink and adhere to soil. The remedial options section describes an approach to selecting treatments that are most likely to succeed in achieving site-specific cleanup levels. This section is mainly concerned with treatment of soils and gives only a brief overview of water treatment options, which are available in other documents. This section includes basic process drawings and gives performance and cost data on technologies that are suitable to treatment of wood preserving wastes, such as thermal treatments, dehalogenation, solvent extraction, soil washing, bioremediation, solidification/stabilization, free product recovery, and sometimes capping.

Technologies are arranged into three types of treatment: immobilization, which does not detoxify; separation/concentration, which partly detoxifies; and destruction, which "completely" detoxifies. Two general options exist: destruction or immobilization. Separation/concentration technologies prepare wood preserving matrices for either destruction or immobilization. Since no single technology can remediate an entire site, use of treatment trains is stressed. Treatment trains include pretreatment and posttreatment components to achieve the best performance by principal technology.

Also, cleanup levels must be weighed in against the amount of energy required to treat contaminants. The lower (more stringent) the cleanup goals, the more energy is required for each type of treatment. This relationship is presented graphically in the report. Thus, from highest to lowest energy required: separation/concentration technologies include thermal desorption, solvent extraction, soil washing, soil flushing, and free product recovery; and immobilization technologies include vitrification, solidification/stabilization, and caps and barriers; destruction technologies include incineration pyrolysis, dehalogenation, on site bioremediation, and in situ bioremediation.

Review of "Technology Selection Guide for Wood Treater Sites" - Harry Allen

This presentation focused on presumptive methods of treatment technology selection using site-specific cleanup goals and control options. It stressed the difference between presumptive remedies, proven alternative technologies, and innovative remedies that are emerging and unproven. The presentation also addressed political issues, such as cleanup goals that require incineration as the cleanup technology but that result in public opposition (the "not in my back yard" [NIMBY] response).

A fact sheet highlighting the limitations of each technology was distributed. Health and safety considerations are important for treatment methods as well as for contaminants. For example, high temperature control applications may release hazardous constituents to the air during remedial activities.

"Table 1 - Site Cleanup Update for Woodtreating Sites" was distributed for comment. The updated table is included as Attachment C. If more current information is available, please fax it to Dr. Allen at (908) 321-6724.

Site Characterization - JoAnn Camacho

This presentation focused on site characterization using the document "Technology Selection Guide for Wood Treater Sites." Photographs and site-specific data were used to illustrate site characterization. Sites must be characterized as to the type of contaminants present (CCA, PCP, creosote, or total petroleum hydrocarbons [TPH]) and whether contaminants are alone or mixed. The media and areas needing treatment include sludges from tanks and lagoons; soil and sediment from process, drip and storage, lagoon, and drainage areas; surface water; and groundwater. Treatment options must be considered early in the site characterization process.

The document also provides information needs for each presumptive remedy. For example, high soil moisture content will adversely affect incineration.

PCP/CCA Stabilization - Edward Bates

This presentation provided an overview of PCP/CCA stabilization. The presentation included discussion of a SITE Program demonstration of the Silicate Technology Corporation (STC) process in 1990 that brought the audience up to date regarding current full-scale remediation of the site by RUST using the same STC process.

The STC technology was demonstrated at the Selma Pressure Treating (SPT) wood preserving site in Selma, CA, during November 1990. Approximately 16 tons of waste were treated. The SPT site waste was contaminated with organics, predominately PCP, and with inorganics, primarily arsenic, with lesser amounts of chromium and copper. Extensive sampling and analysis performed on the waste before and after treatment compared physical, chemical, and leaching characteristics of the raw and treated waste. The objective of the demonstration was to assess the STC process effectiveness in treating the PCP and AS.

SITE demonstration results indicate that the STC process chemically stabilizes contaminated soils containing organic and inorganic contaminants. Specific findings of the STC demonstration are summarized below. It should be noted that post treatment data have been mathematically adjusted to eliminate any apparent reductions due solely to dilution.

- PCP was successfully treated by the STC process. Initial raw waste concentrations of PCP as high as 10,000 ppm were reduced 91% to 97% to values as low a 53 ppm as measured by total waste analysis (EPA Method SW 846-8270 for semi-volatiles using methylene chloride extraction on ground sample passing 100 mesh). This complies with EPA draft policy guidance on stabilization of organics which states that total waste analyses should be used to assess the effectiveness of stabilization processes for treating semi-volatile and non-semivolatile organics (OSWER Directive No. 9200.5-220). Leaching tests for PCP using toxicity characteristic leaching procedure (TCLP 55FR26986 June 1990), but using distilled water instead of acetic acid, indicated reductions up to 97% (from 40.0 ppm to 0.58 ppm). Treatment of other toxic organic compounds could not be evaluated because of the very low concentrations of such compounds.

- Arsenic was successfully immobilized. Standard TCLP tests (TCLP 55FR26986 June 1990) using acetic acid produced reductions up to 92% (from 1.82 ppm to 0.086 ppm). TCLP procedures using distilled water in place of acetic acid produces reductions up to 98% (from 1.25 ppm to 0.012 ppm). Arsenic analyses were by EPA Method 7060 using GFAAS. Copper and chromium were also present at the site but in lower concentrations that were not targeted for treatment.

- After a 28-day curing period (open air, ambient site temperature), the treated wastes exhibited high physical stability. Testing was scheduled for 6, 18, and 36 months following the demonstration to determine long-term stability. Unconfined compressive strength of the treated wastes was moderately high, averaging 260 to 350 psi (ASTM D1633-34).

Currently the Selma site is in full-scale remediation by RUST using the same STC stabilization technology. To facilitate treatment of the site, soils were being excavated and separated into the more highly contaminated (congealed) soil and the larger-volume, less-contaminated soil. For treatment, the two soil types are well blended to make a fairly constant feed for the 4-cubic yard batch mixer. Generally, over 200 cubic yards are processed each work day. By August 1993, over 1000 cubic yards have been processed, meeting or exceeding the following specifications: PCP less than 0.3, arsenic less than 5.0, chromium less than 0.5 to TPL, hexavalent chromium less than 0.5, and copper less than 10 all in ppm by TCLP extract. Physical criteria are permeability less than 1 X 10^{-7} cm/sec and UCS over 15 psi in 5 days and 100 psi in 28 days.

PCP Biotreatment - Richard Brenner

This presentation was organized into the following areas: 1) chemical and fate processes important to treatment effectiveness, 2) biological status of soil, 3) soil bioremediation processes (land treatment, composting, and slurry reactors), and 4) end point analysis.

The effect of PCP chemistry and fate process on water solubility, volatilization, and sorption onto soil was explained. Microbiota amounts, status, and strength of attachment in soils were also discussed, as well as the types of composting (static pile, windrow, and vessel systems); principles of composting; and size, layout, and control requirements.

Two wood preserving sites were used as examples of PCP biotreatment. The Brookhaven, Mississippi Wood Preserving site was used to illustrate land treatment using PCP bioremediation. Performance data for various added fungal microbiota used in the remediation were provided. In addition, treatability data from the Indiana Woodtreating site using indigenous microbiota were given for total polynuclear aromatic hydrocarbons (PAHs) and for noncarcinogenic and carcinogenic PAHs.

Types of biotreatment reactors were discussed, including aerated lagoons, airlift reactors, and fluidized bed soil reactors. Optimal feed characteristics were also presented. These include soil organics (0.25 to 25 percent by weight), solids (10 to 40 percent by weight with a diameter of less than 0.25 inch), temperature (15 to 35 °C), and pH (4.5 to 8.8).

Advantages of bioslurry treatment over composting include rapid treatment rates, increased flexibility, waste containment, and reduced space requirements. Disadvantages include higher costs, restricted currently to batch operation, and lack of a previous application database.

RPMs are most concerned with the following issues concerning PCP biotreatment:

- Are significant quantities of target pollutants detoxified?
- Does the selected biotreatment method meet the required time frame?
- Does the analytical method measure the pollutant below the projected treatment end point?
- Is there evidence of an environmental process already working at the site?

The presentation concluded with the results of two studies of solvent washing of soils contaminated with PCP. Conclusions of these studies were as follows: 1) 50 and 75 percent solutions of ethanol in water achieve higher PCP removal at lower solvent throughputs; 2) the optimal mesh size of soils for soil washing operations is 100 x 140; and 3) PCP extracted from soil is biodegradable in the expanded-bed, anaerobic, granular activated carbon (GAC) reactor.

Creosote Bioslurry - Don Rigger

This presentation highlighted the creosote bioslurry technology, using the Southeastern Wood Preserving site as an example of slurry biotreatment. Sludge and soil at the site was contaminated with 5,000 to 10,000 parts per million (ppm) total PAH, which was reduced to 500 ppm after biotreatment. Site soils also contained 50 to 70 ppm PCP, which was not degraded. Eleven large batch treatments were tracked; the process was 90 percent efficient for treating total PAH and 60 percent efficient for treating carcinogenic PAHs. This process did not meet the land disposal restriction (LDR) of 1.5 ppm for phenanthrene and pyrene; however, the LDR is based on treatment using incineration.

The reaction process is essentially complete in 5 to 10 days. Landfarming could be used as a polishing step. Low temperatures decrease reaction kinetics.

Advantages of slurry biotreatment include ease in controlling variants and water content. Dissolved oxygen uptake rate can be used to estimate PAH removal rate. Disadvantages of this technology include initial high capital costs, large number of mechanical parts, and materials handling difficulties at feed and discharge of process.

Composting - Harry Allen

Composting, or solid phase bioremediation, is an oxidative biological process that degrades heterogeneous organic substrates using thermophilic microbes. For the process to work, temperature must be above ambient, oxygen must be present, a high moisture content is preferred, and the pH should be near neutral. The carbon-to-nitrogen ratio should be about 30 parts carbon to one part nitrogen. Air movement through the pile is essential. The process is inexpensive and commonly used in sewage treatment and yard waste management facilities.

Composting was used to treat creosote as an alternative to incineration at an abandoned wood treating site in Sidney, New York. At this site, soils contaminated with 3,000 to 8,000 ppm total PAHs were treated in the compost pile. Temperature and the amount of nitrogen present were monitored over a 60-day period. The method removed up to 80 percent of the nonvolatile PAHs. Turning the pile was critical for optimal treatment; the pile was turned whenever its temperature fell back to ambient, which resulted in a dramatic increase in temperature. Field scale pilot compost piles were turned on a monthly schedule. Costs per ton were compared to those for other treatment technologies.

Composting was also used at a wood treating site in Hollywood, Maryland on sludges and soils. The 285-day project concluded that composting is more efficient for lower molecular weight PAHs than for the higher molecular weight, carcinogenic PAHs. PCP-contaminated waste did not appear to be removed by composting. Composting is meant to be a portion of a treatment train. Although somewhat effective, composting alone did not achieve most site cleanup levels. Ongoing research to increase the effectiveness of composting was described.

Base-Catalyzed Decomposition (BCD) - Charles Rogers

The BCD process is a base-catalyzed thermal process for halogenated volatiles and semivolatiles, including PCP, dioxins, furans, and polychlorinated biphenyls (PCB). BCD was demonstrated at a Navy site in Guam. PCB levels initially ranged from 25 to 6,500 ppm in 5,000 tons of soil and were reduced by over 99 percent.

BCD is a more cost-effective technology than incineration. BCD system treatment costs, about $250 per ton, are well below incineration costs, which are about $2,000 per ton. Factors such as high moisture and clay content may increase treatment costs. Soils must be excavated, but pieces of wood and other debris are not detrimental to the process.

The BCD process will be demonstrated at the Kopper's Company Superfund site in Morrisville. North Carolina throughout the month of August 1993.

Incineration - Don Oberacker

Incineration detoxifies, reduces waste volume, provides some energy recovery opportunity, and can reclaim some by-products. Types of incineration include 1) rotary kilns, the most popular; 2) infrared conveyor ovens; and 3) circulating bed combustion chambers. Incineration is nearly 100 percent effective on organic contaminants but volatile metals can present problems if they are in the waste. However, incineration is not a popular treatment method with the general public and is one of the most expensive treatment technologies, costing $500 per cubic yard and more. Several companies will bid on and contract for incineration work; a handout listing these companies was provided.

Mobile incineration has been successful at about 36 of 38 Superfund sites. The effect of incinerator design points (time, temperature, and amount of turbulence) on treatment of solids, liquids, and gases was discussed. Moisture in the waste can be a concern. Incineration bottom ash that contains metals is usually stabilized.

Thermal Desorption - Paul dePercin

Thermal desorption is a separation process that was not used at wood preserving sites. The basic process consists of excavating and screening soils, then treating them using desorption. Treatment by-products include treated soils and gases that need additional treatment. Process residuals include organic liquids, which can be condensed and absorbed or destroyed.

Issues concerning thermal desorption include the following: 1) the technology is often confused with incineration; 2) harmful by-products (such as dioxins) may result from treatment; and 3) residuals must be treated using GAC, unlike incineration. GAC treatment entails additional costs of about $200 to $400 per ton. In addition, the technology cannot treat concentrated organics. Soils must have less than 20 percent organics and less than 40 percent moisture. CCA contamination is not a major concern with thermal desorption, because it is contained in the residue and trapped air emissions.

The technology has been used at several pesticide-contaminated agricultural sites. Five thermal desorption technologies have been demonstrated in the EPA Superfund Innovative Technology Evaluation (SITE) Program. The thermal desorption developers in the program include SoilTech ATP Systems, Inc., Roy F. Weston, Inc., Chemical Waste Management, Inc., and Canonie Environmental Services, Inc.

Treatment of mercury-contaminated soil using thermal desorption needs to be studied further. A demonstration is being sought to measure mercury volatilized and absorbed in the residual material.

III. Workshop Case Studies

Three case studies of wood preserving site cleanups were presented. Each case study is summarized below.

Southern Maryland Wood Treating Corporation - Lesley Brunker

From 1965 until 1980, creosote and PCP were used at this site to treat wood without drip pads. Six unlined lagoons were used to store waste from the treatment process. Settling and leaching from the bottom of the lagoons caused the area to become contaminated with dense nonaqueous phase liquids (DNAPL). Initial cleanup efforts taken by the site owner (under the direction of the state) included landfarming the lagoon sludge. This action, however, was done improperly, and resulted in contamination of several additional acres of the site.

The first record of decision (ROD) was issued in 1988 and specified incineration as the treatment method. The cost of cleanup, estimated in the ROD at $40 million, was partly based on two cleanup levels. First, PAH levels on the surface were to be reduced to 2.2 ppm; subsurface PAH levels were to be reduced to 1.0 ppm. However, the 1.0 ppm cleanup level was based on the Sommer's model, which does not accurately predict groundwater partitioning and forces the RPM to select incineration as the cleanup method. Maryland officials required the cleanup costs to be less than the cost estimated for the ROD. Thus far, $8 million has been spent on the cleanup.

The site cleanup proceeded in two phases: the first phase focused on containing groundwater contamination, while second phase efforts consisted of cleaning the soil. The choice of incineration as the method of site cleanup resulted in significant public concern. The public developed very negative perceptions of incineration, the contractor, and EPA. Many of the concerned people did not live in the area when EPA made the decision to use incineration, and thus were not part of the decision-making process. In response, a community relations campaign was started by Region 3.

START was consulted in spring 1992, and helped prepare a report that supported the 1988 decision to use incineration at the site. After EPA decided not to go forward with the 1988 ROD in May 1992, ERT became involved that summer. ERT is preparing a Focus Feasibility Study (FFS) for the site. Both START and ERT guided the RPM on costs and the treatment alternatives. Accompanying the FFS will be a risk assessment for each alternative that will show the risks associated with the implementation of the alternative (short term risk) and the risk posed by the site after remediation would be completed (long term risk). The site will be safe for use when remediation is completed, but whether or not that use will be restricted will depend on which alternative is selected.

Kopper's Company, Charleston, South Carolina - Craig Zeller

This 45-acre site was used to treat wood from the mid 1920s through the mid 1970s. Wood was treated using primarily creosote, however unknown quantities of PCP and CCA were also used during the 1960s. The site is located in a heavily industrialized area of Charleston that includes shipyards and a dredging company. Beazer East, formerly Kopper's Company, sold the property to Braswell Shipyards in 1978, which in turn parcelled off most of the property. In 1984, a barge canal was dredged through an area of the site formerly used by Kopper's as a landfill area. Dredging activity negatively impacted Ashley River which resulted in fish kill. Spoil material from dredging was placed in a bermed area and allowed to drain into a bordering wetland area.

The presentation centered around the characterization of this site. Accompanying handouts provided general information, site operations descriptions, and sample location maps, as well as a conceptual depiction of unconsolidated deposits at the site. The site was proposed for listing on the NPL based upon surface water migration pathway alone. Based on treatability screening conducted by EPA's START Team, bioremediation technologies are under further evaluation for potential remediation of the site. The risk assessment will be completed in early 1994, with the complete RI results available by mid-1994.

The use of historical aerial photographs to determine past use, and then focusing RI efforts on these areas was stressed. Focused analytical list of SVOCs and CCA, coupled with limited full-screen analysis to address risk assessment needs, was encouraged as a cost-efficient method of site characterization. Several lawsuits against Beazer are pending, based upon innocent landowners' defense.

Kopper's Company Superfund Site, Morrisville, North Carolina - Beverly Hudson

This site was listed on the National Priorities List (NPL) in 1989. Site contaminants include PCP, dioxin, furans, and isopropyl ether in groundwater, surface water, and soils. Because of the groundwater contamination, Kopper's installed 4 miles of water lines to nearby residents. The company also supplies bottled water to residents not served by the water lines.

Handouts included site maps, a list of major contaminants, and descriptions of remediation techniques and cleanup levels. The primary remedy calls for 1,000 cubic yards of soil to be treated by off-site incineration. Groundwater will be extracted, treated by carbon adsorption, and discharged to surface water. Water from the contaminated on-site pond will be treated by carbon adsorption and discharged to surface water. Cleanup goals for soil are 95 parts per billion (ppb) PCP and 7 ppb dioxin; cleanup goals for groundwater are 1 ppb PCP and 0.00003 ppb dioxins and furans. RI/FS costs to date are $2 million. The BCD technology is the contingency remedy in the ROD. It will be demonstrated at this site throughout August 1993.

IV. <u>Enforcement Issues at Wood Preserving Sites</u> - Wayne Lee

The OSC and RPM should keep their regional lawyers informed during each phase of a site investigation. This will keep the case on track, conserve money, and prevent additional problems.

Several examples from the two Kopper's Company case studies provided additional insight into enforcement issues. Fundamental points of the presentation included the following:

- Requiring a potentially responsible party (PRP) to release evidence is a good investigatory technique.

- To avoid project delays, minimize PRPs from building language into administrative orders or consent decrees. As an example, PRPs try to increase the number of agency approvals of RI/FS submittals, and thus delay project deadlines.

- Concern is needed when a PRP asks to negotiate without legal counsel. Often PRPs have been well coached by counsel and will try an "end run" to obtain the most advantageous deal for their company.

- Once the record of decision (ROD) is signed, alternate remedies should not be discussed. Alternative remedies may be considered through the remedial design/remedial action (RD/RA) stage.

V. Panel Discussion - Mary Stinson, Moderator

At least 40 participants were present for the panel discussion, which was moderated by Mary Stinson. Each panel participant gave a summary of the technology; questions were then fielded from the audience. Topics included public outcry against incineration and other thermal treatments, future demonstration and research needs, and treatment of off-gases and residuals. The panel discussion lasted about 2 hours.

VI. Evaluation Review

Evaluations were received from 40 of the 66 participants. The Wood Preserving Site Workshop Evaluation Summary is included as Attachment D. The overall response was extremely favorable. Suggestions for improvement included 1) outlines or handouts for all presentations, 2) more site characterization information, especially on treatment technology selection, and 3) lectures on policy and risk assessment or risk management.

VII. Future Workshop Topics and Needs

All participants who returned evaluation forms indicated a need existed for additional workshops on other site types. Topics suggested included 1) organics in groundwater, such as chlorinated solvents, and DNAPLs; 2) metals remediation; 3) pesticides; 4) plating sites; 5) uranium processing; 6) training of any type; 7) battery plants; 8) mine waste sites; and 9) PCB sites.

Additional suggestions included holding wood preserving sites workshops annually.

ATTACHMENT A

FINAL ROSTER

(Six Pages)

Attendee Roster - Final
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August 3-4, 1993
Cincinnati, Ohio

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ATTACHMENT B

FINAL AGENDA

(Two Pages)

Wood Preserving Site Workshop

Hosted by:
EPA Risk Reduction Engineering Laboratory's
Superfund Technical Assistance Response Team

Cincinnati, Ohio
August 3 and 4, 1993

AGENDA

DAY 1

TIME	**SPEAKER**	**TOPIC**
8:20 - 8:30 a.m.	T. Lyons	Introduction
8:30 - 9:05	M. Stinson	Overview and Wood Technology Resource Document
9:05 - 9:40	H. Allen	Presumptive remedies, short sheet
9:40 - 10:15	J. Camacho	Site characterization
10:15 - 10:30		Break
10:30 - 11:05	E. Bates	PCP/CCA stabilization
11:05 - 11:40	R. Brenner	PCP biotreatment
11:40 a.m. - 12:15 p.m.	D. Rigger	Creosote bioslurry
12:15 - 1:30		Lunch
1:30 - 2:05	H. Allen	Composting
2:05 - 2:40	C. Rogers	BCD
2:40 - 3:15	D. Oberacker	Incineration
3:15 -3:50		Break
3:50 - 4:25	P. dePercin	Thermal desorption
4:25 - 4:45	T. Lyons	Summary and adjournment

DAY 2

TIME	SPEAKER	TOPIC
8:30 - 9:00 a.m.	T. Lyons	Welcome and review of previous day's work
9:00 - 9:45	L. Brunker	Southern Maryland Wood Treating Corp. (case study)
9:45 - 10:00		Break
10:00 - 10:45	C. Zeller	Kopper's Co., Inc., Charleston, SC Plant (case study)
10:45 - 11:30	B. Hudson	Kopper's Co., Inc., Morrisville, NC Site (case study)
11:30 a.m. - 12:30 p.m.		Lunch
12:30 - 2:00	W. Lee	Enforcement issues at Kopper's sites
2:00 - 2:30		Break
2:30 - 4:00	M. Stinson (moderator)	Treatment technology panel discussion
4:00 - 4:15	T. Lyons	Issues, review, summary, and adjournment

ATTACHMENT C

TABLE 1. SITE CLEANUP UPDATE FOR WOOD TREATING SITES

(One Page)

TABLE 2. UPDATE ON ERT/WOOD PRESERVERS EXPERT TEAM SITE INVOLVEMENT - AUGUST 1993

	SITE NAME	STATUS	SCOPE OF ASSISTANCE
1	Escambia Wood Treating, Pensacola, FL	Removal Site. NPL listing problems hampering remediation.	ERT conducted extent of contamination (EOC) study, ambient air monitoring, evaluation of treatment alternatives and pilot studies. Ongoing involvement.
2	Escambia Wood Treating, Brunswick, GA	Removal Site. Awaiting listing on NPL.	ERT conducted EOC study, evaluated treatment alternatives, conducted pilot studies, and provided mobile lab support. OSC excavated lagoons stored fill on site, treated and disposed of liquids mobile lab EOC. Ongoing involvement.
3	Escambia Wood Treating, Brookhaven, MS	Removal Site. Awaiting NPL listing, but may not rank.	ERT conducted EOC study, evaluated treatment alternatives, and conducted pilot studies. OSC excavating and solidifying soils. Ongoing involvement.
4	Escambia Wood Treating, Camilla, GA	Removal Site. Awaiting NPL listing.	ERT conducted EOC study. OSC awaiting ERT treatment recommendations from other three Escambia sites. Ongoing involvement.
5	Indiana Wood Treating, Bloomington, IN	Removal Site.	ERT and Expert Team recommended biological treatment to OSC. Remedy was implemented. Ongoing involvement.
	Eastern MD Wood Treating, Federalsburg, MD	*Removal in Progress*	ERT *conducted pilot scale bioremediation studies*, and recommended composting to OSC. Ongoing involvement.
7	Southern MD Wood Treating, Hollywood, MD	NPL Site. Remedial Design.	Expert team evaluated information presented by RPM, and made recommendations. ERT conducted pilot studies and is conducting a focused feasibility study. Ongoing involvement.
8	Wyckoff/Eagle Harbor, Bainbridge Island, WA	NPL Site. RI/FS in Preparation. Removal Action is On-going.	Expert team evaluated information presented by RPM and recommended remedial actions. Assistance in the RI/FS process requested. On-going removal activities include the following: 1) Placement of clean cover over contaminated harbor sediments. 2) Ground water & oil extraction and 3-phase treatment system, including oil/water separation, slurry phase biological treatment, and carbon polishing. 3) Sludge excavation and off site disposal.
9	Southeastern Wood Preserving, Canton, MS	Removal Site.	ERT was requested to provide support for full-scale bioremediation, which is not achieving clean-up goals. Further pilot studies needed. Ongoing involvement.
10	Coleman Evans Wood Preserving, Jacksonville, FL	Removal Action at NPL Site. Reopen ROD due to discovery of dioxin.	ERT conducted an EOC study for dioxin contamination and will conduct a focused feasibility study. OSC conducting a removal action on liquids and sludges and is storing off-site dioxin-contaminated soil on-site. Ongoing involvement.
11	McCormick & Baxter Creosoting, Stockton, CA	NPL Site. RI/FS in progress.	ERT and Expert Team members from START and SITE evaluated information provided by the RPM. Dioxin discovery altered initial remedial plans and triggered need for EOC study and low preliminary remediation goals led to the need for additional treatability studies. Ongoing involvement.
12	GCL Tie & Treating, Sidney, NY	Removal Site. Awaiting Funding.	ERT and Expert Team recommended biological treatment, and ERT is conducting pilot studies to improve treatment efficiency. Ongoing involvement.

ATTACHMENT D

WOOD PRESERVING SITE WORKSHOP EVALUATION SUMMARY

(One Page)

Wood Preserving Site Workshop
Evaluation Form - Tally Sheet

1. Did the workshop meet your expectations? Y-35 N-3 Y/N-2

2. How would you rate the workshop overall?

   Excellent-6 Very Good-23 Good-9 Fair-2 Poor-0

3. How would you rate the technical presentations on day 1?

   Excellent-5 Very Good-18 Good-14 Fair-3 Poor-0

4. How would you rate the case studies and other presenations on day 2?

   Excellent-10 Very Good-16 Good-9 Fair-3 Poor-0

5. Do you think similar workshops on other site types should be held? Y-39 N-0

6. How would you rate the meeting facility and accomodations?

   Excellent-6 Very Good-18 Good-13 Fair-2 Poor-1