RWQCB	Regional Water Quality Control Board
Site	Koppers Company, Inc., Superfund Site
TI	Technical Impracticability
TRC	Beazer's consultant
U.S. EPA	U.S. Environmental Protection Agency

Preliminary Closeout Report

1.0 Introduction

This Preliminary Closeout Report documents that all construction activities for the Koppers Company, Inc. (KII), Superfund Site (Site) (U.S. Environmental Protection Agency [U.S. EPA] Site identification number CAD009112087) have been completed in accordance with Close Out Procedures for National Priorities List Sites (OSWER Directive 9320.2-09A, January 2000). U.S. EPA conducted a pre-final inspection on September 18, 2002, to verify that the potentially responsible party has constructed the remedy in accordance with remedial design (RD) plans and specifications. The potentially responsible party has initiated all activities necessary to achieve Record of Decision (ROD) performance standards and site completion.

2.0 Summary of Site Conditions

2.1 Background

2.1.1 Location and Geography

The Site is an area of approximately 205 acres located in Butte County, in the southern portion of the City of Oroville. The topography of the Site slopes toward the southwest and is bounded by the former Louisiana Pacific (L-P) Lumber Mill to the west, Georgia Pacific Way to the north, and Bagget-Marysville Road to the south and east (Figures 1 and 2). Remnants of mining dredge operations during the 1900s remain throughout the northern portion of the Site.

The Site is located on the northeastern margin of the Sacramento River Valley, where fluvial deposits adjoin the foothills of the Sierra Nevada mountain range (Dames and Moore, 1988). The site lies within the Feather River Floodplain, which locally is approximately 2.7 miles wide. The Site elevation is approximately 145 feet above mean sea level (msl). A historical mining-tailing pile is present at the northern area of the property at approximately 120 feet msl (U.S. EPA, 1989).

Drainage basins in the vicinity of the Site include: the L-P ditch, the Koppers and Drainage Ditches, the Feather River, and the Wyman Ravine (Figure 2). The Koppers Ditch and Drainage Ditch flow to the L-P ditch (located west of the Site) and then drain to the L-P pond, which has potential to overflow to the Feather River during a 100-year storm (U.S. EPA, 1999). The Feather River is located approximately 3,000 feet west of the Site, trending west-southwest at approximately 130 feet above sea level. During periods of high runoff, some surface runoff from the Site may reach the river. The Wyman Ravine is located approximately 2 miles east of the Site and flows west to Palermo Road, then turns south (Figure 1).

The Wyman Ravine is perennial, flowing only during periods of high runoff, and is topographically separated from the Site by a large bluff (Dames and Moore, 1988). It should be noted that current remedial actions on the property have resulted in modified surface flow locally, yet have maintained the general southwest overland flow direction.

Land use near the Site is a mixture of residential, industrial, commercial, and agriculture. Rural homeowners on 1 to 5 acres of land commonly raise livestock and grow produce for home use. Residential areas are to the south, southeast, west, and northeast of the Site. There are three schools within a 2-mile radius of the Site (U.S. EPA, 1989). There were two National Priorities List (NPL) Sites in the vicinity of the Site: the former L-P Lumber Mill, west of the Site and the Western Pacific Railyard, northeast of the Site. The former L-P Lumber Mill was delisted in 1996, and the Western Pacific Railyard was delisted in 2001. West of the Feather River is public open space, the Oroville Wildlife Area (Dames and Moore, 1988).

Both the soil and ground water remediation are covered under one Operable Unit (001).

2.1.2 Site History

Wood treating operations, intended to prevent wood from deterioration by insects or fungi, were conducted at the Site from 1948 to 2001. Wood treating operations resulted in Resource Conservation and Recovery Act (RCRA) hazardous wastes (40 CFR 261), California hazardous wastes (CAC Title 22), and/or nonhazardous wastes that may contain wood-treating chemicals. The wood treatment process involved the use of chemical preservatives such as pentachlorophenol (PCP) from 1948 to 1988, creosote sludges, and chromated copper arsenate solution. The cellon process used PCP in isopropyl ether (IPE) and butane to treat wood. The non-com exterior process®, discontinued in 1986, used chemicals containing formaldehyde and dicyandiamide. Other chemicals historically used at the Site include creosote, naphthalene, boron, phosphorous, diesel oil, and gasoline (Dames and Moore, 1988).

Chemicals were released to the environment through waste disposal practices, spills, fires, products dripping from treated wood, and storage and handling practices. From approximately 1952 to 1973, unlined creosote settling ponds located west of the former process area were used as evaporator basins for process residuals. Occasionally the creosote pond overflowed to a marsh area southwest of the L-P ditch (Dames and Moore, 1988; HSI Geo Trans, 1999b). Upon discontinued use, this area was later backfilled with soil and dredge tailings. From 1961 to 1973, the cellon process released residual wastes across approximately 1 acre near the western site boundary (Dames and Moore, 1988). From 1963 to 1973, wastewater from a pole-washing unit at the northern portion of the Site was not contained and was released just south of the pole washer. In 1963, a fire occurred at the Site resulting in a release of 20,000 gallons of PCP, and the cellon process plant was destroyed. Combustion of PCP produced polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDD/PCDF). Debris from the 1963 fire was initially buried On Property, but was subsequently removed and disposed of offsite under a Regional Water Quality Control Board (RWQCB) order (HSI Geo Trans, 1998). There was another fire at the Site in 1987.

2.1.3 Site Chronology

A chronology of important Site activities and investigations is presented in Table 1.

TABLE 1
Site Activities and Investigation
Preliminary Closeout Report for Koppers Company, Inc., Oroville, California

Event	Date
Mine dredging operations were conducted at the Site.	1900s
Hutchinson Lumber Mill operated at the Site.	1920 to 1948
Wood was treated at the Site with chemicals including, but not limited to, PCP, creosote, and chromated copper arsenate solution to prevent wood deterioration by insects or fungi.	1948 to 2001
Lumber mill facility operated at the Site, concurrently with the wood treatment operations.	1952 to 1962
Process residuals were discharged to unlined creosote settling ponds.	Approximately 1952 to 1973
KCI purchased the property and wood treating operations from the National Wood Treating Company.	1955
Cellon blowdown area was used for residual waste disposal.	1961 to 1973
A fire occurred at the Site; debris was buried On Property and approximately 20,000 gallons of PCP were released from tanks.	1963
Pole-washing unit was used and residual waste was discharged nearby to an unlined surface impoundment.	1963 to 1973
PCP-contaminated ground water was first documented On Property.	1971
PCP was discovered in nearby residential wells.	1972
The RWQCB issued an order for cleanup including (1) the installation of two ground water recovery wells; (2) extraction of contaminated ground water and discharge to spray fields On Property; (3) excavation of buried debris from the 1963 fire for offsite disposal; and (4) construction of wastewater treatment process to discontinue use of unlined ponds.	1973
Waste disposal area in the Eastern Spray Field (fire debris), the two areas in the Western Spray Field (fire debris), and the cellon blowdown area were excavated, and the soils were disposed of at the soil bed of the biological wastewater treatment unit. Associated fire debris was removed to an approved offsite landfill.	1973
Biological wastewater treatment unit was used for the disposal of all residual wastes.	1973 to 1988
KCI installed and began operation of two recovery wells (RW-1 and RW-2) to recover PCP in local ground water in accordance with RWQCB order.	1974
Concentrations of PCP in offsite wells decreased, and the RWQCB order was rescinded.	1974
The RWQCB issued a cease-and-desist order directing KCI to stop discharging PCP into soil at the plant and prepare a work plan detailing:	1982
(1) remedial actions to mitigate damage caused by contaminants flowing west; (2) process changes needed to prevent future contamination; and (3) alternatives for treating excavated soil.	
The Site was proposed for placement on the NPL.	September 1983
Ground water contamination in residential wells was found more than 1 mile south of the Site.	December 1983
Bottled water was supplied to 45 residences with impacted drinking water supply wells.	March 1984 to 1986
Site was placed on the NPL.	September 1984
Ground water monitoring program was initiated.	June 1985
Use of PCP in the wood treating process was phased out.	1986 to 1988
Private residences within areas of impacted ground water were connected to alternate water supply (Oroville-Wyandotte Irrigation District).	March 1986 to date

TABLE 1
Site Activities and Investigation
Preliminary Closeout Report for Koppers Company, Inc., Oroville, California

Event	Date
Consent Order signed between KCI and U.S. EPA, requiring completion of the Remedial Investigation and Feasibility Study (RI/FS).	April 1986
Explosion and fire at the Site. U.S. EPA issued a unilateral removal order for the cleanup, removal, and stabilization of soil.	April 1987
Temporary chip-seal cap was constructed over process area.	1987 to 1988
Site was bought by Beazer East, Inc. (Beazer).	1988
Operations ceased at the Former Biological Treatment Facility (soil) On Property.	1988
Department of Health Services sampled neighboring properties and found elevated dioxins in chicken eggs; an advisory was issued and the source of area wide trace dioxin was not determined.	March 1988
RI Report completed.	June 1988
Risks evaluated by the U.S. EPA and reported in an Endangerment Assessment Report.	November 1988
Beazer sold the Site to KII; however, Beazer retained responsibility for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) matters at the Site.	December 1988
FS completed.	May 1989
ROD for cleanup of ground water and soil was issued for the Site.	September 1989
Explanation of Significant Difference (ESD) issued for the Site that limited soil remediation to 5 feet unless a potential contaminant source to ground water was found.	January 1991
Consent Decree between U.S. EPA and Beazer agreeing that Beazer will conduct remedial action work.	February 1992
Completed bench-scale treatability test for soil washing.	1992
Two concrete drip pads were installed in the process area.	1992
Completed full-scale pilot testing for soil washing. (Not effective in removing all ROD constituents.)	1993
Concentrations of PCDDs/PCDFs above industrial standards for workers, as cited in ROD, were detected in surface soil.	1993
Off Property ground water remediation system started.	March 1993
On Property ground water remediation system started.	February 1994
Shallow ground water investigation completed.	June 1994
Soil Removal Memorandum Action performed to selectively remove impacted dioxin-contaminated soil and place in Cell No. 1 (13,000 cubic yards [cy] of soil).	September 1994
Product recovery well (PR-01) installed.	1994
Soil Fixation Treatability Study completed. (Not implementable as a remedy.)	1994
Hot-water Flushing Treatability Study of Contained Recovery of Oily Wastes performed. (Not a cost-effective remedial action.)	1994
Long-term ground water pilot bioremediation system initiated in the former creosote pond area.	July 1995
Construction of onsite landfill, Cell No. 1, completed.	August 1995
Off Property ground water remedial system was taken offline because the plume retreated upgradient of the extraction wells. The extraction wells were no longer effective in capturing the plume.	December 1995

TABLE 1
Site Activities and Investigation
Preliminary Closeout Report for Koppers Company, Inc., Oroville, California

Event	Date
ROD Amendment No. 1 issued for the Site, changing the soil remedy to an onsite landfill. Cell No. 2 was constructed and partially filled (completed in 2002).	August 1996
Former creosote pond was excavated to 14 feet below ground surface (bgs) (approximately 11,216 cy of soil). Soil placed in Cell No. 2.	1996
Excavated pole washer area (Area 5) to depths of up to 20 feet bgs, 4,830 cy removed. Backfilled with plastic, low-permeability soils beneath and coarse, gravelly onsite soils on top.	September 1997
First five-year review completed. Remedy deemed protective.	December 1997
Excavated former cellon blowdown area to 10 feet bgs (approximately 11,130 cy of soil).	1997
Implemented onsite enhanced PCP bioremediation program in the eastern part of the On Property PCP plume.	March 1998
Restriction for domestic drinking water for 26 residences removed.	April 1998
Implemented Off Property ground water PCP in situ bioremediation program.	August 1998
ROD Amendment No. 2 issued, modifying the ground water remedy to provide for: (1) 4-acre Technical Impracticability (TI) Zone; (2) adding enhanced in situ bioremediation to the remedy; (3) providing monitored natural attenuation as a contingency remedy; and (4) ground water standards changed for PCP (1 part per billion [ppb]) and barium (1,000 ppb).	September 1999
KII ceased operations and began work on RCRA closure, overseen by Department of Toxic Substances Control (DTSC).	March 2001
Restriction for domestic drinking water for one residence removed (seven remaining).	April 2001
In situ bioremediation for polynuclear aromatic hydrocarbons (PAH) in the area of the former creosote pond was terminated at the request of Beazer, because additives apparently resulted in increased mobility of PAHs.	June 2001
Pre-final site inspection. Soil removal completed. Approximately 40,000 cy of material removed from former process areas and new Dri-Con source site.	September 2002
Beazer purchased Site property from KII.	November 2002
Second Five-year Review completed. Remedial actions were deemed protective.	February 2003
Consent Decree amended (incorporated land use covenants restricting access to ground water. The Consent Decree was signed by Region 9 Division Director in June 2003.).	June 2003

2.1.4 Site Discovery and Remedial Activities

PCP-contaminated ground water was first identified On Property in 1971 and identified the following year Off Property in residential drinking water supply wells to the southwest of the Site. In 1973, KCI installed a biological wastewater treatment unit for all process residuals, thereby ceasing discharge to the unlined areas. In 1974, KCI installed and began operating two ground water recovery wells (RW-1 and RW-2). Ground water was extracted from these wells and discharged On Property via irrigation (spray fields) to inhibit plume migration. The RWQCB issued a cease-and-desist order to KCI in 1982, directing KCI to end discharge of PCP into the soil and prepare a work plan detailing: (1) activities to mitigate damage caused by offsite contaminants to the southwest; (2) process changes needed to prevent additional contamination; and (3) alternatives for treating excavated soils. In 1984,

KCI began supplying bottled water to 45 residences and completed a Phase I and Phase II hydrogeologic ground water investigation. Results indicated a plume of PCPs, PAHs, and IPE moving southwest.

In 1984, the Site was placed on the NPL, and the following year ground water monitoring was initiated at the Site. During 1986, KCI signed a Consent Order with the U.S. EPA, agreeing to conduct the RI/FS. Downgradient residences with PCP-affected drinking water supply wells were connected to the Oroville-Wyandotte Irrigation District in 1986. The 1987 fire at the Site resulted in the U.S. EPA issuing a unilateral removal order for the cleanup, removal, and stabilization of impacted soils. A temporary cap was constructed over the process area in 1987 to protect workers from potential exposure to dioxins and furans that may have been created during the fire. In 1992 concrete drip pads were installed to prevent spills from ongoing operations in the vicinity of the chemical cylinders.

The remedial investigation and endangerment assessment were completed in 1988 (Dames and Moore, 1988). Later that year, Beazer sold the Site to KII, yet Beazer retained all CERCLA responsibilities. During 1989, the FS was completed, followed by the ROD. Beazer signed a Consent Decree in 1992, agreeing to perform remedial action under Superfund at the Site. The property owner, KII, continued to operate the wood treating facility under RCRA requirements.

2.1.5 Remedies Selected

This section presents a summary of the remedies selected for the Site and an overview of ROD and post-ROD activities. The document that governs these activities is the Consent Decree for Remedial Action at the Site (between U.S. EPA and Beazer, signed February 1992.) The Consent Decree Amendment was signed by the EPA Region 9 Division Director in June 2003, and includes land use covenants that restrict access to ground water. The selected remedies, as stated in the ROD and ROD Amendments, are intended to reduce contamination to health protective levels consistent with potential future industrial exposure.

Summary of 1989 ROD. The potentially responsible parties completed an FS of the Site in 1989. The U.S. EPA used the results of this study to select methods for addressing contamination, specifically principle public health and environmental threats resulting from historical Site operations. The actions selected were to address both the contaminated soils and ground water. The major components of the selected remedy included the following:

- Removing and treating contaminated ground water with a carbon adsorption process to restore ground water to drinking water standards.
- Treating the contaminated soil in place (proposed treatment technologies included soil washing, soil fixation, and bioremediation), at the time of the ROD, this excluded soil within the wood-treating process area, which was to be addressed when the area became accessible, preferentially when operations ceased at the Site.
- Capping the wood treating area.
- Providing a permanent water supply of sufficient volume to those residents with contaminated wells until remedial objectives are met.
- Discharging treated ground water to the aquifer.

Summary of Explanation of Significant Difference. The Explanation of Significant Difference (ESD) was prepared for U.S. EPA in January 1991, to supplement the 1989 ROD. The ESD specified that the existing remedial objectives for soil remain in effect for surface soils down to a total depth of 5 feet bgs only, unless excavation deeper would prevent extending appreciably the groundwater remedy. This conclusion was based upon the evaluations presented in the *Revised Leachability and Degradation Study*, which recommends that the subsurface soils (soils between 5 feet bgs and the water table) impacts be controlled as potential sources of additional ground water impacts.

Summary of Soil Removal Action. While conducting the field bioremediation treatability study in 1993, PCDDs/PCDFs (dioxins) above industrial standards for workers, as per the 1989 ROD, were detected in onsite surface soils. U.S. EPA ordered a soil removal action for these soils and those from the former pole wash area and required that the soil be excavated and disposed onsite in Cell No. 1.

In August 1995, soil disposal Cell No. 1 (RCRA-designated Class I landfill) was constructed On Property. The landfill was double-lined with 60-milliliter flexible membrane and equipped with leachate monitoring equipment and an unsaturated-zone monitoring apparatus.

Summary of ROD Amendment No. 1-Soil. The original selected remedy for soil was to treat in place, and the following technologies were investigated and found not to be effective or acceptable as a selected remedy:

- A treatability study for soil washing was conducted in 1992 to 1993 for Unit S2. Soil washing was found to be ineffective at treating all ROD constituents to meet ROD standards, and left residuals in soil wash water that were not treatable.
- A soil fixation treatability study was completed in 1994 for Unit S4. Soil fixation failed to successfully reduce the leachability of PAHs and PCP on a consistent basis.
- Laboratory soil bioremediation treatability studies of cancerous PAHs and PCPs were completed during 1992 and 1994 for Unit S1. Although soil bioremediation was shown to enhance the biodegradation of PCP, it was ineffective in treating PCDD/PCDF.

Results from the treatability tests for soils showed that ROD-selected technologies were not capable of reducing contaminant levels to less than ROD-selected standards for residential land use, particularly given the widespread dioxin contamination discovered in 1993. ROD Amendment No. 1 was issued for the Site in August 1996, revising the original ROD soil remedy. The amendment changed the soil remedy to an onsite landfill and revised soil cleanup standards from residential to industrial, thus requiring deed restriction on the property. Onsite soil disposal Cell No. 2 was constructed (also a RCRA-designated Class I landfill). Cell No. 2 was filled with 146,930 cy of material from 1996 to 2002 (see Table 2).

ROD Amendment No. 1 also addressed the following areas not included in the 1989 ROD:

- Drums of debris from the 1987 fire
- The soil filter bed of the biological treatment unit
- Sediments in the fire pond

Figure 3 shows the disposal cell locations and areas of site remediation.

Summary of ROD Amendment No. 2-On Property and Off Property Ground Water.

On Property. A product recovery well, PR-1, was installed adjacent to the former creosote pond in Unit S2 during 1994 for dense nonaqueous phase liquid recovery. While PR-1 accomplishes some mass removal, the viscous nature of the residual creosote prevents removal of appreciable quantities of material from the creosote pond and cellon blowdown area, where an estimated 1 million gallons of free creosote exists over an area of approximately 4 acres. Since 1994, PR-1 has removed 1,270 gallons of product and emulsion (TRC, 2003b).

ROD Amendment No. 2 was issued in September 1999, which modified the ground water remedy for On Property to provide for the following:

- A 4-acre TI Zone, including the area of the former creosote pond and cellon blowdown areas. The major components of the TI Waiver included: (1) sampling for chemicals of concern within the TI Zone and downgradient; (2) provision for future installation of a new well downgradient of the TI Zone for monitoring; and (3) continuation of product recovery at PR-1 and PAH in situ bioremediation at well BW-1 until the creosote recovery at well PR-1 is less than 1 gallon per year.
- Adding enhanced in situ bioremediation as a ground water remedy.
- Providing monitored natural attenuation as a contingency remedy.
- Revised ground water standards for PCP from 2.2 to 1.0 ppb and for barium from 680 to 1,000 ppb.

The ROD Amendment No. 2 stipulated the following for enhanced in situ bioremediation of PCP On Property:

- Nutrient addition (oxygen, nitrogen, and phosphorus) to onsite wells with downgradient monitoring.
- Continued operation of onsite ground water extraction and treatment system.
- Annually evaluate and enhance program accordingly.

Off Property. The ROD Amendment No. 2 stipulated the following for enhanced in situ bioremediation Off Property:

- Nutrient addition (oxygen, nitrogen, and phosphorus) to offsite wells with down-gradient monitoring.
- Annually evaluate and enhance program accordingly.
- Well RI-11 was proposed for nutrient addition; therefore, alternate water supply termination criteria were modified for wells 59, 60, 61, 62, and 81 (U.S. EPA, 1999). PCP verification sampling for these wells cannot take place until nutrient addition at RI-11 has ceased for 1 year to allow for the return of background levels. After this time, if PCP concentrations are less than 0.5 ppb for four consecutive quarters, then the use of the alternate water supply can cease.

2.2 Remedial Construction Activities

In response to and in compliance with the 1989 ROD, Consent Decree, ESD, and ROD Amendment Nos. 1 and 2, the following remedial construction activities have been conducted at the site.

2.2.1 Ground Water

On Property. Beazer constructed the On Property ground water remediation system and began treating ground water extracted from two wells, EW-1 and EW-2, in February 1994. Ground water is treated using air stripping and granular activated carbon. The system is designed to pump 200 gallons per minute (gpm) from each well for a combined capacity of 400 gpm. Treated ground water is reinjected into the aquifer through injection wells IW-3 and IW-4. The onsite ground water remediation system is currently operating and has treated more than 1.7 billion gallons of water to date (GeoTrans, 2003).

Ground water sampling for each contaminant of concern (COC) within the TI Zone and downgradient has continued both On Property and Off Property since 1985. Frequency of sampling is dependent upon the location and contaminant history. A new monitoring well downgradient of the TI Zone is proposed but has not yet been installed; and is not required until 1 year prior to the shutdown of the On Property treatment system.

The product recovery well PR-1 was installed in 1994, in response to Consent Decree requirements. The well is a passive recovery system installed in the center of the creosote dense nonaqueous-phase liquid. Through December 2002, 1,270 gallons of product and emulsion have been recovered (GeoTrans, 2003). Product recovery is continuing at PR-1 and monitored every 2 weeks.

Product recovery was augmented in July 1995 by in situ bioremediation. The intent was to remediate the aqueous-phase PAH impacts resulting from creosote in the saturated zone. The in situ bioremediation was discontinued in June 2001 because the treatment was found to increase the mobility of the PAHs. Currently, treatment in the TI Zone is to be reviewed annually for applicable new biotechnology.

The onsite in situ bioremediation program of the eastern PCP plume began in March 1998. Oxygen-releasing compounds and di-ammonium phosphate additions are made to monitoring wells MW-1, MW-4, MW-6, MW-12, MW-13, and MW-23 on a quarterly basis. Downgradient monitoring wells corresponding to these in situ bioremediation locations are MW-3, MW-5, MW-7, MW-8, and TW-1. Figure 4 shows the extent of the current onsite PCP plume.

The TI Waiver was presented in ROD Amendment No. 2 in September 1999. The TI Waiver states the following will apply to the On Property Pump and Treat (P&T) facility (located downgradient of the TI Zone) once the ground water outside the TI Zone is remediated:

- Six months prior to placing the P&T facility on standby reserve, a detailed contingency plan will be submitted to the U.S. EPA for approval.

- The TI Zone contingency plan will describe activities necessary to maintain the On Property P&T facility in good working order with the ability to resume normal operations within 1 month of determination that any COC is leaving the TI Zone (P&T operations must resume if 95 percent of the upper confidence limit of the mean for four consecutive sampling events for a COC exceeds the ROD standard).

ROD Amendment No. 2 also approved monitored natural attenuation (MNA) as a contingency on the basis of the following criteria:

- The intended effects of enhanced in situ bioremediation, a reduction of PCP concentrations in ground water to below the ROD standard, are not adequately achieved.
- If other active restoration measures are proven not necessary.
- Site data indicate that PCP degradation is occurring.
- Within a reasonable timeframe, natural attenuation is expected to achieve cleanup levels similar to that of a treatment remedy.

These criteria have not been met; therefore, MNA has not been implemented at the site.

Performance and results of the enhanced in situ bioremediation program are reported annually in the Annual Remedial Action Ground Water Monitoring Report, and future recommendations are provided. Hydrographs presented for onsight wells in monitoring reports show PCP concentrations declining or remaining constant for all downgradient wells except MW-2.

During the final soil cleanup of process Area 8C, boron and PCP were released to the ground water beneath the former Dri-Con/CCA Area. This release has impacted the ground water near and downgradient of the former Dri-Con Area. MW-8 is located approximately 200 feet downgradient of the Dri-Con Area. Boron and PCP concentrations in samples from MW-8 have been as high as 12,000 micrograms per liter (µg/L) and 1,100 µg/L, respectively (collected April 2002). As of July 2003, the boron and PCP concentration in samples from MW-8 had decreased to 1,530 µg/L and 250 µg/L. MW-8 is sampled on a monthly basis. Figure 5 shows the current extent of the plume.

The current approach to maintain the ROD standard for boron is to pump MW-8 at a rate of approximately 35 gpm and add that flow to the treatment plant influent from extraction wells EW-1 and EW-2 for a total flow of 400 to 435 gpm. The combined influent is then treated for PCP and is diluted to below the ROD standard of 1,200 µg/L prior to reinjection at upgradient wells IW-3 and IW-4. This reinjection is approved by the state RWQCB.

The extent of the boron and PCP resulting from the 2001 release is relatively limited. Other On Property wells have shown a consistent decrease in PCP concentrations. Off Property wells are consistently below 20 µg/L for PCP (with the exception of well 86). It is anticipated that the On Property ground water cleanup completion will take significantly longer than the Off Property. Upon completion of Off Property and On Property ground water cleanup, DTSC will assume the role of oversight for long-term operations and maintenance (O&M).

Off Property. Beazer continues to provide an alternate water supply for seven affected residences. Five residences have impacted wells near the residual Off Property plume

(wells 59, 60, 61, 62, and 81), and two residences are near monitor well 86 (31C2 and 31D3), which has shown periodic PCP readings. In situ bioremediation is being used to remediate the residual Off Property ground water plume. Monitoring is being conducted for comparison against ROD-selected standards to gauge remedial performance.

The Off Property ground water remedial system began operation in March 1993. This system includes two extraction wells, EW-3 and EW-4, designed to pump at 300 gpm each for a combined capacity of 600 gpm. Ground water was filtered and treated with granular activated carbon to remove PCP and other ROD constituents. During operation, the remediation system extracted 626,578,940 gallons (Geo Trans, 2002). This system was taken offline in December 1995, as the original plume retreated north of the Off Property capture zone.

The revised offsite in situ bioremediation program began in August 1998. Thirteen additions of oxygen-releasing compounds and di-ammonium phosphate have been made to wells 26, RI-11, and RI-20A. Downgradient monitoring points corresponding to these locations include RI-2, RI-10, RI-12, and RI-16B. With exception of well 86, located just south of the On Property boundary along Bagget Marysville Road, PCP readings continue to decline. Figure 6 shows the extent of the current Off Property PCP plume.

Well 86 is subject to periodic detections of PCP ranging as high as 100 µg/L. The source PCP and transport mechanism for this PCP is not clearly understood, but appears to be related elevated water levels in the A-zone. Water level data indicate that well 86 is located within the capture zone of EW-2. No PCP has been detected in downgradient well 31C1, which further suggests the PCP is being captured. The current approach is to monitor both well 86 and downgradient well 31C1 on a quarterly basis until PCP concentrations decline at well 86 for a minimum of 1 year. At that time, this approach will be re-evaluated.

2.2.2 Soil

In compliance with ROD Amendment No. 1, all excavations have been completed, including the former process area. Soil excavation for Cell No. 2 commenced in 1996 and was completed in September 2002 when process Area 8C became available after the facility closure. All excavated soil was disposed of in Cell No. 2, and the final cap was constructed in accordance with approved work plans. Table 2 summarizes soil removal and remedial actions from 1995 to 2002.

2.2.3 Institutional Controls

As part of the selected remedy stated in ROD Amendment No. 2 for this Site, implementation of institutional controls is required to prevent exposure to principal threat contamination remaining in the TI Zone. These institutional controls are to be implemented by Beazer, with input from the U.S. EPA and the DTSC through a land use covenant deed, which will restrict the entire site to industrial use and prohibit drilling of wells within the TI Zone for purposes other than monitoring or remedial activities. Use of ground water within the TI Zone would be prohibited except for wood-treating operations. Future land use will be limited to industrial uses only.

These institutional controls have not yet been implemented. The language of the deed restriction has been approved by DTSC, and is to be implemented by the 2003 amended

Consent Decree between Beazer and the U.S. EPA. Completion is expected by December 2003.

TABLE 2
Summary of Soil Removal and Remedial Actions from 1995 to 2002[a]
Preliminary Closeout Report for Koppers Company, Inc., Oroville, California

Area	Description	Soil Removal Period	Approximate Volume of Soil Removed (cy)	Location of Soil Disposal
Removal Action (Part of 5 and 7e)	Part of Former Pole Washer Area and Former Log Drying Area	1995	13,000	Cell No. 1
1	Former Biological Treatment Facility	1996	21,000	Cell No. 2
2	Soil Storage Building	1996	3,100	Cell No. 2
3	Fire Debris Storage Area	1996	600	Cell No. 2
4	Former Creosote Pond and Cellon Blowdown Area	1996 to 1997	20,500	Cell No. 2
5	Former Pole Washer Area (remainder)	1997	4,830	Cell No. 2
6A	Former Drip Track Area	1997	15,200	Cell No. 2
6B	Former Drip Track Area	1997		Cell No. 2
7A	Former Log Drying Area	1997	28,300	Cell No. 2
7B	Former Log Drying Area	1997		Cell No. 2
7C	Former Log Drying Area	1996 to 1997		Cell No. 2
7D	Former Log Drying Area	1997		Cell No. 2
7E	Former Log Drying Area (remainder)	1997		Cell No. 2
8A	Former Process Area	1997	41,000	Cell No. 2
8B	Former Process Area	1997		Cell No. 2
8C	Former Process Area	1997 and 2002		Cell No. 2
8D	Former Process Area	1997		Cell No. 2
9	Fire Water Pond	1997	3,600	Cell No. 2
10	Biological Test Plots	1997	1,800	Cell No. 2
	Dri-Con Area	2002	6,000	Cell No. 2
	Miscellaneous Materials from KII RCRA Closure	2002	1,000	Cell No. 2
	Total		159,930[b]	13,000 cy in Cell No. 1 146,930 cy in Cell No. 2

[a]TRC 1999, and personal communication 2002.

[b]Volumes are estimated, based on load counts from each soil removal area.

2.2.4 Redevelopment Potential

A portion of the property (205 acres) that has been remediated is currently for sale. It is zoned as industrial and may be divided into multiple parcels. Amenities include electrical power, a city water supply, and two existing buildings, an office and a warehouse with railway access.

The potentially responsible party intends to develop the Site as an industrial park and/or trucking facility over the next few years using state tax incentives for the Oroville area.

3.0 Demonstration of Cleanup Activity Quality Assurance and Quality Control

Activities at the Site were performed in accordance with the requirements of the ROD, ROD Amendments, and Consent Decree, and with RD plans and specifications. The RD Report includes a Quality Assurance Project Plan that incorporates U.S. EPA quality assurance and quality control (QA/QC) procedures and protocol. U.S. EPA analytical methods were used for all samples collected during remedial action activities and for data validation. Reports detailing construction of Cell 2, demolition, soil removal and backfill activities have been prepared by TRC (Beazer's consultant) and submitted to U.S. EPA. The most recent report was submitted in January 2003 (TRC, 2003).

The typical procedures used to assure quality for the ground water remediation and soil removal activities documented in this and other reports are as follows:

- Preconstruction meetings and overview of construction requirements.
- During construction activities, routine observation/inspection and audits by TRC and Beazer representatives to assure conformance to the Construction QA Plan and the Quality Assurance Project Plan.
- Weekly meetings attended by representatives from Beazer, KII, Envirocon, SESI, and TRC.
- Meetings, as needed, particularly for problem resolution and communication of project requirements to other parties.
- Interface and updates to regulatory personnel.
- Routine interface and updates to Beazer personnel.
- Routine interface between the design engineers and construction management team for clarification and/or other variances.
- Field documentation.
- Periodic status review meetings between representatives from regulatory agencies, Beazer, TRC, and other consultants, as appropriate.
- Validation of analytical results.
- Preparation of monthly status reports, monthly discharge reports, and semi-annual and annual ground water monitoring reports.

The final soil removal and cleanup of Area 8C, completed by KII, was a RCRA closure that occurred between summer 2000 and summer 2003. In California, RCRA authority is delegated to the state (DTSC) and employs a self-monitoring approach. DTSC was provided with a copy of the RCRA closure work plan and its subsequent revision.

Independent QA activities were performed by TRC. Complete reports and work plans documenting all procedures used to verify construction activities were performed in accordance with approved specifications and ROD standards. QA activities are recorded in the following documents:

- *Closure Report for the Former Biological Treatment Facility, Koppers Company, Inc., Superfund Site, Feather River Plant, Oroville, California* (TRC, 1997a).
- *Revised RD/RA Workplan for the Expanded Phase Soil Remedy, Koppers Company, Inc., Superfund Site, Feather River Plant, Oroville, California* (TRC, 1997b).
- *Soil Removal Addendum No. 6 - Remaining Shallow Soils Areas, Koppers Company, Inc., Superfund Site, Feather River Plant, Oroville, California* (TRC, 1997).
- *Construction Documentation and Closure Report for Cell No. 2 and Associated Soil Removal Activities, Volume 1 of 3, Koppers Company, Inc., Superfund Site, Feather River Plant, Oroville, California* (TRC, 1999).
- *Soil Remediation Work-Plan Dri-Con/CCA Area, Koppers Company, Inc., Superfund Site, Feather River Plant, Oroville, California* (TRC, 2002).
- *Construction Documentation and Closure Report for Cell No. 2 and Associated Soil Removal Activities, (2002 Addendum), Koppers Company, Inc., Superfund Site, Feather River Plant, Oroville, California* (TRC, 2003).
- *Annual GW Monitoring reports for MW under Cell Nos. 1 and 2. 1995 through 2001 (submitted to date).*

Health and safety protocols were performed in accordance with the Site Health and Safety Program (Dames and Moore, submitted to the U.S. EPA on November 29, 2001.) and other addenda to the Health and Safety Program such as Dust Monitoring Revision 1.0 (TRC, 1997).

4.0 Activities and Schedules for Site Completion

The activities that remain to be completed for the Site are summarized in Table 3.

5.0 Summary of Remediation Costs

The total cost of the selected remedy as of 2003 is approximately $43.2 million. Estimated costs are as follows:

1989 ROD estimated capital O&M	$77.7 million
Total RA cost to PCOR	$43.2 million
Current estimate annual O&M	$230,000

TABLE 3
Completion Schedule
Preliminary Closeout Report for Koppers Company, Inc., Oroville, California

Task	Estimated Date of Completion	Responsible Organization
Deed restrictions: a legal description of the site and the interior areas to be restricted are required and the deed restrictions must be recorded	December 2003	Beazer
Annual review of current On Property and Off Property programs and applied technologies for ground water remediation	April 2004	U.S. EPA, Beazer
Prepare Third Five-Year Review	February 2008	U.S. EPA
Final RA complete report	December 2024	U.S. EPA
Final Close-out Report	December 2024	
Deletion from NPL	September 2025[a]	U.S. EPA

[a]Ground water completion estimate.

6.0 Five-Year Review

CERCLA requires that statutory five-year reviews be conducted at the Site if upon completion of the remedial action, hazardous substances, pollutants, or contaminants will remain onsite above levels that will prevent unlimited an unrestricted exposure. The Site is restricted for industrial use and a TI waiver was granted in 1999 for four of the sites 205 acres requiring five-year review of the remedy protectiveness.

Five-year reviews were completed in December 1997 and February 2003. Both five-year reviews concluded the remedy was protective. The next, or third, review is due February 2008.

7.0 Works Cited

Dames & Moore. 1996. *Soil Removal Action Closure Request, Koppers Company, Inc., Superfund Site*. August.

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Environmental Solutions, Inc. 1994. *Engineering & Design Report Onsite Soil Disposal Cell, Koppers, Company, Inc.* July.

GeoTrans. 2003. *Annual 2002 Remedial Action Groundwater Monitoring Report, Koppers Company, Inc., Superfund Site (Feather River Plant), Oroville, California.* April.

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TRC. 2003. *Construction Documentation and Closure Report for Cell No. 2 and Associated Soil Removal Activities, (2002 Addendum), Koppers Company, Inc., Superfund Site, Feather River Plant, Oroville, California.* January. April 2003 Addendum to Volumes 1, 2, and 3, due April 14, 2003.

TRC. 2002. *Soil Remediation Work-Plan Dri-Con/CCA Area, Koppers Company, Inc., Superfund Site, Feather River Plant, Oroville, California.* August.

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TRC. 1997. *Addendum to the Health and Safety Program – Dust Monitoring Revision 1.0.*

TRC. 1997a. *Closure Report for the Former Biological Treatment Facility, Koppers Company, Inc., Superfund Site, Feather River Plant, Oroville, California.* March.

TRC. 1997b. *Revised RD/RA Workplan for the Expanded Phase Soil Remedy, Koppers Company, Inc., Superfund Site, Feather River Plant, Oroville, California.* March.

TRC. 1997. *Soil Removal Addendum No. 6 - Remaining Shallow Soils Areas, Koppers Company, Inc., Superfund Site, Feather River Plant, Oroville, California*. June.

U.S. Environmental Protection Agency (U.S. EPA). 1999. *Amendment No. 2 to the Record of Decision for the Soil and Ground water Operable Unit, Koppers Company, Inc., Superfund Site, Oroville, California.* September 2

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8.0 Signature

Keith Takata 9-4-03

Director Superfund Division *Date*

U.S. ENVIRONMENTAL PROTECTION AGENCY

Superfund Information Systems

Contaminants of Concern at ARKWOOD, INC. (EPA ID: ARD084930148)

Back to the Profile for this Site

The data and content on this page were last updated on Thursday, August 15, 2013.

Cleanup Activities | Operable Units (OUs) | Site Contacts | Additional Site Documents | Other Names for this Site (Aliases) | Contaminants of Concern | GPRA Measures

The chemical substances (i.e., hazardous substances, pollutants, or contaminants) listed below were identified as contaminants of concern (COC) for the site. COCs are the chemical substances found at the site that the EPA has determined pose an unacceptable risk to human health or the environment. These are the substances that are addressed by cleanup actions at the site. Identifying COCs is a process where the EPA identifies people and ecological resources that could be exposed to contamination found at the site, determines the amount and type of contaminants present, and identifies the possible negative human health or ecological effects that could result from contact with the contaminants.

The contaminants of concern at this site are sorted below by contaminant name. You may also sort this list by the area of the site on which it is found, called operable units (OUs), or sort this list according to the media in which they were found (e.g. soil or ground water).

see the glossary for definitions of contaminated media and operable units (OUs) >>

CAS #	Contaminant Name	Contaminated Media	Area of Site Found (OU)	More Information
TBD-00000002	BASE NEUTRAL ACIDS	Soil	SITEWIDE (00)	
TBD-00000004	DIOXINS/DIBENZOFURANS	Soil	SITEWIDE (00)	
87-86-5	PENTACHLOROPHENOL	Ground Water	SITEWIDE (00)	ATSDR Profile
87-86-5	PENTACHLOROPHENOL	Soil	SITEWIDE (00)	ATSDR Profile

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About CAS

Chemical Abstracts Service (CAS) is a division of the American Chemical Society. CAS builds and maintains the largest and most current database of chemical substance information in the world. These chemical substances are labeled with CAS Registry Numbers® (CASRNs or CAS Numbers) and are used internationally as unique numeric identifiers for a single substance. They have no chemical significance and, because they are widely used, are a link to a wealth of information about

a specific chemical substance. They are provided here for reference purposes to hopefully aide you in researching the respective chemical. For more information, visit the CAS Web site. EXIT disclaimer

About ATSDR

The Agency for Toxic Substances and Disease Registry (ATSDR) is an agency of the U.S. Department of Health and Human Services. ATSDR is charged under the Superfund law (CERCLA) to assess the presence and nature of health hazards at specific Superfund sites, to help prevent or reduce further exposure and the illnesses that result from such exposures, and to expand the knowledge base about health effects from exposure to hazardous substances. ATSDR maintains a series of fact sheets and profiles about contaminants of concern commonly found at Superfund sites. Links to these resources are provided above when available. For more information, visit the ATSDR Web site. EXIT disclaimer

About EPA's IRIS

The Integrated Risk Information System (IRIS), prepared and maintained by the U.S. Environmental Protection Agency (U.S. EPA), is an electronic database containing information on human health effects that may result from exposure to various chemicals in the environment. IRIS was initially developed for EPA staff in response to a growing demand for consistent information on chemical substances for use in risk assessments, decision-making and regulatory activities. The information in IRIS is intended for those without extensive training in toxicology, but with some knowledge of health sciences. For more information, visit the EPA IRIS Web site.

About EPA's SRS

The Substance Registry System (SRS) is the Environmental Protection Agency's (EPA) central system for information about regulated and monitored substances. The system provides a common basis for identification of chemicals, biological organisms, and other substances listed in EPA regulations and data systems, as well as substances of interest from other sources, such as publications. The system does not provide health hazard information at this time. For more information, visit the EPA SRS Web site.

DISCLAIMER: Be advised that the data contained in these profiles are intended solely for informational purposes use by employees of the U.S. Environmental Protection Agency for management of the Superfund program. They are not intended for use in calculating Cost Recovery Statutes of Limitations and cannot be relied upon to create any rights, substantive or procedural, enforceable by any party in litigation with the United States. EPA reserves the right to change these data at any time without public notice.

Koppers Co., Inc. (Oroville Plant) Superfund Site in EPA Pacific Southwest Region 9 is considerably more contaminated than Arkwood, Inc. Superfund Site in EPA South Central Region 6 ever was...

...still I believe it can be instructive to compare these two sites, as they have many analogous aspects, including dioxin in the soils and PCP in the water.

Let's start at the same place for our comparison: the
Superfund Site Progress Profiles on Superfund Information Systems, for which website EPA Headquarters has ownership and responsibility.

Here's Arkwood first:

Superfund Information Systems: Site Progress Profile

US EPA Superfund Information Systems:... | EPA Region 6 (South Central) | ... | US EPA Superfund Information Systems:...

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arkwood epa

U.S. ENVIRONMENTAL PROTECTION AGENCY

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Superfund Site Progress Profile

ARKWOOD, INC. (EPA ID: ARD084930148)

This profile provides you with information on EPA's cleanup progress at this Superfund site. This information includes: Site Location, Cleanup Progress Summary, Cleanup Impact Summary, Contamination, and Cleanup Progress. Please use the links and the "More Details..." box to find more details on this site.

The data and content on this page were last updated on Wednesday, August 21, 2013.

More Details...

- More In-Depth Site Details (EPA Regional Content)
- Site Contacts (EPA Cleanup Managers, etc.)
- Additional Site Documents
- Other Names for this Site (Aliases)
- View GPRA Measures at this Site (see glossary)

1

Site Location

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Site Address: S. OF CITY @ CRICKETT RR JUNC.
OMAHA, Arkansas
72662

County: BOONE

Cleanup Progress Summary

Construction Complete

Physical cleanup activities have been completed.

view detailed list of cleanup activities at this site >>

The National Priorities List (NPL) is the list of the most hazardous sites across the U.S. and its territories.

This site is on the NPL and is known as a Final NPL site (see glossary).

Potentially Responsible Parties (PRPs) were involved in the cleanup effort (see glossary).

Superfund law requires that EPA give communities information about site progress and plans so that they can be actively involved in site cleanup decisions. Learn more about

Cleanup Impact Summary

At each site, EPA assesses the risk to humans and the environment and determines the best approach to address the risk. During initial site studies and cleanup, EPA determines if current human exposures to contaminants are under control and takes actions to control any possible human exposures until cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.

OK **Current human exposures at this site are under control**

see glossary definition for "Human Exposure Environmental Indicator Measure." >>

At each site with known ground water contamination, EPA documents whether ground water contamination is below protective risk-based levels or, if not, whether the migration of contaminated ground water is stabilized.

OK **Contaminated ground water migration is under control**

Find: penta | Next | Previous | Highlight all | Match case

ts > ARKWOOD, INC.

click on this and...

More Details...

Site
the links

More In-Depth Site Details (EPA Regional Content)
Site Contacts (EPA Cleanup Managers, etc.)
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Other Names for this Site (Aliases)
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nmary

Cleanup Impact Summary

At each site, EPA assesses the risk to humans and the environment and determines the best approach to address the

...and the public user is taken to...

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Arkwood's Superfund Site Progress Profile found at

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--- is a dead end ---

Now to the Superfund Site Progress Profile for Koppers (Oroville Plant) found at

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--- same starting point for the public ---

Superfund Information Systems: Site Progress Profile

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Superfund Site Progress Profile
KOPPERS CO., INC. (OROVILLE PLANT) (EPA ID: CAD009112087)

This profile provides you with information on EPA's cleanup progress at this Superfund site. This information includes: Site Location, Cleanup Progress Summary, Cleanup Impact Summary, Contamination, and Cleanup Progress. Please use the links and the "More Details..." box to find more details on this site.

The data and content on this page were last updated on Thursday, August 22, 2013.

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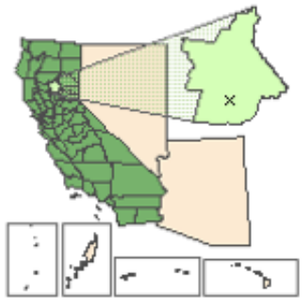
Site Location



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OROVILLE, California
95965

County: BUTTE

U.S. Congressional District: 01

Cleanup Progress Summary

Construction Complete

Physical cleanup activities have been completed.

view detailed list of cleanup activities at this site >>

The National Priorities List (NPL) is the list of the most hazardous sites across the U.S. and its territories.

This site is on the NPL and is known as a Final NPL site (see glossary).

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Superfund law requires that EPA give communities information about site progress and plans so that they can be actively involved in site cleanup decisions. Learn more about community involvement at this site >>

Cleanup Impact Summary

At each site, EPA assesses the risk to humans and the environment and determines the best approach to address the risk. During initial site studies and cleanup, EPA determines if current human exposures to contaminants are under control and takes actions to control any possible human exposures until cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.

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see glossary definition for "Human Exposure Environmental Indicator Measure." >>

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OK **Contaminated ground water migration is under control**

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Koppers Co., Inc. (Oroville Plant)

EPA #: CAD009112087

State: California(CA)

County: Butte

City: Oroville

Congressional District: 02

Other Names: Koppers Company, Inc., Koppers Feather River Plant

Map this site in Cleanups in My Community

Bulletin Board

The Fourth Five Year Review is scheduled to be completed by September 2013.

Links

On this page

- Description and History
- Contaminants and Risks
- Who is Involved
- Investigation and Cleanup Activities
- Cleanup Results to Date
- Potentially Responsible Parties
- Documents and Reports
- Community Involvement
- Public Information Repositories
- Additional Links
- Contacts
- Progress Profile (EPA Headquarters)

Description and History

NPL Listing History

NPL Status: Final

Since 1948 until March 15, 2001, the 205-acre Koppers Company, Inc. (Oroville Plant) site was used to conduct wood treating operations to prevent wood deterioration by insects or fungi. Koppers purchased the plant from the National Wood

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...scrolling down this first page...

Superfund Site Overview Koppers Co., Inc. (Oroville Plant), Pacific Southwest, US EPA

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- Who is Involved
- Investigation and Cleanup Activities
- Potentially Responsible Parties
- Documents and Reports
- Community Involvement
- Additional Links
- Contacts
- Progress Profile (EPA Headquarters)

Description and History

NPL Listing History

NPL Status: Final
Proposed Date: 09/08/83
Final Date: 09/21/84
Deleted Date:

Since 1948 until March 15, 2001, the 205-acre Koppers Company, Inc. (Oroville Plant) site was used to conduct wood treating operations to prevent wood deterioration by insects or fungi. Koppers purchased the plant from the National Wood Treating Company in 1955 and closed the facility March 15, 2001. Chemical and waste water handling procedures and wood treatment and storage operations contaminated the soil and groundwater on and off site. Fires at the Koppers facility occurred in 1963 and 1987, causing increased contamination at the site. Groundwater, surface water, and soils on and off site were contaminated with pentachlorophenol (PCP) and other hazardous substances used in Koppers' wood treating activities. The contaminated groundwater is located beneath this site and off-property south of the Koppers site. In 1973, PCP was discovered in nearby residential wells that are used as a source of drinking water. In 1988, the Koppers Company, Inc. was bought by the parent company of Beazer East, Inc (BEI). BEI later sold the wood treating plants to Koppers Industries, Inc. (KII). After KII closed its wood treating operation in March 2001, KII resold the site back to BEI in November 2002. In November 2006, BEI sold all the 205 acre site exclusive of parcel #1 containing the site's contaminated soils consolidated into two RCRA landfills to Gold Line Express, Inc. of Woodland CA for development as an industrial park (see attached 49 lot parcel plan). BEI remains the recognized potentially responsible party provided the new owner complies with the insitutional controls contained in the deed restrictions. Approximately 10,650 people live within a three mile radius of the site. These people also depend on groundwater as their source of drinking water. The nearest downgradient private water supply well is just off-property to the south, and there are numerous private water supply wells within three miles of the site. Contamination of groundwater from site-related chemicals extends two miles to the south.

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Contaminants and Risks

Contaminated Media

- Groundwater
- Surface Water

Groundwater on property, contains pentachlorophenol (PCP), dioxins, furans, polycyclic aromatic hydrocarbons (PAHs), and heavy metals including copper, chromium, and arsenic. Off-property downgradient groundwater contains PCP. Potential health risks include drinking contaminated groundwater, or excavating soil below five feet on site. An alternative drinking water supply was provided to residents with the potential for contaminated domestic groundwater wells.

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Who is Involved

This site is being addressed through Federal and potentially responsible parties' actions.

Top of page

Investigation and Cleanup Activities

This site is being addressed in three stages: 1. the consolidation of contaminated soil in two corrective action management units which has been completed, 2) contain contaminated groundwater and restore the aquifer using pump and treat technology augmented by nutrient addition to enhance natural biological degradation of the groundwater contamination which has is operating, and 3) monitor a technical impracticability waiver granted for a 4 acre on property area upgradient of the on-property pump and treat system.

Initial Actions

Initial Actions: An alternative water supply was provided by BEI to residents south of the site in areas of potential groundwater contamination since 1986. Between 1987 and 1988, the EPA directed the construction of a temporary chip seal cap over the contaminated soil in the process area. The cap functioned to stabilize the site and to prevent contact with contaminants after a fire spread hazardous substances. In 1994, the EPA directed BEI to build an on-site landfill for disposal of surface soils

Superfund Site Overview Koppers Co., Inc. (Oroville Plant), Pacific Southwest, US EPA

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Investigation and Cleanup Activities

This site is being addressed in three stages: 1. the consolidation of contaminated soil in two corrective action management units which has been completed, 2) contain contaminated groundwater and restore the aquifer using pump and treat technology augmented by nutrient addition to enhance natural biological degradation of the groundwater contamination which has is operating, and 3) monitor a technical impracticability waiver granted for a 4 acre on property area upgradient of the on-property pump and treat system.

Initial Actions

Initial Actions: An alternative water supply was provided by BEI to residents south of the site in areas of potential groundwater contamination since 1986. Between 1987 and 1988, the EPA directed the construction of a temporary chip seal cap over the contaminated soil in the process area. The cap functioned to stabilize the site and to prevent contact with contaminants after a fire spread hazardous substances. In 1994, the EPA directed BEI to build an on-site landfill for disposal of surface soils containing high levels of dioxins. The 15,000 cubic yard landfill Cell #1 was completed in 1995. Subsequent detailed investigations determined dioxin soil contamination was widespread preventing the planned soil remedies.

Cleanup Ongoing

Entire Site: The potentially responsible party for site contamination completed a study of the site in 1989. The EPA used the results of this study to select the following methods to address site contamination: removing and treating contaminated groundwater with a carbon adsorption process; treating the contaminated soil in place; capping the wood treating area; providing a permanent water supply to those residents with contaminated wells; and discharging treated groundwater to the aquifer. Two groundwater extraction and treatment systems were installed: one on-site (400 gpm system still operating) and one off-site (600 gpm system shutdown in Dec. 1995 when the plume retreated) using carbon absorption followed by recharge to the aquifer using injection wells. In 1989, the EPA selected three different treatment technologies to clean up approximately 335,000 cubic yards of contaminated soil. However, treatability tests conducted during the design phases showed that the selected technologies could not achieve cleanup goals for all contaminants. BEI initiated a focused feasibility study to evaluate other cleanup alternatives for soils in 1995. In August of 1996, a Record of Decision (ROD) Amendment #1 was issued changing the soil remedy to on-site landfilling of the remaining contaminated soils. ROD Amendment #1 changed the cleanup standard to industrial use and required deed restrictions to prohibit future residential development.

In September 23, 1999, the EPA issued a ROD Amendment #2 to modify the remedy to 1) provide for a Technical Impracticability Waiver due to Dense Non-Aqueous Liquid for 4 acres of the 200 acre site, 2) add enhanced in-situ bioremediation to the remedy, and 3) provide for Monitored Natural Attenuation (MNA) as a contingency remedy. A modification to the Consent Decree modification for ROD Amendments #1 and #2 was completed September 22, 2003. The land use covenant provision of the ROD restricting the site to industrial use and restricting access and use of groundwater under the site were recorded with the Butte County Recorder on November 12, 2003.

Koppers Industries, Inc. closed the wood treating facility in March 15, 2001 and completed its Resource Conservation and Recovery Act (RCRA) closure under State of California oversight July 2002. Remediation of the area beneath the process area became accessible after the RCRA closure. Final soil remediation was completed in September 2002.

With soil remediation complete and groundwater contamination under control a Preliminary Closeout Report was issued September 4, 2003. To review this preliminary report double click on its title below under Site Documents and Report section. A Final Closure Report cannot be issued until the groundwater aquifer has been restored to the cleanup levels specified in the ROD which will be some years in the future.

In 1982, the State issued two orders to Koppers to clean up contaminated soil and groundwater at the site. In 1986, the EPA and Koppers signed a Consent Order, which required the company to conduct a study into the nature and extent of contamination at the site. In December 1990, BEI signed a Consent Decree to perform the engineering design and cleanup activities at the site. An Explanation of Significant Differences was issued January of 1991 which limited soils cleanup to five feet unless a potential source to groundwater were found. In August of 1996, a ROD Amendment #1 was issued changing the soil remedy to an on-site landfill. In September 1999, a ROD amendment #2 was issued modifying the groundwater remedy to provide for 1) 4 acre Technical Impracticability Zone, 2) adding enhanced in-situ bioremediation to

Superfund Site Overview Koppers Co., Inc. (Oroville Plant), Pacific Southwest, US EPA

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engineering design and cleanup activities at the site. An Explanation of Significant Differences was issued January of 1991 which limited soils cleanup to five feet unless a potential source to groundwater were found. In August of 1996, a ROD Amendment #1 was issued changing the soil remedy to an on-site landfill. In September 1999, a ROD amendment #2 was issued modifying the groundwater remedy to provide for 1) 4 acre Technical Impracticability Zone, 2) adding enhanced in-situ bioremediation to the remedy and 3) providing MNA as a contingency remedy.

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Cleanup Results to Date

Groundwater

To prevent exposure to contaminated groundwater from domestic wells, city water was provided in 1986 to residents with potential for exposure and is paid for by BEI. As the off-property remediation has progressed the need for the alternative water supply program has been reduced from the original thirty-four (34) recipients to seven (7). The remaining seven (7) water supply recipients will continue to receive payment for alternative water supply usage until ROD standards have been met for their drinking water wells.

The off-property pump and treatment facility was taken off-line in December of 1995 as the plume degraded and no contaminants were being removed by the extraction wells. The treatment facility remains in reserve. The residual off-property plume is no longer being fed by contaminants on-property and is continuing to shrink. In August 1998 a pilot in-situ bioremediation program to assist in PCP degradation was initiated and incorporated into the remedy September 1999. The program was initiated with the addition of two nutrients (diammonium phosphate) and oxygen (magnesium peroxide) to three wells and monitoring at five wells. In the first quarter 2004 nutrient addition was reduced to adding only magnesium peroxide.

The on-property pump and treatment facility is still in operation preventing contaminated groundwater from moving off-property. In April 1998 a pilot in-situ bioremediation program was initiated on-property to degrade PCP and incorporated into the remedy in September 1999. The program initially added two nutrients (diammonium phosphate) and oxygen (magnesium peroxide) to six wells and monitoring at five wells. The magnesium peroxide addition was stopped the first quarter 2004. The PCP concentrations in the on-property wells are continuing to decrease. The on-property pump and treat facility will continue to operate until the ROD cleanup standards are meet and then will be held in reserve as long as the Technical Impracticability Waiver remains in effect.

March 8, 1999 BEI submitted a Final Evaluation of Technical Impracticability (TI) of Groundwater Restoration in the Former Creosote Pond and Cellon Blowdown Areas On-property. The TI waiver for the four acres was incorporated into the remedy with ROD Amendment #2 in September 1999. TI zone area and just downgradient is monitored for contaminant movement.

With the demolition of the wood treating facility in 2001 and 2002, boron was mobilized from the DriCon/CCA area and detected by monitoring well MW-8 above the action level. The downgradient on-property treatment plant does not treat for boron. MW-8 was converted to an extraction well to dilute the boron concentration to continue reinjection below the cleanup level. Boron readings are monitored at MW-8 and prior to reinjection for compliance with the ROD.

Soils

In 1987/88 a temporary chip seal cap was placed over the process area. In 1992, two concrete drip pads were installed in the process area to contain wood treating chemicals and prevent any further soil contamination. The cap and drip pads were demolished in 2002 as part of KII's facility closure. Two landfill cells were constructed for disposal of contaminated soils on site. Cell #1 (13,000 cubic yards) was completed in August 1995 as a Removal Action. Cell #2 (147,000 cubic yards capacity) was closed September 2002 with the completion of the soil remediation efforts for the site. 6,000 cubic yards of boron impacted soil was removed from the newly discovered Dri-Con/CCA source and placed in Cell #2 prior to its closure. With soil remediation complete and control of groundwater in place a Preliminary Closeout Report was issued for the site September 4, 2003. A land use covenant was recorded with the Butte County Recorder on November 12, 2003 restricting the site to industrial use and the access and use of groundwater under the site.

In November 2006, BEI sold all the 205 acre site exclusive of parcel #1 containing the site's contaminated soils consolidated into two RCRA landfills to Express, Inc. of Woodland CA for development as an industrial park (see attached 49 lot parcel plan).

The Third Five Year Review Report, completed in July 28, 2008, concluded that currently, all implemented remedies are found to be functioning as intended by the decision

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The Third Five Year Review Report, completed in July 28, 2008, concluded that currently, all implemented remedies are found to be functioning as intended by the decision document and, therefore, are protective of human health and the environment.

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Potentially Responsible Parties

Potentially responsible parties (PRPs) refers to companies that are potentially responsible for generating, transporting, or disposing of the hazardous waste found at the site.

As agreed to in the 1992 Consent Decree for the Koppers Site Remediation, Beazer East, Inc. is the PRP for the Koppers Site in Oroville.

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Documents and Reports

Administrative Records

Original AR - Part 1 (includes updates 1-3)

Original AR - Part 2 (includes updates 4-8)

Fact Sheets

03/01/99 EPA Proposes Groundwater Remedy Modification Plan

09/01/01 Koppers Superfund Site Update

08/01/02 EPA Starts Review of Cleanup at the Koppers Superfund Site and Koppers Site Map

08/01/03 EPA Requests Your Comments on Consent Decree Amendment

01/14/08 Koppers Co. Inc. Five-Year Review Fact Sheet

03/24/09 Koppers Co., Inc. Superfund Site Third Five-year Review Fact Sheet

Maps

08/01/02 Koppers Industries, Inc. Site Map August 2002

05/01/06 Oroville Industrial Park Layout

04/20/09 Koppers Site Plume Map - 1994 - 2007

Records of Decision

09/13/89 Entire Site ROD (9/1989)

01/29/91 Entire Site ESD (1/1991)

08/29/96 ROD Amendment #1 (1996)

09/23/99 Amendment #2 to the Record of Decision for Koppers Company, Inc.

Technical Documents

12/22/97 First Five Year Review (12/1997)

02/07/03 Final Second 5-Year Review Report for Koppers Company, Inc.

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02/07/03 Final Second 5-Year Review Report for Koppers Company, Inc.

09/04/03 Preliminary Closeout Report for Kopper Company, Inc.

11/28/06 Grant Deed

07/28/08 Third Five-Year Review 2008 -Final

03/01/09 Koppers Semiannual 2008 RA Groundwater Monitoring Report

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Community Involvement

Public Meetings:

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Public Information Repositories

The public information repositories for the site are at the following locations:

Butte County Public Library,
1820 Mitchell Ave.,
Oroville, CA 95965

Meriam Library,
California State University at Chico,
Chico, CA 95929-0295

The most complete collection of documents is the official EPA site file, maintained at the following location:

Superfund Records Center
Mail Stop SFD-7C
95 Hawthorne Street, Room 403
San Francisco, CA 94105
(415) 820-4700

Enter main lobby of 75 Hawthorne street, go to 4th floor of South Wing Annex.

Additional Links

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Contacts

EPA Site Manager			
Daewon Rojas-Mickelson	415-947-4191	Rojas-Mickelson.Daewon@epamail.epa.gov	US EPA Region 9 Mail Code SFD 75 Hawthorne Street San Francisco, CA 94105
EPA Community Involvement Coordinator			
Dana Barton	415-972-3087 1-800-231-3075	Barton.Dana@epamail.epa.gov	US EPA Region 9 Mail Code SFD 75 Hawthorne Street San Francisco, CA 94105
EPA Public Information Center			
	415-947-8701	r9.info@epa.gov	
State Contact			
DTSC - Sam V. Martinez, Jr.	916-255-6583	Sam.Martinez@dtsc.ca.gov	8800 Cal Center Drive Sacramento, 95826-3200
RWQCB - Phil Woodward			

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Dana Barton	415-972-3087 1-800-231-3075	Barton.Dana@epamail.epa.gov	US EPA Region 9 Mail Code SFD 75 Hawthorne Street San Francisco, CA 94105
EPA Public Information Center			
	415-947-8701	r9.info@epa.gov	
State Contact			
DTSC - Sam V. Martinez, Jr.	916-255-6583	Sam.Martinez@dtsc.ca.gov	8800 Cal Center Drive Sacramento, 95826-3200
RWQCB - Phil Woodward	530-224-4853		
PRP Contact			
Michael Tischuk	412-208-8809	tischuk@HansonLE.com	Beazer East, Inc.
Jennifer Abrahams	916-853-4526	Jennifer.Abrahams@tetratech.com	Tetra Tech
Community Contact			
Other Contacts			
After Hours (Emergency Response)			
US EPA	(800) 424-8802		

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Following pages are examples of the resources linked to from this first long page we just scrolled through:

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Koppers Co., Inc. (Oroville Plant)

Superfund Site

Original AR - Part 1 (includes updates 1-3)

Administrative Record Index

To request copies of administrative record documents, an electronic order form is available.

The documents contained in this administrative record file were used by the U.S. Environmental Protection Agency in identifying appropriate remedial activities for use at the Koppers Co., Inc. Superfund site in Oroville, California. These documents are available in the repositories at the Merian Library of Cal. State University at Chico, at Butte County Public Library in Oroville and in the Region 9 Superfund Records Center in San Francisco.
The Koppers administrative record includes an initial set of documents compiled in December 1988 and seven supplements, or additional sets of documents, added since that time. All of these documents have been microfilmed. A brief description of each of these groups of documents is provided below:

Group	AR Doc.#	Format	Description
Initial	1-376	microfilm	Arranged chronologically from 9/26/83 to 8/22/88, with undated documents at the end of the sequence.
Suppl.1	377-512	microfilm	Arranged chronologically from 4/7/86 to 8/29/89. The initial group and this supplement were the basis for the 1989 ROD as well as the actions taken in response to the 1987 fire at the site. Documents related to the post-fire removal action are indicated in the index by an(R) below each document number.
Suppl.2	513 & 514	microfilm	Consists of the 1989 Record of Decision (ROD) and the 1991 Explanation of Significant Differences (i.e., minor modifications to the ROD).
Suppl.3	515&516	microfilm	Includes the Consent Decree requiring Beazer East, Inc. to implement the 1989 ROD.
Suppl.4	517-737	microfilm	Post-ROD documents that support the March 1996 proposed plan
Suppl.5	738-750	microfilm	Post-ROD documents, including the Site-Wide Soils Remedy Report, that

...which goes on (definition of terms, handy)...

Superfund Site Document, Koppers Co., Inc. (Oroville Plant), Pacific Southwest, US EPA

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The administrative record file will continue to be added to as documents become available. It will be complete after public comments on EPA's Proposed Plan, EPA's response to comments, and the Record of Decision (ROD) are included.

List of Abbreviations and Acronyms Used in Administrative Record Index

ABBREVIATION	MEANING
ARAR	Applicable or Relevant and Appropriate Restriction (or Requirement)
ATSDR	Agency for Toxic Substances and Disease Registry
CA	State of California
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Superfund)
CRWQCB	California Regional Water Quality Control Board
DHS	Department of Health Services
D&M	Dames & Moore
DTSC	California Department of Toxic Substances Control
EA	Endangerment Assessment
EPA	Environmental Protection Agency
FOIA	Freedom of Information Act
FS	Feasibility Study or Forest Service
FSP	Field Sampling Plan
HRS	Hazard Ranking System
IPE	Isopropyl Ether
LDS	Leak Detection System
MSDS	Material Safety Data Sheets
NPL	National Priorities List
OU	Operable Unit
PAH	Polynuclear Aromatic Hydrocarbon
PCP	Pentachlorophenol
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RA	Remedial Action
RDRA	Remedial Design/Remedial Action
REM	Remedial Hazardous Site Engineering Management (type of contract)
REM/FIT	Remedial Hazardous Site Engineering Management/Hazardous Site Field Investigation Team (contract)
RI	Remedial Investigation
ROC	Record of Communication
ROD	Record of Decision

...and on...

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4/23/1986	Environmental Protection Agency - Region 9	Koppers Industries, Inc	Administrative order on consent #86-04	88056854
5/1/1986	Koppers Industries, Inc	-	Workplan for RI/FS Study	88056855
5/1/1986	Environmental Protection Agency	-	Fact sheet: EPA & Koppers agree on site investigation plan	88056856
5/1/1986	John Kemmerer / Environmental Protection Agency - Region 9	Thomas Hays / Koppers Industries, Inc	TL: w/o pre-printed pages of consent order	88057720
5/2/1986	Steven Trudell / Dames & Moore	Stephen Smith / Koppers Industries, Inc	Ltr: Transmits 16 copies of RI/FS workplan, w/o encls	88057721
5/7/1986	John Kemmerer / Environmental Protection Agency - Region 9	David Kerschner / Koppers Industries, Inc	Ltr: requests additional air quality monitoring	88057722
5/15/1986	Environmental Protection Agency - Region 9	-	Surface water & sediment sampling results w/attach map & memo analysing results	88056857
5/20/1986	Steven Trudell / Dames & Moore	John Kemmerer / Environmental Protection Agency - Region 9	Ltr: Revision #1, RI/FS workplan	88056858
5/22/1986	-	-	Questions & concerns raised at community meeting, reproduced from group memory	88057723
5/22/1986	Steven Trudell / Dames & Moore	John Kemmerer / Environmental Protection Agency - Region 9	Ltr: Initiation of field activities for RI/FS, schedule	88056798
5/29/1986	John Kemmerer / Environmental Protection Agency - Region 9	David Kerschner / Koppers Industries, Inc	Ltr: Asks Koppers to follow certain criteria in reporting analytical results from field activities at Koppers w/o attch	88057724
6/1/1986	John Kemmerer / Environmental Protection Agency - Region 9	David Kerschner / Koppers Industries, Inc	Ltr: Receipt of monthly status rpt	88057725
6/5/1986	Environmental Protection Agency - Region 9	-	Community work group mtg agenda	88057726
6/9/1986	Joe DeMartini / Woodward-Clyde Consultants	John Kemmerer / Environmental Protection Agency - Region 9	Ltr: Transmits final copies of audit plan and checklist forms, w/encls, memo to J DeMartini fr W Hansen 1/14/87 & photos	88056859
6/9/1986	Steven Trudell / Dames & Moore	John Kemmerer / Environmental Protection Agency - Region 9	TL: Revision #2 to RI/FS workplan	88057727
6/10/1986	Steven Trudell / Dames & Moore	John Kemmerer / Environmental Protection Agency - Region 9	TL: w/monthly status rpt for June, rpts initiation of RI/FS for Feather River plant	88057728
6/10/1986	Dames & Moore	Environmental Protection Agency - Region 9	Monthly status rpt for 5/86, w/TL to John Kemmerer fr Steven Trudell	88056799
6/12/1986	John Kemmerer / Environmental Protection Agency - Region 9	David Kerschner / Koppers Industries, Inc	Ltr: Comments on the content of Monthly Status Reports	88057685
6/17/1986	-	-	Community meeting notes on meeting held to accept written comments on RI/FS workplan for Koppers	88057729
6/19/1986	Ken Wells / Roy F Weston, Inc - Weston-SPER	William Lewis / Environmental Protection Agency - Region 9	Ltr: Koppers sampling w/attch data & photocopies of photos	88057730
6/20/1986	John Kemmerer / Environmental Protection Agency - Region 9	Thomas Hays / Koppers Industries, Inc	Ltr: Accounting of all response & oversight costs incurred by EPA	88057731
6/20/1986	Stephen Smith / Koppers Industries, Inc	John Kemmerer / Environmental Protection Agency - Region 9	Ltr: RI/FS quarterly groundwater monitoring rpt for 4/86, w/attchs	88056800
6/20/1986	Steven Trudell / Dames & Moore	John Kemmerer / Environmental Protection Agency - Region 9	Ltr: Monthly Status Report Information RI/FS: Projected sampling schedule w/attachment	88057686
6/23/1986	John Kemmerer / Environmental Protection	David Kerschner / Koppers Industries, Inc	Ltr: Describes what kind of validation criteria is	88057732

...and that's just Administrative Record index part 1 of 2 for the Koppers site; there are over 600 records available to peruse just on this one long page, part 1 of 2.

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Document Request Form

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Here are other examples of invaluable resources, all linked to from just that one Region 9 page shown above (slide 11) and accessible at:

http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/ViewByEPAID/cad009112087?OpenDocument

Koppers PCOR_text only-1.pdf (page 1 of 20)

Preliminary Closeout Report for Koppers Company, Inc., Superfund Site, Oroville, California

Prepared by

U. S. Environmental Protection Agency

September 2003

EPA Koppers Superfund Site

U.S. Environmental Protection Agency $ Region 9 $ San Francisco, CA $ January 2008

Five-Year Review Fact Sheet

This fact sheet provides an update of activities at the Koppers Industries, Inc. Superfund Site and also provides notice of the upcoming five-year review. It is being distributed to EPA's mailing list for the Koppers Site and other interested parties. If you are not on the mailing list and would like to be added, please contact one of the EPA staff listed at the end of this fact sheet.

Five-Year Review

The United States Environmental Protection Agency (EPA) is beginning the third five-year review for the Koppers Superfund Site in Oroville, CA and expects to complete the review in 2008. A five-year review is required by the Superfund law whenever the remedy for a site either leaves waste on site above levels that are safe for unrestricted use or will take longer than five years to reach cleanup goals. The purpose of the five-year review is to determine if the remedy is protective of human health and the environment.

For the Koppers site, the review is required because a) the soil cleanup goals were set at levels that allow for only commercial/industrial use (not residential use)

time. The groundwater treatment and soil consolidation remedies were found to be protective of human health and the environment. The second five-year review evaluated the remedies and any changes at the site that had taken place between December 1997 and February 2003. The review concluded that cleanup remedies remained protective of human health and the environment. The review noted that the deed restriction to prohibit residential use of the Koppers property was not yet in place; that action was completed in November 2003.

Remedy Selection for Koppers

A Record of Decision (ROD) for Koppers was signed in 1989 and has been amended twice, first in 1996 and

Koppers CD Aug_03 183k-1.pdf (page 1 of 5)

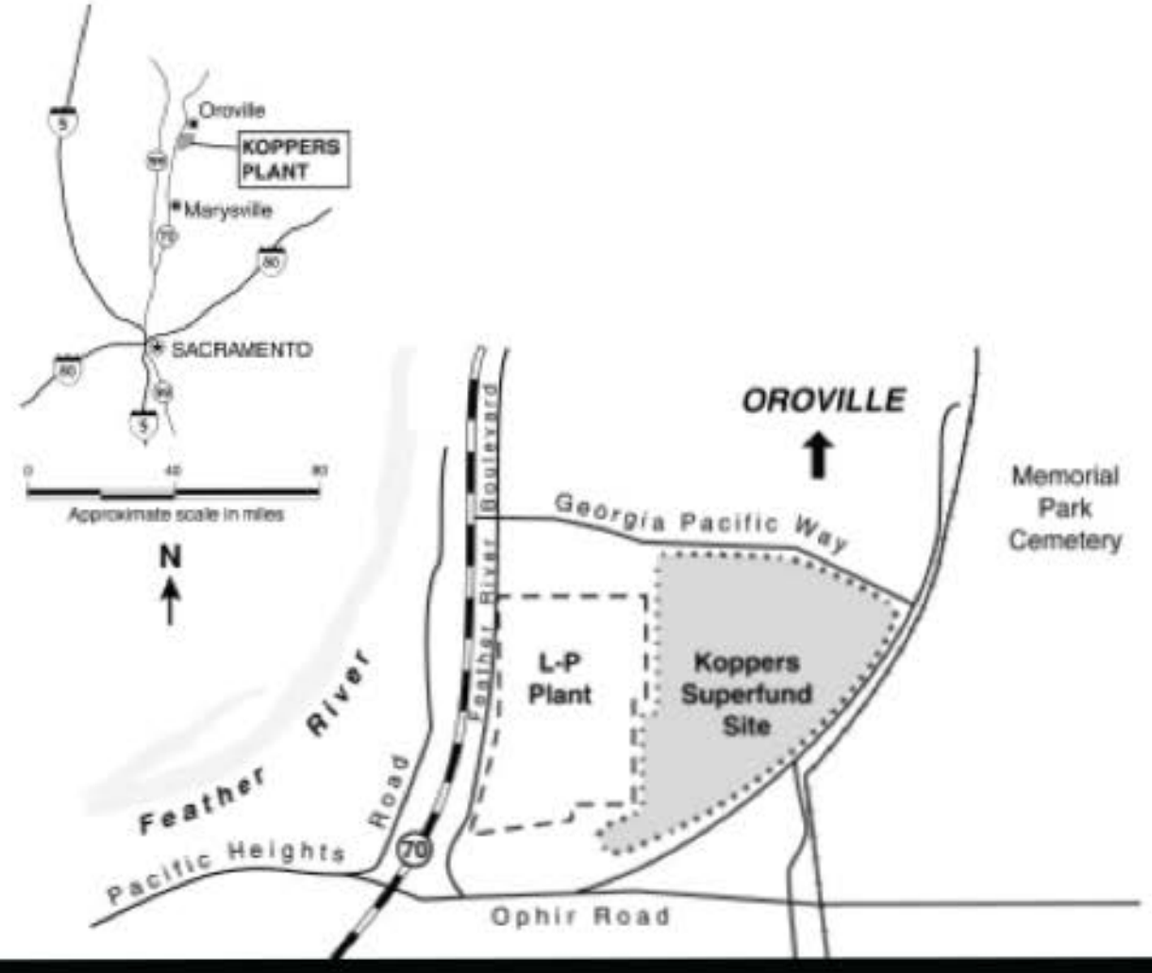
Koppers Co., Inc. Superfund Site Update

United States Environmental Protection Agency • Region 9 • August 2003

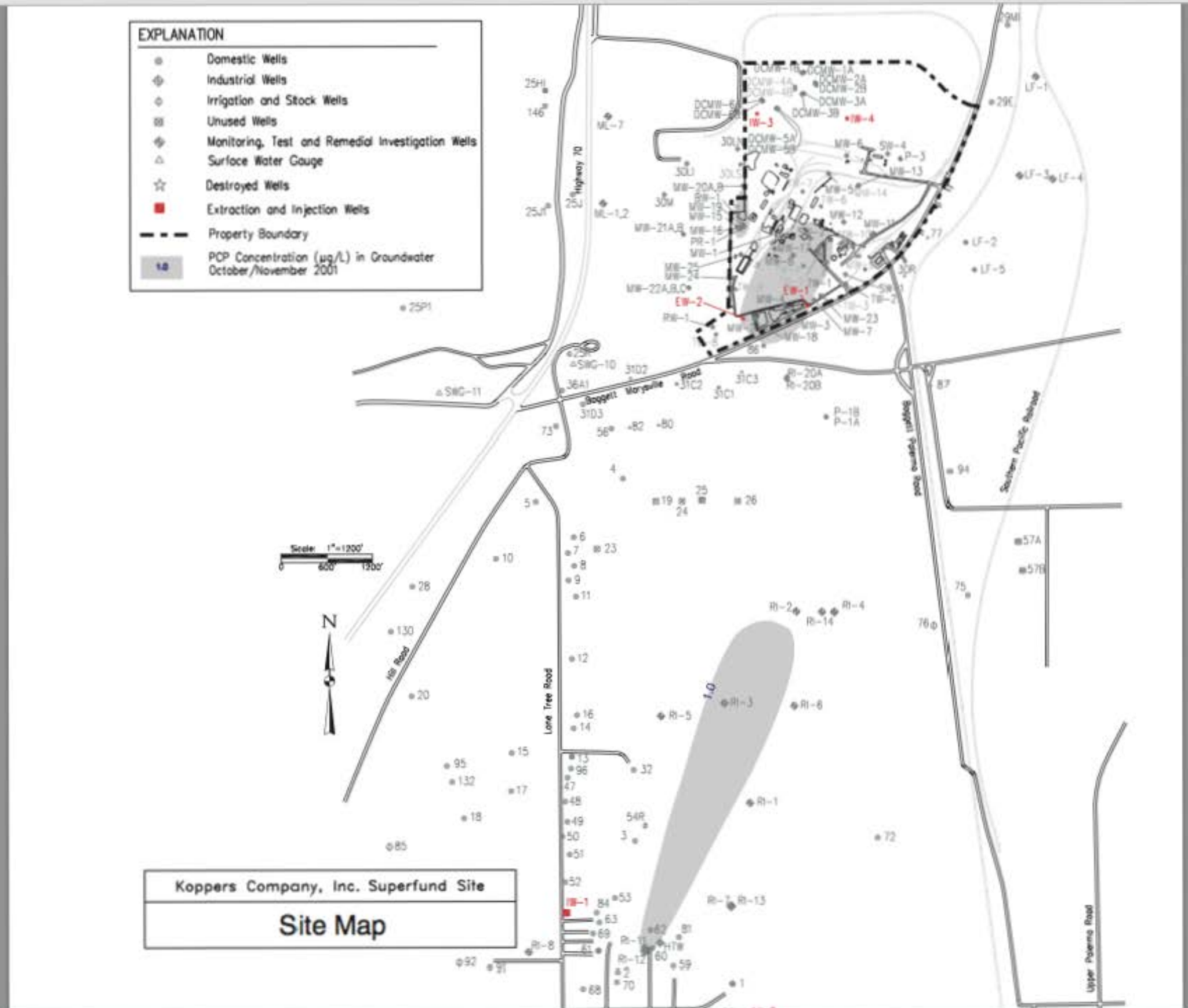
EPA REQUESTS YOUR COMMENTS ON CONSENT DECREE AMENDMENT

INTRODUCTION

The United States Environmental Protection Agency (EPA) invites the public to review and comment on a Consent Decree (CD) amendment concerning the cleanup of the Koppers **Superfund** site in Oroville, CA. The CD availability notice has been published in the Federal Register on **August 7, 2003.** In addition, the EPA has placed a notice in the City's local newspaper announcing the opening of the 30-day public comment period that ends on **September 7, 2003.** This fact sheet also gives an update on the soil and



KoppersSite Map01.pdf (1 page)



koppers entire site ROD-1.pdf (page 1 of 40)

EPA/ROD/R09-89/037
1989

EPA Superfund
Record of Decision:

KOPPERS CO., INC. (OROVILLE PLANT)
EPA ID: CAD009112087
OU 01
OROVILLE, CA
09/13/1989

koppers-1.pdf (page 1 of 12)

EPA KOPPERS SUPERFUND SITE

U.S. Environmental Protection Agency · Region 9
Oroville, California March 1999

EPA PROPOSES GROUNDWATER REMEDY MODIFICATION PLAN

INTRODUCTION

The United States Environmental Protection Agency (EPA) is requesting public comments on this Proposed Plan[1] to modify the groundwater remedy at the Koppers Company, Inc. Superfund site (Koppers site) in Oroville, CA (see Fig. 1, page 2). No change is being proposed to the soils remedy. Based on remedial action monitoring and treatability studies the EPA has concluded that modifying the pump and treat (P&T) groundwater remedy is appropriate to complete the remedy.

EPA's preferred modifications include 1) issuing a Technical Impracticability (TI) Waiver for the groundwater cleanup at the former creosote pond and cellon blown areas due to the presence of dense nonaqueous-phase liquids (DNAPL); 2) allowing

Proposed Plan highlights key information about the remedy alternatives considered for groundwater cleanup, potential human health risks posed by the contaminants, and the present extent of groundwater cleanup at the site.

The modification alternatives considered, and EPA's preferred alternative, are presented for public review and comment. The comment period is from March 15, 1999 to April 13, 1999. EPA invites the public to a meeting scheduled for March 23, 1999 where EPA will present the plan and receive verbal comments (See box below for more information).

The EPA's proposed remedy modifications are preliminary and the final decisions will not be made until all significant public comments are considered. After review and response to public comments, the remedy modifications chosen will be formalized in a document called Amendment #2 to the Record of Decision (Amend.#2ROD). The remedy modifications selected for Amend.#2ROD could differ from what is outlined here based on public comment.

PUBLIC COMMENT PERIOD AND COMMUNITY MEETING	
A 30-day public comment period	Where: Oakdale Heights School

I could go on, but I suggest EPA Region 6 Superfund management visit these websites personally to take a hard look at the Δ I point out between Region 6 standards for reporting, transparency and accountability compared to those upheld by Region 9 as presented in this example.

Thank you

Charles Curtis Grisham, Junior
grish@me.com

Koppers Co., Inc. (Oroville Plant) Superfund Site in EPA Pacific Southwest Region 9 is considerably more contaminated than Arkwood, Inc. Superfund Site in EPA South Central Region 6 ever was...

...still I believe it can be instructive to compare these two sites, as they have many analogous aspects, including dioxin in the soils and PCP in the water.

Let’s start at the same place for our comparison: the
Superfund Site Progress Profiles on Superfund Information Systems, for which website EPA Headquarters has ownership and responsibility.

Here’s Arkwood first:

Superfund Information Systems: Site Progress Profile

Superfund Information Systems:... | EPA Region 6 (South Central) | ... | Superfund Information Systems:...

cfpub.epa.gov/supercpad/cursites/csitinfo.cfm?id=0600124

arkwood epa

U.S. ENVIRONMENTAL PROTECTION AGENCY

Superfund Information Systems

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EPA Home > Superfund > Sites > Superfund Information Systems > Search Superfund Site Information > Search Results > ARKWOOD, INC.

- Superfund Site Information
- Site Documents
- Data Element Dictionary (DED)
- Order Superfund Products

Superfund Site Progress Profile
ARKWOOD, INC. (EPA ID: ARD084930148)

This profile provides you with information on EPA's cleanup progress at this Superfund site. This information includes: Site Location, Cleanup Progress Summary, Cleanup Impact Summary, Contamination, and Cleanup Progress. Please use the links and the "More Details..." box to find more details on this site.

The data and content on this page were last updated on Wednesday, August 21, 2013.

More Details...

- More In-Depth Site Details (EPA Regional Content)
- Site Contacts (EPA Cleanup Managers, etc.)
- Additional Site Documents
- Other Names for this Site (Aliases)
- View GPRA Measures at this Site (see glossary)

1

Site Location

Get an interactive map

EPA Region 6 >
Serving Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 66 tribes

Site Address: S. OF CITY @ CRICKETT RR JUNC.
OMAHA, Arkansas
72662

County: BOONE

Cleanup Progress Summary

Construction Complete

Physical cleanup activities have been completed.

view detailed list of cleanup activities at this site >>

The National Priorities List (NPL) is the list of the most hazardous sites across the U.S. and its territories.

This site is on the NPL and is known as a Final NPL site (see glossary).

Potentially Responsible Parties (PRPs) were involved in the cleanup effort (see glossary).

Superfund law requires that EPA give communities information about site progress and plans so that they can be actively involved in site cleanup decisions. Learn more about

Cleanup Impact Summary

At each site, EPA assesses the risk to humans and the environment and determines the best approach to address the risk. During initial site studies and cleanup, EPA determines if current human exposures to contaminants are under control and takes actions to control any possible human exposures until cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.

OK **Current human exposures at this site are under control**

see glossary definition for "Human Exposure Environmental Indicator Measure." >>

At each site with known ground water contamination, EPA documents whether ground water contamination is below protective risk-based levels or, if not, whether the migration of contaminated ground water is stabilized.

OK **Contaminated ground water migration is under control**

Find: penta Next Previous Highlight all Match case

ts > ARKWOOD, INC.

click on this and...

More Details...

Site
the links

More In-Depth Site Details (EPA Regional Content)
Site Contacts (EPA Cleanup Managers, etc.)
Additional Site Documents
Other Names for this Site (Aliases)
View GPRA Measures at this Site (see glossary)

nmary

Cleanup Impact Summary

At each site, EPA assesses the risk to humans and the environment and determines the best approach to address the

...and the public user is taken to...

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Superfund Site Overview Koppe... | EPA Region 6 (South Central) | ... | 404 Error Page | Region 6 | US ...

www.epa.gov/earth1r6/6sf/pdffiles/0600124.pdf

arkwood epa

EPA United States Environmental Protection Agency

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Last updated on 05/09/2012

Print As-Is

Last updated on 05/09/2012

Find: penta | Next | Previous | Highlight all | Match case

Arkwood’s Superfund Site Progress Profile found at

http://cfpub.epa.gov/supercpad/cursites/csitinfo.cfm?id=0600124

--- is a dead end ---

Now to the Superfund Site Progress Profile for Koppers (Oroville Plant) found at

http://cfpub.epa.gov/supercpad/cursites/csitinfo.cfm?id=0901135

--- same starting point for the public ---

Superfund Information Systems: Site Progress Profile

Superfund Site Overview Koppe... | EPA Region 6 (South Central) | ... | Superfund Information Systems:...

cfpub.epa.gov/supercpad/cursites/csitinfo.cfm?id=0901135

U.S. ENVIRONMENTAL PROTECTION AGENCY

Superfund Information Systems

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EPA Home > Superfund > Sites > Superfund Information Systems > Search Superfund Site Information > Search Results > KOPPERS CO., INC. (OROVILLE PLANT)

- Superfund Site Information
- Site Documents
- Data Element Dictionary (DED)
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click...

Superfund Site Progress Profile
KOPPERS CO., INC. (OROVILLE PLANT) (EPA ID: CAD009112087)

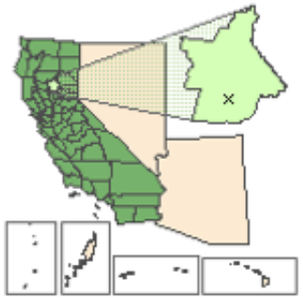
This profile provides you with information on EPA's cleanup progress at this Superfund site. This information includes: Site Location, Cleanup Progress Summary, Cleanup Impact Summary, Contamination, and Cleanup Progress. Please use the links and the "More Details..." box to find more details on this site.

The data and content on this page were last updated on Thursday, August 22, 2013.

More Details...

- More In-Depth Site Details (EPA Regional Content)
- Site Contacts (EPA Cleanup Managers, etc.)
- Additional Site Documents
- Other Names for this Site (Aliases)
- View GPRA Measures at this Site (see glossary)

Site Location



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EPA Region 9 >
Serving Arizona, California, Hawaii, Nevada, Pacific Islands and over 140 tribes

Site Address: BAGGETT-MARYSVILLE RD
OROVILLE, California
95965

County: BUTTE

U.S. Congressional District: 01

Cleanup Progress Summary

Construction Complete

Physical cleanup activities have been completed.

view detailed list of cleanup activities at this site >>

The National Priorities List (NPL) is the list of the most hazardous sites across the U.S. and its territories.

This site is on the NPL and is known as a Final NPL site (see glossary).

Potentially Responsible Parties (PRPs) were involved in the cleanup effort (see glossary).

Superfund law requires that EPA give communities information about site progress and plans so that they can be actively involved in site cleanup decisions. Learn more about community involvement at this site >>

Cleanup Impact Summary

At each site, EPA assesses the risk to humans and the environment and determines the best approach to address the risk. During initial site studies and cleanup, EPA determines if current human exposures to contaminants are under control and takes actions to control any possible human exposures until cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.

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see glossary definition for "Human Exposure Environmental Indicator Measure." >>

At each site with known ground water contamination, EPA documents whether ground water contamination is below protective risk-based levels or, if not, whether the migration of contaminated ground water is stabilized.

OK **Contaminated ground water migration is under control**

...and the public user is taken to the following robust site on yosimite.epa.gov.

koppers 1

Superfund Site Overview Koppe... | EPA Region 6 (South Central) | ... | Superfund Information Systems:...

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arkwood epa

EPA United States Environmental Protection Agency

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You are here: EPA Home » Pacific Southwest » Superfund » Site Overviews » Koppers Co., Inc. (Oroville Plant)

Koppers Co., Inc. (Oroville Plant)

EPA #: CAD009112087

State: California(CA)

County: Butte

City: Oroville

Congressional District: 02

Other Names: Koppers Company, Inc., Koppers Feather River Plant

Map this site in Cleanups in My Community

Bulletin Board

The Fourth Five Year Review is scheduled to be completed by September 2013.

Links

On this page

- Description and History
- Contaminants and Risks
- Who is Involved
- Investigation and Cleanup Activities
- Cleanup Results to Date
- Potentially Responsible Parties
- Documents and Reports
- Community Involvement
- Public Information Repositories
- Additional Links
- Contacts
- Progress Profile (EPA Headquarters)

Description and History

NPL Listing History

NPL Status: Final

Since 1948 until March 15, 2001, the 205-acre Koppers Company, Inc. (Oroville Plant) site was used to conduct wood treating operations to prevent wood deterioration by insects or fungi. Koppers purchased the plant from the National Wood

Find: penta | Next | Previous | Highlight all | Match case

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- Documents and Reports
- Community Involvement
- Additional Links
- Contacts
- Progress Profile (EPA Headquarters)

Description and History

NPL Listing History

NPL Status: Final
Proposed Date: 09/08/83
Final Date: 09/21/84
Deleted Date:

Since 1948 until March 15, 2001, the 205-acre Koppers Company, Inc. (Oroville Plant) site was used to conduct wood treating operations to prevent wood deterioration by insects or fungi. Koppers purchased the plant from the National Wood Treating Company in 1955 and closed the facility March 15, 2001. Chemical and waste water handling procedures and wood treatment and storage operations contaminated the soil and groundwater on and off site. Fires at the Koppers facility occurred in 1963 and 1987, causing increased contamination at the site. Groundwater, surface water, and soils on and off site were contaminated with pentachlorophenol (PCP) and other hazardous substances used in Koppers' wood treating activities. The contaminated groundwater is located beneath this site and off-property south of the Koppers site. In 1973, PCP was discovered in nearby residential wells that are used as a source of drinking water. In 1988, the Koppers Company, Inc. was bought by the parent company of Beazer East, Inc (BEI). BEI later sold the wood treating plants to Koppers Industries, Inc. (KII). After KII closed its wood treating operation in March 2001, KII resold the site back to BEI in November 2002. In November 2006, BEI sold all the 205 acre site exclusive of parcel #1 containing the site's contaminated soils consolidated into two RCRA landfills to Gold Line Express, Inc. of Woodland CA for development as an industrial park (see attached 49 lot parcel plan). BEI remains the recognized potentially responsible party provided the new owner complies with the insitutional controls contained in the deed restrictions. Approximately 10,650 people live within a three mile radius of the site. These people also depend on groundwater as their source of drinking water. The nearest downgradient private water supply well is just off-property to the south, and there are numerous private water supply wells within three miles of the site. Contamination of groundwater from site-related chemicals extends two miles to the south.

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Contaminants and Risks

Contaminated Media

- Groundwater
- Surface Water

Groundwater on property, contains pentachlorophenol (PCP), dioxins, furans, polycyclic aromatic hydrocarbons (PAHs), and heavy metals including copper, chromium, and arsenic. Off-property downgradient groundwater contains PCP. Potential health risks include drinking contaminated groundwater, or excavating soil below five feet on site. An alternative drinking water supply was provided to residents with the potential for contaminated domestic groundwater wells.

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Who is Involved

This site is being addressed through Federal and potentially responsible parties' actions.

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Investigation and Cleanup Activities

This site is being addressed in three stages: 1. the consolidation of contaminated soil in two corrective action management units which has been completed, 2) contain contaminated groundwater and restore the aquifer using pump and treat technology augmented by nutrient addition to enhance natural biological degradation of the groundwater contamination which has is operating, and 3) monitor a technical impracticability waiver granted for a 4 acre on property area upgradient of the on-property pump and treat system.

Initial Actions

Initial Actions: An alternative water supply was provided by BEI to residents south of the site in areas of potential groundwater contamination since 1986. Between 1987 and 1988, the EPA directed the construction of a temporary chip seal cap over the contaminated soil in the process area. The cap functioned to stabilize the site and to prevent contact with contaminants after a fire spread hazardous substances. In 1994, the EPA directed BEI to build an on-site landfill for disposal of surface soils

Investigation and Cleanup Activities

This site is being addressed in three stages: 1. the consolidation of contaminated soil in two corrective action management units which has been completed, 2) contain contaminated groundwater and restore the aquifer using pump and treat technology augmented by nutrient addition to enhance natural biological degradation of the groundwater contamination which has is operating, and 3) monitor a technical impracticability waiver granted for a 4 acre on property area upgradient of the on-property pump and treat system.

Initial Actions

Initial Actions: An alternative water supply was provided by BEI to residents south of the site in areas of potential groundwater contamination since 1986. Between 1987 and 1988, the EPA directed the construction of a temporary chip seal cap over the contaminated soil in the process area. The cap functioned to stabilize the site and to prevent contact with contaminants after a fire spread hazardous substances. In 1994, the EPA directed BEI to build an on-site landfill for disposal of surface soils containing high levels of dioxins. The 15,000 cubic yard landfill Cell #1 was completed in 1995. Subsequent detailed investigations determined dioxin soil contamination was widespread preventing the planned soil remedies.

Cleanup Ongoing

Entire Site: The potentially responsible party for site contamination completed a study of the site in 1989. The EPA used the results of this study to select the following methods to address site contamination: removing and treating contaminated groundwater with a carbon adsorption process; treating the contaminated soil in place; capping the wood treating area; providing a permanent water supply to those residents with contaminated wells; and discharging treated groundwater to the aquifer. Two groundwater extraction and treatment systems were installed: one on-site (400 gpm system still operating) and one off-site (600 gpm system shutdown in Dec. 1995 when the plume retreated) using carbon absorption followed by recharge to the aquifer using injection wells. In 1989, the EPA selected three different treatment technologies to clean up approximately 335,000 cubic yards of contaminated soil. However, treatability tests conducted during the design phases showed that the selected technologies could not achieve cleanup goals for all contaminants. BEI initiated a focused feasibility study to evaluate other cleanup alternatives for soils in 1995. In August of 1996, a Record of Decision (ROD) Amendment #1 was issued changing the soil remedy to on-site landfilling of the remaining contaminated soils. ROD Amendment #1 changed the cleanup standard to industrial use and required deed restrictions to prohibit future residential development.

In September 23, 1999, the EPA issued a ROD Amendment #2 to modify the remedy to 1) provide for a Technical Impracticability Waiver due to Dense Non-Aqueous Liquid for 4 acres of the 200 acre site, 2) add enhanced in-situ bioremediation to the remedy, and 3) provide for Monitored Natural Attenuation (MNA) as a contingency remedy. A modification to the Consent Decree modification for ROD Amendments #1 and #2 was completed September 22, 2003. The land use covenant provision of the ROD restricting the site to industrial use and restricting access and use of groundwater under the site were recorded with the Butte County Recorder on November 12, 2003.

Koppers Industries, Inc. closed the wood treating facility in March 15, 2001 and completed its Resource Conservation and Recovery Act (RCRA) closure under State of California oversight July 2002. Remediation of the area beneath the process area became accessible after the RCRA closure. Final soil remediation was completed in September 2002.

With soil remediation complete and groundwater contamination under control a Preliminary Closeout Report was issued September 4, 2003. To review this preliminary report double click on its title below under Site Documents and Report section. A Final Closure Report cannot be issued until the groundwater aquifer has been restored to the cleanup levels specified in the ROD which will be some years in the future.

In 1982, the State issued two orders to Koppers to clean up contaminated soil and groundwater at the site. In 1986, the EPA and Koppers signed a Consent Order, which required the company to conduct a study into the nature and extent of contamination at the site. In December 1990, BEI signed a Consent Decree to perform the engineering design and cleanup activities at the site. An Explanation of Significant Differences was issued January of 1991 which limited soils cleanup to five feet unless a potential source to groundwater were found. In August of 1996, a ROD Amendment #1 was issued changing the soil remedy to an on-site landfill. In September 1999, a ROD amendment #2 was issued modifying the groundwater remedy to provide for 1) 4 acre Technical Impracticability Zone, 2) adding enhanced in-situ bioremediation to

engineering design and cleanup activities at the site. An Explanation of Significant Differences was issued January of 1991 which limited soils cleanup to five feet unless a potential source to groundwater were found. In August of 1996, a ROD Amendment #1 was issued changing the soil remedy to an on-site landfill. In September 1999, a ROD amendment #2 was issued modifying the groundwater remedy to provide for 1) 4 acre Technical Impracticability Zone, 2) adding enhanced in-situ bioremediation to the remedy and 3) providing MNA as a contingency remedy.

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Cleanup Results to Date

Groundwater

To prevent exposure to contaminated groundwater from domestic wells, city water was provided in 1986 to residents with potential for exposure and is paid for by BEI. As the off-property remediation has progressed the need for the alternative water supply program has been reduced from the original thirty-four (34) recipients to seven (7). The remaining seven (7) water supply recipients will continue to receive payment for alternative water supply usage until ROD standards have been met for their drinking water wells.

The off-property pump and treatment facility was taken off-line in December of 1995 as the plume degraded and no contaminants were being removed by the extraction wells. The treatment facility remains in reserve. The residual off-property plume is no longer being fed by contaminants on-property and is continuing to shrink. In August 1998 a pilot in-situ bioremediation program to assist in PCP degradation was initiated and incorporated into the remedy September 1999. The program was initiated with the addition of two nutrients (diammonium phosphate) and oxygen (magnesium peroxide) to three wells and monitoring at five wells. In the first quarter 2004 nutrient addition was reduced to adding only magnesium peroxide.

The on-property pump and treatment facility is still in operation preventing contaminated groundwater from moving off-property. In April 1998 a pilot in-situ bioremediation program was initiated on-property to degrade PCP and incorporated into the remedy in September 1999. The program initially added two nutrients (diammonium phosphate) and oxygen (magnesium peroxide) to six wells and monitoring at five wells. The magnesium peroxide addition was stopped the first quarter 2004. The PCP concentrations in the on-property wells are continuing to decrease. The on-property pump and treat facility will continue to operate until the ROD cleanup standards are meet and then will be held in reserve as long as the Technical Impracticability Waiver remains in effect.

March 8, 1999 BEI submitted a Final Evaluation of Technical Impracticability (TI) of Groundwater Restoration in the Former Creosote Pond and Cellon Blowdown Areas On-property. The TI waiver for the four acres was incorporated into the remedy with ROD Amendment #2 in September 1999. TI zone area and just downgradient is monitored for contaminant movement.

With the demolition of the wood treating facility in 2001 and 2002, boron was mobilized from the DriCon/CCA area and detected by monitoring well MW-8 above the action level. The downgradient on-property treatment plant does not treat for boron. MW-8 was converted to an extraction well to dilute the boron concentration to continue reinjection below the cleanup level. Boron readings are monitored at MW-8 and prior to reinjection for compliance with the ROD.

Soils

In 1987/88 a temporary chip seal cap was placed over the process area. In 1992, two concrete drip pads were installed in the process area to contain wood treating chemicals and prevent any further soil contamination. The cap and drip pads were demolished in 2002 as part of KII's facility closure. Two landfill cells were constructed for disposal of contaminated soils on site. Cell #1 (13,000 cubic yards) was completed in August 1995 as a Removal Action. Cell #2 (147,000 cubic yards capacity) was closed September 2002 with the completion of the soil remediation efforts for the site. 6,000 cubic yards of boron impacted soil was removed from the newly discovered Dri-Con/CCA source and placed in Cell #2 prior to its closure. With soil remediation complete and control of groundwater in place a Preliminary Closeout Report was issued for the site September 4, 2003. A land use covenant was recorded with the Butte County Recorder on November 12, 2003 restricting the site to industrial use and the access and use of groundwater under the site.

In November 2006, BEI sold all the 205 acre site exclusive of parcel #1 containing the site's contaminated soils consolidated into two RCRA landfills to Express, Inc. of Woodland CA for development as an industrial park (see attached 49 lot parcel plan).

The Third Five Year Review Report, completed in July 28, 2008, concluded that currently, all implemented remedies are found to be functioning as intended by the decision

Superfund Site Overview Koppers Co., Inc. (Oroville Plant), Pacific Southwest, US EPA

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The Third Five Year Review Report, completed in July 28, 2008, concluded that currently, all implemented remedies are found to be functioning as intended by the decision document and, therefore, are protective of human health and the environment.

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Potentially Responsible Parties

Potentially responsible parties (PRPs) refers to companies that are potentially responsible for generating, transporting, or disposing of the hazardous waste found at the site.

As agreed to in the 1992 Consent Decree for the Koppers Site Remediation, Beazer East, Inc. is the PRP for the Koppers Site in Oroville.

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Documents and Reports

Administrative Records

Original AR - Part 1 (includes updates 1-3)

Original AR - Part 2 (includes updates 4-8)

Fact Sheets

03/01/99 EPA Proposes Groundwater Remedy Modification Plan

09/01/01 Koppers Superfund Site Update

08/01/02 EPA Starts Review of Cleanup at the Koppers Superfund Site and Koppers Site Map

08/01/03 EPA Requests Your Comments on Consent Decree Amendment

01/14/08 Koppers Co. Inc. Five-Year Review Fact Sheet

03/24/09 Koppers Co., Inc. Superfund Site Third Five-year Review Fact Sheet

Maps

08/01/02 Koppers Industries, Inc. Site Map August 2002

05/01/06 Oroville Industrial Park Layout

04/20/09 Koppers Site Plume Map - 1994 - 2007

Records of Decision

09/13/89 Entire Site ROD (9/1989)

01/29/91 Entire Site ESD (1/1991)

08/29/96 ROD Amendment #1 (1996)

09/23/99 Amendment #2 to the Record of Decision for Koppers Company, Inc.

Technical Documents

12/22/97 First Five Year Review (12/1997)

02/07/03 Final Second 5-Year Review Report for Koppers Company, Inc.

Superfund Site Overview Koppers Co., Inc. (Oroville Plant), Pacific Southwest, US EPA

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02/07/03 Final Second 5-Year Review Report for Koppers Company, Inc.

09/04/03 Preliminary Closeout Report for Kopper Company, Inc.

11/28/06 Grant Deed

07/28/08 Third Five-Year Review 2008 -Final

03/01/09 Koppers Semiannual 2008 RA Groundwater Monitoring Report

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Community Involvement

Public Meetings:

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Public Information Repositories

The public information repositories for the site are at the following locations:

Butte County Public Library,
1820 Mitchell Ave.,
Oroville, CA 95965

Meriam Library,
California State University at Chico,
Chico, CA 95929-0295

The most complete collection of documents is the official EPA site file, maintained at the following location:

Superfund Records Center
Mail Stop SFD-7C
95 Hawthorne Street, Room 403
San Francisco, CA 94105
(415) 820-4700

Enter main lobby of 75 Hawthorne street, go to 4th floor of South Wing Annex.

Additional Links

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Contacts

EPA Site Manager			
Daewon Rojas-Mickelson	415-947-4191	Rojas-Mickelson.Daewon@epamail.epa.gov	US EPA Region 9 Mail Code SFD 75 Hawthorne Street San Francisco, CA 94105
EPA Community Involvement Coordinator			
Dana Barton	415-972-3087 1-800-231-3075	Barton.Dana@epamail.epa.gov	US EPA Region 9 Mail Code SFD 75 Hawthorne Street San Francisco, CA 94105
EPA Public Information Center			
	415-947-8701	r9.info@epa.gov	
State Contact			
DTSC - Sam V. Martinez, Jr.	916-255-6583	Sam.Martinez@dtsc.ca.gov	8800 Cal Center Drive Sacramento, 95826-3200
RWQCB - Phil Woodward			

Superfund Site Overview Koppers Co., Inc. (Oroville Plant), Pacific Southwest, US EPA

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EPA Site Manager			
Daewon Rojas-Mickelson	415-947-4191	Rojas-Mickelson.Daewon@epamail.epa.gov	US EPA Region 9 Mail Code SFD 75 Hawthorne Street San Francisco, CA 94105
EPA Community Involvement Coordinator			
Dana Barton	415-972-3087 1-800-231-3075	Barton.Dana@epamail.epa.gov	US EPA Region 9 Mail Code SFD 75 Hawthorne Street San Francisco, CA 94105
EPA Public Information Center			
	415-947-8701	r9.info@epa.gov	
State Contact			
DTSC - Sam V. Martinez, Jr.	916-255-6583	Sam.Martinez@dtsc.ca.gov	8800 Cal Center Drive Sacramento, 95826-3200
RWQCB - Phil Woodward	530-224-4853		
PRP Contact			
Michael Tischuk	412-208-8809	tischuk@HansonLE.com	Beazer East, Inc.
Jennifer Abrahams	916-853-4526	Jennifer.Abrahams@tetratech.com	Tetra Tech
Community Contact			
Other Contacts			
After Hours (Emergency Response)			
US EPA	(800) 424-8802		

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Koppers Co., Inc. (Oroville Plant)

Superfund Site

Original AR – Part 1 (includes updates 1-3)

Administrative Record Index

To request copies of administrative record documents, an electronic order form is available.

The documents contained in this administrative record file were used by the U.S. Environmental Protection Agency in identifying appropriate remedial activities for use at the Koppers Co., Inc. Superfund site in Oroville, California. These documents are available in the repositories at the Merian Library of Cal. State University at Chico, at Butte County Public Library in Oroville and in the Region 9 Superfund Records Center in San Francisco.
The Koppers administrative record includes an initial set of documents compiled in December 1988 and seven supplements, or additional sets of documents, added since that time. All of these documents have been microfilmed. A brief description of each of these groups of documents is provided below:

Group	AR Doc.#	Format	Description
Initial	1-376	microfilm	Arranged chronologically from 9/26/83 to 8/22/88, with undated documents at the end of the sequence.
Suppl.1	377-512	microfilm	Arranged chronologically from 4/7/86 to 8/29/89. The initial group and this supplement were the basis for the 1989 ROD as well as the actions taken in response to the 1987 fire at the site. Documents related to the post-fire removal action are indicated in the index by an(R) below each document number.
Suppl.2	513 & 514	microfilm	Consists of the 1989 Record of Decision (ROD) and the 1991 Explanation of Significant Differences (i.e., minor modifications to the ROD).
Suppl.3	515&516	microfilm	Includes the Consent Decree requiring Beazer East, Inc. to implement the 1989 ROD.
Suppl.4	517-737	microfilm	Post-ROD documents that support the March 1996 proposed plan
Suppl.5	738-750	microfilm	Post-ROD documents, including the Site-Wide Soils Remedy Report, that

...which goes on (definition of terms, handy)...

Superfund Site Document, Koppers Co., Inc. (Oroville Plant), Pacific Southwest, US EPA

Superfund Site Document, Kopp... | EPA Region 6 (South Central) | ... | US EPA Superfund Information Systems:...

yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/3dc283e6c5d6056f8

The administrative record file will continue to be added to as documents become available. It will be complete after public comments on EPA's Proposed Plan, EPA's response to comments, and the Record of Decision (ROD) are included.

List of Abbreviations and Acronyms Used in Administrative Record Index

ABBREVIATION	MEANING
ARAR	Applicable or Relevant and Appropriate Restriction (or Requirement)
ATSDR	Agency for Toxic Substances and Disease Registry
CA	State of California
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Superfund)
CRWQCB	California Regional Water Quality Control Board
DHS	Department of Health Services
D&M	Dames & Moore
DTSC	California Department of Toxic Substances Control
EA	Endangerment Assessment
EPA	Environmental Protection Agency
FOIA	Freedom of Information Act
FS	Feasibility Study or Forest Service
FSP	Field Sampling Plan
HRS	Hazard Ranking System
IPE	Isopropyl Ether
LDS	Leak Detection System
MSDS	Material Safety Data Sheets
NPL	National Priorities List
OU	Operable Unit
PAH	Polynuclear Aromatic Hydrocarbon
PCP	Pentachlorophenol
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RA	Remedial Action
RDRA	Remedial Design/Remedial Action
REM	Remedial Hazardous Site Engineering Management (type of contract)
REM/FIT	Remedial Hazardous Site Engineering Management/Hazardous Site Field Investigation Team (contract)
RI	Remedial Investigation
ROC	Record of Communication
ROD	Record of Decision

...and on...

Superfund Site Document, Koppers Co., Inc. (Oroville Plant), Pacific Southwest, US EPA

Superfund Site Document, Kopp... | EPA Region 6 (South Central) | ... | Superfund Information Systems:...

yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/3dc283e6c5d6056f8

4/23/1986	Environmental Protection Agency - Region 9	Koppers Industries, Inc	Administrative order on consent #86-04	88056854
5/1/1986	Koppers Industries, Inc	-	Workplan for RI/FS Study	88056855
5/1/1986	Environmental Protection Agency	-	Fact sheet: EPA & Koppers agree on site investigation plan	88056856
5/1/1986	John Kemmerer / Environmental Protection Agency - Region 9	Thomas Hays / Koppers Industries, Inc	TL: w/o pre-printed pages of consent order	88057720
5/2/1986	Steven Trudell / Dames & Moore	Stephen Smith / Koppers Industries, Inc	Ltr: Transmits 16 copies of RI/FS workplan, w/o encls	88057721
5/7/1986	John Kemmerer / Environmental Protection Agency - Region 9	David Kerschner / Koppers Industries, Inc	Ltr: requests additional air quality monitoring	88057722
5/15/1986	Environmental Protection Agency - Region 9	-	Surface water & sediment sampling results w/attach map & memo analysing results	88056857
5/20/1986	Steven Trudell / Dames & Moore	John Kemmerer / Environmental Protection Agency - Region 9	Ltr: Revision #1, RI/FS workplan	88056858
5/22/1986	-	-	Questions & concerns raised at community meeting, reproduced from group memory	88057723
5/22/1986	Steven Trudell / Dames & Moore	John Kemmerer / Environmental Protection Agency - Region 9	Ltr: Initiation of field activities for RI/FS, schedule	88056798
5/29/1986	John Kemmerer / Environmental Protection Agency - Region 9	David Kerschner / Koppers Industries, Inc	Ltr: Asks Koppers to follow certain criteria in reporting analytical results from field activities at Koppers w/o attch	88057724
6/1/1986	John Kemmerer / Environmental Protection Agency - Region 9	David Kerschner / Koppers Industries, Inc	Ltr: Receipt of monthly status rpt	88057725
6/5/1986	Environmental Protection Agency - Region 9	-	Community work group mtg agenda	88057726
6/9/1986	Joe DeMartini / Woodward-Clyde Consultants	John Kemmerer / Environmental Protection Agency - Region 9	Ltr: Transmits final copies of audit plan and checklist forms, w/encls, memo to J DeMartini fr W Hansen 1/14/87 & photos	88056859
6/9/1986	Steven Trudell / Dames & Moore	John Kemmerer / Environmental Protection Agency - Region 9	TL: Revision #2 to RI/FS workplan	88057727
6/10/1986	Steven Trudell / Dames & Moore	John Kemmerer / Environmental Protection Agency - Region 9	TL: w/monthly status rpt for June, rpts initiation of RI/FS for Feather River plant	88057728
6/10/1986	Dames & Moore	Environmental Protection Agency - Region 9	Monthly status rpt for 5/86, w/TL to John Kemmerer fr Steven Trudell	88056799
6/12/1986	John Kemmerer / Environmental Protection Agency - Region 9	David Kerschner / Koppers Industries, Inc	Ltr: Comments on the content of Monthly Status Reports	88057685
6/17/1986	-	-	Community meeting notes on meeting held to accept written comments on RI/FS workplan for Koppers	88057729
6/19/1986	Ken Wells / Roy F Weston, Inc - Weston-SPER	William Lewis / Environmental Protection Agency - Region 9	Ltr: Koppers sampling w/attch data & photocopies of photos	88057730
6/20/1986	John Kemmerer / Environmental Protection Agency - Region 9	Thomas Hays / Koppers Industries, Inc	Ltr: Accounting of all response & oversight costs incurred by EPA	88057731
6/20/1986	Stephen Smith / Koppers Industries, Inc	John Kemmerer / Environmental Protection Agency - Region 9	Ltr: RI/FS quarterly groundwater monitoring rpt for 4/86, w/attchs	88056800
6/20/1986	Steven Trudell / Dames & Moore	John Kemmerer / Environmental Protection Agency - Region 9	Ltr: Monthly Status Report Information RI/FS: Projected sampling schedule w/attachment	88057686
6/23/1986	John Kemmerer / Environmental Protection	David Kerschner / Koppers Industries, Inc	Ltr: Describes what kind of validation criteria is	88057732

...and that’s just Administrative Record index part 1 of 2 for the Koppers site; there are over 600 records available to peruse just on this one long page, part 1 of 2.

Index headers include:Doc DateAuthor / Author Org.Addressee / Addressee Org.Title / SubjectDoc ID

...and you can order records from link at top the page to...

Document Request, US EPA, Pacific Southwest, Superfund Sites

Document Request, US EPA, Paci... | EPA Region 6 (South Central) | ... | US EPA Superfund Information Systems:...

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You are here: EPA Home » Pacific Southwest » Superfund » Site Overviews » Administrative Records » Document Request

Document Request Form

Turn-around time for receipt of documents is typically 10 to 20 working days.The Superfund Records Center will contact requesters with information on local duplication service providers.

Requested by	
Affiliation	
Email Address	
Phone	
Today's Date	08/23/2013
Superfund Site Name	
Title of Administrative Record	
Documents Requested (specify Document ID or AR #)	
Send copies to (specify name, address, city, state, zip, phone)	
Send bill to (specify name, address, city, state, zip, phone)	
Further instructions/notes	

Cancel | Send Request

Here are other examples of invaluable resources, all linked to from just that one Region 9 page shown above (slide 11) and accessible at:

http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/ViewByEPAID/cad009112087?OpenDocument

Koppers PCOR_text only-1.pdf (page 1 of 20)

Preliminary Closeout Report for Koppers Company, Inc., Superfund Site, Oroville, California

Prepared by

U. S. Environmental Protection Agency

September 2003

Koppers1_08 260kb-1.pdf (page 1 of 6)

EPA Koppers Superfund Site

U.S. Environmental Protection Agency $ Region 9 $ San Francisco, CA $ January 2008

Five-Year Review Fact Sheet

This fact sheet provides an update of activities at the Koppers Industries, Inc. Superfund Site and also provides notice of the upcoming five-year review. It is being distributed to EPA's mailing list for the Koppers Site and other interested parties. If you are not on the mailing list and would like to be added, please contact one of the EPA staff listed at the end of this fact sheet.

Five-Year Review

The United States Environmental Protection Agency (EPA) is beginning the third five-year review for the Koppers Superfund Site in Oroville, CA and expects to complete the review in 2008. A five-year review is required by the Superfund law whenever the remedy for a site either leaves waste on site above levels that are safe for unrestricted use or will take longer than five years to reach cleanup goals. The purpose of the five-year review is to determine if the remedy is protective of human health and the environment.

For the Koppers site, the review is required because a) the soil cleanup goals were set at levels that allow for only commercial/industrial use (not residential use)

time. The groundwater treatment and soil consolidation remedies were found to be protective of human health and the environment. The second five-year review evaluated the remedies and any changes at the site that had taken place between December 1997 and February 2003. The review concluded that cleanup remedies remained protective of human health and the environment. The review noted that the deed restriction to prohibit residential use of the Koppers property was not yet in place; that action was completed in November 2003.

Remedy Selection for Koppers

A Record of Decision (ROD) for Koppers was signed in 1989 and has been amended twice, first in 1996 and

Koppers CD Aug_03 183k-1.pdf (page 1 of 5)

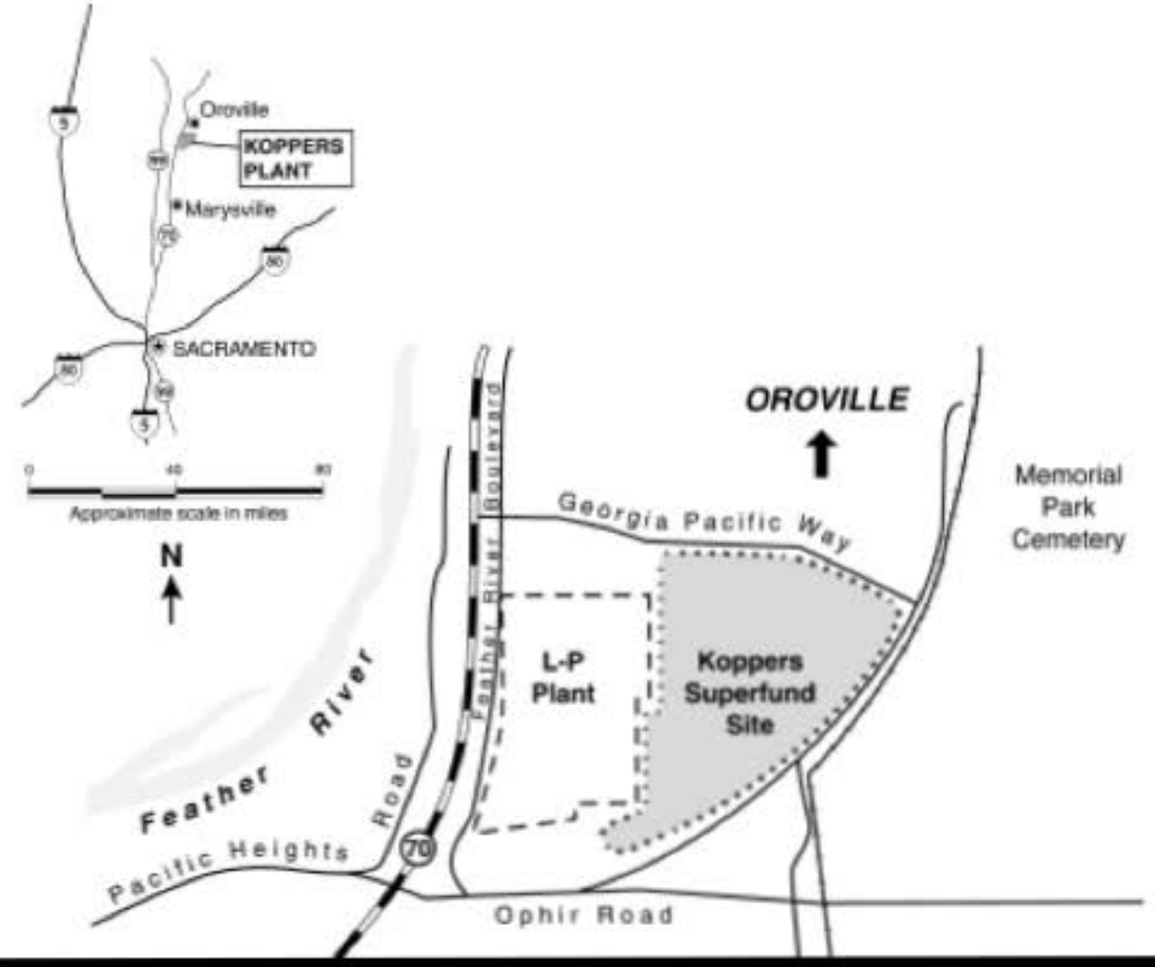
Koppers Co., Inc. Superfund Site Update

United States Environmental Protection Agency • Region 9 • August 2003

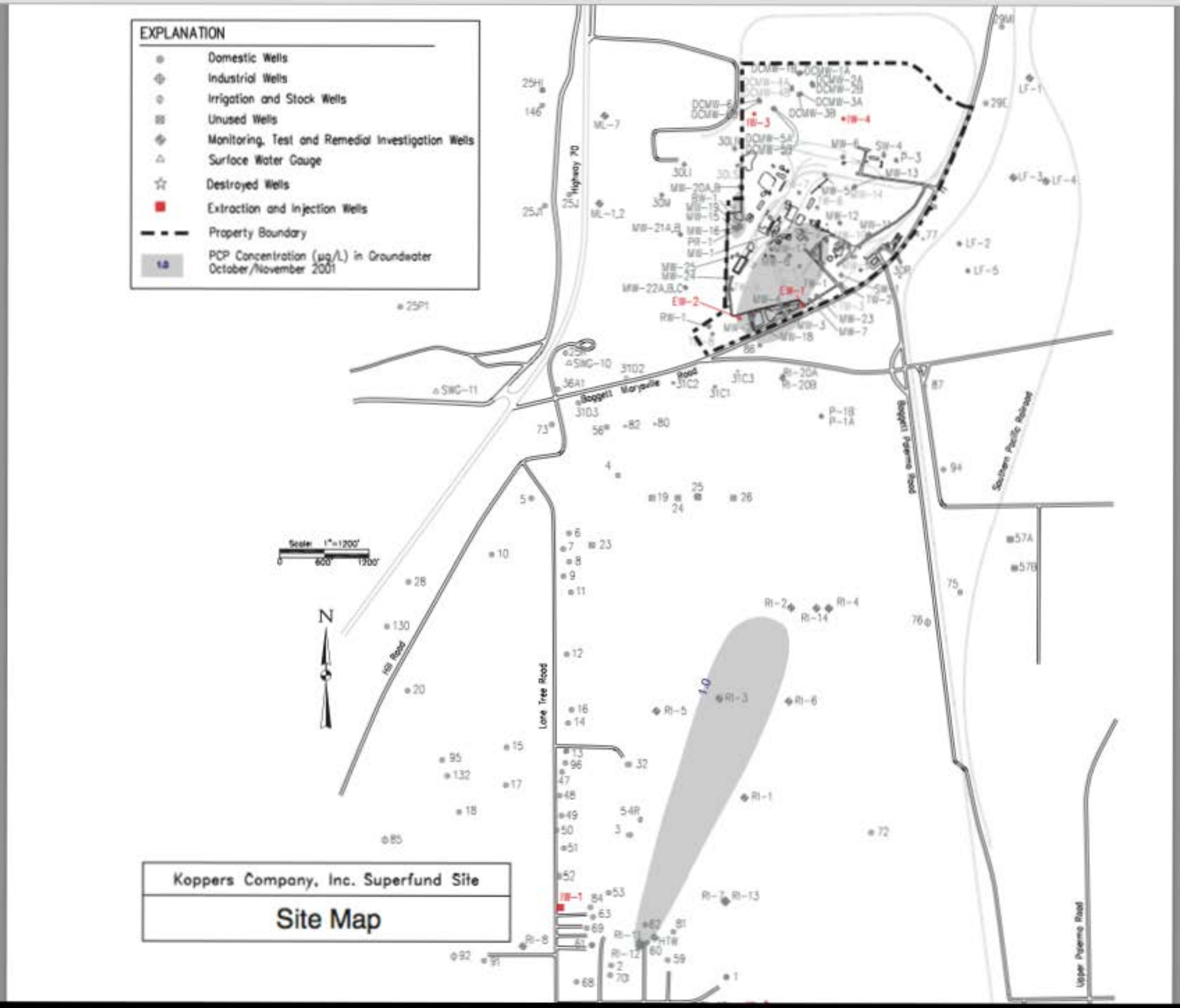
EPA REQUESTS YOUR COMMENTS ON CONSENT DECREE AMENDMENT

INTRODUCTION

The United States Environmental Protection Agency (EPA) invites the public to review and comment on a Consent Decree (CD) amendment concerning the cleanup of the Koppers **Superfund** site in Oroville, CA. The CD availability notice has been published in the Federal Register on **August 7, 2003.** In addition, the EPA has placed a notice in the City's local newspaper announcing the opening of the 30-day public comment period that ends on **September 7, 2003.** This fact sheet also gives an update on the soil and



KoppersSite Map01.pdf (1 page)



koppers entire site ROD-1.pdf (page 1 of 40)

EPA/ROD/R09-89/037
1989

EPA Superfund
Record of Decision:

KOPPERS CO., INC. (OROVILLE PLANT)
EPA ID: CAD009112087
OU 01
OROVILLE, CA
09/13/1989

koppers-1.pdf (page 1 of 12)

EPA KOPPERS SUPERFUND SITE

U.S. Environmental Protection Agency · Region 9
Oroville, California March 1999

EPA PROPOSES GROUNDWATER REMEDY MODIFICATION PLAN

INTRODUCTION

The United States Environmental Protection Agency (EPA) is requesting public comments on this Proposed Plan[1] to modify the groundwater remedy at the Koppers Company, Inc. Superfund site (Koppers site) in Oroville, CA (see Fig. 1, page 2). No change is being proposed to the soils remedy. Based on remedial action monitoring and treatability studies the EPA has concluded that modifying the pump and treat (P&T) groundwater remedy is appropriate to complete the remedy.

EPA's preferred modifications include 1) issuing a Technical Impracticability (TI) Waiver for the groundwater cleanup at the former creosote pond and cellon blown areas due to the presence of dense nonaqueous-phase liquids (DNAPL); 2) allowing

Proposed Plan highlights key information about the remedy alternatives considered for groundwater cleanup, potential human health risks posed by the contaminants, and the present extent of groundwater cleanup at the site.

The modification alternatives considered, and EPA's preferred alternative, are presented for public review and comment. The comment period is from March 15, 1999 to April 13, 1999. EPA invites the public to a meeting scheduled for March 23, 1999 where EPA will present the plan and receive verbal comments (See box below for more information).

The EPA's proposed remedy modifications are preliminary and the final decisions will not be made until all significant public comments are considered. After review and response to public comments, the remedy modifications chosen will be formalized in a document called Amendment #2 to the Record of Decision (Amend.#2ROD). The remedy modifications selected for Amend.#2ROD could differ from what is outlined here based on public comment.

PUBLIC COMMENT PERIOD AND COMMUNITY MEETING	
A 30-day public comment period	Where: Oakdale Heights School

I could go on, but I suggest EPA Region 6 Superfund management visit these websites personally to take a hard look at the Δ I point out between Region 6 standards for reporting, transparency and accountability compared to those upheld by Region 9 as presented in this example.

Thank you

Charles Curtis Grisham, Junior
grish@me.com

U.S. ENVIRONMENTAL PROTECTION AGENCY

Superfund Information Systems

GPRA Measures at ARKWOOD, INC. (EPA ID: ARD084930148)

Back to the Profile for this Site

The data and content on this page were last updated on Thursday, August 15, 2013.

Cleanup Activities | Operable Units (OUs) | Site Contacts | Additional Site Documents | Other Names for this Site (Aliases) | Contaminants of Concern | GPRA Measures

The Government Performance and Results Act (GPRA) is an EPA reform initiative that was passed in 1993 to hold federal agencies accountable for using resources wisely and achieving program results. GPRA requires agencies to develop plans for what they intend to accomplish, measure how well they are doing, make appropriate decisions based on the information they have gathered, and communicate information about their performance to Congress and to the public. EPA is required to report on the following Superfund measures under GPRA:

see glossary definitions for GPRA measures >>
Learn more about GPRA measures

Measure	Status
Final Site Assessment Decision	Yes (09/18/1985)
Human Exposure Under Control	Under current conditions at this site, potential or actual human exposures are under control.
Contaminated Ground Water Migration Under Control	Contaminated ground water migration at this site is under control.
Construction Complete	Yes (06/28/1996)
Site-Wide Ready for Anticipated Use	Yes

DISCLAIMER: Be advised that the data contained in these profiles are intended solely for informational purposes use by employees of the U.S. Environmental Protection Agency for management of the Superfund program. They are not intended for use in calculating Cost Recovery Statutes of Limitations and cannot be relied upon to create any rights, substantive or procedural, enforceable by any party in litigation with the United States. EPA reserves the right to change these data at any time without public notice.

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URL: http://cfpub.epa.gov/supercpad/SiteProfiles/second.gpra
This page design was last updated on Tuesday, January 20, 2009
Content is dynamically generated by ColdFusion

Institutional Controls

Institutional Controls for Arkwood, Inc.

EPA ID: ARD084930148

Institutional Controls are required for this site. This site requires ICs because a decision document, such as a Record of Decision, has documented some level of contamination and/or remedy component at the site that would restrict use of the site. In order to determine the current status of ICs for this site, the site contacts below should be consulted:

Shawn Ghose, RPM Phone: **214-665-6782** Email: **ghose.shawn@epa.gov**

Gloria Moran, Regional Counsel Phone: **214-665-3193** Email: **moran.gloria-small@epa.gov**

ICs are generally defined as administrative and legal tools that do not involve construction or physically changing the site. Common examples of ICs include site use and excavation restrictions put in place through State and local authorities like zoning, permits and easements. ICs are normally used when waste is left onsite and when there is a limit to the activities that can safely take place at the site (i.e., the site cannot support unlimited use and unrestricted exposure) and/or when cleanup components of the remedy remains onsite (e.g., landfill caps, pumping equipment or pipelines). Effective ICs help ensure that these sites can be returned to safe and beneficial use.

Disclaimer: This information is being provided by EPA as an informational tool to further assist the public in determining the types of restrictions that may be in place at National Priorities List sites being addressed by EPA under the Superfund program. In addition to the areas addressed by the institutional controls identified on this web site there may be other areas on the property that require restrictions on use of the property that are not captured in this EPA database. States and other entities may have implemented laws or restrictions applicable to this site. The information provided herein does not replace a title search or meet "All Appropriate Inquiry" requirements. U.S. EPA encourages users to review the Site files to obtain information regarding remedy components, containment systems and the land use for which cleanup standards were selected for these sites. More information and links can be found on the site profile page from which this page was accessed, and EPA regional offices may also be contacted.

Report generated on **October 26, 2007**

EPA/ROD/R09-89/037
1989

EPA Superfund
Record of Decision:

KOPPERS CO., INC. (OROVILLE PLANT)
EPA ID: CAD009112087
OU 01
OROVILLE, CA
09/13/1989

EPA KOPPERS SUPERFUND SITE

U.S. Environmental Protection Agency • Region 9

Oroville, California March 1999

EPA PROPOSES GROUNDWATER REMEDY MODIFICATION PLAN

INTRODUCTION

The United States Environmental Protection Agency (EPA) is requesting public comments on this Proposed Plan[1] to modify the groundwater remedy at the Koppers Company, Inc. Superfund site (Koppers site) in Oroville, CA (see Fig. 1, page 2). No change is being proposed to the soils remedy. Based on remedial action monitoring and treatability studies the EPA has concluded that modifying the pump and treat (P&T) groundwater remedy is appropriate to complete the remedy.

EPA's preferred modifications include 1) issuing a Technical Impracticability (TI) Waiver for the groundwater cleanup at the former creosote pond and cellon blown areas due to the presence of dense nonaqueous-phase liquids (DNAPL); 2) allowing the pump and treat (P&T) remediation to be augmented by enhanced *in-situ* bioremediation; and 3) making provision for monitored natural attenuation (MNA) as a contingency remedy. A glossary of terms used is found at the end of this document.

The EPA, as the lead agency for the site, has prepared this Proposed Plan in consultation with state agencies (Department of Toxic Substances Control, Region 1 and the California Regional Water Quality Control Broad, Central Valley Region). This Proposed Plan highlights key information about the remedy alternatives considered for groundwater cleanup, potential human health risks posed by the contaminants, and the present extent of groundwater cleanup at the site.

The modification alternatives considered, and EPA's preferred alternative, are presented for public review and comment. The comment period is from March 15, 1999 to April 13, 1999. EPA invites the public to a meeting scheduled for March 23, 1999 where EPA will present the plan and receive verbal comments (See box below for more information).

The EPA's proposed remedy modifications are preliminary and the final decisions will not be made until all significant public comments are considered. After review and response to public comments, the remedy modifications chosen will be formalized in a document called Amendment #2 to the Record of Decision (Amend.#2ROD). The remedy modifications selected for Amend.#2ROD could differ from what is outlined here based on public comment.

PUBLIC COMMENT PERIOD AND COMMUNITY MEETING

A 30-day public comment period on this proposed plan and remedy modifications begins March 15, 1999 and closes April 13, 1999. If requested, EPA may extend the comment period by an additional 30 days.

You are invited to attend a community meeting at which EPA will present the proposed plan, receive verbal comments, and answer questions about the remedy modifications.

Where: Oakdale Heights School
(Multipurpose Room)
2255 Las Plumas Avenue
Oroville, CA

When: March 23, 1999

Time: 7:00 p.m.

Public comments may also be made in writing, postmarked no later than April 13, 1999 and sent to:

EPA, Region 9
75 Hawthorne St.
San Francisco, CA 94105
Attn: Charles Berrey (SFD-7-2)

[1] The publication of this fact sheet fulfills the requirements of Section 117(a)(1) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

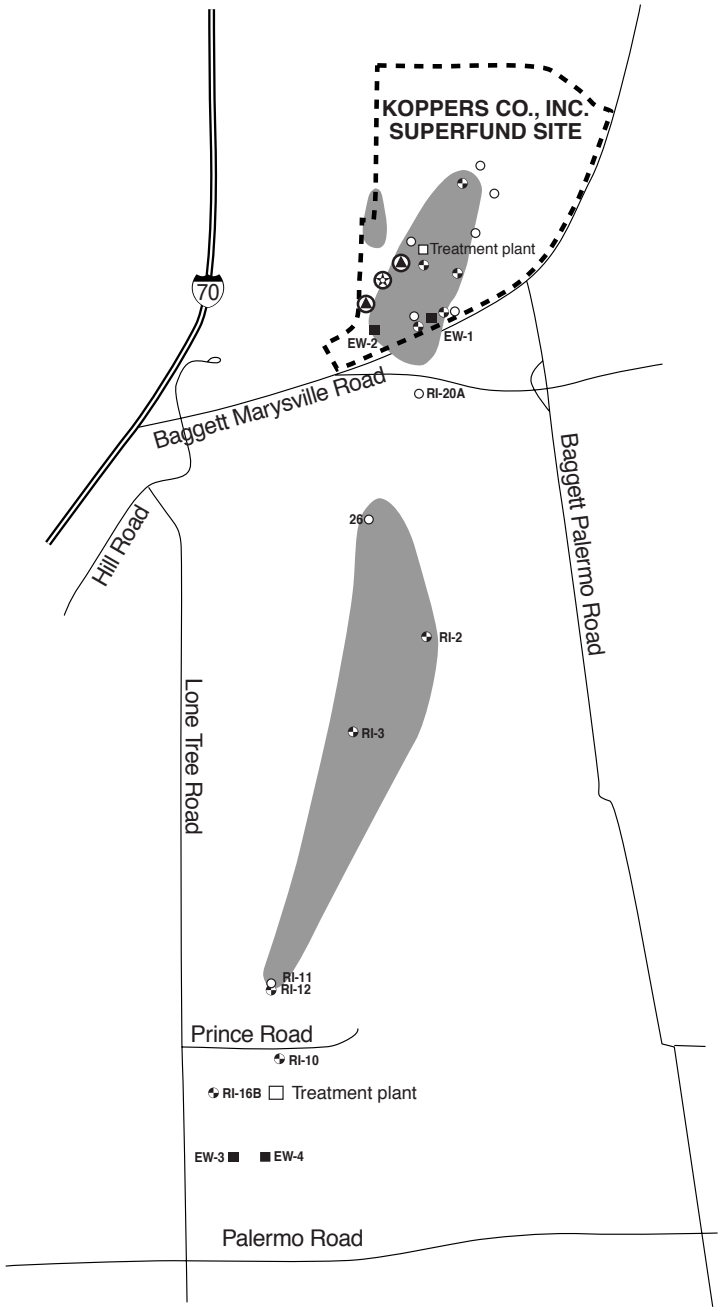

Figure 1: June 1998 Groundwater Plume Map

LEGEND

- Koppers Co., Inc. Superfund Site
- New Monitoring Well
- Plume (June 1998 @ 2.2ppb PCP)
- Wells – Nutrient Addition
- Wells – Monitor Nutrient Transfer and Bioremediation
- Extraction Wells
- Existing Monitoring Wells

N

0 600 1200
Scale in Feet

SITE BACKGROUND

The Koppers Co., Inc. site is in Oroville, California. Hutchinson Lumber Mill owned the property prior to 1948. In 1948, the National Wood Treating Corporation acquired the property and began wood treating operations. Georgia-Pacific acquired the site in 1951, and Koppers Co., Inc. acquired the site from Georgia-Pacific in 1955. Beazer East, Inc. (BEI) purchased Koppers Co., Inc. between June and November 1988. In December 1988, BEI subsequently sold the assets of its Tar and Treated Wood Sector, including the Oroville, California plant operations and property, to a management buy-out group known as Koppers Industries, Inc. (KII). KII continues to operate the plant today, however, BEI retained responsibility for the environmental cleanup issues at the site.

The Koppers facility encompasses approximately 200 acres and has been used for wood treating operations since 1948. Historically, wood poles and ties were pressure treated with pentachlorophenol (PCP), creosote, and inorganic formulations, including chromium and arsenic. Soil and groundwater contamination at the site have resulted from both past wood treatment operations and related waste disposal practices. A fire occurred in the cellon process area in 1963 and again in 1987. The State of California identified the Koppers site as an environmental problem during the early 1970's when constituents associated with

GROUNDWATER REMEDIATION STATUS

wood treatment activities were identified at the site in soils and groundwater. The site was placed on the U.S. EPA's Superfund National Priorities List (NPL) in 1984. Koppers began the Remedial Investigation (RI) in April 1986 and submitted the RI in July 1988. Use of PCP was discontinued at the site in 1988. In November 1988, the EPA completed the Endangerment Assessment (EA), which evaluated risks to human health and the environment from contamination at the site. In May 1989, a Feasibility Study (FS) was conducted which evaluated a wide range of soil and groundwater cleanup alternatives.

In September 1989, the EPA selected soil and groundwater cleanup remedies for the Koppers site and issued a ROD. In January 1991, EPA issued an Explanation of Significant Difference (ESD) to clarify the ROD. Under EPA's oversight, BEI is currently performing the cleanup work under the terms of a Consent Decree, signed in February 1992. In March 1993, a 600 gallon per minute (gpm) off-property groundwater pump and treat (P&T) system began operation. The off-property P&T system was designed to prevent further expansion of the plume of contaminated groundwater that had migrated off the Koppers' plant property, treat the groundwater to remedial standards and then return the water to the aquifer. In December 1995, the P&T system was taken off-line (held in reserve) because the system achieved the cleanup objectives within its zone of capture at extraction wells EW-3 and EW-4 and was unable to affect the up-gradient residual plume.

In February 1994, a 400 gpm on-property groundwater P&T system began operation and continues to operate today. The on-property P&T system was designed to intercept and prevent contaminated groundwater from flowing off the Koppers site by pumping groundwater from beneath the Koppers site, treating the water to the remedial standards and returning the water to the groundwater basin.

In 1996, EPA issued Amend.#1ROD modifying the soils remedy and clarifying certain features of the 1989 ROD. The soils at the Koppers site have been contaminated with a variety of chemicals used in the wood treatment processes. The primary contaminants are PCP, dioxin (which is present as a trace contaminant in industrial grade PCP), arsenic, chromium, and carcinogenic polynuclear aromatic hydrocarbons (cPAHs) which are compounds found in creosote. With the exception of an estimated 20,000 cubic yards of soil in the process area, the soil remedy is complete. The remaining contaminated soil in the process area will be remediated when wood treating ends or the process area equipment is replaced. The overall site status was provided in the August 1998 site fact sheet.

EXPLANATION OF MODIFICATION ALTERNATIVES

The EPA has reviewed the groundwater monitoring program data and determined that a small portion of the site, designated the Area of Interest (AOI) shown on Fig. 2 (on page 4), is not responding to pump and treat remediation efforts. Furthermore, the technology does not exist today to remediate the AOI to drinking water standards. In addition, site data collected outside the AOI has indicated that enhanced *in-situ* bioremediation would speed up groundwater cleanup. As a result of these findings, the EPA is recommending the Record of Decision for the site be amended. The EPA evaluates cleanup alternatives according to nine criteria which are described in Figure #4 (on page 6.) Tables 1 through 3 (on pages 5, 7, & 8) address seven of the nine criteria with comparative analyses for each remedy. State and public acceptance, the eighth and ninth criteria, are being addressed through this proposed plan and public comment period. The proposed groundwater remedy changes for the Koppers site were each reviewed against a no action alternative and other alternatives. A discussion of the remedy alternatives and EPA's preferred alternative are provided below for public comment.

1) TECHNICAL IMPRACTICABILITY (TI) WAIVER PROPOSED REMEDY CHANGE

A TI waiver is used when it is technically impracticable or infeasible, from an engineering perspective, to comply with cleanup standards contained in the applicable or relevant and appropriate requirements (ARARs). The EPA is considering a TI waiver for groundwater restoration at the former creosote pond area and former cellon blow down area

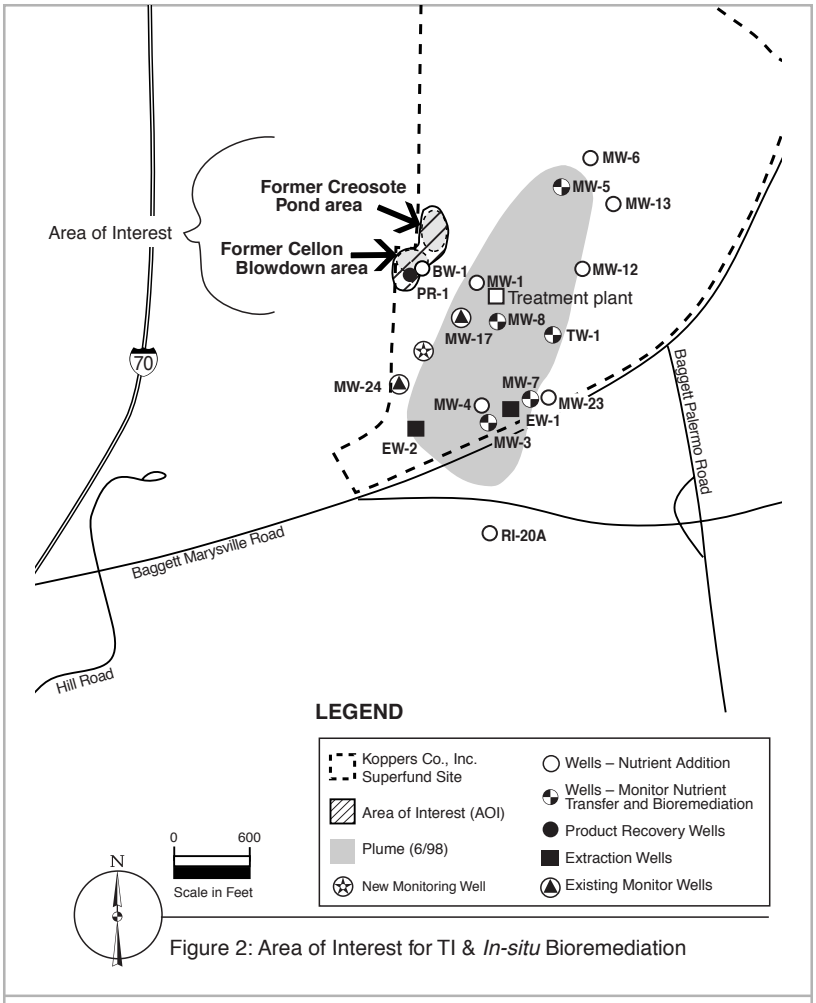

Figure 2: Area of Interest for TI & *In-situ* Bioremediation

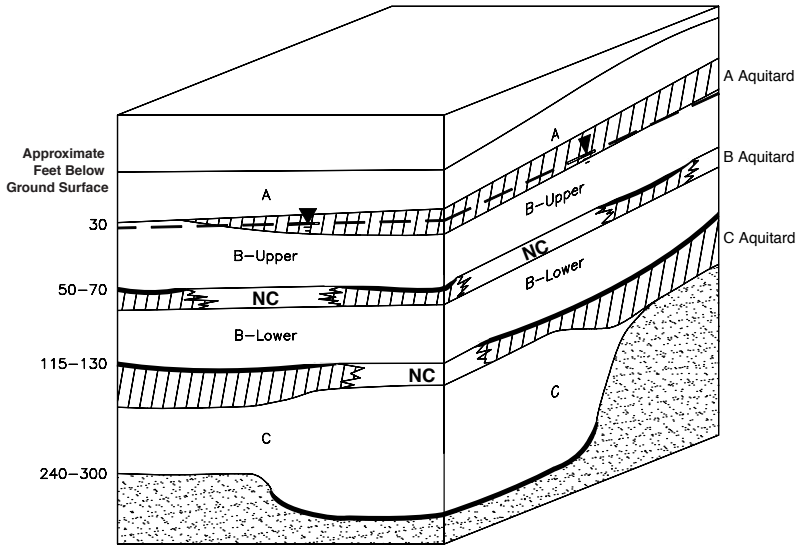

Figure 3: Hydrostratigraphic Block Diagram for the AOI

Legend

- Silt and Clay
- Sand and Silt
- Gravels (Water Transmissive)
- Static Water Level
- DNAPL Residing on Surface of Aquitard
- NC — Not Continuous
- Aquitard — Retards Water Flow

designated the area of interest (AOI) (See Fig. 2). The AOI represents less than 4 acres of the 200 acres at the Koppers site. Specifically, the TI waiver is sought for the following ARARs: Federal drinking water standards; State drinking water standards; Ambient water-quality criteria; State criteria for groundwater cleanup; and California State Water Resources Control Board 68-16 (Statement of Policy with respect to maintaining high quality of waters in California).

A TI waiver is recommended for three reasons at the Koppers site. First, the surface soil contaminants: arsenic, chromium, pentachlorophenol (PCP), creosote, and dioxin which were the source of the groundwater contamination were removed in 1996 and 97. Therefore, potential for additional contaminants cannot impact the groundwater. Second, monitoring data collected since 1986 has not shown contaminants leaving the AOI groundwater area and no creosote or dissolved constituents from creosote have been detected at the P&T system. Third, it is not technically feasible to remove the PCP and creosote DNAPL which remains within the saturated zone beneath the AOI from 30 to 300 feet below ground surface (bgs). DNAPL refers to liquids that do not mix with and are heavier than water, such as creosote. Gravity pulls the DNAPL down through the subsurface until it reaches an impervious or low permeability soil layer like clay. Under the AOI at the Koppers site, the DNAPL is trapped on three clay layers (see Fig. 3). Site boring data indicates creosote is contained on surface depressions at each of the three clay layers 50 to 300 feet below ground. The depressions are like bowls that trap the DNAPL and retard continued migration.

In considering alternative actions to cleanup groundwater in the AOI, EPA evaluated Alternative 1, no

Table 1 - ANALYSIS OF TI WAIVER ALTERNATIVES

Evaluation Criteria	Alternative 1: No Action	Alternative 2: Grout Curtain Wall	Alternative 3: Thermal Treatment - Contained Recovery of Oily Wastes (CROW) Method	Alternative 4: Thermal Treatment - Steam Enhanced Extraction	Alternative 5: Continue Operation of On-Property Pump & Treatment (P&T)	Alternative 6: Monitor After P&T Achieves ARARs Outside of AOI
Protection of Human Health and the Environment	Does not provide overall protection of human health and the environment.	Provides moderately high degree of overall protection of human health and the environment.	Provides low degree of overall protection of human health and the environment.	Provides low degree of overall protection of human health and the environment.	Provides moderately high degree of overall protection of human health and the environment.	Provides moderately high degree of overall protection of human health and the environment.
ARARs Compliance	Does not comply.	Does not comply.	Does not comply.	Does not comply.	Does not comply.	Does not comply.
Long-Term Effectiveness and Permanence	Least effective.	Effective as long as cracks and fissures do not develop in the wall.	Partially effective because 12% of DNAPL would be removed over a 20 yr period. Remaining DNAPL would prevent restoration of groundwater to cleanup standards.	Moderately effective with potential for significant DNAPL removed. However some residual DNAPL would remain preventing restoration of groundwater to cleanup standards.	Not effective as the DNAPL in the AOI would not be removed (P&T will be able to capture the contaminants coming from the AOI).	Not effective as the DNAPL in the AOI would not be removed (if monitoring showed contaminants coming from the AOI, P&T will be operated for removal).
Reduction of Toxicity, Mobility, or Volume	Does not reduce toxicity, mobility, or volume.	Does not reduce toxicity or volume, but effective in reducing mobility.	Effective in reducing toxicity and volume, but not effective in reducing mobility.	Effective in reducing toxicity and volume, but not effective in reducing mobility.	Does not reduce toxicity or volume, but effective in controlling mobility if contamination leaves AOI.	No reduction in toxicity or volume, but effective in controlling contamination leaving AOI.
Implementability	Easy to implement because no action required.	Implementable, but suitability of the soil condition must be evaluated for wall construction.	Difficult to implement technically due to depth of DNAPL. Bench scale testing & computer modeling indicated 12% to 65% of free creosote could be removed within 20 years. Pilot scale test is required.	Difficult to Implement technically because of existence of DNAPL in deeper depths. A pilot scale treatability test is required.	Easy to implement. P&T already in place & operating.	Easy to implement. Requires only maintenance of existing P&T.
Present day Cost with effort up to 30 yrs.	$0	$22 million	$26.7 million	$70 million	$4.5 million	$2.2 million

Note - Alternative 6 is the preferred alternative.

action; Alternative 2, a grout curtain wall barrier; Alternatives 3&4, two different thermal treatment methods; Alternative 5, continuing to operate the P&T once the treatment standards had been achieved outside the AOI; and Alternative 6, shutting down the on-property P&T after reaching ROD cleanup standards outside the AOI and initiating monitoring {EPA's preferred alternative} (See Table 1). In reviewing the remedy alternatives, the remedy must meet the threshold criteria of being protective of human health and the environment and comply with ARARs. None of the alternatives would comply with ARARs because some contamination would still remain, preventing the restoration of groundwater in the AOI to drinking water standards. Thus, none of the alternatives comply with ARARs threshold criteria, and a waiver is required. In addition, the no action alternative is not protective of human health because without monitoring,

EPA could not ensure that the public would be protected. An additional criteria is cost. Alternatives 2, 3, 4, and 5 are no more protective than preferred Alternative 6, but significantly more expensive, (see Table 1, page 5.) Alternative 5, continuing to operate the on-property P&T once cleanup standards have been achieved outside the AOI, would not be more protective than monitoring. The P&T system is unable to extract contaminants out of the AOI. Once the area outside of the AOI is clean, operating the P&T would just be treating already clean groundwater. Alternative 6 is the preferred alternative, because it would be highly protective of public health with long term effectiveness. P&T action could be resumed if monitoring showed contamination leaving the AOI. Also, alternative 6 is the lowest cost and is easy to implement because the system is in place except for one additional monitoring well.

EPA will require monitoring of the AOI semiannually until drinking water standards are met. As part of the contingency plan to support the TI waiver, the on-property P&T system will be maintained even after groundwater outside the AOI is restored. If contaminated groundwater is detected flowing from the AOI, the on-property P&T system will be reactivated to capture and treat the contaminated groundwater. Reactivating the P&T would provide the necessary contingency capability since groundwater from the AOI flows by gravity to the on-property groundwater P&T system extraction wells EW-1 and EW-2 (See Fig. 2, page 4). To ensure adequate data coverage once the P&T is no longer operating, an additional monitoring well will be installed to monitor groundwater south of the AOI as a condition of the TI waiver approval (See Fig. 2, page 4). The monitoring well would be installed and operational prior to allowing the on-property P&T shutdown once groundwater is restored outside the AOI. A deed restriction will be placed on the AOI to prevent future drinking water wells from being installed. Also, an annual review of the industrial activity surrounding the AOI will be conducted to insure no action is taken to adversely influence the AOI.

REMEDY SELECTION NINE CRITERIA ANALYSIS

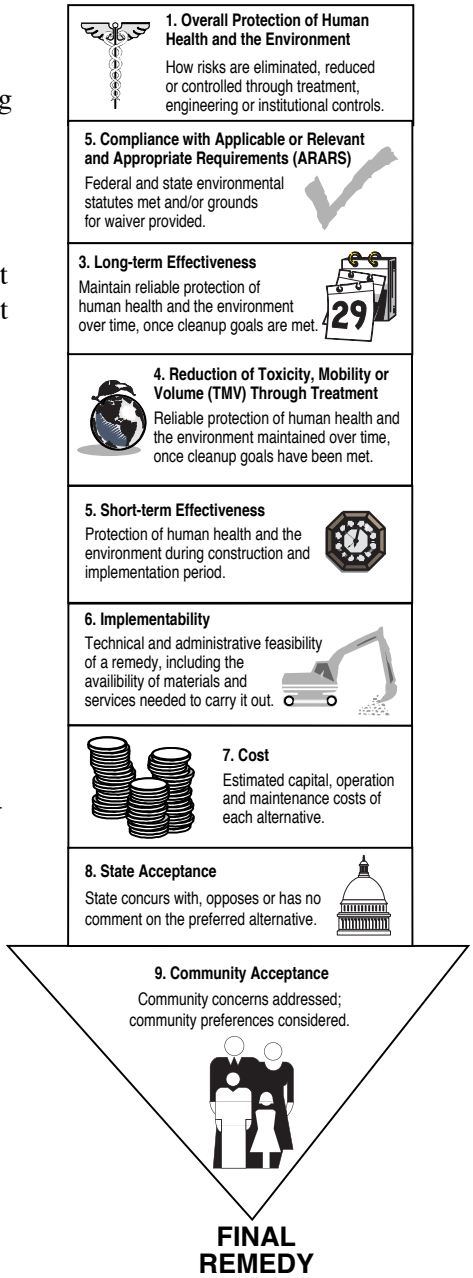

Figure 4

WHAT IS ENHANCED IN-SITU BIOREMEDIATION?

Site and literature data confirm that existing soil bacterium (unicellular microorganisms) will break down PCP to non hazardous substances in place. This break down process that occurs in-place is referred to as *in-situ* bioremediation. The rate and extent of breakdown or degradation depend on various factors such as PCP concentration, temperature, pH, and the amount of nutrient or food available to bacterium. Adequate nutrients such as nitrogen, phosphorous and oxygen aid in the natural breakdown of PCP by bacterium ultimately to carbon dioxide and inorganic chloride. By adding small quantities of nutrients to selected monitoring wells, PCP destruction can be accelerated/enhanced to reduce the time necessary to achieve groundwater cleanup. The needed oxygen, nitrogen and phosphorus can be provided by periodically adding small quantities of magnesium peroxide to release oxygen and diammonium phosphate to supply nitrogen and phosphorous at selected groundwater wells. The addition of nutrients to enhance the natural break down of PCP is enhanced *in-situ* bioremediation. The effect of the nutrients addition will be evaluated by sampling data obtained from down gradient monitoring wells (See Figs.1 & 2 on pages 2 & 4). The duration of the enhanced *in-situ* bioremediation programs will be determined by monitoring results.

2) ENHANCED IN-SITU BIOREMEDIATION GROUNDWATER PROPOSED REMEDY CHANGE

The proposed enhanced *in-situ* bioremediation remedy change alternatives for the on and off-property groundwater plumes were reviewed individually (See Table 2 and 3 on pages 7 & 8). The on-property P&T remediation is an essential part of the continuing groundwater remediation and will run until cleanup standards are met outside the AOI area.

Table 2 - ANALYSIS OF ON-PROPERTY GROUNDWATER REMEDIAL CHANGE ALTERNATIVES

Evaluation Criteria	Alternative 1: No Action	Alternative 2: On-Property Pump and Treatment (P&T) with Enhanced Bioremediation & Monitored Natural Attenuation as Contingency	Alternative 3: On-Property P&T
Protection of Human Health and the Environment	Does not provide overall protection of human health and the environment.	Provides high degree of overall protection of human health and the environment.	Provides high degree of overall protection of human health and the environment.
ARARs Compliance	Does not comply.	Complies.	Complies.
Long-Term Effectiveness and Permanence	Least effective.	Effective as the PCP in the plume will be removed by P&T and then be biodegraded to nonhazardous substance by added nutrients and natural attenuation. Long term effectiveness will depend on how well the added nutrients are distributed in the groundwater for them to act on the PCP. MNA needed as contingency if not all portions of the plume receive nutrients.	Effective as shown by existing P&T.
Reduction of Toxicity, Mobility, or Volume	Partly effective in reducing toxicity, mobility, or volume due to natural attenuation.	Effective in reducing toxicity, mobility, or volume.	Effective in reducing toxicity, mobility, or volume.
Short-Term Effectiveness	Highly effective as no construction needs to be performed.	Effective, but requires adherence to a health and safety plan.	Effective, but requires adherence to a health and safety plan.
Implementability	Easy to implement because no action required.	Easy to implement. Duration of remediation is not known now, but can be estimated using monitoring data collected during the progress of remedial (enhanced bio and natural attenuation) actions.	Easy to implement as P&T already in place and operation.
Present Day Cost With Effort Up to 30 Yrs.	$0	$2.1 million	$4.5 million

Notes - Alternative 2 is the preferred alternative.

P&T is not a needed component for off-property remediation. The existing off-property P&T was turned off in December 1995 because the off-property plume had shrunk and stabilized to such an extent that the P&T system was only treating clean groundwater (See Fig 1, page two). The extent of the off-property plume reduction confirms significant natural attenuation has occurred and a P&T is no longer needed to control the toe of the plume.

• ON-PROPERTY

In considering the alternative actions for the on-property groundwater remedy change, EPA looked at Alternative 1, no action; Alternative 2, the existing on-property P&T aided by enhanced bioremediation with monitored natural attenuation (MNA) as a contingency remedy (EPA's preferred alternative); and Alternative 3, continued operation of the existing P&T without enhanced bioremediation (See Table 2). A no action alternative would not provide overall protection of human health and the environment because it would not provide any monitoring. Operating the on-property P&T with enhanced bioremediation is the preferred remedy due to the faster breakdown of PCP which could allow operation of the on-property P&T to be reduced by 10 to 15 years. Shutting down the on-property P&T and using only enhanced bioremediation was also considered and not included in the alternatives table because it was not considered protective (there is significant risk that on-property contamination could migrate off-site to feed the off-property plume if only enhanced bioremediation is used).

• OFF-PROPERTY

In considering the alternative actions for the off-property groundwater remedy change, EPA looked at Alternative 1, no action; Alternative 2, modify off-property P&T; Alternative 3, enhanced bioremediation; and Alternative 4, monitored natural attenuation. A no action alternative would not provide overall protection

of human health and the environment because it would not provide any monitoring. Enhanced bioremediation by itself was compared to relocating the off-property P&T extraction wells within the residual PCP plume and to the use of monitored natural attenuation as a stand alone remedy (See Table 3). Enhanced bioremediation is the preferred remedy because the method will remediate the residual contamination more efficiently at lower cost than modifying the existing P&T. Site monitoring data has shown that enhanced bioremediation will achieve remediation standards faster than MNA by providing additional or missing nutrients to the natural bacterium that break down PCP. PCP is the only groundwater contaminant off-property. The proposed off-property remedy change would allow the dismantling of the off-property P&T which has not operated for the last three years because extraction wells EW-3 and EW-4 have been PCP free. A contingency plan for MNA will be required if monitoring showed PCP movement toward drinking water wells or the plume was expanding.

3) MONITORED NATURAL ATTENUATION (MNA) PROPOSED CONTINGENCY REMEDY

The EPA is recommending the present groundwater remedies be amended to allow MNA as a contingency remedy to be implemented if (1) EPA finds that nutrient addition cannot be adequately distributed to all areas of the residual on and off-property plumes and (2) if a technical and economic evaluation shows plume degradation has reached a point that MNA will degrade the remaining plume as fast as enhanced *in-situ* bioremediation. MNA uses only

Table 3 - ANALYSIS OF OFF-PROPERTY GROUNDWATER REMEDIAL CHANGE ALTERNATIVES

Evaluation Criteria	Alternative 1: No Action	Alternative 2: Modify Off-Property Pump and Treatment (P&T)	Alternative 3: Enhanced Bioremediation	Alternative 4: Monitored Natural Attenuation
Protection of Human Health and the Environment	Does not provide overall protection of human health and the environment.	Provides high degree of overall protection of human health and the environment.	Provides moderately high degree of overall protection of human health and the environment.	Provides low degree of overall protection of human health and the environment.
ARARs Compliance	Does not comply.	Complies.	Complies.	Complies.
Long-Term Effectiveness and Permanence	Least effective.	Effective as shown by existing P&T.	Effective as the PCP in the plume will be biodegraded to nonhazardous substance by the added nutrients. Long term effectiveness will depend on how well nutrients are distributed in the groundwater for them to act on the PCP.	Moderately effective. PCP in the plume will be biodegraded to nonhazardous substance by natural biological condition of the aquifer. Long term effectiveness will depend on the quantity of the naturally available nutrients in the aquifer.
Reduction of Toxicity, Mobility, or Volume	Partly effective in reducing toxicity, mobility, or volume due to natural attenuation.	Effective in reducing toxicity, mobility, or volume.	Effective in reducing toxicity, mobility, or volume.	Moderately effective in reducing toxicity, mobility, or volume.
Short-Term Effectiveness	Highly effective as no construction needs to be performed.	Effective, but requires adherence to a health and safety plan.	Effective, but requires adherence to a health and safety plan.	Effective.
Implementability	Easy to implement because no action required.	Easy to implement as P&T already in place and operation.	Easy to implement. Duration of remediation is not known now, but can be estimated using monitoring data collected during the progress of remedial action.	Easy to implement. Duration of remediation is not known now, but can be estimated using monitoring data collected during the progress of natural attenuation.
Present day Cost with effort up to 30 yrs.	$0	$5 million	$0.7 million	$1.1 million

Notes - Alternative 3 is the preferred alternative; Alternative 4 is the contingency remedy.

naturally occurring microorganisms such as bacteria to break down hazardous substances into less toxic or nontoxic substances without the addition of enhancing agents. The naturally occurring microorganisms in the soil eat and digest organic substances for nutrients and energy, transforming them into nontoxic substances. The natural bacterium necessary to break down PCP exists at the site, as demonstrated by the off-property plume reduction achieved up-gradient of the off-property P&T system (See Fig. 1, page 2) and the bioremediation treatability soil tests conducted in 1994. The MNA remedy alternative would require the development of a supporting contingency plan for the protection of human health and the environment. MNA was not proposed as the primary remedy because site monitoring data has shown that enhanced bioremediation will achieve remediation standards faster than MNA by providing the appropriate level of nutrients to optimize natural bacterium destruction of PCP.

SUMMARY OF SITE RISKS

Applicable or relevant and appropriate requirements are reviewed as part of a proposed remedy change. The EPA reviewed the groundwater cleanup values for the Koppers Superfund site and determined that changes in cleanup levels were appropriate for Barium and PCP (See Table 4). The proposed changes in cleanup values reflect developments in risk assessment and drinking water standards that have occurred since the signing of the original ROD. The proposed groundwater cleanup changes do not, however, change the basic conclusion in the 1988 Endangerment Assessment (EA). An EA or risk assessment is an evaluation of the risk posed to human health and/or the environment by exposure to contaminants at a site. The EA concluded that off-site and on-site groundwater required remediation to minimize the potential human health risks associated with use of groundwater as a source of drinking water. The EA concluded the excess lifetime cancer risks for the highest exposure which is reasonably expected to occur, ranged from 1x10-3 to 8x10-1, both of which are significantly greater than U.S. EPA's acceptable target risk range of 10-6 to 10-4 for cancer risks. The EA also demonstrated the potential for non-cancer health effects from the use of the groundwater for drinking water purposes. The current standard U.S. EPA Superfund risk assessment procedures are designed to be protective for people drinking 2 liters (a little more than 2 quarts) of drinking water per day, 350 days per year for 30 years - this represents a reasonable maximum exposure (RME) used in risk assessment.

BARIUM:

The EPA proposes changing the original cleanup level of 680 ppb (ug/l) for barium to 1000 ppb (ug/l) to comply with a California maximum contaminant level (MCL), a drinking water standard which is more conservative than the Federal MCL of 2000 ppb (ug/l). Residual non-cancer hazards from human consumption of groundwater cleaned to 1000 ppb (ug/l) barium are not expected to occur because safe drinking water barium levels range as high as 2600 ppb (ug/l).

PENTACHLOROPHENOL:

The EPA proposes changing the original groundwater cleanup value of 2.2 ppb (ug/l) for pentachlorophenol to 1.0 ppb (ug/l) to comply with a federal MCL, a drinking water standard, that was established by U.S. EPA after the ROD was signed. This lowering of the PCP cleanup value was anticipated in the original ROD. Residual excess lifetime cancer risks from drinking water usage of groundwater cleaned to a PCP concentration of 1 ppb would be 4x10-6 using current standard Superfund risk assessment values and procedures, a value that is at the lower end of Superfund's target risk range.

Table 4 - Summary of Groundwater Cleanup (CU) Values

Contaminant	1989 ROD CU Value (ppb)	Proposed CU Value (ppb)	Comment
Pentachlorophenol (PCP)	2.2	1	U.S. EPA MCL
Barium	680	1000	California MCL

HOW EPA ESTIMATES HEALTH RISKS

In the Endangerment Assessment, EPA looks at various ways the public could be exposed to contaminants and evaluates the potential health risks associated with those exposures. For carcinogens (chemicals that can cause concern), potential risk is expressed in terms of the probability of an individual contracting cancer (cancer risk level). This probability is expressed as the maximum number of excess cancers that might occur within a population, and it is calculated assuming an individual has an extended exposure (30 years for residential exposures) to the pollutants. The term "excess cancers" refers to those cancers which would occur in addition to the cancers that would otherwise occur in a population not exposed to site contaminants. For example, a cancer risk level of 6 in 1,000,000 associated with drinking contaminated water means that if one million people drank the water, there may be as many as six additional (or excess) cancers in that population.

For non-carcinogens (chemicals that do not cause cancer but may cause other health effects), the risk level is expressed in terms of the Hazard Index (HI). EPA and other health agencies determine safe levels of daily exposure for non-carcinogens called "reference doses." Safety or risk for a community is determined by comparing its actual daily exposure level to this reference dose - this is done by calculating the HI, which is the actual exposure divided into the reference dose. If the actual exposure is less than the reference dose (HI is less than 1), no health effects are expected to occur. If actual exposure levels are greater than the reference dose (HI greater than 1), a potential health threat may exit. The risk assessment methodology is described in detail in the Endangerment Assessment.

SITE INFORMATION REPOSITORIES AND LOCATIONS

EPA maintains site information repositories at the locations listed below. These site repositories contain project documents, fact sheets and other reference materials, and include the Administrative Record for the site that contains the documents EPA relied on to select the cleanup plans for the site.

The information EPA considered in the evaluation process for this Proposed Plan is available to the public to assist you in providing comments. The administrative record documentation for the site is extensive and you may wish to concentrate initially on the following key documentation: the latest status of groundwater remediation provided in the Semiannual 1998 Remedial Action Groundwater Monitoring Report dated December 09, 1998 by HSI Geotrans; Revised Evaluation of Technical Impracticability of Groundwater Restoration in the Former Creosote Pond and Cellon Blowdown Areas date June 12, 1998; and the soils removal action documentation contained in the Construction Documentation and Closure Report for Cell No. 2 and Associated Soil Removal Activities dated December 3, 1998 by TRC Environmental Solutions, Inc. Additional copies of the fact sheet and the Admistrative Record are available at the following locations:

Oroville Butte County Public Library
1820 Mitchell Avenue
Oroville, CA 95966

Contact: Brenda Crotts
(530) 538-7642

Hour: Tues. and Wed. 10-8 p.m., Thurs. 2-6 p.m., Fri. 10-5 p.m., and Sat. 12-4 p.m.

California State University
Meriam Library
400 West First Street
Chico, CA 95929-0295

Contact: William A. Jones
(530) 898-5710

Special Collection
Monday-Friday 9:00 p.m. - 4:00 p.m.

Superfund Records Center
95 Hawthorne Street
San Francisco, CA 94105

(415) 536-2000

Monday - Friday, 8:30 a.m. to 4:00 p.m.

GLOSSARY

Applicable or relevant and appropriate requirements (ARARs): The Superfund law requires compliances with any promulgated standard requirement, criteria, or limitation under Federal and state environmental laws or facility siting laws under the circumstance of a release or threat of release.

Bioremediation - the use of microorganisms (such as bacteria) to transform substances into non-toxic compounds

Carcinogenic - a substance that causes cancer

Cellon: a process for treating wood with a combination of PCP, diesel, buton, isopropyl ether

Creosote - semi-volatile organic mixture composed of numerous polynuclear aromatic hydrocarbons (PAHs) used as a wood preservative - some PAHs can cause cancer (cPAHs)

Diammonium Phosphate - natural occurring compound used as a source of the nutrients nitrogen and phosphorous

Dense Non-Aqueous Phase Liquids (DNAPLs) - liquids that are both not soluble in water and denser than water such as creosote

Dioxin - constitutes a class of complex organic compounds containing chlorine (chlorinated aromatic hydrocarbons) which were present as impurities in PCP. Dioxin is a strong cancer-causing agent. The main classes of dioxins are polychlorinated dibenzodioxins (PCDs) and the polychorinated dibenzofurans (PCDFs), the most toxic of which is 2,3,7, P-tetrachorodibenzodioxin (2,3,7, P-TCDD).

Endangerment Assessment or Risk Assessment - an evaluation of the risk posed to human health and/or the environment by exposure to contaminants at a site

Extraction Well - a well constructed to remove groundwater. Groundwater extracted from these wells is sent to a treatment facility for cleanup

In-situ - a Latin term meaning *in place*; in situ treatment of soil is performed without the need for excavation

Magnesium Peroxide - a patented formulation called Oxygen Release Compound that slowly releases molecular oxygen when placed in water

Maximum Contaminant Level (MCL) - MCLs are primary and secondary drinking water standards - They are enforceable regulatory levels, under the Safe Drinking Water Act, and must be met by all public drinking water systems to which they apply.

Monitored Natural Attenuation (MNA): MNA is the natural occurrence of microorganisms such as bacteria to break down hazardous substances into less toxic or nontoxic substances

Monitoring well - well used to allow data sampling for analysis of ground water

Off-Property - off-property area is the property south of the wood treatment facility owned by Koppers with impacted groundwater (south of Baggett-Marysville Road)

On-Property - on-property area is the wood treatment facility property owned by Koppers (north and west of Baggett-Marysville Road)

Parts per billion - one part in 1,000,000,000 parts

Pentachlorophenol (PCP) - a polar organic compound used extensively as a wood preservative at Koppers - PCP has been shown to cause cancer in laboratory animals and is a probable human carcinogen.

Pump and Treat System (P&T): P&T system is the installation of extraction wells that remove contaminated ground water. The water is then treated by removing the contamination by carbon absorption

Preliminary Remediation Goals (PRGs) - Risk-based default cleanup levels that combine current EPA toxicity values with "standard" exposure factors to estimate contaminant concentration in environmental media (soil, air, and water) considered protective of humans, including sensitive groups, over a lifetime

pH - scale of acidity

Record of Decision (ROD) - A legal document issued by EPA that provides the remedy actions for cleaning up a Superfund site

Up-gradient - A location with higher or greater, water elevation, relative to a specified reference point

FOR FURTHER INFORMATION ABOUT KOPPERS

You can call Jackie Lane, EPA community involvement coordinator, toll-free at (800) 231-3075 or (415) 744-2267. If you did not receive this proposed plan through the mail, but would like future publications, you can leave your name and address on the toll-free line as well.

PUBLIC COMMENT PERIOD MARCH 15 THROUGH APRIL 13, 1999.

You are invited to attend a community meeting regarding the Proposed Plan for the Koppers Superfund site on:

When: Thursday, March 23, 1999

Where: Oakdale Heights School
2255 Las Plumas Avenue
Oroville, CA

Time: 7:00 p.m.

At this meeting, EPA representatives will describe the alternatives evaluated and present EPA's preferred alternative. You will have the opportunity to ask questions, and give written and verbal comments on all the alternatives.

United States Environmental Protection Agency, Region 9
75 Hawthorne Street (SFD-3)
San Francisco, CA 94105
Attention: Jackie Lane

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U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, CA 94105

Attn: Ms. Kim Hoang
Northern California Cleanup Section (SFD-7-4)

Subject: Semiannual 2008
Remedial Action Groundwater Monitoring Report
Koppers Company, Inc. Superfund Site
(Feather River Plant)
Oroville, California

Dear Ms. Hoang:

On behalf of Beazer East, Inc. (Beazer), two copies of the *Semiannual 2008 Remedial Action Groundwater Monitoring Report for the Koppers Company, Inc. Superfund Site, (Feather River Plant), Oroville, California* are attached, one hard copy and one copy on CD. At the EPA's recommendation, the format of this report has been streamlined compared to previous reporting formats.

Beazer is in the process of optimizing the Remedial Action groundwater sampling for the Feather River Plant. The optimized program will be presented to the EPA in the near future.

If you have any questions regarding this document, please contact Mike Tischuk at (412) 208-8809.

Sincerely,

GEOTRANS

Jennifer Abrahams

Jennifer A. Abrahams, P.G.
Project Manager

Attachments

cc: Phil Woodward, RWQCB (CD version)
Mike Tischuk, Beazer (CD version)
K.C. Hendrix, F&TS (CD version)
Bill Jones, CSU - Chico Government Doc. Section
Ed Cargile, DTSC (CD version)
Steve Seidenglanz (CD version)
Nancy Brower, Butte County Public Library

Semiannual 2008 Remedial Action Groundwater Monitoring Report Koppers Company, Inc. Superfund Site (Feather River Plant) Oroville, California

March 2009

Prepared for:

Beazer East, Inc.
One Oxford Centre
Suite 3000
Pittsburgh, PA 15219

Prepared by:

GeoTrans, Inc.

10860 Gold Center Drive, Suite 200
Rancho Cordova, CA 95670

GeoTrans, Inc.
A TETRA TECH COMPANY

10860 Gold Center Drive
Suite 200
Rancho Cordova, CA 95670-6070

www.geotransinc.com 916-853-1800 FAX 916-853-1860

SEMIANNUAL 2008 REMEDIAL ACTION GROUNDWATER MONITORING REPORT KOPPERS COMPANY, INC. SUPERFUND SITE (FEATHER RIVER PLANT) OROVILLE, CALIFORNIA

March 2009

Prepared for:

Beazer East, Inc.
One Oxford Centre, Suite 3000
Pittsburgh, PA 15219

Prepared by:

GeoTrans
10860 Gold Center Drive, Suite 200
Rancho Cordova, CA 95670
(916) 853-1800

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1.0 INTRODUCTION

This report presents the groundwater monitoring data collected during the First Quarter and Semiannual (Second Quarter) 2008 sampling episodes at the Koppers Company, Inc. Superfund Site in Oroville, California (Site). The data presented in this report include analytical results for groundwater samples collected in January through June 2008, and monthly water level data for January through June 2008. The Record of Decision (ROD) (EPA, 1989) divides the impacted groundwater at the Site; the On-Property groundwater occurs north and west of Baggett-Marysville Road (see Figure 1) and the Off-Property groundwater includes impacted groundwater south of Baggett-Marysville Road.

This report has been prepared in compliance with the Consent Decree (CD) (EPA, 1992) and the Amendment to the CD (EPA, 2003a). The CD and Amendment to the CD describe work to be conducted during the Remedial Action (RA) phase of the project. This report is also prepared in accordance with the Monitoring Well Evaluation Report (Simon Hydro-Search, March 1994), which was modified by the EPA in a letter to Beazer East, Inc., dated May 10, 1994, and with the Revised Off-Property Groundwater Remedy Report (Hydro-Search, November 1995).

1.1 Background

Groundwater at the Site has been monitored since June 1985. This section presents a description of Remedial Actions and groundwater monitoring conducted both Off-Property and On-Property.

1.1.1 Off-Property

Remedial Action (RA) groundwater monitoring began in the Second Quarter 1993, following the start-up operation of the Initial Phase of Off-Property groundwater remediation. The Expanded-Phase Off-Property Groundwater Remediation began in April 1995, following documentation of reduction of the Off-Property plume and extension of the hydraulic

capture zone beyond the boundaries of the plume (Hydro-Search and Dames & Moore, June 1994). The focus of RA Off-Property groundwater monitoring during the Expanded-Phase is to assess the effects of the remediation system and the enhanced bioremediation program on the aquifer. The operation of the Off-Property remediation system was suspended on December 28, 1995, in accordance with the Revised Off-Property Groundwater Remedy Report (Hydro-Search, November 1995) and EPA approval presented in their December 19, 1995 letter commenting on the report.

The Off-Property groundwater *in situ* bioremediation program was implemented in August 1998 to augment pentachlorophenol degradation. Enhancements are added to wells 26, 59, 81, RI-20A, and RI-11.

1.1.2 On-Property

The On-Property Groundwater Remediation System began operation in February 1994. It includes two extraction wells: EW-1 and EW-2, designed with the capacity to pump up to 300 gpm, but operated at 200 gpm each. Monitoring well MW-8 was added to the extraction system in August 2002, as a groundwater remedy designed to contain and extract the effects of increased boron concentrations at the Dri-Con/CCA Tank Area. Groundwater is extracted at 35 gpm from well MW-8 and blended with the influent to the On-Property Groundwater Remediation System. Groundwater is treated by air stripping and with GAC to remove ROD constituents. Treated groundwater is reinjected into the aquifer through injection wells IW-3 and IW-4.

Implementation of Expanded-Phase activities for the On-Property groundwater remediation system includes continued operation of a product recovery well and the On-Property *in situ* groundwater bioremediation system. Enhancements are added to wells MW-1, MW-4, MW-6, MW-12, MW-13, and MW-23.

The Site conceptual model includes two distinct On-Property pentachlorophenol plumes. The eastern plume is attributed to activities at the former pole washer area and the process area. The western On-Property plume is attributed to pentachlorophenol cosolved in the dense non-aqueous phase liquid (DNAPL) under the former creosote pond area and former cellon blowdown area (referred to as the TI Zone). Groundwater impacts within the TI Zone are interpreted to be due to the presence of creosote emulsion within the aquifer. Emulsion is typically observed in the groundwater samples collected in the TI Zone (K.C. Hendrix, personal communication).

The Amendment #2 to the Record of Decision for the Soil and Ground Water Operable Unit (Amendment #2)(EPA, September 1999) amends selected remedial actions for impacted groundwater, modifying both the cleanup standards and cleanup technologies selected in the 1989 ROD. The Amendment #2 provides for: a Technical Impracticability Waiver for groundwater restoration in the TI Zone due to the presence of DNAPL (the western pentachlorophenol plume); adding enhanced *in situ* bioremediation to the remedy to augment pentachlorophenol destruction; and, adding monitored natural attenuation as a contingency remedy. The ROD standards identified in Amendment #2 remained the same as the 1989 ROD goals, with the two following exceptions: the pentachlorophenol ROD standard was revised from 2.2 parts per billion (ppb) to 1.0 ppb, and the barium standard was revised from 680 ppb to 1,000 ppb. The Amendment to the CD incorporates Amendment #2, and also specifies criteria to evaluate the completeness of the groundwater remedy, both Off-Property and On-Property.

1.2 Purpose and Objectives

The RA groundwater monitoring program has three primary components:

- Water level monitoring;
- Chemical concentration monitoring; and
- Alternative Water Supply Program (AWSP) monitoring.

The purpose of water level monitoring is to define the elevation of the water table surface across the Site. This information is used to define groundwater flow directions, to estimate the magnitude of the groundwater gradient, and to verify the extent of hydraulic capture zones.

The purpose of chemical concentration monitoring is to assess the extent of constituents above the standards defined in the ROD and updated in Amendment #2. The objectives of the assessment are to verify the extent of impacts, and to evaluate the performance of the extraction system, the enhanced bioremediation program, and the progress of the remedy.

The CD and Amendment to the CD include provisions for the AWSP. Part of the AWSP includes monitoring private wells in the vicinity of the Off-Property plume where pentachlorophenol has been detected at one-half the ROD standard, or 0.5 ppb.

Monthly water level data for January through June 2008 are discussed in Section 2.0, chemical concentration data for First Quarter and Semiannual (Second Quarter) 2008 monitoring are discussed in Section 3.0, and data from private wells are discussed in Section 4.0. A discussion of the operation and performance of the Off-Property and On-Property groundwater treatment plants is included in Section 5.0, as they pertain to water levels or chemical concentrations in groundwater. The annual summary and conclusions are presented in Section 6.0. References cited are listed in Section 7.0.

2.0 WATER LEVEL DATA

Monthly groundwater elevations were measured in On-Property and Off-Property wells between January and June 2008, and are reported in Table 1. Access to some wells is limited during rainy periods and during the summer due to fire danger associated with dry vegetation, therefore, not all wells were measured each month.

Groundwater elevations for wells screened in the B-Zone aquifer wells were used to prepare groundwater contour maps for Off-Property and On-Property wells during January and June 2008, shown on Figures 2A, 2B, 3A, and 3B.

The groundwater elevation measurements are normally collected at the end of each month and occur over a period of several consecutive days. Occasionally, this time period extends into the beginning of the following month, however, the data collected are interpreted to be representative of the same month.

The groundwater flow directions, as interpreted from the January and June 2008 groundwater contours, are consistent with 1995 through December 2007 groundwater flow directions and those observed prior to start-up of the groundwater remediation systems.

The Off-Property groundwater flow direction is generally to the south-southwest. The hydraulic gradient ranges from 0.001 to 0.0017 feet per foot (ft/ft).

The On-Property groundwater flow direction is generally to the south. The hydraulic gradient ranges from 0.0018 to 0.005 ft/ft upgradient of the influence of extraction wells EW-1, EW-2, and MW-8. Pumping from EW-1, EW-2, and MW-8 has resulted in cones of depression around these wells, as shown on Figures 2B and 3B. The groundwater contours demonstrate that impacted groundwater is captured by the extraction wells. The

contours also indicate that On-Property groundwater is hydraulically separated from the Off-Property groundwater.

3.0 CHEMICAL CONCENTRATION DATA

The groundwater wells scheduled to be sampled and the corresponding chemical analyses scheduled to be conducted during the First Quarter and Semiannual 2008 monitoring events are shown in Tables 2A, 2B, 3A, and 3B. The groundwater monitoring program for these quarters followed the sampling schedule presented in the Monitoring Well Evaluation Report (Simon Hydro-Search, March 1994), as modified by the EPA in a letter to Beazer East, Inc., dated May 10, 1994. The First Quarter and Semiannual (Second Quarter) 2008 sampling rounds were performed in March and June 2008, respectively.

The groundwater analytical results are presented in Tables 4A, 4B, 5A, 5B, 6, and 7. Electrical conductivity (EC), pH, temperature, and turbidity are measured in the field to evaluate the physical characteristics of the groundwater prior to sampling (Tables 4A and 5A). In general, stabilization of these parameters indicates that the well has been adequately purged and that the sampled water is representative of the aquifer. At this Site, these parameters are not related to impacts by ROD constituents.

The First Quarter and Semiannual (Second Quarter) 2008 groundwater data evaluated in the reports were found to be reliable and useable.

3.1 Off-Property

This section discusses the Off-Property groundwater monitoring results (Table 4B).

3.1.1 Monitoring Results

Off-Property wells were sampled in accordance with the schedules shown in Tables 2A and 2B, with the following exceptions: well 31C2 had an inoperative dedicated submersible pump and could not be sampled, and, well RI-12 was damaged by a wild fire and could not be sampled.

Off-Property groundwater samples were analyzed for pentachlorophenol, the results are presented in Table 4B and shown on Figures 4A and 4B. The pentachlorophenol concentrations detected at well RI-3 have decreased significantly since the implementation of the bioremediation program; the concentrations at well RI-3 have been below 1 ppb since November 2006. Figure 5B shows pentachlorophenol concentrations versus time for well RI-3.

Well 86, an Off-Property upper B-Zone well, was sampled during the First Quarter and Semiannual (Second Quarter) 2008 sampling rounds. Pentachlorophenol has been detected in well 86 intermittently from 1986 to 1988, and since 1999. The detections of pentachlorophenol correlate with times at which the water level in well 86 reaches or exceeds 122 feet mean sea level (msl). The pentachlorophenol detections typically persist for eight to 12 months after the time the water level reaches this elevation. Since November 1999, some of the pentachlorophenol detections have been above the ROD standard. The pentachlorophenol concentrations have remained above the ROD standard since February 2002, with the exception of the non-detect result for Third Quarter 2006, due to the repeated and extended durations of water levels above 122 feet msl. A summary of pentachlorophenol concentrations and corresponding water levels from well 86 from November 1999 through June 2008 is presented in Table 7.

Well 25, located approximately 2,200 feet downgradient of well 86, screened in the A- and B-Zones, has been sampled quarterly since the First Quarter 2000 sampling round. The results of the quarterly sampling events indicate that pentachlorophenol has not been detected in well 25. Wells 86 and 25 will continue to be sampled for pentachlorophenol on a quarterly basis until the analytical results for both wells are less than the reporting limit of 0.5 ppb for four consecutive quarters. Pentachlorophenol results for samples from well 25 were less than the reporting limit of 0.5 ppb for the First Quarter and Semiannual 2008 sampling rounds.

3.1.2 Off-Property Groundwater *In Situ* Bioremediation Program

The Off-Property bioremediation program is considered to be effectively enhancing bioremediation of pentachlorophenol. This program will continue through the remainder of 2008. If the pentachlorophenol concentrations detected in samples from well RI-3 remain below the ROD standard of 1 ppb throughout 2008, this program may be terminated in 2009.

3.2 On-Property

This section discusses the On-Property groundwater monitoring results, and, the product recovery well.

3.2.1 Monitoring Results

Various On-Property wells were sampled for a combination of pentachlorophenol, isopropyl ether (IPE), polynuclear aromatic hydrocarbons (PAHs), benzene, ethylbenzene, xylenes, arsenic, barium, boron, cadmium, chromium, copper, and mercury depending on previous detections of these analytes (see Tables 3A and 3B).

First Quarter and Semiannual (Second Quarter) 2008 analytical results for On-Property wells are presented in Tables 5A, 5B, and 6. On-Property boron concentrations are shown on Figures 6A and 6B. The On-Property pentachlorophenol concentration contours for First Quarter and Semiannual (Second Quarter) 2008 are shown on Figures 7A and 7B.

The discussion of the On-Property monitoring results is divided into the two pentachlorophenol plumes: the TI Zone Plume (the western plume) and the eastern plume.

3.2.1.1 TI Zone Plume

Wells sampled in the TI Zone Plume include MW-15, MW-16, and MW-19. In addition, wells MW-24 and MW-25 are downgradient of the TI Zone plume and monitor constituents potentially migrating from the TI Zone. Numerous PAHs are detected in groundwater

samples collected from well MW-16, as indicated in Table 6, due to the presence of creosote emulsion in the groundwater samples.

The following observations may be made for constituents analyzed in and downgradient of the TI Zone:

- Pentachlorophenol was detected above the ROD standard in well MW-16, but was below the ROD standard at downgradient wells MW-24 and MW-25.

- Xylenes were detected in wells MW-15 and MW-16 and ethylbenzene was detected in well MW-16. Ethylbenzene and xylenes were below their respective applicable and appropriate requirements (ARARs). Benzene was not detected in either sample from wells MW-15 and MW-16, however, the detection limit was elevated for both samples due to matrix interference.

- PAHs were detected in samples from wells MW-15, MW-16, MW-19, and MW-24 (Table 6). Carcinogenic PAHs (cPAHs) were detected in samples from wells MW-15 (at 4.51 ppb in March 2008 and 0.64 ppb in June 2008), MW-16 (at 9,940 ppb in March 2008 and 7,190 ppb in June 2008), and MW-19 (at 1.56/0.94 ppb in March 2008 and 0.37/0.42 ppb in June 2008) The MW-16 results are not believed to be representative of aqueous-phase cPAH concentrations in groundwater, but are considered to be emulsion present in well MW-16. Well MW-24 had one PAH compound (pyrene) detected at concentrations of 3.6 ppb in March 2008 and 2.8 ppb in June 2008. The detection of this compound is very close to its practical quantitation limit. PAHs were not detected in the sample from well MW-25.

- Boron was detected in samples collected from well MW-25 (Table 5B and Figures 6A and 6B). Although the boron concentrations detected at MW-25 (a C-Zone well) exceed the ROD standard of 1,200 ppb, these C-Zone

concentrations are considered to occur naturally and to be unrelated to wood treating operations at the Site.

3.2.1.2 Eastern Plume

The pentachlorophenol concentrations at wells MW-3 and TW-1 have decreased significantly since implementation of the On-Property groundwater *in situ* bioremediation program (Figures 8B and 8G).

The increased concentrations of pentachlorophenol and boron (Table 5B) detected at well MW-8 are attributed to impacts from the Dri-Con/CCA Tank Area. The pentachlorophenol concentrations through June 2008 have remained below 300 ppb. The boron concentrations at MW-8 exceed the ROD standard of 1,200 ppb, ranging from 1,400 to 2,460 ppb except for a detection of 732 ppb on March 12, 2008.

Groundwater extraction at well MW-8 began in July 2002 to contain and remove the effects of the pulse of increased boron and pentachlorophenol concentrations from the Dri-Con/CCA tank area. This extracted groundwater is blended with the treatment plant influent. The treatment plant effluent continues to perform effectively, the effluent pentachlorophenol concentrations remain below the reporting limit of 0.5 ppb and the boron concentrations remain below 700 ppb.

Figures 8A through 8G show pentachlorophenol concentrations versus time for selected On-Property wells using a semi-log scale, at the request of the EPA.

The following observations may be made for the other constituents analyzed:

- Isopropyl ether was not detected above the ROD standard of 2,800 ppb in the two extraction wells (EW-1, EW-2) (Table 5B).

- Benzene, ethylbenzene and xylenes were not detected in the two extraction wells (EW-1, EW-2).

- Boron was detected in samples from the 5 wells analyzed (Table 5B and Figures 6A and 6B). The detected concentrations are consistent with historical detections, with the exception of MW-8, as discussed above. The boron concentrations exceed the ROD standard of 1,200 ppb in wells MW-8 and MW-18. Well MW-18 is screened in the C-Zone. As discussed above, elevated boron concentrations in the C-Zone are considered to occur naturally and are unrelated to wood treating operations. The boron concentrations at B-Zone wells MW-7 were below the ROD standard. The boron concentrations were below the ROD standard for C-Zone wells MW-17 and SW-1.

- Arsenic, cadmium, chromium, copper and mercury were not detected in the two extraction wells, and barium was detected at concentrations below the ROD standard in the two extraction wells (Table 5B).

3.2.2 On-Property Groundwater *In Situ* Bioremediation Program

The results of the implementation of the On-Property Groundwater *In Situ* Bioremediation Program indicate that the enhancements have stimulated the aerobic degradation of pentachlorophenol. The pentachlorophenol concentration trends at select downgradient monitoring wells are posted in Figures 8A, 8B, 8D, 8E, and 8G. Enhancements will continue to be added quarterly to wells MW-1, MW-4, MW-6, MW-12, MW-13, and MW-23 to continue stimulating the degradation of pentachlorophenol at least for as long as pentachlorophenol concentrations continue to exceed 10 ppb at well MW-2.

3.2.3 Product Recovery Well

Product recovery well PR-1 was installed in the former creosote pond area to operate as a passive recovery system in an area where mobile creosote is present. The well has two separate screened intervals; each 10-foot screen is located immediately above a clay lens, where free creosote is perched. Mobile creosote enters the well through the two screened intervals and collects in a five-foot deep sump, or tailpipe, at the bottom of the well. The production history of well PR-1 is presented in Table 8. Through June 2008, approximately 1,300 gallons of product have been recovered. In addition, over 850 gallons of creosote/water emulsion have been recovered. These volumes are based on a visual assessment of the fluid purged from well PR-1. Black purged fluid is identified as product, and gray and brown purged fluid is identified as creosote/water emulsion.

3.3 Monitoring-Parameter Trends

The following sampling frequency evaluation was proposed in the Monitoring Well Evaluation Report (Simon Hydro-Search, March 1994). If a parameter is detected above its respective ROD standard, it will also be analyzed for in the next quarter. If the detection above the ROD standard is verified, then the sampling frequency for that parameter in that well will be increased to the next highest frequency. In a similar fashion, if a constituent in a specific well is not detected above its respective ROD standard for four sampling rounds, its frequency will be decreased to the next lowest frequency.

Tables 9 through 16 present qualitative monitoring results since the Annual 1996 Monitoring Round. The recommendations in the Monitoring Well Evaluation Report were implemented in the Second Quarter 1994. Based on the data in Tables 9 through 16, the following changes will be effective beginning Third Quarter 2008:

- Pentachlorophenol sampling will be discontinued indefinitely at well RI-12 due to the inoperable dedicated pump in the well.

- The sampling frequency for boron at well MW-17 will be decreased from semiannually to annually.

4.0 ALTERNATIVE WATER SUPPLY PROGRAM

The CD and Amendment to the CD include provisions for an Alternative Water Supply Program (AWSP) for domestic water users. Part of the AWSP involves monitoring private wells in the vicinity of the Off-Property plume that have had detections of pentachlorophenol above one-half of the ROD standard, or 0.5 ppb.

The degradation of the residual pentachlorophenol at well RI-11 is being enhanced in accordance with the revised Off-Property Groundwater *In Situ* Bioremediation Program. As mentioned previously, the Bioremediation Program was expanded to include adding enhancements to private wells 59 and 81. Based on the EPA approval in July 2006 (EPA, July 2006), the additions at the two private wells began in September 2006. The AWSP will remain in effect for five private wells in the vicinity of RI-11 (59, 60, 61, 62, and 81) until completion of the bioremediation enhancement program and implementation of a field sampling plan for these wells.

Additionally, two private wells (31C2, 31D3) will remain part of the AWSP while pentachlorophenol concentrations are detected at well 86. Quarterly pentachlorophenol monitoring of wells 86 and 25 will continue until analytical results are less than 0.5 ppb for four consecutive quarters at both wells. Wells 31C2 and 31D3 will be sampled semiannually for pentachlorophenol during this time period. Well 31D3 was sampled during the Semiannual 2008 monitoring round. The dedicated pump for privately owned well 31C2 was inoperable and, therefore, was not sampled. The pentachlorophenol analytical result was below 0.5 ppb at well 31D3.

5.0 OPERATION OF THE GROUNDWATER TREATMENT SYSTEMS

As discussed in Section 1.1, operation of the Off-Property remediation system was suspended on December 28, 1995 with EPA approval. The results of First Quarter and Semiannual (Second Quarter) 2008 groundwater sampling and water level data (Tables 1 and 4B, and Figures 2A and 3A) indicate that the Off-Property plume is hydraulically separated from the eastern On-Property plume.

During the First Quarter and Semiannual (Second Quarter 2008), the average weekly combined pumping rate from EW-1, EW-2, and MW-8 ranged from approximately 200 to 300 gpm (Figure 9). Over 2,579,909,350 gallons of groundwater had been treated by the On-Property system by the end of June 2008. The system has met the treatment and discharge objectives, as detailed in Monthly Discharge Monitoring Reports prepared under NPDES Permit No. CA 0082988, Monitoring and Reporting Program No. 92-220.

The weekly combined pumping rates are calculated from the On-Property treatment system effluent cumulative gallon totalizer. The multi-media filter in this unit became clogged with trapped sediment, which restricts water flow through this unit and creates high operating pressures and reduced treatment capacity. GeoTrans scheduled cleaning out and replacing the media in third quarter 2008.

The injection wells performed without incident during the First and Second quarters of 2008.

6.0 CONCLUSIONS

This report presents the Semiannual 2008 sampling data from the Koppers Company, Inc. Superfund Site, Oroville, California. The data include monthly water level data, analytical results for groundwater samples and operational data from the groundwater remediation systems. The scope of work completed during the First and Second Quarters of 2008 sampling events and data collected for these events are summarized in Table 17.

Water level data indicate that the groundwater flow direction and gradient are consistent with previous years. The groundwater extraction wells pumped at rates sufficient to capture the eastern On-Property plume. The data indicate that operation of the On-Property system has caused the eastern On-Property plume and the Off-Property plume to become hydraulically separated.

The operation of the Off-Property remediation system was suspended in December 1995 with EPA approval. The intrinsic remediation of the Off-Property plume has progressed, and implementation of the Off-Property groundwater *in situ* bioremediation program will further enhance the intrinsic remediation. The concentrations in well RI-3 have continued to decrease and are now below the ROD standard. The Off-Property bioremediation program may be terminated in 2009 if the pentachlorophenol concentrations detected in samples from well RI-3 remain below the ROD standard of 1 ppb for the remaining two quarters of 2008.

The chemical data indicate that the pentachlorophenol mass in the eastern On-Property plume has decreased at a fairly aggressive rate. The extraction wells are pumping at a rate sufficient to capture the plume. The implementation of the On-Property groundwater *in situ* bioremediation program is anticipated to accelerate the degradation of the eastern On-Property pentachlorophenol plume. This program is anticipated to continue at least as long as pentachlorophenol concentrations at well MW-2 exceed 10 ppb.

Groundwater is being extracted from well MW-8 to contain and extract the effects of increased boron concentrations at the Dri-Con/CCA Tank Area.

The following changes will be effective beginning Third Quarter 2008:

- Pentachlorophenol sampling will be discontinued indefinitely at well RI-12 due to the inoperable dedicated pump in the well.

- The sampling frequency for boron at well MW-17 will be decreased from quarterly to semiannually

7.0 REFERENCES

EPA, 1989, Operable Unit Record of Decision, Koppers Superfund Site, Oroville, California, EPA Region IX, San Francisco, California (September 13, 1989).

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THIRD FIVE-YEAR REVIEW REPORT

FOR
KOPPERS COMPANY, INC.
SUPERFUND SITE
OROVILLE, CALIFORNIA

July 2008

Approved by:

Kathleen Salyer
Chief, Site Cleanup Branch
EPA, Region 9

Date:

7/28/08

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Acronyms & Abbreviations

ARARs	Applicable or Relevant and Appropriate Requirements
asl	above sea level
ATSDR	Agency for Toxic Substances and Disease Registry
AWSP	alternate water supply plan
Beazer	Beazer East, Inc.
CAMU	Corrective Action Management Unit
CD	Consent Decree
CDPH	California Department of Public Health
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
cy	cubic yards
DAP	di-ammonium phosphate
DNAPL	dense nonaqueous-phase liquid
DTSC	Department of Toxic Substances Control
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FS	Feasibility Study
GAC	granular activated carbon
gpm	gallons per minute
IC	Institutional control
IPE	isopropyl ether
KII	Koppers Industries, Inc.
L-P	Louisiana-Pacific Corp.
MCL	Maximum Contaminant Level
MNA	monitored natural attenuation
msl	mean sea level

NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	operations and maintenance
ORC	oxygen releasing compounds
OU	Operable unit
OWID	Oroville-Wyandotte Irrigation District (current name is South Feather Water & Power Agency)
P&T	Pump and treat
PAH	polynuclear aromatic hydrocarbon
PCDDs/PCDFs	polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans
PCOR	Preliminary Close Out Report
PCP	pentachlorophenol
ppb	parts per billion
ppm	part per million
PR-1	passive recovery well
RA	remedial action
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
TI	Technical Impracticability

Executive Summary

The United States Environmental Protection Agency (EPA) completed the third site-wide five-year review of the remedial actions implemented at the Koppers Company, Inc., Superfund Site (Koppers), located east of Highway 70 in Oroville, California. The purpose of the five-year review is to evaluate whether the remedial measures implemented at Koppers continue to be protective of human health and the environment.

Koppers is bounded by the former Louisiana-Pacific Corporation (a delisted Superfund site) to the west, Georgia Pacific Way to the north and Baggett-Marysville Road to the south and east. Historically, wood-treatment operations were conducted at Koppers. Residual waste was discharged to unlined evaporative basins. Product handling and two fires (1963 and 1987) have also contributed to contamination at Koppers.

Chemicals of concern at Koppers include pentachlorophenol (PCP), isopropyl ether (IPE), polynuclear aromatic hydrocarbons (PAHs), polychlorinated dibenzo-p-dioxins\polychlorinated dibenzofurans (PCDDs/PCDFs), arsenic, barium, boron, chromium, copper, and creosote.

A Record of Decision (ROD) was signed for Koppers in September 1989 detailing four main impacted soil locations and impacted groundwater on and off property. An Explanation of Significant Differences (ESD) was issued in January 1991, and ROD Amendment No. 1 was issued in August 1996, modifying the soil remedy. ROD Amendment No. 2 was issued in September 1999, modifying the groundwater remedy.

All ROD, ESD, ROD Amendment No. 1, and ROD Amendment No. 2 selected remedies have been implemented. The remedies included excavation, disposal into onsite landfill cells and capping of contaminated soils, debris and sediments; groundwater pump and treat with enhanced in situ bioremediation; product recovery; providing an alternate water supply; and institutional controls. The Koppers Site achieved construction completion with the signing of the Preliminary Close Out Report (PCOR) on September 4, 2003.

This is the third site-wide five-year review for the Koppers Site. The activities conducted for this five-year review included a site inspection, technical interviews of operators and regulators of the site, community interviews and technical review and analysis of data from the last five years of reports submitted by Beazer East, Inc. (Beazer). Currently, all implemented remedies are found to be functioning as intended by the decision document and, therefore, are protective of human health and the environment.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name : Koppers Company, Inc. Superfund Site

EPA ID: CAD009112087 **CERCLIS ID :** 0943

Region: 9 **State:** California **City/County:** Oroville/Butte

SITE STATUS

NPL status: ☒ Final ☐ Deleted ☐ Other (specify)

September 21, 1984

Remediation status (choose all that apply): ☒ Operating ☒ Complete

Multiple OUs? ☐ YES ☒ NO **Construction completion date:** 09/04/2003 (site-wide)

Has site been put into reuse? ☒ YES ☐ NO

REVIEW STATUS

Reviewing agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency _____

Author name: Kim Hoang, PhD, MPH

Author title: Remedial Project Manager **Author affiliation:** EPA Region 9

Review period: Data: July 2002 – July 2007 - Technical Reports: October 2002 – October 2007

Date(s) of Site inspection: December 18-19, 2007

Type of review: ☒ Statutory

☐ Policy ☐ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only

☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead

☐ Regional Discretion)

Review number: ☐ 1 (first) ☐ 2 (second) ☒ 3 (third) ☐ Other (specify)

Triggering action:

☐ Actual RA Onsite Construction at OU No.__

☐ Actual RA at OU No.__

☒ Previous Five-Year Review Report

☐ Construction Completion

☐ Other (specify) _____

Triggering action date: February 7, 2003

Due date (five years after triggering action date): February 7, 2008

Issues and Recommendations

Issues

There are no issues that affect protectiveness.

Protectiveness Statement

The remedy at the Koppers Superfund Site is protective of human health and the environment because all exposure pathways that could result in unacceptable risk are being controlled. Residents within the former plume have been provided with an alternate water supply. A deed restriction on the property prevents unacceptable exposure to on-site soil contamination and restricts the property for industrial use only. Current data indicate that the groundwater remediation is progressing and that the remedy is functioning as required to achieve groundwater remediation standards.

1.0 Introduction

The United States Environmental Protection Agency has conducted a third five-year review of the remedial action implemented at the Koppers Company, Inc. Superfund Site (also referred to as the Koppers Site, Koppers, or the Site) located south of Oroville, California, east of Highway 70.

The purpose of the five-year review process is to evaluate whether the remedial measures implemented at the Site are protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify any deficiencies found during the review and provide recommendations for addressing them.

By statute, EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121(c), as amended, states:

> "If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the Site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented."

The NCP, in section 300.430(f)(4)(ii), states:

> "If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action."

Consequently, this five-year review was performed because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unrestricted use and unlimited exposure.

This is the third five-year review for the Koppers Site. EPA conducted an initial five-year review in December 1997. No deficiencies were noted at that time. In the second five-year review, completed in 2003, EPA found that the soil remedy was completed successfully and concluded that the existing pump-and-treat (P&T) system was remediating the immediate threats posed by the Site. The triggering action for this third statutory review is the date of the second five-year review, February 7, 2003.

2.0 Site Chronology

Table 2-1 provides the chronology of key events associated with the Koppers Company, Inc. Superfund site. A more detailed chronology table is provided in Appendix A.

TABLE 2-1
Chronology of Site Events

Event	Date
Dredge mining operations were conducted at the Site.	1900s
Wood was treated at the Site with several chemicals including pentachlorophenol, creosote, and chromated copper arsenate solution to prevent wood deterioration by insects or fungi. Several contaminants were discharged to the soil during process operations.	1920 to 2001
Koppers purchased the property and wood-treating operations from the National Wood Treating Company.	1955
A fire occurred at the Site; approximately 20,000 gallons of PCP were released from tanks. Debris was buried on property initially, then later excavated and disposed of at an approved landfill.	1963
Groundwater found contaminated with PCP on property and off property.	1971 to 1972
Regional Water Quality Control Board (RWQCB) issued several orders to Koppers to clean up groundwater, end discharge of PCP into soil, and clean up contaminated soil. Koppers implemented these orders.	1973 to 191982
Site was placed on the National Priorities List (NPL).	September 1984
Residences within areas of impacted groundwater were connected to Oroville Wyandotte Irrigation District (OWID). Thirty-four residences were initially put on the alternate water supply plan (AWSP), with Koppers paying for their water bill. Of those thirty-four, seven are still on the AWSP, receiving payment from Beazer East, Inc. (Beazer) for their annual water bill.	March 1986 to date
Administrative Order on Consent signed between Koppers and EPA, requiring completion of the Remedial Investigation and Feasibility Study (RI/FS).	April 1986
Explosion and fire at the Site. EPA issued a unilateral order for the cleanup, removal, and stabilization of soil and debris.	April 1987
After the fire, Department of Health Services sampled neighboring properties and found elevated dioxin levels in chicken eggs; an advisory was issued and the source of area-wide trace dioxin was not determined.	March 1988
Koppers and the associated Site were bought by Beazer East, Inc. (Beazer).	1988
Beazer sold the property and wood-treating operations to Koppers Industries, Inc. (KII), yet Beazer retained responsibility for CERCLA matters at the Site.	December 1988
RI/FS reports completed. ROD for cleanup of groundwater and soil was issued for the Site, covering four soil units on the property (S1 through S4) and two groundwater units (referred to as on-property and off-property).	1988 to 1989

TABLE 2-1
Chronology of Site Events

Event	Date
ESD issued for the Site to limit cleanup standards for soil in the ROD (which were based on direct human exposure) to a depth of 5 feet, and confirm that EPA will establish cleanup standards for deeper soils based on protection of groundwater from subsurface soil contamination. The ESD also clarifies the ROD's requirements for institutional controls.	January 1991
Consent Decree between EPA and Beazer requiring Beazer to conduct remedial action work as specified in the ROD.	February 6, 1992
Soil remedial action implemented for the four soil units. Treatability studies found soil washing and soil bioremediation not to be implementable. Soil from one bioremediation test plot with high dioxin level was landfilled in Cell #1.	1989 to 1995
Groundwater remediation action implemented on property and off property.	1993 to 1994
Pilot study for in situ biotreatment system of creosote in on-property western groundwater plume. Terminated in 2001 at the request of Beazer, because additives apparently resulted in increased mobility of PAHs.	1995 to 2001
Off-property groundwater remedial system taken off line because the plume retreated. The extraction wells were no longer effective in capturing the plume.	December 1995
ROD Amendment No. 1 issued for the Site in 1996, modifying the soil remedies in the four units by changing the cleanup standards to allow for industrial use only and requiring that contaminated soils be placed in an onsite landfill. This ROD amendment also required a deed restriction be added to the ICs to prohibit future residential use of the property. Construction of Cell # 2 completed in 2002.	1996 to 2002
First five-year review completed (statutory review, triggered 5 years after initiation of remedial action (RA) implementation. Remedial actions were deemed protective of public health and the environment and were functioning as designed.	December 1997
Implemented in situ enhanced bioremediation program to treat PCP in the on-property eastern plume.	March 1998
Implemented off property groundwater in situ bioremediation program.	August 1998
ROD Amendment No. 2 issued for the Site, modifying the groundwater remedy to provide for: (1) 4-acre Technical Impracticability (TI) Zone for plume areas with dense nonaqueous-phase liquid (DNAPL), (2) adding enhanced in situ bioremediation to the remedy, (3) providing monitored natural attenuation as a contingency remedy, and (4) revising groundwater standards for PCP (1 part per billion [ppb]) and barium (1,000 ppb).	September 1999
Koppers ceased operations and began work on Resource Conservation and Recovery Act (RCRA) closure, overseen by Department of Toxic Substances Control (DTSC).	March 15, 2001
Beazer East, Inc. purchased Site property from KII.	November 2002
Second five-year review completed. Remedial actions were deemed protective.	February 2003
Preliminary Close Out Report signed by EPA.	September 4, 2003
Amended Consent Decree entered by the court to implement changes in ROD Amendments No. 1 and No. 2.	September 22, 2003
Covenant to Restrict Use of Property to Industrial use only recorded with Butte County.	November 12, 2003

TABLE 2-1
Chronology of Site Events

Event	Date
Site Certification from DTSC.	June 30, 2004
Beazer sold most of property to North Ophir Land, LLC.	November 28, 2006
EPA approved to change oxygen-releasing compounds (ORC) from magnesium peroxide to the calcium peroxide-based compound for Groundwater In-Situ Bioremediation Program.	January 31, 2007
Third five-year review initiated.	November 5, 2007
North Ophir Land, LLC, sold portions of the property to Strategic Development Holding Co, LLC.	December 18, 2007

3.0 Site Background

3.1 Physical Characteristics

The Site is located approximately 2 miles south of Oroville off Highway 70 on Baggett-Marysville Road. Oroville is the county seat of Butte County, with a population of 14,400 as of 2007. It is situated at the head of navigation on the Feather River. The Yuba River flows into the Feather River near Marysville, California, and these flow together to the Sacramento River. Geologically, Oroville is situated at the meeting place of three provinces: the Central Valley alluvial plain to the west, the crystalline Sierra Nevada to the southeast, and the volcanic Cascade Mountains to the north. It has a Mediterranean climate.

The Koppers Company, Inc. Superfund Site is an area of approximately 205 acres located in Butte County, in the southern portion of the City of Oroville. The topography of the Site slopes toward the southwest. Koppers is bounded by the former Louisiana-Pacific Corporation (L-P) Lumber Mill to the west, Georgia Pacific Way to the north, and Baggett-Marysville Road to the south and east (Figure 3-1). Remnants of dredge mining operations during the 1900s remain throughout the northern portion of the Site.

The Site has been used for wood-treating operations since 1948 (EPA, 1989). Elevation of the Site is approximately 145 feet above sea level (asl). A historical mining tailing pile is present at the northern area of the property at approximately 120 feet asl (EPA, 1989). The Site is not located in an area that is considered environmentally sensitive.

3.2 Land and Resource Use

Land use near the Site is a mixture of residential, industrial, commercial, and agricultural. Rural homeowners on 1 to 5 acres of land commonly raise livestock and grow produce for home use. Residential areas are to the south, southeast, west, and northeast of the Site. There are three schools within a 2-mile radius of the Site (EPA, 1989). There were two NPL sites in the vicinity of Koppers: the L-P Corporation site, west of the Site, and the Western Pacific Railroad site, northeast of the Site. The former L-P Corporation site was deleted from the NPL in 1996, and the Western Pacific Railroad site was deleted in 2001. West of the Feather River is public open space, the Oroville Wildlife Area (Dames and Moore, 1988).

In September 2003, Beazer, the owner and responsible party at the Site, and the DTSC completed negotiations on a land use covenant intended to protect current and future users of the site, because the soil cleanup actions (per ROD Amendment No. 1) do not allow for unrestricted use of the property. The land use covenant incorporates 1) restrictions that prohibit certain uses of the property and prohibit certain activities, and 2) requirements for soil management whenever any excavation occurs. The future use of the property has been restricted to industrial/commercial use. Extraction of groundwater is prohibited except for Site remedial activities. Existing drainage patterns may be altered provided that the alteration does not impact onsite landfills, former pole-wash area, former dri-con area,

process area cap at the former biological treatment facility, TI zone, or remedial actions on the property. Irrigation or other activities that introduce water to subsurface soils are prohibited. All users and developers of the property are directed to preserve the integrity of all remedial systems including the P&T systems, onsite landfills, extraction and monitoring wells, remediation wells, and caps. The covenant provides right of entry and access for implementing remediation and operations and maintenance (O&M) until the CERCLA lead agency determines that such activities are not needed.

The majority of the property (205 acres) that has been remediated has been sold for redevelopment. It was purchased in November 2006 by North Ophir Land, LLC, and then subsequently sold to Strategic Development Holding Co, LLC, in December 2007. The land is zoned as industrial and will likely be divided into multiple parcels.

3.3 History of Contamination

Wood-treating operations, intended to prevent wood from deterioration by insects or fungi, were conducted at the Site from 1948 to 2001. The wood-treatment process involved the use of chemical preservatives such as PCP (from 1948 to 1988), creosote, and chromated copper arsenate solution. The cellon process used PCP in isopropyl ether and butane to treat wood. The non-com exterior (NCX®) process, discontinued in 1986, used chemicals containing formaldehyde and dicyandiamide. Other chemicals historically used at the Site include creosote, naphthalene, boron, phosphorous, diesel oil, and gasoline (Dames and Moore, 1988).

Chemicals were released to the environment through waste disposal practices, spills, fires, products dripping from treated wood, and storage and handling practices. From approximately 1952 to 1973, unlined creosote settling ponds located west of the former process area were used as evaporator basins for process residuals. Occasionally the creosote ponds overflowed to a marsh area southwest of the L-P ditch (Dames and Moore, 1988; HSI Geo Trans, 1999). Upon discontinued use, this area was later backfilled with soil and dredge tailings. From 1961 to 1973, the cellon process released residual wastes across approximately 1 acre near the western Site boundary (Dames and Moore, 1988). From 1963 to 1973, wastewater from a pole-washing unit at the northern portion of the Site was not contained and released just south of the pole washer. In 1963, a fire occurred at the Site resulting in a release of 20,000 gallons of PCP, and the cellon process plant was destroyed. Combustion of PCP produced polychlorinated dibenzo-p-dioxins (PCDDs)/polychlorinated dibenzofurans (PCDFs). The debris from the fire was buried on property (Dames and Moore, 1988). There was another fire at the Site in 1987. The debris collected after the fire was placed in drums and stored on property (HSI Geo Trans, 1998).

3.4 Initial Responses

PCP-contaminated groundwater was first identified on property in 1971. The RWQCB issued two orders to Koppers in 1973 and 1982, directing Koppers to treat groundwater and end discharge of PCP into the soil. Koppers installed and operated two recovery wells from 1974 onsite. In 1984, when groundwater contamination was found more than 1 mile offsite, Koppers began supplying bottled water to 45 residences and completed a Phase I and Phase

II hydrogeologic groundwater investigation. Results indicated a plume of PCP, PAHs, and IPE moving southwest.

In 1984, the Site was placed on the NPL. Koppers signed an Administrative Order on Consent with the EPA in 1986, agreeing to conduct the RI/FS. As part of the initial response activities, Koppers began a groundwater monitoring program, and provided an alternate water supply through the OWID to downgradient residences with PCP-impacted drinking water supply wells. In 1987, a fire at the Site resulted in the EPA issuing an order for the cleanup, removal, and stabilization of impacted soils and debris.

At the request of Citizens for Clean Water, a local community group concerned with the contamination and cleanup of this Site, the Agency for Toxic Substances and Disease Registry (ATSDR) performed a public health assessment of the Site after the 1987 fire. The report was published in 2000. After reviewing and evaluating environmental sampling data and exposure pathways, ATSDR concluded the following:

- Past exposures to domestic contaminated well water, smoky air (from the fires), and onsite contaminated soils might have resulted in some short-term reversible adverse health effects such as skin irritations and headaches, but these exposures were unlikely at high enough concentrations or long enough duration to cause long-term health effects.
- As of the time of the report in 2000, after the remedial actions were underway, the Site posed no apparent public health hazards.

Table 2-1 summarized the responses on the Site. Table A-1 in Appendix A provides the detailed actions summarized in Table 2-1.

3.5 Basis for Taking Action

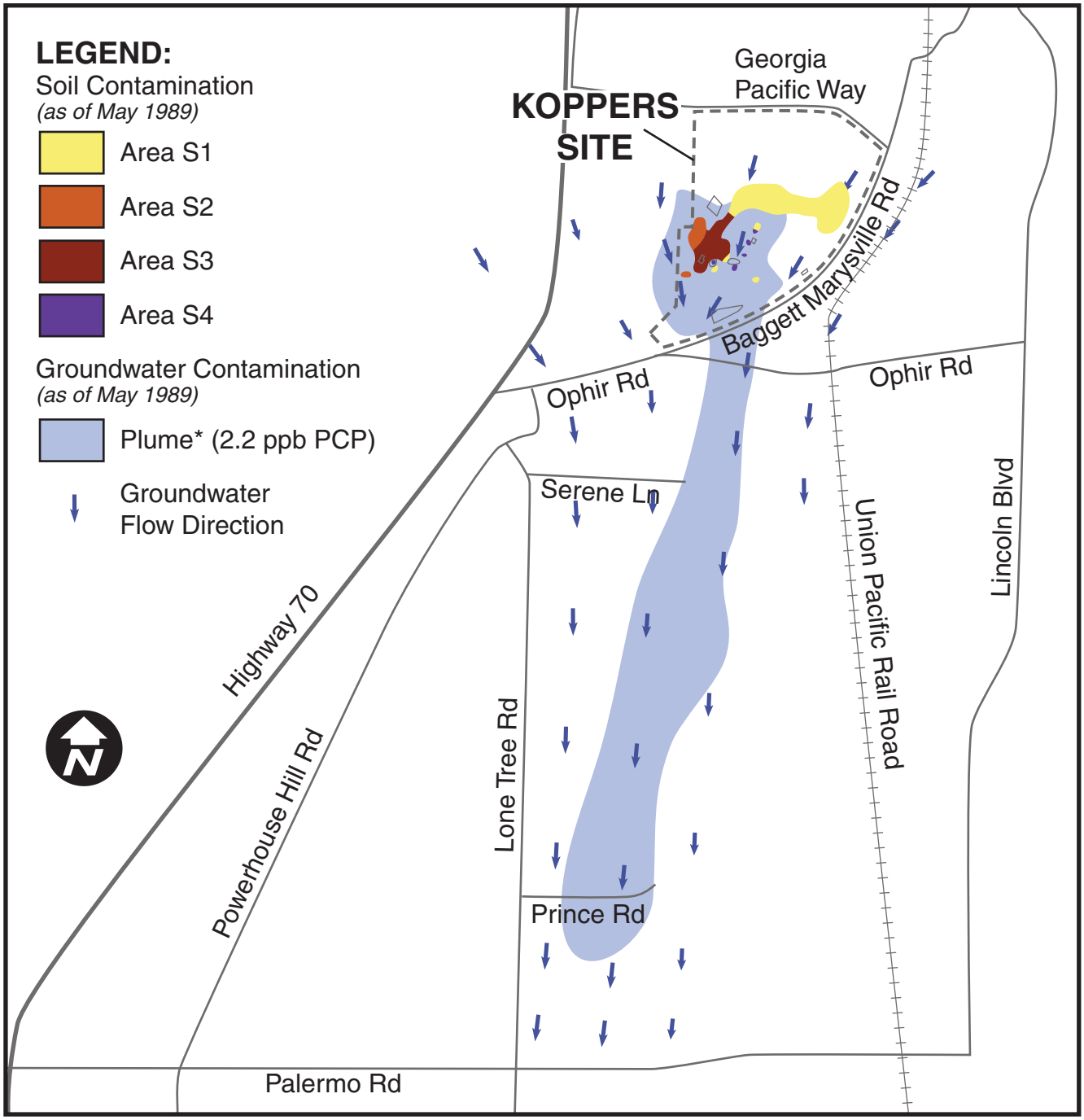
Contamination was found in soil at several areas on property, and in groundwater both on property and off property. The groundwater on-property plume extended to beneath the adjacent L-P site and was contaminated with higher concentrations of contaminants, including creosote which was previously disposed into an unlined pond. The off-property groundwater plume was characterized to be about 2,000 feet wide and extended over 2 miles south of the Koppers Site. The main contaminant found in groundwater off property at levels exceeding the drinking water standard was PCP.

The 1989 ROD identified one operable unit that covered both soil and groundwater (Operable Unit (OU) 1). The ROD referred to four different "soil units" labeled S1 thru S4 and had separate remedies for each. The 1989 ROD combined the "off-site- and on-site groundwater areas of contamination" into one unit and selected a pump & treat remedy for that unit, along with product recovery well(s) in the creosote pond area. Table 3-1 and Figure 3-1 identify contaminants of concern (hazardous substances, pollutants, and contaminants) that have been released at the Site.

TABLE 3-1
Estimated Quantities of Contaminated Media

Unit Designation	Chemicals of Concern	Area	Area and Volume of Contaminated Media
Soil: Area S1	PCP and PCDDs/ PCDFs	Former pole-wash area and areas along the drip track leading to the process area, areas east and south of the process area, the fire debris site at the eastern side of the western spray field, and the surface soils throughout the treated wood transport areas.	Area: 869,300 square feet, covering the largest surface area of the four OUs. Volume of contaminated soil: 110,000 cubic yards (cy).
Soil: Area S2 (includes future TI zone[a])	Present as dense nonaqueous-phase liquids (DNAPLs): PCP, PAHs, PCDDs/PCDFs[a], and carcinogenic PAHs[a]	Former creosote pond and cellon blowdown areas, an area of creosote-contaminated soil along the L-P ditch, and sediments in offsite drainage ditches and ponds southwest of the Site.	Area: 800,000 square feet, containing the largest volume of soil on the Site due to soil contamination extending to water table (25-30 feet [ft] deep). Volume of contaminated soil: 200,000 cy.
Soil: Area S3	PCP, PAHs, Metals	Wood-treating process area used in normal production operations at the Site.	Area: 308,000 square feet. Volume of contaminated soil: 19,400 cy.
Soil: Area S4	Metals (arsenic, chromium, and copper)	East and south of the process area, where wood treated with metals was stored.	Area: 84,600 square feet. Volume of contaminated soil: 4,000 cy.
Other soil areas	Not defined	Drums of debris from 1987 fire, soil filter bed of the Biological Treatment Unit, and sediments in the fire pond [b].	Volume of contaminated soil: 100,000 cy.
On-property groundwater Off-property groundwater	PCP, IPE, PAHs, Metals (arsenic and chromium) PCP, IPE	North and west of Baggett-Marysville Road. South of Baggett-Marysville Road.	Volume of contaminated groundwater: 84,000,000 cubic feet (cf). Volume of contaminated groundwater: 300,000,000 cf.

[a] Identified in ROD Amendment No. 2 (EPA, 1999)
[b] Identified in ROD Amendment No. 1 (EPA, 1996)



*Based on October, 1988 Sampling Results

FIGURE 3-1
SITE MAP

4.0 Remedial Action

The following sections summarize the remedial actions selected, as well as the implementation, operation, and maintenance of remedial systems.

4.1 Remedy Selection

The remedies were selected in several stages, as stated in the ROD, soil removal action memorandum and ROD Amendments, due to new information found onsite during the RA phase. The initial ROD (EPA, 1989) provided the basis for taking actions as described in Section 3.5.

Table 4-1 summarizes the cleanup standards from the 1989 ROD, and the two ROD amendments. These standards were based on direct exposures from current and future residential use of the Site. Exposure scenarios that posed unacceptable public health risks included drinking contaminated groundwater; and contact exposure to contaminated soils and sediments by trespassers, by construction workers implementing the soil remedies and by potential future residential use of the Site. The ESD (EPA, 1991) added the provision to require the establishment of subsurface soil cleanup standards below 5 ft to ensure the protection of groundwater.

TABLE 4-1
Remediation Standards

Media	Chemical	Units[a]	Standard from ROD and ROD Amendments
Soil	Arsenic	ppm	7.15[b]
	Chromium	ppm	181[b]
	Carcinogenic PAHs[c]	ppm	0.19
	PCDD/PCDFs[d]	ppt	30
	Pentachlorophenol	ppm	17
Sediments	Arsenic	ppm	7.15[b]
	Carcinogenic PAHs	ppm	11
	PCDD/PCDFs	ppb	1.8
Groundwater	Benzene	ppb	1.0
	Ethylbenzene	ppb	680
	Total Xylenes	ppb	1,750
	Isopropyl Ether	ppb	2,800
	Carcinogenic PAHs	ppb	0.007
	PCDD/PCDFs	ppq	0.53

TABLE 4-1
Remediation Standards

Media	Chemical	Units[a]	Standard from ROD and ROD Amendments
	Pentachlorophenol	ppb	1.0
	Arsenic	ppb	6-27[e]
	Barium	ppb	1,000
	Boron	ppb	1,200
	Cadmium	ppb	5
	Chromium	ppb	6-35[e]
	Copper	ppb	13-30[e]
	Mercury	ppb	2

[a] Units:
ppm = parts per million
ppt = parts per trillion
ppb = parts per billion
ppq = parts per quadrillion

[b] Background concentration per ROD Amendment No.1

[c] Includes benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(123-cd)pyrene

[d] Polychlorinated dibenzodioxins and polychlorinated dibenzofurans (dioxins)

[e] Because chemical is naturally occurring, value ranges are based on background in groundwater

The remedies selected for soil cleanup in the ROD would treat the contaminated soil to remove contaminants and achieve the cleanup goals (proposed treatment technologies included soil washing, soil fixation, and bioremediation). As described in the ROD, the soil within the wood-treating process area (Area S3) was to be capped until the area became accessible. When operations ceased at the Site, this area would then be cleaned up with an appropriate technology to be selected based on contaminant levels in soil and the success of the other soil cleanup approaches used at the Site.

During implementation of the ROD, it was found that most of the contaminated soil onsite contained a mixture of several contaminants (e.g., both organic and inorganic contaminants) not as well separated as envisioned in the ROD. Therefore, the initial soil remedies selected in the ROD were not implementable for the mixtures of contaminants found in all the soil areas. ROD Amendment No. 1 selected a new soil remedy in which 1) all the contaminated soil was to be excavated and landfilled onsite; 2) cleanup standards for contaminated soil were changed to industrial standards instead of residential standards; and 3) institutional controls (via a land use covenant, or deed restriction) were required to restrict future use of the Site to industrial use. Based on the results of the Leachability and Degradation Study (HydroSearch, Inc., 1996), which identified two areas of the site with potential to impact groundwater (the former pole wash area and the former creosote pond area), ROD amendment No. 1 also required the removal of the potential source material in both areas as part of the new soil cleanup. As a result, EPA did not establish the subsurface soil cleanup

standards as envisioned in the 1991 ESD. A summary of all the soil remedy selections is presented in Table 4-2.

TABLE 4-2
Remedy Selection for the Soil Units

Unit Designation	ROD (1989)	ROD Amendment No. 1
Soil: Area S1	In situ biodegradation by applying water with nutrients and oxygen to soil contaminated with PCP, dioxins, and furans.	Modify soil remedies in ROD to onsite landfill in Cell No. 2 for contaminated soils from all four units (S1 through S4), as well as other contaminated soil areas not addressed in ROD. Total area of soil to be cleaned up was 25 acres, with estimated soil volume at 100,000 cy. Cleanup goals were changed to industrial use standards. Institutional Controls were implemented via a land use covenant (deed restriction) as described in Section 3.2.
Soil: Area S2 (includes TI zone[a] from ROD Amendment No. 2)	Soil excavation and washing of soil contaminated with PAHs, metals, PCP, and dioxins/furans.	
Soil: Area S3	Cap the process area to contain PCP, PAHs, dioxins/furans, and metals contamination until soil beneath the treating operations is accessible, with groundwater pumping to control leaching.	
Soil: Area S4	Excavation and chemical fixation of soils contaminated with arsenic and chromium. Small volume of contaminated soil can be disposed offsite at a permitted landfill.	
Other contaminated soil areas	Not addressed.	

For the groundwater remedies, the initial ROD selected P&T technology to treat groundwater both onsite and offsite, with onsite groundwater contaminated with DNAPL going through pretreatment before carbon adsorption. Treated water would be discharged or reinjected. For offsite private wells contaminated by Koppers' operations, the ROD provided a permanent alternative water supply. The ROD Amendment No. 2 added the in situ bioremediation component to the groundwater treatment remedy and declared a TI zone waiver for the areas contaminated with DNAPL containing PAHs and creosote, which cannot be removed and treated thoroughly enough to achieve the groundwater cleanup standards for the site. A summary of all the groundwater remedy selections from all the records of decision is presented in Table 4-3.

TABLE 4-3
Remedy Selection for the Groundwater Operable Units

Unit Designation	ROD (1989)	ROD Amendment No. 2 (1999) modified groundwater remedies in the ROD. Add the following:
On-property groundwater	Installation of extraction wells and treatment plant to treat contaminated water by carbon adsorption. Pretreatment required for water containing contaminants not treatable with carbon. Treated water disposed to surface water or reinjected into groundwater via injection wells.	1) Augment the P&T remediation by enhanced in situ bioremediation to on-property eastern plume treatment by adding nutrients (oxygen, nitrogen, phosphorus) to onsite wells with downgradient monitoring. 2) TI waiver for the groundwater cleanup at the former creosote pond and cellon blowdown areas due to the presence of DNAPL (on-property western plume). Allow monitored natural attenuation (MNA) as a contingency remedy (on- and off-property plumes). 3) Revised groundwater standards for PCP from 2.2 to 1.0 ppb and for barium from 680 ppb to 1,000 ppb. The complete list of remediation standards is provided in Table 4-1.
Off-property groundwater	Installation of extraction wells, with contaminated water treated by carbon adsorption. Provide an alternate water supply via OWID to those residents with contaminated wells until remedial standards are met.	1) Augment the P&T remediation by enhanced in situ bioremediation (on-property eastern plume). Allow MNA as a contingency remedy. 2) Revised groundwater standards for PCP from 2.2 to 1.0 ppb and for barium from 680 ppb to 1,000 ppb. The complete list of remediation standards is provided in Table 4-1. 3) Modify alternate water supply termination criteria to provide conditions under which the use of the alternate water supply can cease.

4.2 Remedy Implementation

In 1992, a Consent Decree (CD) was signed between Beazer and EPA. Under the consent decree, Beazer was to design, construct, and operate the cleanup remedies specified in the ROD for contaminated soil and groundwater at the Site. In 2003, a Stipulated Amendment to the CD required Beazer to implement the ROD Amendments No. 1 and No. 2 for the changes in soil and groundwater remedies, respectively.

4.2.1 Soil

For soil remedies, several pilot treatability studies were conducted for soils from 1993 to 1995, including in situ bioremediation for soils in area S1, soil excavation and soil washing for soils in area S2, and fixation for soils in area S4. The soils in area S3 (process area) were capped and were to be cleaned up at a later date, when access to this soil would not disrupt plant operations.

Results of the treatability studies showed that the cleanup technologies selected for the soil remedies were unsuccessful because they could not reduce contaminant levels to the residential cleanup standards and/or they were not capable by themselves of treating the

combination of organic contaminants and metals that was actually typical of soils found everywhere on the Site. During the in situ bioremediation treatability study for soils in area S1, high levels of PCDDs/PCDFs (dioxins) were found in the test plots, and a removal action was ordered by EPA in 1995. This contaminated soil was landfilled onsite in a RCRA-designated Class I landfill, later referred to as Cell No. 1.

Other alternatives were considered to treat this contaminated soil, and the 1996 ROD Amendment No. 1 changed all the soil remedies selected in the ROD to an onsite landfill. Onsite soil disposal Cell No. 2 was constructed as a RCRA-designated Class I landfill. Cell No. 2 was filled with 146,930 cy of material from 1996 to 2002. ROD Amendment No. 1 also changed the future land use from residential to industrial and required institutional controls via a land use covenant to restrict future use of the Site to industrial use.

On November 12, 2003, a Covenant to Restrict Use of Property (Koppers Superfund Site, Oroville, Butte County, California) was recorded in the official records of Butte County, as required by the ROD Amendment No. 1.

4.2.2 Groundwater

To implement the groundwater remedy selected in the ROD, the on-property P&T groundwater remediation system was constructed and included groundwater extraction wells EW-1 and EW-2, with 200 gallons per minute (gpm) capacity each, injection wells IW-3 and IW-4 for treated water, air strippers, and activated carbon filters. Since the late 1980s, a small-scale BIFAR™ system had been in operation at the Koppers plant to treat contaminated groundwater and industrial process wastewaters. This system was expanded to handle wastewater flows resulting from the initial onsite soil remedies. The BIFAR™ unit was a biodegradation treatment process in which chemicals were converted by micro-organisms into less toxic compounds. The onsite treatment system started operation in February 1994.

In September 1994, Beazer installed a passive recovery well (PR-1) in the former cellon blowdown area and former creosote pond area to evaluate whether the subsurface pools of creosote on property can be effectively removed by draining them into a recovery well. The well has two separate screened intervals. Each 10-foot screen is located immediately above a clay lens, where free creosote is perched. The mobile creosote enters the well through the screened intervals and collects in a 5-foot deep sump at the bottom of the well. Fluid is purged periodically from the well and taken to an off-site location for disposal.

Beazer also initiated a pilot study in 1995 to determine whether biodegradation can be used to reduce the volume and mobility of PAHs, which are the contaminants of concern in the creosote. The 3-year pilot in situ groundwater biodegradation study showed increased deterioration of the mobile creosote contaminants near the nutrient injection well BW-1.

From 1997 to 1998, Beazer applied for an EPA TI determination for groundwater restoration in the former creosote pond and cellon blowdown areas. This was because the on-property P&T system cannot effectively remove creosote from the DNAPLs found trapped on three clay layers under this area.

In March 1998, EPA approved adding the PCP in situ bioremediation to the on-property treatment process. ORC, including magnesium peroxide and di-ammonium phosphate

(DAP) to supply nitrogen and phosphorous, were added periodically to on-property wells MW-1, MW-4, MW-6, MW-12, MW-13, and MW-23. Monitoring wells MW-3, MW-5, MW-7, MW-8, and TW-1 were used to monitor the effectiveness of this process.

The off-property groundwater treatment system was constructed south of Prince Road and began operation in 1993. It included two extraction wells (EW-3 and EW-4) with capacity of 300 gpm each, a treatment plant, injection wells, and approximately 1,500 ft of pipelines. Initially, the treated water was discharged to Wyman Ravine. Later it was reinjected into groundwater. In December 1995, the off-property P&T system was shut down because the system achieved the cleanup objectives at the extraction wells. Downstream monitoring wells RI-2 and RI-3 were used to monitor the off-property groundwater plume.

Residences with contaminated private drinking water wells were put on an alternate water supply plan (AWSP) in which they were initially supplied with bottled water, and later on were connected to the OWID. The AWSP also required Beazer to reimburse residents for the cost of OWID water. Following the treatment of the off-property groundwater plume, 26 of the original set of contaminated wells were found to be within the cleanup criteria and taken off the AWSP.

In August 1998, the PCP in situ bioremediation started off-property. Magnesium peroxide and DAP were added to off-property wells RI-11, RI-20A, and 26. Performance evaluation of this system was based on data from off-property monitoring wells RI-2, RI-3, RI-10, RI-12, and RI-16B.

A ROD Amendment No. 2 was signed in 1999 approving the TI waiver for the former creosote pond and cellon blowdown areas due to presence of DNAPLs, allowing the P&T groundwater remediation to be augmented by enhanced in situ bioremediation, and making provision for monitored natural attenuation.

Construction of remedial systems was completed in 2003 and the PCOR was signed on September 4, 2003. At the time of the PCOR, it was expected that cleanup levels (excluding the TI zone) would be met by 2024.

4.3 System Operations/Operations and Maintenance

System O&M includes maintenance of the two onsite landfills and O&M of the treatment systems for the groundwater remediation on and off property. Current reporting requirements of data include either semiannual or annual or both.

4.3.1 Soil

Construction of the two onsite landfills Cells No. 1 and No. 2, or Corrective Action Management Units (CAMUs), which were designed and built for soil remediation, was completed in September 2002. Maintenance includes groundwater monitoring beneath/adjacent to the CAMUs, settlement monitoring, maintenance of side-slope covers, leachate monitoring and removal, and conducting regular inspections as long as the CAMUs remain in place.

Table 4-4 summarizes the monitoring systems in place for soil remedies.

TABLE 4-4
Summary of Soil Monitoring Systems

Unit Designation	Description	Monitoring system	Monitoring schedule	Monitoring Analysis (chemicals)	Data included in Annual/Semiannual report
Soil: Cell 1 Corrective Action Management Unit (CAMU) Soil: Cell 2 (CAMU)	Both landfills are double-lined with 60 milliliter flexible membrane, contain leachate monitoring equipment, and are equipped with unsaturated zone monitoring apparatus.	13 settlement monuments periodically inspected for evidence of changes in elevations or signs of damage.	Annually	n/a	Annual report only
		Groundwater MW: around Cell 1: 6 MW: DCMW-1A, DCMW-2A,DCMW-3A, DCMW-1B,DCMW-2B, DCMW-3B Around Cell 2: 4 MW: DCMW-5A, DCMW-5B, DCMW-6A, DCMW-6B	Monthly	Chemicals of concern	Annual report only
		Leachate monitoring by checking a passive leachate collection regularly, which is pumped out on an as needed basis. The leachate is sent to an appropriate disposal facility.	As needed		Not reported. Confirmed with onsite manager that these checks are conducted regularly

4.3.2 Groundwater

The on-property groundwater P&T treatment system has been in operation since February 1994. A product recovery well was installed in the former creosote pond and cellon blowdown areas in 1994 to recover creosote. The off-property groundwater P&T treatment system began operation in March 1993 and was shut down in December 1995, as the original plume retreated. By December 1997, the groundwater plume, which initially extended continuously from the Koppers property to 2 miles south of the property, was split into two plumes: on-property plume and off-property plume. In 1998, an in situ bioremediation program was implemented for both the on-property and off-property groundwater plumes. Groundwater sampling for each contaminant of concern (COC) has continued both on- and off-property since 1985. Frequency of sampling is dependent upon the location and contaminant history.

Changes in operations and monitoring during the O&M period are described below.

4.3.2.1 On Property

The on-property plumes include a western plume below the former creosote pond and cellon blowdown areas and an eastern plume being treated by the onsite P&T treatment plant and in situ PCP bioremediation.

For western plume, a 3-year pilot in situ PAH bioremediation system was operated at well BW-1 in the former creosote pond and cellon blowdown areas from 1998 to 2001. The system was shut down in September 2001 because monitoring data indicated treatment had resulted in an apparent increase in mobility of PAHs downgradient.

In 1999, about 4 acres surrounding the former creosote pond and cellon blowdown areas were declared a TI zone in the ROD Amendment No. 2. This was because both the existing P&T treatment system and in situ PAH bioremediation failed to remedy the DNAPLs present in the clay layers beneath this area. Currently, monitoring for carcinogenic PAHs (cPAHs) continues downgradient of the TI zone to ensure that the ROD standard of 0.007 ppb for total cPAHs is not exceeded.

The product recovery well PR-1 in the TI zone is still in operation. Fluid is purged twice or three times a month from the well. Black purged fluid is identified as product, gray and brown fluid is identified as creosote/water emulsion. The creosote is recovered and disposed off site at the Clean Harbors Aragonite, LLC facility in Utah. Manifests for the disposal of wastes collected on site are available from the Beazer offices located in Pittsburg, PA.

Through July 2007, approximately 1,300 gallons of product were recovered to date (since 1994). Overall, about 850 gallons of creosote/water emulsion have been recovered. Current recovery rate in the last several years is approximately 5 gallons of product, and 3 gallons of creosote/water emulsion per recovery episode, which occurs approximately every two weeks.

For the eastern plume, the P&T treatment system was augmented with an enhanced in situ PCP bioremediation in March 1998. Both of these processes are currently operating on property. The P&T treatment system operates 24 hours per day, 7 days per week and is monitored by an onsite operator. The in situ PCP bioremediation includes quarterly addition of nutrients (ORC/DAP) to on-property wells MW-1, MW-4, MW-6, MW-12, MW-13, and MW-23. Monitoring wells MW-3, MW-5, MW-7, MW-8, and TW-1 were used to monitor the effectiveness of this process. In January 2007, the ORC (calcium peroxide) product was changed to a calcium peroxide-based compound, EHC-O. All changes were made with regulatory approval.

During the final soil cleanup of the process area (OU S3) in 2002, boron and PCP were released to the groundwater beneath the former dri-con/CCA tank area. This release has impacted the groundwater in this area. Boron and PCP concentrations in samples from MW-8, downgradient of the dri-con area, were found as high as 12,000 ppb and 1,100 ppb, respectively. To maintain the ROD standard for boron, in 2002, MW-8 was modified to become an extraction well, with about 35 gpm extracted groundwater blended with the treatment plant influent from EW-1 and EW-2. At MW-8, PCP concentration remained at below 400 ppb, and boron concentrations ranged from 2,080 to 2,870 ppb, above the ROD standard of 1,200 ppb. The treatment plant continues to perform effectively, with effluent

PCP concentration below the reporting limit of 0.5 ppb, and boron concentration below 700 ppb.

4.3.2.2 Off Property

For off-property groundwater, the P&T treatment system was shut down in 1995 because the extraction wells met the cleanup standards. During operation, the system treated 626,578,940 gallons. The in situ bioremediation program has been in operation since August 1998, with magnesium peroxide and DAP added quarterly to off-property wells RI-11, RI-20A, and 26. In March 2004, EPA approved discontinuing DAP addition to groundwater, and analyses for the bioremediation program were limited to PCP. Performance evaluation of this system was based on data from off-property monitoring wells RI-2, RI-3, RI-10, RI-12, and RI-16B.

PCP has been detected in monitoring well 86, an off-property well, intermittently from 1986 to 1988, and since 1999. Since November 1999, some PCP detections have been above ROD standard, usually associated with water level in this well exceeding 122 feet mean sea level (msl). High PCP levels usually persist for 8 to 12 months after the time the water level reaches this elevation. Since February 2002, PCP concentrations have remained above the ROD standard, with the exception of the non-detect result for third quarter 2006, due to the repeated and extended durations of water levels above 122 msl. Water-level data indicated that well 86 is located within the on-property eastern plume captured by EW-2. No PCP has been detected in downgradient well 31C1, which further suggests the PCP is being captured. Both well 86 and well 31C1 are currently being monitored quarterly until PCP concentrations decline at well 86 for a minimum of 1 year.

Beazer continues to fund the costs of the AWSP for seven affected residences. Five residences have impacted water wells (wells 59, 60, 61, 62, and 81) near the residual off-property plume, and two residences are near well 86 (31C2 and 31D3), which has shown periodic high PCP readings. These wells continue to be monitored.

The O&M costs, as reported by Beazer's contractor, GeoTrans, Inc., are as follows:

- O&M costs for 2006 were approximately $190,000, which included $32,000 for groundwater sampling and $158,000 for operating the system and labor.
- O&M costs for 2007 were approximately $208,000, which included $28,000 for groundwater sampling and $180,000 for operating the system, utilities, parts, and labor.

Table 4-5 summarizes the monitoring systems in place for groundwater remedies.

TABLE 4-5
Summary of Groundwater Monitoring Systems

Unit Designation	Description	Monitoring system	Monitoring schedule	Monitoring Analysis (chemicals)	Data included in Annual/Semiannual report
On-property groundwater West plume	TI zone exists over an area of approximately 4 acres, where former creosote pond and cellon blowdown areas, where groundwater is contaminated with DNAPL of creosote and creosote emulsion	Water level monitoring at MW-15, MW-19, MW-20A, MW-20B, MW-21A, MW-21B, MW-22A, MW-22B, MW-22C	Monthly	n/a	Annual/ Semiannual reports
		Chemical monitoring at MW-15, MW-16, MW-17, MW-18, MW-19, MW-20A, MW-24, MW-25,	Quarterly	PCP, IPE, PAHs, benzene, ethylbenzene, xylenes, arsenic, barium, boron, cadmium, chromium, copper, mercury, and PCDD/PCDF	Annual/ Semiannual reports
	Product recovery well PR-1 operates as a passive recovery system		Collected every 2 weeks	n/a	Annual/ Semiannual reports
On-property East plume	P&T system with 2 extraction wells EW-1 and EW-2 pumped at 200 gpm. Contaminated water treated using air stripping and granular activated carbon (GAC), and reinjected into the aquifer through Injection Wells IW-3 and IW-4	Water level monitoring at EW-01, EW-02, MW-01, MW-02, MW-03, MW-4, MW-05, MW-07, MW-08, MW-11, MW-12, MW-13, MW-16, MW-17, MW-18, MW-23, MW-24, MW-25, SW-01, TW-01, TW-02	Monthly		Annual/ Semiannual
		Chemical monitoring at EW-01, EW-02, MW-02, MW-03, MW-05, MW-07, MW-08, SW-01, TW-01	Quarterly	PCP, IPE, PAHs, benzene, ethylbenzene, xylenes, arsenic, barium, boron, cadmium, chromium, copper, mercury, and PCDD/PCDF	Annual/ Semiannual

TABLE 4-5
Summary of Groundwater Monitoring Systems

Unit Designation	Description	Monitoring system	Monitoring schedule	Monitoring Analysis (chemicals)	Data included in Annual/Semiannual report
	In situ bioremediation: nutrients are added to MW-1, MW-4, MW-6, MW-12, MW-13, MW-23	Chemical monitoring at MW-3, MW-5, MW-7, MW-8, TW-1	Quarterly	PCP, orthophosphate as phosphorus, nitrite as nitrogen, nitrate as nitrogen, and ammonia as total nitrogen	Annual/ Semiannual
Off-property groundwater GW plume	In situ bioremediation: nutrients are added to 26, RI-20A quarterly and 11, 59, 81 semiannually. After March 2004, discontinue addition of DAP as nutrient	Chemical monitoring at RI-2, RI-3, RI-10, RI-12, and RI-16B After second quarter of 2004, chemical monitoring at RI-2, RI-6, RI-10, RI-12, RI-16B semiannually	Quarterly/ Semi-annually (after second quarter of 2004)	PCP, orthophosphate as phosphorus, nitrite as nitrogen, nitrate as nitrogen, and ammonia as total nitrogen. After March 2004, only PCP analysis	Annual/ Semiannual
	AWSP: 7 residents are still being reimbursed because PCP levels remain above 0.5 ppb in their wells	Chemical monitoring at 59, 60, 61, 62, 81, 31C2, and 3103	Semiannual	PCP	Annual/ Semiannual
Institutional controls	Deed restriction to limit future use of Site to industrial use	Oversight and Inspection by DTSC	Annual	n/a	Not reported, but confirmed with DTSC

4.4 Institutional Controls

A land use covenant to restrict the use of the Koppers Site was entered with Butte County in November 2003. DTSC has the primary role for enforcement of the institutional controls for the Site. The land use covenant restricts the entire Site to industrial use and prohibits drilling of wells within the TI zone for purposes other than monitoring or remedial activities. Use of groundwater within the TI zone is prohibited except for wood-treating operations

The off-property vacant land south of the former Koppers plant (south of Baggett-Marysville Road and east of Lone Tree Road) is currently zoned as Heavy Industrial (M2). An amendment to the City General Plan is currently in circulation at the City to change the zoning of 784-acres south of Baggett-Marysville Road and east of Lone Tree Road (this area will be called the South Ophir Specific Plan Area). The proposed plan for this area is mixed

industry, high tech business, industrial park, and mixed residential types of not more than 1,500 dwelling units. This area is within the service area of the South Feather Water & Power Agency (the successor to OWID), and water must be supplied by this provider. If for some reason this water purveyor cannot supply enough water, then water is to be provided by another water purveyor.

5.0 Progress since Last Five-Year Review

The first five-year review for this Site was completed in December 1997; the second was completed in February 2003. The protectiveness statement from the second five-year review was: "Currently all implemented remedies are functioning as intended by the decision document and, therefore, are protective of human health and the environment at this time."

Several outstanding issues were identified during the second five-year review. They are summarized in Table 5-1, including follow-up activities in the last 5 years to address them.

TABLE 5-1
Status of Recommendations from Second Five-Year Review

From Table 8.1 of Second Five-Year Review				Third Five-Year Review Implementation Status
Issue	**Recommendations/ Follow-up Action**	**Party Responsible**	**Milestone Date**	
A deed restriction is not yet in place for the on-property portion of the Site	Continue negotiations on the wording of the deed restriction.	Beazer, DTSC, EPA	August 2003	Land use covenant recorded with Butte County in November 2003.
Annual review of technology of PAH remediation	To be conducted once per year.	EPA, Beazer	By April of every year	Implemented. No new technology recommended.
Ongoing semiannual and annual evaluation of monitoring data in groundwater monitoring report	To be conducted twice annually.	EPA, Beazer	April and October of every year	Implemented. See semiannual and annual reports.
In situ bioremediation within the TI zone on property ceased in June 2001	Evaluation of viable alternatives as necessary.	Beazer	Annually (April), at a minimum until data suggest otherwise	Implemented. No new technology recommended.
Seven drinking water supply wells remain on an alternative drinking water supply source	Continue to supply alternative water and monitor COC concentrations in wells.	Beazer	Annually (April), until data suggest otherwise	Ongoing program.
Increased concentrations of PCP in well 86	Continue to evaluate concentrations and groundwater levels in wells 86 and 31C1 monthly.	Beazer	Monthly until data indicates otherwise	Study conducted from 2003 to 2004 with monthly data collected. See summary below.

TABLE 5-1
Status of Recommendations from Second Five-Year Review

From Table 8.1 of Second Five-Year Review				Third Five-Year Review Implementation Status
Issue	**Recommendations/ Follow-up Action**	**Party Responsible**	**Milestone Date**	
Modifications to the Groundwater Monitoring Report	Implement modifications to concentration versus time plots and include the TI zone on all Site maps.	Beazer	April 2003	Implemented. TI zone is now indicated on the site figures and the concentration vs. time plots now have log scales.
Increase in boron concentrations in groundwater at well MW-8	Continue to extract groundwater from this well and treat with the on-property treatment system. Evaluate boron concentration of influent regularly.	Beazer	December 2003, or until EPA approves alternative approach	Ongoing operation. See summary below.

The second five-year review report identified two unanticipated contaminant detections in groundwater that would impact the protectiveness of the selected remedies. One was an increased concentration of PCP in off-property well 86. The other was detection of boron in the eastern plume on-property well MW-8. Boron concentrations detected in well MW-8 have exceeded the remediation standard of 1,200 ppb since November 2001.

These issues have been addressed since the previous five-year review as follows:

- PCP has been detected in well 86 intermittently from 1986 to 1988, and since 1999. The higher PCP concentrations in this well were reportedly associated with periods of higher water levels in this well (exceeding 120 ft above mean sea level). The PCP detections typically persist for eight to twelve months after the time the water level reaches this elevation. In 2003-2004, to evaluate whether well 86 was within the capture zone of the on-property groundwater extraction system, Beazer conducted two field data collections during a 6-month period. The first field activity involved resurveying the top of casing elevation for well 86. The second field activity included a pump test in EW-2, with water-level measurements conducted in MW-2 and well 86. The results showed that well 86 is screened in the B zone aquifer, where Extraction well EW-2 is screened, and located within the capture zone of this extraction well. Sampling of well 31C1 was discontinued after this study, since well 31C1 is screened in the A zone, where initially well 86 was thought to be screened until the resurvey determined otherwise.
- For the boron issue in well MW-8, both short-term and long-term groundwater remediation work plans were prepared to address this issue. The on-property groundwater remediation system was not designed to remove boron from extracted groundwater. Therefore, a short-term remedy was implemented in August 2002, which consists of blending extracted boron-impacted groundwater from well MW-8 with treatment plant influent. In May 2003, the effectiveness of the short-term remedy was

evaluated, and a long-term remedy for boron-impacted groundwater containment, as well as maintenance of the remediation standard for effluent discharge from the treatment plant was presented. The short-term remedy was found to be effective. The current long-term remedy would continue the blending of groundwater extracted from MW-8 to the influent from EW-1 and EW-2 into the treatment plant. The treatment plant continues to perform effectively, with effluent PCP concentration below the reporting limit of 0.5 ppb, and boron concentration below 700 ppb.

6.0 Five-Year Review Process

6.1 Administrative Components of the Five-Year Review Process

This section presents the activities performed during the five-year review process and a summary of the findings. This third five-year review consisted of a review of relevant documents; interviews with community members; interviews with technical staff familiar with the Koppers Company, Inc. regulatory requirements and operations; a regulatory review; ecological and human health risk evaluations, and a Site inspection. The Koppers Company, Inc. five-year review was led by Kim Hoang, the EPA Remedial Project Manager for the Site. EPA received technical support from CH2M HILL, Inc.

Through Site inspection, document review and technical interviews, it has been determined that all of these key components are being conducted per the currently agreed upon requirements. Some of the documentation that was available and provided for inspection by the Operations and Maintenance Manager, K.C Hendrix, of GeoTrans, Inc., included Site Heath and Safety Plan, Operations and Maintenance Manual, Post Closure Maintenance and Monitoring Plan, Training Records, Maintenance Records , Field Sampling Logs, and Inspection Logs.

6.2 Community Notification and Involvement

As part of the startup of the five-year review process, EPA published a notification in the *Oroville Mercury Register* (*Oroville Mercury Register*, 2007) and sent a fact sheet to local residents on January 14, 2008, announcing that EPA started the five-year review of the cleanup actions undertaken at the Koppers Site.

A fact sheet was sent out in January 2008 regarding the preparation of the current five-year review. The location of the information repositories and contacts were also provided in the fact sheet. The mailing list for the fact sheet was compiled from a pre-existing mailing list merged with a list of addresses within the historically affected areas of the 95965 and 95968 postal codes. EPA placed additional fact sheets in the Butte County Library on January 29, 2008. No community inquiries have been received by EPA as a result of the public notice or the fact sheet.

On January 29, 2008, EPA contacted community members including city officials, business owners and residents in the vicinity of the Koppers Site to obtain community input on the current status of the Site cleanup. All of the community interviews were conducted in person. The results of the community interviews are described in Section 6.6.2 of this report.

Following the release of this five-year review report, EPA will produce and distribute a fact sheet to the community near the Site. The fact sheet will summarize the findings of the five-year review and instructions on how to access a copy of the review.

In January 2008, the CDPH released a report analyzing pancreatic cancer trends in the Oroville area from 1988 to 2005. The report was requested in May 2007 by a local citizen who was concerned about pancreatic cancer in the Oroville area, and that it might be related to a chemical fire in 1987 at the Koppers Site.

After the Koppers fire, ATSDR conducted environmental assessments in the area. As a routine part of that assessment, ATSDR worked with the Cancer Registry of Northern California to look at cancer incidence in Oroville from data in 1988 and 1989. The ATSDR study showed no increased risk of cancer in the area, but recommended "that it would be advisable for the Cancer Registry of Northern California to redo its analysis in the future."

The new 2008 study responded to a citizen concern and represented a follow-up to the earlier Cancer Registry of Northern California analysis, which was part of the ATSDR report in 2000. It looked at pancreatic cancer incidence data from both primary and secondary cases between 1988 and 2005. Annual population estimates for the Oroville area were derived from the 1990 and 2000 U.S. decennial censuses. The study included preliminary analyses looking at observed and expected cases for every year during this period, followed with the main statistical analysis based on 2-year intervals beginning with 1988 to 1990 and ending with 2004 to 2005. Results from the preliminary analyses showed no difference between observed and expected cases for the years 1988 to 2003, and a higher number of observed cases from 2004 to 2005, comparing both to expected cases and previous observed cases. Results from the statistical analysis of two-year intervals confirmed the above finding, with no significant difference found between observed and expected cases for the years 1988 to 2003, while the observed cases were nearly twice the expected cases during 2004 to 2005. The Environmental Health Investigations Branch of CDPH is currently following up on this study, in collaboration with the Butte County Public Health Department, to investigate what factors may have contributed to this increase.

6.3 Document Review

As part of the five-year review process, CH2M HILL conducted a review of documents related to activities associated with the Koppers Site. The documents reviewed included decision documents associated with the recommended remedial actions for the Site, the first and second five-year review reports, O&M documentation, and other reports and correspondence prepared after the publication of the second five-year review. Appendix C provides a list of the documents reviewed as part of this five-year review.

6.3.1 ARAR Review

Appendix D contains three tables that list the Applicable or Relevant and Appropriate Requirements (ARARs) established in the above-referenced decision documents, summarize the requirement for each ARAR, cite the regulatory basis for each ARAR, state the evaluated status of each ARAR, and provide comments where applicable, including comments on any regulatory changes since the 2003 five-year review.

Action-specific ARARs. There are no changes to existing action-specific ARARs as stated in the ROD, ROD Amendments, and previous five-year reviews.

Chemical-specific ARARs. There are no changes to existing chemical-specific ARARs as stated in the ROD, ROD Amendments, and previous five-year reviews. On January 23, 2006, the rule for all drinking water systems to comply with the new maximum contaminant level (MCL) for arsenic of 10 ppb (adopted January 22, 2001) came into effect. As noted in the previous five-year review for the Koppers site, the new MCL for arsenic is less than half the Site background concentration.

Location-specific ARARs. A new regulation for property that contains hazardous waste (Title 22, California Codes of Regulation, Chapter 39, Section 67391.1, effective April 19, 2003) requires all land use covenants to be signed by the DTSC and the landowner, and be recorded in the county where the land is located. The signature requirement is considered applicable to the land use covenants at Koppers, where land use will be restricted to industrial uses, and groundwater wells will be used for monitoring or injection purposes only.

6.3.2 Human Health and Ecological Risk Assessment Review

There have been no changes in the last five years to the Site conditions or to the exposure pathways in consideration of both human health and ecological risk. Although some toxicity values for specific constituents of concern found in soil and groundwater at the Site have changed, these changes have not had a significant effect on the protectiveness of the current remediation standards. The detailed review is provided in Appendix E.

6.4 Data Review

Semiannual reports (October of each year) and annual reports (April of each year) submitted by Beazer were reviewed for this five-year review. The period covered by the reports was from the annual 2002 report (April 2002) through the semiannual 2007 report (October 2007). The detailed evaluation results are provided in the groundwater data review memorandum found in Appendix F of this report. Table 6-1 provides a summary of the monitoring results for the five-year period.

6.4.1 Soil

The areas of interest include the soil disposal cells; the on-property TI zone, also known as the western plume, which includes product recovery of DNAPL; the on-property eastern plume where groundwater monitoring and enhanced in situ bioremediation are being conducted; and the off-property plume to the south, which also includes groundwater monitoring, in situ bioremediation, and residential wells where alternate water supplies are required.

In summary, for the five-year period covered by this review, the soil disposal cells showed little change in the settlement. Groundwater monitoring around the cells was conducted monthly and reported annually. The samples were analyzed for pentachlorophenol, arsenic, chromium, copper, and PAHs. Copper was detected at 58.2 ppb, above the ROD standard of 13 to 30 ppb, in well DCMW-1A during a 2006 sampling event. For all other sampling events, concentrations of the chemicals of concern in the disposal cell monitoring wells were below the ROD standards.

6.4.2 Groundwater

6.4.2.1 On Property

For the TI zone on property, in the last five years (from July 2002 to June 2007), the product recovery well on the TI zone was purged 127 times, yielding about 675 gallons of product with about 328 gallons of creosote/water emulsion extracted. Water level monitoring of the groundwater plume in the TI zone showed no change in water levels. Chemical monitoring for this zone showed PCP concentrations below the ROD standards for all wells except for MW-16. The concentration of PCP in MW-16 has decreased from 2003 to 2007. MW-25 has high boron levels, which have remained more or less constant or decreased minimally in the last 5 years. MW-15, MW-16, MW-19, and MW-24 show PAH concentrations above ROD standards in the last 5 years. PAHs show an increasing trend in MW-15.

For the eastern groundwater plume on property, overall water level has been fairly stable since 1999, with levels in individual wells fluctuating 5 to 10 feet between wet and dry seasons. The current treatment operation includes groundwater extraction from EW-1, EW-2, and MW-8. The combined influent allows dilution of the high concentration boron water from MW-8, and the influent is then treated by the air stripper and GAC filter to remove other contaminants before the treated water is reinjected into the groundwater via injection wells IW-3 and IW-4. Chemical monitoring of the treatment plant showed that the effluent PCP is less than 0.5 ppb and the boron concentration is less than 700 ppb. PCP was detected at concentrations above the ROD cleanup level in wells MW-2, MW-3, MW-18, and MW-8, with a decreasing trend from 2003 to 2007 in all wells except for MW-8. Boron concentrations are above ROD levels in MW-18. The in situ bioremediation continues to operate on property to enhance the P&T system, with one of the nutrients changed from magnesium peroxide to calcium peroxide in 2007. Figure 6-1 shows that the size of the plume has remained more or less the same from 2002 to 2007.

6.4.2.2 Off Property

The off-property groundwater plume is still undergoing in situ bioremediation at the current time. The P&T system was shut down in 1995 because contaminant levels in the extraction wells met the cleanup standards. Water-level monitoring showed stable water level since 1999. Chemical monitoring showed that PCP concentrations at RI-2, RI-6, RI-10, RI-12, and RI-16B have been below the reporting limit of 0.5 ppb since the second quarter of 2004. PCP concentrations detected at well RI-3 have decreased significantly, with the concentrations below 1 ppb in 2007. The plume map in Figure 6-1 shows that the off-property groundwater plume has receded in the last 5 years, which reflects the effectiveness of the ongoing in situ bioremediation treatment.

Well 86 has PCP concentrations above ROD standards and is showing a slow decreasing trend. However, while this well is located off property, based on the plume map in Figure 3-1, it is actually within the capture zone of the on-property extraction well EW-2, and thus contaminated groundwater in the vicinity of Well 86 is currently being captured and treated by the on-property P&T treatment system.

Beazer continues to monitor the private wells for the residences in the AWSP and pays the water bill for the seven families whose wells were contaminated and remain shut down.

TABLE 6-1
Summary of Results

Unit Designation	Previous 5 Yr Review Results	2003	2004	2005	2006	2007	Current changes from Last Five-Year Review
Soil Disposal Cells 1 and 2:							
Soil: Cell 1/ 2 monument survey	As of December 2001, there were no recorded changes in settlement monuments on the disposal cells.	No substantial change in the lateral and vertical positions of the monuments.	No substantial change in the lateral and vertical positions of the monuments.	No substantial change in the lateral and vertical positions of the monuments.	No substantial change in the lateral and vertical positions of the monuments.	No substantial change in the lateral and vertical positions of the monuments.	No changes.
Soil: Cell 1/ 2 groundwater monitoring Notes: ROD standard: Copper - 13 to 30 ppb	Only chemical of concern detected in monitoring points was copper in the shallow aquifer at concentrations less than background level.	Copper DCMW-1A at 11.7 ppb DCMW-2A at 19.2 ppb	Copper DCMW-2A at 14.1 ppb (close to the quantitation limit of 10 ppb and was not considered to be indicative of a release from the disposal cell).	Site constituents were not detected in the disposal cell wells.	Copper DCMW-1A at 58.2 ppb. Because this well is upgradient of the disposal cells, this detection level is considered to be anomalous, and not indicative of a release from the disposal cells.	Data not included in 2007 semi-annual report.	Increase in copper concentration from 2003 to 2006.
On-property Groundwater West Plume:							
Water level Notes: Groundwater has been extracted from well MW-8 at approximately 35 gpm since July 31, 2002, as approved by the EPA. This extraction has influenced groundwater flow in the vicinity of well MW-8. A depression in the groundwater elevations is present in the vicinity of well MW-8	Water levels are monitored monthly.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons. Groundwater flow directions from 2003 to 2007 are consistent with 1995 flow directions and that observed prior to startup of groundwater remediation systems.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons. Groundwater flow directions from 2003 to 2007 are consistent with 1995 flow directions and that observed prior to startup of groundwater remediation systems.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons. Groundwater flow directions from 2003 to 2007 are consistent with 1995 flow directions and that observed prior to startup of groundwater remediation systems.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons. Groundwater flow directions from 2003 to 2007 are consistent with 1995 flow directions and that observed prior to startup of groundwater remediation systems.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons. Groundwater flow directions from 2003 to 2007 are consistent with 1995 flow directions and that observed prior to startup of groundwater remediation systems.	No change. Groundwater flow directions from 2003 to 2007 are consistent with 1995 flow directions and that observed prior to startup of groundwater remediation systems.
Chemical monitoring Notes: All values are in ppb (ug/L) ND = Non Detect ROD standards: PCP - 1.0 ppb Boron - 1,200 ppb PAHs - 0.007 ppb Benzene - 1.0 ppb	Remedial actions within the TI zone are functioning as intended. Installation of a new monitoring well downgradient of the TI zone (required 1 year prior to shutdown of on-property treatment system) may provide a more comprehensive conclusion.	Upgradient wells MW-15 PCP <0.5, PAH 4000-7700 MW-16 PCP 36-58, PAH 100000-4000000 MW-19 PCP <0.5, PAH 23-226 MW-20A PCP <0.5, PAH ND Downgradient wells MW-24 PCP <1, Boron 514 , PAH 4-6 MW-25 PCP <0.5, Boron 3700-3900, PAH -ND	Upgradient wells MW-15 PAH 5000-9000 MW-16 PCP 36-53, PAH 600000-13000000 MW-19 PAH 18-50 MW-20A PCP <0.5 Downgradient wells MW-24 PCP <1, Boron 504 , PAH 4-6 MW-25 PCP <0.5, Boron 3720-4320, PAH -ND	Upgradient wells MW-15 PCP <0.5, PAH 6900-7300 MW-16 PCP 15-40, PAH 500000-1450000 MW-19 PCP <0.5, PAH 9-10 MW-20A PCP <0.5, PAH-ND Downgradient wells MW-24 PCP <1, Boron 524 , PAH 3-5 MW-25 PCP <0.5, Boron 3920-3940 , PAH -ND	Upgradient wells MW-15 PAH 6000-9000 MW-16 PCP 11-20, PAH 300000-900000 MW-19 PAH ND-16 MW-20A PCP <0.5 Downgradient wells MW-24 PCP <1, Boron 520-510 , PAH ND-4 MW-25 PCP <0.5, Boron 3660-3800 , PAH -ND	Upgradient wells MW-15 PCP <0.5, PAH 6600-8000 MW-16 PCP 12-16, PAH 200000-800000 MW-19 PAH ND Downgradient wells MW-24 PCP <1, PAH 3-5 MW-25 PCP <0.5, Boron 3470-3900 , PAH -ND	PCP concentrations are below the ROD standards for all wells except for MW-16. Concentration of PCP in MW-16 has decreased from 2003 to 2007. MW-25 has high boron concentration which has remained more or less constant or decreases minimally in the last 5 years. MW-15, MW-16, MW-19 and MW-24 show PAH concentrations above ROD standards in the last 5 years. PAHs show an increasing trend in MW-15.
PR-1 (Product Recovery Well)	Product recovery is continuing at PR-1 and monitored every 2 weeks. Recovery is greater than 1 gallon per year.	07/2002-06/2003 137 gallons of product and 65 gallons of emulsion	07/2003-06/2004 140 gallons of product and 70 gallons of emulsion	07/2004-06/2005 134 gallons of product and 60 gallons of emulsion .	07/2005-06/2006 135 gallons of product and 68 gallons of emulsion	07/2006-06/2007 130 gallons of product and 65 gallons of emulsion	Increase in quantity of product recovered.

TABLE 6-1
Summary of Results

Unit Designation	Previous 5 Yr Review Results	2003	2004	2005	2006	2007	Current changes from Last Five-Year Review
On-property Groundwater East Plume:							
Water level	The onsite groundwater remediation system continues to treat groundwater extracted from EW-1 and EW-2. Influent PCP concentrations have decreased over time to 5.2 ppb. Injection wells IW-3 and IW-4 are functioning optimally. The increase in PCP concentration in well 86 is being monitored to verify that EW-1 and EW-2 are adequately capturing the plume. Groundwater extraction at well MW-8 began in July 2002. Periodic increases in PCP concentration in well 86 are reportedly related to groundwater elevation increases in the A-Zone. Recent detection of increased PCP in well MW-8 to 780 ppb and boron at 2,450 ppb is attributed to historical activities at the dri-con/CCA Tank Area.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons.	Water levels overall decreased slightly from 1986 to 1990, increased from 1991 through 1999, and began to level off from 1999 through present.
Chemical monitoring Notes: ND = Non Detect		MW-2 PCP 59-84, Boron 1300-1500 in Aug, 586 in Dec, PAH – ND MW-3 PCP 40-60, Boron 1200-1500 MW-18 PCP <0.5, Boron 3200-3450, PAH ND MW-8 PCP 250-430, Boron 1050-1500, PAH ND-50	MW-2 PCP 67-63, MW-3 PCP 20-30, Boron 1180-1300 MW-18 Boron 3100-3600 MW-8 PCP 340-390, Boron 1220-1280, PAH ND Treatment plant effluent PCP is less than 0.5 ppb, and boron concentration is less than 700 ppb.	MW-2 PCP 24-37, Boron 546, PAH ND MW-3 PCP 10-15, Boron 1110-1170 MW-18 PCP <0.5, Boron 3200-3400, PAH ND MW-8 PCP 360-370, Boron 1300-1600, PAH ND Treatment plant effluent PCP is less than 0.5 ppb, and boron concentration is less than 700 ppb.	MW-2 PCP 27-19 MW-3 PCP 1-3, Boron 920-950, MW-18 Boron 3000-3250, PAH 540-707 MW-8 PCP 250-290, Boron 1700-2300, PAH ND Treatment plant effluent PCP is less than 0.5 ppb, and boron concentration is less than 700 ppb.	MW-2 PCP 25-20 MW-3 PCP 1-2, Boron 840, MW-18 Boron 2990-3060 MW-8 PCP 200-350, Boron 2000-2900, PAH ND Treatment plant effluent PCP is less than 0.5 ppb, and boron concentration is less than 700 ppb.	PCP has been detected at concentrations above the ROD cleanup level in Wells MW-2, MW-3, MW-18 and MW-8. PCP concentrations in all the above wells except for MW-8 show a decreasing trend from 2003 to 2007. Boron concentrations are above ROD levels in MW-18.
On-property groundwater in situ bioremediation	Concentration trends in the wells overall indicate stabilization in PCP trends. Monitored natural attenuation not yet implemented. Bioremediation ceased at well BW-1 in June 2001 as it resulted in increase in mobility of PAHs.	PCP concentrations are below detection limit except for well MW-8.	The results of the implementation of the On-Property Groundwater In Situ Bioremediation Program indicate that the enhancements have stimulated the aerobic degradation of pentachlorophenol.	Results of the implementation of the On-Property Groundwater In Situ Bioremediation Program indicate that the enhancements have stimulated the aerobic degradation of PCP to less than ROD standards in MW -5 and 7.	Dissolved mobile PAHs have been detected at low concentrations at well MW-24. The steady decrease in pentachlorophenol concentrations at MW-16 indicates that bioremediation of pentachlorophenol was stimulated, and this increased bioactivity appears to be ongoing.	The results of the implementation of the On-Property Groundwater In Situ Bioremediation Program indicate that the enhancements have stimulated the aerobic degradation of pentachlorophenol.	In situ bioremediation has stimulated aerobic degradation of PCP, but the size of the plume (Figure 3-1) has remained more or less the same from 2002 to 2007.
Off-property Groundwater GW Plume:							
Notes: Pentachlorophenol has been detected in well 86 intermittently from 1986 to 1988, and since 1999. The detections of pentachlorophenol are correlated with times at which the water level in well 86 reaches or exceeds 122 feet msl. The pentachlorophenol detections typically persist for 8 to 12 months after the time the water level reaches this elevation	Monitoring data do not indicate that any contaminants would be captured by extraction from wells EW-3 or EW-4. PCP in well 86 > 50 ppb since 2000. Boron detected in vicinity of MW-8.	Well PCP (ppb) Upgradient RI-2 0.5 RI-3 -10 86 0-100 25 0.5 Downgradient RI-12 0.5	Well PCP (ppb) Upgradient RI-2 0.5 RI-3 -10 86 0-140 25 0.5 Downgradient RI-12 0.5	Well PCP (ppb) Upgradient RI-2 0.5 RI-3 -5 86 0-90 25 0.5 Downgradient RI-12 0.5	Well PCP (ppb) Upgradient RI-2 0.5 RI-3 .5-3.5 86 3-100 25 0.5 Downgradient RI-12 0.5	Well PCP (ppb) Upgradient RI-2 0.5 RI-3 .5-1 86 0-40 25 0.5 Downgradient RI-12 0.5	PCP concentrations detected at well RI-3 have decreased significantly with the concentrations below 1 ppb in 2007. Well 86 has PCP concentrations above ROD standards and is showing a slow decreasing trend.

TABLE 6-1
Summary of Results

Unit Designation	Previous 5 Yr Review Results	2003	2004	2005	2006	2007	Current changes from Last Five-Year Review
Off-property groundwater in situ bioremediation	Concentration trends in the wells indicate a decreasing trend in PCP except for an anomalous detection in well RI-12 during November 2000 (0.66 ppb).	Nitrate concentration in wells RI-2, RI-3, RI-10, and RI-12 are higher than concentration in background wells. Concentration in RI13 is less than 15 ppb.	The addition of DAP (nutrients) has been discontinued.	The Off- Property Bioremediation Program is considered to be enhancing bioremediation of pentachlorophenol effectively. Sampling at RI-2, RI-6, RI-10, RI-12 and RI-16B has been reduced to semiannual monitoring.	As of September 2006, ORC socks have been added to wells 59 and 81 to enhance the bioremediation of pentachlorophenol detected at well 59.	-	In situ bioremediation has stimulated aerobic degradation of PCP.
Off-property AWS	Beazer continues to provide an alternate water supply for downgradient residences with PCP-impacted drinking water supply wells. As of December 2001, five residences with private wells in the vicinity of RI-11 (59, 60, 61, 62, and 81), plus wells 31C2 and 31D3, remain in the AWS program.	The pentachlorophenol analytical results were below 0.5 ppb for each sample collected at both wells 31C2 and 31D3.	The pentachlorophenol analytical results were below 0.5 ppb for each sample collected at both wells 31C2 and 31D3.	The pentachlorophenol analytical results were below 0.5 ppb at both wells 31C2 and 31D3.	The pentachlorophenol analytical results were below 0.5 ppb at both wells 31C2 and 31D3.	The pentachlorophenol analytical results were below 0.5 ppb at both wells 31C2 and 31D3.	The pentachlorophenol analytical results were below 0.5 ppb at both wells 31C2 and 31D3 from 2003 to 2007.

6.4.3 Institutional Controls

Enforcement of the institutional controls implemented by the land use covenant consists of an annual site inspection conducted by DTSC, as confirmed through the interview with DTSC. There is no written report from DTSC for these annual inspections, and they are not reported in the semi-annual and annual Beazer reports.

The majority of the property (205 acres) that has been remediated has been sold for redevelopment. It was first purchased in November 2006 by North Ophir Land, LLC, and then subsequently sold to Strategic Development Holding Co, LLC, in December 2007. The land is zoned as industrial and will likely be divided into multiple parcels. Amenities include electrical power, city water supply, two existing buildings, an office, and a warehouse with railway access.

6.5 Site Inspection

Caroline Ziegler and Seena Babu (from CH2M HILL) and Kim Hoang from EPA took part in a Site inspection on December 18 and December 19, 2007. K.C Hendrix, Site Manager for GeoTrans, Inc led the Site inspection. Weather conditions during the inspection were overcast and breezy with temperatures around 48 degrees Fahrenheit.

The inspection was accomplished by walking the Site and observing, photographing, and documenting Site information. The purpose of the Site inspection was to assess the integrity of the landfill cover and to observe the onsite P&T system. The extraction wells, product recovery well, and the inactive offsite groundwater P&T system were included as part of this inspection. Other Site security features such as fencing and gates were also noted. Visual inspection of some of the monitoring wells was also conducted to note any damage.

The landfill site and the onsite P&T system were accessible by vehicle and foot. During landfill cover inspection, the inspectors walked the Site looking for areas of wind or water erosion on the cover, indications of ponding, indications of stressed vegetation, signs of animal burrowing, and other physical deterioration. Both landfills present on the property have a vegetative cover, and no signs of erosion were evident. The drainage channel located in between the landfills is lightly vegetated and in good condition. In general, no sections of the cap appear to be exposed and the integrity of the landfill cap appears to have been maintained. A buffer zone and a fence surrounding the landfill cap provide an additional factor of safety. There is no regular leachate extraction system at this Site. The leachate elevation levels are monitored and extracted only as needed. The last extraction was conducted in 2006, and approximately 4,000 gallons of liquid were removed. The monitoring system appeared to be in good condition, and there were no indications of damage or disturbance to the leachate well points. Landfill gas vents were observed on the landfills; however, the gases are released to the atmosphere, and there are no monitoring or treatment measures in place to control potential migration of landfill gases. Annual surveys are conducted to mark the height of the settlement monuments on the landfill in order to check for subsidence.

The Site manager reported that there were problems with security and vandalism at Koppers. A portion of the fence surrounding the soil disposal cells was cut out and stolen in 2004. Also, some illegal dumping of trash and white goods happens on a regular basis.

The fence gate to the pump station was locked at the time of the inspection. An alarm system is maintained in the pump station to prevent unauthorized entry to the station. The onsite treatment plant, including air strippers, filters, carbon absorption units, surge tanks and effluent and influent holding tanks, appeared to be well maintained and in good condition.

As a part of the onsite inspection, the location of the storage building, which was formerly used to store contaminated soil, was noted. Presently the building is not in use and has been decontaminated and pressure washed. Injection well 3 and the product recovery well appear to be in good condition, and there are no indications of damage.

The biological treatment bed near EW-1 was inspected on December 19, 2007. Standing water was observed in the bed, which can be attributed to the heavy rainfall on December 18, 2007. Wells EW-1 and EW-2 were both leaking at the time of inspection. Leaking well EW-2 can be of potential concern because pentachlorophenol has been detected at concentrations above the ROD cleanup level (1 ppb) in EW-2 with values ranging from 12 ppb in 2003 to 2.9 in 2007.

Inspection of the offsite treatment plant and adjoining areas were conducted by driving through the area and stopping occasionally for documentation and photographs. The inactive offsite treatment plant was not accessible due to locked gate and fence. The offsite treatment plant has been abandoned, and all treatment units except for the carbon absorption units have been removed. Wells RI-11 and RI-12 were observed for signs of damage, and the general direction of the offsite pentachlorophenol plume was noted. The locations of four unknown wells that could not be located on the map were noted south of Prince Road. These appeared to be old or abandoned wells. Location of extraction wells EW-3 and EW-4 could not be found during the inspection.

A general inspection of Site documents including but not limited to O&M documents, Site Health and Safety Plans, Quarterly and Annual Monitoring Checklists were conducted and found satisfactory. The Site inspection checklist is incorporated in Appendix G of this five-year review report. Select site photographs are found in Appendix H.

6.6 Interviews

As part of the five-year review process, both community and technical interviews were conducted with people having knowledge of and/or concerns with the Koppers Site.

6.6.1 Technical Interviews

The following individuals were interviewed regarding their knowledge of, or concerns about, technical aspects of the remedial actions that have been conducted at the Koppers Company, Inc. and ongoing operations and maintenance activities.

- Mike Tischuk – Beazer East, Inc., Project Manager
- Jennifer Abrahams – GeoTrans, Inc., Project Manager
- K.C. Hendrix – GeoTrans, Inc., Operations and Maintenance Manager
- Phil Woodward – Regional Water Quality Control Board, Project Manager
- Ed Cargile, Department of Toxic Substances Control, Project Manager

The following subsections summarize the key comments from the technical interviews.

6.6.1.1 Responsible Party Interviews

Mr. Mike Tischuk, of Beazer East, Inc., represents the responsible party for the remedial activities being conducted at the Koppers Site in Oroville, California. Ms. Jennifer Abrahams is the responsible party contractor project manager and she, along with Mr. K.C. Hendrix, both of GeoTrans, Inc., are overseeing the operations, maintenance, and reporting requirements for the Site. Mr. Hendrix conducts day-to-day activities onsite, including treatment system operations, groundwater monitoring, leachate collection, Site inspections, routine maintenance, etc. Ms. Abrahams is the overall project manager responsible for report preparation, communications with the responsible party and regulators, etc. The reporting is provided by GeoTrans, Inc. to Mr. Tischuk for his review and approval prior to distribution to the appropriate stakeholders. All three agree that the remedial activities are going very well. They feel that the remedy is functioning as expected, and that the groundwater remediation is progressing. They feel that the ROD and CD requirements are being met. They are planning to review the system operations during calendar year 2008 to determine potential optimization opportunities that could result in greater efficiencies.

The responsible party representatives are aware of a recent complaint from an Oroville resident to the State and Local Public Health Department that the pancreatic cancer spike in the region is due to the 1987 fire at the Koppers Site. Mr. Tischuk stated that he thought a correlation between the pancreatic cancer cluster and the fire at the Site was unlikely because none of the residents affected live close to the plume. He also indicated that a dioxin study was conducted after the 1987 fire, and no remarkable results were noted.

6.6.1.2 State Agency Interviews

EPA is the lead agency overseeing the remedial activities at the Koppers Site. The two state agencies that serve in supporting roles for oversight are the RWQCB and DTSC. The project managers from both these agencies were interviewed as part of the five-year review process. Phil Woodward, RWQCB, and Ed Cargile, DTSC, both feel that the remedial activities that have been and are being conducted at the Site are going well.

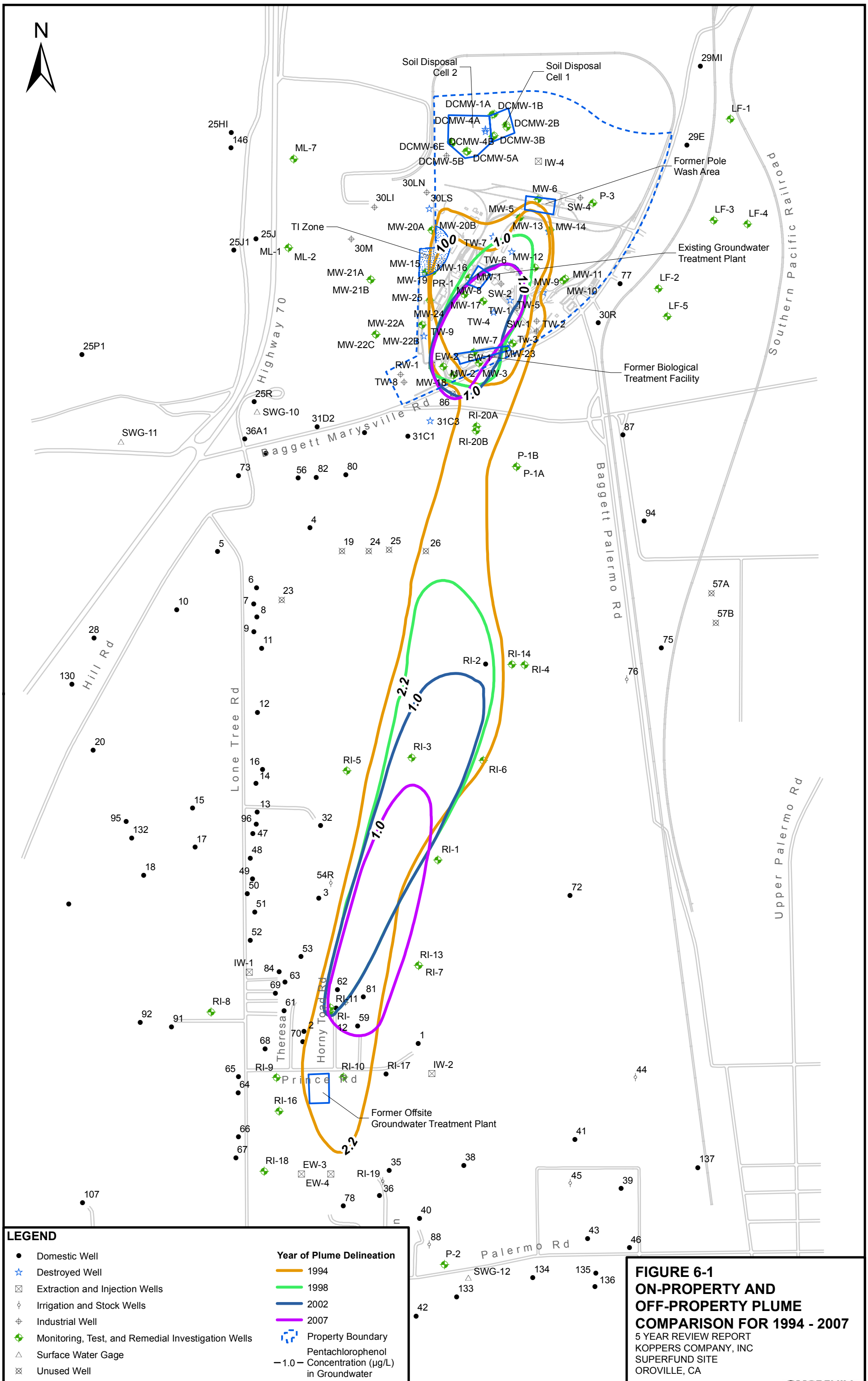
Both Mr. Cargile and Mr. Woodward were asked whether they were aware of any community issues. They both stated that they had not received any complaints or heard of any issues about the project in a very long time. However, Mr. Cargile recently was contacted by a community member in regards to the potential pancreatic cancer spike in the region and the issue of whether it is related to the 1987 fire at Koppers Site. Mr. Woodward was also aware of the complaint.

Copies of the completed interview forms are provided in Appendix I.

6.6.2 Community Interviews

EPA conducted interviews with six community members. Interviewees were asked to participate based on their role in the community or location relative to the Koppers Site. Interviewees included the local librarian, two businesses neighboring the Koppers Site, residents living adjacent to the Koppers Site, and residents living near the offsite plume. No interviewees voiced concerns or complaints with the cleanup processes, activities, or

administration. Overall feedback was very positive. Copies of the completed community interview forms are provided in Appendix B.



LEGEND

- Domestic Well
- Destroyed Well
- Extraction and Injection Wells
- Irrigation and Stock Wells
- Industrial Well
- Monitoring, Test, and Remedial Investigation Wells
- Surface Water Gage
- Unused Well

Year of Plume Delineation

- 1994
- 1998
- 2002
- 2007
- Property Boundary
- 1.0 Pentachlorophenol Concentration (µg/L) in Groundwater

FIGURE 6-1
ON-PROPERTY AND OFF-PROPERTY PLUME COMPARISON FOR 1994 - 2007
5 YEAR REVIEW REPORT
KOPPERS COMPANY, INC
SUPERFUND SITE
OROVILLE, CA

CH2MHILL

BAO \\ZINFANDEL\PROJ\USENVIRONMENTALPROTE\363329KOPPERS\GIS\MAPFILES\OFFSITE_PLUME.MXD OFFSITE_PLUME.PDF 2/6/2008 11:24:49

7.0 Technical Assessment

7.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

7.1.1 Soil

All remedial actions pertaining to soil, as mandated in the 1989 ROD, 1991 ESD, and 1996 ROD Amendment No. 1, have been implemented. The objective of the selected soil remedies was to reduce contamination to health protective levels consistent with potential future industrial exposure. Field observations and confirmation sampling during soil remediation were conducted in accordance with the approved Remedial Action Work Plan. As of January 2007, there were no substantial recorded changes in settlement monuments on the disposal cells either laterally or vertically, and the only chemical of concern detected in monitoring points was copper in the shallow aquifer at concentrations above background (GeoTrans, Inc. and EMKO, 2007). Remedial actions completed to date pertaining to this remedy are functioning as intended by the applicable decision documents.

7.1.2 Groundwater

7.1.2.1 On Property

All remedial actions pertaining to groundwater, as mandated in the 1989 ROD, and 1999 ROD Amendment No. 2 have been implemented. Remedial actions within the TI zone are functioning as intended by the decision document where implemented. Product recovery is continuing at PR-1 and monitored every 2 weeks. Through December 2006, approximately 1,250 gallons of product had been recovered. In addition, over 820 gallons of creosote/water emulsion have been recovered. Recovery is greater than 1 gallon per year (approximately 5 gallons of product per recovery episode); therefore, this remedial action continues and is functioning as intended.

The onsite groundwater P&T remediation system continues to treat groundwater extracted from EW-1 and EW-2. The system is pumping at optimum rates with minimal shutdown time due to maintenance. Influent PCP concentrations have decreased over time. Injection wells IW-3 and IW-4 are functioning optimally. It was observed during the December 2007 Site inspection that both extraction wells EW-1 and EW-2 had minor leaks that were described by the O&M manager as an on-going problem. The area around the wells is fenced and the O&M manager tries to control the leaks on a regular basis. The potential for exposure is minimized; however, because it is an on-going problem, it should be more optimally addressed. Photos 10 and 11 found in

H show that there is no secondary containment for either of the extraction wells; therefore any leaks go directly onto the ground. Monitoring data do, however, indicate that they are adequately capturing the plume in Sub-unit A. Extraction of MW-8 water and diluting it with the influent water from EW-1 and EW-2 continues to mitigate the high boron

concentration in MW-8, reducing the high boron concentration in MW-8 to around 700 ppm in the effluent from the treatment plant, below the ROD standards.

The operation of the On-property In Situ Bioremediation Program continues to enhance the P&T system. However, the plume maps in Figure 3-1 for 2002 and 2007 show little change of the on-property plume. So, the combined treatment system is effective in containing the plume, but not as effective as previous years in reducing it.

7.1.2.2 Off Property

The Off Property In Situ Bioremediation Program, which began in 1998, continues with ORC additions made to wells 26, RI-11, and RI-20A and since September 2006, wells 59 and 81. Downgradient monitoring points corresponding to these locations include RI-2, RI-6, RI-10, RI-12, and RI-16B. The Off-Property Bioremediation Program seems to be efficient in enhancing bioremediation of pentachlorophenol, as established by the reduction of the groundwater plume from 2002 to 2007.

In compliance with the ROD and Consent Decree, as amended, Beazer continued to provide an alternate water supply (i.e., the OWID system) for downgradient residences with PCP-impacted drinking water supply wells. Currently, five residences with private wells in the vicinity of RI-11 (59, 60, 61, 62, and 81), plus two residences with private wells 31C2 and 31D3, remain in the alternate water supply program. The following wells are sampled on a regular basis: 31C2, 31D3, 31C1, 25, and 86. Removal from the program is contingent upon meeting the alternative water supply termination criteria , which is not anticipated until cessation of in situ bioremediation at RI-11. Remedial actions pertaining to providing an alternative drinking water supply are functioning as intended by decision documents.

7.1.3 Institutional Controls

The Covenant to Restrict Use of Property for the former Koppers property (including groundwater use) was documented in the official records of Butte County in November 2003. A review of a recently obtained Condition of Title confirmed that this deed restriction is in place and is functioning as intended.

For the area overlying the groundwater plume that is located south of the Koppers property (see Figure 6-1), no institutional controls (ICs) have been required in EPA's selected remedies in order to ensure protectiveness. Initially, in lieu of an IC for the off-property plume area, the alternate water supply program required by the ROD addressed any existing water supply wells in this area, and it required Beazer to connect all residents located either within the plume (i.e., all residents with contaminated wells) or within a defined buffer area around the plume to the OWID system. The alternate water supply program continues to this day, with reimbursements provided to all residents whose wells remain contaminated. This program, coupled with the off-property well monitoring program conducted by Beazer, has been successful in preventing the use of contaminated wells as a source of water supply.

The current location of the plume, (i.e., largely in a land-locked rural area) combined with the primary land use (agriculture and raising of livestock) make it highly unlikely that anyone would install a new water supply well within the area of the plume. In addition, there is currently a City of Oroville ordinance that requires all parcels in a new subdivision

to be connected to a public water supply system. This ordinance would apply to development of land in the vicinity of the off-property plume.

7.1.4 Optimization

The current remedial operations and monitoring are effective in treating the contaminants left on the Site, and in addressing the issues identified from the second five-year review. Beyond their continuation, some additional potential improvements in operation and reporting are identified in Table 7-1.

TABLE 7-1
Recommendations for Optimization

Suggestion	Recommendations/Follow-up Action
Water-level data currently not analyzed beyond hydrographs	Perform a capture analysis once every 5 years for the P&T system, to be used in the five-year review report.
On-property groundwater plume did not seem to be reduced in size between 2002 and 2007, as compared to reduction seen in previous years	Optimize the groundwater remedy by revisiting both the P&T pump rates and the in-situ bioremediation program on- and off-property. This optimization study may include additional sampling, aquifer testing, capture zone analysis, consideration of additional wells for the in-situ bioremediation or any other additional appropriate task.
Clarity of semiannual and annual reports	Reorganize reports to separate past activities and results from the latest ones. Provide distinct summaries to list actual current operations and results, either in table format or separate sections.
Leaking extraction wells	While the areas are fenced, and there is no potential exposure, Beazer should find a more permanent solution to eliminate the leaks, either by replacing parts and/or providing secondary containment so as not to allow for contaminated groundwater to contact the ground surface.

7.2 Question B: Are the Assumptions Used at the Time of Remedy Selection Still Valid?

The ARARs review (Appendix D) showed that a new regulation for property that contains hazardous waste (Title 22, CCR, Chapter 39, Section 67391.1, effective April 19, 2003) requires all land use covenants to be signed by the DTSC and the landowner, and be recorded in the county where the land is located. The signature requirement is considered applicable to the entire site where land use will be restricted to industrial uses, and groundwater wells will be used for monitoring or injection purposes only. DTSC signed the Covenant to Restrict Use of Property in October 2003, and it was recorded at the Butte County Clerk-Recorder's Office in November 2003.

The risk review revealed that there have been a number of changes to the toxicity values for specific constituents of concern in soil and groundwater at the Koppers Site since the final endangerment assessment was submitted in 1988.

On January 23, 2006, the rule for all drinking water systems to comply with the new standard for arsenic of 10 ppb (adopted January 22, 2001) came into effect. The new MCL for arsenic is less than half the Site background concentration (which is 27 ppb). At the time the 1989 ROD selected background levels as the cleanup goal for arsenic, the arsenic MCL was 50 ppb, i.e., greater than local background levels. For a contaminant such as arsenic, which is also a naturally-occurring chemical in groundwater, there would be no long-term benefit in attempting to clean up a site to levels below background concentrations. The background concentration for arsenic of 27 ppb will continue to be the cleanup standard for groundwater at the Koppers Site.

Pentachlorophenol was not evaluated as a carcinogen in 1988 and has since been classified as one. This change does not affect protectiveness because 1) the clean-up level for groundwater was updated in ROD Amendment 2 to the current MCL and 2) the cleanup level for soil, although originally set at the State's Total Threshold Limit Concentration for soil, is still protective for industrial use of the property based on EPA's May 2008 Regional Screening Levels for Chemical Contaminants at Superfund Sites.

For PCDDs/PCDFs (dioxins) expressed as 2,3,7,8-TCDD Toxic Equivalency Factor, the ROD cleanup standard for groundwater was set at 0.53×10^{-7} ppb. The current MCL for groundwater is 3×10^{-8} ppb (i.e., 0.3×10^{-7} ppb), but this difference does not affect protectiveness, particularly since the area of dioxin-contaminated groundwater is within the TI waiver zone as defined in ROD Amendment No. 2, where groundwater use is severely restricted. For soil cleanup levels, the change in toxicity factors is similarly relatively small and does not affect the protectiveness of the remedy

7.3 Question C: Has Any Other Information Come to Light that Could Call Into Question the Protectiveness of the Remedy?

Although portions of the Site have been sold, based upon the condition of title review, it appears that appropriate institutional controls are in place to maintain remedy protectiveness.

7.4 Technical Assessment Summary

According to the data reviewed, the Site inspection, and the interviews, the remedy is functioning as intended by the ROD, as modified by the ESD and two ROD Amendments. There have to date been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy; however, the property was recently sold and is anticipated to be redeveloped. The deed restriction, which is a part of the condition of title for the property, is very explicit and any future redevelopment should not affect the protectiveness of the remedy, if the restrictions are followed as prescribed.

At the time of the December 2007 Site inspection, both extraction wells EW-1 and EW-2 were observed to be leaking. According to the O&M manager, these leaks are a regular occurrence. The water from the leaks falls directly onto the grass covered ground and soaks back into the soil (pictures of the extraction wells are included in Appendix H). However,

the leaks appeared to be minor at the time of the site inspection, and the area around the wells is fenced to minimize potential exposure. With the fence preventing exposure to contaminated water, at the current time these leaks are considered to be O&M issues that need to be addressed, but they do not affect the protectiveness of the remedy.

8.0 Issues and Recommendations

There is no issue identified that affects the current protectiveness of the remedy.

9.0 Protectiveness Statement

The remedy at the Koppers Superfund Site is protective of human health and the environment because all exposure pathways that could result in unacceptable risk are being controlled. Residents within the former plume have been supplied with an alternate source of drinking water. A deed restriction on the property prevents unacceptable exposure to on-site soil contamination and restricts the property for industrial use only. Current data indicate that the groundwater remediation is progressing and that the remedy is functioning as required to achieve groundwater remediation standards.

10.0 Next Five-Year Review

The next five-year review for the Koppers Company, Inc. Superfund Site will be completed in July 2013.

11.0 References

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Appendix A
Detailed Site Chronology

APPENDIX A

Detailed Site Chronology

TABLE A-1
Chronology of Site Events
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Event	Date
Mine dredging operations were conducted at the Site.	1900s
Hutchinson Lumber Mill operated at the Site.	1920 to 1948
National Wood Treating Company operated at the Site.	1948 to 1955
Wood was treated at the Site with chemicals including, but not limited to, pentachlorophenol (PCP), creosote, and chromated copper arsenate solution to prevent wood deterioration by insects or fungi.	1948 to 2001
Lumber mill facility operated at the Site, concurrently with the wood-treatment operations.	1952 to 1962
Creosote residuals from wood-treating process were discharged to unlined settling ponds near the western Site boundary.	Approximately 1952 to 1973
Koppers purchased the property and wood-treating operations from the National Wood Treating Company.	1955
A fire occurred at the Site; approximately 20,000 gallons of PCP were released from tanks. Debris was buried on property initially, then later excavated and disposed of at an approved landfill.	1963
Wastes from cellon process (mixiing PCP with isopropyl ether and butane, then injecting moisture into wood for wood preservation) disposed at an area near creosote disposal pond.	1961 to 1973
Treated poles encrusted with PCP crystals were washed with caustic water over unlined soil, apparently contributing greatly to the Site's contamination.	1963 to 1973
PCP-contaminated groundwater was first documented on property.	1971
PCP was discovered in nearby residential wells.	1972
Regional Water Quality Control Board (RWQCB) issued a Cease and Desist Order to Koppers to treat contaminated groundwater.	1973
Koppers installed and began operation of two recovery wells (RW-1 and RW-2) to recover PCP in local groundwater in accordance with RWQCB order.	1974
Concentrations of PCP in offsite wells decreased, and the RWQCB order was rescinded.	1974
Waste disposal area in the Eastern Spray Field (fire debris), the two areas in the Western Spray Field (fire debris), and the cellon blowdown area were excavated, and the soils were disposed of at the soil bed of the biological wastewater treatment unit (BWTU).	1973
BWTU was used for the disposal of all residual wastes.	1973 to 1988
The RWQCB ordered Koppers to conduct a comprehensive groundwater and soil investigation. Koppers found that groundwater contamination was contained by the extraction wells on property. The soil survey showed that over 43,000 cy of onsite soil were contaminated with at least 10 ppm of PCP.	1981 to 1982

TABLE A-1
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Event	Date
The RWQCB issued a Cease-and-Desist order directing Koppers to end discharge of PCP into soil at the plant, and a Cleanup and Abatement Order directing Koppers to clean up contaminated soils.	1982
The Site was proposed for placement on the National Priorities List (NPL).	September 1983
Groundwater contamination in residential wells was found about 1.5 mile south of the Site. Of the 108 wells sampled, 19 showed PCP levels higher than 0.5 ppb.	December 1983
Bottled water was supplied to 45 residences with impacted drinking water supply wells, and start negotiation with Oroville Wyndotte Irrigation District (OWID) to upply residents with domestic water at Koppers expense.	March 1984 to 1986
Site was placed on the NPL.	September 1984
Groundwater monitoring program was initiated.	June 1985
Use of PCP in the wood-treating process was phased out.	1986 to 1988
Residences within areas of impacted groundwater were connected to Oroville Wyandotte Irrigation District (OWID). Thirty-four residences were initially put on the alternate water supply plan (AWSP), with Koppers paying for their water bill. Of those thirty-four, seven are still on the AWSP, receiving payment from Koppers for their annual water bill.	March 1986 to date
The RWQCB rescinded the two 1982 orders and adopted a new order requiring Koppers to complete a RI/FS in accordance with EPA guidelines and time schedule.	January 1986
Administrative Order of Consent signed between Koppers and EPA, requiring completion of the Remedial Investigation and Feasibility Study (RI/FS).	April 1986
Quarterly monitoring conducted for water wells south of the plant.	From 1986
Explosion and fire at the Site. EPA issued a unilateral removal order for the cleanup, removal, and stabilization of soil.	April 1987
After the fire, Department of Health Services (DHS) sampled neighboring properties and found elevated dioxins in chicken eggs; an advisory was issued and the source of area-wide trace dioxin was not determined.	March 1988
Temporary chip-seal cap was constructed over process area.	1987 to 1988
Koppers and the associated Site was bought by Beazer East, Inc. (Beazer).	1988
Operations ceased at the Former Biological Wastewater Treatment Facility (soil) on property.	1988
RI Report completed, including investigation of soil, groundwater, surface water and air.	June 1988
Risks evaluated by the EPA and reported in an Endangerment Assessment Report.	November 1988
Beazer sold the Koppers Superfund Site to Koppers Industries, Inc. (KII), yet Beazer retained responsibility for CERCLA matters at the Site.	December 1988
Feasibility Study completed.	May 1989

TABLE A-1
Chronology of Site Events
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Oroville, Butte County, California

Event	Date
Record of Decision (ROD) for cleanup of groundwater and soil was issued for the Site with soil remediation alternatives in four operable units (S1 through S4) based on risk from direct exposure to contaminated surface soil, and groundwater remediation in two operable units (G1 and G2) based on ingestion risk of groundwater.	September 1989
Explanation of Significant Difference (ESD) issued for the Site to include protection of groundwater from subsurface soil contamination, which limited soil remediation to 5 feet unless a potential contaminant source to groundwater was found.	January 1991
The RWQCB issued a Cleanup and Abatement Order requiring Beazer to clean up past discharge of wood-treating compounds to the lagoon located at the biological wastewater treatment unit. The lagoon was designated as a toxic pit under the law and must be removed.	
Consent Decree between EPA and Beazer agreeing that Beazer will conduct remedial action work as specified in the ROD.	February 6, 1992
Two concrete drip pads were installed in S3 as part of the concrete cap designed as an interim remedy to prevent migration of the contaminants while the plant is still in operation.	1992
Completed soil washing pilot study (remedy selection for S2 and S3) found inadequate as a remedy by itself.	1993
Construction of test plots for in situ biodegradetion pilot study for soil in area S1. Found higher than expected concentrations of PCDDs/PCDFs (above industrial standards for workers) and PAHs in surface soil. Contaminated soil to be landfilled onsite as the most effective remedy. Pilot study canceled.	1993
Off property groundwater remediation system constructed and operation started (600 gpm).	March 1993
On-property groundwater remediation system constructed and operation started (400 gpm).	February 1994
Product recovery well (PR-01) installed to recover and cleanup of the creosote pools trapped on top of clay layers in the on-property groundwater contaminated plume.	1994
Soil Fixation Treatability Study completed for area S4. Effective for arsenic, chromium and other metals, but not for PCP and PAHs. Found to be not implementable as a remedy. Soil landfilled offsite at a permitted facility.	1994
Pilot study for in situ biotreatment system of creosote in on-property groundwater plume.	July 1995
Construction complete for onsite landfill, Cell No. 1 for dioxin-contaminated soil from S-1 test plot soils (15,000 cy).	August 1995
Off-property groundwater remedial system taken off line because the plume retreated. The extraction wells were no longer effective in capturing the plume.	December 1995

TABLE A-1
Chronology of Site Events
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Event	Date
ROD Amendment No. 1 issued for the Site, modifying the soil remedies in the ROD (which were found to be not implementable and not cost effective) to an onsite landfill (incineration and thermal desorption also considered as alternatives and found to be not the best remedies for this Site), Also changed soil cleanup level from residential to industrial, and required deed restriction for future land use. Cell No. 2 was to contain 100,000 cy and occupy about 7 acres onsite adjacent to Cell No. 1. Soil in S1 and S2 will be landfilled first, soil in S3 (process area) will be landfilled after the plant closed.	August 1996
Former creosote pond in area S2 was excavated to 14 feet below ground surface (bgs) (approximately 11,216 cy of soil). Soil placed in Cell No. 2.	1996
Excavated former cellon blowdown in area S2 to 10 feet bgs (approximately 11,130 cy of soil). Soil placed in Cell No. 2.	1997
Excavated pole-wash area S1 to depths of up to 20 feet bgs, 4,830 cy removed. Backfilled with plastic, low-permeability soils beneath and coarse, gravelly onsite soils on top. Soil placed in Cell No. 2.	September 1997
First five-year review completed (statutory review, triggered 5 years after initiation of RA implementation. Remedial actions were deemed protective of public health and the environment and were functioning as designed.	December 1997
Implemented in situ enhanced bioremediation program to treat PCP in the on-property eastern plume. Periodic quantities of magnesium peroxide (supply oxygen) and di-ammonium phosphate (supply nitrogen and phosphorous) were added to MW-1, MW-4, MW-6, MW-12, MW-13, and MW-23. Monitoring wells system included MW-3, MW-5, MW-7, MW-8, and TW-1.	March 1998
Restriction for domestic drinking water for 26 residences removed (private wells taken off the alternative drinking water supply).	April 1998
Implemented off-property groundwater in situ bioremediation program, similar to onsite program. Magnesium peroxide and di-ammonium phosphate were added to RI-11, RI-20A, and Well 26. Monitoring wells system included RI-2, RI-3, RI-10, RI-12, and RI-16B.	August 1998
ROD Amendment No. 2 issued for the Site, modifying the groundwater remedy to provide for: (1) 4-acre Technical Impracticability (TI) Zone for plume areas with DNAPL, (2) adding enhanced in situ bioremediation to the remedy, (3) providing monitored natural attenuation as a contingency remedy, and (4) groundwater standards changed for PCP (1 part per billion [ppb]) and barium (1,000 ppb).	September 1999
Koppers ceased operations and began work on Resource Conservation and Recovery Act (RCRA) closure, overseen by Department of Toxic Substances Control.	March 15, 2001
Restriction for domestic drinking water for one residence removed (seven remaining).	April 2001
Pilot in situ bioremediation study of creosote treatment in the area of the former creosote pond terminated at the request of Beazer, because additives apparently resulted in increased mobility of polynuclear aromatic hydrocarbons (PAHs).	June 2001
Elevated boron concentrations detected in monitoring well MW-8 (on-property eastern plume).	July 2002

TABLE A-1
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Event	Date
Soil removal completed. Cell # 2 construction complete.	September 2002
RWQCB transmits Order No. R5-2002-0163, rescinding waste discharge requirements as per Order No. 97-076.	September 2002
Beazer East, Inc. purchased Site property from KII.	November 2002
Second five-year review completed. Remedial actions were deemed protective.	February 2003
Consent Decree amended (incorporated land use covenants restricting access to groundwater) (signed by EPA).	June 2003
Public notice was issued for lodging of proposed CERCLA Consent Decree amendment, United States vs Beazer East, Inc civil action No. S-91-767.	August 2003
Preliminary Close Out Report (PCOR) signed by EPA.	September 4, 2003
Amended Consent Decree entered by the court.	September 22, 2003
Covenant to Restrict Use of Property recorded with Butte County.	November 12, 2003
Site Certification from DTSC.	June 30, 2004
Monthly reporting was reduced to quarterly reporting.	May, 2006
Beazer East, Inc. sold most of property to North Ophir Land, LLC.	November 28, 2006
EPA approved to change ORC from magnesium peroxide to the calcium peroxide-based compound for Groundwater In-Situ Bioremediation Program.	January 31, 2007
Third five-year review initiated.	November 5, 2007
North Ophir Land, LLC, sold portions of the property to Strategic Development Holding Co, LLC.	December 18, 2007

Appendix B
Community Interviews Record

APPENDIX B

Community Interviews Record

INTERVIEW DOCUMENTATION FORM			
The following is a list of individuals interviewed for the community involvement portion of this five-year review. See the attached contact records for a detailed summary of the interviews. Interviews were conducted by Mr. Luis Garcia-Bakarich, Community Involvement Coordinator, U.S. Environmental Protection Agengy (EPA) Region 9, and Ms. Jen Blonn, Superfund Intern, EPA Region 9.			
Name	**Title/Position**	**Organization**	**Date**
1. Brenda Crotts	Branch Librarian	Butte County Library	1/29/08
2. Reba & Dan Pierce	Owner & Staff, also Residential Neighbor	NORCA Precision Machinery	1/29/08
3. John Rowe	Owner	Diversified Products	1/29/08
4. Owen Young	Resident	----------	1/29/08
5. Walter Shaner	Resident	----------	1/29/08
6. Alfred Herfi	Resident	----------	1/29/08

EPA staff asked each interviewee the following six questions.

1. What is your overall impression of the project? (general sentiment)
2. What effects have Site operations had on the surrounding community?
3. Are you aware of any community concerns regarding the Site or its operation and administration? If so, please give details.
4. Are you aware of any events, incidents, or activities at the Site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.
5. Do you feel well informed about the Site's activities and progress?
6. Do you have any comments, suggestions, or recommendations regarding the Site's management or operation?

INTERVIEW RECORD

Site Name: Koppers	**EPA ID No.:**	
Subject: Five-Year Review	**Time:** PM	**Date:** 1/29/08
Type: ☐ Telephone ☒Visit ☐ Other **Location of Visit:** Oroville (Butte County), CA	☐ Incoming ☐ Outgoing	

Contact Made By:

Name: Luis Garcia-Bakarich **Accompanied by:** Jen Blonn, U.S. EPA	**Title:** Community Involvement Coordinator, U.S. EPA	**Organization:** US EPA, Region 9

Individual Contacted:

Name: Brenda Crotts	**Title:** Branch Librarian	**Organization:** Butte County Library
Telephone No: (530)538-7196 **Fax No:** **E-Mail Address:**	**Street Address:** 1820 Mitchell Avenue **City, State, Zip:** Oroville, CA 95966	

Summary Of Conversation

- Doesn't have much of an impression of the site. No one has come in to the library to request information lately.
- Not aware of effects Site operations have had on the community in the past 5 years. Recalled concerns over chickens 20 years ago and recent discussion of health concerns from past contamination.
- Not aware of community concerns regarding the Site or its operation and administration.
- Not aware of any events, incidents, or activities at the Site such as vandalism, trespassing, or emergency responses from local authorities.
- Not well informed about the Site's activities and progress because she chooses not to read the fliers.
- No comments, suggestions, or recommendations regarding the Site's management or operation.

INTERVIEW RECORD

Site Name: Koppers	**EPA ID No.:**	
Subject: Five-Year Review	**Time:** PM	**Date:** 1/29/08
Type: ☐ Telephone ☒Visit ☐ Other **Location of Visit:** Oroville (Butte County), CA	☐ Incoming ☐ Outgoing	

Contact Made By:

Name: Luis Garcia-Bakarich **Accompanied by:** Jen Blonn, U.S. EPA	**Title:** Community Involvement Coordinator, U.S. EPA	**Organization:** US EPA, Region 9

Individual Contacted:

Name: Reba & Dan Pierce	**Title:** Owner, staff, residents	**Organization:** NORCA Precision Machinery
Telephone No: (530)534-6872 **Fax No:** **E-Mail Address:**	**Street Address:** 5625 Baggett-Marysville Rd. **City, State, Zip:** Oroville, CA 95965	

Summary Of Conversation

Reba Pierce lives directly across Baggett-Marysville Rd. from the Koppers Superfund Site. Her residence is located on the same parcel as NORCA Precision Machinery, which Reba Pierce owns. Dan, Reba's son, works at the facility.

- Both feel the Koppers Site was cleaned up well and EPA did all that it could.
- Stated that the cleanup positively affected the surrounding community because documentation of cleanup is publicly available. Stated that this is good for property values.
- Not aware of community concerns regarding the Site or its operation and administration.
- Aware of individuals going onto the Site at night. Referred to these activities as harmless. Activities include cars pulling onto the property and youth socializing.
- Do not feel they need to be well informed about the Site because they are not concerned with it.
- No concerns or suggestions and happy with cleanup.

INTERVIEW RECORD

Site Name: Koppers	**EPA ID No.:**	
Subject: Five-Year Review	**Time:** PM	**Date:** 1/29/08
Type: ☐ Telephone ☒Visit ☐ Other **Location of Visit:** Oroville (Butte County), CA	☐ Incoming ☐ Outgoing	

Contact Made By:

Name: Luis Garcia-Bakarich **Accompanied by:** Jen Blonn, U.S. EPA	**Title:** Community Involvement Coordinator, U.S. EPA	**Organization:** US EPA, Region 9

Individual Contacted:

Name: John Rowe **Accompanied by:** Ron Morgan, Health & Safety Coordinator	**Title:** Owner	**Organization:** Diversified Products
Telephone No: (530) 534-3966 **Fax No:** **E-Mail Address:**	**Street Address:** 5523 Baggett Marysville Road **City, State, Zip:** Oroville, CA 95965	

Summary Of Conversation

- Does not have much of an impression of the Site. He has not received much information.
- Stated that the cleanup has made the Site more attractive.
- Not aware of any community concerns regarding the Site or its operation and administration.
- Has seen hunters on the property.
- Does not feel well informed about the Site and would like more information.
- Is more interested in commercial development than environmental concerns.

INTERVIEW RECORD

Site Name: Koppers	**EPA ID No.:**	
Subject: Five-Year Review	**Time:** PM	**Date:** 1/29/08
Type: ☐ Telephone ☒Visit ☐ Other **Location of Visit:** Oroville (Butte County), CA	☐ Incoming ☐ Outgoing	

Contact Made By:		
Name: Luis Garcia-Bakarich **Accompanied by:** Jen Blonn, U.S. EPA	**Title:** Community Involvement Coordinator, U.S. EPA	**Organization:** US EPA, Region 9

Individual Contacted:		
Name: Owen Young	**Title:** Resident	**Organization:**
Telephone No: (530)532-4352 **Fax No:** **E-Mail Address:**	**Street Address:** 4823 Powerhouse Hill Road **City, State, Zip:** Oroville, CA 95965	

Summary Of Conversation

Mr. Young currently receives a water reimbursement, funded by Beazer East, Inc.

- Happy with cleanup.
- Does not believe that the cleanup had noticeable effects on the community.
- Not aware of any community concerns regarding the Ssite or its operation and administration. Only aware of people who are happy with it.
- Not aware of anyone trespassing or causing problems on the Site.
- Felt well informed about the property years ago but not lately.
- No concerns, suggestions, or recommendations.

INTERVIEW RECORD

Site Name: Koppers	**EPA ID No.:**	
Subject: Five-Year Review	**Time:** PM	**Date:** 1/29/08
Type: ☐ Telephone ☒Visit ☐ Other **Location of Visit:** Oroville (Butte County), CA	☐ Incoming ☐ Outgoing	

Contact Made By:

Name: Luis Garcia-Bakarich **Accompanied by:** Jen Blonn, U.S. EPA	**Title:** Community Involvement Coordinator, U.S. EPA	**Organization:** US EPA, Region 9

Individual Contacted:

Name: Walter Shaner	**Title:** Resident	**Organization:**
Telephone No: (530)533-3496 **Fax No:** **E-Mail Address:**	**Street Address:** 467 Lone Tree Road **City, State, Zip:** Oroville, CA 95965	

Summary Of Conversation

Mr. Shaner previously received supplied water through Beazer East, Inc. He is located near the offsite plume and treatment pump.

- Believes that everything was done that could have been to clean up the Site.
- Stated that there were no significant impacts on the community.
- Not aware of any community concerns regarding the Site or its operation and administration.
- Not aware of any events, incidents, or activities at the Site such as vandalism, trespassing, or emergency responses from local authorities.
- Feels well informed about the Site.
- No concerns, suggestions, or recommendations.

INTERVIEW RECORD

Site Name: Koppers	**EPA ID No.:**	
Subject: Five-Year Review	**Time:** PM	**Date:** 1/29/08
Type: ☐ Telephone ☒Visit ☐ Other **Location of Visit:** Oroville (Butte County), CA	☐ Incoming ☐ Outgoing	

Contact Made By:

Name: Luis Garcia-Bakarich **Accompanied by:** Jen Blonn, U.S. EPA	**Title:** Community Involvement Coordinator, U.S. EPA	**Organization:** US EPA, Region 9

Individual Contacted:

Name: Alfred Herfi	**Title:** Resident	**Organization:**
Telephone No: (530)532-1537 **Fax No:** **E-Mail Address:**	**Street Address:** 62 Horny Toad Rd. **City, State, Zip:** Oroville, CA 95965	

Summary Of Conversation

Mr. Herfi currently receives a water reimbursement, funded by Beazer East, Inc. He is located near the offsite plume and treatment pump.

- Believes Site activities are going pretty well.
- One of the pumps made a lot of noise, but not a current concern due to decommissioning of offsite pump and treat unit. Overall cleanup has had a positive effect on the community.
- Community is concerned with cancer risks from the Site.
- Not aware of anyone trespassing on the Site.
- Feels well informed about Site activities and progress.
- No concerns, suggestions, or recommendations.

Appendix C
Documents Reviewed

APPENDIX C

Documents Reviewed

General

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Human Health and Ecological Risk

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Ebasco Services Incorporated. 1988. *Final Endangerment Assessment, Koppers Company Feather River Plant Superfund Site.* November.

Data

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GeoTrans, Inc. 2004. *Annual 2003 Remedial Action Groundwater Monitoring Report Koppers Company, Inc. Superfund Site (Feather River Plant), Oroville, California.* March.

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GeoTrans, Inc. 2005. *Annual 2004 Remedial Action Groundwater Monitoring Report, Koppers Company, Inc. Superfund Site (Feather River Plant), Oroville, California.* April.

GeoTrans, Inc. 2005. *Semiannual 2005 Remedial Action Groundwater Monitoring Report, Koppers Company, Inc. Superfund Site (Feather River Plant), Oroville, California.* September.

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Appendix D
ARARs Review Memorandum

Koppers Company, Inc. Superfund Site 5-Year Review

Applicable or Relevant and Appropriate Requirements Review

PREPARED FOR: Kim Hoang/U.S. Environmental Protection Agency, Region 9 Superfund Division

PREPARED BY: CH2M HILL, Inc.

DATE: February 22, 2008

This technical memorandum presents an evaluation of the Applicable or Relevant and Appropriate Requirements (ARARs) for the Koppers Company, Inc. Superfund Site (Koppers site) located in Oroville, California. The U.S. Environmental Protection Agency (EPA) identification number for the site is CAD009112087.

Purpose of the ARARs Review

The purpose of an ARARs review is to determine whether laws, regulations, or guidance promulgated since the approval of site decision documents alter the remedy's protectiveness of human health and the environment.

ARARs are established in the site decision documents, primarily in Record of Decision (ROD) documents. Changes to ARARs, where necessary, can be memorialized in ROD Amendment documents, Explanation of Significant Differences (ESD) documents, and 5-Year Review documents.

The preamble to the National Contingency Plan (NCP) states that remedy selection decisions are not to be reopened unless new or modified requirements call into question the protectiveness of the selected remedy (55 CFR 8757, March 8, 1990). This is interpreted to mean generally that ARARs are frozen at the time of remedy approval, unless updated by additional decision documents.

ARARs Background

Section 121(d) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires that remedial actions implemented at CERCLA sites are carried out in compliance with any federal or more stringent state environmental standards, requirements, criteria, or limitations that are determined to be ARARs.

CERCLA response actions are exempted by law from the requirement to obtain federal, state, or local permits related to any activities conducted completely on site. However, this

does not remove the requirement to meet the substantive provisions of permitting regulations that are ARARs. The specific ARAR terms are defined below.

Applicable. Applicable requirements are cleanup standards, criteria, or limitations promulgated under federal or state law that specifically address the situation at a CERCLA site. A requirement is applicable if the jurisdictional prerequisites of the environmental standard show a direct correspondence when objectively compared with the conditions at the site.

Relevant and Appropriate. If a requirement is not legally applicable, the requirement is evaluated to determine whether it is relevant and appropriate. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable, address problems or situations sufficiently similar to the circumstances of the proposed response action and are well suited to the conditions of the site. The criteria for determining relevance and appropriateness are listed in 40 CFR 300.400(g) (2).

To Be Considered (TBC). TBC criteria are requirements that may not meet the definition of an ARAR, but still may be useful in determining whether to take action at a site or to what degree action is necessary. TBC criteria, as defined in 40 CFR 300.400(g) (3), are non-promulgated advisories or guidance issued by federal or state government that are not legally binding but may provide useful information or recommended procedures for remedial action. Although TBC criteria do not have the status of ARARs, they are considered together with ARARs to establish the required level of cleanup for protection of human health and the environment.

Pursuant to EPA guidance, ARARs generally are classified into three categories: action-specific, chemical-specific, and location-specific requirements. These categories of ARARs are identified below:

- **Action-specific ARARs** are requirements that apply to specific actions that may be associated with site remediation. Action-specific ARARs often define acceptable handling, treatment, and disposal procedures for hazardous substances. These requirements are triggered by the particular remedial activities that are selected to accomplish a remedy. Examples of action-specific ARARs include requirements applicable to landfill closure, wastewater discharge, hazardous waste disposal, and emissions of air pollutants.
- **Chemical-specific ARARs** include those laws and regulations that regulate the release to the environment of materials possessing certain chemical or physical characteristics or containing specified chemical compounds. These requirements generally set health- or risk-based concentration limits or discharge limits for specific hazardous substances.
- **Location-specific ARARs** are those requirements that relate to the geographical or physical location of the site, rather than the nature of the contaminants or the proposed site remedial actions. These requirements may limit the placement of remedial action and may impose additional constraints on the cleanup action. For example, location-specific ARARs may refer to activities in the vicinity of wetlands, floodplains, endangered species habitat, and areas of historical or cultural significance.

Site Background

The Koppers site is located in Butte County just south of the Oroville, California city limits. The site covers approximately 200 acres, including the area where wood treating operations were performed and the predominately southward extending groundwater plume. The EPA identification number for the site is CAD009112087. The site is a CERCLA Superfund Site, and was placed on the National Priorities List (NPL) on September 21, 1984.

The following site-related documents were used in preparing this ARARs review technical memorandum:

- ROD, September 13, 1989
- ESD, January 29, 1991
- ROD Amendment No. 1, August 29, 1996
- First 5-Year Review, December 22 , 1997
- ROD Amendment No. 2, September 23, 1999
- Second 5-Year Review, February 7, 2003

Selected Remedies

The 1989 ROD selected remedies to provide on-site treatment of four areas of contaminated soil (Soil Units 1 through 4) and remove contaminants from on-site and off-site groundwater. The major components of the ROD selected remedies include:

- Groundwater extraction, carbon filtration treatment, and reinjection until California State Action Levels are achieved in all on-site and off-site monitoring wells using two distinct treatment systems
- *In situ* biodegradation at Soil Unit 1
- Excavation and soil washing at Soil Unit 2
- Capping at Soil Unit 3
- Excavation and treatment by chemical fixation and on-plant disposal of soil at Soil Unit 4

The ESD issued on January 29, 1991 modified portions of the ROD by establishing a soil depth of 5 feet for existing remedial objectives unless a source of groundwater contamination was found. ROD Amendment No. 1, issued on August 29, 1996, changed the soil remedy to on-site landfilling, changed cleanup standards for soil from residential to industrial, and provided for institutional controls. ROD Amendment No. 2 ,issued on September 23, 1999, modified the groundwater remedy to provide for a 4-acre Technical Impracticability (TI) Zone waiver due to the presence of dense non-aqueous phase liquids (DNAPLs), added enhanced *in situ* bioremediation as a remedial option, provided monitored natural attenuation as a contingency remedy, lowered the standard for pentachlorophenol (PCP) in groundwater to 1 part per billion (ppb) from 2.2 ppb, and increased the standard for barium in groundwater to 1,000 ppb from 680 ppb.

Remediation Standards

The 1989 ROD established the soil and groundwater cleanup criteria for the Koppers site with the following statement:

> *"The soil cleanup goals for the major contaminants at the Koppers site are 17 parts per million (ppm) for PCP, 30 parts per trillion (ppt) for dioxins and furans, background for arsenic and chromium, and 0.19 ppm for carcinogenic polyaromatic hydrocarbons (PAHs). Remedial objectives for groundwater are based on the more stringent goal of 10^{-6} excess cancer risk from use of groundwater as a drinking water supply or state action levels"..*

The ROD amendments (1996 and 1999) limited the ROD cleanup standards to the top 5 feet of soil and changed the soil cleanup standards from residential to industrial. Groundwater cleanup standards were modified to include implementation of a 4-acre TI Zone for groundwater remediation in the area of the former creosote pond at Soil Unit 2, as well as revision of groundwater cleanup standards for PCP from 2.2 to 1.0 ppb and for barium from 680 to 1,000 ppb.

Soil remediation was achieved by excavation and on-site landfilling in 2002.

The groundwater remediation goals are to restore contaminated groundwater, using extraction, to the following standards:

- Cleanup standards as documented in the 1989 ROD, amendments, and 5-year reviews
- Federal or state Maximum Contaminant Levels (MCLs)

On January 23, 2006, the rule for all drinking water systems to comply with the new standard for arsenic of 10 ppb (adopted January 22, 2001) came into effect. The new MCL for arsenic is less than half the site background concentration. The *Water Quality Control Plan for Sacramento and San Joaquin River Basins* of September 15, 1998 expressly states that its water quality objectives do not require improvement over naturally occurring background concentrations. The background concentration for arsenic of 27 ppb will continue to be the cleanup standard for groundwater at the Koppers site. Because this standard was adopted in January 2001, it was discussed in the second 5year review that was completed in 2003. Therefore, no chemical-specific changes to ARARs are noted for this ARARs evaluation.

The groundwater cleanup criteria established for the site in the 1989 ROD and ROD amendments are presented in Table D-1.

Site ARARs Review

Tables D-2 through D-4 list the ARARs established in the above-referenced decision documents, summarize the requirement for each ARAR, cite the regulatory basis for each ARAR, state the evaluated status of each ARAR, and provide comments where applicable, including comments on any regulatory changes since the 2003 5-Year Review.

Table D-2 contains action–specific ARARs, Table D-3 contains chemical–specific ARARs, and Table D-4 contains location-specific ARARs. Current versions of the California Code of Regulations (CCR) and the Code of Federal Regulations (CFR) were consulted (via the internet or in hard copy) to review pertinent updates of laws, regulations, or guidance.

Site ARARs Summary

The basis for ARARs are laws and regulations applicable to the site location, remedy actions, and/or contaminants of concern.

The Koppers site consists of approximately 200 acres in Oroville, California. It is a CERCLA Superfund Site and was placed on the NPL on September 21, 1984. CERCLA response actions are exempted by law from the requirement to obtain federal, state, or local permits related to any activities conducted completely on site. However, this does not remove the requirement to meet the substantive provisions of permitting regulations that are ARARs. Koppers site ARARs (as established in the ROD, ROD Amendments, and previous 5-year reviews) are evaluated and discussed in detail in Tables D-2 through D-4, and summarized briefly below.

Action-specific ARARs. The risk review revealed that there have been a number of changes to the toxicity values for specific constituents of concern in soil and groundwater at the Koppers Site since the final endangerment assessment was submitted in 1988.

On January 23, 2006, the rule for all drinking water systems to comply with the new standard for arsenic of 10 ppb (adopted January 22, 2001) came into effect. The new MCL for arsenic is less than half the Site background concentration. The Water Quality Control Plan for Sacramento and San Joaquin River Basins of September 15, 1998, expressly states that its water quality objectives do not require improvement over naturally occurring background concentrations. The background concentration for arsenic of 27 ppb will continue to be the cleanup standard for groundwater at the Koppers Site.

Pentachlorophenol was not evaluated as a carcinogen in 1988 and has since been classified as one. This change does not affect protectiveness because the clean-up value for groundwater remains the same as what was used in the ROD and ROD amendment.

For PCDDs/PCDFs (dioxin) as 2,3,7,8-TCDD Toxic Equivalency Factor, the cleanup standard was changed from 0.53×10^{-7} ppb to 3×10^{-8} ppb, but this does not affect protectiveness since this area of contamination is under TI waiver.

Chemical-specific ARARs. There are no changes to existing chemical-specific ARARs as stated in the ROD, ROD Amendments, and previous 5-year reviews.

Location-specific ARARs. The ARARs review showed that a new regulation for property that contains hazardous waste (Title 22, CCR, Chapter 39, Section 67391.1, effective April 19, 2003) requires all land use covenants to be signed by the DTSC and the landowner, and be recorded in the county where the land is located. The signature requirement is considered applicable to the entire site where land use will be restricted to industrial uses, and groundwater wells will be used for monitoring or injection purposes only. DTSC signed the Covenant to Restrict Use of Property in October 2003, and it was recorded at the Butte County Cleark-Recorder's Office in November 2003.

Tables

TABLE D-1
Groundwater Remediation Standards
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Chemical	Standard or Cleanup Level	Reference	Current (September 2007) Drinking Water Standard, MCLs
Pentachlorophenol (PCP)	1.0 ppb[a,b]	State and Federal MCL	1.0 ppb, effective 01/1991 (Federal) and 09/08/1994 (State)
Pentachlorophenol (PCP) at well RI-11	0.5 ppb for four consecutive quarters before use of alternative water supply can cease	1999 ROD Amendment #2	NA
Isopropyl Ether	2,800 ppb	TBC from 1989 ROD	NA
Benzene	1.0 ppb	State MCL	1.0 ppb, effective 02/25/1989
Ethylbenzene	680 ppb	State MCL	680 ppb, effective 02/25/1989
Xylenes	1,750 ppb	State MCL	1,750 ppb, effective 02/25/1989
Barium	1,000[b]	State and Federal MCL	1,000 ppb, effective 06/24/1977
Boron	1,200 ppb	TBC from 1989 ROD	NA
Cadmium	5 ppb	State and Federal MCL	5.0 ppb, effective 01/1991 (Federal) and 09/08/1994 (State)
Copper	13-30 ppb	State Secondary MCL	1,000 ppb, effective 1977
Mercury	2 ppb	State and Federal MCL	2 ppb, effective 06/24/1977
Arsenic	Background (27 ppb)	1989 ROD	10 ppb effective 01/23/2006 (Federal)
Chromium	50 ppb	1989 ROD	50 ppb effective 06/24/1977 (State)
PCDDs/PCDFs (dioxin) as 2,3,7,8-TCDD Toxic Equivalency Factor	0.53×10^{-7} ppb[a]	1989 ROD	3×10^{-8} ppb, effective 9/8/1994
Total Carcinogenic PAHs	0.007 ppb[a]	1989 ROD	NA

Notes:
MCL = maximum contaminant level
PAH = polynuclear aromatic hydrocarbon
ppb = parts per billion
ROD = Record of Decision
[a]Waived for TI Zone
[b]Updated from remediation standard in 1989 ROD

TABLE D-2
Action-Specific ARARs
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Action	Media	Citation	Requirement	Origin	ARARs Determination	Comments
Cleanup Actions	Groundwater	Porter-Cologne Water Quality Control Act (CCR Sections 13140-13147, 13172, 13260, 13262, 12267, and 13304)	Title 27 CCR, Section 20410, and Title 23 CCR, Section 2550.6	1999 ROD Amendment	Relevant and Appropriate	There have been no substantive changes to this regulation since the 1999 ROD amendment.
Cleanup Actions	Groundwater	Porter-Cologne Water Quality Control Act (CCR Sections 13000, 13140, 13240, 13260, 13263, 13267, 13300, 13307, and 13394)	State Water Resources Control Board Resolution 92-49 (as amended April 21, 1994) (Subparagraph IIIG)	1989 ROD	Relevant and Appropriate	Applies to groundwater remedial actions. The groundwater cleanup system will be operated in such a way that the best water quality reasonable is restored. Amended on October 2, 1996 by SWRCB Resolution No. 96-079 to include provisions for a containment zone policy. There have been no changes to Subpart IIIG.
Underground Injection	Groundwater	SDWA 40 CFR 144, including section 144.13 (4) (c) Underground Injection Control	Safe Drinking Water Act Underground Injection Control	1989 ROD	Applicable	If treated groundwater is injected, then it must be done in compliance with regulations for a Class V underground injection well. There have been no changes to this regulation.
Disposal in On-site Landfill	Soil	Title 22, 66264.301(a)(1)(B)	Requires landfill foundation to be placed on a foundation or base capable of providing adequate support to prevent liner failure	1999 ROD Amendment	Applicable	On-site landfill design and construction have been completed.
Disposal in On-site Landfill	Soil	40 CFR 264.301(c) as implemented through Title 22, 66264.301(c)	Design standards for a landfill liner system, the leachate collection and removal systems, and leak detection systems	1999 ROD Amendment	Applicable	On-site landfill design and construction have been completed.
Disposal in On-site Landfill	Soil	40 CFR 264.303(g)-(i) as implemented through Title 22, 66264.301(a)	Requires that during construction of a landfill the liner must be inspected to ensure that it meets the standards	1999 ROD Amendment	Applicable	On-site landfill design and construction have been completed.
Disposal in On-site Landfill	Soil	40 CFR 264.310(a) as implemented through Title 22, 66264.310(a)	Requirements for the design and construction of a landfill cover	1999 ROD Amendment	Applicable	There have been no changes to this regulation.
Disposal in On-site Landfill	Soil	40 CFR 264.14 as implemented through Title 22 66264.14	Requires maintenance of security during placement of contaminated soil and debris in the landfill	1999 ROD Amendment	Applicable	On-site landfill design and construction have been completed.
Disposal in On-site Landfill	Soil	40 CFR 264.15 as implemented through Title 22, 66264.15	General requirements for inspection of the landfill during placement of soil and contaminated debris	1999 ROD Amendment	Applicable	On-site landfill design and construction have been completed.
Disposal in On-site Landfill	Soil	40 CFR 264.314 and 264.316 as implemented through Title 22, 66264.314 and 66264.316	Requirements for management of liquids and containers in a landfill	1999 ROD Amendment	Applicable	On-site landfill design and construction have been completed.
Disposal in On-site Landfill	Soil	40 CFR 624.117 and 624.118 as implemented through Title 22 66264.117 and 66264.118	Requirements for landfill post-closure care and maintenance and written post-closure plan	1999 ROD Amendment	Applicable	There have been no changes to these regulations.
Disposal in On-site Landfill	Soil	40 CFR 264.91(a), 264.94, 64.97 and 264.98 as	Requirements for detection and evaluation monitoring, including	1999 ROD Amendment	Applicable	There have been no changes to these regulations.

TABLE D-2
Action-Specific ARARs
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Action	Media	Citation	Requirement	Origin	ARARs Determination	Comments
		implemented through Title 22, 66264.91(a), 66264.94, 66264.97, and 66264.98	monitoring of soil pore and liquids, to ensure that the landfill does not release any contaminants to groundwater			
Disposal in On-site Landfill	Soil	40 CFR 264.303(b) as implemented through Title 22, 66264.303(b)	Requirements for inspections during placement of contaminated soil and debris in the landfill	1999 ROD Amendment	Applicable	On-site landfill design and construction have been completed.
Disposal in On-site Landfill	Soil	40 CFR 264.552 as implemented through Title 22, 66264.552	Requirements for designating a Corrective Action Management Unit	1999 ROD Amendment	Applicable	On-site landfill design and construction have been completed.
Disposal of RCRA Wastes	Spent Carbon	RCRA, Land Disposal Restrictions	Restrictions on disposal of RCRA wastes	1989 ROD	Relevant and Appropriate	As stated in the 1991 ROD, "RCRA land disposal restrictions are not applicable but are relevant and appropriate to disposal of treatment media due to the presence of constituents which are sufficiently similar to RCRA wastes." The contaminated groundwater contains PCB, a listed waste. PCP is a F037 listed waste. Adsorbents and other materials used for remediation of groundwater VOCs, such as activated carbon, chemical-adsorbing resins, or other materials used in the treatment of groundwater or air will contain the chemicals after use.
Disposal of RCRA Wastes	Spent Carbon	27 CCR, Division 2 Subdivision 1	Title 27 establishes waste and siting classification systems and minimum waste management standards for discharges of waste to land for treatment, storage, and disposal. Title 27 also contains corrective action provisions for responding to leaks and other unauthorized discharges. Spent carbon will be classified and handled in accordance with appropriate regulations.	1989 ROD	Applicable	There have been no substantive changes to this regulation.
Transportation of Waste for Off-site Treatment, Storage, or Disposal	Waste	40 CFR 264.70; Subpart E	Manifest system, recordkeeping, and reporting procedures for hazardous waste	1989 ROD	Applicable	Applicable when waste is transported for off-site treatment, storage, or disposal. There have been no changes to this regulation.
Response Activities under the NCP	Worker Safety	Occupational Health and Safety Act, 29 USC Sections 651-678	Regulates worker health and safety; applies to all response activities under the NCP	1989 ROD	Applicable	Applicable when carbon (used for on site treatment) is shipped off-site. There have been no changes to this regulation.
Transportation of Hazardous Materials	Hazardous Materials	Hazardous Materials Transportation Act, 49 USC Sections 1802 - 1813	Regulates transportation of hazardous materials	1989 ROD	Applicable	Applicable when carbon (used for on site treatment) is shipped off-site. There have been no changes to this regulation.
Transportation of Hazardous Materials	Hazardous Materials	Hazardous Materials Transportation Regulations, 49 CFR Parts 107, and 171 - 177	Regulates transportation of hazardous materials	1989 ROD	Applicable	Applicable when carbon (used for on site treatment) is shipped off-site. There have been no changes to this regulation.
Air Stripping	Air	Title 22 CCR 66265.1030-	Applies to treatment, storage,	1989 ROD	Relevant and Appropriate	There have been no changes to this regulation.

TABLE D-2
Action-Specific ARARs
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Action	Media	Citation	Requirement	Origin	ARARs Determination	Comments
		66265.1035	and disposal facilities with process vents associated with solvent extraction or air or steam stripping operations managing RCRA hazardous wastes with organic concentrations of at least 10 ppm. These operations must reduce total organic emissions below specified device to reduce the total organic emissions by 95 percent by weight.			
Air Stripping	Air	Butte County Air Pollution Control District Rules 201, 202, 203, and 207	Requirement regarding nuisance conditions, emissions, and fugitive dust	1989 ROD	Applicable	There have been no changes to this regulation.
Soil Remediation	Soil	40 CFR 6.302(a) and Appendix A; Executive Order 11990	Requirements to avoid or mitigate impacts to wetlands	1989 ROD	Applicable	On-site landfill design and construction has been completed.

Notes:
CCR = California Code of Regulations
CFR = Code of Federal Regulations
COC = contaminants of concern
CWA = Clean Water Act
EPA = U.S. Environmental Protection Agency
RCRA = Resource Conservation and Recovery Act
SDWA = Safe Drinking Water Act
USC = United States Code
VOC = volatile organic compound

TABLE D-3
Chemical-Specific ARARs
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Contaminant	Media	Citation	Requirement	Origin	ARARs Determination	Comments
All COCs	Groundwater	Safe Drinking Water Act (40 U.S.C. 300 et seq.) National Primary Drinking Water Standards (40 CFR Part 141)	Chemical-specific drinking water standard MCLs have been promulgated under the Safe Drinking Water Act (SWDA). Drinking-water MCLs have also been promulgated under SDWA. MCL goals (MCLGs) above zero are considered chemical-specific ARARs under the NCP (40 CFR 300,430(e)(2)(1)(B)). When the MCLGs are equal to zero (which is generally the case for a chemical considered a carcinogen), the MCL is considered to be a chemical-specific ARAR, instead of the MCLG (40 CFR 300.430(e)(2)(I)(C)).	1999 ROD Amendment #2	Relevant and Appropriate	MCLs are ARARs for any water that is considered to be a source or potential source of drinking water. MCLs are applicable at the tap when the water is directly provided to 25 or more people or 15 or more service connections. Otherwise, MCLs are relevant and appropriate. The COCs remain unchanged since the 1999 ROD Amendment #2. The MCL for arsenic is less than half the site background concentration. The Water Quality Control Plan for the Sacramento Basin and San Joaquin River Basin expressly states that its water quality objectives do not require improvement over naturally occurring background concentrations.
All COCs	Groundwater	California Safe Drinking Water Act CCR Title 22, Division 4, Chapter 15, Articles 4, 5.5, and 16	California primary drinking water standards establish enforcement limits for chemicals that may affect public health or the aesthetic qualities of drinking water. However, only those requirements that are more stringent than federal standards are ARARs. Also establishes monitoring requirements to ensure treated effluent is meeting cleanup standards.	1989 ROD and 1999 ROD Amendment #2	Relevant and Appropriate	California has not adopted a new MCL for arsenic. The current state MCL for arsenic is 50 ppb. The site background level for arsenic in groundwater is 27 ppb, which was established in the 1989 ROD as the cleanup standard for on-site and off-site groundwater. The COCs and state MCLs for the site remain unchanged since the 1999 ROD Amendment #2.
All COCs	Groundwater	California State Water Resources Control Board Resolution 88-63	In May 1988, the Central Valley Regional Water Board incorporated the State Board Policy of "Sources of Drinking Water" into the Basin Plan. The policy provides for a municipal and domestic supply designation for all waters of the State with some exceptions.		Applicable	Groundwaters of the state are considered to be suitable or potentially suitable for municipal or domestic supply with the following exceptions: 1) the total dissolved solids in the groundwater exceed 3,000 mg/L, and/or 2) the water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day. Groundwater at the site is considered a potential source of drinking water under state authority.
All COCs	Groundwater	California State Water Resources Control Board Resolution 68-16	On October 28, 1968, the State Water Resources Control Board adopted Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality Waters in California". This policy calls for maintaining the existing high quality of State waters unless it is demonstrated that any change would be consistent with the maximum public benefit and not unreasonably affect beneficial uses.		Applicable	The original discharge of contamination to groundwater at the site was in violation of this resolution. The 1998 ROD Amendment created a 4-acre Technical Impracticability Zone for groundwater associated with the former creosote pond and cellon blowdown areas. Groundwater quality in all other areas associated with the site needs to be restored to its original quality as determined by the cleanup standards.

Notes:
CCR = California Code of Regulations
CDHS = California Department of Health Services
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
CFR = Code of Federal Regulations
COC = contaminant of concern
CWA = Clean Water Act
EPA = U. S. Environmental Protection Agency
H&S Code = California Health and Safety Code
MCL = maximum contaminant level
NCP = National Contingency Plan
ROD = Record of Decision
SDWA = Safe Drinking Water Act
USC = United States Code

TABLE D-4
Location-Specific ARARs
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Location	Citation	Requirement	Origin	ARARs Determination	Comments
Property Containing Landfill	40 CFR 264.18 as implemented through California EPA, Department of Toxic Substances Control, Hazardous Waste Regulations, Title 22, Chapter 14 22") 66264.18	Requires that new facilities not be located within 61 meters of a fault which has been displaced in Holocene time. In addition, a landfill located in a floodplain must be designed, constructed, operated, and maintained to prevent washout by a 100-year flood or must otherwise meat standards designed to withstand such a flood.	1999 ROD Amendment	Applicable	No substantive changes have been made to this regulation.
Property Containing Landfill	40 CFR 264.301(c) as implemented through Title 22, 66264.301(c)	Design standards for a landfill liner system, the leachate collection and removal systems, and leak detection systems.	1999 ROD Amendment	Applicable	No substantive changes have been made to this regulation.
Property Requiring Deed Restriction	Title 22, CCR, Chapter 39, Section 67391.1	As of April 19, 2003 The DTSC requires all properties which contain hazardous waste and require a land use covenant (LUC) to have the LUC signed by the California Department of Toxic Substances Control (DTSC)	April 19, 2003	Applicable	The ROD Amendment #2 required a deed restriction for the Site to prevent exposure to contaminants in the Technical Impracticability Zone, to prevent installation of wells in this zone other than for monitoring or remediation, and to limit future land uses to industrial. This regulation would be applicable to the land use covenant for the site.
Property Containing Hazardous Waste	Title 22, CCR, Chapter 39, Section 67391.1	For properties that contain hazardous waste, citation requires all land use covenants to be signed by the DTSC and the landowner and be recorded in the county where the land is located.	New regulation	TBC	New regulation, effective April 19, 2003, for properties that contain hazardous waste should be considered. If the site contains hazardous waste, then a land use covenant would be applicable.

Notes:
CCR = California Code of Regulations
CFR = Code of Federal Regulations
DTSC = Department of Toxic Substances Control
EPA = U. S. Environmental Protection Agency
LUC = Land Use Covenant
ROD = Record of Decision
TBC = To be continued

Appendix E
Human Health, Toxicology and Ecological Risk Analysis Memorandum

Koppers Company Feather River Plant Superfund Site 5-Year Review

Human Health, Toxicology, and Ecological Risk Analysis

PREPARED FOR: U.S. Environmental Protection Agency, Region 9

PREPARED BY: CH2M HILL, Inc.

DATE: March 21, 2008

This technical memorandum presents a human health, toxicology, and ecological risk analysis to support the 5-year review of the Koppers Company Feather River Plant Superfund Site (Koppers site) near Oroville, California.

In an effort to determine whether the remedy at the Koppers site remains protective of human health and the environment, this memorandum discusses changes in site conditions, changes in exposure pathways, and changes in toxicity values since selection of the site remedy. An Endangerment Assessment for the site was prepared by Ebasco Services, Incorporated (1988), which was reviewed as part of this evaluation.

Current Site Conditions

The Koppers site is located in Butte County, south of the city limits of Oroville, California. The property owner, Koppers Industries, Inc., operated a wood-treating facility under Resource Conservation and Recovery Act (RCRA) requirements until operations ceased in March 2001.

Land use near the Koppers site is a mixture of residential, industrial, commercial, and agriculture and has not changed since the previous 5-year review. Rural homeowners on 1 to 5 acres of land commonly raise livestock and grow produce for home use. Residential areas are located to the northeast, southeast, south, and west of the site. Nearby residents were provided alternative water supplies until their own wells were deemed free of contamination. Although redevelopment is planned in the future, no land use changes have occurred in the last 5 years.

Identified Exposure Pathways

The exposure pathways for both human and ecological receptors evaluated in the 1988 Endangerment Assessment included:

- Inhalation of airborne dusts generated at the site,

- Contact with contaminated sediments in off-site ponds,
- Residential exposure to off-site soils, and
- Potential dietary exposures to persons who might consume meat or milk from cows that drink contaminated groundwater or eat produce grown with contaminated groundwater.

Potential future exposure pathways evaluated include:

- Exposure to surface soil by human or ecological receptors living at the site,
- Exposure to contaminated sediment or surface water by human or ecological receptors as a result of contaminated soil erosion in areas on and near the site,
- Exposure to a construction worker excavating into subsurface soil, and
- Exposure to a person using contaminated groundwater as a drinking water supply in on- and off-site well locations.

There are no new pathways that need to be addressed.

Toxicity Values

There have been a number of changes to the toxicity values for specific constituents of concern in soil and groundwater at the Koppers site since the final Endangerment Assessment was submitted in 1988. For example, pentachlorophenol (PCP) was not evaluated as a carcinogen in 1988 and has since been classified as one. Table E-1 provides a direct comparison between the 1988 toxicity values and current U.S. Environmental Protection Agency (EPA) Region 9 values. The chemicals listed are compiled from Table 3-4 of the Endangerment Assessment.

Summary of Analysis

There have been no changes in the last 5 years to the Koppers site conditions or to the exposure pathways in consideration of both human health and ecological risk. Although some toxicity values for specific constituents of concern found in soil and groundwater at the site have changed, these changes have not significantly affected the protectiveness of the remediation standards.

References

Ebasco Services Incorporated. 1988. Final Endangerment Assessment. Koppers Company Feather River Plant Superfund Site. November.

TABLE E-1
Direct Comparison Between the 1988 Toxicity Values used in the Endangerment Assessment and Current EPA Region 9 Values
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Chemical	Ingestion Exposure				Inhalation Exposure			
	RfDo mg/kg/day		SFo (mg/kg/day)$^{-1}$		RfDi mg/kg/day		SFi (mg/kg/day)$^{-1}$	
	Table 3-4[a]	Region 9[b]	Table 3-4[a]	Region 9[b]	Table 3-4[a]	Region 9[b]	Table 3-4[a]	Region 9[b]
Organic Compounds								
Benzene	--	0.004	0.029	0.055	--	0.0086	0.029	0.027
Ethylbenzene	0.1	0.1	--	0.011	--	0.29	--	0.0087
Isopropyl Ether	0.26	--	--	--	0.26	0.11	--	--
Methylene chloride	--	0.06	0.0075	0.0075	--	0.86	--	0.0016
Pentachlorophenol (PCP)	0.03	0.03	--	0.012	--	0.03	--	0.012
2,3,4,6-Tetrachlorophenol	0.03	0.03	--	--	--	0.03	--	--
Polychlorinated dibenzodioxins (PCDDs)	1.00E-09	--	1.56E+05	1.30E+05	--	--	1.56E+05	1.30E+05
Noncarcinogenic PAHs (naphthalene)	0.41	0.02	--	--	--	0.000857	--	0.12
Carcinogenic PAHs (benzo(a)pyrene)	--	--	11.5	7.3	--	--	6.1	7.3
Toluene	0.3	0.2	--	--	1.5	0.11	--	--
Xylenes (mixed)	2	0.2	--	--	0.44	0.029	--	--
Inorganic Compounds								
Arsenic	--	0.0003	1.5	1.5	--	--	50	15.05
Barium	0.05	0.07	--	--	0.00014	0.00014	--	--
Boron	0.086	0.2	--	--	--	0.0057	--	--
Chromium III	1	1.5	--	--	--	--	--	--

TABLE E-1
Direct Comparison Between the 1988 Toxicity Values used in the Endangerment Assessment and Current EPA Region 9 Values
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Chemical	Ingestion Exposure				Inhalation Exposure			
	RfDo mg/kg/day		SFo $(mg/kg/day)^{-1}$		RfDi mg/kg/day		SFi $(mg/kg/day)^{-1}$	
	Table 3-4[a]	Region 9[b]	Table 3-4[a]	Region 9[b]	Table 3-4[a]	Region 9[b]	Table 3-4[a]	Region 9[b]
Chromium VI	0.005	0.003	--	--	--	2.2E-06	41	294
Copper	0.037	0.04	--	--	--	--	--	--
Nickel	0.02	0.02	--	--	--	--	0.84	--

Notes:
[a]From Table 3-4 of the Endangerment Assessment, Ebasco Services, Incorporated (1988).
[b]Toxicity values as they appear on the October 2004 EPA Region 9 Table of Preliminary Remediation Goals.

mg/kg/day = milligrams per kilogram per day.

RfDo = Reference Dose, oral

SFo = Cancer Slope, oral

RfDi = Reference Dose, inhalation

SFi = Cancer Slope, inhalation

Appendix F
Data Review Memorandum

Groundwater Data Review Memorandum for Koppers Co., Inc. Superfund Site (Oroville, California), 5-Year Review

PREPARED FOR: Kim Hoang, PhD, MPH

PREPARED BY: CH2M HILL, Inc.

DATE: April 2, 2008

PROJECT NUMBER: 363329.SR.05

This technical memorandum summarizes findings from a review of documents and data related mostly to groundwater monitoring activities at the Koppers Co., Inc. Superfund Site (Koppers) during the current 5-year review period (Years 2003 to 2007).

The purpose of this data review is to identify trends in the information collected from groundwater monitoring to support an evaluation of whether the implemented groundwater remedies at the site remain protective of human health and the environment. This data review memorandum will be incorporated into the third 5-Year Review Report being prepared for the site.

A brief discussion of the past remedial activities relating to handling of the soils follows.

Background

While conducting a field bioremediation study at the Koppers site in 1993, dioxins were detected in onsite surface soils at levels that exceeded industrial standards for the workers per the 1989 Record of Decision (ROD). The U.S. Environmental Protection Agency (EPA) ordered a soil removal action for these dioxin contaminated soils as well as the former pole wash area. The soils were excavated and disposed of in soil disposal Cell No. 1, which was constructed in August 1995. Additionally, all soil excavations were completed, including the former process area known as 8C, in compliance with ROD Amendment No. 1 (August 1996).

Soil excavation for Cell No. 2 commenced in 1996 and was completed in September 2002 when the former process area 8C became available after facility closure in 2001. All excavated soils were disposed of in Cells No. 1 and 2, and the final caps were constructed in accordance with approved work plans. The soil remedial action achieved construction completion in 2003. For this reason, no data review was conducted for soils. Soil disposal Cells No. 1 and No. 2 are found onsite in the northeast corner of the facility. Groundwater and leachate monitoring continues at and in the vicinity of the two cells to ensure that no impacts to groundwater result from materials placed into the units. In addition, these disposal cells are surveyed annually to ensure that settlement or subsidence is not occurring that would compromise the integrity of the caps.

Groundwater Remediation Standards

The current groundwater restoration remediation standards that apply to both on- and off-property groundwater remediation (excluding the Technical Impracticability [TI] Zone, also known as the west plume) are based on the ROD, ROD Amendment No. 2, and Applicable or Relevant and Appropriate Requirements (ARARs), as listed in Table F-1:

TABLE F-1

Groundwater Remediation Standards

Chemical	Unit	Standard
Benzene	ppb	1.0
Ethylbenzene	ppb	680
Total Xylenes	ppb	1,750
Isopropyl Ether	ppb	2,800
Carcinogenic PAHs[a]	ppb	0.007
PCDD/PCDFs[b]	ppq	0.53
Pentachlorophenol	ppb	1.0
Arsenic	ppb	6-27[c]
Barium	ppb	1,000
Boron	ppb	1,200
Cadmium	ppb	5
Chromium	ppb	6-35
Copper	ppb	13-30
Mercury	ppb	2

Notes:

ppb=parts per billion; ppq=parts per quadrillion
[a]Includes benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(123-cd)pyrene.
[b] Polychlorinated dibenzodioxins and polychlorinated dibenzofurans (dioxins).
[c] Because arsenic is naturally occurring, this value is based on background levels in groundwater.

Data Review

Tables F-2 and F-3 show the types of monitoring data currently collected at the Koppers site as part of operations and maintenance of the groundwater remedial action requirements and the general results of the monitoring data over the last 5-year period, respectively. The areas of interest include the two soil disposal cells; the on-property TI Zone, also known as the western plume, which includes product recovery of dense nonaqueous phase liquid (DNAPL); the on-property eastern plume where groundwater monitoring and enhanced *in situ* bioremediation are being conducted; and the off-property plume to the south, which also includes groundwater monitoring, *in situ* bioremediation, and residential wells where

alternate water supplies are required. Table F-2 also includes the institutional controls requirement for conducting an annual site inspection.

TABLE F-2
Types of Monitoring Data
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Unit Designation	Description	Monitoring System	Monitoring Schedule	Monitoring Analysis (Chemicals)	Data included in Annual/Semiannual report
Soil Disposal Cells No. 1 and No. 2:					
Soil: Monument Survey	Settlement monuments located on both disposal cells are periodically inspected for evidence of changes in elevations or signs of damage.	13 settlement monuments	Annually	See Table F-8 attached.	Annual
Soil: Groundwater Monitoring	Six groundwater monitoring wells are located around Cell No. 1, and four wells are located around Cell No. 2.	Cell No. 1: DCMW-1A, DCMW-2A, DCMW-3A, DCMW-1B, DCMW-2B, and DCMW-3B Cell No. 2: DCMW-5A, DCMW-5B, DCMW-6A, and DCMW-6B	Quarterly	Pentachlorophenol (PCP), arsenic, chromium, copper, and polynuclear aromatic hydrocarbon (PAH).	Annual/Semiannual
Leachate Monitoring	Both landfills are double-lined with 60-ml flexible membrane, contain leachate monitoring equipment, and are equipped with unsaturated zone monitoring apparatus.	There is no leachate extraction system; passive leachate collection is checked regularly and pumped out on an "as needed" basis. The leachate is sent to an appropriate disposal facility.			Not included in the semiannual or annual reports, but Koppers site manager confirms conducting these checks.
On-property Groundwater West Plume:					
Water Level	TI Zone is within the creosote pond and cellon blowdown area, where a significant mass of creosote and creosote emulsion DNAPL exists over an area of approximately 4 acres.	MW-15, MW-16, MW-19, MW-20A, MW-20B, MW-21A, MW-21B,MW-22A, MW-22B, MW-22C, MW-24, and MW-25	Monthly	--	Annual/Semiannual
Chemical Monitoring		MW-15, MW-16, MW-19, MW-20A, MW-24, and MW-25	Quarterly	PCP, isopropylether (IPE), PAH, benzene, ethylbenzene, xylenes, arsenic, barium, boron, cadmium, chromium, copper, mercury, and polychlorinated dibenzo-p-dioxins (PCDD/PCDF).	Annual/Semiannual
Product Recovery Well (PR-1)	PR-1 was installed in the former creosote pond area to operate as a passive recovery system where mobile creosote is present.	PR-1	Every 2 weeks	Quantity of product and creosote recovered is measured and recorded.	Annual/Semiannual
On-property Groundwater East Plume:					
Water Level	The groundwater treatment system is designed to pump 200 gallons per minute (gpm) from two extraction wells, EW-1 and EW-2, for a combined capacity of 400 gpm. The groundwater is treated using air stripping and granular activated carbon (GAC). The treated groundwater is reinjected into the aquifer through Injection Wells IW-3 and IW-4.	EW-01, EW-02, MW-01, MW-02, MW-03, MW-4, MW-05, MW-06, MW-07, MW-08, MW-11, MW-12, MW-13, MW-17, MW-18, MW-23, SW-01, TW-01, TW-02, and P-03	Monthly	--	Annual/Semiannual
Chemical Monitoring		EW-01, EW-02, MW-02, MW-03, MW-05, MW-07, MW-08, SW-01, TW-01, MW-17, and MW-18	Quarterly	PCP, isopropylether, PAH, benzene, ethylbenzene, xylenes, arsenic, barium, boron, cadmium, chromium, copper, mercury, and PCDD/PCDF.	Annual/Semiannual
In situ Bioremediation	Oxygen-releasing compound (EHC-O) additions are made to the monitoring wells.	Enhancement addition wells MW-1, MW-4, MW-6, MW-12, MW-13, and MW-23 Monitoring Wells MW-3, MW-5, MW-7, MW-8, and TW-1	Quarterly	PCP, orthophosphate as phosphorus, nitrite as nitrogen, nitrate as nitrogen, and ammonia as total nitrogen.	Annual/Semiannual

TABLE F-2
Types of Monitoring Data
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Unit Designation	Description	Monitoring System	Monitoring Schedule	Monitoring Analysis (Chemicals)	Data included in Annual/Semiannual report
Off-property Groundwater Plume:					
Water Level	Formerly part of pump-and-treat groundwater remedial system. Off-property system was taken offline in December 1995. Now, groundwater is monitored quarterly and compared against ROD-selected standards. Although well 86 is monitored as a part of the off-property plume, it appears to be contained by the on-property east plume. Well 25 is the downgradient well used to monitor well 86 for contaminant migration	3,5,15,18,25,26,31,31C1,31C2,68,86,P-1a, P-1B, RI-1, RI-2, RI-3, RI-4, RI-6, RI-8,RI-9,RI-10, RI-11, RI-12, RI-14, RI-15, RI-16A, RI-16B, RI-16C, RI-16D, RI-17A ,RI-17B, RI-17C, RI-17D, RI-18A, RI-18B, RI-19A, RI-19B, RI-20A, RI-20B	Monthly	--	Annual/Semiannual
Chemical Monitoring		25, 31C1, 31C2, 31D3, 86, EW-3, EW-4, RI-2, RI-3, RI-6, RI-10,RI-11,RI-12, RI-15, RI-16B, RI-20A, RI-20B	Quarterly except for those below	PCP	Annual/Semiannual
		EW-3, EW-4, RI-10, RI-15, and RI-20B	Semi annual	PCP	
In situ Bioremediation	Oxygen-releasing compounds are added to the monitoring wells.	Enhancement addition wells: 26, RI-20A , RI-11, 59, 81 Monitoring Wells: RI-2, RI-3, RI-10, RI-12, and RI-16B	Semi annual	PCP, orthophosphate as phosphorus, nitrite as nitrogen, nitrate as nitrogen, and ammonia as total nitrogen.	Annual/Semiannual
Off-property Alternate Water Supply (AWS)	Seven residents are provided with AWS reimbursement for presence of PCP above 0.5 ppb in their wells.	59,60,61,62, 81, 31C2, and 3103	Semi annual	PCP	Annual/Semiannual
Institutional Control	As required by the covenant to restrict use (2003) and confirmed by Ed Cargile of the Department of Toxic Substances Control (DTSC, 2008), annual inspection of the property is conducted by DTSC to ensure compliance with the covenant restrictions and prohibitions.	DTSC inspection	Annually	No chemical analysis is conducted; the purpose of the inspection is to ensure compliance with the covenant restrictions and prohibitions. This includes confirming that no activities are disturbing capped areas or allowing water to seep into the subsurface that might increase mobilization of contaminants left in place.	Not included in the semiannual or annual reports, but Ed Cargile of DTSC confirms conducting these inspections once per year.

TABLE F-3
Summary of Results
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Unit Designation	Previous 5-Yr Review Results	2003	2004	2005	2006	2007	Current Changes from Last 5-Yr Review
Soil Disposal Cells No. 1 and No. 2:							
Soil: Monument Survey	As of December 2001, there were no recorded changes in settlement monuments at the disposal cells.	No substantial change in the lateral and vertical positions of the monuments.	No substantial change in the lateral and vertical positions of the monuments.	No substantial change in the lateral and vertical positions of the monuments.	No substantial change in the lateral and vertical positions of the monuments.	No substantial change in the lateral and vertical positions of the monuments.	No changes
Soil: Groundwater Monitoring Note: Copper ROD standard = 13 to 30 ppb	The only chemical of concern detected at monitoring points was copper in the shallow aquifer at concentrations less than background level.	Copper: DCMW-1A at 11.7 ppb DCMW-2A at 19.2 ppb	Copper: DCMW-2A at 14.1 ppb (close to the quantitation limit of 10 ppb and not considered to be indicative of a release from the disposal cell).	Site constituents were not detected in the disposal cell wells.	Copper: DCMW-1A at 58.2 ppb	Data were not included in 2007 semiannual report.	Increase in copper concentration from 2003 to 2006.
On-property Groundwater West Plume:							
Water Level Notes: Groundwater has been extracted from well MW-8 at approximately 35 gpm since July 31, 2002, as approved by the EPA. This extraction has influenced groundwater flow in the vicinity of well MW-8. A depression in the groundwater elevation is present in the vicinity of well MW-8.	Water levels are monitored monthly.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons. Groundwater flow directions from 2003 to 2007 are consistent with 1995 flow directions and those observed prior to startup of groundwater remediation systems.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons. Groundwater flow directions from 2003 to 2007 are consistent with 1995 flow directions and those observed prior to startup of groundwater remediation systems.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons. Groundwater flow directions from 2003 to 2007 are consistent with 1995 flow directions and those observed prior to startup of groundwater remediation systems.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons. Groundwater flow directions from 2003 to 2007 are consistent with 1995 flow directions and those observed prior to startup of groundwater remediation systems.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons. Groundwater flow directions from 2003 to 2007 are consistent with 1995 flow directions and those observed prior to startup of groundwater remediation systems.	No change. Groundwater flow directions from 2003 to 2007 are consistent with 1995 flow directions and those observed prior to startup of groundwater remediation systems.
Chemical Monitoring Notes: All values are in ppb (ug/L) ND = Non Detect PCP ROD standard = 1.0 ppb Boron ROD standard = 1,200 ppb PAHs ROD standard = 0.007 ppb Benzene ROD standard = 1.0 ppb	Remedial actions within the TI Zone are functioning as intended. Installation of a new monitoring well downgradient of the TI Zone (required 1 year prior to shutdown of on-property treatment system) may provide a more comprehensive conclusion.	<u>Upgradient Wells</u> MW-15: PCP <0.5, PAH 4000-7700 MW-16: PCP 36-58, PAH 100000-4000000 MW-19: PCP <0.5, PAH 23-226 MW-20A: PCP <0.5, PAH ND <u>Downgradient Wells</u> MW-24: PCP <1, Boron 514 , PAH 4-6 MW-25: PCP <0.5, Boron 3700-3900 , PAH ND	<u>Upgradient Wells</u> MW-15: PAH 5000-9000 MW-16: PCP 36-53, PAH 600000-13000000 MW-19: PAH 18-50 MW-20A: PCP <0.5 <u>Downgradient Wells</u> MW-24: PCP <1, Boron 504 , PAH 4-6 MW-25: PCP <0.5, Boron 3720-4320 , PAH ND	<u>Upgradient Wells</u> MW-15: PCP <0.5, PAH 6900-7300 MW-16: PCP 15-40, PAH 500000-1450000 MW-19: PCP <0.5, PAH 9-10 MW-20A: PCP <0.5, PAH ND <u>Downgradient Wells</u> MW-24: PCP <1, Boron 524 , PAH 3-5 MW-25: PCP <0.5, Boron 3920-3940 , PAH ND	<u>Upgradient Wells</u> MW-15: PAH 6000-9000 MW-16: PCP 11-20, PAH 300000-900000 MW-19: PAH ND-16 MW-20A: PCP <0.5 <u>Downgradient Wells</u> MW-24: PCP <1, Boron 520-510 , PAH ND-4 MW-25: PCP <0.5, Boron 3660-3800 , PAH ND	<u>Upgradient wells</u> MW-15: PCP <0.5, PAH 6600-8000 MW-16: PCP 12-16, PAH 200000-800000 MW-19: PAH ND <u>Downgradient Wells</u> MW-24: PCP <1, PAH 3-5 MW-25: PCP <0.5, Boron 3470-3900 , PAH ND	PCP concentrations are below the ROD standards for all wells except for MW-16. Concentration of PCP in MW-16 has decreased from 2003 to 2007 MW-25 has high boron concentration, which has remained more or less constant or decreased minimally in the last 5 years. MW-15, MW-16, MW-19, and MW-24 show PAH concentrations above ROD standards in the last 5 years. PAH shows an increasing trend in MW-15.
Product Recovery Well (PR-1)	Product recovery is continuing at PR-1 and monitored every 2 weeks. Recovery is greater than 1	850 gallons of product and 625 gallons of creosote recovered.	980 gallons of product and 690 gallons of creosote recovered.	1,100 gallons of product and 750 gallons of creosote recovered.	1,250 gallons of product and 820 gallons of creosote recovered.	1,300 gallons of product and 850 gallons of creosote recovered.	Increase in quantity of product recovered.

TABLE F-3
Summary of Results
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Unit Designation	Previous 5-Yr Review Results	2003	2004	2005	2006	2007	Current Changes from Last 5-Yr Review
	gallon per year.						
On-property Groundwater East Plume:							
Water Level	The onsite groundwater remediation system continues to treat groundwater extracted from EW-1 and EW-2. Influent PCP concentrations have decreased over time to 5.2 ppb. Injection wells IW-3 and IW-4 are functioning optimally. The increase in PCP concentration in well 86 is being monitored to verify that EW-1 and EW-2 are adequately capturing the plume. Groundwater extraction at MW-8 began in July 2002. Periodic increases in PCP concentration in well 86 are reportedly related to groundwater elevation increases in the A-Zone. Recent detection of increased PCP in MW-8 to 780 ppb and boron at 2,450 ppb is attributed to historical activities at the Dri-Con/CCA Tank Area.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons.	Water levels in individual wells vary 5 to 10 feet between wet and dry seasons.	Water levels overall decreased slightly from 1986 to 1990, increased from 1991 through 1999, and began to level off from 1999 through present.
Chemical Monitoring Note: ND = Non Detect		MW-2: PCP 59-84, Boron 1300-1500 in Aug, 586 in Dec, PAH – ND MW-3: PCP 40-60, Boron 1200-1500 MW-18: PCP <0.5, Boron 3200-3450, PAH ND MW-8: PCP 250-430, Boron 1050-1500, PAH ND-50	MW-2: PCP 67-63, MW-3: PCP 20-30, Boron 1180-1300 MW-18: Boron 3100-3600 MW-8: PCP 340-390, Boron 1220-1280, PAH ND Treatment plant effluent PCP is less than 0.5 ppb and boron concentration is less than 700 ppb.	MW-2: PCP 24-37, Boron 546, PAH ND MW-3: PCP 10-15, Boron 1110-1170 MW-18: PCP <0.5, Boron 3200-3400, PAH ND MW-8: PCP 360-370, Boron 1300-1600, PAH ND Treatment plant effluent PCP is less than 0.5 ppb and boron concentration is less than 700 ppb.	MW-2: PCP 27-19 MW-3: PCP 1-3, Boron 920-950, MW-18: Boron 3000-3250, PAH 540-707 MW-8: PCP 250-290, Boron 1700-2300, PAH ND Treatment plant effluent PCP is less than 0.5 ppb and boron concentration is less than 700 ppb.	MW-2: PCP 25-20 MW-3: PCP 1-2, Boron 840, MW-18: Boron 2990-3060 MW-8: PCP 200-350, Boron 2000-2900, PAH ND Treatment plant effluent PCP is less than 0.5 ppb and boron concentration is less than 700 ppb.	PCP has been detected at concentrations above the ROD cleanup level in MW-2, MW-3, MW-18, and MW-8. PCP concentrations in MW-2, MW-3, and MW-18 show a decreasing trend from 2003 to 2007. Boron concentrations are above ROD levels in MW-18.
In situ Bioremediation	Concentration trends in the wells overall indicate stabilization in PCP trends. Monitoring of natural attenuation has not yet been implemented. Bioremediation ceased at BW-1 in June 2001 as it resulted in increase in mobility of PAHs.	PCP concentrations are below detection limit except for MW-8.	The results of the implementation of the On-Property Groundwater *In Situ* Bioremediation Program indicate that the enhancements have stimulated the aerobic degradation of PCP.	The results of the implementation of the On-Property Groundwater *In Situ* Bioremediation Program indicate that the enhancements have stimulated the aerobic degradation of PCP to less than ROD standards in MW -5 and MW-7.	Dissolved mobile PAHs have been detected at low concentrations at MW-24. The steady decrease in PCP concentrations at MW-16 indicates that PCP bioremediation was stimulated, and this increased bioactivity appears to be ongoing.	The results of the implementation of the On-Property Groundwater *In Situ* Bioremediation Program indicate that the enhancements have stimulated the aerobic degradation of PCP.	*In situ* bioremediation has stimulated aerobic degradation of PCP, but the size of the plume (see Figure B-1) has remained more or less the same from 2002 to 2007.

TABLE F-3
Summary of Results
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Unit Designation	Previous 5-Yr Review Results	2003	2004	2005	2006	2007	Current Changes from Last 5-Yr Review
Off-property Groundwater Plume:							
Water Level / Chemical Monitoring Notes: PCP has been detected in well 86 intermittently from 1986 to 1988 and since 1999. The detections of PCP are correlated with times at which the water level in well 86 reaches or exceeds 122 feet mean sea level (msl). The PCP detections typically persist for 8 to 12 months after the time the water level reaches this elevation.	Monitoring data do not indicate that any contaminants would be captured by extraction from EW-3 or EW-4. PCP in well 86 has been >50 ppb since 2000. Boron was detected in vicinity of MW-8.	PCP (ppb) <u>Upgradient Wells</u> RI-2: <0.5 RI-3: 8-10 86: 20-100 25: <0.5 <u>Downgradient Wells</u> RI-12: <0.5	PCP (ppb) <u>Upgradient Wells</u> RI-2 <0.5 RI-3 4-10 86 40-140 25 <0.5 <u>Downgradient Wells</u> RI-12 <0.5	PCP (ppb) <u>Upgradient Wells</u> RI-2 <0.5 RI-3 2-5 86 30-90 25 <0.5 <u>Downgradient Wells</u> RI-12 <0.5	PCP (ppb) <u>Upgradient Wells</u> RI-2 <0.5 RI-3 0.5-3.5 86 13-100 25 <0.5 <u>Downgradient Wells</u> RI-12 <0.5	PCP (ppb) <u>Upgradient Wells</u> RI-2 <0.5 RI-3 0.5-1 86 20-40 25 <0.5 <u>Downgradient Wells</u> RI-12 <0.5	PCP concentrations detected at well RI-3 have decreased significantly, with the concentrations below 1 ppb in 2007. Well 86 has PCP concentrations above ROD standards and is showing a slow decreasing trend,
In situ bioremediation	Concentration in the wells indicate a decreasing trend in PCP except for an anomalous detection in well RI-12 during November 2000 (0.66 ppb).	Nitrate concentration in RI-2, RI-3, RI-10, and RI-12 are higher than concentrations in background wells. The nitrate concentration in RI-13 is less than 15 ppb.	The addition of DAP (nutrients) has been discontinued.	The *in situ* bioremediation program is considered to be effectively enhancing bioremediation of PCP. Sampling at RI-2, RI-6, RI-10, RI-12, and RI-16B has been reduced to semiannual monitoring.	As of September 2006, oxygen releasing compound (ORC) socks have been added to wells 59 and 81 to enhance the bioremediation of PCP detected at well 59.	-	*In situ* bioremediation has stimulated aerobic degradation of PCP.
Off-property AWS	Beazer East, Inc. continues to provide an AWS for down-gradient residences with drinking water supply wells impacted by PCP. As of December 2001, five residences with private wells in the vicinity of RI-11 (59, 60, 61, 62, and 81), plus wells 31C2 and 31D3, remain in the AWS program.	The PCP analytical results were below 0.5 ppb for each sample collected at wells 31C2 and 31D3.	The PCP analytical results were below 0.5 ppb for each sample collected at wells 31C2 and 31D3.	The PCP analytical results were below 0.5 ppb at wells 31C2 and 31D3.	The PCP analytical results were below 0.5 ppb at wells 31C2 and 31D3.	The PCP analytical results were below 0.5 ppb at wells 31C2 and 31D3.	The PCP analytical results were below 0.5 ppb at both wells 31C2 and 31D3 from 2003 to 2007.

Soil Disposal Cells

The three types of data currently collected for monitoring remedial activities associated with the soil disposal cells are settlement, groundwater, and leachate data.

Settlement Monitoring

Thirteen settlement monuments are located on disposal Cells No. 1 and No. 2 and are periodically inspected for evidence of change in elevations or signs of damage. The survey data presented in the annual monitoring reports indicate that there has been no substantial change in the lateral and vertical positions of the monuments.

Groundwater Monitoring

There are six groundwater monitoring wells (DCMW-1A, -2A, -3A, -1B, -2B, and -3B) located on the north side of the Koppers property near disposal Cell No. 1 to monitor for constituents of concern derived from the materials in the disposal cell. Four more groundwater monitoring wells (DCMW-5A, -5B, -6A, and -6B) were installed around Cell No. 2 to monitor for early indication of release from that disposal cell. These wells are sampled and analyzed for PCP, arsenic, chromium, copper, and PAHs. Of these, PCP, arsenic, and chromium were below their respective reporting limits of 0.5 ppb, 5 ppb, and 5ppb, respectively. Copper was detected at 58.2 ppb, which is above the ROD standard of 13-30 ppb, in well DCMW-1A during the 2006 sampling event. Other wells showed copper concentrations below the ROD standard or below the reporting limit of 10ppb. According to the annual reports, this copper detection is anomalous and not considered to be indicative of a release from the disposal cells since well DCMW-1A is upgradient of the cell.

Leachate Monitoring

The soil disposal cells are double-lined with a 60-ml flexible membrane containing leachate monitoring equipment and equipped with unsaturated zone monitoring apparatus. There is no leachate extraction system, but leachate is passively collected and the leachate level is checked regularly and pumped out on an as-needed basis. The leachate is shipped to an appropriate disposal facility, Aragonite, a permitted commercial hazardous waste incinerator located in Utah, using a hazardous waste manifest. These leachate shipments occur intermittently once every 18 months.

On-property and Off-property Groundwater Monitoring

In order to determine the progress of the remedial action for groundwater, groundwater monitoring is conducted on both on- and ff-property wells on a regular basis (see Table F-2). Groundwater monitoring data from 2003 to 2007 was evaluated and is summarized below with the help of Figures F-2 through F-4 and Tables F-2 through F-8). The monitoring well review data has been divided into on-property well data and off-property well data to be consistent with the 5-year review documents. Each section describes water-level monitoring to define elevation of water table surface across the site within the last 5 years, chemical concentration monitoring to determine the concentration of constituents above the standards defined in the ROD, and change in concentration of chemicals of concern as a result of the *in situ* bioremediation system.

On-Property Groundwater Monitoring

Various on-property wells were sampled for a combination of PCP, isopropyl ether, PAHs, benzene, ethyl benzene, xylene, arsenic, barium, boron, cadmium, chromium, copper, and mercury, depending on previous detections of these analytes. Wells sampled include EW-l, EW-2, MW-2, MW-3, MW-5, MW-7, MW-8, MW-15, MW-16, MW-17, MW-18, MW-19, MW-20A, MW-24, MW-25, SW-1, and TW-1. The discussion on concentration of chemicals of concern is divided into two pentachlorophenol plumes: the TI Zone plume (west plume) and the east plume.

TI Zone / West Plume

Water Level Monitoring

Groundwater elevations are measured monthly in west plume wells. The hydrographs for seasonal variability of groundwater elevations show that the water levels in individual wells vary 5 to 10 feet between wet and dry seasons. The hydrographs from previous years indicate that water levels decreased overall slightly from 1986 to 1990, increased from 1991 through 1999, and began to level off from 1999 through the present. The groundwater flow directions from 2003 to 2007 are consistent with 1995 flow directions and those observed prior to startup of groundwater remediation systems. The on-property groundwater flow direction is generally to the south.

Chemical Concentration Monitoring

The wells that are monitored include MW-15, MW-16, MW-19, and MW-20A within the TI Zone plume. Downgradient wells used to monitor constituents potentially migrating from the TI Zone include MW-24 and MW-25. A summary of results for each contaminant of concern from 2003 to 2007 is presented below, and final conclusions are provided at the end of this section.

- MW-16 is showing a steady reduction of PCP concentration but is still above the cleanup levels as specified in the ROD (1 ppb). The most recent concentration was 16 ppb measured in May 2007. MW-24 has PCP concentrations below ROD standards, while MW-25 has shown concentrations below the reporting limit of 0.5 ppb for 2003 through 2007. Wells having PCP concentrations below the reporting limit were not included in the tables.
- Although decreasing, the boron concentrations found in MW-25 have remained above the ARARs cleanup level of 1,200 ppb. Most recently in 2007, the boron concentration in MW-25 was 3,470 ppb. Concentration of boron is also decreasing at a very slow rate in MW-24, but is below cleanup level. Because MW-24 is downgradient of MW-25, the data seems to indicate that boron in groundwater is not migrating south.
- Monitoring data indicated that bioremediation had resulted in an apparent increase in mobility of PAHs downgradient. Currently, monitoring for PAHs continues downgradient of the TI Zone to ensure that the ROD standards of 0.007 ppb are not exceeded. PAHs were detected in groundwater from wells MW-15, MW-16, MW-19, and MW-24 over the last 5 years. Concentrations of Total Carcinogenic PAHs and Total PAHs in wells MW-15, MW-16, MW-19, and MW-24 vary significantly over time and are above the ROD standard of 0.007 ppb. For well MW-15, Total Carcinogenic PAH concentrations have declined from 2003 to 2007 (concentrations were within 100 ppb in

2002, then increased to approximately 300 ppb in 2003/2004, and steadily decreased to less than 10 ppb since 2005). By comparison, Total PAH concentrations increased from 4,333 ppb in 2003 to 8,041 ppb in 2007. PAH (Total Carcinogenic and Total PAH) concentrations for MW-16 and MW-19 are showing a decreasing trend. MW-24 concentrations have declined from 2003 to 2007, although there is a significant variation in data from 2003 to 2004. PAH concentrations in well MW-24 may be due to the production of biosurfactants stimulated by bioremediation.

- Concentration of isopropyl ether is below the ROD standard of 2,800 ppb in wells MW-24 and MW-25. MW-24 shows an increasing trend from 2003 to 2007, although values are below ROD standards. Isopropyl ether concentration in MW-25 is below the reporting limit of 1 ppb.

Ethyl benzene and xylenes detected in wells MW-15 and MW-16 are below the cleanup level of the ROD (680 ppb and 1750 ppb, respectively), although the concentrations in MW-15 vary significantly and are showing an increasing trend. MW-16 is below ROD standards and has remained essentially the same from 2003 to 2007. Ethyl benzene and xylene concentrations in MW-24 are less than the reporting limit.

Benzene concentrations have been less than 0.5 ppb since 2003 in all wells except for MW-16. Well MW-16 had greater than 1 ppb of benzene in 2003, but eventually reduced to less than 0.5 ppb in 2007.

- Barium concentration in groundwater is decreasing at a very slow rate in wells MW-24 and MW-25, but both are below ROD cleanup levels.

Chromium, copper, and arsenic are below reporting limits for MW-24 and MW-25 from 2003 to 2007.

- PCDDs/PCDFs as 2,3,7,8 TCDD were detected in groundwater samples collected from well MW-16. The PCDDs/PCDF concentrations in MW-16 vary significantly over time and are above the ROD cleanup level of 0.53×10^{-7} ppb. Product recovery well PR-1, which collects mobile creosote, is located approximately 25 feet south of well MW-16 and is believed to have increased the flow of creosote in the area. Hence, the 2006 annual groundwater monitoring report attributes the concentration of PCDDs/PCDFs in the well to emulsion in groundwater and not presence of dissolved-phase constituents.

The monitoring wells data in the TI Zone (west plume) show a general decreasing trend of contaminants in all wells. Although the PCP concentration in well MW-16 and boron concentration in well MW-25 are above the screening levels, downgradient well MW-24 shows both PCP and boron concentrations below ROD standards. This indicates that the west plume is not migrating to the south. PAH concentrations in the TI Zone exceed the ROD standards. Monitoring in these wells should be continued for further evaluation of downgradient mobility of PAHs.

Product Recovery Well

To enhance treatment of PCP in DNAPL in the groundwater, product recovery is continuing at PR-1 in the TI Zone. Product recovery well PR-1 was installed in the former creosote pond area to operate as a recovery system. Through December 2006, approximately 1,250 gallons of product has been recovered. The creosote recovery rate has been consistent since 2001. Refer to Table F-7 for a summary of the PR-1 production history.

East Plume

Water Level Monitoring

Groundwater elevations are measured monthly in the east plume wells. The hydrographs for seasonal variability of groundwater elevations show that the water levels in individual wells vary 5 to 10 feet between wet and dry seasons. The groundwater flow direction in the east plume area is generally to the south.

Chemical Concentration Monitoring

Based on data from the on-property monitoring wells, , the downgradient extent of of the east plume can be defined by wells MW-18, MW-2, MW-3, and off-property well 86. Groundwater has been extracted and blended with treatment plant influent since August 2002 from MW-8. Extraction from MW-8 is intended to contain and reduce the effects of increased boron and PCP concentrations at the Dri-Con/CCA tank area.

- PCP has been detected at concentrations above the ROD cleanup level in wells MW-2 and MW-3. The values range from 59 ppb in 2003 to 20 ppb in 2007 for MW-2, and 44 ppb in 2003 to 1.2 ppb in 2007 for MW-3. The results also indicate that PCP has been reducing at a steady rate for the three wells. PCP has been detected at concentrations above the ROD standard at well TW-1; the concentrations range from 15 ppb in 2003 to 1.1 ppb in 2007, indicating they are declining at a good rate. All other wells sampled in this zone have PCP concentrations below the reporting limit of 0.5 ppb (see Table F-2). Wells having PCP concentrations below the reporting limits have not been included in the tables and figures presented at the end of this appendix.

- Boron was detected in all the wells sampled. MW-18 has shown a very slow boron reduction from 3,230 ppb in 2003 to 2,990 ppb in 2007; however, the values are above the ROD standard of 1,200 ppb. MW-3 and MW-17 have also shown steady reductions in boron concentration, which was detected at less than 1,200 ppb in 2007. All other wells sampled in the east plume area have concentrations below the cleanup level. Wells having boron concentrations below the reporting limit have not been included in the tables presented at the end of this appendix. Further investigations are required for high boron concentrations occurring in well MW-8. Boron concentrations in MW-8 have been increasing steadily over the last 5 years, from below 1,200 ppb in 2004 to more than 2,500 ppb in 2007.

- PAH concentration in MW-8 has decreased over time, but does not meet the ROD standard of 0.007 ppb. Measured PAHs in MW-8 decreased from 52 ppb to 28 ppb in 2003. In 2006, PAHs were detected at 3.29 ppb in MW-8.

  MW-18 had high concentrations of PAHs that exceeded ROD standards in 2006. Further monitoring data is required to assess the reason for the sudden increase of PAHs in

MW-18. The high peak in PAHs may be due to migration of PAHs downstream from TI Zone wells.

Total PAHs were detected below ROD standards in MW-2 from 2003 to 2005.

- The concentration of isopropyl ether has decreased below the cleanup level of 2,800 ppb in well EW-2 and is continuing to decline at a steady rate. Isopropyl ether has been detected at concentrations below the reporting limit in EW-1. Other wells sampled in this zone show concentrations below the ROD standard.

  Benzene and ethyl benzenes were detected below reporting limits in all sampled wells in the east plume area.

- Barium concentrations in EW-1 and EW-2 are decreasing at a slow rate, and concentrations since 2003 have been below the ROD standard of 1,000 ppb. Arsenic, cadmium, chromium, and mercury were detected below reporting limits in all sampled wells in the east plume area. Copper concentrations have been detected at less than the reporting limit for all wells sampled in this area.

Data from the east plume monitoring wells show a general decreasing trend of contaminants in all wells, indicating that the pump-and-treat system is working effectively in this area.

On-Property Groundwater In Situ Bioremediation Program

Enhanced bioremediation of the east on-properly PCP plume began on March 6, 1998. PCP degradation was augmented by adding oxygen and nutrients to wells MW-1, MW-4, MW-6, MW-12, MW-13, and MW-23 between March 1998 and First Quarter 2004. The wells were not sampled during this period. During Second Quarter 2004, the enhancements were revised in accordance with the *Revisions to the Off-Property and On-Property Groundwater In situ Bioremediation Programs, Koppers Company, Inc. Superfund* Sire *(Feather River Plant), Oroville, California* (GeoTrans, Inc., February 2004) and EPA's March 16, 2004 approval. The revisions included reducing the amounts of ORC added and eliminating the nutrient addition. The oxygen enhancement added to the site wells was switched from a magnesium peroxide compound to a calcium peroxide-based compound effective First Quarter 2007.

The On-Property Groundwater *In Situ* Bioremediation Program seems to have enhanced the remediation of groundwater PCP concentrations. The size of the east plume detected in the semiannual (Second Quarter) 2007 review has declined compared to the size of the plume when the bioremediation program began. However, the plume map shows no reduction in size from 2002 to 2007, indicating that *in situ* bioremediation may not have been as effective during the last 5 years with the application of enhancements to the current wells. Enhancement addition wells may have to be revised to facilitate more effective bioremediation.

Off –Property Groundwater Monitoring

This section discusses the off-property ground water monitoring results. Wells sampled include 25, 59, 86, 31C1, 31C2, 31D3, RI-2, RI-3, RI-6, RI-10, RI-11, RI-12, RI-15, RI-16B, RI-20A, and RI-20B. All off-property groundwater wells are sampled and analyzed for PCP only.

Water Level Monitoring

The hydrographs for seasonal variability of water levels in individual groundwater wells vary 5 to 10 feet between wet and dry seasons. The hydrographs indicate that water levels overall decreased slightly from 1986 to 1990, increased from 1991 through 1999, and began to level off from 1999 through the present. The groundwater flow directions from 2003 to 2007 are consistent with 1995 flow directions and those observed prior to startup of groundwater remediation systems. The off-property groundwater flow direction is generally south-southwest.

Chemical Concentration Monitoring

The upgradient extent of the residual off-property plume is defined by well RI-3, and the downgradient extent is defined by well RI-11. PCP concentrations detected at well RI-3 have decreased significantly, with the concentrations below 10 ppb since 2003 and below 1 ppb (ROD standard) since November 2006. RI-11 has not been measured since 2003 due to bioremediation enhancement additions, but concentration of PCP in RI-12, which is south of RI-11, has been less than 0.5 ppb from 2003 to 2007. Groundwater monitoring reports indicate that PCP concentrations have decreased significantly after implementation of the bioremediation program.

Well 86 is an off-property well but is contained by the on-property east plume. PCP concentrations in well 86 have been decreasing at a slow rate from 2003 to 2007, but the values vary significantly (see Table F-5). The concentrations remain above the ROD standard of 1 ppb. The latest annual groundwater monitoring report (GeoTrans, Inc., 2006) indicates that the PCP detections in well 86 are related to the B-zone aquifer and does not indicate impacts to the A-zone aquifer as identified in earlier reports. The monitoring reports present information indicating that PCP detected at well 86 is captured by extraction well EW-2.Well 25, which is located approximately 2,200 feet downgradient of well 86 and is used to monitor well 86 for contaminant migration, shows PCP concentrations less than the reporting limit of 0.5 ppb. This indicates that the on-property east plume has not migrated beyond well 86.

PCP concentration in well 59 is below the ROD standard, and all other wells sampled in the off-property area show concentrations below the reporting limit of 0.5 ppb. Wells having PCP concentrations below the reporting limit have not been included in the tables and figures presented at the end of this appendix.

Off-Property Groundwater In situ Bioremediation Program

Enhanced bioremediation of the residual off-property PCP plume began on August 26, 1998, in accordance with the Revised Off-Property Groundwater *In Situ* Bioremediation Program. PCP degradation was augmented by adding oxygen and nutrients to three specific wells in the residual off-property plume and evaluating changes in nutrient and PCP concentrations at downgradient wells. The oxygen and nutrients were added in the form of ORCs and di-ammonium phosphate. Wells 26, RI-20A, and RI-11 were not sampled during the enhancement program (through First Quarter 2004). During Second Quarter 2004, the enhancements were revised by reducing the amounts of ORCs and eliminating the nutrient addition in accordance with the *Revisions 10 of the Off-Property and On Property Groundwater In situ Bioremediation Programs, Koppers Company, Inc. Superfund Site (Feather River Plant),*

Oroville, California (GeoTrans, Inc., February 2004) and EPA's March 16, 2004 approval. The EPA issued a letter on January 31, 2007 accepting the use of a calcium peroxide-based compound to replace the magnesium peroxide compound previously used for remediation.

Samples were collected from downgradient monitoring wells and analyzed for PCP, orthophosphate as phosphorus, nitrite as nitrogen, nitrate as nitrogen, and ammonia as total nitrogen to estimate the effectiveness of the bioremediation program. The off-property bioremediation program seems to be efficient in enhancing bioremediation of PCP, as established by the groundwater monitoring reports.

Alternate Water Supply Wells

In compliance with the ROD and Consent Decree, Beazer East, Inc. continues to provide an alternate water supply for seven residences with impacted wells of greater than 0.5 ppb PCP (half ROD standard). Groundwater is monitored quarterly and compared against ROD-selected standards to gauge remedial performance. The monitoring wells associated with AWS wells are 59, 60, 61, 62, 81, 31C2, and 31D3. Quarterly monitoring of wells 86 and 25 is supposed to continue until analytical results are less than 0.5 ppb for four consecutive quarters at wells 31C2 and 31D3. PCP analytical results were below 0.5 ppb for samples collected from wells 31C2 and 31D3 from 2003 to 2007.

Figures

FIGURE F-1
Site Map

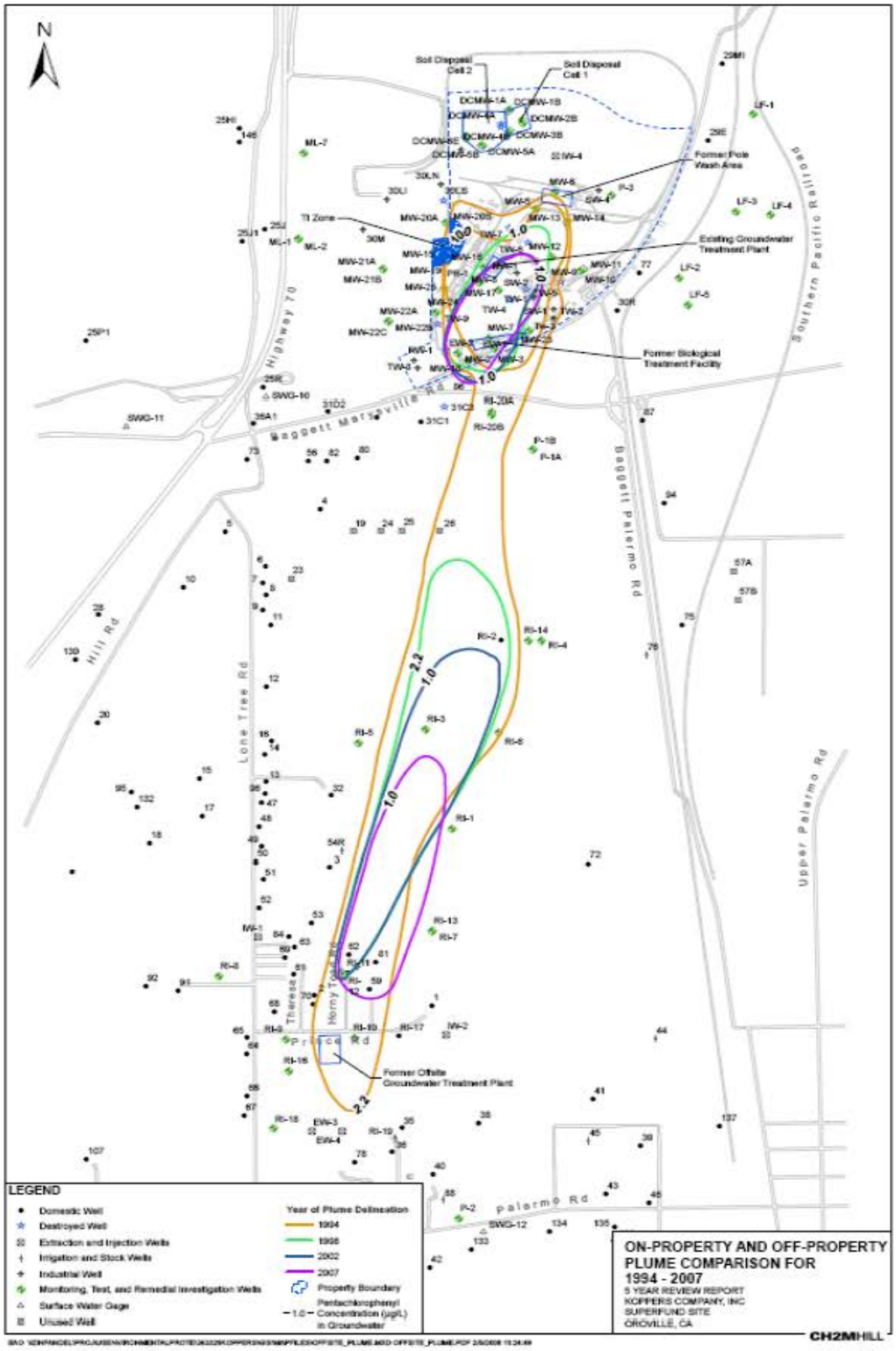
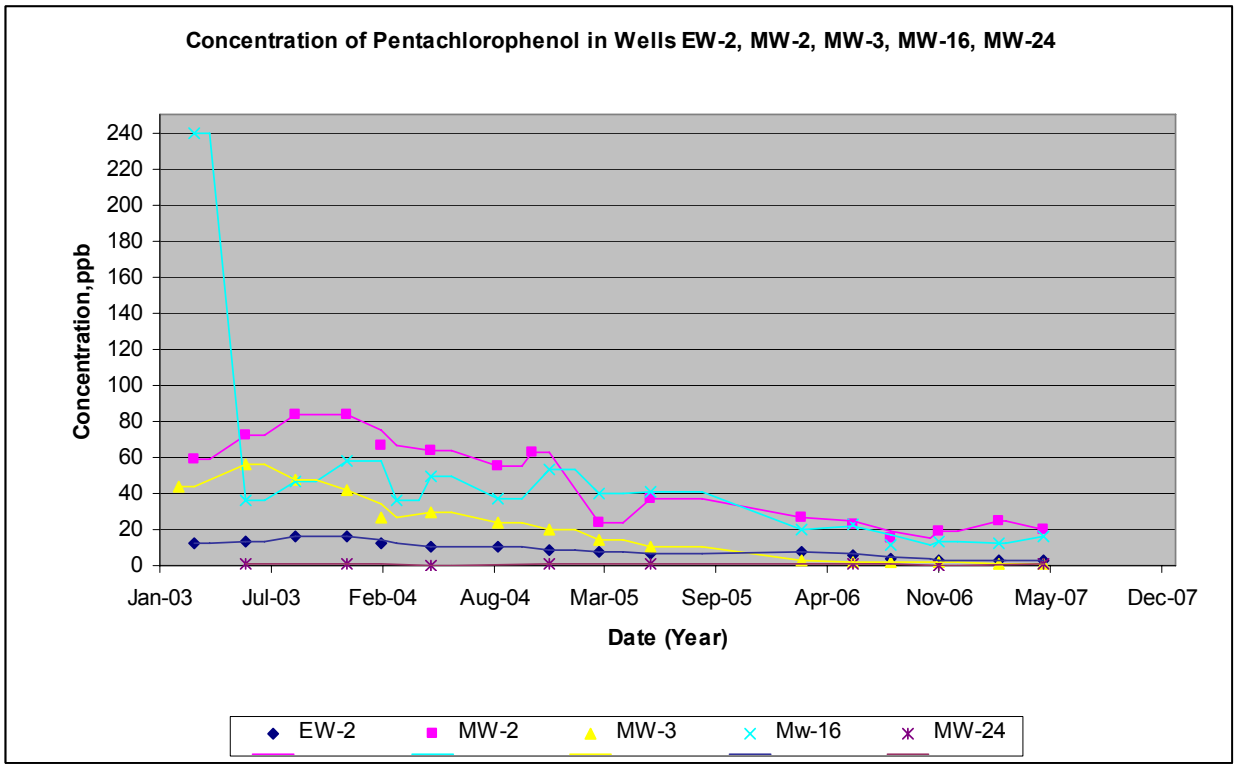


FIGURE F-2
Concentration of Pentachlorophenol in Groundwater Monitoring Wells, 2003-2007



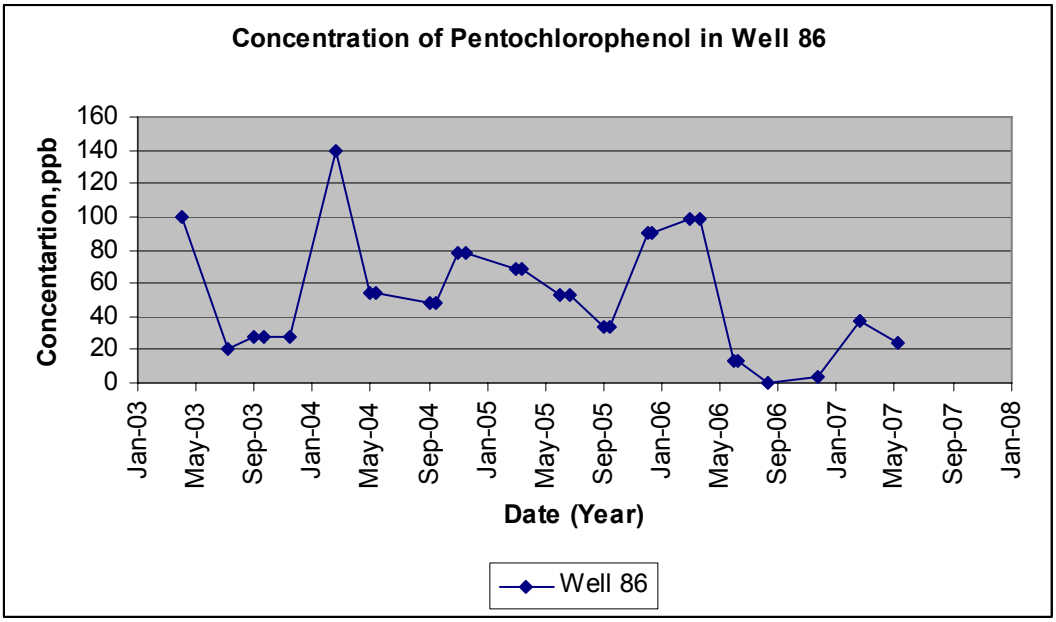


FIGURE F-2 (CONTINUED)
Concentration of Pentachlorophenol in Groundwater Monitoring Wells, 2003-2007

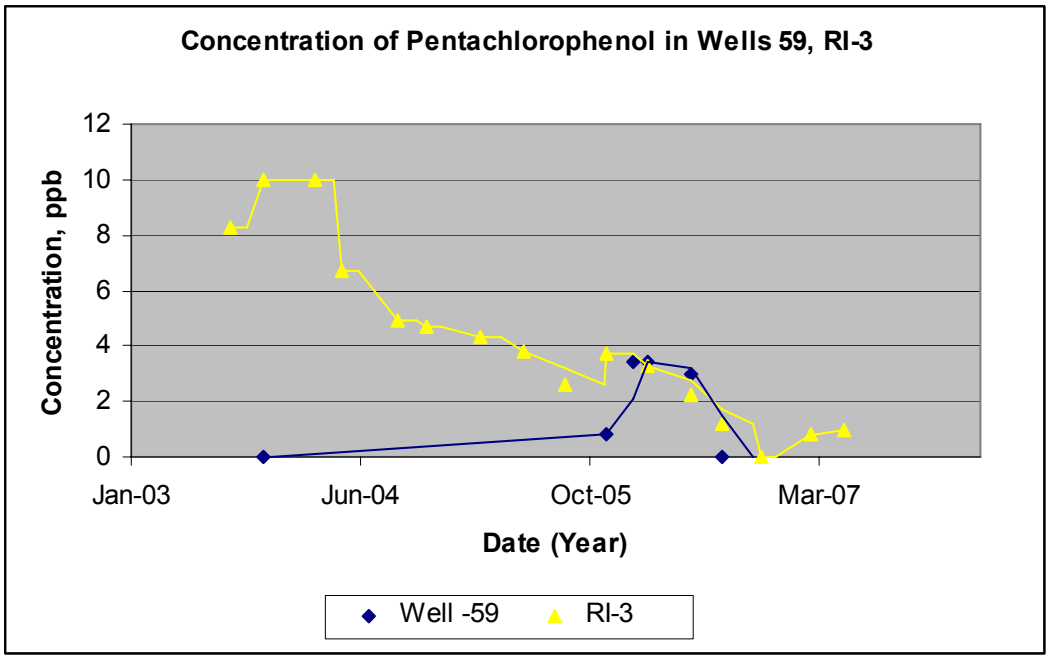


FIGURE F-3
Concentration of Boron in Groundwater Monitoring Wells, 2003-2007

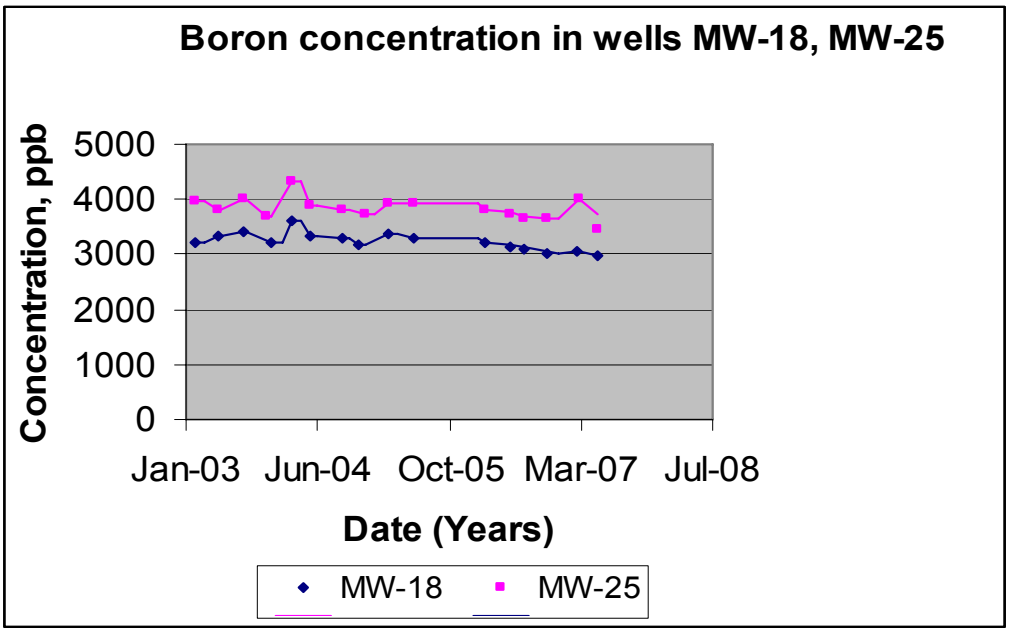
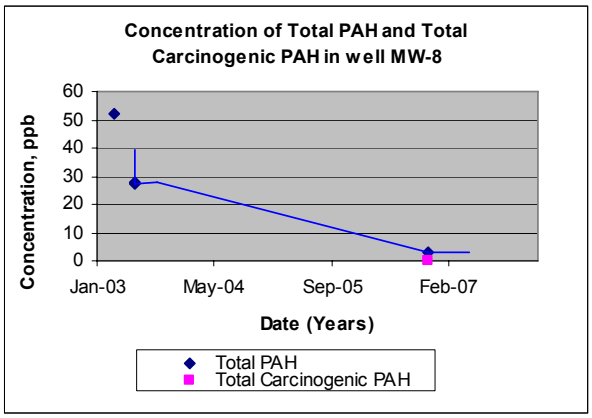
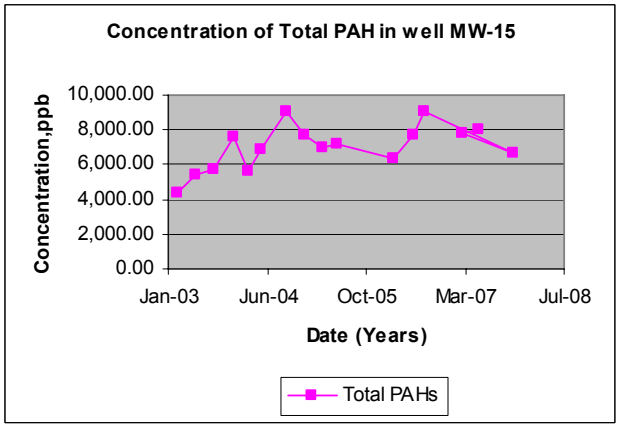
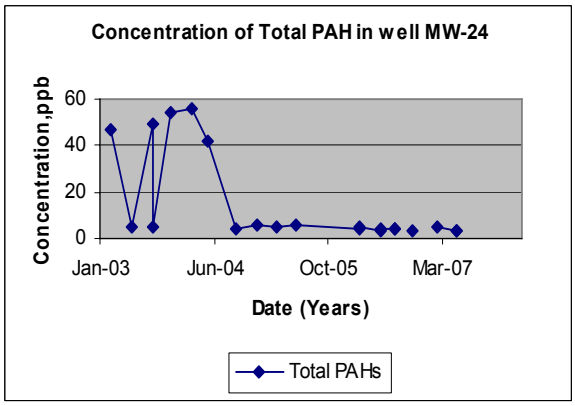


FIGURE F-4
Concentration of PAHs in Groundwater Monitoring Wells, 2003-2007







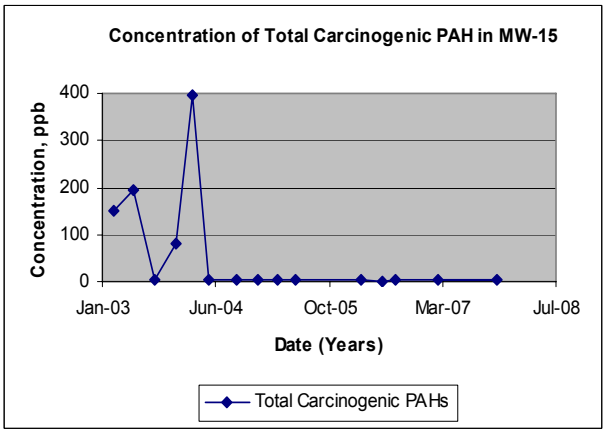
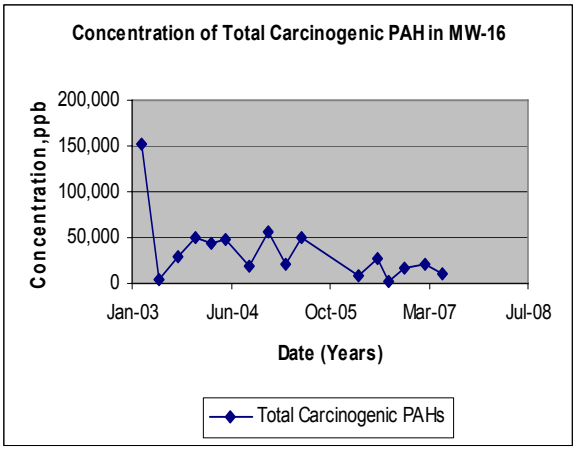
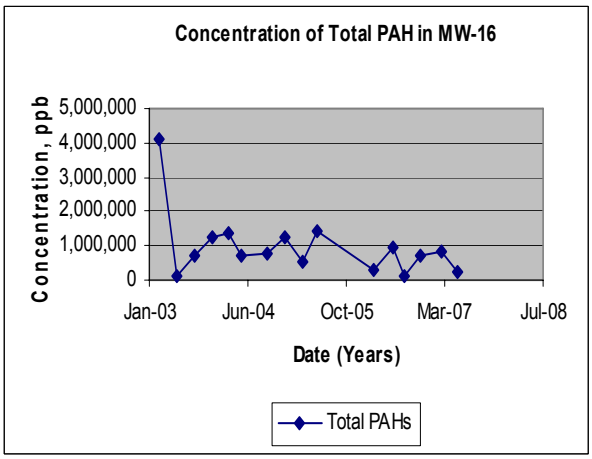
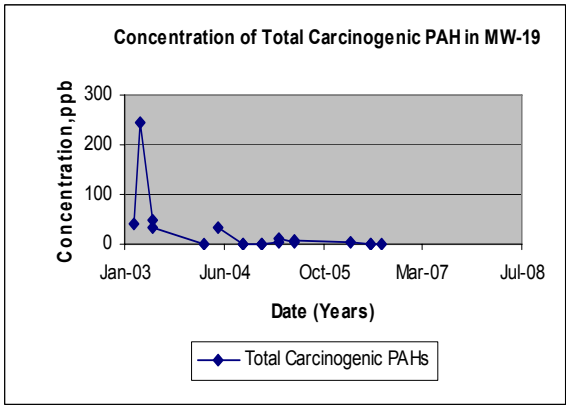
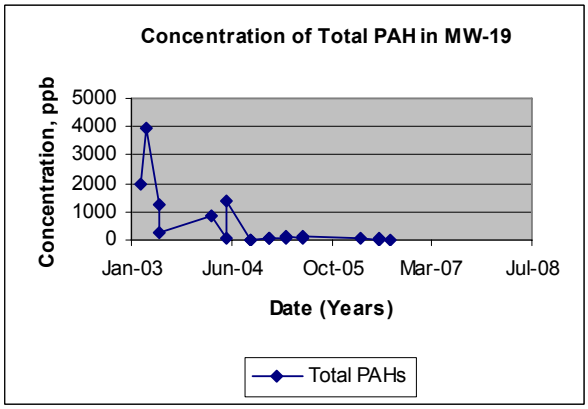


FIGURE F-4 (CONTINUED)
Concentration of PAHs in Groundwater Monitoring Wells, 2003-2007









Tables

TABLE F-4
Concentration of Pentachlorophenol in Groundwater Monitoring Wells, 2003 through 2007
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Wells	EW-1	EW-2	MW-2	MW-3	MW-16	MW-24	59	RI-3
Date								
Feb-03				44				
Mar-03	<0.5	12	59		240			
Jun-03	<0.5	13	72	56	36	0.83		
Sep-03	<0.5	16	84	48	47			8.3
Nov-03							<0.5	10
Dec-03	<0.5	16	84	42	58	0.54		
Feb-04	<0.5	12	67	27				
Mar-04					36			10
May-04	<0.5	10	64	29	49	<0.5		6.7
Sep-04	<0.5	10	55	24	37			4.9
Nov-04			63					4.7
Dec-04	<0.5	8.6		20	53	0.59		
Mar-05	<0.5	7.6	24	14	40			4.3
Jun-05	<0.5	7.1	37	10	41	0.53		3.8
Sep-05								2.6
Dec-05							0.81	3.7
Jan-06							3.4	
Mar-06	<0.5	7.5	27	2.8	20		3.4	3.3
Jun-06	<0.5	5.6	23	1.5	23	0.7	3	2.2
Aug-06	< 0.5	3.7	15	1.8	11		<0.5	1.2
Nov-06	< 0.5	3.2	19	1.8	13	<0.5		<0.5
Feb-07	< 0.5	3.2	25	1.3	12			0.8
Apr-07								0.96
May-07	< 0.5	2.9	20	1.2	16	0.61		

TABLE F-5
Concentration of Pentachlorophenol in Groundwater Monitoring Well 86, 2003 through 2007
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Date	PCP (µg/l)
Apr-03	100
Jul-03	20
Sep-03	28
Sep-03	28
Nov-03	28
Feb-04	140
May-04	54
May-04	54
Sep-04	48
Sep-04	48
Nov-04	78
Nov-04	78
Mar-05	68
Mar-05	68
Jun-05	53
Jun-05	53
Sep-05	34
Sep-05	34
Dec-05	90
Dec-05	90
Mar-06	99
Mar-06	99
Jun-06	13

TABLE F-6
Concentration of Boron in Groundwater Monitoring Wells, 2003 through 2007
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

	EW-1	EW-2	MW-2	MW-3	MW-7	MW-17	MW-18	MW-24	MW-25	SW-1
Mar-03	540	588		1360		1300	3230		3970	1130
Apr-03	566	626		1450	696					
May-03	512	577		1290	624					
Jun-03	583	645		1510	725	1340	3340		3790	1120
Jun-03	525	590		1410						
Jul-03	649	642	1490	1490	741					
Aug-03	556	611	1390		701					
Sep-03	517	581		1380	665	1310	3420		3990	1190
Sep-03	555	583		1400						
Oct-03	507	561		1310	638					
Nov-03	508	597		1410	657					
Dec-03	492	574	586	1310	632			514	3700	1140
Dec-03	473	567		1290	602	1230	3220			
Feb-04	504	586		1290	625					
Feb-04	481	576		1280	604	1180				
Mar-04	481	570		1250	609		3630		4320	
Apr-04	543	584		1320	714					
May-04	489	600		1210	676					1190
May-04	523	615		1300	693	1270	3330		3880	
Jun-04	485	586		1220	661					
Jul-04	530	638		1270	721					
Aug-04	488	586		1220	638					
Sep-04	504	613		1270	654	1180				
Sep-04	519	613		1230	645		3280		3800	
Oct-04	481	575		1190	606					
Nov-04						1200	3190			1070
Dec-04	493	570		1180	606			504	3720	
Mar-05	500	601		1170	625	1230	3380		3940	
Apr-05										
Jun-05	491	619		1110	653	1160	3290		3920	1230

TABLE F-6
Concentration of Boron in Groundwater Monitoring Wells, 2003 through 2007
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

	EW-1	EW-2	MW-2	MW-3	MW-7	MW-17	MW-18	MW-24	MW-25	SW-1
Feb-06										
Mar-06	495	565			604	1180	3230		3800	952
Jun-06	463	560		948	602	1090	3150		3730	1090
Aug-06	474	545			583		3100		3670	1170
Nov-06	453	548		924		1030	3030	510	3660	1080
Dec-06					526					
Feb-07	494	588			584		3060		3990	
May-07	445	532		840	543	981	2990		3470	938

TABLE F-7
Production History of Well PR-1
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Date	Total Fluid *	Product	Emulsion
09/30/94	15.5	5.6	0
10/05/94	12.5	0.75	0.75
11/02/94	14	0.25	0.25
12/01/94	10	0.75	0.75
01/30/95	11.5	0	4
02/21/95	6	0	3.75
04/11/95	43	0	40
05/11/95	14	4.6	5
06/07/95	13.3	4.3	4
07/11/95	13.5	4	6.3
07/25/95	8.3	0	5
08/23/95	8.92	1.25	4.17
09/19/95	5.8	4.2	0.8
10/20/95	5.8	0	1.67
11/29/95	5	0	1.67
12/22/95	6.25	0	0.83
01/30/96	6.25	0	1.25
02/21/96	6.25	0	2.5
03/20/96	5	0	1.25
04/23/96	6.25	0	1.25
05/23/96	5.8	0.4	0
06/17/96	6.25	0	1.25
07/31/96	7.05	1.25	2.5
08/27/96	5.8	3.75	1.7
09/24/96	5.4	0	0.83
10/28/96	5.4	0	0.83
11/20/96	5	0	0.83
12/23/96	6.18	0	1.6
01/27/97	8.3	0	3.3
02/28/97	8.75	0	2.5
03/25/97	8.75	0	3.75
04/22/97	9.83	0	3.75
05/19/97	7.92	0	2.92

TABLE F-7 (CONTINUED)
Production History of Well PR-1
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Date	Total Fluid *	Product	Emulsion
06/24/97	7.08	1.67	0.83
07/30/97	20.42	7.5	7.5
08/26/97	23.3	7.5	10.4
09/23/97	18.4	9.6	3.8
10/28/97	12.9	5.4	2.5
12/09/97	9.13	5	0.83
12/30/97	9.59	1.25	4.17
01/27/98	7.9	0.4	3.75
02/24/98	9.17	0	3.75
03/26/98	10.42	4.17	1.25
04/27/98	16.7	10	2.5
05/26/98	19.2	7.5	5
06/24/98	12.5	4.6	3.8
07/23/98	21.67	7.5	10
08/18/98	21.65	12.9	4.17
09/22/98	19.98	10.4	4.58
10/22/98	23.75	8.75	10
12/01/98	29.17	13.75	11.25
12/30/98	30	10	15
01/19/99	17.1	7.5	5
02/19/99	20.4	7.5	10
03/16/99	19.17	7.5	7.5
04/19/99	22.08	10	7.5
05/19/99	27.08	12.5	10
08/23/99	34.58	15	19.58
07/19/99	30	15	10
08/24/99	27.5	12.5	10
09/22/99	27.5	15	7.5
10/22/99	32.5	17.5	10
11/24/99	30	15	10
12/08/99	26.25	11.25	10
01/28/00	28.75	13.75	10
02/23/00	23.33	8.75	10
03/29/00	21.66	7.08	10

TABLE F-7 (CONTINUED)
Production History of Well PR-1
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Date	Total Fluid *	Product	Emulsion
04/12/00	15.8	5	10.8
04/25/00	12.5	3.3	5
05/09/00	9.16	3.75	1.25
05/22/00	10.38	3.3	2.5
06/05/00	10.41	3.75	2.5
06/20/00	11.25	4.58	2.5
07/18/00	11.67	5	2.5
08/01/00	14.17	6.67	2.5
08/23/00	14.17	5	5
09/11/00	17.33	7.5	5
09/25/00	17.9	10.4	2.5
10/09/00	15	7.5	2.5
10/23/00	12.46	4.16	3.3
11/06/00	11.25	3.75	2.5
11/20/00	12.5	5	2.5
12/04/00	13.3	5	2.5
12/18/00	12.5	5	2.5
01/02/01	12.5	5	2.5
01/16/01	12.5	5	2.5
02/01/01	15	6	2.57
02/13/01	14	6.13	2.63
02/27/01	15	6	2.57
03/13/01	14	6.13	2.63
03/27/01	11	4.71	2.36
04/10/01	13	5.69	2.44
04/24/01	14	6.36	2.55
05/08/01	15	6.25	3.33
05/22/01	14	6.36	2.55
06/05/01	11	4.89	2.44
06/19/01	13	5.2	2.6
07/03/01	15	6.56	2.81
07/17/01	13	5.2	2.6

TABLE F-7 (CONTINUED)
Production History of Well PR-1
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Date	Total Fluid *	Product	Emulsion
10/22/02	13	5.2	2.6
11/05/02	13	5.2	2.6
11/19/02	13	5.2	2.6
12/03/02	13	5.2	2.6
12/18/02	13	5.2	2.6
12/31/02	13	5.2	2.6
01/14/03	13	5.2	2.6
01/28/03	13	5.2	2.6
02/11/03	13	5.2	2.6
02/25/03	13	5.2	2.6
03/11/03	13	5.2	2.6
03/25/03	13	5.2	2.6
04/08/03	13	5.2	2.6
04/22/03	13	5.2	2.6
05/06/03	13	5.2	2.6
05/20/03	13	5.2	2.6
06/03/03	13	5.2	2.6
06/16/03	13	5.2	2.6
07/01/03	13	5.2	2.6
07/18/03	13	5.2	2.6
07/30/03	13	5.2	2.6
08/12/03	13	5.2	2.6
08/26/03	13	5.2	2.6
09/09/03	13	5.2	2.6
09/23/03	13	5.2	2.6
10/08/03	13	5.2	2.6
10/21/03	13	5.2	2.6
11/05/03	13	5.2	2.6
11/18/03	13	5.2	2.6
12/03/03	13	5.2	2.6
12/16/03	13	5.2	2.6
12/30/03	13	5.2	2.6

TABLE F-7 (CONTINUED)
Production History of Well PR-1
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Date	Total Fluid *	Product	Emulsion
05/10/05	13	5.2	2.6
05/24/05	13	5.2	2.6
06/07/05	13	5.2	2.6
06/21/05	13	5.2	2.6
07/05/05	13	5.2	2.6
07/19/05	13	5.2	2.6
08/01/05	13	5.2	2.6
08/16/05	13	5.2	2.6
08/30/05	13	5.2	2.6
09/15/05	13	5.2	2.6
09/27/05	13	5.2	2.6
10/11/05	13	5.2	2.6
10/25/05	13	5.2	2.6
11/08/05	13	5.2	2.6
11/18/05	13	5.2	2.6
12/06/05	13	5.2	2.6
12/20/05	13	5.2	2.6
01/03/06	13	5.2	2.6
01/17/06	13	5.2	2.6
01/31/06	13	5.2	2.6
02/14/06	13	5.2	2.6
02/28/06	13	5.2	2.6
03/14/06	13	5.2	2.6
03/28/06	13	5.2	2.6
04/11/06	13	5.2	2.6
04/24/06	13	5.2	2.6
05/09/06	13	5.2	2.6
05/23/06	13	5.2	2.6
06/06/06	13	5.2	2.6
06/20/06	13	5.2	2.6
07/05/06	13	5.2	2.6
07/20/06	13	5.2	2.6
08/01/06	13	5.2	2.6
08/14/06	13	5.2	2.6
08/29/06	13	5.2	2.6
09/18/06	13	5.2	2.6
09/26/06	13	5.2	2.6

TABLE F-7 (CONTINUED)
Production History of Well PR-1
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

10/11/06	13	5.2	2.6
10/24/06	13	5.2	2.6
11/13/06	13	5.2	2.6
11/28/06	13	5.2	2.6
12/12/06	13	5.2	2.6
12/26/06	13	5.2	2.6
	3,268	1,251.1	821.2

Notes: All values in gallons.

These volumes are based on a visual assessment of the fluid purged from well PR-1. Black purged fluid is identified as product, gray and brown fluid is identified as emulsion, and clear fluid is identified as water.

* This volume includes water, product, and emulsion pumped from well PR-1.

TABLE F-8
Summary of Disposal Cells Monument Survey
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Monument Number	1	2	3	4	5	5-2003	6-2003	7-2003	8-2003	9-2003	10-2003	11-2003	12-2003
2001 Eastings[1]	6,684,390.62	6,684,419.97	6,684,432.94	6,684,352.67	6,684,338.13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2001 Northing[1]	2,299,545.62	2,299,588.89	2,299,513.30	2,299,502.28	2,299,574.57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2002 Eastings[1]	6,684,390.62	6,684,419.98	6,684,432.96	6,684,352.69	6,684,338.15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2002 Northing[1]	2,299,545.61	2,299,588.88	2,299,513.29	2,299,502.27	2,299,574.56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2001-2002 Delta Eastings	0.00	0.01	0.02	0.02	0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2001-2002 Delta Northings	-0.01	-0.01	-0.01	-0.01	-0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2003 Eastings[1]	6,684,390.62	6,684,419.99	6,684,432.96	6,684,352.70	6,684,338.16	6,683,950.01	6,683,923.74	6,684,031.64	6,684,034.39	6,684,085.15	6,684,122.39	6,684,160.01	6,683,988.08
2003 Northing[1]	2,299,545.62	2,299,588.89	2,299,513.30	2,299,502.28	2,299,574.57	2,299,384.15	2,299,491.64	2,299,488.86	2,299,370.81	2,299,441.85	2,299,411.37	2,299,497.67	2,299,444.08
2002-2003 Delta Eastings	0.00	0.01	0.00	0.01	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2002-2003 Delta Northings	0.01	0.01	0.01	0.01	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2004 Eastings[1]	6,684,390.62	6,684,419.98	6,684,432.95	6,684,352.69	6,684,338.15	6,683,949.99	6,683,923.72	6,684,031.62	6,684,034.36	6,684,085.12	6,684,122.37	6,684,160.00	6,683,988.05
2004 Northings[1]	2,299,545.59	2,299,588.87	2,299,513.28	2,299,502.26	2,299,574.55	2,299,384.13	2,299,491.63	2,299,488.84	2,299,370.77	2,299,441.81	2,299,411.34	2,299,497.65	2,299,444.05
2003-2004 Delta Eastings	0.00	-0.01	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02	-0.03	-0.03	-0.02	-0.01	-0.03
2003-2004 Delta Northings	-0.03	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01	-0.02	-0.04	-0.04	-0.03	-0.02	-0.03
2005 Eastings[1]	6,684,390.64	6,684,419.98	6,684,432.96	6,684,352.69	6,684,338.16	6,683,950.00	6,683,923.72	6,684,031.62	6,684,034.37	6,684,085.12	6,684,122.37	6,684,160.00	6,683,988.05
2005 Northings[1]	2,299,545.60	2,299,588.87	2,299,513.28	2,299,502.26	2,299,574.56	2,299,384.12	2,299,491.62	2,299,488.84	2,299,370.76	2,299,441.81	2,299,411.34	2,299,497.64	2,299,444.05
2004-2005 Delta Eastings	0.02	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
2004-2005 Delta Northings	0.01	0.00	0.00	0.00	0.01	-0.01	-0.01	0.00	-0.01	0.00	0.00	-0.01	0.00
2006 Eastings[1]	6,684,390.64	6,684,419.99	6,684,432.97	6,684,352.71	6,684,338.17	6,683,950.02	6,683,923.76	6,684,031.65	6,684,034.40	6,684,085.14	6,684,122.39	6,684,160.02	6,683,988.08
2006 Northings[1]	2,299,545.61	2,299,588.88	2,299,513.29	2,299,502.27	2,299,574.56	2,299,384.13	2,299,491.61	2,299,488.83	2,299,370.77	2,299,441.81	2,299,411.34	2,299,497.65	2,299,444.05
2005-2006 Delta Eastings	0.00	0.01	0.01	0.02	0.01	0.02	0.04	0.03	0.03	0.02	0.02	0.02	0.03
2005-2006 Delta Northings	0.01	0.01	0.01	0.01	0.00	0.01	-0.01	-0.01	0.01	0.00	0.00	0.01	0.00
2007 Eastings[1]	6,684,390.64	6,684,420.00	6,684,432.98	6,684,352.71	6,684,338.17	6,683,950.04	6,683,923.78	6,684,031.66	6,684,034.42	6,684,085.15	6,684,122.41	6,684,160.03	6,683,988.10
2007 Northings[1]	2,299,545.62	2,299,588.89	2,299,513.30	2,299,502.28	2,299,574.57	2,299,384.12	2,299,491.59	2,299,488.83	2,299,370.75	2,299,441.80	2,299,411.33	2,299,497.65	2,299,444.04
2006-2007 Delta Eastings	0.00	0.01	0.01	0.00	0.00	0.02	0.02	0.01	0.02	0.01	0.02	0.01	0.02
2006-2007 Delta Northings	0.01	0.01	0.01	0.01	0.01	-0.01	-0.02	0.00	-0.02	-0.01	-0.01	0.00	-0.01

TABLE F-8 (CONTINUED)
Summary of Disposal Cells Monument Survey
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Monument Number	1	2	3	4	5	5-2003	6-2003	7-2003	8-2003	9-2003	10-2003	11-2003	12-2003
2001 Elevations (ft,msl)	180.54	178.95	178.54	179.34	179.11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2002 Elevations (ft,msl)	180.53	178.95	178.53	179.34	179.11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2001-2002 Elevation Delta	-0.01	0.00	-0.01	0.00	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2003 Elevations (ft,msl)	180.53	178.95	178.53	179.34	179.11	202.62	202.78	203.92	202.24	204.36	203.61	202.13	204.52
2002-2003 Elevation Delta	0.00	0.00	0.00	0.00	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2004 Elevations (ft,msl)	180.52	178.94	178.52	179.33	179.1	202.56	202.73	203.86	202.18	204.3	203.53	202.06	204.46
2003-2004 Elevation Delta	-0.01	-0.01	-0.01	-0.01	-0.01	-0.06	-0.05	-0.06	-0.06	-0.06	-0.08	-0.07	-0.06
2005 Elevations (ft,msl)	180.52	178.94	178.52	179.33	179.10	202.56	202.72	203.85	202.18	204.29	203.52	202.05	204.45
2004-2005 Elevation Delta	0.00	0.00	0.00	0.00	0.00	0	-0.01	-0.01	0	-0.01	-0.01	-0.01	-0.01
2006 Elevations (ft,msl)	180.52	178.94	178.52	179.32	179.10	202.54	202.7	203.83	202.16	204.28	203.49	202.02	204.44
2005-2006 Elevation Delta	0.00	0.00	0.00	-0.01	0.00	-0.02	-0.02	-0.02	-0.02	-0.01	-0.03	-0.03	-0.01
2007 Elevations (ft,msl)	180.516	178.936	178.516	179.325	179.10	202.527	202.693	203.819	202.137	204.261	203.476	202.005	204.417
2006-2007 Elevation Delta	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.02	-0.02	-0.01	-0.02	-0.02

[1] Coordinates listed in this table are California State Plane Coordinates, Zone 2, NAD 83.
ft, msl = feet mean sea level.
Coordinates and elevations surveyed by GDA Engineering, Surveying, Planning.
Cell #2 was opened in the summer of 2002 and material was added. New settlement marker monuments were installed.

Appendix G
Site Inspection Checklist

APPENDIX G

Site Inspection Checklist

This appendix presents the checklist for the Koppers Company, Inc. Superfund Site (Koppers site) inspection conducted on December 18 and 19, 2007. The site inspection team roster is presented in table G-1, followed by the site inspection checklist.

TABLE G-1
Team Roster for Site Inspection, December 18 and19, 2007
Third Five-Year Review Report for Koppers Company, Inc. Superfund Site
Oroville, Butte County, California

Name	Title	Affiliation
Kim Hoang	Remedial Project Manager	U.S. Environmental Protection Agency
K.C. Hendrix	Operations and Maintenance Manager	GeoTrans, Inc.
Caroline Ziegler	Project Manager	CH2M HILL, Inc.
Seena Babu	Project Engineer	CH2M HILL, Inc.

Site Inspection Checklist

I. SITE INFORMATION

Site name: Koppers Company, Inc. Superfund Site

Date(s) of inspection: December 18 and 19, 2007

Location and Region: Oroville (Butte County), CA

EPA ID: CAD009112087

Agency, office, or company leading the five-year review: U.S. Environmental Protection Agency, Region 9

Weather/temperature: Breezy, cold, light rain

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☒ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other_____
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments:

- ☒ Inspection team roster attached
- ☒ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** K. C. Hendrix (Name) Site Manager (Title) 12/18 & 19/2007 (Date)
   Interviewed ☒at site ☐ at office ☐ by phone Phone no. 530-370-5481
   Problems, suggestions; ☐ Report attached _____

2. **O&M staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

   Agency Regional Water Quality Control Board (RWQCB)
   Contact Name: Phil Woodward; Title: Project Manager; Date: 01/08/08; Phone no.: 530-224-4853
   Problems; suggestions; ☐ Report attached _____

   Agency Department of Toxic Substances Control (DTSC)
   Contact Name: Ed Cargile; Title: Project Manager; Date: 01/29/08; Phone no.: 916-255-3703
   Problems; suggestions; ☐ Report attached _____

   Agency _____

Contact _____ _____ _____ _____
Name Title Date Phone no.

Problems; suggestions; ☐ Report attached _____
_____

Agency _____

Contact _____ _____ _____ _____
Name Title Date Phone no.

Problems; suggestions; ☐ Report attached _____
_____

4. **Other interviews** (optional) ☐ Report attached.

Mike Tischuk, Project Manager, Beazer East, Inc.

Jennifer Abrahams, Project Manager, GeoTrans, Inc.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

☒ O&M manual	☒ Readily available	☒ Up to date	☐ N/A
☒ As-built drawings	☒ Readily available	☒ Up to date	☐ N/A
☒ Maintenance logs	☒ Readily available	☒ Up to date	☐ N/A

Remarks: Operations and maintenance (O&M) manual – May 1998; post-closure maintenance and monitoring plan and as-built drawings for disposal Cells No. 1 and No. 2 – Feb 2004; soil disposal cell records, operation records for groundwater remediation system and daily inspection report, weekly and monthly inspection reports, treatment plant discharge records, extraction well flow records.

2. **Site-Specific Health and Safety Plan** ☒ Readily available ☒ Up to date ☐ N/A
☒ Contingency plan/emergency response plan ☒ Readily available ☒ Up to date ☐ N/A
Remarks**:** Site-Specific Health and Safety Plan – March 2005.

3. **O&M and OSHA Training Records** ☒ Readily available ☒ Up to date ☐ N/A
Remarks: _____
_____

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	☐ N/A
☒ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☐ N/A
☐ Other permits_____	☐ Readily available	☐ Up to date	☐ N/A

Remarks: There was an NPDES discharge permit (No. CA0082988) issued in 1992 for an off-site discharge. This permit was rescinded in 1997.

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☐ N/A
Remarks: Landfill gases not monitored, vent is open to air

6. **Settlement Monument Records** ☒ Readily available ☒ Up to date ☐ N/A
Remarks: Last surveyed January 2007.

7. **Groundwater Monitoring Records** ☒ Readily available ☒ Up to date ☐ N/A
Remarks: Semiannual groundwater monitoring reports to document quarterly groundwater sampling events are submitted to EPA and the Regional Water Quality Control Board (RWQCB).

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☐ N/A
Remarks: Leachate elevation levels at the disposal cells are monitored monthly and extracted only as required.

9. **Discharge Compliance Records**
☐ Air ☐ Readily available ☐ Up to date ☐ N/A
☒ Water (effluent) ☒ Readily available ☒ Up to date ☐ N/A
Remarks: Effluent discharge is monitored and reported monthly, meeting substantive permitting requirements.

10. **Daily Access/Security Logs** ☒ Readily available ☒ Up to date ☐ N/A
Remarks: _____

IV. O&M COSTS

1. **O&M Organization**
☐ State in-house ☐ Contractor for State
☐ PRP in-house ☒ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other_____
_____

2. **O&M Cost Records**
☐ Readily available ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate: Approximately $833,000 per year inclusive to operate and maintain both on- and off-property pump-and-treat system and to conduct sitewide groundwater monitoring. ☐ Breakdown attached

Total annual cost by year for review period if available

From_1/1/2006___ To_12/31/2006__ __$190,000_____ ☐ Breakdown attached
Date Date Total cost
For On-Property pump and treat system and groundwater monitoring
From_1/1/2007 __ To_12/31/2007__ __$208,000_____ ☐ Breakdown attached
Date Date Total cost
For On-Property pump and treat system and groundwater monitoring
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: O& Mcosts are usually for motor relay equipment, electrical problems, and general maintenance. No unanticipated or unusually high O&M costs reported over the review period 2003-2007.
_____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☒ Location shown on site map ☒ Gates secured ☐ N/A
Remarks: There is no fence around the whole 205-acre site. However, various areas within the site are fenced, including the treatment system, the disposal cells, the Technical Impracticability(TI) product recovery well found in the TI Zone, and the on-site extraction wells. A portion of the disposal cell fence was removed by vandals about 2 years ago. It has been replaced.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks: There were signs posted on the fences at both the treatment plant and disposal cells.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**
Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) Site inspections
Frequency annually
Responsible party/agency Department of Toxic Substances Control
Contact EdCargile (Name) Project Manager (Title) 916-255-3703 (Phone no.)

Reporting is up-to-date ☒ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes ☒ No ☐ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks: A deed restriction was recorded with Butte County in 2003 and has been incorporated as part of the title. The deed restriction restricts land use in certain areas of the property that continue to be owned and maintained by Beazer East. These areas include the on-site treatment plant, the disposal cells, the TI Zone including product recovery well, PR-1, the on-site extraction wells, and re-injection wells. The rest of the property has been sold and is planned for redevelopment.

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks: Although there is no current evidence of vandalism in the areas that are owned, operated, and maintained by Beazer East as part of the continuing remedial action at the site, there are other areas of the property, owned by a redevelopment company, that are accessible by vehicle where evidence of illegal dumping has occurred.

2. **Land use changes on site** ☒ N/A
Remarks: Currently zoned for commercial / industrial use as in previous years.

3. **Land use changes off site** ☒ N/A
Remarks: Currently zoned for residential/agricultural use as in previous years.

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A

Remarks: Gravel roads onsite. Paved roads offsite are not owned by Beazer East.

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☒ Settlement not evident
Areal extent_____ Depth_____
Remarks: Annual settlement surveys are conducted at the disposal cells to check for any subsidence that may be occurring over time.

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident
Lengths_____ Widths_____ Depths_____
Remarks: _____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
Areal extent_____ Depth_____
Remarks: _____

4. **Holes** ☐ Location shown on site map ☒ Holes not evident
Areal extent_____ Depth_____
Remarks: _____

5. **Vegetative Cover** ☒ Grass ☒ Cover properly established ☒ No signs of stress
☐ Trees/Shrubs (indicate size and locations on a diagram)
Remarks: _____

6. **Alternative Cover (armored rock, concrete, etc.)** ☒ N/A
Remarks: _____

7. **Bulges** ☐ Location shown on site map ☒ Bulges not evident
Areal extent_____ Height_____
Remarks: _____

8. **Wet Areas/Water Damage** ☒ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent_____
☐ Ponding ☐ Location shown on site map Areal extent_____
☐ Seeps ☐ Location shown on site map Areal extent_____
☐ Soft subgrade ☐ Location shown on site map Areal extent_____
Remarks: _____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☒ No evidence of slope instability
Areal extent_____
Remarks: _____

B. Benches ☐ Applicable ☒ N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
   Remarks: _____
   _____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
   Remarks: _____
   _____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
   Remarks: _____
   _____

C. Letdown Channels ☐ Applicable ☒ N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☐No evidence of settlement
   Areal extent_____ Depth_____
   Remarks: _____
   _____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
   Material type_____ Areal extent_____
   Remarks: _____
   _____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
   Areal extent_____ Depth_____
   Remarks: _____
   _____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
   Areal extent_____ Depth_____
   Remarks: _____
   _____

5. **Obstructions** Type_____ ☐ No obstructions
   ☐ Location shown on site map Areal extent_____
   Size_____
   Remarks: _____
   _____

6. **Excessive Vegetative Growth** Type_____
   ☐ No evidence of excessive growth
   ☐ Vegetation in channels does not obstruct flow
   ☐ Location shown on site map Areal extent_____
   Remarks: _____
   _____

D. Cover Penetrations ☒ Applicable ☐ N/A

1. **Gas Vents** ☐Active ☒ Passive
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☒ Good condition

☐ Evidence of leakage at penetration ☐ Needs Maintenance
☐ N/A
Remarks: Landfill gases are not monitored or sampled. The gas vents allow for inorganics to escape to the open air.

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☒ N/A
Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☒ N/A
Remarks: _____

4. **Leachate Extraction Wells**
☒ Properly secured/locked ☒ Functioning ☐ Routinely sampled ☒ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks: There is not a leachate extraction system, but passive leachate collection which is checked regularly and pumped out on an "as needed" basis. The leachate is sent to an appropriate disposal facility.

5. **Settlement Monuments** ☒ Located ☒ Routinely surveyed ☐ N/A
Remarks: The settlement monuments located on both disposal cells 1 and 2 are surveyed annually. The annual survey report for 2006 was available for review.

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs Maintenance
Remarks: _____

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs Maintenance
Remarks: _____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs Maintenance ☐ N/A
Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A

☐ Siltation not evident
Remarks: _____
_____

2. **Erosion** Areal extent_____ Depth_____
☐ Erosion not evident
Remarks: _____
_____

3. **Outlet Works** ☐ Functioning ☐ N/A
Remarks: _____
_____

4. **Dam** ☐ Functioning ☐ N/A
Remarks: _____
_____

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement_____ Vertical displacement_____
Rotational displacement_____
Remarks: _____
_____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks: _____
_____

I. Perimeter Ditches/ ☒ Off-Site Discharge ☒ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☒ Siltation not evident
Areal extent_____ Depth_____
Remarks: _____
_____.

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☒ Vegetation does not impede flow
Areal extent_____ Type_____
Remarks: _____
_____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
Areal extent_____ Depth_____
Remarks: _____
_____

4. **Discharge Structure** ☒ Functioning ☐ N/A
Remarks: There is an open discharge channel between the two disposal cells; a slight vegetative cover was observed.

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
Areal extent_____ Depth_____
Remarks: _____
_____

2. **Performance Monitoring** Type of monitoring_____

☐ Performance not monitored
Frequency_____ ☐ Evidence of breaching
Head differential_____
Remarks: _____
_____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☒ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
☒ Good condition ☒ All required wells properly operating ☐ Needs Maintenance ☐ N/A
Remarks: _____
_____
_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☒ Needs Maintenance
Remarks: Both extraction wells associated with the on-site treatment system, EW-1 and EW-2, were observed to be leaking at the time of the site inspection on December 19, 2007.
_____

3. **Spare Parts and Equipment**
☒ Readily available ☒ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks: _____
_____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps, and Electrical**
☐ Good condition ☐ Needs Maintenance
Remarks: _____
_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks: _____
_____

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks: _____
_____

C. Treatment System ☒ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☒ Air stripping ☒ Carbon adsorbers
☒ Filters____Sand filters_____
☐ Additive (*e.g.*, chelation agent, flocculent)_____
☐ Others_____
☒ Good condition ☐ Needs Maintenance
☒ Sampling ports properly marked and functional
☒ Sampling/maintenance log displayed and up to date
☒ Equipment properly identified
☐ Quantity of groundwater treated annually_____

☐ Quantity of surface water treated annually_____
Remarks_____
_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
☐ N/A ☒ Good condition ☐ Needs Maintenance
Remarks: _____
_____

3. **Tanks, Vaults, Storage Vessels**
☐ N/A ☒ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
Remarks: _____
_____

4. **Discharge Structure and Appurtenances**
☐ N/A ☒ Good condition ☐ Needs Maintenance
Remarks: _____
_____

5. **Treatment Building(s)**
☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks: _____
_____

6. **Monitoring Wells** (pump and treatment remedy)
☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks: Although not all of the wells were visited at the time of the site inspection, the O&M site manager showed the log sheets used to record the information for conducting the required quarterly, semiannual, and annual groundwater monitoring.
_____

D. Monitoring Data

1. Monitoring Data
☒ Is routinely submitted on time ☒ Is of acceptable quality

2. Monitoring data suggests:
☒ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining
Note: In most of the wells.

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☒ N/A
Remarks: Monitored natural attenuation is a contingency remedy for the on- and off-property groundwater plumes excluding the TI Zone (also known as the west plume). However, this remedy has not been implemented because the *in situ* bioremediation remedy is currently being conducted in both the on-site east plume and the off-site plume.
_____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The primary objectives of the remedial actions conducted at the Koppers site are to restore groundwater to drinking water standards both on and off site, exclusive of the TI Zone (also known as the west plume). The implementation of this remedy continues with an on-site extraction and treatment system, augmented by *in situ* bioremediation and product recovery from the TI Zone. The off-site plume is undergoing *in situ* bioremediation as well. The groundwater monitoring well network continues to be monitored on a quarterly basis and reported semiannually. An alternate water supply continues to be provided to seven local residences where remedial action objectives have not yet been met.

The excavation/disposal/capping objectives relating to the soil cleanup and in compliance with ROD Amendment No. 1, have been completed, including the former process area. Soil excavation for disposal Cell No. 2 commenced in 1996 and was completed in September 2002 when process Area 8C became available after the facility closure. All excavated soils were disposed in Cell No. 2, and the final cap was constructed in accordance with approved work plans. The disposal cells are surveyed regularly to ensure limited subsidence. A passive leachate collection system is monitored and any collected leachate is disposed of at an off-site authorized disposal facility. There are monitoring wells surrounding the disposal cells that are sampled regularly to ensure that disposal wastes are not contributing to further groundwater contamination.

For the purposes of conducting this 5-year review, a Condition of Title report was obtained for the Koppers site. A Covenant to Restrict Use of the Property has been incorporated into the title documents and, based on interviews with key personnel and the site inspection, it appears that the institutional controls are currently functioning as intended.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

A site inspection was conducted on December 18 and 19, 2007 concurrently with an interview of the site operations and maintenance manager, K.C. Hendrix. The remedial action systems and current O&M activities and documentation all appeared to be in order. However, there was one issue observed while conducting the site inspection. Both of the on-site extraction wells, EW-1 and EW-2, were leaking on December 19, 2007. As long as these O&M procedures continue to be followed, the remedy should remain protective for the long term. In the short term, the leaking extraction wells should be repaired.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Wells EW-1 and EW-2 were both leaking at the time of the site inspection. Leaking well EW-2 could be of potential concern because PCP has been detected at concentrations above the ROD cleanup level (1 ppb) in EW-2, with values ranging from 12 ppb in 2003 to 2.9 ppb in 2007.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

There is an opportunity to optimize the groundwater monitoring system using principles set forth in long-term monitoring optimization methodologies prepared by EPA and other federal agencies. An optimization evaluation can help to identify opportunities for improving remedy effectiveness, improving efficiency, and speeding progress toward site closure.

Appendix H
Site Inspection Photographs

Photo 1: Onsite water treatment plant

Photo 2: Onsite Soil Disposal Cells

Photo 3: Leachate sumps on Landfill

Photo 4: Landfill gas vents

Photo 5: Landfill settlement monument

Photo 6: Location of former soil storage building

Photo 7: Injection well-3

Photo 8: Product Recovery Well

Photo 9: Biological treatment bed

Photo 10: EW-1

Photo 11: EW-2

Photo 12: Former off-site water treatment plant

Photo 13: Wells RW-11 and RW-12

Appendix I
Technical Interview Checklists

APPENDIX I

Interview Checklists

TECHNICAL INTERVIEW DOCUMENTATION FORM

The following is a list of individuals interviewed for this 5-year review. the attached contact record(s) provide a detailed summary of the interviews.

Name	Title/Position	Organization	Date
K.C. Hendrix	Site Operations and Maintenance Manager	GeoTrans, Inc.	12/18/07 and 12/19/07
Name	**Title/Position**	**Organization**	**Date**
Phil Woodward	Project Manager	Regional Water Quality Control Board (RWQCB)	01/08/2008
Name	**Title/Position**	**Organization**	**Date**
Jennifer Abrahams	Project Manager	GeoTrans, Inc.	1/11/2008
Name	**Title/Position**	**Organization**	**Date**
Mike Tischuk	Project Manager	Beazer East, Inc.	1/28/2008
Name	**Title/Position**	**Organization**	**Date**
Ed Cargile	Project Manager	Department of Toxic Substances Control (DTSC)	01/29/2008

INTERVIEW RECORD

Site Name: Koppers Company, Inc. Superfund Site	**EPA ID No.:** CAD009112087	
Subject: Interview with Operations and Maintenance Site Manager	**Time:** 1:00 pm	**Date:** 12/18/2007
Type: ☐ Telephone ☒Visit ☐ Other **Location of Visit:** Oroville (Butte County), CA	☐ Incoming ☐ Outgoing	

Contact Made By:

Name: Kim Hoang	**Title:** Project Manager	**Organization:** EPA Region 9

Individual Contacted:

Name: K.C. Hendrix	**Title:** Site Manager	**Organization:** GeoTrans, Inc.
Telephone No: 530-370-5481 **Fax No:** 916-853-1860 **E-Mail Address:** kchendrix@geotransinc.com	**Street Address:** 3035 Prospect Park Drive, Suite 40 **City, State, Zip:** Rancho Cordova, CA 95670	

Summary Of Conversation

Caroline Ziegler and Seena Babu, representatives from CH2M HILL, and Kim Hoang, representative of EPA Region 9, conducted an interview with K.C. Hendrix (GeoTrans, Inc.) on December 18, 2007 at 1:00 pm, followed by a site inspection of on-site property including treatment plant, disposal cells, and TI Zone area. Another interview was conducted on December 19, 2007 at 9:00 am to check available documentation and records, followed by a site visit to the off-site property.

K.C. Hendrix indicated that his overall impression of the treatment system is that it is functioning as per the operations and maintenance (O&M) requirements. According to him, the current treatment remedy is adequate and the plume is being contained. Other issues/topics discussed are briefly documented below:

- There are no effluent discharge permits available onsite.
- All 200 acres of the site are open with fencing only around the treatment plant and disposal cells.
- Vandalism and trespassing is a concern at all times. The landfill fence was cut out and stolen in 2005. An alarm system is maintained in the on-property treatment plant to prevent unauthorized entry to the plant. The alarm also autodials K.C. Hendrix in case of emergency.
- On-site property is currently zoned for commercial/industrial use, and off-site property is currently zoned for residential/agricultural use.
- O&M costs are for electrical system maintenance and repairs.
- The disposal cell leachate level is monitored monthly and extracted as required. The last leachate extraction was in 2006 and approximately 4,000 gallons were removed. Gas vents are open to air with no sampling/monitoring of landfill gases. There is a vegetated drainage channel between the two disposal cells for discharge of runoff from the covers of the disposal cells.
- Boron occurs naturally in the area and is detected occasionally during groundwater sampling. MW-8 is sampled monthly for boron and quarterly for PCP.

Site documents were inspected on December 19, 2007 and found satisfactory. Documents included the Site Heath and Safety Plan, Operations and Maintenance Manual, Post Closure Maintenance and Monitoring Plan, K.C. Hendrix training records, soil disposal cell records, inspection log sheets, operation records for the groundwater remediation system, daily inspection sheets, weekly and monthly inspection reports, extraction well flow records, and treatment plan discharge records.

After the interview, it was determined that a list of questions would also be sent to GeoTrans, Inc. representative Jennifer Abrahams for further information (including information on effluent discharge compliance records and permits).

INTERVIEW RECORD

Site Name: Koppers Company, Inc. Superfund Site	**EPA ID No.:** CAD009112087	
Subject: Interview with RWQCB contact	**Time:** 2:30 pm	**Date:** 1/8/2008
Type: ☒ Telephone ☐ Visit ☐ Other **Location of Visit:**	☐ Incoming ☒ Outgoing	

Contact Made By:

Name: Caroline Ziegler	**Title:** Project Manager	**Organization:** CH2M HILL, Inc.

Individual Contacted:

Name: Phil Woodward	**Title:** Project Manager	**Organization:** Regional Water Quality Control Board (RWQCB)
Telephone No: 530-224-4853 **Fax No:** 530- 224-4857 **E-Mail Address:** pwoodward@waterboards.ca.gov	**Street Address:** Redding Branch Office 415 Knollcrest Drive, Suite 100 **City, State, Zip:** Redding, CA 96002	

Summary Of Conversation

Caroline Ziegler and Seena Babu, representatives from CH2M HILL, conducted a telephone interview with Phil Woodward (RWQCB) on January 8, 2008 at 2:30 pm as part of the agency interviews to be conducted for the 5-year Koppers site review report. Phil Woodward has been involved with the Koppers site since 1987/1988 as a State agency contact from the RWQCB. Phil indicated that his overall impression of the site and the treatment system is that it is functioning as expected. According to him, the groundwater issues are being addressed by bioremediation and natural attenuation and the on-property treatment plant is functioning as expected. Other issues/topics discussed are briefly documented below:

- Landfill: RWQCB has no involvement in the day-to-day issues of the landfill and monitoring wells at the Koppers site. Phil Woodward mentioned that RWQCB was involved during the design and construction phase of the landfill and he agrees that all requirements have been met during construction. EPA is involved with daily issues related to landfill operation, groundwater monitoring around the landfill, and vegetative cover.
- RWQCB receives semiannual groundwater monitoring reports from Beazer East, Inc./GeoTrans, Inc. and agrees that the reports indicate a decreasing trend in concentration of contaminants of concern at the site.
- Phil Woodward receives a discharge monitoring report from Beazer regularly. Waste discharge monitoring reports were required to be sent to RWQCB when the wood-treating facility was operating. Since the facility has ceased operation and the site has become a Superfund site under EPA, RWQCB is not required to issue permits on a Superfund site, although substantive requirements still must be met. According to Phil, Beazer is not really required to send the discharge monitoring report to RWQCB. Phil also thought that groundwater monitoring could likely be reduced from semiannual to annual monitoring, if needed.
- Phil confirmed that he has not received any complaints or issues from the project in the last 2 years, including complaints related to vandalism.
- Phil thinks that both natural processes (attenuation) and the *in situ* treatment has contributed to the decreasing trend of contaminant levels in groundwater. He added that Beazer and its consultants keep the board well informed on site activities and the status of the project.
- RWQCB does not keep up with the &M requirements of the site. EPA is responsible for verifying that the groundwater monitoring and treatment is performed as per requirements.
- The Annual Groundwater Monitoring Report, 2006 (GeoTrans, Inc.) refers to NPDES Permit No. CA 0082988 for meeting treatment and discharge objectives. Phil indicated that this permit is no longer in force. It had been established previously

while the site was operating; however, because the site is now a Superfund site, no permits are required and only substantive requirements must be followed.

- Phil mentioned that he was informed about a complaint to the State and Local Public Health Department from a resident of Oroville regarding a pancreatic cancer spike in the region near the Koppers site on the day of this interview. This is the first community concern that he had heard of about the site in a very long time.
- Phil did not have any further comments, suggestions, or recommendations regarding the site. He did say that there is an opportunity for optimization by reducing groundwater monitoring at the site.

INTERVIEW RECORD

Site Name: Koppers Company, Inc. Superfund Site	**EPA ID No.:** CAD009112087	
Subject: Interview with Project Manager of Geo Trans, Inc.	**Time:** 10:00 am	**Date:** 1/11/2008
Type: ☒ Telephone ☐ Visit ☐ Other **Location of Visit:**	☐ Incoming ☒ Outgoing	

Contact Made By:

Name: Caroline Ziegler	**Title:** Project Manager	**Organization:** CH2M HILL, Inc.

Individual Contacted:

Name: Jennifer Abrahams	**Title:** Project Manager	**Organization:** GeoTrans, Inc.
Phone No: 916-853-1800 **Fax No:** 916-853-1860 **E-mail Address:** jabrahams@geotransinc.com	**Street Address:** 3035 Prospect Park Drive, Suite 40 **City, State, Zip:** Rancho Cordova, CA 95670	

Summary Of Conversation

Caroline Ziegler and Seena Babu, representatives from CH2M HILL, conducted a telephone interview with Jennifer Abrahams (GeoTrans, Inc.) on January 11, 2008 at 10:00 am as part of the technical interviews to be conducted for the 5-year Koppers review report. Jennifer Abrahams has been involved with the Koppers site for the last 12 years as the Project Manager. GeoTrans, Inc. is a consultant to the potentially responsible party (PRP) Beazer East, Inc. and assists in complying with the ROD and Consent Decree requirements related to groundwater monitoring and treatment.

Jennifer indicated that her overall impression of the site and the treatment system is that it is functioning as expected and groundwater remediation is progressing. According to Jennifer, the off-property groundwater extraction and treatment system was put into place in 1993, and the on-property system was started in February 1994. The primary contaminant of concern in groundwater is pentachlorophenol (PCP). The off-property groundwater remediation system was taken offline in 1995 because the plume had retreated upgradient of the two extraction wells. In 1998, the groundwater remediation was enhanced both on- and off-property using *in situ* bioremediation techniques. The groundwater monitoring data shows an overall decreasing trend of PCP both on- and off- property. In 2006, GeoTrans, Inc. noted the presence of PCP in one of the private off-property wells through routine alternate water supply program (AWSP) monitoring. An oxygen releasing compound (ORC) was added to the well to stimulate bioremediation of the PCP, and surrounding wells in the vicinity continue to be monitored.

Other issues/topics discussed are briefly documented below:

- Concentrations of PCP in the on-property wells are continuing to decrease. The TI zone is self contained; hence, there are no issues with transfer of contaminants to surrounding areas. MW-24, immediately downgradient of the TI zone, has had very low concentrations (<5 ug/L) of polynuclear aromatic hydrocarbons (PAHs) detected since 1998. The presence of PAHs in groundwater at MW-24 was attributed to the production of biosurfactants stimulated by the oxygen and nutrient addition to the TI zone that was part of the TI Zone bioremediation program started in 1995. The addition of ORC and nutrients disturbed the natural equilibrium of the TI zone, and the resultant biosurfactants mobilized some PAHs from the creosote. As a result, bioremediation has been discontinued at the TI Zone. PAHs have not been detected in the influent of the treatment system.
- Jennifer indicated that Beazer East, Inc. and GeoTrans, Inc. are working toward optimization based on the sampling data. The off-property plume is being remediated, and the groundwater monitoring results show a decreasing trend.
- O&M costs:

  There were unexpected O&M costs due to an unanticipated high concentration of boron in MW-8 in 2002. Hence,

GeoTrans began to extract groundwater from MW-8 and blend this water with the influent to the groundwater treatment system to get effluent boron concentrations below the ROD standard. The remedy of groundwater extraction at MW-8 and blending with the influent was approved by EPA, RWQCB, and DTSC.

O&M costs for 2006 were approximately $190,000, which included $32,000 for groundwater sampling and $158,000 for operating the system and labor.

O&M costs for 2007 were approximately $208,000, which included $28,000 for groundwater sampling and $180,000 for operating the system, utilities, parts, and labor.

- Opportunity to optimize sampling in the O&M plans:
- Jennifer mentioned that a conservative approach to optimize sampling at the site was initiated in the 1990s. Because the concentrations in the plume have continued to decrease over the years, GeoTrans is considering optimization in sampling. A few of the approaches suggested include:

  Conducting only confirmation and boundary sampling

  Reducing the number of wells sampled

  Reducing the frequency of sampling

  Reducing the parameters analyzed

  Characterizing and defining the plume annually rather than semiannually
- A copy of any hazardous waste manifests of contaminated carbon or other wastes generated as part of the site remediation should be on file with Bob Fisher of Beazer East, Inc., located in Pittsburgh, PA.
- Jennifer indicated that there is no current NPDES permit in place for effluent discharge. She indicated that the permit mentioned in the 2006 annual report had applied to off-property, but it is no longer in force. The NPDES permit for the discharge of off-property effluent was issued in 1992 and rescinded in 1997. There is not an on-property NPDES permit.
- The recent complaint from an Oroville resident to the State and Local Public Health Department that the pancreatic cancer spike in the region is due to the 1987 fire at the Koppers site was discussed. Jennifer stated that she thought a correlation between the pancreatic cancer cluster and the fire at the site was unlikely.
- Jennifer did not have any other comments, suggestions, or recommendations regarding the site.

INTERVIEW RECORD

Site Name: Koppers Company, Inc. Superfund Site	**EPA ID No.:** CAD009112087	
Subject: Interview with Project Manager of Beazer East, Inc.	**Time:** 10:00 am	**Date:** 1/28/2008
Type: ☒ Telephone ☐ Visit ☐ Other **Location of Visit:**	☐ Incoming ☒ Outgoing	

Contact Made By:

Name: Caroline Ziegler	**Title:** Project Manager	**Organization:** CH2M HILL, Inc.

Individual Contacted:

Name: Mike Tischuk	**Title:** Project Manager	**Organization**: Beazer East, Inc.
Phone No: (412) 208-8809 **E-mail Address:** Mike.Tischuk@hanson.biz	**Street Address:** One Oxford Centre, Suite 3000 **City, State, Zip:** Pittsburgh, PA 15219	

Summary Of Conversation

Caroline Ziegler and Seena Babu, representatives from CH2M HILL, conducted a telephone interview with Mike Tischuk (Beazer East, Inc.) on January 28, 2008 at 10:00 am as part of the technical interviews conducted for the Koppers site 5-year review report. Mike has been involved with the Koppers site for the last 14 years as the Project Manager. Beazer East, Inc. is the PRP and is responsible for complying with the ROD and Consent Decree requirements related to soil and groundwater monitoring and treatment. The Koppers site was formerly operated by Koppers Company, Inc., which was sold in 1989 and then became Koppers Industries, Inc.

Mike Tischuk indicated that his overall impression of the site and the treatment system is that it is functioning as expected and groundwater remediation is progressing.

Other issues/topics discussed are briefly documented below:

- According to Mike, review of the groundwater monitoring reports indicates that the contaminated plume shows a decreasing trend. Mike discussed that the TI Zone, which is under the Technical Impracticability Waiver, is discrete, isolated, and has no receptors.
- Mike agreed that the Koppers site follows a set O&M plan.
- O&M costs:
  - Beazer East, Inc. is trying to cut down O&M costs by optimizing the groundwater sampling events
  - There have been no recent unexpected O&M costs
- Opportunity to optimize sampling in the O&M plans:

The following approaches were suggested:

- Reduce the number of wells sampled
- Reduce the frequency of sampling
- Prepare a report for optimization planning
- Mike indicated that in the near future, EPA and other regulatory agencies might be more open to the idea of optimization considering that the Koppers site has a lot of historical data

- The recent complaint from an Oroville resident to the State and Local Public Health Department that the pancreatic cancer spike in the region is due to the 1987 fire at the Koppers site was discussed. Mike stated that he thought a

correlation between the pancreatic cancer cluster and the fire at the site was unlikely because none of the residents affected live close to the plume. He also indicated that a dioxin study was conducted after the 1987 fire and no remarkable results were found.

- Mike stated that the Oroville residents are hoping for industrialists to develop the Koppers site area and bring them more jobs.
- Mike suggested that EPA should try and reduce the cost associated with the Koppers site.
- He did not have any other comments, suggestions, or recommendations regarding the site.

INTERVIEW RECORD

Site Name: Koppers Company, Inc. Superfund Site	**EPA ID No.:** CAD009112087	
Subject: Interview with DTSC contact	**Time:** 10:00 am	**Date:** 1/29/2008
Type: ☒ Telephone ☐ Visit ☐ Other **Location of Visit:**	☐ Incoming ☒ Outgoing	

Contact Made By:

Name: Caroline Ziegler	**Title:** Project Manager	**Organization:** CH2M HILL, Inc.

Individual Contacted:

Name: Ed Cargile	**Title:** Project Manager	**Organization:** Department of Toxic Substances Control (DTSC)
Telephone No: 916-255-3703 **Fax No:** 916-255-3697 **E-Mail Address:** ECargile@dtsc.ca.gov	**Street Address:** 8800 Cal Center Drive **City, State, Zip:** Sacramento, CA 95826-3200	

Summary Of Conversation

Caroline Ziegler and Seena Babu, representatives from CH2M HILL, conducted a telephone interview with Ed Cargile (DTSC) on January 29, 2008 at 10:00 am as part of the agency interviews conducted for the Koppers 5-year review report. Ed Cargile has been involved with the Koppers site since 1989 as an agency contact from the DTSC.

Ed indicated that his overall impression of the site and the treatment system is that it is functioning as expected. According to Ed, there has been a noticeable reduction of the PCP plume, and site cleanup is progressing quicker than expected.

Other issues/topics discussed are briefly documented below:

- Landfill: As the PRP, Beazer East, Inc. signed a letter of certification with DTSC wherein they discussed the landfill construction activities and concurred on the remedies.
- Responsibilities of the DTSC include both groundwater and soil contamination. EPA has been the lead agency since 1984; The DTSC, as well as the RWQCB, serve as following agencies for the remedial activities being conducted at the site. The DTSC and EPA have reviewed all the necessary documents pertaining to groundwater and soil contamination.
- The DTSC receives monthly discharge monitoring reports and semiannual groundwater monitoring reports from Beazer, Inc./GeoTrans, Inc. Ed Cargile also has frequent conversations with Beazer and their consultant, GeoTrans, Inc.
- The DTSC has to conduct site visits at least once per year to confirm that the Koppers site is complying with the requirements of the Deed Restriction. Ed indicated that they usually go out to the site to check if anything is out of the normal (for example, any land features that impact groundwater directly or indirectly). Ed stated that the owner is not allowed to discharge to groundwater, change balance of infiltration in any way, or construct injection wells other than those that already exist for remedial purposes.
- Ed stated that he has not received any complaints or issues from the project. The only contact was in regard to the potential pancreatic cancer spike in the region due to the 1987 fire at Koppers site. According to Ed, a correlation between the pancreatic cancer cluster and the fire at the site was unlikely and there should be no issues of exposure.

Ed did not have any other comments, suggestions, or recommendations regarding the site. He said that this is a good stage of the project to aim for optimization at the site.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Superfund Information Systems

Operable Units (OUs) at ARKWOOD, INC. (EPA ID: ARD084930148)

Back to the Profile for this Site

The data and content on this page were last updated on Thursday, August 15, 2013.

Additional Site Documents | Other Names for this Site (Aliases) | Contaminants of Concern | Cleanup Activities | Operable Units (OUs) | Site Contacts | GPRA Measures

Many NPL sites are large and complicated. These sites are often broken up into smaller areas to make cleanup easier and more manageable. These areas are called “Operable Units” or OUs. Activities and funding that are applicable to the entire site are tracked under OU 00, often called the “Sitewide” operable unit. All sites have this operable unit. This page provides a list of all of the Operable Units at this site.

see the glossary for definitions of types of contaminants and operable units (OUs) >>

OU ID	Name	Types of Contaminants found at this OU	Cleanup Technologies Used	Cleanup Status at this OU
01	GROUNDWATER/SOIL	No Contaminants	No Cleanup Technologies	Study Not Begun
00	SITEWIDE	Base Neutral Acids; Dioxins/Dibenzofurans	Access Restriction; Alternate Drinking Water; Not Specified; Cap; Deed Notices; Disposal; Excavation; Incineration; Monitoring; Natural Attenuation; Revegetation; Soil Washing	Construction Complete

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8.3.1 FAULT ZONE

THE KOPPERS SITE IS NOT LOCATED WITHIN 61 METERS (200 FEET) OF A FAULT. THEREFORE, THE FAULT ZONE REQUIREMENT OF 40 CFR SECTION 264.18(A) IS SATISFIED.

8.3.2 FLOODPLAIN

A HAZARDOUS WASTE TREATMENT FACILITY LOCATED IN A 100-YEAR FLOODPLAIN MUST BE DESIGNED, CONSTRUCTED, OPERATED, AND MAINTAINED TO PREVENT WASHOUT OF ANY HAZARDOUS WASTE BY A 100-YEAR FLOOD. THE KOPPERS SITE IS LOCATED IN A 100-YEAR FLOODPLAIN OF THE FEATHER RIVER. THE REQUIREMENTS OF 40 CFR PART 264.18(B) MUST BE MET. THIS MEANS THAT FACILITIES SUCH AS THE SOIL WASHING UNIT WILL HAVE TO BE DESIGNED, CONSTRUCTED, OPERATED, AND MAINTAINED TO PREVENT WASHOUT FROM A 100-YEAR FLOOD.

8.4 TO BE CONSIDERED CRITERIA

IN ESTABLISHING SELECTED REMEDIAL ALTERNATIVES, EPA CONSIDERS VARIOUS PROCEDURES, CRITERIA, ADVISORIES, AND RESOLUTIONS. THESE "TO BE CONSIDERED" CRITERIA (TBCS) DO NOT CARRY THE WEIGHT OF ARARS, BUT ARE RELEVANT TO THE CLEANUP OF THE SITE. THE FOLLOWING DISCUSSION PRESENTS SELECTED CRITERIA RELEVANT TO THE SELECTION OF REMEDIAL ALTERNATIVES.

8.4.1 STATE CRITERIA FOR GROUND WATER CLEANUP

CALIFORNIA'S CRITERIA FOR EVALUATING DRINKING WATER QUALITY AND GROUND WATER CLEANUP ARE ADVISORY DRINKING WATER ACTION LEVELS AND ADVISORY APPLIED ACTION LEVELS RESPECTIVELY. THESE CRITERIA ARE PRESENTED IN TABLE 8-2.

DRINKING WATER ACTION LEVELS ARE HEALTH-BASED CONCENTRATION LIMITS SET BY THE DEPARTMENT OF HEALTH SERVICES (DHS) TO LIMIT PUBLIC EXPOSURE TO SUBSTANCES NOT YET REGULATED BY PROMULGATED STANDARDS.

APPLIED ACTION LEVELS (AALS) WERE DEVELOPED BY DHS FOR USE WITH THE CALIFORNIA GUIDANCE IN THE "SITE MITIGATION DECISION TREE." AALS ARE GUIDELINES THAT DHS USES TO EVALUATE THE RISK A SITE POSES. WHILE THE DHS APPLIED ACTION LEVELS ARE NOT PROMULGATED STANDARDS AND ARE NOT, THEREFORE, ARARS, THEY HAVE BEEN TAKEN INTO CONSIDERATION IN DEVELOPING CLEANUP STANDARDS FOR THE KOPPERS SITE PURSUANT TO THE NATIONAL CONTINGENCY PLAN (NCP).

8.4.2 CALIFORNIA RESOLUTION 68-16

RESOLUTION 68-16 IS CALIFORNIA'S "STATEMENT OF POLICY WITH RESPECT TO MAINTAINING HIGH QUALITY OF WATERS IN CALIFORNIA". EPA REGARDS RESOLUTION 68-16 AS CRITERIA TO ESTABLISH GROUND WATER CLEANUP LEVELS. THE POLICY REQUIRES MAINTENANCE OF EXISTING WATER QUALITY UNLESS IT IS DEMONSTRATED THAT A CHANGE WILL BENEFIT THE PEOPLE OF THE STATE, WILL NOT UNREASONABLY AFFECT BENEFICIAL USES OF THE WATER, AND WILL NOT RESULT IN WATER QUALITY LESS THAN PRESCRIBED BY OTHER STATE POLICIES.

A BENEFICIAL USE OF THE GROUND WATER IN THE AQUIFER SYSTEM IS DRINKING WATER. ESTABLISHING A CLEANUP LEVEL WHICH MAINTAINS THIS BENEFICIAL USE SHOULD ATTAIN THE REQUIREMENTS OF RESOLUTION 68-16.

8.4.3 CENTERS FOR DISEASE CONTROL DIOXIN ADVISORIES

THE CENTERS FOR DISEASE CONTROL (CDC) HAVE ADVISED EPA ON SETTING CLEANUP STANDARDS FOR SUPERFUND SITES WITH DIOXINS IN SOILS. SOILS ON SITES THAT ARE CURRENTLY OR POTENTIALLY A RESIDENTIAL AREA HAVE BEEN CLEANED UP TO 1 UG/L. THE CDC HAS ALSO ADVISED THAT INDUSTRIAL EXPOSURE SHOULD BE LIMITED TO SOILS LESS THAN 5-7 UG/L. NO ADVISORY LEVEL HAS BEEN DEVELOPED FOR AGRICULTURAL LAND USAGE, BUT CURRENT INDICATION IS THAT THE LEVEL MAY BE LESS THAN THAT FOR RESIDENTIAL OR INDUSTRIAL LAND USE.

#SCAA

9.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

TWELVE SOIL ALTERNATIVES AND TWO GROUND WATER ALTERNATIVES WERE EVALUATED AND COMPARED FOR THE

KOPPERS SITE. EACH OF THE ALTERNATIVES WERE EVALUATED WITH RESPECT TO EPA'S NINE EVALUATION CRITERIA.

1) OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT,
2) COMPLIANCE WITH ARARS,
3) SHORT TERM EFFECTIVENESS IN PROTECTING HUMAN HEALTH AND THE ENVIRONMENT,
4) LONG TERM EFFECTIVENESS AND PERMANENCE IN PROTECTING HUMAN HEALTH AND THE ENVIRONMENT,
5) REDUCTION OF TOXICITY, MOBILITY, AND VOLUME OF CONTAMINANTS BY TREATMENT,
6) TECHNICAL AND ADMINISTRATIVE FEASIBILITY OF IMPLEMENTATION,
7) CAPITAL AND OPERATION AND MAINTENANCE COSTS,
8) COMMUNITY ACCEPTANCE,
9) STATE ACCEPTANCE.

A SUMMARY OF THE EVALUATION OF ALTERNATIVES WITH RESPECT TO THESE CRITERIA IS PRESENTED IN TABLES 9-1 TO 9-5. SINCE COMMENTS ON EACH ALTERNATIVE WERE NOT RECEIVED FROM THE STATE OF CALIFORNIA OR THE COMMUNITY, THE LAST TWO CRITERIA ARE NOT INCLUDED IN THE TABLES. A GENERAL DISCUSSION OF STATE AND COMMUNITY ACCEPTANCE FOLLOWS. A FULL DOCUMENTATION OF ALL STATE AND COMMUNITY INPUT IS PROVIDED IN THE RESPONSE SUMMARY.

A BRIEF DISCUSSION OF THE COMPARISON OF ALTERNATIVES FOLLOWS THE SECTIONS ON STATE AND COMMUNITY ACCEPTANCE.

9.1 STATE ACCEPTANCE

THE STATE OF CALIFORNIA SUPPORTS THE TREATMENT AND DISPOSAL OPTIONS PROPOSED BY EPA, AND HAS THE FOLLOWING CONCERNS OR SUGGESTIONS REGARDING THE SELECTED REMEDIES:

- THE CLEANUP LEVEL FOR DIOXINS/FURANS IN SOIL SHOULD BE SET AT THE 10(-6) CANCER RISK LEVEL (30 PPT).

- THE CLEANUP LEVEL FOR PCP IN GROUND WATER SHOULD BE LOWER THAN THE STATE ACTION LEVEL OF 2.2 PPB TO ACCOUNT FOR OTHER CARCINOGENS.

THE MAJORITY OF THE COMMENTS RAISED BY THE STATE ARE RELEVANT TO THE CONSENT DECREE FOR THE REMEDIAL DESIGN/REMEDIAL ACTIONS, OR THE DETAILS OF THE RD/RA. THESE CONCERNS WILL BE SAVED FOR CONSIDERATION AT THE APPROPRIATE TIME.

9.2 COMMUNITY ACCEPTANCE

EXCEPT FOR ONE LETTER, ALL COMMUNITY COMMENTS WERE PROVIDED DURING A PUBLIC HEARING ON THE PROPOSED PLAN. UNIFIED COMMENTS ON THE PROPOSED PLAN WERE NOT PROVIDED BY ANY COMMUNITY GROUP AS A WHOLE. THE FOLLOWING CONCERNS FROM INDIVIDUALS WERE RAISED:

- CLEANUP LEVELS SHOULD NOT BE GREATER THAN BACKGROUND.

- SOIL FIXATION SHOULD NOT BE USED SINCE IT DOES NOT REMOVE CONTAMINATION.

SEVERAL COMMUNITY COMMENTS ALSO DEALT WITH THE IMPLEMENTATION OF THE REMEDIAL ACTION AND CAN NOT BE DEFINITIVELY ADDRESSED AT THIS TIME. THESE WILL BE CONSIDERED AT THE APPROPRIATE TIME.

9.3 COMPARATIVE ANALYSIS OF ALTERNATIVES FOR UNIT S1

THE ALTERNATIVES EVALUATED FOR UNIT S1 ARE EXCAVATION AND SOIL WASHING (S1-1), IN SITU BIODEGRADATION (S1-2), EXCAVATION AND ONSITE LANDFILLING (S1-3), AND LIMITED EXCAVATION AND CAPPING (S1-4). ALL ALTERNATIVES ARE EVALUATED IN TABLE 9-1.

ALTERNATIVES S1-3, AND S1-4 DO NOT PROVIDE ADEQUATE OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT, OR COMPLY WITH ARARS. S1-4 HAS PROBLEMS IN LONG-TERM EFFECTIVENESS, SINCE IT WILL NOT ACHIEVE REMEDIAL OBJECTIVES. NEITHER S1-3 NOR S1-4 REDUCES TOXICITY, MOBILITY AND VOLUME BY TREATMENT.

BOTH S1-1 AND S1-2, ARE PROTECTIVE, WOULD COMPLY WITH ARARS, AND INVOLVE TREATMENT TO REDUCE

SOURCES.

ADDITIONALLY, AN INVESTIGATION OF AIR EMISSIONS FROM KOPPERS' ONGOING WOOD TREATING OPERATIONS IS UNDERWAY BY EPA. AT THIS POINT, IT IS UNCLEAR WHETHER THESE EMISSIONS POSE A PUBLIC HEALTH THREAT, OR WHETHER THEY WOULD NEED TO BE ADDRESSED UNDER CERCLA OR OTHER STATUTORY AUTHORITIES. IT IS POSSIBLE THAT FUTURE ACTIONS WILL BE NEEDED TO ADDRESS THESE EMISSIONS.

#SSC

5.0 SUMMARY OF SITE CHARACTERISTICS

SITE CHARACTERIZATION ACTIVITIES AT THE KOPPERS SITE HAVE INVOLVED SAMPLING AND ANALYSIS OF SOIL, GROUND WATER, SURFACE WATER, SEDIMENT, AND AIRBORNE PARTICULATE MATTER.

CHEMICAL ANALYSES OF SOILS FROM THE KOPPERS SITE REVEALED THE PRESENCE OF WOOD TREATMENT FORMULATION CHEMICALS IN ON-SITE SOILS, RESULTING FROM PAST PROCESSING AND WASTE MANAGEMENT PRACTICES AT THE KOPPERS SITE. WOOD TREATMENT SOLUTIONS DRIPPED ONTO THE GROUND AS THE TREATED WOODS WERE REMOVED FROM THE PROCESS AREAS AND AS TREATED WOOD WAS HANDLED. WASTE WATERS FROM WOOD TREATING PROCESSES WERE COLLECTED IN UNLINED PONDS. IN ADDITION, PROCESS FIRES IN 1963 AND 1987 RESULTED IN RELEASES OF PENTACHLOROPHENOL (PCP) AND POLYCHLORINATED DIBENZODIOXINS DIBENZOFURANS (PCDDS/PCDFS) TO SITE SOILS. CONTAMINATION RELEASES TO ONSITE SOIL FROM THE 1987 FIRE WERE ADDRESSED BY A MITIGATION PROGRAM DIRECTED BY EPA.

TABLE 5-1 SUMMARIZES THE RESULTS OF ALL SOIL SAMPLING AT THE SITE. PCP WAS FREQUENTLY DETECTED, SHOWING ELEVATED CONCENTRATIONS AT THE PROCESS AREA, THE FORMER CELLON BLOWDOWN AREA, THE POLE WASHING AREA, AND THE AREAS ALONG THE RAILCAR TRACKS NORTH OF THE PROCESS AREA. PCP WAS ALSO DETECTED IN TWO OFF-SITE SOIL SAMPLES WHERE CONTAMINATED WELL WATER WAS USED FOR IRRIGATION. POLYNUCLEAR AROMATIC HYDROCARBONS (PAHS) WERE DETECTED ON SITE AT ELEVATED CONCENTRATIONS IN AREAS IN WHICH CREOSOTE WAS STORED OR USED; FOR INSTANCE, IN THE VICINITY OF THE FORMER CREOSOTE POND AND THE PROCESS AREA. PHENANTHRENE, A PAH COMPOUND, WAS DETECTED IN ONE OFF-SITE SAMPLE FROM THE IRRIGATED PROPERTY.

PCDD/PCDFS WERE DETECTED IN SITE SOILS. THE HIGHEST LEVELS OF PCDDS/PCDFS OBSERVED IN SAMPLES COLLECTED BY KOPPERS FOR THE RI/FS WERE IN SOILS FROM THE KOPPERS PROCESS AREA, AND IN THE FORMER CELLON BLOWDOWN AREA.

ARSENIC, CHROMIUM, AND COPPER WERE USED BY KOPPERS IN THE COPPER CHROMATED ARSENATE (CCA) PROCESS. ELEVATED CONCENTRATIONS OF ALL THREE METALS WERE FOUND AT THE PROCESS AREA, WITH ELEVATED LEVELS OF ARSENIC AND CHROMIUM ALSO DETECTED NORTH AND WEST OF THE PROCESS AREA WHERE WOOD TREATED WITH THESE METALS WAS STORED.

GROUND WATER IN THE AREA OCCURS IN THREE AQUIFERS. THE PHYSICAL AND CHEMICAL CHARACTERISTICS OF THESE AQUIFERS HAVE BEEN CHARACTERIZED IN THE REMEDIAL INVESTIGATION. GROUND WATER FROM THE SITE FLOWS IN A GENERALLY SOUTHERLY DIRECTION. CONTAMINATION ORIGINATING FROM THE KOPPERS SITE WAS DETECTED IN OFF-SITE WELLS IN 1972. IN ORDER TO PREVENT FURTHER OFF-SITE MIGRATION, TWO RECOVERY WELLS WERE INSTALLED ON THE KOPPERS PROPERTY TO INTERCEPT CONTAMINATED GROUND WATER. AT THE PRESENT TIME, ONLY ONE OF THESE WELLS (RW-2) IS STILL IN OPERATION.

GROUND WATER QUALITY HAS BEEN CHARACTERIZED BY SAMPLING THROUGHOUT THE RI/FS, BEGINNING IN JUNE, 1986. DATA USED TO ASSESS SITE RISKS WERE COLLECTED THROUGH DECEMBER, 1987. QUARTERLY MONITORING OF GROUND WATER HAS CONTINUED TO THE PRESENT AND RESULTS FROM THIS TESTING CAN BE FOUND IN THE ADMINISTRATIVE RECORD. THIRTY-NINE ON-SITE WELLS AND 105 OFF-SITE WELLS WERE SAMPLED DURING THE RI EFFORTS. SAMPLES WERE COLLECTED FROM BOTH MONITORING WELLS AND EXISTING PRIVATE WELLS. GROUND WATER SAMPLES WERE COLLECTED USING STANDARD EPA PROTOCOL AND WERE ANALYZED FOR VOLATILE AND SEMIVOLATILE ORGANICS AND INORGANICS.

CHEMICALS DETECTED IN ON-SITE AND OFF-SITE GROUND WATER ARE LISTED IN TABLE 5-2, ALONG WITH THE FREQUENCY OF DETECTION, GEOMETRIC MEAN, AND MAXIMUM CONCENTRATIONS.

PCP WAS DETECTED WITH HIGH FREQUENCY IN BOTH ON- AND OFF-SITE MONITORING WELLS. THE HIGHEST LEVELS WERE OBSERVED IN THE FORMER CELL ON BLOWDOWN DISCHARGE AREA NEXT TO THE LOUISIANA-PACIFIC (L-P) PROPERTY LINE. PCP WAS DETECTED IN OFF-SITE GROUND WATER, UP TO 2 MILES SOUTH OF THE SITE, IN A NARROW PLUME WHICH APPEARS TO FOLLOW THE ROUTE OF A BURIED PALEOVALLEY.

ISOPROPYL ETHER (IPE) HAS BEEN DETECTED IN BOTH ON- AND OFF-SITE WELLS ASSOCIATED WITH THE PCP PLUME. PCP AND IPE ORIGINATED FROM THE SAME WOOD TREATMENT FORMULATION. THE HIGHEST IPE CONTAMINATION WAS DETECTED IN THE PROCESSING AREA. IPE WAS DETECTED IN OFF-SITE GROUND WATER UP TO APPROXIMATELY 1 MILE SOUTH OF THE SITE.

POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) HAVE BEEN DETECTED IN BOTH ON- AND OFF-SITE GROUND WATER. THE HIGHEST CONCENTRATIONS OF PAHS WERE DETECTED AT THE LOCATION OF THE FORMER CREOSOTE POND AND IN THE PROCESS AREA. DETECTED OFF-SITE VALUES OCCURRED IN ISOLATED WELLS AND DID NOT FORM A DISTINCT PLUME.

PCDDS/PCDFS ARE KNOWN CONTAMINANTS OF TECHNICAL PCP AND WERE ALSO FORMED BY COMBUSTION OF PCP IN THE 1987 CELLON PROCESS FIRE. LOW LEVELS HAVE ALSO BEEN DETECTED IN ON-SITE AND OFF-SITE GROUND WATER SAMPLES.

ARSENIC, BORON, AND CHROMIUM WERE DETECTED AT LOW LEVELS IN A SMALL PERCENTAGE OF ON-SITE GROUND WATER SAMPLES. COPPER, CHROMIUM, AND ARSENIC WERE ALL DETECTED NEAR THE CCA TREATMENT AREA. THESE METALS HAVE BEEN DETECTED A FEW TIMES IN OFFSITE WELLS IN VERY LOW LEVELS THAT MAY BE ATTRIBUTABLE TO NATURALLY OCCURRING METALS.

SEDIMENT RESULTS ARE PRESENTED IN TABLE 5-1. SURFACE WATER RESULTS ARE PRESENTED IN TABLE 5-3. PCP WAS DETECTED IN ALL SEDIMENT SAMPLE LOCATIONS AND IN 17 OF 20 SURFACE WATER SAMPLE LOCATIONS. THE HIGHEST CONCENTRATIONS WERE IN THE DITCH BETWEEN THE KOPPERS AND L-P SITES, AND IN A DRAINAGE CHANNEL IMMEDIATELY SOUTH OF THE KOPPERS SITE. PAHS WERE DETECTED IN ALL SEDIMENT SAMPLES AND AT LOW LEVELS IN SURFACE WATERS SOUTH OF THE KOPPERS PROPERTY. THE HIGHEST PAH LEVELS IN SEDIMENT SAMPLES WERE DETECTED IN THE DITCH BETWEEN THE KOPPERS AND L-P SITES. ARSENIC, CHROMIUM, AND COPPER WERE MEASURED IN ALL SEDIMENT SAMPLES; ARSENIC, BORON, AND COPPER WERE DETECTED IN ON-SITE AND OFF-SITE SURFACE WATERS.

RESULTS FROM SAMPLING OF AIRBORNE PARTICULATE ARE PRESENTED IN TABLE 5-4. MAXIMUM PCP, ARSENIC, AND COPPER CONCENTRATIONS WERE DETECTED AT THE MIDSITE PROCESS LOCATION. THE HIGHEST PAHS CONCENTRATION WAS REPORTED AT THE NORTHERN WOOD STORAGE AREA.

#SSR

6.0 SUMMARY OF SITE RISKS

THE EPA PREPARED AN ENDANGERMENT ASSESSMENT TO DOCUMENT THE POTENTIAL RISKS ASSOCIATED WITH THE NO-ACTION REMEDIAL ALTERNATIVE AT THE KOPPERS SITE. THIS DOCUMENT IS INCLUDED IN THE ADMINISTRATIVE RECORD.

WOOD TREATING OPERATIONS AND WASTE WATER HANDLING AT THE SITE HAVE CONTAMINATED SITE SOILS. WATER PASSING OVER CONTAMINATED SOILS HAS LED TO IMPACTS ON SURFACE WATERS AND SEDIMENTS ON THE SITE. CONTAMINATED SOIL HAS BECOME AIRBORNE DUE TO VEHICULAR TRAFFIC AND WIND EROSION. SOIL CONTAMINATION HAS, IN TURN, MIGRATED INTO GROUND WATER, WHICH HAS MIGRATED OFF-SITE. THE USE OF CONTAMINATED GROUND WATER TO IRRIGATE OFFSITE SOILS HAS LED TO CONTAMINATED OFFSITE SOILS.

CHARACTERIZATION OF THESE MEDIA IN THE REMEDIAL INVESTIGATION LED TO THE DOCUMENTATION OF SIXTEEN ORGANIC AND INORGANIC CONTAMINANTS THAT HAVE BEEN TREATED AS CHEMICALS OF CONCERN IN THE ASSESSMENT OF SITE RISKS.

TABLE 6-1 PRESENTS THE CONTAMINANTS OF CONCERN IN ALL MEDIA. TABLE 6-2 PRESENTS THE CONCENTRATIONS (GEOMETRIC MEANS AND MAXIMA) OF THESE CONTAMINANTS THAT WERE DETECTED AND USED TO ASSESS SITE RISKS.

PCDDS/PCDFS ARE CONTAMINANTS OF CONCERN AT THIS SITE. THE CONCENTRATIONS OF THE VARIOUS COMPONENTS THAT MAKE UP THIS GROUP OF COMPOUNDS ARE COMBINED INTO ONE CONCENTRATION REPRESENTING 2,3,7,8 TETRACHLORO DIBENZO-DIOXIN, THE COMPOUND OF MOST CONCERN FROM A TOXICOLOGICAL STANDPOINT. THE CALCULATION OF THIS TOXICITY EQUIVALENT FACTOR (TEF) IS DOCUMENTED IN THE ENDANGERMENT ASSESSMENT. WHEN THE TOXICITY AND REMEDIATION OF PCDDS/PCDFS ARE DISCUSSED IN THIS RECORD OF DECISION, THEY ARE GIVEN IN TERMS OF TEF.

A VARIETY OF POTENTIAL CURRENT AND FUTURE EXPOSURE SCENARIOS WERE EVALUATED. TABLE 6-3 PRESENTS THE SIX CURRENT USE SCENARIOS AND FOUR FUTURE-USE SCENARIOS FOR EXPOSURE THAT WERE EVALUATED.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name : Koppers Company, Inc. Superfund Site

EPA ID: CAD009112087 **CERCLIS ID :** 0943

Region: 9 **State:** California **City/County:** Oroville/Butte

SITE STATUS

NPL status: ☒ Final ☐ Deleted ☐ Other (specify)

September 21, 1984

Remediation status (choose all that apply): ☒ Operating ☒ Complete

Multiple OUs? ☐ YES ☒ NO **Construction completion date:** 09/04/2003 (site-wide)

Has site been put into reuse? ☒ YES ☐ NO

REVIEW STATUS

Reviewing agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency _____

Author name: Kim Hoang, PhD, MPH

Author title: Remedial Project Manager **Author affiliation:** EPA Region 9

Review period: Data: July 2002 – July 2007 - Technical Reports: October 2002 – October 2007

Date(s) of Site inspection: December 18-19, 2007

Type of review: ☒ Statutory

☐ Policy ☐ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only

☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead

☐ Regional Discretion)

EPA United States Environmental Protection Agency

Pacific Southwest, Region 9: Superfund

Serving Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations

Koppers Co., Inc. (Oroville Plant)

On this page

Bulletin Board

The Fourth Five Year Review is scheduled to be completed by September 2013.

EPA #: CAD009112087

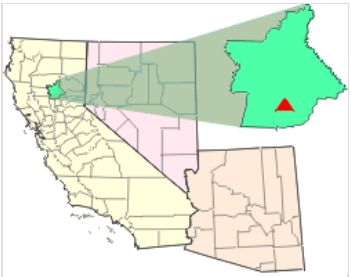
State: California(CA)

County: Butte

City: Oroville

Congressional District: 02

Other Names: Koppers Company, Inc., Koppers Feather River Plant



Map this site in Cleanups in My Community

NPL Listing History

NPL Status: Final
Proposed Date: 09/08/83
Final Date: 09/21/84
Deleted Date:

Links

- Description and History
- Contaminants and Risks
- Who is Involved
- Investigation and Cleanup Activities

- Cleanup Results to Date
- Potentially Responsible Parties
- Documents and Reports
- Community Involvement

- Public Information Repositories
- Additional Links
- Contacts
- Progress Profile (EPA Headquarters)

Description and History

Since 1948 until March 15, 2001, the 205-acre Koppers Company, Inc. (Oroville Plant) site was used to conduct wood treating operations to prevent wood deterioration by insects or fungi. Koppers purchased the plant from the National Wood Treating Company in 1955 and closed the facility March 15, 2001. Chemical and waste water handling procedures and wood treatment and storage operations contaminated the soil and groundwater on and off site. Fires at the Koppers facility occurred in 1963 and 1987, causing increased contamination at the site. Groundwater, surface water, and soils on and off site were contaminated with pentachlorophenol (PCP) and other hazardous substances used in Koppers' wood treating activities. The contaminated groundwater is located beneath this site and off-property south of the Koppers site. In 1973, PCP was discovered in nearby residential wells that are used as a source of drinking water. In 1988, the Koppers Company, Inc. was bought by the parent company of Beazer East, Inc (BEI). BEI later sold the wood treating plants to Koppers Industries, Inc. (KII). After KII closed its wood treating operation in March 2001, KII resold the site back to BEI in November 2002. In November 2006, BEI sold all the 205 acre site exclusive of parcel #1 containing the site's contaminated soils consolidated into two RCRA landfills to Gold Line Express, Inc. of Woodland CA for development as an industrial park (see attached 49 lot parcel plan). BEI remains the recognized potentially responsible party provided the new owner complies with the insitutional controls contained in the deed restrictions. Approximately 10,650 people live within a three mile radius of the site. These people also depend on groundwater as their source of drinking water. The nearest downgradient private water supply well is just off-property to the south, and there are numerous private water supply wells within three miles of the site. Contamination of groundwater from site-related chemicals extends two miles to the south.

Contaminants and Risks

Contaminated Media

- Groundwater
- Surface Water

Groundwater on property, contains pentachlorophenol (PCP), dioxins, furans, polycyclic aromatic hydrocarbons (PAHs), and heavy metals including copper, chromium, and arsenic. Off-property downgradient groundwater contains PCP. Potential health risks include drinking contaminated groundwater, or excavating soil below five feet on site. An alternative drinking water supply was provided to residents with the potential for contaminated domestic groundwater wells.

Who is Involved

This site is being addressed through Federal and potentially responsible parties' actions.

Investigation and Cleanup Activities

This site is being addressed in three stages: 1. the consolidation of contaminated soil in two corrective action management units which has been completed, 2) contain contaminated groundwater and restore the aquifer using pump and treat technology augmented by nutrient addition to enhance natural biological degradation of the groundwater contamination which has is operating, and 3) monitor a technical impracticability waiver granted for a 4 acre on property area upgradient of the on-property pump and treat system.

Initial Actions

Initial Actions: An alternative water supply was provided by BEI to residents south of the site in areas of potential groundwater contamination since 1986. Between 1987 and 1988, the EPA directed the construction of a temporary chip seal cap over the contaminated soil in the process area. The cap functioned to stabilize the site and to prevent contact with contaminants after a fire spread hazardous substances. In 1994, the EPA directed BEI to build an on-site landfill for disposal of surface soils containing high levels of dioxins. The 15,000 cubic yard landfill Cell #1 was completed in 1995. Subsequent detailed investigations determined dioxin soil contamination was widespread preventing the planned soil remedies.

Cleanup Ongoing

Entire Site: The potentially responsible party for site contamination completed a study of the site in 1989. The EPA used the results of this study to select the following methods to address site contamination: removing and treating contaminated groundwater with a carbon adsorption process; treating the contaminated soil in place; capping the wood treating area; providing a permanent water supply to those residents with contaminated wells; and discharging treated groundwater to the aquifer. Two groundwater extraction and treatment systems were installed: one on-site (400 gpm system still operating) and one off-site (600 gpm system shutdown in Dec. 1995 when the plume retreated) using carbon absorption followed by recharge to the aquifer using injection wells. In 1989, the EPA selected three different treatment technologies to clean up approximately 335,000 cubic yards of contaminated soil. However, treatability tests conducted during the design phases showed that the selected technologies could not achieve cleanup goals for all contaminants. BEI initiated a focused feasibility study to evaluate other cleanup alternatives for soils in 1995. In August of 1996, a Record of Decision (ROD) Amendment #1 was issued changing the soil remedy to on-site landfilling of the remaining contaminated soils. ROD Amendment #1 changed the cleanup standard to industrial use and required deed restrictions to prohibit future residential development.

In September 23, 1999, the EPA issued a ROD Amendment #2 to modify the remedy to 1) provide for a Technical Impracticability Waiver due to Dense Non-Aqueous Liquid for 4 acres of the 200 acre site, 2) add enhanced in-situ bioremediation to the remedy, and 3) provide for Monitored Natural Attenuation (MNA) as a contingency remedy. A modification to the Consent Decree modification for ROD Amendments #1 and #2 was completed September 22, 2003. The land use covenant provision of the ROD restricting the site to industrial use and restricting access and use of groundwater under the site were recorded with the Butte County Recorder on November 12, 2003.

Koppers Industries, Inc. closed the wood treating facility in March 15, 2001 and completed its Resource Conservation and Recovery Act (RCRA) closure under State of California oversight July 2002. Remediation of the area beneath the process area became accessible after the RCRA closure. Final soil remediation was completed in September 2002.

With soil remediation complete and groundwater contamination under control a Preliminary Closeout Report was issued September 4, 2003. To review this preliminary report double click on its title below under Site Documents and Report section. A Final Closure Report cannot be issued until the groundwater aquifer has been restored to the cleanup levels specified in the ROD which will be some years in the future.

In 1982, the State issued two orders to Koppers to clean up contaminated soil and groundwater at the site. In 1986, the EPA and Koppers signed a Consent Order, which required the company to conduct a study into the nature and extent of contamination at the site. In December 1990, BEI signed a Consent Decree to perform the engineering design and cleanup activities at the site. An Explanation of Significant Differences was issued January of 1991 which limited soils cleanup to five feet unless a potential source to groundwater were found. In August of 1996, a ROD Amendment #1 was issued changing the soil remedy to an on-site landfill. In September 1999, a ROD amendment #2

was issued modifying the groundwater remedy to provide for 1) 4 acre Technical Impracticability Zone, 2) adding enhanced in-situ bioremediation to the remedy and 3) providing MNA as a contingency remedy.

Cleanup Results to Date

Groundwater

To prevent exposure to contaminated groundwater from domestic wells, city water was provided in 1986 to residents with potential for exposure and is paid for by BEI. As the off-property remediation has progressed the need for the alternative water supply program has been reduced from the original thirty-four (34) recipients to seven (7). The remaining seven (7) water supply recipients will continue to receive payment for alternative water supply usage until ROD standards have been met for their drinking water wells.

The off-property pump and treatment facility was taken off-line in December of 1995 as the plume degraded and no contaminants were being removed by the extraction wells. The treatment facility remains in reserve. The residual off-property plume is no longer being fed by contaminants on-property and is continuing to shrink. In August 1998 a pilot in-situ bioremediation program to assist in PCP degradation was initiated and incorporated into the remedy September 1999. The program was initiated with the addition of two nutrients (diammonium phosphate) and oxygen (magnesium peroxide) to three wells and monitoring at five wells. In the first quarter 2004 nutrient addition was reduced to adding only magnesium peroxide.

The on-property pump and treatment facility is still in operation preventing contaminated groundwater from moving off-property. In April 1998 a pilot in-situ bioremediation program was initiated on-property to degrade PCP and incorporated into the remedy in September 1999. The program initially added two nutrients (diammonium phosphate) and oxygen (magnesium peroxide) to six wells and monitoring at five wells. The magnesium peroxide addition was stopped the first quarter 2004. The PCP concentrations in the on-property wells are continuing to decrease. The on-property pump and treat facility will continue to operate until the ROD cleanup standards are meet and then will be held in reserve as long as the Technical Impracticability Waiver remains in effect.

March 8, 1999 BEI submitted a Final Evaluation of Technical Impracticability (TI) of Groundwater Restoration in the Former Creosote Pond and Cellon Blowdown Areas On-property. The TI waiver for the four acres was incorporated into the remedy with ROD Amendment #2 in September 1999. TI zone area and just downgradient is monitored for contaminant movement.

With the demolition of the wood treating facility in 2001 and 2002, boron was mobilized from the DriCon/CCA area and detected by monitoring well MW-8 above the action level. The downgradient on-property treatment plant does not treat for boron. MW-8 was converted to an extraction well to dilute the boron concentration to continue reinjection below the cleanup level. Boron readings are monitored at MW-8 and prior to reinjection for compliance with the ROD.

Soils

In 1987/88 a temporary chip seal cap was placed over the process area. In 1992, two concrete drip pads were installed in the process area to contain wood treating chemicals and prevent any further soil contamination. The cap and drip pads were demolished in 2002 as part of KII's facility closure. Two landfill cells were constructed for disposal of contaminated soils on site. Cell #1 (13,000 cubic yards) was completed in August 1995 as a Removal Action. Cell #2 (147,000 cubic yards capacity) was closed September 2002 with the completion of the soil remediation efforts for the site. 6,000 cubic yards of boron impacted soil was removed from the newly discovered Dri-Con/CCA source and placed in Cell #2 prior to its closure. With soil remediation complete and control of groundwater in place a Preliminary Closeout Report was issued for the site September 4, 2003. A land use covenant was recorded with the Butte County Recorder on November 12, 2003 restricting the site to industrial use and the access and use of groundwater under the site.

In November 2006, BEI sold all the 205 acre site exclusive of parcel #1 containing the site's contaminated soils consolidated into two RCRA landfills to Express, Inc. of Woodland CA for development as an industrial park (see attached 49 lot parcel plan).

The Third Five Year Review Report, completed in July 28, 2008, concluded that currently, all implemented remedies are found to be functioning as intended by the decision document and, therefore, are protective of human health and the environment.

Potentially Responsible Parties

Potentially responsible parties (PRPs) refers to companies that are potentially responsible for generating, transporting, or disposing of the hazardous waste found at the site.

As agreed to in the 1992 Consent Decree for the Koppers Site Remediation, Beazer East, Inc. is the PRP for the Koppers Site in Oroville.

Documents and Reports

Administrative Records

Original AR - Part 1 (includes updates 1-3)

Original AR - Part 2 (includes updates 4-8)

Fact Sheets

03/01/99 EPA Proposes Groundwater Remedy Modification Plan

09/01/01 Koppers Superfund Site Update

08/01/02 EPA Starts Review of Cleanup at the Koppers Superfund Site and Koppers Site Map

08/01/03 EPA Requests Your Comments on Consent Decree Amendment

01/14/08 Koppers Co. Inc. Five-Year Review Fact Sheet

03/24/09 Koppers Co., Inc. Superfund Site Third Five-year Review Fact Sheet

Maps

08/01/02 Koppers Industries, Inc. Site Map August 2002

05/01/06 Oroville Industrial Park Layout

04/20/09 Koppers Site Plume Map - 1994 - 2007

Records of Decision

09/13/89 Entire Site ROD (9/1989)

01/29/91 Entire Site ESD (1/1991)

08/29/96 ROD Amendment #1 (1996)

09/23/99 Amendment #2 to the Record of Decision for Koppers Company, Inc.

Technical Documents

12/22/97 First Five Year Review (12/1997)

02/07/03 Final Second 5-Year Review Report for Koppers Company, Inc.

09/04/03 Preliminary Closeout Report for Kopper Company, Inc.

11/28/06 Grant Deed

07/28/08 Third Five-Year Review 2008 -Final

03/01/09 Koppers Semiannual 2008 RA Groundwater Monitoring Report

Community Involvement

Public Meetings:

Public Information Repositories

Additional Links

Contacts

The public information repositories for the site are at

EPA Site Manager

Daewon Rojas-Mickelson
415-947-4191
Rojas-Mickelson.Daewon@epamail.epa.gov
US EPA Region 9
Mail Code SFD
75 Hawthorne Street
San Francisco, CA 94105
EPA Community Involvement Coordinator

Dana Barton
415-972-3087
1-800-231-3075
Barton.Dana@epamail.epa.gov
US EPA Region 9
Mail Code SFD
75 Hawthorne Street
San Francisco, CA 94105
EPA Public Information Center

415-947-8701
r9.info@epa.gov
State Contact

DTSC - Sam V. Martinez, Jr.

RWQCB - Phil Woodward
916-255-6583

530-224-4853
Sam.Martinez@dtsc.ca.gov
8800 Cal Center Drive
Sacramento, 95826-3200
PRP Contact

Michael Tischuk

Jennifer Abrahams
412-208-8809

916-853-4526
tischuk@HansonLE.com

Jennifer.Abrahams@tetratech.com
Beazer East, Inc.

Tetra Tech
Community Contact

Other Contacts

After Hours (Emergency Response)

US EPA
(800) 424-8802

Last updated February 28, 2013
Last updated on 08/22/2013

the following locations:

Butte County Public Library,
1820 Mitchell Ave.,
Oroville, CA 95965

Meriam Library,
California State University at Chico,
Chico, CA 95929-0295

The most complete collection of documents is the official EPA site file, maintained at the following location:

Superfund Records Center
Mail Stop SFD-7C
95 Hawthorne Street, Room 403
San Francisco, CA 94105
(415) 820-4700

Enter main lobby of 75 Hawthorne street, go to 4th floor of South Wing Annex.

TABLE 5-2. CONTAMINANTS OF CONCERN, KOPPERS FEATHER RIVER PLANT

COMPOUND	ON-SITE GROUNDWATER DETECTION FREQUENCY	GEOMETRIC MEAN (A)	MAXIMUM CONCENTRATION
ORGANICS		(UG/L)	(UG/L)
PCP	111/160	160	44,000
IPE	21/42	660	9,400
PCDDS/PCDFS			
* TETRA DIOXINS (TOTAL)	1/6	0.00025	0.00025
* PENTA DIOXINS	1/6	0.00038	0.00038
* HEXA DIOXINS	1/6	0.00012	0.00012
* HEPTA DIOXINS	2/6	0.0009	0.0022
* OCTA DIOXINS	5/6	0.0098	0.022
* TETRA FURANS (TOTAL)	1/6	0.0014	0.0014
* PENTA FURANS	1/6	0.00082	0.00082
* HEXA FURANS	1/6	0.00015	0.00015
* HEPTA FURANS	1/6	0.000076	0.000076
* OCTA FURANS	1/6	0.000020	0.000020
PAHS			
* ACENAPHTHENE	3/80	300	1,600
* ACENAPTHYLENE	2/80	3.9	6
* ANTHRACENE	19/80	0.34	3,900
* BENZO(A)ANTHRACENE	4/80	4.52	2,000
* BENZO(A)PYRENE	2/80	390	520
* BENZO(B)FLUORANTHENE	4/80	1.0	410
* BENZO(K)FLUORANTHENE	4/80	0.79	290
* CHRYSENE	6/80	0.85	1,600
* DIBENZOFURAN	3/5	180	970
* FLUORANTHENE	35/80	0.29	9,700
* FLUORENE	24/80	3.25	12,000
* INDENO(1,2,3-CD)PYRENE	2/80	89	130
* 2-METHYLNAPHTHALENE	3/5	160	2,000
* NAPHTHALENE	13/80	105	70,000
* PHENANTHRENE	26/80	1.36	26,000
* PYRENE	30/80	0.29	8,200
BENZENE (ON-SITE GW ONLY)	3/7	4.8	19
ETHYL BENZENE (ON-SITE GW ONLY)	3/7	8.7	110
METHYLENE CHLORIDE (ON-SITE GW ONLY)	4/7	2.2	4.0
TOLUENE (ON-SITE GW ONLY)	2/7	21	150
XYLENES (TOTAL) (ON-SITE GW ONLY)	4/7	18	410

INORGANICS		(MG/L)	(MG/L)
ARSENIC	2/47	0.021	0.022
BARIUM	2/2	1.2	1.3
BORON	34/39	0.57	1.9
CHROMIUM (TOTAL)	18/98	0.02	0.095
COPPER	6/38	0.066	0.25

(A) GEOMETRIC MEAN OF POSITIVE DETECTS ONLY.

COMPOUND	OFF-SITE GROUNDWATER DETECTION FREQUENCY	GEOMETRIC MEAN (A)	MAXIMUM CONCENTRATION
ORGANICS		(UG/L)	(UG/L)
PCP	116/372	3.1	680
IPE	20/107	65	1,300
PCDDS/PCDFS			
* TETRA DIOXINS (TOTAL)	1/4	0.000012	0.000012
* PENTA DIOXINS	0/4	---	---
* HEXA DIOXINS	1/4	0.00003	0.0011
* HEPTA DIOXINS	2/4	0.000033	0.0013
* OCTA DIOXINS	2/4	0.000067	0.0025
* TETRA FURANS (TOTAL)	1/2	0.00045	0.00045
* PENTA FURANS	1/4	0.000012	0.000012
* HEXA FURANS	0/4	---	---
* HEPTA FURANS	2/4	0.000027	0.00095
* OCTA FURANS	0/4	---	---
PAHS			
* ACENAPHTHENE	1/113	0.10	0.10
* ACENAPTHYLENE	---	---	---
* ANTHRACENE	4/113	0.012	0.097
* BENZO(A)ANTHRACENE	1/113	0.0080	0.008
* BENZO(A)PYRENE	1/113	0.0080	0.008
* BENZO(B)FLUORANTHENE	3/113	0.0035	0.0045
* BENZO(K)FLUORANTHENE	---	---	---
* CHRYSENE	2/113	0.0060	0.006
* DIBENZOFURAN	---	---	---
* FLUORANTHENE	4/113	0.034	0.23
* FLUORENE	2/113	0.088	0.10
* INDENO(1,2,3-CD)PYRENE	---	---	---
* 2-METHYLNAPHTHALENE	---	---	---
* NAPHTHALENE	3/113	0.081	0.18
* PHENANTHRENE	15/113	0.011	0.51
* PYRENE	---	---	---
BENZENE (ON-SITE GW ONLY)			
ETHYL BENZENE (ON-SITE GW ONLY)			
METHYLENE CHLORIDE (ON-SITE GW ONLY)			
TOLUENE (ON-SITE GW ONLY)			
XYLENES (TOTAL) (ON-SITE GW ONLY)			

TABLE 5-3. CONTAMINANTS OF CONCERN, SURFACE WATER, KOPPERS FEATHER RIVER SITE

COMPOUND	DETECTION FREQUENCY	GEOMETRIC MEAN (A)	MAXIMUM CONCENTRATION
ORGANICS		(UG/L)	(UG/L)
PCP	15/18	8.22	140
IPE	6/15	21.41	50
PCDDS/PCDFS		(NG/L)	(NG/L)
* TETRA FURANS (TOTAL)	1/6	0.60	0.60
* HEXA FURANS	3/12	5.19	8.52
* HEPTA FURANS	3/12	13.52	19.85
* OCTA FURANS	1/12	11.10	11.10
* HEXA DIOXINS (TOTAL)	2/6	3.32	3.35
* HEPTA DIOXINS	3/12	35.30	44.55
* OCTA DIOXINS	6/12	17.25	96.65
PAHS		(UG/L)	(UG/L)
* ANTHRACENE	2/5	0.03	0.041
* FLUORANTHENE	1/5	0.10	0.10
* FLUORENE	1/5	0.22	0.22
* PHENANTHRENE	1/5	0.28	0.28
INORGANICS		(MG/L)	(MG/L)
ARSENIC	14/31	0.01	0.030
BORON	15/24	0.77	1.10
CHLORIDE	15/32	11.99	71
CHROMIUM	3/31	0.03	0.030
COPPER	6/31	0.01	0.030

(A) GEOMETRIC MEAN OF POSITIVE DETECTS ONLY.

grish <grish@me.com>
To: Gloria-Small Moran <Moran.Gloria-Small@epamail.epa.gov>
Cc: grish <grish@me.com>
Fwd: EPA Response to Grisham FOIA request EPA-R6-2013-001194

February 5, 2013 2:32 PM

5 Attachments, 3.6 MB

Ms. Moran,

I forward this for your information.

Thank you.

Charles Grisham

Begin forwarded message:

From: grish <grish@me.com>
Subject: Fwd: EPA Response to Grisham FOIA request EPA-R6-2013-001194
Date: December 31, 2012 11:22:46 AM PST
To: Tina Kirst <Kirst.Tina@epamail.epa.gov>
Cc: grish <grish@me.com>, Carlos Sanchez <Sanchez.Carlos@epamail.epa.gov>, Diana Ortiz <Ortiz.Diana@epamail.epa.gov>, Gloria-Small Moran <Moran.Gloria-Small@epamail.epa.gov>, Ruben Moya <Moya.Ruben@epamail.epa.gov>

Dear Ms. Kirst,

That document #9382259 does not include the "Monthly Progress Report - August" from Jean Mescher of McKesson Corporation; it includes only the following:

1) A three-page report dated 30 August 2012 to McKesson contractor Jim Fleer of Oxford Environmental & Safety, Inc 14348 Nieman Rd. Overland Park, KS 6622 from Norma James, President, Arkansas Analytical, Inc., 11701 I-30 Bldg 1, Ste 115 - Little Rock, AR 72209, consisting of a cover letter dated August 30, 2012, one page of "Analytical Results" and one page of "Quality Control Results;"

2) A one-page "Chain of Custody Record," also from Ms. James to Mr. Fleer.

Attached here for your reference are the "Monthly Progress Report" documents for July 2012 (document #9382258) and September 2012 (document #9382262), also for supplied by your office in response to this same FOIA request.

You will see that these latter two documents each contain a letter from Jean A. Mescher, Project Coordinator, Director, Environmental Services, McKesson Corporation to Mr. Ruben Moya, Superfund Remedial Project Manager, Superfund AR/LA Enforcement Section (6SF-RA), U.S. Environmental Protection Agency, with copies to "Mark Moix, ADEQ, EPA Assistant Regional Counsel (6C-W A)* (w/o enclosure) and Chief, Superfund Enforcement Branch (6H-E)* (w/o enclosure)."

These narrative reports are the actual "Monthly Progress Report" documents and, like all others I have ever seen related to the PRP McKesson's activities at the Arkwood site, are on McKesson Corporation letterhead and are signed by Jean Mescher, who in each report makes the following attestation:

"I certify that the information contained in or accompanying this submission is true, accurate, and complete to the best of my knowledge, information and belief, and that I, as project coordinator, have made reasonable inquiry into its veracity."

Therefore, as yet, I have not been supplied with the "Monthly Progress Report - August" as requested and described above.

Furthermore, I will be forwarding to you and the copied persons hereon an email reply I made to Ms. Letitia Lane regarding missing attachments to previous FOIA responses. I request all responsive and releasable attachments and enclosures to documents previously released to me as responsive to any of my FOIA requests. If you would like me to compile a list of these missing attachements, I will be happy to.

I hope, however, that your system allows you to track the responsive attachments to responsive documents already released to me and that you will be able to release those missing attachments to me as well in the near future. This applies to all FOIA requests I have made of EPA to date please.

Thank you for your kind attention to these matters.

Sincerely,

Curt Grisham

2012 Septe...cher (1.1 MB)

2012 July Pr...her (1.3 MB)

Begin forwarded message:

From: Kirst.Tina@epamail.epa.gov
Subject: Re: EPA Response to Grisham FOIA request EPA-R6-2013-001194
Date: December 31, 2012 9:35:07 AM PST
To: grish <grish@me.com>
Cc: Sanchez.Carlos@epamail.epa.gov, Ortiz.Diana@epamail.epa.gov, Moran.Gloria-Small@epamail.epa.gov, Moya.Ruben@epamail.epa.gov

Hi Mr. Grisham:

It was our intention to provide the August 2012 Monthly Progress Report on the Compact Disc (CD) provided to you in response to your Freedom Of Information Act Request EPA-R6-2013-001194. If the document was not included, please accept our apologies. I have attached a copy of the Report for your review; however, please note that the August 2012 report is not entitled "Monthly Progress Report" but is identified on the CD as Document ID # 9382259. We did locate the document on our archive CDs which are duplicate CDs of what was provided to you. The document is also noted on the Metadata Extraction PDF entitled "Metadata-EPA-R6-2013-001194.pdf".

The additional files included on the CD are to assist you in searching the CD. The .xlsx is the excel spreadsheet. You may click on the hyperlinks on the spreadsheet in order to view the documents. The .exe file is Adobe Reader and is provided on the disc incase you do not have Adobe Reader so that you may download the file. The remaining files: .inf, .idx, .log,and .pdx are provided to enable you to search the CD.

Please accept this as fulfillment of your request. For any future requests for Monthly Progress Reports or any other information, please access the following link and submit a new FOIA request: http://www.foia.gov/report-makerequest.html.

Thank you so much.

Tina Kirst I Toeroek Associates, Inc.
Contractor I U.S. Environmental Protection Agency Region 6 Superfund Division
phone: 214-665-2242 I fax: 214-665-7570
email: kirst.tina@epa.gov

From: grish <grish@me.com>
To: Diana Ortiz/R6/USEPA/US@EPA
Cc: grish <grish@me.com>, Tina Kirst/R6/USEPA/US@EPA, Gloria-Small Moran/R6/USEPA/US@EPA, Ruben Moya/R6/USEPA/US@EPA, Carlos Sanchez/R6/USEPA/US@EPA
Date: 12/23/2012 11:30 AM
Subject: EPA Response to Grisham FOIA request EPA-R6-2013-001194

Dear Ms. Ortiz,

I am in receipt of your December 17, 2012 letter (attached) covering EPA's response to my above-captioned FOIA request (submitted by me on November 8, 2012) for Arkwood "Monthly Progress Reports for August 2012, September 2012 and October 2012."

Unfortunately, the August 2012 Monthly Progress Report for Arkwood is not included, whereas the July 2012 Monthly Progress Report is. This lacuna is also reflected in the indexing file included on the CD and titled "Metadata-EPA-R6-2013-001194.pdf."

Please consider this request incompletely fulfilled and provide me with the missing report and supporting data.

Also, for my general information going forward, please explain the other files included on the CD provided to me. Specifically, please explain the purpose or use of the files with the following extensions: .exe, .inf, .idx, .log, .pdx, .xlsx.

The "readme" text file with extension .txt I understand and am comfortable with.

Generally, for security reasons, I do not open files with these or other extensions of unknown type, origin or function (particularly .exe - executable files) unless I know exactly what they are and what they will do to my computer's operating system.

Thank you.

Sincerely,

Curt Grisham

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS TX 75202-2733

DEC 17 2012

Mr. Charles Grisham, Jr.
P.O. Box 31526
San Francisco, California 94131

Re: Freedom of Information Act Request EPA-R6-2013-001194 / Arkwood Inc. / SSID # 06A3

Dear Mr. Grisham:

This is in response to your Freedom of Information Act (FOIA) request dated November 8, 2012, for information pertaining to the Arkwood Incorporated Superfund Site (ARD084930148), located in Omaha, Arkansas. Specifically, your request states that you are seeking Monthly Progress Reports for August 2012, September 2012 and October 2012.

In compliance with your request, we are providing responsive U.S. Environmental Protection Agency Region 6 Superfund Division documents on one Compact Disc (CD). The documents contained on the CD are in Adobe System Inc.'s common Portable Document Format ™ (PDF).

If you should have any questions or need additional information, please contact me at

(214) 665-7315. The Region 6 Freedom of Information Officer will bill at a later date, if appropriate.

Sincerely,

for Diana Ortiz
Superfund FOIA Coordinator

Enclosure

EPA-R6-2013-001194

DOCID	DOC_DATE	PAGE_COUNT	TITLE	REL_DOCID	DOC_CLASS	Doc Class Description	PHASE_ACTIVITY	Phase Activity Description	ACCESS_CODE	SITE_ID	Site Name	SSID/OUID	TRACKING_TYPE	TRACKING	Tracking Description	ADDRESSEE	AUTHOR	DOC_TYPE	Doc Type Description
9382258	08/22/2012	9	PROGRESS REPORT FOR JULY 2012 FOR THE ARKWOOD INCORPORATED				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.02		MOYA RUBEN , (U.S. ENVIRONMENTAL PROTECTION AGENCY)	MESCHER JEAN , (MCKESSON CORPORATION)	16 | 44 | 85	CORRESPONDENCE | REPORT / STUDY | ELECTRONIC RECORD
9382259	08/30/2012	4	[ARKWOOD MONTHLY SAMPLING FOR 08/25/2012 SDG NO. 1208285]				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.09		FLEER JIM , (OXFORD ENVIRONMENTAL & SAFETY INCORPORATED)	JAMES NORMA , (ARKANSAS ANALYTICAL INCORPORATED)	46 | 85 | 16	SAMPLING / ANALYSIS | ELECTRONIC RECORD | CORRESPONDENCE
9382260	10/02/2012	5	[ARKWOOD MONTHLY SAMPLING FOR 09/25/2012 SDG NO. 1209285]				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.09		FLEER JIM , (OXFORD ENVIRONMENTAL & SAFETY INCORPORATED)	JAMES NORMA , (ARKANSAS ANALYTICAL INCORPORATED)	46 | 16 | 85	SAMPLING / ANALYSIS | CORRESPONDENCE | ELECTRONIC RECORD
9382261	09/12/2012	1	TER REMEDIATION SUMMARY FOR JUNE 2012, REVISED				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.24		MOYA RUBEN , (U.S. ENVIRONMENTAL PROTECTION AGENCY)	MOIX MARK , (ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY)	16 | 85	CORRESPONDENCE | ELECTRONIC RECORD
9382262	10/10/2012	10	PROGRESS REPORT FOR SEPTEMBER 2012 FOR THE ARKWOOD INCORPORA				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.02		MOYA RUBEN , (U.S. ENVIRONMENTAL PROTECTION AGENCY)	MESCHER JEAN , (MCKESSON CORPORATION)	16 | 44 | 85	CORRESPONDENCE | REPORT / STUDY | ELECTRONIC RECORD
9382263	10/18/2012	4	[ARKWOOD MONTHLY SAMPLING FOR 10/16/2012 SDG NO. 1210170]				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.09		FLEER JIM , (OXFORD ENVIRONMENTAL & SAFETY INCORPORATED)	JAMES NORMA , (ARKANSAS ANALYTICAL INCORPORATED)	16 | 46 | 85	CORRESPONDENCE | SAMPLING / ANALYSIS | ELECTRONIC RECORD
9382264	11/09/2012	9	PROGRESS REPORT FOR OCTOBER 2012 FOR THE ARKWOOD INCORPORA				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.02		MOYA RUBEN , (U.S. ENVIRONMENTAL PROTECTION AGENCY)	MESCHER JEAN , (MCKESSON CORPORATION)	16 | 85 | 44	CORRESPONDENCE | ELECTRONIC RECORD | REPORT / STUDY

9382259.pdf (934 KB)

grish <grish@me.com>
To: Kirst.Tina@epamail.epa.gov
Cc: grish <grish@me.com>, Carlos Sanchez <Sanchez.Carlos@epamail.epa.gov>, Diana Ortiz <Ortiz.Diana@epamail.epa.gov>, Gloria-Small Moran <Moran.Gloria-Small@epamail.epa.gov>, Ruben Moya <Moya.Ruben@epamail.epa.gov>
Re: EPA Response to Grisham FOIA request EPA-R6-2013-001194

December 31, 2012 10:54 AM

Hi Ms. Kirst,

That document (reattached here) does not include the "Monthly Progress Report" from Jean Mescher of McKesson Corporation; it includes only the following:

1) A three-page report dated 30 August 2012 to McKesson contractor Jim Fleer of Oxford Environmental & Safety, Inc 14348 Nieman Rd. Overland Park, KS 6622 from Norma James, President, Arkansas Analytical, Inc., 11701 I-30 Bldg 1, Ste 115 - Little Rock, AR 72209, consisting of a cover letter dated August 30, 2012, one page of "Analytical Results" and one page of "Quality Control Results;"
2) A one-page "Chain of Custody Record," also from Ms. James to Mr. Fleer.

The
On Dec 31, 2012, at 9:35 AM, Kirst.Tina@epamail.epa.gov wrote:

Hi Mr. Grisham:

It was our intention to provide the August 2012 Monthly Progress Report on the Compact Disc (CD) provided to you in response to your Freedom Of Information Act Request EPA-R6-2013-001194. If the document was not included, please accept our apologies. I have attached a copy of the Report for your review; however, please note that the August 2012 report is not entitled "Monthly Progress Report" but is identified on the CD as Document ID # 9382259. We did locate the document on our archive CDs which are duplicate CDs of what was provided to you. The document is also noted on the Metadata Extraction PDF entitled "Metadata-EPA-R6-2013-001194.pdf".

The additional files included on the CD are to assist you in searching the CD. The .xlsx is the excel spreadsheet. You may click on the hyperlinks on the spreadsheet in order to view the documents. The .exe file is Adobe Reader and is provided on the disc incase you do not have Adobe Reader so that you may download the file. The remaining files: .inf, .idx, .log,and .pdx are provided to enable you to search the CD.

Please accept this as fulfillment of your request. For any future requests for Monthly Progress Reports or any other information, please access the following link and submit a new FOIA request: http://www.foia.gov/report-makerequest.html.

Thank you so much.

Tina Kirst I Toeroek Associates, Inc.
Contractor I U.S. Environmental Protection Agency Region 6 Superfund Division
phone: 214-665-2242 I fax: 214-665-7570
email: kirst.tina@epa.gov

From: grish <grish@me.com>
To: Diana Ortiz/R6/USEPA/US@EPA
Cc: grish <grish@me.com>, Tina Kirst/R6/USEPA/US@EPA, Gloria-Small Moran/R6/USEPA/US@EPA, Ruben Moya/R6/USEPA/US@EPA, Carlos Sanchez/R6/USEPA/US@EPA
Date: 12/23/2012 11:30 AM
Subject: EPA Response to Grisham FOIA request EPA-R6-2013-001194

Dear Ms. Ortiz,

I am in receipt of your December 17, 2012 letter (attached) covering EPA's response to my above-captioned FOIA request (submitted by me on November 8, 2012) for Arkwood "Monthly Progress Reports for August 2012, September 2012 and October 2012."

Unfortunately, the August 2012 Monthly Progress Report for Arkwood is not included, whereas the July 2012 Monthly Progress Report is. This lacuna is also reflected in the indexing file included on the CD and titled "Metadata-EPA-R6-2013-001194.pdf."

Please consider this request incompletely fulfilled and provide me with the missing report and supporting data.

Also, for my general information going forward, please explain the other files included on the CD provided to me. Specifically, please explain the purpose or use of the files with the following extensions: .exe, .inf, .idx, .log, .pdx, .xlsx.

The "readme" text file with extension .txt I understand and am comfortable with.

Generally, for security reasons, I do not open files with these or other extensions of unknown type, origin or function (particularly .exe - executable files) unless I know exactly what they are and what they will do to my computer's operating system.

Thank you.

Sincerely,

Curt Grisham

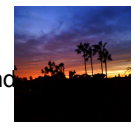
<20121217 Ortiz to Grisham Jr FOIA cover.pdf><Metadata-EPA-R6-2013-001194.pdf><9382259.pdf>

Curt Grisham <grish@me.com>

March 7, 2013 12:33 PM

To: Gloria-Small Moran <Moran.Gloria-Small@epamail.epa.gov>

Fwd: Undeliverable: Re: Your Freedom of Information Act Requests: EPA-R6-2013-003349, EPA-R6-2013-003350, and R6-2013-003351 / ARKWOOD SF SITE



1 Attachment, 11 KB

FYI
cg

Begin forwarded message:

From: Curt Grisham <grish@icloud.com>
Date: March 7, 2013, 12:32:48 PST
To: Tina Kirst <kirst.tina@epa.gov>
Subject: Fwd: Undeliverable: Re: Your Freedom of Information Act Requests: EPA-R6-2013-003349, EPA-R6-2013-003350, and EPA-R6-2013-003351 / ARKWOOD SF SITE

Ms. Kirst,

Please note: after I replied to all copied on your most recent to me, Ms Ortiz' bounced back as you see. This leads me to believe she is also not receiving her copies of your messages.

Please advise.

Charles Grisham

Begin forwarded message:

From: postmaster@usepa.onmicrosoft.com
Date: March 7, 2013, 11:59:53 PST
To: grish@icloud.com
Subject: Undeliverable: Re: Your Freedom of Information Act Requests: EPA-R6-2013-003349, EPA-R6-2013-003350, and EPA-R6-2013-003351 / ARKWOOD SF SITE

Delivery has failed to these recipients or groups:

ortiz.diana@usepa.onmicrosoft.com
The e-mail address you entered couldn't be found. Please check the recipient's e-mail address and try to resend the message. If the problem continues, please contact your helpdesk.

Diagnostic information for administrators:

Generating server: usepa.onmicrosoft.com

ortiz.diana@usepa.onmicrosoft.com
#550 5.1.1 RESOLVER.ADR.RecipNotFound; not found ##rfc822;ortiz.diana@usepa.onmicrosoft.com

Original message headers:

Received: from mail124-co9-R.bigfish.com (207.46.163.23) by

BL2PRD0910HT005.namprd09.prod.outlook.com (10.255.111.40) with Microsoft SMTP
Server (TLS) id 14.16.275.6; Thu, 7 Mar 2013 19:59:53 +0000
Received: from mail124-co9 (localhost [127.0.0.1]) by
mail124-co9-R.bigfish.com (Postfix) with ESMTP id 6D330A40189 for
<ortiz.diana@usepa.onmicrosoft.com>; Thu, 7 Mar 2013 19:59:52 +0000 (UTC)
X-Forefront-Antispam-Report: CIP:161.80.134.170;KIP:(null);UIP:(null);IPV:NLI;H:mblast03.pyd.epa.gov;RD:mblast03.pyd.epa.gov;E
FVD:NLI
X-SpamScore: -3
X-BigFish: ps-3(zz98dIc85fhc857h12d5I62a3Izz1f42h1ee6h1de0h1202h1e76h1d1ah1d2ahzz18c673hz31h668h839hd25he5bh1288h12
a5h12bdh137ah139eh13eah1441h1504h1537h162dh1631h1758h1898h18e1h1946h19b5h1b0ah1155h)
Received-SPF: softfail (mail124-co9: transitioning domain of icloud.com does not designate 161.80.134.170 as permitted sender) client
-ip=161.80.134.170; envelope-from=grish@icloud.com; helo=mblast03.pyd.epa.gov ;.pyd.epa.gov ;
Received: from mail124-co9 (localhost.localdomain [127.0.0.1]) by mail124-co9
(MessageSwitch) id 136268639021131_31069; Thu, 7 Mar 2013 19:59:50 +0000
(UTC)
Received: from CO9EHSMHS018.bigfish.com (unknown [10.236.132.254]) by
mail124-co9.bigfish.com (Postfix) with ESMTP id EC641820073 for
<ortiz.diana@usepa.onmicrosoft.com>; Thu, 7 Mar 2013 19:59:49 +0000 (UTC)
Received: from mblast03.pyd.epa.gov (161.80.134.170) by
CO9EHSMHS018.bigfish.com (10.236.130.28) with Microsoft SMTP Server id
14.1.225.23; Thu, 7 Mar 2013 19:59:49 +0000
Received: from mblast03.pyd.epa.gov (localhost.localdomain [127.0.0.1]) by
localhost (Postfix) with SMTP id EAD94D7CA10 for
<ortiz.diana@usepa.onmicrosoft.com>; Thu, 7 Mar 2013 14:59:48 -0500 (EST)
Received: from mintra03.pyd.epa.gov (mintra03.pyd.epa.gov [161.80.134.169]) by
mblast03.pyd.epa.gov (Postfix) with ESMTP id C3DFDD7CCD1 for
<ortiz.diana@usepa.onmicrosoft.com>; Thu, 7 Mar 2013 14:59:48 -0500 (EST)
Received: by mintra03.pyd.epa.gov (Postfix) id 966397A8335; Thu, 7 Mar 2013
14:59:48 -0500 (EST)
Delivered-To: ortiz.diana@epa.gov
Received: from mintra03.pyd.epa.gov (localhost.localdomain [127.0.0.1]) by
localhost (Postfix) with SMTP id 8AB957A8328; Thu, 7 Mar 2013 14:59:48 -0500
(EST)
Received: from mseive01.rtp.epa.gov (mseive01.rtp.epa.gov [134.67.100.69]) by
mintra03.pyd.epa.gov (Postfix) with ESMTP id 65FFD7A832B; Thu, 7 Mar 2013
14:59:48 -0500 (EST)
Received: from mseive01.rtp.epa.gov (localhost.localdomain [127.0.0.1]) by
localhost (Postfix) with SMTP id 101584441D; Thu, 7 Mar 2013 14:59:48 -0500
(EST)
Received: from nk11p03mm-asmtp002.mac.com (nk11p03mm-asmtp002.mac.com
[17.158.232.237]) by mseive01.rtp.epa.gov (Postfix) with ESMTP id 84DE54440B;
Thu, 7 Mar 2013 14:59:47 -0500 (EST)
Received: from [10.70.66.195] (mobile-166-137-187-180.mycingular.net
[166.137.187.180]) by nk11p03mm-asmtp002.mac.com (Oracle Communications
Messaging Server 7u4-26.01(7.0.4.26.0) 64bit (built Jul 13 2012)) with
ESMTPSA id <0MJB00KD03JI4W30@nk11p03mm-asmtp002.mac.com>; Thu, 07 Mar 2013
19:59:44 +0000 (GMT)
X-Proofpoint-Virus-Version: vendor=fsecure
engine=2.50.10432:5.9.8327,1.0.431,0.0.0000
definitions=2013-03-07_07:2013-03-07,2013-03-07,1970-01-01 signatures=0
X-Proofpoint-Spam-Details: rule=notspam policy=default score=0 spamscore=0
ipscore=0 suspectscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam
adjust=0 reason=mlx scancount=1 engine=6.0.2-1203120001
definitions=main-1303070160
References: <7ECC5541217DC248AC94183FC58B816C0E08690E@BY2PRD0910MB379.namprd09.prod.outlook.com>
In-Reply-To: <7ECC5541217DC248AC94183FC58B816C0E08690E@BY2PRD0910MB379.namprd09.prod.outlook.com>
MIME-Version: 1.0 (1.0)
Content-Transfer-Encoding: 7bit
Content-Type: multipart/alternative;
boundary="Apple-Mail-6926C749-DE6B-4282-BC0E-D587F4D106AD"
Message-ID: <41ADDE20-0D25-4E97-8CED-B68ED15D1E85@icloud.com>
CC: "Ortiz, Diana" <Ortiz.Diana@epa.gov>, "Patrick, Dwayne"
<Patrick.Dwayne@epa.gov>, "Moya, Ruben" <moya.ruben@epa.gov>, "Stanley,
Deborah-j" <Stanley.Deborah-J@epa.gov>, "Martin, Sharon"
<Martin.Sharon@epa.gov>, "Albright, Glodine" <albright.glodine@epa.gov>,
"Dellinges, Delorise" <Dellinges.Delorise@epa.gov>
X-Mailer: iPhone Mail (10B146)
From: Curt Grisham <grish@icloud.com>
Subject: Re: Your Freedom of Information Act Requests: EPA-R6-2013-003349,
EPA-R6-2013-003350, and EPA-R6-2013-003351 / ARKWOOD SF SITE
Date: Thu, 7 Mar 2013 11:59:40 -0800
To: "Kirst, Tina" <kirst.tina@epa.gov>
X-PMX-Version: 5.5.9.395186, Antispam-Engine: 2.7.2.376379, Antispam-Data: 2013.3.7.195414

X-PerlMx-Spam: Gauge=IIIIIIIII, Probability=9%, Report='
HTML_50_70 0.1, HTML_NO_HTTP 0.1, MULTIPLE_RCPTS 0.1, SUPERLONG_LINE 0.05, BODYTEXTH_SIZE_10000_LESS 0, BODYTEXTP_SIZE_3000_LESS 0, BODY_SIZE_5000_5999 0, BODY_SIZE_7000_LESS 0, CTYPE_MULTIPART_NO_QUOTE 0, DATE_TZ_NA 0, __ANY_URI 0, __BOUNCE_CHALLENGE_SUBJ 0, __BOUNCE_NDR_SUBJ_EXEMPT 0, __C230066_P5 0, __CT 0, __CTE 0, __CTYPE_HAS_BOUNDARY 0, __CTYPE_MULTIPART 0, __CTYPE_MULTIPART_ALT 0, __HAS_FROM 0, __HAS_HTML 0, __HAS_MSGID 0, __HAS_X_MAILER 0, __HTML_FONT_BLUE 0, __IN_REP_TO 0, __MIME_HTML 0, __MIME_VERSION 0, __MSGID_APPLEMAIL 0, __MULTIPLE_RCPTS_CC_X2 0, __PHISH_PHRASE3 0, __SANE_MSGID 0, __STYLE_RATWARE_2 0, __SUBJ_ALPHA_END 0, __TAG_EXISTS_HTML 0, __TO_MALFORMED_2 0, __URI_NO_PATH 0, __URI_NO_WWW 0, __URI_NS , __cbl.abuseat.org_ERROR '
Return-Path: grish@icloud.com

Reporting-MTA: dns;usepa.onmicrosoft.com
Received-From-MTA: dns;mail124-co9-R.bigfish.com
Arrival-Date: Thu, 7 Mar 2013 19:59:53 +0000

Original-Recipient: rfc822;ortiz.diana@usepa.onmicrosoft.com
Final-Recipient: rfc822;ortiz.diana@usepa.onmicrosoft.com
Action: failed
Status: 5.1.1
Diagnostic-Code: smtp;550 5.1.1 RESOLVER.ADR.RecipNotFound; not found

mime-attac...t.eml (11 KB)

grish <grish@me.com>

March 18, 2013 2:28 PM

To: Stephen Tzhone <Tzhone.Stephen@epamail.epa.gov>
Cc: grish <grish@me.com>, foia_helpdesk@bah.com, Diana Ortiz <Ortiz.Diana@epamail.epa.gov>, Leticia Lane <Lane.Leticia@epamail.epa.gov>, Sloan.Charlene@epamail.epa.gov
appeal of EPA-R6-2013-003349

1 Attachment, 52 KB

Dear Mr. Tzhone,

I attach the online confirmation of my appeal to the above. I have not received an automated response from the foiaonline system, and this appeal is marked "closed." I just wanted to make sure my appeal was correctly submitted, received and in process.

Thank you,
Charles Grisham

View My FOIA Requests

Results 25

6 items found, displaying all items.

1

Tracking Number	Type	Track	Submitted	Due	Phase	Detail
EPA-HQ-2013-004621	Appeal	Complex	03/18/2013	04/15/2013	Closed	
I appeal this response as incomplete for the following reasons (please see attached uploaded files as evidence to support my statements): 1) Mr. Moya did not make “numerous attempts to contact” me regarding this FOIA request; Mr. Moya made NO attempts to contact me regarding this request. 2) My request was extremely clear in its original form and should have required no discussion whatsoever with me in order for EPA to fulfill. My original request numbered EPA-R6-2013-003349 stated: “Please provide copies of all communications in the above matter (correspondence with attachments, emails with attachments, telephone or in-person meeting agendas, attachments and notes, etc.) exchanged between EPA (its staff, managers, employees, representatives, contractors, agents etc.) and McKesson Corporation (its employees, agents, representatives, contractors, etc. and that of any McKesson subsidiary entity) during the following time interval: May 1, 2012 until present.” I couldn’t have been any more lucid in my request language, I believe. 3) EPA released one (1) document as responsive to the above request. I do not consider that a complete response as I do not believe that one (1) document comprises “... all communications in the above matter... during the following time interval: May 1, 2012 until present.”						
EPA-R6-2013-003351	Request	Complex	02/04/2013	03/21/2013	Closed	
EPA-R6-2013-003350	Request	Complex	02/04/2013	03/21/2013	Closed	
EPA-R6-2013-003349	Request	Complex	02/04/2013	03/21/2013	Closed	
EPA-R6-2013-002441	Request	Complex	12/31/2012	02/01/2013	Closed	
EPA-R6-2013-001194	Request	Complex	11/08/2012	12/12/2012	Closed	

grish <grish@me.com>

December 23, 2012 9:30 AM

To: Diana Ortiz <Ortiz.Diana@epamail.epa.gov>
Cc: grish <grish@me.com>, Tina Kirst <Kirst.Tina@epamail.epa.gov>, Gloria-Small Moran <Moran.Gloria-Small@epamail.epa.gov>, Ruben Moya <Moya.Ruben@epamail.epa.gov>, Carlos Sanchez <Sanchez.Carlos@epamail.epa.gov>
EPA Response to Grisham FOIA request EPA-R6-2013-001194

2 Attachments, 199 KB

Dear Ms. Ortiz,

I am in receipt of your December 17, 2012 letter (attached) covering EPA's response to my above-captioned FOIA request (submitted by me on November 8, 2012) for Arkwood "Monthly Progress Reports for August 2012, September 2012 and October 2012."

Unfortunately, the August 2012 Monthly Progress Report for Arkwood is not included, whereas the July 2012 Monthly Progress Report is. This lacuna is also reflected in the indexing file included on the CD and titled "Metadata-EPA-R6-2013-001194.pdf."

Please consider this request incompletely fulfilled and provide me with the missing report and supporting data.

Also, for my general information going forward, please explain the other files included on the CD provided to me. Specifically, please explain the purpose or use of the files with the following extensions: .exe, .inf, .idx, .log, .pdx, .xlsx.

The "readme" text file with extension .txt I understand and am comfortable with.

Generally, for security reasons, I do not open files with these or other extensions of unknown type, origin or function (particularly .exe - executable files) unless I know exactly what they are and what they will do to my computer's operating system.

Thank you.

Sincerely,

Curt Grisham

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS TX 75202-2733

DEC 17 2012

Mr. Charles Grisham, Jr.
P.O. Box 31526
San Francisco, California 94131

Re: Freedom of Information Act Request EPA-R6-2013-001194 / Arkwood Inc. / SSID # 06A3

Dear Mr. Grisham:

This is in response to your Freedom of Information Act (FOIA) request dated

November 8, 2012, for information pertaining to the Arkwood Incorporated Superfund Site (ARD084930148), located in Omaha, Arkansas. Specifically, your request states that you are seeking Monthly Progress Reports for August 2012, September 2012 and October 2012.

In compliance with your request, we are providing responsive U.S. Environmental Protection Agency Region 6 Superfund Division documents on one Compact Disc (CD). The documents contained on the CD are in Adobe System Inc.'s common Portable Document Format ™ (PDF).

If you should have any questions or need additional information, please contact me at (214) 665-7315. The Region 6 Freedom of Information Officer will bill at a later date, if appropriate.

Sincerely,

for Diana Ortiz
Superfund FOIA Coordinator

Enclosure

EPA-R6-2013-001194

DOCID	DOC_DATE	PAGE_COUNT	TITLE	REL_DOCID	DOC_CLASS	Doc Class Description	PHASE_ACTIVITY	Phase Activity Description	ACCESS_CODE	SITE_ID	Site Name	SSID/OUID	TRACKING_TYPE	TRACKING	Tracking Description	ADDRESSEE	AUTHOR	DOC_TYPE	Doc Type Description
9382258	08/22/2012	9	PROGRESS REPORT FOR JULY 2012 FOR THE ARKWOOD INCORPORATED				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.02		MOYA RUBEN , (U.S. ENVIRONMENTAL PROTECTION AGENCY)	MESCHER JEAN , (MCKESSON CORPORATION)	16 | 44 | 85	CORRESPONDENCE | REPORT / STUDY | ELECTRONIC RECORD
9382259	08/30/2012	4	[ARKWOOD MONTHLY SAMPLING FOR 08/25/2012 SDG NO. 1208285]				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.09		FLEER JIM , (OXFORD ENVIRONMENTAL & SAFETY INCORPORATED)	JAMES NORMA , (ARKANSAS ANALYTICAL INCORPORATED)	46 | 85 | 16	SAMPLING / ANALYSIS | ELECTRONIC RECORD | CORRESPONDENCE
9382260	10/02/2012	5	[ARKWOOD MONTHLY SAMPLING FOR 09/25/2012 SDG NO. 1209285]				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.09		FLEER JIM , (OXFORD ENVIRONMENTAL & SAFETY INCORPORATED)	JAMES NORMA , (ARKANSAS ANALYTICAL INCORPORATED)	46 | 16 | 85	SAMPLING / ANALYSIS | CORRESPONDENCE | ELECTRONIC RECORD
9382261	09/12/2012	1	TER REMEDIATION SUMMARY FOR JUNE 2012, REVISED				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.24		MOYA RUBEN , (U.S. ENVIRONMENTAL PROTECTION AGENCY)	MOIX MARK , (ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY)	16 | 85	CORRESPONDENCE | ELECTRONIC RECORD
9382262	10/10/2012	10	PROGRESS REPORT FOR SEPTEMBER 2012 FOR THE ARKWOOD INCORPORA				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.02		MOYA RUBEN , (U.S. ENVIRONMENTAL PROTECTION AGENCY)	MESCHER JEAN , (MCKESSON CORPORATION)	16 | 44 | 85	CORRESPONDENCE | REPORT / STUDY | ELECTRONIC RECORD
			[ARKWOOD MONTHLY SAMPLING FOR 10/16/2012													FLEER JIM , (OXFORD ENVIRONMENTAL & SAFETY	JAMES NORMA , (ARKANSAS ANALYTICAL		CORRESPONDENCE | SAMPLING / ANALYSIS |

9382263	10/18/2012	4	SDG NO. 1210170J	RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.09	INCORPORATED)	INCORPORATED)	16 | 46 | 85	ELECTRONIC RECORD
9382264	11/09/2012	9	PROGRESS REPORT FOR OCTOBER 2012 FOR THE ARKWOOD INCORPORA	RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.02	MOYA RUBEN , (U.S. ENVIRONMENTAL PROTECTION AGENCY)	MESCHER JEAN , (MCKESSON CORPORATION)	16 | 85 | 44	CORRESPONDENCE | ELECTRONIC RECORD | REPORT / STUDY

grish <grish@me.com>
To: Stephen Tzhone <Tzhone.Stephen@epamail.epa.gov>
Cc: grish <grish@me.com>
Fwd: EPA Response to Grisham FOIA request EPA-R6-2013-001194

March 7, 2013 2:09 PM

5 Attachments, 3.6 MB

Begin forwarded message:

From: grish <grish@me.com>
Subject: Fwd: EPA Response to Grisham FOIA request EPA-R6-2013-001194
Date: February 5, 2013 2:32:30 PM PST
To: Gloria-Small Moran <Moran.Gloria-Small@epamail.epa.gov>
Cc: grish <grish@me.com>

Ms. Moran,

I forward this for your information.

Thank you.

Charles Grisham

Begin forwarded message:

From: grish <grish@me.com>
Subject: Fwd: EPA Response to Grisham FOIA request EPA-R6-2013-001194
Date: December 31, 2012 11:22:46 AM PST
To: Tina Kirst <Kirst.Tina@epamail.epa.gov>
Cc: grish <grish@me.com>, Carlos Sanchez <Sanchez.Carlos@epamail.epa.gov>, Diana Ortiz <Ortiz.Diana@epamail.epa.gov>, Gloria-Small Moran <Moran.Gloria-Small@epamail.epa.gov>, Ruben Moya <Moya.Ruben@epamail.epa.gov>

Dear Ms. Kirst,

That document #9382259 does not include the "Monthly Progress Report - August" from Jean Mescher of McKesson Corporation; it includes only the following:

1) A three-page report dated 30 August 2012 to McKesson contractor Jim Fleer of Oxford Environmental & Safety, Inc 14348 Nieman Rd. Overland Park, KS 6622 from Norma James, President, Arkansas Analytical, Inc., 11701 I-30 Bldg 1, Ste 115 - Little Rock, AR 72209, consisting of a cover letter dated August 30, 2012, one page of "Analytical Results" and one page of "Quality Control Results;"

2) A one-page "Chain of Custody Record," also from Ms. James to Mr. Fleer.

Attached here for your reference are the "Monthly Progress Report" documents for July 2012 (document #9382258) and September 2012 (document #9382262), also for supplied by your office in response to this same FOIA request.

You will see that these latter two documents each contain a letter from Jean A. Mescher, Project Coordinator, Director, Environmental Services, McKesson Corporation to Mr. Ruben Moya, Superfund Remedial Project Manager, Superfund AR/LA Enforcement Section (6SF-RA), U.S. Environmental Protection Agency, with copies to "Mark Moix, ADEQ, EPA Assistant Regional Counsel (6C-W A)* (w/o enclosure) and Chief, Superfund Enforcement Branch (6H-E)* (w/o enclosure)."

These narrative reports are the actual "Monthly Progress Report" documents and, like all others I have ever seen related to the PRP McKesson's activities at the Arkwood site, are on McKesson Corporation letterhead and are signed by Jean Mescher, who in each report makes the following attestation:

"I certify that the information contained in or accompanying this submission is true, accurate, and complete to the best of my knowledge, information and belief, and that I, as project coordinator, have made reasonable inquiry into its veracity."

Therefore, as yet, I have not been supplied with the "Monthly Progress Report - August" as requested and described above.

Furthermore, I will be forwarding to you and the copied persons hereon an email reply I made to Ms. Letitia Lane regarding missing attachments to previous FOIA responses. I request all responsive and releasable attachments and enclosures to documents previously released to me as responsive to any of my FOIA requests. If you would like me to compile a list of these missing attachements, I will be happy to.

I hope, however, that your system allows you to track the responsive attachments to responsive documents already released to me and that you will be able to release those missing attachments to me as well in the near future. This applies to all FOIA requests I have made of EPA to date please.

Thank you for your kind attention to these matters.

Sincerely,

Curt Grisham

2012 Septe...cher (1.1 MB)

2012 July Pr...her (1.3 MB)

Begin forwarded message:

From: Kirst.Tina@epamail.epa.gov
Subject: Re: EPA Response to Grisham FOIA request EPA-R6-2013-001194
Date: December 31, 2012 9:35:07 AM PST
To: grish <grish@me.com>
Cc: Sanchez.Carlos@epamail.epa.gov, Ortiz.Diana@epamail.epa.gov, Moran.Gloria-Small@epamail.epa.gov, Moya.Ruben@epamail.epa.gov

Hi Mr. Grisham:

It was our intention to provide the August 2012 Monthly Progress Report on the Compact Disc (CD) provided to you in response to your Freedom Of Information Act Request EPA-R6-2013-001194. If the document was not included, please accept our apologies. I have attached a copy of the Report for your review; however, please note that the August 2012 report is not entitled "Monthly Progress Report" but is identified on the CD as Document ID # 9382259. We did locate the document on our archive CDs which are duplicate CDs of what was provided to you. The document is also noted on the Metadata Extraction PDF entitled "Metadata-EPA-R6-2013-001194.pdf".

The additional files included on the CD are to assist you in searching the CD. The .xlsx is the excel spreadsheet. You may click on the hyperlinks on the spreadsheet in order to view the documents. The .exe file is Adobe Reader and is provided on the disc incase you do not have Adobe Reader so that you may download the file. The remaining files: .inf, .idx, .log,and .pdx are provided to enable you to search the CD.

Please accept this as fulfillment of your request. For any future requests for Monthly Progress Reports or any other information, please access the following link and submit a new FOIA request: http://www.foia.gov/report-makerequest.html.

Thank you so much.

Tina Kirst I Toeroek Associates, Inc.
Contractor I U.S. Environmental Protection Agency Region 6 Superfund Division
phone: 214-665-2242 I fax: 214-665-7570
email: kirst.tina@epa.gov

From: grish <grish@me.com>
To: Diana Ortiz/R6/USEPA/US@EPA
Cc: grish <grish@me.com>, Tina Kirst/R6/USEPA/US@EPA, Gloria-Small Moran/R6/USEPA/US@EPA, Ruben Moya/R6/USEPA/US@EPA, Carlos Sanchez/R6/USEPA/US@EPA
Date: 12/23/2012 11:30 AM
Subject: EPA Response to Grisham FOIA request EPA-R6-2013-001194

Dear Ms. Ortiz,

I am in receipt of your December 17, 2012 letter (attached) covering EPA's response to my above-captioned FOIA request (submitted by me on November 8, 2012) for Arkwood "Monthly Progress Reports for August 2012, September 2012 and October 2012."

Unfortunately, the August 2012 Monthly Progress Report for Arkwood is not included, whereas the July 2012 Monthly Progress Report is. This lacuna is also reflected in the indexing file included on the CD and titled "Metadata-EPA-R6-2013-001194.pdf."

Please consider this request incompletely fulfilled and provide me with the missing report and supporting data.

Also, for my general information going forward, please explain the other files included on the CD provided to me. Specifically, please explain the purpose or use of the files with the following extensions: .exe, .inf, .idx, .log, .pdx, .xlsx.

The "readme" text file with extension .txt I understand and am comfortable with.

Generally, for security reasons, I do not open files with these or other extensions of unknown type, origin or function (particularly .exe - executable files) unless I know exactly what they are and what they will do to my computer's operating system.

Thank you.

Sincerely,

Curt Grisham

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS TX 75202-2733

DEC 17 2012

Mr. Charles Grisham, Jr.
P.O. Box 31526
San Francisco, California 94131

Re: Freedom of Information Act Request EPA-R6-2013-001194 / Arkwood Inc. / SSID # 06A3

Dear Mr. Grisham:

This is in response to your Freedom of Information Act (FOIA) request dated November 8, 2012, for information pertaining to the Arkwood Incorporated Superfund Site (ARD084930148), located in Omaha, Arkansas. Specifically, your request states that you are seeking Monthly Progress Reports for August 2012, September 2012 and October 2012.

In compliance with your request, we are providing responsive U.S. Environmental Protection Agency Region 6 Superfund Division documents on one Compact Disc (CD). The documents contained on the CD are in Adobe System Inc.'s common Portable Document Format ™ (PDF).

If you should have any questions or need additional information, please contact me at (214) 665-7315. The Region 6 Freedom of Information Officer will bill at a later date, if appropriate.

Sincerely,

for Diana Ortiz
Superfund FOIA Coordinator

Enclosure

EPA-R6-2013-001194

DOCID	DOC_DATE	PAGE_COUNT	TITLE	REL_DOCID	DOC_CLASS	Doc Class Description	PHASE_ACTIVITY	Phase Activity Description	ACCESS_CODE	SITE_ID	Site Name	SSID/OUID	TRACKING_TYPE	TRACKING	Tracking Description	ADDRESSEE	AUTHOR	DOC_TYPE	Doc Type Description
9382258	08/22/2012	9	PROGRESS REPORT FOR JULY 2012 FOR THE ARKWOOD INCORPORATED				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.02		MOYA RUBEN , (U.S. ENVIRONMENTAL PROTECTION AGENCY)	MESCHER JEAN , (MCKESSON CORPORATION)	16 | 44 | 85	CORRESPONDENCE | REPORT / STUDY | ELECTRONIC RECORD
9382259	08/30/2012	4	[ARKWOOD MONTHLY SAMPLING FOR 08/25/2012 SDG NO. 1208285]				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.09		FLEER JIM , (OXFORD ENVIRONMENTAL & SAFETY INCORPORATED)	JAMES NORMA , (ARKANSAS ANALYTICAL INCORPORATED)	46 | 85 | 16	SAMPLING / ANALYSIS | ELECTRONIC RECORD | CORRESPONDENCE
9382260	10/02/2012	5	[ARKWOOD MONTHLY SAMPLING FOR 09/25/2012 SDG NO. 1209285]				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.09		FLEER JIM , (OXFORD ENVIRONMENTAL & SAFETY INCORPORATED)	JAMES NORMA , (ARKANSAS ANALYTICAL INCORPORATED)	46 | 16 | 85	SAMPLING / ANALYSIS | CORRESPONDENCE | ELECTRONIC RECORD
9382261	09/12/2012	1	TER REMEDIATION SUMMARY FOR JUNE 2012, REVISED				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.24		MOYA RUBEN , (U.S. ENVIRONMENTAL PROTECTION AGENCY)	MOIX MARK , (ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY)	16 | 85	CORRESPONDENCE | ELECTRONIC RECORD
9382262	10/10/2012	10	PROGRESS REPORT FOR SEPTEMBER 2012 FOR THE ARKWOOD INCORPORA				RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.02		MOYA RUBEN , (U.S. ENVIRONMENTAL PROTECTION AGENCY)	MESCHER JEAN , (MCKESSON CORPORATION)	16 | 44 | 85	CORRESPONDENCE | REPORT / STUDY | ELECTRONIC RECORD
			[ARKWOOD													FLEER JIM ,			

9382263	10/18/2012	4	MONTHLY SAMPLING FOR 10/16/2012 SDG NO. 1210170]	RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.09	(OXFORD ENVIRONMENTAL & SAFETY INCORPORATED)	JAMES NORMA , (ARKANSAS ANALYTICAL INCORPORATED)	16 | 46 | 85	CORRESPONDENCE | SAMPLING / ANALYSIS | ELECTRONIC RECORD
9382264	11/09/2012	9	- PROGRESS REPORT FOR OCTOBER 2012 FOR THE ARKWOOD INCORPORA	RA	REMEDIAL ACTION	REL	ARD084930148	ARKWOOD INC	06A3	KEY	23.02	MOYA RUBEN , (U.S. ENVIRONMENTAL PROTECTION AGENCY)	MESCHER JEAN , (MCKESSON CORPORATION)	16 | 85 | 44	CORRESPONDENCE | ELECTRONIC RECORD | REPORT / STUDY

PDF

9382259.pdf (934 KB)

grish <grish@me.com>
To: Gloria-Small Moran <Moran.Gloria-Small@epamail.epa.gov>
Cc: grish <grish@me.com>
Fwd: Final Disposition, Request EPA-R6-2013-002441

February 5, 2013 2:39 PM

FYI: this request was for "Monthly Progress Reports for October 2012, November 2012 and December 2012 for Arkwood Superfund Site aka ARKWOOD, INC. (EPA ID: ARD084930148)"

however, released under this request were Sept., Oct. & Nov. 2012 MPRs; December was not included; September was already provided under a different req. #

cg

Begin forwarded message:

From: "Lane.Leticia@epa.gov" <Lane.Leticia@epa.gov>
Subject: Final Disposition, Request EPA-R6-2013-002441
Date: February 4, 2013 11:42:21 AM PST
To: "grish@icloud.com" <grish@icloud.com>

Request EPA-R6-2013-002441 has been processed with the following final disposition: Full grant

One or more records were released as a result of this request. These records can be retrieved here: View Records

This disposition can be appealed by filling out the appeal creation form here: Create Appeal

grish <grish@me.com> December 31, 2012 11:26 AM

To: Tina Kirst <Kirst.Tina@epamail.epa.gov>
Cc: grish <grish@me.com>, Carlos Sanchez <Sanchez.Carlos@epamail.epa.gov>, Diana Ortiz <Ortiz.Diana@epamail.epa.gov>, Gloria-Small Moran <Moran.Gloria-Small@epamail.epa.gov>, Ruben Moya <Moya.Ruben@epamail.epa.gov>, Leticia Lane <Lane.Leticia@epamail.epa.gov>
Fwd: Interim Release, Request EPA-R6-2012-000715 - 06-FOI-00411-12

Ms. Kirst,

FYI, per my previous email response to you today.

Curt Grisham

Begin forwarded message:

From: Lane.Leticia@epamail.epa.gov
Subject: Re: Interim Release, Request EPA-R6-2012-000715 - 06-FOI-00411-12
Date: December 19, 2012 10:25:43 AM PST
To: curt grisham <grish@icloud.com>

Mr. Grisham,

I am checking with the Division assigned to your request. I did forward your email to this office.

Thank you.

Leticia Lane
U.S. EPA Region 6
Enterprise, Technology&Architecture Section (6MD-OE)
Regional Freedom of Information Act Officer
Phone: (214)665-7202
Fax: (214)665-2146
lane.leticia@epa.gov

From: curt grisham <grish@icloud.com>
To: Leticia Lane/R6/USEPA/US@EPA
Date: 12/19/2012 11:05 AM
Subject: Re: Interim Release, Request EPA-R6-2012-000715 - 06-FOI-00411-12

Ms. Lane,

I find several documents (emails) that have critically important attachments.

However, I do not find the email attachments themselves. I have noted this effect in the past with the responses to previous FOIA requests I have submitted to EPA.

Is this standard FOIA practice for EPA? How do I obtain the attachments? Must I submit an additional FOIA request specifically requesting each item (attachment, enclosure, etc.)?

Also, you mention that this release "was a partial response to this request." I thought today was the deadline for

final response. I don't recall agreeing to an additional extension, although I would have agreed to such if I had been asked.

Thank you,

Curt Grisham

On Dec 19, 2012, at 9:50, Lane.Leticia@epamail.epa.gov wrote:

Mr. Grisham,

I'm forwarding an email that didn't go through, because we had an old email address. I was able to locate a new email address from a recent FOIA request you submitted. Below you will find a link to the the Website where you can view documents, this was a partial response to this request.

Thank you.

Leticia Lane
U.S. EPA Region 6
Enterprise, Technology&Architecture Section (6MD-OE)
Regional Freedom of Information Act Officer
Phone: (214)665-7202
Fax: (214)665-2146
lane.leticia@epa.gov

----- Forwarded by Leticia Lane/R6/USEPA/US on 12/19/2012 08:47 AM -----

EPAHUB12/USEPA/US, EPAMAILR812/USEPA/US

To: "curt@grish.org" <curt@grish.org>

cc:

Date: 09:38:29 AM EST Today

Subject: Interim Release, Request EPA-R6-2012-000715

Request EPA-R6-2012-000715 has been approved for an interim release.

The released records can be retrieved here: View Records

This is a partial release to your request. Thank you.

grish <grish@me.com>
To: Stephen Tzhone <Tzhone.Stephen@epamail.epa.gov>
Cc: grish <grish@me.com>
Fwd: Your FOIA Request - EPA-R6-2013-003351

March 7, 2013 2:08 PM

1 Attachment, 246 KB

Begin forwarded message:

From: grish <grish@me.com>
Subject: Re: Your FOIA Request - EPA-R6-2013-003351
Date: February 6, 2013 11:53:15 AM PST
To: Langley.Shirley@epa.gov
Cc: grish <grish@me.com>

Ms. Langley,

Thank you; here it is (attached):

Charles Grisham

McKesson Corporation
One Post Street, 34th Floor
San Francisco, CA 94104
608.848.4134 Tel

Jean A. Mescher
Director, Environmental Services

[redacted]

McKESSON
Empowering Healthcare

Certified Mail

September 24, 2012

Mr. Ruben Moya, Superfund Remedial Project Manager
Superfund AR/LA Enforcement Section (6SF-RA)
U.S. Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202

Subject: Groundwater Remediation
Arkwood, Inc. Site, Omaha, Arkansas

Dear Mr. Moya:

The purpose of this letter is to request an extension in responding to your August 22, 2012 request. In your August 22, 2012 letter, you requested a proposal to be submitted in September 2012 that would detail the steps to be taken to address the EPA concerns about the fate and transport of pentachlorophenol (PCP) at the Arkwood, Inc, Site. We are requesting a two week extension until October 12, 2012 to respond to the EPA's concerns.

Please do not hesitate to contact me at (608) 848-4134 if you any questions about this extension request.

Sincerely,

Jean A. Mescher, Project Coordinator
Director, Environmental Services

Enclosure

Copy:

- Mark Moix, ADEQ*
- EPA Assistant Regional Counsel (6C-WA)* (w/o enclosure)
- Chief, Superfund Enforcement Branch (6H-E)* (w/o enclosure)

*** CERTIFIED MAIL**

9387620

9387620

On Feb 6, 2013, at 8:20 AM, Langley.Shirley@epa.gov wrote:

02/06/2013 11:16 AM
FOIA Request: EPA-R6-2013-003351

Mr. Grisham,

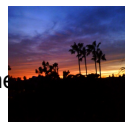
You stated that you had problems uploading your supporting documents for your request. I will attach them for you. Please send them to me at langley.shirley@epa.gov.

Thank you

Shirley Langley

grish <grish@me.com>

March 7, 2013 3:15 PM



To: Leticia Lane <Lane.Leticia@epamail.epa.gov>
Cc: grish <grish@me.com>, Diana Ortiz <Ortiz.Diana@epa.gov>, Dwayne Patrick <Patrick.Dwayne@epa.gov>, Stephe <Tzhone.Stephen@epamail.epa.gov>, Deborah-j Stanley <Stanley.Deborah-J@epa.gov>, Sharon Martin <Martin.Sharon@epa.gov>, Glodine Albright <albright.glodine@epa.gov>, Delorise Dellinges <Dellinges.Delorise@epa.gov>, Langley.Shirley@epa.gov, Gloria-Small Moran <Moran.Gloria-Small@epamail.epa.gov>
Fwd: Undeliverable: Re: Extension letter - EPA-R6-2013-003349, EPA-R6-2013-003350, and EPA-R6-2013-003351 (subject heading altered by Grisham)

7 Attachments, 279 KB

Ms. Lane,

Could you please ask your IT department about this error, which occurs only when I reply all to an email containing Ms Ortiz's email address and which has not happened to me before today?

Thank you,

Charles Grisham

Begin forwarded message:

From: postmaster@usepa.onmicrosoft.com
Subject: Undeliverable: Re: Extension letter - EPA-R6-2013-003349, EPA-R6-2013-003350, and EPA-R6-2013-003351 (subject heading altered by Grisham)
Date: March 7, 2013 3:10:55 PM PST
To: grish@me.com

Delivery has failed to these recipients or groups:

ortiz.diana@usepa.onmicrosoft.com
The e-mail address you entered couldn't be found. Please check the recipient's e-mail address and try to resend the message. If the problem continues, please contact your helpdesk.

Diagnostic information for administrators:

Generating server: usepa.onmicrosoft.com

ortiz.diana@usepa.onmicrosoft.com
#550 5.1.1 RESOLVER.ADR.RecipNotFound; not found ##rfc822;ortiz.diana@usepa.onmicrosoft.com

Original message headers:

Received: from mail97-ch1-R.bigfish.com (216.32.181.171) by
BL2PRD0910HT004.namprd09.prod.outlook.com (10.255.111.39) with Microsoft SMTP
Server (TLS) id 14.16.275.6; Thu, 7 Mar 2013 23:10:54 +0000
Received: from mail97-ch1 (localhost [127.0.0.1]) by mail97-ch1-R.bigfish.com
(Postfix) with ESMTP id 25D4A2E00FDfor <ortiz.diana@usepa.onmicrosoft.com>;
Thu, 7 Mar 2013 23:10:54 +0000 (UTC)
X-Forefront-Antispam-Report: CIP:161.80.134.170;KIP:(null);UIP:(null);IPV:NLI;H:mblast03.pyd.epa.gov;RD:mblast03.pyd.epa.gov;EFVD:NLI
X-SpamScore: -9
X-BigFish: ps-9(zzbb2dI98dI9371I936eIc85fh113bMzz1f42h1ee6h1de0h1202h1e76h1d1ah1d2ahzzz31h793h5ah5ch5bh668h839hd25he5bh1288h12a5h12bdh137ah139eh13eah1441h1504h1537h162dh1631h1662h1758h1898h18e1h1946h19b5h1b0ah1b2bh1155h)

Received-SPF: softfail (mail97-ch1: transitioning domain of me.com does not designate 161.80.134.170 as permitted sender) client-ip
=161.80.134.170; envelope-from=grish@me.com; helo=mblast03.pyd.epa.gov ;.pyd.epa.gov ;
Received: from mail97-ch1 (localhost.localdomain [127.0.0.1]) by mail97-ch1
(MessageSwitch) id 1362697851593106_15107; Thu, 7 Mar 2013 23:10:51 +0000
(UTC)
Received: from CH1EHSMHS008.bigfish.com (snatpool2.int.messaging.microsoft.com
[10.43.68.230]) by mail97-ch1.bigfish.com (Postfix) with ESMTP id 8ADBB460244
for <ortiz.diana@usepa.onmicrosoft.com>; Thu, 7 Mar 2013 23:10:51 +0000
(UTC)
Received: from mblast03.pyd.epa.gov (161.80.134.170) by
CH1EHSMHS008.bigfish.com (10.43.70.8) with Microsoft SMTP Server id
14.1.225.23; Thu, 7 Mar 2013 23:10:49 +0000
Received: from mblast03.pyd.epa.gov (localhost.localdomain [127.0.0.1]) by
localhost (Postfix) with SMTP id 2AB76D7CCE5 for
<ortiz.diana@usepa.onmicrosoft.com>; Thu, 7 Mar 2013 18:10:49 -0500 (EST)
Received: from mintra03.pyd.epa.gov (mintra03.pyd.epa.gov [161.80.134.169]) by
mblast03.pyd.epa.gov (Postfix) with ESMTP id F201CD7CB60 for
<ortiz.diana@usepa.onmicrosoft.com>; Thu, 7 Mar 2013 18:10:48 -0500 (EST)
Received: by mintra03.pyd.epa.gov (Postfix) id D9C0B7A832F; Thu, 7 Mar 2013
18:10:48 -0500 (EST)
Delivered-To: ortiz.diana@epa.gov
Received: from mintra03.pyd.epa.gov (localhost.localdomain [127.0.0.1]) by
localhost (Postfix) with SMTP id D30AD7A8321; Thu, 7 Mar 2013 18:10:48 -0500
(EST)
Received: from mseive01.rtp.epa.gov (mseive01.rtp.epa.gov [134.67.100.69]) by
mintra03.pyd.epa.gov (Postfix) with ESMTP id 021CF7A8326; Thu, 7 Mar 2013
18:10:48 -0500 (EST)
Received: from mseive01.rtp.epa.gov (localhost.localdomain [127.0.0.1]) by
localhost (Postfix) with SMTP id CDAD844418; Thu, 7 Mar 2013 18:10:47 -0500
(EST)
Received: from nk11p03mm-asmtp001.mac.com (nk11p03mm-asmtpout001.mac.com
[17.158.232.236]) by mseive01.rtp.epa.gov (Postfix) with ESMTP id 5B7D44443F;
Thu, 7 Mar 2013 18:10:45 -0500 (EST)
Received: from [10.0.1.3] ([50.136.208.127]) by nk11p03mm-asmtp001.mac.com
(Oracle Communications Messaging Server 7u4-26.01(7.0.4.26.0) 64bit (built
Jul 13 2012)) with ESMTPSA id <0MJB00NL3CDH2XB0@nk11p03mm-asmtp001.mac.com>;
Thu, 07 Mar 2013 23:10:32 +0000 (GMT)
X-Proofpoint-Virus-Version: vendor=fsecure
engine=2.50.10432:5.9.8327,1.0.431,0.0.0000
definitions=2013-03-07_09:2013-03-07,2013-03-07,1970-01-01 signatures=0
X-Proofpoint-Spam-Details: rule=notspam policy=default score=0 spamscore=0
ipscore=0 suspectscore=0 phishscore=0 bulkscore=0 adultscore=0 classifier=spam
adjust=0 reason=mlx scancount=1 engine=6.0.2-1203120001
definitions=main-1303070197
Subject: Re: Extension letter - EPA-R6-2013-003349, EPA-R6-2013-003350,
and EPA-R6-2013-003351 (subject heading altered by Grisham)
MIME-Version: 1.0 (Apple Message framework v1283)
Content-Type: multipart/alternative;
boundary="Apple-Mail=_93EABF50-6A64-4FAB-B4AA-58554D594DE6"
From: grish <grish@me.com>
In-Reply-To: <528019067.5385.1362692303663.JavaMail.jboss@prod-ssl.erulemaking.net>
Date: Thu, 7 Mar 2013 15:10:28 -0800
CC: grish <grish@me.com>, "Ortiz, Diana" <Ortiz.Diana@epa.gov>, "Patrick,
Dwayne" <Patrick.Dwayne@epa.gov>, Stephen Tzhone
<Tzhone.Stephen@epamail.epa.gov>, "Stanley, Deborah-j"
<Stanley.Deborah-J@epa.gov>, "Martin, Sharon" <Martin.Sharon@epa.gov>,
"Albright, Glodine" <albright.glodine@epa.gov>, "Dellinges, Delorise"
<Dellinges.Delorise@epa.gov>, <Langley.Shirley@epa.gov>, Gloria-Small Moran
<Moran.Gloria-Small@epamail.epa.gov>
Message-ID: <27BE12B2-97D6-413A-A97D-CDA9FB209C40@me.com>
References: <528019067.5385.1362692303663.JavaMail.jboss@prod-ssl.erulemaking.net>
To: "Lane.Leticia@epa.gov" <Lane.Leticia@epa.gov>
X-Mailer: Apple Mail (2.1283)
X-PMX-Version: 5.5.9.395186, Antispam-Engine: 2.7.2.376379, Antispam-Data: 2013.3.7.230317
X-PerlMx-Spam: Gauge=IIIIIIIII, Probability=9%, Report='
HTML_50_70 0.1, HTML_NO_HTTP 0.1, MULTIPLE_RCPTS 0.1, FROM_NAME_ONE_WORD 0.05, SUPERLONG_LINE 0.05, BODYTEXTH_S
IZE_10000_LESS 0, BODYTEXTP_SIZE_3000_LESS 0, BODY_SIZE_10000_PLUS 0, DATE_TZ_NA 0, PDF_ATTACHED 0, PDF_ATTACHED
_2 0, PDF_SIZE_25_50K 0, __ANY_URI 0, __ATTACHMENT_SIZE_25_50K 0, __BOUNCE_CHALLENGE_SUBJ 0, __BOUNCE_NDR_SUBJ_
EXEMPT 0, __CT 0, __CTYPE_HAS_BOUNDARY 0, __CTYPE_MULTIPART 0, __CTYPE_MULTIPART_ALT 0, __HAS_FROM 0, __HAS_HTML
0, __HAS_MSGID 0, __HAS_X_MAILER 0, __IN_REP_TO 0, __MIME_HTML 0, __MIME_VERSION 0, __MIME_VERSION_APPLEMAIL 0, _
_MSGID_APPLEMAIL 0, __MULTIPLE_RCPTS_CC_X2 0, __SANE_MSGID 0, __TAG_EXISTS_HTML 0, __TO_MALFORMED_2 0, __TO_NO
_NAME 0, __URI_NO_PATH 0, __URI_NO_WWW 0, __URI_NS , __USER_AGENT_APPLEMAIL 0, __X_MAILER_APPLEMAIL 0, __cbl.abus
eat.org_ERROR '

Return-Path: grish@me.com

Reporting-MTA: dns;usepa.onmicrosoft.com
Received-From-MTA: dns;mail97-ch1-R.bigfish.com
Arrival-Date: Thu, 7 Mar 2013 23:10:54 +0000

Original-Recipient: rfc822;ortiz.diana@usepa.onmicrosoft.com
Final-Recipient: rfc822;ortiz.diana@usepa.onmicrosoft.com
Action: failed
Status: 5.1.1
Diagnostic-Code: smtp;550 5.1.1 RESOLVER.ADR.RecipNotFound; not found

From: grish <grish@me.com>
Subject: **Re: Extension letter - EPA-R6-2013-003349, EPA-R6-2013-003350, and EPA-R6-2013-003351 (subject heading altered by Grisham)**
Date: March 7, 2013 3:10:28 PM PST
To: "Lane.Leticia@epa.gov" <Lane.Leticia@epa.gov>
Cc: grish <grish@me.com>, "Ortiz, Diana" <Ortiz.Diana@epa.gov>, "Patrick, Dwayne" <Patrick.Dwayne@epa.gov>, Stephen Tzhone <Tzhone.Stephen@epamail.epa.gov>, "Stanley, Deborah-j" <Stanley.Deborah-J@epa.gov>, "Martin, Sharon" <Martin.Sharon@epa.gov>, "Albright, Glodine" <albright.glodine@epa.gov>, "Dellinges, Delorise" <Dellinges.Delorise@epa.gov>, <Langley.Shirley@epa.gov>, Gloria-Small Moran <Moran.Gloria-Small@epamail.epa.gov>

Dear Ms. Lane,

I received the attached "extension letters" from you via email today. Since they do not ask my permission to extend the deadline for response (as has been the courtesy extended to me in the past), I am merely acknowledging them.

For your information, I did not receive the usual letters acknowledging my FOIA requests numbered EPA-R6-2013-003349, EPA-R6-2013-003350, and EPA-R6-2013-003351 (as also has been the courtesy extended to me in the past). Perhaps the government has altered it standard operating procedure with the new FOIA online system.

I did receive the attached automated email acknowledgements when I submitted these requests; do these automated emails replace the acknowledgement letters that used to be sent on EPA letterhead (example attached)?

Sincerely,

Charles Grisham

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 Ross Avenue
Dallas, TX 75202-2733

March 7, 2013

Charles Grisham
Box 31526
San Francisco, CA 94131-0526

Request Identification Number (RIN): EPA-R6-2013-003349

Dear Mr. Grisham:

This is in response to your Freedom of Information Act request which we have numbered EPA-R6-2013-003349. An extension of time required to comply with your request is necessary.

The reason for this extension is the need for consultation, which shall be conducted with all practicable speed, with another agency or EPA office having a substantial subject matter interest in your request. (5 USC 552(a)(6)(B)(iii)(III))

You may expect a reply by March 21, 2013.

Thank You,

Leticia Lane

Leticia Lane
Regional Freedom of Information Act Officer

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 Ross Avenue
Dallas, TX 75202-2733

March 7, 2013

Charles Grisham
Box 31526
San Francisco, CA 94131-0526

Request Identification Number (RIN): EPA-R6-2013-003350

Dear Mr. Grisham:

This is in response to your Freedom of Information Act request which we have numbered EPA-R6-2013-003350. An extension of time required to comply with your request is necessary.

The reason for this extension is the need for consultation, which shall be conducted with all practicable speed, with another agency or EPA office having a substantial subject matter interest in your request. (5 USC 552(a)(6)(B)(iii)(III))

You may expect a reply by March 21, 2013.

Thank You,

Leticia Lane

Leticia Lane
Regional Freedom of Information Act Officer

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 Ross Avenue
Dallas, TX 75202-2733

March 7, 2013

Charles Grisham
Box 31526
San Francisco, CA 94131-0526

Request Identification Number (RIN): EPA-R6-2013-003351

Dear Mr. Grisham:

This is in response to your Freedom of Information Act request which we have numbered EPA-R6-2013-003351. An extension of time required to comply with your request is necessary.

The reason for this extension is the need for consultation, which shall be conducted with all practicable speed, with another agency or EPA office having a substantial subject matter interest in your request. (5 USC 552(a)(6)(B)(iii)(III))

You may expect a reply by March 21, 2013.

Thank You

Thank You,

Leticia Lane

Leticia Lane
Regional Freedom of Information Act Officer

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 Ross Avenue
Dallas, TX 75202-2733

March 22, 2012

Mr. Charles Grisham
P. O. Box 31526
San Francisco, CA 94131

RE: Request Identification Number (RIN): 06-FOI-00292-12

Dear Mr. Grisham:

Thank you for your Freedom of Information (FOIA) request dated March 21, 2012 and received in this office on March 22, 2012, for records related to:

Requesting a copy of the information sent to Don A. Smith in response to his FOIA request regarding Arkwood.

The initial analysis for your request identifies reply possible from the following division:

6SF – Superfund Division

The program that has been assigned this request will be responding to you directly.

The Agency has twenty (20) business days to respond to your request, except when you have agreed to an alternate due date or unusual circumstances exists that would require an extension of time under 5 U.S.C. 552(a)(6)(B). Please be advised that you may be charged a FOIA processing fee in accordance with the revised FOIA Fee Schedule at 40 C.F.R. § 2.107. If you've requested a fee waiver, additional justification may be required from you in order for the EPA to make a final determination.

We hope to respond to you soon. In the interim, please contact me if you have any questions about your request. Please cite your FOIA request number in all communications regarding this request.

Sincerely,

Leticia Lane

Leticia Lane
Regional Freedom of Information Officer
Enterprise, Technology & Architecture Section (6MD-OE)
214-665-7202 Office
214-665-2146 Fax
lane.leticia@epa.gov

From: "foia@erulemaking.net" <foia@erulemaking.net>
Subject: FOIA Request EPA-R6-2013-003351 Submitted
Date: February 4, 2013 2:20:37 PM PST
To: "grish@icloud.com" <grish@icloud.com>

This message is to confirm your request submission to the FOIAonline application: View Request. Request information is as follows:

- Tracking Number: EPA-R6-2013-003351
- Requester Name: charles grisham
- Date Submitted: Mon Feb 04 17:20:36 EST 2013
- Request Status: Submitted
- Description: Regarding Arkwood Inc. Superfund Site in Omaha, Boone County Arkansas EPA ID#ARD084930148:
  Please provide the response from McKesson to EPA referred to in the following quote from FOIA response document #9387620, letter from Mescher to Mr. Ruben Moya, EPA, dated September 24, 2012:
  "The purpose of this letter is to request an extension in responding to your August 22, 2012 request. In your August 22, 2012 letter, you requested a proposal to be submitted in September 2012 that would detail the steps to be taken to address the EPA concerns about the fate and transport of pentachlorophenol (PCP) at the Arkwood, Inc, Site. We are requesting a two week extension until October 12, 2012 to respond to the EPA's concerns."

  NOTE: unable to upload supporting files on the foiaonline system; problem reported to the foiaonline helpdesk.

From: "foia@erulemaking.net" <foia@erulemaking.net>
Subject: FOIA Request EPA-R6-2013-003350 Submitted
Date: February 4, 2013 2:13:57 PM PST
To: "grish@icloud.com" <grish@icloud.com>

This message is to confirm your request submission to the FOIAonline application: View Request. Request information is as follows:

- Tracking Number: EPA-R6-2013-003350
- Requester Name: charles grisham
- Date Submitted: Mon Feb 04 17:13:57 EST 2013
- Request Status: Submitted
- Description: Regarding Arkwood, Inc. Superfund Site in Omaha, Boone County, Arkansas EPA ID# ARD084930148:

  Please provide copies of Monthly Progress Reports (the narrative written and certified by McKesson project manager Jean Mescher on McKesson letterhead) and supporting data for August 2012, December 2012 and January 2013.

From: "foia@erulemaking.net" <foia@erulemaking.net>
Subject: FOIA Request EPA-R6-2013-003349 Submitted
Date: February 4, 2013 2:10:40 PM PST
To: "grish@icloud.com" <grish@icloud.com>

This message is to confirm your request submission to the FOIAonline application: View Request. Request information is as follows:

- Tracking Number: EPA-R6-2013-003349
- Requester Name: charles grisham
- Date Submitted: Mon Feb 04 17:10:40 EST 2013
- Request Status: Submitted
- Description: Regarding Arkwood, Inc. Superfund Site in Omaha, Boone County, Arkansas EPA ID# ARD084930148:

  Please provide copies of all communications in the above matter (correspondence with attachments, emails with attachments, telephone or in-person meeting agendas, attachments and notes, etc.) exchanged between EPA (its staff, managers, employees, representatives, contractors, agents etc.) and McKesson Corporation (its employees, agents, representatives, contractors, etc. and that of any McKesson subsidiary entity) during the following time interval: May 1, 2012 until present.

On Mar 7, 2013, at 1:38 PM, Lane.Leticia@epa.gov wrote:

03/07/2013 04:37 PM
FOIA Request: EPA-R6-2013-003351

Attached you will find an extension letter. Thank you.

<R6 - Extension Letter - 03-07-13 -EPA-R6-2013-003351.pdf>

grish <grish@me.com> February 4, 2013 2:27 PM

To: Leticia Lane <Lane.Leticia@epamail.epa.gov>
Cc: grish <grish@me.com>, Carlos Sanchez <Sanchez.Carlos@epamail.epa.gov>, Diana Ortiz <Ortiz.Diana@epamail.epa.gov>, Gloria-Small Moran <Moran.Gloria-Small@epamail.epa.gov>, Ruben Moya <Moya.Ruben@epamail.epa.gov>, Tina Kirst <Kirst.Tina@epamail.epa.gov>
New FOIA requests and difficulty with appeals Re: EPA Response to Grisham FOIA request EPA-R6-2013-001194 and EPA-R6-2013-002441

Dear Ms. Lane,

Please see the new requests I made today. I am unable to file an appeal to the incomplete responses to EPA-R6-2013-001194 and EPA-R6-2013-002441 online due to errors already reported to infoonline helpdesk. I also am unable to upload supporting files online due to website errors.

Thank you.

Charles Grisham

EPA-R6-2013-003351 Request TBD 02/04/2013 TBD Submitted
Regarding Arkwood Inc. Superfund Site in Omaha, Boone County Arkansas EPA ID#ARD084930148: Please provide the response from McKesson to EPA referred to in the following quote from FOIA response document #9387620, letter from Mescher to Mr. Ruben Moya, EPA, dated September 24, 2012: "The purpose of this letter is to request an extension in responding to your August 22, 2012 request. In your August 22, 2012 letter, you requested a proposal to be submitted in September 2012 that would detail the steps to be taken to address the EPA concerns about the fate and transport of pentachlorophenol (PCP) at the Arkwood, Inc, Site. We are requesting a two week extension until October 12, 2012 to respond to the EPA's concerns." NOTE: unable to upload supporting files on the foiaonline system; problem reported to the foiaonline helpdesk.

EPA-R6-2013-003350 Request TBD 02/04/2013 TBD Submitted
Regarding Arkwood, Inc. Superfund Site in Omaha, Boone County, Arkansas EPA ID# ARD084930148: Please provide copies of Monthly Progress Reports (the narrative written and certified by McKesson project manager Jean Mescher on McKesson letterhead) and supporting data for August 2012, December 2012 and January 2013.

EPA-R6-2013-003349 Request TBD 02/04/2013 TBD Submitted
Regarding Arkwood, Inc. Superfund Site in Omaha, Boone County, Arkansas EPA ID# ARD084930148: Please provide copies of all communications in the above matter (correspondence with attachments, emails with attachments, telephone or in-person meeting agendas, attachments and notes, etc.) exchanged between EPA (its staff, managers, employees, representatives, contractors, agents etc.) and McKesson Corporation (its employees, agents, representatives, contractors, etc. and that of any McKesson subsidiary entity) during the following time interval: May 1, 2012 until present.

I wish to appeal:
EPA-R6-2013-002441 Request Complex 12/31/2012 02/01/2013 Closed
request Monthly Progress Reports for October 2012, November 2012 and December 2012 for Arkwood Superfund Site aka ARKWOOD, INC. (EPA ID: ARD084930148)

I wish to appeal:
EPA-R6-2013-001194 Request Complex 11/08/2012 12/12/2012 Closed
request Monthly Progress Reports for August 2012, September 2012 and October 2012 for Arkwood Superfund Site aka ARKWOOD, INC. (EPA ID: ARD084930148)
On Dec 31, 2012, at 11:22 AM, grish wrote:

Dear Ms. Kirst,

That document # does not include the "Monthly Progress Report - August" from Jean Mescher of McKesson Corporation; it includes only the following:

1) A three-page report dated 30 August 2012 to McKesson contractor Jim Fleer of Oxford Environmental & Safety, Inc 14348 Nieman Rd. Overland Park, KS 6622 from Norma James, President, Arkansas Analytical, Inc., 11701 I-30 Bldg 1, Ste 115 - Little Rock, AR 72209, consisting of a cover letter dated August 30, 2012, one page of "Analytical Results" and one page of "Quality Control Results;"

2) A one-page "Chain of Custody Record," also from Ms. James to Mr. Fleer.

Attached here for your reference are the "Monthly Progress Report" documents for July 2012 (document #9382258) and September 2012 (document #9382262), also for supplied by your office in response to this same FOIA request.

You will see that these latter two documents each contain a letter from Jean A. Mescher, Project Coordinator, Director, Environmental Services, McKesson Corporation to Mr. Ruben Moya, Superfund Remedial Project Manager, Superfund AR/LA Enforcement Section (6SF-RA), U.S. Environmental Protection Agency, with copies to "Mark Moix, ADEQ, EPA Assistant Regional Counsel (6C-W A)* (w/o enclosure) and Chief, Superfund Enforcement Branch (6H-E)* (w/o enclosure)."

These narrative reports are the actual "Monthly Progress Report" documents and, like all others I have ever seen related to the PRP McKesson's activities at the Arkwood site, are on McKesson Corporation letterhead and are signed by Jean Mescher, who in each report makes the following attestation:

"I certify that the information contained in or accompanying this submission is true, accurate, and complete to the best of my knowledge, information and belief, and that I, as project coordinator, have made reasonable inquiry into its veracity."

Therefore, as yet, I have not been supplied with the "Monthly Progress Report - August" as requested and described above.

Furthermore, I will be forwarding to you and the copied persons hereon an email reply I made to Ms. Letitia Lane regarding missing attachments to previous FOIA responses. I request all responsive and releasable attachments and enclosures to documents previously released to me as responsive to any of my FOIA requests. If you would like me to compile a list of these missing attachements, I will be happy to.

I hope, however, that your system allows you to track the responsive attachments to responsive documents already released to me and that you will be able to release those missing attachments to me as well in the near future. This applies to all FOIA requests I have made of EPA to date please.

Thank you for your kind attention to these matters.

Sincerely,

Curt Grisham

<2012 September Progress Report - Mescher.pdf>
<2012 July Progress Report - Mescher.pdf>

Begin forwarded message:

From: Kirst.Tina@epamail.epa.gov
Subject: Re: EPA Response to Grisham FOIA request EPA-R6-2013-001194
Date: December 31, 2012 9:35:07 AM PST
To: grish <grish@me.com>
Cc: Sanchez.Carlos@epamail.epa.gov, Ortiz.Diana@epamail.epa.gov, Moran.Gloria-Small@epamail.epa.gov, Moya.Ruben@epamail.epa.gov

Hi Mr. Grisham:

It was our intention to provide the August 2012 Monthly Progress Report on the Compact Disc (CD) provided to you in response to your Freedom Of Information Act Request EPA-R6-2013-001194. If the document was not included, please accept our apologies. I have attached a copy of the Report for your review; however, please note that the August 2012 report is not entitled "Monthly Progress Report" but is identified on the CD as Document ID # 9382259. We did locate the document on our archive CDs which are duplicate CDs of what was provided to you. The document is also noted on the Metadata Extraction PDF entitled "Metadata-EPA-R6-2013-001194.pdf".

The additional files included on the CD are to assist you in searching the CD. The .xlsx is the excel spreadsheet. You may click on the hyperlinks on the spreadsheet in order to view the documents. The .exe file is Adobe Reader and is provided on the disc incase you do not have Adobe Reader so that you may download the file. The remaining files: .inf, .idx, .log,and .pdx are provided to enable you to search the CD.

Please accept this as fulfillment of your request. For any future requests for Monthly Progress Reports or any other information, please access the following link and submit a new FOIA request: http://www.foia.gov/report-makerequest.html.

Thank you so much.

Tina Kirst l Toeroek Associates, Inc.
Contractor l U.S. Environmental Protection Agency Region 6 Superfund Division
phone: 214-665-2242 l fax: 214-665-7570
email: kirst.tina@epa.gov

From: grish <grish@me.com>
To: Diana Ortiz/R6/USEPA/US@EPA
Cc: grish <grish@me.com>, Tina Kirst/R6/USEPA/US@EPA, Gloria-Small Moran/R6/USEPA/US@EPA, Ruben Moya/R6/USEPA/US@EPA, Carlos Sanchez/R6/USEPA/US@EPA
Date: 12/23/2012 11:30 AM
Subject: EPA Response to Grisham FOIA request EPA-R6-2013-001194

Dear Ms. Ortiz,

I am in receipt of your December 17, 2012 letter (attached) covering EPA's response to my above-captioned FOIA request (submitted by me on November 8, 2012) for Arkwood "Monthly Progress Reports for August 2012, September 2012 and October 2012."

Unfortunately, the August 2012 Monthly Progress Report for Arkwood is not included, whereas the July 2012 Monthly Progress Report is. This lacuna is also reflected in the indexing file included on the CD and titled "Metadata-EPA-R6-2013-001194.pdf."

Please consider this request incompletely fulfilled and provide me with the missing report and supporting data.

Also, for my general information going forward, please explain the other files included on the CD provided to me. Specifically, please explain the purpose or use of the files with the following extensions: .exe, .inf, .idx, .log, .pdx, .xlsx.

The "readme" text file with extension .txt I understand and am comfortable with.

Generally, for security reasons, I do not open files with these or other extensions of unknown type, origin or function (particularly .exe - executable files) unless I know exactly what they are and what they will do to my computer's operating system.

Thank you.

Sincerely,

Curt Grisham

<20121217 Ortiz to Grisham Jr FOIA cover.pdf>
<Metadata-EPA-R6-2013-001194.pdf>
<9382259.pdf>

r6foia@epa.gov

July 24, 2013 1:24 PM

To: "grish@icloud.com" <grish@icloud.com>

Expedited Processing Decision - see attached correspondence

1 Attachment, 289 KB

07/24/2013 04:23 PM
FOIA Request: EPA-R6-2013-008408

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

July 24, 2013

OFFICE OF
ENVIRONMENTAL INFORMATION

Mr. Charles Grisham
P.O. Box 31526
San Francisco, CA 94131-0526

RE: Request Number: EPA-R6-2013-008408

Dear Mr. Grisham:

This is in response to your request for expedited processing in connection with your Freedom of Information Act (FOIA) request to the U.S. Environmental Protection Agency (EPA) Region 6 seeking copies of all communications regarding Arkwood, Inc. Superfund Site in Omaha, Boone County, Arkansas, EPA ID#ARD084930148.

Based on the information provided, we are denying your request for expedited processing. You have not demonstrated that the lack of expedited treatment could reasonably be expected to pose an imminent threat to the life or physical safety of an individual. Your request will be processed as expeditiously as possible by Region 6.

Under the FOIA, you have the right to appeal this expedited processing determination to the National Freedom of Information Office, U.S. EPA, FOIA and Privacy Branch, 1200 Pennsylvania Avenue, N.W. (2822T), Washington, DC 20460 (U.S. Postal Service Only), E-mail: foia_hq@epa.gov. Only items mailed through the United States Postal Service may be delivered to 1200 Pennsylvania Avenue, NW. If you are submitting your appeal via hand delivery, courier service or overnight delivery, you must address your correspondence to 1301 Constitution Avenue, N.W., Room 6416J, Washington, DC 20004. Your appeal must be made in writing, and it must be submitted no later than 30 calendar days from the date of this letter. The Agency will not consider appeals received after the 30 calendar day limit. The appeal letter should include the request number listed above. For quickest possible handling, the appeal letter and its envelope should be marked "Freedom of Information Act Appeal."

If you have any questions concerning this please contact me at (202) 566-1667.

Sincerely,

Larry F. Gottesman
National FOIA Officer

View My FOIA Requests

Results 25

6 items found, displaying all items.

1

Tracking Number	Type	Track	Submitted	Due	Phase	Detail
EPA-HQ-2013-004621	Appeal	Complex	03/18/2013	04/15/2013	Closed	
I appeal this response as incomplete for the following reasons (please see attached uploaded files as evidence to support my statements): 1) Mr. Moya did not make “numerous attempts to contact” me regarding this FOIA request; Mr. Moya made NO attempts to contact me regarding this request. 2) My request was extremely clear in its original form and should have required no discussion whatsoever with me in order for EPA to fulfill. My original request numbered EPA-R6-2013-003349 stated: “Please provide copies of all communications in the above matter (correspondence with attachments, emails with attachments, telephone or in-person meeting agendas, attachments and notes, etc.) exchanged between EPA (its staff, managers, employees, representatives, contractors, agents etc.) and McKesson Corporation (its employees, agents, representatives, contractors, etc. and that of any McKesson subsidiary entity) during the following time interval: May 1, 2012 until present.” I couldn’t have been any more lucid in my request language, I believe. 3) EPA released one (1) document as responsive to the above request. I do not consider that a complete response as I do not believe that one (1) document comprises “... all communications in the above matter... during the following time interval: May 1, 2012 until present.”						
EPA-R6-2013-003351	Request	Complex	02/04/2013	03/21/2013	Closed	
EPA-R6-2013-003350	Request	Complex	02/04/2013	03/21/2013	Closed	
EPA-R6-2013-003349	Request	Complex	02/04/2013	03/21/2013	Closed	
EPA-R6-2013-002441	Request	Complex	12/31/2012	02/01/2013	Closed	
EPA-R6-2013-001194	Request	Complex	11/08/2012	12/12/2012	Closed	

foia_helpdesk <foia_helpdesk@bah.com>
To: grish <grish@me.com>
Re: [External] appeal of EPA-R6-2013-003349

March 18, 2013 4:39 PM

Mr Grisham,

We see that your appeal was submitted on March 18, 2013. The tracking number of the appeal is EPA-R6-2013-004621.

If you have any additional questions about the status of your appeal, please contact the Region 6 FOIA Office directly at (214) 665-7202.

FOIAonline Help Desk

On 3/18/13 5:28 PM, "grish" <grish@me.com> wrote:

> Dear Mr. Tzhone,
>
> I attach the online confirmation of my appeal to the above. I have not received an automated response from the foiaonline system, and this appeal is marked "closed." I just wanted to make sure my appeal was correctly submitted, received and in process.
>
> Thank you,
> Charles Grisham

foia_helpdesk <foia_helpdesk@bah.com>

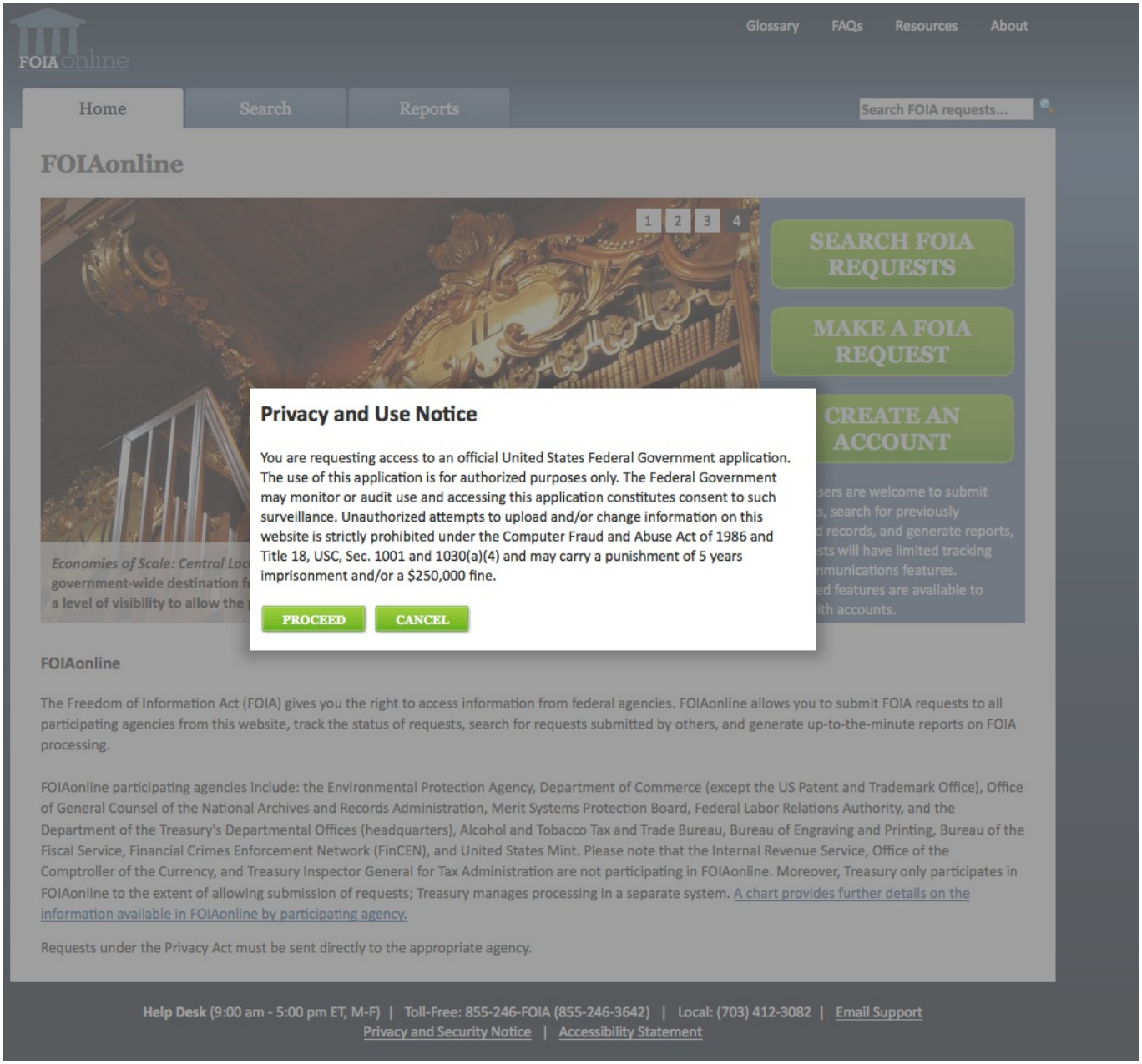
February 4, 2013 1:06 PM

To: grish <grish@me.com>

Re: [External] what I see

1 Attachment, 247 KB

On 2/4/13 3:47 PM, "grish" <grish@me.com> wrote:



grish <grish@me.com>
To: Moran.Gloria-Small@epamail.epa.gov
Cc: grish <grish@me.com>, Moya.Ruben@epamail.epa.gov
Re: Arkwood questions & Fwd: FOIA Request EPA-R6-2013-001194 Submitted - REPLY

December 8, 2012 6:07 AM

Dear Gloria and Ruben,

According to the FOIA online system, my recent request is due by Dec. 12, 2012. Will the EPA be able to meet that?

Thank you,

Curt

[Following pasted in from website:]

Results
One item found.
1

Tracking Number	Type	Track	Submitted	Due	Phase	Detail
EPA-R6-2013-001194	Request	Complex	11/08/2012	12/12/2012	Assignment	

request Monthly Progress Reports for August 2012, September 2012 and October 2012 for Arkwood Superfund Site aka ARKWOOD, INC. (EPA ID: ARD084930148)

[- End of pasted material -]

On Nov 15, 2012, at 4:28 PM, grish wrote:

OK, many thanks!
Curt

On Nov 15, 2012, at 3:51 PM, Moran.Gloria-Small@epamail.epa.gov wrote:

Hello Mr. Grisham:

Thank you for your email to me. I am in discussions with Mr. Moya that will allow for a decision that will enable you to receive available reports soon from Mr. Moya, and at some point will allow for the safeguards and protections of FOIA to be implemented for documents that are not currently in existence. For the moment, Mr. Moya will be transmitting some reports to you directly. These reports will be transmitted with the condition that the FOIA requirements cannot be circumvented with regard to any upcoming reports, not yet in existence, that will be drafted in the future and contain activities at the site that occur in the future.

Best Regards,

Gloria Moran
Assistant Regional Counsel
Superfund Branch (6RC-S)
U.S.EPA, Region 6
1445 Ross Avenue
Dallas TX 75202-2733
214-665-3193
214-665-6460 (fax)
moran.gloria-small@epamail.epa.gov

From: grish <grish@me.com>
To: Gloria-Small Moran/R6/USEPA/US@EPA

Cc: grish <grish@me.com>, Ruben Moya/R6/USEPA/US@EPA
Date: 11/15/2012 10:53 AM
Subject: Arkwood questions & Fwd: FOIA Request EPA-R6-2013-001194 Submitted

---

Dear Gloria,

I like the new FOIA mechanism online; it is very simple to use!

Here's my first regular FOIA request to be copied on the monthly reports submitted by PRP McKesson.

Ruben and I wonder if the following process would be OK with you:

1) Anything Ruben gets or sees about Arkwood will be flagged or copied into a file to be considered for release to me;
2) Monthly Ruben will run those past you except where you have given blanket permission already for certain items (e.g. OK to release McKesson Monthly Progress Reports to Grisham provided he has an open and active FOIA request in the system; OK to release monthly water test data ditto; etc.)
2) b. If you have already blanketed it and my FOIA req exists, Ruben will not need to run it past you each time.
3) Ruben will ship responsive docs just once a month, unless he feels I should see something sooner (something that has been cleared of course.)

Does that work for you & the Office of Regional Counsel?

(I realize I still have a broad open request (06-FOI-00411-12) in the works, so anything that will be included in that need not cause duplication of effort, I hope.)

Thank you and best regards,

Curt

Begin forwarded message:

From: curt grisham <grish@icloud.com>
Subject: Fwd: FOIA Request EPA-R6-2013-001194 Submitted
Date: November 8, 2012 1:08:33 PM PST
To: Ruben Moya <Moya.Ruben@epamail.epa.gov>

Request Information
Tracking Number :*EPA-R6-2013-001194*
Requester Name :charles grisham
Date Submitted :11/08/2012
Request Status :Submitted
Description :
request Monthly Progress Reports for August 2012, September 2012 and October 2012 for Arkwood Superfund Site aka ARKWOOD, INC. (EPA ID: ARD084930148)

"Tzhone, Stephen" <tzhone.stephen@epa.gov> August 16, 2013 4:44 AM
To: Curt Grisham <grish@icloud.com>
Cc: "Ortiz, Diana" <Ortiz.Diana@epa.gov>, "Tamez, Adam" <Tamez.Adam@epa.gov>, "Sanchez, Carlos" <sanchez.carlos@epa.gov>, "Patrick, Dwayne" <Patrick.Dwayne@epa.gov>
RE: Delivery Notification: Delivery has failed

Hi Curt,

Thanks for letting me know about the email delivery notification. I did receive your original email on cc and have forwarded it to Diana Ortiz just in case. I'm not sure why your email to the FOIA Team was returned and I have forwarded the diagnostic error code in your message to our help desk for support.

Thanks,

Stephen L. Tzhone
Superfund Remedial Project Manager
214.665.8409
tzhone.stephen@epa.gov

From: Curt Grisham [mailto:grish@icloud.com]
Sent: Thursday, August 15, 2013 4:30 PM
To: Tzhone, Stephen
Subject: Fwd: Delivery Notification: Delivery has failed

FYI team address R6_6SF_FOIA_Team@epa.gov rejected my email; other people experience the same?

Begin forwarded message:

From: postmaster@mac.com
Date: August 15, 2013, 14:15:51 PDT
To: grish@icloud.com
Subject: Delivery Notification: Delivery has failed

This report relates to a message you sent with the following header fields:

Message-id: <0BF9FD02-9EAB-4929-959F-DA30369D777C@icloud.com>
Date: Thu, 15 Aug 2013 14:15:29 -0700
From: Curt Grisham <grish@icloud.com>
To: "Ortiz, Diana" <Ortiz.Diana@epa.gov>
Subject: Re: Notice of Ten-day Extension for FOIA # EPA-R6-2013-008408 / FOLLOW-UP TO EPA-R6-2013-003349-HQ-APP-2013-004621 / SSID # 06A3

Your message cannot be delivered to the following recipients:

Recipient address: R6_6SF_FOIA_Team@epa.gov
Reason: Remote SMTP server has rejected address

Diagnostic code: smtp;550 5.1.1 <R6_6SF_FOIA_Team@epa.gov>: Recipient address rejected: User unknown in relay recipient table
Remote system: dns;mseive13.pyd.epa.gov (TCP|17.158.232.236|50935|161.80.153.98|25) (mseive13.pyd.epa.gov ESMTP Postfix)

CC Grisham <grish@icloud.com> August 16, 2013 9:44 AM
To: "Lane, Leticia" <Lane.Leticia@epa.gov>
Cc: CC Grisham <grish@icloud.com>, Stephen Tzhone <tzhone.stephen@epa.gov>
Re: Notice of Ten-day Extension for FOIA # EPA-R6-2013-008408 / FOLLOW-UP TO EPA-R6-2013-003349-HQ-APP-2013-004621 / SSID # 06A3

4 Attachments, 422 KB

Ms. Lane,

You are right. I did receive those acknowledgement as an automated response to my submission. All automated responses I have ever received from FOIA online are attached as PDF files for reference.

The big differences between then new automated process and the old human-operated process from this public user's perspective:

1) There is no mention of a timeframe or due date in the automated email confirmation.

2) It is completely impersonal, a machine spitting out the same information I just typed in and saw confirmed already in the FOIA online system. I would have no way of knowing from this auto-reply if or when a human will take it up and work on it, or anything else about it.

I think the public deserves better, especially considering how much it pays for government, then to see legions of contractors hired on top of federal payroll (e.g. Booz Allen Hamilton, which maintains FOIA Online);

I realize you didn't choose the automated process or build the system and website, but I am hoping you can filter this up to someone who is responsible for the new FOIA process.

I have extensive additional notes (some of which I believe I have already sent you in the past) from previous problems with the FOIA Online system, many emails back-and-forth between the Booz Allen system administrator for FOIA Online (Pat), who logged the bugs I was finding and offered workarounds to make the website work (e.g. functions for uploading supporting files, downloading responsive files.)

As I said to Pat at that time: for as much as I imagine the taxpayers pay Booz Allen to build and maintain FOIA Online (and for so many other critical government functions farmed out to BAH), I would expect a FOIA Online website that is robust, user-intuitive, secure, speedy, state-of-the-art and, frankly, more twenty-first century.

To me it appears BAH did the absolute minimum to meet the requirements of the FOIA Online RFP.

Thank you for your assistance and please understand none of the above is directed toward you personally.

Sincerely,

Curt Grisham

Preview of "...ce" (317 KB)

r6foia@epa.gov July 21, 2013 9:52 AM
To: grish@icloud.com
FOIA Request EPA-R6-2013-008408 Submitted

This message is to confirm your request submission to the FOIAonline application: View Request. Request information is as follows:

- Tracking Number: EPA-R6-2013-008408
- Requester Name: charles grisham
- Date Submitted: Sun Jul 21 12:51:58 EDT 2013
- Request Status: Submitted
- Description: The intent and purpose of this request is to submit the same request as my most recent previous FOIA request (EPA-R6-2013-003349, which became appeal HQ-APP-2013-004621) but to have the documents responsive to that same request for a different time period TO-WIT beginning seamlessly at whatever point in time the EPA response to my FOIA request EPA-R6-2013-003349-A (HQ-APP-2013-004621 left off and including all information from that point in time to the present time responsive to the same request language as used in my above-enumerated most recent previous FOIA request, which is as follows:

  "Please provide copies of all communications in the above matter (correspondence with attachments, emails with attachments, telephone or in-person meeting agendas, attachments and notes, etc.) exchanged between EPA (its staff, managers, employees, representatives, contractors, agents etc.) and McKesson Corporation (its employees, agents, representatives, contractors, etc. and that of any McKesson subsidiary entity) during the following time interval: May 1, 2012 until present."

r6foia@epa.gov July 24, 2013 1:25 PM
To: grish@icloud.com
FOIA Expedited Processing Disposition Reached for EPA-R6-2013-008408

Your request for Expedited Processing for the FOIA request EPA-R6-2013-008408 has been denied. Additional details for this request are as follows:

- Request Created on: 07/21/2013
- Expedited Disposition Reason: See attached correspondence
- Request Long Description: The intent and purpose of this request is to submit the same request as my most recent previous FOIA request (EPA-R6-2013-003349, which became appeal HQ-APP-2013-004621) but to have the documents responsive to that same request for a different time period TO-WIT beginning seamlessly at whatever point in time the EPA response to my FOIA request EPA-R6-2013-003349-A (HQ-APP-2013-004621 left off and including all information from that point in time to the present time responsive to the same request language as used in my above-enumerated most recent previous FOIA request, which is as follows:

  "Please provide copies of all communications in the above matter (correspondence with attachments, emails with attachments, telephone or in-person meeting agendas, attachments and notes, etc.) exchanged between EPA (its staff, managers, employees, representatives, contractors, agents etc.) and McKesson Corporation (its employees, agents, representatives, contractors, etc. and that of any McKesson subsidiary entity) during the following time interval: May 1, 2012 until present."

r6foia@epa.gov August 5, 2013 12:32 PM
To: grish@icloud.com
FOIA Request EPA-R6-2013-008809 Submitted

This message is to confirm your request submission to the FOIAonline application: View Request. Request information is as follows:

- Tracking Number: EPA-R6-2013-008809
- Requester Name: charles grisham
- Date Submitted: Mon Aug 05 15:32:37 EDT 2013
- Request Status: Submitted
- Description: Regarding Arkwood, Inc. Superfund Site in Omaha, Boone County, Arkansas EPA ID# ARD084930148:

  Please provide all records, details, agendas, notes, communications, follow-up documentation et cetera regarding the meetings which took in federal government offices in Washington D.C. as follows:

  29 June 1987

  Meeting in person with officials of Environmental Protection Agency, officials of Public Works & Transportation, Hon. John Paul Hammerschmidt, Arkansas Governor Dale Bumpers, Bud Grisham and others.

  30 June 1987

  Meeting in person with Governor Dale Bumpers, Hon. John Paul Hammerschmidt, Bud Grisham and others during which EPA sent over and distributed a memorandum to those assembled, which document EPA then later that same day asked all assembled to return, as EPA had erred and distributed something that was not meant to be made public.

  Particularly, I request a copy of the above-referenced issued-and-retracted memorandum, likely dated either 29 June 1987 or 30 June 1987,

On Aug 15, 2013, at 3:17 PM, "Lane, Leticia" <Lane.Leticia@epa.gov> wrote:

Mr. Grisham,

Per the acknowledgment letters you used to receive from our FOIA Office, we do not generate this letter anymore. The way it works now is, when a requester submits a FOIA request into the FOIA Online system, there is a button on our end to select , when we start the process of your FOIA request. This button generates an email to you the FOIA requester. You won't see a name you may see a group name of R6FOIA.
Below you will find the status of your requests.

STATUS-
You have 2 active FOIA requests in Region 6.

EPA-R6-2013-008408 – with a original due date of August 19, 2013 (due dates are generated by the FOIA Online system)
The Superfund Division has requested a 10 day extension with a new due date of September 3, 2013.
Acknowledgement Sent: July 22, 2013, notice from/to requester through FOIA Online system.

EPA-R6-2013-008809 – with a original due date of September 4, 2013 (due dates are generated by the FOIA Online system)
Acknowledgement Sent: August 6, 2013, notice from/to requester through FOIA Online system.

Hope this helps with acknowledgment of FOIA requests received.

Thank you.

Leticia Lane
U.S. EPA Region 6
Enterprise, Technology&Architecture Section (6MD-OE)
Regional Freedom of Information Act Officer
Phone: (214)665-7202
Fax: (214)665-2146
lane.leticia@epa.gov

From: Curt Grisham [mailto:grish@icloud.com]
Sent: Thursday, August 15, 2013 4:15 PM
To: Ortiz, Diana
Cc: Whitener, Susan; Kirst, Tina; Lane, Leticia; Langley, Shirley; R6 6SF FOIA Info; R6 6SF FOIA Team; Moran, Gloria; Tzhone, Stephen; Sanchez, Carlos
Subject: Re: Notice of Ten-day Extension for FOIA # EPA-R6-2013-008408 / FOLLOW-UP TO EPA-R6-2013-003349-HQ-APP-2013-004621 / SSID # 06A3

Dear Ms Ortiz,

Thank you for your communication. I requested the information for my meeting with R6 on 5 September 2013.

I did not receive any acknowledgement from R6 for this FOIA request or the one subsequent to it.

This is the first communication I have had from R6 I this matter, other than to decline my request for expedited response from EPA.

What was the original date by which EPA R6 originally committed to respond to this request? I was not informed.

Since the new date for EPA response is one day before I leave to come to Dallas, please hold any materials to be mailed for my pickup in person when I arrive in Dallas, since as mentioned I need the materials for my merit there.

I also need the response to my other more recent FOIA request; please advise the status, as it has not been acknowledged by your office.

The series of delays, mistakes and omissions I have experienced in this process of requesting public information from your office is not an "inconvenience;" it materially affects my ability to accomplish my objectives, which I strongly believe are in the public's best interest.

Again, please advise the original and revised response dates for all FOIA requests I currently have pending with EPA R6. If I do not receive the responses by the meeting date, I will not be able to accomplish fully my purpose for traveling there.

Sincerely,

Curt Grisham
On Aug 15, 2013, at 13:47, "Ortiz, Diana" <Ortiz.Diana@epa.gov> wrote:

Good Afternoon Mr. Grisham,

This e-mail is to notify you that EPA will be taking a 10-day extension for the above mentioned FOIA. This will put the new target date at 09/03/13.

The justification for this extension is:

__X____ the need for consultation, which shall be conducted with all practicable speed, with another agency or EPA office having a substantial subject matter interest in your request. (5 USC 552(a)(6)(B)(iii)(III))

I am sorry for any inconvenience this may cause.

Diana Ortiz
Superfund FOIA Coordinator
Information Management Team (6SF-VI)
(214) 665-7315

grish.org <curt@grish.org>

April 28, 2011 8:47 AM

To: Sanchez.Carlos@epamail.epa.gov

Cc: Donald Williams <Williams.Donald@epamail.epa.gov>, Shawn Ghose <Ghose.Shawn@epamail.epa.gov>, Tammie <HYNUM@adeq.state.ar.us>, "Clem, Sarah" <CLEM@adeq.state.ar.us>, Dianna Kilburn <KILBURN@adeq.state.ar.us Egan <EGAN@adeq.state.ar.us>, tkresse@usgs.gov, "grish.org" <curt@grish.org>

Charles Curtis Grisham, Jr. Formal Comments on Draft Third Five-Year Review for Arkwood, Inc. Superfund Site

2 Attachments, 190 KB

Thursday, April 28, 2011 08:45

Dear Carlos,

As discussed, I am delivering my formal comments and concerns regarding the Draft Third Five-Year Review for the Arkwood, Inc. Superfund Site.

You told me on the telephone Monday that if I had these to you before the end of this week they would be taken into consideration for the final version of the Third Five-Year Review for the Arkwood, Inc. Site

Please acknowledge your receipt of this communication and its two attachments totaling fourteen pages (14pp.) not including this email message.

Thank you.

Sincerely,

Curt Grisham

FINAL3rd5y...orm (101 KB) FINALGrisha...view (88 KB)

Sanchez.Carlos@epamail.epa.gov April 28, 2011 11:04 AM
To: "grish.org" <curt@grish.org>
Cc: "Clem, Sarah" <CLEM@adeq.state.ar.us>, "grish.org" <curt@grish.org>, Williams.Donald@epamail.epa.gov, Marilyn Egan <EGAN@adeq.state.ar.us>, Tammie Hynum <HYNUM@adeq.state.ar.us>, Dianna Kilburn <KILBURN@adeq.state.ar.us>, Ghose.Shawn@epamail.epa.gov, tkresse@usgs.gov
Re: Charles Curtis Grisham, Jr. Formal Comments on Draft Third Five-Year Review for Arkwood, Inc. Superfund Site

---

Thank You Mr. Grisham for your comment on the Five Year Review. We will consider your comments before we finalize the report. CAS

Carlos A. Sanchez
Chief, AR/TX Section
Region 6, Superfund Division (6SF-RA)
sanchez.carlos@epa.gov
(214) 665-8507

From: "grish.org" <curt@grish.org>
To: Carlos Sanchez/R6/USEPA/US@EPA
Cc: Donald Williams/R6/USEPA/US@EPA, Shawn Ghose/R6/USEPA/US@EPA, Tammie Hynum <HYNUM@adeq.state.ar.us>, "Clem, Sarah" <CLEM@adeq.state.ar.us>, Dianna Kilburn <KILBURN@adeq.state.ar.us>, Marilyn Egan <EGAN@adeq.state.ar.us>, tkresse@usgs.gov, "grish.org" <curt@grish.org>
Date: 04/28/2011 10:47 AM
Subject: Charles Curtis Grisham, Jr. Formal Comments on Draft Third Five-Year Review for Arkwood, Inc. Superfund Site

---

Thursday, April 28, 2011 08:45

Dear Carlos,

As discussed, I am delivering my formal comments and concerns regarding the Draft Third Five-Year Review for the Arkwood, Inc. Superfund Site.

You told me on the telephone Monday that if I had these to you before the end of this week they would be taken into consideration for the final version of the Third Five-Year Review for the Arkwood, Inc. Site

Please acknowledge your receipt of this communication and its two attachments totaling fourteen pages (14pp.) not including this email message.

Thank you.

Sincerely,

Curt Grisham
[attachment "FINAL3rd5yearReviewInterviewForm.pdf" deleted by Carlos Sanchez/R6/USEPA/US] [attachment "FINALGrishamJrConcernsReDraft3rd5yearReview.pdf" deleted by Carlos Sanchez/R6/USEPA/US]

Recieved March 7th
via email
from Shawn
Ghose USEPA
region IV

Third Five-Year Review Report
For

Arkwood, Inc. Site
Boone County
Omaha, Arkansas

DRAFT

March 2011

Prepared By
Region 6

United States Environmental Protection Agency
Dallas, Texas

THIRD FIVE-YEAR REVIEW
Arkwood, Inc.
ARD084930148
Boone County, Arkansas

This memorandum documents EPA's approval of the Third Five-Year Review Report for the Arkwood, Inc Site prepared by EPA with data and reports provided by McKesson Corporation.

Summary of Five-Year Review Findings Arkwood was a wood treating site where wood treating fluids contaminated the soil and groundwater. The soil remedy was implemented in two phases. Phase I was pretreatment (drying and separation of contaminated soil from rock fragments), storage of contaminated soil to implement the remedy specified in the ROD, and backfilling with clean soil to minimize the environmental impact. Phase II was off-site incineration of the impacted soil. The above procedure was followed by placement of a topsoil cap and seeding. The remediation area is fenced with signs and locked gates. The groundwater beneath the site is impacted by residual contamination. New Cricket Spring, located about 1/4-mile downgradient of the wood treating area, is impacted by the Site. Pentachlorophenol (PCP) concentration at New Cricket Spring has decreased significantly since the soil remedy was completed. As a part of the groundwater remedy, water at New Cricket Spring is treated by an ozone oxidation process to destroy the PCP contamination in the groundwater. The groundwater treatment system was installed in 1997 and upgraded in 1998 and 1999. In late 2005, McKesson installed injection wells near the sink hole where wood treating wastes were disposed. The sink hole is hydraulically connected to New Cricket Spring through subsurface fractures. Injection of ozonated water into the wells from December 2005 through August 2009 was used to destroy residual PCP in the subsurface fractures with a goal of cleaning up New Cricket Spring permanently. Non-ozonated water continues to be injected in the vicinity of the sink hole as a means of continued flushing and to facilitate efficient operation of the treatment system at New Cricket Spring. The ozone injection system has reduced PCP concentration in New Cricket Spring by more than 95 percent. However, the PCP values have reached an approximate average of 50 ppb over the past five years and less than 20 ppb average over the past two years. The current injection and treatment systems are able to destroy PCP in the water to the level set by Arkansas Department of Environmental Quality (ADEQ) (9.3 µg/l monthly average and 18.7 µg/l daily maximum).

Actions Needed

No major deficiencies were noted. To ensure future protectiveness, a Deed Restriction was filed by the property owner in August 2010. The Deed Restriction protected the existing cap, provided notice of residual contamination remaining on the site, and that the site is zoned for industrial use. The Deed Restriction of August 2010 needs minor corrections in the metes and bound description. It is anticipated that the corrections will be completed in the next twelve months. In addition the New Cricket Spring groundwater treatment system should continue until water exiting from the New Cricket Spring meets ADEQ Water Quality Standard for PCP at the Arkwood Site

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Determinations

I have determined that the remedy for the Arkwood site is protective of human health and the environment and will remain so provided the action items identified in the Third Five-Year Review Report are addressed as described above.

_____

Samuel Coleman, P.E.
Director

Superfund Division

U.S. Environmental Protection Agency, Region 6

CONCURRENCES
THIRD FIVE-YEAR REVIEW REPORT
for the
Arkwood, Inc. Site

Shawn Ghose M.S., P.E. ASME Remedial Project Manager Arkansas/Texas Section, Remedial Branch Superfund Division	Date
Gloria Moran, Site Attorney Superfund Branch Office of Regional Counsel	Date
Carlos Sanchez Chief, Arkansas/Texas Section Remedial Branch, Superfund Division	Date
Charles Faultry Associate Director, Remedial Branch Superfund Division	Date
Mark Peycke Associate Director, Superfund Branch Office of Regional Counsel	Date
Pamela Phillips Deputy Director, Superfund Division	Date

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Attachments

Attachment 1: Arkansas Water Quality Standards Calculation
Attachment 2: List of Documents Reviewed
Attachment 3: Photographic Log – Site Inspection
Attachment 4: Site Inspection Form

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List of Acronyms

ADEQ	Arkansas Department of Environmental Quality (formerly ADPCE)
AOC	Administrative Order on Consent
ARARs	Applicable or Relevant and Appropriate Requirements
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chemicals of Concern
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
gpm	gallons per minute
HASP	Health and Safety Plan
IRIS	Integrated Risk Information System
mg/kg	milligram per kilogram
mg/l	milligram per liter
MMI	Mass Merchandisers, Inc.
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PCP	Pentachlorophenol
PER	Preliminary Engineering Report
PNA	Polynuclear Aromatics
ppb	parts per billion
PRP	Potentially Responsible Party
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial Design/Remedial Action
RDWP	Remedial Design Work Plan
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SARA	Superfund Amendments and Reauthorization Act of 1986
SOW	Statement of Work
μg/l	microgram per liter

EXECUTIVE SUMMARY

This is the third five-year review for the Arkwood, Inc. Site (Site) located in Boone County in Omaha, Arkansas. The results of this five-year review indicate that the remedy is protective of human health and the environment. Soil remediation was completed in 1995 followed by placement of a topsoil cap and seeding. The vegetation is in good condition. The groundwater treatment system, located immediately downgradient of the mouth of New Cricket Spring, is functioning as designed and is meeting treatment goals. Therefore, the remedies that were implemented for soil and groundwater at the Site continue to be protective of human health and the environment.

Soil Remediation

The remedy that was implemented for soil remediation is protective of human health and the environment. The soil remedy was implemented in two phases. During the first phase, the affected soil was dried, excavated and separated from the rock fragments. In Phase II, the impacted soils were transported offsite for incineration. Verification sampling was conducted to ensure that the affected soil above cleanup goals had been removed. The excavations were backfilled with clean materials, a topsoil cap was placed and the Site was seeded. Perimeter fencing is in place and is effective in preventing unauthorized entry or use of the Site. The Site is in good condition and is inspected and maintained on a regular basis.

Groundwater Remediation

The remedy that was implemented for the groundwater is protective of human health and the environment. The Site is located in an area of karst geology that is characterized by subsurface fractures and channels hydraulically connecting the Site to New Cricket Spring. Although the main source area (Site soils) no longer exists, the groundwater continues to be impacted by residual contaminants in the subsurface fractures and channels.

The data confirm that the treatment system is effectively removing contaminants from the water. An ozone injection pilot study was initiated in December 2005 that operated through August 2009 to evaluate the potential for accelerating reduction of residual PCP in the subsurface between the Site and New Cricket Spring. The pilot system followed by continued injection of non-ozonated water has successfully reduced the average PCP concentration at New Cricket Spring to a level slightly exceeding the ADEQ clean-up goal. The groundwater contaminants will continue to naturally attenuate over time.

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Five Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Arkwood, Inc. Site		
EPA ID: AKD084930148		
Region: 6	**State:** Arkansas	**City/County:** Omaha/Boone County

SITE STATUS				
NPL Status	(X) Final	( ) Deleted	( ) Other (specify)	
Remediation Status(choose all that apply)	( ) Under Construction	(X) Operating	(X) Complete	
Multiple OUs?	( )YES	(X) NO	**Construction Completion Date:** 12/13/95	
Has site been put into reuse?	( ) YES	(X) NO		

REVIEW STATUS				
Reviewing Agency:	(X) EPA	( ) State	( ) Tribe	( ) Other Federal Agency_____
Author Name: Shawn Ghose M.S., P.E. , ASME				
Author Title: Remedial Project Mgr	**Author Affiliation: USEPA**			
Review Period: 3/06 to 3/11				
Date(s) of site inspection: by USEPA and ADEQ personnel				
Type of Review:	(X) Statutory ( ) Policy	(X) Post-Sara ( ) Pre-Sara ( ) NPL-Removal only ( ) Non-NPL Remedial Action Site ( ) NPL State/Tribe-lead ( ) Regional Discretion		
Review number	( )1(first)	( )2(second)	(X) 3 (third)	( ) Other (specify)_____
Triggering Action: ( ) Actual RA Onsite Construction ( ) Construction Completion ( ) Other (specify _____		( ) Actual RA Start at OU #_____ (X) Previous Five-Year Review Report		
Triggering action date: 3/31/2006				
Due date (five years after triggering action date): 3/31/2011				

Five Year Review Summary form

Deficiencies

The following deficiency was identified:

- The property owner recorded a deed notice in August 2010. However , the Deed Restriction requires minor corrections in the description. Industrial use of only the capped area need to be added to the Deed Restriction.

Recommendations and Follow-up Actions

The following action is required to correct the deficiencies and ensure that protectiveness is maintained:

- Corrections to metes and bound description and addition of industrial use on the Deed Restriction, within twelve months.

Protectiveness Statements:

The remedial actions for the soil and groundwater are protective of human health and the environment. Since both media remedies are protective, the remedy for the Site is protective of human health and the environment.

Other Comments:

The Site is in good condition and is inspected and maintained on a regular basis. No changes in land use are planned and the perimeter fence has been effective in preventing unauthorized access to the Site.

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Arkwood, Inc. Site
Third Five-Year Review Report

I. Introduction

EPA Region 6 has conducted a third five-year review of the remedial actions implemented at the Arkwood, Inc. Site located in Omaha, Boone County, Arkansas. The review was conducted from December 2010 through February 2011 in general accordance with the Comprehensive Five-year Review Guidance, EPA 540-R-01-007, June 2001, and this report documents the results of the review. The purpose of five-year reviews is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify deficiencies found during the review, if any, and identify recommendations to address them.

This review is required by statute. EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA §121(c), as amended, which states:

> If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

NCP Section 300.430(f)(4)(ii), 40 CFR § 300.430(f)(4)(ii) states:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

This is the third five-year review for the Arkwood, Inc. Site. The triggering action for this review was second five-year report completed in March 2006. Due to the fact that Site soils were remediated to industrial levels which are above levels that allow for unrestricted use and unlimited exposure, and residual contaminants remain in the karst geology features of fractures and channels beneath the Site resulting in ongoing treatment of groundwater at New Cricket Spring, five-year reviews are required.

II. Site Chronology

Table 1: Chronology of Site Events

Date	Event
1962	Arkwood, Inc. commences wood-treating operations.
1973	Mass Merchandisers, Inc. (MMI) takes over operation of the plant under a lease agreement with the owner.
1981	Arkansas Department of Pollution Control and Ecology (ADPCE) receives a complaint about potentially affected water in the railroad tunnel.
1981 – 1985	Preliminary investigations by ADPCE indicate detectable levels of pentachlorophenol (PCP) in the area immediately surrounding the Site.
6/84	Plant operation ceases.
9/04/85	U.S. Environmental Protection Agency (EPA) proposes adding the Site to the National Priorities List (NPL).
5/15/86	EPA and MMI enter into an Administrative Order on Consent (AOC) for performance of a Remedial Investigation/Feasibility Study (RI/FS).
3/31/89	The Site is added to the NPL.
5/90	The RI/FS is completed by MMI.
9/28/90	EPA issues a Record of Decision (ROD) for the Site.
5/30/91	Execution of a Consent Decree (CD)
9/24/92	Entry of a corrected Consent Decree (CD) between EPA and MMI for Site remediation.
9/92	EPA approves a Remedial Design Work Plan (RDWP) for the Site.
11/16/93	A Preliminary Engineering Report (PER) is approved for the Site.
2/94	Remedial Action activities commence.
6/14/95	An Explanation of Significant Differences (ESD) is executed changing treatment of the affected soils to incineration at an offsite facility.
12/13/95	Remedial Action is complete.
5/97	An ozone pilot treatment system is installed at the Site.
11/97 – 1/98	The treatment system is upgraded with an ozone diffuser and baffles.
10/99 – 12/99	A new higher capacity ozone treatment system is installed.
12/05 – 8/09	Operate ozone injection pilot system.
8/09 - present	Injection of non-ozonated groundwater near sinkhole.

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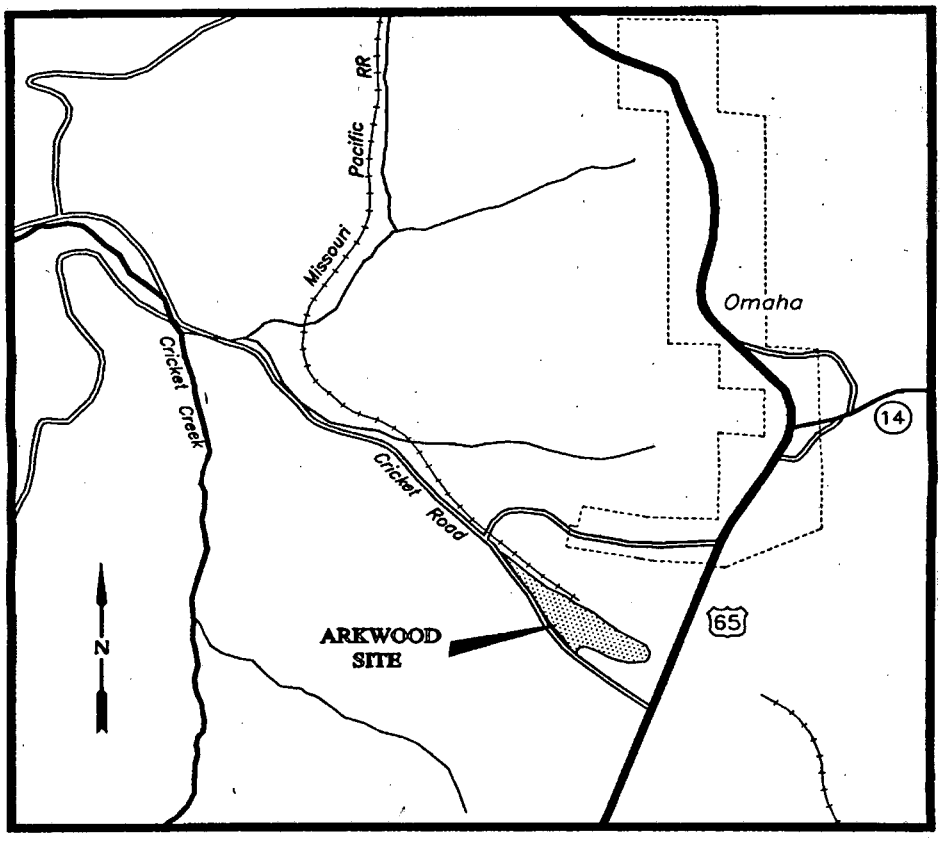
III. Background

A. Location

The Arkwood, Inc. Site is located in Omaha in Section 27, T.21N., and R.21W., in Boone County, Arkansas. The Site is approximately one-half mile southwest of Omaha, Arkansas, and lies to the west of U.S. Highway 65 (see Figure 1 below). The Site is a 30-acre parcel that slopes gently toward the northwest. It is located in a valley on Cricket Creek Road, bounded by ridges covered with native trees. The Site is generally sparsely vegetated and covered with gravel and rocks mixed with native, clayey soils. Near-surface soils were impacted by the former wood-treating operations that used creosote and pentachlorophenol (PCP) in the processes. The Site is in an area of karst geology that is characterized by subsurface fractures and channels. New Cricket Spring, located down valley immediately west of the Site, is affected by the former Site activities.

Figure 1



GENERAL AREA MAP

The area immediately to the north is a steeply-sloped wooded hillside. The outskirts of the Omaha, Arkansas community starts approximately one-half mile to the north of the Site. Old Highway 65 lies to the east of the Site with woods beyond the highway. To the south is Cricket Creek Road. On the other side of Cricket Creek Road is a track of undeveloped woods. Storm water and runoff from this area flow onto the Arkwood Site. To the east, down the valley, are scattered residences; the closest being approximately one-half mile from the Site.

B. History

The Site was developed in the 1950's when a railroad company excavated about 40 to 50 feet below natural grade to obtain fill dirt for constructing a railroad embankment. Arkwood, Inc. began wood treating operations at the Site in 1962. The operations consisted of a millwork shop, a wood-treating plant that used creosote and PCP in its process, and a yard for storing treated wood products prior to sale. Wood-treating operations involved bringing untreated timber posts and poles to the Site, placing the wood materials into a treatment cylinder where the chemical preservatives were introduced under pressure.

In 1973, the site owner leased the wood-treating facility to Mass Merchandisers, Inc. (MMI). MMI continued to operate the Arkwood plant until June 1984. Subsequently, the remaining inventory was sold or removed from the site. In January 1985, MMI's lease expired and was not renewed. The owner dismantled the plant in 1986.

During its 20-plus years of operation, wastes from plant operations were disposed of onsite. From 1962 through 1970, wastes were reportedly dumped into a sinkhole adjacent to the treatment plant. The sinkhole was subsequently sealed and the wastes were placed in a ditch adjacent to the railroad until approximately 1974 when MMI began using a chemical recovery process. Other wastes included liquids used to wash the treatment plant floor and equipment. Such waste liquids were accumulated in a tank and then spread over the wood storage yard to control dust.

ADPCE initially received a complaint about the Site in 1981. Preliminary investigations revealed detectable levels of PCP in area groundwater. In 1985, EPA proposed that the Site be added to the National Priorities List (NPL). The Site was formally added to the NPL on March 31, 1989.

With EPA oversight, MMI conducted a Remedial Investigation and Feasibility Study (RI/FS) to determine the nature and extent of contamination and to investigate possible remedies for the Site. The RI/FS was conducted between 1987 and 1990 pursuant to an Administrative Order on Consent (AOC). The Regional Administrator of EPA Region VI approved the Record of Decision (ROD) for the Site on September 28, 1990.

The 1990 ROD documented that the principle threat from the Site was direct contact with soils contaminated above health based levels. In addition, the 1990 ROD stated that these soils posed a long-term threat to groundwater. Site soils were affected with PCP, polynuclear aromatic hydrocarbons (PNAs), and dioxin. Affected materials were defined as "all Site materials that contain greater than 300 mg/kg PCP, greater than 20

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µg/kg dioxin as 2,3,7,8-TCDD equivalents (dioxin), or greater than 6.0 mg/kg carcinogenic polynuclear aromatic hydrocarbons (c-PNAs) as benzo-a-pyrene equivalents". New Cricket Spring contained concentrations of PCP above the Arkansas Water Quality Standard.

In April 1991, a Consent Decree (CD) was entered between the United States of America, on behalf of the EPA (United States) and MMI to remediate the Site. The CD includes the ROD and a Statement of Work (SOW) as Appendices A and B, respectively, (collectively the Consent Decree). A corrected CD was entered on September 23, 1992, including the same attachments.

In September 1992, EPA approved the Remedial Design Work Plan (RDWP) for the Site. The RDWP provides a definition of the predesign studies, design elements, review schedules, and deliverables to EPA for MMI to implement the CD. Pursuant to the RDWP, MMI prepared a Preliminary Engineering Report (PER), dated May 21, 1993. This PER, presented the results of certain redesign studies and certain design criteria. Based on evaluation of the results of the Pre-Design Studies documented in the PER and in the subsequent Report on Additional Field Scale Pilot Studies (dated July 23, 1993), MMI proposed a phased approach for the soil remedy.

EPA agreed to the phased approach on November 16, 1993 as presented in correspondence from Cynthia J. Kaleri. Phase I of the soil project for the Site consisted of the pretreatment and storage stage of the remedy specified in the ROD and CD. Phase I also included backfilling activities that were necessary to minimize adverse environmental impacts prior to implementation of Phase II. MMI prepared an Interim Remedial Action Design (IRAD) and Preliminary Remedial Action Plan (PRAP) to describe the Phase I remedial activities. The EPA conditionally approved both the IRAD and PRAP on June 29, 1994. Preparation of the Site for Phase I activities began in February 1994 and was completed in July 1994. Phase I remediation began on August 1, 1994, and was suspended due to weather on October 14, 1994. Work performed during this period included excavation of affected soil, pretreatment of this soil, and storage of the pretreated soil for final treatment. Phase I activities performed during 1994 are documented in the Preliminary Interim Remedial Action Statement of Completion Report submitted to EPA in February 1995. Phase I remediation resumed in May 1995 and was completed by mid-August 1995.

Phase II of the project was the Final Remedial Action for the Site and consisted of off-site incineration of affected materials and Site closure, excluding groundwater issues. The ROD and CD specified onsite incineration for the remedy for affected materials at the Site. However, due to changes in conditions since entry of the ROD and CD, MMI and EPA agreed that off-site incineration was a more appropriate remedy. To document the change in the final remedy, EPA prepared an Explanation of Significant Difference (ESD) that was signed by the Regional Administrator on June 14, 1995. The Arkwood Inc. Site soil remediation project was completed December 13, 1995.

Although none of the domestic or municipal wells sampled during the study contained confirmed evidence of wood-treatment compounds, an extension to the Omaha

municipal water line was constructed in 1991 to provide city water to designated residences down gradient from the Site as a safeguard. As set forth in the CD and based on the results of the Dye Tracing Study, spring sampling was conducted quarterly for four years after the soil remediation was completed. In addition, an ozone pilot system was installed in April 1997 and data was collected during varying flow events and equipment settings. Based on the results, the treatment system was upgraded in 1997 and a new, higher capacity system was installed in 1999. An ozone injection pilot study was operated from December 2005 through August 2009 with the goal of accelerating reduction of residual PCP in the subsurface between the Site and New Cricket Spring. From August 2009 to the present, non-ozonated water continues to be injected in the vicinity of the sinkhole as a means of continued flushing and to facilitate efficient operation of the treatment system at New Cricket Spring.

IV. Remedial Actions

A. Remedy Selection

Soil Remedy

The EPA Regional Administrator for Region 6 signed the Record of Decision (ROD) on September 28, 1990. The ROD stated that all Site materials containing greater than 300 mg/kg PCP, greater than 20 μg/kg dioxin as 2,3,7,8 TCDD equivalents, or greater than 6.0 mg/kg carcinogenic polynuclear aromatic hydrocarbons as benzo-a-pyrene equivalents were defined as affected and would be incinerated onsite. However, based on additional studies, final treatment of the affected material was changed to incineration at an offsite facility.

Groundwater Remedy

As part of the groundwater remedy, treatment at New Cricket Spring was required if after two years following completion of the soils remedy, the water quality at the spring did not meet Arkansas Water Quality Standards. Since the spring continued to exceed standards after the two-year period, installation of a water treatment system was initiated.

The EPA determined that these alternatives were protective of human health and the environment, attained federal and state requirements that are applicable or relevant and appropriate, were cost-effective compared to equally environmentally protective alternatives, and utilized permanent solutions and alternative treatment technologies to the maximum extent practicable.

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B. Remedy Implementation

MMI managed the remediation activities. Roy F. Weston, Inc. provided oversight for the EPA during the implementation of the soil remediation. The Remediation Actions were completed in phases.

a. Soil Remediation

Near-surface soils were impacted by the former wood treating operations that used creosote and PCP in the processes. The 1990 ROD specified that all sludges and affected soils would be excavated, pre-treated onsite, and then incinerated onsite. Affected soils were defined as those soils containing contaminants greater than the clean up goals. Clean up goals included the following: 300 mg/kg PCP, 6 mg/kg benzo-(a)-pyrene equivalents (c-PNAs), and 20 μg/kg tetracholorodibenzo-p-dioxin equivalents (dioxin). The pretreatment step was anticipated to produce a "coarse" material fraction separate from the fine, affected soils. The 1990 ROD provided that the coarse material be tested and, if clean up goals were met, the material could be backfilled onsite. The 1990 ROD stipulated that coarse materials not meeting the clean up goals would be incinerated along with the fines.

Based upon information generated in the RI/FS, the 1990 ROD estimated that affected soils totaled about 20,000 cubic yards to an approximate depth of one to two feet on the main area of the Site, and four to five feet in the railroad ditch area. The 1990 ROD estimated that sludges in the railroad ditch area and material in the sinkhole totaled 425 cubic yards.

In order to optimize the design as well as the implementation of the soils remedy, the Remedial Design (RD) and Remedial Action (RA) activities outlined in the CD were completed in two phases. The CD Statement of Work (SOW) outlined the initial consideration of a phased approach, to be determined during the preliminary design (SOW, Section II (A)(21), p. 17). EPA correspondence with MMI dated November 16, 1993, approved a phased approach and detailed the split of remedial activities for each of 2 phases. EPA issued a fact sheet to describe the approved phased approach on May 6, 1994.

The phased approach allowed remedial activities to be started one year ahead of the original RD/RA schedule provided in the CD. Implementation of the phased RD/RA project also provided information which helped determine that the volume of affected fines was much less than that estimated in the ROD (3,500 cubic yards as compared to 7,000 cubic yards), prior to the completion of the remedial design for Phase II. This information was used to plan and complete an Explanation of Significant Differences (ESD) on June 14, 1995, which changed one aspect of the soils remedy. Rather than constructing an onsite incinerator, the small volume of fines (and other affected debris) could be shipped off-site for incineration and disposal.

The ESD provided resource savings for EPA and the PRP in completing the soils remedy two years ahead of the CD schedule and eliminated the concerns about constructing an incinerator in close proximity to the Omaha school.

The Phase I RD/RA included excavation, pretreatment, and temporary storage onsite. The Phase I RA was initiated in the spring of 1994 and was completed in the summer of 1995. The Phase II RD/RA included off-site incineration and site closure activities. The Phase II RA was initiated upon completion of Phase I and all soil remedial activities were completed on December 13, 1995. A total of approximately 8,700 cubic yards of soil was excavated and pretreated resulting in approximately 5,200 cubic yards of clean coarse material and 3,500 cubic yards of affected fine soil. The affected soil was transported offsite and incinerated.

b. Site Closure Activities

As a part of Site closure activities, MMI performed the following activities:

- Constructed a perimeter fence along the north boundary of the Site (the rest of the Site was fenced previously);
- Backfilled and regraded the remediated areas. An additional 600 cubic yards of topsoil was brought to the Site in addition to the approximately 11,000 cubic yards of topsoil stockpiled during the Site preparation period;
- The Site was seeded with a variety of grasses; and
- A complete survey of the Site was completed.

EPA, ADPCE and MMI performed a final inspection on December 13, 1995. Site maintenance activities included inspecting the Site regularly to assess the condition of the vegetative cover, storm water ditches and perimeter fencing.

c. Groundwater Remediation

A major conclusion from the Arkwood Remedial Investigation Report prepared April 4, 1990 concerning ground water is quoted as:

> "It was determined that the site is underlain by a shallow, unconfined karst aquifer within the St. Joe Formation. Water movement appears to be dominated by conduit flow through fractures and other features that have been widened and enlarged by solution activity. A diffuse flow component of the aquifer appears to transport water from zones of storage within the deeper residuum clays and subcutaneous zone to the larger conduit network. The apparent lack of a well-defined water table complicates the determination of aquifer characteristics such flow direction, gradient and velocity. The affected ground water emerging from New Cricket Spring provides evidence to indicate that this spring is hydraulically down gradient of the Arkwood site and that it is formed by the only major conduit to which affected groundwater has been shown to be converging. Pentachlorophenol (PCP) levels detected in New Cricket Spring have been found to range from 1.0 to 2.3 mg/l."

The 1990 ROD specified that New Cricket Spring would be monitored for two years following completion of the soils remedy. If the concentration of PCP did not meet the

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Arkansas Water Quality Standard via natural attenuation at the end of the two year monitoring period, treatment of the spring would be required.

During the intervening two years, the PCP concentrations at New Cricket Spring dropped significantly. However, since the levels remained above Arkansas Water Quality Standards, a pilot treatment system was installed in April 1997. The system was upgraded in late 1997/early 1998 by installation of an ozone diffuser and a stainless steel baffle system. In the fall of 1999, a new higher capacity treatment system was installed. An ozone injection pilot study was operated from December 2005 through August 2009 with a goal of accelerating reduction of residual PCP in the subsurface between the Site and New Cricket Spring. From August 2009 to the present, non-ozonated water continues to be injected in the vicinity of the sinkhole as a means of continued flushing and to facilitate efficient operation of the treatment system at New Cricket Spring.

Sampling of Springs

Based on the dye tracing studies, four springs were identified for monitoring: New Cricket Spring, Walnut Creek Spring, Cricket Creek Spring, and Railroad Tunnel Spring. As shown in Table 2 below, these springs were sampled quarterly from 1996 through 1999 except during periods of insufficient flow. In year 2000, spring sampling was reduced to only New Cricket Creek since this is the only spring that continues to be impacted with PCP. Monthly sampling was initiated May 15, 2000. Data from the sampling is shown in Table 2 and Figure 2.

Table 2
Spring Samples 1996 – 2010

Date	New Cricket Spring Flow GPM	Average GPM	New Cricket Spring PCP	Average PCP
7/2/1996	112		688	
10/11/1996	2		651	
		57		**670**
1/20/1997	34		681	
3/16/1997	34		330	
7/18/1997	2		775	
9/30/1997	50		560	
		30		**586**
1/20/1998	42		561	
5/7/1998	65		196	
7/23/1998	3		561	
11/4/1998	8		570	
		30		**472**
1/29/1999	60		288	
7/12/1999	42		ND	
		51		**288**

3/8/2000	5		284	
5/15/2000	2		272	
6/23/2000	75		389	
7/28/2000	3		627	
8/20/2000	2		424	
9/25/2000	1		577	
10/26/2000	1		114	
11/27/2000	25		632	
		14		**415**

Date	New Cricket Spring Flow GPM	Average GPM	New Cricket Spring PCP	Average PCP
2/26/2001	3		338	
3/13/2001	3		376	
4/27/2001	3		349	
5/27/2001	2		388	
7/27/2001	48		560	
8/27/2001	6		372	
9/27/2001	2		895	
10/22/2001	6		275	
11/30/2001	28		441	
12/22/2001	60		114	
		16		**411**
1/28/2002	12		373	
2/21/2002	15		372	
3/8/2002	22		318	
3/22/2002	42		226	
4/22/2002	22		79	
5/28/2002	70		71	
6/26/2002	17		259	
8/2/2002	17		231	
8/27/2002	12		178	
9/25/2002	10		95	
10/28/2002	8		461	
12/7/2002	2		398	
12/29/2002	35		218	
		21		**255**
2/3/2003	7		340	
3/7/2003	35		228	
4/8/2003	12		274	
6/4/2003	42		147	
7/7/2003	9		220	
8/7/2003	10		221	
8/28/2003	6		71	
9/29/2003	2		534	
10/28/2003	24		200	
12/10/2003	21		150	
		18		**237**

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Date	New Cricket Spring Flow GPM	Average GPM	New Cricket Spring PCP	Average PCP
1/3/2004	26		139	
2/3/2004	29		144	
3/3/2004	28		84	
4/3/2004	30		85	
5/5/2004	65		115	
5/15/2004	20		102	
6/9/2004	12		300	
6/30/2004	30		222	
8/9/2004	6		84	
9/3/2004			43	
		27		**132**
10/4/2004	12			
11/3/2004	94		155	
11/14/2004	26		75	
11/22/2004	28		75	
12/1/2004	35		72	
12/21/2004	9		253	
		34		**134**
1/3/2005	10		279	
2/3/2005	12		155	
3/1/2005	34		208	
4/4/2005	9		148	
4/25/2005	6		121	
5/3/2005	9		150	
6/2/2005	3		151	
6/20/2005	2		55	
7/13/2005	2		95	
8/3/2005	12		85	
10/3/2005	27		63	
11/3/2005	6		278	
11/14/2005	6		15	
11/28/2005	8		47	
12/20/2005	27		7	
12/26/2005	27		11	
11/28/2005	8		47	
		10		**132**

Date	New Cricket Spring Flow GPM	Average GPM	New Cricket Spring PCP	Average PCP
1/2/2006	21		42	
1/9/2006	20		32	
1/16/2006	28		32	
1/23/2006	33		16	
1/30/2006	41		34	
2/6/2006	38		<5.10	
2/13/2006	34		24	

2/20/2006	21		6	
2/27/2006	26		20	
3/6/2006	16		25	
3/13/2006	57		107	
3/20/2006	48		26	
3/27/2006	27		4.09J	
4/3/2006	24		11	
4/10/2006	16		39	
4/17/2006	22		8	
4/24/2006	16		7	
4/27/2006	50		11	
4/29/2006	193		28	
5/1/2006	94		23	
5/8/2006	59		52	
5/15/2006	22		15	
5/22/2006	16		<5.00	
5/30/2006	17		6	
6/7/2006	3		253	
6/12/2006	2		LE	
6/19/2006	17		52	
6/26/2006	17		75	
7/5/2006	22		10	
7/17/2006	17		22	
8/7/2006	17		24	
8/14/2006	17		<5.00	
9/5-6/2006	23		7	
9/18/2006	24		6	
10/2/2006	24		17	
10/16/2006	41		40	
10/16/2006	81		92	
10/18/2006	27		118	
11/7/2006	41		53	
11/20/2006	24		57	
11/30/2006	636		<50.0	
12/4/2006	59		<54.3	
12/6/2006	37		<52.6	
12/18/2006	21		24	
		47		**39**

Date	**New Cricket Spring Flow GPM**	**Average GPM**	**New Cricket Spring PCP**	**Average PCP**
1/8/2007	21		17	
1/22/2007	79		35	
2/5/2007	27		26	
2/19/2007	47		20	
3/5/2007	27		<5.00	
3/19/2007	25		NA	
4/9/2007	23		<5.00	
4/23/2007	30		7	

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5/7/2007	21		2.90J	
5/21/2007	20		4.36J	
6/4/2007	20		<5.00	
6/18/2007	21		10	
7/9/2007	20		15	
7/23/2007	18		9	
8/6/2007	1		191	
9/10/2007	23		217	
9/24/2007	18		16	
10/10/2007	18		6	
10/22/2007	18		1190	
11/5/2007	18		209	
11/19/2007	18		20	
12/3/2007	18		20	
12/17/2007	32		87	
		24		**123**

Date	**New Cricket Spring Flow GPM**	**Average GPM**	**New Cricket Spring PCP**	**Average PCP**
1/7/2008	23		<5.00	
1/21/2008	23		58	
2/4/2008	24		52	
2/18/2008	83		57	
3/3/2008	580		<5.00	
3/17/2008	44		11	
4/7/2008	78		10	
4/12/2008	240		7	
4/13/2008	100		7	
4/14/2008	78		8	
5/10/2008	68		75	
5/27/2008	18		189	
6/9/2008	30		77	
6/23/2008	580		6	
7/7/2008	80		194	
7/10/2008	140		254	
7/21/2008	42		477	
8/4/2008	22		108	
8/18/2008	36		31	
9/1/2008	25		32	
9/22/2008	40		22	
10/6/2008	21		20	
10/20/2008	21		13	
11/3/2008	24		<5.00	
11/17/2008	30		28	
12/1/2008	24		12	
12/22/2008	24		<5.00	
		93		**76**

Date	New Cricket Spring Flow GPM	Average GPM	New Cricket Spring PCP	Average PCP
1/5/2009	32		7	
1/26/2009	27		<5.00	
2/9/2009	90		<5.00	
2/23/2009	31		6	
3/9/2009	30		6	
3/23/2009	30		<5.00	
4/6/2009	38		6	
4/20/2009	243		9	
5/4/2009	343		8	
5/18/2009	51		6	
6/8/2009	38		<5.00	
6/29/2008	25		9	
7/20/2009	47		39	
8/10/2009	24		31	
9/13/2009	22		8	
10/12/2009	104		21	
11/9/2009	45		<50	
12/7/2009	28		8	
		69		**13**
1/10/2010	42		13	
2/15/2010	87		11	
3/15/2010	35		<5.00	
4/15/2010	40		10	
5/17/2010	180		11	
6/13/2010	43		15	
7/8/2010	33		66	
8/19/2010	17		16	
9/21/2010	33		28	
10/18/2010	20		15	
11/20/2010	21		5	
12/16/2010	24		6	
		48		**18**

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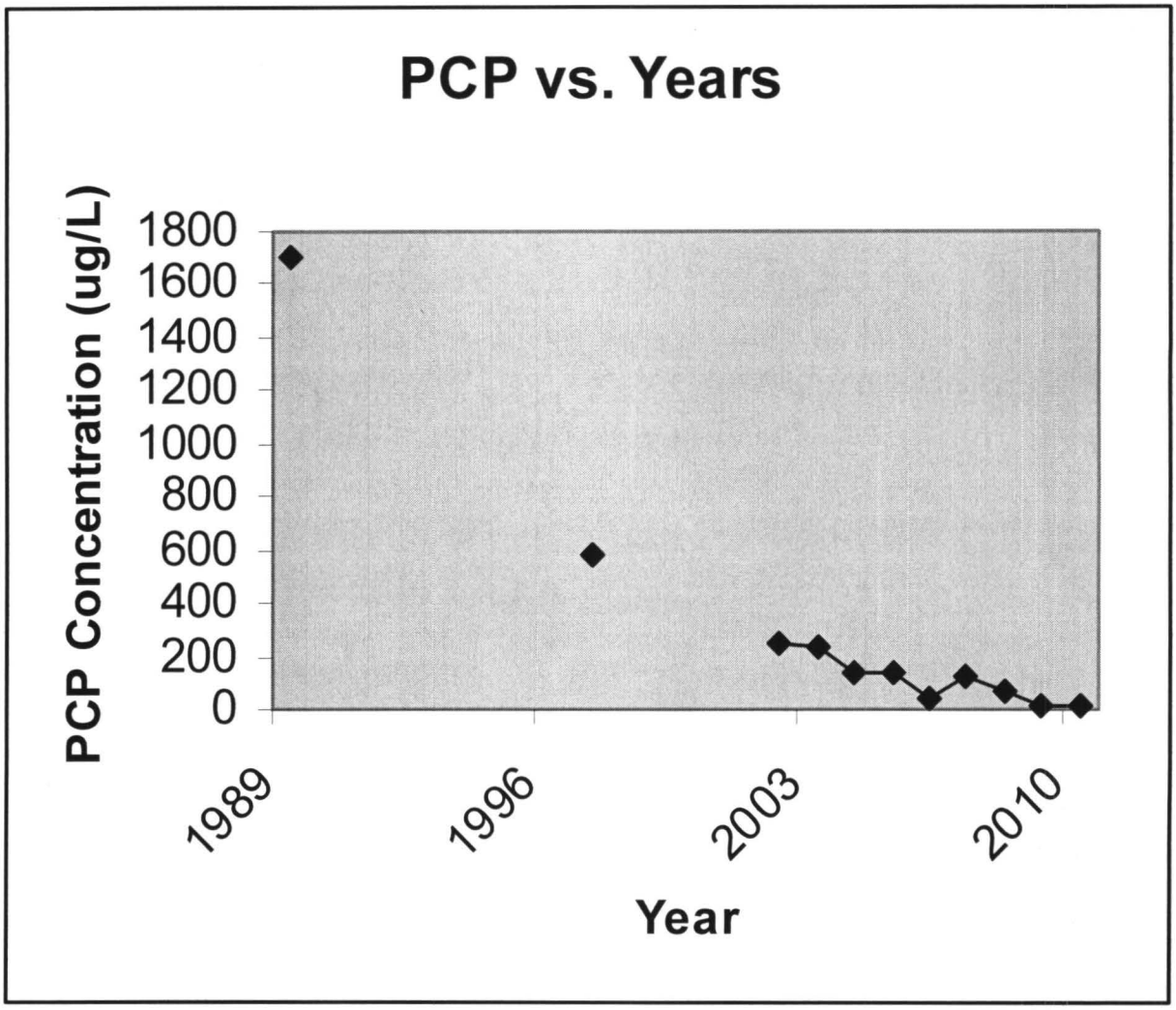
Figure 2a
New Cricket Spring
PCP Concentrations
1989-2010



PCP vs. Years

1989/1990≅1700	2006≅39
1996/1998≅581	2007≅123
2002≅255	2008≅76
2003≅237	2009≅13
2004≅134	2010≅18
2005≅132	

Figure 2b
New Cricket Spring
PCP Concentrations – Semi-Log
1989-2010

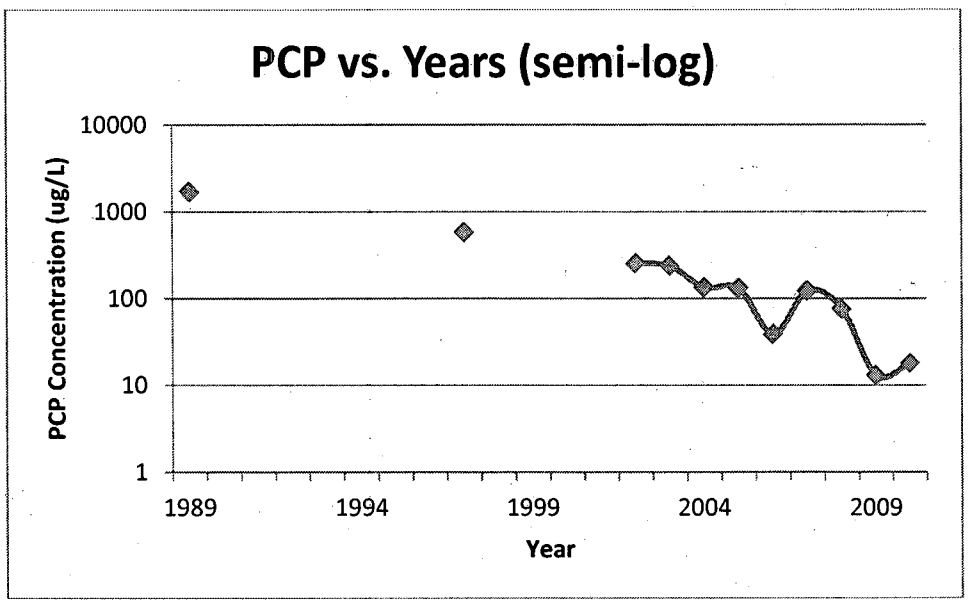


Table 3

New Cricket Spring

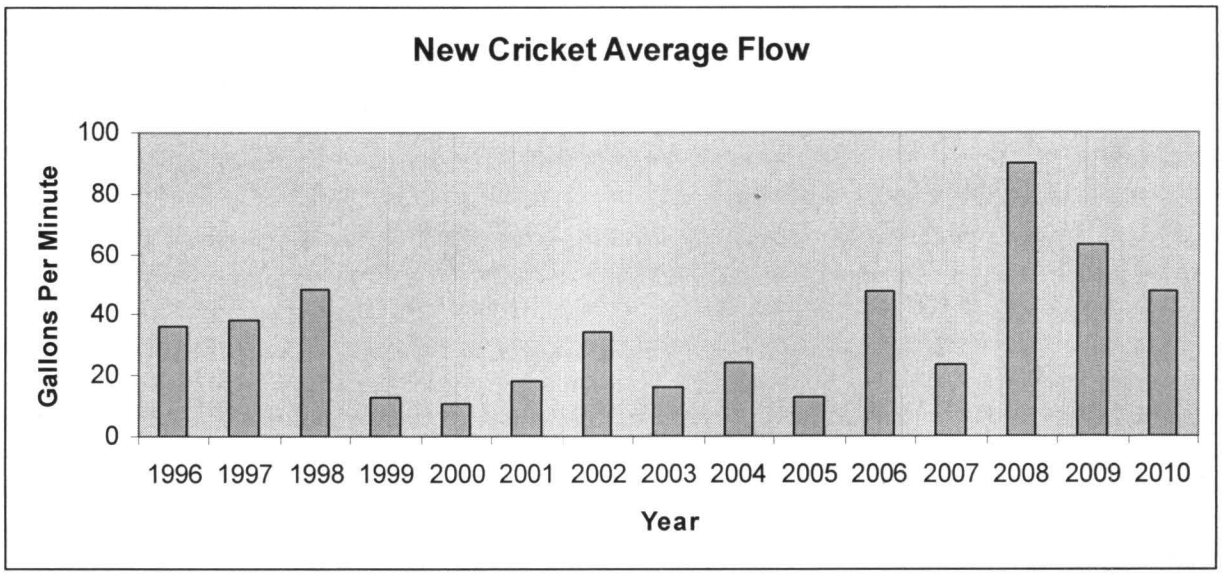
Average Flow Rates **1996 – 2010**

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
JAN		29	179	3	10	7	16	26	24	16	27	50	23	30	42
FEB		104	76	2	3	50	16	19	30	28	30	37	54	61	87
MAR		115	127	8	2	14	63	24	27	22	37	26	312	30	35
APR		42	36	5	8	5	70	15	22	12	54	27	124	141	40
MAY	15	18	40	8	5	5	59	22	23	9	41	21	43	197	180
JUN	6	21	9	84	8	5	95	20	16	2	10	21	305	32	43
JUL	12	12	9	6	84	17	18	12	21	6	19	19	87	47	33
AUG	7	12	20	6	1	8	8	5	17	7	17	1	29	24	17
SEP	50	16	12	5	1	6	8	2	12	13	24	21	33	22	33
OCT	12	13	20	9	1	10	8	10	32	23	43	18	21	104	20
NOV	127	30	12	6	2	9	27	22	50	8	234	18	27	45	21
DEC	58	41	33	13	4	74	23	17	12	25	39	25	24	28	24
AVG	36	38	48	13	11	18	34	16	24	13	48	24	90	63	48

New Cricket Spring Flow Dynamics

The volume of water flow at New Cricket Spring has been measured over the past fifteen years. Flows vary from less than 1/2 gallon per minute (gpm) to over 1,000 gpm.

Figure 3



Treatment System Operations

The groundwater treatment system is an ozone oxidation system. Groundwater from the spring is piped to a sump adjacent to the treatment building. The treatment system is composed of an ozone generator and a mass transfer system. The mass transfer system is designed for injection of the ozone into the water stream and to allow for contact between the ozone and water streams. The mass transfer system has the capability for recirculation to allow for variable flow from the spring. The affected water is processed through the treatment system and the treated water is discharged over a weir into the receiving stream. Table 4, below, presents the results of operational data for 2005 – 2010.

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Table 4: Ozone Injection Pilot Study

Date	Variables		Spring	PCP	
	Water Inj	O3 Inj	Flow	Mouth	Weir
12/8/05			5		
12/9/05	35		5		
12/14/05	35	1lb/10 g	21	28	
12/15/05	35	1lb/10 g	30/27	29.3	
12/20/05	36	1lb/10 g	27	7.39	<5.10
12/26/05	36	1lb/10 g	27	11.4	11.1
1/2/06	36	1lb/10 g	21	42.4	35.1
1/9/06	36	1lb/10 g	20	32.4	33
1/16/06	36	1lb/10 g	27.5	32.3	<5.00
1/23/06	36	1lb/10 g	34/32	15.9	<5.00
1/30/06	36	1lb/10 g	41	34.3	<5.00
2/6/06	36	1lb/10 g	38	<5.10	<5.00
2/13/06	36	1lb/10 g	34	23.9	<5.00
2/20/06	36	1lb/10 g	21	5.53	4.19J
2/27/06	36	1lb/10 g	26	19.9	<5.00
3/6/06	34	1-2lb/10 g	16	25.1	<5.00
3/13/06	33	1-2lb/10 g	57	107	<5.00
3/20/06	32	1-2lb/10 g	48	26.2	<5.00
3/27/06	32	1-2lb/10 g	27	4.09J	<5.00
4/3/06	34	2-3lb/10 g	24	11.3	<5.00
4/10/06	33	2-3lb/10 g	16.4	39.3	<5.00
4/17/06	34	2-3lb/10 g	22	7.94	7.82
4/24/06	35	2-3lb/10 g	16	7.0	<5.00
4/27/06	33	2-3lb/10 g	50	11.3	NA
4/29/06	33	2-3lb/10 g	193	28.2	NA
5/1/06	33	2-3lb/10 g	94	23.4	7.16
5/8/06	33	2-3lb/10 g	59	52.3	23.3
5/15/06	34	2-3lb/10 g	21.7	14.9	<5.00
5/22/06	34	2-3lb/10 g	16	<5.00	<5.00
5/30/06	34	2-3lb/10 g	16.7	5.64	<5.00

6/7/06	0	0	3	253	<5.00
6/12/06	0	0	2.19	LE	LE
6/19/06	34	0	16.7	52.1	14.3
6/26/06	34	0	16.7	74.7	<5.00
7/5/06	35	0	21.7	9.8	<5.00
7/17/06	34	0	16.7	21.9	4.01J
8/7/06	34	0	16.7	23.6	18
8/14/06	34	0	16.7	<5.00	5.22
9/5-6/06	34	0	23	6.57	<5.10
9/18/06	34	0	24	6.29	<5.00
10/2/06	34	0	24	16.8	<5.00
10/16/06	34	2-3lb/10 g	41	39.6	2.22J
10/16/06	34	5-6lb/10g	81	92.3	19.4
10/18/06	34	5-6lb/10g	27	118	<5.00
11/7/06	35	2-4lb/10g	41	52.7	4.70J
11/20/06	35	2-4lb/10g	24	57.4	<5.00
11/30/06	35	5-6lb/10g	636	<50.0	<5.00
12/4/06	35	5-6lb/10g	59	<54.3	<5.00
12/6/06	35	5-6lb/10g	37	<52.6	<5.00
12/18/06	35	2-3lb/10 g	21	24.1	<5.00
1/8/07	35	2-3lb/10 g	21	16.7	<5.00
1/22/07	35	2-3lb/10 g	79	34.6	<5.00
2/5/07	35	2-3lb/10 g	27	25.9	<5.00
2/19/07	35	2-3lb/10 g	47	19.6	<5.00
3/5/07	35	2-3lb/10 g	27	<5.00	<5.00
3/19/07	35	2-3lb/10 g	25	NA	NA
4/9/07	35	2-3lb/10 g	23	<5.00	<5.00
4/23/07	35	2-3lb/10 g	30	7.27	<5.00
5/7/07	35	2-3lb/10 g	21	2.90J	<5.00
5/21/07	35	2-3lb/10 g	20	4.36J	<5.00
6/4/07	35	2-3lb/10 g	20	<5.00	<5.00
6/18/07	35	0	21	9.62	<5.00
7/9/07	35	0	20	15.0	<5.00
7/23/07	35	0	18	8.65	<5.00
8/6/07	0	0	1	191	9.19

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9/10/07	35	0	23	217	26.4
9/24/07	35	0	18	16.2	19.4
10/10/07	35	2-3lb/10 g	18	5.63	1.15J
10/22/07	35	2-4lb/10g	18	1190	53.7
11/5/07	35	2-4lb/10g	18	209	7.93
11/19/07	35	2-4lb/10g	18	19.8	24.1
12/3/07	35	2-4lb/10g	18	20.1	<5.00
12/17/07	36	2-4lb/10g	32	87.4	1.20J
1/7/08	36	2-4lb/10g	23	<5.00	<5.00
1/21/08	36	2-4lb/10g	23	58	<5.00
2/4/08	36	2-4lb/10g	24	52	<5.00
2/18/08	35	2-4lb/10g	83	57	15
3/3/08	35	5-6lb/10g	580	<5.00	<5.00
3/17/08	35	5-6lb/10g	44	11	<5.00
4/7/08	35	5-6lb/10g	78	10	<5.00
4/12/08	35	5-6lb/10g	240	6.5	NA
4/13/08	35	5-6lb/10g	100	6.8	NA
4/14/08	35	5-6lb/10g	78	8.2	NA
5/10/08	36	5-6lb/10g	68	75	<5.00
5/27/08	0	0	18	189	<5.00
6/9/08	35	2-4lb/10g	30	77	<5.00
6/23/08	35	2-4lb/10g	580	5.6	<5.00
7/7/08	35	2-4lb/10g	80	194	189
7/10/08	35	5-6lb/10g	140	254	20
7/21/08	35	5-6lb/10g	42	477	<5.00
8/4/08	35	2-4lb/10g	22	108	14
8/18/08	35	2-4lb/10g	36	31	<5.00
9/1/08	35	2-4lb/10g	25	32	<5.00
9/22/08	35	2-4lb/10g	40	22	<5.00
10/6/08	35	2-4lb/10g	21	20	<5.00
10/20/08	33	2-4lb/10g	21	13	<5.00
11/3/08	35	2-4lb/10g	24	<5.00	<5.00
11/17/08	35	2-4lb/10g	30	28	<5.00
12/1/08	35	2-4lb/10g	24	12	<5.00
12/22/08	33	2-4lb/10g	24	<5.00	<5.00

1/5/09	35	2-4lb/10g	32	7.3	<5.00
1/26/09	32	2-4lb/10g	27	<5.00	<5.00
2/9/09	33	2-4lb/10g	90	<5.00	<5.00
2/23/09	33	2-4lb/10g	31	6	<5.00
3/9/09	34	2-4lb/10g	30	5.7	<5.00
3/23/09	33	2-4lb/10g	30	<5.00	<5.00
4/6/09	32	2-4lb/10g	38	5.8	<5.00
4/20/09	32	2-4lb/10g	243	8.5	<5.00
5/4/09	33	2-4lb/10g	343	8.2	8.7
5/18/09	33	2-4lb/10g	51	6.2	<5.00
6/8/09	35	2-4lb/10g	38	<5.00	<5.00
6/29/08	33	2-4lb/10g	25	9.1	<5.00
7/20/09	32	2-4lb/10g	47	39	<5.00
8/10/09	32	2-4lb/10g	23.7	31	<5.00
9/13/09	32	0	22	8	<5.00
10/12/09	32	0	104	21	<5.00
11/9/09	32	0	45	<50	<5.00
12/7/09	32	0	28	8.2	<5.00
1/10/10	32	0	42	13	<5.00
2/15/10	32	0	87	11.1	<5.00
3/15/10	32	0	35	<5.00	<5.00
4/15/10	32	0	40	9.62	<5.00
5/17/10	32	0	180	11	<5.00
6/13/10	32	0	43	15	<5.00
7/8/10	32	0	33	66	<2
8/19/10	0-20	0	17	16.3	<5.00
9/21/10	34	0	33	28.2	<5.00
10/18/10	37	0	20	14.9	<10.00
11/20/10	37	0	21	4.89	<4.00
12/16/10	37	0	24	6,15	<5.00

NOTES: Flow rates in gallons per minute (gpm)
O3 injection rates in pounds per 10 gallons
PCP concentrations in parts per billion (ppb)
NA - not analyzed
LE - Lab Error - samples not usable

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V. Five-Year Review Process

Shawn Ghose, EPA Remedial Project Manager for the site, led the Arkwood, Inc. Site five-year review.

The five-year review consisted of reviewing the data against the established criteria and an inspection of the Site.

VI. Five Year-Review Findings

A. Interviews

Ms. Jean Mescher, Arkwood Project Coordinator and Director of Environmental Services at McKesson Corporation (former owners of MMI) was contacted as part of the five-year review. Ms. Mescher stated that the vegetative cover at the Site is healthy with minimal stress locations. The Site is inspected every week. The groundwater treatment system located at the mouth of New Cricket Spring is operating well and is successfully meeting treatment goals. Ms. Mescher stated that there have been no complaints or inquiries concerning the site with the exception of an unauthorized temporary boat parking.

B. Site Inspection

Representatives of USEPA, ADEQ and McKesson Corporation conducted an inspection of the Site on February 23, 2011. Within the perimeter of the Site fence, the inspection included an evaluation of the surface condition, vegetation, storm water drainage system, buildings, perimeter fence, and gates. The groundwater treatment facilities onsite and at the mouth of New Cricket Spring were also inspected.

The Site was found to be in good condition. There was no evidence of topsoil erosion or surface cracks and the vegetative cover is healthy. The storm water drainage ditches were free from debris and in working order. The perimeter road was in good condition there was no evidence of unauthorized access to the Site.

The onsite treatment building and associated equipment as well as the pump house and equipment at the mouth of New Cricket Spring were all in good condition. Equipment was well maintained and in good working order. Monthly operational samples are collected at the mouth of New Cricket Spring and at the effluent point (weir) following treatment with ozone.

C. Risk Information Review

The following standards were identified as applicable or relevant and appropriate requirements (ARARS) in the Record of Decision. The standards were reviewed for changes that could affect the protectiveness of the remedy.

Federal
Resource Conservation and Recovery Act
Comprehensive Environmental Response, Compensation, and Liability Act
Superfund Amendments and Reauthorization Act

State
Arkansas Water Quality Standards

ADEQ Regulation 2 sets a water quality standard for PCP based on pH. Based on ADEQ Regulation 2 and as calculated by Masoud Arjmandi (see Attachment 1), the State Water Quality Standards for pentachlorophenol at the point of discharge are currently 9.3 µg/l and 18.7 µg/l for monthly averages and daily maximums, respectively.

The Arkwood, Inc. Site continues to be in compliance with the Federal and State ARARS. The remedial action involved excavation and transportation of affected soils to an offsite incinerator. Affected ground water is treated at New Cricket Spring to Arkansas Water Quality Standards.

D. Data Review

A review of records and monitoring reports through December 2010 indicates that the concentration of PCP emanating from New Cricket Spring has decreased significantly since the soil remediation was completed. It is anticipated that the PCP concentration will continue to attenuate over time. In the meantime, groundwater discharging at New Cricket Spring is collected and treated to Arkansas Water Quality Standards.

VII. Assessment

The following conclusions support the determination that the implemented remedy at the Arkwood, Inc. Site is continuing to be protective of human health and the environment.

Question A: Is the remedy functioning as intended by the decision documents?

Institutional Controls and Other Measures: The property owner is required to record an acceptable Deed Restriction to correctly record the survey description, protect the existing topsoil cap, provide notice of residual contamination and maintenance requirements remaining at the Site and provide notice that the Site is

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zoned for industrial use. There are no changes or planned changes in land use. Fences and gates are maintained and provide an adequate means to restrict access. The groundwater exiting New Cricket Spring is being treated until it meets the ADEQ water quality standard for PCP.

Remedial Action Performance: The soil remediation, including excavation and offsite incineration of the affected soils and capping of the remaining soils, has been effective in minimizing the potential for dermal contact with the Chemicals of Concern (COC) and has removed the source area for groundwater impacts. The groundwater treatment system located at the mouth of New Cricket Spring is effective in reducing PCP concentrations to below ADEQ water quality standards.

System Operations and Maintenance (O & M): Groundwater treatment system operations are conducted by an environmental contractor. The contractor is responsible for maintaining the groundwater treatment system in good operating condition and collecting monthly operational samples, as well as, inspecting the Site fencing, vegetative cover, storm water drainage system and buildings.

Early Indicators of Potential Remedy Failure: There is no indication of remedy failure. The Site is inspected on a regular basis and operation and maintenance activities of the groundwater treatment system are monitored daily.

Question B: Are the assumptions used at the time of remedy selection still valid?

Changes in Standards To Be Considered: This five-year review did not identify any changes in Federal or State standards that impact the soil or groundwater remedies at the Arkwood, Inc. The Site is in compliance with the State Water Quality Standards for PCP of 9.3 µg/l for a monthly average and 18.7 µg/l for a daily maximum.

Changes in Exposure Pathways: This five-year review did not identify any changes in exposure pathways since the completion of the soil remediation. Institutional controls have been effective in preventing any current or planned changes in land use. There is no indication that the treated wastes were not properly characterized, removed and treated during the soil remediation. There is no indication that the groundwater hydrology was not adequately characterized prior to the implementation of the groundwater remedy.

Changes in Toxicity and Contaminant Characteristics: The clean-up levels for PCP, c-PNAs and dioxin have not changed. As long as the Site cap remains undisturbed, the Site is protective of human health and the environment and the remedy selection is still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has been identified that questions the protectiveness of the remedy.

VIII. Deficiencies

Although the property owner recorded a deed notice in August 2010, a correction to some metes and bound description is needed. The corrections should be recorded by the Site owner.

IX. Recommendations and Follow-up Actions

Site owner needs to record corrections to the description to make the Deed Restriction acceptable.

X. Protectiveness Statements

The remedies that were implemented for soil and groundwater at the Arkwood, Inc. Site continue to be protective of human health and the environment. Since the remedies for soil and groundwater are protective of human health and the environment, the remedy for the Site is protective of human health and the environment.

Soil Remedy

The remedy that was implemented for the affected soils is protective of human health and the environment. The excavation and offsite incineration of the affected soil has been effective in preventing exposure due to direct contact and fugitive dust and has improved groundwater conditions by removing source material. Recording of an appropriate deed restriction to correctly record the survey description, protect the existing cap, provide notice of residual contamination and maintenance requirements remaining at the Site and provide notice that the Site is zoned for industrial will ensure that the remedy will remain protective and provide notice of Site conditions for future property owners. Perimeter fencing is in place and is effective in preventing unauthorized entry or use of the Site. The surface vegetation at the Site is in good condition and is inspected and maintained on a regular basis.

Groundwater Remedy

The remedy that was implemented for the groundwater is protective of human health and the environment. The ground water continues to be collected and treated to ADEQ water quality standards at the mouth of New Cricket Spring. Since the affected soil at

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the Site has been removed, the ground water should continue to attenuate naturally over time.

XI. Next Five-Year Review

The next five-year review will be conducted in 2016. The scope of the next review may be limited to an inspection of the Site to ascertain that the surface vegetation and topsoil cap continue to be in good condition and an inspection of the groundwater treatment system to ensure that it is in good working order.

Attachment 1
Arkansas Water Quality Standards Calculations

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STATE OF ARKANSAS
DEPARTMENT OF POLLUTION CONTROL & ECOLOGY
HAZARDOUS WASTE DIVISION
8001 NATIONAL DRIVE, P.O. BOX 8913
LITTLE ROCK, ARKANSAS 72219-8913
PHONE: (501)682-0744 FAX: 682-0880

January 30, 1998

RECEIVED
FEB 09 RECD
ENV. & ENG SERVICES

Jean Mescher, Project Coordinator
Director, Environmental Services
McKesson Corporation
One Post Street
San Francisco, CA 94104-5296

RE: New Cricket Spring
Arkwood Superfund Site, Omaha, Arkansas

Dear Ms. Mescher:

Based on pH of 7.38 for the nearest station to the New Cricket Spring (Station WHI67), the State Water Quality Standards for pentachlorophenol (PCP) at the point of discharge are as follows:

1. Monthly average: 9.3 μg/l
2. Daily Maximum: 18.7 μg/l

Moreover, pH values of the treated water of the New Cricket Spring shall not be below 6.0 or above 9.0

If you have any questions, please call me at (501) 682-0852.

Sincerely,

Masoud Arjmandi
Engineer II, Superfund Branch

cc: Mike Bates, Chief, HWD
Jean Koeninger, Superfund Branch Manager, HWD
Kin Siew, Engineer Supervisor, Superfund Branch, HWD
Mo Shafii, Engineer II, NPDES Branch, WD
Cynthia J. Kaleri, Project Manager, EPA Region 6 (6SF-LP)

Attachment 2
Documents Reviewed

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DOCUMENTS REVIEWED

Arkwood, Inc. Site, Activity Report, July 1996 – September1997, R2P5 Environmental Remediation, Inc., October 1997.

Arkwood, Inc. Site, Activity Report, July 1997 – September 1998, R2P5 Environmental Remediation, Inc., October 1998.

Arkwood, Inc. Site, Activity Report, July 1998 – September 1999, R2P5 Environmental Remediation, Inc., November 1999.

Arkwood, Inc. Site, Activity Report, July 1999 – September 2000, R2P5 Environmental Remediation, Inc., November 2000.

Arkwood, Inc. Site, Activity Report, October 2000 – September 2001, R2P5 Environmental Remediation, Inc., November 2001.

Arkwood, Inc. Site, Activity Report, October 2001 – September 2002, R2P5 Environmental Remediation, Inc., November 2002.

Arkwood, Inc. Site, Activity Report, October 2002 – September 2003, R2P5 Environmental Remediation, Inc., November 2003.

Arkwood, Inc. Site, Activity Report, October 2003 – September 2004, R2P5 Environmental Remediation, Inc., January 2005.

Arkwood, Inc. Site, Activity Report, October 2004 – September 2005, R2P5 Environmental Remediation, Inc., January 2006.

Arkwood, Inc. Site, Activity Report, October 2005 – September 2006, R2P5 Environmental Remediation, Inc., November 2003.

Arkwood, Inc. Site, Activity Report, October 2006 – September 2007, R2P5 Environmental Remediation, Inc., January 2005.

Arkwood, Inc. Site, Activity Report, October 2007 – December 2008, R2P5 Environmental Remediation, Inc., January 2006.

Arkwood, Inc. Site, Activity Report, January 2009 – December 2009, R2P5 Environmental Remediation, Inc., January 2006.

Corrected Consent Decree, United States of America, Plaintiff, v. Mass Merchandisers, Inc., Defendant, September 23, 1992.

Explanation of Significant Differences, Arkwood, Inc. Site, Environmental Protection Agency Region 6, June 14, 1995.

Interim Remedial Action Design, Arkwood, Inc. Site, The Forrester Group, June 29, 1994.

Preliminary Engineering Report, Arkwood, Inc. Site, The Forrester Group, May 21, 1993.

Preliminary Remedial Action Plan, Arkwood, Inc. Site, The Forrester Group, June 29, 1994.

Record of Decision, Arkwood, Inc. Site, Environmental Protection Agency, Region 6, September 28, 1990.

Report on Additional Pilot Scale Field Studies, Arkwood, Inc. Site, The Forrester Group, 7/23/93.

Site Closeout Report, Arkwood, Inc. Site, The Forrester Group, July 1996.

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Attachment 3
Photographic Log – Site Inspection

Photographic Log
Arkwood Superfund Site
Five Year Review Site Visit
February 23, 2011

Figure 1-Grass cover over soil remediation area.

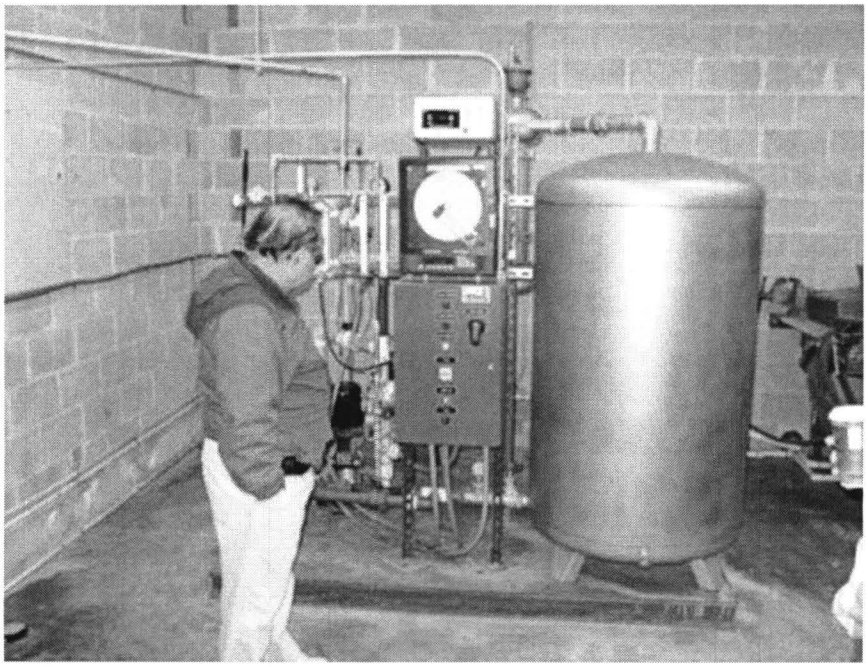

Figure 2-Injection system skid.

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Figure 3 -Injection well field.

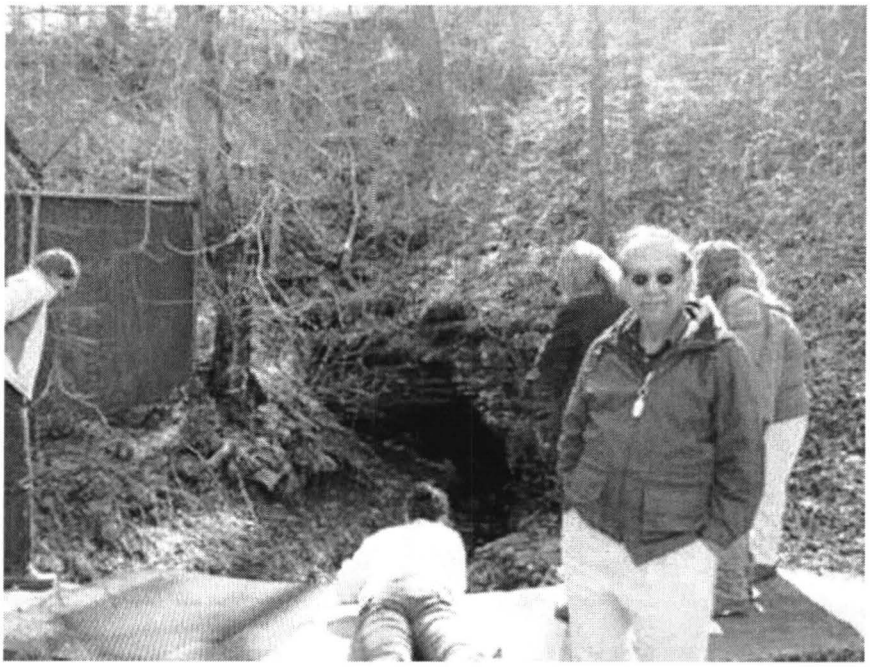

Figure 4 - Mouth of New Cricket Spring.

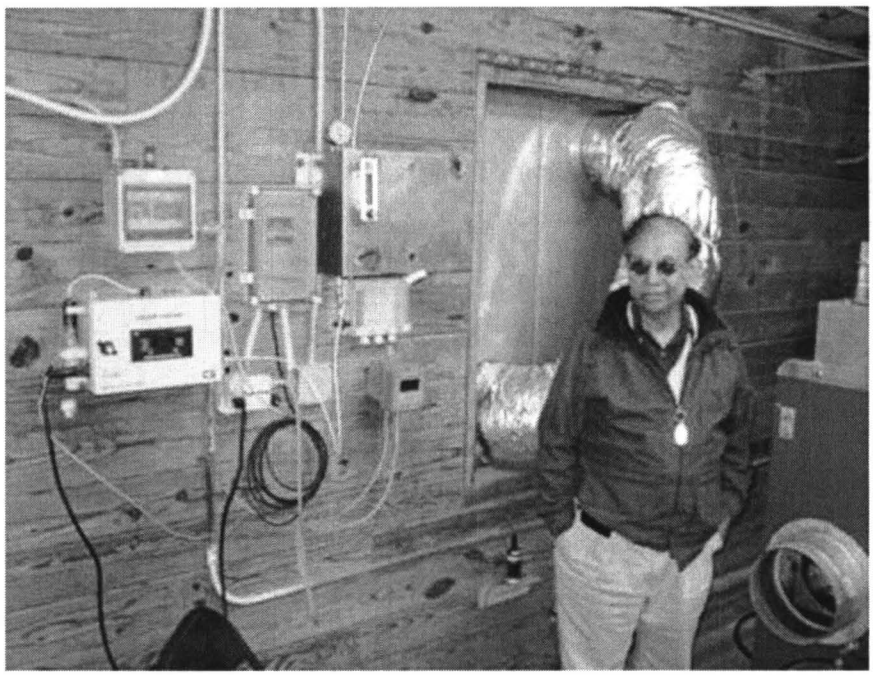

Figure 5 - Treatment system instrumentation equipment.

Figure 6 - Site security camera.

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Attachment 4
Site Inspection Form

Arkwood Site Inspection Checklist
Five-year Review

Performed By: Shawn Ghose

Date of Inspection: Feb 23, 2011 Temperature: 45°F % Cloud cover: ~50% Inches of snow: —

Site Inspection:

For each item listed below, identify if the item is in good condition or needs maintenance and performing adequately or needs repair, adjustment or upgrade. Comments are required for each item designated as needing maintenance, repair, adjustment or upgrade.

Site conditions observed:	Condition: Good	Condition: Maintenance needed	Performance: Adequate	Performance: Repair	Performance: Adjustment	Performance: Upgrade
Fencing:	✓		✓			
Signage:	✓		✓			
Buildings and improvements	✓		✓			
General site conditions	✓		✓			
Cover:						
Erosion	✓		✓			
Cracking	✓		✓			
Vegetative Cover	✓		✓			
Groundwater Injection:						
Withdrawal wells	✓		✓			
Injection wells	✓		✓			
Related equipment and systems	✓		✓			
Surface Water Treatment:						
Ozone generation	✓		✓			
Treatment train	✓		✓			

Comments:

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Arkwood Site Inspection Checklist
Five-year Review

Documentation review:

For each documentation item listed below, identify if the documentation is readily available and up-to-date. Comments are required for each item identified as not meeting expectations.

Documentation reviewed:	Readily available: Yes	Readily available: No	Up-to-date: Yes	Up-to-date: No
Training records:				
Hazwopper update:	✓		✓	
Health and safety plan	✓		✓	
Access/Sign-In logs	✓		✓	
Operation and maintenance documentation:				
O&M manual	✓		✓	
As-built drawings	✓		✓	

Comments:

ADEQ

ARKANSAS
Department of Environmental Quality

Hand Delivered Mail Receipt

Date	3/11/11
Division	Haz Waste
Sender	Shawn Ghose
Received By	Marilyn Egan

grish.org <curt@grish.org>

March 23, 2012 10:05 AM

To: Carlos Sanchez <Sanchez.Carlos@epamail.epa.gov>
Cc: "grish.org" <curt@grish.org>, Charles Faultry <Faultry.Charles@epamail.epa.gov>, Donald Williams <Williams.Donald@epamail.epa.gov>, Gloria-Small Moran <Moran.Gloria-Small@epamail.epa.gov>, Shawn Ghose <Ghose.Shawn@epamail.epa.gov>, Armendariz.al@Epa.gov, woolford.james@Epa.gov, Coleman.sam@Epa.gov, marks@adeq.state.ar.us, benefield@adeq.state.ar.us, Phillips.pam@Epa.gov
Fwd: Charles Curtis Grisham, Jr. Formal Comments on Draft Third Five-Year Review for Arkwood, Inc. Superfund Site

2 Attachments, 190 KB

Mr. Sanchez and all copy recipients:

In yesterday's letter I attached a DRAFT version of my formal comments and concerns for the then-draft Arkwood Third Five-Year Review.

Here is the FINAL version, with its covering document, exactly as I submitted it to Carlos Sanchez on April 28, 2011.

I stand behind all assertions in both versions and am available to show my supporting documentation at any time.

Charles Curtis Grisham, Junior

Begin forwarded message:

From: "grish.org" <curt@grish.org>
Date: April 28, 2011 8:47:03 AM PDT
To: Sanchez.Carlos@epamail.epa.gov
Cc: Donald Williams <Williams.Donald@epamail.epa.gov>, Shawn Ghose <Ghose.Shawn@epamail.epa.gov>, Tammie Hynum <HYNUM@adeq.state.ar.us>, "Clem, Sarah" <CLEM@adeq.state.ar.us>, Dianna Kilburn <KILBURN@adeq.state.ar.us>, Marilyn Egan <EGAN@adeq.state.ar.us>, tkresse@usgs.gov, "grish.org" <curt@grish.org>
Subject: Charles Curtis Grisham, Jr. Formal Comments on Draft Third Five-Year Review for Arkwood, Inc. Superfund Site

Thursday, April 28, 2011 08:45

Dear Carlos,

As discussed, I am delivering my formal comments and concerns regarding the Draft Third Five-Year Review for the Arkwood, Inc. Superfund Site.

You told me on the telephone Monday that if I had these to you before the end of this week they would be taken into consideration for the final version of the Third Five-Year Review for the Arkwood, Inc. Site

Please acknowledge your receipt of this communication and its two attachments totaling fourteen pages (14pp.) not including this email message.

Thank you.

Sincerely,

Curt Grisham

FINAL3rd5y...orm (101 KB)

FINALGrisha...view (88 KB)

Third Five-Year Review Interview Record Arkwood, Inc. Superfund Site ~~Akrwood Wood Treaters~~, Omaha, AR	**Interviewee:** Curt Grisham Charles Curtis Grisham, Jr

Site Name	EPA ID No.	Date of Interview	Interview Method
Arkwood Wood Treaters	EPA ID# ARD084930148		Survey Per E-mail

Interview Contacts	Organization	Phone	E-mail	Address
Shawn Ghose	EPA Region VI	(214) 665-6782	Ghose.Shawn@epamail.epa.gov	Shawn Ghose (6SF-AP) US EPA Region 6, 1445 Foss Avenue, Suite 1200 Dallas, TX 75202

Interview Questions (Please address the period since the second five-year review was completed in April 2006)

1. From your perspective, what effect have remedial actions at the site had on the surrounding community since completion of the second five-year review in April 2006? Are you aware of any community concerns regarding the site or its operation and administration?

Response: Because nothing has been done by EPA or ADEQ to revitalize the Site and prepare it for return to productive use, the surrounding community of Omaha and Boone County continues to be deprived of jobs, tax revenues and other economic advantages as a result.

2. Have there been routine communications or activities conducted by your office regarding the site since the last five-year review? If so, please describe purpose and results.

Response: NO

3. Are you aware of any events, incidents, or activities that have occurred at the site since the last five-year review, such as dumping, vandalism, trespassing, or emergency response from local authorities? If so, please give details.

Response: **McKesson employee Robert Ritchie stored a large fuel-powered watercraft on the Superfund Site for over a year, only removing it after its presence was brought to the attention Frank Robinson, VP Real Estate, McKesson Corporation.**

4. Since the last five-year review have there been any complaints, violations, or other incidents related to the site that required a response? If so, please summarize the events and result.

Response: **NO**

7. Do you feel well-informed about the site's condition and status since the last five-year review?

Response: **NO**

8. Do you have any comments, suggestions, or recommendations regarding the remedy for the site or its operation and administration since the last five-year review?

Response: **Please see attached eleven-page (11 pp.) document titled: Concerns of Charles Curtis Grisham, Jr. Regarding the Draft "Third Five-Year Review Report for Arkwood Inc. Site, Boone County, Omaha, Arkansas, March 2011, Prepared By Region 6, United States Environmental Protection Agency, Dallas, Texas" ("Review Report") prepared by EPA with data and reports provided by McKesson Corporation**

9. Please provide any additional comments in the spaces provided. **Please see attached eleven-page (11 pp.) document titled: Concerns of Charles Curtis Grisham, Jr. Regarding the Draft "Third Five-Year Review Report for Arkwood Inc. Site, Boone County, Omaha, Arkansas, March 2011, Prepared By Region 6, United States Environmental Protection Agency, Dallas, Texas" ("Review Report") prepared by EPA with data and reports provided by McKesson Corporation**

Concerns of Charles Curtis Grisham, Jr. Regarding the Draft "Third Five-Year Review Report for Arkwood Inc. Site, Boone County, Omaha, Arkansas, March 2011, Prepared By Region 6, United States Environmental Protection Agency, Dallas, Texas" ("Review Report") prepared by EPA with data and reports provided by McKesson Corporation

I. **Concern:** Arkansas Water Quality Standards for Aquatic Life as defined by Arkansas Department of Environmental Quality (ADEQ) for the Site are not in full compliance with Section 303(c) and Section 304(a) of the Clean Water Act, or with United States Environmental Protection Agency (EPA) National Recommended Water Quality Criteria: 2002.

A. The Arkansas standards are inappropriately stringent with regard to "designated uses" of New Cricket Spring, which uses have not been defined by ADEQ for New Cricket Spring (NCS).

1. Arkansas Water Quality Standards for the purposes of the "remedial goal" for pentachlorophenol (PCP) in New Cricket Spring, as determined in a letter of January 30, 1998 from Masoud Arjmandi of ADEQ and "based on pH of 7.38 for the nearest station to the New Cricket Spring" are:

a) Monthly Average: 9.3 µg/L

b) Daily Maximum: 18.7 µg/L

2. According to Sarah Clem, ADEQ Branch Manager, Water Quality Planning Branch, Water Division, as recorded in a meeting on April 12, 2011 at ADEQ headquarters:

a) APC&EC Regulation 2 is the law in Arkansas for water quality standards.

b) Regulation 2 mirrors EPA National Recommended Water Quality Criteria.

c) Standards for PCP in surface water are addressed specifically by Reg. 2.508, the sole reference to PCP in the entirety of Regulation 2.

d) In determining the water quality standards for New Cricket Spring, near the Arkwood Site, "certain factors that are used in calculating those limitations" besides the pH-dependent formula stated in Regulation 2.508 were used to derive the numeric values stated by Mr. Arjmandi in the above-referenced letter of 1998, which numeric values have become the *de facto* Arkansas water quality standards and remedial goal for New Cricket Spring according to the draft Third Five-Year Review of the Site.

e) Those "other factors" were not precisely known by Ms. Clem at the time of our meeting, except that:

(1) The absolute values expressed in Mr. Arjmandi's letter, which set the remedial goal for NCS, were arrived at by a "permit engineer" in the Water Division of ADEQ using a "permitting-type process," even though no permit was applied for or issued for NCS or the Site.

f) ADEQ has the responsibility for re-evaluation of the remedial goal for New Cricket Spring during the drafting of the Third Five-Year Review.

II. **Concern**: ADEQ should re-evaluate and revise the "water quality standards" currently governing the groundwater remediation requirements at NCS near the

Arkwood Site. ADEQ should relax the stringency of those standards based upon the "designated uses" of New Cricket Spring (none) and considering the following material (***emphasis added***):

A. See following quoted from QUALITY CRITERIA for WATER 1986 by United States Environmental Protection Agency, Office of Water Regulations and Standards, Washington, DC 20460 May 1, 1986 (EPA 440/5-86-001)

1. "TO INTERESTED PARTIES: Section 304(a)(l) of the Clean Water Act (33 U.S.C. 1314(a) (1) requires the Environmental Protection Agency (EPA) to publish and periodically update ambient water quality criteria. These criteria are to accurately reflect the latest scientific knowledge (a) on the kind and extent of all identifiable effects on health and welfare including, but not limited to, plankton, fish shellfish, wildlife, plant life, shorelines, beaches, aesthetics, and recreation which may be expected from the presence of pollutants in any body of water including ground water; (b) on the concentration and dispersal of pollutants, or their byproducts, through biological, physical, and chemical processes; and (c) on the effects of pollutants on biological community diversity, productivity, and stability, including information on the factors affecting rates of eutrophication and organic and inorganic sedimentation for varying types of receiving waters. ***These criteria are not rules and they do not have regulatory impact. Rather, these criteria present scientific data and guidance of the environmental effects of pollutants which can be useful to derive***

regulatory requirements based on considerations of water quality impacts."

B. See following quoted from the EPA National Recommended Water Quality Criteria: 2002, (United States Environmental Protection Agency, Office of Water, Office of Science and Technology, November 2002, (EPA-822-R-02-047)

1. "As part of the water quality standards triennial review process defined in Section 303(c)(1) of the CWA, the states and authorized tribes are responsible for maintaining and revising water quality standards. ***Water quality standards consist of designated uses, water quality criteria to protect those uses, a policy for antidegradation, and general policies for application and implementation. Section 303(c)(1) requires States and Tribes to review, and modify if appropriate, their water quality standards at least once every three years.***"

2. "States and authorized tribes must adopt water quality criteria that protect designated uses. ***Protective criteria are based on a sound scientific rationale and contain sufficient parameters or constituents to protect the designated uses***. Criteria may be expressed in either narrative or numeric form. ***States and authorized tribes have four options when adopting water quality criteria for which EPA has published section 304(a) criteria***. They can: (1) establish numerical values based on recommended section 304(a) criteria; (2) adopt section 304(a) criteria modified to reflect site-specific conditions; (3) adopt criteria derived using

other scientifically defensible methods; or (4) establish narrative criteria where numeric criteria cannot be determined (40 CFR 131.11)."

III. **Concern**: Third Five-Year Review Report should include reference to steps already taken and further steps to be taken by the United States Environmental Protection Agency (EPA) to return the Arkwood, Inc. Site ("Site") to productive use in compliance with the EPA's Return to Use Initiative, Land Revitalization Initiative, the Fiscal Year 2011–2015 EPA Strategic Plan, and Superfund Redevelopment Initiative, which states in part:

A. "Reusing sites also plays an important role in long-term protectiveness because new users act as stewards for the land. Superfund Redevelopment has developed two specific measures to assess and report on a range of accomplishments and outcomes realized through cleaning up and redeveloping formerly contaminated sites."

1. Sitewide Ready for Anticipated Use
2. Cross Program Revitalization Measures

B. The references should include a statement that Site has received or will receive a determination of "Sitewide Ready for Anticipated Reuse" which EPA describes as follows:

1. "This SWRAU measure was developed to comply with EPA's responsibility to report long-term, outcome-based accomplishments under the Government Performance and Results Act. The introduction of this measure also reflects the high priority that EPA places on land reuse and revitalization as an integral part of the Agency's cleanup mission for the

Superfund program, as well as its attention to post-construction activities at NPL sites."

C. The references should include a statement that Site has been brought to the attention of the Superfund Reuse Coordinator for Region 6 to be considered for a Ready for Reuse (RfR) determination

IV. **Concern**: Third Five-Year Review Report should include a statement that Remedial Project Manager for Arkwood Site will comply with and conform to EPA "Guidance for Documenting and Reporting Performance in Achieving Land Revitalization" (OSWER 9200.1-74) (http://www.epa.gov/fedfac/sf_ff_final_cprm_guidance.pdf) which states:

A. "The purpose of this guidance is to provide technical direction to U.S. Environmental Protection Agency (EPA) managers and staff in fulfilling the Agency's responsibilities for documenting and reporting accomplishments in achieving revitalization of land at Superfund and Federal facility sites."

V. **Concern**: "Summary of Five-Year Review Findings" contains assumptions, conclusions and statements that are inaccurate, false or unsupported by the data contained within the Review Report.

A. Conclusions regarding the efficacy of the on-site injection of ozonated and ordinary water are NOT supported by the data.

1. Does not account for evidence of natural attenuation.
2. Vast majority of improvement of PCP concentrations at mouth of New Cricket Spring (NCS) took place long BEFORE injection wells were installed

a) See figure 2a: PCP down from ~1700 ppb to 134 ppb between 1989 and 2004

b) Since installation of injection wells (2005), PCP down from 132 ppb to 18 ppb, with intermittent reversals (rises) in PCP levels at NCS

B. Correct conclusion from Third Five-Year Review: injection wells slowed down and even reversed improvement i.e. are counter-productive to groundwater remediation effort and should be discontinued

C. Remove the following inaccurate statement: "The ozone injection system has reduced PCP concentration in New Cricket Spring by more than 95 percent."

1. This statement is patently false and unsupported by the data contained in the Third Five-Year Review. In fact, the opposite is true: PCP concentrations were falling steadily and rapidly until the injection system was installed, after which time the PCP concentrations stopped falling off so steeply, then leveled off and even sometimes increased, proving that the injection system is exacerbating the groundwater contamination, not facilitating groundwater remediation at NCS.

VI. **Concern**: The Deed Restriction recorded by the Arkwood Site owner on August 30, 2010 per EPA specification and in satisfaction of EPA requirement for Institution Control at the Site includes more than just the remediated area and needs to be modified (with EPA authorization) to apply to only the area that was actually the subject of remediation activities and operations.

A. Carlos Sanchez of EPA expressed his consent to authorize such modification of the Deed Restriction based upon a new legal description of just the

remediated area, releasing unaffected adjacent areas from the Deed Restriction as currently recorded.

1. I provided Mr. Sanchez with the revised description and accompanying survey map on April 20, 2011 which encompasses the remediated area completely and solely.
2. Owner is awaiting Mr. Sanchez' written authorization to record a Correction Deed to effect modification of the Institutional Control.

B. EPA should provide a statement that only the remediated area is subject to EPA control and that Site owner is free to use and dispose of all adjacent and adjoining lands as owner sees fit.

C. Access, control and authority over all adjacent unaffected areas should be returned to the owner as soon as possible.

1. Owner should have a key to the gated fence which encloses unaffected areas as well as the remediated subject area.

VII. **Concern**: "Actions Needed" section contains should state that the major deficiency is that the flawed "injection pilot study," which is a failed experiment that should be immediately discontinued, dismantled and removed from the Site in order for accurate testing and measurement of NCS water quality under natural conditions can take place to see if it meets Arkansas Water Quality Standards without further treatment, disturbance or interference.

A. This section should delete the following inaccurate statement: "The Deed Restriction of August 2010 needs minor corrections in the metes and bound

description. It is anticipated that the corrections will be completed in the next twelve months."

1. This is not true. Deed Restriction was recorded to the specification of Donald Williams, Deputy Director, Superfund, Region 6.

VIII. Concern: Responsible Party McKesson Corporation appears to have incentive to prevent or delay the conclusion of remedial activities at the Arkwood Site and to block progress towards returning the Site to productive use.

A. McKesson employee Jean A. Mescher has repeatedly expressed her unwillingness to have Site returned to productive use and has attempted to block my efforts to overcome obstacles to the Site's full or partial deletion from the National Priorities list and its eventual return to productive use, in keeping with EPA stated policy and guidance.

B. Jean A. Mescher, representing McKesson Corporation, repeatedly makes offers to purchase Site and surrounding unencumbered property held by Site owner at a price the owner considers vastly under market value. At the same time Ms. Mescher has advanced McKesson's undervalued offers to purchase Site and surrounding property, she makes disparaging statements regarding not just the Site but also surrounding unencumbered property. For example:

1. "...I strongly believe that McKesson has the bad end of the deal. I was thinking more in the range of $50,000. It's hard to explain to my management that I recommend paying even this much to ensure the property is mothballed when we already have that ability with our existing contracts." (Jean Mescher, November 3, 2005)

2. “This is a nuisance thing for us and nothing more. We already have the contractual agreements in place to eliminate use of these properties pretty much forever...” (Jean Mescher, November 3, 2005)

3. “...McKesson’s incentive is to ensure that this property is ‘mothballed’ indefinitely...” (Jean Mescher, December 7, 2005)

4. “Therefore, I felt (and explained to my management) that this was more than fair for property that has NO POSSIBLE USE IN THE FORESEEABLE FUTURE. Considering the residual contaminants at the main site, it will be well beyond your and my lifetimes before the site could be considered for any use. Any use of the hillside acreage will cause erosion which would render our water treatment plant ineffective. Please reconsider our offer of $100,000. Jean.” (Jean Mescher, December 12, 2005)

5. “...McKesson views this property as a liability -- not an asset.” (Jean Mescher, April 9, 2010)

6. “Degradation of these contaminants to acceptable levels allowing for use of the Site is not estimated to occur for possibly hundreds of years.” (Jean Mescher, April 9, 2010)

7. “Our offer of $25,000 for the Site remains active through May 1, 2010 at which time this offer is withdrawn.” (Jean Mescher, April 9, 2010)

C. Jean Mescher has claimed that McKesson controls property adjacent to Site (“hillside acreage”) which is also held by Site owner; this property is unaffected by Site or Superfund activities; yet Ms. Mescher, representing McKesson,

asserts control of the adjacent lands and likewise makes offers to purchase for McKesson at a price far below fair market value.

D. Jean Mescher has engaged attorney Don A. Smith of Smith, Cohen & Horan, PLC, 1206 Garrison Avenue, Fort Smith, Arkansas to represent McKesson Corporation for the purpose of repeatedly making demands of and threatening legal action against both Site owner and me, Charles Curtis Grisham, Jr., as result of my contacts with EPA and ADEQ requesting information about the Site and remedial activities conducted by McKesson and its contractors.

1. My inquiries were for the sole purpose of facilitating the conclusion of remedial activities, deletion of the Arkwood Site from the National Priorities List, and the return of the Site to productive use within the Institutional Controls specified by EPA.

CC Grisham <grish@me.com>

August 22, 2013 3:33 PM

To: Stephen Tzhone <tzhone.stephen@epa.gov>
Cc: CC Grisham <grish@me.com>, Carlos Sanchez <sanchez.carlos@epa.gov>
Fwd: Complaint of EPA staff non-responsiveness/ Arkwood Inc. Partial Deletion/ Fwd: formal request

1 Attachment, 89 KB

Steve,

I would like the following added to my Part V. (suggestions for governmental improvement) and added to the official record:

Item: EPA ignored my formal questions and concerns submitted before the deadline concerning Draft 3rd 5-year site review of Arkwood Superfund site.

Following is salient excerpt from the entire forwarded email string below:

On March 22, 2012, I wrote to Carlos Sanchez:

"The most important communication to you from me that you have ignored is my document containing my formal comments and concerns for the Draft Third Five-Year Review for Arkwood. I have attached my concerns document here again. It took me many hours to prepare.

"I delivered this document to you on April 28, 2011, under the deadline you set. You acknowledged receipt on the same day, when you wrote to me:

'Thank You Mr. Grisham for your comment on the Five Year Review. We will consider your comments before we finalize the report. CAS'

"In a reply that you took almost four months for you to make to my May 24, 2011 inquiry, you state:

'Mr. Grisham,
Sorry for the delay in completing and sending you the copy of the Third Five Year Review. Here it is. We are also working with the site attorney to respond to your comments and questions you had for the site. Also, we will check with the Region Reuse Coordinators and check with the potential future reuse for the site. CAS'

"The Third Five-Year Review for Arkwood, which now cannot be changed, was finalized without the promised consideration of my formal comments and concerns. The errors and misstatements I pointed out in my concerns document persisted into the finalized version and became official and immutable.

"Stated otherwise: formal commentary from a concerned member of the public was willfully or neglectfully ignored by EPA during the production of the Third Five-Year Review for the Arkwood site."

Begin forwarded message:

From: "grish.org" <curt@grish.org>
Subject: Re: Complaint of EPA staff non-responsiveness/ Arkwood Inc. Partial Deletion/ Fwd: formal request
Date: March 22, 2012 12:57:16 PM PDT
To: Carlos Sanchez <Sanchez.Carlos@epamail.epa.gov>
Cc: "grish.org" <curt@grish.org>, Charles Faultry <Faultry.Charles@epamail.epa.gov>, Donald Williams <Williams.Donald@epamail.epa.gov>, Gloria-Small Moran <Moran.Gloria-Small@epamail.epa.gov>, Shawn Ghose <Ghose.Shawn@epamail.epa.gov>, Armendariz.al@Epa.gov, woolford.james@Epa.gov, Coleman.sam@Epa.gov, marks@adeq.state.ar.us, benefield@adeq.state.ar.us, Phillips.pam@Epa.gov

Mr. Sanchez,

Your reply is unsatisfactory.

As I indicated to Mr. Faultry yesterday and today, there are other outstanding communications from me that you have neglected besides the November 30, 2011 and November 23, 2011 letters I wrote to you.

The most important communication to you from me that you have ignored is my document containing my formal comments and concerns for the Draft Third Five-Year Review for Arkwood. I have attached my concerns document here again. It took me many hours to prepare.

I delivered this document to you on April 28, 2011, under the deadline you set. You acknowledged receipt on the same day, when you wrote to me:

"Thank You Mr. Grisham for your comment on the Five Year Review. We will consider your comments before we finalize the report. CAS"

In a reply that you took almost four months for you to make to my May 24, 2011 inquiry, you state:

"Mr. Grisham,
Sorry for the delay in completing and sending you the copy of the Third Five Year Review. Here it is. We are also working with the site attorney to respond to your comments and questions you had for the site. Also, we will check with the Region Reuse Coordinators and check with the potential future reuse for the site. CAS"

The Third Five-Year Review for Arkwood, which now cannot be changed, was finalized without the promised consideration of my formal comments and concerns. The errors and misstatements I pointed out in my concerns document persisted into the finalized version and became official and immutable.

Stated otherwise: formal commentary from a concerned member of the public was willfully or neglectfully ignored by EPA during the production of the Third Five-Year Review for the Arkwood site.

I consider that a serious failure.

Do you ever intend to fulfill your promise to respond to the comments and concerns I had for the site, which I formally submitted to you under deadline on April 28, 2011?

Can you tell me what caused your delay of more than three and one-half months in your response to my November 30, 2011 letter, when you knew time was of the essence in this matter?

Can you tell me what "misunderstanding" caused a delay of more than four months in your writing the promised letter to ADEQ regarding partial deletion for Arkwood?

I think I deserve some explanation of these failures as a concerned member of the public and as a taxpayer.

Charles Curtis Grisham, Jr.

110426DRA...view (89 KB)

On Mar 22, 2012, at 10:37 AM, Carlos Sanchez wrote:

Mr. Grisham,
As Mr. Faultry indicated to you yesterday, I am working on a response to your November letter and it will be sent out on tomorrow, Friday, March 23, 2012. Regarding your request for partial deletion, there was a misunderstanding on what and how much information we needed to send to the state ADEQ when we request the partial deletion. We will be sending the request to the state next week. CAS

Carlos A. Sanchez
Chief, AR/TX Section
Region 6, Superfund Division (6SF-RA)
sanchez.carlos@epa.gov
(214) 665-8507

From: "grish.org" <curt@grish.org>
To: Charles Faultry/R6/USEPA/US@EPA
Cc: "grish.org" <curt@grish.org>, James Woolford/DC/USEPA/US@EPA, Sam Coleman/R6/USEPA/US@EPA, Al Armendariz/R6/USEPA/US@EPA, Pam Phillips/R6/USEPA/US@EPA, marks@adeq.state.ar.us, benefield@adeq.state.ar.us, Donald Williams/R6/USEPA/US@EPA, Carlos Sanchez/R6/USEPA/US@EPA, Gloria-Small Moran/R6/USEPA/US@EPA
Date: 03/22/2012 11:54 AM
Subject: Complaint of EPA staff non-responsiveness/ Arkwood Inc. Partial Deletion/ Fwd: formal request

---

Mr. Faultry,

As you know, I am disappointed that promises made to me by Mr. Sanchez have not been kept and that he has not been responsive to my formal communications.

Years ago I gave up attempting to work directly with Arkwood Remedial Project Manager Shawn Ghose due to his chronic unresponsiveness to my communications and his lack of diligence.

I just spoke with Ryan Benefield, Deputy Director at Arkansas Department of Environmental Quality. Mr. Benefield, who is familiar with the Arkwood site, said he has heard nothing about "partial deletion" for Arkwood from the EPA since the idea first came up some four years ago (and went nowhere).

This is contrary to the promise made to me by Mr. Sanchez below on November 25, 2011.

Has Mr. Sanchez written to ADEQ requesting their concurrence that the Arkwood Inc. Superfund site (EPA ID: ARD084930148 Site ID: 0600124) be submitted for partial deletion from the National Priorities List?

If Mr. Sanchez has written that letter to ADEQ, could I please receive a copy of that letter?

The Arkwood landowner and surrounding community have already lost years of use of the property, when it arguably should have been deleted and returned to industrial reuse long ago, if the RPM Mr. Ghose had performed his duties and responsibilities with diligence.

Please request that Mr. Sanchez work more diligently on this matter and that he respond timely to all my communications and to those of other stakeholders at the Arkwood site.

Please request that Shawn Ghose, Remedial Project Manager for Arkwood, be replaced with a different RPM for Arkwood.

Please review the Arkwood site management history to determine if the installation of the onsite injection operations by McKesson at Arkwood was properly approved by EPA through the concurrence process.

The scientific data prove that the installation and operation of the onsite injection operations caused a release of contaminant and hindered the existing EPA-approved groundwater remedy.

No study has been performed to assess the possible damage of McKesson's ongoing injection of water onsite at high pressure, underground, 24 hours a day, 365 days a year for many years, continuing indefinitely.

If McKesson's injection operations cause a sinkhole or other ill effect, the Arkwood land will have been further

damaged.

If EPA did not approve through full concurrence the "injection wells" and injection operations that McKesson installed on the Arkwood site, I ask that EPA order McKesson to cease injection operations on the site, to remove that injection apparatus from the site and to repair the damage it has inflicted on the Arkwood land.

Once the injection apparatus has been removed with EPA approval, and the damage its installation and operation caused to the Arkwood land has been repaired by McKesson, I ask that EPA submit Arkwood for full, not partial, deletion from the NPL.

Thank you,

Curt Grisham

Begin forwarded message:

From: Sanchez.Carlos@epamail.epa.gov
Date: November 25, 2011 7:38:56 AM PST
To: "grish.org" <curt@grish.org>
Cc: Williams.Donald@epamail.epa.gov, Ghose.Shawn@epamail.epa.gov
Subject: Re: formal request

Curt,
This letter is all we need to start the process to partially delete the Arkwood site from the National Priorities List (Superfund). We will keep you inform and provide update as the process moves forward. The first step involves EPA sending a letter to ADEQ requesting their approval to delete the site. CAS

Carlos A. Sanchez
Chief, AR/TX Section
Region 6, Superfund Division (6SF-RA)
sanchez.carlos@epa.gov
(214) 665-8507

From: "grish.org" <curt@grish.org>
To: Carlos Sanchez/R6/USEPA/US@EPA
Cc: "grish.org" <curt@grish.org>
Date: 11/23/2011 03:37 PM
Subject: formal request

Hi Carlos,

Here's a scan of the letter I'm putting in the mail to you today.

Please let me know if this letter in not complete for the purpose or if you need anything else to get the ball rolling.

If you wouldn't mind, please acknowledge receipt of the formal letter once you have received it via USPS.

Thank you and Happy Thanksgiving.

Curt

[attachment "20111123ReqPartDel.pdf" deleted by Carlos Sanchez/R6/USEPA/US]

Third Five-Year Review Report

Arkwood, Inc. Site
Boone County
Omaha, Arkansas

July 2011

Prepared By
Region 6

United States Environmental Protection Agency
Dallas, Texas

640906

THIRD FIVE-YEAR REVIEW
Arkwood, Inc.
ARD084930148
Boone County, Arkansas

This memorandum documents the Environmental Protection Agency's (EPA) approval of the third Five-Year Review report for the Arkwood, Inc., Superfund site. This document was prepared by EPA with data and reports provided by McKesson Corporation.

Summary of Five-Year Review Findings

Arkwood was a wood treating site where wood treating fluids contaminated the soil and ground water. The soil remedy was implemented in two phases. Phase I was pretreatment (drying and separation of contaminated soil from rock fragments), storage of contaminated soil to implement the remedy specified in the ROD, and backfilling with clean soil to minimize the environmental impact. Phase II was off-site incineration of the impacted soil. The above procedure was followed by placement of a six-inch topsoil cap and seeding. The remediation area is fenced with signs and locked gates. The ground water beneath the site is impacted by residual contamination. New Cricket Spring, located about 1/4-mile downgradient of the wood treating area, is impacted by the site. Pentachlorophenol (PCP) concentrations at New Cricket Spring have decreased significantly since the soil remedy was completed. As a part of the ground water remedy, water at New Cricket Spring was treated by an ozone oxidation process to destroy the PCP contamination in the groundwater. The ground water treatment system was installed in 1997 and upgraded in 1998 and 1999.

In late 2005, McKesson installed injection wells near the sinkhole where wood treating wastes were disposed. The sinkhole is hydraulically connected to New Cricket Spring through subsurface fractures. Ozonated water was injected into the wells from December 2005 through August 2009 to destroy residual PCP in the subsurface fractures with a goal of cleaning up New Cricket Spring permanently. Non-ozonated water continues to be injected in the vicinity of the sinkhole as a means of flushing and facilitating the efficient operation of the treatment system at New Cricket Spring. The ozone injection system has reduced PCP concentrations in New Cricket Spring by more than 95 percent. However, the PCP values have reached an average of 50 micrograms per liter (ug/l) over the past five years and an average concentration below 20 ug/l over the past two years. The current injection and treatment systems are able to destroy PCP in the water to the level set by Arkansas Department of Environmental Quality (ADEQ) (9.3 µg/l monthly average and 18.7 µg/l daily maximum). The PCP concentrations have attained the cleanup concnetrations several times in the last few years. While the average PCP concentration at New Cricket Spring has been successfully reduced to a level slightly exceeding the ADEQ cleanup goal, the attainment of cleanup values has not been consistent (see semi-log plot, Figure 2b). The ground water treatment system should continue until water exiting the New Cricket Spring consistently meets ADEQ water quality standards for PCP.

Actions Needed

No major deficiencies were noted in this Five Year Review. To ensure future protectiveness, a Deed Restriction was filed by the property owner in August 2010. The Deed Restriction protected the existing cap, provided a notice of residual contamination remaining on the site, and restricted future use to industrial purposes. The Deed Restriction of August 2010 needs minor corrections in the metes and bounds description and to add the notice that the site is zoned for industrial use only within 12 months of this review. It is anticipated that the corrections will be completed within the next twelve months. In January 2011, EPA made a Sitewide Ready for Anticipated Use determination at the Arkwood site. In addition, the New Cricket Spring ground water treatment system should continue until water exiting from the New Cricket Spring meets ADEQ Water Quality Standard for PCP at the site.

Determinations

I have determined that the remedy for the Arkwood site is protective of human health and the environment and will remain so provided the action items identified in the third Five-Year Review report are addressed as described above.

Pamela Phillips, Acting

Samuel Coleman, P.E.
Director
Superfund Division
U. S. Environmental Protection Agency, Region 6

8/18/11
Date

CONCURRENCES
THIRD FIVE-YEAR REVIEW REPORT
Arkwood, Inc.

7/20/11

Shawn Ghose M.S., P.E. ASME — Date
Remedial Project Manager
Arkansas/Texas Section, Remedial Branch
Superfund Division

7/21/11

Carlos Sanchez — Date
Chief, Arkansas/Texas Section
Remedial Branch, Superfund Division

7/21/11

Charles Faultry — Date
Associate Director, Remedial Branch
Superfund Division

8/10/11

Gloria Moran, Site Attorney — Date
Superfund Branch
Office of Regional Counsel

08/11/11

Mark Peycke, Chief — Date
Superfund Branch
Office of Regional Counsel

8/18/11

Pamela Phillips — Date
Deputy Director, Superfund Division

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Attachments

Attachment 1: Arkansas Water Quality Standards Calculation
Attachment 2: List of Documents Reviewed
Attachment 3: Photographic Log – Site Inspection
Attachment 4: Site Inspection Form

List of Acronyms

ADEQ	Arkansas Department of Environmental Quality (formerly ADPCE)
AOC	Administrative Order on Consent
ARARs	Applicable or Relevant and Appropriate Requirements
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chemicals of Concern
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
gpm	gallons per minute
HASP	Health and Safety Plan
IRIS	Integrated Risk Information System
mg/kg	milligram per kilogram
mg/l	milligram per liter
MMI	Mass Merchandisers, Inc.
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PCP	Pentachlorophenol
PER	Preliminary Engineering Report
PNA	Polynuclear Aromatics
ppb	parts per billion
PRP	Potentially Responsible Party
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial Design/Remedial Action
RDWP	Remedial Design Work Plan
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SARA	Superfund Amendments and Reauthorization Act of 1986
SOW	Statement of Work
µg/l	microgram per liter

EXECUTIVE SUMMARY

This is the third Five-Year Review for the Arkwood, Inc., site located in Boone County in Omaha, Arkansas. The results of this Five-Year Review indicate that the remedy is protective of human health and the environment. Soil remediation was completed in 1995 followed by placement of a topsoil cap and seeding. The vegetation is in good condition. The ground water treatment system, located immediately downgradient of the mouth of New Cricket Spring, is functioning as designed and is meeting treatment goals. Therefore, the remedy that was implemented for soil and ground water at the site continues to be protective of human health and the environment.

Soil Remediation

The remedy that was implemented for soil remediation is protective of human health and the environment. The soil remedy was implemented in two phases. During the first phase, the impacted soil was dried, excavated and separated from the rock fragments. In Phase II, the impacted soil was transported offsite for incineration. Verification sampling was conducted to ensure that the affected soil above cleanup goals had been removed. The excavated areas were backfilled with clean materials, covered with a topsoil cap, and the entire site was seeded. Perimeter fencing is in place and is effective in preventing unauthorized entry or use of the site. The site is in good condition and is inspected and maintained on a regular basis.

Ground water Remediation

The remedy that was implemented for the ground water is protective of human health and the environment. The Site is located in an area of karst geology that is characterized by subsurface fractures and channels hydraulically connecting the site to New Cricket Spring. Although the main source area (contaminated soil) no longer exists, the ground water continues to be impacted by residual contaminants in the subsurface fractures and channels.

Ground water monitoring data confirm that the treatment system is removing contaminants from the water effectively. An ozone injection pilot study was initiated in December 2005 and operated through August 2009 to evaluate the potential for accelerating reduction of residual PCP in the subsurface between the site and New Cricket Spring. The system, followed by continued injection of non-ozonated water, has successfully reduced the average PCP concentration at New Cricket Spring to a level slightly exceeding the Arkansas Department of Environmental Quality (ADEQ) cleanup goal. The ground water contaminants will continue to attenuate naturally over time.

Five Year Review Summary Form

SITE IDENTIFICATION			
Site Name: Arkwood, Inc. Site			
EPA ID: ARD084930148			
Region: 6	**State:** Arkansas	**City/County:** Omaha/Boone County	
SITE STATUS			
NPL Status	⊗ Final	○ Deleted	○ Other (specify)
Remediation Status(choose all that apply)	○ Under Construction	⊗ Operating	⊗ Complete
Multiple OUs?	○YES	⊗ NO	**Construction Completion Date:** 12/13/95
Has site been put into reuse?	○ YES	⊗ NO	
REVIEW STATUS			
Reviewing Agency:	⊗ EPA	○ State	○ Tribe ○ Other Federal Agency_____
Author Name: Shawn Ghose M.S., P.E. , ASME			
Author Title: Remedial Project Mgr	**Author Affiliation: USEPA**		
Review Period: 3/06 to 3/11			
Date(s) of site inspection: by USEPA and ADEQ personnel			
Type of Review:	⊗ Statutory ○ Policy	⊗ Post-Sara ○ Pre-Sara ○ NPL-Removal only ○ Non-NPL Remedial Action Site ○ NPL State/Tribe-lead ○ Regional Discretion	
Review number	○1(first)	○2(second)	⊗ 3 (third) ○ Other (specify)_____
Triggering Action: ○ Actual RA Onsite Construction ○ Construction Completion ○ Other (specify _____		○ Actual RA Start at OU #_____ ⊗ Previous Five-Year Review Report	
Triggering action date: 3/31/2006			
Due date (five years after triggering action date): 3/31/2011			

Five Year Review Summary form

Deficiencies

The following deficiency was identified:

- The property owner recorded a deed notice in August 2010. However, the Deed Restriction requires minor corrections in the description of the metes and bounds. In addition, a notice that the site is zoned for industrial use only must be added to the Deed Restriction.

Recommendations and Follow-up Actions

The following action is required to correct the deficiencies and ensure that protectiveness is maintained:

- Correction to metes and bounds description and the restriction to industrial use only on the Deed Restriction within twelve months.

Protectiveness Statements:

The remedial actions for the soil and ground water are protective of human health and the environment. Since both media remedies are protective, the remedy for the Site is protective of human health and the environment.

Other Comments:

The Site is in good condition and is inspected and maintained on a regular basis. No changes in land use are planned and the perimeter fence has been effective in preventing unauthorized access to the Site.

Arkwood, Inc. Site
Third Five-Year Review Report

I. Introduction

EPA Region 6 has conducted a third Five-Year Review of the remedial actions implemented at the Arkwood, Inc., site located in Omaha, Boone County, Arkansas. This review was conducted from December 2010 through February 2011, in accordance with the Comprehensive Five-Year Review Guidance, EPA 540-R-01-007, dated June 2001. This report documents the results of this review. The purpose of a Five-Year Review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of these reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify deficiencies found during the review, if any, and identify recommendations to address them.

This review is required by statute. EPA must implement Five-Year Reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA §121(c), as amended, which states:

> "If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented."

NCP Section 300.430(f)(4)(ii), 40 CFR § 300.430(f)(4)(ii) states:

> "If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action."

This is the third Five-Year Review for the Arkwood, Inc., site. The triggering action for this review was the second Five-Year Review report completed in March 2006. Because site soil was remediated to industrial levels, which are above levels that allow for unrestricted use and unlimited exposure, and residual contaminants remain in the karst geology features of fractures and channels beneath the Site resulting in ongoing treatment of ground water at New Cricket Spring, Five-Year Reviews are required.

II. Site Chronology

Table 1: Chronology of Site Events

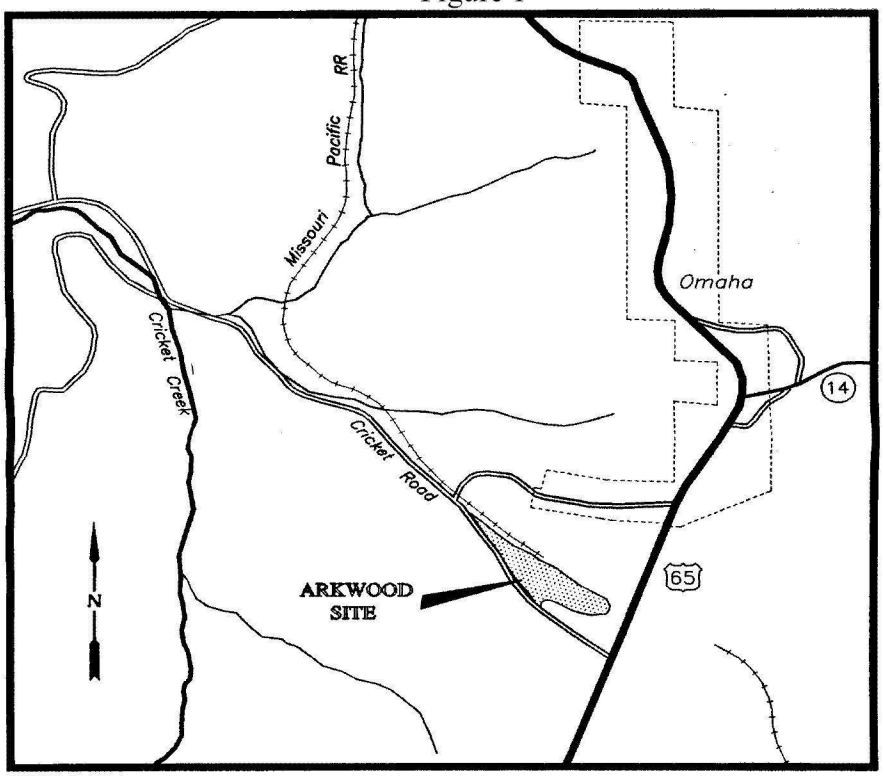
Date	Event
1962	Arkwood, Inc. commences wood-treating operations.
1973	Mass Merchandisers, Inc. (MMI) takes over operation of the plant under a lease agreement with the owner.
1981	Arkansas Department of Pollution Control and Ecology (ADPCE) receives a complaint about potentially affected water in the railroad tunnel.
1981 – 1985	Preliminary investigations by ADPCE indicate detectable levels of pentachlorophenol (PCP) in the area immediately surrounding the Site.
6/84	Plant operation ceases.
9/04/85	U.S. Environmental Protection Agency (EPA) proposes adding the Site to the National Priorities List (NPL).
5/15/86	EPA and MMI enter into an Administrative Order on Consent (AOC) for performance of a Remedial Investigation/Feasibility Study (RI/FS).
3/31/89	The Site is added to the NPL.
5/90	The RI/FS is completed by MMI.
9/28/90	EPA issues a Record of Decision (ROD) for the Site.
5/30/91	Execution of a Consent Decree (CD)
9/24/92	Entry of a corrected Consent Decree (CD) between EPA and MMI for Site remediation.
9/92	EPA approves a Remedial Design Work Plan (RDWP) for the Site.
11/16/93	A Preliminary Engineering Report (PER) is approved for the Site.
2/94	Remedial Action activities commence.
6/14/95	An Explanation of Significant Differences (ESD) is executed changing treatment of the affected soils to incineration at an offsite facility.
12/13/95	Remedial Action is complete.
5/97	An ozone pilot treatment system is installed at the Site.
11/97 – 1/98	The treatment system is upgraded with an ozone diffuser and baffles.
10/99 – 12/99	A new higher capacity ozone treatment system is installed.
12/05 – 8/09	An ozone injection pilot system is operated.
8/09 - present	Non-ozonated ground water is injected continually near sinkhole.

III. Background

A. Location

The Arkwood, Inc., site is located in Omaha, Section 27, T.21N. and R.21W., Boone County, Arkansas. The site is approximately one-half mile southwest of Omaha, Arkansas, and lies to the west of the old U.S. Highway 65 (see Figure 1 below). The site is a 30-acre parcel that slopes gently toward the northwest. It is located in a valley on Cricket Creek Road, bounded by ridges covered with native trees. The site is generally sparsely vegetated and covered with gravel and rocks mixed with native, clayey soils. Near-surface soils were contaminated by the former wood-treating operations that used creosote and pentachlorophenol (PCP) in the processes. The site is in an area of karst geology that is characterized by subsurface fractures and channels. New Cricket Spring, located down valley immediately west of the site, was contaminated by the former site activities.

Figure 1



GENERAL AREA MAP

The area immediately to the north is a steeply-sloped wooded hillside. The outskirts of the Omaha, Arkansas, community starts approximately one-half mile to the north of the Site. Old Highway 65 lies to the east of the Site with woods beyond the highway. To the south is Cricket Creek Road. On the other side of Cricket Creek Road is a track of undeveloped woods. Storm water and runoff from this area flow onto the site. East of the site are scattered residences; the closest being approximately one-half mile from the site.

B. History

The site was developed in the 1950's when a railroad company excavated about 40 to 50 feet below natural grade to obtain fill dirt for constructing a railroad embankment. Arkwood, Inc. began wood treating operations at the Site in 1962. The operations consisted of a millwork shop, a wood-treating plant that used creosote and PCP in its process, and a yard for storing treated wood products prior to sale. Wood-treating operations involved bringing untreated timber posts and poles to the Site, and placing the wood materials into a treatment cylinder where the chemical preservatives were introduced under pressure.

In 1973, the site owner leased the wood-treating facility to Mass Merchandisers, Inc. (MMI). MMI continued to operate the Arkwood plant until June 1984. Subsequently, the remaining inventory was sold or removed from the site. In January 1985, MMI's lease expired and was not renewed. The owner dismantled the plant in 1986.

During its 20-plus years of operation, wastes from plant operations were disposed of onsite. From 1962 through 1970, wastes were reportedly dumped into a sinkhole adjacent to the treatment plant. The sinkhole was subsequently sealed and the wastes were placed in a ditch adjacent to the railroad until approximately 1974 when MMI began using a chemical recovery process. Other wastes included liquids used to wash the treatment plant floor and equipment. Such waste liquids were accumulated in a tank and then spread over the wood storage yard to control dust.

The Arkansas Department of Pollution Control and Ecology (ADPCE) received a complaint about the Site in 1981. Preliminary investigations revealed detectable levels of PCP in area ground water. In 1985, EPA proposed the Site for inclusion on the National Priorities List (NPL). The Site was formally added to the NPL on March 31, 1989.

With EPA oversight, MMI conducted a Remedial Investigation and Feasibility Study (RI/FS) to determine the nature and extent of contamination and to investigate possible remedies for the Site. The RI/FS was conducted between 1987 and 1990 pursuant to an Administrative Order on Consent (AOC). The Regional Administrator for EPA Region 6 approved the Record of Decision (ROD) for the site on September 28, 1990.

The 1990 ROD documented that the principle threat from the Site was direct contact with soils contaminated above health-based levels. In addition, the 1990 ROD stated that these soils posed a long-term threat to groundwater. Site soils were contaminated with PCP, polynuclear aromatic hydrocarbons (PAHs), and dioxin. Contaminated materials were defined as all site materials that contain greater than 300 milligrams per kilogram (mg/kg) PCP, greater than 20 micrograms per kilogram (µg/kg) dioxin as 2,3,7,8-TCDD equivalents, or greater than 6.0 mg/kg carcinogenic polynuclear aromatic hydrocarbons (c-PAHs) as benzo-a-pyrene equivalents. New Cricket Spring contained concentrations of PCP above the Arkansas Water Quality Standard.

In April 1991, a Consent Decree (CD) was entered between the United States of America, on behalf of the EPA (United States) and MMI to remediate the Site. The CD includes the ROD and a Statement of Work (SOW) as Appendices A and B, respectively, (collectively the Consent Decree). A corrected CD was entered on September 23, 1992, including the same attachments.

In September 1992, EPA approved the Remedial Design Work Plan (RDWP) for the Site. The RDWP provides a definition of the pre-design studies, design elements, review schedules, and deliverables to EPA for MMI to implement the CD. Pursuant to the RDWP, MMI prepared a Preliminary Engineering Report (PER), dated May 21, 1993. This PER, presented the results of certain redesign studies and certain design criteria. Based on evaluation of the results of the pre-design studies documented in the PER and in the subsequent Report on Additional Field Scale Pilot Studies (dated July 23, 1993), MMI proposed a phased approach for the soil remedy.

EPA agreed to the phased approach on November 16, 1993. Phase I of the soil project for the site consisted of the pretreatment and storage stage of the remedy specified in the ROD and CD. This phase also included backfilling activities that were necessary to minimize adverse environmental impacts prior to implementation of Phase II. MMI prepared an Interim Remedial Action Design (IRAD) and Preliminary Remedial Action Plan (PRAP) to describe the Phase I remedial activities. The EPA conditionally approved both the IRAD and PRAP on June 29, 1994. Preparation of the site for Phase I activities began in February 1994 and was completed in July 1994. Phase I remediation began on August 1, 1994, and was suspended due to weather on October 14, 1994. Work performed during this period included excavation of affected soil, pretreatment of this soil, and storage of the pretreated soil for final treatment. Phase I activities performed during 1994 are documented in the Preliminary Interim Remedial Action Statement of Completion Report submitted to EPA in February 1995. Phase I remediation resumed in May 1995 and was completed by mid-August 1995.

Phase II of the project was the Final Remedial Action for the Site and consisted of off-site incineration of affected materials and Site closure, excluding ground water issues. The ROD and CD specified onsite incineration for the remedy for affected materials at the Site. However, due to changes in conditions since entry of the ROD and CD, MMI and EPA agreed that off-site incineration was a more appropriate remedy. To document the change in the final remedy, EPA prepared an Explanation of Significant Difference (ESD) that was signed by the Regional Administrator on June 14, 1995. The soil remediation project was completed December 13, 1995.

Although none of the domestic or municipal wells sampled during the study contained confirmed evidence of wood-treatment compounds, an extension to the Omaha municipal water line was constructed in 1991 to provide city water to designated residences down gradient from the site as a safeguard. As set forth in the CD and based on the results of a dye tracing study, the springs were sampled quarterly for four years after the soil remediation was completed. In addition, an ozone pilot system was installed in April 1997. Based on the results of the pilot study, the treatment system was upgraded in 1997 and a new, higher capacity system was installed in 1999. A second ozone injection pilot study was conducted from December 2005 through August 2009 with the goal of accelerating the reduction of residual PCP in the subsurface between the site and New Cricket Spring. Non-ozonated water continues to be injected in the vicinity of the sinkhole as a means of continued flushing and to facilitate efficient operation of the treatment system at New Cricket Spring.

IV. Remedial Actions

A. Remedy Selection

Soil Remedy

The EPA Regional Administrator for Region 6 signed the Record of Decision (ROD) on September 28, 1990. The ROD stated that all site soil containing greater than 300 mg/kg PCP, greater than 20 µg/kg dioxin as 2,3,7,8 TCDD equivalents, or greater than 6.0 mg/kg carcinogenic polynuclear aromatic hydrocarbons as benzo(a)pyrene equivalents were to be incinerated onsite. However, final treatment of the contaminated material was changed to incineration at an offsite facility.

Ground water Remedy

As part of the ground water remedy, treatment at New Cricket Spring was required if, after two years following completion of the soil remedy, the water quality at the spring did not meet Arkansas Water Quality Standards. Since the spring continued to exceed standards after the two-year period, installation of a water treatment system was initiated.

The EPA determined that this remedy was protective of human health and the environment, attained federal and state requirements that are applicable or relevant and appropriate, was cost-effective compared to equally environmentally protective alternatives, and utilized permanent solutions and alternative treatment technologies to the maximum extent practicable.

B. Remedy Implementation

Mass Merchandisers, Inc. (MMI) managed the remedial activities. Roy F. Weston, Inc., provided oversight for the EPA during the implementation of the soil remediation. The remedial actions were completed in phases.

a. Soil Remediation

Near-surface soils were contaminated by the former use of creosote and PCP in the treatment processes. The 1990 ROD specified that all contaminated sludge and soil would be excavated, pre-treated onsite, and then incinerated onsite. Contaminated soils were defined as those soils containing contaminants greater than the following clean up goals: 300 mg/kg PCP, 6.0 mg/kg benzo-(a)-pyrene equivalents (c-PNAs), and 20 µg/kg tetracholorodibenzo-p-dioxin equivalents. The pretreatment step was anticipated to produce a coarse material fraction separate from the fine, affected soils. The 1990 ROD provided that the coarse material be tested and, if clean up goals were met, the material could be backfilled onsite. The 1990 ROD stipulated that coarse materials not meeting the clean up goals would be incinerated along with the fines.

Based upon information generated in the RI/FS, the 1990 ROD estimated the volume of contaminated soils to be about 20,000 cubic yards to an approximate depth of one to two feet on the main area of the site, and a depth of four to five feet in the railroad ditch area. The ROD estimated the volume of sludge in the railroad ditch area and material in the sinkhole totaled 425 cubic yards.

In order to optimize the design as well as the implementation of the soils remedy, the Remedial Design (RD) and Remedial Action (RA) activities outlined in the CD were completed in two phases. The CD Statement of Work (SOW) outlined the initial consideration of a phased approach, to be determined during the preliminary design (SOW, Section II (A)(21), p. 17). EPA approved a phased approach and detailed the split of remedial activities for each of 2 phases in correspondence with MMI dated November 16, 1993. EPA issued a fact sheet to describe the approved phased approach on May 6, 1994.

The phased approach allowed remedial activities to be started one year ahead of the original RD/RA schedule provided in the CD. Implementation of the phased RD/RA project also provided information which helped determine that the volume of affected fines was much less than that estimated in the ROD (3,500 cubic yards as compared to 7,000 cubic yards), prior to the completion of the remedial design for Phase II. This information was used to plan and complete an Explanation of Significant Differences (ESD) on June 14, 1995, which changed one aspect of the soil remedy. Rather than constructing an onsite incinerator, the small volume of fine material (and other affected debris) was shipped off-site for incineration and disposal.

The ESD provided resource savings for EPA and the PRP by completing the soils remedy two years ahead of the CD schedule and also eliminated the concerns about constructing an incinerator in close proximity to the Omaha school.

The Phase I RD/RA included excavation, pretreatment, and temporary storage of contaminated soil onsite. The Phase I RA was initiated in Spring 1994 and was completed in Summer 1995. The Phase II RD/RA included off-site incineration and site closure activities. The Phase II RA was initiated upon completion of Phase I and all soil remedial activities were completed on December 13, 1995. A total of approximately 8,700 cubic yards of soil was excavated and pretreated resulting in approximately 5,200 cubic yards of clean coarse material and 3,500 cubic yards of affected fine soil. The affected soil was transported offsite and incinerated.

b. Site Closure Activities

As a part of Site closure activities, MMI performed the following activities:

- Constructed a perimeter fence along the north boundary of the Site (the rest of the Site was fenced previously);
- Backfilled and regraded the remediated areas. An additional 600 cubic yards of topsoil was brought to the Site. Approximately 11,600 cubic yards of topsoil was used during the Site preparation period;
- Seeded the Site with a variety of grasses; and
- Completed a complete survey of the Site.

EPA, ADPCE, and MMI performed a final inspection on December 13, 1995. Site maintenance activities included inspecting the Site regularly to assess the condition of the vegetative cover, storm water ditches and perimeter fencing.

c. Ground water Remediation

A major conclusion from the Arkwood Remedial Investigation Report (April 4, 1990) concerning ground water was:

> "It was determined that the site is underlain by a shallow, unconfined karst aquifer within the St. Joe Formation. Water movement appears to be dominated by conduit flow through fractures and other features that have been widened and enlarged by solution activity. A diffuse flow component of the aquifer appears to transport water from zones of storage within the deeper residuum clays and subcutaneous zone to the larger conduit network. The apparent lack of a well-defined water table complicates the determination of aquifer characteristics such as flow direction, gradient and velocity. The presence of shallow ground water is intermittent and depends on the precipitation. During periods of heavy rain, the subsurface fractures are saturated. The affected ground water emerging from New Cricket Spring provides evidence to indicate that this spring is hydraulically downgradient of the Arkwood site and that it is formed by the only major conduit to which affected ground water has been shown to be converging. Pentachlorophenol (PCP) levels detected in New Cricket Spring have been found to range from 1.0 to 2.3 mg/l."

The 1990 ROD specified that New Cricket Spring would be monitored for two years following completion of the soil remedy. If the concentration of PCP did not meet the Arkansas Water Quality Standard via natural attenuation at the end of the two year monitoring period, treatment of the spring would be required.

During the intervening two years, the PCP concentrations at New Cricket Spring dropped significantly. However, since the levels remained above Arkansas Water Quality Standards, a pilot treatment system was installed in April 1997. The system was upgraded in late 1997 by the installation of an ozone diffuser and a stainless steel baffle system. In Fall 1999, a new, higher capacity treatment system was installed. An ozone injection pilot study was operated from December 2005 through August 2009 with a goal of accelerating the reduction of residual PCP in the subsurface between the Site and New Cricket Spring. From August 2009 to the present, non-ozonated water continues to be injected in the vicinity of the sinkhole as a means of flushing the ground water and facilitating the efficient operation of the treatment system at New Cricket Spring.

<u>Sampling of Springs</u>

Based on the dye tracing studies, four springs were identified for monitoring: New Cricket Spring, Walnut Creek Spring, Cricket Creek Spring, and Railroad Tunnel Spring. As shown in Table 2 below, these springs were sampled quarterly from 1996 through 1999 except during periods of insufficient flow. In 2000, spring sampling was reduced to only New Cricket Spring, since this is the only spring that continued to be contaminated with PCP. Monthly sampling was initiated in May 2000. Three samples are collected monthly at the site: one from the mouth of the spring, one from the weir, and a duplicate sample generally from the weir. The third sample is used by the laboratory to run their QA/QC analyses. Six surrogate compounds are evaluated for recovery as presented in the analytical reports attached to the monthly reports. Data from the sampling is shown in Table 2 and Figure 2.

Table 2
Spring Samples 1996 – 2010

Date	New Cricket Spring Flow GPM	Average GPM	New Cricket Spring PCP	Average PCP (ppb)
7/2/1996	112		688	
10/11/1996	2		651	
		57		**670**
1/20/1997	34		681	
3/16/1997	34		330	
7/18/1997	2		775	
9/30/1997	50		560	
		30		**586**
1/20/1998	42		561	
5/7/1998	65		196	
7/23/1998	3		561	
11/4/1998	8		570	
		30		**472**
1/29/1999	60		288	
7/12/1999	42		ND	
		51		**288**
3/8/2000	5		284	
5/15/2000	2		272	
6/23/2000	75		389	
7/28/2000	3		627	
8/20/2000	2		424	
9/25/2000	1		577	
10/26/2000	1		114	
11/27/2000	25		632	
		14		**415**
2/26/2001	3		338	
3/13/2001	3		376	
4/27/2001	3		349	
5/27/2001	2		388	
7/27/2001	48		560	
8/27/2001	6		372	
9/27/2001	2		895	
10/22/2001	6		275	
11/30/2001	28		441	
12/22/2001	60		114	
		16		**411**
1/28/2002	12		373	
2/21/2002	15		372	
3/8/2002	22		318	
3/22/2002	42		226	
4/22/2002	22		79	

5/28/2002	70		71	
6/26/2002	17		259	
8/2/2002	17		231	
8/27/2002	12		178	
9/25/2002	10		95	
10/28/2002	8		461	
12/7/2002	2		398	
12/29/2002	35		218	
		21		**255**
2/3/2003	7		340	
3/7/2003	35		228	
4/8/2003	12		274	
6/4/2003	42		147	
7/7/2003	9		220	
8/7/2003	10		221	
8/28/2003	6		71	
9/29/2003	2		534	
10/28/2003	24		200	
12/10/2003	21		150	
		18		**237**
1/3/2004	26		139	
2/3/2004	29		144	
3/3/2004	28		84	
4/3/2004	30		85	
5/5/2004	65		115	
5/15/2004	20		102	
6/9/2004	12		300	
6/30/2004	30		222	
8/9/2004	6		84	
9/3/2004			43	
				132
		27		
10/4/2004	12			
11/3/2004	94		155	
11/14/2004	26		75	
11/22/2004	28		75	
12/1/2004	35		72	
12/21/2004	9		253	
				134
		34		
1/3/2005	10		279	
2/3/2005	12		155	
3/1/2005	34		208	
4/4/2005	9		148	
4/25/2005	6		121	
5/3/2005	9		150	
6/2/2005	3		151	
6/20/2005	2		55	
7/13/2005	2		95	

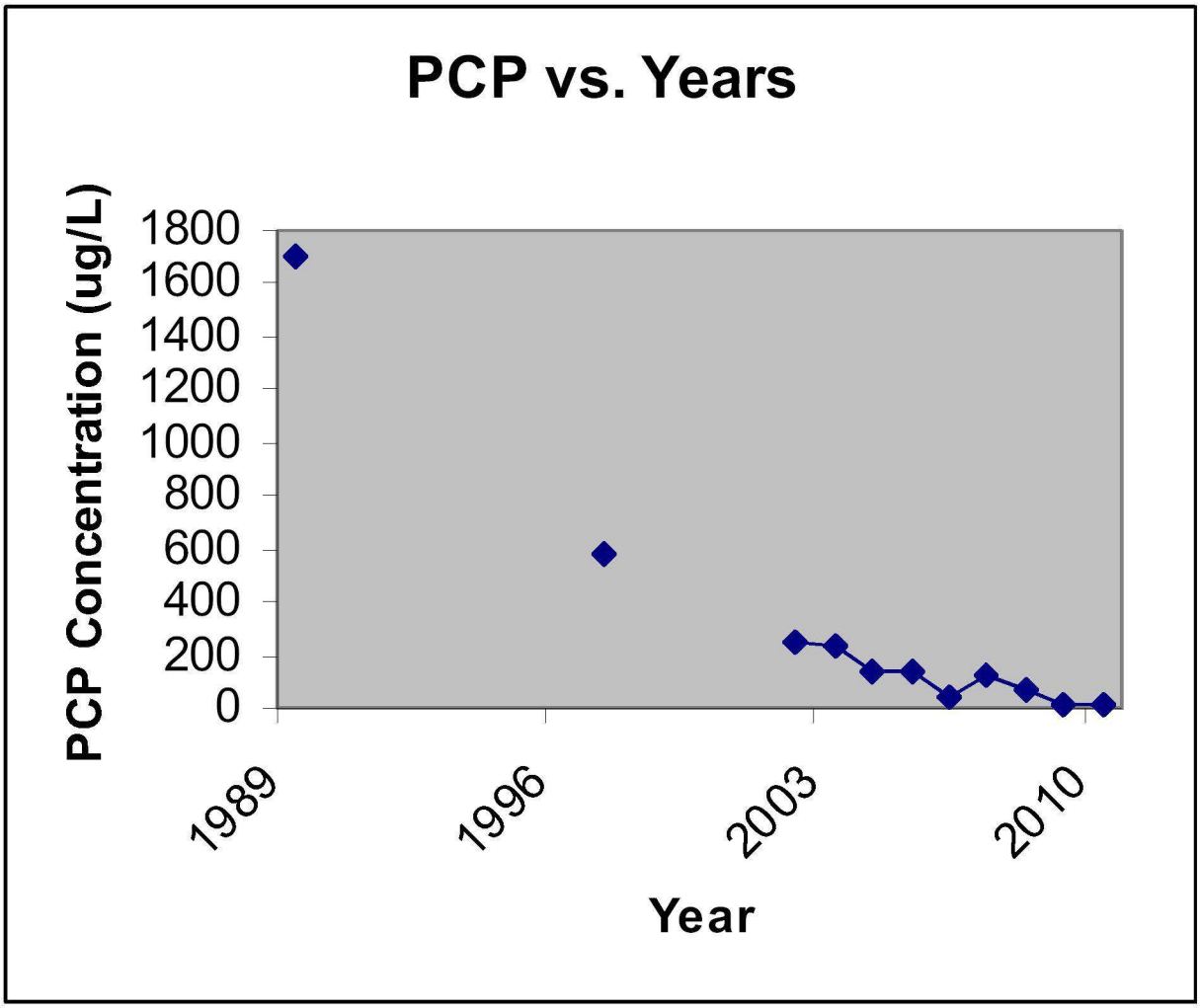
8/3/2005	12		85	
10/3/2005	27		63	
11/3/2005	6		278	
11/14/2005	6		15	
11/28/2005	8		47	
12/20/2005	27		7	
12/26/2005	27		11	
11/28/2005	8		47	
		10		**132**

1/2/2006	21		42
1/9/2006	20		32
1/16/2006	28		32
1/23/2006	33		16
1/30/2006	41		34
2/6/2006	38		<5.10
2/13/2006	34		24
2/20/2006	21		6
2/27/2006	26		20
3/6/2006	16		25
3/13/2006	57		107
3/20/2006	48		26
3/27/2006	27		4.09J
4/3/2006	24		11
4/10/2006	16		39
4/17/2006	22		8
4/24/2006	16		7
4/27/2006	50		11
4/29/2006	193		28
5/1/2006	94		23
5/8/2006	59		52
5/15/2006	22		15
5/22/2006	16		<5.00
5/30/2006	17		6
6/7/2006	3		253
6/12/2006	2		LE
6/19/2006	17		52
6/26/2006	17		75
7/5/2006	22		10
7/17/2006	17		22
8/7/2006	17		24
8/14/2006	17		<5.00
9/5-6/2006	23		7
9/18/2006	24		6
10/2/2006	24		17
10/16/2006	41		40
10/16/2006	81		92
10/18/2006	27		118
11/7/2006	41		53

11/20/2006	24		57	
11/30/2006	636		<50.0	
12/4/2006	59		<54.3	
12/6/2006	37		<52.6	
12/18/2006	21		24	
		47		**39**
1/8/2007	21		17	
1/22/2007	79		35	
2/5/2007	27		26	
2/19/2007	47		20	
3/5/2007	27		<5.00	
3/19/2007	25		NA	
4/9/2007	23		<5.00	
4/23/2007	30		7	
5/7/2007	21		2.90J	
5/21/2007	20		4.36J	
6/4/2007	20		<5.00	
6/18/2007	21		10	
7/9/2007	20		15	
7/23/2007	18		9	
8/6/2007	1		191	
9/10/2007	23		217	
9/24/2007	18		16	
10/10/2007	18		6	
10/22/2007	18		1190	
11/5/2007	18		209	
11/19/2007	18		20	
12/3/2007	18		20	
12/17/2007	32		87	
		24		**123**
1/7/2008	23		<5.00	
1/21/2008	23		58	
2/4/2008	24		52	
2/18/2008	83		57	
3/3/2008	580		<5.00	
3/17/2008	44		11	
4/7/2008	78		10	
4/12/2008	240		7	
4/13/2008	100		7	
4/14/2008	78		8	
5/10/2008	68		75	
5/27/2008	18		189	
6/9/2008	30		77	
6/23/2008	580		6	
7/7/2008	80		194	
7/10/2008	140		254	

7/21/2008	42		477	
8/4/2008	22		108	
8/18/2008	36		31	
9/1/2008	25		32	
9/22/2008	40		22	
10/6/2008	21		20	
10/20/2008	21		13	
11/3/2008	24		<5.00	
11/17/2008	30		28	
12/1/2008	24		12	
12/22/2008	24		<5.00	
		93		**76**
1/5/2009	32		7	
1/26/2009	27		<5.00	
2/9/2009	90		<5.00	
2/23/2009	31		6	
3/9/2009	30		6	
3/23/2009	30		<5.00	
4/6/2009	38		6	
4/20/2009	243		9	
5/4/2009	343		8	
5/18/2009	51		6	
6/8/2009	38		<5.00	
6/29/2008	25		9	
7/20/2009	47		39	
8/10/2009	24		31	
9/13/2009	22		8	
10/12/2009	104		21	
11/9/2009	45		<50	
12/7/2009	28		8	
		69		**13**
1/10/2010	42		13	
2/15/2010	87		11	
3/15/2010	35		<5.00	
4/15/2010	40		10	
5/17/2010	180		11	
6/13/2010	43		15	
7/8/2010	33		66	
8/19/2010	17		16	
9/21/2010	33		28	
10/18/2010	20		15	
11/20/2010	21		5	
12/16/2010	24		6	
		48		**18**

Figure 2a
New Cricket Spring
PCP Concentrations
1989-2010



PCP vs. Years

1989/1990≅1700	2006≅39
1996/1998≅581	2007≅123
2002≅255	2008≅76
2003≅237	2009≅13
2004≅134	2010≅18
2005≅132	

Figure 2b
New Cricket Spring
PCP Concentrations – Semi-Log
1989-2010

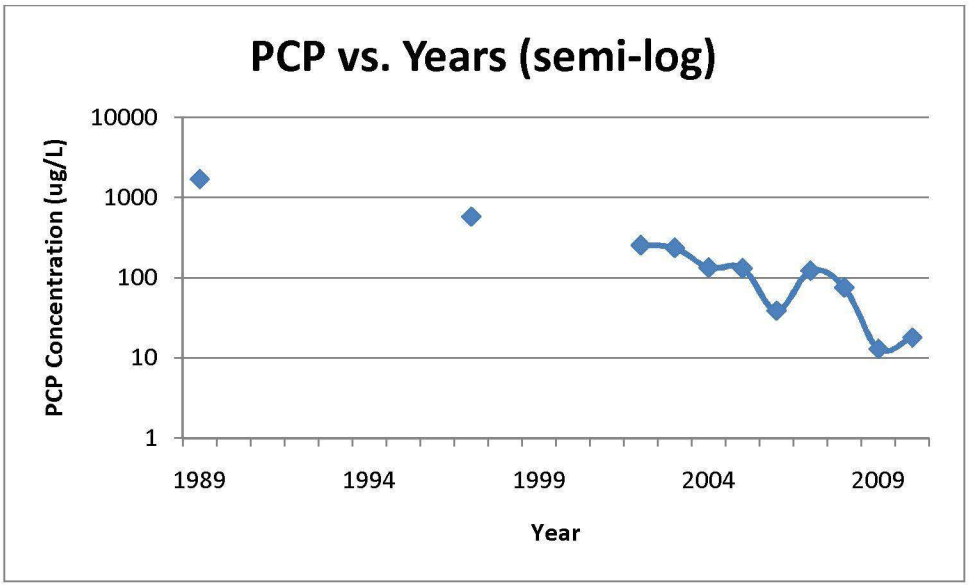


Table 3
New Cricket Spring

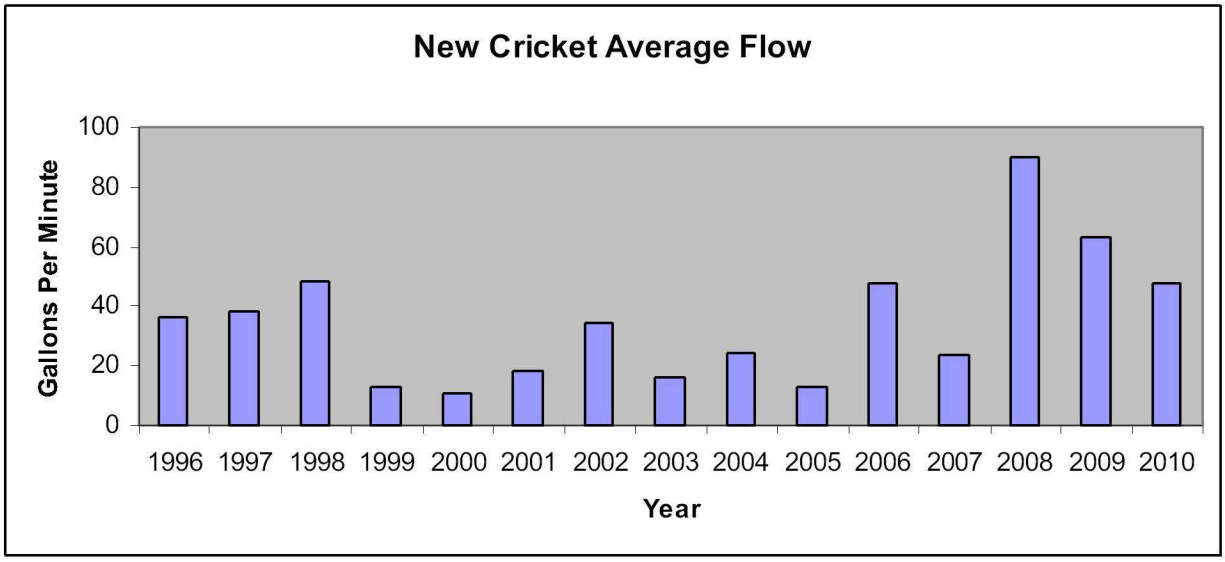
Average Flow Rates **1996 – 2010**

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
JAN		29	179	3	10	7	16	26	24	16	27	50	23	30	42
FEB		104	76	2	3	50	16	19	30	28	30	37	54	61	87
MAR		115	127	8	2	14	63	24	27	22	37	26	312	30	35
APR		42	36	5	8	5	70	15	22	12	54	27	124	141	40
MAY	15	18	40	8	5	5	59	22	23	9	41	21	43	197	180
JUN	6	21	9	84	8	5	95	20	16	2	10	21	305	32	43
JUL	12	12	9	6	84	17	18	12	21	6	19	19	87	47	33
AUG	7	12	20	6	1	8	8	5	17	7	17	1	29	24	17
SEP	50	16	12	5	1	6	8	2	12	13	24	21	33	22	33
OCT	12	13	20	9	1	10	8	10	32	23	43	18	21	104	20
NOV	127	30	12	6	2	9	27	22	50	8	234	18	27	45	21
DEC	58	41	33	13	4	74	23	17	12	25	39	25	24	28	24
AVG	36	38	48	13	11	18	34	16	24	13	48	24	90	63	48

New Cricket Spring Flow Dynamics

The volume of water flow at New Cricket Spring has been measured over the past fifteen years. Flows vary from less than 1/2 gallon per minute (gpm) to over 1,000 gpm.

Figure 3



Treatment System Operations

The ground water treatment system is an ozone oxidation system. Ground water from the spring is piped to a sump adjacent to the treatment building. The treatment system is composed of an ozone generator and a mass transfer system. The mass transfer system is designed for injection of the ozone into the water stream and to allow for contact between the ozone and water streams. The mass transfer system has the capability for recirculation to allow for variable flow from the spring. The affected water is processed through the treatment system and the treated water is discharged over a weir into the receiving stream. The results of operational data for 2005 – 2010 are presented in Table 4.

Table 4: Ozone Injection Pilot Study

Date	Variables		Spring	PCP	
	Water Inj	O3 Inj	Flow	Mouth	Weir
12/8/05			5		
12/9/05	35		5		
12/14/05	35	1lb/10 g	21	28	
12/15/05	35	1lb/10 g	30/27	29.3	
12/20/05	36	1lb/10 g	27	7.39	<5.10
12/26/05	36	1lb/10 g	27	11.4	11.1
1/2/06	36	1lb/10 g	21	42.4	35.1
1/9/06	36	1lb/10 g	20	32.4	33
1/16/06	36	1lb/10 g	27.5	32.3	<5.00
1/23/06	36	1lb/10 g	34/32	15.9	<5.00
1/30/06	36	1lb/10 g	41	34.3	<5.00
2/6/06	36	1lb/10 g	38	<5.10	<5.00
2/13/06	36	1lb/10 g	34	23.9	<5.00
2/20/06	36	1lb/10 g	21	5.53	4.19J
2/27/06	36	1lb/10 g	26	19.9	<5.00
3/6/06	34	1-2lb/10 g	16	25.1	<5.00
3/13/06	33	1-2lb/10 g	57	107	<5.00
3/20/06	32	1-2lb/10 g	48	26.2	<5.00
3/27/06	32	1-2lb/10 g	27	4.09J	<5.00
4/3/06	34	2-3lb/10 g	24	11.3	<5.00
4/10/06	33	2-3lb/10 g	16.4	39.3	<5.00
4/17/06	34	2-3lb/10 g	22	7.94	7.82
4/24/06	35	2-3lb/10 g	16	7.0	<5.00
4/27/06	33	2-3lb/10 g	50	11.3	NA
4/29/06	33	2-3lb/10 g	193	28.2	NA
5/1/06	33	2-3lb/10 g	94	23.4	7.16
5/8/06	33	2-3lb/10 g	59	52.3	23.3
5/15/06	34	2-3lb/10 g	21.7	14.9	<5.00
5/22/06	34	2-3lb/10 g	16	<5.00	<5.00
5/30/06	34	2-3lb/10 g	16.7	5.64	<5.00

6/7/06	0	0	3	253	<5.00
6/12/06	0	0	2.19	LE	LE
6/19/06	34	0	16.7	52.1	14.3
6/26/06	34	0	16.7	74.7	<5.00
7/5/06	35	0	21.7	9.8	<5.00
7/17/06	34	0	16.7	21.9	4.01J
8/7/06	34	0	16.7	23.6	18
8/14/06	34	0	16.7	<5.00	5.22
9/5-6/06	34	0	23	6.57	<5.10
9/18/06	34	0	24	6.29	<5.00
10/2/06	34	0	24	16.8	<5.00
10/16/06	34	2-3lb/10 g	41	39.6	2.22J
10/16/06	34	5-6lb/10g	81	92.3	19.4
10/18/06	34	5-6lb/10g	27	118	<5.00
11/7/06	35	2-4lb/10g	41	52.7	4.70J
11/20/06	35	2-4lb/10g	24	57.4	<5.00
11/30/06	35	5-6lb/10g	636	<50.0	<5.00
12/4/06	35	5-6lb/10g	59	<54.3	<5.00
12/6/06	35	5-6lb/10g	37	<52.6	<5.00
12/18/06	35	2-3lb/10 g	21	24.1	<5.00
1/8/07	35	2-3lb/10 g	21	16.7	<5.00
1/22/07	35	2-3lb/10 g	79	34.6	<5.00
2/5/07	35	2-3lb/10 g	27	25.9	<5.00
2/19/07	35	2-3lb/10 g	47	19.6	<5.00
3/5/07	35	2-3lb/10 g	27	<5.00	<5.00
3/19/07	35	2-3lb/10 g	25	NA	NA
4/9/07	35	2-3lb/10 g	23	<5.00	<5.00
4/23/07	35	2-3lb/10 g	30	7.27	<5.00
5/7/07	35	2-3lb/10 g	21	2.90J	<5.00
5/21/07	35	2-3lb/10 g	20	4.36J	<5.00
6/4/07	35	2-3lb/10 g	20	<5.00	<5.00
6/18/07	35	0	21	9.62	<5.00
7/9/07	35	0	20	15.0	<5.00
7/23/07	35	0	18	8.65	<5.00
8/6/07	0	0	1	191	9.19

9/10/07	35	0	23	217	26.4
9/24/07	35	0	18	16.2	19.4
10/10/07	35	2-3lb/10 g	18	5.63	1.15J
10/22/07	35	2-4lb/10g	18	1190	53.7
11/5/07	35	2-4lb/10g	18	209	7.93
11/19/07	35	2-4lb/10g	18	19.8	24.1
12/3/07	35	2-4lb/10g	18	20.1	<5.00
12/17/07	36	2-4lb/10g	32	87.4	1.20J
1/7/08	36	2-4lb/10g	23	<5.00	<5.00
1/21/08	36	2-4lb/10g	23	58	<5.00
2/4/08	36	2-4lb/10g	24	52	<5.00
2/18/08	35	2-4lb/10g	83	57	15
3/3/08	35	5-6lb/10g	580	<5.00	<5.00
3/17/08	35	5-6lb/10g	44	11	<5.00
4/7/08	35	5-6lb/10g	78	10	<5.00
4/12/08	35	5-6lb/10g	240	6.5	NA
4/13/08	35	5-6lb/10g	100	6.8	NA
4/14/08	35	5-6lb/10g	78	8.2	NA
5/10/08	36	5-6lb/10g	68	75	<5.00
5/27/08	0	0	18	189	<5.00
6/9/08	35	2-4lb/10g	30	77	<5.00
6/23/08	35	2-4lb/10g	580	5.6	<5.00
7/7/08	35	2-4lb/10g	80	194	189
7/10/08	35	5-6lb/10g	140	254	20
7/21/08	35	5-6lb/10g	42	477	<5.00
8/4/08	35	2-4lb/10g	22	108	14
8/18/08	35	2-4lb/10g	36	31	<5.00
9/1/08	35	2-4lb/10g	25	32	<5.00
9/22/08	35	2-4lb/10g	40	22	<5.00
10/6/08	35	2-4lb/10g	21	20	<5.00
10/20/08	33	2-4lb/10g	21	13	<5.00
11/3/08	35	2-4lb/10g	24	<5.00	<5.00
11/17/08	35	2-4lb/10g	30	28	<5.00
12/1/08	35	2-4lb/10g	24	12	<5.00
12/22/08	33	2-4lb/10g	24	<5.00	<5.00

1/5/09	35	2-4lb/10g	32	7.3	<5.00
1/26/09	32	2-4lb/10g	27	<5.00	<5.00
2/9/09	33	2-4lb/10g	90	<5.00	<5.00
2/23/09	33	2-4lb/10g	31	6	<5.00
3/9/09	34	2-4lb/10g	30	5.7	<5.00
3/23/09	33	2-4lb/10g	30	<5.00	<5.00
4/6/09	32	2-4lb/10g	38	5.8	<5.00
4/20/09	32	2-4lb/10g	243	8.5	<5.00
5/4/09	33	2-4lb/10g	343	8.2	8.7
5/18/09	33	2-4lb/10g	51	6.2	<5.00
6/8/09	35	2-4lb/10g	38	<5.00	<5.00
6/29/08	33	2-4lb/10g	25	9.1	<5.00
7/20/09	32	2-4lb/10g	47	39	<5.00
8/10/09	32	2-4lb/10g	23.7	31	<5.00
9/13/09	32	0	22	8	<5.00
10/12/09	32	0	104	21	<5.00
11/9/09	32	0	45	<50	<5.00
12/7/09	32	0	28	8.2	<5.00
1/10/10	32	0	42	13	<5.00
2/15/10	32	0	87	11.1	<5.00
3/15/10	32	0	35	<5.00	<5.00
4/15/10	32	0	40	9.62	<5.00
5/17/10	32	0	180	11	<5.00
6/13/10	32	0	43	15	<5.00
7/8/10	32	0	33	66	<2
8/19/10	0-20	0	17	16.3	<5.00
9/21/10	34	0	33	28.2	<5.00
10/18/10	37	0	20	14.9	<10.00
11/20/10	37	0	21	4.89	<4.00
12/16/10	37	0	24	6,15	<5.00

NOTES: Flow rates in gallons per minute (gpm)
O3 injection rates in pounds per 10 gallons
PCP concentrations in parts per billion (ppb)
NA - not analyzed
LE - Lab Error - samples not usable

V. Five-Year Review Process

Shawn Ghose, the EPA Remedial Project Manager for the site, led the Arkwood, Inc., site Five-Year Review.

This Five-Year Review consisted of interviews, reviewing the data against established cleanup criteria, and an inspection of the site.

VI. Five Year-Review Findings

A. Interviews

Ms. Jean Mescher, Arkwood Project Coordinator and Director of Environmental Services at McKesson Corporation (former owners of MMI), was contacted as part of the third Five-Year Review. Ms. Mescher stated that the vegetative cover at the site is healthy. The site is inspected every week. The ground water treatment system located at the mouth of New Cricket Spring is operating well and is successfully meeting the established treatment goals. Ms. Mescher stated that there have been no complaints or inquiries concerning the site with the exception of an unauthorized temporary boat parking,

On February 16, 2011, Mr. Ghose interviewed Mr. Robert Ritchie on the phone (408-227-9398). Mr. Ritchie's house is located down slope from the capped area going towards New Cricket Spring. Mr. Ritchey bought the property at 660 Old Cricket Road, Omaha, AR in 1997 shortly after the remedy for the capped area was completed. Mr Ritchie reported "a lot of activity" on the capped area. Mr. Richie also reported that the McKesson Corporation site manager "comes and maintains the site at least twice a month." Mr. Ritchie indicated that he receives water from the city, as do his neighbors located down slope from the site.

On April 21, 2011, Mr. Ghose spoke with Ms. Gina Dunn of the City of Omaha Mayor's office. Ms. Dunn was aware that McKesson was performing the O&M activities at the site. She explained that she drives by the site on Cricket Road and used to be able to see the site from the road. Ms. Dunn indicated that the site is not visible from Cricket Road because the trees have grown. Ms. Dunn said that she is not aware of any complaints from the Cricket Road neighborhood about the site.

On April 12, 2011 the EPA and ADEQ had a teleconference with Kurt Grisham, representative of Mr Bud Grisham, land owner of the Arkwood Superfund Site. Participants on the teleconference were Jean Mescher representing McKesson Corporation (RP) and Tim Kresse, a consultant from USGS for EPA. Main topic of discussion was the long process of ground water cleanup at New Cricket Spring. Kurt Grisham believes that the cleanup of the ground water is almost complete and questioned some of the monitoring results from McKesson. Kurt Grisham believes EPA should consider deleting the Arkwood Site from the National Priorities List (NPL).

B. Site Inspection

Representatives of USEPA, ADEQ, and McKesson Corporation conducted an inspection of the site on February 23, 2011. The inspection included an evaluation of the surface condition, vegetation, storm water drainage system, buildings, perimeter fence, and gates. The ground water treatment facilities onsite and at the mouth of New Cricket Spring were also inspected.

The site was found to be in good condition. There was no evidence of topsoil erosion or surface cracks and the vegetative cover is healthy. The storm water drainage ditches were free from debris and in working order. Fences and gates are maintained and provide an adequate means to restrict access. The perimeter road was in good condition and there was no evidence of unauthorized access to the site.

The onsite treatment building and associated equipment as well as the pump house and equipment at the mouth of New Cricket Spring were all in good condition. The equipment was well maintained and in good working order. Monthly operational samples are collected at the mouth of New Cricket Spring and at the effluent point (weir) following treatment with ozone.

C. Risk Information Review

The following standards were identified as Applicable or Relevant and Appropriate requirements (ARARs) in the Record of Decision. The standards were reviewed for changes that could affect the protectiveness of the remedy.

<u>Federal</u>

Resource Conservation and Recovery Act
Comprehensive Environmental Response, Compensation, and Liability Act
Superfund Amendments and Reauthorization Act

<u>State</u>

Arkansas Water Quality Standards

ADPCE Regulation 2 sets a water quality standard for PCP based on pH. Based on ADPCE Regulation 2 and as calculated by Masoud Arjmandi of ADPCE (now ADEQ) (see Attachment 1), the State Water Quality Standards for pentachlorophenol at the point of discharge are currently 9.3 µg/l and 18.7 µg/l for monthly averages and daily maximums, respectively.

The Arkwood, Inc. Site continues to be in compliance with the Federal and State ARARs. The remedial action involved excavation and transportation of affected soils to an offsite incinerator. Affected ground water is treated at New Cricket Spring to Arkansas Water Quality Standards.

EPA's dioxin reassessment has been developed and undergone review over many years with the participation of scientific experts in EPA and other federal agencies, as well as scientific experts in the private sector and academia. The results of the assessment have currently not been

finalized or adopted into state or federal standards. Therefore, the dioxin toxicity reassessment for this Site will be updated during the next Five Year Review.

D. Data Review

A review of records and monitoring reports through December 2010 indicates that the concentration of PCP emanating from New Cricket Spring has decreased significantly since the soil remediation was completed. It is anticipated that the PCP concentration will continue to attenuate over time. In the meantime, ground water discharges at New Cricket Spring are collected and treated to Arkansas Water Quality Standards.

VII. Assessment

The following conclusions support the determination that the implemented remedy at the Arkwood, Inc. Site is continuing to be protective of human health and the environment.

Question A: Is the remedy functioning as intended by the decision documents?

Institutional Controls and Other Measures: The property owner has filed a Deed Restriction which provides a notice of residual contamination and maintenance requirements remaining at the Site. The property owner will be revising the Deed Restriction to correct minor errors in the metes and bounds and to provide an additional notice that the Site is zoned for industrial use only. There are no changes or planned changes in land use. The ground water exiting New Cricket Spring is being treated until it meets the ADEQ water quality standard for PCP.

Remedial Action Performance: The soil remediation, including excavation and offsite incineration of the contaminated soil and capping of the remaining soil, has been effective in minimizing the potential for dermal contact with the site contaminants and has removed the source of ground water contamination. The ground water treatment system located at the mouth of New Cricket Spring is effective in reducing PCP concentrations to below ADEQ water quality standards.

Operations and Maintenance (O&M): Ground water treatment system operations are conducted by an environmental contractor, James E. Fleer, Principal Engineer, Oxford Environmental and Safety, Inc. The contractor is responsible for maintaining the ground water treatment system and collecting monthly operational samples, as well as inspecting the site fencing, vegetative cover, storm water drainage system and buildings.

Early Indicators of Potential Remedy Failure: There is no indication of remedy failure. The site is inspected on a regular basis and operation and maintenance activities of the ground water treatment system are monitored daily.

Question B: Are the assumptions used at the time of remedy selection still valid?

Changes in Standards To Be Considered: This Five-Year Review did not identify any changes in Federal or State standards that impact the soil or ground water remedies at the Arkwood, Inc. The site currently meets the State Water Quality Standards for PCP of 9.3 µg/l (monthly average) and 18.7 µg/l (daily maximum).

Changes in Exposure Pathways: This five-year review did not identify any changes in exposure pathways since the completion of the soil remediation. The filed Deed Restriction, when revised to correct the minor errors in the metes and bounds description and to provide notice that the Site is zoned for only industrial use, will be effective in preventing any current or planned changes in land use. Access to the remediated area is restricted because of fencing, signs and locked gates. There is no indication that the treated wastes were not properly characterized, removed and treated during the soil remediation. There is no indication that the ground water hydrology was not adequately characterized prior to the implementation of the ground water remedy.

Changes in Toxicity and Contaminant Characteristics: The cleanup levels for PCP, c-PNAs, and dioxin have not changed since the last Five-Year Review. EPA's dioxin reassessment has been developed and undergone review over many years with the participation of scientific experts in EPA and other federal agencies, as well as scientific experts in the private sector and academia. The Agency followed current cancer guidelines and incorporated the latest data and physiological/biochemical research into the assessment. The results of the assessment have currently not been finalized or adopted into State or Federal standards. In addition, EPA/OSWER has proposed to revise the interim preliminary remediation goals (PRGs) for dioxin and dioxin-like compounds based on technical assessment of scientific and environmental data. However, EPA has not made any final decisions on interim PRGs at this time. Therefore, the dioxin toxicity reassessment for this Site will be updated during the next Five Year Review. As long as the Site cap remains undisturbed, the Site is protective of human health and the environment and the remedy selection is still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has been identified that questions the protectiveness of the remedy.

VIII. Deficiencies

The property owner recorded a Deed Restriction notice in August 2010. The property owner has agreed to correct minor errors in the metes and bounds description in the restriction and to add a notice that the Site is zoned for industrial use only within 12 months of this review.

IX. Recommendations and Follow-up Actions

As noted above, the property owner has agreed to correct minor errors in the metes and bounds description in the restriction and to add a notice that the Site is zoned for industrial use only within 12 months of this review.

X. Protectiveness Statements

The remedies that were implemented for soil and ground water at the Arkwood, Inc. Site continue to be protective of human health and the environment. Since the remedies for soil and ground water are protective of human health and the environment, the remedy for the Site is protective of human health and the environment.

Soil Remedy

The remedy that was implemented for the affected soils is protective of human health and the environment. The excavation and offsite incineration of the affected soil has been effective in preventing exposure due to direct contact and fugitive dust and has improved ground water conditions by removing source material. The Deed Restriction provides notice of the residual contamination remaining on the Site. The property owner will revise the Deed Restriction to correct minor errors in the metes and bounds description and to provide notice that the Site is zoned for industrial use only The Deed Restriction will ensure that the remedy will remain protective and provide notice of Site conditions for future property owners. Perimeter fencing, locks and signs are in place and are effective in preventing unauthorized entry or use of the Site. The surface vegetation at the Site is in good condition and is inspected and maintained on a regular basis.

Ground water Remedy

The remedy that was implemented for the ground water is protective of human health and the environment. The ground water continues to be collected and treated to ADEQ water quality standards at the mouth of New Cricket Spring. Non-ozonated water continues to be injected in the vicinity of the sinkhole to flush the ground water and facilitate the efficient operation of the treatment system at New Cricket Spring. Also, since the affected soil at the Site has been removed, the ground water should continue to attenuate naturally over time

XI. Next Five-Year Review

The next five-year review will be conducted in 2016. The scope of the next review may be limited to an inspection of the Site to ascertain that the surface vegetation and topsoil cap continue to be in good condition and an inspection of the ground water treatment system to ensure that it is in good working order.

Attachment 1
Arkansas Water Quality Standards Calculations