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March 16, 2009

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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:

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

March 2009

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TABLE OF CONTENTS

Section ***Page***

1.0 INTRODUCTION 1
1.1 Background 1
1.1.1 Off-Property 1
1.1.2 On-Property 2
1.2 Purpose and Objectives 3

2.0 WATER LEVEL DATA 5

3.0 CHEMICAL CONCENTRATION DATA 7
3.1 Off-Property 7
3.1.1 Monitoring Results 7
3.1.2 Off-Property Groundwater *In Situ* Bioremediation Program 9
3.2 On-Property 9
3.2.1 Monitoring Results 9
3.2.1.1 TI Zone Plume 9
3.2.2 On-Property Groundwater *In Situ* Bioremediation Program 12
3.2.3 Product Recovery Well 13
3.3 Monitoring-Parameter Trends 13

4.0 ALTERNATIVE WATER SUPPLY PROGRAM 15

5.0 OPERATION OF THE GROUNDWATER TREATMENT SYSTEMS 16

6.0 CONCLUSIONS 17

7.0 REFERENCES 19

TABLES

Table 1. Groundwater Levels in Wells, First Quarter and Semiannual Sampling Rounds 2008
Table 2A. Off-Property Sampling Schedule, First Quarter Sampling Round 2008
Table 2B. Off-Property Sampling Schedule, Semiannual Sampling Round 2008
Table 3A. On-Property Sampling Schedule, First Quarter Sampling Round 2008
Table 3B. On-Property Sampling Schedule, Semiannual Sampling Round 2008
Table 4A. Off-Property Groundwater Field Parameters, First Quarter and Semiannual Sampling Rounds 2008
Table 4B. Off-Property Individual ROD Constituents, First Quarter and Semiannual Sampling Rounds 2008
Table 5A. On-Property Groundwater Field Parameters, First Quarter and Semiannual Sampling Rounds 2008
Table 5B. On-Property Individual ROD Constituents, First Quarter and Semiannual Sampling Rounds 2008
Table 6. On-Property Polynuclear Aromatic Hydrocarbon Compounds Based On EPA Method 8310 PQLs, First Quarter and Semiannual Sampling Rounds 2008
Table 7. Pentachlorophenol Concentrations and Groundwater Levels at Well 86
Table 8. Well PR-1 Production History
Table 9. Remedial Action Monitoring Parameter Trend Evaluation, Pentachlorophenol
Table 10. Remedial Action Monitoring Parameter Trend Evaluation, Polynuclear Aromatic Hydrocarbons
Table 11. Remedial Action Monitoring Parameter Trend Evaluation, Isopropyl Ether
Table 12. Remedial Action Monitoring Parameter Trend Evaluation, Benzene, Ethylbenzene, and Xylenes
Table 13. Remedial Action Monitoring Parameter Trend Evaluation, PCDDs/PCDFs
Table 14. Remedial Action Monitoring Parameter Trend Evaluation, Arsenic, Copper, Barium
Table 15. Remedial Action Monitoring Parameter Trend Evaluation, Chromium
Table 16. Remedial Action Monitoring Parameter Trend Evaluation, Boron
Table 17. Groundwater Sampling Summary, Semiannual 2008

FIGURES

Figure 1. Site Plan
Figure 2A. Off-Property Groundwater Contours, January 2008
Figure 2B. On-Property Groundwater Contours, January 2008
Figure 3A Off-Property Groundwater Contours, June 2008
Figure 3B. On-Property Groundwater Contours, June 2008
Figure 4A. Off-Property Pentachlorophenol Concentrations, First Quarter Monitoring 2008
Figure 4B. Off-Property Pentachlorophenol Concentrations, Semiannual Monitoring 2008
Figure 5A. Pentachlorophenol Trend - RI-2
Figure 5B. Pentachlorophenol Trend - RI-3
Figure 5C. Pentachlorophenol Trend - RI-10
Figure 6A. On-Property Boron Concentrations, First Quarter Monitoring 2008
Figure 6B. On-Property Boron Concentrations, Semiannual Monitoring 2008
Figure 7A. On-Property Pentachlorophenol Concentrations, First Quarter Monitoring 2008
Figure 7B. On-Property Pentachlorophenol Concentrations, Semiannual Monitoring 2008
Figure 8A. Pentachlorophenol Trend – MW-2
Figure 8B. Pentachlorophenol Trend – MW-3
Figure 8C. Pentachlorophenol Trend – MW-5
Figure 8D. Pentachlorophenol Trend – MW-7
Figure 8E. Pentachlorophenol Trend – MW-8
Figure 8F. Pentachlorophenol Trend – MW-16
Figure 8G. Pentachlorophenol Trend – TW-1
Figure 9. On-Property Treatment Plant

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).

EPA, 1992, Consent Decree between Beazer East, Inc., and the United States of America, EPA Region IX, San Francisco, California (February 7, 1992).

EPA, September 1999, Amendment #2 to the Record of Decision for the Soil and Ground Water Operable Unit, Koppers Company, Inc. Superfund Site, Oroville, California (September 23, 1999).

EPA, 2003a, Amendment to the Consent Decree between Beazer East, Inc. and the United States of America, EPA Region IX, San Francisco, California (September 22, 2003).

EPA, 2006, Letter to Beazer East, Inc., Subject: Addendum to the Off-property Groundwater *In Situ* Bioremediation Program, Koppers Company, Inc. Superfund Site (July 18, 2006).

Hydro-Search, Inc., November 1995, Revised Off-Property Groundwater Remedy Report, Koppers Company, Inc. Superfund Site, (Feather River Plant), Oroville, California.

Hydro-Search, Inc., and Dames & Moore, June 1994, Draft Off-Property Groundwater Remedy Report, Koppers Company, Inc. Superfund Site, (Feather River Plant), Oroville, California.

Simon Hydro-Search, March 1994, Draft Monitoring Well Evaluation Report, Koppers Company, Inc. Superfund Site (Feather River Plant), Oroville, California.