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June 21, 2011

Grantsburg Public Library
Attention: Judy
416 S Pine St
Grantsburg, Wisconsin 54840

Subject: Final 2010 Annual Report
Penta Wood Products Site, Siren, WI
WA No. 004-LRLR-05WE, Contract No. EP-S5-06-01

Dear Judy:

On behalf of the U.S. Environmental Protection Agency, please file the enclosed 2010 Annual Report for the Penta Wood Products Site in Siren, Wisconsin in your repository.

If you have any questions, please feel free to call me at 414-847-0561.

Sincerely,

CH2M HILL

Keli McKenna

Keli McKenna
Site Manager

Enclosure

c: Pat Vogtman, PO/USEPA Region 5 (w/o enclosure)
Thomas Harrison, CO/USEPA Region 5 (w/o enclosure)
Denise Boone, WAM/USEPA Region 5
Phil Richard/WDNR
Mike Niebauer, ASM/CH2M HILL, Milwaukee
Phil Smith, RTL/CH2M HILL, Milwaukee
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June 21, 2011

Ms. Patti Meyer
Burnett Community Library
P.O. Box 510
Webster, Wisconsin 54893

Subject: Final 2010 Annual Report
Penta Wood Products Site, Siren, WI
WA No. 004-LRLR-05WE, Contract No. EP-S5-06-01

Dear Ms. Meyer:

On behalf of the U.S. Environmental Protection Agency, please file the enclosed 2010 Annual Report for the Penta Wood Products Site in Siren, Wisconsin in your repository.

If you have any questions, please feel free to call me at 414-847-0561.

Sincerely,

CH2M HILL

Keli McKenna

Keli McKenna
Site Manager

Enclosure

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Thomas Harrison, CO/USEPA Region 5 (w/o enclosure)
Denise Boone, WAM/USEPA Region 5
Phil Richard/WDNR
Mike Niebauer, ASM/CH2M HILL, Milwaukee
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REGION 5 RAC2

REMEDIAL ACTION CONTRACT FOR

Remedial, Enforcement Oversight, and
Non-Time Critical Removal Activities at Sites of Release
or Threatened Release of Hazardous Substances in Region 5

2010 ANNUAL REPORT
LONG-TERM RESPONSE ACTION
Penta Wood Products Site
Town of Daniels, Wisconsin

WA No. 004-LRLR-05WE / Contract No. EP-S5-06-01

June 2011

PREPARED FOR

U.S. Environmental Protection Agency

PREPARED BY

CH2M HILL
Ecology and Environment, Inc.
Environmental Design International, Inc.
Teska Associates, Inc.

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2010 ANNUAL REPORT

PENTA WOOD PRODUCTS SITE
Town of Daniels, Wisconsin

Long-Term Response Action

WA No. 004-LRLR-05WE / Contract No. EP-S5-06-01

June 2011

Contents

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Tables

Figures

Abbreviations and Acronyms

BTEX	benzene, toluene, ethylbenzene, and xylene
CAMU	Corrective Action Management Unit
EMT	Environmental Monitoring Technologies
ES	Enforcement Standard
EW	extraction well
ft^3	cubic feet
g/cm^3	grams per cubic centimeter
gpm	gallons per minute
GW	groundwater
lb	pound
LNAPL	light nonaqueous phase liquid
MG	million gallons
µg/L	micrograms per liter
mg/L	milligrams per liter
MW	monitoring well
NAPL	nonaqueous phase liquid
ORP	oxidation-reduction potential
PCP	pentachlorophenol
RA	remedial action
scfm	standard cubic feet per minute
USEPA	U.S. Environmental Protection Agency
WA	Work Assignment
WAM	Work Assignment Manager
WDNR	Wisconsin Department of Natural Resources
WPDES	Wisconsin Pollutant Discharge Elimination System

SECTION 1

Introduction

This annual report documents the groundwater monitoring, groundwater treatment system, and bioventing system operation, hazardous waste generation and disposal, and site inspection and maintenance activities at the Penta Wood Products Site as performed by CH2M HILL for the U.S. Environmental Protection Agency (USEPA) under Work Assignment (WA) No. 004-LRLR-05WE.

The remedial action (RA) includes operation and maintenance and performance monitoring of the groundwater extraction and treatment system, light nonaqueous phase liquid (LNAPL) removal and bioventing system.

The continued operation of the groundwater extraction wells has depressed the water table in the LNAPL zone and promoted LNAPL removal. The continued operation of the groundwater extraction wells also effectively captures groundwater containing 1,000 micrograms per liter (µg/L) or more of pentachlorophenol (PCP). Continuous operation of the LNAPL recovery has reduced a source of PCP to the groundwater. Bioventing has been implemented to promote natural degradation of the residual diesel fuel petroleum hydrocarbons and PCP in unsaturated zones including the LNAPL smear zone. The most concentrated portions of the PCP groundwater plume are being contained, collected, and treated and the concentration of PCP in the groundwater is being reduced to a level that allows natural attenuation to achieve the NR 140 standards. All discharges are complying with Wisconsin Pollutant Discharge Elimination System (WPDES) standards.

Effects of the continued operation of the groundwater extraction wells, LNAPL recovery and biovent system on the extent of contamination are monitored through semiannual groundwater sampling events. Soil gas parameters have been measured to monitor oxygen uptakes and soil samples collected to evaluate contamination reductions in soils resulting from bioventing system operation.

An evaluation of alternatives that would (1) accelerate the site cleanup activities, and/or (2) reduce the long-term operation and maintenance costs associated with continued operation was performed in 2010. The purpose of the evaluation was to identify options for optimizing the overall Penta Wood Products Site RA. It was determined that additional extraction wells could increase the LNAPL recovery rate and potentially provide a small reduction in long-term system operation costs and operation time to achieve cleanup objectives. Three additional extraction wells were installed in 2010 and will begin operation in 2011.

SECTION 2

Groundwater Monitoring

The tenth year of post-RA groundwater monitoring at the Penta Wood Products Site included two groundwater sampling events. The semiannual groundwater sampling event was conducted in May 2010 and consisted of sampling six monitoring wells, five residential wells, and one onsite potable well, along with static water level measurements collected at all monitoring wells, and measuring product thickness in monitoring wells where LNAPL was present. The annual groundwater sampling event was conducted in October 2010, and consisted of sampling 14 monitoring wells (Figure 1), 5 residential wells (Figure 2), and 1 onsite potable well; measuring static water levels in all monitoring wells; and measuring product thickness in monitoring wells where LNAPL was present. This report presents the results of the two groundwater sampling events and includes tables and figures presenting historical groundwater data. It is an update of the previous year's report, retaining and updating evaluations based on the new data and also contains a summary from the past 5 years of operation and maintenance. The treatment system operated for approximately 1 year prior to September 2001, when it was shut down to allow for pilot testing and plant modifications intended to help meet effluent criteria. Since it was restarted on February 27, 2004, the treatment system has been running continuously with the exception of occasional downtime from routine maintenance and repairs. The October 2010 monitoring well results reflect approximately 6.5 years of system operation since the groundwater treatment system was restarted. The groundwater results also reflect approximately 3 years of biovent system operations.

During the groundwater sampling events, samples were collected to monitor groundwater contaminant levels. Parameters that were analyzed include PCP; naphthalene; benzene, toluene, ethylbenzene, and xylene (BTEX); dissolved metals; and natural attenuation parameters. A summary of the analytical results for the May and October sampling events are provided in Appendix A and the natural attenuation parameters that were sampled for in May and October are provided in Appendix B.

Water level and LNAPL measurements are made to determine the remaining LNAPL thickness and the groundwater flow direction(s) in the unconfined and semiconfined aquifers. Groundwater elevations, oil/water interface measurement data, historical LNAPL thickness data, and other observations are included in Appendix C.

Trends in the distribution and concentrations of PCP and other parameters are used with water level measurements to evaluate the effectiveness of the treatment system in capturing the affected groundwater, also known as capture zone analysis. The capture zone analysis and parameters help to assess the effectiveness of the groundwater and LNAPL extraction, treatment, and natural attenuation.

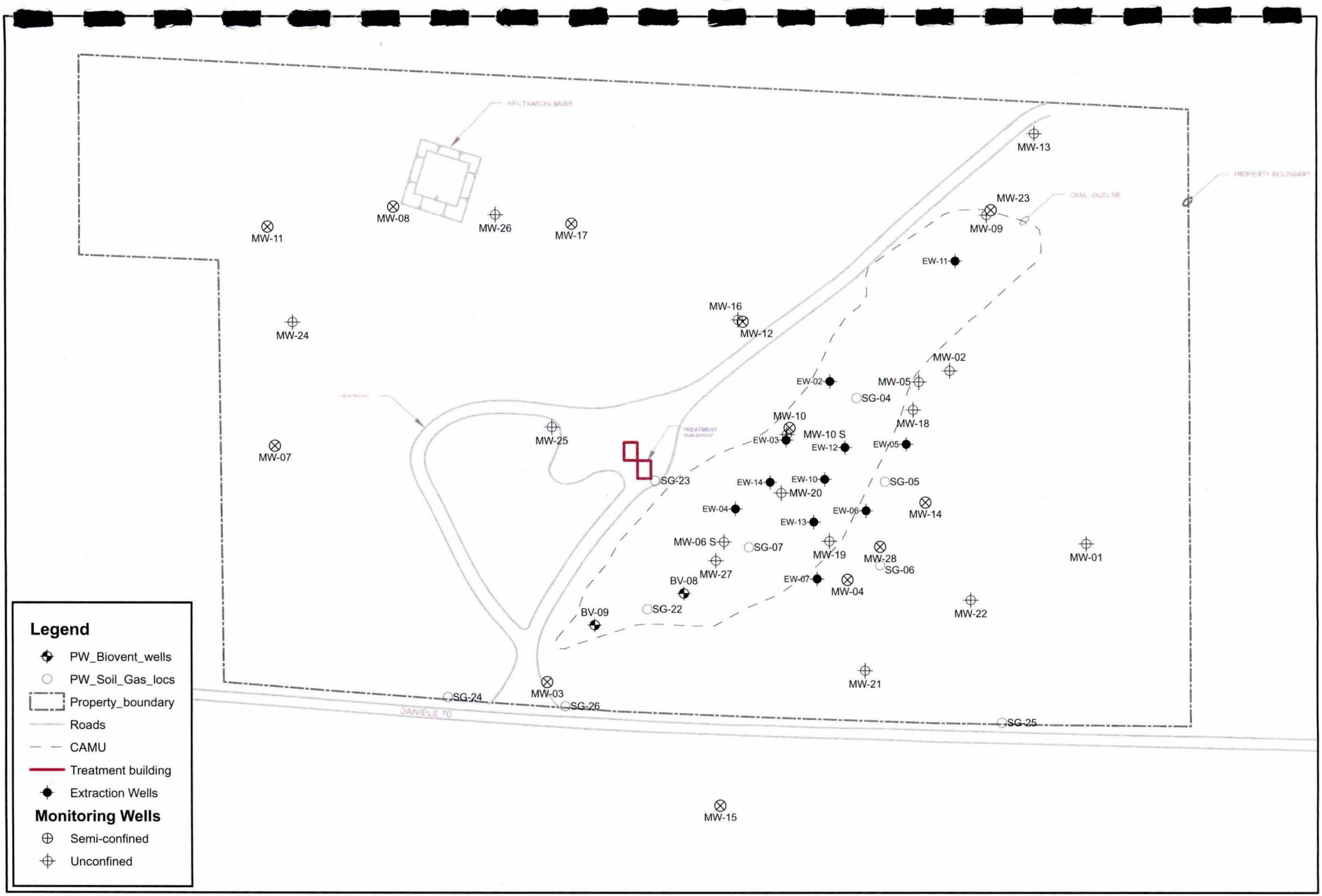

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Figure 1
Well Location Map
2010 Annual Report
Pentawood Products Superfund Site
Siren, Wisconsin

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Figure 2
Residential Sampling Map
Pentawood Products Superfund Site
Siren WI

2.1 Water Levels and LNAPL Measurements

Water levels in all monitoring wells were measured in May and October 2010. A water level indicator was used to measure the distance from the top of the inner well casing to the water surface. In wells where LNAPL has been previously detected, the depth to the product surface (if present) and water surface were measured from the top of the inner well casing using an oil/water interface probe. After the semiannual sampling event in May, two NAPL absorbent socks were installed in monitoring wells (MW) 18 and MW-20. The socks remove the LNAPL by selectively allowing oil to penetrate the absorbent sock material and then are removed from the well and disposed of.

The following sections provide a discussion of LNAPL thickness and distribution, and the effects the groundwater extraction well network has had on the unconfined and semiconfined aquifers.

2.1.1 LNAPL Thickness

LNAPL was observed in multiple monitoring wells during the annual and semiannual sampling events. The observed LNAPL thicknesses are summarized in Table 1.

TABLE 1
2010 Monitoring Well LNAPL Measurement
Penta Wood Products Site

Monitoring Well	Semiannual Event May 2010	Annual Event October 2010
MW-10S	0.51 ft	0 ft
MW-18	2.01 ft	N/A*
MW-19	1.1 ft	0.59 ft
MW-20	0.85 ft	N/A*

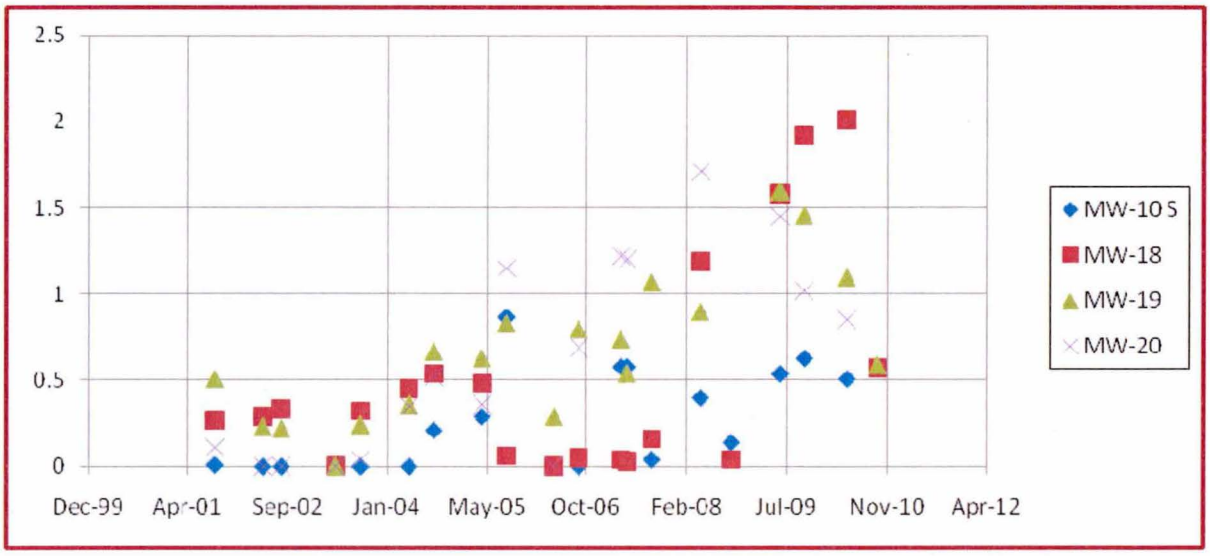
*Measurements not available because absorbent nonaqueous phase liquid (NAPL) socks were in the monitoring wells immediately prior to sampling event.

The NAPL absorbent socks were installed on May 20, 2010 and removed on June 26, 2010, at which point new NAPL socks were installed and removed on October 19, 2010. The total amount of product removed using the socks was approximately 18 pounds and was disposed of through the waste handling procedures at the treatment facility. The socks were removed just prior to the annual sampling event in October; therefore, the LNAPL measurements for MW-18 and MW-20 are possibly inaccurate, trending on the low side.

In May 2010, the LNAPL thickness measured for MW-18 is at or near the maximum thickness measured in the monitoring wells. The other monitoring wells, MW-10S, MW-19, and MW-20 showed a decrease in LNAPL thickness in May. The decrease in May LNAPL thickness appears to be the result of successful LNAPL pumping and bioventing, which results in the volatilization of the residual diesel fuel petroleum hydrocarbons and PCP in the LNAPL smear zone. LNAPL thickness in MW-19 and MW-20 has shown a significant decrease from the October 2009 to the May 2010 measurement and an even more significant decrease in October 2010 from the spring event.

MW-10S has shown a trend of decreasing LNAPL in the last two measurements and did not have a measureable amount in October 2010. The thickness in MW-18 increased in May 2010 but showed a decrease as of October 2010. The greatest LNAPL thickness in all monitoring wells was in the summer of 2009. The large decrease in LNAPL measurements in October 2010 can also be explained by the general increase in groundwater elevation at the site (increased 2 feet between May and October). It is known that when water levels are high, NAPL becomes more bound up in the formation and is not manifested as thickness as readily. Historical LNAPL thickness is shown in Figure 3.

FIGURE 3
Historical LNAPL Thickness
Penta Wood Products Site



2.1.2 Capture Zone Analysis

The groundwater extraction system at the Penta Wood Products Site was designed to create a depression in the water table promoting migration of contamination toward the extraction wells and to enhance the LNAPL recovery at the site. The capture effectiveness was primarily evaluated based on site-specific field data including potentiometric surface maps and calculated horizontal gradients as described in the following sections.

2.1.2.1 Unconfined Aquifer

Potentiometric Surface

The water level elevations recorded in May 2010 (Figure 4) and October 2010 (Figure 5) continued to show a consistent capture zone in the unconfined aquifer resulting from the operation of the groundwater collection system. The May and October 2010 groundwater elevation contours indicated a groundwater divide existing beneath the site, running from the southwest to the northeast. The capture zone is bounded by MW-09 on the north, MW-16 on the west, and MW-22 on the east, as indicated by the lower water level elevations observed in the monitoring wells located within or adjacent to the Corrective Action Management Unit (CAMU).

The discharge of treated groundwater into the infiltration basin has continued to show minimal to no response on the unconfined aquifer. In the unconfined aquifer, some variability in the groundwater table observed from 2009 to 2010, although the capture zone appeared to be largely intact. The variability of the water table surface is likely a function of both the influence of the treatment system's pumping wells and varying surface infiltration rates across the site.

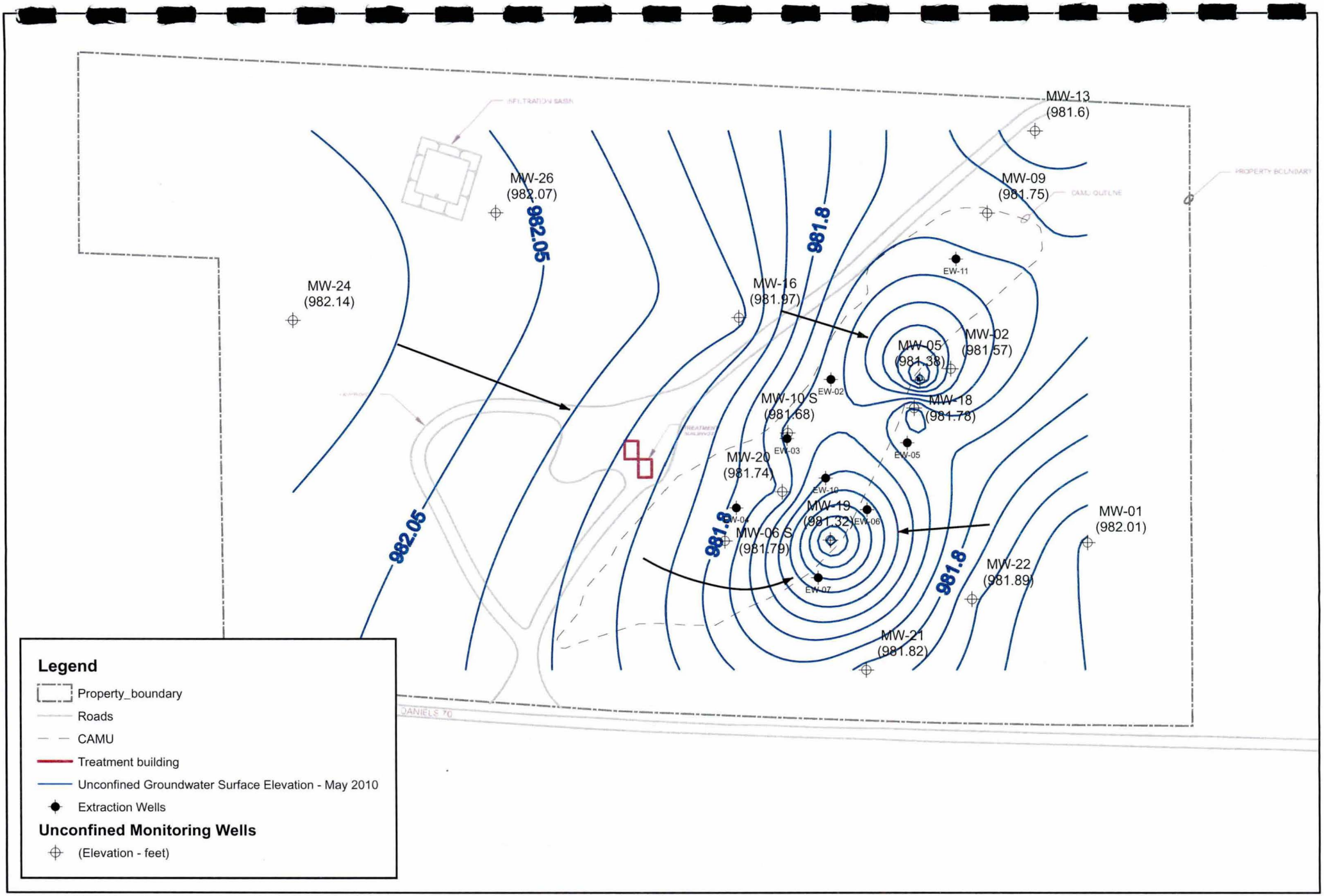


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Figure 4
Unconfined Groundwater Elevation - May 2010
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Pentawood Pruducts Superfund Site
Siren, Wisconsin

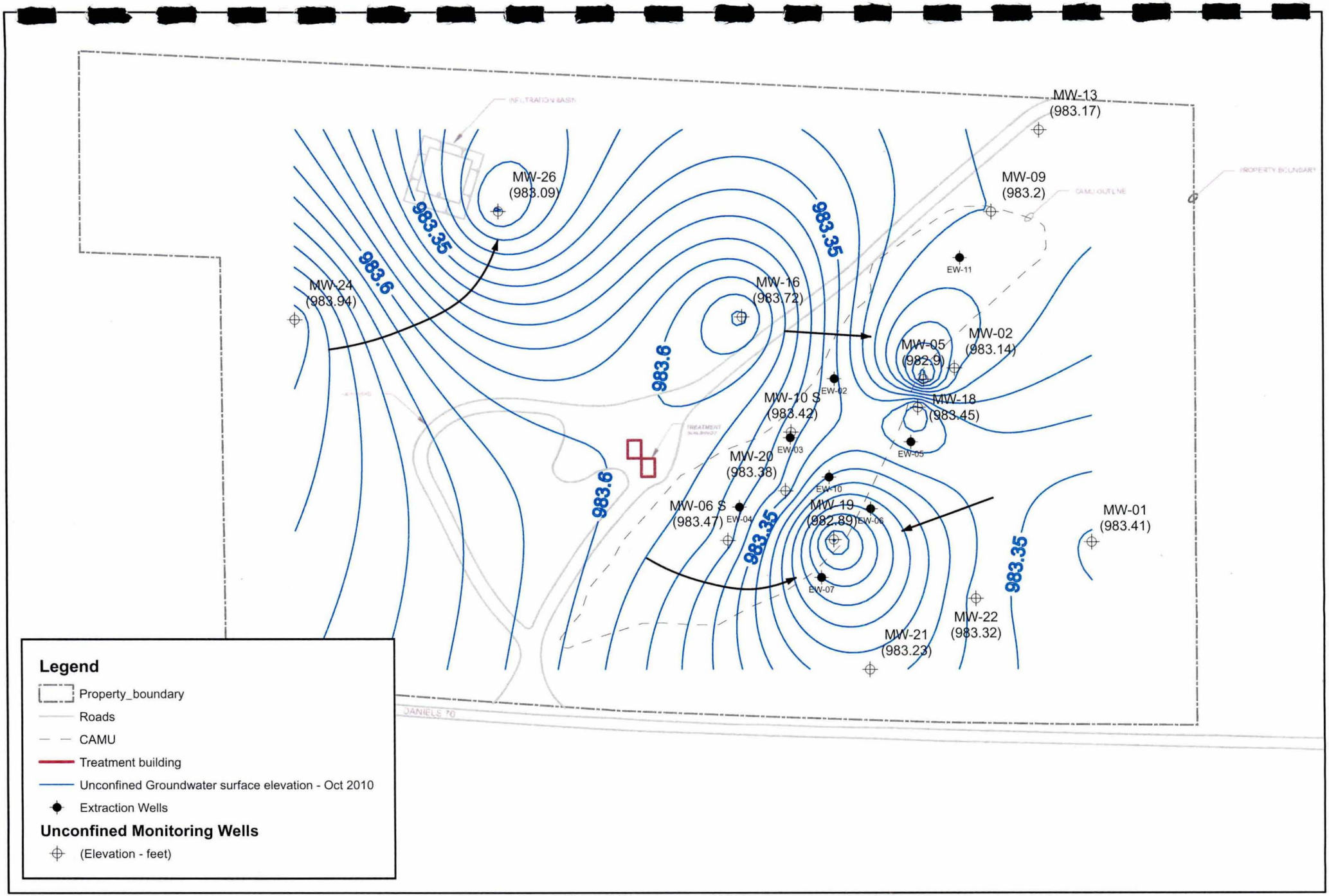

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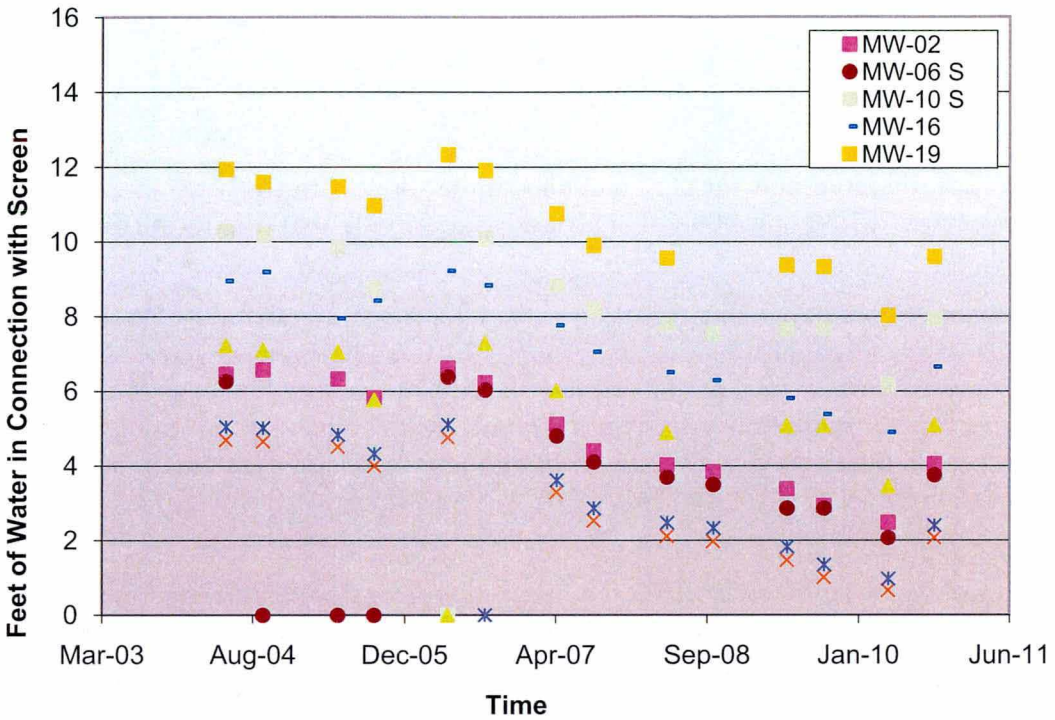
Figure 5
Unconfined Groundwater Elevation - October 2010
2010 Annual Report
Pentawood Pruducts Superfund Site
Siren, Wisconsin

Water levels in the unconfined aquifer have been steadily declining in the last ten years due largely to reduced precipitation in the region. During the summer and fall of 2010 increased rainfall raised the water table at the site approximately 2 feet. Figure 6 shows the trends in depth to groundwater in unconfined monitoring wells since 2002.

FIGURE 6
Amount of Water in Unconfined Wells
Penta Wood Products Site



Hydraulic Gradients

Horizontal hydraulic gradients were calculated using monitoring wells screened in the unconfined aquifer located inside and outside the capture zone created by the extraction wells. The gradients were calculated for 2004 (which represents the treatment system operation shortly after startup), 2008, 2009, and 2010 and are summarized in Table 2.

TABLE 2
Horizontal Hydraulic Gradients in the Unconfined Aquifer
Penta Wood Products Site

Monitoring Well Outside Capture Zone	Monitoring Well Inside Capture Zone	Gradients							
		May 2004	May 2008	June 2009	May 2010	September 2004	October 2008	October 2009	October 2010
MW-09	MW-05	0.0012	0.0019	--	0.0009	0.0025	0.0019	0.0013	0.0008
MW-6S	MW-19	0.0019	0.0023	0.0024	0.0019	--	--	0.0024 (outward)	0.0024
MW-16	MW-10S	0.0009	0.0011	0.0017	0.0010	0.0015	0.0016	0.0017	0.0011
MW-22	MW-19	0.0012	0.0016	0.0021	0.0017	0.0013	--	0.0020	0.0013

The horizontal gradients indicate that hydraulic capture was maintained at similar levels in 2010 to historical levels. The horizontal gradient calculated between MW-09 and MW-05 in October 2010 is slightly less than in previous years but still shows an inward gradient. The gradient from MW-6S to MW-19 showed a gradient direction toward the CAMU, which is a change from the previous result in 2009 which showed a slight outward gradient, creating better capture for the plume. The gradients from MW-16 to MW-10S and MW-22 to MW-19 show gradients slightly less but similar to what was observed in 2008 and 2004.

The calculated hydraulic gradients support the definition of the capture zone created by the extraction wells.

2.1.2.2 Semiconfined Aquifer

Potentiometric Surface

Groundwater in the semiconfined aquifer exhibited similar flow patterns between May 2010 (Figure 7) and October 2010 (Figure 8) with a groundwater divide that ran north-south beneath the site.

West of this divide, groundwater flow direction was to the west and northwest. Water levels recorded near the extraction wells in May and October 2010 indicate a localized groundwater depression on the eastern half of the divide that resulted from extraction well pumping. The continued treatment system optimization led to an increased localized depression in the area of the CAMU. Continued pumping is expected to maintain and enlarge the containment.

Hydraulic Gradients

Horizontal hydraulic gradients were calculated using monitoring wells screened in the semiconfined aquifer located inside and outside the capture zone created by the extraction wells. The gradients were calculated for 2004, 2008, 2009, and 2010. The calculated gradients are summarized in Table 3.

Operation of the extraction wells and continued treatment system optimization has resulted in an increased capture zone around the extraction wells in 2010 over previous years. All gradients showed an inward flow toward the wells and the majority of the gradients have increased over the previous years. The exception is MW-14 to MW-10 which still maintains a positive gradient but slightly less than 2009.

TABLE 3
Horizontal Hydraulic Gradients in the Semiconfined Aquifer
Penta Wood Products Site

Monitoring Well Outside Capture Zone	Monitoring Well Inside Capture Zone	Gradients							
		May 2004	May 2008	June 2009	May 2010	September 2004	October 2008	October 2009	October 2010
MW-12	MW-10	-0.0005	0.0008	0.0008	0.0010	-0.0034	-0.0011	-0.0034	0.0009
MW-14	MW-10	-0.0013	0.0010	0.0008	0.0014	0.0008	-0.0007	0.0006	0.0003
MW-23	MW-10	-0.0005	0.0008	0.0006	0.0009	0.0007	-0.0002	0.0005	0.0005

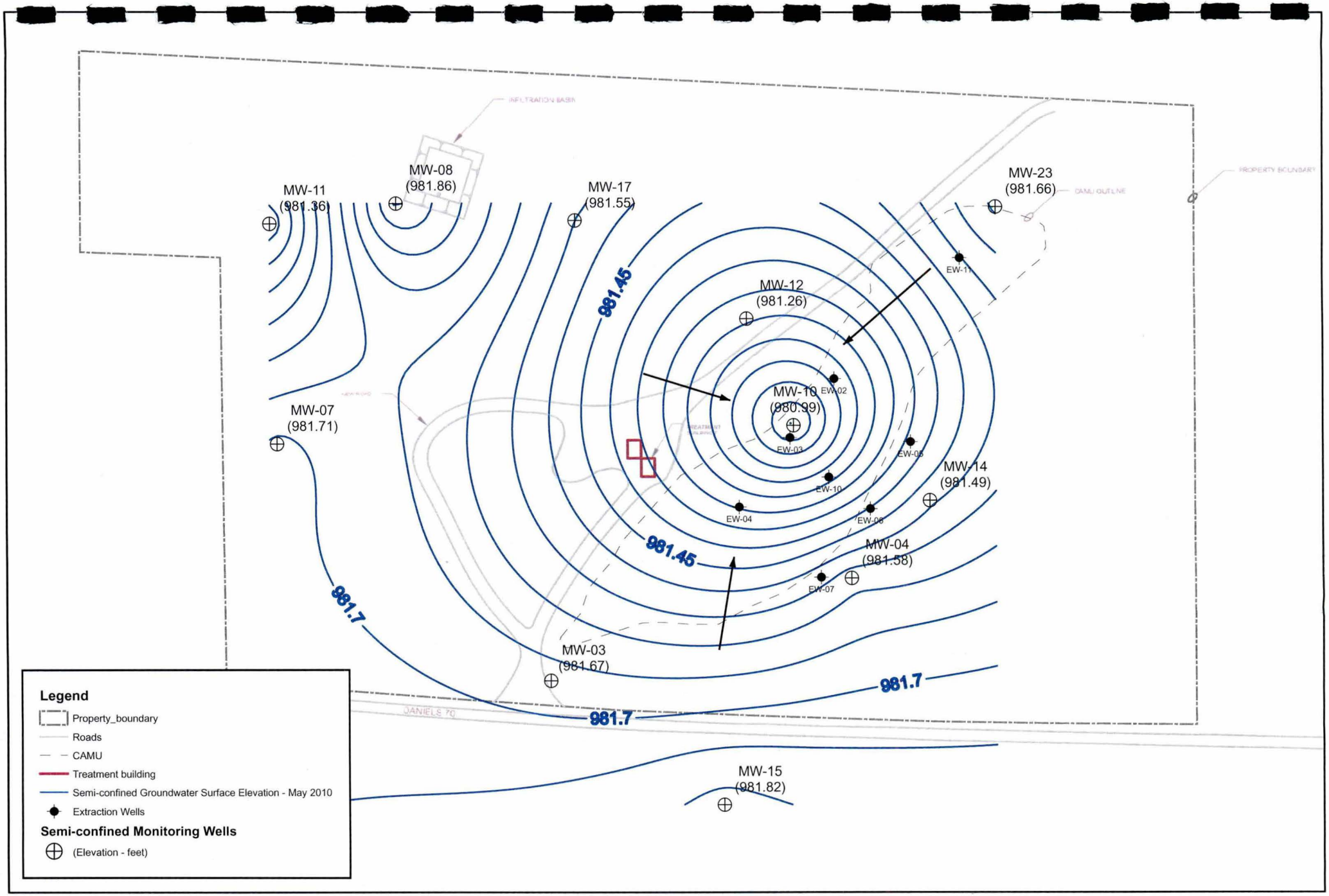


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Figure 7

Semi-confined Groundwater Elevation - May 2010
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Pentawood Pruducts Superfund Site
Siren, Wisconsin

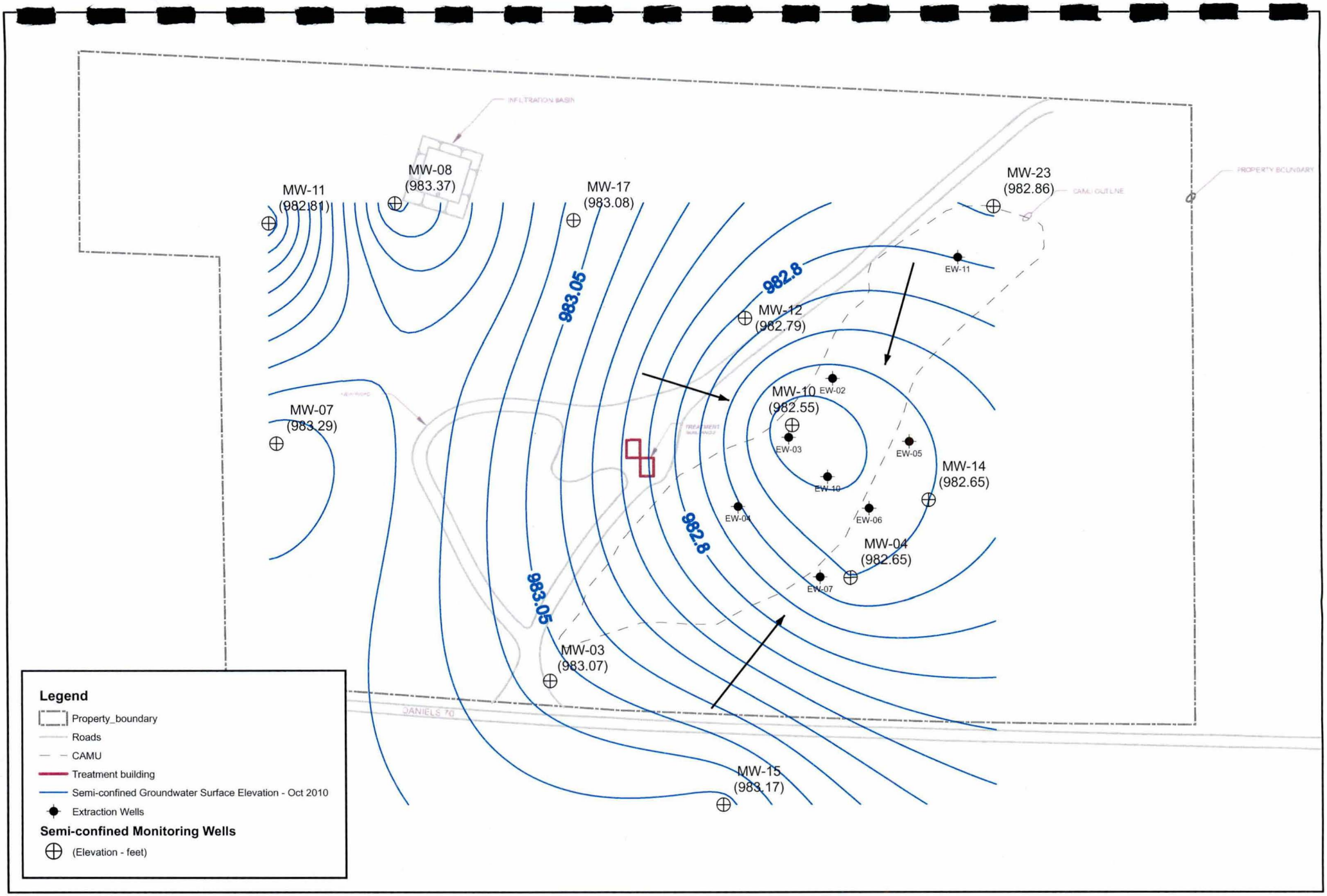

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Figure 8

Semi-confined Groundwater Elevation - October 2010
2010 Annual Report
Pentawood Pruducts Superfund Site
Siren, Wisconsin

2.2 Groundwater Sampling and Analysis

Groundwater analytical data is presented to evaluate the performance of the RA at the site. The data is analyzed in accordance with the following objectives:

- Confirm that contaminants do not extend to residential drinking water wells.
- Evaluate the current monitoring data to determine whether the plume is declining in size since the February 2004 restart of the treatment system.
- Evaluate the infiltration basin area to determine the effect of re-infiltration on groundwater quality.
- Evaluate the influent data from the groundwater extraction system to determine the amount of PCP removed to date.
- Identify changes needed to groundwater monitoring strategy.

Environmental Monitoring Technologies (EMT) of Morton Grove, Illinois, analyzed both the semiannual and annual samples. Quality control samples consisting of field blanks, duplicate samples, and matrix spike/matrix spike duplicate samples were collected at the frequency specified in the *Sampling and Analysis Plan* (CH2M HILL, 2000; revised February 2005). All monitoring well and residential well sample result packages were submitted to the USEPA Region 5 Central Regional Laboratory for data validation.

2.2.1 Residential Well Sampling Procedures

Five residential wells and one onsite potable well were sampled during the semiannual sampling (May 2010) and annual sampling (October 2010).

Semiannual sampling (May 2010) results received from EMT showed that PCP, BTEX, and naphthalene were not detected in the residential wells or in the onsite potable well.

Annual sampling (October 2010) results from EMT showed that PCP, BTEX, and naphthalene were not detected in the residential wells or in the onsite potable well. The BTEX internal standard area counts for residential well RW01 were recovered below acceptable criteria; therefore, RW01 was resampled on November 30, 2010. BTEX was not detected in the reanalysis, and therefore, the initial results were rejected. The residential well sample information (names, addresses, and telephone numbers) and the analytical results were submitted under separate cover to Tom Williams, USEPA Work Assignment Manager (WAM), on June 21, 2010, and to Denise Boone, USEPA WAM, on January 4, 2011 (Appendix D).

2.2.2 Monitoring Well Sampling Procedures

For the semiannual sampling event conducted in May 2010, six monitoring wells were sampled. The following monitoring wells were selected for this event:

- MW-09
- MW-12
- MW-15
- MW-19
- MW-22
- MW-26

MW-09 is located at the north end of the CAMU; MW-19 was chosen to represent the unconfined groundwater in the LNAPL area; MW-15 was chosen to assess southern, off

property contamination; MW-12 and MW-22 were chosen to assess the impacts of plant operation to the perimeter of the plume, particularly in the direction of residential wells; and MW-26 was chosen to monitor groundwater quality near the treated water infiltration basin. Sampling of these wells was started on May 18, 2010 and completed on May 20, 2010. All monitoring wells were purged of at least three well volumes before sampling. MW-22 was purged and sampled using disposable polyvinyl chloride bailers. The remaining monitoring wells were purged and sampled with dedicated Grundfos pumps installed in 2005.

For the annual sampling event conducted during October 2010, fourteen monitoring wells were sampled. The following monitoring wells were sampled for this event:

- MW-02
- MW-03
- MW-05
- MW-06S
- MW-07
- MW-09
- MW-10
- MW-12
- MW-15
- MW-16
- MW-17
- MW-19
- MW-22
- MW-26

Sampling of the wells was completed between October 5 and 7, 2010. Monitoring wells MW-03, MW-05, MW-07, MW-10, MW-12, MW-16, MW-17, MW-19, and MW-26, were purged and sampled with dedicated Grundfos© Redi-Flo 2 pumps, which were installed in 2005. Wells MW-02, MW-06S, MW-09, MW-13, MW-15, and MW-22 were purged and sampled using disposable polyvinyl chloride bailers.

Results of the semiannual and annual sampling events are discussed in the following sections.

2.2.3 PCP Plume

The monitoring well analytical results tables presented in Appendix A are formatted into two unique tables: May 2010 semiannual sampling results and the October 2010 annual sampling results.

To observe PCP trends over time, the PCP concentration were contoured separately between the semiconfined and the unconfined aquifers. PCP concentration contours that exceed 1,000 µg/L are presented in Figures 9 (unconfined) and 11 (semiconfined). PCP concentration contours that exceed the Wisconsin NR 140 enforcement standard of 1 µg/L are presented in Figures 10 (unconfined) and 12 (semiconfined). Several historic contours are presented to establish a baseline condition before the operation of the groundwater extraction and treatment system. The 2009 and 2010 contours are also presented to show changes in the contours over the last year.

A comparison of the unconfined 1,000 µg/L PCP contour lines in Figure 9 for 2008, 2009, and 2010 shows that the high concentration plume has remained stable from the 1994 baseline. In 2010, the levels of PCP in the most contaminated well in the sampling program dropped significantly – in MW-19 the level of PCP dropped from 31,800 µg/L to 4,470 µg/L or a drop of more than 85 percent. The 1-µg/L contour shown in Figure 11 is slightly larger than the 1,000-µg/L contour, which is likely due to a combination of the groundwater collection system drawing water towards the approximate center of the plume and biodegradation resulting from the availability of oxygen in groundwater around the plume perimeter. The large reductions in the unconfined plume size are evidence that the PCP NAPL source is not continuing to contribute to the groundwater contamination outside the immediate LNAPL area.

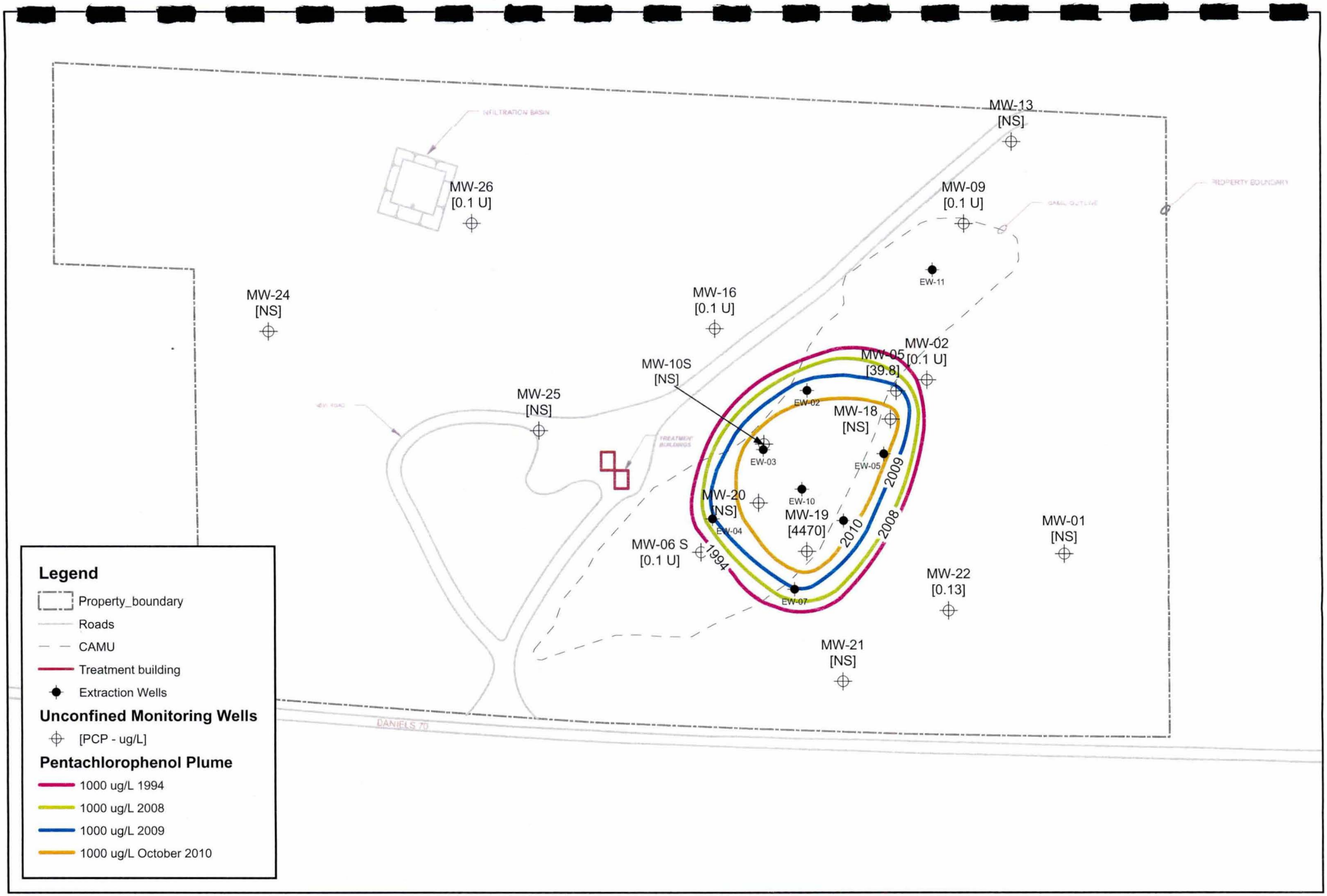

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Figure 9
Unconfined PCP Plume - 1000 ug/L
2010 Annual Report
Pentawood Pruducts Superfund Site
Siren, Wisconsin

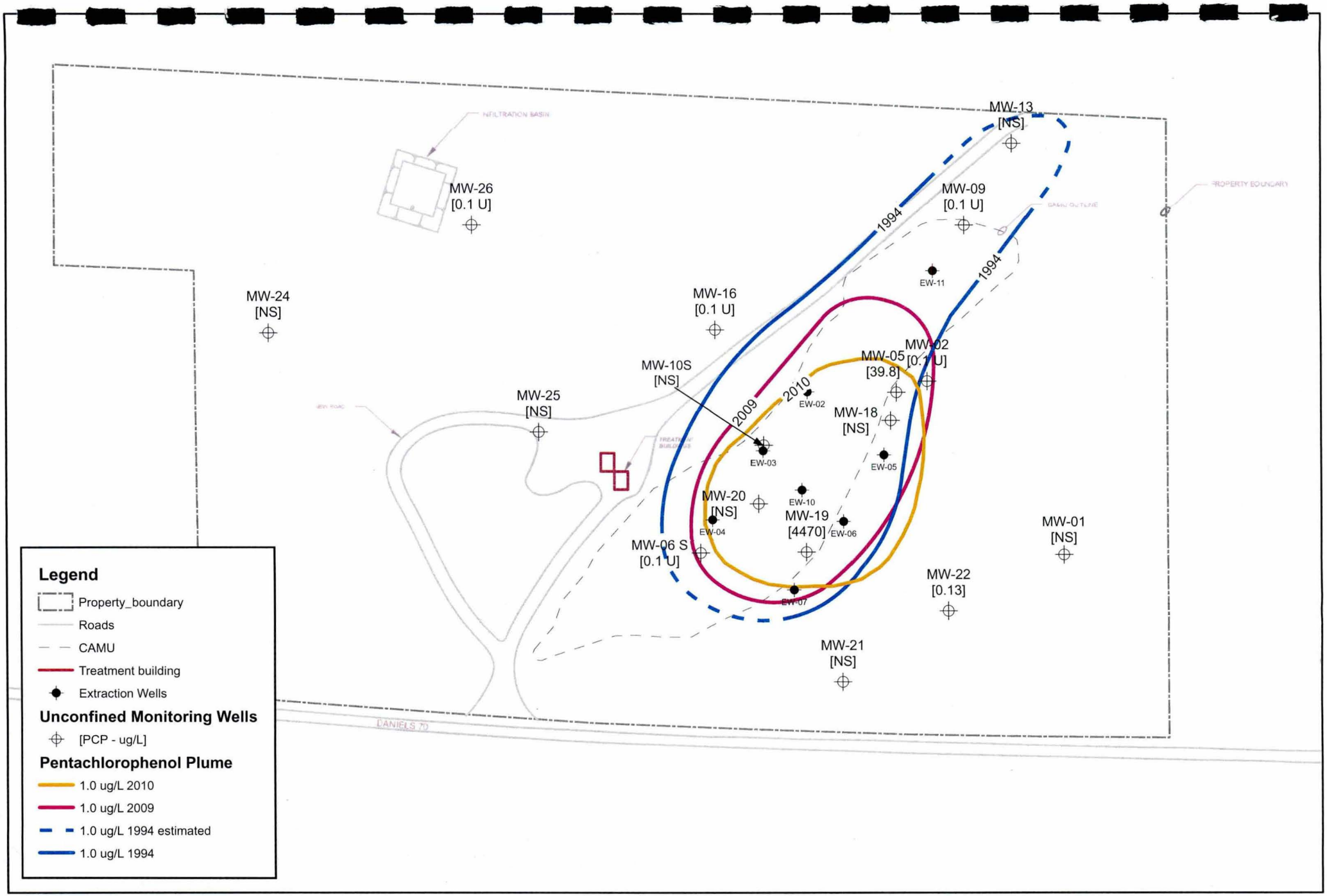

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Figure 10
Unconfined PCP Plume - 1.0 ug/L
2010 Annual Report
Pentawood Pruducts Superfund Site
Siren, Wisconsin

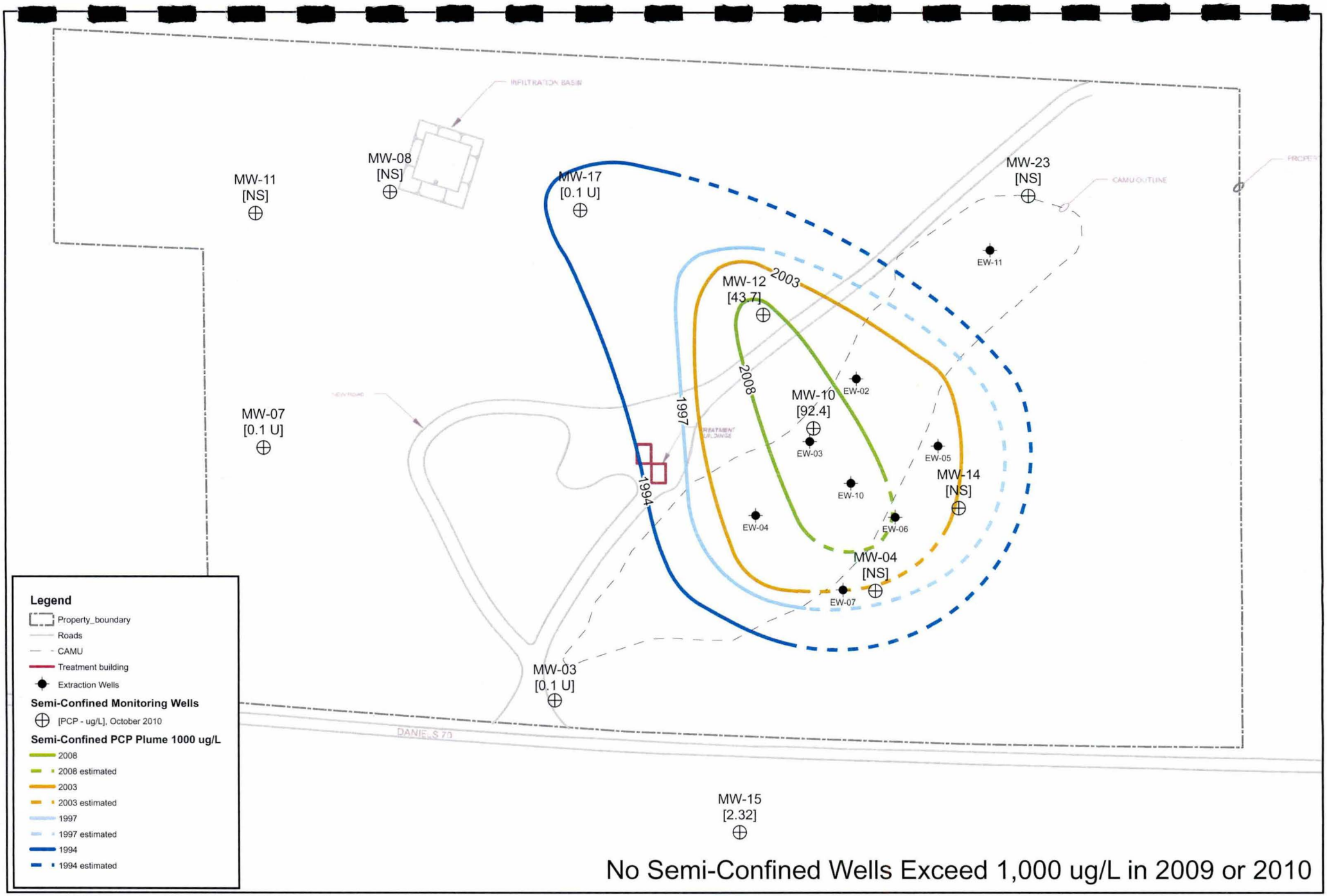

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Figure 11
Semi-Confined PCP Plume - 1000 ug/L
2010 Annual Report
Pentawood Pruducts Superfund Site
Siren, Wisconsin

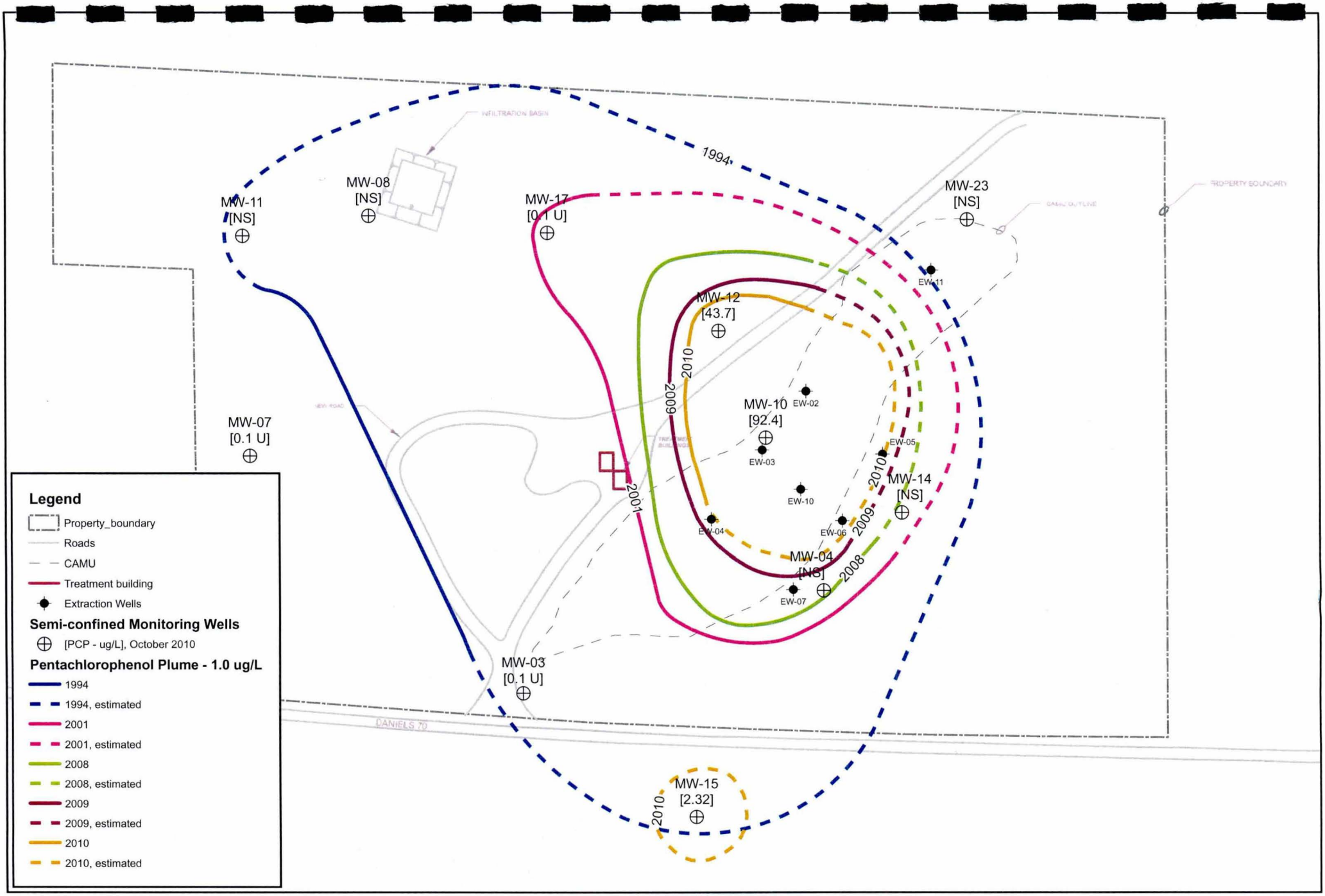

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Figure 12
Semi-Confined PCP Plume - 1.0 ug/L
2010 Annual Report
Pentawood Pruducts Superfund Site
Siren, Wisconsin

A comparison of the semiconfined 1,000 µg/L PCP contour lines in Figure 11 for 1994, 1997, 2003, 2008, 2009, and 2010 shows that the high concentration plume in the semiconfined aquifer has shrunk significantly from the 1994 baseline. In October 2009, all wells at the site were reduced in concentration to below the 1,000 µg/L level. In particular, MW-10 and MW-12 had PCP concentration drops from 1,630 and 1,670 µg/L in 2008 to 92.4 µg/L and 43.7 µg/L in 2010, respectively. The 1 µg/L plume in the semiconfined aquifer as shown in Figure 12 shrunk in magnitude similar to the 1,000 µg/L, and is anticipated to continue to shrink. PCP trends are discussed below for individual monitoring wells within the PCP plume.

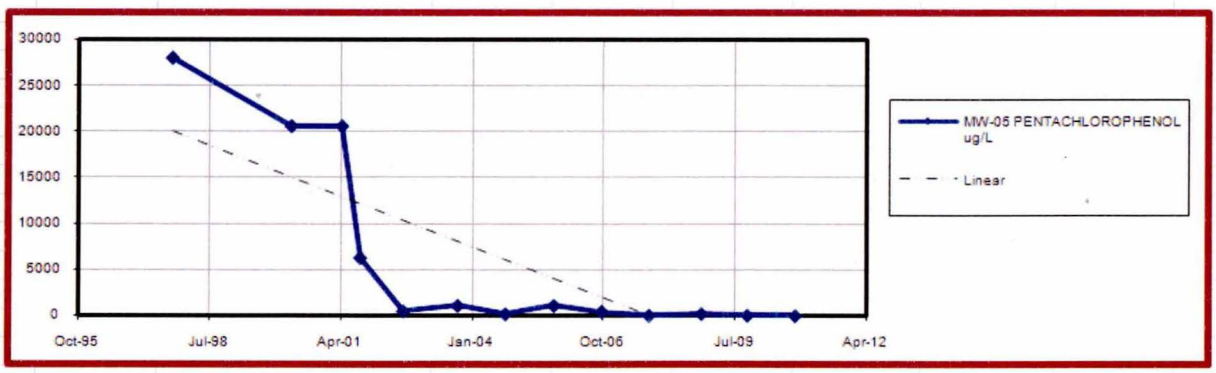
2.2.3.1 MW-15

MW-15 is a semiconfined well and is the southernmost well at the site. It is the last well between the site and adjacent residences. A detection of 2.32 µg/L was analyzed in October of 2010, which is inconsistent with historical data. PCP concentrations in MW-15 have historically been nondetected with one detection in 2001 of 0.077 J. Due to contamination decreasing in all other areas of the site and no detections in neighboring residences, the detection was considered suspect. Laboratory data were reviewed, and it is anticipated that the detection was caused by laboratory cross contamination during the sample preparation.

2.2.3.2 MW-05

PCP concentration in monitoring well MW-05 dropped sharply from 20,600 µg/L, before groundwater treatment system operation, to 39.8 µg/L in the most recent sample in October 2010 (see Figure 13). PCP concentrations remain low in this area because nearby uncontaminated groundwater is being drawn radially toward extraction well (EW) 02 and EW-05 since their activation in February 2004, thereby purging the aquifer of PCP. Free product has never been observed in this well. MW-5 is considered an unconfined aquifer well and like similar wells has shown a significant decrease in PCP concentration.

FIGURE 13
MW-05 PCP Concentration

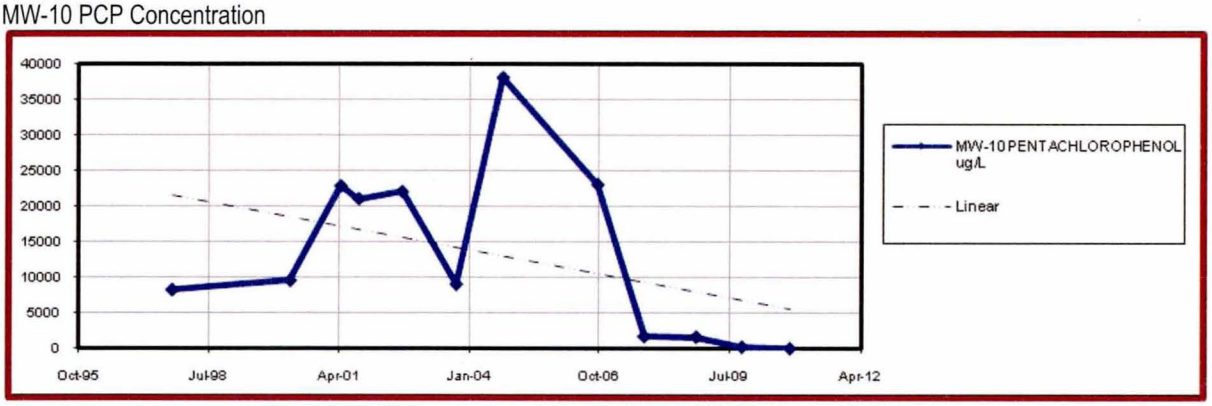


2.2.3.3 MW-10

PCP in the semiconfined monitoring well MW-10 increased from a concentration of 9,530 µg/L shortly before the startup of the treatment system to 22,000 µg/L in August 2002 (see Figure 14). Concentrations in the well did not drop immediately, but by September 2003, concentrations fell to 9,000 µg/L. In September 2004, PCP concentrations at MW-10

increased to 38,000 µg/L. This is likely a result of the extraction system restart in February 2004. MW-10 is located very close to extraction well EW-03, which pulls product toward it while actively pumping. In September 2006, a concentration of 23,000 µg/L was reported, but by October 2010, PCP concentrations at MW-10 decreased to 92.4 µg/L.

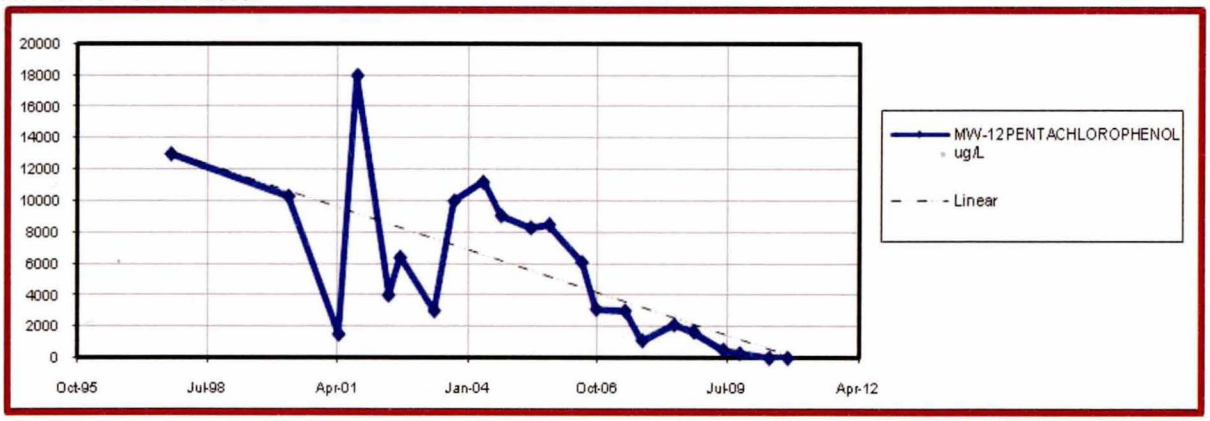
FIGURE 14
MW-10 PCP Concentration



2.2.3.4 MW-12

Although monitoring well MW-12, located in the semiconfined aquifer, has shown wide fluctuations in PCP between groundwater collection periods, as shown in Figure 15, there is an overall decreasing trend in the PCP concentration. PCP has declined from a concentration of 18,000 µg/L in September 2001 to 43.7 µg/L in the most recent sample in October 2009. Free product has never been observed in this well.

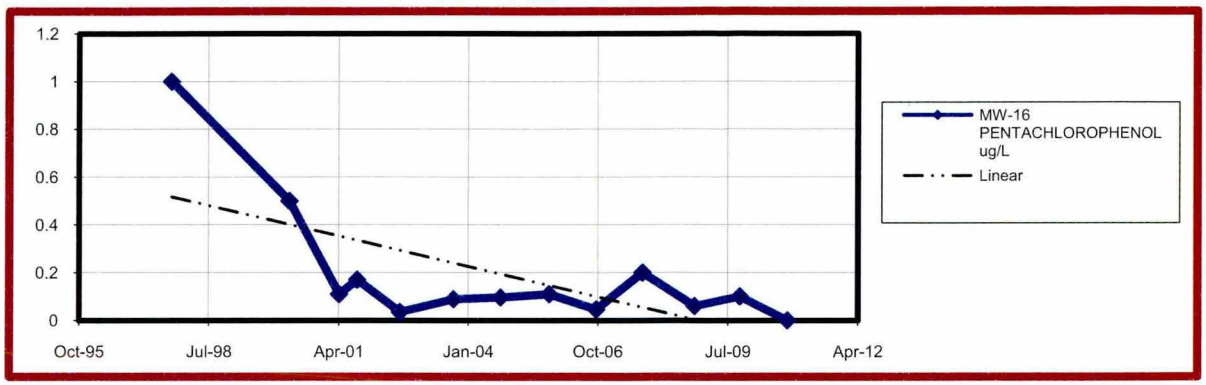
FIGURE 15
MW-12 PCP Concentration



2.2.3.5 MW-16

Monitoring well MW-16 has shown very low concentrations of PCP or nondetected for PCP during groundwater collection periods, as shown in Figure 16. The highest concentration of PCP was observed at 0.2 µg/L in September 2006. PCP was not detected in 2009 or in 2010. Free product has never been observed in this well. MW-16 is an unconfined well located just outside of the areas with LNAPL present.

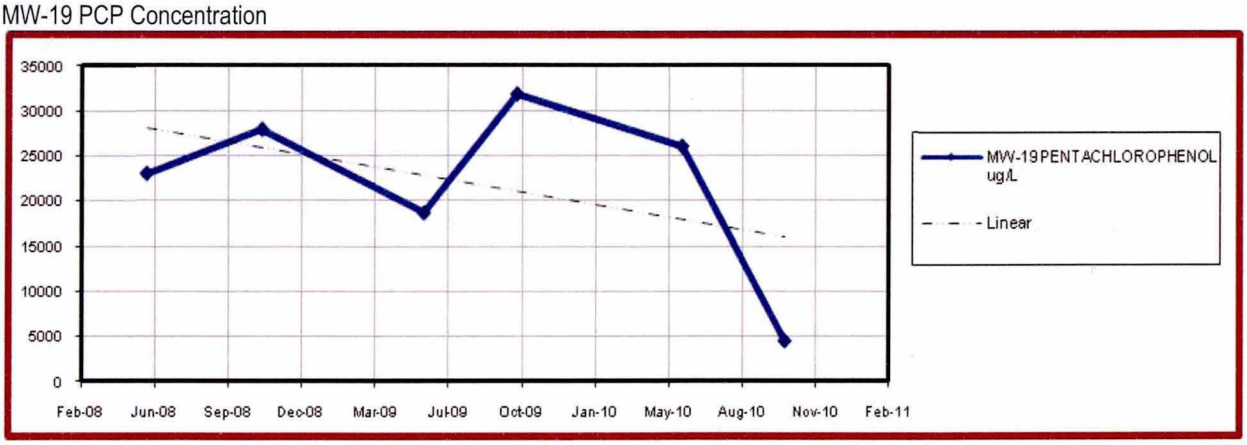
FIGURE 16
MW-16 PCP Concentration



2.2.3.6 MW-19

LNAPL has been present in MW-19 since monitoring began, and any entrainment of LNAPL droplets in the sample will have notable effects on PCP concentrations. LNAPL was measured in MW-19 in May 2010 at a thickness of 1.10 feet and a thickness of 0.59 foot in October 2010. The PCP concentrations were measured at 26,000 µg/L in May 2010 and 4,470 µg/L in October 2010, which is less than what was observed in 2009. Although variability of PCP concentrations in samples collected from wells with LNAPL is expected, the variability of PCP concentrations in this well appears reduced since the installation of dedicated sampling equipment in the well in 2005. In the most recent sample from October 2010 there was an 85 percent decline in the concentration of PCP from October 2009. The decline could potentially signify a marked reduction in LNAPL source at the site.

FIGURE 17
MW-19 PCP Concentration



2.2.4 Naphthalene

Naphthalene was detected in 1 monitoring well at a level above the reporting limit in 2009: MW-19 with concentrations of 123 µg/L in May 2010 and 102 µg/L in October 2010. The concentration has decreased from 5,260 µg/L to 102 µg/L in MW-19 since 2000.

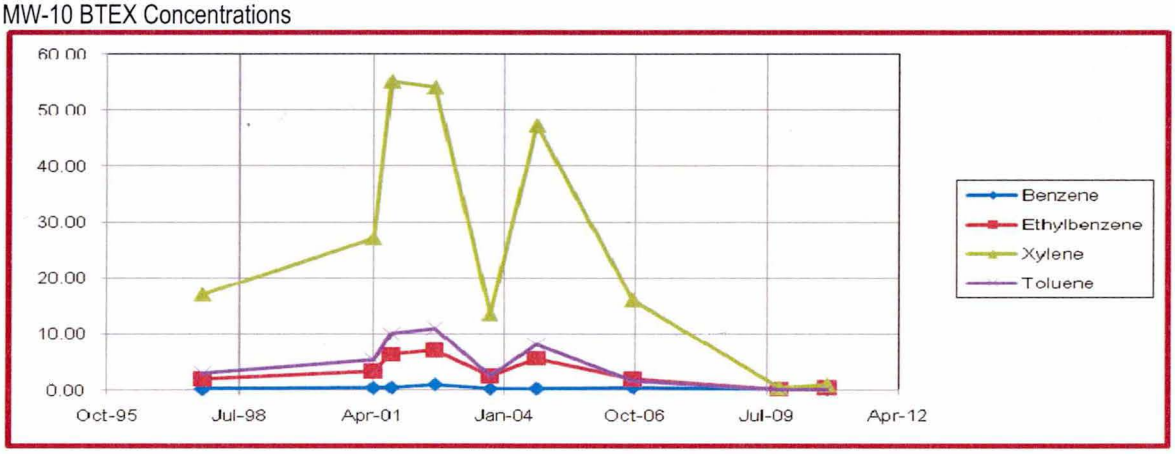
2.2.5 BTEX

BTEX compounds were detected above the reporting limits at three monitoring wells in 2010. Benzene was not detected in any well. In 2010, ethylbenzene was detected in MW-15 (0.21 µg/L), MW-22 (0.22 µg/L), and MW-26 (0.3 µg/L). Ethylbenzene was not detected in any of these wells in the past.

2.2.5.1 MW-10

Since 2004, a consistent decrease in BTEX concentrations has been observed. The concentration of ethylbenzene has decreased from 5.58 µg/L to nondetected, toluene has decreased from 8.09 µg/L to 0.073 µg/L and xylene has decreased from 47.1 µg/L to nondetected in October of 2010.

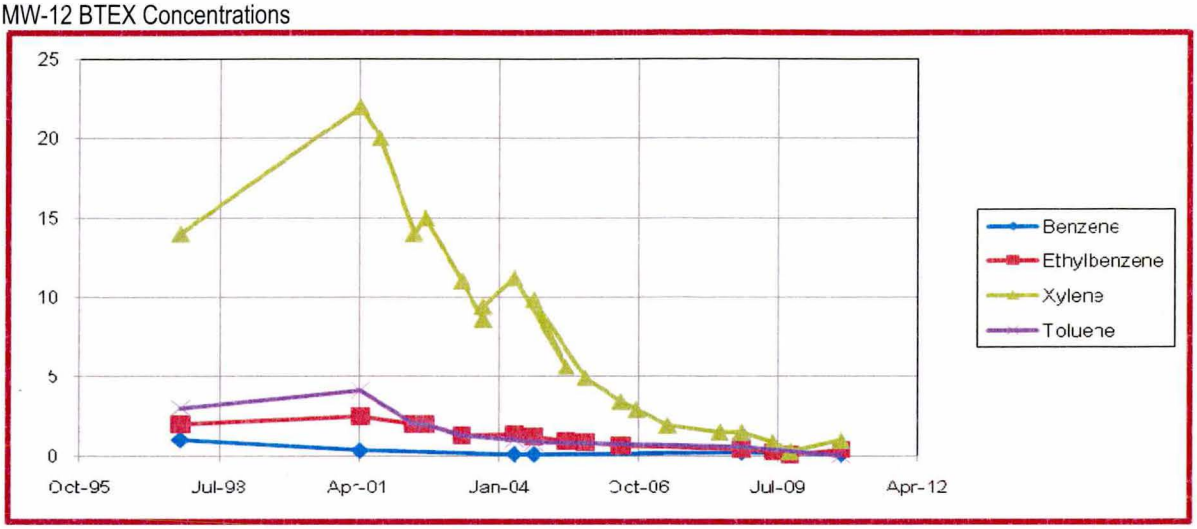
FIGURE 18
MW-10 BTEX Concentrations



2.2.5.2 MW-12

The concentrations have shown steady declines especially over the last 5 years. Since 2004, the ethylbenzene concentration has ranged from a high of 1.39 µg/L to currently nondetected. Xylene concentration has ranged from 11.2 µg/L to nondetected currently.

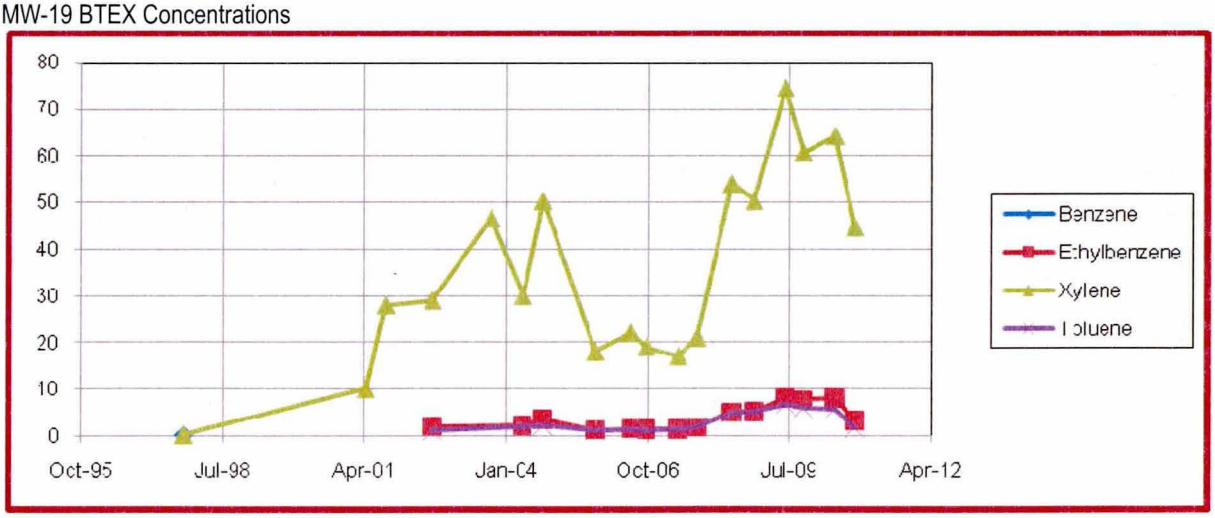
FIGURE 19
MW-12 BTEX Concentrations



2.2.5.3 MW-19

The concentrations have variability over time most likely due to the presence of ongoing NAPL in the well. Xylene was detected in MW-19 at a concentration of 64.3 µg/L, toluene was detected at a concentration of 5.65 µg/L, and ethylbenzene was detected at a concentration of 7.95 µg/L. The last two results from 2010 do shown reductions in concentrations of all analytes.

FIGURE 20
MW-19 BTEX Concentrations



2.2.6 Dissolved Metals

In previous years, both total and dissolved metals analyses were performed on samples collected from monitoring wells. Suspended solids often have a significant impact on total metals concentrations; therefore, total metal concentrations may not be indicative of actual groundwater conditions. Beginning in 2006, total metals analyses were removed from the sampling plan, as they are often biased high as a result of the frequent presence of

suspended solids. Dissolved arsenic, copper, iron, manganese, and zinc were sampled in May and October 2010.

2.2.6.1 Arsenic

Dissolved arsenic was not detected in any of the wells in May 2010. Dissolved arsenic was detected in one monitoring well in October 2010: MW-05, with a concentration of 3.36 µg/L which is above the Wisconsin Department of Natural Resources (WDNR) Preventive Action Limit for arsenic of 1 µg/L but below the maximum contaminant level of 10 µg/L.

2.2.6.2 Copper

Dissolved copper was not detected in any of the wells in May 2010 or October 2010.

2.2.6.3 Iron

In May and October 2010, dissolved iron was detected above the WDNR Enforcement Standard (ES) of 0.3 milligrams per liter (mg/L) in the following wells: MW-03, MW-05, MW-06S, MW-07, MW-10, MW-12, MW-15, and MW-26, with concentrations ranging from 0.311 mg/L (MW-15) to 3.03 mg/L (MW-05). In addition, dissolved iron was detected in MW-09 at 0.109 mg/L, MW-17 at 0.163 mg/L, MW-19 at 0.114 mg/L, and MW-22 at 0.0742 mg/L, below the WDNR ES of 0.3 mg/L. A minor increase in iron concentrations was observed both at the plume interior wells and at the perimeter wells in 2009 and 2010. Elevated iron concentrations are an indicator of natural attenuation; therefore, the elevated concentrations suggest natural attenuation is occurring.

2.2.6.4 Manganese

In May and October 2010, dissolved manganese exceeded the WDNR ES of 0.05 mg/L at 6 wells (MW-05, MW-07, MW-10, MW-12, and MW-19) ranging from 0.0632 mg/L (MW-07) to 12.6 mg/L (MW-05). An additional 2 monitoring wells (MW-03, and MW-06S) had dissolved manganese detected at concentrations ranging from 0.012 mg/L to 0.0167 mg/L below the WDNR ES of 0.05 mg/L. Elevated manganese concentrations are an indicator of natural attenuation. Both plume interior wells and perimeter wells reported slightly higher manganese concentrations in 2010 than 2009. The increase in manganese concentrations in wells throughout the site suggests that natural attenuation is occurring.

2.2.6.5 Zinc

Dissolved zinc was not detected in any of the monitoring wells sampled.

2.2.7 Natural Attenuation Parameters

Natural attenuation is a remediation approach that relies on natural processes that work to reduce mass and concentration of contaminants in soil and groundwater. Natural attenuation processes include dispersion, dilution, abiotic transformation, volatilization, sorption, and biodegradation. Biodegradation is often the most important process for compounds that can be transformed or reduced by indigenous microorganisms.

Appendix B contains a table presenting the natural attenuation parameters for each well as measured for the past 5 years.

2.2.7.1 Oxidation/Reduction

Evaluation of the data generated during 2010 suggested that areas at the perimeter or outside the PCP plume are under slight to strong oxidizing conditions as shown by elevated oxidation-reduction potential (ORP). The ORP levels in 2010 are decreasing from 2009; however, they are still within the range where reductive dechlorination can occur. ORP measurements at wells in the most concentrated area of the PCP plume (greater than 1,000 µg/L) have not been able to be measured because of the possibility of LNAPL affecting the field measurements. It is expected that the wells within the most concentrated area of the PCP plume would exhibit reducing conditions. This is supported by reducing conditions measured in MW-5, located near the fringe of the PCP plume.

2.2.7.2 Chloride

Elevated chloride concentrations are an indicator of PCP degradation. About 700 µg/L of chloride is produced for each 1,000 µg/L of PCP degraded. Generally, chloride is higher at the plume interior wells than at the perimeter wells. In 2010, the semiconfined wells had chloride levels ranging from 11.6 mg/L (MW-17) to 67.2 mg/L (MW-03). The unconfined wells ranged from 0.56 mg/L (MW-02) to 20.4 mg/L (MW-26 which is located near the infiltration basin). Historically, MW-03 and MW-21 reported the highest chloride levels, possibly because of their proximity to the highway where influence from seasonal road salting may have caused elevated chloride concentrations.

Since the beginning of groundwater extraction, correlation between PCP degradation and chloride production has been difficult because, as chloride is produced, it is removed by the extraction system, creating a net effect that is difficult to discern.

2.2.7.3 Nitrate

In 2010, nitrate levels remained relatively low, ranging from nondetectable (less than 0.1 mg/L) to 6.94 mg/L (MW-06S), and remaining comparable to concentrations observed in 2009.

2.2.7.4 Methane

Methane, a product of anaerobic degradation, was detected in four wells in October 2010 (MW-03, MW-05, MW-07, and MW-10) at low concentrations ranging from 0.0016 to 0.0280 mg/L and one well in May 2010 (MW-19) at a concentration of 0.0014 mg/L. The absence of methane at or above the detection limit in most wells suggests that degradation is occurring primarily under nonmethanogenic, anaerobic, or sulfate-reducing conditions.

2.2.7.5 Sulfate

Once oxygen and nitrate are depleted, sulfate can also be used as an electron acceptor. Sulfate continues to fluctuate within the plume and has not shown any clear trends. Sulfate levels in 2010 were similar to previous years.

2.2.8 Groundwater Quality near the Infiltration Basin

Large quantities of treated groundwater have been discharged at the site's infiltration basin since the beginning of operation. Approximately 155 million gallons (MG) of groundwater have been re-infiltrated from 2000 through 2010. The water would be expected to displace

groundwater over a considerable area. The re-infiltration of the treated groundwater helps to maintain a water balance to offset the extracted volume of water.

2.2.8.1 Unconfined Aquifer

MW-26 is used to determine the effects that the infiltration basin has on the unconfined aquifer in the area. PCP, methane, nitrate, iron, and manganese concentrations in MW-26 have remained similar to background levels, as would be expected for the discharge of treated groundwater. Sulfate concentrations have increased from a background value of less than 10 mg/L to a high of 2,360 mg/L in June 2009, but in the most recent samples collected in October 2010 the sulfate levels were 232 mg/L.

The water discharged at the infiltration basin had been previously extracted from an area of high PCP concentrations and treated to remove dissolved PCP. Chloride does not change significantly during the treatment of the extracted groundwater. A baseline chloride concentration was not measured in MW-26 before the operation of the groundwater treatment system. However, chloride concentrations decreased from 30 mg/L in 2001 to 11 mg/L in 2003 while the treatment system was shut down for renovations. Chloride concentrations increased after the treatment system was restarted in 2004, and have ranged from 17 to 203 mg/L, with the most recent concentration of 20.0 mg/L in October 2010.

2.2.8.2 Semiconfined Aquifer

MW-17 is used to determine the effects of the infiltration basin on the semiconfined aquifer. MW-17 is sampled annually for PCP and natural attenuation parameters. PCP, methane, manganese, and iron in MW-17 have remained similar to background levels. Nitrate concentrations dropped in 2009 because the source area groundwater has minimal nitrate; however they increased to 5.18 mg/L in 2010 which is similar to the levels experienced from 2005-2008. Sulfate concentrations have remained close to the background value of 10 mg/L as 9.68 mg/L. The water discharged at the infiltration basin was extracted from an area of high PCP concentrations and treated to remove dissolved PCP. Chloride does not change significantly during the treatment of the extracted groundwater. The background chloride level of 4.8 mg/L measured in 1997 has increased to 11.6 mg/L in October 2010.

Another benefit of re-infiltrating groundwater is that treatment results in aeration and re-oxygenation of the groundwater. Dissolved oxygen has generally increased in MW-17. A groundwater divide in the semiconfined aquifer exists at the location of the infiltration basin; therefore, a portion of this oxygenated water should flow towards the extraction wells and the PCP plume and provide a supply of oxygen for aerobic biodegradation of the PCP.

2.3 Summary

Groundwater treatment system operation and optimization has led to continuous capture of site contaminants. Similar to previous years, the capture zone can be observed in potentiometric surface maps from data collected in May 2010 and October 2010, in both the unconfined and semiconfined aquifers.

LNAPL is present in four unconfined aquifer wells (MW-10S, MW-18, MW-19, and MW-20) and was at its greatest thickness in late 2009 and early in 2010. In October 2010, the LNAPL thicknesses in the wells declined. The reductions in NAPL thickness could be impacted by a

rebounding water table but reductions in thickness may have also been related to optimized NAPL removal from site recovery wells.

Results from the residential well and potable well sampling in May 2010 and October 2010, indicate that PCP, BTEX, or naphthalene are not present in any residential wells or in the onsite potable well.

Large reductions in PCP concentrations in wells in the unconfined aquifer parallel the reduction in NAPL, this is evidence that reduction in the PCP source is occurring at the site. Historically the PCP plume exceeding 1,000 µg/L has been relatively stable in the unconfined aquifer centered on the CAMU but in October 2010 has been reduced in size. The 1 µg/L plume in the unconfined aquifer has shrunk significantly since 1994, where it extended to MW-13 and currently occupies nearly the same footprint as the 1,000 µg/L plume.

The PCP plume in the semiconfined aquifer shrunk significantly in recent groundwater events. The 1,000 µg/L completely disappeared in the 2009 plume map because of the rapid decline of concentrations in wells MW-12 and MW-10. The 1-µg/L plume in the semiconfined aquifer has shrunk significantly over time and now appears only around the CAMU area where the highest PCP contamination is present. The declining trends in the semiconfined aquifer continued in 2010, levels of PCP declining by up to 85 percent from the same time last year.

There has been a significant reduction in PCP concentrations that can be observed through the steady decline of influent concentrations of the treatment system. There have also been large PCP and LNAPL mass removals as a result of treatment system operation. These topics are discussed in detail in Sections 3 and 4. Rapid reductions in PCP in the unconfined aquifer and reduction of NAPL thickness show evidence of a reduction in the source at the site. Naphthalene and BTEX are also in decline in several wells in the area of elevated PCP. Evaluation of the natural attenuation parameters revealed similar conditions to those in 2009.

2.4 Recommendations

It is recommended that the reduced sampling program be continued in 2011. Two new monitoring wells were installed in 2011 and will replace the two monitoring wells in areas on the south side of the site (MW-27 and MW-28) that frequently have low water levels. We are also recommending that MW-20 be sampling during October 2011 sampling event to confirm reduction seen in PCP during 2010. Three new extraction wells (EW-12, EW-13, and EW-14) being installed in late 2010 to early 2011 will be operated to increase LNAPL extraction.

SECTION 3

Treatment System Operation and Maintenance

The treatment system at the Penta Wood Products Site consists of groundwater extraction and treatment, LNAPL recovery, and bioventing. The groundwater extraction system extracts and treats groundwater containing dissolved phase PCP and depresses the groundwater table exposing more of the LNAPL smear zone. The bioventing system was installed to provide oxygen for the aerobic biodegradation of residual diesel fuel petroleum hydrocarbons and PCP in the LNAPL smear zone. The depressed groundwater table also causes the LNAPL to pool near the LNAPL extraction wells.

Groundwater treatment system discharge monitoring is performed in accordance with the WPDES permit dated November 2007.

The following sections describe the performance and activities related to the operation of the groundwater extraction and bioventing system.

3.1 Groundwater Extraction System

The groundwater extraction system was operated between September 27, 2000, and September 27, 2001. After 1 year of operation, the system was shut down and the groundwater treatment system was redesigned to include additional pretreatment. The groundwater treatment system was restarted on February 27, 2004, after construction activities were completed. The groundwater treatment system operated intermittently from February to mid-July 2004, and began consistent operation starting in late July 2004. From 2004 through 2010 the extraction system operated consistently with the exception of shutdowns for routine maintenance and service or as a result of system alarms.

The following section describes the groundwater extraction system performance, which includes the estimates of groundwater and PCP extracted, operational and maintenance items, and a discussion of the LNAPL and groundwater extraction wells.

3.1.1 Groundwater Extraction and LNAPL Removal Performance

The estimated PCP mass removed from the groundwater in 2010 was approximately 301 pounds and 7,774 pounds since the groundwater extraction began in 2000 (Table 4).

In addition to the PCP mass removed through groundwater extraction, PCP mass is removed through the extraction of LNAPL. The volume of liquid waste that was extracted through the LNAPL recovery system can be used to make a rough estimate of the mass of PCP removed by LNAPL extraction. The plant recovered approximately 41,463 gallons of liquid waste in the separator through 2010. The liquid waste was disposed of offsite. Before 2008, approximately one half of the liquid waste was water. Continued optimization resulted in relatively pure waste oil being removed from the subsurface and disposed of offsite. Assuming an LNAPL density of 0.84 grams per cubic centimeter (g/cm^3) and a PCP

concentration of 5 percent, this volume equates to about 943 pounds of PCP present in LNAPL removed in 2010 (Table 5).

TABLE 4
PCP Mass Removed with the Groundwater Extraction System
Penta Wood Products Site

Operation Period	Volume of Groundwater Extracted (gallons)	Average PCP Influent Concentration (µg/L)	PCP Mass Removed (lbs)
09/27/00 to 12/18/00	11,712,960[a]	12,535	1,224
02/02/01 to 02/08/01	691,200[a]	12,535	72
03/16/01 to 06/10/01	9,288,000[a]	10,356	802
06/15/01 to 09/27/01	6,822,720[a]	7,535	429
	Total PCP Mass Removed from 2000 to 2001		2,527
02/27/04 to 12/31/04	18,548,154	9,227	1,427[b]
01/01/05 to 12/31/05	21,374,796	7,300	1,301[b]
01/01/06 to 12/31/06	14,759,392	6,425	791[b]
01/01/07 to 12/31/07	16,551,336	3,557	491
01/01/08 to 12/31/08	18,118,696	3,255	492
01/01/09 to 12/31/09	18,533,648	2,883	445
01/01/10 to 12/31/10	18,561,632	1,948	301
		Total PCP Mass Removed 2000 to 2010	7,774

Notes:
[a] Volumes are estimated
[b] Values were revised based on measured volumes. Values previously reported were based on estimated volumes.

TABLE 5
PCP Mass Removed from the Free Product Recovery System
Penta Wood Products Site

Operation Period	Amount of Liquid Extracted (gal)	Amount of NAPL Extracted (gal)	Amount of Fuel Oil Removed[c] (gal)	Amount of PCP Removed[d] (gal)	Amount of PCP Removed[d] (lb)
2004	7,640	3,820 [a]	3,629	191	1,338
2005	3,404	1,702 [a]	1,617	85	596
2006	7,550	3,775 [a]	3,586	189	1,322
2007	11,079	5,540 [a]	5,263	277	1,940
2008	4,002	4,002 [b]	3,802	200	1,402
2009	5,090	5,090 [b]	4,836	255	1,783
2010	2,716 [e]	2,716 [b]	2,580	136	951
			25,312	**1,332**	**9,333**

Notes:
[a] Assumes 50% of the extracted liquid is LNAPL
[b] Assumes 100% of the extracted liquid is LNAPL based on system optimization and observations of waste in storage tank.
[c] Assumes LNAPL is 95% of the fuel oil.
[d] Assumes LNAPL is 5% PCP.
[e] Includes LNAPL recovered with absorbent socks.

In accordance with WPDES permit, PCP concentrations in the influent were measured quarterly and are summarize in Table 6.

The remaining PCP mass in the aquifer matrix is adsorbed on the aquifer matrix, dissolved in the groundwater, and present as in the LNAPL residual zone. The estimated LNAPL remaining in the aquifer matrix (such as soil) and dissolved in the groundwater is shown in Table 7. The estimated PCP mass remaining in the LNAPL is shown in Table 8. It should be noted that the contaminant mass estimates are based on many simplifying assumptions and expected to be accurate only to within a one order-of-magnitude range. As a result, the estimates are intended for general comparisons of the relative significance of contaminant mass in different media. Table 8 summarizes the PCP mass estimates (remaining and removed) for 2010.

Since the system was restarted in 2004, the system extracted over 126 MG of groundwater, or approximately 6 pore volumes. In 2010, the system extracted over 18 MG (over 1 pore volume) and groundwater extraction rates averaged 50 gallons per minute (gpm) while the system was operating. The effective extraction rate over 2010, which includes time when the extraction wells were not operating, was 39 gpm. With consistent operation, the groundwater extraction system maintained capture of the PCP plume as discussed in the previous section.

Installation of three new LNAPL and groundwater wells began in 2010 and will be completed in early 2011. The new extraction wells were placed with the LNAPL zone to provide additional LNAPL removal. The pumping rate for LNAPL was optimized in 2008 and 2009 and the greatest amounts of LNAPL ever pumped were from these years. Greater LNAPL recovery with the three new wells will significantly contribute to decreasing the PCP plume. The 3 new pumps will increase the average extraction rate to approximately 69 gpm while the system is operating.

TABLE 6
Quarterly PCP Influent Concentrations
Penta Wood Products Site

Date	Influent PCP Concentration (µg/L)
March 2010	2,050 J
June 2010	1,970
September 2010	1,830
December 2010	1,940

J – Analyte detected below quantitation limits

As a result of the system operation, there has been a significant reduction in the annual average PCP influent concentrations since the system was initially started in 2004 (result in November 2004 was 9,140 µg/L).

3.1.2 Groundwater Treatment System Operation and Maintenance

Continued groundwater treatment system optimization since 2008, led to a reduction in carbon changeout frequency, eliminating the need for partial carbon changeouts, and decreasing disposal costs. Optimization of the dosage and monitoring of the pretreatment

chemical addition resulted in reduced solids loading to the carbon vessels and extended the operating time between carbon changeouts. The treatment system can operate 16 to 20 weeks and treat 8.0 MG of water before requiring changeout of the lead carbon vessel. In 2007, carbon changeouts on the lead 10,000-pound carbon vessels were required every 4 to 5 weeks and typically only treated 2.5 MG of water because of excessive pressure loss in the carbon vessels. The pressure loss was because of solids accumulating in the upper portion of the vessel and resultant clogging of the carbon pore spaces. A total of two carbon changeouts were completed in 2010.

3.1.3 LNAPL Extraction Wells Operation and Maintenance

LNAPL removal performance was improved by routinely adjusting the LNAPL pump depth to account for water level fluctuations. The LNAPL pumps have the intake at the top of the pumps and if the water level changes significantly, the pump depth may be too deep or shallow and pump only water or not pump at all. Therefore, the LNAPL pumps were raised or lowered on a monthly basis in 2010, to ensure the pump was at the appropriate depth within the extraction well.

TABLE 7
Estimate of PCP Mass Remaining in Soil and Groundwater for 2010
Penta Wood Products Site

Contaminant	Parameter	Unconfined MW-10S, 19, 20 (Area 1)[a]	Unconfined MW-6S, PW01 (Area 2)	Unconfined MW-3 (Area 3)	Unconfined MW-16 (Area 4)	Semiconfined MW-5,10,18 (Area 1)	Semiconfined MW-6, PW-01 (Area 2)	Semiconfined MW-3 (Area 3)	Semiconfined MW-12 (Area 4)	Total Contaminant Mass (lb)
	Aquifer Media Volume (ft^3):	3,540,000	2,790,000	1,800,000	6,100,000	5,900,000	4,650,000	3,000,000	10,200,000	
	Aquifer Water Volume (ft^3):	1,416,000	1,116,000	720,000	2,440,000	2,360,000	1,860,000	1,200,000	4,080,000	
Mass in 2010 (6^{th} Year Following Groundwater Extraction System restarted in February 2004) Based on Groundwater Sampling in October 2009										
PCP	Conc. (µg/L)	26.00				92.4			43.7	
K_d[b] = 0.60	Mass in soil (lb)	6,134	0	0	0	36.3	0	0	29.7	6,200
	Mass in GW (lb)	2,292	0.0	0.0	0.0	13.6	0.0	0.0	11.1	2,317
	Total Mass (lb)	**8,426**	**0.0**	**0.0**	**0.0**	**49.9**	**0.0**	**0.0**	**40.8**	**8,517**

Notes:
[a] LNAPL product present in all three wells in this subarea.
[b] K_d from Hydrogeologic Investigation, December 1994.

Contaminant mass estimates are based on many simplifying assumptions and are expected to be accurate only to within a one order-of-magnitude range. As a result, they are intended as general comparisons of the relative significance of contaminant mass in different media.

Soil density = 1.78 g/cm^3; ft^3 = cubic feet; GW = groundwater

TABLE 8
Summary of 2010 PCP Mass Estimates
Penta Wood Products Site

Penta Wood Products Site	PCP Mass (lb)	Notes
PCP Mass Remaining		
LNAPL Residual Zone	6,000	Based on original mass less the mass estimated from recovered LNAPL.
Soil (Saturated zone – Adsorbed)	6,200	Based on groundwater concentration and a PCP K_d of 0.6.
Groundwater (saturated zone – dissolved)	2,300	Based on weighted average groundwater concentrations.
Total PCP Mass Remaining	14,500	
PCP Mass Removed		
Removed by LNAPL Recovery System through 2010	9,333	Assuming LNAPL is 5% PCP and based on actual LNAPL recovered.
Removed by GW Extraction System through 2010	7,774	Estimate was revised based on actual GW extraction volumes and concentrations from 2004 through 2010 (see Table 4).
	17,107	

Note: Remaining contaminant mass estimates are based on many simplifying assumptions and are expected to be accurate only to within a one order-of-magnitude range. As a result, they are intended as general comparisons of the relative significance of contaminant mass in different media.

3.2 Bioventing System

The bioventing system was installed to provide oxygen for the aerobic biodegradation of residual diesel fuel petroleum hydrocarbons and PCP in the LNAPL smear zone. As the groundwater extraction system extracts and treats groundwater containing dissolved phase PCP, the groundwater table is depressed, which exposes more of the LNAPL smear zone to the air supplied by the bioventing system.

The bioventing system was first started September 24, 2007. Due to the increases of methane and the frozen ground surface (which prevents upward release of the methane and may result in a lateral spreading of the methane to nearby residences), the biovent system is shut down during the winter months. The system is restarted after the spring ground thaw. In June 2009, the biovent operation was modified to reduce the operating time to 5 days per month. Evaluation of the monitoring data showed that oxygen levels can reach saturation levels within the first several days of blower operation in the majority of the unsaturated zone and during 1 month of not operating, only a small decrease in the oxygen levels are observed. The effectiveness of the biovent, therefore, is not compromised by this pulsed operation, which can provide a reduction in operation costs through the lowered energy consumption. Under these parameters, the biovent system was restarted on May 20, 2010, and operated 5 days per month through October 22, 2010, when the bioventing system was shut down for the winter.

3.2.1 Soil Gas Monitoring

Since startup of the bioventing system, carbon dioxide and methane levels have decreased in the bioventing wells; however, the oxygen levels at SG-07S and SG-22 located within the wood chip area have remained at low percentages relative to the other monitored wells. Intermediate wells, deep wells, and shallow wells located outside of the wood chip area have exhibited similar changes in gas composition including increasing oxygen levels and decreasing carbon dioxide levels throughout the months of bioventing activity. Oxygen has generally stabilized for each well at approximately 20 percent. Methane has not been detected or has been found at low concentrations in these wells after the initial startup. No major temperature changes have been observed that would cause concern for a potential fire hazard. Table 9 provides a summary of the baseline measurements prior to startup, measurements right after the biovent system was turned on after the winter, and measurements one month prior to winter shutdown.

TABLE 9
Bioventing System Soil Gas Measurement Summary
Penta Wood Products Site

Well ID	O_2 (%)			CO_2 (%)			CH_4 (%)		
	Baseline (09/21/07)	Startup from Winter Shutdown (05/20/10)	1 Month Prior to Winter Shutdown (09/20/10)	Baseline (09/21/07)	Startup from Winter Shutdown (05/20/10)	1 Month Prior to Winter Shutdown (09/20/10)	Baseline (09/21/07)	Startup from Winter Shutdown (05/20/10)	1 Month Prior to Winter Shutdown (09/20/10)
Shallow									
SG-04S	21.2	19.3	20.8	0.1	0.2	0.2	0.1	0.0	0.0
SG-05S	17.8	17.6	20.9	1.7	0.5	0.0	0.0	0.0	0.0
SG-06S	17	20.0	20.8	2.3	0.0	0.1	0.0	0.0	0.0
SG-07S	4.3	1	0	28.5	27.1	35.6	14.1	21.4	22.4
SG-22	0.9[a]	0.5	13.6	27.3	23.9	10.2	18.3[a]	7.6	5.9
Intermediate									
SG-04I	1.4	9.2	20.8	14.9	3.5	0.4	0.0	0.0	0.0
SG-05I	9.2	17.2	20.9	8.1	0.4	0.0	0.0	0.0	0.0
SG-06I	12.8	19.7	20.8	5.5	0.0	0.1	0.0	0.0	0.0
SG-07I	12.5	14.9	19.6	7.9	1.7	0.8	0.0	0.1	0.1
Deep									
SG-04D	1.7	6.7	20.7	14.6	7.4	0.5	0.0	0.0	0.0
SG-05D	1.6	17	20.9	14.7	0.5	0.0	0.0	0.0	0.0
SG-06D	6.1	19.3	20.3	11.7	0.4	0.3	0.0	0.0	0.0
SG-07D	2.0	15	19.3	16.5	2.1	0.9	0.0	0.1	0.1
Perimeter									
SG-23 (3 feet)	18.3	20.6	20.6	1.7	0.0	0.0	0.0	0.0	0.0
SG-24 (5 feet)	19.1	20.4	20.5	0.7	0.3	0.6	0.0	0.1	0.0
SG-25 (5 feet)	17.9	20.6	--	2.3	0.0	--	0.0	0.0	--
SG-26 (5 feet)	21.3	20.4	20.9	0.0	0.0	0.0	0.0	0.0	0.0

3.2.2 Soil Sampling

Soil samples were collected in 2010 to measure the remaining concentration of PCP and total petroleum hydrocarbons from within areas of the unsaturated and groundwater smear zones. The soils were collected at the extraction well locations installed to examine the soils and lithology prior to installation of the wells. The shallow samples were collected from within identified fill areas or non-native soils, specifically targeting woodchips if present. The intermediate samples were collected from 10 to 70 feet within the unsaturated zone. The deep samples were collected within 5 to 8 feet of the water table collecting samples from the NAPL smear zone and were collected on average from 70 to 100 feet below ground surface. The samples locations were selected based on high photoionization detector readings within each designated zone. Three samples were collected from EW-12, EW-13, and EW-14 each. The soil samples were analyzed for total petroleum hydrocarbons and pentachlorophenol.

In 1998, initial soils samples were collected prior to the excavation and construction of the CAMU but within the final CAMU footprint. Soil samples were also taken from soil gas monitoring wells that have since been abandoned and reinstalled in different locations. Soil gas wells SG-01, SG-02, SG-04, SG-05, SG-07, and SG-08 were located very close to where the new extraction wells are located. Following the initial soil sampling, the CAMU was constructed; therefore, comparison of historic soil samples to current soil samples needs to consider the changes in top of ground surface elevation

The construction of the CAMU include placement of wood chips over native soils. The shallow soil samples collected in 1998 were collected from within the native soils while the shallow soil samples collected in 2010 were collected from within the woodchip fill. A depth of 5 ft in 1998 more properly corresponds to a depth of approximately 15 feet in 2010 post-construction. Because the samples collected are from different soils, the results from the 1998 (Table 10) and 2010 shallow soil samples (Table 11) are not considered directly comparable.

The results for shallow samples (0 to 10 feet), intermediate samples (10 to 70 feet) and deep samples (70 to 100 feet) are summarized in Tables 11, 12, and 13, respectively.

TABLE 10
Shallow Depth Analytical Results—1998
Penta Wood Products Site

Location	Date	Depth Below Ground Surface (feet)	% Moisture	PCP (µg/Kg)	Diesel Range Organics (mg/Kg)
1998 Analytical Results					
SG-1	Feb-98	5		1,300,000	18,000
SG-4	Feb-98	5		160,000	1,100
SG-7	Feb-98	5		970,000	19,000
SG-1	Apr-98	5	22.7	1,290,000	18,000
SG-4	Apr-98	5	7.6	157,000	1,100
SG-7	Apr-98	5	41.1	973,000	19,000

Note: Shallow soil sample were collected from native soils

TABLE 11
Shallow Depth Analytical Results—2010
Penta Wood Products Site

Location	Date	Depth Below Ground Surface (feet)	% Moisture	PCP (µg/Kg)	Diesel Range Organics (mg/Kg)	Gasoline Range Organics (mg/Kg)
2010 Analytical Results						
EW-12	Dec-10	06-07	16.8	96,900	1,510	127
EW-13	Dec-10	06-07	12.9	6,350	406	45.2
EW-14	Dec-10	04-05	18.3	<45	<23.9	3.7J

Note: Shallow soil sample were collected from within the CAMU woodchip fill soils.

TABLE 12
Intermediate Depth Analytical Results
Penta Wood Products Site

Location	Date	Depth Below Ground Surface (feet)	% Moisture	PCP (µg/Kg)	Diesel Range Organics (mg/Kg)	Gasoline Range Organics (mg/Kg)
2010 Analytical Results						
EW12	Dec-10	68-69	2.29	1,770	95.1	8.49
EW12 (duplicate)	Dec-10	68-69	13.4	114,000	1,660	185
EW13	Dec-10	55-54	8.1	<30	<11.3	<2.54
EW14	Dec-10	76-77	67.1	2530	<58.1	<11.8
1998 Analytical Results						
SG-2	Feb-98	40		180,000	1,000	
SG-5	Feb-98	40		160,000	1,900	
SG-8	Feb-98	40		350,000	6,800	
SG-2	Apr-98	40	7.4	179,000	1,000	
SG-5	Apr-98	40	6.5	155,000	1,900	
SG-8	Apr-98	40	4.4	317,000	7,300	

The PCP concentrations measured in 2010 in the intermediate soil zone are all significantly less than the initial PCP concentrations in 1998.

TABLE 13
Deep Depth Analytical Results
Penta Wood Products Site

Location	Date	Depth Below Ground Surface (feet)	% Moisture	PCP (µg/Kg)	Diesel Range Organics (mg/Kg)	Gasoline Range Organics (mg/Kg)
2010 Analytical Results						
EW12	Dec-10	96-97	8.91	23,900	151	96
EW13	Dec-10	100-101	5.43	6,250	105	16.7
EW14	Dec-10	103-104	5.78	<39.4	<20.2	<4.78

There were no deep samples taken in 1998 and therefore the 2010 data cannot be compared to an initial concentration. During installation of the three extraction wells a noticeable sheen was observed on drilling fluid once the water table was reached and there were visibly contaminated soils within the smear zone, but they did not appear saturated with LNAPL.

3.2.3 Bioventing System Operation and Maintenance

Process measurements, such as air injection well flow rates and pressures, and vacuum before and pressure after the air injection blower are monitored periodically during the biovent operation. Measured pressures in each well stabilize at approximately 1 pound per square inch. Air flow rates for the deep bioventing wells (EW-02, EW-03, EW-04, EW-05, EW-06, and EW-07) were set between 300 and 430 standard cubic feet per minute (scfm). Air flow rates for each of the shallow bioventing wells (BV-08 and BV-09) were set at approximately 160 scfm. Deep wells were designed for a maximum flow of 500 scfm and shallow wells for a maximum of 200 scfm.

The biovent system was restarted on May 20, 2010, after the spring ground thaw. The system was shut down for the winter on October 22, 2010.

3.3 Summary

The groundwater extraction system operated from January 2010 through December 2010. More than 18 MG of groundwater, or over 1 pore volume, were removed from the extraction zone in 2010. An estimated 1,252 pounds of PCP were removed through the combination of LNAPL recovery (951 pounds) and dissolved-phase PCP from groundwater (301 pounds). Continued attention to optimization of system operations has led to increased operation of the groundwater extraction system and enhancement of the groundwater capture. The capture zone observed in 2008 was maintained in 2010.

The bioventing system operated for approximately 6 months in 2010. During that time, shallow wells within the wood chip area indicated decreases in methane and carbon dioxide concentrations, but oxygen concentrations increased only slightly in these wells. The intermediate and deep wells, and shallow wells located outside of the wood chip area exhibited similar changes in gas composition with each other and followed the pattern of increasing oxygen levels and decreasing carbon dioxide levels throughout the months of

bioventing activity. Oxygen generally stabilized for each well at approximately 20 percent. Methane was not detected or was found at low concentrations in all of the wells.

The bioventing system was shut down for the winter because of concerns about methane migration with the frozen ground surface. However, based on the relatively low oxygen utilization rate observed during previous years, the oxygen is not expected to drop below the 5 percent minimum level for aerobic biodegradation in the deep and intermediate zones while the bioventing is down for the winter months.

Influent concentration of PCP from the groundwater extraction wells has declined over time from approximately 8,000 µg/L in 2004 to approximately 1,948 µg/L in 2010 resulting in an overall decline in mass of PCP removed from the groundwater extraction. The total amount of PCP removed from the environment by the LNAPL recovery and groundwater extraction systems through 2010 is nearly 18,000 pounds. A majority of this mass is estimated to be recovered from the LNAPL.

Erosion at the site has been almost entirely halted although erosion controls will need to be monitored this spring to prevent runoff from work that was completed in conjunction with the extraction well installation.

3.4 Recommendations

The bioventing system should continue to operate in 2011, in conjunction with the LNAPL recovery to maximize the biodegradation of LNAPL in the unsaturated zone. Installation of the three new extraction wells will be completed in 2011, and the wells will be started. Soil gas monitoring will be performed and the bioventing system will be restarted in the spring after snow melts and the ground thaws. Soil gas measurements will be monitored during startup of the bioventing system in the spring and will then be measured at the start of the monthly operation.

Opportunities for continued optimization of the groundwater extraction and treatment system and LNAPL recovery operations will be evaluated throughout the year. The treatment system will continue to run through 2011.

SECTION 4

Waste Generation and Disposal Summary

The RA activities at the site result in the generation of hazardous waste. Hazardous waste management procedures for the Penta Wood Products Site (USEPA ID No. WID006176945) are outlined in the *Waste Handling Plan* (CH2M HILL 2005). Table 14 summarizes the amount and type of waste generated in 2010.

TABLE 14
2010 Detailed Hazardous Waste Generation Summary
Penta Wood Products Site

Manifest #	Date	Filter Cake (lbs)	Carbon (lbs)	LNAPL (lbs)	Yearly Total (lbs)
003862611JJK	1/13/2010	27,140			
003862613JJK	1/13/2010		26,783		
006641785JJK	2/9/2010	29,620			
006641787JJK	3/16/2010	31,240			
006646524JJK	3/19/2010			4,987	
006988705JJK	6/1/2010		28,378		
006988911JJK	6/2/2010	36,400			
006989157JJK	7/14/2010	33,600			
006989158JJK	8/25/2010	23,760			
007690264JJK	9/9/2010		26,066		
007691983JJK	10/18/2010	29,180			
2010 Total (lbs):		210,940	81,227	34,937	327,104

Table 15 summarizes the amount of waste generated and disposed of offsite from 2000 to 2010.

TABLE 15
Hazardous Waste Generation Summary
Penta Wood Products Site

Date	Filter Cake (lbs)	Misc. Debris (lbs)	Carbon (lbs)	LNAPL (lbs)	Water (gal)	Yearly Total (lbs)
2000	0	200	6,000	5,009*		11,209
2001	0	400	56,100	6,166*		62,666
2002	0	1,400	48,000	10,790*	27,756	87,946
2003	0	600	0	3,083*	1,376	5,059
2004	155,960	3,200	102,000	53,522*		314,682

TABLE 15
Hazardous Waste Generation Summary
Penta Wood Products Site

Date	Filter Cake (lbs)	Misc. Debris (lbs)	Carbon (lbs)	LNAPL (lbs)	Water (gal)	Yearly Total (lbs)
2005	178,800	1,290	104,987	23,847*		308,924
2006	112,640	1,200	136,520	52,892*		303,252
2007	174,020	2,200	263,552	77,615*		517,387
2008	211,402	3,176	70,007	28,036		312,621
2009	233,840	1,116	49,757	35,659		320,372
2010	210,940	0	81,227	34,937		327,104

Notes:

*Volume shows represents amount disposed of offsite and is estimated to be approximately 50% pure LNAPL and 50 percent mixture of water and emulsified LNAPL.

The optimization of the extraction and treatment system and LNAPL recovery system has impacted the hazardous waste generated at the site per year. The amount of carbon disposed of in 2010 includes a carbon changeout from 2009; therefore, the disposed mass is greater than the mass changed out in 2010. The frequency of carbon changeouts in 2010 stayed the same as in 2009. The amount of filter cake generated is directly related to the amount of water treated and has increased since production began because of the increased volume of water being treated by the system. The amount of LNAPL disposal removed in 2010 is about the same volume as the LNAPL removed in 2009. The large amount is due to the improved maintenance on the extraction pumps and larger thickness of LNAPL because of containment efforts and declining water levels.

SECTION 5

Site Inspection and Maintenance

5.1 Community Relations

No community relations issues were encountered in 2010. The fire and police department from Burnett County visited the site on October 18, 2010, to tour the plant and become familiar with the operations.

5.2 Site Condition

Trees planted on the east side of the property in 2008 continued to be watered and fertilized. A few trees were lost over the 2009 winter; however, it was estimated that there was an overall 75 percent survival rate. In 2010, the trees continued to have a high survival rate. Erosion at the site was almost entirely halted because of erosion control features that are maintained on the site. Additional grass seed and fertilizer is placed around the site to increase the vegetative cover. The grass around the monitoring well, bioventing wells, and extraction wells was also mowed to maintain accessibility in more frequently travelled areas and to minimize biological hazards in these areas.

The extraction well installation and connection to the treatment system required the use of many trucks, drill rigs, and heavy equipment during the winter months at the site. Gravel was placed on the CAMU to minimize damage to the soil cover. Final site restoration following construction activities was delayed until the snow melted.

5.3 Health and Safety

A Health and Safety audit was performed on August 26, 2010. The following are protective measures undertaken following the health and safety audit:

- Items in the laboratory were inspected and labeled.
- All plastic fuel storage containers were placed into the fire cabinet. The kerosene can was replaced with one that has a safety cap. Other old fuel storage containers without safety caps were moved to the mezzanine but marked with permanent marker "DO NOT USE."
- The Health and Safety Plan was updated with hazard communication attachment.
- Labels updated for electrical components in compliance with NFPA 70E.
- Calibration information for monthly air monitoring is to be documented on the daily log (instrument name, serial number, precalibration results).
- First-aid kit was inspected, and all necessary items were replaced.
- New 20-pound fire extinguisher was installed outside near the propane tank.

- Utility knives were removed.
- An Activity Hazard Analysis was located for mowing.
- Ensured Activity Hazard Analyses were reviewed by the health and safety manager.
- Turbidity meter wiring was secured for hard wire power supply.
- Extension ladder was repaired.
- Tornado shelter was identified.
- Ensured that all operator training was complete.
- Relocated sign indicating hearing protection required in granulated activated carbon room in front of door.

5.4 Recommendation

Health and safety audits should be performed in 2011, to proactively review site operations and evaluate compliance with the health and safety procedures and regulatory requirements.

Final site restoration will be performed by HIS Constructors in the spring of 2011. The site driveway will also be inspected and may require maintenance, including additional material and regrading. The area to the west of the treatment building has few trees; therefore, additional red and white pine trees will be planted in 2011.

SECTION 6

References

CH2M HILL. 1998. *Feasibility Study Report.* Penta Wood Products RI/FS.

CH2M HILL. 2000. *Sampling and Analysis Plan.* Revised April 2001.

CH2M HILL. 2005. *Waste Handling Plan.*

Appendix A
Analytical Results

Penta Wood
Volatile Results
May 2010 Groundwater Samples - Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-09	MW-12	MW-12	MW-15	MW-19	MW-22	MW-26
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		5/18/2010	5/19/2010	5/19/2010	5/18/2010	5/20/2010	5/18/2010	5/19/2010
Field Sample Identification:		10CP24-14	10CP24-15	10CP24-16	10CP24-18	10CP24-19	10CP24-20	10CP24-21
Laboratory Sample Identification:		10050516-01B	10050550-03A	10050550-04A	10050516-03B	10050550-06A	10050516-05B	10050550-02A
Volatile Organic Compounds	**Units**							
BENZENE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ETHYLBENZENE	ug/l	5.0 U	5.0 U	5.0 U	5.0 U	7.95	5.0 U	5.0 U
TOLUENE	ug/l	5.0 U	5.0 U	5.0 U	5.0 U	5.65	5.0 U	5.0 U
XYLENES	ug/l	5.0 U	5.0 U	5.0 U	5.0 U	64.3	5.0 U	5.0 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Semivolatile Results
May 2010 Groundwater Samples - Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-09	MW-12	MW-12	MW-15	MW-19	MW-22	MW-26
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		5/18/2010	5/19/2010	5/19/2010	5/18/2010	5/20/2010	5/18/2010	5/19/2010
Field Sample Identification:		10CP24-14	10CP24-15	10CP24-16	10CP24-18	10CP24-19	10CP24-20	10CP24-21
Laboratory Sample Identification:		10050516-01B	10050550-03B	10050550-04B	10050516-03B	10050550-06B	10050516-05B	10050550-02B
Semivolatile Organic Compounds	**Units**							
NAPHTHALENE	ug/l	1.0 U	1.0 U	1.0 U	1.0 U	123	NR	1.0 U
PENTACHLOROPHENOL	ug/l	0.073 J	70.3	81.9	0.1 U	26,000	0.1 U	0.13 J

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Dissolved Metals Results
May 2010 Groundwater Samples - Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01
Field Sample Location:		MW-09	MW-12	MW-12	MW-15	MW-19	MW-26
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water, Dup	Water	Water	Water
Sample Collection Date:		5/18/2010	5/19/2010	5/19/2010	5/18/2010	5/20/2010	5/19/2010
Field Sample Identification:		10CP24-14	10CP24-15	10CP24-16	10CP24-18	10CP24-19	10CP24-21
Laboratory Sample Identification:		10050516-01C	10050550-03C	10050550-04C	10050516-03C	10050550-06C	10050550-02C
Dissolved Metals (Filtered)	**Units**						
ARSENIC	ug/l	2 UJ	1.9 J	2 UJ	2 UJ	2 UJ	1.8 J
COPPER	ug/l	10 UJ	3.5 J	3.8 J	10 UJ	3.2 J	10 UJ
IRON	ug/l	120 UJ	228 J	225 J	194 J	92.2 UJ	236 J
MANGANESE	ug/l	7.1 J	913 J	633 J	10 UJ	1,870 J	10 UJ
ZINC	ug/l	20 UJ	11 J	8.2 J	20 UJ	20 UJ	15 J

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Dissolved Gas Results
May 2010 Groundwater Samples - Monitoring Wells

	Field Site Identifier:	01	01	01	01	01	01	01
	Field Sample Location:	MW-09	MW-12	MW-12	MW-15	MW-19	MW-22	MW-26
	Sample Interval:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Matrix:	Water	Water	Water, Dup	Water	Water	Water	Water
	Sample Collection Date:	5/18/2010	5/19/2010	5/19/2010	5/18/2010	5/20/2010	5/18/2010	5/19/2010
	Field Sample Identification:	10CP24-14	10CP24-15	10CP24-16	10CP24-18	10CP24-19	10CP24-20	10CP24-21
	Laboratory Sample Identification:	10050516-01H	10050550-03B	10050550-04B	10050516-03H	10050550-06B	10050516-05C	10050550-02B
Dissolved Gasses	**Units**							
METHANE	ug/l	1.3 U	1.3 U	1.3 U	1.3 U	1.4	1.3 U	1.3 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Wet Chemistry Results
May 2010 Groundwater Samples - Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-09	MW-12	MW-12	MW-15	MW-19	MW-22	MW-26
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		5/18/2010	5/19/2010	5/19/2010	5/18/2010	5/20/2010	5/18/2010	5/19/2010
Field Sample Identification:		10CP24-14	10CP24-15	10CP24-16	10CP24-18	10CP24-19	10CP24-20	10CP24-21
Laboratory Sample Identification:		10050516-01A	10050550-03A	10050550-04A	10050516-03A	10050550-06A	10050516-05A	10050550-02A
Wet Chemistry	**Units**							
ALKALINITY, TOTAL (AS CACO3)	mg/l	63 UB	308	308	300	136	66 UB	230
CHLORIDE (AS CL)	mg/l	2.6	14.7	14.7	10.7	21.5	9.2	20.4
HARDNESS (AS CACO3)	mg/l	67.9	496	432	342	199	NR	486
NITROGEN, NITRATE (AS N)	mg/l	2.42 J	1.87 J	1.91 J	4.57 J	0.05 UJ	1.9 J	2.41 J
SULFATE (AS SO4)	mg/l	11	116	117	6.3	32.4	6.9	279
SULFIDE	mg/l	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NR	1.0 U
TOTAL ORGANIC CARBON	mg/l	25.7 UB	41.8 UB	36.1 UB	26.7 UB	50.4 UB	58.8 UB	20.1 J

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Volatile Results
May 2010 Groundwater Samples - Residential Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		DW-01	RW-01	RW-01	RW-02	RW-03	RW-04	RW-05
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		5/19/2010	5/19/2010	5/19/2010	5/19/2010	5/19/2010	5/19/2010	5/19/2010
Field Sample Identification:		10CP24-01	10CP24-22	10CP24-27	10CP24-23	10CP24-24	10CP24-25	10CP24-26
Laboratory Sample Identification:		10050515-01A	10050515-08A	10050515-04A	10050515-05A	10050515-09A	10050515-06A	10050515-03A
Volatile Organic Compounds	**Units**							
BENZENE	ug/l	0.4 U	0.4 UJ	0.4 U	0.4 U	0.4 UJ	0.4 UJ	0.4 U
ETHYLBENZENE	ug/l	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 UJ	5.0 UJ	5.0 U
TOLUENE	ug/l	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 UJ	5.0 UJ	5.0 U
XYLENES	ug/l	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 UJ	5.0 UJ	5.0 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Semivolatile Results
May 2010 Groundwater Samples - Residential Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		DW-01	RW-01	RW-01	RW-02	RW-03	RW-04	RW-05
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		5/19/2010	5/19/2010	5/19/2010	5/19/2010	5/19/2010	5/19/2010	5/19/2010
Field Sample Identification:		10CP24-01	10CP24-22	10CP24-27	10CP24-23	10CP24-24	10CP24-25	10CP24-26
Laboratory Sample Identification:		10050515-01B	10050515-08B	10050515-04B	10050515-05B	10050515-09B	10050515-06B	10050515-03B
Semivolatile Organic Compounds	**Units**							
NAPHTHALENE	ug/l	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
PENTACHLOROPHENOL	ug/l	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Volatile Results
October 2010 Groundwater Samples - Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-02	MW-03	MW-05	MW-06S	MW-07	MW-09	MW-10
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water	Water	Water
Sample Collection Date:		10/6/2010	10/5/2010	10/6/2010	10/7/2010	10/6/2010	10/6/2010	10/7/2010
Field Sample Identification:		11CP02-19	11CP02-20	11CP02-21	11CP02-22	11CP02-23	11CP02-24	11CP02-25
Laboratory Sample Identification:		10100243-09G	10100135-03G	10100243-07G	10100330-05G	10100243-03G	10100243-01G	10100330-03G
Volatile Organic Compounds	**Units**							
BENZENE	ug/l	0.1 U	0.1 U	0.1 U	0.5 UJ	0.1 U	0.1 U	0.1 U
ETHYLBENZENE	ug/l	0.4 U	0.4 U	0.4 U	2.0 U	0.4 U	0.4 U	0.4 U
TOLUENE	ug/l	0.4 U	0.4 U	0.4 U	2.0 U	0.4 U	0.4 U	0.051 J
XYLENES	ug/l	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Volatile Results
October 2010 Groundwater Samples - Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-10	MW-12	MW-12	MW-15	MW-16	MW-17	MW-19
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water, Dup	Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		10/7/2010	10/5/2010	10/5/2010	10/7/2010	10/5/2010	10/5/2010	10/7/2010
Field Sample Identification:		11CP02-26	11CP02-28	11CP02-29	11CP02-30	11CP02-31	11CP02-32	11CP02-33
Laboratory Sample Identification:		10100330-01G	10100191-03G	10100191-01G	10100330-11G	10100191-05G	10100135-01G	10100330-13G
Volatile Organic Compounds	**Units**							
BENZENE	ug/l	0.1 U	0.1 U	0.1 U	0.5 UJ	0.1 U	0.1 U	0.5 UJ
ETHYLBENZENE	ug/l	0.4 U	0.4 U	0.4 U	2.0 UJ	0.4 U	0.4 U	3.21 J
TOLUENE	ug/l	0.074 J	0.044	0.4 U	2.0 UJ	0.4 U	0.4 U	1.7 J
XYLENES	ug/l	1.0 U	1.0 U	1.0 U	5.0 UJ	1.0 U	1.0 U	44.7 J

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Volatile Results
October 2010 Groundwater Samples - Monitoring Wells

Field Site Identifier:		01	01
Field Sample Location:		MW-22	MW-26
Sample Interval:		N/A	N/A
Matrix:		Water	Water
Sample Collection Date:		10/6/2010	10/5/2010
Field Sample Identification:		11CP02-34	11CP02-35
Laboratory Sample Identification:		10100243-05G	10100135-05G
Volatile Organic Compounds	**Units**		
BENZENE	ug/l	0.1 U	0.1 U
ETHYLBENZENE	ug/l	0.4 U	0.4 U
TOLUENE	ug/l	0.4 U	0.4 U
XYLENES	ug/l	1.0 U	1.0 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Dissolved Metals Results
October 2010 Groundwater Samples - Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-02	MW-03	MW-05	MW-06S	MW-07	MW-09	MW-10
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water	Water	Water
Sample Collection Date:		10/6/2010	10/5/2010	10/6/2010	10/7/2010	10/6/2010	10/6/2010	10/7/2010
Field Sample Identification:		11CP02-19	11CP02-20	11CP02-21	11CP02-22	11CP02-23	11CP02-24	11CP02-25
Laboratory Sample Identification:		10100243-09D	10100135-03D	10100243-07D	10100330-05D	10100243-03D	10100243-01D	10100330-03D
Dissolved Metals (Filtered)	**Units**							
ARSENIC	ug/l	2 U	2 U	3.36 J	2 U	2 U	2 U	2 U
COPPER	ug/l	8 U	10 U	8 U	5 J	8 U	8 U	8 U
IRON	ug/l	43 J	805	3,030	531	989	109 J	488
MANGANESE	ug/l	9.4 J	12 J	12,600	19.7 J	63.2	16.7 U	1,780
ZINC	ug/l	20 U	20 U	20 U	20 U	20 U	20 U	20 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Dissolved Metals Results
October 2010 Groundwater Samples - Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-10	MW-12	MW-12	MW-15	MW-16	MW-17	MW-19
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water, Dup	Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		10/7/2010	10/5/2010	10/5/2010	10/7/2010	10/5/2010	10/5/2010	10/7/2010
Field Sample Identification:		11CP02-26	11CP02-28	11CP02-29	11CP02-30	11CP02-31	11CP02-32	11CP02-33
Laboratory Sample Identification:		10100330-01D	10100191-03D	10100191-01D	10100330-11D	10100191-05D	10100135-01D	10100330-13D
Dissolved Metals (Filtered)	**Units**							
ARSENIC	ug/l	2 U	2 U	2 U	2 U	2 U	2 U	2 U
COPPER	ug/l	8 U	8 U	8 U	8 U	8 U	10 U	2.9 J
IRON	ug/l	396	358	332	311	50 U	163	114
MANGANESE	ug/l	1,820	834	859	16.7 U	16.7 U	10 U	942
ZINC	ug/l	20 U	20 U	20 U	20 U	20 U	20 U	20 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Dissolved Metals Results
October 2010 Groundwater Samples - Monitoring Wells

Field Site Identifier:		01	01
Field Sample Location:		MW-22	MW-26
Sample Interval:		N/A	N/A
Matrix:		Water	Water
Sample Collection Date:		10/6/2010	10/5/2010
Field Sample Identification:		11CP02-34	11CP02-35
Laboratory Sample Identification:		10100243-05D	10100135-05D
Dissolved Metals (Filtered)	**Units**		
ARSENIC	ug/l	2 U	2 U
COPPER	ug/l	4.1 J	10 U
IRON	ug/l	74.2 J	376
MANGANESE	ug/l	16.7 U	10 U
ZINC	ug/l	20 U	20 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Dissolved Gas Results
October 2010 Groundwater Samples - Monitoring Wells

	Field Site Identifier:	01	01	01	01	01	01	01
	Field Sample Location:	MW-02	MW-03	MW-05	MW-06S	MW-07	MW-09	MW-10
	Sample Interval:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Matrix:	Water	Water	Water	Water	Water	Water	Water
	Sample Collection Date:	10/6/2010	10/5/2010	10/6/2010	10/7/2010	10/6/2010	10/6/2010	10/7/2010
	Field Sample Identification:	11CP02-19	11CP02-20	11CP02-21	11CP02-22	11CP02-23	11CP02-24	11CP02-25
	Laboratory Sample Identification:	10100243-09H	10100135-03H	10100243-07H	10100330-05H	10100243-03H	10100243-01H	10100330-03H
Dissolved Gasses	**Units**							
METHANE	ug/l	1.3 U	1.6	4.1	1.3 U	28	1.3 U	1.8

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Dissolved Gas Results
October 2010 Groundwater Samples - Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-10	MW-12	MW-12	MW-15	MW-16	MW-17	MW-19
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water, Dup	Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		10/7/2010	10/5/2010	10/5/2010	10/7/2010	10/5/2010	10/5/2010	10/7/2010
Field Sample Identification:		11CP02-26	11CP02-28	11CP02-29	11CP02-30	11CP02-31	11CP02-32	11CP02-33
Laboratory Sample Identification:		10100330-01H	10100191-03H	10100191-01H	10100330-11H	10100191-05H	10100135-01H	10100330-13H
Dissolved Gasses	**Units**							
METHANE	ug/l	2.3	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Dissolved Gas Results
October 2010 Groundwater Samples - Monitoring Wells

Field Site Identifier:		01	01
Field Sample Location:		MW-22	MW-26
Sample Interval:		N/A	N/A
Matrix:		Water	Water
Sample Collection Date:		10/6/2010	10/5/2010
Field Sample Identification:		11CP02-34	11CP02-35
Laboratory Sample Identification:		10100243-05H	10100135-05H
Dissolved Gasses	**Units**		
METHANE	ug/l	1.3 U	1.3 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Wet Chemistry Results
October 2010 Groundwater Samples - Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-02	MW-03	MW-05	MW-06S	MW-07	MW-09	MW-10
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water	Water	Water
Sample Collection Date:		10/6/2010	10/5/2010	10/6/2010	10/7/2010	10/6/2010	10/6/2010	10/7/2010
Field Sample Identification:		11CP02-19	11CP02-20	11CP02-21	11CP02-22	11CP02-23	11CP02-24	11CP02-25
Laboratory Sample Identification:		10100243-09C	10100135-03C	10100243-07C	10100330-05C	10100243-03C	10100243-01C	10100330-03C
Wet Chemistry	**Units**							
ALKALINITY, TOTAL (AS CACO3)	mg/l	62	510	274	11 UB	226	27	308
CHLORIDE (AS CL)	mg/l	0.6 J	67.2	11.4 J	21.3	13.8 J	3.3 J	7.2 J
HARDNESS (AS CACO3)	mg/l	52.5	906	437	56.9	482	88.1	390
NITROGEN, NITRATE (AS N)	mg/l	1.01 J	3.62	0.10 UJ	6.94 J	2.24 J	3.35	0.10 UJ
SULFATE (AS SO4)	mg/l	4.2 J	19.8 J	79.4	11 J	168	14 J	48.2 J
SULFIDE	mg/l	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOTAL ORGANIC CARBON	mg/l	24	2.2 J	4.2	6.8	10.4	7.6	2.2

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Wet Chemistry Results
October 2010 Groundwater Samples - Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-10	MW-12	MW-12	MW-15	MW-16	MW-17	MW-19
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water, Dup	Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		10/7/2010	10/5/2010	10/5/2010	10/7/2010	10/5/2010	10/5/2010	10/7/2010
Field Sample Identification:		11CP02-26	11CP02-28	11CP02-29	11CP02-30	11CP02-31	11CP02-32	11CP02-33
Laboratory Sample Identification:		10100330-01C	10100191-03C	10100191-01C	10100330-11C	10100191-05C	10100135-01C	10100330-13C
Wet Chemistry	**Units**							
ALKALINITY, TOTAL (AS CACO3)	mg/l	272	320	316	252	39	160	84
CHLORIDE (AS CL)	mg/l	7.3 J	14.4 J	14.4 J	13.2 J	5.7 J	11.6 J	13.6 J
HARDNESS (AS CACO3)	mg/l	346	548	483	430	29.3	225	77.8
NITROGEN, NITRATE (AS N)	mg/l	0.10 UJ	1.73	1.72	5.49 J	0.63 J	5.18	0.10 UJ
SULFATE (AS SO4)	mg/l	47.7 J	119	119	6.9 J	6.3 J	9.7 J	18.7 J
SULFIDE	mg/l	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOTAL ORGANIC CARBON	mg/l	1.8	53.9 J	22.9 J	1.0 U	15.7	1.6	17.4

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Wet Chemistry Results
October 2010 Groundwater Samples - Monitoring Wells

Field Site Identifier:	01	01	01
Field Sample Location:	MW-19	MW-22	MW-26
Sample Interval:	N/A	N/A	N/A
Matrix:	Water	Water	Water
Sample Collection Date:	10/7/2010	10/6/2010	10/5/2010
Field Sample Identification:	11CP02-33	11CP02-34	11CP02-35
Laboratory Sample Identification:	10100330-13F	10100243-05C	10100135-05C
Wet Chemistry	**Units**		
ALKALINITY, TOTAL (AS CACO3)	mg/l	84	62	236
CHLORIDE (AS CL)	mg/l	13.6 J	1.8 J	20.0 J
HARDNESS (AS CACO3)	mg/l	77.8	40.9	478
NITROGEN, NITRATE (AS N)	mg/l	0.10 UJ	0.90 J	1.77
SULFATE (AS SO4)	mg/l	18.7 J	5.6 J	232
SULFIDE	mg/l	1.0 U	1.0 U	1.0 U
TOTAL ORGANIC CARBON	mg/l	17.4	24.6	0.6 J

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Volatile Results
October 2010 Groundwater Samples - Residential Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		DW-01	RW-01	RW-01	RW-02	RW-03	RW-04	RW-05
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		10/7/2010	10/5/2010	10/5/2010	10/5/2010	10/5/2010	10/5/2010	10/5/2010
Field Sample Identification:		11CP02-01	11CP02-36	11CP02-37	11CP02-38	11CP02-39	11CP02-40	11CP02-41
Laboratory Sample Identification:		10100331-01C	10100192-07C	10100192-08C	10100192-04C	10100192-05C	10100192-01C	10100192-02C
Volatile Organic Compounds	**Units**							
BENZENE	ug/l	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
ETHYLBENZENE	ug/l	0.4 U	0.4 UJ	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
TOLUENE	ug/l	0.4 U	0.4 UJ	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
XYLENES	ug/l	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Penta Wood
Semivolatile Results
October 2010 Groundwater Samples - Residential Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		DW-01	RW-01	RW-01	RW-02	RW-03	RW-04	RW-05
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		10/7/2010	10/5/2010	10/5/2010	10/5/2010	10/5/2010	10/5/2010	10/5/2010
Field Sample Identification:		11CP02-01	11CP02-36	11CP02-37	11CP02-38	11CP02-39	11CP02-40	11CP02-41
Laboratory Sample Identification:		10100331-01A	10100192-07A	10100192-08A	10100192-04A	10100192-05A	10100192-01A	10100192-02A
Semivolatile Organic Compounds	**Units**							
NAPHTHALENE	ug/l	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
PENTACHLOROPHENOL	ug/l	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Appendix B
Natural Attenuation Data

Well	Sample Date	Temp. (C)	Specific Cond. (umhos/cm²)	DO (mg/L)	DO (%)	pH	ORP (mV)	Turbidity (ntu)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	PCP (ug/L)	Chloride (mg/L)
DW-01	9/24/2003								1.48	<0.005	<0.05	<2	<0.5	<0.05	66.9
DW-01	5/31/2005								1.5 J	<0.004 J	<0.05 J	6.5	<0.002	0.039 J	29 J
DW-01	5/10/2007								1.8	<0.01	<0.100	17 J	<0.002	0.074 J	29
DW-01	9/19/2007								1.5 J	0.0024 J	<0.100	14 J	<0.002	<0.093	27
DW-01	5/20/2008								NT	NT	NT	NT	NT	0.094 UJ	NT
DW-01	10/23/2008								1.79 J	0.0046 J	0.642 J	9.07	0.002 UJ	0.1 UJ	29.6
DW-01	6/3/2009								NT	NT	NT	NT	NT	<0.1	NT
DW-01	10/8/2009								NT	NT	NT	NT	NT	0.1 UJ	NT
MW-01	10/9/1997	8.46	475	11.23	96.2	7.32	171.0		6.5	NT	<0.02	6.3	<0.01	2.0	18
MW-01	4/5/2000	8.56	416	10.34	86.5	7.14	290.6		1.6	<0.002	<0.05	2.5	0.0003	<0.5	8.7
MW-01	4/24/2001	8.69	431	9.83	84.6	7.08	168.7		6.5	<0.015	<0.025	13.0	<0.00011	<0.1	24
MW-01	9/11/2001	10.18	370	10.63	NR	7.00	235.8		2.6	0.001	<0.035	<8.2	<0.01	0.5	10
MW-01	5/14/2002	8.89	541	9.68	83.6	7.17	113.7		2.7	0.005	<0.011	7.8		0.1	9
MW-01	8/6/2002	8.82	439	NR	89.2	7.33	241.1		<0.15	0.00095 B	<0.011	7.9	<0.01	0.1	7
MW-01	4/29/2003	9.03	383	3.03	26.5	7.13	151.8		2.6	<0.005 J	<0.025	10.0	<0.0005	<0.1 J	4.3
MW-01	9/24/2003	9.22	349	10.23	89.2	7.16	322.6	53.2	2.61	0.036	0.1 J	<2	<0.0005	0.1	3.3
MW-01	5/4/2004	9.15	314	NR	93.8	7.05	217.0	NR	2.1 J	15.0 R	790 R	2.0 R		1.06 J	4.3 R
MW-01	9/21/2004	10.05	279	10.89	97.1	7.07	91.1	160	1.8 J	2.60 J	838.0	5.2 J		0.3	2.7
MW-01	5/10/2005	9.30	540	11.68	102.2	7.08	190.8	155	1.7 J	<0.01	<0.05	14 R	<0.002	0.1	3.6 J
MW-01	9/29/2005	8.96	282	12.12	105.1	7.15	154.6	217	1.9	0.0038 J	<0.05	16.0	<0.002	0.1	6.2
MW-01	5/31/2006	10.76	252	9.33	94.0	7.62	156.3	85	1.6 J	<0.01	<0.05	17.0	<0.002	0.049 J	2.3 J
MW-01	9/25/2006	Well Dry							Well Dry						
MW-01	5/8/2007	8.95	274	9.47	82.5	6.99	87.8	109	1.9 J	0.0063 J	<0.100	15 J	<0.002	0.11 J	2.2 J
MW-01	9/18/2007	9.81	274	11.33	100.6	6.74	180.5	67	3 J	<0.01	<0.100	12 J	<0.002	<0.093	9.4
MW-01	10/21/2008	8.70	276	9.78	84.0	7.17	226.0	58	1.62 J	0.01 UJ	0.388	6.19	0.002 UJ	0.42 UJ	3.91
MW-02	10/9/1997	9.49	143	8.82	77.2	6.42	274.1		1.1	NT	<0.02	17.0	<0.01	<1.0	4
MW-02	4/5/2000	9.47	111	9.59	81.4	6.85	305.8		<0.1	0.003	<0.05	58.3	0.0003	<0.5	1
MW-02	9/12/2001	12.00	172	11.50	99.8	7.62	96.9		2.3	0.057	<0.035	10	<0.01	0.51	6.2
MW-02	8/6/2002	9.96	128	6.31	NR	5.41	380.5		<0.15	0.018	0.0	10.0	<0.01	0.1	3
MW-02	9/24/2003	9.85	172	7.07	62.8	6.19	326.2	Off Scale	2.02	0.443	3.03	3 J	<0.0005	0.28	1 J
MW-02	9/21/2004	10.29	319	1.17	10.7	6.01	182.6	Off Scale	1.4 J	0.0222 J	25800.00	4.0 R		1.26	12 J
MW-02	9/28/2005	10.27	358	8.95	88.0	6.26	156.2	Off Scale	<0.1	0.0093 J	0.07	27.0	<0.002	2.2 J	6
MW-02	9/26/2006	11.03	345	2.44	22.5	6.28	205.0	Off Scale	0.12	<0.0026	<0.05	20.0	<0.002	2.3	1.6 J
MW-02	9/19/2007	10.00	350	7.18	65.3	5.95	200.3	Off Scale	0.22 J	0.0065 J	<0.100	16 J	<0.002	3.7	3.6
MW-02	10/21/2008	10.23	299	9.55	92.3	6.37	184.3	395.00	1.1 J	0.0052 J	0.424 J	12.9	0.002 UJ	1.6 J	3.17
MW-02	10/6/2009	9.57	272	4.86	43.0	6.47	212.0	8.20	0.81 J	0.01 UJ	0.129 J	11.6 J	0.00083 UJ	2.21 J	1.97 J
MW-02	10/6/2010	13.28	0.34	NR	89.567	6.73	114.133	741	1.01 H	0.0094 J	0.043 J	4.2 J	<0.0013	<0.1	0.56 J
MW-03	10/8/1997	10.34	696	3.52	31.5	6.91	38.4		4.4	0.011	0.3	16.0	<0.01	<1.0	42
MW-03	4/4/2000	Parameters not measured							2.8	0.010	0.5	12.5	0.0016	<0.6	64
MW-03	4/25/2001	10.27	1039	3.77	33.8	6.83	169.1		4.42	0.008	0.1	11.0	NT	<0.11	47
MW-03	9/13/2001	11.53	1118	16.44	NR	6.93	99.0		4	0.031	0.9	14.0	<0.01	0.093	58
MW-03	8/7/2002	10.36	1007	4.50	NR	6.74	165.1		<0.15	0.011	0.2	16.0	<0.01	0.1	69
MW-03	9/23/2003	10.32	873	5.68	50.9	7.06	147.3	0.65	4.43	0.008 J	<0.001	<2	0.0025	0.31	52.4
MW-03	9/21/2004	10.70	1071	0.38	3.4	6.80	87.2	10.6	3.5 J	4.99 J	278.0	8.9 R		0.37	62 J
MW-03	9/28/2005	10.58	948	24.95	(*)	6.82	242.6	25.9	3.3	0.0067 J	0.1	24.0	<0.002	0.2 J	62.0
MW-03	9/25/2006	Well Dry							Well Dry						
MW-03	9/20/2007	Well Dry							Well Dry						
MW-03	10/21/2008	11.98	1129	1.26	11.8	6.80	63.4	72.8	2.73 J	0.0152 J	2.14	15.2	0.0049 J	0.1 UJ	60.5
MW-03	10/7/2009	12.34	1098	5.05	51.0	6.87	127.0	NR	2.55 J	0.0124 J	0.722 J	11 J	0.021 J	0.1 UJ	53.8 J
MW-03	10/5/2010	12.82	1.3	25.7	NR	6.52	108	12.2	3.62	0.0120	0.805	19.8	0.0016	0.1 U	67.2
MW-04	10/9/1997	9.61	228	1.09	8.0	8.41	-137.9		<0.1	NT	0.04	6.3	0.139	<1.0	7.3
MW-04	4/4/2000	9.43	237	1.38	NR	8.49	NR		<0.1	0.047	<0.05	10.8	0.0008	<0.5	9.6
MW-05	10/10/1997	10.68	887	0.38	3.4	6.24	28.8		<0.1	NT	4.9	15.0	<0.01	28000	50
MW-05	4/7/2000	8.76	737	4.81	39.3	6.03	119.4		<0.1	3.350	3.4	34.3	0.0009	20600	49
MW-05	4/26/2001	12.29	1018	3.71	36.0	6.40	-39.7		<0.13	11.300	7.6	28.0	NT	20600	42
MW-05	9/13/2001	11.45	698	10.19	97.0	6.80	-68.6		0.17	8.500	4.1	22.0	<0.01	6300	29
MW-05	8/7/2002	11.80	589	5.02	NR	6.15	35.2		<0.15	7.840	7.9	21.0		510	26

Well	Sample Date	Temp. (C)	Specific Cond. (umhos/cm²)	DO (mg/L)	DO (%)	pH	ORP (mV)	Turbidity (ntu)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	PCP (ug/L)	Chloride (mg/L)
MW-05	9/25/2003	10.60	559	2.99	27.0	6.54	-21.3		<0.05	8.320	13.4	20.0	0.00047 J	1100	22.1
MW-05	9/22/2004	11.80	749	8.43	82.8	6.53	-98.5	56.8	0.01 R	5,650 J	30.5	24 R		194	29 J
MW-05	9/28/2005	11.13	627	3.27	30.3	6.47	-60.4	0.98	<0.1	7.6	19.0	35.0	0.0230	1100 J	18.0
MW-05	9/26/2006	11.49	736	4.79	46.5	6.64	221.0	0.72	<0.1	8.0	23.0	27.0	0.0087 J	460	16.0
MW-05	9/20/2007	11.60	583	2.95	28.8	6.53	-68.9	0.80	0.1 UJ	7.6	25.0	39 J	0.0098	31	13.0
MW-05	10/22/2008	10.47	552	2.79	26.8	6.74	-73.0	1.08	0.05 UJ	9.7 J	10.5 J	24.8	0.011 J	206	8.68
MW-05	10/7/2009	13.43	631	3.30	29.8	6.69	-75.5	NR	0.05 UJ	11.8 J	6 J	55.1 J	0.017 J	33.3 J	8.59 J
MW-05	10/6/2010	12.87	638.5	1.9	18.825	6.37	27.875	1.995	<0.1	12.6	3.0	79.4	0.004	40	11.40
MW-06S	10/9/1997	11.26	792	5.25	48.0	6.21	232.1		4.5	NT	0.02	0.9	<0.01	<1.0	72
MW-06S	4/7/2000	Not measured. Sampled for VOCs only													
MW-06S	4/26/2001	12.03	453	2.78	26.7	5.92	142.2		0.87	0.347	<0.025	12	NT	3	14
MW-06S	9/12/2001	Not measured due to product in the well.							1.1	0.8	<0.035	16	<0.01	1.1	12
MW-06S	8/7/2002	12.75	583	NR	41.4	6.08	77.8		<0.15	1.790	3.33	18	0.2700	88 B	17
MW-06S	9/25/2003	Not measured due to product in the well.							1.01	0.961	1.10	17	0.1300	0.33	23.9
MW-06S	9/27/2006	CAMU wells not measured							3.9	0.590	<0.05	18	0.0035 J	0.21	18.0
MW-06S	9/20/2007	10.81	569	6.24	57.0	5.86	86.9	NR	4.7 J	0.2	0.51	34 J	0.003	0.099	30
MW-06S	10/23/2008	10.68	227	8.83	79.5	6.60	245.0	NR	7.11 J	0.0653 J	0.438 J	11	0.002 UJ	2.65	28.3
MW-06S	10/8/2009	Well Dry							Well Dry						
MW-06S	10/7/2010	14.30	0.68	92.66667	NR	6.26	76.9667	>1000	6.94	0.02	0.53	11.00	<0.0013	<0.1	21.30
MW-07	10/14/1997	10.13	709	8.23	73.0	6.86	6.0		4.9	NT	0.62	6.0	<0.01	<1.0	7.6
MW-07	4/4/2000	9.87	693	5.82	51.5	7.01	156.1		2.7	0.026	0.36	6.1	0.004	<0.5	4.8
MW-07	4/25/2001	12.60	721	7.54	71.2	6.89	127.5		3.6	0.007	0.15	6.5	0.0047	<0.1	8.4
MW-07	9/11/2001	11.04	824	8.36	74.5	6.27	208.0		3	0.0044	0.23	10	0.012	0.083	23
MW-07	8/7/2002	12.68	812	NR	93.7	6.71	256.3		<0.15	0.004 B	0.305	10	<0.01	0.03	21
MW-07	9/24/2003	10.38	680	6.85	61.6	6.90	98.7	1.97	2.97	<0.005	0.09 J	<2	0.0049	0.044 J	12.2
MW-07	9/22/2004	13.90	736	7.89	77.5	6.71	35.2	14.5	3.4 J	9.75 J	1640 J	6.8 R		5.75	7.2 J
MW-07	9/27/2005	10.44	789	8.01	71.9	5.53	146.0	6.97	1.8	0.016	0.88	130 J	<0.002 J	<0.12	18
MW-07	9/27/2006	11.16	799	5.47	69.1	6.77	220.1	NR	1.8	0.068 J	<0.05	110	0.0043 J	0.087 J	15
MW-07	9/20/2007	10.55	771	7.43	67.2	6.69	120.5	(off scale)	1.5 J	0.022	0.26	170 J	0.0037	<0.093	16
MW-07	10/22/2008	10.26	911	8.76	78.4	7.16	112.3	835	1.54 J	0.0416 J	0.926 J	98.9	0.11 J	<0.1	14.1
MW-07	10/8/2009	10.29	811	10.28	96.1	7.33	183.6	(off scale)	1.91 J	0.109 J	0.687 J	152 J	0.0024 J	0.403 J	12.2 J
MW-07	10/6/2010	12.26	748	8.05	77.6	6.02	61.9	167	2.24	0.0632	0.989	168	0.0280	<0.1	13.8
MW-08	10/14/1997	9.73	363	4.28	37.2	7.93	12.2		1.4	NT	0.148	4.5	0.0365	<1.0	4.2
MW-08	4/5/2000	10.07	295	3.78	33.5	6.91	252.3		3.5	0.0053	<0.05	6.5	0.0072	<0.5	6.26
MW-08	4/26/2001	11.08	358	5.50	52.3	7.94	151.3		1.52	0.027	<0.025	7.47	0.0116	0.2	3.25
MW-08	9/11/2001	10.49	386	4.08	NR	7.77	29.3		1.5	0.018	0.07	<7.6	<0.01	0.062	3.8
MW-08	8/8/2002	11.80	375	NR	75.2	7.56	160.9		<0.15	0.0053 B	0.011 B	6	<0.01	<0.04	4.2
MW-08	9/25/2003	10.67	414	6.20	57.8	7.79	125.4	4.15	2.6	0.006 J	<0.05	<2	0.0092	<0.11	11
MW-08	9/23/2004	11.89	449	5.50	52.8	7.14	11.0	2.99	2.4 J	12.0 J	256	5.8 J	3.75 J	1.94	15
MW-08	9/28/2005	11.10	407	8.25	71.0	7.56	195.2	52.2	2.0 J	0.016	0.13	19	0.0026	0.031 J	20
MW-08	9/25/2006	Well Dry							Well Dry						
MW-08	9/20/2007	11.86	543	4.67	43.9	7.34	-50.4	28.0	1.5 J	0.013	0.21	76 J	<0.002	<0.093	21
MW-08	10/22/2008	10.77	560	5.42	48.9	7.61	25.0	30.4	1.92 J	0.0131 J	0.707 J	73.1	0.0008 J	<0.1	24.3
MW-09	10/8/1997	10.59	171	6.30	54.9	5.63	217.6		4.2	NT	<0.0001	3.4	<0.01	<1.0	45
MW-09	4/5/2000	9.65	153	6.36	44.7	5.78	321.7		1.97	0.0217	<0.05	8.46	0.000396	0.6	3.15
MW-09	4/23/2001	9.62	172	5.21	43.1	5.72	162.7		2.46	0.034	<0.025	27	<0.00012	0.12	3.22
MW-09	9/12/2001	11.23	206	5.75	NR	5.54	309.8		3.3	0.016	0.11	<6.8	<0.01	0.76	6.5
MW-09	8/6/2002	9.21	253	1.96	17.3	5.27	391.9		<0.15	0.0063 B	<0.011	22	<0.01	0.54	11
MW-09	9/25/2003	9.22	206	3.53	34.3	5.62	278.7	73.3	2.36	0.016	0.24	24	<0.0005	2.3	4.4
MW-09	9/22/2004	11.91	228	4.99	47.5	5.28	148.1	5.93	1.8 J	8.51 J	0.24 J	26 R	<10.0 J	2.92	3.2 J
MW-09	9/27/2005	10.45	168	(*)	--	4.33	333.6	0.76	1.9 J	0.0054 J	<0.05	20	<0.002 J	0.57	2.6
MW-09	9/25/2006	Well Dry							Well Dry						
MW-09	9/21/2007	9.85	199	7.20	65.2	5.24	239.5	1.50	3.8 J	0.0041 J	<0.100	15 J	<0.002	0.37	2.6
MW-09	10/22/2008	9.28	205	13.1	122.1	5.84	282.5	3.38	2.48 J	0.01 UJ	0.166 J	14.9	0.002 UJ	<0.1	3.44
MW-09	10/8/2009	Well needs redevelopment; pump was pulled							Well needs redevelopment; pump was pulled						
MW-09	5/18/2010	12.17	0.16	6.99	NR	5.88	197.775	20.1	2.42	0.01	0.120 UJ	11.00	<0.0013	0.073 J	2.63
MW-09	10/6/2010	13.29	NR	NR	76.767	6.34	72.33	17.43	3.35	<0.016	0.11	14.00	<0.0013	<0.1	3.26

Well	Sample Date	Temp. (C)	Specific Cond. (umhos/cm²)	DO (mg/L)	DO (%)	pH	ORP (mV)	Turbidity (ntu)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	PCP (ug/L)	Chloride (mg/L)
MW-10	10/15/1997	10.88	803	0.38	3.4	6.83	-33.2		4.9	NT	0.00219	13	0.0135	3400	35
MW-10	4/6/2000	10.76	988	0.47	4.2	6.82	27.4		1.72	1.59	0.1159	13.8	0.003067	9530	55.9
MW-10	4/26/2001	12.31	1029	4.52	42.8	6.89	-103.5		0.18	2.38	5.65	22	NT	22800	48
MW-10	9/12/2001	11.18	1188	6.55	63.1	6.89	-71.1		0.13	3.2	2.4	23	<0.01	21000	61
MW-10	8/7/2002	14.24	1010	NR	60.9	6.30	-147.8		<0.15	2.54	10.7	20	0.011	22000	56
MW-10	10/1/2003								<0.05	1.85	2.59	3	0.00062	9000	22
MW-10	9/23/2004	Not measured due to product in the well							0.0018 J	1.81	0.0241	18	<10.0	38000	38
MW-10	9/29/2005	Well Dry										Well Dry			
MW-10	9/27/2006	Not measured due to product in the well							<0.1	2.6	0.12	24	<0.002	23000 J	14
MW-10	9/20/2007	Not measured due to product in the well							0.68 J	2.7	0.55	25 J	0.0024	1700	20
MW-10	10/23/2008	Not measured due to product in the well							0.05 UJ	2.21 J	1.11 J	28.1	0.006 J	1630	12.4
MW-10	10/7/2009	Not measured due to product in the well							0.05 UJ	2.23 J	1.21 J	58.7 J	0.017 J	220 J	9.82 J
MW-10	5/19/2010	Not measured due to product in the well								1820	488	48.2	2.3	92	7.26
MW-10S	10/15/1997	13.18	339	10.49	100.0	7.55	135.6		<0.1	NT	0.0000454	23	<0.01	12000	38
MW-10S	4/7/2000	9.41	599	5.02	41.5	6.37	331.6		<100	10.1	<0.05	138	0.001567	56100	53
MW-10S	4/25/2001	Not measured due to product in the well							1.5	6.03	11.30	8.6	0.0006	49000	11
MW-10S	9/12/2001	Not measured due to product in the well							4.7	7.60	0.048	13	<0.01	82000	10
MW-10S	8/7/2002	13.62	431	NR	66.1	6.31	303.8		0.11	7.07	0.0673	14	<0.01	390	10
MW-10S	9/25/2003	Not measured due to product in the well							3.41	5.9	<0.05	2	<0.0005	2200	6.7
MW-10S	9/22/2004	Not measured due to product in the well							3.6 J	3740 J	0.0227 J	15 R	<10.0 J	9490	24 J
MW-10S	9/29/2005	Not measured due to product in the well							2.0 J	3.9	<0.05	120 J	<0.002	<0.11	16
MW-10S	9/27/2006	Not measured due to product in the well							1.2	2.5	<0.05	79	<0.002	2700 J	8.6
MW-10S	9/20/2007	Not measured due to product in the well							1.3	1.3	<0.100	69 J	<0.002	24	8.7
MW-10S	10/23/2008	Not measured due to product in the well							Well Dry				0.002 UJ	Well Dry	
MW-10S	10/7/2009	Pump is set above water table; No sample collected							Pump is set above water table; No sample collected						
MW-11	10/15/1997	13.98	398	4.86	47.2	7.94	144.3		3.4	NT	<0.0001	12	<0.01	<1.0	7.5
MW-11	4/4/2000	13.24	427	6.57	61.9	7.80	215.5		3.09	<0.002	<0.05	9.41	0.000138	<0.6	6.98
MW-11	4/4/2001	12.98	337	6.98	67.6	7.86	138.5		3.74	<0.015	<0.025	3.48	<0.00011	<0.11	6.25
MW-11	9/10/2001	13.13	414	9.09	NR	7.77	100.0		3.1	0.00045	<0.035	<7.4	<0.010	0.091	8
MW-11	8/6/2002	13.12	455	5.37	NR	7.58	240.6		<0.15	0.0012 B	<0.011	7.6	<0.01	<0.04	7.8
MW-11	9/23/2003	12.66	396	6.29	60.7	7.81	245.9	11.3	2.94	<0.005	<0.05	<2	<0.0005	<0.11	6.7
MW-11	9/21/2004	12.15	494	0.48	4.4	7.64	159.3	7.76	3.0 J	1.40 J	15.6	6.2 J	<10.0	0.0656	9
MW-11	9/29/2005	11.55	502	8.12	96.9	7.26	177.2	0.32	2.4 J	0.003 J	<0.05	9.7	<0.002	740 J	14
MW-11	9/27/2006	11.91	490	NR	53.8	7.82	159.2	0.16	0.53 J	<0.01 J	<0.05 J	8.8 J	<0.002 J	<0.11	16 J
MW-11	9/20/2007	11.83	520	5.05	47.5	7.54	75.7	0.28	2.4 J	<0.01	<0.100	19 J	<0.002	<0.093	20
MW-11	10/22/2008	11.93	546	6.93	64.6	7.64	208.7	0.20	2.26 J	0.01 UJ	0.533	17.8	0.002 UJ	0.27	19.9
MW-12	10/15/1997	10.16	1044	2.86	25.0	6.93	41.2		<0.1	NT	0.000267	15	<0.01	5000	48
MW-12	4/6/2000	10.10	1097	0.63	5.6	6.89	169.9		0.483	1.59	0.1128	11.9	0.001553	10300	54.5
MW-12	4/6/2001	Parameters not measured							0.43	1.57	0.131	16	0.048	1500	48
MW-12	9/13/2001	11.02	1142	3.95	36.7	6.84	22.2		<0.53	1.4	0.74	16	<0.01	18000	47
MW-12	5/14/2002	10.28	933	0.75	7.0	6.72	110.0		0.67	1.68	<0.011	17		4300	40
MW-12	8/7/2002	12.21	920	NR	45.9	6.69	150.0		0.46	1.6	0.105	15	<0.01	6400	37
MW-12	4/29/2003	10.95	982	5.24	47.2	6.80	126.1		0.8	1.56	<0.025	20	<0.05	3000	31
MW-12	9/23/2003	10.89	864	3.07	27.8	6.62	306.1	0.54	1.17	1.53	<0.05	<2	0.00049 J	10000	30.8
MW-12	5/4/2004	10.64	897	7.50	71.7	7.15	126.2		1.1 J	1480 R	52.7	14 R	1.34 J	11200 J	29
MW-12	9/22/2004	13.49	939	3.87	37.6	6.77	95.6	0.83	1.1 J	1230 J	53.9	12 R	<10.0 J	9060 J	26 J
MW-12	5/12/2005	11.24	1774	2.79	26.4	6.88	176.6	0.46	1.3 J	1.4	<0.05	16 R	<0.002	8300 J	23 J
MW-12	9/27/2005	11.67	760	0.70	6.4	6.56	169.3	4.28	1.1 J	1.3	<0.05	26 J	<0.002 J	8500 J	20
MW-12	6/7/2006	12.10	788	4.85	38.1	6.76	175.9	2.13	2.1 J	1.1 J	0.05 R	32	<0.002	6100 J	21 J
MW-12	9/26/2006	12.39	872	NR	41.5	7.07	214.1	1.29	1.9 J	1.2 J	<0.05	15 J	<0.002 J	3100	14 J
MW-12	5/9/2007	12.15	771	NR	NR	6.60	155.5	0.58	2.4 J	1.1	<0.100	37 J	<0.002	3000 J	13
MW-12	9/19/2007	11.85	737	3.19	30.6	6.79	144.8	1.27	2.8 J	0.82	<0.100	29 J	<0.002	1100	14
MW-12	5/20/2008	11.61	705	1.86	18.2	6.95	168.4	0.00	2 J	1.0	0.1 UJ	25	0.002 UJ	2100 J	12
MW-12	10/21/2008	10.23	706	3.44	31.7	7.06	110.2	0.50	2.96 J	1.14	0.927	31.8	0.002 UJ	1670 J	13.1
MW-12	6/2/2009	12.99	711	9.30	88.8	7.28	131.8	3.70	2.65 J	1.04	0.310	59.9	0.0008 UJ	521 J	12.3
MW-12	10/6/2009	10.97	742	4.88	44.8	7.00	184.4	0.37	1.84 J	0.987 J	0.307 J	85.4 J	0.00083 UJ	295 J	13.7 J
MW-12	5/19/2011	11.92	0.79	6.43	NR	6.94	162.40	0.76	1.91 J	0.913	0.228	117.0	<0.0013	81.9	14.7
MW-12	10/5/2010	14.78	0.99	35.60	NR	7.01	85.73	2.07	1.73	0.859	0.358	119.0	<0.0013	43.7	14.4

Well	Sample Date	Temp. (C)	Specific Cond. (umhos/cm^2)	DO (mg/L)	DO (%)	pH	ORP (mV)	Turbidity (ntu)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	PCP (ug/L)	Chloride (mg/L)
MW-13	10/8/1997	12.79	185	6.00	54.1	6.19	206.7		1.3	0.000027	0.0000067	1.4	<0.01	0.7	2.7
MW-13	4/5/2000	9.67	189	8.29	51.5	5.49	296.7		<100	0.112	<0.05	431	0.0003	0.8	4.4
MW-13	4/23/2001	9.08	140	3.44	26.8	5.59	207.9		1.8	0.110	<0.025	35	<0.00012	0.2	3.5
MW-13	9/10/2001	10.69	203	NR	NR	5.54	196.0		2.5	0.027	0.052	<7.5	<0.01	0.69	5.4
MW-13	8/5/2002	11.49	223	5.36	48.3	5.38	333.1		<0.15	0.045	1.31	8.4	<0.01	0.64	6.8
MW-13	9/23/2003	11.16	195	3.50	32.3	5.80	317.0	432	1.86	0.182	0.96	7	<0.0005	2.9	5.1
MW-13	9/21/2004	11.13	208	1.57	13.8	5.60	229.7	151	2.4 J	3.67 J	<0.124 J	6.4 R	<10.0 J	4.67	6.5 J
MW-13	9/27/2005	12.48	168	(*)	NR	5.19	335.1	221	0.6	0.0071 J	<0.05	19	<0.002 J	0.85	3.1
MW-13	9/25/2006	Well Dry							Well Dry						
MW-13	9/18/2007	11.42	163	7.33	69.0	5.39	311.2	0.50	0.31 J	0.0063 J	<0.100	29 J	<0.002	0.53	2.9
MW-13	10/21/2008	10.50	142	11.66	105.9	5.87	196.4	167	0.45 J	<0.01	0.207	10.1	0.002 UJ	0.31 UJ	1.9 J
MW-13	10/7/2009	12.90	106	8.11	76.8	6.24	54.5	235	0.77 J	0.01 UJ	0.05 UJ	9.71 J	0.00083 UJ	0.16 J	2.12 J
MW-14	10/9/1997	9.32	252	6.43	56.2	8.09	108.9		1.6	NT	<0.0001	2.4	<0.01	<1.0	8.0
MW-14	4/6/2000	9.10	283	6.92	60.0	7.42	257.3		2.2	<0.002	<0.05	4.1	0.0002	<0.5	15.7
MW-15	10/16/1997	9.29	409	4.49	39.1	8.22	149.8		4.1	NT	0.00001	6.3	<0.01	<1	6.5
MW-15	4/4/2000	8.08	483	10.72	85.1	7.69	284.1		3.5	<0.002	<0.05	10	0.0003	<0.5	12.3
MW-15	4/25/2001	11.79	675	8.73	81.3	7.73	179.4		4.0	<0.015	<0.025	3	<0.0001	<0.11	15.0
MW-15	9/12/2001	9.74	548	9.80	NR	8.00	153.3		3.7	0.000	<0.035	<4.5	<0.01	0.077	17.0
MW-15	8/6/2002	10.24	508	NR	101.4	7.72	285.7		<0.15	<0.00042	<0.011	5	<0.01	<0.04	16.0
MW-15	9/23/2003	9.74	483	9.14	81.7	7.90	213.6	26.1	3.8	<0.005	<0.05	<2	<0.0005	<0.1	17.4
MW-15	9/21/2004	9.85	514	8.49	77.4	7.55	73.5	4.11	3.2 J	0.976 J	36.70	3.9 J	<10.0	0.3	16.0
MW-15	9/29/2005	11.44	580	10.25	89.3	7.58	163.8	1.50	4.2 J	0.0016 J	<0.05	6	<0.002	<0.11	17.0
MW-15	9/27/2006	11.95	607	NR	89.5	7.84	118.3	3.68	4.7 J	<0.002 B	<0.05 J	5.9 J	<0.002 J	< 0.11	14 J
MW-15	9/19/2007	12.75	574	11.08	106.6	7.01	197.0	1.50	5.7 J	<0.01	<0.100	13 J	<0.002	<0.1	15
MW-15	5/20/2008	12.21	551	8.40	80.5	7.66	136.3	0.80	4.7 J	0.00052 J	0.100 UJ	6.6	0.002 UJ	0.18 J	14
MW-15	10/21/2008	11.78	575	7.56	70.2	7.54	98.6	1.27	6.05 J	<0.01	0.854	6.99	0.002 UJ	0.1 UJ	14.6
MW-15	6/2/2009	13.58	560	8.78	85.0	7.83	159.0	NR	5.33 J	<0.01	0.301	6.42	0.0008 UJ	0.1 UJ	13.5
MW-15	10/7/2009	10.20	576	8.46	75.5	7.65	28.9	16.90	4.74 J	<0.0001 UJ	0.293 J	6.52 J	0.00083 UJ	0.1 UJ	12.9 J
MW-15	5/18/2010	13.09	0.563	9.26	NR	7.42	130.93	19.37	4.57 J	0.010 UJ	0.194 J	6.30	<0.0013	<0.1	10.7
MW-15	10/7/2010	12.50	543	7.986667	75.267	7.32	85.73	2.53	5.49	<0.016	0.311	6.91	<0.0013	2.3	13.2
MW-16	10/14/1997	9.86	409	8.57	74.8	6.82	99.4		3.2	NT	0.00002	8.10	<0.01	<1	6.1
MW-16	4/6/2000	9.77	169	8.16	70.0	6.63	310.9		3.9	1.69	<0.05	24.1	<0.001068	<0.5	6.5
MW-16	4/26/2001	10.46	1102	4.72	43.2	6.81	75.6		8.7	0.009	0.03	29.0	<0.00012	<0.11	3.6
MW-16	9/10/2001	Parameters not measured							5.8	0.00082	<0.035	11.0	<0.01	0.17	1.8
MW-16	8/6/2002	11.70	247	10.86	NR	6.11	331.3		<0.15	0.0091 B	0.08	13.0	<0.01	0.0	2.0
MW-16	9/23/2003	10.97	216	10.27	93.2	6.34	349.1	29.0	3.5	<0.005	<0.05	3 J	<0.0005	0.089 J	6.2
MW-16	9/21/2004	10.68	222	0.07	0.6	6.49	173.9	37.4	2.1 J	0.617 J	0.025	5.5 J	<10.0	0.1	3.7
MW-16	9/29/2005	10.48	373	11.12	97.6	6.79	233.4	12.8	1.5	0.0021 J	<0.05	71 J	<0.002	<0.11	11.0
MW-16	9/26/2006	10.69	278	9.33	87.7	6.45	232.3	51.80	1.2 J	<0.00059 B	<0.05 J	32 J	<0.002 J	0.046 J	4.1 J
MW-16	9/18/2007	10.91	210	11.55	105.1	5.89	318.4	NR	1.2 J	<0.01	<0.100	23 J	<0.002	0.2	4.5
MW-16	10/22/2008	9.15	248	17.98	156.2	6.52	224.5	267.00	0.99 J	0.02 J	0.318 J	43.2	0.002 UJ	0.08 J	7.51
MW-16	10/6/2009	9.61	173	10.62	93.2	7.03	177.8	164.00	1.03 J	0.0486 J	0.458 J	36.7 J	0.00083 UJ	0.1 UJ	6.35 J
MW-16	10/5/2010	12.82	0.29	100.0667	NR	7.82	104.667	292.33	0.63	<0.016	<0.05	6.3	<0.0013	<0.001	5.74
MW-17	10/15/1997	9.26	399	4.53	39.0	7.89	147.2		4.1	NT	<0.0001	10	<0.01	<1	4.8
MW-17	4/6/2000	9.15	438	4.81	41.8	7.73	254.9		4.2	<0.002	<0.05	<3	0.0001	<0.5	4.9
MW-17	4/26/2001	10.38	412	9.64	85.7	7.77	58.6		5.0	<0.015	<0.025	6.8	NT	0.7	4.1
MW-17	9/11/2001	11.44	457	6.96	62.9	7.49	262.0		4.4	<0.00027	0.31	<9.3	<0.01	<0.059	4.8
MW-17	8/8/2002	12.88	425	NR	65.8	7.64	204.5		<0.15	<0.00042	<0.011	7.4	<0.01	0.032	4.6
MW-17	9/25/2003	9.80	405	6.45	57.3	7.80	206.0	358	5.1	<0.005	<0.05	<2	<0.0005	0.46	4.4
MW-17	9/22/2004	11.02	498	9.13	87.0	7.57	150.5	8.23	4.8 J	0.045 J	0.0139 J	8.6 R	<10.0 J	2.82	4.1 J
MW-17	9/27/2005	11.94	368	(*)	NR	6.31	325.4	0.23	5.1 J	<0.01	<0.05	7.8	<0.002 J	0.054 J	3.9
MW-17	9/26/2006	11.74	429	NR	61.9	7.75	222.0	1.05	5.5 J	<0.01 J	<0.05 J	6.5 J	<0.002 J	<0.11	2.9 J
MW-17	9/19/2007	10.42	385	10.15	92.6	7.60	113.7	0.30	5.6 J	<0.01	<0.100	14 J	<0.002	<0.099	4.7
MW-17	10/22/2008	10.57	376	7.24	65.7	7.76	126.0	0.66	5.75 J	0.01 UJ	0.374 J	7.75	0.002 UJ	0.095	7.78
MW-17	10/6/2009	11.03	361	9.33	84.8	7.80	167.1	1.69	1.65 J	0.01 UJ	0.16 J	6.86 J	0.00083 UJ	0.1 UJ	6.54 J
MW-17	10/5/2010	12.85	0.53	68.9	NR	7.87	105.667	1.85	5.18	<0.01	0.163	9.68	<0.013	<0.1	11.6
MW-18	10/10/1997	11.51	777	1.03	9.2	6.13	-12.1		<0.1	NT	0.03	11.0	<0.01	8800	49

Well	Sample Date	Temp. (C)	Specific Cond. (umhos/cm²)	DO (mg/L)	DO (%)	pH	ORP (mV)	Turbidity (ntu)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	PCP (ug/L)	Chloride (mg/L)
MW-19	10/16/1997	8.43	662	12.11	103.4	8.23	133.6		3.8	NT	<0.0001	19	<0.01	8900	47
MW-19	4/7/2000	7.80	650	5.02	40.3	6.75	323.2		7.0	<0.002	<0.05	90	0.0003	11000	37.4
MW-19	4/7/2001	Not measured due to product in the well							3.37	1.79	<0.025	47	NT	25600	39
MW-19	9/12/2001	Not measured due to product in the well							1.3	1.8	0.071	<9.7	0.0160	400000	19
MW-19	5/13/2002	Not measured due to product in the well							2	2.07	<0.011	16		14000	33
MW-19	8/8/2002	Not measured due to product in the well							0.16	3.11	0.218	16	<0.01	11000	22
MW-19	4/29/2003	Not measured due to product in the well							3	3.59	<0.025	27	0.0024	4900	20
MW-19	9/25/2003	Not measured due to product in the well							2	4.47	0.05 J	90	0.0057	15000	17.5
MW-19	5/4/2004	Not measured due to product in the well							0.71 J	3.36	0.031	16 R	1.13 J	70000 J	25.0
MW-19	9/22/2004	Not measured due to product in the well							1.5 J	2.65	<0.124	23 R	<10.0 J	111000	15 J
MW-19	5/10/2005	Not measured due to product in the well							0.76 J	2.3	<0.05	29 R	<0.002	45000 J	18 J
MW-19	9/29/2005	Not measured due to product in the well							0.75	2.7	<0.05	40 J	<0.002	13000 J	19.0
MW-19	6/7/2006	Not measured due to product in the well							0.76 J	2.7 J	<0.05 J	36	<0.002	17000 J	18 J
MW-19	9/27/2006	Not measured due to product in the well							0.66 J	3.1	<0.05	30	<0.002 J	8200 J	14.0
MW-19	5/9/2007	Not measured due to product in the well							0.29 J	2.6	<0.100	59 J	<0.002	11000 J	15
MW-19	9/20/2007	Not measured due to product in the well							0.28 J	3.1	<0.100	42 J	<0.002	3500	17
MW-19	5/20/2008	Not measured due to product in the well							0.44 J	2.9	0.100 UJ	42	<0.002	23000 J	16
MW-19	10/24/2008	Not measured due to product in the well							0.04 J	4.85 J	0.51 J	46.2	0.0021 J	27900	15.9
MW-19	6/2/2009	Not measured due to product in the well							0.01 UJ	4.05	0.222	44.7	0.0039 J	18600 J	12.8
MW-19	10/8/2009	Not measured due to product in the well							0.05 UJ	3.19 J	0.237 J	42 J	0.002 J	31800 J	14.3 J
MW-19	5/20/2010	Not measured due to product in the well							0.05 UJ	1870 J	92.2 UJ	32.4	1.4	26000	21.5
MW-19	10/7/2010	Not measured due to product in the well							NT	942	114.000	18.7	NT	4470	13.6
MW-20	10/15/1997	Well Dry							NT	NT	NT	NT	<0.01	11000	NT
MW-20	4/26/2001	Not measured due to product in the well							<0.13	2.25	0.84	67	NT	36600	24
MW-20	9/12/2001	Not measured due to product in the well							0.15	2.8	<0.035	24	<0.01	83000	16
MW-20	8/7/2002	Not measured due to product in the well							<0.15	3.28	0.206	25	<0.01	30000 B	22
MW-20	9/25/2003	Not measured due to product in the well							<1.25	3.25	0.35	80 J	0.0054	13000	19.4 J
MW-20	9/22/2004	Not measured due to product in the well							0.29 J	2.32	2.07	23 R	<10.0 J	133000	24 J
MW-20	10/25/2005	Not measured due to product in the well							2.1 J	2.4	0.14	39 J	<0.002	63000 J	13
MW-20	9/27/2006	Not measured due to product in the well							0.22	4.2	0.094 J	71	<0.002 J	44000 J	16
MW-20	9/20/2007	Not measured due to product in the well							0.1 UJ	4.8	<0.100	98 J	<0.002	9500	18
MW-20	10/23/2008	Not measured due to product in the well							0.13 J	3.4 J	0.462	28.9	0.002 UJ	41000	15.7
MW-21	2/9/1998	8.50	559	8.35	NT	7.05	177.5		NT	NT	<0.1	9.1	0.011	<1.0	71
MW-21	5/14/2002	9.29	457	10.66	93.5	5.86	152.0		2.0		0.130	7.3		0.1	69
MW-21	8/6/2002	10.72	444	NR	99.0	6.79	297.6		<0.15	0.00063 B	<0.011	9.6		0.0	49
MW-21	4/29/2003	9.91	473	3.72	NR	6.65	144.9		2.5	<0.005	<0.025	12.0	<0.0005	0.2	41
MW-21	9/24/2003	9.30	491	11.13	97.7	6.74	326.0	400	2.6	<0.005	<0.05	<2	<0.0005	0.063 J	48
MW-21	5/4/2004	10.10	557	NR	89.2	6.50	196.3	NR	2.3 J	0.718 R	14000 R	3.6 R	<10.0	<0.135 B	67
MW-21	9/21/2004	9.80	510	10.37	92.5	6.61	102.1	365	2.4 J	0.484 J	10300 J	4.8 R	<10.0 J	0.5	63 J
MW-21	5/10/2005	10.47	544	10.89	94.1	6.63	159.6	103	2.8 J	0.00047 J	<0.05	12 R	<0.002	0.3	49 J
MW-21	9/27/2005	10.45	444	13.46	(*)	6.32	129.8	969	2.4 J	0.0098 J	0.036 J	17.0	<0.002 J	0.046 J	47
MW-21	6/1/2006	9.76	496	8.23	62.7	6.77	200.8	684	2.7 J	0.017 J	0.047 J	20.0	<0.002	0.023 J	65 J
MW-21	9/25/2006	Well Dry							Well Dry						
MW-21	5/8/2007	10.64	429	9.20	82.9	6.04	200.1	312	4.2 J	<0.01	<0.100	9.3 J	<0.002	<0.098	33 J
MW-21	9/18/2007	12.17	352	7.89	NR	6.32	235.8	150	3.7 J	<0.01	<0.100	12 J	<0.002	0.13	29
MW-21	10/21/2008	8.57	411	12.83	110.1	6.58	211.3	44.4	2.69 J	<0.01	0.294 J	<7.27	0.002 UJ	0.1 UJ	68.8
MW-22	2/9/1998	8.70	558	7.50	NT	6.86	119.5		NT	NT	<0.1	18	0.013	<1.0	56
MW-22	5/14/2002	9.91	423	10.25	91.3	6.77	85.5		3.7 J	0.0035	0.023	14		0.1	18
MW-22	8/6/2002	11.37	343	NR	101.6	6.86	323.7		<0.15	<0.00042	0.025 B	12	<0.01	0.1	7
MW-22	9/24/2003	9.70	303	10.92	96.4	6.89	345.4	1038	2.2	0.542	2.77	3 J	<0.0005	0.3	5
MW-22	9/21/2004	9.78	316	10.59	94.5	6.64	99.3	777	2.2 J	<15.0 J	<0.025 J	6.7 R	<10.0 J	0.2	11 J
MW-22	9/28/2005	9.70	Meter not working		87.4	6.66	260.8	59.5	1.7 J	0.0013 J	<0.05	18	<0.002	0.16 J	10
MW-22	9/25/2006	Well Dry							Well Dry						
MW-22	9/18/2007	11.85	276	8.23	NR	6.53	227.9	NR	2.5 J	<0.01	<0.100	10 J	<0.002	0.13	8.2
MW-22	5/20/2008	10.05	268	NR	86.6	6.43	273.7	1045.9	2.3 J	0.0036	0.100 UJ	12	0.002 UJ	0.77 J	8.4
MW-22	10/21/2008	10.31	243	12.46	111.0	6.90	238.5	NR	1.48 J	<0.01	0.303 J	6.95	0.002 UJ	0.09 UJ	4.69
MW-22	6/2/2009	9.97	188	NR	NR	7.07	196.7	NR	1.97 J	<0.01	0.083	6.73	0.0008 UJ	0.1 UJ	6.92
MW-22	10/6/2009	8.94	173	10.02	86.6	7.12	187.4	918.00	5.31 J	0.168 J	1.56 J	7.53 J	0.00083 UJ	0.1 UJ	7 J

Well	Sample Date	Temp. (C)	Specific Cond. (umhos/cm²)	DO (mg/L)	DO (%)	pH	ORP (mV)	Turbidity (ntu)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	PCP (ug/L)	Chloride (mg/L)
MW-22	5/18/2010	11.91	0.177	11.7075	NR	6.35	238.25	772	1.9 J	<0.01	NT	6.90	<0.0013		9.21
MW-22	10/6/2010	12.85	NR	NR	94.367	6.83	123.667	451.83	0.9	<0.01	0.074	5.62	<0.0013	0.13	1.8 J
MW-23	2/27/1998	9.63	270	13.68	122.3	7.93	159.0		NT	NT	<0.1	7.6	0.0566	<1.0	8.7
MW-23	9/11/2001	11.57	322	3.21	28.8	7.46	112.6		<0.13	0.029	<0.035	<8.2	<0.01	0.49	10
MW-24	2/8/1998	13.80	524	5.35	NR	6.62	80.0		NT	NT	<0.1	5.2	<0.01	<1	19
MW-24	4/24/2001	15.30	634	3.67	34.9	6.28	209.2		3.6	0.0024	<0.025	12	<0.0001	0.1	36
MW-25	2/9/1998	8.69	808	8.16	NR	6.95	55.0		NT	NT	<0.1	9.9	0.017	<1.0	16
MW-26	4/24/2001	11.24	646	7.73	71.8	7.05	190.2		5.0	<0.015	0.04	10	<0.0001	<0.1	22
MW-26	9/10/2001	Parameters not measured							3.2	<0.004	0.1	12	<0.01	0.16	30
MW-26	5/14/2002	12.28	588	7.55	72.8	7.11	17.8		3 J	0.00073	<0.011	15		0.1	27
MW-26	8/5/2002	11.30	588	NR	66.3	6.52	280.1		<0.15	0.00056 B	<0.011	14	<0.01	0.03	18
MW-26	4/29/2003	10.58	621	8.68	79.2	6.53	157.3		3.5	<0.005	<0.025	14	<0.0005	<0.1	18
MW-26	9/23/2003	10.84	513	7.41	67.7	6.70	279.8	23.7	3.74	<0.005	<0.05	<2	<0.0005	<0.11	11
MW-26	5/4/2004	9.85	172	7.07	62.8	6.19	326.2	NR	3.9 J	1.23 R	0.039	42 R	<10.0	<0.242 B	17
MW-26	9/23/2004	13.16	931	8.85	87.2	6.44	63.4	44.6	1.5 J	19.3	620	120	<10.0	0.393	28
MW-26	5/10/2005	11.49	1120	10.48	97.2	6.92	197.0	NR	2.8 J	0.0018 J	<0.05	200 R	<0.002	0.061 J	26 J
MW-26	9/27/2005	12.13	845	6.77	63.2	6.78	129.2	5.24	1.9 J	<0.01	<0.05	170 J	<0.002 J	0.027 J	25
MW-26	6/7/2006	11.71	830	7.97	74.7	7.00	113.3	2.93	1.8 J	<0.0025 J	<0.05 J	140	<0.002	<0.11	29 J
MW-26	9/27/2006	12.24	1011	7.10	66.6	7.11	227.3	1.03	1.5 J	<0.01 J	<0.05 J	87 J	<0.002 J	<0.11	23 J
MW-26	5/8/2007	11.36	852	7.60	70.4	7.51	60.9	3.07	1.5 J	<0.01	<0.100	210 J	<0.002	<0.093	21 J
MW-26	9/19/2007	11.65	892	6.03	56.2	7.04	129.7	3.40	1.3 J	<0.01	<0.100	220 J	<0.002	<0.095	25
MW-26	5/20/2008	11.80	921	7.06	66.5	7.06	181.1	0.00	1.8 J	<0.0025	0.100 UJ	230	0.002 UJ	0.096 UJ	22
MW-26	10/22/2008	10.88	953	4.74	43.0	6.96	192.9	1.83	2.36 J	0.01 UJ	0.777 J	235	0.002 UJ	<0.1	21.7
MW-26	6/2/2009	13.40	901	15.21	146.0	7.37	195.6	4.10	1.83 J	<0.01	0.341	2360	0.0008UJ	0.1 UJ	203
MW-26	10/6/2009	12.63	845	9.82	96.6	7.15	133.2	0.31	1.7 J	0.01 UJ	0.325 J	212 J	0.00083 UJ	0.1 UJ	20.7 J
MW-26	5/19/2011	12.84	0.919	12.24	NR	7.06	133.767	2.81	2.41 J	0.010 UJ	0.236 J	279	<0.0013	0.13 J	20.4
MW-26	10/5/2010	12.11	985	2.31	21.625	6.75	102.075	0.67	1.77	<0.01	0.376	232	<0.0013	<0.1	20
PW-01	10/23/1997	11.10	550	5.00	NR	8.92	185.0		7.7	NT	0.0012	10	0.0195	5	48
PZ-03	2/9/1998	7.50	212	11.02	NR	6.91	164.0		NT	NT	NT	NT	NT	<1	NT

(*) Readings outside normal range, instrument response in question.
NR - Parameter not Recorded.
NT - Parameter not tested.

Appendix C
Groundwater Elevations and Observations, and LNAPL Measurements

Well	Casing Dia. (inches)	Approx. Well Depth (ft)	TOC Elev. (ft MSL)	Aquifer[a]	May 2010			October 2010		
					Depth to Water (ft) DTW	DTB	Comments (DTP = Depth to Product)	Depth to Water (ft) DTW	DTB	Comments (DTP = Depth to Product)
MW-01	2	97	1072.32	UC	90.31	95.45		88.91		
MW-02	2	85	1064.85	UC	83.28	84.3		81.71		
MW-03	4	182	1129.5	SC	147.83	174.5		146.43		
MW-04	4	187	1087.81	SC	106.23	188		105.16		
MW-05	4	118	1071.73	UC	90.35	114.2		88.83		
MW-06 S	2	129.05	1108.63	UC	126.84	128.9		125.16		
MW-07	4	140.5	1096.39	SC	114.68	140.34		113.1		
MW-08	4	160	1091.28	SC	109.42	159.42		107.91		
MW-09	2	54	1020.71	UC	35.62	53.55		34.03		
MW-10	4	131	1089.74	SC	108.75	135.75		107.19		
MW-10 S	2	115.23	1090.43	UC	109.19	114.00	DTP=108.68[b]	107.01		
MW-11	2	155.5	1085.58	SC	104.22	158.99		102.77		
MW-12	2	135	1081.99	SC	100.73	109		99.2		
MW-13	2	27	1006.1	UC	24.5	29.6		22.93		
MW-14	2	175	1078.5	SC	97.01	175.1		95.85		
MW-15	2	170	1127.22	SC	145.4	171.82		144.05		
MW-16	2	106.5	1081.92	UC	99.95	105.4		98.2		
MW-17	2	134	1084.5	SC	102.95	115.6		101.42		
MW-18	6	116	1072.44	UC	92.40	113.00	DTP=90.39[c]	89.48		DTP=88.91[f]
MW-19	2	112	1088.17	UC	107.80	114.35	DTP=106.7[d]	105.79		DTP=105.2[g]
MW-20	2	107.5	1097.76	UC	116.75	120.53	DTP=115.9[e]	114.38		
MW-21	2	114.9	1095.7	UC	113.88	114.78		112.47		
MW-22	2	105.16	1084.7	UC	102.81	103.92		101.38		
MW-23	2	125	1017.57	SC	35.91	128.7		34.71		
MW-24	2	125	1084.1	UC	101.96	108.2		100.16		
MW-25	2	117.8	1095.24	UC	113.24	118.8		111.01		
MW-26	2	141	1087.07	UC	105	141		103.98		

[a] UC=Unconfined aquifer; SC=semiconfined aquifer

[b]MW-10 S NAPL thickness in ft 0.51

[c]MW-18 NAPL thickness in ft 2.01

[d]MW-19 NAPL thickness in ft 1.1

[e]MW-20 NAPL thickness in ft 0.85

[f]MW-18 NAPL thickness in ft 0.57

[g]MW-19 NAPL thickness in ft 0.59

Appendix D

Residential Well Memoranda

CH2M HILL
135 South 84th Street
Suite 325
Milwaukee, WI 53214
Tel 414.272.2426
Fax 414.272.4408

CH2MHILL

June 21, 2010

Mr. Thomas G. Williams
Remedial Project Manager (SR-6J)
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60604-3507

Subject: Subcontract No. 599, May 2010 Sampling Results
Penta Wood Products Site, Town of Daniels, Wisconsin
Long-Term Response Action (LTRA)
WA No. 004-LRLR-05WE, Contract No. EP-S5-06-01

Dear Tom:

Please find the enclosed results of the residential and potable well semi-annual groundwater sampling event that took place between May 20, 2010 and May 21, 2010. This sampling event included the analysis of pentachlorophenol (PCP), benzene, ethylbenzene, toluene, xylene (BTEX), and naphthalene. The following table provides information on the residential wells where samples were collected.

LTRA Residential Well Information
Penta Wood Products Site – Town of Daniels, Wisconsin

Location ID	Resident Name	Resident Address	Resident Phone Number	WI Well No.
RW01	Bill Ellis (formerly Skold)	8713 Daniels 70	(715) 349-5840	SX 303
RW02	LaVonne Brethorst	8627 Daniels 70	(715) 349-5237	Unknown
RW03	Ken and Sheri Nelson	Daniels 70 (same driveway as V. Engstrom)	(715) 349-8070	JB 251
RW04	Vayne Engstrom	8526 Daniels 70	(715) 349-5212	AN 547
RW05	Timothy Tjader	8783 Daniels 70	(715) 349-5192	Unknown

All analyses were performed by Environmental Monitoring & Technologies, Inc. (EMT) of Morton Grove, Illinois. Analytical results were received by CH2M HILL on June 10, 2010, and were submitted on June 14, 2010, to the United States Environmental Protection Agency (USEPA) for validation. The following summary is based on a review of the data prior to receiving final validation results from USEPA.

The results of the May 2010 semi-annual groundwater sampling event showed no detections of BTEX, naphthalene or PCP in any of the residential wells.

If you have any questions or comments, please contact me at 414.272.1052, ext. 40227, or Keli McKenna at ext. 40561.

Sincerely,

CH2M HILL

Shannon Olson

Shannon Olson
Project Chemist

Enclosure

cc: Pat Vogtman, PO/USEPA Region 5 (w/o enclosure)
Parveen Vij, CO/USEPA Region 5 (w/o enclosure)
Bill Schultz/WDNR
Keli McKenna, SM/CH2M HILL, Milwaukee
Mike Niebauer, ASM/CH2M HILL, Milwaukee
Phil Smith, RTL/CH2M HILL, Milwaukee
Ike Johnson, PM/CH2M HILL, Milwaukee
Dan Plomb, DPM/CH2M HILL, Milwaukee
Jewelle Keiser, QAM/CH2M HILL, Milwaukee
Dave Shekoski, Sample Coordinator/CH2M HILL, Milwaukee
Cherie Wilson, AA/CH2M HILL, Milwaukee

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847.967.6666 • 800.246.0663 • fax: 847.967.6735 • www.emt.com

Report of Laboratory Analysis

CLIENT: CH2M HILL
Lab Order: 10050515
Project: 344511/Penta Wood Products Site
Lab ID: 10050515-08

Client Sample ID: 10CP24-22 ⇒ RW-01
Report Date: 5/28/2010
Collection Date: 5/19/2010 10:40:00 AM
Matrix: Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270D / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.409	5/24/10 17:50	58590	1.00	MG3
Surrogates:									
2-Fluorobiphenyl	36.0	20-140		%REC	0	5/24/10 17:50	58590	1.00	MG3
4-Terphenyl-d14	92.3	20-140		%REC	0	5/24/10 17:50	58590	1.00	MG3
Nitrobenzene-d5	35.7	20-140		%REC	0	5/24/10 17:50	58590	1.00	MG3
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0704	5/23/10	58580	1.00	AT2
Surrogates:									
3,5-Dichlorobenzoic Acid	41.3	40-140		%REC	0	5/23/10	58580	1.00	AT2
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.5	0.5		µg/L	0.0400	5/27/10 23:12	58729	1.00	JL
Ethylbenzene	< 5.	5.		µg/L	0.0300	5/27/10 23:12	58729	1.00	JL
Toluene	< 5.	5.		µg/L	0.0434	5/27/10 23:12	58729	1.00	JL
Xylenes, Total	< 5.	5.		µg/L	0.120	5/27/10 23:12	58729	1.00	JL
Surrogates:									
4-Bromofluorobenzene	111	75-135		%REC	0	5/27/10 23:12	58729	1.00	JL
Fluorobenzene	105	75-135		%REC	0	5/27/10 23:12	58729	1.00	JL
Toluene-d8	106	75-135		%REC	0	5/27/10 23:12	58729	1.00	JL

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT: CH2M HILL
Lab Order: 10050515
Project: 344511/Penta Wood Products Site
Lab ID: 10050515-04

Client Sample ID: 10CP24-27 ⇒ RW-01 FR
Report Date: 5/28/2010
Collection Date: 5/19/2010 10:45:00 AM
Matrix: Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270D / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.410	5/24/10 15:41	58590	1.00	MG3
Surrogates:									
2-Fluorobiphenyl	59.6	20-140		%REC	0	5/24/10 15:41	58590	1.00	MG3
4-Terphenyl-d14	88.6	20-140		%REC	0	5/24/10 15:41	58590	1.00	MG3
Nitrobenzene-d5	58.6	20-140		%REC	0	5/24/10 15:41	58590	1.00	MG3
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0701	5/23/10	58580	1.00	AT2
Surrogates:									
3,5-Dichlorobenzoic Acid	56.7	40-140		%REC	0	5/23/10	58580	1.00	AT2
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.5	0.5		µg/L	0.0400	5/23/10 05:40	58622	1.00	JL
Ethylbenzene	< 5.	5.		µg/L	0.0300	5/23/10 05:40	58622	1.00	JL
Toluene	< 5.	5.		µg/L	0.0434	5/23/10 05:40	58622	1.00	JL
Xylenes, Total	< 5.	5.		µg/L	0.120	5/23/10 05:40	58622	1.00	JL
Surrogates:									
4-Bromofluorobenzene	102	75-135		%REC	0	5/23/10 05:40	58622	1.00	JL
Fluorobenzene	97.7	75-135		%REC	0	5/23/10 05:40	58622	1.00	JL
Toluene-d8	95.2	75-135		%REC	0	5/23/10 05:40	58622	1.00	JL

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT: CH2M HILL
Lab Order: 10050515
Project: 344511/Penta Wood Products Site
Lab ID: 10050515-05

Client Sample ID: 10CP24-23 ⇒ RW-02
Report Date: 5/28/2010
Collection Date: 5/19/2010 9:35:00 AM
Matrix: Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270D / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.407	5/24/10 16:24	58590	1.00	MG3
Surrogates:									
2-Fluorobiphenyl	73.4	20-140		%REC	0	5/24/10 16:24	58590	1.00	MG3
4-Terphenyl-d14	85.0	20-140		%REC	0	5/24/10 16:24	58590	1.00	MG3
Nitrobenzene-d5	72.0	20-140		%REC	0	5/24/10 16:24	58590	1.00	MG3
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0703	5/23/10	58580	1.00	AT2
Surrogates:									
3,5-Dichlorobenzoic Acid	56.4	40-140		%REC	0	5/23/10	58580	1.00	AT2
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.5	0.5		µg/L	0.0400	5/23/10 06:16	58622	1.00	JL
Ethylbenzene	< 5.	5.		µg/L	0.0300	5/23/10 06:16	58622	1.00	JL
Toluene	< 5.	5.		µg/L	0.0434	5/23/10 06:16	58622	1.00	JL
Xylenes, Total	< 5.	5.		µg/L	0.120	5/23/10 06:16	58622	1.00	JL
Surrogates:									
4-Bromofluorobenzene	101	75-135		%REC	0	5/23/10 06:16	58622	1.00	JL
Fluorobenzene	98.2	75-135		%REC	0	5/23/10 06:16	58622	1.00	JL
Toluene-d8	92.8	75-135		%REC	0	5/23/10 06:16	58622	1.00	JL

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT: CH2M HILL
Lab Order: 10050515
Project: 344511/Penta Wood Products Site
Lab ID: 10050515-09

Client Sample ID: 10CP24-24 ⇒ RW-03
Report Date: 5/28/2010
Collection Date: 5/19/2010 9:45:00 AM
Matrix: Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270D / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.409	5/24/10 18:32	58590	1.00	MG3
Surrogates:									
2-Fluorobiphenyl	63.1	20-140		%REC	0	5/24/10 18:32	58590	1.00	MG3
4-Terphenyl-d14	93.6	20-140		%REC	0	5/24/10 18:32	58590	1.00	MG3
Nitrobenzene-d5	58.2	20-140		%REC	0	5/24/10 18:32	58590	1.00	MG3
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0701	5/23/10	58580	1.00	AT2
Surrogates:									
3,5-Dichlorobenzoic Acid	59.7	40-140		%REC	0	5/23/10	58580	1.00	AT2
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.5	0.5		µg/L	0.0400	5/27/10 23:46	58729	1.00	JL
Ethylbenzene	< 5.	5.		µg/L	0.0300	5/27/10 23:46	58729	1.00	JL
Toluene	< 5.	5.		µg/L	0.0434	5/27/10 23:46	58729	1.00	JL
Xylenes, Total	< 5.	5.		µg/L	0.120	5/27/10 23:46	58729	1.00	JL
Surrogates:									
4-Bromofluorobenzene	102	75-135		%REC	0	5/27/10 23:46	58729	1.00	JL
Fluorobenzene	107	75-135		%REC	0	5/27/10 23:46	58729	1.00	JL
Toluene-d8	106	75-135		%REC	0	5/27/10 23:46	58729	1.00	JL

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT: CH2M HILL
Lab Order: 10050515
Project: 344511/Penta Wood Products Site
Lab ID: 10050515-06

Client Sample ID: 10CP24-25 ⇒ RW-04
Report Date: 5/28/2010
Collection Date: 5/19/2010 9:47:00 AM
Matrix: Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270D / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.409	5/24/10 17:07	58590	1.00	MG3
Surrogates:									
2-Fluorobiphenyl	74.6	20-140		%REC	0	5/24/10 17:07	58590	1.00	MG3
4-Terphenyl-d14	90.1	20-140		%REC	0	5/24/10 17:07	58590	1.00	MG3
Nitrobenzene-d5	72.3	20-140		%REC	0	5/24/10 17:07	58590	1.00	MG3
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0704	5/23/10	58580	1.00	AT2
Surrogates:									
3,5-Dichlorobenzoic Acid	61.3	40-140		%REC	0	5/23/10	58580	1.00	AT2
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.5	0.5		µg/L	0.0400	5/28/10 00:20	58729	1.00	JL
Ethylbenzene	< 5.	5.		µg/L	0.0300	5/28/10 00:20	58729	1.00	JL
Toluene	< 5.	5.		µg/L	0.0434	5/28/10 00:20	58729	1.00	JL
Xylenes, Total	< 5.	5.		µg/L	0.120	5/28/10 00:20	58729	1.00	JL
Surrogates:									
4-Bromofluorobenzene	106	75-135		%REC	0	5/28/10 00:20	58729	1.00	JL
Fluorobenzene	104	75-135		%REC	0	5/28/10 00:20	58729	1.00	JL
Toluene-d8	107	75-135		%REC	0	5/28/10 00:20	58729	1.00	JL

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT: CH2M HILL
Lab Order: 10050515
Project: 344511/Penta Wood Products Site
Lab ID: 10050515-03

Client Sample ID: 10CP24-26 ⇒ RW-05
Report Date: 5/28/2010
Collection Date: 5/19/2010 10:06:00 AM
Matrix: Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270D / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.409	5/24/10 14:58	58590	1.00	MG3
Surrogates:									
2-Fluorobiphenyl	56.4	20-140		%REC	0	5/24/10 14:58	58590	1.00	MG3
4-Terphenyl-d14	101	20-140		%REC	0	5/24/10 14:58	58590	1.00	MG3
Nitrobenzene-d5	53.2	20-140		%REC	0	5/24/10 14:58	58590	1.00	MG3
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0704	5/23/10	58580	1.00	AT2
Surrogates:									
3,5-Dichlorobenzoic Acid	61.4	40-140		%REC	0	5/23/10	58580	1.00	AT2
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.5	0.5		µg/L	0.0400	5/23/10 05:05	58622	1.00	JL
Ethylbenzene	< 5.	5.		µg/L	0.0300	5/23/10 05:05	58622	1.00	JL
Toluene	< 5.	5.		µg/L	0.0434	5/23/10 05:05	58622	1.00	JL
Xylenes, Total	< 5.	5.		µg/L	0.120	5/23/10 05:05	58622	1.00	JL
Surrogates:									
4-Bromofluorobenzene	100	75-135		%REC	0	5/23/10 05:05	58622	1.00	JL
Fluorobenzene	97.9	75-135		%REC	0	5/23/10 05:05	58622	1.00	JL
Toluene-d8	93.0	75-135		%REC	0	5/23/10 05:05	58622	1.00	JL

Qualifiers:

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E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT: CH2M HILL
Lab Order: 10050515
Project: 344511/Penta Wood Products Site
Lab ID: 10050515-01

Client Sample ID: 10CP24-01 ⇒ DW-01
Report Date: 5/28/2010
Collection Date: 5/19/2010 10:25:00 AM
Matrix: Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270D / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.407	5/24/10 14:16	58590	1.00	MG3
Surrogates:									
2-Fluorobiphenyl	89.0	20-140		%REC	0	5/24/10 14:16	58590	1.00	MG3
4-Terphenyl-d14	106	20-140		%REC	0	5/24/10 14:16	58590	1.00	MG3
Nitrobenzene-d5	85.9	20-140		%REC	0	5/24/10 14:16	58590	1.00	MG3
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0705	5/23/10	58580	1.00	AT2
Surrogates:									
3,5-Dichlorobenzoic Acid	70.3	40-140		%REC	0	5/23/10	58580	1.00	AT2
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.5	0.5		µg/L	0.0400	5/23/10 03:55	58622	1.00	JL
Ethylbenzene	< 5.	5.		µg/L	0.0300	5/23/10 03:55	58622	1.00	JL
Toluene	< 5.	5.		µg/L	0.0434	5/23/10 03:55	58622	1.00	JL
Xylenes, Total	< 5.	5.		µg/L	0.120	5/23/10 03:55	58622	1.00	JL
Surrogates:									
4-Bromofluorobenzene	100	75-135		%REC	0	5/23/10 03:55	58622	1.00	JL
Fluorobenzene	98.3	75-135		%REC	0	5/23/10 03:55	58622	1.00	JL
Toluene-d8	97.8	75-135		%REC	0	5/23/10 03:55	58622	1.00	JL

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

CH2M HILL
135 South 84th Street
Suite 325
Milwaukee, WI 53214
Tel 414.272.2426
Fax 414.272.4408

January 4, 2011

Denise Boone
Remedial Project Manager (SR-6J)
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60604-3507

Subject: Subcontract No. 599, October 2010 and November 2010 Sampling Results
Penta Wood Products Site, Town of Daniels, Wisconsin
Long-Term Response Action (LTRA)
WA No. 004-LRLR-05WE, Contract No. EP-S5-06-01

Dear Denise:

Please find the enclosed results of the residential and potable well annual groundwater sampling event that took place between October 5, 2010 and October 7, 2010. This sampling event included the analysis of pentachlorophenol (PCP), benzene, ethylbenzene, toluene, xylene (BTEX), and naphthalene. The following table provides information on the residential wells where samples were collected.

LTRA Residential Well Information

Penta Wood Products Site – Town of Daniels, Wisconsin

Location ID	Resident Name	Resident Address	Resident Phone Number	WI Well No.
RW01	Bill Ellis (formerly Skold)	8713 Daniels 70	(715) 349-5840	SX 303
RW02	LaVonne Brethorst	8627 Daniels 70	(715) 349-5237	Unknown
RW03	Ken and Sheri Nelson	Daniels 70 (same driveway as V. Engstrom)	(715) 349-8070	JB 251
RW04	Vayne Engstrom	8526 Daniels 70	(715) 349-5212	AN 547
RW05	Timothy Tjader	8783 Daniels 70	(715) 349-5192	Unknown

All analyses were performed by Environmental Monitoring & Technologies, Inc. (EMT) of Morton Grove, Illinois. Analytical results were received by CH2M HILL on October 29, 2010. During a review of the preliminary results, CH2M Hill's project chemist observed that the BTEX internal standard area counts for residential well RW01 were recovered below acceptance criteria. Since the United States Environmental Protection Agency (USEPA) data validator would have rejected these results as being biased low, RW01 was resampled on November 30, 2010. BTEX was not detected in the reanalysis; therefore, the initial results were rejected for project use.

All of the annual groundwater results, excluding the results from the resampled residential well, were submitted under a cover letter on November 23, 2010 to the USEPA for validation. The resampled residential well was submitted under a separate cover letter on December 28, 2010. The following summary is based on a review of the data before receiving final validation results from USEPA.

The results of the October 2010 annual groundwater sampling event showed no detections of BTEX, naphthalene or PCP in any of the residential wells.

If you have any questions or comments, please contact me at 414.272.1052, ext. 40227, or Keli McKenna at ext. 40561.

Sincerely,

CH2M HILL

Shannon Olson/CR

Shannon Olson
Project Chemist

Enclosure

cc: Pat Vogtman, PO/USEPA Region 5 (w/o enclosure)
Parveen Vij, CO/USEPA Region 5 (w/o enclosure)
Bill Schultz/WDNR
Keli McKenna, SM/CH2M HILL, Milwaukee
Mike Niebauer, ASM/CH2M HILL, Milwaukee
Phil Smith, RTL/CH2M HILL, Milwaukee
Ike Johnson, PM/CH2M HILL, Milwaukee
Dan Plomb, DPM/CH2M HILL, Milwaukee
Jewelle Keiser, QAM/CH2M HILL, Milwaukee
Dave Shekoski, Sample Coordinator/CH2M HILL, Milwaukee
Cherie Wilson, AA/CH2M HILL, Milwaukee

RW04

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Report of Laboratory Analysis

CLIENT:	CH2M HILL	**Client Sample ID:**	11CP02-40
Lab Order:	10100192	**Report Date:**	10/22/2010
Project:	344511/Penta Wood Products Site	**Collection Date:**	10/5/2010 3:00:00 PM
Lab ID:	10100192-01	**Matrix:**	Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270D / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.409	10/12/10 19:10	61607	1.00	MG3
Surrogates:									
2-Fluorobiphenyl	64.5	20-140		%REC	0	10/12/10 19:10	61607	1.00	MG3
4-Terphenyl-d14	71.9	20-140		%REC	0	10/12/10 19:10	61607	1.00	MG3
Nitrobenzene-d5	57.6	20-140		%REC	0	10/12/10 19:10	61607	1.00	MG3
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0700	10/13/10	61726	1.00	AT2
Surrogates:									
3,5-Dichlorobenzoic Acid	61.7	40-140		%REC	0	10/13/10	61726	1.00	AT2
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.1	0.1		µg/L	0.0400	10/8/10 13:51	61635	1.00	XN
Ethylbenzene	< 0.4	0.4		µg/L	0.0300	10/8/10 13:51	61635	1.00	XN
Toluene	< 0.4	0.4		µg/L	0.0434	10/8/10 13:51	61635	1.00	XN
Xylenes, Total	< 1.	1.		µg/L	0.120	10/8/10 13:51	61635	1.00	XN
Surrogates:									
4-Bromofluorobenzene	94.3	75-135		%REC	0	10/8/10 13:51	61635	1.00	XN
Fluorobenzene	96.0	75-135		%REC	0	10/8/10 13:51	61635	1.00	XN
Toluene-d8	96.3	75-135		%REC	0	10/8/10 13:51	61635	1.00	XN

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

RW05

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Report of Laboratory Analysis

CLIENT:	CH2M HILL	**Client Sample ID:**	11CP02-41
Lab Order:	10100192	**Report Date:**	10/22/2010
Project:	344511/Penta Wood Products Site	**Collection Date:**	10/5/2010 4:15:00 PM
Lab ID:	10100192-02	**Matrix:**	Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270D / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.409	10/12/10 19:53	61607	1.00	MG3
Surrogates:									
2-Fluorobiphenyl	70.3	20-140		%REC	0	10/12/10 19:53	61607	1.00	MG3
4-Terphenyl-d14	72.2	20-140		%REC	0	10/12/10 19:53	61607	1.00	MG3
Nitrobenzene-d5	69.3	20-140		%REC	0	10/12/10 19:53	61607	1.00	MG3
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0700	10/13/10	61726	1.00	AT2
Surrogates:									
3,5-Dichlorobenzoic Acid	51.5	40-140		%REC	0	10/13/10	61726	1.00	AT2
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.1	0.1		µg/L	0.0400	10/8/10 14:26	61635	1.00	XN
Ethylbenzene	< 0.4	0.4		µg/L	0.0300	10/8/10 14:26	61635	1.00	XN
Toluene	< 0.4	0.4		µg/L	0.0434	10/8/10 14:26	61635	1.00	XN
Xylenes, Total	< 1.	1.		µg/L	0.120	10/8/10 14:26	61635	1.00	XN
Surrogates:									
4-Bromofluorobenzene	91.9	75-135		%REC	0	10/8/10 14:26	61635	1.00	XN
Fluorobenzene	98.8	75-135		%REC	0	10/8/10 14:26	61635	1.00	XN
Toluene-d8	98.5	75-135		%REC	0	10/8/10 14:26	61635	1.00	XN

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

R1002

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Report of Laboratory Analysis

CLIENT: CH2M HILL
Lab Order: 10100192
Project: 344511/Penta Wood Products Site
Lab ID: 10100192-04

Client Sample ID: 11CP02-38
Report Date: 10/22/2010
Collection Date: 10/5/2010 2:35:00 PM
Matrix: Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270D / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.409	10/12/10 20:36	61607	1.00	MG3
Surrogates:									
2-Fluorobiphenyl	73.2	20-140		%REC	0	10/12/10 20:36	61607	1.00	MG3
4-Terphenyl-d14	78.4	20-140		%REC	0	10/12/10 20:36	61607	1.00	MG3
Nitrobenzene-d5	69.7	20-140		%REC	0	10/12/10 20:36	61607	1.00	MG3
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0702	10/13/10	61726	1.00	AT2
Surrogates:									
3,5-Dichlorobenzoic Acid	61.9	40-140		%REC	0	10/13/10	61726	1.00	AT2
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.1	0.1		µg/L	0.0400	10/9/10 00:26	61660	1.00	XN
Ethylbenzene	< 0.4	0.4		µg/L	0.0300	10/9/10 00:26	61660	1.00	XN
Toluene	< 0.4	0.4		µg/L	0.0434	10/9/10 00:26	61660	1.00	XN
Xylenes, Total	< 1.	1.		µg/L	0.120	10/9/10 00:26	61660	1.00	XN
Surrogates:									
4-Bromofluorobenzene	90.2	75-135		%REC	0	10/9/10 00:26	61660	1.00	XN
Fluorobenzene	94.1	75-135		%REC	0	10/9/10 00:26	61660	1.00	XN
Toluene-d8	94.3	75-135		%REC	0	10/9/10 00:26	61660	1.00	XN

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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RW03

Report of Laboratory Analysis

CLIENT:	CH2M HILL	**Client Sample ID:**	11CP02-39
Lab Order:	10100192	**Report Date:**	10/22/2010
Project:	344511/Penta Wood Products Site	**Collection Date:**	10/5/2010 3:20:00 PM
Lab ID:	10100192-05	**Matrix:**	Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270D / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.408	10/12/10 23:12	61607	1.00	MG3
Surrogates:									
2-Fluorobiphenyl	46.0	20-140		%REC	0	10/12/10 23:12	61607	1.00	MG3
4-Terphenyl-d14	71.9	20-140		%REC	0	10/12/10 23:12	61607	1.00	MG3
Nitrobenzene-d5	47.0	20-140		%REC	0	10/12/10 23:12	61607	1.00	MG3
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0696	10/13/10	61726	1.00	AT2
Surrogates:									
3,5-Dichlorobenzoic Acid	63.6	40-140		%REC	0	10/13/10	61726	1.00	AT2
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.1	0.1		µg/L	0.0400	10/9/10 01:00	61660	1.00	XN
Ethylbenzene	< 0.4	0.4		µg/L	0.0300	10/9/10 01:00	61660	1.00	XN
Toluene	< 0.4	0.4		µg/L	0.0434	10/9/10 01:00	61660	1.00	XN
Xylenes, Total	< 1.	1.		µg/L	0.120	10/9/10 01:00	61660	1.00	XN
Surrogates:									
4-Bromofluorobenzene	93.2	75-135		%REC	0	10/9/10 01:00	61660	1.00	XN
Fluorobenzene	96.8	75-135		%REC	0	10/9/10 01:00	61660	1.00	XN
Toluene-d8	95.9	75-135		%REC	0	10/9/10 01:00	61660	1.00	XN

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
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R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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RW01

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Report of Laboratory Analysis

CLIENT:	CH2M HILL	**Client Sample ID:**	11CP02-36
Lab Order:	10100192	**Report Date:**	10/22/2010
Project:	344511/Penta Wood Products Site	**Collection Date:**	10/5/2010 3:45:00 PM
Lab ID:	10100192-07	**Matrix:**	Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270D / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.408	10/12/10 23:55	61607	1.00	MG3
Surrogates:									
2-Fluorobiphenyl	61.2	20-140		%REC	0	10/12/10 23:55	61607	1.00	MG3
4-Terphenyl-d14	72.5	20-140		%REC	0	10/12/10 23:55	61607	1.00	MG3
Nitrobenzene-d5	62.3	20-140		%REC	0	10/12/10 23:55	61607	1.00	MG3
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0706	10/13/10	61726	1.00	AT2
Surrogates:									
3,5-Dichlorobenzoic Acid	65.0	40-140		%REC	0	10/13/10	61726	1.00	AT2
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
~~Benzene~~	< 0.1	0.1		µg/L	0.0400	10/9/10 01:35	61660	1.00	~~XN~~
Ethylbenzene	< 0.4	0.4		µg/L	0.0300	10/9/10 01:35	61660	1.00	XN
Toluene	< 0.4	0.4		µg/L	0.0434	10/9/10 01:35	61660	1.00	XN
~~Xylenes, Total~~	< 1.	1.		µg/L	0.120	10/9/10 01:35	61660	1.00	~~XN~~
Surrogates:									
4-Bromofluorobenzene	97.7	75-135		%REC	0	10/9/10 01:35	61660	1.00	XN
Fluorobenzene	92.2	75-135		%REC	0	10/9/10 01:35	61660	1.00	XN
Toluene-d8	101	75-135		%REC	0	10/9/10 01:35	61660	1.00	XN

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT:	CH2M HILL	**Client Sample ID:**	11CP02-01
Lab Order:	10100331	**Report Date:**	10/22/2010
Project:	344511/Penta Wood Products Site	**Collection Date:**	10/7/2010 3:55:00 PM
Lab ID:	10100331-01	**Matrix:**	Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270D / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.408	10/13/10 13:28	61687	1.00	MG3
Surrogates:									
2-Fluorobiphenyl	81.5	20-140		%REC	0	10/13/10 13:28	61687	1.00	MG3
4-Terphenyl-d14	87.1	20-140		%REC	0	10/13/10 13:28	61687	1.00	MG3
Nitrobenzene-d5	87.0	20-140		%REC	0	10/13/10 13:28	61687	1.00	MG3
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0704	10/15/10	61791	1.00	AT2
Surrogates:									
3,5-Dichlorobenzoic Acid	49.6	40-140		%REC	0	10/15/10	61791	1.00	AT2
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.1	0.1		µg/L	0.0400	10/21/10 17:09	61935	1.00	MNN
Ethylbenzene	< 0.4	0.4		µg/L	0.0300	10/21/10 17:09	61935	1.00	MNN
Toluene	< 0.4	0.4		µg/L	0.0434	10/21/10 17:09	61935	1.00	MNN
Xylenes, Total	< 1.	1.		µg/L	0.120	10/21/10 17:09	61935	1.00	MNN
Surrogates:									
4-Bromofluorobenzene	94.3	75-135		%REC	0	10/21/10 17:09	61935	1.00	MNN
Fluorobenzene	101	75-135		%REC	0	10/21/10 17:09	61935	1.00	MNN
Toluene-d8	98.5	75-135		%REC	0	10/21/10 17:09	61935	1.00	MNN

Qualifiers:

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R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT:	CH2M HILL	**Client Sample ID:**	11CP02-49
Lab Order:	10120003	**Report Date:**	12/7/2010
Project:	344511/Penta Wood Products Site	**Collection Date:**	11/30/2010 11:45:00 AM
Lab ID:	10120003-01	**Matrix:**	Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.1	0.1		µg/L	0.0400	12/6/10 16:19	62815	1.00	JL
Ethylbenzene	< 0.4	0.4		µg/L	0.0300	12/6/10 16:19	62815	1.00	JL
Toluene	< 0.4	0.4		µg/L	0.0434	12/6/10 16:19	62815	1.00	JL
Xylenes, Total	< 1.	1.		µg/L	0.120	12/6/10 16:19	62815	1.00	JL
Surrogates:									
4-Bromofluorobenzene	99.5	75-135		%REC	0	12/6/10 16:19	62815	1.00	JL
Fluorobenzene	99.9	75-135		%REC	0	12/6/10 16:19	62815	1.00	JL
Toluene-d8	96.6	75-135		%REC	0	12/6/10 16:19	62815	1.00	JL

Qualifiers:

- B - Analyte detected in the associated Method Blank
- E - Estimated
- H - Holding Time Exceeded
- S - Spike Recovery outside accepted recovery limits
- R - RPD outside accepted recovery limits
- J - Analyte detected below quantitation limits