CORRECTIVE ACTION MONITORING REPORT
2009 SECOND SEMIANNUAL EVENT

FORMER HOUSTON WOOD PRESERVING WORKS
4910 LIBERTY ROAD
HOUSTON, TEXAS

January 15, 2010

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1.0 EXECUTIVE SUMMARY

This semi-annual report presents a summary and evaluation of the Corrective Action Groundwater Monitoring for the Closed Surface Impoundment (Solid Waste Management Unit (SWMU) No. 1) at the former Wood Preserving Works facility (the Site) located in Houston, Texas. The groundwater monitoring activities for this period were performed by Pastor, Behling & Wheeler, LLC (PBW) on behalf of Union Pacific Railroad (UPRR) in July 2009.

The two uppermost groundwater bearing units, the A-Transmissive Zone (A-TZ) and the B-Transmissive Zone (B-TZ), were monitored during this period. Groundwater elevation data collected during the Juy 2009 sampling event show groundwater flow in the A-TZ to the northwest in the western portion of SWMU No. 1 and to the southeast in the eastern portion of SWMU No. 1 with a hydraulic gradient of approximately 0.005 ft/ft. This groundwater flow was similar to the 2009 first semi-annual monitoring event.

Groundwater elevation data collected in the B-TZ show groundwater flow to the northwest with a hydraulic gradient of 0.005 ft/ft. Groundwater flow during the 2009 first semi-annual monitoring event was also to the northwest.

Analytical results from the July 2009 sampling event were compared to Texas Commission on Environmental Quality Texas Risk Reduction Program Protective Concentration Limits, as designated in Section IV.D of the Compliance Plan, dated June 10, 2005. Constituent concentrations were below their respective PCLs for the eighth consecutive semi-annual monitoring event. Monitoring wells in both the A-TZ and B-TZ are considered to be compliant for this monitoring period.

2.0 INTRODUCTION

This semi-annual report presents a summary and evaluation of groundwater monitoring data collected during the 2009 second semi-annual monitoring period (July through December) at the Union Pacific Railroad (UPRR) former Houston Wood Preserving Works facility (the Site) located at 4910 Liberty Road in Houston, Texas (Figure 1). Semi-annual groundwater monitoring is required for the Site as a condition of the Texas Commission on Environmental Quality (TCEQ) Hazardous Waste Permit No. 50343 and associated Compliance Plan (CP) No. 50343, both renewed and issued on June 10, 2005. Groundwater monitoring at the Site is performed to monitor groundwater quality beneath the Closed Surface Impoundment Unit No. 001 (Solid Waste Management Unit (SWMU) No. 1).

On behalf of UPRR, Pastor, Behling & Wheeler, LLC. (PBW) conducted groundwater monitoring activities at the Site on July 22, 2009. Groundwater monitoring activities included sampling and gauging the background and point of compliance (POC) wells and piezometers associated with SWMU No. 1. The sampling event, analytical data, and data evaluation provided in this report fulfill the semi-annual corrective action reporting requirements for the second half of 2009 as described in the CP, Section VII.C.2. This section requires the following reporting elements:

Semi-Annual Corrective Action Report Requirements	**Report Section, Table(s) and/or Figure(s)**
A narrative summary of the evaluations made in accordance with CP Sections V, VI, and VII for the preceding six-month period. These periods shall be January 1 through June 30 and July 1 through December 31 (VII.C.2.a.)	3.0
Summary of Methods utilized for management of recovered/purged water (VII.C.2.b.)	3.2
An updated table and map of the monitoring and corrective action system wells (VII.C.2.c.)	Section 3.1.1 and Figure 2
The results of the chemical analyses, submitted in a tabulated format in a form acceptable to the Executive Director, which clearly indicates each parameter that exceeds the Groundwater Protection Standard (GWPS). Copies of the original laboratory report for chemical analyses showing detection limits and quality control and quality assurance data shall be provided if requested by the Executive Director (VII.C.2.d.)	Tables 1 & 2 Appendix C
Tabulation of the water level elevations (relative to mean sea level), depth to water measurements, and total depth of well measurements collected since the data that was submitted in the previous semiannual report (VII.C.2.e.)	Table 4
Potentiometric surface maps showing the elevation of the water table at the time of sampling and direction of groundwater flow gradients (VII.C.2.f.)	Figures 3 & 4
A notation of the presence or absence of non-aqueous phase liquids (NAPLs), both light and dense phases, in each well during each sampling event since the last event covered in the previous semiannual report and tabulation of depth and thickness of NAPLs, if detected (VII.C.2.g.)	Table 4

Semi-Annual Corrective Action Report Requirements (cont'd)	Report Section, Table(s) and/or Figure(s)
Quarterly tabulations of quantities of recovered groundwater and NAPLs, and graphs of monthly recorded flow rates versus time for the recovery wells during each period. A narrative summary describing and evaluating the NAPL recovery program shall also be included (VII.C.2.h.)	Not Applicable
Tabulation of the total contaminant mass recovered from each recovery system for each reporting period, if such a system is installed (VII.C.2.i.)	Not Applicable
Tabulation of the data evaluation results pursuant to Section VI.D and status of each well listed on CP Table V with regard to compliance with the corrective action objectives and compliance with the GWPSs (VII.C.2.j.)	Table 5
Maps of the contaminated area depicting concentrations of constituents listed in Table IV and any newly detected Table III constituents as isopleths contours or discrete concentrations if isopleths contours cannot be inferred (VII.C.2.k.)	Not Applicable
Maps indicating the extent and thickness of the LNAPLs and DNAPLs, if detected (VII.C.2.l.)	Not Detected
An updated schedule summary as required by Section X (VII.C.2.m.)	Appendix D
Summary of any changes made to the monitoring/corrective action program and a summary of recovery well inspections, repairs, and any operational difficulties (VII.C.2.n.)	None
A table of the modifications and amendments made to this Compliance Plan with their corresponding approval dates by the executive director or the Commission and a brief description of each action (VII.C.2.o.)	None
Corrective Measures Implementation (CMI) Report to be submitted in accordance with Section VIII.F, if necessary (VII.C.2.p.)	Not Applicable
Tabulation of well casing elevations in accordance with Attachment B No. 16 (VII.C.2.q.)	Table 4
Recommendation for any changes (VII.C.2.r.)	None
Certification and well installation diagram for any new well installation or replacement and certification for any well plugging and abandonment (VII.C.2.s.)	Not Applicable
A summary of any activity within an area subject to institutional control (VII.C.2.t.)	None
Any other items requested by the Executive Director (VII.C.2.u.)	None

As of December 2009, a recovery system had not been installed at this facility. Therefore, Provisions 8, 9, and 10 that relate to recovery wells or recovery system, are not applicable to this reporting period.

Responses to each of the semi-annual report provisions required by CP Section VII.C.2 are provided in Section 3.0. Conclusions and recommendations are provided in Section 4.0.

3.0 2009 SEDOND SEMI-ANNUAL GROUNDWATER MONITORING EVENT

A discussion of each of the semi-annual report provisions required by CP Section VII.C.2 is presented below by reference number to the list of provisions in Section 2.0.

3.1 Narrative Summary of First Semi-annual Monitoring Activities

The CP requires an evaluation of the Corrective Action Program (Section V) and Groundwater Monitoring Program summarizing the overall effectiveness of the Corrective Action Program (Section VI). This narrative summary includes provisions for response and reporting requirements as detailed in the CP Section VII, as discussed below.

3.1.1 Corrective Action Program

Groundwater samples were collected from the Background and POC wells (as detailed in CP Table V, which is provided in Appendix A) to assess potentially affected groundwater quality in the A-Transmissive Zone (A-TZ) and the B-Transmissive Zone (B-TZ). These water-bearing zones are defined as:

- A-TZ refers to the first sand unit encountered at approximately 13 feet below ground surface (bgs) and averages 7 feet in thickness; and
- B-TZ refers to the second sand unit encountered at approximately 30 feet bgs and averages 9 feet in thickness.

The definitions of the A-TZ and B-TZ are consistent with the Uppermost Transmissive Zone (UTZ) and Second Transmissive Zone (STZ), respectively, as defined in CP Provision I.A.

The following monitoring wells were sampled during this event (Figure 2):

- A-TZ POC wells: MW-01A, MW-02, MW-07, MW-10A, and MW-11A;
- A-TZ Background well: MW-08;
- B-TZ POC wells: MW-10B, MW-11B, and P-10; and
- B-TZ background well: P-12.

3.1.2 Groundwater Monitoring

PBW performed quarterly inspections of SWMU No. 1 in July and October? 2009 and conducted semi-annual groundwater sampling activities on July 22, 2009. Groundwater sampling was performed using procedures outlined in a U.S. Environmental Protection Agency (EPA) document titled *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures* (EPA/540/S-95/504) published in April 1996 and approved in the CP application. Groundwater samples were analyzed for the Detected Hazardous and Solid Waste Constituents listed in the CP, Table III (Appendix A).

Monitoring wells are equipped with dedicated polytetrafluoroethylene (PTFE) tubing for groundwater sampling. A Master-Flex® peristaltic pump was used to collect the groundwater samples. An approximate one-foot section of disposable silicon tubing was placed around the pump head and attached to the PTFE tubing for proper operation of the pump. Groundwater was pumped from the screened interval of each well at a flow rate of less than 0.5 L/min using a flow-through cell, field parameters including temperature, pH, specific conductivity, dissolved oxygen, and turbidity were measured during purging and sampling activities. When field parameters had stabilized to the EPA-specified criteria, a sample was then collected for analysis. The samples were also collected at a flow rate of less than 0.5 L/min. Recorded field parameters are summarized in Appendix B.

For each well, sample bottles were filled directly from the pumping apparatus described above, and were sealed and packed in coolers with sufficient ice to maintain a sample temperature of approximately 4°C. The sample coolers were delivered to ALS Laboratory, in Houston, Texas for analysis. Chain-of-Custody (COC) forms were completed and kept with their respective samples. Copies of the analytical data and COCs are included in Appendix C. Groundwater samples were then analyzed for the Detected Hazardous and Solid Waste Constituents listed in the CP, Table III (Appendix A).

3.2 Purge Water Management

Approximately 4.5 gallons of purge water was generated during the July 2009 low-flow groundwater sampling event. The purge water was containerized in a Department of Transportation (DOT) certified, 55-gallon steel drum and temporarily stored on site in a fenced and locked container storage area (NOR 006). Since the groundwater sampled and analyzed during this event did not contain hazardous constituents above the applicable health-based levels (i.e. PCLs discussed in Section 3.10), the purge water generated was not considered hazardous in accordance with the EPA "contained-in determination"

detailed in the 1986 EPA memorandum "RCRA Regulatory Status of Contaminated Groundwater". Wastes generated during the 2009 semi-annual monitoring event were picked up from the Site by Clean Harbors Environmental Services, Inc. and transported to the Clean Harbors Deer Park LP facility, located at 2027 Independence Parkway South, La Porte, Texas for disposal on October 22, 2009 under EPA waste codes F034 and K001, and TCEQ Notice of Registration (NOR) waste code 0917406H.

3.3 Monitoring and Corrective Action System Wells

A summary of the current monitoring and corrective action groundwater wells is discussed in Section 3.1.1. Configuration of the current monitoring and corrective action well network is presented on Figure 2.

3.4 Analytical Results

The 2009 second semi-annual groundwater analytical results from the A-TZ and B-TZ are summarized in Tables 1 and 2, respectively and the laboratory analytical report is provided in Appendix C. The analytical results were compared to the Detected Hazardous and Solid Waste Constituent limits, which are taken from the TCEQ Texas Risk Reduction Program (TRRP) Tier 1 Protective Concentration Levels (PCLs). TRRP PCLs serve as the Groundwater Protection Standard (GWPS), as detailed in Section IV.D and Table III of the CP. If any concentrations exceeded the concentration limits of this report, the concentration is bolded within the table.

Quality assurance/quality control (QA/QC) samples (field blank, matrix spike and matrix spike duplicate results) are summarized in Table 3.

3.5 Well Measurements

During the sampling event, the following information was recorded at each monitoring well:

Before Sampling

- The presence of light NAPLs was evaluated; and
- Depth to groundwater below the top of casing was measured to the nearest 0.01 foot.

After Sampling

- The presence of dense non-aqueous phase liquids (DNAPLs) were evaluated using visual observations and an oil-water interface probe; and
- Total well depths of the wells were measured.

Table 4 provides a summary of these measurements. None of the compliance wells had measurable amounts or any indication of LNAPL or DNAPL.

3.6 Potentiometric Surface Maps

Groundwater elevation data recorded during the 2009 second semi-annual monitoring event were used to create potentiometric surface maps of the A-TZ and B-TZ, presented on Figures 3 and 4, respectively.

Groundwater elevation data collected during the July 2009 sampling event show groundwater flow in the A-TZ to the northwest in the western portion of SWMU No. 1 and to the southeast in the eastern portion of SWMU NO. 1 with a hydraulic gradient of approximately 0.005 ft/ft (Figure 3). A-TZ groundwater flow was similar to the flow observed during the 2009 first semi-annual monitoring event.

Groundwater elevation data collected in the B-TZ show groundwater flow to the northwest with a hydraulic gradient of 0.005 ft/ft (Figure 4). Groundwater flow during the 2009 first semi-annual monitoring event was also to the northwest.

3.7 Non-Aqueous Phase Liquids

Measurable amounts of LNAPL and/or DNAPL were not observed in any of the compliance wells.

3.8 Recovered Groundwater and NAPL

To date, a recovery system has not been installed at the SWMU No. 1; therefore, this provision is not applicable.

3.9 Contaminant Mass Recovered

With the groundwater analytical data for the POC wells in compliance and no groundwater recovery system installed, or necessary, this provision is not applicable for the Site.

3.10 Analytical Data Evaluation

Section VI.D of the CP describes two methods which may be used to determine the compliance status of a given well:

1) Analytical results may be either directly compared with PCLs (CP Table III; included in Appendix A), or
2) Analytical results can be statistically compared PCLs using the Confidence Interval Procedure for the mean concentration based on normal, log-normal, or non-parametric distribution, which the 95% confidence coefficient of the t-distribution will be used in construction of the confidence interval.

Direct comparison to PCLs was used to evaluate the analytical data. Tables 1 and 2 show the results of a direct comparison of data for this sampling event to the respective PCLs. Wells and piezometers are in compliance if each of the constituents listed in the CP Table III was reported at a concentration less than or equal to the PCL. Based on the analytical results from the July 2009 monitoring event the compliance wells completed in both transmissive zones are compliant with groundwater results below their respective PCLs; therefore the monitoring wells are considered to be compliant for this monitoring period. Compliance status for each of the monitoring wells is provided in Table 5.

Monitoring wells in A-TZ and B-TZ have not exceeded the established CP PCLs since July 2005, at which time dibenzofuran exceeded its respective PCL of 0.098 mg/L in MW-01A (0.11 mg/L). Including the 2009 second semi-annual analytical data, the SMWU No. 1 monitoring wells have been compliant for eight consecutive semi-annual monitoring events (four years).

A QA/QC review and Data Usability Summary (DUS) were prepared for the July 2009 analytical data by Conestoga-Rovers & Associates (CRA). Analytical results were flagged based on the data validation review of the QA/QC samples.

The following samples were qualified as *Estimated (J)*:

- P-10 and FD-02 for Acenapthene;
- MW-11B for Acenapthylene;
- MW-01A, MW-10B, MW-11B and FD-01 for Anthracene;
- MW-11A for Bis(2-ethylhexyl)phthalate;
- MW-01A, MW02 and FD-01 for Dibenzofuran;
- MW-01A, MW02, MW-10B, MW-11A, MW-11B and FD-01 for Fluoranthene;
- MW-01A, MW02 and FD-01 for 2-Methylnaphthalene;
- MW-01A and FD-01 for Naphthalene; and
- MW-01A, MW-10B, MW-11B and FD-01 for Pyrene.

A DUS for the laboratory analyses is included in Appendix C, and validated qualifiers were added to the data tables (Tables 1 and 2). Based on the QA/QC data review, the analytical data are usable for the intended use.

3.11 Reported Concentration Maps

Reported concentrations of each constituent analyzed for the 2009 Second Semi-Annual Groundwater Monitoring Event are presented on Figures 5 and 6 for the A-TZ and B-TZ compliance wells, respectively. In the event a constituent exceeded their respective PCL, the value would be highlighted on the figures. There were no exceedances of PCLs for any of the required constituents.

3.12 Extent of NAPL

Measurable amounts of LNAPL or DNAPL were not detected in any of the compliance wells.

3.13 Updated Compliance Schedule

Section X of the CP requires that the Permittee submit a schedule summarizing the activities required by the Compliance Plan issued on June 10, 2005, which was originally submitted to the TCEQ on August 4, 2004. An updated compliance schedule is included as Appendix D of this report.

3.14 Summary of Changes Made to Corrective Action Program

No changes have been made to the corrective action program.

3.15 Modifications and Amendments to Compliance Plan

A compliance plan renewal application was submitted to TCEQ on December 23, 2003 consistent with the renewal requirements for the RCRA permit at the site. The RCRA permit and CP were issued June 10, 2005. There have been no modifications or amendments to the Compliance Plan since the last permit issued.

3.16 Corrective Measures Implementation (CMI) Report

A Response Action Plan (RAP) has not been submitted; therefore, this provision does not apply.

3.17 Well Casing Elevations

Top-of-casing elevations referenced to feet above Mean Sea Level (MSL) for each compliance monitoring well are summarized in Table 4.

3.18 Recommendation for Changes

There are no recommendations for changes to the monitoring program or to the Corrective Action Program.

3.19 Well Installation and/or Abandonment

No monitoring wells were installed or abandoned as part of the monitoring program or the Corrective Action Program during the reporting period.

3.20 Activity Within Area Subject to Institutional Control

No areas are under institutional control; therefore, this provision does not apply.

3.21 Other Requested Items

No other items have been requested by the executive director.

TABLES

Table 1
Summary of Analytical Results for the A-Transmissive Zone (A-TZ)
Semiannual Monitoring Report: 2009 Second Semiannual Event

Houston Wood Preserving Works
Houston, Texas

Analyte	PCL (mg/L)	Monitoring Well IDs (Concentrations mg/L)																				
		MW-01A			DUP-01			MW-02			MW-07			MW-08			MW-10A			MW-11A		
		7/22/2009	LQ	VQ	7/22/2009	LQ	VQ	7/22/2009	LQ	VQ	7/22/2009	LQ	VQ	7/22/2009	LQ	VQ	7/22/2009	LQ	VQ	7/22/2009	LQ	VQ
Acenaphthene	1.5	0.085			0.091			0.032		U	<0.0009	U		<0.0009	U		<0.0009	U		0.014		U
Acenaphthylene	1.5	<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U	
Anthracene	7.3	0.0011	J		0.0014	J		<0.0006	U		<0.0006	U		<0.0006	U		<0.0006	U		<0.0006	U	
bis(2-ethylhexyl)phthalate	0.006	<0.0033	U		<0.0033	U		<0.0033	U		<0.0033	U		<0.0033	U		<0.0033	U		<0.0033	U	
Dibenzofuran	0.098	0.0037	J	U	0.0038	J	U	0.0042	J	U	<0.0007	U		<0.0007	U		<0.0007	U		<0.0007	U	
Fluoranthene	0.98	0.0037	J		0.0039	J		0.0011	J		<0.0005	U		<0.0005	U		<0.0005	U		0.0011	J	
Fluorene	0.98	0.04			0.041			0.015		U	<0.0006	U		<0.0006	U		<0.0006	U		<0.0006	U	
2-Methylnaphthalene	0.098	0.0017	J		0.0019	J		0.0025	J		<0.0009	U		<0.0009	U		<0.0009	U		<0.0009	U	
Naphthalene	0.49	0.0029	J		0.0031	J		0.012			<0.0006	U		<0.0006	U		<0.0006	U		<0.0006	U	
Phenanthrene	0.73	<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U	
Pyrene	0.73	0.0019	J		0.0021	J		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U	

Notes:
PCL = Protective Concentration Level
The Compliance Plan Section IV.D defines the Groundwater Protection Standard (GWPS) as the PCL
DUP-01= Duplicate sample collected at MW-01A

LQ - Lab Qualifier
J = Estimated value between the SDL and the MQL
U = Value not detected greater than the MQL

VQ - Validation Qualifier
U = Value qualified as non-detect due to analyte concentrations in the field blanks.

Table 2
Summary of Analytical Results for the B-Transmissive Zone (B-TZ)
Semiannual Monitoring Report: 2009 First Semiannual Event

Houston Wood Preserving Works
Houston, Texas

Analyte	PCL (mg/L)	Monitoring Well IDs (Concentrations mg/L)														
		MW-10B			MW-11B			P-10			DUP-02			P-12		
		7/22/2009	LQ	VQ	1/22/2009	LQ	VQ	1/22/2009	LQ	VQ	1/22/2009	LQ	VQ	1/22/2009	LQ	VQ
Acenaphthene	1.5	0.067		U	0.12			0.0044	J	U	0.0045	J	U	<0.0009	U	
Acenaphthylene	1.5	<0.0005	U		0.0015	J		<0.0005	U		<0.0005	U		<0.0005	U	
Anthracene	7.3	0.0029	J		0.0043	J		<0.0006	U		<0.0006	U		<0.0006	U	
bis(2-ethylhexyl)phthalate	0.006	<0.0033	U		<0.0033	U		<0.0033	U		<0.0033	U		<0.0033	U	
Dibenzofuran	0.098	0.023			0.054			<0.0007	U		<0.0007	U		<0.0007	U	
Di-n-butyl phthalate	2.4	<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U	
Fluoranthene	0.98	0.0022	J		0.0036	J		<0.0005	U		<0.0005	U		<0.0005	U	
Fluorene	0.98	0.033		U	0.053			<0.0006	U		<0.0006	U		<0.0006	U	
Naphthalene	0.49	0.0082			0.048			<0.0006	U		<0.0006	U		<0.0006	U	
Phenol	7.3	<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U	
Pyrene	0.73	0.0013	J		0.002	J		<0.0005	U		<0.0005	U		<0.0005	U	

Notes:
PCL = Protective Concentration Level
The Compliance Plan Section IV.D defines the Groundwater Protection Standard (GWPS) as the PCL
DUP-02 = Duplicate sample collected at P-10

LQ - Lab Qualifier
J = Estimated value between the SDL and the MDQ
U = Value not detected greater than the MQL

VQ - Validation Qualifier
U = Value qualified as non-detect due to analyte concentrations in the field blanks.

Table 3
Summary of Analytical Results for Quality Assurance/Quality Control Samples
Semiannual Monitoring Report: 2009 Second Semiannual Event

Houston Wood Preserving Works
Houston, Texas

Analyte	PCL (mg/L)	Sample IDs (Concentrations mg/L)					
		FB-01		P-12(MS)[1]		P-12(MSD)[1]	
		Field Blank		Matrix Spike		Matrix Spike Duplicate	
		7/22/2009		7/22/2009		7/22/2009	
Acenaphthene	1.5	0.014		0.03291		0.03475	
Acenaphthylene	1.5	<0.0005	U	0.03323		0.03682	
Anthracene	7.3	<0.0006	U	0.03274		0.03502	
bis(2-ethylhexyl)phthalate	0.006	<0.0033	U	0.03411		0.03451	
Dibenzofuran	0.098	0.0034	J	0.003378		0.03651	
Di-n-butyl phthalate	2.4	<0.0005	U	0.03251		0.03586	
Fluoranthene	0.98	<0.0005	U	0.03306		0.03476	
Fluorene	0.98	0.007		0.03438		0.03663	
2-Methylnaphthalene	0.098	<0.0009	U	0.03328		0.03506	
Naphthalene	0.49	<0.0006	U	0.03152		0.03424	
Phenanthrene	0.73	0.0016	J	0.03279		0.03525	
Phenol	7.3	<0.0005	U	0.06613		0.07322	
Pyrene	0.73	<0.0005	U	0.03352		0.03504	

Notes:
PCL = Protective Concentration Level
(1) = P-12(MS) and P-12(MSD) are matrix spike and matrix spike duplicate samples collected at P-12, respectively.
J = Estimated value between the SDL and the MQL.

Table 4

Water Level Measurements
Semiannual Monitoring Report: 2009 Second Semiannual Event

Houston Wood Preserving Works
Houston, Texas

Well ID	Top of Casing Elevation (TOC) (ft MSL)	Date Measured	Water Depth (ft. BTOC)	Depth to NAPL (ft. BTOC)	Total Well Depth as Completed (ft. BTOC)	Total Well Depth (ft. BTOC)	Potentiometric Elevation (ft. MSL)
A-TZ Monitoring Locations							
MW-01A	47.92	7/22/2009	6.96	ND	20.2	19.91	40.96
MW-02	47.97	7/22/2009	7.56	ND	20.3	20.21	40.41
MW-07	48.86	7/22/2009	7.67	ND	NA	24.83	41.19
MW-08	49.33	7/22/2009	7.96	ND	26.8	25.72	41.37
MW-10A	49.86	7/22/2009	9.03	ND	25.9	25.55	40.83
MW-11A	50.05	7/22/2009	8.89	ND	24.4	24.06	41.16
B-TZ Monitoring Locations							
MW-10B	49.94	7/22/2009	9.09	ND	48.8	48.35	40.85
MW-11B	50.18	7/22/2009	9.16	ND	46.8	47.10	41.02
P-10	47.69	7/22/2009	6.67	ND	40.0	43.89	41.02
P-12	48.78	7/22/2009	7.12	ND	40.0	43.46	41.66

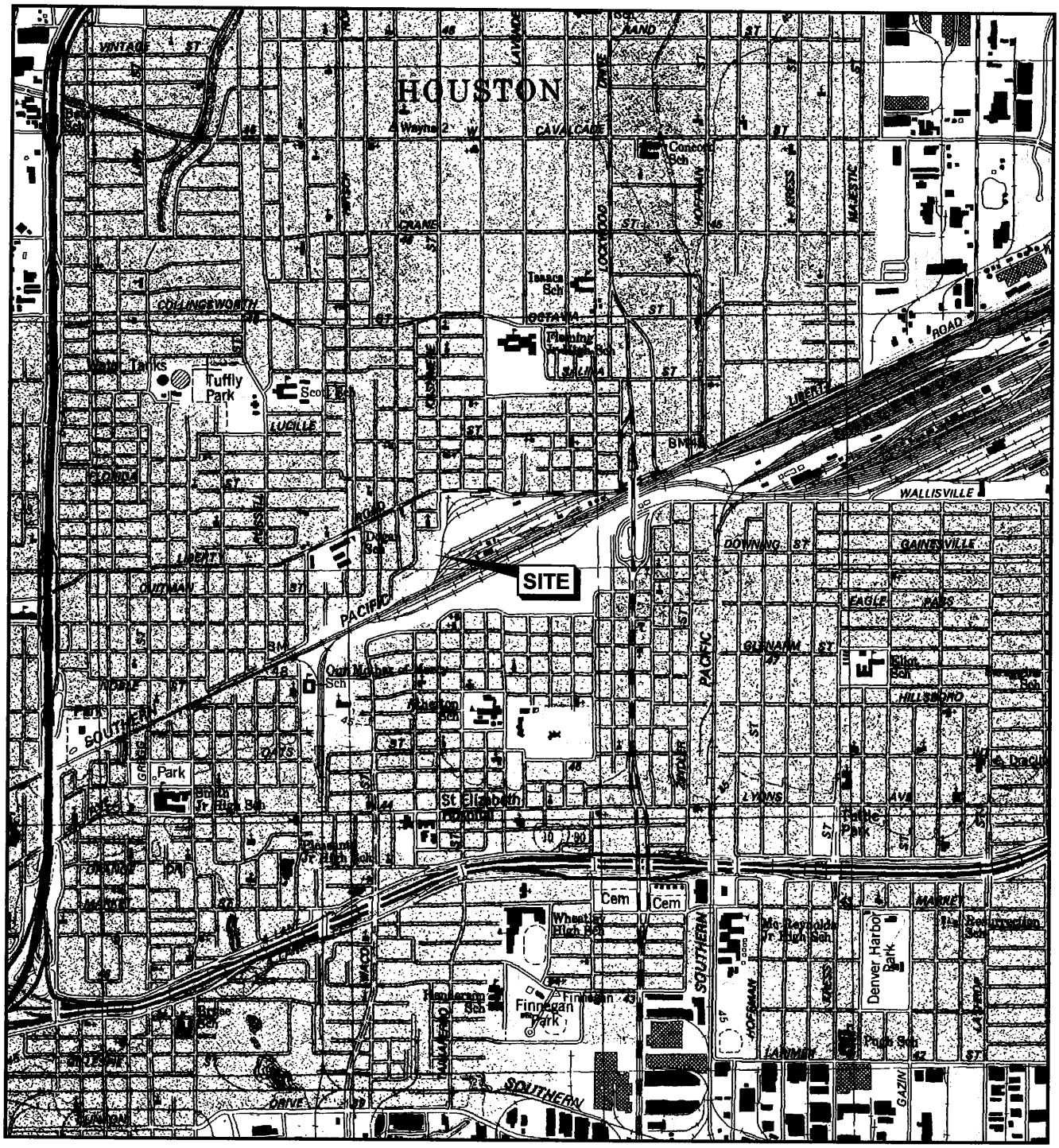
Notes
BTOC = feet below the top of the well casing
ft. MSL = feet above Mean Sea Level
NA = Information not available
ND = Not Detected

Table 5
Compliance Status of Wells and Piezometers
Semiannual Monitoring Report: 2009 Second Semiannual Event

Houston Wood Preserving Works
Houston, Texas

Zone	Monitoring Well Location	Well Designation	Compliance Status
A-TZ Monitoring Location	MW-01A	Point of Compliance	Compliant
	MW-02	Point of Compliance	Compliant
	MW-07	Point of Compliance	Compliant
	MW-08	Background Well	Compliant
	MW-10A	Point of Compliance	Compliant
	MW-11A	Point of Compliance	Compliant
B-TZ Monitoring Location	MW-10B	Point of Compliance	Compliant
	MW-11B	Point of Compliance	Compliant
	P-10	Point of Compliance	Compliant
	P-12	Background Well	Compliant

FIGURES



QUADRANGLE LOCATION

N

Scale in Feet

0 1000 2000

Source:
U.S.G.S. 7.5 minute quadrangle, Settegast, Texas, 1982.

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Figure 1

SITE LOCATION MAP

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DATE: JAN., 2010	CHECKED: ECM	

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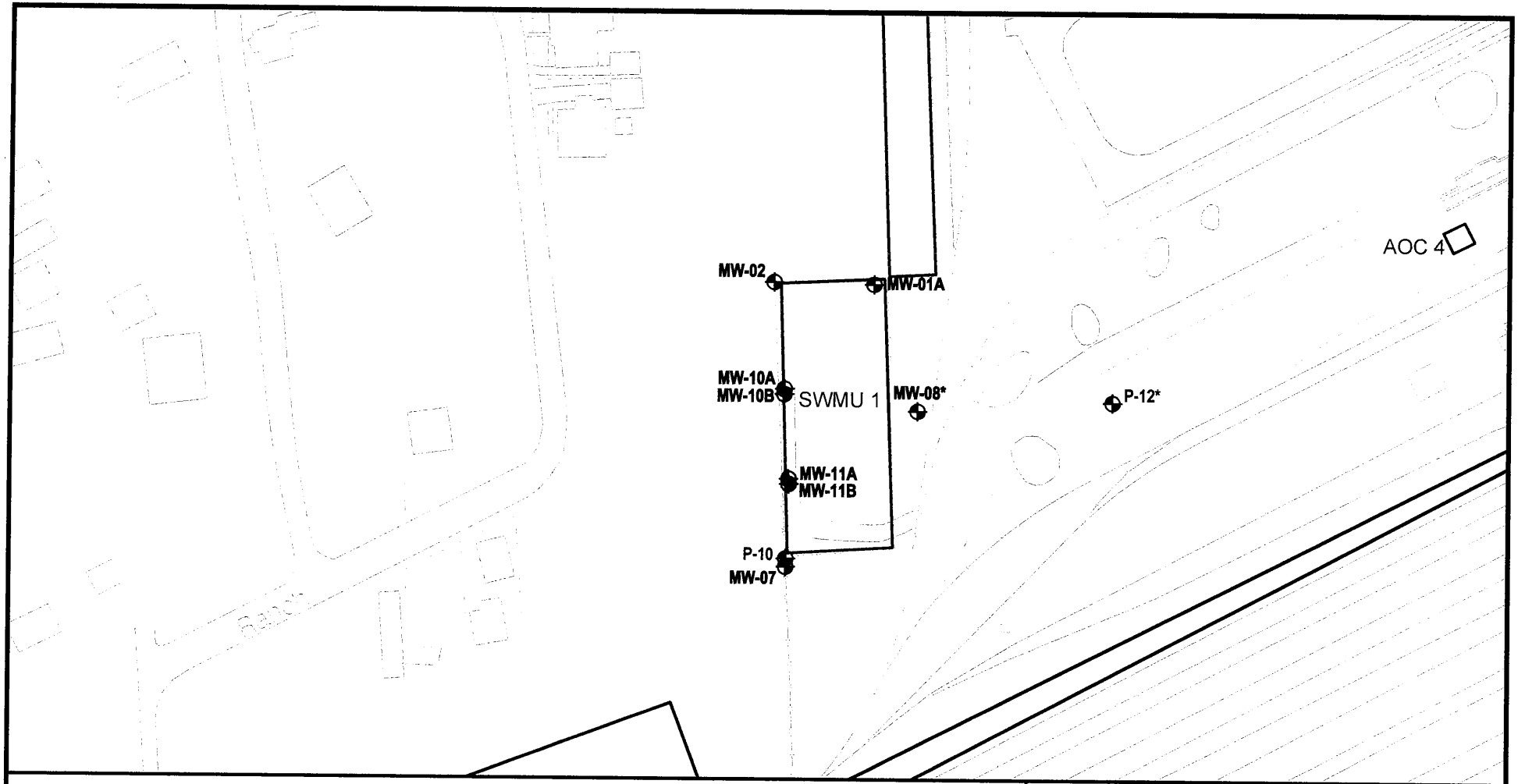

EXPLANATION

Road, Parking Lot, Sidewalk

Fence

Railroad

Zone A Monitoring Well Location

Zone B Monitoring Well Location

Note:
* Background well.

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Approx. Scale in Feet

0 60 120

Source:
Base map from ERM-Southwest, Inc
0014419a310.dwg, 6/19/2006.

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HOUSTON WOOD PRESERVING WORKS

Figure 2

CORRECTIVE ACTION MONITORING WELL NETWORK TCEQ PERMIT UNIT NO. 1

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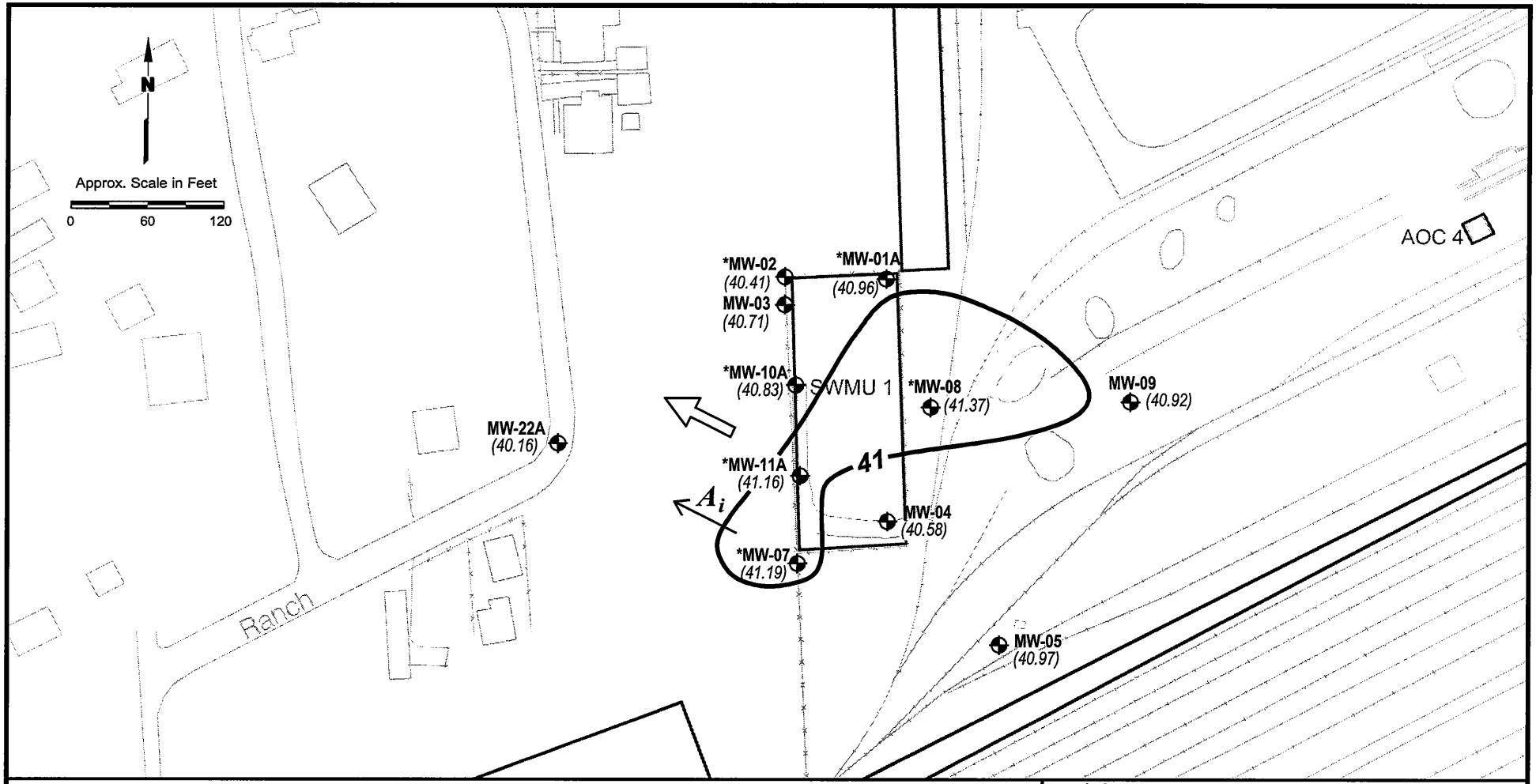

EXPLANATION

- Road, Parking Lot, Sidewalk
- Fence
- Railroad
- A-TZ Monitoring Well Location (* - Compliance Well)
- (40.97) Groundwater Elevation (Ft, MSL)
- 41 Groundwater Elevation Contour (Ft, MSL) C.I.= 1 Ft
- General Groundwater Flow Direction

ESTIMATED GRADIENT

$A_i \rightarrow A_i = \frac{1ft}{210ft} = 0.005\ ft/ft$

Source:
Base map from ERM-Southwest, Inc
0014419a310.dwg, 6/19/2006.

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Figure 3

A-TZ POTENTIOMETRIC SURFACE CONTOUR MAP JULY 22, 2009

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: JAN., 2010	CHECKED: ECM	

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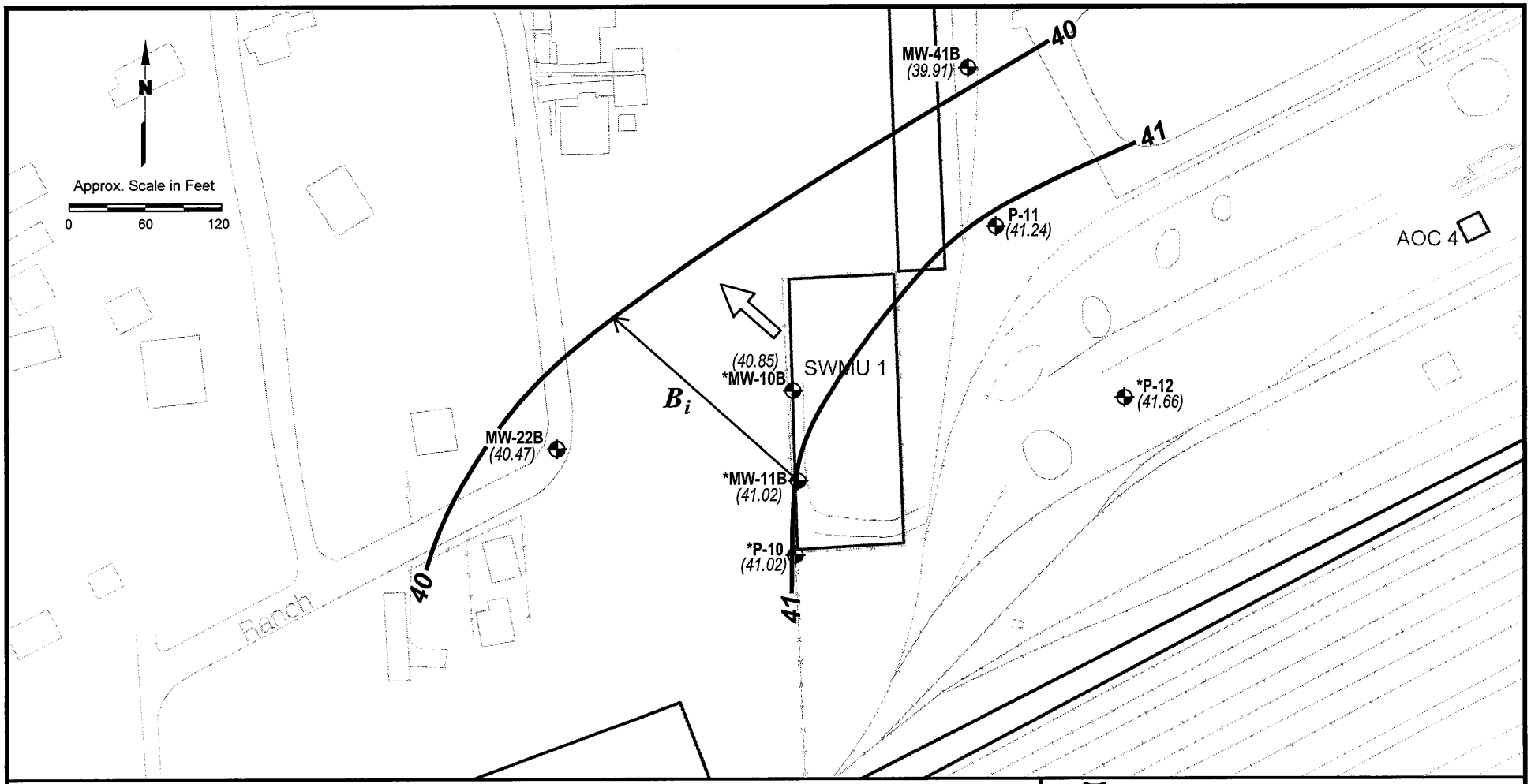

EXPLANATION

- Road, Parking Lot, Sidewalk
- Fence
- Railroad
- B-TZ Monitoring Well Location (* - Compliance Well)
- (40.85) Groundwater Elevation (Ft, MSL) (NM = Not Measured)
- —41— Groundwater Elevation Contour (Ft, MSL) C.I.= 1 Ft
- General Groundwater Flow Direction

ESTIMATED GRADIENT

$B_i \rightarrow B_i = \frac{1ft}{193ft} = 0.005\ ft/ft$

Source:
Base map from ERM-Southwest, Inc
0014419a310.dwg, 6/19/2006.

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Figure 4

B-TZ POTENTIOMETRIC SURFACE CONTOUR MAP JULY 22, 2009

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: JAN., 2010	CHECKED: ECM	

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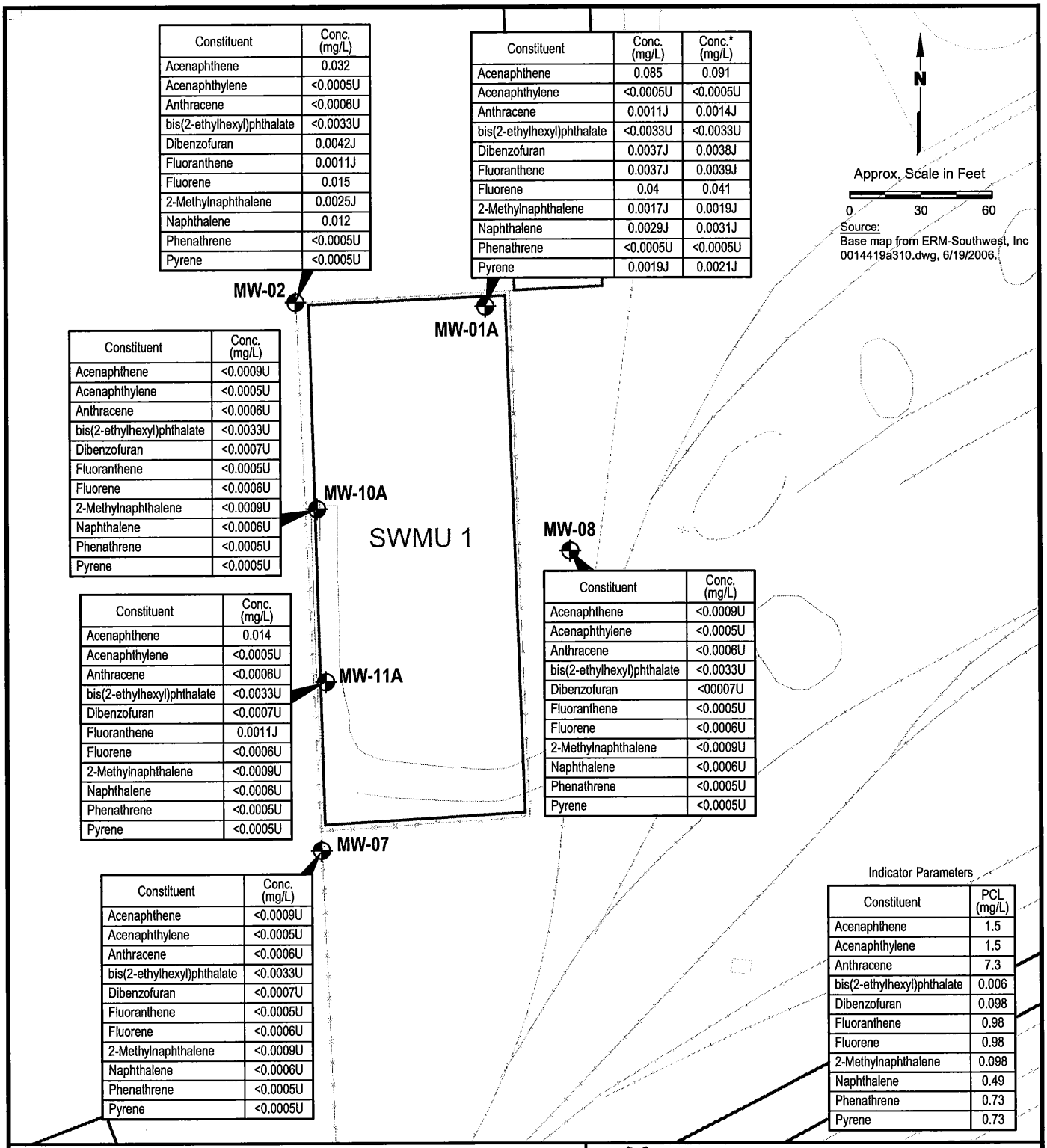

Constituent	Conc. (mg/L)
Acenaphthene	0.032
Acenaphthylene	<0.0005U
Anthracene	<0.0006U
bis(2-ethylhexyl)phthalate	<0.0033U
Dibenzofuran	0.0042J
Fluoranthene	0.0011J
Fluorene	0.015
2-Methylnaphthalene	0.0025J
Naphthalene	0.012
Phenathrene	<0.0005U
Pyrene	<0.0005U

Constituent	Conc. (mg/L)	Conc.* (mg/L)
Acenaphthene	0.085	0.091
Acenaphthylene	<0.0005U	<0.0005U
Anthracene	0.0011J	0.0014J
bis(2-ethylhexyl)phthalate	<0.0033U	<0.0033U
Dibenzofuran	0.0037J	0.0038J
Fluoranthene	0.0037J	0.0039J
Fluorene	0.04	0.041
2-Methylnaphthalene	0.0017J	0.0019J
Naphthalene	0.0029J	0.0031J
Phenathrene	<0.0005U	<0.0005U
Pyrene	0.0019J	0.0021J

Constituent	Conc. (mg/L)
Acenaphthene	<0.0009U
Acenaphthylene	<0.0005U
Anthracene	<0.0006U
bis(2-ethylhexyl)phthalate	<0.0033U
Dibenzofuran	<0.0007U
Fluoranthene	<0.0005U
Fluorene	<0.0006U
2-Methylnaphthalene	<0.0009U
Naphthalene	<0.0006U
Phenathrene	<0.0005U
Pyrene	<0.0005U

Constituent	Conc. (mg/L)
Acenaphthene	0.014
Acenaphthylene	<0.0005U
Anthracene	<0.0006U
bis(2-ethylhexyl)phthalate	<0.0033U
Dibenzofuran	<0.0007U
Fluoranthene	0.0011J
Fluorene	<0.0006U
2-Methylnaphthalene	<0.0009U
Naphthalene	<0.0006U
Phenathrene	<0.0005U
Pyrene	<0.0005U

Constituent	Conc. (mg/L)
Acenaphthene	<0.0009U
Acenaphthylene	<0.0005U
Anthracene	<0.0006U
bis(2-ethylhexyl)phthalate	<0.0033U
Dibenzofuran	<00007U
Fluoranthene	<0.0005U
Fluorene	<0.0006U
2-Methylnaphthalene	<0.0009U
Naphthalene	<0.0006U
Phenathrene	<0.0005U
Pyrene	<0.0005U

Constituent	Conc. (mg/L)
Acenaphthene	<0.0009U
Acenaphthylene	<0.0005U
Anthracene	<0.0006U
bis(2-ethylhexyl)phthalate	<0.0033U
Dibenzofuran	<0.0007U
Fluoranthene	<0.0005U
Fluorene	<0.0006U
2-Methylnaphthalene	<0.0009U
Naphthalene	<0.0006U
Phenathrene	<0.0005U
Pyrene	<0.0005U

Indicator Parameters

Constituent	PCL (mg/L)
Acenaphthene	1.5
Acenaphthylene	1.5
Anthracene	7.3
bis(2-ethylhexyl)phthalate	0.006
Dibenzofuran	0.098
Fluoranthene	0.98
Fluorene	0.98
2-Methylnaphthalene	0.098
Naphthalene	0.49
Phenathrene	0.73
Pyrene	0.73

EXPLANATION

- Fence
- Railroad
- A-TZ Monitoring Well Location

Notes:
1. * Duplicates sample taken at MW-1A.
2. Sample collected on July 22, 2009.
3. J= Estimated value between SQL and MDL.
4. U= Value not detected greater than the MDL.

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Figure 5

A-TZ REPORTED CONCENTRATIONS 2009 2nd SEMI ANNUAL MONITORING EVENT

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: JAN., 2010	CHECKED: ECM	

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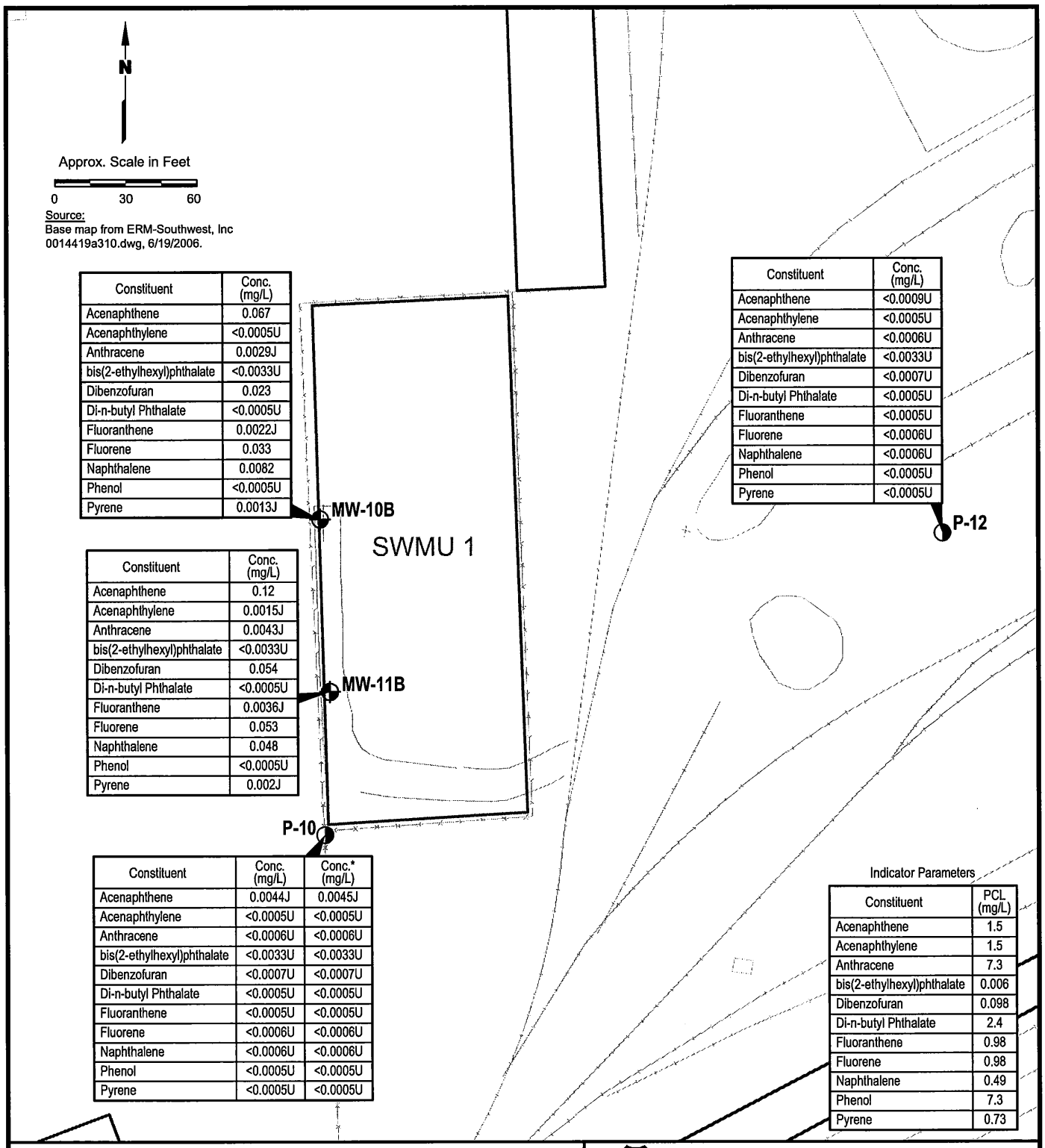

Constituent	Conc. (mg/L)
Acenaphthene	0.067
Acenaphthylene	<0.0005U
Anthracene	0.0029J
bis(2-ethylhexyl)phthalate	<0.0033U
Dibenzofuran	0.023
Di-n-butyl Phthalate	<0.0005U
Fluoranthene	0.0022J
Fluorene	0.033
Naphthalene	0.0082
Phenol	<0.0005U
Pyrene	0.0013J

Constituent	Conc. (mg/L)
Acenaphthene	0.12
Acenaphthylene	0.0015J
Anthracene	0.0043J
bis(2-ethylhexyl)phthalate	<0.0033U
Dibenzofuran	0.054
Di-n-butyl Phthalate	<0.0005U
Fluoranthene	0.0036J
Fluorene	0.053
Naphthalene	0.048
Phenol	<0.0005U
Pyrene	0.002J

Constituent	Conc. (mg/L)	Conc.* (mg/L)
Acenaphthene	0.0044J	0.0045J
Acenaphthylene	<0.0005U	<0.0005U
Anthracene	<0.0006U	<0.0006U
bis(2-ethylhexyl)phthalate	<0.0033U	<0.0033U
Dibenzofuran	<0.0007U	<0.0007U
Di-n-butyl Phthalate	<0.0005U	<0.0005U
Fluoranthene	<0.0005U	<0.0005U
Fluorene	<0.0006U	<0.0006U
Naphthalene	<0.0006U	<0.0006U
Phenol	<0.0005U	<0.0005U
Pyrene	<0.0005U	<0.0005U

Constituent	Conc. (mg/L)
Acenaphthene	<0.0009U
Acenaphthylene	<0.0005U
Anthracene	<0.0006U
bis(2-ethylhexyl)phthalate	<0.0033U
Dibenzofuran	<0.0007U
Di-n-butyl Phthalate	<0.0005U
Fluoranthene	<0.0005U
Fluorene	<0.0006U
Naphthalene	<0.0006U
Phenol	<0.0005U
Pyrene	<0.0005U

Indicator Parameters

Constituent	PCL (mg/L)
Acenaphthene	1.5
Acenaphthylene	1.5
Anthracene	7.3
bis(2-ethylhexyl)phthalate	0.006
Dibenzofuran	0.098
Di-n-butyl Phthalate	2.4
Fluoranthene	0.98
Fluorene	0.98
Naphthalene	0.49
Phenol	7.3
Pyrene	0.73

EXPLANATION

- Fence
- Railroad
- B-TZ Monitoring Well Location
- Piezometer Location

Notes:
1. * Duplicates sample taken at P-10.
2. Sample collected on July 22, 2009.
3. J= Estimated value between SQL and MDL.
4. U= Value not detected greater than the MDL.

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Figure 6

B-TZ REPORTED CONCENTRATIONS 2009 2nd SEMI ANNUAL MONITORING EVENT

PROJECT: 1358	BY: ZGK	REVISIONS
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APPENDIX A
COMPLIANCE PLAN TABLES

TABLE III - CORRECTIVE ACTION PROGRAM
Table of Detected Hazardous and Solid Waste Constituents and Concentration Limits for the Ground-Water Protection Standard

Closed Surface Impoundment (NOR Unit No. 001, SWMU No. 01)

A-Transmissive Zone		B-Transmissive Zone	
COLUMN A Hazardous Constituents	COLUMN B Concentration Limits (mg/l)	COLUMN A Hazardous Constituents	COLUMN B Concentration Limits (mg/l)
Acenaphthene	1.5[PCL]	Acenaphthene	1.5[PCL]
Acenaphthylene	1.5[PCL]	Acenaphthylene	1.5[PCL]
Anthracene	7.3[PCL]	Anthracene	7.3[PCL]
Dibenzofuran	0.098[PCL]	Dibenzofuran	0.098[PCL]
Bis(2-ethylhexyl)phthalate	0.006[PCL]	Bis(2-ethylhexyl)phthalate	0.006[PCL]
Fluoranthene	0.98[PCL]	Fluoranthene	0.98[PCL]
Fluorene	0.98[PCL]	Fluorene	0.98[PCL]
2-Methylnaphthalene	0.098[PCL]	Di-n-butyl phthalate	2.4[PCL]
Naphthalene	0.49[PCL]	Naphthalene	0.49[PCL]
Phenanthrene	0.73[PCL]	Phenol	7.3[PCL]
Pyrene	0.73[PCL]	Pyrene	0.73[PCL]

PCL Alternate Concentration Limit pursuant to 30 TAC §335.160(b) based upon the Protective Concentration Level determined under 30 TAC Chapter 350 for Residential Land Use. The PCL value, Column B, will change as updates to the rule are promulgated. Changes to the rule automatically change the concentration value established in Column B in this table.

APPENDIX B
FIELD PARAMETERS

Table B-1
Groundwater Sampling Field Parameters
Semiannual Monitoring Report: 2009 Second Semiannual Event

Houston Wood Preserving Works
Houston, Texas

Field Parameter	Monitoring Well IDs									
	A-Transmissive Zone						B-Transmissive Zone			
	MW-01A	MW-02	MW-07	MW-08	MW-10A	MW-11A	MW-10B	MW-11B	P-10	P-12
	1/22/2009	1/22/2009	1/22/2009	1/22/2009	1/22/2009	1/22/2009	1/22/2009	1/22/2009	1/22/2009	1/22/2009
Time Sampled (hrs CST)	11:50	10:45	14:20	13:20	9:30	7:55	10:10	8:40	15:45	17:10
Temperature (°C)	26.3	23.4	23.7	25.30	24.40	24.70	23.4	24.9	23.8	24.10
pH (Standard Units)	6.97	6.63	6.93	7.13	7.07	6.97	6.79	6.89	7.03	6.74
Specific Conductivity (µS)	1,610	960	890	740	1,070	1,140	1,240	1,250	1,140	1,360
Dissolved Oxygen (mg/L)	0.86	0.17	1.63	1.72	1.31	0.32	0.36	0.21	0.86	0.61
Turbidity (NTU)	6.30	3.30	1.70	6.00	3.70	7.60	4.60	1.70	5.20	2.30

APPENDIX C
LABORATORY ANALYTICAL REPORTS and DATA USABILITY SUMMARIES

APPENDIX D
UPDATED COMPLIANCE SCHEDULE