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February 24, 2010

Illinois Environmental Protection Agency
Division of Land Pollution Control #33, Permits Section
(Groundwater Monitoring Unit)
1021 North Grand Avenue, East
Springfield, IL 62702

RE: 2009 RCRA Annual Groundwater Monitoring Report
Former Koppers Company Wood Treating Facility
Carbondale, Illinois
EPA I.D. # ILD 000 819 946

Greetings:

On behalf of Beazer East, Inc. (Beazer), enclosed are three copies of the 2009 Annual RCRA Groundwater Monitoring Report for the above-referenced facility. If you have any questions, please call Mr. Michael Slenska of Beazer at (412) 208-8857 or me at (412) 429-2694.

Best Regards,

Field & Technical Services, LLC

Angela M Gatchie

Angie Gatchie
Data Manager

Enclosure

cc: M. Slenska, Beazer (w/o enclosure)
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2009 ANNUAL RCRA GROUNDWATER MONITORING REPORT

FORMER KOPPERS WOOD-TREATING SITE
CARBONDALE, ILLINOIS

EPA ID No. ILD 000 819 946

Prepared for:

Beazer East, Inc.

Prepared by:

Field & Technical Services, LLC
200 Third Avenue
Carnegie, Pennsylvania 15106

February 24, 2010

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ABBREVIATIONS/ACRONYMS

AOC	Areas of Concern
Beazer	Beazer East, Inc.
BM&S	Beazer Materials and Services, Inc.
BTEX	Benzene, Toluene, Ethylbenzene, and total Xylenes
CAMU	Corrective Action Management Unit
CZC	Chromated Zinc Chloride
DNAPL	Dense Non-Aqueous Phase Liquid
DO	Dissolved Oxygen
FCAP	Fluoro-Chrome-Arsenate Phenol
FTS	Field & Technical Services, LLC
GMP	Groundwater Monitoring Plan
IEPA	Illinois Environmental Protection Agency
IGMP	Interim Groundwater Monitoring Program
IWQC	Illinois Water Quality Criteria
Koppers Inc.	Koppers Industries, Inc.
NAPL	Non-Aqueous Phase Liquid
Non-Com	Non-Combustible fire retardant
O&M	Operations and Maintenance
ORP	Oxygen Reduction Potential
PAHs	Polynuclear Aromatic Hydrocarbons
RCRA	Resource Conservation and Recovery Act
Site	Former Koppers Wood-Treating Site, North Marion Street, immediately northeast of Carbondale in Jackson County, Illinois (ILD 000 819 946)
SOP	Standard Operation Procedure
SU	Standard Units
TACO	Tiered Approach to Corrective Action Objectives (IEPA)
TEF	Toxicity Equivalent Factor
TEQ	Toxicity Equivalent Quotient
USEPA	United States Environmental Protection Agency

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1.0 INTRODUCTION

Field & Technical Services, LLC (FTS), on behalf of Beazer East, Inc. (Beazer), prepared this 2009 Annual Resource Conservation and Recovery Act (RCRA) Groundwater Monitoring Report for the Former Koppers Wood-Treating Site (Site) in Carbondale, Illinois. This report satisfies Beazer's obligations under the United States Environmental Protection Agency (USEPA) Administrative Order on Consent and the Illinois Environmental Protection Agency (IEPA) Consent Decree. The USEPA Identification Number for the Site is ILD 000 819 946, and the Illinois Site Inventory Number is 0778010002.

Beazer monitors Site groundwater on a semi-annual basis in accordance with the Interim Groundwater Monitoring Program (IGMP). The IGMP satisfies the requirements of the RCRA Interim Status closure and post-closure periods for the closed RCRA surface impoundments and was implemented in 1994 to evaluate Site-wide groundwater quality during the period between the completion of the remedial investigation and the initiation of remedial actions. The IEPA approved the original IGMP in January 1994, and the USEPA approved the revised IGMP in March 2001. Although remedial actions at the Site have been substantially completed, the IGMP will continue to be implemented until a long-term, post-remediation Groundwater Monitoring Plan (GMP) has been established (USEPA is currently reviewing a draft GMP, the latest version of which was submitted to the USEPA on October 6, 2008).

This report provides a summary and evaluation of the groundwater monitoring data collected in 2009 and is organized into six sections.

- **Section 1** includes this introduction and report organization.
- **Section 2** reviews the Site background information, geology, and hydrogeology.
- **Section 3** presents information on the current monitoring program and well network at the Site, as well as field procedures.
- **Section 4** discusses the presence of non-aqueous phase liquid (NAPL), groundwater flow patterns and migration assessments, and vertical gradients at the Site.
- **Section 5** presents groundwater quality results.
- **Section 6** presents the conclusions and future activities.

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2.0 SITE DESCRIPTION AND HISTORY

The Site is located on North Marion Street, immediately northeast of the city of Carbondale in Jackson County, Illinois. In approximately 1905, Ayer & Lord Tie Company began producing pressure-treated railroad crossties, utility poles, and other wood products at the Site. In 1940, Koppers Company purchased the facility. In 1944, Koppers Company was restructured and the Site became owned by Koppers Company, Inc. In 1988, Koppers Company, Inc. was acquired, indirectly, by a publicly-traded company known as Beazer PLC and the Site was sold to Koppers Industries, Inc. (Koppers Inc.). Included in this sale were all rights to the name "Koppers." Consequently, the seller, Koppers Company, Inc., changed its name to Beazer Materials and Services, Inc. (BM&S) in 1989 and BM&S changed its name to Beazer East, Inc. in 1990. Koppers Inc. ceased wood-treating operations at the Site in 1991 and conveyed the Site to Beazer East, Inc. on February 24, 1992. During the years of operation, Koppers used a variety of chemicals at one time or another, including creosote, pentachlorophenol, fluoro-chrome-arsenate phenol (FCAP), chromated zinc chloride (CZC), and non-combustible fire retardant (Non-Com).

The USEPA and the IEPA identified the following eleven (11) areas of concern (AOCs) for the Site-wide monitoring program (as shown on Figure 1).

- Area 1 – the wood-treating cylinders
- Area 2 – the former sprayfield
- Area 3 – the drip track
- Area 4 – the former north drainage ditch
- Area 5 – the former wastepile area
- Area 6 – the former lagoon area
- Area 7 – the offsite spill area
- Area 8 – the service yard
- Area 9 – the storage tanks
- Area 10 – the closed RCRA surface impoundments
- Area 11 – the plant production area

Koppers Company discontinued use of the RCRA surface impoundment system (AOC 10) and sprayfield (AOC 2) in 1988, and excavated all sludge and visibly impacted soil from within the impoundments for disposal in a permitted landfill. Beazer subsequently closed the surface impoundment system as a landfill (pursuant to the RCRA).

Beginning in 2004 and continuing through 2006, Beazer conducted various remediation activities as part of the RCRA corrective action program, including:

- Additional building/structure demolition in the former process area (completed);
- The relocation of part of Glade Creek (completed);
- The installation of a trench-based dense non-aqueous phase liquid (DNAPL) barrier near the former Glade Creek channel (completed);
- Construction of a containment cell within a Corrective Action Management Unit (CAMU) to consolidate/manage various materials generated during the remediation activities (ongoing[1]);
- Excavation of waste piles and surficial "coal tar" materials from various areas of the Site (completed).
- Installation of a surface cover over the former Process Area (completed);
- Installation of a DNAPL recovery well at RW-23 (completed); and,
- Excavation of visually impacted Glade Creek sediments (completed).

Operation and maintenance (O&M) of the completed and ongoing remedial components – including the DNAPL barrier, DNAPL recovery well, the wastewater treatment plant, and the CAMU containment cell – are being conducted. In addition to this O&M work, post-remediation groundwater monitoring is being conducted. Beazer submitted a draft long-term, post-remediation GMP on November 16, 2007. Beazer and the USEPA discussed the draft GMP during a July 2008 meeting, and a revised draft GMP was submitted to the USEPA on October 6, 2008, which is currently being reviewed by the USEPA. In the interim, groundwater monitoring continues to be performed under the IGMP, with approved modifications to reflect current Site conditions and the status of the remediation activities.

[1] The CAMU containment cell currently has a temporary cover in place; the final cover system is anticipated to be installed following placement of additional materials into the cell in 2010.

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2.1 SITE GEOLOGY

Site geology is characterized by unconsolidated, Pleistocene Age glacial sediments, which overlie Pennsylvanian Age bedrock. The glacial sediments are approximately 50 to 110 feet thick. The uppermost glacial sediments range from approximately 25 to 45 feet thick and average approximately 40 feet thick. In general, these glacial deposits consist of silty clay with trace sand and occasional sand lenses (not more than several inches thick).

Below the uppermost glacial sediments are the shallow (upper) glacial sediment deposits consisting of gray or dark brown uniform (massive) silty clay. These sediments are noted for their lack of sand particles, fracture joints, or bedding, and are also characterized by an occasional isolated clayey silt layer or peat deposit. This massive clay unit appears to be continuous across the Site and varies in thickness from approximately 10 to 30 feet.

The lower glacial sediment is a gray, fine-to-medium sand with varying amounts of silt and occasional isolated silty clay lenses. This layer, situated just above bedrock, is encountered between 60 and 90 feet below ground surface and ranges from 15 to 40 feet thick.

Between the lower glacial sediment and the top of competent bedrock is a thin layer (up to several feet thick) of a very dense, variable color mixture of sand and gravel with significant amounts of clay and silt filling the coarse-grain voids. Particles of coal can be found within this layer, which is noticeably denser than the overlying materials.

The bedrock beneath the Site consists of Paleozoic Age sedimentary rock on the order of 10,000 feet thick. The bedrock surface beneath the Site is fairly flat with a slope of approximately 0.5 to 0.7 percent toward the northwest. The bedrock is predominantly light-to-dark shale with occasional thin layers of coal or limestone. The shale is thinly bedded, the coal and limestone layers are laminated, and all are moderately cemented.

2.2 SITE HYDROGEOLOGY

Groundwater at the Site exists in both the unconsolidated glacial deposits and in bedrock. Due to the vertical thickness and lithologic characteristics of the sediments, four monitoring intervals were identified. The intervals were designated as the A/B-, C-, D-, and E-units. The A/B- through D-units are monitoring intervals within the unconsolidated materials, and the E-unit is the monitoring interval within the uppermost portion of bedrock. These units correspond to the various geologic units identified above, as summarized in the following table:

Geologic Description	Reference Nomenclature	Comments
Glacial Uppermost Sediments	A/B-unit	The A-unit refers to the upper portion of the glacial deposit, including the water table and the unsaturated unit. The B-unit refers to the lower portion of the glacial deposit. The A- and B-units are considered one hydrogeologic unit (the A/B-unit) based on their similar nature and degree of interaction.
Shallow (Upper) Glacial Sediments	C-unit	The C-unit includes the massive silty clay layer.
Lower Glacial Sediments	D-unit	The D-unit includes a dense sand layer in addition to a sand and gravel layer and a weathered shale/residual soil layer.
Bedrock	E-unit	The E-unit is defined as competent bedrock.

The A/B-unit was originally designated as two separate units. However, review of historical information for the Site shows that, for the purposes of assessing groundwater movement and quality, the A- and B-units can be grouped into one hydrostratigraphic unit. Both units have similar water-transmitting properties and they are not separated by confining layers. Both units contain thin, discontinuous lenses of sand, although these lenses are more common in the B-unit but are not believed to significantly affect groundwater flow through the A/B-unit.

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3.0 INTERIM GROUNDWATER MONITORING PROGRAM

FTS conducted the 2009 IGMP groundwater sampling events from February 9 through 12, 2009 and August 23 through 27, 2009.

The current IGMP includes gauging at all existing monitoring wells (currently 69), nine piezometers, six temporary piezometers, five staff gauges and two DNAPL barrier trench sumps and sampling of 48 wells. Figure 1 shows all monitoring locations (i.e., wells, piezometers, trench sumps, and surface water gauges). Table 1 identifies which monitoring locations were gauged and sampled during each 2009 semi-annual monitoring event. The following changes to the IGMP occurred in 2009:

- Well OW-205B was removed from the sampling program (due to the presence of DNAPL in this well, and the fact that sampling is being conducted at nearby/downgradient wells OW-206A and OW-207A), but will continue to be gauged during subsequent events. This change was identified in an April 22, 2009 letter report to the USEPA entitled *DNAPL Extent and Groundwater Quality near OW-205A/B.*

In February 2009, water levels were measured at 84 wells/piezometers and groundwater samples were collected from 48 wells (Table 1). Water-level measurements were also obtained at two DNAPL barrier trench sumps and five surface water gauges during the February 2009 event.

In August 2009, water levels were measured at 84 wells/piezometers and groundwater samples were collected from 48 wells (Table 1). Water-level measurements were also obtained at two DNAPL barrier trench sumps and two surface water gauges during the August 2009 event. Surface water gauges GC-1, GC-2, and Pond-2 could not be located during the August 2009 sampling event and are thought to have been destroyed by floodwaters. Beazer is planning to replace these surface water gauges and to resurvey the existing surface water gauges in the first quarter of 2010.

3.1 WELL GAUGING

At the beginning of each sampling event, FTS field technicians used an oil/water interface probe to gauge each well/piezometer for depth-to-water, depth-to-NAPL, and total well depth. If NAPL was detected, the technician confirmed its presence via a new, clear disposable bailer and, if applicable, measured its thickness. Prior to use at each well, the technician cleaned the oil/water interface probe using an Alconox™ solution and deionized water rinse. The disposable bailers were disposed of after a single use. The 2009 well gauging data are summarized in Tables 2 through 4.

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3.2 WELL PURGING

Low-flow purging methods were used during both 2009 sampling events, in accordance with the updated Standard Operating Procedures (SOP) document titled "Low Flow (Minimal Drawdown) Groundwater Sampling Procedures," submitted to the USEPA on October 22, 2007. During the low-flow purging, groundwater was removed from each well using either a peristaltic pump, a stainless steel Monsoon submersible pump, or a stainless steel Hurricane submersible pump, and disposable tubing. Field measurements of water quality parameters (pH, dissolved oxygen [DO], oxygen reduction potential [ORP], specific conductivity, temperature, and turbidity) were measured while purging each well, using a YSI 556 multi-parameter meter and a La Motte 2020e turbidity meter. Field measurements were taken every three to five minutes. The field technicians recorded field observations on the groundwater sampling forms. Purging continued until field measurements had stabilized (i.e., three consecutive readings were obtained within the following criteria):

- ±0.1 s.u. for pH;
- ±10% for DO;
- ±10 mv for ORP;
- ±3% for specific conductivity;
- ±10% for temperature; and,
- ±10% for turbidity.

The field technicians cleaned the submersible pumps using the following procedures. Each pump had its own set of dedicated buckets for cleaning.

1) Wash in Alconox™ soap and deionized water
2) Rinse in deionized water
3) Rinse in acetone
4) Rinse in deionized water

3.3 GROUNDWATER SAMPLING

After the wells were purged, the technicians collected the groundwater samples. For wells that were purged dry, they allowed the water levels to recover prior to sample collection. In accordance with the IGMP and low-flow sampling SOP, the FTS field crew collected groundwater samples using either a peristaltic pump or a submersible stainless steel Monsoon/Hurricane pump and disposable Teflon®-lined tubing. Samples collected for dissolved metals analysis were field-filtered using either a

peristaltic pump or a stainless steel Monsoon pump equipped with a 0.45 micron filter and disposable Teflon®-lined tubing. The samples were analyzed for the following constituents by TestAmerica (Pittsburgh, Pennsylvania):

- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) (USEPA SW-846 Method 8021B).
- Polynuclear aromatic hydrocarbons (PAHs) and pentachlorophenol (USEPA SW-846 Method 8270C).
- Total recoverable phenolics (USEPA SW-846 Method 9066).
- Total and dissolved arsenic, chromium, and copper (USEPA SW-846 Method 6010B).
- Dioxins/Furans (USEPA SW-846 Method 8290) for wells OW-022BR, OW-035B, OW-102B, and OW-202A during the first semi-annual sampling event only.

3.4 MONITORING WELL INSPECTION

During the February 2009 event, a comprehensive well inspection was conducted, which included 68 wells, nine piezometers, and six temporary piezometers. The technicians observed that the majority of the monitoring wells associated with the IGMP were in good condition, with only minor well repairs required. These minor well repairs, performed during or soon after the February 2009 event, included relabeling wells and replacing missing or broken well caps. It was observed during the February 2009 well inspection that monitoring wells OW-44A and OW-44D both had damaged casings and cracked pads. These wells were repaired and re-surveyed in August 2009. A comprehensive well inspection will also be completed in conjunction with the 2010 first semi-annual monitoring event, and identified deficiencies will be addressed and repairs completed as necessary.

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4.0 DNAPL DISTRIBUTION AND GROUNDWATER MIGRATION ASSESSMENT

4.1 NON-AQUEOUS PHASE LIQUIDS

As shown on Table 2, FTS observed DNAPL in P-8A, OB23-04B, OW-205B, R-008A, R-13E and the south DNAPL barrier trench sump during both the February and August 2009 monitoring events. Measured DNAPL thicknesses ranged from trace (P-8A, February event) to 5.61 feet (OB23-04B, February event).

In 2009, DNAPL levels in R-013E were gauged on a monthly basis; DNAPL thicknesses ranged from 0.20 to 0.49 feet. No DNAPL was removed from R-013E in 2009. The volume of DNAPL removed from R-013E has been decreasing over time; DNAPL has not been removed from this well since May 2007.

Measurements of DNAPL thickness were also collected in wells R-008A and OW-205B throughout 2009. In well R-008A, DNAPL thicknesses ranged from 0.04 to 0.72 feet; no DNAPL was removed from R-008A in 2009. At well OW-205B, DNAPL thicknesses ranged from 0.11 to 1.16 feet in 2009. DNAPL was removed from well OW-205B on two occasions in 2009, resulting in a total recovered DNAPL volume of 0.59 gallons in 2009.

In late 2004, Beazer initiated DNAPL recovery from the south sump of the trench-based DNAPL barrier located near Glade Creek. In 2009, approximately 1,700 gallons of DNAPL were recovered from the south sump. The only other collection sump installed in the trench, referred to as the north sump, has never contained DNAPL.

In late October 2005, Beazer initiated DNAPL recovery activities at recovery well RW-23, which is located in the former process area of the Site. Water is pumped from this well to increase the hydraulic gradient and draw DNAPL into the recovery well. DNAPL is pumped as it accumulates in the well. In 2009, approximately 630 gallons of DNAPL were recovered from RW-23.

4.2 GROUNDWATER FLOW PATTERNS

FTS used the depth-to-groundwater measurements from the A/B-, C-, D-, and E-unit monitoring wells, piezometers, and surface water gauges to calculate potentiometric surface elevations (Tables 3 and 4). These data were subsequently used to construct potentiometric surface maps and infer horizontal directions of groundwater flow in each of the monitored units. Figures 2 through 9 provide the potentiometric surface maps for each unit during each semi-annual event. The potentiometric contours and

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associated flow patterns for both monitoring events are discussed below for each of the four hydrogeologic units.

4.2.1 A/B-UNIT

Figures 2 and 3 show the A/B-unit potentiometric contours for the 2009 February and August sampling events, respectively. Because localized vertical gradients exist within the A/B-unit, some well data may appear to conflict with the drawn A/B-unit contours or data from adjacent wells. Professional judgment was used to draw the contours in these locations. As shown on Figures 2 and 3, groundwater was mounded near the south central portion of the Site in both February and August. Groundwater in this portion of the Site generally moves outward from the center of the mound. The lateral extent of the drawdown cone developed by pumping at recovery well RW-23 (Figure 3) is expected to be small, given the low permeability of the A/B unit.

In the eastern portion of the Site, groundwater generally moves toward Glade Creek, which represents a discharge boundary in the unit. Groundwater flow patterns were consistent with previous observations.

Historical groundwater and surface water elevation data indicate that Smith Ditch (a seasonal water body that flows to the north) changes between being a discharge and recharge feature for A/B-unit groundwater. In 2009, Smith Ditch appears to have been a gaining feature during the February and August events.

4.2.2 C-UNIT

Figures 4 and 5 show the C-unit potentiometric surfaces for the February and August 2009 sampling events, respectively. Because the C-unit acts as a confining unit between the A/B- and D-units, the direction of groundwater movement in the unit is predominantly vertical (downward); therefore, inferring groundwater flow directions from Figures 4 and 5 are not appropriate. The distributions of potentiometric head observed in the unit in 2009 are consistent with previous observations.

4.2.3 D-UNIT

Figures 6 and 7 show the D-unit potentiometric surface for the February and August 2009 sampling events, respectively. Throughout the Site, flow was generally to the north-northeast in both the February and August 2009 events. These groundwater elevations and flow patterns are consistent with previous observations.

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4.2.4 E-UNIT

Figures 8 and 9 show the E-unit groundwater elevation contours for the February and August 2009 sampling events, respectively. During the February 2009 event, flow in the eastern portion of the Site was generally to the east-southeast. Flow in the western portion of the Site moves generally to the west and southwest. Groundwater elevations observed in February 2009 were slightly lower to those observed in February 2008.

During the August 2009 event, flow in the eastern portion of the Site was generally to the east. Flow in the western portion of the Site was to the north-northeast. August 2009 groundwater elevations were slightly higher than those observed in August 2008 in the E-unit. Historical data shows that there can be significant variations in the flow patterns for the E-unit.

4.3 GROUNDWATER MIGRATION ASSESSMENT

FTS calculated the average horizontal groundwater linear flow velocities (Table 5) for each sampling event using the Darcy flow equation:

$$V_L = \frac{K * i}{n_e}$$

where:

V_L = average linear groundwater flow velocity
K = hydraulic conductivity
i = average horizontal hydraulic gradient
n_e = effective porosity

Horizontal gradients and linear groundwater velocities calculated using the 2009 groundwater elevation data for selected well pairs are summarized in Table 5. For February and August 2009, all of the average horizontal gradients (A/B-, C-, D-, and E-units) fall within the typical historical range as shown on Table 5.

It should be noted that constituent velocities will be less than the groundwater linear velocities presented in Table 5 because factors such as adsorption, dispersion, and biologic activity will retard the movement of dissolved constituents. Therefore, the groundwater linear velocity represents a conservatively high velocity when compared to constituent velocity.

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4.4 VERTICAL HYDRAULIC GRADIENT

Vertical hydraulic gradients calculated using the 2009 groundwater elevation data for selected well pairs are presented in Table 6. A positive number indicates a downward gradient whereas a negative number indicates an upward gradient. An upward vertical gradient suggests that the vertical component of the groundwater flow will be from the lower to upper monitored interval. This potentially limits downward vertical migration of constituents. Figure 10 shows the calculated vertical gradient directions between the A-, B-, and C-units and between the D- and E-units. The overall results are similar to the vertical gradients observed in 2008.

In the A/B-unit, groundwater flows downward and outward from the central portion of the Site (beneath the A/B-unit groundwater mound located near the former process area [Figures 2 and 3]), predominantly toward Glade Creek. Near Glade Creek, groundwater generally moves upward, discharging to the Creek as shown in the OW-044A/B well pair. In 2006 and 2008, Beazer installed additional wells closer to the new alignment of Glade Creek to monitor groundwater flow and constituent migration in this area.

The C-unit is an aquitard that is interpreted to separate the local groundwater flow system of the A/B-unit from a more regional flow system that includes the D- and E-units.

Groundwater flow in the D- and E-units is interpreted to be predominantly lateral beneath the Site. Vertical gradients between the D- and E-units vary spatially and seasonally and are likely controlled by spatial variability in hydraulic conductivity within the E-unit, and the degree of hydraulic communication between the D- and E-units.

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5.0 GROUNDWATER QUALITY

TestAmerica analyzed the groundwater samples and FTS reviewed the resulting data for quality and completeness. Upon acceptance, FTS electronically transferred the data into a database for storage, reduction, and evaluation. Table 7 summarizes wells in which target analytes were detected during the 2009 groundwater monitoring events. Appendix A (Tables A-3 and A-4) summarizes the 2009 analytical results and compares them to applicable IEPA Tiered Approach to Corrective Action Objectives (TACO) Tier I groundwater standards. In doing so, data from D- and E-Unit wells are compared to Class I standards and data from A/B- and C-Unit wells are compared to Class II standards. Table 8 summarizes data that exceeded applicable TACO groundwater standards for the first and second semi-annual 2009 groundwater sampling events. Table 9 summarizes data collected from wells OW-041A, OW-41B, OW-205A, OW-206A, and OW-207A (located near Glade Creek) compared to the Illinois Water Quality Criteria (IWQC). Please note that the IWQC are not applicable to groundwater but comparison is being done as requested by USEPA. Table 10 presents the toxicity equivalent quotient (TEQ) summary for wells that were sampled for dioxins/furans during the first semi-annual sampling event (OW-022BR, OW-035B, OW-102B, and OW-202A).

5.1 FIELD MEASUREMENTS

The final field measurements collected during sampling are summarized in Appendix A (Tables A-1 and A-2). Field-measured specific conductivity, temperature, and pH data for 2009 are similar to those measured historically.

Of all the wells that were sampled in 2009, eleven wells had pH readings in excess of 8.5 SU in at least one of the 2009 events (OW-202B, OW-204B, OW-035DR, OW-037D, OW-102D, R-014D, OW-027E, OW-035E, OW-200E, OW-201E, and R-014E). This is a decrease from the fourteen wells with >8.5 SU pH readings in the 2008 measurements. Well OW-203A was the only well that had a pH reading below 6.0 SU.

5.2 POLYNUCLEAR AROMATIC HYDROCARBONS

In accordance with the IGMP, TestAmerica analyzed the groundwater samples for 16 PAHs using USEPA SW-846 Method 8270C. The suite of PAHs consists of:

acenaphthene	benzo(g,h,i)perylene	fluorene
acenaphthylene	benzo(k)fluoranthene	indeno(1,2,3-cd)pyrene
anthracene	chrysene	naphthalene
benzo(a)anthracene	dibenzo(a,h)anthracene	phenanthrene
benzo(a)pyrene	fluoranthene	pyrene
benzo(b)fluoranthene		

Table 7 lists the wells with PAH detections and the range of total PAH detections for 2009. These results are similar to previous data in that low-level PAH detections appear sporadically in most wells.

As indicated in Table 8, one or more PAH concentrations in groundwater samples from wells OW-027D, OW-041D, and OW-205A exceeded TACO groundwater standards in the first semi-annual 2009 event. Also, one or more PAH concentrations in groundwater samples from wells OW-027A, OW-033E Dup, OW-037D Dup, OW-204A Dup, and OW-205A exceeded TACO groundwater standards in the second semi-annual 2009 event. Well OW-205A was the only well to have exceedences in both sampling events. PAH results for all other wells/events were below the applicable TACO groundwater standards.

Note that the PAHs that exceeded TACO standards in the February 2009 samples from wells OW-027D and OW-041D were also detected in the associated field blanks. Based on this, and the fact that PAHs were not detected in the August 2009 samples from these wells, the February 2009 PAH data from OW-027D and OW-041D are not likely representative of actual groundwater quality at these wells.

It should also be noted that the PAHs that exceeded TACO standards in the August 2009 duplicate samples collected from OW-033E, OW-037D and OW-204A were not detected in the associated parent samples collected from these wells. Accordingly, the data for these duplicate samples are suspect. The data for the August 2009 sample collected from well OW-027A is not consistent with historical results for this well and may also be suspect. Sample data collected from OW-027A in 2010 will be used to determine if the August 2009 results were anomalous.

The exceedance of the TACO standard for naphthalene in the samples collected from OW-205A is consistent with historical data for this well.

5.3 PENTACHLOROPHENOL

Each groundwater sample was analyzed for pentachlorophenol using USEPA SW-846 Method 8270C. Table 7 shows there were no detections of pentachlorophenol in either sampling event for 2009. The pentachlorophenol results for 2009 are consistent with historical data.

5.4 VOLATILE ORGANIC COMPOUNDS

Groundwater samples were analyzed for benzene, toluene, ethylbenzene and xylenes (BTEX) using USEPA SW-846 Method 8021B. There were detections of BTEX in wells OW-205A in both events as shown in Table 7; however, there were no

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exceedances of the applicable TACO groundwater standards, as shown in Table 8. The VOC results for 2009 are consistent with historical data.

5.5 METALS

Each IGMP groundwater sample was analyzed for total (unfiltered) and dissolved (filtered) arsenic, chromium, and copper by USEPA SW-846 Method 6010B. As presented in Table 8, dissolved arsenic in well OW-026A was the only metal that exceeded an applicable TACO standard for both sampling events. All other detections were below the applicable TACO groundwater standards. The metals results for 2009 are consistent with historical data.

5.6 TOTAL RECOVERABLE PHENOLICS

Groundwater samples were analyzed for total recoverable phenolics using USEPA SW-846 Method 9066. Table 7 lists the wells with detections and the range of results. Total recoverable phenolics were detected in samples from both 2009 events. The total recoverable phenolics results for the 2009 sampling events are similar to those reported historically, in that low-level total recoverable phenolics detections appear to be sporadic occurrences. There are no TACO Tier I groundwater standards for total recoverable phenolics.

5.7 DIOXIN/FURAN

Although not part of the IGMP, groundwater samples collected from wells OW-022BR, OW-035B, OW-102B, and OW-202A in February 2009 were analyzed for dioxins/furans using USEPA SW-846 Method 8290 at the request of the USEPA during a July 16, 2008 meeting. Table 10 shows the detected concentrations of dioxins and furans with their calculated toxicity equivalent quotient (TEQ) concentration. The TEQ concentration is calculated by multiplying the concentration of each dioxin or furan by its respective toxicity equivalent factor (TEF). The resulting TEQ concentrations are then summed for each sample to determine the total TEQ.

Dioxins/furans were detected at low levels in each of the four wells during the first semi-annual 2009 event. 2,3,7,8-TCDD was not detected in any of the four samples, and all four samples had 2,3,7,8-TCDD TEQ concentrations below USEPA's Maximum Contaminant Level (MCL) for 2,3,7,8-TCDD (3E-5 parts per billion). Note that the MCL value is not applicable, as these wells are not potential drinking water sources. The comparison was made only to demonstrate that the detected concentrations are low.

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Beazer has completed the agreed-upon two rounds of sampling at these wells for dioxins/furans, and based on the results, does not anticipate continued analysis of groundwater samples for dioxins/furans.

5.8 DATA QUALITY

Field and laboratory data quality control measures were implemented as required by the IGMP. All of the necessary data qualifiers were added to the Site database and are present in the data summary tables provided in Appendix A (Tables A-3 and A-4). Data Evaluation Reports are included in Appendix B. While some qualifiers were added to the data, none of the data were rejected based on evaluation of the quality control data.

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6.0 CONCLUSIONS AND CHANGES TO THE INTERIM GROUNDWATER MONITORING PROGRAM

Beazer has evaluated the 2009 IGMP data and reached the following conclusions:

- The 2009 groundwater flow directions and velocities for each monitored interval were similar to those reported historically.
- DNAPL was present in six of the 86 Site monitoring points (OB23-04B, OW-205B, P-8A, R-008A, R-013E, and the South Sump). The 86 locations are comprised of 84 wells/piezometers and two trench sumps (north sump and south sump).
- The 2009 groundwater quality data are consistent with historical results.

Beazer submitted a draft long-term, post-remediation GMP to the USEPA on November 16, 2007. Beazer and the USEPA discussed the draft GMP during a July 2008 meeting, and a revised draft GMP was submitted to the USEPA on October 6, 2008, which is currently being reviewed by the USEPA. The GMP proposes several modifications to the current IGMP, and will be implemented following approval by the USEPA. In the interim, groundwater monitoring will continue to be performed under the IGMP.

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TABLES

Table 1
Summary of IGMP Program
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

Well Identification	2009 First Semi-Annual Event		2009 Second Semi-Annual Event	
	Gauged	Sampled	Gauged	Sampled
DNAPL Barrier Trench Sumps				
North Sump	X	---	X	---
South Sump	X	---	X	---
Surface Water Gauges				
GC-1	X	---	NM[1]	---
GC-2	X	---	NM[1]	---
Pond-1	X	---	X	---
Pond-2	X	---	NM[1]	---
Smith-1	X	---	X	---
A-Unit				
OW-003A	X	---	X	---
OW-017A	X	X	X	X
OW-026A	X	X	X	X
OW-027A	X	X	X	X
OW-031A	X	X	X	X
OW-041A	X	X	X	X
OW-044A	X	---	X	---
OW-202A	X	X	X	X
OW-203A	X	X	X	X
OW-204A	X	X	X	X
OW-205A	X	X	X	X
OW-206A	X	X	X	X
OW-207A	X	X	X	X
P-2	X	---	X	---
P-3	X	---	X	---
P-4A	X	---	X	---
P-6A	X	---	X	---
P-7A	X	---	X	---
P-8A	X	---	X	---
R-008A	X	---	X	---
R-013A	X	X	X	X
TP-5A	X	---	X	---
TP-11A	X	---	X	---
TP-12A	X	---	X	---
TP-13A	X	---	X	---
TP-14A	X	---	X	---
TP-15A	X	---	X	---
B-Unit				
OB23-04B	X	---	X	---
OW-010B	X	X	X	X
OW-022BR	X	X	X	X
OW-035B	X	X	X	X
OW-036B	X	X	X	X
OW-037B	X	X	X	X
OW-039BR2	X	X	X	X
OW-040B	X	X	X	X
OW-041B	X	X	X	X
OW-042B	X	X	X	X
OW-043B	X	---	X	---
OW-044B	X	---	X	---
OW-102B	X	X	X	X
OW-202B	X	X	X	X
OW-204B	X	X	X	X
OW-205B	X	---[2]	X	---[2]
P-5B	X	---	X	---
P-6B	X	---	X	---
P-7B	X	---	X	---
S-003B	X	---	X	---

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Table 1 (Continued)
Summary of IGMP Program
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

Well Identification	2009 First Semi-Annual Event		2009 Second Semi-Annual Event	
	Gauged	Sampled	Gauged	Sampled
C-Unit				
OW-017C	X	X	X	X
OW-023C	X	X	X	X
OW-027C	X	---	X	---
OW-035C	X	X	X	X
OW-036C	X	---	X	---
R-013C	X	---	X	---
R-014C	X	X	X	X
D-Unit				
A-008D	X	---	X	---
OW-010D	X	---	X	---
OW-012D	X	X	X	X
OW-017D	X	---	X	---
OW-023D	X	X	X	X
OW-027D	X	X	X	X
OW-035DR	X	X	X	X
OW-036D	X	---	X	---
OW-037D	X	X	X	X
OW-039DR	X	X	X	X
OW-040D	X	X	X	X
OW-041D	X	X	X	X
OW-042DR	X	---	X	---
OW-044D	X	X	X	X
OW-102D	X	X	X	X
OW-202D	X	X	X	X
R-013D	X	---	X	---
R-014D	X	X	X	X
E-Unit				
A-008E	X	---	X	---
OW-003E	X	---	X	---
OW-012E	X	---	X	---
OW-027E	X	X	X	X
OW-033E	X	X	X	X
OW-035E	X	X	X	X
OW-039ER	X	X	X	X
OW-102E	X	X	X	X
OW-200E	X	X	X	X
OW-201E	X	X	X	X
R-013E	X	---	X	---
R-014E	X	X	X	X
Total	**91**	**48**	**88**	**48**

Notes:
"X" indicates field applies to that well
"---" indicates field does not apply to that well
"NM" indicates well was not gauged
1. Surface water gauges GC-1, GC-2, and Pond-2 could not be located during the August 2009 sampling event and are thought to have been destroyed by floodwaters.
2. OW-205B removed from sampling program due to the presence of DNAPL and the fact that sampling is performed at nearby/downgradient wells OW-206A and OW-207A.

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Table 2
Summary of 2009 DNAPL Thickness Measurements
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

Well Identification	First Semi-Annual (February 9, 2009)			Second Semi-Annual (August 24, 2009)		
	Depth to DNAPL (Feet TOC)	Total Well Depth (Feet TOC)	DNAPL Thickness (Feet)	Depth to DNAPL (Feet TOC)	Total Well Depth (Feet TOC)	DNAPL Thickness (Feet)
P-8A	18.19	18.19	Trace	17.80	18.24	0.44
R-008A	16.17	16.61	0.44	15.80	16.67	0.87
OB23-04B	46.32	51.93	5.61	46.42	51.99	5.57
OW-205B	30.94	31.81	0.87	29.81	31.22	1.41
R-013E	134.68	135.03	0.35	135.42	135.99	0.57
South Sump	50.14	51.30	1.16	50.31	51.30	0.99

Notes:
feet TOC - feet below top of casing

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Table 3
Summary of Groundwater Elevations
February 9, 2009
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

Well	Gauging Date	Measuring Point Elevation (Feet msl)	Top of Screen Elevation (Feet msl)	Bottom of Screen Elevation (Feet msl)	Depth to Groundwater (Feet TOC)	Groundwater/ Surface Water Elevation (Feet msl)
DNAPL Barrier Trench Sumps						
North Sump	09-Feb-09	378.67	NA	NA	7.64	371.03
South Sump	09-Feb-09	377.01	NA	NA	6.44	370.57
Surface Water Gauges						
Pond-1	09-Feb-09	372.52	NA	NA	4.80	367.72
Pond-2	09-Feb-09	371.03	NA	NA	3.24	367.79
GC-1	09-Feb-09	370.55	NA	NA	2.73	367.82
GC-2	09-Feb-09	365.69	NA	NA	4.37	361.32
Smith-1	09-Feb-09	388.90	NA	NA	4.42	384.48
A-Unit						
OW-003A	09-Feb-09	380.36	372.58	362.58	3.89	376.47
OW-017A	09-Feb-09	393.93	385.80	375.80	9.25	384.68
OW-026A	06-Feb-09	399.56	382.00	372.00	5.89	393.67
OW-027A	09-Feb-09	391.69	383.00	373.00	4.05	387.64
OW-031A	09-Feb-09	399.00	388.80	378.80	5.56	393.44
OW-041A	09-Feb-09	375.52	368.02	358.02	6.68	368.84
OW-044A	09-Feb-09	378.35	362.10	352.10	7.82	370.53
OW-202A	09-Feb-09	394.73	390.25	380.25	2.51	392.22
OW-203A	09-Feb-09	376.89	369.39	359.39	9.39	367.50
OW-204A	09-Feb-09	380.64	373.14	363.14	5.79	374.85
OW-205A	09-Feb-09	372.80	360.30	350.30	3.60	369.20
OW-206A	09-Feb-09	368.62	362.27	352.27	1.56	367.06
OW-207A	09-Feb-09	371.91	364.74	354.74	4.01	367.90
P-2	09-Feb-09	376.38	NA	NA	7.63	368.75
P-3	02-Feb-09	372.69	NA	NA	7.71	364.98
P-4A	09-Feb-09	376.64	369.14	359.14	5.65	370.99
P-6A	09-Feb-09	376.58	369.09	359.08	8.64	367.94
P-7A	09-Feb-09	377.84	370.34	360.34	5.55	372.29
P-8A	09-Feb-09	377.49	370.00	360.00	7.06	370.43
TP-5A	09-Feb-09	381.81	372.01	362.01	13.58	368.23
TP-11A	09-Feb-09	375.58	365.68	355.68	3.10	372.48
TP-12A	09-Feb-09	374.04	369.04	359.04	4.15	369.89
TP-13A	09-Feb-09	375.85	370.95	360.95	7.85	368.00
TP-14A	09-Feb-09	372.25	367.25	357.25	3.06	369.19
TP-15A	09-Feb-09	372.82	367.72	357.72	3.42	369.40
R-008A	09-Feb-09	387.89	381.10	371.10	2.28	385.61
R-013A	09-Feb-09	387.68	379.92	369.92	3.03	384.65
B-Unit						
OB23-04B	09-Feb-09	401.34	361.41	351.41	14.88	386.46
OW-010B	09-Feb-09	381.47	344.00	334.00	8.13	373.34
OW-022BR	09-Feb-09	395.97	361.24	351.24	3.80	392.17
OW-035B	09-Feb-09	399.35	371.50	361.50	4.61	394.74
OW-036B	09-Feb-09	396.78	360.90	350.90	12.33	384.45
OW-037B	09-Feb-09	394.74	361.20	351.20	4.36	390.38
OW-039BR2	09-Feb-09	382.69	365.19	355.19	15.00	367.69
OW-040B	09-Feb-09	377.91	342.20	332.20	10.80	367.11
OW-041B	09-Feb-09	375.16	333.90	323.90	5.35	369.81
OW-042B	09-Feb-09	388.68	357.65	347.65	1.31	387.37
OW-043B	09-Feb-09	394.38	363.90	353.90	7.64	386.74
OW-044B	09-Feb-09	378.78	342.10	332.10	7.30	371.48
OW-102B	09-Feb-09	397.19	364.00	354.00	3.42	393.77
OW-202B	09-Feb-09	395.26	365.37	355.37	6.53	388.73
OW-204B	09-Feb-09	381.04	363.54	353.54	12.78	368.26
OW-205B	09-Feb-09	373.37	350.87	340.87	26.09	347.28
P-5B	09-Feb-09	382.05	361.55	351.55	13.31	368.74
P-6B	09-Feb-09	376.51	359.01	349.01	9.06	367.45
P-7B	09-Feb-09	377.63	360.13	350.13	6.39	371.24
S-003B	09-Feb-09	392.19	362.30	352.30	3.92	388.27

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Table 3 (Continued)
Summary of Groundwater Elevations
February 9, 2009
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

Well	Gauging Date	Measuring Point Elevation (Feet msl)	Top of Screen Elevation (Feet msl)	Bottom of Screen Elevation (Feet msl)	Depth to Groundwater (Feet TOC)	Groundwater/ Surface Water Elevation (Feet msl)
C-Unit						
OW-017C	09-Feb-09	393.31	322.91	312.91	18.75	374.56
OW-023C	09-Feb-09	401.43	313.97	303.97	26.86	374.57
OW-027C	09-Feb-09	391.14	320.53	310.53	16.24	374.90
OW-035C	09-Feb-09	400.02	313.30	303.30	25.67	374.35
OW-036C	09-Feb-09	396.93	311.27	301.27	22.12	374.81
R-013C	09-Feb-09	388.58	321.23	311.23	14.41	374.17
R-014C	09-Feb-09	393.35	321.30	311.30	19.79	373.56
D-Unit						
A-008D	09-Feb-09	388.71	279.30	269.30	14.68	374.03
OW-010D	09-Feb-09	382.19	296.58	286.58	9.85	372.34
OW-012D	09-Feb-09	395.82	286.70	276.70	22.25	373.57
OW-017D	09-Feb-09	394.08	291.05	281.05	19.94	374.14
OW-023D	09-Feb-09	401.42	287.81	272.81	27.05	374.37
OW-027D	09-Feb-09	391.40	278.53	268.53	17.90	373.50
OW-035DR	09-Feb-09	399.32	280.84	270.84	24.96	374.36
OW-036D	03-Feb-08	397.28	287.71	277.71	24.16	373.12
OW-037D	09-Feb-09	395.07	281.57	271.57	21.76	373.31
OW-039DR	02-Feb-09	381.85	284.35	274.35	10.06	371.79
OW-040D	09-Feb-09	377.68	291.40	281.40	6.20	371.48
OW-041D	09-Feb-09	376.68	294.10	284.10	4.44	372.24
OW-042DR	09-Feb-09	390.45	280.30	270.30	16.36	374.09
OW-044D	09-Feb-09	379.01	283.80	273.80	8.22	370.79
OW-102D	09-Feb-09	396.85	288.80	278.80	23.45	373.40
OW-202D	09-Feb-09	395.10	303.32	293.32	19.84	375.26
R-013D	09-Feb-09	387.03	280.91	270.91	13.06	373.97
R-014D	09-Feb-09	393.44	276.90	266.90	19.71	373.73
E-Unit						
A-008E	09-Feb-09	388.61	255.90	245.90	14.94	373.67
OW-003E	09-Feb-09	378.10	270.16	260.16	5.50	372.60
OW-012E	09-Feb-09	395.76	262.71	252.71	21.69	374.07
OW-027E	09-Feb-09	390.98	263.46	253.46	17.51	373.47
OW-033E	09-Feb-09	398.77	265.50	255.50	24.76	374.01
OW-035E	09-Feb-09	399.19	265.81	255.81	25.05	374.14
OW-039ER	09-Feb-09	382.04	261.54	251.54	9.39	372.65
OW-102E	09-Feb-09	396.91	264.80	254.80	23.94	372.97
OW-200E	09-Feb-09	387.47	262.89	252.89	13.83	373.64
OW-201E	09-Feb-09	389.69	264.30	254.30	15.56	374.13
R-013E	09-Feb-09	387.22	262.24	252.24	13.09	374.13
R-014E	09-Feb-09	392.87	259.46	249.46	20.05	372.82

Notes:
Feet msl - feet above mean sea level
Feet TOC - feet below top of casing
NA - not applicable or not available
NM - not measured or could not be located

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Table 4
Summary of Groundwater Elevations
August 23 and 24, 2009
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

Well	Gauging Date	Measuring Point Elevation (Feet msl)	Top of Screen Elevation (Feet msl)	Bottom of Screen Elevation (Feet msl)	Depth to Groundwater (Feet TOC)	Groundwater/ Surface Water Elevation (Feet msl)
DNAPL Barrier Trench Sumps						
North Sump	24-Aug-09	378.67	NA	NA	8.31	370.36
South Sump	24-Aug-09	377.01	NA	NA	7.07	369.94
Surface Water Gauges						
Pond-1	24-Aug-09	372.52	NA	NA	0.89	371.63
Pond-2	24-Aug-09	371.03	NA	NA	NM	NM
GC-1	23-Aug-09	370.55	NA	NA	NM	NM
GC-2	23-Aug-09	365.69	NA	NA	NM	NM
Smith-1	24-Aug-09	388.90	NA	NA	5.80	383.10
A-Unit						
OW-003A	24-Aug-09	380.36	372.58	362.58	3.22	377.14
OW-017A	23-Aug-09	393.93	385.80	375.80	8.09	385.84
OW-026A	23-Aug-09	399.56	382.00	372.00	8.17	391.39
OW-027A	23-Aug-09	391.69	383.00	373.00	4.70	386.99
OW-031A	23-Aug-09	399.00	388.80	378.80	5.66	393.34
OW-041A	23-Aug-09	375.52	368.02	358.02	6.27	369.25
OW-044A	24-Aug-09	379.20	362.10	352.10	7.41	371.79
OW-202A	23-Aug-09	394.73	390.25	380.25	3.71	391.02
OW-203A	23-Aug-09	376.89	369.39	359.39	7.47	369.42
OW-204A	23-Aug-09	380.64	373.14	363.14	9.42	371.22
OW-205A	24-Aug-09	372.80	360.30	350.30	3.45	369.35
OW-206A	23-Aug-09	368.62	362.27	352.27	2.61	366.01
OW-207A	23-Aug-09	371.91	364.74	354.74	4.50	367.41
P-2	24-Aug-09	376.38	NA	NA	6.34	370.04
P-3	24-Aug-09	372.69	NA	NA	6.99	365.70
P-4A	24-Aug-09	376.64	369.14	359.14	4.63	372.01
P-6A	24-Aug-09	376.58	369.09	359.08	7.52	369.06
P-7A	24-Aug-09	377.84	370.34	360.34	5.58	372.26
P-8A	24-Aug-09	377.49	370.00	360.00	5.05	372.44
TP-5A	24-Aug-09	381.81	372.01	362.01	11.66	370.15
TP-11A	23-Aug-09	375.58	365.68	355.68	4.50	371.08
TP-12A	24-Aug-09	374.04	369.04	359.04	4.88	369.16
TP-13A	24-Aug-09	375.85	370.95	360.95	5.29	370.56
TP-14A	24-Aug-09	372.25	367.25	357.25	3.56	368.69
TP-15A	24-Aug-09	372.82	367.72	357.72	3.83	368.99
R-008A	24-Aug-09	387.89	381.10	371.10	5.31	382.58
R-013A	23-Aug-09	387.68	379.92	369.92	3.48	384.20
B-Unit						
OB23-04B	24-Aug-09	401.34	361.41	351.41	14.92	386.42
OW-010B	23-Aug-09	381.47	344.00	334.00	6.24	375.23
OW-022BR	23-Aug-09	395.97	361.24	351.24	3.21	392.76
OW-035B	23-Aug-09	399.35	371.50	361.50	5.72	393.63
OW-036B	23-Aug-09	396.78	360.90	350.90	12.81	383.97
OW-037B	23-Aug-09	394.74	361.20	351.20	3.39	391.35
OW-039BR2	23-Aug-09	382.69	365.19	355.19	13.97	368.72
OW-040B	23-Aug-09	377.91	342.20	332.20	9.70	368.21
OW-041B	23-Aug-09	375.16	333.90	323.90	4.90	370.26
OW-042B	23-Aug-09	388.68	357.65	347.65	1.16	387.52
OW-043B	24-Aug-09	394.38	363.90	353.90	6.61	387.77
OW-044B	23-Aug-09	378.78	342.10	332.10	6.30	372.48
OW-102B	23-Aug-09	397.19	364.00	354.00	4.15	393.04
OW-202B	23-Aug-09	395.26	365.37	355.37	7.16	388.10
OW-204B	23-Aug-09	381.04	363.54	353.54	11.19	369.85
OW-205B	24-Aug-09	373.37	350.87	340.87	6.90	366.47
P-5B	24-Aug-09	382.05	361.55	351.55	12.69	369.36
P-6B	24-Aug-09	376.51	359.01	349.01	7.01	369.50
P-7B	24-Aug-09	377.63	360.13	350.13	5.33	372.30
S-003B	24-Aug-09	392.19	362.30	352.30	2.01	390.18

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Table 4 (Continued)
Summary of Groundwater Elevations
August 23 and 24, 2009
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

Well	Gauging Date	Measuring Point Elevation (Feet msl)	Top of Screen Elevation (Feet msl)	Bottom of Screen Elevation (Feet msl)	Depth to Groundwater (Feet TOC)	Groundwater/ Surface Water Elevation (Feet msl)
C-Unit						
OW-017C	23-Aug-09	393.31	322.91	312.91	16.34	376.97
OW-023C	23-Aug-09	401.43	313.97	303.97	24.47	376.96
OW-027C	23-Aug-09	391.14	320.53	310.53	13.78	377.36
OW-035C	23-Aug-09	400.02	313.30	303.30	23.12	376.90
OW-036C	24-Aug-09	396.93	311.27	301.27	21.16	375.77
R-013C	23-Aug-09	388.58	321.23	311.23	11.98	376.60
R-014C	23-Aug-09	393.35	321.30	311.30	15.80	377.55
D-Unit						
A-008D	24-Aug-09	388.71	279.30	269.30	12.15	376.56
OW-010D	23-Aug-09	382.19	296.58	286.58	7.34	374.85
OW-012D	23-Aug-09	395.82	286.70	276.70	19.71	376.11
OW-017D	23-Aug-09	394.08	291.05	281.05	17.46	376.62
OW-023D	23-Aug-09	401.42	287.81	272.81	24.63	376.79
OW-027D	23-Aug-09	391.40	278.53	268.53	14.82	376.58
OW-035DR	23-Aug-09	399.32	280.84	270.84	22.51	376.81
OW-036D	23-Aug-09	397.28	287.71	277.71	22.09	375.19
OW-037D	23-Aug-09	395.07	281.57	271.57	18.21	376.86
OW-039DR	23-Aug-09	381.85	284.35	274.35	7.64	374.21
OW-040D	23-Aug-09	377.68	291.40	281.40	3.28	374.40
OW-041D	24-Aug-09	376.68	294.10	284.10	1.92	374.76
OW-042DR	23-Aug-09	390.45	280.30	270.30	13.91	376.54
OW-044D	23-Aug-09	379.89	283.80	273.80	5.22	374.67
OW-102D	23-Aug-09	396.85	288.80	278.80	19.91	376.94
OW-202D	23-Aug-09	395.10	303.32	293.32	17.42	377.68
R-013D	23-Aug-09	387.03	280.91	270.91	10.63	376.40
R-014D	23-Aug-09	393.44	276.90	266.90	16.88	376.56
E-Unit						
A-008E	23-Aug-09	388.61	255.90	245.90	12.41	376.20
OW-003E	23-Aug-09	378.10	270.16	260.16	3.03	375.07
OW-012E	24-Aug-09	395.76	262.71	252.71	19.37	376.39
OW-027E	23-Aug-09	390.98	263.46	253.46	14.43	376.55
OW-033E	23-Aug-09	398.77	265.50	255.50	22.27	376.50
OW-035E	23-Aug-09	399.19	265.81	255.81	22.53	376.66
OW-039ER	23-Aug-09	382.04	261.54	251.54	7.31	374.73
OW-102E	23-Aug-09	396.91	264.80	254.80	20.42	376.49
OW-200E	23-Aug-09	387.47	262.89	252.89	11.51	375.96
OW-201E	23-Aug-09	389.69	264.30	254.30	13.16	376.53
R-013E	24-Aug-09	387.22	262.24	252.24	10.59	376.63
R-014E	23-Aug-09	392.87	259.46	249.46	16.78	376.09

Notes:
Feet msl - feet above mean sea level
Feet TOC - feet below top of casing
NA - not applicable or not available
NM - not measured or could not be located

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Table 5
2009 Average Horizontal Groundwater Flow Velocities
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

First Semi-Annual (February 9, 2009)					Second Semi-Annual (August 25, 2009)				
Well Pair	**Horizontal Distance (feet)**	**Elevation Difference (feet)**	**Hydraulic Gradient (feet/feet)**	**Linear Flow Velocity (feet/day)**	**Well Pair**	**Horizontal Distance (feet)**	**Elevation Difference (feet)**	**Hydraulic Gradient (feet/feet)**	**Linear Flow Velocity (feet/day)**
A/B-Unit -- k=7.92E-7 ft/sec (6.8E-02 ft/day), n_e = 0.10, V_L = 3.8 E-3 to 1.45E-2 ft/day Typical historical hydraulic gradient: 0.004 to 0.020 ft/ft									
OW--31A to OW-042B	660	6.07	0.009	6.3E-03	OW-102B to S-003B	1020	2.86	0.003	1.9E-03
OW-017A to OW-003A	1050	8.21	0.008	5.3E-03	OW-017A to OW-003A	1050	8.70	0.008	5.6E-03
		Average	**0.009**	**5.8E-03**			**Average**	**0.006**	**3.8E-03**
C-Unit -- k=4.58E-8 ft/sec (3.95E-03 ft/day), n_e = 0.05, V_L = 8.24E-5 to 2.19E-4 ft/day Typical historical hydraulic gradient: 0.002 to 0.003 ft/ft									
R-013C to R-014C	240	0.61	0.0025	2.0E-04	R-014C to R-013C	240	0.95	0.0040	3.1E-04
OW-017C to OW-035C	700	0.21	0.0003	2.4E-05	OW-017C to OW-036C	860	1.20	0.0014	1.1E-04
		Average	**0.0014**	**1.1E-04**			**Average**	**0.0027**	**2.1E-04**
D-Unit -- k=1.85E-05 ft/sec (1.6 ft/day), n_e = 0.20, V_L = 6.5E-3 to 1.97E-2 ft/day Typical historical hydraulic gradient: 0.001 to 0.003 ft/ft									
OW-202D to OW-037D	1446	1.95	0.0013	1.1E-02	OW-202D to OW-027D	1870	1.10	0.0006	4.7E-03
OW-017D to OW-010D	1247	1.80	0.0014	1.2E-02	OW-017D to OW-010D	1247	1.77	0.0014	1.1E-02
		Average	**0.0014**	**1.1E-02**			**Average**	**0.0010**	**8.0E-03**
E-Unit -- k=5.33E-06 ft/sec (4.61E-01 ft/day), n_e = 0.05, V_L = 8.57E-3 to 1.7E-2 ft/day Typical historical hydraulic gradient: 0.002 to 0.004 ft/ft									
OW-033E to OW-102E	532	1.04	0.0020	1.8E-02	R-013E to OW-200E	280	0.67	0.0024	2.2E-02
OW-012E to OW-003E	497	1.47	0.0030	2.7E-02	OW-012E to OW-003E	500	1.32	0.0026	2.4E-02
		Average	**0.0025**	**2.3E-02**			**Average**	**0.0025**	**2.3E-02**

Notes:

v = (k * i) / ne

Where:

v = velocity

k = hydraulic conductivity

i = hydraulic gradient

ne = effective porosity

V_L = typical linear flow velocity of Unit

Table 6
2009 Vertical Hydraulic Gradients at Selected Well Clusters
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

Well Cluster	Vertical Gradient (feet/feet)	
	First Semi-Annual	Second Semi-Annual
A- and B-Unit to C-Unit		
OW-017A TO OW-017C	1.9E-03	1.4E-01
OW-027A TO OW-027C	2.0E-01	1.5E-01
OW-035B TO OW-035C	3.5E-01	2.9E-01
OW-036B TO OW-036C	1.9E-01	1.7E-01
OW-044A TO OW-044B	-4.8E-02	-3.5E-02
R-013A TO R-013C	1.8E-01	1.3E-01
D-Unit to E-Unit		
A-008D TO A-008E	1.5E-02	1.5E-02
OW-012D TO OW-012E	-2.1E-02	-1.2E-02
OW-027D TO OW-027E	2.0E-03	2.0E-03
OW-035DR TO OW-035E	1.5E-02	1.0E-02
OW-102D TO OW-102E	1.8E-02	1.9E-02
R-013D TO R-013E	-8.6E-03	-1.2E-02
R-014D TO R-014E	5.2E-02	2.7E-02

Notes:
Positive values indicate a downward vertical gradient.
Negative values indicate an upward vertical gradient.
The vertical gradient is calculated using the following equation:

$i_v = (GWE_{shallow} - GWE_{deep}) / (Mp_{shallow} - Mp_{deep})$

where:

i_v = vertical gradient
$GWE_{shallow}$ = groundwater elevation of the shallow well
GWE_{deep} = groundwater elevation of the deep well
$Mp_{shallow}$ = elevation of the midpoint of the shallow well screen
Mp_{deep} = elevation of the midpoint of the deep well screen

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Table 7
2009 Summary of Wells with Detections
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

Constituent	Wells Detected: First Semi-Annual	Wells Detected: Second Semi-Annual	Lowest Detected Concentration (sample, event)	Highest Detected Concentration (sample, event)
Total PAHs [(a)]	OW-010B OW-026A OW-027D OW-027 DUP OW-035B OW-035E OW-037B OW-040D OW-041D OW-102E OW-205A OW-206A R-014D R-014E	OW-022BR OW-026A OW-026A DUP OW-027A OW-031A DUP OW-033E DUP OW-035B OW-035E OW-037D DUP OW-039BR OW-201E OW-204A DUP OW-205A R-014E	0.19 (OW-031A DUP, 2nd)	2180 (OW-205A, 1st)
Pentachlorophenol	None	None	None	None
BTEX [(b)]	OW-205A	OW-205A	54.2 (OW-205A, 2nd)	61.5 (OW-205A, 1st)
Arsenic (Dissolved)	OW-017C OW-017C DUP OW-023C OW-023C DUP OW-026A OW-035C OW-035C DUP OW-041B OW-041D OW-202D	OW-010B OW-017C OW-026A OW-026A DUP OW-027A OW-035C OW-041B OW-041D OW-202D R-014C	12 (OW-017C DUP, 1st)	271 (OW-026A DUP, 2nd)
Arsenic (Total)	OW-017C OW-017C DUP OW-023C OW-023C DUP OW-026A OW-035C OW-035C DUP OW-041B OW-041D OW-202D	OW-010B OW-017C OW-026A OW-026A DUP OW-027A OW-035C OW-041B OW-041D OW-205A R-014C	11.2 (OW-041D, 1st)	327 (OW-026A, 1st)
Chromium (Dissolved)	OW-204B	OW-204B	59.1 (OW-204B, 2nd)	75.2 (OW-204B, 1st)
Chromium (Total)	OW-010B OW-017C OW-017C DUP OW-022BR OW-023D OW-026A OW-033E OW-036B OW-039BR2 OW-041A OW-044D OW-102B OW-203A OW-204A OW-204B OW-206A OW-207A R-014C	OW-010B OW-017C OW-022BR OW-023D OW-027D OW-033E OW-033E DUP OW-036B OW-039BR2 OW-040D OW-044D OW-202D OW-203A OW-204A OW-204A DUP OW-204B OW-206A	5.2 (OW-026A, 1st)	786 (OW-204A, 2nd)
Copper (Dissolved)	OW-039BR2	None	146 (OW-039BR2, 1st)	146 (OW-039BR2, 1st)
Copper (Total)	OW-039BR2	OW-039ER OW-202B OW-202D	28.2 (OW-039ER, 2nd)	171 (OW-039BR2, 1st)
Total Recoverable Phenolics	OW-017C DUP OW-027E OW-039BR2 OW-041D OW-102E OW-201E OW-201E DUP OW-203A OW-205A	OW-017A OW-027E OW-031A OW-031A DUP OW-035DR OW-035E OW-036B OW-039DR OW-042B OW-044D OW-102B OW-201E OW-202D OW-207A	0.012 (OW-041D, OW-203A, 1st) (OW-044D, OW-207A, 2nd)	0.32 (OW-035E, 2nd)

Notes:

[(a)] Wells in which at least one PAH compound was detected. Concentrations listed are total PAHs.

[(b)] Wells in which at least one BTEX compound was detected. Concentrations listed are total BTEX.

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Table 8
Summary of TACO Tier 1 Exceedances
First and Second Semi-Annual 2009 Sampling Events
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility - Carbondale, Illinois

Well	Parameter	Sample Result (ug/L)	TACO Class I (D- and E-Unit Wells)	TACO Class II (A/B and C-Unit Wells)
First Semi-Annual Sampling Event				
TACO Tier 1 Exceedance				
OW-026A	Arsenic, dissolved	225		200
OW-027D	Benzo(a)anthracene Benzo(b)fluoranthene Benzo(k)fluoranthene	0.17 B 0.28 B 0.32 B	0.13 0.13 0.17	
OW-041D	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Dibenzo(a,h)anthracene Indeno(1,2,3-cd)pyrene	0.55 B 0.44 B 0.47 B 0.54 B 0.57 B 0.57 B	0.13 0.2 0.13 0.17 0.3 0.43	
OW-205A	Naphthalene	2100	220	
Second Semi-Annual Sampling Event				
TACO Tier 1 Exceedance				
OW-026A	Arsenic, dissolved	267		200
OW-026A DUP	Arsenic, dissolved	271		200
OW-027A	Benzo(a)anthracene Benzo(b)fluoranthene Benzo(k)fluoranthene Dibenzo(a,h)anthracene	1.4 1.4 1.5 1.7		0.65 0.9 0.85 1.5
OW-033E DUP	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Dibenzo(a,h)anthracene Indeno(1,2,3-cd)pyrene	0.58 0.53 0.6 0.64 0.7 0.65	0.13 0.2 0.13 0.17 0.3 0.43	
OW-037D DUP	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Dibenzo(a,h)anthracene	0.32 0.28 0.34 0.35 0.38	0.13 0.2 0.13 0.17 0.3	
OW-204A DUP	Benzo(a)anthracene Benzo(b)fluoranthene Benzo(k)fluoranthene	1.1 1 0.91		0.65 0.9 0.85
OW-205A	Naphthalene	270		220

Notes:
TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standards are different for Class I (D and E unit wells) and Class II (A/B and C unit wells).

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Table 9
Summary of Analytical Data Compared to the IWQC
First and Second Semi-Annual 2009 Sampling Events
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

ANALYTE	UNITS	IWQC[1,2] Aquatic Life	IWQC[1,2] Human Health	OW-041A 2/10/2009	OW-041A 8/26/2009	OW-041B 2/10/2009	OW-041B 8/26/2009	OW-205A 2/9/2009	OW-205A 8/27/2009	OW-206A 2/9/2009	OW-206A 8/26/2009	OW-207A 2/9/2009	OW-207A 8/25/2009
Metals (Method 6010B)													
ARSENIC - SOLUBLE	UG/L	190	--	10 U	10 U	**59.5**	**60.1**	10 U	10 U	10 U	10 U	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	**100**	**89.3**	10 U	**13.1**	10 U	10 U	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	--	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	**36.6**	5 U	5 U	5 U	5 U	5 U	**23.4**	**6.7**	**7.7**	5 U
COPPER - SOLUBLE	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
BTEX (Method 8021B)													
BENZENE	UG/L	860	310	1 U	1 U	1 U	1 U	**9.4**	**6**	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	14	--	1 U	1 U	1 U	1 U	**30**	**29**	1 U	1 U	1 U	1 U
TOLUENE	UG/L	600	--	1 U	1 U	1 U	1 U	**4.1**	**3.2**	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	360	--	1 U	1 U	1 U	1 U	**18**	**16**	1 U	1 U	1 U	1 U
SVOCs (Method 8270C SIM)													
PENTACHLOROPHENOL	UG/L	13	2.5	0.99 U	1 U	0.96 U	1 U	280 U	1.1 U	1.1 U	1 U	1 U	0.98 U
SVOCs (Method 8270C SIM)													
ACENAPHTHENE	UG/L	62	--	0.2 U	0.2 U	0.19 U	0.2 U	**80**	**56**	0.22 U	0.2 U	0.2 U	0.2 U
ACENAPHTHYLENE	UG/L	15	--	0.2 U	0.2 U	0.19 U	0.2 U	56 U	**1.2**	0.22 U	0.2 U	0.2 U	0.2 U
ANTHRACENE	UG/L	0.53	35,000	0.2 U	0.2 U	0.19 U	0.2 U	56 U	**1.5**	**0.26 B**	0.2 U	0.2 U	0.2 U
BENZO(A)ANTHRACENE	UG/L	--	0.16	0.13 U	0.13 U	0.12 U	0.13 U	36 U	0.14 U	0.14 U	0.13 U	0.13 U	0.13 U
BENZO(A)PYRENE	UG/L	--	0.016	0.2 U	0.2 U	0.19 U	0.2 U	56 U	0.22 U	0.22 U	0.2 U	0.2 U	0.2 U
BENZO(B)FLUORANTHENE	UG/L	--	0.16	0.18 U	0.18 U	0.17 U	0.18 U	50 U	0.19 U	**0.2 B**	0.18 U	0.18 U	0.18 U
BENZO(GHI)PERYLENE	UG/L	--	--	0.2 U	0.2 U	0.19 U	0.2 U	56 U	0.22 U	0.22 U	0.2 U	0.2 U	0.2 U
BENZO(K)FLUORANTHENE	UG/L	--	1.6	0.17 U	0.17 U	0.16 U	0.17 U	47 U	0.18 U	0.19 U	0.17 U	0.17 U	0.17 U
CHRYSENE	UG/L	--	16	0.2 U	0.2 U	0.19 U	0.2 U	56 U	0.22 U	0.22 U	0.2 U	0.2 U	0.2 U
DIBENZO(A,H)ANTHRACENE	UG/L	--	0.016	0.2 U	0.2 U	0.19 U	0.2 U	56 U	0.22 U	0.22 U	0.2 U	0.2 U	0.2 U
FLUORANTHENE	UG/L	1.8	120	0.2 U	0.2 U	0.19 U	0.2 U	56 U	**0.76**	0.22 U	0.2 U	0.2 U	0.2 U
FLUORENE	UG/L	16	4,500	0.2 U	0.2 U	0.19 U	0.2 U	56 U	**18**	0.22 U	0.2 U	0.2 U	0.2 U
INDENO(1,2,3-CD)PYRENE	UG/L	--	0.16	0.2 U	0.2 U	0.19 U	0.2 U	56 U	0.22 U	0.22 U	0.2 U	0.2 U	0.2 U
NAPHTHALENE	UG/L	68	--	0.2 U	0.2 U	0.19 U	0.2 U	**2100**	**270**	0.22 U	0.2 U	0.2 U	0.2 U
PHENANTHRENE	UG/L	3.7	--	0.2 U	0.2 U	0.19 U	0.2 U	56 U	**12**	**0.22 B**	0.2 U	0.2 U	0.2 U
PYRENE	UG/L	--	3,500	0.2 U	0.2 U	0.19 U	0.2 U	56 U	**0.3**	0.22 U	0.2 U	0.2 U	0.2 U
Phenolics (Method 9066)													
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	0.01 U	0.01 U	**0.013**	0.01 U	0.01 U	0.01 U	0.01 U	0.012 B

Notes:
IWQC - Illinois Water Quality Criteria
BTEX - benzene, toluene, ethylbenzene, xylenes
SVOCs - semivolatile organic compounds
U - compound was analyzed but not detected
J - an estimated result
DUP - Duplicate sample
B - field blank contamination
Bold - constituent detected
Shade ■ - indicates concentration exceeds IWQC (Illinois Water Quality Criteria)

1 - For metals and BTEX, Illinois Water Quality Criteria obtained from 35 IAC 302.208. For PAHs and pentachlorophenol, Illinois Water Quality Criteria obtained from the following table: http://www.epa.sate.il.us/water/water-quality-standards/water-quality-criteria-list.pdf Aquatic life criteria represent the lower of the Acute Aquatic (AATC) and the Chronic AquaticToxicity Criterion Toxicity Criterion (CATC). Human health criteria represent the lower of the Human Threshold Criterion (HTC) and the Human Nonthreshold Criterion (HNC).
2 - IWQC are not applicable to groundwater, but comparison being done as requested by USEPA.

Table 10
TEQ Summary
Toxic Equivalents of Detected Dioxin and/or Furans
2009 First Semi-Annual RCRA Groundwater Data
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

ANALYTE NAME	UNITS	TEFs	OW-022BR 2/12/2009	OW-035B 2/11/2009	OW-035B DUP	OW-102B 2/9/2009	OW-202A 2/9/2009
Dioxins/Furans (Method 8290)							
1,2,3,4,6,7,8-HPCDD	UG/L	0.01	0.0000038 U	0.0000056 U	0.000015 U	0.0000039 U	**0.000031 J**
1,2,3,4,6,7,8-HPCDF	UG/L	0.01	**0.00015**	0.000015 U	**0.000035 J**	0.00000097 U	0.0000083 U
1,2,3,4,7,8,9-HPCDF	UG/L	0.01	0.0000054 U	0.00000044 U	0.0000013 U	0.00000026 U	0.0000012 U
1,2,3,4,7,8-HXCDD	UG/L	0.1	0.0000021 U	0.0000046 U	0.0000021 U	0.00000052 U	0.0000044 U
1,2,3,4,7,8-HXCDF	UG/L	0.1	**0.00004 J**	0.0000033 U	0.000007 U	0.00000025 U	0.00000095 U
1,2,3,6,7,8-HXCDD	UG/L	0.1	0.0000017 U	0.0000037 U	0.0000017 U	0.0000007 U	0.0000036 U
1,2,3,6,7,8-HXCDF	UG/L	0.1	0.0000062 U	0.00000066 U	0.0000012 U	0.00000036 U	0.00000077 U
1,2,3,7,8,9-HXCDD	UG/L	0.1	0.0000016 U	0.0000036 U	0.0000017 U	0.00000052 U	0.0000035 U
1,2,3,7,8,9-HXCDF	UG/L	0.1	0.0000015 U	0.0000004 U	0.0000003 U	0.00000034 U	0.00000099 U
1,2,3,7,8-PECDD	UG/L	1	0.000004 U	0.0000089 U	0.0000045 U	0.0000008 U	0.0000072 U
1,2,3,7,8-PECDF	UG/L	0.03	0.00000063 U	0.00000072 U	0.00000071 U	0.00000029 U	0.00000091 U
2,3,4,6,7,8-HXCDF	UG/L	0.1	0.0000026 U	0.00000035 U	0.00000069 U	0.00000034 U	0.00000086 U
2,3,4,7,8-PECDF	UG/L	0.3	0.0000022 U	0.00000076 U	0.00000074 U	0.0000003 U	0.00000096 U
2,3,7,8-TCDD	UG/L	1	0.0000088 U	0.0000081 U	0.0000078 U	0.000001 U	0.0000091 U
2,3,7,8-TCDF	UG/L	0.1	0.0000012 U	0.00000091 U	0.00000069 U	0.00000038 U	0.0000011 U
OCDD	UG/L	0.0003	**0.000054 J**	**0.000058 J**	**0.0002 J**	**0.000081 J**	**0.0003**
OCDF	UG/L	0.0003	**0.00023**	0.000026 U	**0.000069 J**	0.0000024 U	0.000038 U
TOTAL HPCDD	UG/L	NA	0.0000045 U	0.0000056 U	0.000016 U	0.0000052 U	**0.00007**
TOTAL HPCDF	UG/L	NA	**0.00015**	0.000014 U	**0.000035**	0.0000021 U	**0.000027**
TOTAL HXCDD	UG/L	NA	0.0000022 U	0.000015 U	0.0000021 U	0.0000007 U	**0.000042**
TOTAL HXCDF	UG/L	NA	**0.00004**	0.0000033 U	0.000007 U	0.00000036 U	0.0000036 U
TOTAL PECDD	UG/L	NA	0.000004 U	0.0000089 U	0.0000045 U	0.0000008 U	0.0000072 U
TOTAL PECDF	UG/L	NA	0.000003 U	0.00000091 U	0.00000085 U	0.00000034 U	0.0000013 U
TOTAL TCDD	UG/L	NA	0.0000088 U	0.0000081 U	0.0000078 U	0.000001 U	0.0000091 U
TOTAL TCDF	UG/L	NA	0.0000012 U	0.00000091 U	0.00000069 U	0.00000038 U	0.0000011 U
2,3,7,8-TCDD TEQ - ND = 0	UG/L	NA	5.59E-06	1.74E-08	4.31E-07	2.43E-08	4.00E-07

Notes:
U - compound was analyzed but not detected
J - estimated result
DUP - Duplicate sample
Bold - constituent detected
TEQ - Toxicity Equivalent Quotient
TEQs were calculated using zero for nondetect values
TEFs - values taken from the 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

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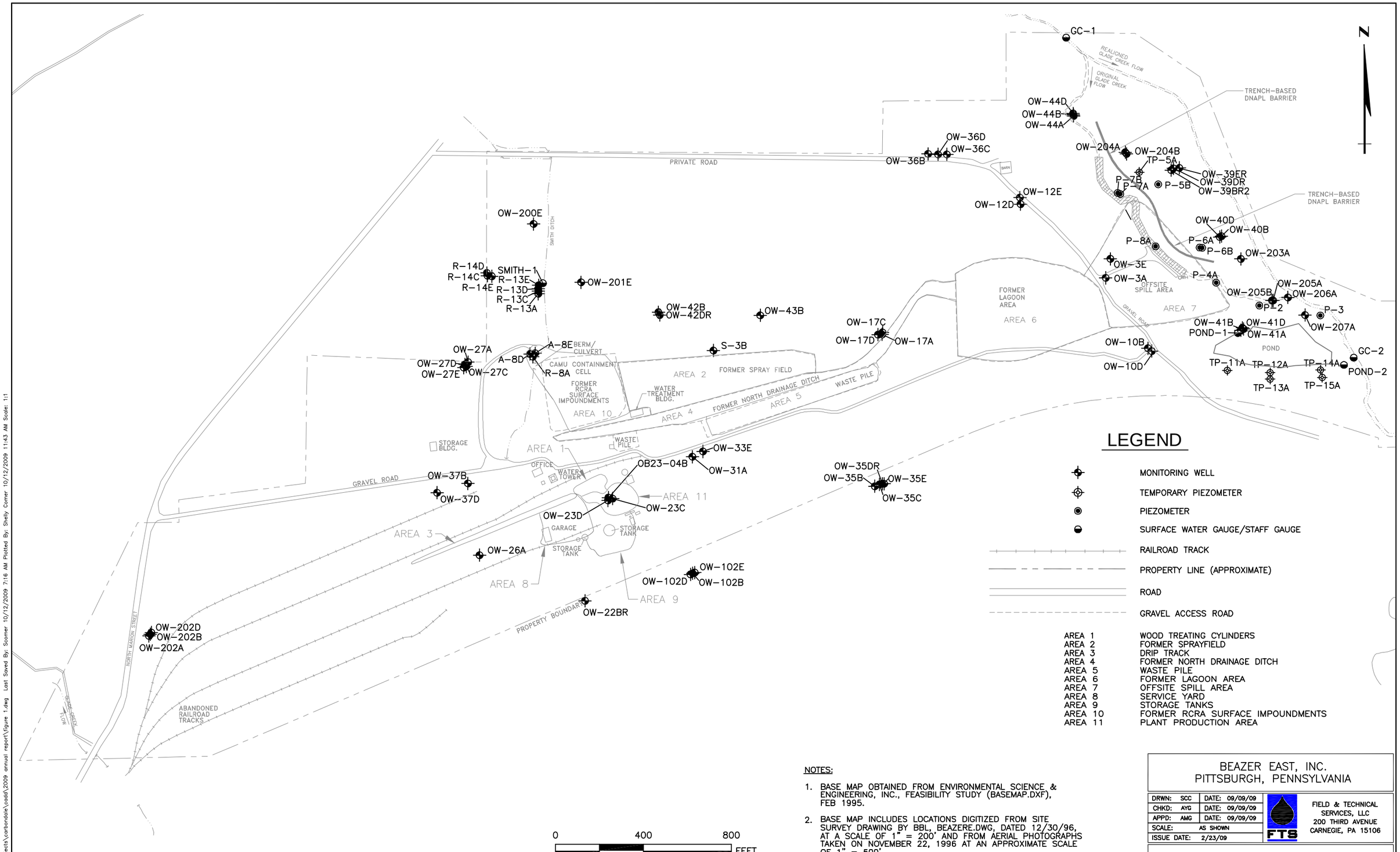
US EPA ARCHIVE DOCUMENT

FIGURES

US EPA ARCHIVE DOCUMENT



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REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE:

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN: SCC	DATE: 09/09/09	
CHKD: AYG	DATE: 09/09/09	
APPD: AMG	DATE: 09/09/09	
SCALE: AS SHOWN		
ISSUE DATE: 2/23/09		

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FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2009 ANNUAL RCRA GROUNDWATER MONITORING REPORT
FORMER KOPPERS WOOD TREATING SITE
CARBONDALE, ILLINOIS

SITE PLAN

PROJECT NO: OM041409
DRAWING NUMBER
FIGURE 1

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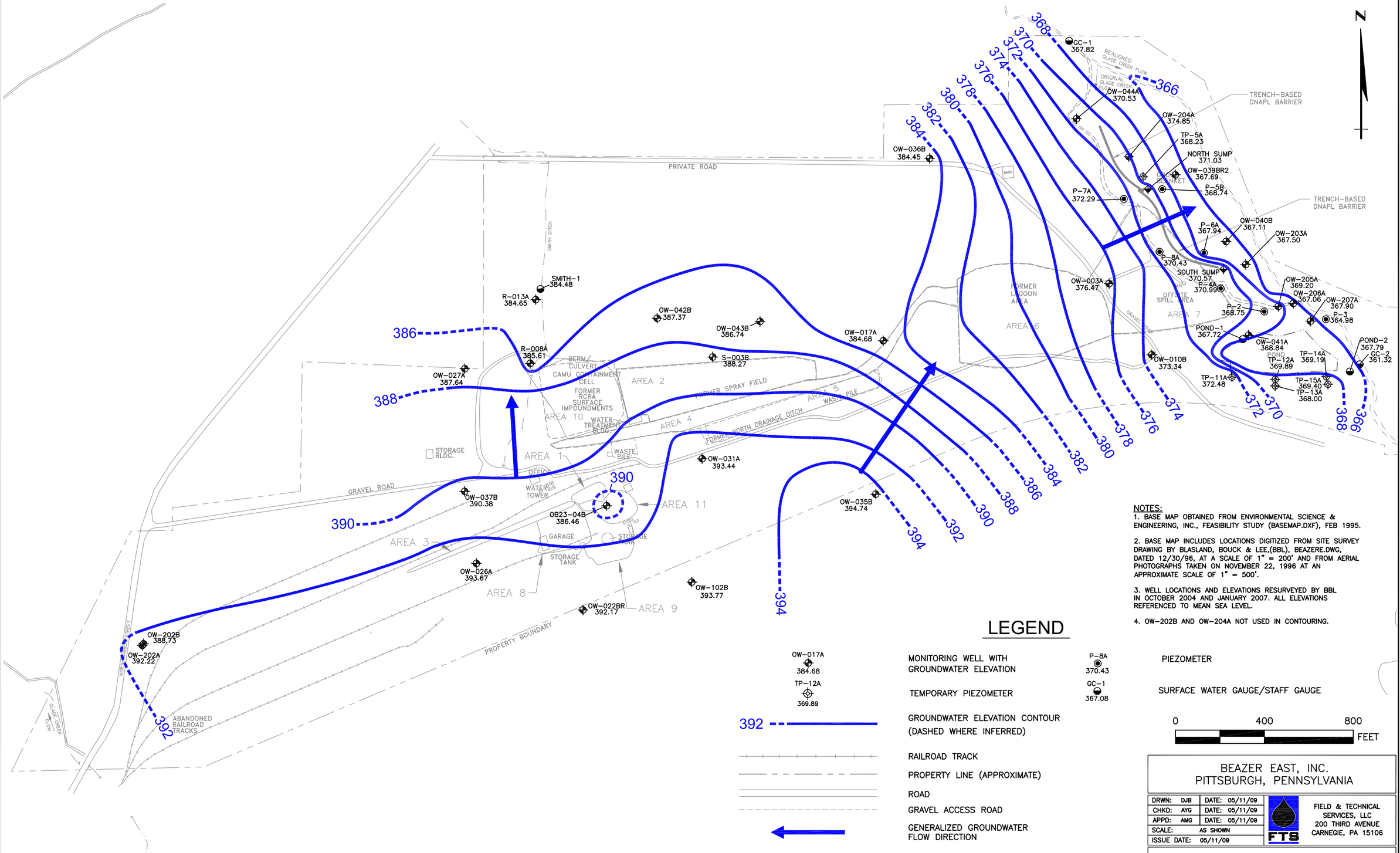

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3. WELL LOCATIONS AND ELEVATIONS RESURVEYED BY BBL IN OCTOBER 2004 AND JANUARY 2007. ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL.

4. OW-202B AND OW-204A NOT USED IN CONTOURING.

LEGEND

OW-017A 384.68	MONITORING WELL WITH GROUNDWATER ELEVATION
TP-12A 369.89	TEMPORARY PIEZOMETER
392	GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
	RAILROAD TRACK
	PROPERTY LINE (APPROXIMATE)
	ROAD
	GRAVEL ACCESS ROAD
	GENERALIZED GROUNDWATER FLOW DIRECTION
P-8A 370.43	PIEZOMETER
GC-1 367.08	SURFACE WATER GAUGE/STAFF GAUGE

0 400 800 FEET

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN: DJB	DATE: 05/11/09	FIELD & TECHNICAL SERVICES, LLC 200 THIRD AVENUE CARNEGIE, PA 15106
CHKD: AYG	DATE: 05/11/09	
APPD: AMG	DATE: 05/11/09	
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ISSUE DATE: 05/11/09		

2009 ANNUAL RCRA GROUNDWATER MONITORING REPORT
FORMER KOPPERS WOOD TREATING SITE
CARBONDALE, ILLINOIS

GROUNDWATER ELEVATION CONTOUR MAP A/B UNIT FROM FEBRUARY 8–9, 2009

PROJECT NO: OM041409
DRAWING NUMBER
FIGURE 2

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE:

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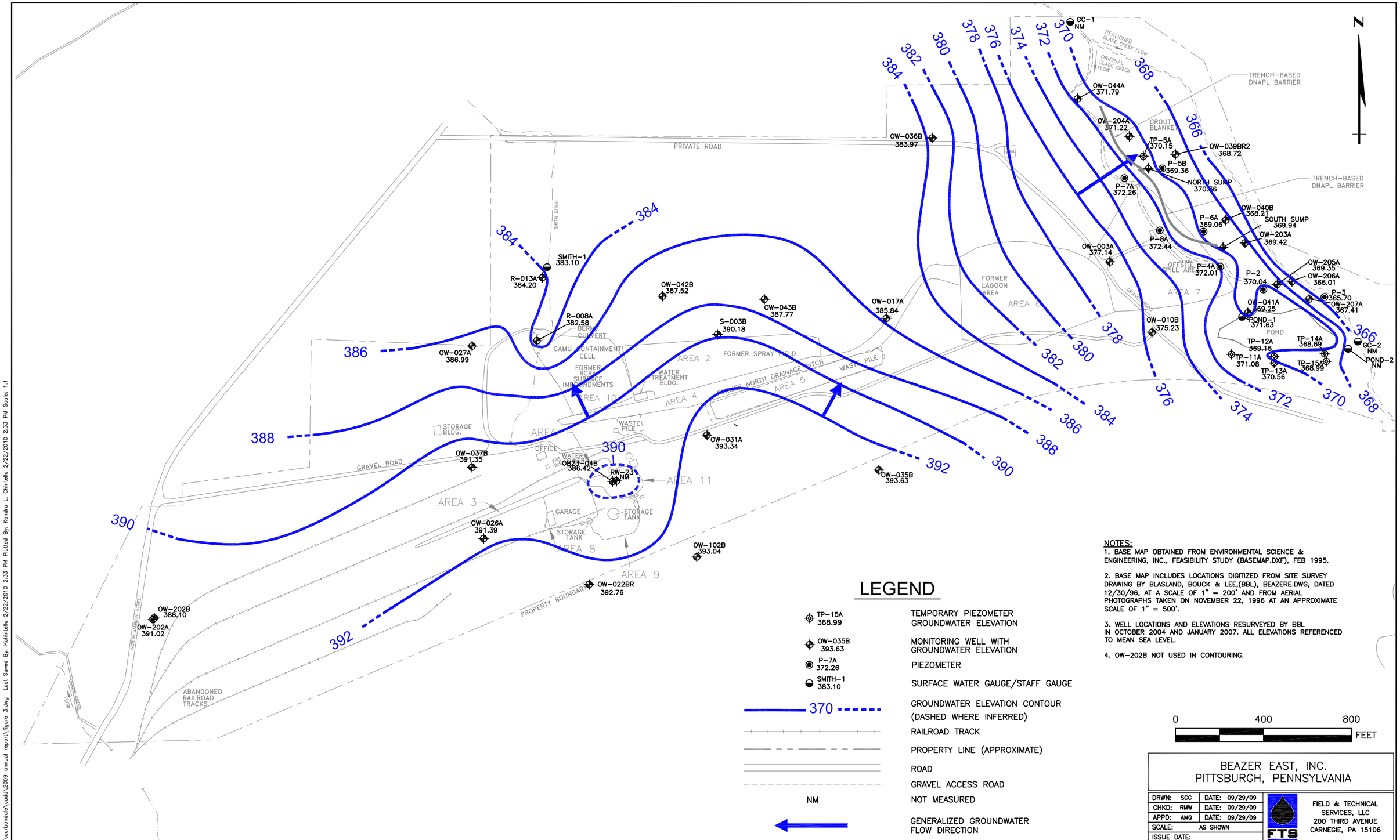

LEGEND

TP-15A 368.99	TEMPORARY PIEZOMETER GROUNDWATER ELEVATION
OW-035B 393.63	MONITORING WELL WITH GROUNDWATER ELEVATION
P-7A 372.26	PIEZOMETER
SMITH-1 383.10	SURFACE WATER GAUGE/STAFF GAUGE
370	GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
	RAILROAD TRACK
	PROPERTY LINE (APPROXIMATE)
	ROAD
	GRAVEL ACCESS ROAD
NM	NOT MEASURED
	GENERALIZED GROUNDWATER FLOW DIRECTION

NOTES:

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3. WELL LOCATIONS AND ELEVATIONS RESURVEYED BY BBL IN OCTOBER 2004 AND JANUARY 2007. ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL.

4. OW-202B NOT USED IN CONTOURING.

0 400 800 FEET

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN: SCC	DATE: 09/29/09	FIELD & TECHNICAL SERVICES, LLC 200 THIRD AVENUE CARNEGIE, PA 15106
CHKD: RMW	DATE: 09/29/09	
APPD: AMG	DATE: 09/29/09	
SCALE: AS SHOWN		
ISSUE DATE:		

2009 ANNUAL RCRA GROUNDWATER MONITORING REPORT
FORMER KOPPERS WOOD TREATING SITE
CARBONDALE, ILLINOIS

GROUNDWATER ELEVATION CONTOUR MAP A-B-UNIT
AUGUST 23-24, 2009

PROJECT NO: OM041409
DRAWING NUMBER
FIGURE 3

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE:

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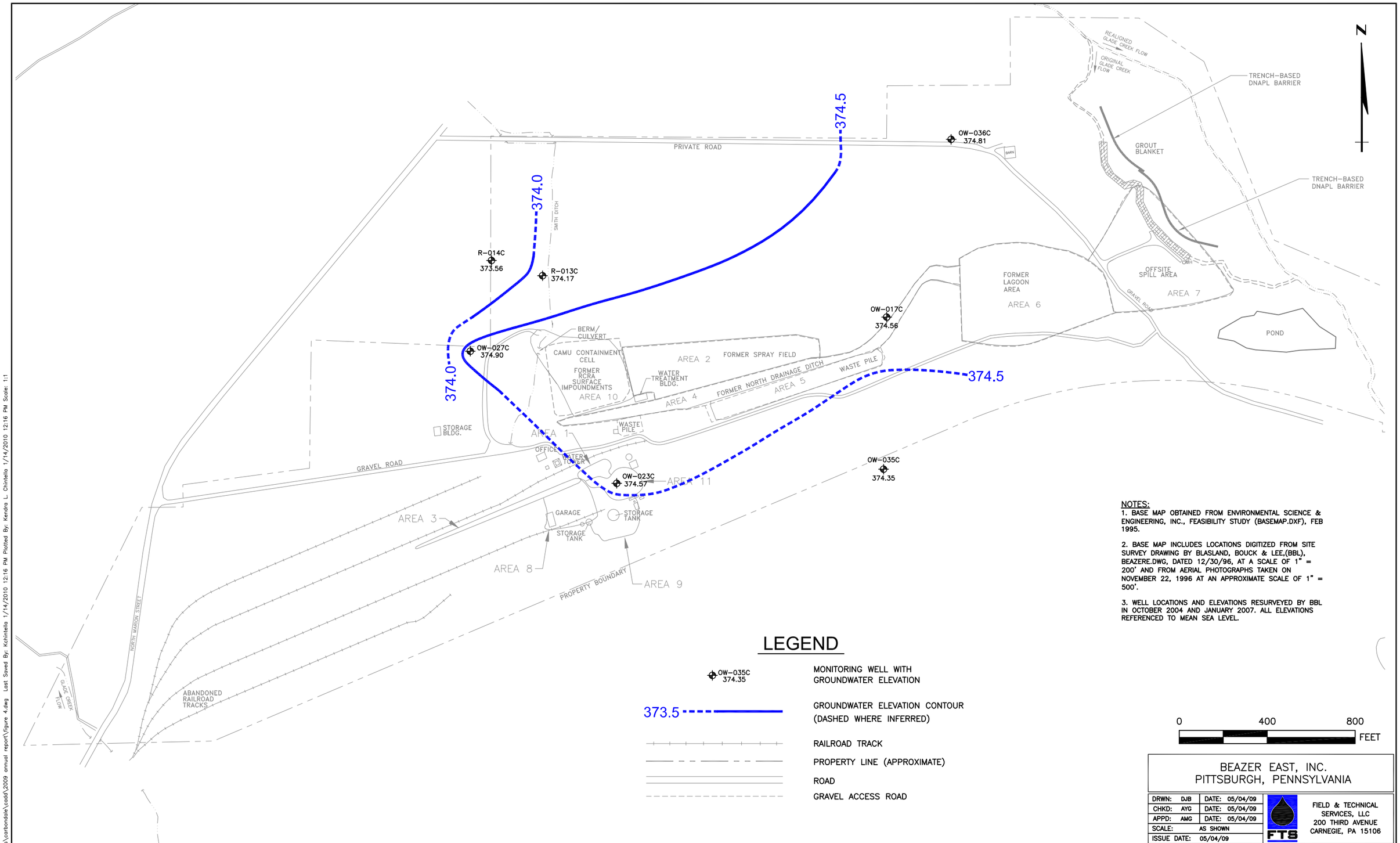

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3. WELL LOCATIONS AND ELEVATIONS RESURVEYED BY BBL IN OCTOBER 2004 AND JANUARY 2007. ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL.

LEGEND

OW-035C 374.35	MONITORING WELL WITH GROUNDWATER ELEVATION
373.5	GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
	RAILROAD TRACK
	PROPERTY LINE (APPROXIMATE)
	ROAD
	GRAVEL ACCESS ROAD

0 400 800 FEET

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN: DJB	DATE: 05/04/09		
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APPD: AMG	DATE: 05/04/09		
SCALE: AS SHOWN			
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FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2009 ANNUAL RCRA GROUNDWATER MONITORING REPORT
FORMER KOPPERS WOOD TREATING SITE
CARBONDALE, ILLINOIS

GROUNDWATER CONTOURS
C-ZONE
FEBRUARY 9, 2009

PROJECT NO: OM041409
DRAWING NUMBER
FIGURE 4

REV #	DATE	DESCRIPTION	APPD

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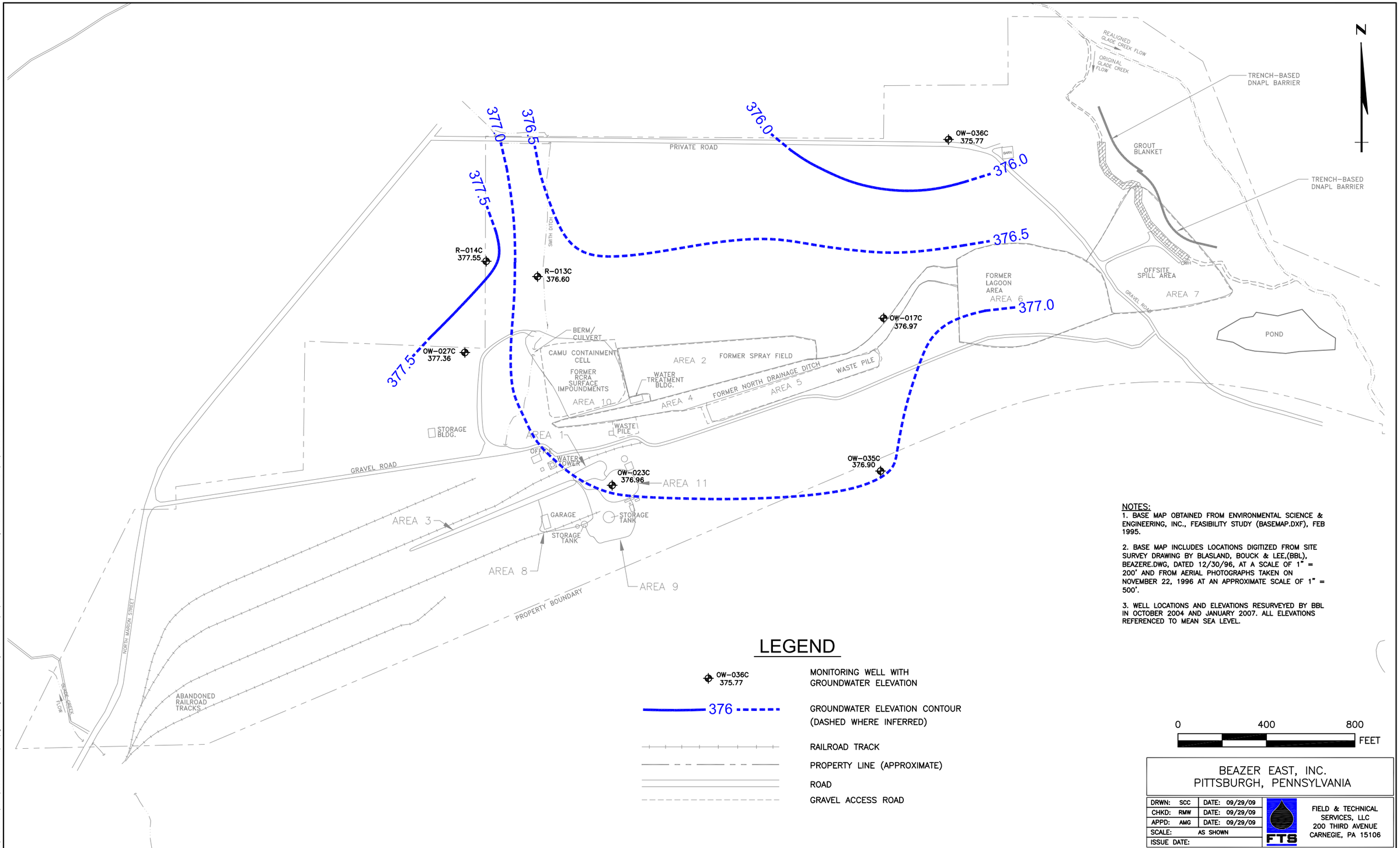

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3. WELL LOCATIONS AND ELEVATIONS RESURVEYED BY BBL IN OCTOBER 2004 AND JANUARY 2007. ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL.

LEGEND

OW-036C 375.77	MONITORING WELL WITH GROUNDWATER ELEVATION
376	GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
	RAILROAD TRACK
	PROPERTY LINE (APPROXIMATE)
	ROAD
	GRAVEL ACCESS ROAD

0 400 800 FEET

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN: SCC	DATE: 09/29/09		FIELD & TECHNICAL SERVICES, LLC 200 THIRD AVENUE CARNEGIE, PA 15106
CHKD: RMW	DATE: 09/29/09		
APPD: AMG	DATE: 09/29/09		
SCALE: AS SHOWN			
ISSUE DATE:			

2009 ANNUAL RCRA GROUNDWATER MONITORING REPORT
FORMER KOPPERS WOOD TREATING SITE
CARBONDALE, ILLINOIS

GROUNDWATER ELEVATION CONTOUR MAP C-UNIT AUGUST 23-24, 2009

PROJECT NO: OM041409
DRAWING NUMBER
FIGURE 5

REV #	DATE	DESCRIPTION	APPD

REFERENCE:

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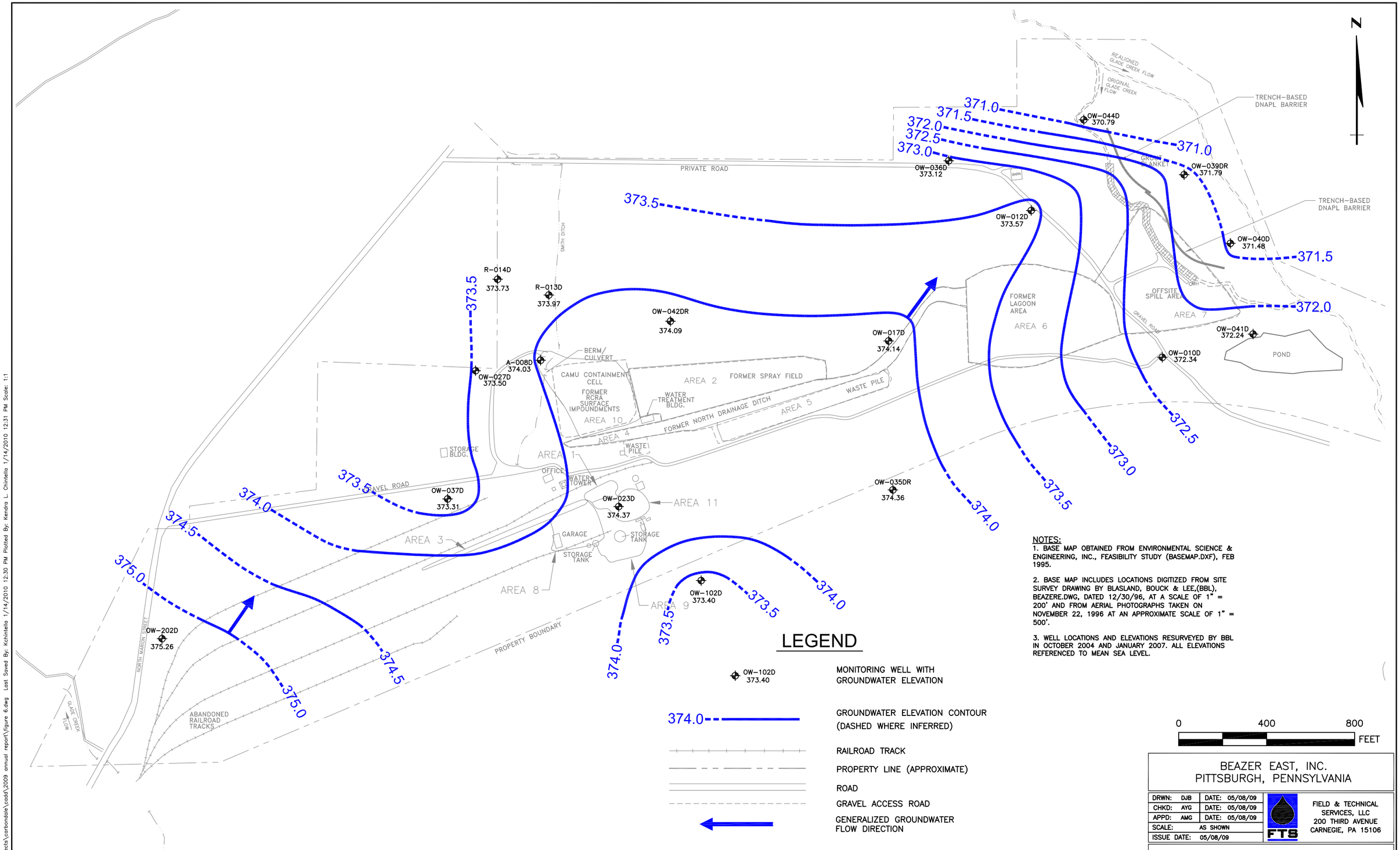

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3. WELL LOCATIONS AND ELEVATIONS RESURVEYED BY BBL IN OCTOBER 2004 AND JANUARY 2007. ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL.

LEGEND

OW-102D 373.40	MONITORING WELL WITH GROUNDWATER ELEVATION
374.0	GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
	RAILROAD TRACK
	PROPERTY LINE (APPROXIMATE)
	ROAD
	GRAVEL ACCESS ROAD
	GENERALIZED GROUNDWATER FLOW DIRECTION

0 400 800 FEET

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN: DJB	DATE: 05/08/09		FIELD & TECHNICAL SERVICES, LLC 200 THIRD AVENUE CARNEGIE, PA 15106
CHKD: AYG	DATE: 05/08/09		
APPD: AMG	DATE: 05/08/09		
SCALE: AS SHOWN			
ISSUE DATE: 05/08/09			

2009 ANNUAL RCRA GROUNDWATER MONITORING REPORT
FORMER KOPPERS WOOD TREATING SITE
CARBONDALE, ILLINOIS

GROUNDWATER CONTOURS
D-UNIT
FEBRUARY 9, 2009

PROJECT NO: OM041409
DRAWING NUMBER
FIGURE 6

REV #	DATE	DESCRIPTION	APPD

REFERENCE:

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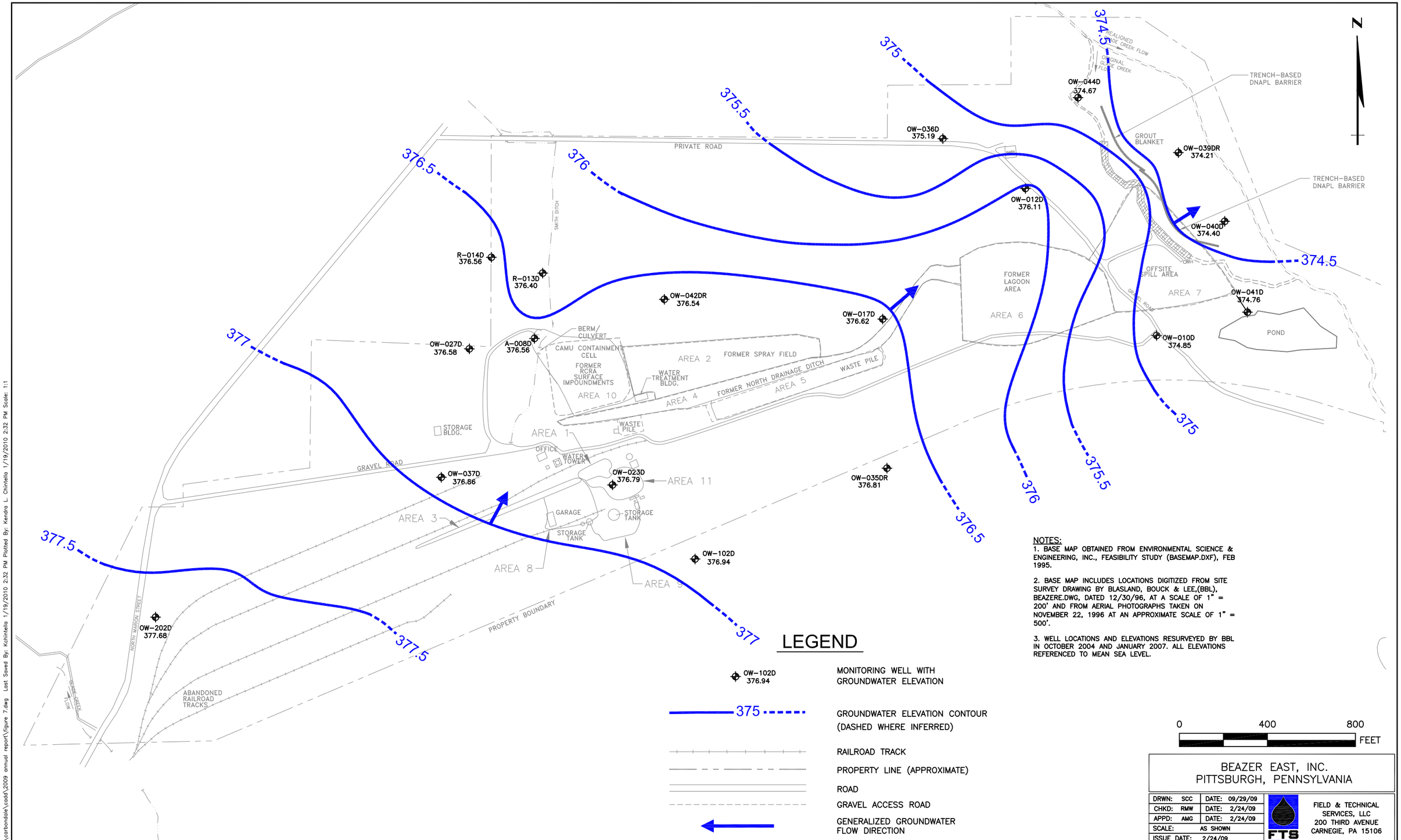

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3. WELL LOCATIONS AND ELEVATIONS RESURVEYED BY BBL IN OCTOBER 2004 AND JANUARY 2007. ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL.

LEGEND

OW-102D 376.94	MONITORING WELL WITH GROUNDWATER ELEVATION
375	GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
	RAILROAD TRACK
	PROPERTY LINE (APPROXIMATE)
	ROAD
	GRAVEL ACCESS ROAD
	GENERALIZED GROUNDWATER FLOW DIRECTION

0 400 800 FEET

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN: SCC	DATE: 09/29/09		FIELD & TECHNICAL SERVICES, LLC 200 THIRD AVENUE CARNEGIE, PA 15106
CHKD: RMW	DATE: 2/24/09		
APPD: AMG	DATE: 2/24/09		
SCALE: AS SHOWN			
ISSUE DATE: 2/24/09			

2009 ANNUAL RCRA GROUNDWATER MONITORING REPORT
FORMER KOPPERS WOOD TREATING SITE
CARBONDALE, ILLINOIS

GROUNDWATER ELEVATION CONTOUR MAP D-UNIT
AUGUST 23-24, 2009

PROJECT NO: OM041409
DRAWING NUMBER
FIGURE 7

REV #	DATE	DESCRIPTION	APPD

REFERENCE:

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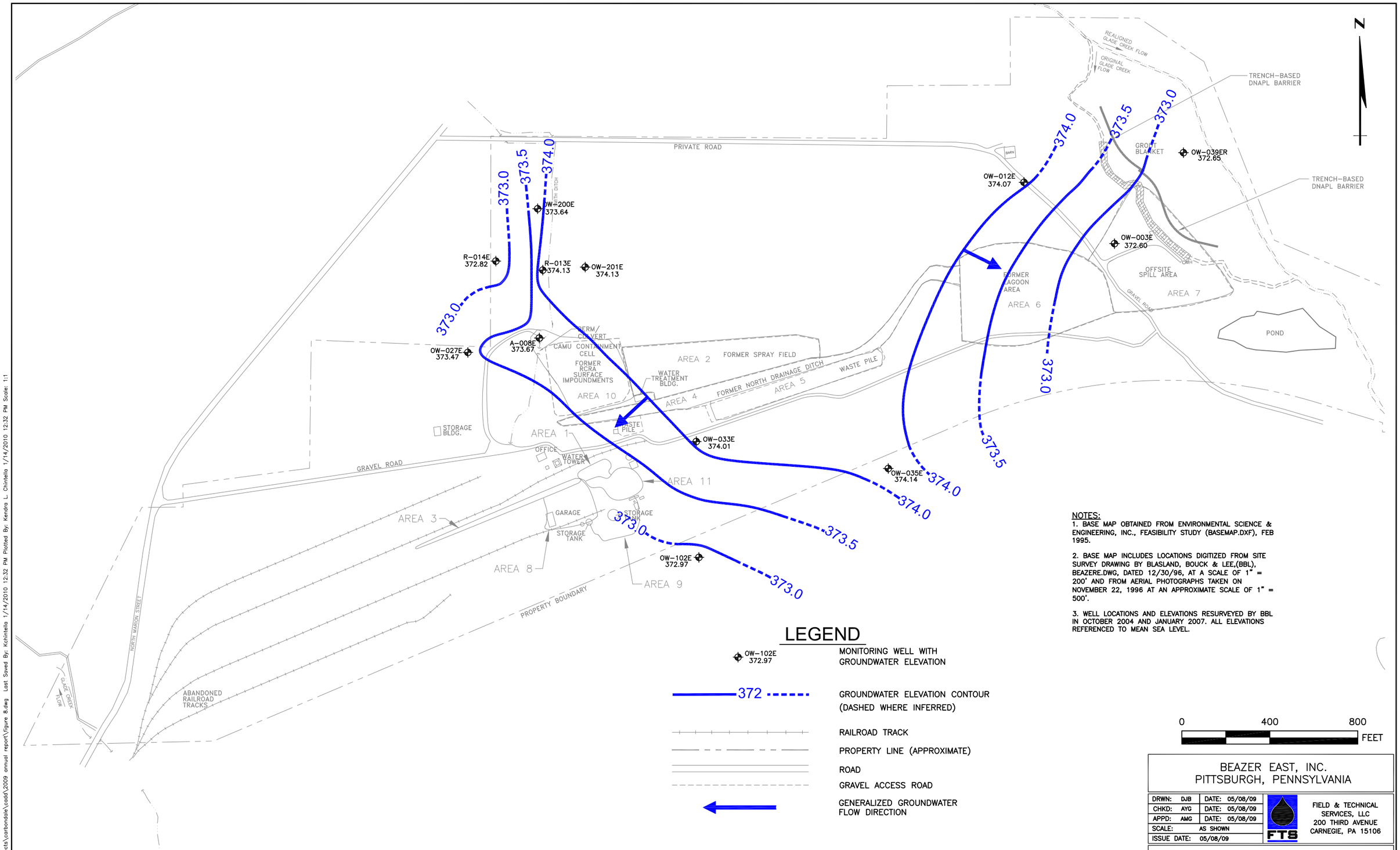

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3. WELL LOCATIONS AND ELEVATIONS RESURVEYED BY BBL IN OCTOBER 2004 AND JANUARY 2007. ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL.

LEGEND

OW-102E 372.97	MONITORING WELL WITH GROUNDWATER ELEVATION
372	GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
	RAILROAD TRACK
	PROPERTY LINE (APPROXIMATE)
	ROAD
	GRAVEL ACCESS ROAD
	GENERALIZED GROUNDWATER FLOW DIRECTION

0 400 800 FEET

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN: DJB	DATE: 05/08/09		FIELD & TECHNICAL SERVICES, LLC 200 THIRD AVENUE CARNEGIE, PA 15106
CHKD: AYG	DATE: 05/08/09		
APPD: AMG	DATE: 05/08/09		
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2009 ANNUAL RCRA GROUNDWATER MONITORING REPORT
FORMER KOPPERS WOOD TREATING SITE
CARBONDALE, ILLINOIS

GROUNDWATER CONTOURS
E-UNIT
FEBRUARY 9, 2009

PROJECT NO: OM041409
DRAWING NUMBER
FIGURE 8

REV #	DATE	DESCRIPTION	APPD

REFERENCE:

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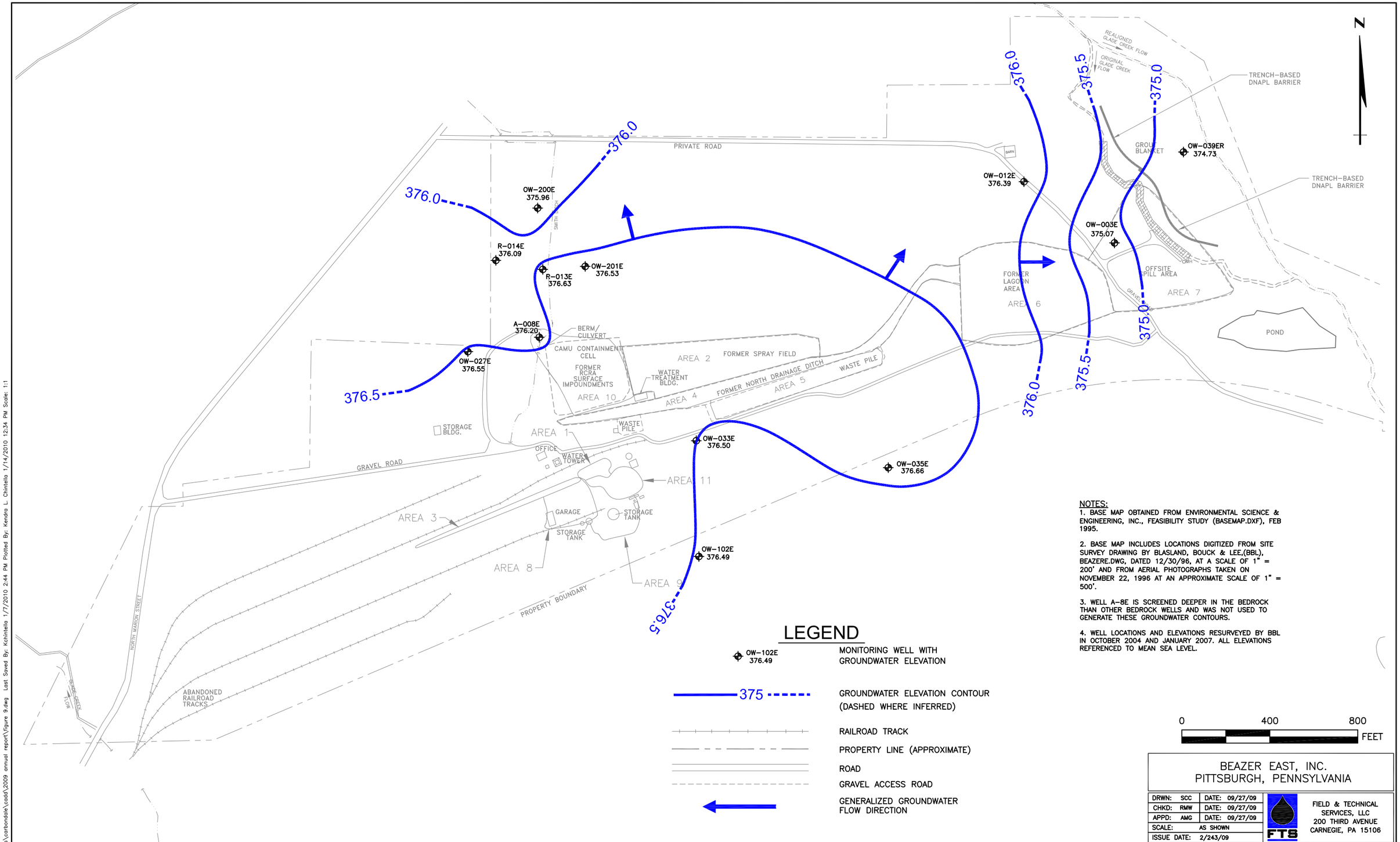

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3. WELL A-8E IS SCREENED DEEPER IN THE BEDROCK THAN OTHER BEDROCK WELLS AND WAS NOT USED TO GENERATE THESE GROUNDWATER CONTOURS.

4. WELL LOCATIONS AND ELEVATIONS RESURVEYED BY BBL IN OCTOBER 2004 AND JANUARY 2007. ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL.

LEGEND

OW-102E 376.49	MONITORING WELL WITH GROUNDWATER ELEVATION
375	GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
	RAILROAD TRACK
	PROPERTY LINE (APPROXIMATE)
	ROAD
	GRAVEL ACCESS ROAD
	GENERALIZED GROUNDWATER FLOW DIRECTION

0 400 800 FEET

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN: SCC	DATE: 09/27/09	
CHKD: RMW	DATE: 09/27/09	
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FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2009 ANNUAL RCRA GROUNDWATER MONITORING REPORT
FORMER KOPPERS WOOD TREATING SITE
CARBONDALE, ILLINOIS

GROUNDWATER ELEVATION CONTOUR MAP E-UNIT
AUGUST 23-24, 2009

PROJECT NO: OM041409
DRAWING NUMBER
FIGURE 9

REV #	DATE	DESCRIPTION	APPD

REFERENCE:

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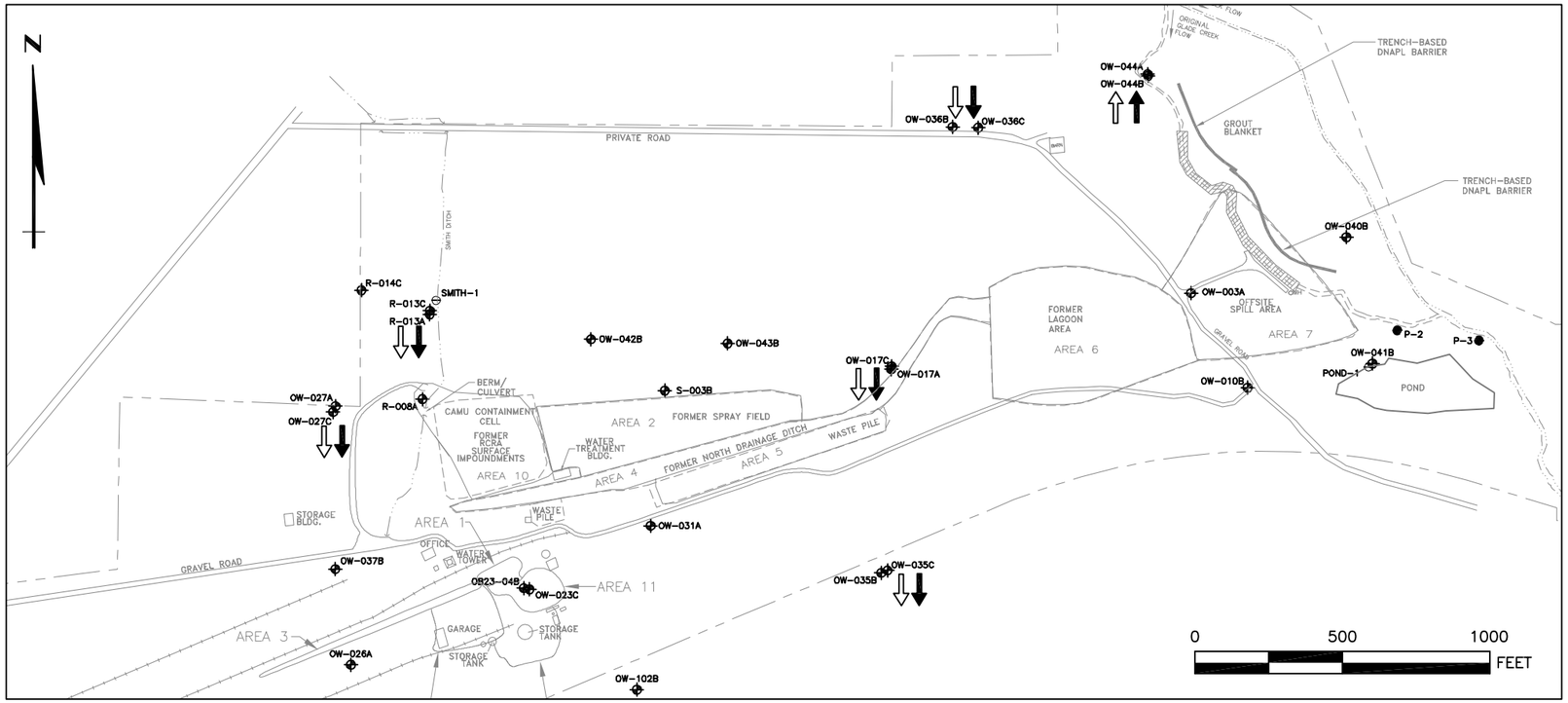
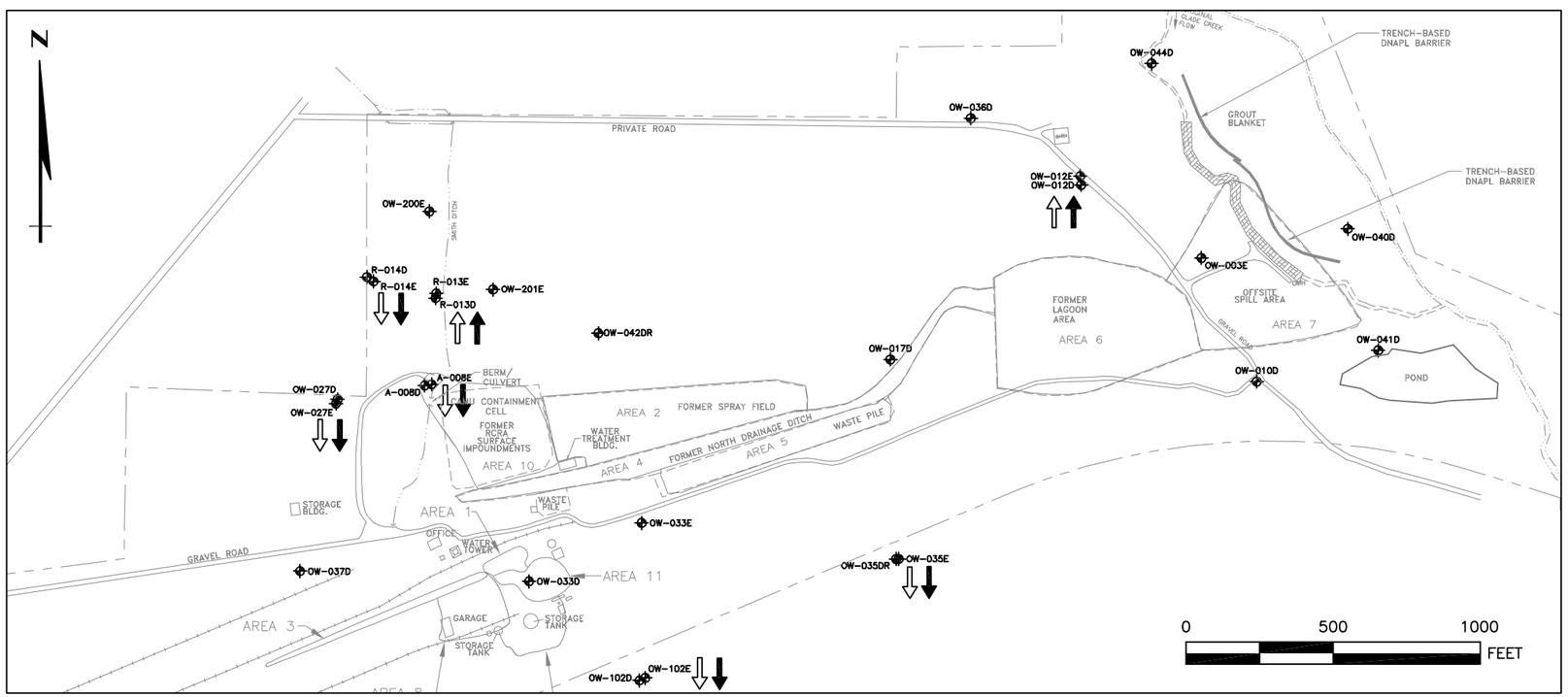


A-UNIT
B-UNIT
C-UNIT



D-UNIT
E-UNIT

LEGEND

- OW-017D — MONITORING WELL
- P-3 — PIEZOMETER
- SMITH-1 — SURFACE WATER GAUGE
- FIRST SEMIANNUAL VERTICAL HYDRAULIC GRADIENT DIRECTION
- SECOND SEMIANNUAL VERTICAL HYDRAULIC GRADIENT DIRECTION
- RAILROAD TRACK
- PROPERTY LINE (APPROXIMATE)
- ROAD
- GRAVEL ACCESS ROAD

REV #	DATE	DESCRIPTION	APPD
3			
2			
1			

REFERENCE:

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN: SCC	DATE: 10/13/09	
CHKD: RMB	DATE: 10/13/09	
APPD: KCF	DATE: 10/13/09	
SCALE: AS SHOWN		
ISSUE DATE:		

FTS

FIELD & TECHNICAL SERVICES, LLC
200 THIRD AVENUE
CARNEGIE, PA 15106

2009 ANNUAL RCRA GROUNDWATER MONITORING REPORT
FORMER KOPPERS WOOD TREATING SITE
CARBONDALE, ILLINOIS

2009 VERTICAL HYDRAULIC GRADIENT DIRECTIONS

PROJECT NO: 0M041408
DRAWING NUMBER
FIGURE 10

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US EPA ARCHIVE DOCUMENT

APPENDIX A

SUMMARY OF 2009 FIELD AND ANALYTICAL DATA

Table A-1
Groundwater Field Parameter Data
First Semi-Annual 2009
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

Well	pH (SU)	Specific Conductivity (µS/cm)	Temperature (°C)	Oxidation Reduction Potential (mV)	Dissolved Oxygen (mg/l)	Turbidity (NTU)
A Unit						
OW-017A	6.83	1322	12.09	37.7	2.80	5.07
OW-026A	6.46	1157	15.95	-79.5	0.41	17.50
OW-027A	6.42	604	10.87	56.7	0.95	12.60
OW-031A	6.57	683	11.51	71.6	0.29	3.35
OW-041A	7.21	1250	13.22	47.3	0.53	8.44
OW-202A	6.72	284	12.94	109.2	4.19[1]	18.50
OW-203A	6.23	2618	14.61	5.1	0.53	0.81
OW-204A	6.63	743	13.93	40.4	4.68[1]	16.30
OW-205A	6.36	1434	14.18	-55.8	0.49	3.70
OW-206A	6.65	2390	11.66	42.5	0.83	60.90
OW-207A	7.12	703	13.16	-11.8	0.64	12.10
R-013A	6.47	1726	12.22	15.1	0.59	20.10
B Unit						
OW-010B	6.95	2888	13.63	2.8	1.40	6.20
OW-022BR	7.20	1950	11.19	-7.4	0.56	11.50
OW-035B	7.49	815	14.33	35.4	0.46	0.26
OW-036B	6.89	2482	15.92	48.7	0.34	17.40
OW-037B	6.87	4038	13.70	-37.3	1.29	18.50
OW-039BR2	7.14	2140	14.78	96.1	1.12	11.90
OW-040B	7.18	4294	15.57	-161.9	0.48	1.22
OW-041B	7.01	1330	14.60	-109.6	0.86	4.32
OW-042B	6.84	2508	13.99	-51.0	0.44	5.07
OW-102B	7.47	3438	14.21	19.8	1.72	1.33
OW-202B	8.70	3036	14.62	-38.6	0.69	26.70
OW-204B	8.82	4368	16.91	-16.9	1.00	0.99
C Unit						
OW-017C	7.29	1610	14.41	-102.2	0.34	0.69
OW-023C	7.24	4521	16.16	-113.7	0.14	2.33
OW-035C	7.41	1829	16.05	-127.5	1.04	2.10
R-014C	7.54	1969	16.02	-107.2	0.29	6.22
D Unit						
OW-012D	7.88	1612	15.01	70.2	1.15	4.02
OW-023D	8.07	3252	17.49	127.5	0.20	1.04
OW-027D	7.36	2493	14.16	-120.3	0.37	0.68
OW-035DR	12.19	4345	15.50	-141.1	0.26	1.81
OW-037D	9.33	6279	15.48	-156.1	0.37	2.10
OW-039DR	7.61	1388	14.47	-157.3	0.28	0.89
OW-040D	7.68	1972	14.64	-128.0	0.45	19.60
OW-041D	7.62	1118	14.28	-207.6	0.33	12.70
OW-044D	7.19	143	12.78	78.5	1.25	5.69
OW-102D	9.07	2384	14.97	-23.6	0.39	0.13
OW-202D	8.49	3056	16.32	-196.4	0.59	0.89
R-014D	9.84	4664	15.45	-34.8	0.53	3.99
E Unit						
OW-027E	12.41	9156	13.83	-128.4	0.66	3.51
OW-033E	7.28	9532	16.05	-89.5	1.61	3.68
OW-035E	11.89	7736	13.50	-82.6	0.67	3.20
OW-039ER	7.79	2650	16.60	-220.9	0.27	7.85
OW-102E	7.92	12240	15.03	-150.1	0.78	0.95
OW-200E	8.37	11310	15.43	-206.7	1.21	21.60
OW-201E	12.37	6575	15.00	-108.1	0.49	4.58
R-014E	8.89	13890	15.50	-48.8	0.28	14.90

Notes
°C = degree celsius
mg/l = milligrams per liter
mV = millivolts
NTU = nephelometric turbidity unit
SU = standard units
uS/cm = microSiemens per centimeter
1. Dissolved Oxygen results for OW-202A and OW-204A were not consistent with historical results.
Air bubbles were observed in tubing during purging.

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Table A-2
Groundwater Field Parameter Data
Second Semi-Annual 2009
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

Well	pH (SU)	Specific Conductivity (µS/cm)	Temperature (°C)	Oxidation Reduction Potential (mV)	Dissolved Oxygen (mg/l)	Turbidity (NTU)
A Unit						
OW-017A	7.10	1159	19.59	34.2	0.28	1.88
OW-026A	6.25	1265	17.93	-96.0	0.48	8.97
OW-027A	6.56	2069	17.51	28.0	1.11	15.2
OW-031A	6.56	813	20.62	74.0	0.23	1.42
OW-041A	6.94	1613	20.00	34.0	0.36	4.78
OW-202A	6.31	796	22.33	-166.8	0.51	1.05
OW-203A	5.86	3174	20.01	162.7	0.60	14.5
OW-204A	6.84	1749	20.38	25.4	0.32	11.6
OW-205A	6.82	265	24.14	-99.9	0.78	19.7
OW-206A	6.62	8444	24.21	90.1	1.29	18.5
OW-207A	7.08	1072	18.04	-29.5	0.65	18.0
R-013A	6.53	1916	20.79	-101.4	0.51	6.49
B Unit						
OW-010B	6.93	3707	18.25	-77.3	0.39	4.49
OW-022BR	6.90	4903	17.84	-61.7	0.56	16.4
OW-035B	7.87	856	18.12	-85.1	0.62	1.22
OW-036B	6.94	2089	16.10	-103.4	0.42	3.85
OW-037B	6.79	3779	19.25	-91.0	0.47	17.2
OW-039BR2	7.41	4553	19.70	-1.9	0.42	1.55
OW-040B	6.87	5339	17.11	-158.3	0.83	2.31
OW-041B	7.40	1037	19.25	-130.3	0.74	14.2
OW-042B	6.65	4265	19.87	-80.7	1.13	6.0
OW-102B	7.13	3478	17.95	16.4	0.52	2.81
OW-202B	6.68	2943	18.63	76.2	0.55	12.7
OW-204B	8.68	4513	18.31	71.5	0.46	1.04
C Unit						
OW-017C	7.34	2624	16.76	-121.9	0.33	0.27
OW-023C	7.46	4192	20.47	-43.2	1.88	5.83
OW-035C	7.80	2044	17.61	-72.0	0.96	4.53
R-014C	7.85	2490	17.49	-110.6	0.47	6.01
D Unit						
OW-012D	7.86	1601	16.48	-150.1	0.96	7.42
OW-023D	7.88	3215	17.08	-191.0	0.50	0.63
OW-027D	7.57	5943	14.93	-132.9	0.30	0.86
OW-035DR	12.56	5862	16.76	-217.8	0.08	3.08
OW-037D	9.69	7545	16.93	-218.0	0.23	4.97
OW-039DR	7.63	2107	16.25	-181.5	0.77	2.79
OW-040D	7.64	1969	20.64	-159.2	0.29	16.2
OW-041D	7.61	1302	19.51	-129.2	1.61	3.14
OW-044D	7.88	1699	18.76	-146.7	0.49	15.5
OW-102D	7.94	3088	15.36	-154.9	0.64	0.40
OW-202D	7.90	4295	16.28	-226.3	0.27	1.47
R-014D	11.97	4707	16.73	-88.8	0.13	3.27
E Unit						
OW-027E	12.81	8581	16.58	-305.7	0.57	2.25
OW-033E	7.60	8943	18.01	-73.9	0.92	3.31
OW-035E	12.17	8620	18.31	-290.1	0.47	8.09
OW-039ER	7.66	3151	17.88	-181.6	1.19	7.04
OW-102E	7.82	15060	16.84	-97.0	0.10	2.47
OW-200E	8.97	13510	18.69	-310.7	0.09	18.4
OW-201E	12.38	6922	19.69	-330.6	0.88	4.39
R-014E	9.40	17080	18.37	-41.0	0.66	12.2

Notes
°C = degree celsius
mg/l = milligrams per liter
mV = millivolts
NTU = nephelometric turbidity unit
SU = standard units
uS/cm = microSiemens per centimeter

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Table A-3
Analytical Summary
First Semi-Annual 2009 RCRA Groundwater Data
2009 Annual RCRA Groundwater Moniroting Report
Carbondale Facility, Carbondale, Illinois

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-010B 2/11/2009	OW-012D 2/10/2009	OW-012D DUP	OW-017A 2/11/2009	OW-017C 2/11/2009	OW-017C DUP	OW-022BR 2/12/2009	OW-023C 2/11/2009	OW-023C DUP	OW-023D 2/9/2009	OW-026A 2/12/2009
Metals (Method 6010B)														
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	**13.8**	**12**	10 U	**18.1**	**17.5**	10 U	**225**
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	**15.7**	**14.4**	10 U	**29**	**27.9**	10 U	**327**
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	**36.9**	5 U	5 U	5 U	**7.8**	**7.4**	**98.6**	5 U	5 U	**58.2**	**5.2**
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
BTEX (Method 8021B)														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
SVOCs (Method 8270C SIM)														
PENTACHLOROPHENOL	UG/L	1	5	1 U	0.94 U	0.97 U	0.96 U	0.94 U	0.97 U	0.99 U	0.96 U	0.96 U	0.98 U	0.99 U
SVOCs (Method 8270C SIM)														
ACENAPHTHENE	UG/L	420	2,100	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	**1.8**
ACENAPHTHYLENE	UG/L	210	1,050	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U
ANTHRACENE	UG/L	2,100	10,500	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	**1.3**
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	**0.22**	0.12 U	0.13 U	0.12 U	0.12 U	0.13 U	0.13 U	0.12 U	0.12 U	0.13 U	0.13 U
BENZO(A)PYRENE	UG/L	0.2	2	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	**0.2**	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.18 U	0.17 U	0.17 U	0.18 U	0.18 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	**0.21**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	**0.21**	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.17 U	0.16 U	0.16 U	0.17 U	0.17 U
CHRYSENE	UG/L	1.5	7.5	**0.21**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	**0.21**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U
FLUORANTHENE	UG/L	280	1,400	**0.23**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U
FLUORENE	UG/L	280	1,400	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	**0.22**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U
NAPHTHALENE	UG/L	140	220	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U
PHENANTHRENE	UG/L	210	1,050	**0.22**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U
PYRENE	UG/L	210	1,050	**0.2**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U
Phenolics (Method 9066)														
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.013**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Notes:
BTEX - benzene, toluene, ethylbenzene, xylenes
SVOCs - semivolatile organic compounds
U - compound was analyzed but not detected
J - an estimated result
DUP - Duplicate sample
B - field blank contamination
EB - Equipment blank
TB - Trip blank
Bold - constituent detected
Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

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Table A-3 (Continued)
Analytical Summary
First Semi-Annual 2009 RCRA Groundwater Data
2009 Annual RCRA Groundwater Moniroting Report
Carbondale Facility, Carbondale, Illinois

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-027A 2/10/2009	OW-027D 2/10/2009	OW-027D DUP	OW-027E 2/11/2009	OW-031A 2/11/2009	OW-033E 2/12/2009	OW-035B 2/11/2009	OW-035C 2/10/2009	OW-035C DUP	OW-035DR 2/11/2009	OW-035E 2/12/2009
Metals (Method 6010B)														
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**25.8**	**26.6**	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**29**	**27.6**	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	5 U	5 U	5 U	5 U	5 U	**37.3**	5 U	5 U	5 U	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
BTEX (Method 8021B)														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
SVOCs (Method 8270C SIM)														
PENTACHLOROPHENOL	UG/L	1	5	1.1 U	1 U	0.96 U	0.96 U	0.99 U	0.95 U	1 U	0.94 U	0.94 U	0.96 U	0.95 U
SVOCs (Method 8270C SIM)														
ACENAPHTHENE	UG/L	420	2,100	0.22 U	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U
ACENAPHTHYLENE	UG/L	210	1,050	0.22 U	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U
ANTHRACENE	UG/L	2,100	10,500	0.22 U	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.14 U	**0.17 B**	0.12 U	0.12 U	0.13 U	0.12 U	0.13 U	0.12 U	0.12 U	0.12 U	0.12 U
BENZO(A)PYRENE	UG/L	0.2	2	0.22 U	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.2 U	**0.28 B**	0.17 U	0.17 U	0.18 U	0.17 U	0.18 U	0.17 U	0.17 U	0.17 U	0.17 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.22 U	**0.24 B**	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.19 U	**0.32 B**	0.16 U	0.16 U	0.17 U	0.16 U	0.17 U	0.16 U	0.16 U	0.16 U	0.16 U
CHRYSENE	UG/L	1.5	7.5	0.22 U	**0.25 B**	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.22 U	**0.21 B**	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U
FLUORANTHENE	UG/L	280	1,400	0.22 U	**0.23 B**	**0.19 B**	0.19 U	0.2 U	0.19 U	**0.21**	0.19 U	0.19 U	0.19 U	0.19 U
FLUORENE	UG/L	280	1,400	0.22 U	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.22 U	**0.25 B**	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U
NAPHTHALENE	UG/L	140	220	0.22 U	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	**0.28**
PHENANTHRENE	UG/L	210	1,050	0.22 U	**0.33 B**	**0.37 B**	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	**0.21**
PYRENE	UG/L	210	1,050	0.22 U	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	**0.4**	0.19 U	0.19 U	0.19 U	0.19 U
Phenolics (Method 9066)														
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	0.01 U	**0.02**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Notes:
BTEX - benzene, toluene, ethylbenzene, xylenes
SVOCs - semivolatile organic compounds
U - compound was analyzed but not detected
J - an estimated result
DUP - Duplicate sample
B - field blank contamination
EB - Equipment blank
TB - Trip blank
Bold - constituent detected
Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

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Table A-3 (Continued)
Analytical Summary
First Semi-Annual 2009 RCRA Groundwater Data
2009 Annual RCRA Groundwater Moniroting Report
Carbondale Facility, Carbondale, Illinois

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-036B 2/11/2009	OW-037B 2/10/2009	OW-037D 2/10/2009	OW-039BR2 2/11/2009	OW-039DR 2/12/2009	OW-039ER 2/9/2009	OW-040B 2/10/2009	OW-040D 2/10/2009	OW-041A 2/10/2009	OW-041B 2/10/2009	OW-041D 2/9/2009
Metals (Method 6010B)														
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**59.5**	**12.8**
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**100**	**11.2**
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	**5.5**	5 U	5 U	**72.3**	5 U	5 U	5 U	5 U	**36.6**	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	**146**	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	**171**	25 U	25 U	25 U	25 U	25 U	25 U	25 U
BTEX (Method 8021B)														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
SVOCs (Method 8270C SIM)														
PENTACHLOROPHENOL	UG/L	1	5	0.97 U	0.96 U	0.97 U	0.94 U	0.95 U	0.94 U	0.99 U	0.96 U	0.99 U	0.96 U	0.94 U
SVOCs (Method 8270C SIM)														
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	**0.54 B**
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	**0.27 B**	0.13 U	0.12 U	0.12 U	0.12 U	0.13 U	0.12 U	0.13 U	0.12 U	**0.55 B**
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	**0.44 B**
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	**0.44 B**	0.17 U	0.17 U	0.17 U	0.17 U	0.18 U	0.17 U	0.18 U	0.17 U	**0.47 B**
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.19 U	**0.2 B**	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	**0.56 B**
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	**0.6 B**	0.16 U	0.16 U	0.16 U	0.16 U	0.17 U	0.16 U	0.17 U	0.16 U	**0.54 B**
CHRYSENE	UG/L	1.5	7.5	0.19 U	**0.39 B**	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	**0.54 B**
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	**0.76 B**	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	**0.57 B**
FLUORANTHENE	UG/L	280	1,400	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	**0.62 B**
FLUORENE	UG/L	280	1,400	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	**0.28 B**
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	**0.64 B**	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	**0.57 B**
NAPHTHALENE	UG/L	140	220	0.19 U	**1.2 B**	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U
PHENANTHRENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	**0.25 B**	0.2 U	0.19 U	**0.62 B**
PYRENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	**0.56 B**
Phenolics (Method 9066)														
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	0.01 U	**0.013**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.012**

Notes:
BTEX - benzene, toluene, ethylbenzene, xylenes
SVOCs - semivolatile organic compounds
U - compound was analyzed but not detected
J - an estimated result
DUP - Duplicate sample
B - field blank contamination
EB - Equipment blank
TB - Trip blank
Bold - constituent detected
Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

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Table A-3 (Continued)
Analytical Summary
First Semi-Annual 2009 RCRA Groundwater Data
2009 Annual RCRA Groundwater Moniroting Report
Carbondale Facility, Carbondale, Illinois

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-042B 2/10/2009	OW-044D 2/12/2009	OW-102B 2/9/2009	OW-102D 2/10/2009	OW-102E 2/11/2009	OW-200E 2/10/2009	OW-201E 2/12/2009	OW-201E DUP	OW-202A 2/9/2009	OW-202B 2/10/2009	OW-202D 2/10/2009
Metals (Method 6010B)														
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**12.3**
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**15.6**
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	5 U	**8.2**	**5.5**	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
BTEX (Method 8021B)														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
SVOCs (Method 8270C SIM)														
PENTACHLOROPHENOL	UG/L	1	5	0.98 U	1 U	0.99 U	0.97 U	1 U	0.95 U	0.96 U	0.97 U	0.95 U	0.99 U	0.99 U
SVOCs (Method 8270C SIM)														
ACENAPHTHENE	UG/L	420	2,100	0.2 U	0.21 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U
ACENAPHTHYLENE	UG/L	210	1,050	0.2 U	0.21 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U
ANTHRACENE	UG/L	2,100	10,500	0.2 U	0.21 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	0.14 U	0.13 U	0.13 U	0.13 U	0.12 U	0.12 U	0.13 U	0.12 U	0.13 U	0.13 U
BENZO(A)PYRENE	UG/L	0.2	2	0.2 U	0.21 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.18 U	0.19 U	0.18 U	0.17 U	0.18 U	0.17 U	0.17 U	0.17 U	0.17 U	0.18 U	0.18 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.2 U	0.21 U	0.2 U	0.19 U	**0.23**	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.17 U	0.18 U	0.17 U	0.16 U	**0.17**	0.16 U	0.16 U	0.16 U	0.16 U	0.17 U	0.17 U
CHRYSENE	UG/L	1.5	7.5	0.2 U	0.21 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.2 U	0.21 U	0.2 U	0.19 U	**0.23**	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U
FLUORANTHENE	UG/L	280	1,400	0.2 U	0.21 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U
FLUORENE	UG/L	280	1,400	0.2 U	0.21 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.2 U	0.21 U	0.2 U	0.19 U	**0.24**	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U
NAPHTHALENE	UG/L	140	220	0.2 U	0.21 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U
PHENANTHRENE	UG/L	210	1,050	0.2 U	0.21 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U
PYRENE	UG/L	210	1,050	0.2 U	0.21 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U
Phenolics (Method 9066)														
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	0.01 U	0.01 U	**0.013**	0.01 U	**0.028**	**0.03**	0.01 U	0.01 U	0.01 U

Notes:
BTEX - benzene, toluene, ethylbenzene, xylenes
SVOCs - semivolatile organic compounds
U - compound was analyzed but not detected
J - an estimated result
DUP - Duplicate sample
B - field blank contamination
EB - Equipment blank
TB - Trip blank
Bold - constituent detected
Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

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Table A-3 (Continued)
Analytical Summary
First Semi-Annual 2009 RCRA Groundwater Data
2009 Annual RCRA Groundwater Moniroting Report
Carbondale Facility, Carbondale, Illinois

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-203A 2/11/2009	OW-204A 2/10/2009	OW-204B 2/9/2009	OW-205A 2/9/2009	OW-206A 2/9/2009	OW-207A 2/9/2009	R-013A 2/10/2009	R-014C 2/10/2009	R-014D 2/10/2009	R-014E 2/11/2009
Metals (Method 6010B)													
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	**75.2**	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	**34.3**	**302**	**73.1**	5 U	**23.4**	**7.7**	5 U	**30.7**	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
BTEX (Method 8021B)													
BENZENE	UG/L	5	25	1 U	1 U	1 U	**9.4**	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	**30**	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	**4.1**	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	**18**	1 U	1 U	1 U	1 U	1 U	1 U
SVOCs (Method 8270C SIM)													
PENTACHLOROPHENOL	UG/L	1	5	0.97 U	0.98 U	1 U	280 U	1.1 U	1 U	1 U	1 U	0.96 U	1 U
SVOCs (Method 8270C SIM)													
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.2 U	0.2 U	**80**	0.22 U	0.2 U	0.2 U	0.2 U	0.19 U	0.21 U
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.2 U	0.2 U	56 U	0.22 U	0.2 U	0.2 U	0.2 U	0.19 U	0.21 U
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.2 U	0.2 U	56 U	**0.26 B**	0.2 U	0.2 U	0.2 U	0.19 U	0.21 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	0.13 U	0.13 U	36 U	0.14 U	0.13 U	0.13 U	0.13 U	0.12 U	0.14 U
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.2 U	0.2 U	56 U	0.22 U	0.2 U	0.2 U	0.2 U	0.19 U	0.21 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	0.18 U	0.18 U	50 U	**0.2 B**	0.18 U	0.18 U	0.18 U	0.17 U	0.19 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.19 U	0.2 U	0.2 U	56 U	0.22 U	0.2 U	0.2 U	0.2 U	0.19 U	0.21 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.17 U	0.17 U	47 U	0.19 U	0.17 U	0.17 U	0.17 U	0.16 U	0.18 U
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.2 U	0.2 U	56 U	0.22 U	0.2 U	0.2 U	0.2 U	0.19 U	0.21 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.2 U	0.2 U	56 U	0.22 U	0.2 U	0.2 U	0.2 U	0.19 U	0.21 U
FLUORANTHENE	UG/L	280	1,400	0.19 U	0.2 U	0.2 U	56 U	0.22 U	0.2 U	0.2 U	0.2 U	0.19 U	0.21 U
FLUORENE	UG/L	280	1,400	0.19 U	0.2 U	0.2 U	56 U	0.22 U	0.2 U	0.2 U	0.2 U	0.19 U	0.21 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.2 U	0.2 U	56 U	0.22 U	0.2 U	0.2 U	0.2 U	0.19 U	0.21 U
NAPHTHALENE	UG/L	140	220	0.19 U	0.2 U	0.2 U	**2100**	0.22 U	0.2 U	0.2 U	0.2 U	0.19 U	**0.36**
PHENANTHRENE	UG/L	210	1,050	0.19 U	0.2 U	0.2 U	56 U	**0.22 B**	0.2 U	0.2 U	0.2 U	**0.29 B**	**0.22**
PYRENE	UG/L	210	1,050	0.19 U	0.2 U	0.2 U	56 U	0.22 U	0.2 U	0.2 U	0.2 U	0.19 U	0.21 U
Phenolics (Method 9066)													
PHENOLICS	MG/L	--	--	**0.012**	0.01 U	0.01 U	**0.013**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Notes:
BTEX - benzene, toluene, ethylbenzene, xylenes
SVOCs - semivolatile organic compounds
U - compound was analyzed but not detected
J - an estimated result
DUP - Duplicate sample
B - field blank contamination
EB - Equipment blank
TB - Trip blank
Bold - constituent detected
Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

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Analytical Summary
First Semi-Annual 2009 RCRA Groundwater Data
2009 Annual RCRA Groundwater Moniroting Report
Carbondale Facility, Carbondale, Illinois

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	BOTTLE BLANK 2/9/2009	EB 2/9/2009	EB 2/9/2009	EB 2/9/2009	EB 2/9/2009	EB 2/10/2009	EB 2/11/2009	EB 2/12/2009	TB 2/9/2009	TB 2/11/2009	TB 2/12/2009
Metals (Method 6010B)														
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
CHROMIUM - TOTAL	UG/L	--	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	NA	NA	NA
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	NA	NA	NA
BTEX (Method 8021B)														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
SVOCs (Method 8270C SIM)														
PENTACHLOROPHENOL	UG/L	1	5	0.98 U	0.94 U	0.96 U	0.97 U	0.97 U	0.96 U	0.96 U	0.99 U	NA	NA	NA
SVOCs (Method 8270C SIM)														
ACENAPHTHENE	UG/L	420	2,100	0.2 U	0.19 U	0.19 U	0.19 U	**0.52**	0.19 U	0.19 U	0.2 U	NA	NA	NA
ACENAPHTHYLENE	UG/L	210	1,050	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	NA	NA	NA
ANTHRACENE	UG/L	2,100	10,500	0.2 U	0.19 U	0.19 U	0.19 U	**0.25**	0.19 U	0.19 U	0.2 U	NA	NA	NA
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	**0.38**	0.12 U	0.13 U	0.13 U	0.12 U	0.12 U	0.13 U	NA	NA	NA
BENZO(A)PYRENE	UG/L	0.2	2	0.2 U	**0.31**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	NA	NA	NA
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.18 U	**0.38**	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.18 U	NA	NA	NA
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.2 U	**0.42**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	NA	NA	NA
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.17 U	**0.47**	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.17 U	NA	NA	NA
CHRYSENE	UG/L	1.5	7.5	0.2 U	**0.46**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.2 U	**0.54**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	NA	NA	NA
FLUORANTHENE	UG/L	280	1,400	0.2 U	0.19 U	0.19 U	0.19 U	**0.6**	0.19 U	0.19 U	0.2 U	NA	NA	NA
FLUORENE	UG/L	280	1,400	0.2 U	0.19 U	0.19 U	0.19 U	**0.46**	0.19 U	0.19 U	0.2 U	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.2 U	**0.47**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	NA	NA	NA
NAPHTHALENE	UG/L	140	220	0.2 U	0.19 U	0.19 U	0.19 U	**0.31**	0.19 U	0.19 U	0.2 U	NA	NA	NA
PHENANTHRENE	UG/L	210	1,050	0.2 U	0.19 U	0.19 U	0.19 U	**1.5**	0.19 U	0.19 U	0.2 U	NA	NA	NA
PYRENE	UG/L	210	1,050	0.2 U	0.19 U	0.19 U	0.19 U	**0.37**	0.19 U	0.19 U	0.2 U	NA	NA	NA
Phenolics (Method 9066)														
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	NA	NA

Notes:
BTEX - benzene, toluene, ethylbenzene, xylenes
SVOCs - semivolatile organic compounds
U - compound was analyzed but not detected
J - an estimated result
DUP - Duplicate sample
B - field blank contamination
EB - Equipment blank
TB - Trip blank
Bold - constituent detected
Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

US EPA ARCHIVE DOCUMENT

Table A-4
Analytical Summary
Second Semi-Annual 2009 RCRA Groundwater Data
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

ANALYTE_NAME	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-010B 8/27/2009	OW-012D 8/24/2009	OW-017A 8/25/2009	OW-017C 8/25/2009	OW-022BR 8/26/2009	OW-023C 8/26/2009	OW-023D 8/26/2009	OW-026A 8/27/2009	OW-026A DUP
Metals (Method 6010B)												
ARSENIC - SOLUBLE	UG/L	50	200	**16.8**	10 U	10 U	**16.6**	10 U	10 U	10 U	**267**	**271**
ARSENIC - TOTAL	UG/L	--	--	**17.4**	10 U	10 U	**17.5**	10 U	10 U	10 U	**262**	**270**
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	**25.4**	5 U	5 U	**70.3**	**31.6**	5 U	**7.2**	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
BTEX (Method 8021B)												
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
SVOCs (Method 8270C SIM)												
PENTACHLOROPHENOL	UG/L	1	5	0.97 U	0.94 U	0.96 U	1 U	0.99 U	0.96 U	0.96 U	1.1 U	0.94 U
SVOCs (Method 8270C SIM)												
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.19 U	0.19 U	0.2 U	**0.71**	0.19 U	0.19 U	**2.7 J**	**3.7 J**
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.22 U	0.19 U
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	**1.9 J**	**2.6 J**
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	0.12 U	0.12 U	0.13 U	0.13 U	0.12 U	0.12 U	0.14 U	0.12 U
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.22 U	0.19 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	0.17 U	0.17 U	0.18 U	0.18 U	0.17 U	0.17 U	0.2 U	0.17 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.22 U	0.19 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.16 U	0.16 U	0.17 U	0.17 U	0.16 U	0.16 U	0.19 U	0.16 U
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.22 U	0.19 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.22 U	0.19 U
FLUORANTHENE	UG/L	280	1,400	0.19 U	0.19 U	0.19 U	0.2 U	**0.21**	0.19 U	0.19 U	0.22 U	0.19 U
FLUORENE	UG/L	280	1,400	0.19 U	0.19 U	0.19 U	0.2 U	**0.24**	0.19 U	0.19 U	**0.22**	**0.29**
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.22 U	0.19 U
NAPHTHALENE	UG/L	140	220	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.22 U	0.19 U
PHENANTHRENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	**0.22**	0.19 U
PYRENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.22 U	0.19 U
Phenolics (Method 9066)												
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	**0.018 B**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Notes:
BTEX - benzene, toluene, ethylbenzene, xylenes
SVOCs - semivolatile organic compounds
U - compound was analyzed but not detected
J - an estimated result
DUP - Duplicate sample
B - field blank contamination
EB - Equipment blank
TB - Trip blank
Bold - constituent detected
Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action objectives, IEPA) Tier 1 Standard.

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Table A-4 (Continued)
Analytical Summary
Second Semi-Annual 2009 RCRA Groundwater Data
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

ANALYTE_NAME	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-027A 8/24/2009	OW-027D 8/27/2009	OW-027E 8/25/2009	OW-031A 8/25/2009	OW -031A DUP	OW-033E 8/26/2009	OW-033E DUP	OW-035B 8/27/2009	OW-035C 8/26/2009
Metals (Method 6010B)												
ARSENIC - SOLUBLE	UG/L	50	200	**15**	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**16**
ARSENIC - TOTAL	UG/L	--	--	**17.5**	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**18.3**
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	5 U	**31.5**	5 U	5 U	5 U	**22.1**	**21.2**	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
BTEX (Method 8021B)												
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
SVOCs (Method 8270C SIM)												
PENTACHLOROPHENOL	UG/L	1	5	0.98 U	0.94 U	0.96 U	0.96 U	0.95 U	0.95 U	0.94 U	0.96 U	0.94 U
SVOCs (Method 8270C SIM)												
ACENAPHTHENE	UG/L	420	2,100	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
ACENAPHTHYLENE	UG/L	210	1,050	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
ANTHRACENE	UG/L	2,100	10,500	**0.2**	0.19 U	0.19 U	0.19 U	**0.19**	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	**1.4**	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	**0.58**	0.12 U	0.12 U
BENZO(A)PYRENE	UG/L	0.2	2	**1.2**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	**0.53**	0.19 U	0.19 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	**1.4**	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	**0.6**	0.17 U	0.17 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	**1.4**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	**0.61**	0.19 U	0.19 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	**1.5**	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	**0.64**	0.16 U	0.16 U
CHRYSENE	UG/L	1.5	7.5	**1.4**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	**0.6**	0.19 U	0.19 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	**1.7**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	**0.7**	0.19 U	0.19 U
FLUORANTHENE	UG/L	280	1,400	**0.61**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	**0.19**	0.19 U	0.19 U
FLUORENE	UG/L	280	1,400	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	**1.5**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	**0.65**	0.19 U	0.19 U
NAPHTHALENE	UG/L	140	220	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
PHENANTHRENE	UG/L	210	1,050	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
PYRENE	UG/L	210	1,050	**0.65**	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	**0.22**	0.19 U
Phenolics (Method 9066)												
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	**0.024 B**	**0.014 B**	**0.016 B**	0.01 U	0.01 U	0.01 U	0.01 U

Notes:
BTEX - benzene, toluene, ethylbenzene, xylenes
SVOCs - semivolatile organic compounds
U - compound was analyzed but not detected
J - an estimated result
DUP - Duplicate sample
B - field blank contamination
EB - Equipment blank
TB - Trip blank
Bold - constituent detected
Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action objectives, IEPA) Tier 1 Standard.

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Table A-4 (Continued)
Analytical Summary
Second Semi-Annual 2009 RCRA Groundwater Data
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

ANALYTE_NAME	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-035DR 8/25/2009	OW-035E 8/27/2009	OW-036B 8/25/2009	OW-037B 8/27/2009	OW-037D 8/24/2009	OW-037D DUP	OW-039BR2 8/26/2009	OW-039DR 8/25/2009	OW-039ER 8/24/2009
Metals (Method 6010B)												
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	5 U	5 U	**6**	5 U	5 U	5 U	**48.3**	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	**28.2**
BTEX (Method 8021B)												
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
SVOCs (Method 8270C SIM)												
PENTACHLOROPHENOL	UG/L	1	5	0.95 U	0.95 U	1 U	0.96 U	0.95 U	0.95 U	1 U	0.98 U	0.95 U
SVOCs (Method 8270C SIM)												
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.12 U	0.12 U	0.13 U	0.12 U	0.12 U	**0.32**	0.13 U	0.13 U	0.12 U
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	**0.28**	0.2 U	0.2 U	0.19 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	0.17 U	0.18 U	0.17 U	0.17 U	**0.34**	0.18 U	0.18 U	0.17 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	**0.31**	**0.24**	0.2 U	0.19 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.16 U	0.17 U	0.16 U	0.16 U	**0.35**	**0.21**	0.17 U	0.16 U
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	**0.32**	0.2 U	0.2 U	0.19 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	**0.38**	**0.29**	0.2 U	0.19 U
FLUORANTHENE	UG/L	280	1,400	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
FLUORENE	UG/L	280	1,400	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	**0.35**	**0.25**	0.2 U	0.19 U
NAPHTHALENE	UG/L	140	220	0.19 U	**0.31**	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
PHENANTHRENE	UG/L	210	1,050	0.19 U	**0.19**	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
PYRENE	UG/L	210	1,050	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
Phenolics (Method 9066)												
PHENOLICS	MG/L	--	--	**0.026 B**	**0.32 B**	**0.02**	0.01 U	0.01 U	0.01 U	0.01 U	**0.017 B**	0.01 U

Notes:
BTEX - benzene, toluene, ethylbenzene, xylenes
SVOCs - semivolatile organic compounds
U - compound was analyzed but not detected
J - an estimated result
DUP - Duplicate sample
B - field blank contamination
EB - Equipment blank
TB - Trip blank
Bold - constituent detected
Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action objectives, IEPA) Tier 1 Standard.

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Table A-4 (Continued)
Analytical Summary
Second Semi-Annual 2009 RCRA Groundwater Data
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

ANALYTE_NAME	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-040B 8/24/2009	OW-040D 8/26/2009	OW-041A 8/26/2009	OW-041B 8/26/2009	OW-041D 8/27/2009	OW-042B 8/24/2009	OW-044D 8/25/2009	OW-102B 8/25/2009	OW-102D 8/24/2009
Metals (Method 6010B)												
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	**60.1**	**15.4**	10 U	10 U	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	**89.3**	**13.7**	10 U	10 U	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	5 U	**6**	5 U	5 U	5 U	5 U	**16.7**	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
BTEX (Method 8021B)												
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
SVOCs (Method 8270C SIM)												
PENTACHLOROPHENOL	UG/L	1	5	0.97 U	0.96 U	1 U	1 U	0.95 U	0.94 U	0.99 U	1 U	0.96 U
SVOCs (Method 8270C SIM)												
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	0.12 U	0.13 U	0.13 U	0.12 U	0.12 U	0.13 U	0.13 U	0.12 U
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	0.17 U	0.18 U	0.18 U	0.17 U	0.17 U	0.18 U	0.18 U	0.17 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.16 U	0.17 U	0.17 U	0.16 U	0.16 U	0.17 U	0.17 U	0.16 U
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
FLUORANTHENE	UG/L	280	1,400	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
FLUORENE	UG/L	280	1,400	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
NAPHTHALENE	UG/L	140	220	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
PHENANTHRENE	UG/L	210	1,050	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
PYRENE	UG/L	210	1,050	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U
Phenolics (Method 9066)												
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.015**	**0.012 B**	**0.03 B**	0.01 U

Notes:
BTEX - benzene, toluene, ethylbenzene, xylenes
SVOCs - semivolatile organic compounds
U - compound was analyzed but not detected
J - an estimated result
DUP - Duplicate sample
B - field blank contamination
EB - Equipment blank
TB - Trip blank
Bold - constituent detected
Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action objectives, IEPA) Tier 1 Standard.

US EPA ARCHIVE DOCUMENT

Table A-4 (Continued)
Analytical Summary
Second Semi-Annual 2009 RCRA Groundwater Data
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

ANALYTE_NAME	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-102E 8/27/2009	OW-200E 8/24/2009	OW-201E 8/25/2009	OW-202A 8/24/2009	OW-202B 8/24/2009	OW-202D 8/25/2009	OW-203A 8/26/2009	OW-204A 8/26/2009	OW-204A DUP
Metals (Method 6010B)												
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	**14.4**	10 U	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	5 U	5 U	5 U	5 U	5 U	**6**	**110**	**786**	**706**
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	**31.4**	**123**	25 U	25 U	25 U
BTEX (Method 8021B)												
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
SVOCs (Method 8270C SIM)												
PENTACHLOROPHENOL	UG/L	1	5	0.96 U	0.95 U	1 U	1 U	0.98 U	1 U	1 U	1.2 U	1 U
SVOCs (Method 8270C SIM)												
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.19 U	0.2 U	0.2 U	0.2 U	0.21 U	0.2 U	0.23 U	0.21 U
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.2 U	0.2 U	0.2 U	0.21 U	0.2 U	0.23 U	0.21 U
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.19 U	0.2 U	0.2 U	0.2 U	0.21 U	0.2 U	0.23 U	0.21 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.12 U	0.12 U	0.13 U	0.13 U	0.13 U	0.14 U	0.13 U	0.15 U	**1.1**
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.19 U	0.2 U	0.2 U	0.2 U	0.21 U	0.2 U	0.23 U	**0.74**
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	0.17 U	0.18 U	0.18 U	0.18 U	0.19 U	0.18 U	0.21 U	**1**
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.19 U	0.19 U	**0.26**	0.2 U	0.2 U	0.21 U	0.2 U	0.23 U	**0.76**
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.16 U	0.17 U	0.17 U	0.17 U	0.18 U	0.17 U	0.2 U	**0.91**
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.19 U	0.2 U	0.2 U	0.2 U	0.21 U	0.2 U	0.23 U	**0.88**
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.19 U	**0.29**	0.2 U	0.2 U	0.21 U	0.2 U	0.23 U	**0.79**
FLUORANTHENE	UG/L	280	1,400	0.19 U	0.19 U	0.2 U	0.2 U	0.2 U	0.21 U	0.2 U	0.23 U	**0.92**
FLUORENE	UG/L	280	1,400	0.19 U	0.19 U	0.2 U	0.2 U	0.2 U	0.21 U	0.2 U	0.23 U	0.21 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.19 U	**0.29**	0.2 U	0.2 U	0.21 U	0.2 U	0.23 U	**0.8**
NAPHTHALENE	UG/L	140	220	0.19 U	0.19 U	0.2 U	0.2 U	0.2 U	0.21 U	0.2 U	0.23 U	0.21 U
PHENANTHRENE	UG/L	210	1,050	0.19 U	0.19 U	0.2 U	0.2 U	0.2 U	0.21 U	0.2 U	0.23 U	0.21 U
PYRENE	UG/L	210	1,050	0.19 U	0.19 U	0.2 U	0.2 U	0.2 U	0.21 U	0.2 U	0.23 U	**0.97**
Phenolics (Method 9066)												
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	**0.03 B**	0.01 U	0.01 U	**0.02 B**	0.01 U	0.01 U	0.01 U

Notes:
BTEX - benzene, toluene, ethylbenzene, xylenes
SVOCs - semivolatile organic compounds
U - compound was analyzed but not detected
J - an estimated result
DUP - Duplicate sample
B - field blank contamination
EB - Equipment blank
TB - Trip blank
Bold - constituent detected
Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action objectives, IEPA) Tier 1 Standard.

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Table A-4 (Continued)
Analytical Summary
Second Semi-Annual 2009 RCRA Groundwater Data
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

ANALYTE_NAME	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-204B 8/26/2009	OW-205A 8/27/2009	OW-206A 8/26/2009	OW-207A 8/25/2009	R-013A 8/24/2009	R-014C 8/26/2009	R-014D 8/27/2009	R-014E 8/27/2009	BOTTLE BLANK 8/24/2009
Metals (Method 6010B)												
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	**15.7**	10 U	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	**13.1**	10 U	10 U	10 U	**16.1**	10 U	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	**59.1**	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	**55.6**	5 U	**6.7**	5 U	5 U	5 U	5 U	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
BTEX (Method 8021B)												
BENZENE	UG/L	5	25	1 U	**6**	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	**29**	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	**3.2**	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	**16**	1 U	1 U	1 U	1 U	1 U	1 U	1 U
SVOCs (Method 8270C SIM)												
PENTACHLOROPHENOL	UG/L	1	5	1 U	1.1 U	1 U	0.98 U	0.96 U	0.95 U	0.95 U	0.96 U	1.1 U
SVOCs (Method 8270C SIM)												
ACENAPHTHENE	UG/L	420	2,100	0.21 U	**56**	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.22 U
ACENAPHTHYLENE	UG/L	210	1,050	0.21 U	**1.2**	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.22 U
ANTHRACENE	UG/L	2,100	10,500	0.21 U	**1.5**	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.22 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.14 U	0.14 U	0.13 U	0.13 U	0.12 U	0.12 U	0.12 U	0.12 U	0.14 U
BENZO(A)PYRENE	UG/L	0.2	2	0.21 U	0.22 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.22 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.19 U	0.19 U	0.18 U	0.18 U	0.17 U	0.17 U	0.17 U	0.17 U	0.2 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.21 U	0.22 U	0.2 U	0.2 U	0.19 U	0.17 U	0.19 U	0.19 U	0.22 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.18 U	0.18 U	0.17 U	0.17 U	0.16 U	0.16 U	0.16 U	0.16 U	0.19 U
CHRYSENE	UG/L	1.5	7.5	0.21 U	0.22 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.22 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.21 U	0.22 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.22 U
FLUORANTHENE	UG/L	280	1,400	0.21 U	**0.76**	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.22 U
FLUORENE	UG/L	280	1,400	0.21 U	**18**	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.22 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.21 U	0.22 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.22 U
NAPHTHALENE	UG/L	140	220	0.21 U	**270**	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	**0.2**	0.22 U
PHENANTHRENE	UG/L	210	1,050	0.21 U	**12**	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	**0.23**	0.22 U
PYRENE	UG/L	210	1,050	0.21 U	**0.3**	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.22 U
Phenolics (Method 9066)												
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	0.01 U	**0.012 B**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Notes:
BTEX - benzene, toluene, ethylbenzene, xylenes
SVOCs - semivolatile organic compounds
U - compound was analyzed but not detected
J - an estimated result
DUP - Duplicate sample
B - field blank contamination
EB - Equipment blank
TB - Trip blank
Bold - constituent detected
Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action objectives, IEPA) Tier 1 Standard.

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Table A-4 (Continued)
Analytical Summary
Second Semi-Annual 2009 RCRA Groundwater Data
2009 Annual RCRA Groundwater Monitoring Report
Carbondale Facility, Carbondale, Illinois

ANALYTE_NAME	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	EB 8/24/2009	EB 8/25/2009	EB 8/26/2009	EB 8/27/2009	TRIP BLANK 8/24/2009	TRIP BLANK 8/25/2009	TRIP BLANK 8/26/2009	TRIP BLANK 8/27/2009
Metals (Method 6010B)											
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	NA	NA	NA	NA
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	NA	NA	NA	NA
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	NA	NA	NA	NA
CHROMIUM - TOTAL	UG/L	--	--	5 U	5 U	5 U	5 U	NA	NA	NA	NA
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	NA	NA	NA	NA
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	NA	NA	NA	NA
BTEX (Method 8021B)											
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
SVOCs (Method 8270C SIM)											
PENTACHLOROPHENOL	UG/L	1	5	1 U	1 U	0.95 U	0.98 U	NA	NA	NA	NA
SVOCs (Method 8270C SIM)											
ACENAPHTHENE	UG/L	420	2,100	0.2 U	0.21 U	0.19 U	0.2 U	NA	NA	NA	NA
ACENAPHTHYLENE	UG/L	210	1,050	0.2 U	0.21 U	0.19 U	0.2 U	NA	NA	NA	NA
ANTHRACENE	UG/L	2,100	10,500	0.2 U	0.21 U	0.19 U	0.2 U	NA	NA	NA	NA
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	0.14 U	0.12 U	0.13 U	NA	NA	NA	NA
BENZO(A)PYRENE	UG/L	0.2	2	0.2 U	0.21 U	0.19 U	0.2 U	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.18 U	0.19 U	0.17 U	0.18 U	NA	NA	NA	NA
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.2 U	0.21 U	0.19 U	0.2 U	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.17 U	0.18 U	0.16 U	0.17 U	NA	NA	NA	NA
CHRYSENE	UG/L	1.5	7.5	0.2 U	0.21 U	0.19 U	0.2 U	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.2 U	0.21 U	0.19 U	0.2 U	NA	NA	NA	NA
FLUORANTHENE	UG/L	280	1,400	0.2 U	0.21 U	0.19 U	0.2 U	NA	NA	NA	NA
FLUORENE	UG/L	280	1,400	0.2 U	0.21 U	0.19 U	0.2 U	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.2 U	0.21 U	0.19 U	0.2 U	NA	NA	NA	NA
NAPHTHALENE	UG/L	140	220	0.2 U	0.21 U	0.19 U	0.2 U	NA	NA	NA	NA
PHENANTHRENE	UG/L	210	1,050	0.2 U	0.21 U	0.19 U	0.2 U	NA	NA	NA	NA
PYRENE	UG/L	210	1,050	0.2 U	0.21 U	0.19 U	0.2 U	NA	NA	NA	NA
Phenolics (Method 9066)											
PHENOLICS	MG/L	--	--	0.01 U	**0.019**	0.01 U	0.01 U	NA	NA	NA	NA

Notes:
BTEX - benzene, toluene, ethylbenzene, xylenes
SVOCs - semivolatile organic compounds
U - compound was analyzed but not detected
J - an estimated result
DUP - Duplicate sample
B - field blank contamination
EB - Equipment blank
TB - Trip blank
Bold - constituent detected
Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action objectives, IEPA) Tier 1 Standard.

US EPA ARCHIVE DOCUMENT

APPENDIX B

DATA EVALUATION REPORTS FOR 2009

US EPA ARCHIVE DOCUMENT

FTS, LLC

DATE: March 13, 2009

FROM: Kendra Chintella

SUBJECT: Carbondale Semi-Annual GW

SAMPLE DELIVERY GROUP (SDG): C9B110239

SAMPLES: OW-207A, OW-204B, OW-039ER, OW-202A, OW-023D, OW-206A, OW-41D, OW-205A, OW-102B, EB0001, EB-1101, EB1079, EB1415, BOTTLE BLANK, OW-035C, OW-202B, OW-202D, OW-204A, R-014C, OW-012D, OW-041A, OW-037B, OW-040B, R-014D, OW-200E, OW-040D, OW-037D, OW-027A, OW-027D, OW-102D, OW-042B, R-013A, OW-041B, OW-99A-021009(OW-035C), OW-99B(OW-012D), OW-99C(OW-027D), TRIP BLANK

ANALYSES: Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

LABORATORY: TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- □ Data Completeness
  Noncompliances: None

- □ Holding Times
  Noncompliances: None

- □ Laboratory Blank Contamination
  Noncompliances: None

- □ Field Blank Contamination
  Noncompliances: Several SVOCs were detected in the equipment blanks. See next page for details.

- □ Field Duplicate Precision:
  Noncompliances: See attached page for details.

- □ Surrogate Recoveries
  Noncompliances: None

- □ Matrix Spike and Matrix Spike Duplicate
  Noncompliances: The MS/MSD recoveries of several SVOCs fell below the control limits. The MS/MSD recovery of toluene was slightly above the control limits. No action was taken as the LCS recoveries were compliant.

- □ Laboratory Control Sample
  Noncompliances: None

Field Blank Contamination:

The following analytes were detected in the aqueous equipment blank, EB001, at the following concentrations:

Analyte	Maximum Concentration	Blank Action Level
Benzo(a)anthracene	0.38 ug/l	1.9 ug/l
Benzo(a)pyrene	0.31 ug/l	1.55 ug/l
Benzo(b)fluoranthene	0.38 ug/l	1.9 ug/l
Benzo(g,h,i)perylene	0.42 ug/l	2.1 ug/l
Benzo(k)fluoranthene	0.47 ug/l	2.35 ug/l
Chrysene	0.46 ug/l	2.3 ug/l
Dibenzo(a,h)anthracene	0.54 ug/l	2.3 ug/l
Indeno(1,2,3-cd)pyrene	0.47 ug/l	2.35 ug/l

The following analytes were detected in the aqueous equipment blank, EB1415, at the following concentrations:

Analyte	Maximum Concentration	Blank Action Level
Acenaphthene	0.52 ug/l	2.6 ug/l
Anthracene	0.25 ug/l	1.25 ug/l
Fluoranthene	0.6 ug/l	3.0 ug/l
Fluorene	0.46 ug/l	2.3 ug/l
Naphthalene	0.31 ug/l	1.55 ug/l
Phenanthrene	1.5 ug/l	7.5 ug/l
Pyrene	0.37 ug/l	1.85 ug/l

An action level of 5X the maximum concentration was used to evaluate the sample data for field blank contamination. Associated samples with concentrations below the blank action level were qualified as “B”, for field blank contamination.

Field Duplicate Precision:

FIELD DUPLICATE PRECISION					
ANALYTE	OW-035C	QUAL	OW-99A	QUAL	RPD
Arsenic, dissolved	25.8		26.6		3.05
Arsenic, total	29		27.6		4.95
ANALYTE	OW-027D	QUAL	OW-99C	QUAL	RPD
Benzo(a)anthracene	0.17		0.12	U	NC
Benzo(b)fluoranthene	0.28		0.17	U	NC
Benzo(g,h,i)perylene	0.24		0.19	U	NC
Benzo(k)fluoranthene	0.32		0.16	U	NC
Chrysene	0.25		0.19	U	NC
Dibenzo(a,h)anthracene	0.21		0.19	U	NC
Fluoranthene	0.23		0.19		19.05
Indeno(1,2,3-cd)pyrene	0.25		0.19	U	NC
Phenanthrene	0.33		0.37		11.43

NC – not calculated due to nondetect result

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US EPA ARCHIVE DOCUMENT

FTS, LLC

DATE: March 13, 2009

FROM: Kendra Chintella

SUBJECT: Carbondale Semi-Annual GW

SAMPLE DELIVERY GROUP (SDG): C9B120216

SAMPLES: OW-102E, OW-017C, OW-017A, OW-027E, OW-035DR, OW-036B, R-014E, OW-023C, OW-203A, OW-010B, OW-031A, OW-039BR2, OW-035B, M-99D(OW-017C), M-99F(OW-023C), EB-1101, EB-1079, TRIP BLANK

ANALYSES: Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

LABORATORY: TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- □ Data Completeness
  Noncompliances: None

- □ Holding Times
  Noncompliances: None

- □ Laboratory Blank Contamination
  Noncompliances: None

- □ Field Blank Contamination
  Noncompliances: None

- □ Field Duplicate Precision:
  Noncompliances: See attached page for details.

- □ Surrogate Recoveries
  Noncompliances: None

- □ Matrix Spike and Matrix Spike Duplicate
  Noncompliances: None

- □ Laboratory Control Sample
  Noncompliances: None

Field Duplicate Precision:

FIELD DUPLICATE PRECISION					
ANALYTE	OW-017C	QUAL	M-99D	QUAL	RPD
Arsenic, dissolved	13.8		12		13.95
Arsenic, total	15.7		14.4		8.64
Chromium, total	7.8		7.4		5.26
Total Recoverable Phenolics	0.01	U	0.013		NC
ANALYTE	OW-023C	QUAL	M-99F	QUAL	RPD
Arsenic, dissolved	18.1		17.5		3.37
Arsenic, total	29		27.9		3.87

NC – not calculated due to nondetect result

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FTS, LLC

DATE: March 13, 2009

FROM: Kendra Chintella

SUBJECT: Carbondale Semi-Annual GW

SAMPLE DELIVERY GROUP (SDG): C9B130159

SAMPLES: OW-102B, OW-202A, OW-035B, OW-022BR, OW-099A-021109(OW-035B)

ANALYSES: Method 8290 (Dioxins/Furans)

LABORATORY: TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- □ Data Completeness
  Noncompliances: None

- □ Holding Times
  Noncompliances: None

- □ Laboratory Blank Contamination
  Noncompliances: None

- □ Field Duplicate Precision
  Noncompliances: See attached page for details.

- □ Surrogate Recoveries
  Noncompliances: None

- □ Matrix Spike and Matrix Spike Duplicate
  Noncompliances: The MS/MSD recoveries of OCDD and 1,2,3,4,7,8,9-HpCDF were above the control limits. The RPD of OCDD was outside of the control limits. No action was taken as the LCS recoveries were compliant.

- □ Laboratory Control Sample
  Noncompliances: The LCS recoveries of 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD were above the control limits. No action was taken as the MS/MSD recoveries were compliant.

Field Duplicate Precision:

FIELD DUPLICATE PRECISION					
ANALYTE	OW-035B	QUAL	OW-99A	QUAL	RPD
1,2,3,4,6,7,8-HpCDF	15	U	35	J	NC
OCDD	58	J	200		110.08*
OCDF	26	U	69	J	NC
Total HpCDF	14	U	35		NC

NC – not calculated due to nondetect result
* - The RPD is greater than 30%, the associated samples are qualified as estimated, “J,” due to laboratory or field sampling imprecision

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FTS, LLC

DATE: March 13, 2009

FROM: Kendra Chintella

SUBJECT: Carbondale Semi-Annual GW

SAMPLE DELIVERY GROUP (SDG): C9B130219

SAMPLES: OW-039DR, OW-035E, OW-044D, OW-201E, OW-22BR, OW-026A, OW-033E, M-99E(OW-201E), EB-1415, TRIP BLANK

ANALYSES: Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

LABORATORY: TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- □ Data Completeness
  Noncompliances: None

- □ Holding Times
  Noncompliances: None

- □ Laboratory Blank Contamination
  Noncompliances: None

- □ Field Blank Contamination
  Noncompliances: None

- □ Field Duplicate Precision:
  Noncompliances: See attached page for details.

- □ Surrogate Recoveries
  Noncompliances: None

- □ Matrix Spike and Matrix Spike Duplicate
  Noncompliances: The MS/MSD recoveries of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, benzo(a)pyrene, and total recoverable phenolics fell below the control limits. No action was taken as the LCS recoveries were compliant.

- □ Laboratory Control Sample
  Noncompliances: None

Field Duplicate Precision:

FIELD DUPLICATE PRECISION					
ANALYTE	OW-201E	QUAL	M-99E	QUAL	RPD
Total Recoverable Phenolics	0.028		0.03		6.90

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FTS, LLC

DATE: September 25, 2009

FROM: Kendra Chintella

SUBJECT: Carbondale Semi-Annual GW

SAMPLE DELIVERY GROUP (SDG): C9H260253

SAMPLES: BOTTLE BLANK, R-013A, OW-200E, OW-037D, OW-039ER, OW-202A, OW-202B, OW-027A, OW-099A(OW-037D), EB-082409, TB-082409, OW-12D, OW-40B, OW-102D, OW-42B, OW-27E, OW-035DR, OW-017A, OW-031A, OW-207A, OW-044D, OW-202D, OW-017C, OW-099B(OW-031A), EB-082509, TB-082509, OW-102B, OW-201E, OW-039DR, OW-036B

ANALYSES: Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

LABORATORY: TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- □ Data Completeness
  Noncompliances: None

- □ Holding Times
  Noncompliances: None

- □ Laboratory Blank Contamination
  Noncompliances: None

- □ Field Blank Contamination
  Noncompliances: Phenolics were detected in the equipment blank. See next page for details.

- □ Field Duplicate Precision:
  Noncompliances: See attached page for details.

- □ Surrogate Recoveries
  Noncompliances: None

- □ Matrix Spike and Matrix Spike Duplicate
  Noncompliances: None

- □ Laboratory Control Sample
  Noncompliances: None

Field Blank Contamination:

The following analyte was detected in the aqueous equipment blank, EB-082509, at the following concentrations:

Analyte	Maximum Concentration	Blank Action Level
Total Recoverable Phenolics	0.019 mg/l	0.095 mg/l

An action level of 5X the maximum concentration was used to evaluate the sample data for field blank contamination. Associated samples with concentrations below the blank action level were qualified as “B”, for field blank contamination.

Field Duplicate Precision:

FIELD DUPLICATE PRECISION					
ANALYTE	OW-037D	QUAL	OW-99A	QUAL	RPD
Benzo(a)anthracene	0.12	U	0.32		NC
Benzo(a)pyrene	0.19	U	0.28		NC
Benzo(b)fluoranthene	0.17	U	0.34		NC
Benzo(g,h,i)perylene	0.19	U	0.31		NC
Benzo(k)fluoranthene	0.16	U	0.35		NC
Chrysene	0.19	U	0.32		NC
Dibenzo(a,h)anthracene	0.19	U	0.38		NC
Indeno(1,2,3-cd)pyrene	0.19	U	0.35		NC
ANALYTE	OW-031A	QUAL	OW-99B	QUAL	RPD
Anthracene	0.19	U	0.19		NC
Total Recoverable Phenolics	0.014		0.016		13.33

NC – not calculated due to nondetect result

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FTS, LLC

DATE: September 25, 2009

FROM: Kendra Chintella

SUBJECT: Carbondale Semi-Annual GW

SAMPLE DELIVERY GROUP (SDG): C9H270164

SAMPLES: OW-035C, OW-023C, EB-082609, R-014C, OW-033E, OW-203A, OW-041A, OW-204B, OW-039BR2, OW-204A, OW-099C(OW-033E), OW-99D(OW-204A), OW-206A, OW-023D, OW-022BR, OW-041B, OW-040D, TRIP BLANK-082609

ANALYSES: Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

LABORATORY: TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- □ Data Completeness
  Noncompliances: None

- □ Holding Times
  Noncompliances: None

- □ Laboratory Blank Contamination
  Noncompliances: None

- □ Field Blank Contamination
  Noncompliances: None

- □ Field Duplicate Precision:
  Noncompliances: See attached page for details.

- □ Surrogate Recoveries
  Noncompliances: None

- □ Matrix Spike and Matrix Spike Duplicate
  Noncompliances: The MS/MSD recoveries of benzo(a)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene were below the control limits. No action was taken as the LCS recoveries were compliant.

- □ Laboratory Control Sample
  Noncompliances: None

Field Duplicate Precision:

FIELD DUPLICATE PRECISION					
ANALYTE	OW-033E	QUAL	OW-099C	QUAL	RPD
Benzo(a)anthracene	0.12	U	0.58		NC
Benzo(a)pyrene	0.19	U	0.53		NC
Benzo(b)fluoranthene	0.17	U	0.6		NC
Benzo(g,h,i)perylene	0.19	U	0.61		NC
Benzo(k)fluoranthene	0.16	U	0.64		NC
Chromium, total	22.1		21.2		4.16
Chrysene	0.19	U	0.6		NC
Dibenzo(a,h)anthracene	0.19	U	0.7		NC
Fluoranthene	0.19	U	0.19		NC
Indeno(1,2,3-cd)pyrene	0.19	U	0.65		NC
ANALYTE	OW-204A	QUAL	OW-99D	QUAL	RPD
Benzo(a)anthracene	0.15	U	1.1		NC
Benzo(a)pyrene	0.23	U	0.74		NC
Benzo(b)fluoranthene	0.21	U	1		NC
Benzo(g,h,i)perylene	0.23	U	0.74		NC
Benzo(k)fluoranthene	0.2	U	0.91		NC
Chromium, total	786		706		10.72
Chrysene	0.23	U	0.88		NC
Dibenzo(a,h)anthracene	0.23	U	0.79		NC
Fluoranthene	0.23	U	0.92		NC
Indeno(1,2,3-cd)pyrene	0.23	U	0.8		NC
Pyrene	0.23	U	0.97		NC

NC – not calculated due to nondetect result

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FTS, LLC

DATE: September 25, 2009

FROM: Kendra Chintella

SUBJECT: Carbondale Semi-Annual GW

SAMPLE DELIVERY GROUP (SDG): C9H280195

SAMPLES: R-014D, R-014E, OW-035B, OW-102E, OW-035E, OW-010B, OW-027D, OW-041D, EB-082709, OW-026A, OW-037B, OW-205A, OW-99E(OW-026A), TB-082709

ANALYSES: Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

LABORATORY: TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- □ Data Completeness
  Noncompliances: None

- □ Holding Times
  Noncompliances: None

- □ Laboratory Blank Contamination
  Noncompliances: None

- □ Field Blank Contamination
  Noncompliances: None

- □ Field Duplicate Precision:
  Noncompliances: See attached page for details.

- □ Surrogate Recoveries
  Noncompliances: None

- □ Matrix Spike and Matrix Spike Duplicate
  Noncompliances: None

- □ Laboratory Control Sample
  Noncompliances: None

Field Duplicate Precision:

FIELD DUPLICATE PRECISION					
ANALYTE	OW-026A	QUAL	OW-99E	QUAL	RPD
Acenaphthene	2.7		3.7		31.25*
Anthracene	1.9		2.6		31.11*
Arsenic, dissolved	267		271		1.49
Arsenic, total	262		270		3.01
Fluorene	0.22		0.29		27.45
Phenanthrene	0.22		0.19	U	NC

NC – not calculated due to nondetect result
* - RPD is greater than 30%, the associated samples are qualified as estimated, “J,” due to laboratory or field sampling imprecision.

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