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Off-Site Data Summary and Fingerprinting Evaluation

Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

April 6, 2011

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Superfund Site
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Executive Summary

This report summarizes and presents an evaluation of all the off-Site data collected between 2008 and 2010 by Beazer East Inc. (Beazer) in the vicinity of the Cabot Carbon/Koppers Site (Site). These data collection efforts were undertaken by Beazer at the request of United States Environmental Protection Agency (US EPA) to delineate off-Site concentrations to Florida Department of Environmental Protection (FDEP) delineation criteria. The delineation criteria were assumed to be either FDEP default residential and commercial/industrial soil cleanup target levels (SCTLs) or Site-specific background concentrations.

The sampling program consisted of collecting surface soils in the vicinity of the Site as well as collecting background surface soils from areas of Gainesville not affected by any potential releases from the Site. Soils from near the Site were collected in phases, starting first with samples within 100 feet of the Site, and then if delineation criteria were not met, collecting samples further from the Site to identify locations where delineation criteria were met. Note that shallow subsurface soils (0.5 to 2 feet below ground surface) from a subset of off-Site locations were also collected and analyzed. Background soils were collected from three land use types: 18 samples from residential neighborhoods, five samples from residential neighborhoods along busy streets, and three samples from commercial/industrial areas.

Based on the results of the on-Site human health risk assessment, three constituents in soils were identified as having the greatest potential to pose a potential human health risk and were analyzed in the off-Site sampling program. Those constituents were: arsenic, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated dibenzo-*p*-dioxins and polychlorinated dibenzofurans (PCDD/Fs). The evaluation of the off-Site data presented in this report progresses from relatively simple comparisons of measured concentrations to delineation criteria to, depending upon constituent and if needed, more sophisticated statistical evaluations to determine if the Site or other sources were responsible for constituent concentrations exceeding delineation criteria. If delineation criteria are met, or if the Site is not responsible for the exceedances of delineation criteria, additional delineation by Beazer is not necessary.

All three key constituents exhibited dramatic declines in concentration within a very short distance (100 feet) from the boundary of the former Koppers Facility. On average, arsenic concentrations declined by nearly 100-fold, PAH concentrations declined by between 2- and 70-fold (depending upon compass direction), and PCDD/Fs had the greatest decline of over 100-fold. As a consequence of these declines, concentrations

of both arsenic and PAHs (expressed as benzo(a)pyrene toxic equivalents (BaP-TE)) were less than delineation criteria (i.e., either default FDEP SCTLs or the relevant background concentration) at almost all off-Site locations. But for FDEP's very stringent SCTLs for PCDD/Fs (expressed as 2,3,7,8-tetrachlorodibenzo-*p*-dioxin equivalents (TCDD-TEQ)), which were exceeded at many off-Site locations, concentrations of all three constituents in almost all off-Site sampling locations within approximately 100 feet of the Site would be less than either the SCTL or the relevant background concentration. If either US EPA's existing residential preliminary remediation goal (PRG) or proposed interim residential PRG for PCDD/Fs, or the Site-specific PRG developed by Beazer, was used as the delineation criteria in lieu of FDEP's SCTL, all off-Site soils, even those within 100 feet of the Site, would meet such PCDD/F delineation criteria.

For arsenic, statistical evaluations of the off-Site data beyond simple comparisons to SCTL and background concentrations were not necessary. Twenty four of 27 off-Site samples, most of which were collected approximately 100 from the Site, had concentrations below the default residential delineation criterion (Figure ES 1). The three samples that exceeded the default residential delineation criterion of 2.1 mg/kg exceeded the criterion only slightly (by less than 50%) and were far below the highest arsenic concentrations measured in either residential background or industrial background samples (14.5 mg/kg and 13.4 mg/kg, respectively). These findings indicate that any potential off-Site arsenic impacts are not associated with unacceptable risks and that additional off-Site delineation of arsenic beyond the locations that have been sampled already is not required. Consequently, no additional off-Site sampling for arsenic is proposed.

For PAHs, comparison of off-Site data to SCTLs indicated that most (16 of 19) off-Site samples to the north and west of the Site had PAH concentrations below the default residential delineation criterion (Figure ES 2). The composition of individual PAHs in the sample with the highest PAH concentration to the west of the Site (SS13 with a BaP-TE concentration of 550 ug/kg, more than five times higher than the default delineation criterion) was different from the PAH composition of on-Site samples. The composition was also different from the composition of background samples. These differences in composition provide strong evidence that the source of the PAHs found at this location were not from the Site nor were they similar to the PAHs found throughout Gainesville. Based on these findings this elevated concentration appears to be the result of a localized and unique source of PAHs. The other two sampling locations to the west of the Site that exceeded the default delineation criterion (SS06 and SS07 with BaP-TE concentrations of 280 and 110 ug/kg, respectively) had a PAH

composition that is indistinguishable from the composition of PAHs in most Site samples. That does not mean, however, that the Site was the source of the PAHs at these locations. Many sources other than the Site have PAH compositions indistinguishable from those of Site samples. Importantly, the other sampling locations in the vicinity of these two samples had PAH concentrations that were less than the default delineation criterion indicating that the source of PAHs at these locations was likely localized and not related to the Site.

Concentrations of PAHs in all off-Site soil samples to the east and south of the Site exceeded the default residential delineation criterion and two samples exceeded the default commercial/industrial delineation criterion (Figure ES 2). All of the off-Site samples to the east and south were located in areas where numerous potential sources of PAHs, not related to the Site, were likely to be present. For example, samples to the south of the Site were collected along NW 23rd Avenue, a heavily traveled road in a mixed use area. Similarly, samples to the east of the Site were collected from a commercial/industrial area. All of these locations were likely subject to deposition of PAHs from a variety of sources including cars, trucks and other motorized vehicles. The presence of other sources of PAHs to the east and south of the Site may well be responsible for the exceedances of the SCTLs at those locations. The importance of these other sources relative to the Site can be determined by comparing the PAH concentrations of soils from east and south of the Site to the PAH concentrations measured in soils collected from areas of Gainesville with similar land-use but not affected by the Site. Such a comparison revealed that the PAH concentrations (expressed as BaP-TE) in off-Site soil samples to the east and south of the Site were consistent with or less than PAH concentrations found in other comparable areas and neighborhoods of Gainesville. These findings indicate that the concentrations to the east and south of the Site, though higher than the SCTLs, were consistent with PAH concentrations expected in Gainesville and were not caused by the Site.

This conclusion is further supported by a statistical analysis that indicated the composition of PAHs measured in soils to the east and south of the Site was different from the composition of PAHs measured in Site soils and similar to the composition of PAHs measured in soils from background areas of Gainesville not affected by the Site. These comparisons indicate that the Site was not the primary source of the PAHs measured in off-Site soils to the east and south of the Site. Rather, the source (or sources) appears to be the same as the source (or sources) of PAHs present at background locations of Gainesville.

In summary, PAH concentrations in almost all soil samples to the west and north of the Site were less than the SCTL. PAH concentrations at the few locations that did exceed delineation criteria did not appear to be Site-related. Additionally, PAHs in soils to the east and south of the Site, though above default residential delineation criteria, were consistent with background concentrations and had a composition different from on-Site soils. These findings indicate that any potential off-Site impacts from PAHs are not associated with unacceptable risks and that additional off-Site delineation of PAHs beyond the locations that have been sampled already is not required. Consequently, no additional off-Site sampling for PAHs is proposed.

For PCDD/Fs, comparison of off-Site data to SCTLs indicated that 65 of 89 (73%) samples collected in the residential areas to the west of the Site exceeded FDEP's default residential delineation criterion of 7 ng/kg TCDD-TEQ (Figure ES 3). However, all samples were below US EPA's current residential PRG of 1,000 ng/kg and US EPA's proposed interim residential PRG of 72 ng/kg. Furthermore, all TCDD-TEQ concentrations in these samples were also less than the Site-specific residential SCTL of 95 ng/kg which is based on Florida's statutory allowable risk level of one in one million ($1x10^{-6}$). TCDD-TEQ concentrations in the five subsurface samples (6"-24" depth) collected from west of the Site were less than FDEP's default residential delineation criterion and were substantially lower than the surface soil sample taken at the same location. These results are consistent with the hypothesis that any potential impacts to soils to the west of the Site, if such impacts existed, would most likely have occurred via transport in the air and not via a subsurface transport pathway. Based on these findings, further analysis of subsurface soils is not necessary.

TCDD-TEQ concentrations were less than the FDEP default commercial/industrial delineation criterion of 30 ng/kg at five of seven commercial/industrial sample locations north and east of the Site (Figure ES 3). At the other two locations, concentrations were slightly greater than the default delineation criterion (35 and 38 ng/kg). TCDD-TEQ concentrations at all locations were less than the current US EPA commercial/industrial PRG of 5,000 to 20,000 ng/kg and less than the US EPA interim proposed commercial/industrial PRG of 950 ng/kg. The mean concentration of TCDD-TEQ (18.4 ng/kg) was below FDEP's default commercial/industrial delineation criterion and slightly higher than the industrial background mean (11.4 ng/kg). Five of seven samples were less than the industrial background maximum (30.2 ng/kg). These results suggest off-Site concentrations of TCDD-TEQ to the north and east of the Site may be consistent with concentrations found in areas of Gainesville with comparable land use.

TCDD-TEQ concentrations at three locations in mixed use areas south of the Site were less than the FDEP's default commercial/industrial delineation criterion but were greater than the FDEP's default residential delineation criterion (Figure ES 3). The TCDD-TEQ concentrations at all three locations were less than the current US EPA residential and commercial/industrial PRGs and less than the US EPA interim proposed residential and commercial/industrial PRGs. Furthermore, TCDD-TEQ concentrations at all locations were less than the Site-specific residential SCTL of 95 ng/kg.

The PCDD/F composition of Site and off-Site samples was examined to determine whether the samples exceeding delineation criteria were potentially Site-related or were associated with other sources. The evaluation of PCDD/F composition included a visual comparison of PCDD/F concentrations among sample groups, spatial plots of congener and homologue ratios, and principal components analysis (PCA), a technique used to aid in recognizing patterns in a large multivariate data set, such as the soil data collected at the Site and its vicinity.

Results of the fingerprinting evaluation indicate that other sources of PCDD/Fs exist in the vicinity of the Site and are influencing TCDD-TEQ concentrations in several off-Site samples. These samples are identified on Figure ES 3. A cluster of seven samples located near the intersection of NW 6th Street and NW 28th Ave had elevated TEQ concentrations compared to other samples in their immediate vicinity. Additionally, multiple lines of evidence developed as part of the fingerprinting evaluation, including differences in the relative proportions of several PCDD/F congeners and homologues, as well as the PCA, indicated these samples had a different PCDD/F composition than surrounding samples to the west of the Site and also had a different composition than Site samples. These findings point to another source of PCDD/Fs in this area. Some of the properties near the intersection of NW 6th Street and NW 28th Avenue have a commercial use including an electronics repair shop, an electronics fabricator, and a radiator repair shop. It is possible that current or historical activities on these properties have contributed to the elevated PCDD/F concentrations.

Several lines of evidence developed by the fingerprinting evaluation also indicated that samples SS302 and SS303 located to the northeast of the Site (Figure ES 3) have a PCDD/F composition that is different than the nearby Site and off-Site samples. These samples were collected in an industrial area northeast of the Site characterized by a variety of uses especially automobile repair shops. The fingerprinting evaluation also indicates that sample SS01 to the north of the Site has a unique PCDD/F composition, although this sample has a relatively low TEQ concentration (5 ng/kg).

Further, just because the fingerprinting evaluation did not identify a particular sampling location as having a PCDD/F composition different from the Site, does not mean the Site is responsible for the PCDD/Fs at such a location. As described in the report, many sources of PCDD/Fs exist. Some of these, such as the residential use of pentachlorophenol as an insecticide or the use of pentachlorophenol treated wood for construction, could lead to localized elevated TCDD-TEQ concentrations with a PCDD/F composition that is indistinguishable from the Site. In such cases, unexpectedly high TCDD-TEQ concentrations may be the only evidence of a unique source of PCDD/Fs at a particular location.

In summary, while TCDD-TEQ concentrations in many off-Site samples exceed FDEP's SCTL, the fingerprinting analysis developed multiple lines of evidence indicating that some of those exceedances were related to sources other than the Site. Additional delineation of PCDD/F concentrations at such locations by Beazer is not necessary; however, further delineation of PCDD/F concentrations may be necessary along some streets to the west and south of the Site where default SCTLs have not been met.

Based on the evaluation of off-Site data, this report recommends collection of additional surface soil samples in public rights of way along NW 31st Lane (three samples), NW 30th Avenue (two samples,) and NW 27th Avenue (two samples) to the west of the Site. The report recommends collection of additional surface soil samples in public rights of way along NW 3rd Terrace and NW 2nd Street (four samples from each) to the south of the Site. The off-Site samples should be analyzed for PCDD/Fs. The report also recommends collection of 12 additional background samples from commercial/industrial areas of Gainesville and 10 additional background samples from residential busy streets. The background samples should be analyzed for PAHs and PCDD/Fs.

Lastly, it is important to realize that the residential busy street background samples, the samples collected 100 feet to the west of the Site in 2009 and the off-Site samples collected in 2010 to the north, east and south were analyzed for all three key constituents (i.e., arsenic, PAHs and PCDD/Fs). Knowing that the default FDEP residential SCTLs are based upon an allowable excess lifetime cancer risk of $1x10^{-6}$, comparison of the concentrations of each of the constituents to their respective SCTL allows estimation of the potential risk associated with those three constituents in each soil sample (using conservative, FDEP assumptions). For example, if BaP-TE exceeds its SCTL by a factor of two in a sample, the associated potential cancer risk, based on FDEP's default assumptions used to derive the SCTL, is estimated as two times one in one million, or $2x10^{-6}$. Using this approach the potential risks associated with residential busy street samples can then be compared to the potential risks associated

with concentrations in off-Site soil samples. When conducting such a comparison using FDEP default SCTLs it is critical to keep in mind that the default SCTLs assume a stringent allowable risk level and are derived using: deterministic calculations; overestimates of likely bioavailability; a combination of conservative exposure parameters that overestimate exposure for most people; and, in the case of TCDD-TEQ, a cancer slope factor that substantially overestimates potential risk and is subject to considerable scientific criticism. In other words, exceedance of a FDEP default SCTL does not, by itself, indicate a potentially unacceptable human health risk exists.

Nevertheless when such a comparison is conducted, the average potential excess lifetime cancer risk associated with background concentrations of arsenic, PAHs and PCDD/Fs for a resident living near a busy street is about 14 times higher than FDEP's allowable risk limit of $1x10^{-6}$. Moreover, the average potential excess lifetime cancer risk associated with samples 100 feet west of the Site is about four times lower than the average potential excess lifetime cancer risk associated with background samples from residential busy streets. Similarly, the overall potential cancer risk combined from arsenic, PAHs and PCDD/Fs associated with off-Site samples to the south is consistent with or less than that found in other areas of Gainesville with comparable land use. Thus, based on a simple comparison of surface soil concentrations to FDEP default SCTLs, potential risks in the vicinity of the Site appear to be similar to or lower than the potential risks associated with other areas of Gainesville.

1. Introduction

This report summarizes the results of surface soil sampling conducted in 2009 and 2010 near the Cabot Carbon/Koppers Site (Site) in Gainesville, Florida. An evaluation of the data is presented to show whether measured concentrations in surface soil are elevated relative to Florida Department of Environmental Protection (FDEP) delineation criteria (i.e., default residential and commercial/industrial soil cleanup target levels (SCTLs) or Site-specific background concentrations). Further, measured concentrations are evaluated to determine whether constituents in soil samples exceeding delineation criteria may potentially be related to Site activities or are associated with other sources. The report also recommends additional sampling, where needed, to achieve delineation.

The Site encompasses approximately 90 acres of land within the northern part of the city limits of Gainesville, Florida and is zoned industrial. The next closest area zoned industrial is the Gainesville Industrial Area, which is located several miles to the north. The former Cabot Carbon property, located east of the Site, the marshy area to the north of the old Cabot Carbon Facility, and the property to the east of the Site are zoned commercial. Properties to the south of the Site have mixed use. The land to the west and northwest of the Site is zoned single family and multiple family residential, with some mixed use along NW 6th Street. Scattered small businesses and a trailer park are located to the north/northwest of the Site. Commercial facilities border the Site to the south and east along NW 23rd Avenue and north Main Street. To the northeast, the adjacent land is primarily undeveloped and heavily vegetated.

In September of 2005, Beazer East Inc. (Beazer) asked AMEC Earth and Environmental (AMEC) to review historical soil and sediment data from the Site to determine its adequacy for conducting a human health risk assessment (HHRA). AMEC recommended additional soil and sediment sampling at the Site, which was conducted in November and December of 2006. The results were presented in the Data Summary Report (AMEC 2007) and addendum (AMEC 2010). Surface soil samples were collected from two depth increments (0 to 0.25-foot and 0.25 to 0.5-foot depth increments) at a total of 95 locations throughout the Site. Forty-eight of those samples were collected from the nodes of a 300-foot by 300-foot grid. The remaining 47 locations were selected to provide more focused sampling in areas requiring additional characterization. All of these surface soil samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and metals. Soil from 40 surface soil locations was also analyzed for polychlorinated dibenzo-*p*-dioxins and polychlorinated dibenzofurans (PCDD/Fs). Twenty-eight of these samples were collected from grid nodes. The remaining 22 samples were focused on the perimeter of the Site. Subsurface soil samples (0.5 to 2 feet and 2 to 6 feet) were collected from 47 of the locations from which surface soil samples were

collected. Twenty-five of those samples were collected from nodes of the grid; the remaining 22 samples were more focused soil samples collected primarily within known source areas. All of these subsurface soil samples were analyzed for VOCs, SVOCs and metals. A subset of 30 subsurface locations was analyzed for PCDD/Fs. Nineteen of those samples were collected from nodes of the sampling grid. The remaining 11 samples were focused primarily within and adjacent to areas suspected of having elevated concentrations of other constituents of potential concern (COPCs).

On December 23, 2008 the United States Environmental Protection Agency (US EPA) approved the Off-Site Soil Sampling Plan (AMEC 2008), which called for the collection of surface soil samples in public rights of way (ROWs) to the west of the former Koppers Facility and at residential background locations. The Quality Assurance Project Plan (Environmental Standards 2008), which outlined field and laboratory quality assurance procedures, was approved by the US EPA on January 6, 2009.

The first phase of off-Site field work was performed from February 9 to 12, 2009, and included the collection of surface soil samples from five locations in the ROW along the western property boundary of the Site, 17 locations approximately 100 to 200 feet west of the Site, and 18 background locations in residential neighborhoods located more than one mile from the Site. These soil samples were analyzed for PCDD/Fs, arsenic and polycyclic aromatic hydrocarbons (PAHs). These three constituents are referred to as the "key constituents," because the majority of potential on-Site risk was associated with them (ARCADIS 2010a). The results of this sampling were reported to US EPA on April 16, 2009 (AMEC 2009a).

In response to comments from Alachua County, the City of Gainesville and the Florida Department of Environmental Protection (FDEP), in June 2009 Beazer proposed the collection of additional surface soil samples at 24 locations between approximately 150 to 300 feet west of the Site. US EPA agreed with the proposed additional sampling in June 2009 following a conference call and meeting. The second phase of field work was performed on June 10 and 11, 2009 and samples were collected from the 24 locations for PCDD/F analysis. The results were reported to US EPA in September 2009 (AMEC 2009b).

Based on the results of the off-Site surface soil sampling program conducted during the first half of 2009, Beazer proposed the collection of additional soil samples on NW 29th Avenue, NW 28th Avenue, and NW 26th Avenue, in public ROWs. The proposed sampling was approved by US EPA on November 11, 2009. The third phase of field work was performed on December 17, 2009 and samples were

collected from the 12 proposed locations for PCDD/F analysis. The results were reported to US EPA in March 2010 (AMEC 2010).

Based on the results of the off-Site surface soil sampling conducted in 2009, and in response to comments from FDEP and Alachua County, Beazer proposed additional soil sampling in areas surrounding the Site and at additional background locations in industrial areas and near residential busy streets.

On April 26, 2010, on behalf of Beazer East Inc. (Beazer), AMEC submitted two proposals for additional soil sampling in areas surrounding the Site. The documents titled "Amended Additional Off-Site Soil Sampling – Western Grid" and "Amended Additional Off-Site Soil Sampling – South, East, Northeast and Non-Residential Background Locations" were approved by the US EPA on May 25, 2010. All sampling methods and activities in the 2010 soil sampling proposals were designed in accordance with the Off-Site Soil Sampling Plan (AMEC 2008), which was approved by the US EPA on December 23, 2008; and the Quality Assurance Project Plan (Environmental Standards 2008), which was approved by the US EPA on January 6, 2009.

From May through mid-September 2010, the US EPA obtained access agreements for 48 of 61 properties where soil sampling was proposed west of the Site. Soil sampling activities were conducted by AMEC from September 10 to September 16, 2010. Surface soil samples were collected from three industrial background locations; five residential busy street locations; 10 locations to the north, east and south of the Site; and 52 locations to the west of the Site. The US EPA oversaw the sample collection activities, collected split samples for quality assurances purposes, and coordinated access to the residential properties. Field efforts were also periodically overseen by the Alachua County Department of Health. All pre-investigation planning and field sample collection efforts were also audited for compliance with the applicable work plans and related planning documents by Environmental Standards, Inc. The results of the September 2010 field effort were transmitted via email to Scott Miller of US EPA on December 28, 2010[1] (ARCADIS 2010b).

The goal of this data summary report is to evaluate all of the off-Site soil data collected to date to determine whether additional delineation is required. Additional delineation may be required if measured constituent concentrations exceed either

[1] The December 28, 2010 email to Scott Miller of US EPA from Paul Anderson of ARCADIS, and attached figures and tables, are presented in Attachment 1 to this report.

default FDEP SCTLs or Site-specific background concentrations and the concentrations above such criteria are Site-related. Exceedance of default SCTLs does not indicate that potentially unacceptable risks are present. FDEP default SCTLs assume a stringent allowable risk level and are derived using: deterministic calculations; overestimates of likely bioavailability; a combination of conservative exposure parameters that overestimate exposure for most people; and, in the case of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin equivalents (TCDD-TEQ), a cancer slope factor that substantially overestimates potential risk and is subject to considerable scientific criticism. In other words, exceedance of a FDEP default SCTL does not, by itself, indicate a potentially unacceptable human health risk exists.

If concentrations are found to be above delineation criteria, the report evaluates whether the concentrations exceeding those criteria may potentially be related to the Site or whether other sources appear to be primarily responsible for the presence of one or more of the key constituents at those locations. If other sources appear to be responsible for the observed concentrations, then further delineation by Beazer is not required. Note that if the analyses described in this report cannot determine whether a source different from the Site contributed constituents to a particular sampling location, that does not mean the Site is responsible for the constituents at that location. It only means that based on available data, the contribution of other sources cannot be determined. For any areas where additional delineation may be required, the report recommends where such samples need to be collected, how many should be collected and what constituents should be measured.

Section 2 summarizes the data collected to date for each of the key constituents; compares off-Site data to SCTLs; and for constituents exceeding such criteria (i.e., PAHs and PCDD/Fs), presents graphical and statistical analyses that evaluate whether the Site or other sources may be primarily responsible for the presence of constituents at those locations. Section 3 discusses recommended additional sampling. Section 4 summarizes key findings, and references are presented in Section 5.

2. Summary and Evaluation of Off-Site Data

This section of the report presents a summary of the off-Site data collected to date, compares the off-Site data to delineation criteria used by the State of Florida (i.e., default residential and industrial SCTLs or Site-specific background concentrations), and, when appropriate, presents additional analyses designed to determine the potential sources of key constituents to off-Site sampling locations. The additional analyses present several lines of evidence starting with simple graphical evaluations followed by, if necessary, more complex statistically-based techniques. Arsenic data are summarized first followed by PAHs and then PCCD/Fs. For reference, Site and off-Site sampling locations are shown in Figure 2-1.

2.1 Arsenic

Arsenic concentrations have been analyzed at 32 off-Site sampling locations and at over 100 on-Site locations (Table 2-1, Figure 2-2). Of the 32 off-Site sampling locations, five are located along the immediate western property line of the Site and the remaining 27 locations are located approximately 100 to 400 feet from the property boundary of the former KI Facility.[2]

Arsenic concentrations declined dramatically over a very short distance (100 feet) from the boundary of the former Koppers Facility. Site concentrations range from less than 10 mg/kg to over 500 mg/kg with an arithmetic mean concentration of 90 mg/kg (Table 2-1, Figure 2-2). Off-Site concentrations of arsenic range from less than the detection limit to 3.1 mg/kg with an arithmetic mean concentration of less than 1 mg/kg to the west of the Site and an arithmetic mean concentration of about 1.5 mg/kg to the north, east and south of the Site. (Table 2-1, Figure 2-2). Thus, as a general observation, off-Site arsenic concentrations decline by about 50- to 100-fold within approximately 100 feet of the Site. This decline suggests limited off-Site arsenic impacts associated with historical operations at the Site.

Arsenic concentrations at 24 of the 27 off-Site sampling locations were below FDEP's default residential delineation criterion (i.e., the residential SCTL) and were below the default industrial delineation criteria (i.e., the industrial SCTL) at all off-Site locations (Figures 2-2 and 2-3). Arsenic concentrations at the three sampling locations that exceeded the residential SCTL were only marginally greater (less than 1.5-fold) than the SCTL. Results of the background sampling from 2009 and 2010 indicate that arsenic concentrations in background sampling locations also exceeded the default residential SCTL occasionally (Figure 2-3). The default residential SCTL was exceeded at two of 25 background locations. An arsenic concentration of 14.5 mg/kg was measured in a single residential background sampling location and an arsenic concentration of 13.4 mg/kg was measured in a single industrial background sampling location (Figure 2-3). Both of those exceedances were substantially higher than any of the off-Site arsenic concentrations, suggesting that the off-Site arsenic concentrations are consistent with Site-specific background concentrations.

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[2] Given the close proximity of the five western fence line samples to the Site (within a few feet of the property line), concentrations of arsenic and the other key constituents at these locations are not considered representative of off-Site conditions and are not referred to as off-Site sampling locations by this report. When these five samples are called out by the report, they are referred to as the “western fence line samples."

The finding that the arsenic concentrations in almost all off-Site sampling locations were less than FDEP's default residential SCTL and were consistent with background concentrations indicates that delineation criteria have been met and that additional off-Site delineation of arsenic beyond the locations that have been sampled already is not required. Consequently, no additional off-Site sampling for arsenic is proposed.[3] These results also indicate that any potential off-Site arsenic impacts, if such are present, are not associated with unacceptable risks.

2.2 Polycyclic Aromatic Hydrocarbons

PAH concentrations have been analyzed at 27 off-Site sampling locations[4] and at over 100 on-Site locations (Table 2-2, Figure 2-4). For purposes of comparing off-Site PAH concentrations to SCTLs and Site-specific background concentrations, PAH concentrations are expressed as benzo(a)pyrene toxic equivalent (BaP-TE) concentrations[5]. As with arsenic, BaP-TE concentrations declined dramatically over a very short distance (100 feet) from the Site boundary. On-Site concentrations ranged from less than 100 micrograms per kilogram (ug/kg) to over 10,000 ug/kg with an arithmetic mean concentration of 6,452 ug/kg (Table 2-2, Figure 2-4). Most on-Site sampling locations had a BaP-TE concentration between 1,000 ug/kg and 10,000 µg/kg (Figure 2-4). In comparison, off-Site concentrations of BaP-TE ranged from less than 50 ug/kg to 8,700 ug/kg with an arithmetic mean concentration of 93 ug/kg to the west of the Site and an arithmetic mean concentration of between 1,000 and 3,000 ug/kg to the north, east and south of the Site (Table 2-2, Figure 2-4). The rather high off-Site arithmetic mean concentrations for samples to the south and east of the Site were largely the result of elevated concentrations in two samples. Absent these samples, off-Site concentrations to the south and east were less than 1,000 µg/kg and

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[3] Additionally, the background sampling results from the residential, industrial and residential busy street locations were generally consistent and indicated that arsenic concentrations at most sampling locations were below FDEP's default residential SCTL but with occasional exceedances of the default residential SCTL. Given this general consistency, no further background sampling of arsenic is proposed either.

[4] The five western fence line samples are excluded from this off-Site total.

[5] BaP-TE concentrations are calculated by multiplying the concentration of individual potentially carcinogenic PAHs by their relative potency factor developed by US EPA. The BaP-TE concentration associated with each potentially carcinogenic PAH present at a particular sampling location are summed to derive the BaP-TE concentration of that particular sampling location.

the arithmetic mean concentrations would also be substantially lower. Thus, as a general observation, off-Site BaP-TE concentrations to the west of the Site were about 50- to 100-fold lower than on-Site concentrations within approximately 100 feet of the Site.

The comparison of off-Site BaP-TE concentrations to FDEP's SCTLs is presented by compass direction of the off-Site samples relative to the Site. In other words, off-Site samples collected to the west are discussed separately from off-Site samples collected to the south, east, and north. Because some off-Site samples exceeded FDEP's SCTLs, this section also presents an evaluation of the composition of PAHs in such samples to determine if the Site or some other source is primarily responsible for the PAHs present in a particular sample. The additional evaluation of PAH composition is presented after the comparison of off-Site BaP-TE concentrations to FDEP delineation criteria.

2.2.1 West Off-Site Samples

BaP-TE concentrations at 14 of the 17 off-Site sampling locations in the residential neighborhood to the west of the Site were below FDEP's default residential delineation criterion (i.e., the residential SCTL) and were also consistent with residential background concentrations measured in 2009 (Figures 2-4 and 2-5). BaP-TE concentrations were greater than FDEP's default residential SCTL at three locations (Figures 2-4 and 2-5). As discussed in more detail below, evaluation of the composition of PAHs at the sampling location with the highest BaP-TE concentration (sampling location SS13 with a BaP-TE concentration of 550 ug/kg) suggests a source other than the Site is responsible for the majority of PAHs detected at that location. As also discussed below, the spatial pattern of PAH concentrations in the vicinity of the other two locations with BaP-TE concentrations greater than the default residential delineation criterion (sampling locations SS06 and SS07) suggests that a source other than the Site was responsible for the majority PAHs detected at those sampling locations.

2.2.2 North Off-Site Samples

BaP-TE concentrations at the two off-Site sampling locations on the Department of Public Works property to the north of the Site were below FDEP's default industrial delineation criterion (i.e., the industrial SCTL) of 700 ug/kg and were also below FDEP's default residential delineation criterion (Figures 2-4 and 2-5). Additionally, the concentrations were below those measured in industrial background samples (Figure 2-5). These results indicate that delineation criteria have been met and that further delineation of PAHs to the north of the Site is not necessary.

2.2.3 East Off-Site Samples

BaP-TE concentrations at four of the five off-Site sampling locations in the commercial/industrial area to the east of the Site were below FDEP's default industrial delineation criterion (Figures 2-4 and 2-5). One location near the southeast corner of the Site (location SS310) exceeded the default industrial criterion (Figures 2-4 and 2-5). With the exception of the BaP-TE concentration measured at location SS310, all concentrations measured to the east of the Site were consistent with or less than industrial background (Figure 2-5). As discussed in more detail below, evaluation of the composition of PAHs at location SS310 suggests a source other than the Site was responsible for the majority of PAHs detected at that location.

2.2.4 South Off-Site Samples

BaP-TE concentrations at two of the three off-Site sampling locations in the mixed use area to the south of the Site were below FDEP's default industrial delineation criterion (Figures 2-4 and 2-5). One location to the southwest of the Site (location SS307) exceeded the default industrial criterion (Figures 2-4 and 2-5). The BaP-TE concentration at all locations exceeded FDEP's default residential delineation criterion. However, with the exception of the BaP-TE concentration measured at location SS307, all concentrations measured to the south of the Site were consistent with or less than background concentrations measured along busy residential streets (Figure 2-5). As discussed in more detail below, evaluation of the composition of PAHs at location SS307 and the general nature of that sampling location suggests a source other than the Site was responsible for the majority of PAHs detected at that location.

2.2.5 Fingerprinting PAHs

With the exception of the aforementioned three off-Site sampling locations to the west of the Site, one off-Site location near the southwest corner of the Site and another location near the southeast corner of the Site, all off-Site locations had BaP-TE concentrations that were either below applicable FDEP SCTLs or were consistent with or less than background concentrations. For the five locations, exceeding FDEP delineation criteria, the question then becomes, whether the PAH concentrations measured at those locations are Site-related or whether another source (or sources) may be responsible for the detected concentrations. If the Site is determined to be potentially responsible for the presence of those concentrations, then additional delineation might be necessary. However, if the Site is not likely to be responsible for those concentrations, then additional delineation would not be required. The remainder of the discussion of off-Site PAH concentrations describes a commonly used method to characterize and compare the composition of PAHs at different sampling locations. The process of characterizing and comparing the composition of PAHs in environmental

samples, as well as characterizing and comparing the composition of other constituents such as PCDD/Fs, is commonly referred to as "fingerprinting."

In the environment, PAHs have both natural sources (e.g., oil seeps, bitumens, coal, plant debris, forrest and prairie fires) and anthropogenic sources (e.g., creation of refined fuels from crude oils, combustion of fossil and petroleum-based fuels). The PAHs can be divided into three general categories indicating their mechanism of formation and potential source: (1) pyrogenic sources: those derived from oxygen-depleted, high-temperature processes (e.g., incomplete combustion, pyrolysis, cracking, and destructive distillation); (2) petrogenic sources: those derived directly from petroleum, including fuel oils, coal, lubricants, and the derivatives of those material and (3) diagenetic sources: those derived from recent biological transformations of natural organic matter (Uhler and Emsbo-Mattingly 2006; Yunker, Macdonald et al. 2002). In urban environments such as exist in Gainesville, both pyrogenic and petrogenic hydrocarbons are ubiquitous. It turns out that the relative concentration of some individual PAHs can vary depending upon the source. These differences in relative concentration, or composition, of individual PAHs can be used to determine whether PAHs in a set of environmental samples have a common source or not.

For this evaluation, the goal is to determine first whether the composition of the PAHs detected in Site surface soil samples differs from the PAH composition in background surface soil samples, and if so, whether the PAH composition of off-Site surface soil samples collected near the Site is more similar to the composition found in background soil samples or to the composition in Site soil samples. If the composition of PAHs in an off-Site sample differs from the composition of Site samples, or is more similar to the composition of PAHs in background samples than it is to Site samples, such a finding would suggest that the source of the majority of PAHs in that off-Site sample was not the Site. However, the converse is not necessarily true. If the composition of PAHs in an off-Site sample is similar to or indistinguishable from the composition of PAHs in Site samples, that does not necessarily mean the Site is the source of the PAHs. It only means that based on the data available, the contribution of other sources cannot be determined using fingerprinting. In such cases, additional evaluations, such as comparing the concentrations of PAHs present at adjoining sampling locations, may be undertaken to determine if the elevated concentrations are consistent with a localized source of PAHs.

The PAH fingerprinting evaluation calculates ratios of the concentrations of individual PAHs for each sampling location. Numerous quantitative diagnostic ratios have been defined in the literature to differentiate pyrogenic PAHs from other hydrocarbon sources (Murphy and Morrison 2007). In this evaluation, the ratio of fluoranthene/pyrene concentrations (Fl/Py) and of benz(a)anthracene/benzo(a)pyrene

concentrations (BaA/BaP) were selected to characterize the compositional differences of PAH mixtures detected in the vicinity of the Site. The selected PAHs have been reported to retain their relative concentrations over large concentration ranges and under various weathering and/or biodegradation conditions (Costa, White et al. 2004; Uhler and Emsbo-Mattingly 2006), which is imperative for establishing a petrogenic or pyrogenic source.

Once the ratios are calculated, they can be plotted to examine the relationship between different sampling locations. The simplest plots show a particular PAH ratio for each Site and off-Site sampling location. Figure 2-6 presents such a plot of the Fl/Py ratio[6]. The vast majority of on-Site samples have a Fl/Py ratio equal to or less than 1.0 while most of the off-Site samples to the east and south have Fl/Py ratios ranging between 1.1 and 1.3 (Figure 2-6). This difference in the Fl/Py ratios between on-Site and off-Site samples to the east and south indicates a source other than the Site is responsible for the majority of PAHs detected at those off-Site sampling locations. Additionally, the Fl/Py ratios of the industrial and residential busy street background samples (arithmetic mean of 1.2 to 1.3) were very similar to those of the off-Site samples to the east and south (arithmetic mean of 1.3) and not similar to the majority of on-Site samples (arithmetic mean of 0.8;Table 2-3). This finding indicates that the sources of the majority of the PAHs detected in off-Site samples to the east and south were similar to the sources that contributed PAHs to background locations of Gainesville. This conclusion is further supported by the general similarity of BaP-TE concentrations between off-Site samples to the south[7] and east and samples collected in commercial/industrial and residential busy street background locations of Gainesville

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[6] Note that Figure 2-6 only shows the Fl/Py ratio for sampling locations that have BaP-TE concentrations that exceed FDEP's default residential delineation criterion of 100 µg/kg. The goal of fingerprinting evaluation was to determine whether PAHs present at off-Site locations that do not meet delineation criteria are potentially related to the Site, and, therefore, may require additional delineation. Sampling locations already shown to meet SCTLs do not require additional delineation. Sampling locations with BaP-TE concentrations equal to or less than the default delineation criterion are shown, for reference, as open circles on Figure 2-6.

[7] Off-Site location SS307, near the southwest corner of the Site, had a BaP-TE concentration about three times higher than the highest concentration detected in any of the background samples and much higher than the BaP-TE concentration detected in all other off-Site samples to the south (Figure 2-5). This elevated BaP-TE concentration appears to be related to a localized source, most likely runoff from the parking lot of a small shopping center located next to the sampling location.

(Figure 2-5). It also indicates that background sources, not Site-related sources, are responsible for the exceedance of the SCTL. Collectively, these results indicate the Site was not the primary source of PAHs at off-Site sampling locations to the east and south and that additional delineation of PAHs to the east and south of the Site is not necessary.

Three sampling locations to the west of the Site had BaP-TE concentrations that exceeded the default residential delineation criterion (SS06, SS07, SS13). The Fl/Py ratio for these three samples fell within the range of ratios found for the majority of Site samples (Figure 2-6) and, therefore, this ratio could not be used to distinguish between Site and non-Site related sources. However, sample SS13 has a BaA/BaP ratio (1.6) that is almost two times higher than the average Site BaA/BaP ratio (0.9, Table 2-3) and its BaA/BaP ratio is exceeded by only two of 103 Site samples. Site samples SS082 and SS058 have BaA/BaP ratios of 2.5 and 1.7, respectively. The BaA/BaP ratio for all other Site samples is less than 1.5. The unique BaA/BaP ratio for sample SS131 combined with its uncharacteristically high BaP-TE concentration (550 ug/kg) compared to the two off-Site samples adjoining it (70 and 32 ug/kg) indicates the PAHs at this location were a localized occurrence not related to the Site.

The BaA/BaP ratios for samples SS06 and SS07 were not distinct from Site samples; however, the BaP-TE concentrations of adjacent Site and off-Site samples were substantially lower than the concentrations and samples SS06 and SS07 (Figure 2-4). While the fingerprinting evaluation may indicate that the PAHs in samples SS06 and SS07 have a composition similar to Site samples, the BaP-TE concentrations greater than the default delineation criterion appear localized and are not likely to be associated with the Site. Rather they are likely to have been introduced to the area when someone used readily available creosote-treated building materials or coal tar-derived materials (e.g., driveway sealer, roofing tar) in the vicinity of these sampling locations.

In summary, a comparison of off-Site BaP-TE concentrations to the FDEP SCTL and to background concentrations combined with the fingerprinting evaluation indicates that off-Site PAH concentrations have been delineated and that additional off-Site sampling for PAHs is not necessary.

2.3 Dioxins

PCDD/F concentrations have been analyzed at 48 Site locations, five western fence line locations and 99 off-Site locations (Table 2-4, Figure 2-7). Analysis of soil samples for PCDD/Fs includes the seventeen 2,3,7,8-substituted PCDD/F congeners and 10 homologue groups. For purposes of comparing off-Site PCDD/F concentrations to the SCTL and Site-specific background concentrations, PCDD/F concentrations are

expressed as 2,3,7,8-tetrachlorodibenzo-*p*-dioxin toxic equivalent (TCDD-TEQ) concentrations[8].

TCDD-TEQ concentrations showed an even more dramatic decline within 100 feet of the boundary of the former Koppers Facility than arsenic or PAHs. Site TCDD-TEQ concentrations ranged from less than 5 ng/kg to over 90,000 ng/kg with an arithmetic mean concentration of 4,177 ng/kg (Table 2-4, Figure 2-7). Most Site sampling locations had a TCDD-TEQ concentration between 1,000 ng/kg and 5,000 ng/kg (Figure 2-7). In comparison, off-Site concentrations of TCDD-TEQ ranged from less than 5 ng/kg to 70 ng/kg with an arithmetic mean concentration of between 14 and 18 ng/kg (Table 2-4, Figure 2-7). Thus, off-Site TCDD-TEQ concentrations are generally more than 100 times lower than Site concentrations. This decline in concentration indicates a very rapid attenuation of any TCDD-TEQ impacts associated with historical operations at the Site.

The comparison of off-Site TCDD-TEQ concentrations to FDEP delineation criteria is presented according to the compass direction of the off-Site samples relative to the Site. Because off-Site samples exceeded FDEP delineation criteria, this section also presents a fingerprinting evaluation of the composition of PCDD/F to determine if the Site or some other source is primarily responsible for the PCDD/F present in a particular sample. The PCDD/F fingerprinting evaluation is presented after the comparison of off-Site TCDD-TEQ concentrations to FDEP delineation criteria.

2.3.1 West of Site

Eighty-nine surface soil samples were collected west of the Site and analyzed for PCDD/Fs. TCDD-TEQ concentrations in surface soil samples ranged from less than 1 ng/kg to 70 ng/kg (Table 2-4, Figures 2-7 and 2-8), and 24 of 89 surface soil concentrations (27%) were equal to or less than FDEP's default residential delineation criterion (7 ng/kg) (Figures 2-7 and 2-8). The sample mean (15.2 ng/kg) and maximum (70 ng/kg) are greater than the residential busy street mean (5.3 ng/kg) and maximum (10 ng/kg).

[8] TCDD-TEQ concentrations were derived by multiplying the concentrations of each of the 17 PCDD/F congeners in a sample by the corresponding World Health Organization (WHO) mammalian toxic equivalency factors (TEFs) and summing the resulting toxic equivalent (TEQ) concentrations associated with each congener to derive a TCDD-TEQ concentration for each sample.

It is crucial to recognize that concentrations of TCDD-TEQ in all soil samples collected to the west of the Site were below US EPA's current residential preliminary remediation goal (PRG) of 1,000 ng/kg. Though US EPA's proposed interim PRG of 72 ng/kg for TCDD-TEQ has not been adopted by the agency, all concentrations to the west of the Site were less than this proposed PRG as well. All TCDD-TEQ concentrations were also less than the Site-specific residential SCTL of 95 ng/kg (ARCADIS 2010c) which is based on Florida's statutory allowable risk level of one in one million ($1x10^{-6}$) (Figure 2-7). When comparing results to FDEP's default residential delineation benchmark for dioxin (i.e., the default residential SCTL), it is important to keep in mind that the default SCTLs assume a stringent allowable risk level and are derived using: deterministic calculations; overestimates of likely bioavailability; a combination of conservative exposure parameters that overestimate exposure for most people; and, in the case of TCDD-TEQ, a cancer slope factor that substantially overestimates potential risk and is subject to considerable scientific criticism. In other words, exceedance of a FDEP default SCTL does not, by itself, indicate a potentially unacceptable human health risk exists. Indeed, when all of the comparisons of TCDD-TEQ concentrations to available benchmarks are viewed as a whole, these results continue to suggest that TCDD-TEQ concentrations measured in soils collected from 100 feet and further to the west of the Site do not pose an unacceptable risk to residents.

Five subsurface samples (6 to 24-inch depth) were also collected and analyzed for PCDD/Fs. The TCDD-TEQ concentration in all subsurface samples was less than FDEP's default residential delineation criterion. TCDD-TEQ concentrations in all subsurface samples were also substantially lower than the surface soil sample taken at the same location. These results are consistent with the hypothesis that any potential impacts to soils to the west of the Site, if such impacts existed, would most likely have occurred via transport in the air and not via a subsurface transport pathway. Based on these findings delineation criteria have been met in subsurface soils and further analysis of subsurface soils is not necessary.

2.3.2 North and East of Site

TCDD-TEQ concentrations were less than the FDEP default commercial/industrial delineation criterion (i.e., the default commercial/industrial SCTL of 30 ng/kg) at five of seven sample locations (Figures 2-7 and 2-8). At the other two locations, concentrations were slightly greater than the default delineation criterion (i.e., 38 and 35 ng/kg at locations SS300 and SS303, respectively). The mean concentration of TCDD-TEQ (18.4 ng/kg) was below FDEP's default commercial/industrial delineation criterion and slightly higher than the industrial background mean (11.4 ng/kg; Table 2-4). Five of seven samples were less than the industrial background maximum (30.2 ng/kg). These results suggest off-Site concentrations of TCDD-TEQ to the north and

east of the Site may be consistent with concentrations found in areas of Gainesville with comparable land use.

In addition, it should be noted that TCDD-TEQ concentrations at all locations were less than the current US EPA commercial/industrial PRG of 5,000 to 20,000 ng/kg and less than the US EPA interim proposed commercial/industrial PRG of 950 ng/kg.

2.3.3 South of Site

Three surface soil samples to the south of the Site were collected from ROWs situated in residential and mixed use areas. Therefore, either of FDEP's default residential or commercial/industrial delineation criteria may be applicable, depending upon the land use surrounding a specific sample. Comparisons to both default criteria are discussed below.

TCDD-TEQ concentrations at all three locations were less than the FDEP's default commercial/industrial delineation criterion but were greater than the FDEP's default residential delineation criterion of 7 ng/kg (Figures 2-7 and 2-8). The mean concentration (18.2 ng/kg; Table 2-4) was greater than both the industrial background mean (11.4 ng/kg) and the residential busy street mean (5.3 ng/kg). The maximum (26 ng/kg) was less than the industrial background maximum (30.2 ng/kg) but greater than the residential busy street maximum (10 ng/kg; Figure 2-8). These results suggest that off-Site concentrations of TCDD-TEQ south of the Site may be consistent with concentrations found in industrial land use areas of Gainesville.

In addition, it should be noted that TCDD-TEQ concentrations at all three locations were less than the current US EPA residential (1,000 ng/kg) and commercial/industrial PRGs and less than the US EPA interim proposed residential (72 ng/kg) and commercial/industrial PRGs. Furthermore, TCDD-TEQ concentrations at all locations were less than the Site-specific residential SCTL of 95 ng/kg (ARCADIS 2010c).

2.3.4 Dioxin Sources and Fingerprint Analysis

This section describes the approach and results of the dioxin fingerprinting analyses.

2.3.4.1 Introduction

PCDD/Fs are ubiquitous in the environment due to both natural and anthropogenic sources. Anthropogenic sources include chemical manufacturing, pulp and paper mills, municipal and medical waste incineration, coal combustion, copper smelting, home fireplaces and woodstoves, cigarette smoke, backyard burning of refuse, and numerous others. According to the US EPA (2005) combustion and incineration are the

most significant sources of PCDD/PCDFs released to the environment and backyard burning of refuse is the single largest source of PCDD/Fs in the environment. Van Wijnen et al. (1992) found that small scale incineration of scrap wire and metal resulted in local TEQ soil concentrations many times greater than levels of concern.

The composition of anthropogenic PCDD/F sources often displays a unique "fingerprint" or "signature", characterized by the relative contributions of congeners or homologue groups. The PCDD/F composition of Site and off-Site samples was examined to determine if other PCDD/F sources exist near the Site that are not related to Site activities. This evaluation included a visual comparison of PCDD/F concentrations among sample groups, spatial plots of congener and homologue ratios, and principal components analysis, a technique used to aid in recognizing patterns in a multivariate data set.

The PCDD/F composition of Site samples would be expected to be attributable to the use of pentachlorophenol-based wood preservatives at the Site. However, Bright et al. (1999) found that the signature of pentachlorophenol is similar to other combustion sources in the environment. Therefore, if an off-Site sample has a signature similar to a Site sample it does not necessarily mean that the Site is the source. Potential alternate sources of PCDD/Fs near the Site include auto exhaust, residential waste burning (common in Gainesville prior to wide spread municipal trash pickup), fires, pesticide use, and other local activities in both residential and non-residential areas..

Results of the fingerprinting evaluation indicate that other sources of PCDD/Fs exist in the vicinity of the Site and are influencing TCDD-TEQ concentrations in some off-Site samples. These samples are identified on Figure 2-9. A cluster of seven samples located near the intersection of NW 6th Street and NW 28th Avenue have elevated TCDD-TEQ concentrations compared to other samples in their immediate vicinity and, as will be shown, are different in composition from surrounding samples. The current land use of some of the properties near this intersection is not residential. These properties include an electronics repair shop at 2803 NW 6th Street, AA Advanced Electronics; an electronics fabricator at 2805 NW 6th Street, CircuitWerkes; and a radiator repair shop at 2721 NW 6th Street, Cain's Radiator Warehouse.

Samples SS302 and SS303 located to the northeast of the Site (Figure 2-9) also have a PCDD/F composition that is different than the nearby Site and off-Site samples. These samples were collected in an industrial area characterized by a variety of uses, especially automobile repair shops. Sample SS01 to the north of the Site also has a unique composition, although this sample has a low TCDD-TEQ concentration (5 ng/kg).

2.3.4.2 Dioxin Composition

The PCDD/F composition can be examined qualitatively by looking at the relative proportions of individual congeners and homologue groups in a sample or sample group (i.e., Site, off-Site west, residential busy street background, etc.). Figure 2-10 illustrates the contribution of each congener to the mean TCDD-TEQ of each sample group. For all sample groups, 1,2,3,4,6,7,8-heptachlorodibenzo-*p*-dioxin (1,2,3,4,6,7,8-HpCDD) is the largest contributor to TCDD-TEQ. The proportional contributions made by the remaining congeners, however, vary by location. The 1,2,3,7,8-pentachlorodibenzo-*p*-dioxin (1,2,3,7,8-PeCDD) congener comprises 18% of the total TCDD-TEQ in cluster samples (green bars) while it comprises only 6% of TCDD-TEQ in Site samples. In background samples, furans such as 2,3,4,7,8-pentachlorodibenzofuran (2,3,4,7,8-PeCDF) contribute to TCDD-TEQ to a greater degree than in the other sample groups. For many of the congeners there is an apparent trend in their relative proportions progressing from Site to fence line to off-Site groups.

Figure 2-11 illustrates the proportional contribution of each homologue group on a log scale. Octachlorodibenzo-*p*-dioxin (OCDD) and heptachlorinated dibenzo-p-dioxins (HpCDD) make up the largest average percentage of total homologues for all samples. However, here again the cluster samples show a unique pattern relative to the other samples groups, particularly in the relative contributions of tetra-, penta-, and hexachlorinated dibenzo-p-dioxins (TCDD, PeCDD, HxCDD). Background samples are shown to have greater proportions of tetra-, penta- and hexachlorinated dibenzofurans (TCDF, PeCDF, HxCDF). Again, for the homologue groups a trend exists in their proportions progressing from Site to fence line to off-Site sample groups.

The PCDD/F composition can also be examined by looking at ratios of the concentrations of the various congeners and homologue groups. Although many ratio combinations are possible, three were selected based on the apparent differences noted in figures 2-10 and 2-11 and are presented here. The ratios were plotted a map of the Site and vicinity to identify spatial patterns in the composition which can then be used to identify the locations of potential sources of PCDD/Fs not related to the Site.

The data indicate that 1,2,3,7,8-PeCDD is contributing more to TCDD-TEQ concentrations in off-Site samples, particularly in the cluster of samples to west of the Site, than it is to Site samples and that the opposite is true for OCDD (Figure 2-10). Therefore, the ratio of 1,2,3,7,8-PeCDD to OCDD is shown in Figure 2-12. The cluster samples have much higher ratios of 1,2,3,7,8-PeCDD to OCDD than surrounding samples and than most Site samples. The ratio at location SS237 (190×10^{-5}), is more than double the highest ratio observed on the Site. This is an indication that some a source other than the Site is contributing to PCDD/Fs in these cluster samples. As

stated noted above, several non-residential uses are present in the vicinity of the cluster, including an electronics shop. Nothing is known about its specific operations, but elevated 1,2,3,7,8-PeCDD would be consistent with the burning of scrap wire (van Wijnen et al. 1992). In addition the1,2,3,7,8-PeCDD to OCDD ratio is elevated at three other sample locations (circled), SS01, SS302 and SS303 suggesting non-Site-related sources are contributing to PCDD/Fs measured at those locations as well.

The data also indicate that total HxCDD is more abundant in cluster samples than in the other off-Site samples (Figure 2-11). When this ratio is plotted on a map, a similar pattern results (Figure 2-13). Ratios are elevated in cluster samples compared to surrounding samples, as well as the Site samples[9]. The same is true for samples SS302 and SS303 (circled). This provides further evidence of an alternate source of PCDD/Fs at these locations.

Finally, the data indicate that total TCDD is more abundant in the cluster samples than in Site samples (Figure 2-11). The ratio of total TCDD to total PCDD/F homologues is shown on Figure 2-14. Again, the cluster samples are shown as having higher ratios than the surrounding samples and, in fact, have some of the highest ratios of all Site and off-Site samples[10]. This provides one more line of evidence that an alternate source is primarily responsible for the PCDD/Fs measured at the sampling locations within the cluster and influenced samples outside of the cluster. In addition, similar to the other ratio plots, this figure also shows that the ratios of samples SS01, SS302 and SS303 (circled) are conspicuously higher than those of nearby samples providing more evidence of alternate sources at these locations as well.

In summary, several qualitative lines of evidence based on the ratios of different congeners and homologues suggest that the PCDD/F concentrations at several off-Site locations have been affected by sources other than the Site. The likelihood of another important source at the western cluster is supported by the presence of higher TCDD-TEQ concentrations than would be expected at that location based on the

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[9] Note also that several of the samples along NW 28th Avenue and in the vicinity of the circled cluster samples have an elevated ratio suggesting the influence of the source identified by the cluster samples may have extended beyond just the samples circled on Figure 2-13.

[10] Note also that several of the samples along NW 28th Avenue and in the vicinity of the circled cluster samples have an elevated ratio suggesting the influence of the source identified by the cluster samples may have extended beyond just the samples circled on Figure 2-14.

results from adjacent samples to the south, east and west, and that the second highest TCDD-TEQ concentration measured off-Site (60 ng/kg) was detected in one of the samples that comprises the western cluster.

2.3.4.3 Multivariate Analysis

To further investigate the differences in composition among samples collected on and near the Site using more quantitative techniques, a multivariate analysis of the homologue data set was conducted. Principal components analysis (PCA) is a multivariate technique in which a set of correlated variables (in this case the 10 homologue group concentrations) are transformed, by matrix algebra, into a set of uncorrelated variables or principal components. It is often used to reduce the dimensionality of the data set, i.e. to produce a smaller set of principal components that adequately represent the total variance of the data set. A multivariate dataset of *n* correlated variables can be represented in *n*-dimensional space by *n* coordinate axes. PCA is essentially an orthogonal rotation of the coordinate axes such that they are uncorrelated and such that the first coordinate axis (called the first principal component) in the rotated coordinate system represents the greatest variance possible and the second coordinate axis in the new system represents the second greatest variance possible and so on. Optimally, the first $k<n$ principal components will be sufficient to explain the variance and structure of the original correlated variables. If so, the dataset is plotted and examined in the new *k*-dimensional space and similarities and differences among individuals (surface soil samples in this case) become apparent. The correlation of the original variables to the *k* principal components can be examined to determine which variables drive the variance within each component and thus which variables explain differences among individual samples. PCA has been widely used to investigate the presence of one or more source profiles of PCDD/Fs in the environment using datasets consisting of individual congeners or homologue groups (Murphy and Morrison 2007). PCA was used here to investigate patterns in the PCDD/F composition of samples, to further investigate the potential for alternate sources of PCDD/Fs unrelated to Site activities, and to confirm, if possible, the conclusions of the qualitative evaluation of congener and homologue ratios presented above. All Site and off-Site surface soil samples were included in the analysis along with the pilot industrial and residential busy street background samples. All analyses were conducted on PCDD/F homologue data (transformed to proportions) using SAS 9.2.

PCA results indicate that the first four principal components explain 93% of the variance of the data set. Therefore the original 10 variable data set (10 homologue groups) can be adequately represented in four-dimensional space. Figures 2-15 through 2-19 provide a series of two and three dimensional plots of the first four principal components. In PCA, the origin represents the mean of the data set in the

new coordinate system. Therefore as expected the majority of the data points plot near the origin. What is immediately apparent on all the PCA plots is that the cluster samples (green triangles) are very different from the other sample groups. They tend to have higher values for the first principal component (PC1) (Figures 2-15 through 2-19) which is correlated with all the tetra-, penta-, and hexachlorinated dioxins and furans. In addition, they tend to have higher values for PC3 which is correlated with TCDD and PeCDD. This is consistent with the findings in the qualitative and ratio analysis described above. The background samples tend to have large values for PC1 as well, consistent with the larger proportion of furans in these samples compared to the other sample groups. However, they tend to show great variability in all other principal components. This would be expected given that they were collected over a wide area and would reflect a variety of point and non-point sources.

The location of some individual samples on the PCA plots indicates differences in PCDD/F composition compared to the majority of Site and off-Site data. Samples SS01, SS302 and SS303, previously noted on the ratio plots, tend to be located away from the other data points in the PCA plots (Figures 2-15, 2-16 and 2-17). Samples SS63, SS230 and SS238 tend to plot away from the bulk of the off-Site west sample locations and closer to some of the cluster samples (Figures 2-15, 2-16 and 2-17). These three samples are located on or near NW 28th Avenue to the east of and relatively close to the cluster samples and, therefore, could be influenced by the same source as the cluster samples. Sample SS300, located north of the Site (Figure 2-1) also tends to plot away from the bulk of the Site sample locations and nearby samples particularly on PC2 and PC3 (Figures 2-15 through 2-18). Sample SS81, located west of the Site along NW 26th Avenue (Figure 2-1), also tends to plot away from the bulk of the Site sample locations, particularly on PC2 and PC4 (Figures 2-15 and 2-17). Finally, sample SS307, located southwest of the Site (Figure 2-1), also tends to plot away from the bulk of the Site sample locations particularly on PC 2 and PC3 (Figures 2-15, 2-16 and 2-18) indicating differences in PCDD/F composition.

Further, just because the fingerprinting evaluation did not identify a particular sampling location as having a PCDD/F composition different from the Site, does not mean the Site is responsible for the PCDD/Fs at such a location. As described above, many sources of PCDD/Fs exist. Some of these, such as the residential use of pentachlorophenol as an insecticide or the use of pentachlorophenol treated wood for construction, could lead to localized elevated TCDD-TEQ concentrations with a PCDD/F composition that is indistinguishable from the Site. In such cases, unexpectedly high TCDD-TEQ concentrations may be the only evidence of a unique source of PCDD/Fs at a particular location. For example, one of the sampling locations on NW 30th Avenue (SS55) has the highest measured off-Site TCDD-TEQ concentration (70 ng/kg, Figures 2-1 and 2-7). The presence of this concentration is inconsistent with the overall spatial pattern of TCDD-TEQ concentrations measured to the west of the Site. Interestingly, the two locations closest to SS55 (SS11 and

SS211) also have relatively high TCDD-TEQ concentrations (35 and 39 ng/kg, respectively, Figures 2-1 and 2-7). This cluster of three samples with elevated TCDD-TEQ concentrations relative to the other samples in its vicinity is suggestive of the presence of a localized source of PCDD/Fs.

In summary, results of the PCDD/F fingerprinting analysis provide evidence that alternate sources of PCDD/Fs exist near the Site. A cluster of at least seven samples (and perhaps more based on the results of the PCA) to the west of the Site in the vicinity of NW 6th Street and NW 28th Avenue were shown to have a different fingerprint characterized by a higher proportion of lower chlorinated dioxins (TCDD, PeCDD, and HxCDD). This source may also be influencing the composition of other samples along NW 28th Avenue (SS63, SS230 and SS238). A similar congener pattern was noted in off-Site samples SS01, SS302 and SS303 to the north and east of the Site, particularly with respect to TCDD and 1,2,3,7,8-PeCDD ratios indicating the existence of one or more sources of PCDD/Fs unrelated to the Site to the northeast. PCA results indicate that other samples, SS81 located west of the Site on NW 26th Avenue and SS300 located north of the Site, and SS307 located south of the Site have PCDD/F compositions that may also be influenced by other PCDD/F sources not related to historic Site activities.

3. Additional Off-Site Sampling

The above evaluation of off-Site sampling data collected to date suggests that additional off-Site sampling is needed to achieve delineation for PCDD/Fs in a few locations. The proposed sampling program has three elements. Each of these is described in more detail below.

3.1 Background samples

Sample sizes of the 2010 commercial/industrial and residential busy street background samples were limited because the goal of the study was to collect only enough data to develop a preliminary sense of whether concentrations of arsenic, PAHs and TCDD-TEQ were either greater than FDEP SCTLs or were different from the residential background samples collected in 2009. If the 2010 background samples suggested that commercial/industrial and residential busy street background concentrations exceed SCTLs, additional data collection may be warranted for one or more constituents to meet reasonable sample size requirements for more rigorous statistical comparisons.

The results of the 2010 pilot background program indicated exceedances of one or more default SCTLs are relatively common for PAHs and PCDD/Fs. Based on those

results Beazer proposes to collect additional samples at both residential busy street background areas and commercial/industrial background areas.

Beazer proposes to collect an additional 12 samples from commercial/industrial areas located more than a mile from the Site. Figure 3-1 presents three candidate background industrial areas. The 2010 commercial/industrial samples were collected from the industrial area along NE 23rd Avenue. Approximately equal numbers of samples (i.e., about four from each of the three background commercial/industrial areas) will be collected and analyzed for PAHs and PCDD/Fs to complete the background industrial dataset.

Beazer also proposes to collect an additional 10 samples from residential neighborhoods along busy streets that are located more than a mile from the Site. Areas proposed for collection of additional residential busy street samples are shown in Figure 3-1. Samples will be analyzed for PAHs and PCDD/Fs to complete the background residential busy street dataset.

3.2 Additional Samples South of the Site

The concentrations of arsenic and PAHs in the samples collected to the south of the Site were either below SCTLs or appeared consistent with or less than concentrations measured in residential busy street background samples. Additionally, the fingerprinting analysis provided very strong evidence that the dominant sources of PAHs in the samples to the south of the Site were not Site-related. Therefore, additional analysis of surface soils to the south of the Site for arsenic and PAHs is not proposed. However, TCDD-TEQ concentrations were above default residential SCTLs and, based on the data collected to date, also appeared to be higher than the residential busy street background data. For one sample (SS307) the fingerprinting analysis suggested that a source other than the Site was dominant. At the other two sampling locations (SS308 and SS309), the fingerprinting analysis did not provide strong evidence of the contribution of sources distinguishable from the Site. Based on these results, Beazer proposes to collect eight additional surface soil samples south of the Site. Four samples will be collected along NW 3rd Terrace and four samples along NW 2nd Street (Figure 3-2). The samples will be located within the ROW of each street 100, 200, 300 and 400 feet south of existing samples. The samples will be analyzed for PCDD/Fs. The analyses will be conducted in phases. The 100-foot samples (i.e., SS281 and SS285) will be analyzed first. If delineation criteria are met within a specific ROW, no other samples in that ROW will be analyzed. If delineation criteria are not met at the 100-foot sample, then the 200-foot sample will be analyzed. Analysis of successively more distant samples will continue until the delineation criteria are met or the most distant sample is analyzed, whichever comes first.

3.3 Additional Samples West of the Site

The 2010 samples collected to the west of the Site suggested that TCDD-TEQ concentrations in some of the western-most samples along some streets (NW 31st Lane, NW 30th Avenue and NW 27th Avenue) were greater than the SCTL (Figure 2-7). Further, the fingerprinting analysis did not indicate that samples along these streets had fingerprints clearly indicative of a non-Site source. Therefore, to complete delineation along these streets, Beazer proposes to collect eight additional samples (Figure 3-2) from the public ROWs along these three streets. Three samples will be collected on NW 31st Lane and two samples each on NW 30th Avenue and NW 27th Avenue (Figure 3-2). As with the sampling proposed to the south, the samples to the west will be spaced at approximate 100-foot intervals from the westernmost existing sample on each of the streets. On each street, the sample 100 feet west of existing westernmost sample will be analyzed for PCDD/Fs (i.e., SS272, SS275 and SS278). As with the samples to the south, the other samples and may be analyzed for PCDD/Fs based on the results of the initial analyses.

At this time, Beazer does not believe that any other off-Site sampling is necessary. Further sampling to the west, in the vicinity of NW 6th Street, should not be conducted until residential busy street background concentrations are characterized. When the existing samples along NW 6th Street that appear to be influenced by a source (or sources) other than the Site are excluded, the TCDD-TEQ concentrations in samples closest to NW 6th Street are similar to the TCDD-TEQ concentrations measured in the 2010 residential busy street background samples. This suggests that when a full background dataset is available, data from existing samples to the west of the Site may be sufficient to demonstrate delineation to Site-specific background concentrations.

Similarly, until a full background industrial dataset is available, additional sampling in the commercial/industrial areas to the east and north of the existing off-Site samples should not be conducted. Once the industrial background data are available, the need for further sampling in those areas can be assessed. Beazer also does not believe that additional samples should be collected between the Site boundary and the existing off-Site samples to the east at this time. Such samples, if needed, can be collected as part of the remedial design program.

4. Conclusions

This report summarizes and presents an evaluation of all the off-Site arsenic, PAH and PCDD/F data collected between 2008 and 2010 by Beazer in the vicinity of the Cabot Carbon/Koppers Site. These data collection efforts were undertaken by Beazer at the request of US EPA to delineate off-Site concentrations to FDEP delineation criteria.

The delineation criteria were assumed to be either FDEP default residential or default commercial/industrial SCTLs, or Site-specific background concentrations.

All three key constituents exhibited dramatic declines in concentration 100 feet of the boundary of the former Koppers Faciltiy. . On average, arsenic concentrations declined by nearly 100-fold, PAH concentrations declined by between 2- and 70-fold, depending upon off-Site direction, and PCDD/Fs had the greatest decline of over 100-fold.

Arsenic

The arsenic concentration at 25 of 27 off-Site samples was less than FDEP's default residential delineation criterion. The two samples that exceeded the default residential delineation criterion of 2.1 mg/kg were only slightly above the criterion (exceeded the criterion by less than 50%) and were far below the highest arsenic concentrations measured in either residential background or industrial background locations. These findings indicate that any potential off-Site arsenic impacts are not associated with unacceptable risks, that delineation criteria have been met, and that additional off-Site delineation of arsenic beyond the locations that have been sampled already is not required. Consequently, no additional off-Site sampling for arsenic is proposed.

PAHs

For PAHs, comparison of off-Site data to SCTLs indicated that most (16 of 19) off-Site samples to the north and west of the Site had PAH concentrations below the default residential delineation criterion. The composition of individual PAHs in the sample with the highest PAH concentration to the west of the Site (SS13 with a BaP-TE concentration of 545 ug/kg, more than five times higher than the default delineation criterion) was different from the PAH composition of on-Site samples indicating the source of the PAHs found at this location was not the Site. The other two sampling locations to the west of the Site that exceeded the default delineation criterion (SS06 and SS07 with BaP-TE concentrations of 280 and 110 ug/kg, respectively) had a PAH composition that is indistinguishable from the composition of PAHs found at the Site. Because the other sampling locations in the vicinity of these samples had PAH concentrations that were less than the default delineation criterion, the source of PAHs at this location was likely localized and not related to the Site.

Concentrations of PAHs in all off-Site soil samples to the east and south of the Site exceeded the default residential delineation criterion and two samples exceeded the default commercial/industrial delineation criterion. All of the off-Site samples to the east and south were located in areas where numerous potential sources of PAHs, not related to the Site, were likely to be present and subject to deposition of PAHs from a variety of sources including cars, trucks and other motorized vehicles. The presence of

these other sources of PAHs to the east and south of the Site may well be responsible for the exceedances of the SCTLs at those locations. This hypothesis is supported by the finding that PAH concentrations in off-Site soil samples to the east and south of the Site were consistent with or less than found in other comparable areas and neighborhoods of Gainesville.This conclusion is further supported by a statistical analysis that indicated the composition of PAHs in soils to the east and south of the Site was similar to the composition of PAHs in soils from background areas of Gainesville not affected by the Site and was different from the composition of PAHs measured in Site soils.

In summary, the evaluation of off-Site PAHs indicates that any potential off-Site impacts from PAHs are not associated with unacceptable risks, that delineation criteria have been met, and that additional off-Site delineation of PAHs beyond the locations that have been sampled already is not required. Consequently, no additional off-Site sampling for PAHs is proposed.

PCDD/Fs

For PCDD/Fs, comparison of off-Site data to SCTLs indicated that approximately three quarters of the samples collected in the residential areas to the west of the Site as well as the three samples to the south of the Site exceeded FDEP's default residential delineation criterion. However, all of the samples to the south of the Site and most of the samples to the east and north of the Site had TCDD-TEQ concentration less than the FDEP default commercial industrial delineation criterion. TCDD-TEQ concentrations in all off-Site samples were below US EPA's current residential PRG, were below US EPA's current commercial industrial PRGs, were below US EPA's proposed interim residential PRG, were below US EPA's proposed commercial industrial PRG, and were below the Site-specific residential SCTL developed by ARCADIS (2010c). If any of US EPA's existing or proposed PRGs for PCDD/Fs were used as the delineation criteria in lieu of FDEP's SCTLs, all off-Site soils, even those within 100 feet of the Site, would meet such PCDD/F delineation criteria and additional delineation would not be required. When the comparisons of TCDD-TEQ concentrations to available benchmarks are viewed as a whole, they indicate that TCDD-TEQ concentrations measured in soils collected from 100 feet and further from the Site do not pose an unacceptable risk to residents.

Most off-Site samples to the west had higher TCDD-TEQ concentrations than background residential samples; however, the range of TCDD-TEQ concentrations in off-Site samples near NW 6th Street was similar to the concentrations measured in residential busy street background samples. This finding suggests that PCDD/F concentrations in the vicinity of NW 6th Street may be similar to those found along other streets in Gainesville that are similar in nature to NW 6th Street. TCDD-TEQ

concentrations to the south, east and north of the Site were similar to background TCDD-TEQ concentrations measured in commercial/industrial areas of Gainesville.

Results of the PCDD/F fingerprinting analysis provide evidence that alternate sources of PCDD/Fs exist near the Site. A cluster of at least seven samples (and perhaps more based on the results of the PCA and some of the congener and homologue ratios) to the west of the Site in the vicinity of NW 6th Street and NW 28th Avenue were shown to have a different fingerprint characterized by a higher proportion of lower chlorinated dioxins (TCDD, PeCDD, and HxCDD). This source may also be influencing the composition of other samples along NW 28th Avenue (SS63, SS230 and SS238). A similar congener pattern was noted in off-Site samples SS01, SS302 and SS303 to the north and east of the Site, particularly with respect to TCDD and 1,2,3,7,8-PeCDD ratios indicating the existence of one or more sources of PCDD/Fs unrelated to the Site to the northeast. PCA results indicate that other samples, SS81 located west of the Site on NW 26th Avenue and SS300 located north of the Site, and SS307 located south of the Site have PCDD/F compositions that may also be influenced by other PCDD/F sources not related to historic Site activities.

Lastly, TCDD-TEQ in five subsurface samples (6 to 24-inch depth) collected from west of the Site were less than FDEP's default residential delineation criterion and were substantially lower than the surface soil sample taken at the same location. These results are consistent with the hypothesis that any potential impacts to soils to the west of the Site, if such impacts existed, would most likely have occurred via transport in the air and not via a subsurface transport pathway. Based on these findings, further analysis of subsurface soils is not necessary.

Recommended Additional Sampling

Based on the evaluation of off-Site data, this report recommends collection of additional surface soil samples in public rights of way along NW 31st Lane (three samples), NW 30th Avenue (two samples,) and NW 27th Avenue (two samples) to the west of the Site. The report recommends collection of additional surface soil samples in public rights of way along NW 3rd Terrace and NW 2nd Street (four samples from each) to the south of the Site. The off-Site samples should be analyzed for PCDD/Fs. The report also recommends collection of 12 additional background samples from commercial/industrial areas of Gainesville and 10 additional background samples from residential busy streets. The background samples should be analyzed PAHs and PCDD/Fs.

Conclusion

Lastly, it is important to realize that the residential busy street background samples, the samples collected 100 feet to the west of the Site in 2009 and the off-Site samples collected in 2010 to the north, east and south were analyzed for all three key constituents (i.e., arsenic, PAHs and PCDD/Fs). Knowing that the default FDEP residential SCTLs are based upon an allowable excess lifetime cancer risk of $1x10^{-6}$, comparison of the concentrations of each of the constituents to their respective SCTL allows estimation of the potential risk associated with those three constituents in each soil sample (using conservative, FDEP default assumptions). For example, if BaP-TE exceeds its SCTL by a factor of two in a sample, the associated potential cancer risk, based on FDEP's default assumptions used to derive the SCTL is estimated as two times one in one million, or $2x10^{-6}$. Using this approach the potential risks associated with residential busy street samples can then be compared to the potential risks associated with concentrations in off-Site soil samples. When conducting such a comparison using FDEP default SCTLs it is critical to keep in mind that the default SCTLs assume a stringent allowable risk level and are derived using: deterministic calculations; overestimates of likely bioavailability; a combination of conservative exposure parameters that overestimate exposure for most people; and, in the case of TCDD-TEQ, a cancer slope factor that substantially overestimates potential risk and is subject to considerable scientific criticism. In other words, exceedance of a FDEP default SCTL does not, by itself, indicate a potentially unacceptable human health risk exists.

Nevertheless when such a comparison is conducted, the average potential excess lifetime cancer risk associated with background concentrations of arsenic, PAHs and PCDD/Fs for a resident living near a busy street is about 14 times higher than FDEP's allowable risk limit of $1x10^{-6}$. Moreover, the average potential excess lifetime cancer risk associated with samples 100 feet west of the Site is about four times lower than the average potential excess lifetime cancer risk associated with background samples from residential busy streets. Similarly, the overall potential cancer risk combined from arsenic, PAHs and PCDD/Fs associated with off-Site samples to the south is consistent with or less than that found in other areas of Gainesville with comparable land use. Thus, based on a simple comparison of surface soil concentrations to FDEP default SCTLs, potential risks in the vicinity of the Site appear to be similar to or lower than the potential risks associated with other areas of Gainesville.

5. References

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ARCADIS

Table 2-1. Summary Statistics: Arsenic (mg/kg) in Surface Soil (0-6")
Cabot Carbon/Koppers Superfund Site

Location	Group (Date)	N	Min.	Max.	Mean (Std.err.)
Background	BGI (2010)	3	0.77	13.4	5.06 (4.17)
	BGR (2009)	18	0.15	14.5	1.13 (0.79)
	BGRS (2010)	5	0.42	1.15	0.82 (0.15)
Off-Site	OSN & OSE (2010)	7	0.50	2.07	1.31 (0.21)
	OSS (2010)	3	1.03	3.14	1.86 (0.65)
	OSW (2009)	17	0.10	3.00	0.92 (0.21)
	OSWF (2009)	5	3.43	15.8	7.51 (2.39)
Site	(2006)	103	0.45	2160	89.5 (23.6)

Notes: BGI = Industrial Background; BGR = Residential Background; BGRS = Residential Busy Street Background; OS = Off-Site; E = East; S = South; W = West; WF = Western Fence Line.

ARCADIS

Table 2-2. Summary Statistics: BaP-TE (µg/kg) in Surface Soil (0-6")
Cabot Carbon/Koppers Superfund Site

Location	Group (Date)	N	Min.	Max.	Mean (Std.err.)
Background	BGI (2010)	3	520	1803	1207 (373)
	BGR (2009)	18	5	146	32 (9)
	BGRS (2010)	5	161	2689	1293 (520)
Off-Site	OSN & OSE (2010)	7	72	5502	983 (755)
	OSS (2010)	3	154	8733	3063 (2835)
	OSW (2009)	17	15	545	93 (32)
	OSWF (2009)	5	553	6360	3360 (946)
Site	(2006)	103	2.6	83947	6452 (1161)

Notes: BGI = Industrial Background; BGR = Residential Background; BGRS = Residential Busy Street Background; OS = Off-Site; E = East; S = South; W = West; WF = Western Fence Line.

ARCADIS

Table 2-3. Summary Statistics of Benz(a)anthracene, Benzo(a)Pyrene, Fluoranthene, and Pyrene Ratios
Cabot Carbon/Koppers Superfund Site

Location	Group	Statistic	N	Min	Mean	Standard Deviation	Max	Sample Id	%N > 1
Site		FL/Py	103	0.4	0.9	0.2	1.4	SS082	31%
		BaA/BaP		0.5	0.9	0.3	2.6	SS082	22%
Background	BGI	FL/Py	3	1.2	1.3	0.1	1.5	SS311	100%
		BaA/BaP		0.8	0.8	0.1	0.9	SS312	0%
	BGRS	FL/Py	5	1.2	1.2	0.0	1.3	SS315	100%
		BaA/BaP		0.7	0.8	0.1	0.9	SS315	0%
	BGR	FL/ Py	18	1.0	1.1	0.1	1.4	SS41	100%
		BaA/BaP		0.6	0.8	0.1	0.9	SS38	0%
Off-Site	West	FL/Py	17	0.4	0.9	0.3	1.2	SS10	47%
		BaA/BaP		0.4	0.8	0.3	1.6	SS13	12%
	South	FL/Py	3	1.2	1.3	0.1	1.3	SS307	100%
		BaA/BaP		0.7	0.8	0.0	0.8	SS307	0%
	East	FL/Py	5	1.1	1.3	0.1	1.4	SS302	100%
		BaA/BaP		0.7	0.8	0.0	0.8	SS302	0%
	North	FL/Py	2	0.9	1.0	0.1	1.0	SS300	50%
		BaA/BaP		0.6	0.9	0.3	1.1	SS300	50%

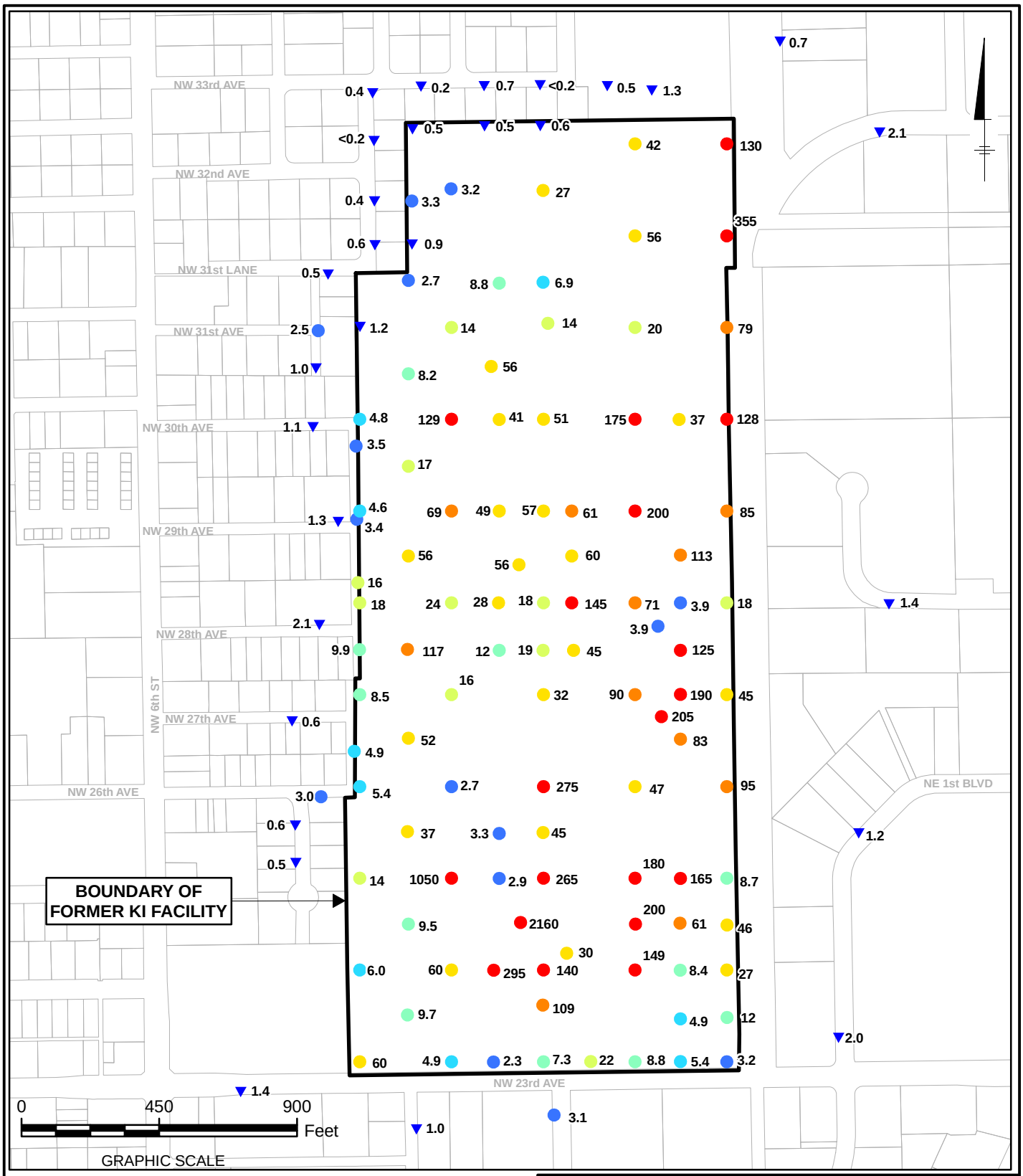
Notes: BGI = Industrial Background; BGR = Residential Background; BGRS = Residential Busy Street Background.

ARCADIS

Table 2-4. Summary Statistics: TCDD-TEQ (ng/kg) in Surface Soil (0-6")
Cabot Carbon/Koppers Superfund Site

Location	Group (Date)	N	Min.	Max.	Mean (Std.err.)
Background	BGI (2010)	3	1.53	30.2	11.4 (9.4)
	BGR (2009)	18	0.17	6.6	1.5 (0.4)
	BGRS (2010)	5	0.97	9.98	5.3 (1.9)
Off-Site	OSN & OSE (2010)	7	4.16	37.88	18.4 (5.1)
	OSS (2010)	3	14.09	25.94	18.2 (3.9)
	OSW (2010)	52	3.44	60.0	13.9 (1.5)
	OSW (2009, 2010)	89	0.68	69.7	15.2 (1.3)
	OSWF (2009)	5	46.01	1301.6	572 (220)
Site	(2006)	48	4.60	92704	4177 (2197)

Notes: BGI = Industrial Background; BGR = Residential Background; BGRS = Residential Busy Street Background; OS = Off-Site; E = East; S = South; W = West; WF = Western Fence Line.



LEGEND:

ARSENIC (mg/kg)

- ▼ ≤ 2.1
- 2.1 - 4
- 4 - 7
- 7 - 12
- 12 - 25
- 25 - 60
- 60 - 120
- > 120

NOTES:

1. FIELD DUPLICATES AVERAGED AT EACH LOCATION.
2. 0-3" AND 3-6" DEPTHS AVERAGED FOR SITE SAMPLES.

CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FL

OFF-SITE DATA SUMMARY AND FINGERPRINTING EVALUATION

ARSENIC CONCENTRATIONS SURFACE SOILS 2006 - 2010 RESULTS

ARCADIS

FIGURE
ES 1

CITY: SYR DIV/GROUP: IM DB: KES LD: PIC: PM: TM: TR:
Project (Project #)
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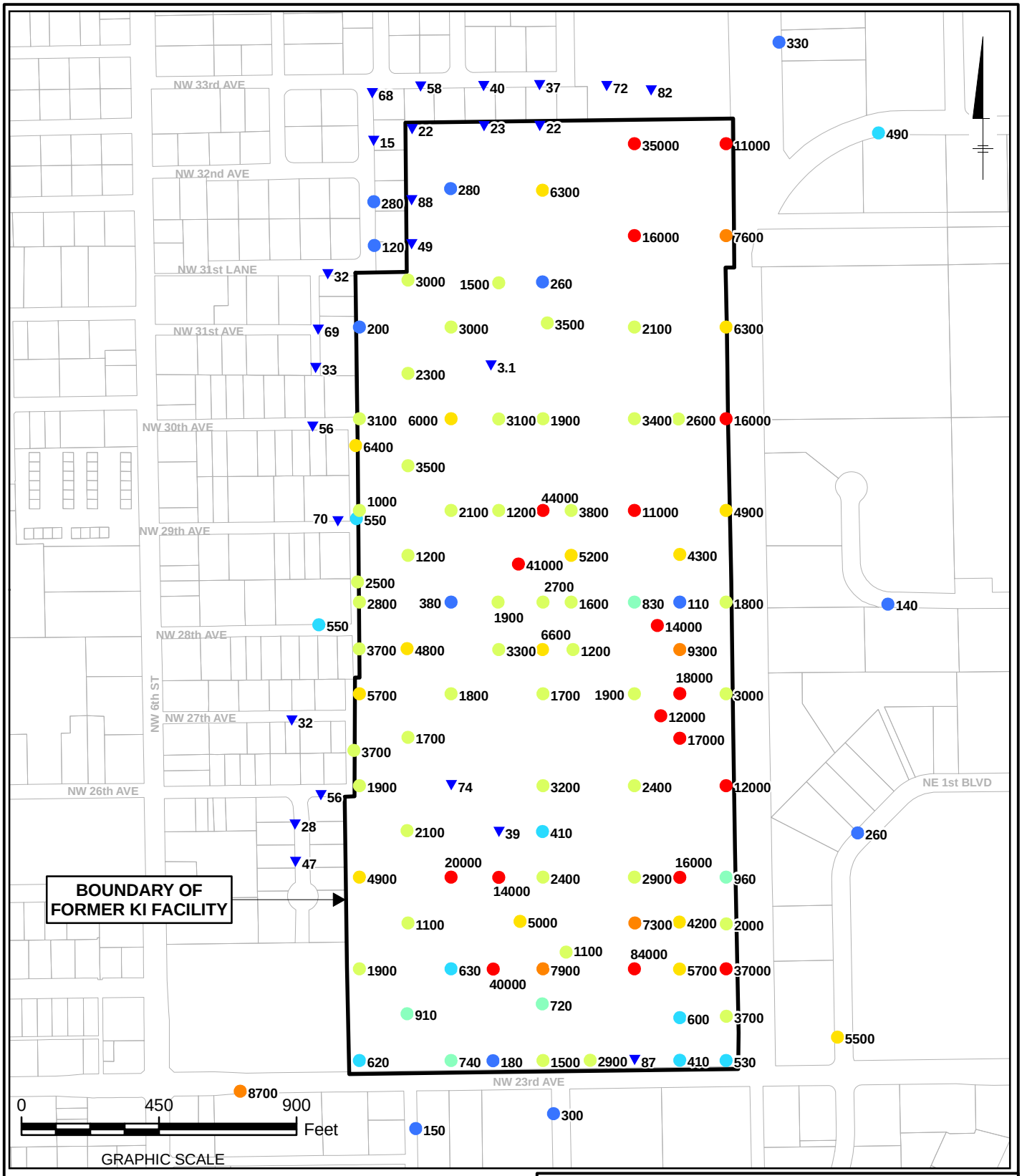


LEGEND:

BaP-TE (µg/kg)

- ▼ ≤ 100
- ● 100 - 400
- ● 400 - 700
- ● 700 - 1,000
- ● 1,000 - 4,000
- ● 4,000 - 7,000
- ● 7,000 - 10,000
- ● >10,000

NOTES:

1. FIELD DUPLICATES AVERAGED AT EACH LOCATION.
2. 0-3" AND 3-6" DEPTHS AVERAGED FOR SITE SAMPLES.

CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FL

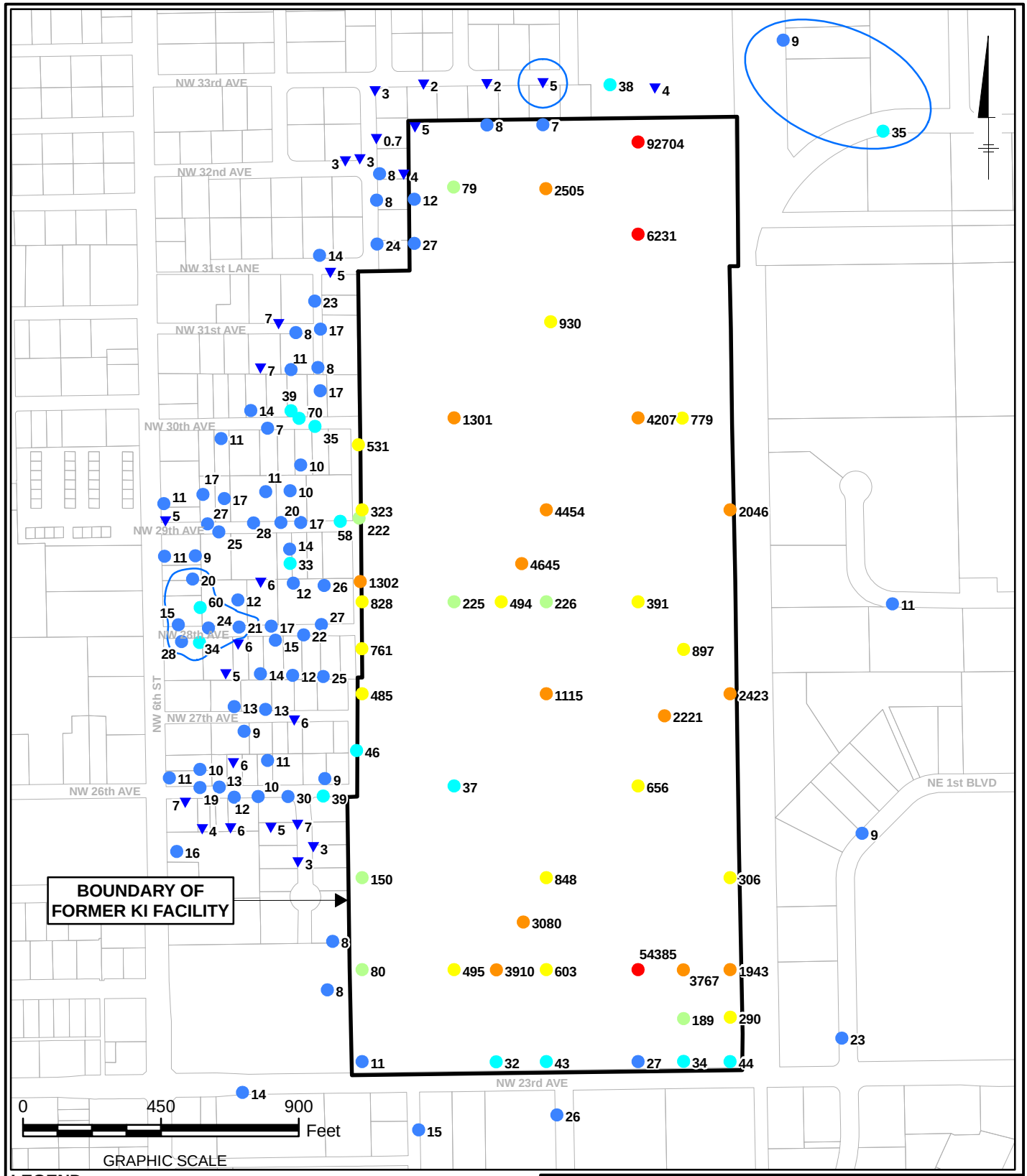
OFF-SITE DATA SUMMARY AND FINGERPRINTING EVALUATION

BaP-TE CONCENTRATIONS SURFACE SOILS 2006-2010 RESULTS

ARCADIS

FIGURE
ES-2

CITY: SYR DIV/GROUP: IM DB: KES LD: PIC: PM: TM: TR:
Project (Project #)
Q:\Beazer\Gainesville_FL\BCCZ\mxd\BaPTEResults_ES.mxd - 3/24/2011 @ 10:35:30 AM



LEGEND:

TCDD - TEQ (µg/kg)

- ▼ ≤ 7
- ● 7 - 30
- ● 30 - 72
- ● 72 - 250
- ● 250 - 1,000
- ● 1,000 - 5,000
- ● > 5,000

CLUSTERS INDICATING AN EFFECT OF OTHER SOURCES ON THESE SAMPLES AND POSSIBLY OTHER SAMPLES IN THEIR VICINITY

NOTES:

1. FIELD DUPLICATES AVERAGED AT EACH LOCATION.
2. 0-3" AND 3-6" DEPTHS AVERAGED FOR SITE SAMPLES.

CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FL

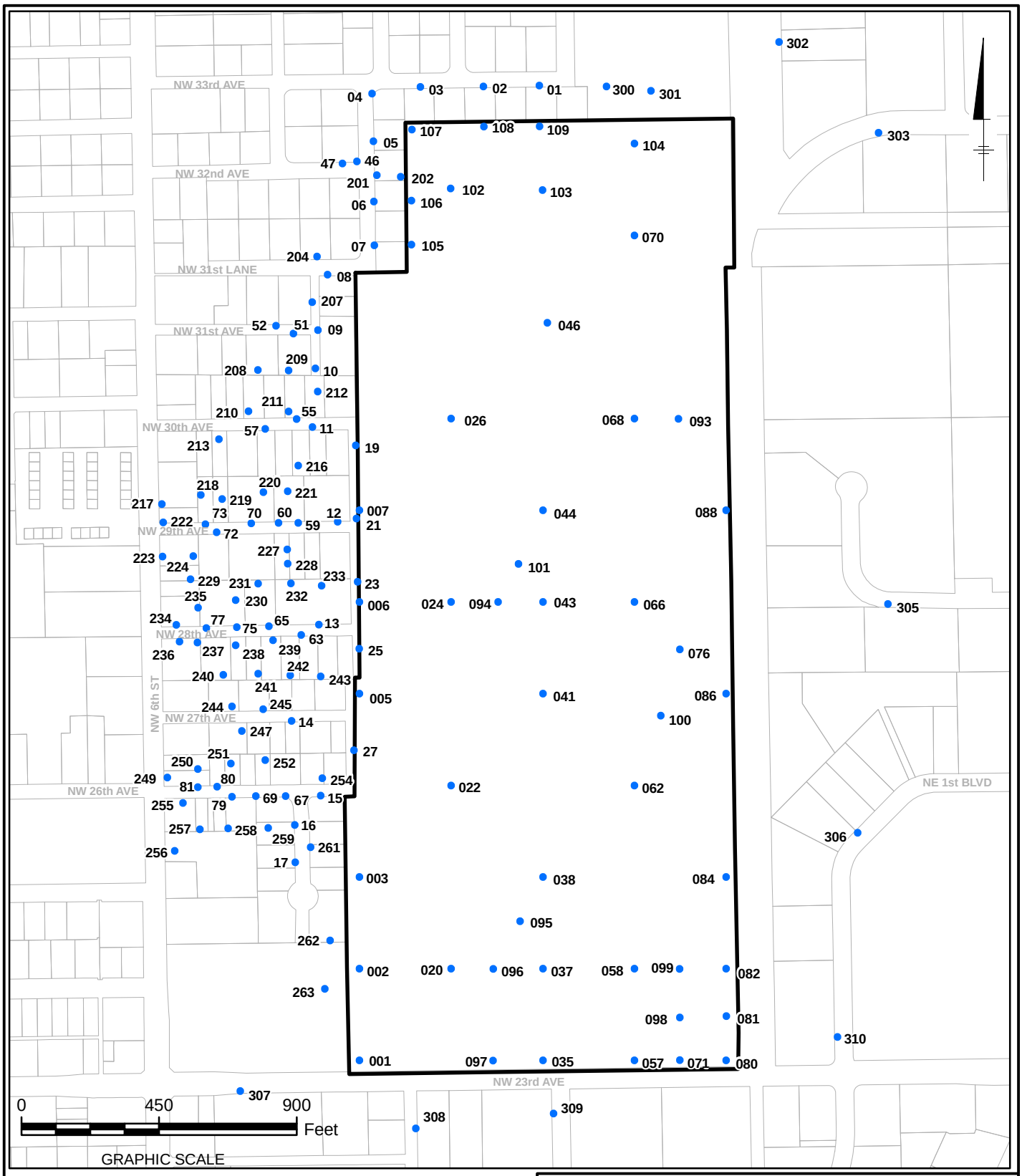
OFF-SITE DATA SUMMARY AND FINGERPRINTING EVALUATION

TCDD - TEQ CONCENTRATIONS SURFACE SOILS 2006 - 2010 RESULTS

ARCADIS

FIGURE
ES 3

CITY: SYR DIV/GROUP: IM DB: KES LD: PIC: PM: TM: TR:
Project (Project #)
Q:\Beazer\Gainesville_FL\BCC2\mxd\TCDD_TEQ_ConcSurfaceSoils_ES.mxd - 3/31/2011 @ 1:21:06 PM



LEGEND:

- SOIL SAMPLE LOCATION

NOTE:

1. ACTUAL SAMPLE IDENTIFICATION IS PRECEDED BY SS (E.G. 307 = SS307)

CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FL

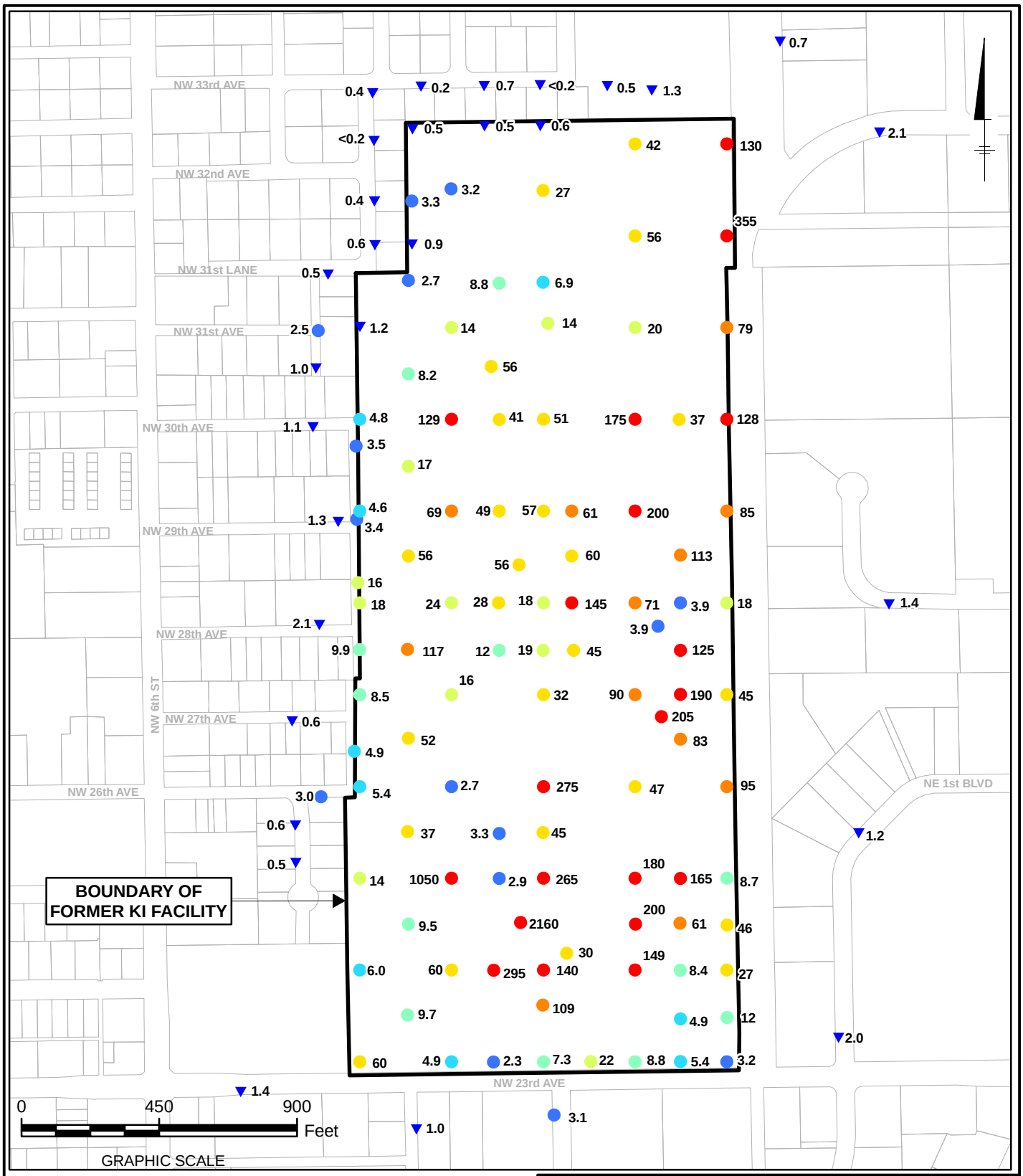
OFF-SITE DATA SUMMARY AND FINGERPRINTING EVALUATION

SOIL SAMPLE LOCATION MAP

ARCADIS

FIGURE
2-1

CITY: SYR DIV/GROUP: IM DB: KES LD: PIC: PM: TM: TR:
Project (Project #)
Q:\Beazer\Gainesville_FL\BCCZ\mxd\SampleLocs.mxd - 3/24/2011 @ 10:15:22 AM



LEGEND:

ARSENIC (mg/kg)

- ▼ ≤ 2.1
- 2.1 - 4
- 4 - 7
- 7 - 12
- 12 - 25
- 25 - 60
- 60 - 120
- > 120

NOTES:

1. FIELD DUPLICATES AVERAGED AT EACH LOCATION.
2. 0-3" AND 3-6" DEPTHS AVERAGED FOR SITE SAMPLES.

CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FL

OFF-SITE DATA SUMMARY AND FINGERPRINTING EVALUATION

ARSENIC CONCENTRATIONS SURFACE SOILS 2006 - 2010 RESULTS

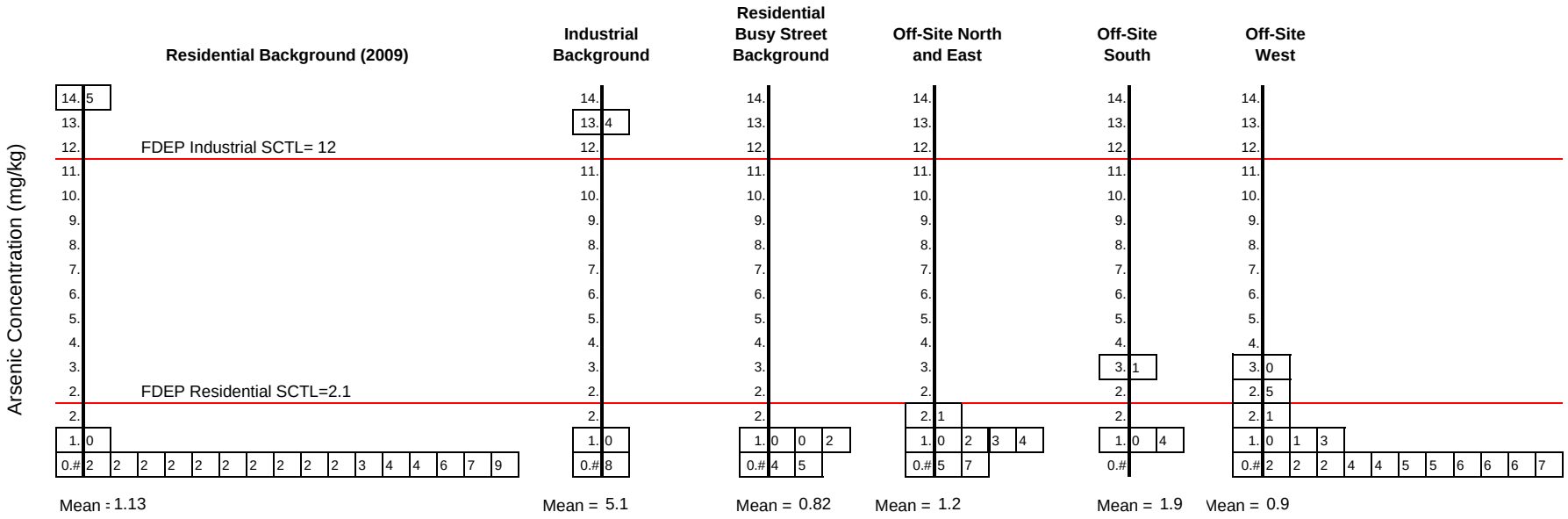
ARCADIS

FIGURE 2-2

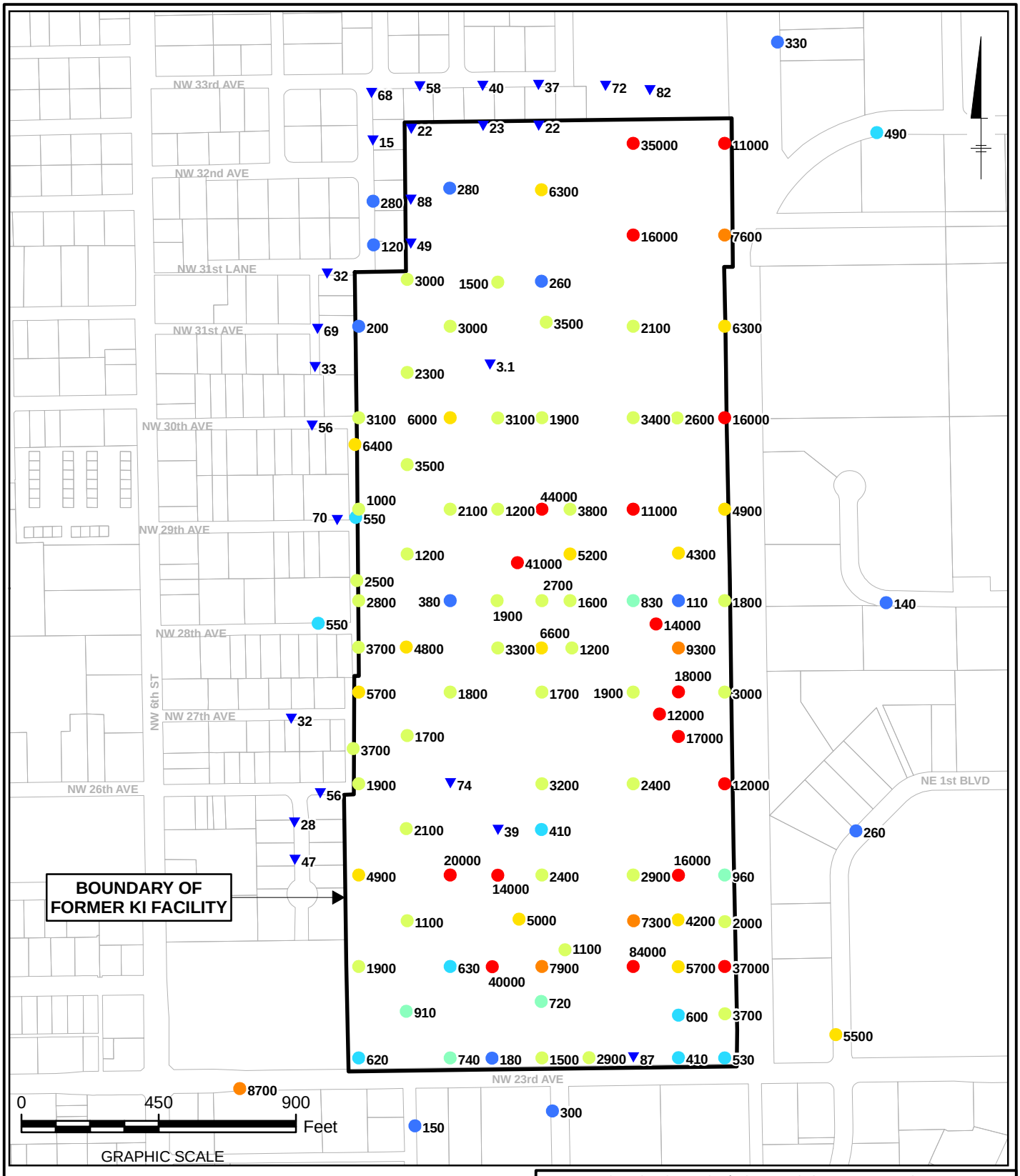
CITY: SYR DIV/GROUP: IM DB: KES LD: PIC: PM: TM: TR:
Project (Project #)
Q:\Beazer\Gainesville_FL\BCCZ\mxd\ArsenicResults.mxd - 3/24/2011 @ 10:25:07 AM

ARCADIS

Figure 2-3
Stem and Leaf Plots of Arsenic Concentrations
Cabot Carbon/Koppers Superfund Site



Note: The vertical axis reflects the grouping of data within intervals. Each sample concentration within an interval is detailed in the boxes next to the interval. FDEP industrial and residential SCTLs are shown as horizontal red lines. All boxes below the lines represent samples that are below the SCTL.



LEGEND:

BaP-TE (µg/kg)

- ▼ ≤ 100
- ● 100 - 400
- ● 400 - 700
- ● 700 - 1,000
- ● 1,000 - 4,000
- ● 4,000 - 7,000
- ● 7,000 - 10,000
- ● >10,000

NOTES:

1. FIELD DUPLICATES AVERAGED AT EACH LOCATION.
2. 0-3" AND 3-6" DEPTHS AVERAGED FOR SITE SAMPLES.

CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FL

OFF-SITE DATA SUMMARY AND FINGERPRINTING EVALUATION

BaP-TE CONCENTRATIONS SURFACE SOILS 2006-2010 RESULTS

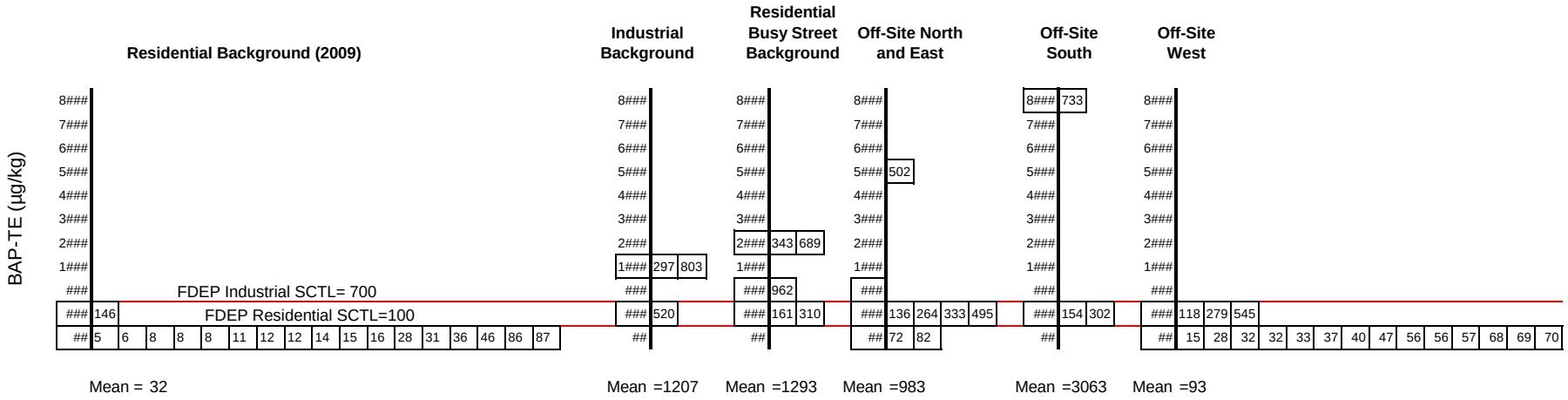
ARCADIS

FIGURE
2-4

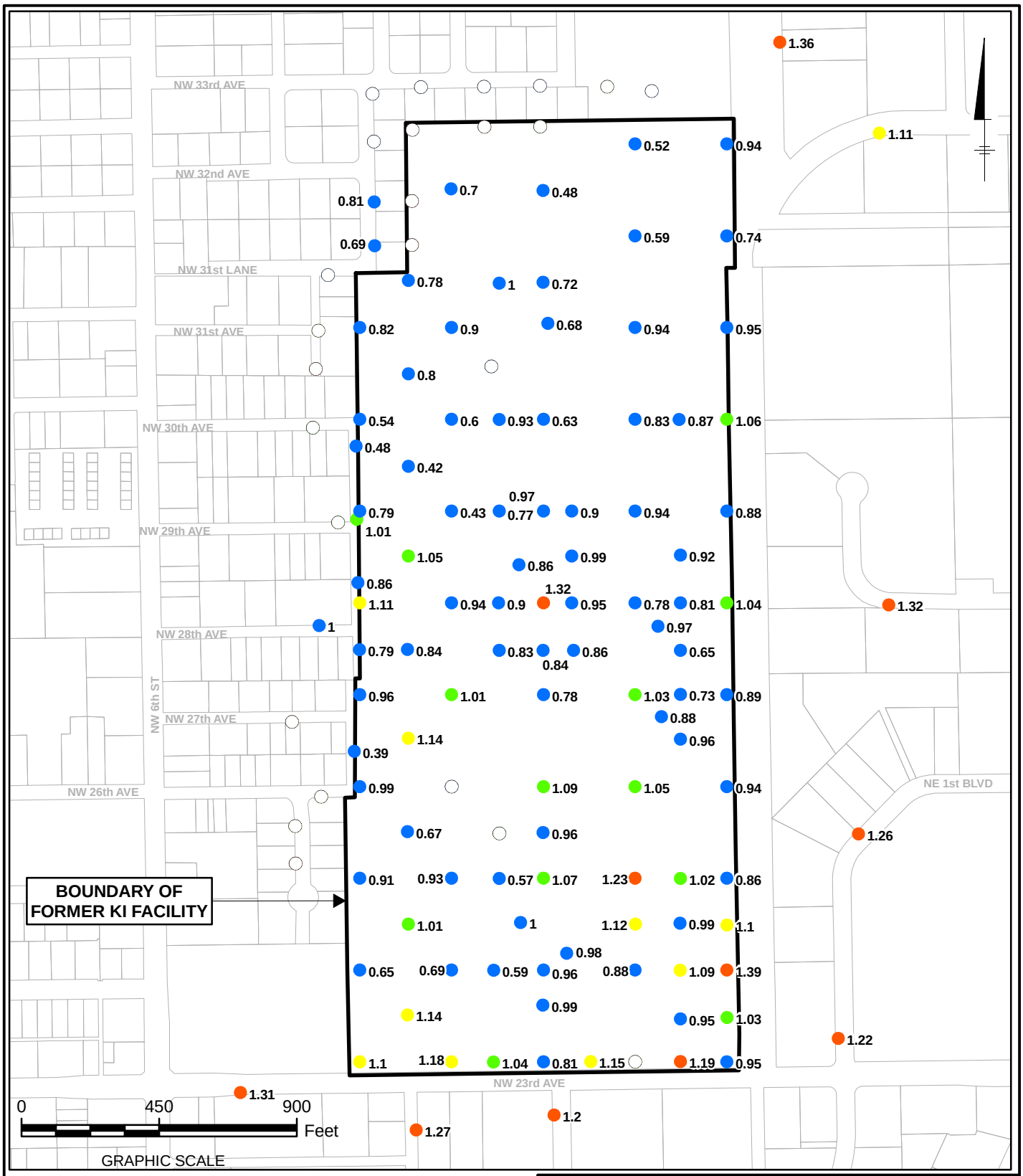
CITY: SYR DIV/GROUP: IM DB: KES LD: PIC: PM: TM: TR:
Project (Project #)
Q:\Beazer\Gainesville_FL\BCCZ\mxd\BaPTEResults.mxd - 3/24/2011 @ 10:35:15 AM

ARCADIS

Figure 2-5
Stem and Leaf Plots of BaP-TE Concentrations
Cabot Carbon/Koppers Superfund Site



Note: The vertical axis reflects the grouping of data within intervals. Each sample concentration within an interval is detailed in the boxes next to the interval. FDEP industrial and residential SCTLs are shown as horizontal red lines. All boxes below the lines represent samples that are below the SCTL.



LEGEND:

- ○ BaP-TE RESULT < 100 µg/kg

FLUORANTHENE/PYRENE

- ● ≤ 1.0
- ● 1.0 - 1.09
- ● 1.1 - 1.19
- ● > 1.2

NOTES:

1. FIELD DUPLICATES AVERAGED AT EACH LOCATION.
2. 0-3" AND 3-6" DEPTHS AVERAGED FOR SITE SAMPLES.

CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FL

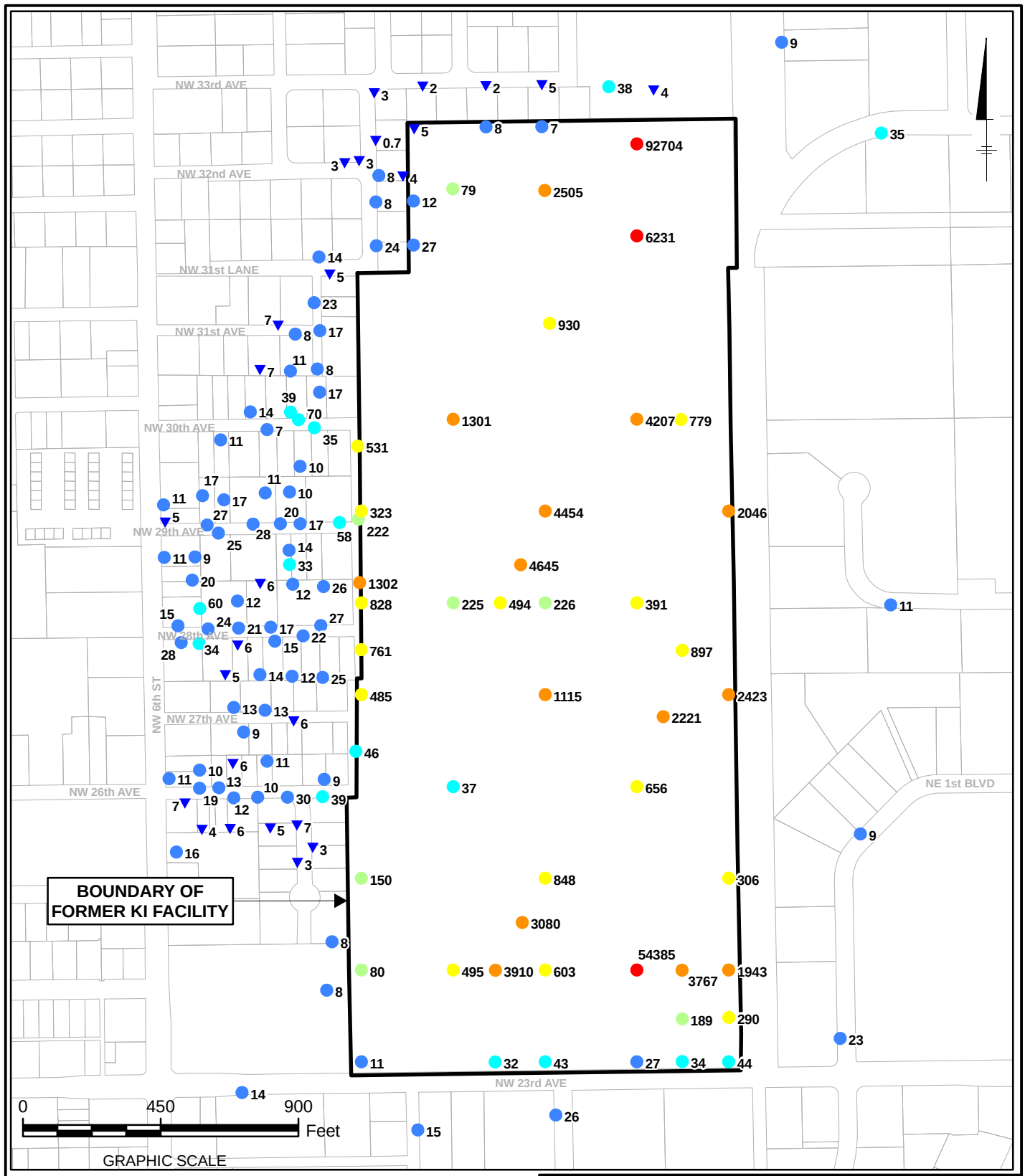
OFF-SITE DATA SUMMARY AND FINGERPRINTING EVALUATION

FLUORANTHENE/PYRENE RATIO PLOT

ARCADIS

FIGURE
2-6

CITY: SYR DIV/GROUP: IM DB: KES LD: PIC: PM: TM: TR:
Project (Project #)
Q:\Beazer\Gainesville_FL\BCCZ\mxd\Fluoranthene_vs_Pyrene.mxd - 3/24/2011 @ 11:40:43 AM



LEGEND:

TCDD - TEQ (µg/kg)

- ▼ ≤ 7
- ● 7 - 30
- ● 30 - 72
- ● 72 - 250
- ● 250 - 1,000
- ● 1,000 - 5,000
- ● > 5,000

NOTES:

1. FIELD DUPLICATES AVERAGED AT EACH LOCATION.
2. 0-3" AND 3-6" DEPTHS AVERAGED FOR SITE SAMPLES.

CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FL

OFF-SITE DATA SUMMARY AND FINGERPRINTING EVALUATION

TCDD - TEQ CONCENTRATIONS SURFACE SOILS 2006 - 2010 RESULTS

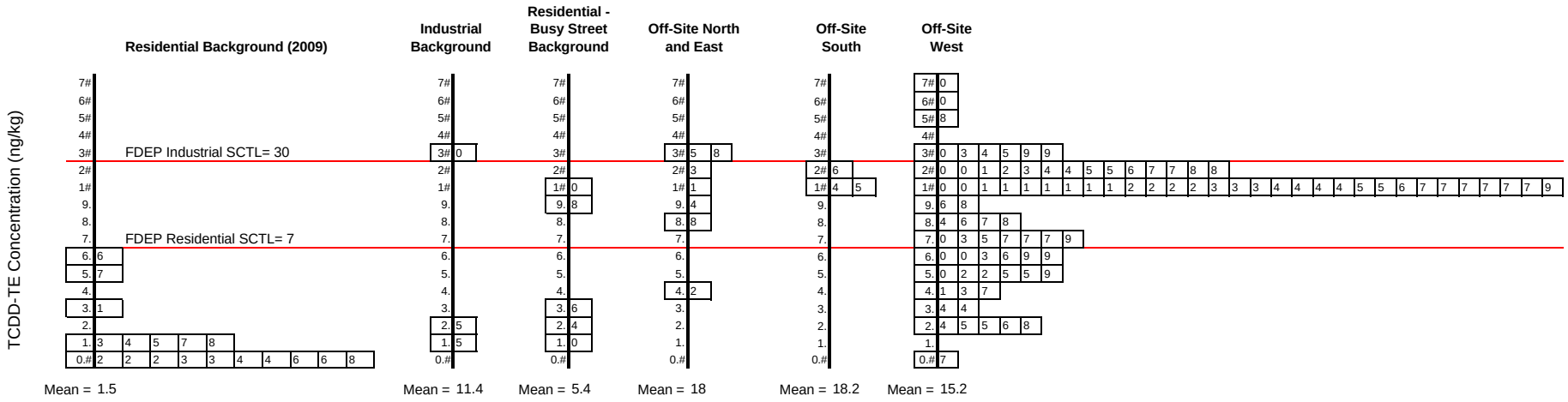
ARCADIS

FIGURE 2-7

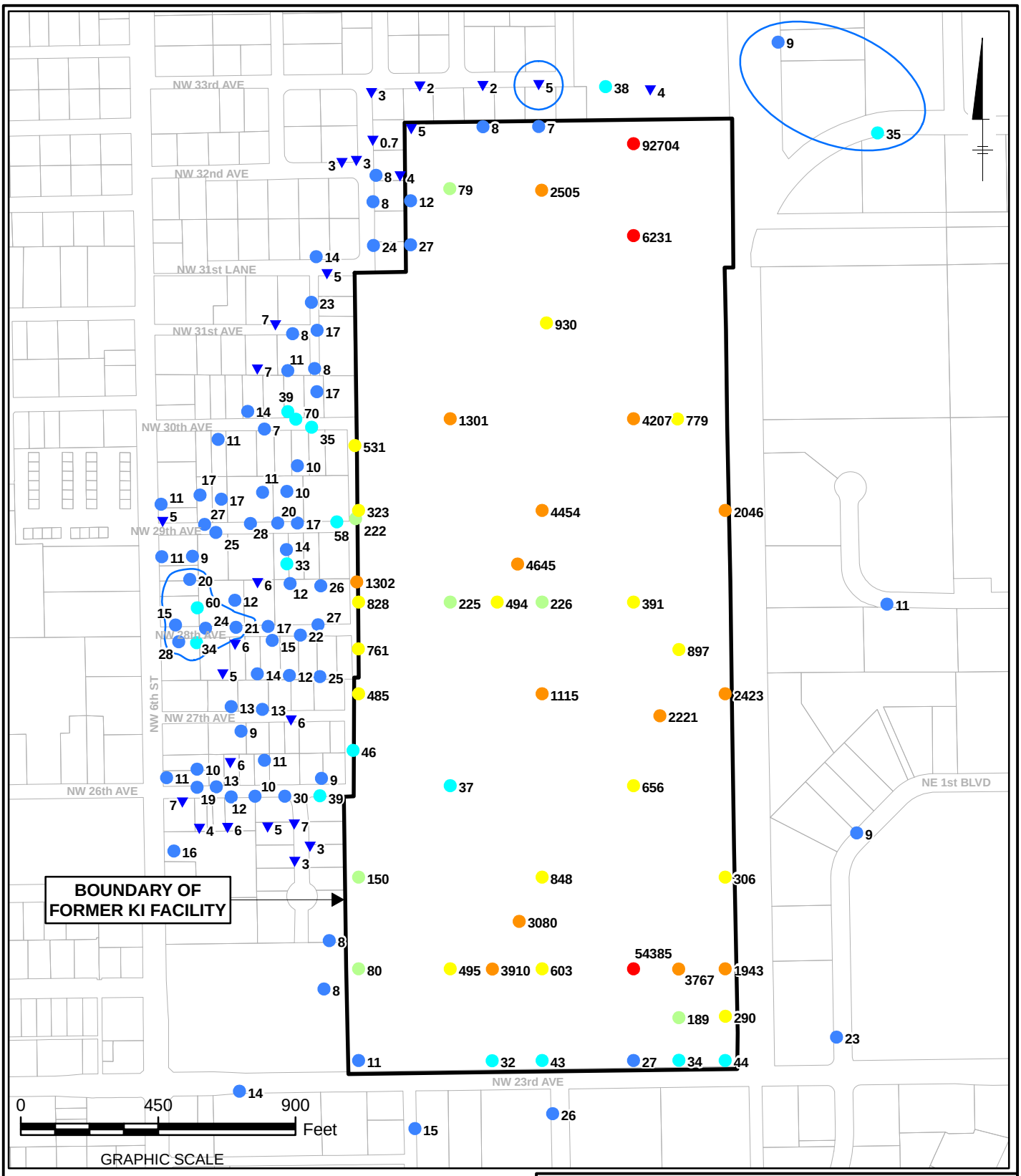
CITY: SYR DIV/GROUP: IM DB: KES LD: PIC: PM: TM: TR:
Project (Project #)
Q:\Beazer\Gainesville_FL\BCC2\mxd\TCDD_TEQ_ConcSurfaceSoils.mxd - 3/24/2011 @ 10:39:11 AM

ARCADIS

Figure 2-8
Stem and Leaf Plots of TCDD-TEQ Concentrations
Cabot Carbon/Koppers Superfund Site



Note: The vertical axis reflects the grouping of data within intervals. Each sample concentration within an interval is detailed in the boxes next to the interval. FDEP industrial and residential SCTLs are shown as horizontal red lines. All boxes below the lines represent samples that are below the SCTL.



LEGEND:

TCDD - TEQ (µg/kg)

- ▼ ≤ 7
- ● 7 - 30
- ● 30 - 72
- ● 72 - 250
- ● 250 - 1,000
- ● 1,000 - 5,000
- ● > 5,000
- ○ CLUSTERS INDICATING AN EFFECT OF OTHER SOURCES ON THESE SAMPLES AND POSSIBLY OTHER SAMPLES IN THEIR VICINITY

NOTES:

1. FIELD DUPLICATES AVERAGED AT EACH LOCATION.
2. 0-3" AND 3-6" DEPTHS AVERAGED FOR SITE SAMPLES.

CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FL

OFF-SITE DATA SUMMARY AND FINGERPRINTING EVALUATION

TCDD - TEQ AND SELECT SAMPLES WITH DISTINCT FINGERPRINT

ARCADIS

FIGURE 2-9

CITY: SYR DIV/GROUP: IM DB: KES LD: PIC: PM: TM: TR:
Project (Project #)
Q:\Beazer\Gainesville_FL\BCCZ\mxd\TCDD_TEQ_and_additional_Samples.mxd - 3/31/2011 @ 1:22:44 PM

Figure 2-10
Average Congener TCDD-TEQ Contributions by Sample Location Group
Cabot Carbon/Koppers Superfund Site

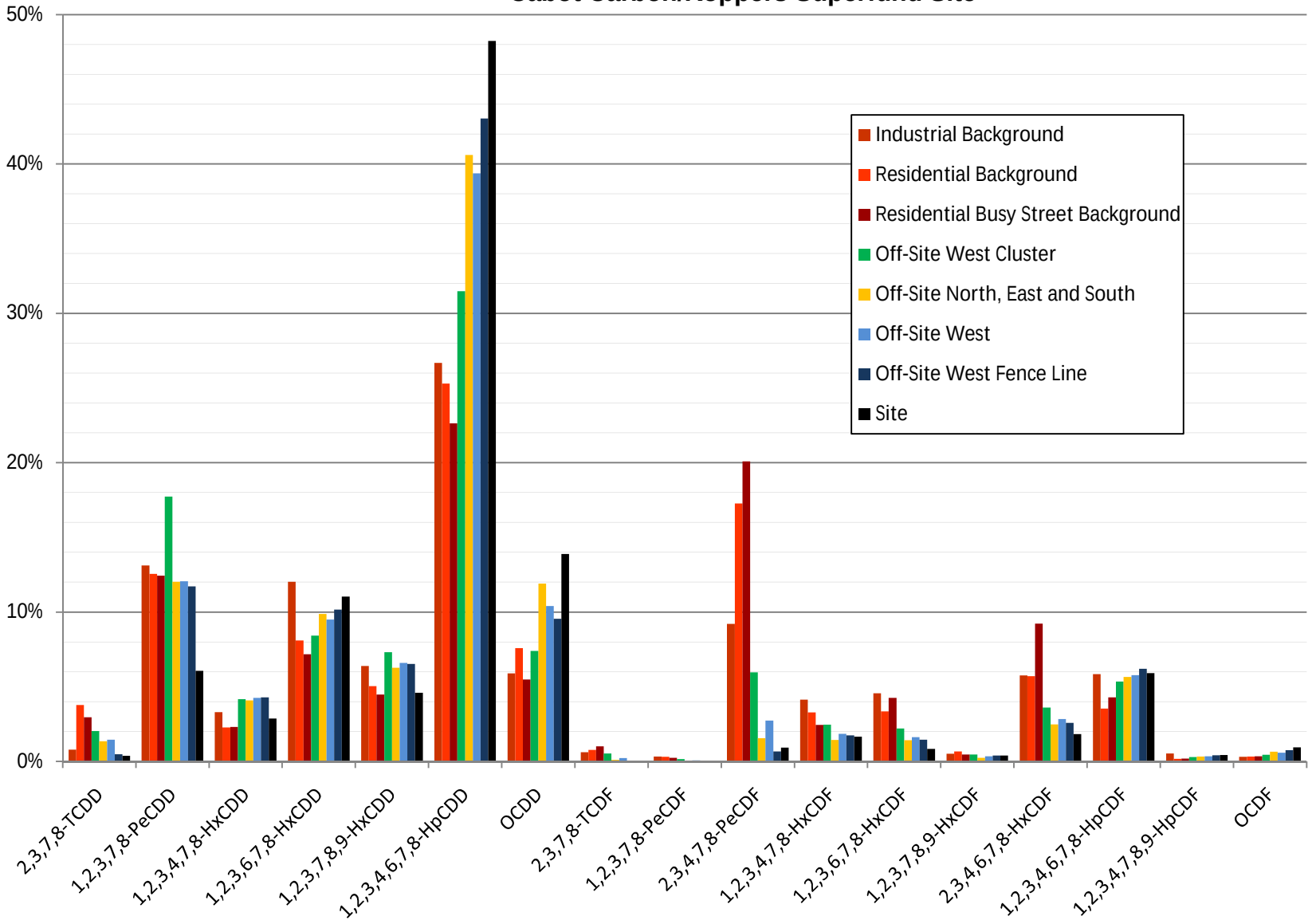
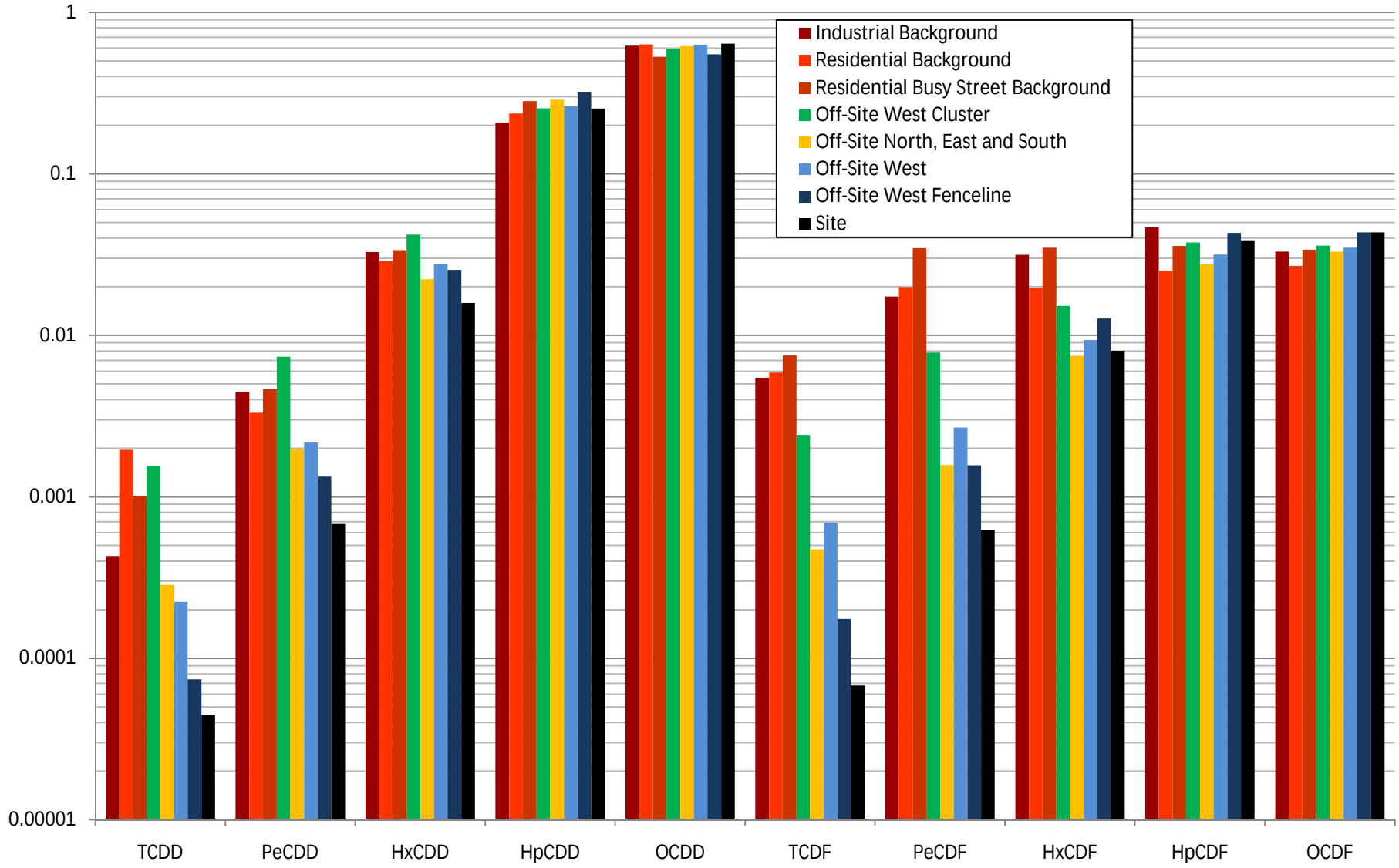
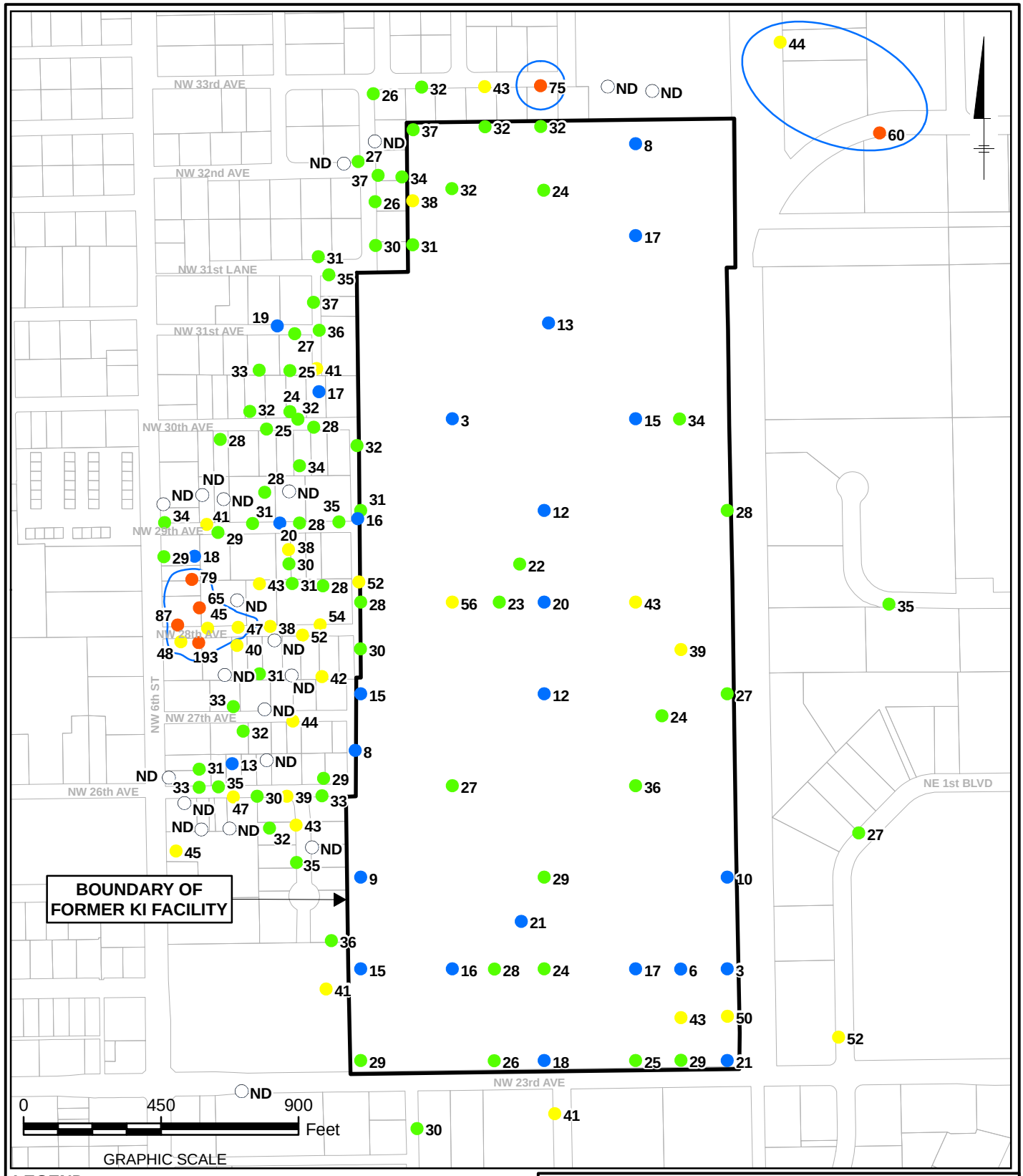


Figure 2-11
Average Homologue Group Proportions by Sample Location Group
Cabot Carbon/Koppers Superfund Site





LEGEND:

1,2,3,7,8-PeCDD/OCDD (x 10^{-5})

- ≤ 21
- 22 - 37
- 38 - 59
- > 60

ND 1,2,3,7,8-PeCDD NOT DETECTED

CLUSTERS INDICATING AN EFFECT OF OTHER SOURCES ON THESE SAMPLES AND POSSIBLY OTHER SAMPLES IN THEIR VICINITY

NOTES:

1. FIELD DUPLICATES AVERAGED AT EACH LOCATION.
2. 0-3" AND 3-6" DEPTHS AVERAGED FOR SITE SAMPLES.

CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FL

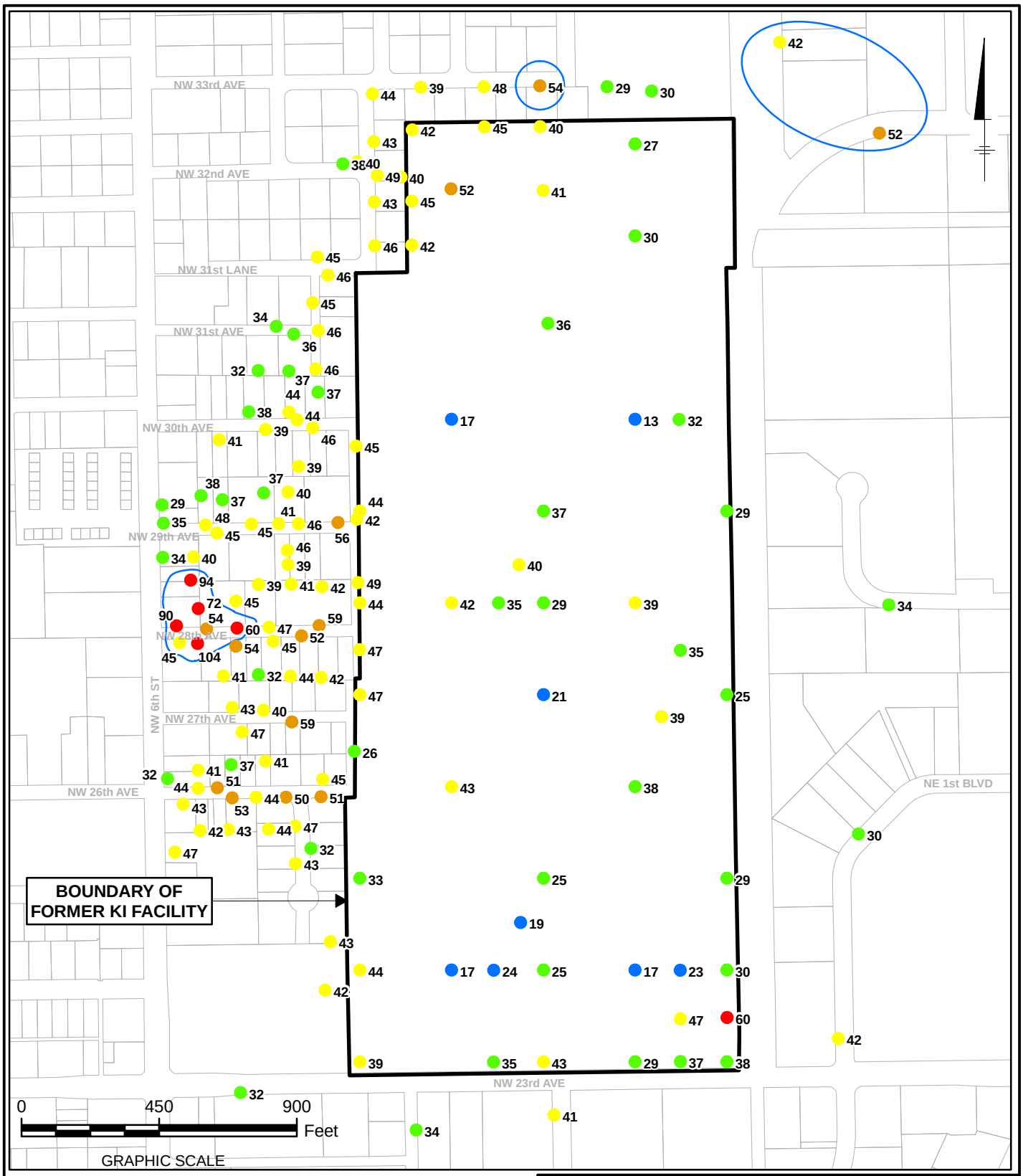
OFF-SITE DATA SUMMARY AND FINGERPRINTING EVALUATION

1,2,3,7,8-PeCDD/OCDD RATIO PLOT

ARCADIS

FIGURE
2-12

CITY: SYR DIV/GROUP: IM DB: KES LD: PIC: PM: TM: TR:
Project (Project #)
Q:\Beazer\Gainesville_FL\BCCZ\mxd\12378PeCDD_vs_OCDD_Ratio.mxd - 4/1/2011 @ 11:35:14 AM



LEGEND:

TOTAL HxCDD/OCDD (x 10^{-3})

- ≤ 24
- 24 - 38
- 39 - 49
- 50 - 59
- > 59

CLUSTERS INDICATING AN EFFECT OF OTHER SOURCES ON THESE SAMPLES AND POSSIBLY OTHER SAMPLES IN THEIR VICINITY

NOTES:

1. FIELD DUPLICATES AVERAGED AT EACH LOCATION.
2. 0-3" AND 3-6" DEPTHS AVERAGED FOR SITE SAMPLES.

CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FL

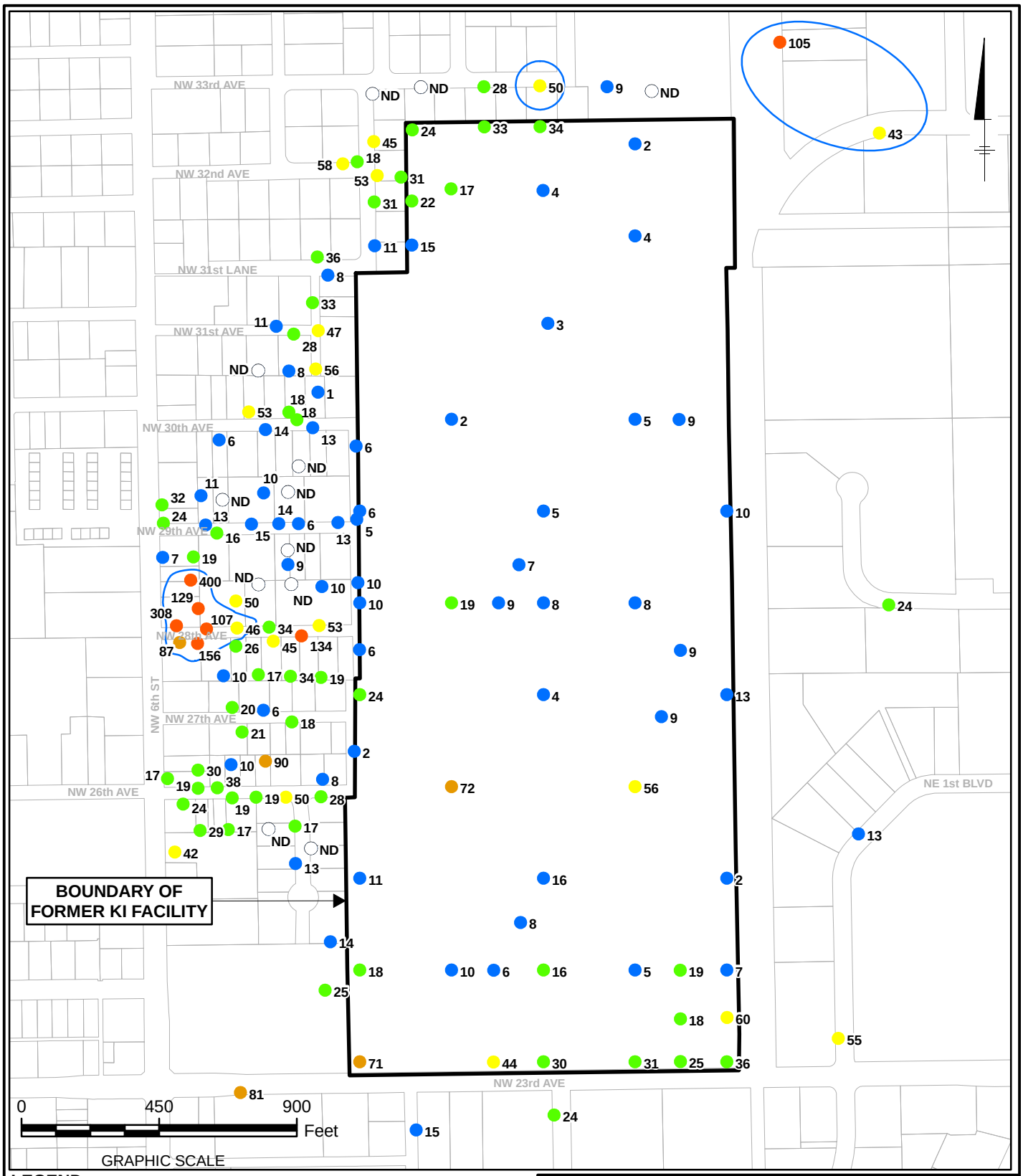
OFF-SITE DATA SUMMARY AND FINGERPRINTING EVALUATION

TOTAL HxCDD/OCDD RATIO PLOT

ARCADIS

FIGURE
2-13

CITY: SYR DIV/GROUP: IM DB: KES LD: PIC: PM: TM: TR:
Project (Project #)
Q:\Beazer\Gainesville_FL\BCCZ\mxd\Total_HxCDD_vs_OCDD.mxd - 3/31/2011 @ 1:17:39 PM



LEGEND:

TOTAL TCDD/TOTAL HOMOLOGUES (x 10^{-5})

- ≤ 16
- 17 - 39
- 40 - 69
- 70 - 99
- > 100

ND TOTAL TCDD NOT DETECTED

CLUSTERS INDICATING AN EFFECT OF OTHER SOURCES ON THESE SAMPLES AND POSSIBLY OTHER SAMPLES IN THEIR VICINITY

NOTES:

1. FIELD DUPLICATES AVERAGED AT EACH LOCATION.
2. 0-3" AND 3-6" DEPTHS AVERAGED FOR SITE SAMPLES.

CABOT CARBON/KOPPERS SUPERFUND SITE
GAINESVILLE, FL

OFF-SITE DATA SUMMARY AND FINGERPRINTING EVALUATION

TOTAL TCDD/ TOTAL HOMOLOGUES RATIO PLOT

ARCADIS

FIGURE 2-14

CITY: SYR DIV/GROUP: IM DB: KES LD: PIC: PM: TM: TR:
Project (Project #)
Q:\Beazer\Gainesville_FL\BCCZ\mxd\TCDD_vs_Homologue.mxd - 4/1/2011 @ 11:35:58 AM

Figure 2-15. Principal Component Plot: PC2 vs. PC1

Cabot Carbon/Koppers Superfund Site

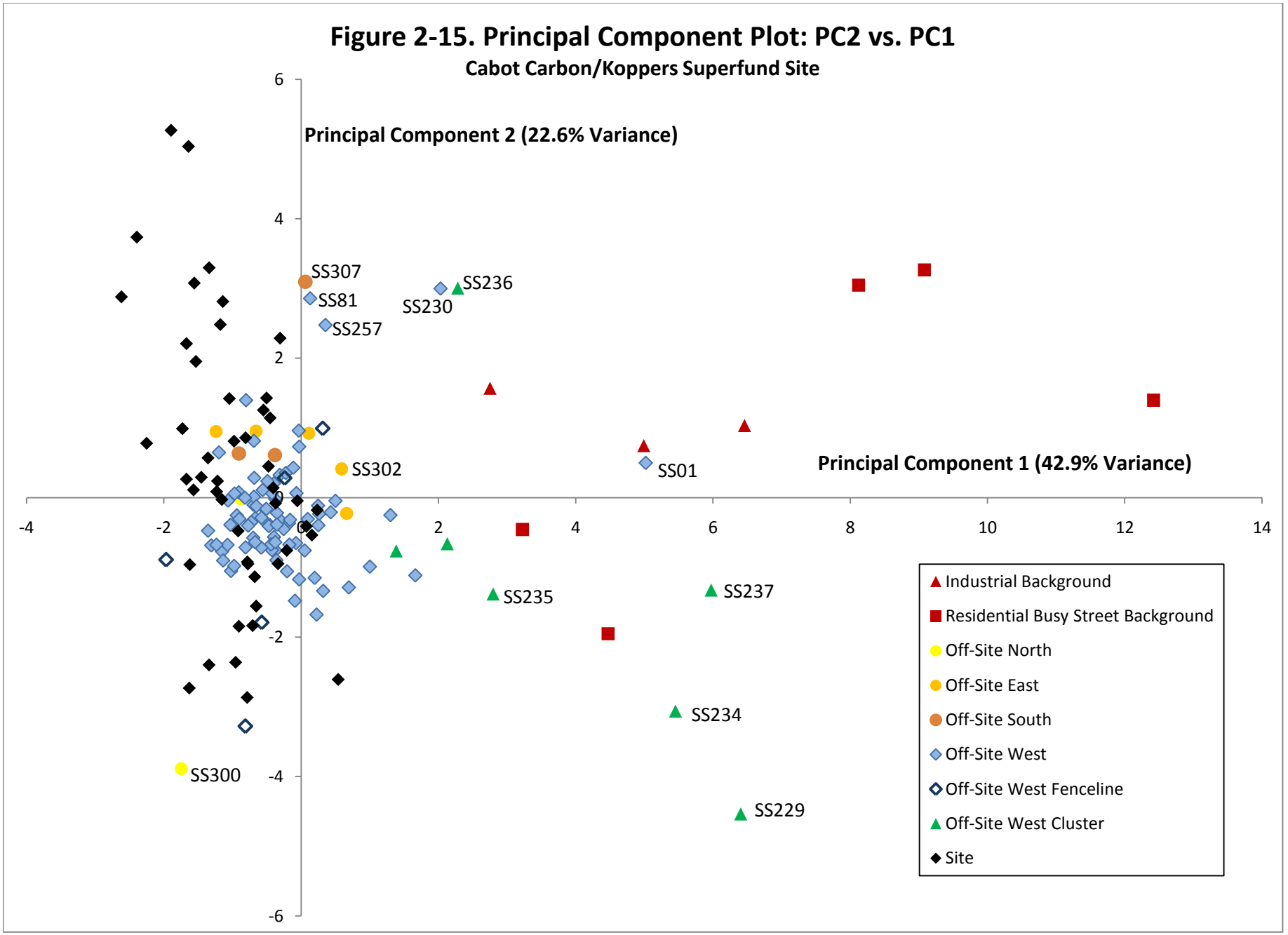


Figure 2-16. Principal Component Plot: PC3 vs. PC1

Cabot Carbon/Koppers Superfund Site

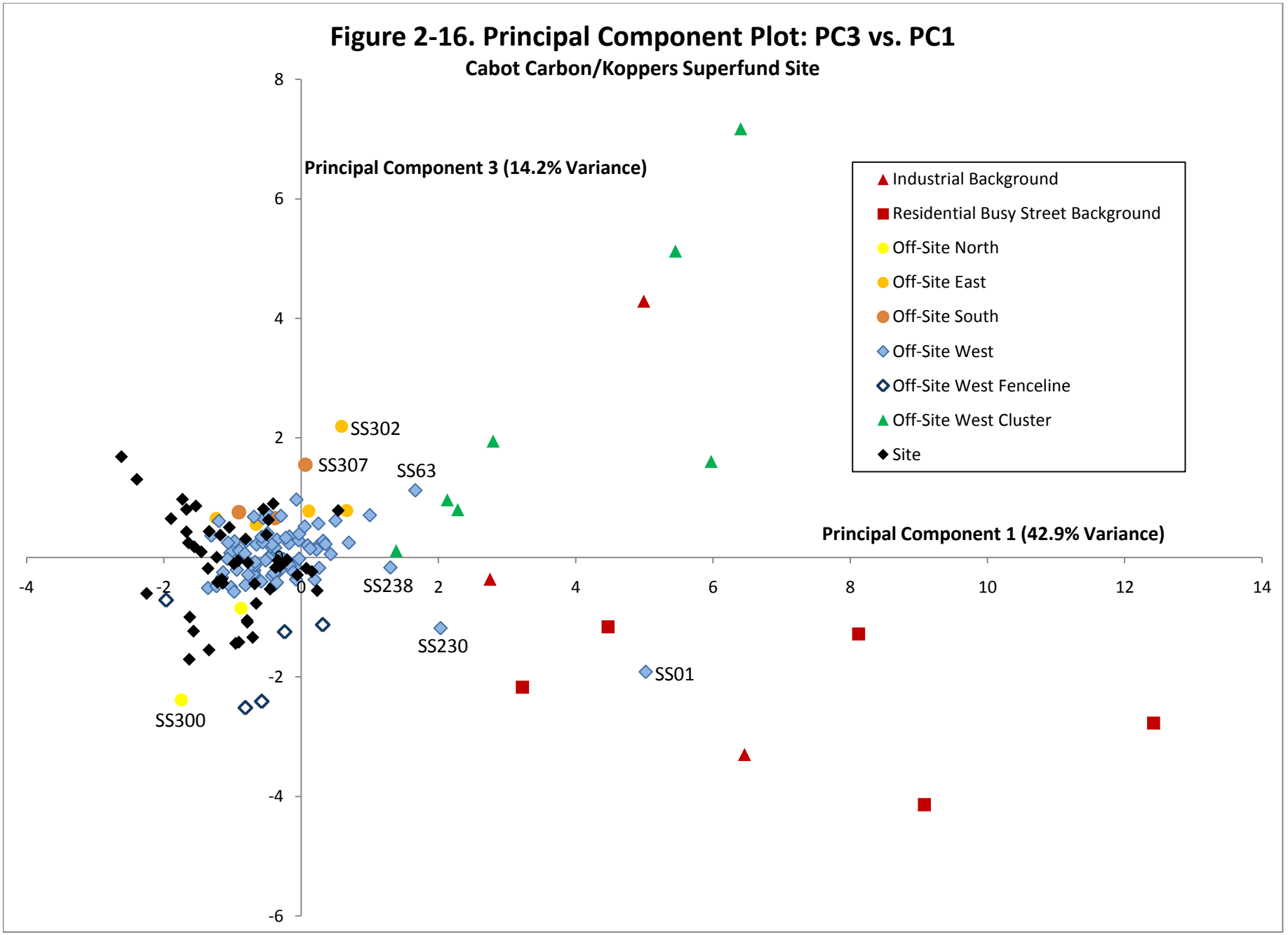


Figure 2-17. Principal Component Plot: PC4 vs. PC1

Cabot Carbon/Koppers Superfund Site

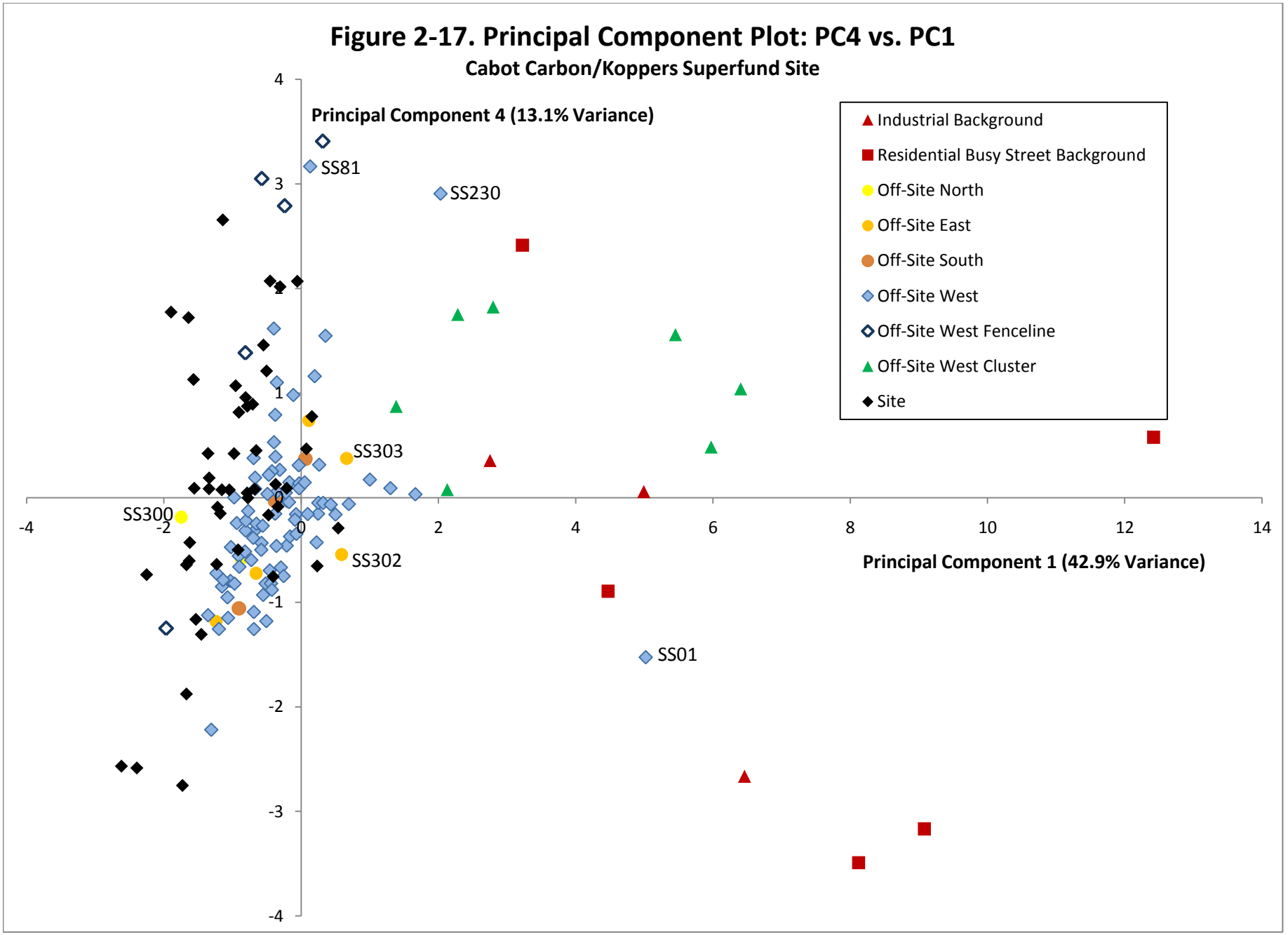


Figure 2-18. PCA 3-Dimensional Plot: PC1, PC2 and PC3
Cabot Carbon/Koppers Superfund Site

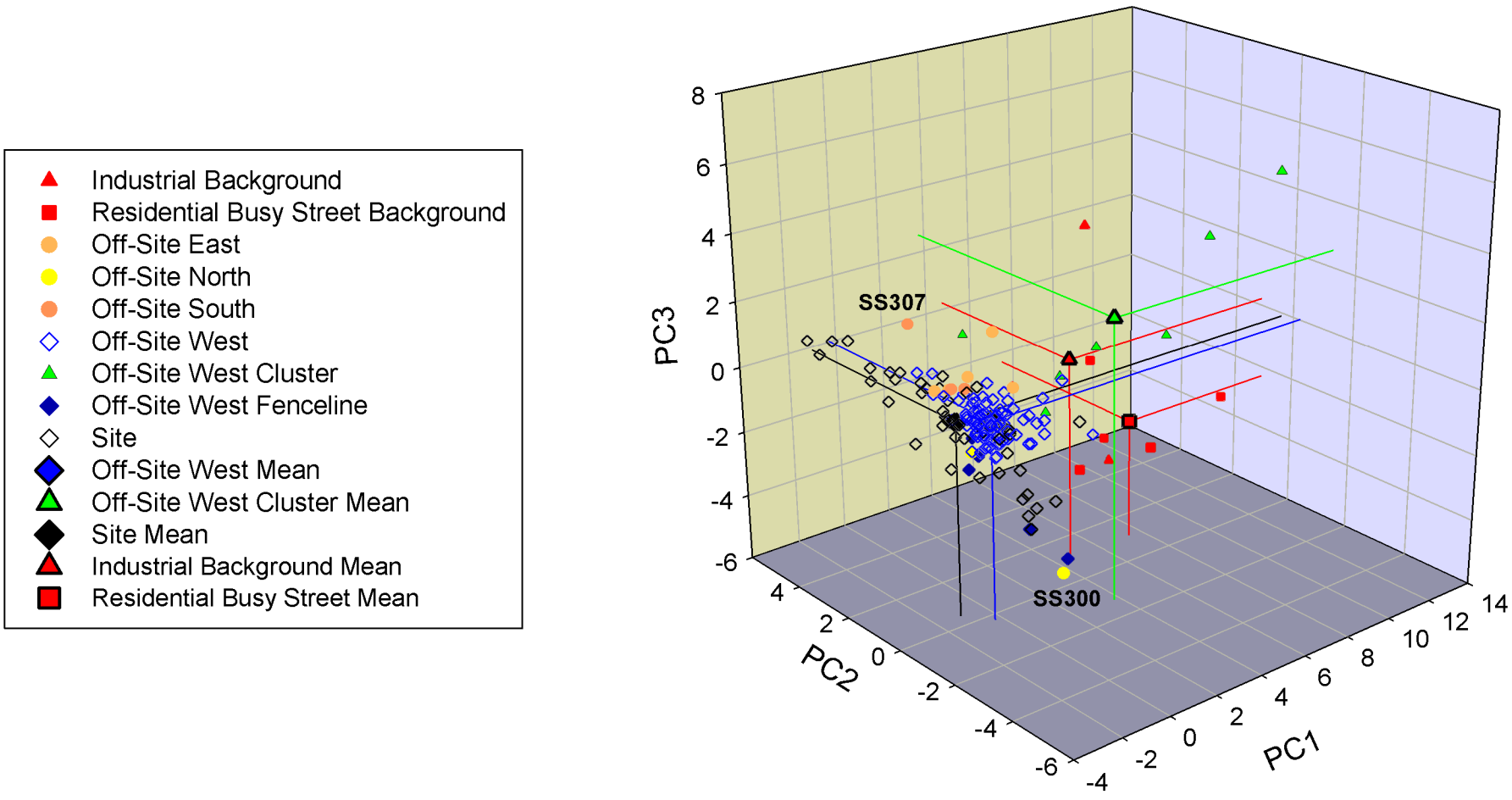
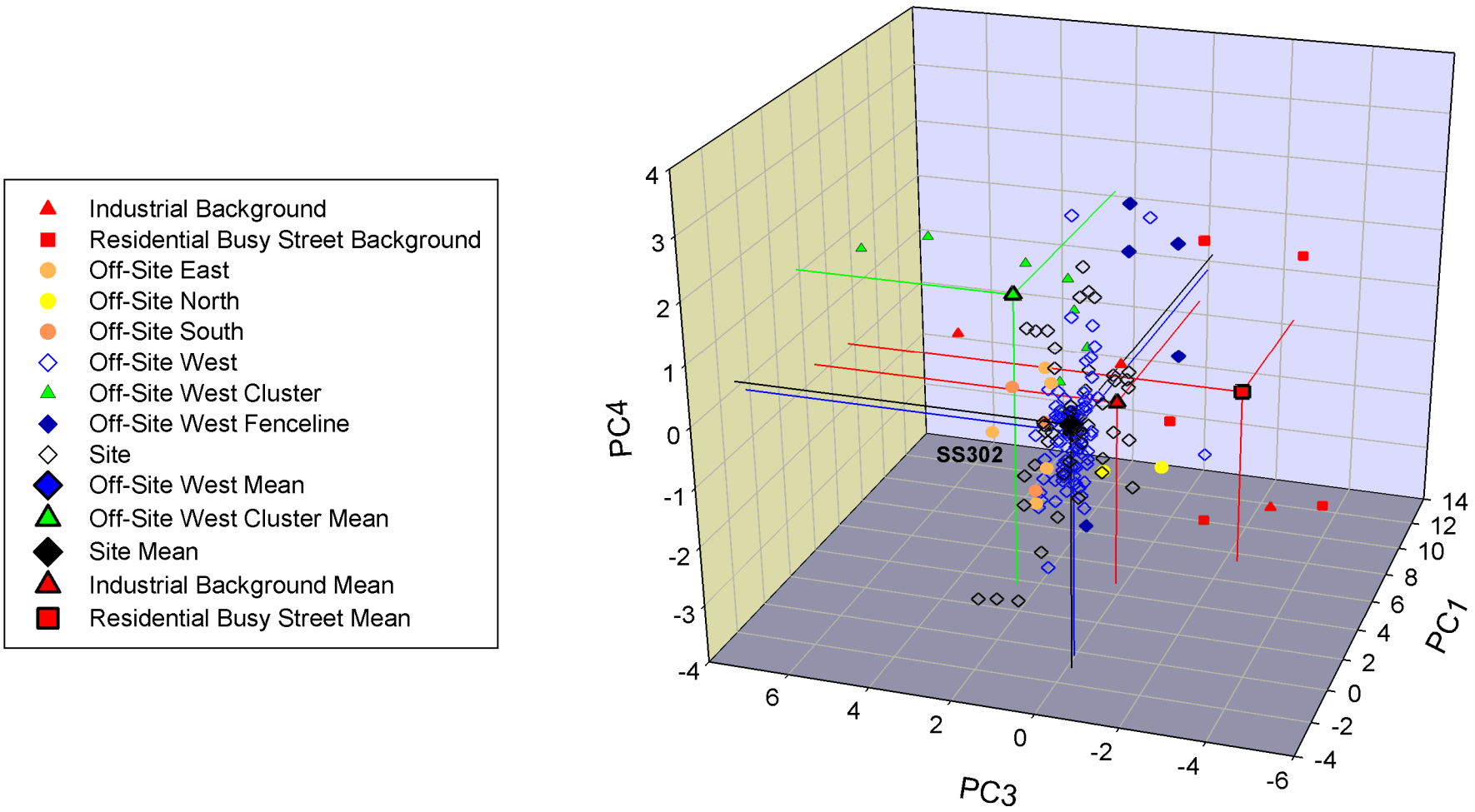
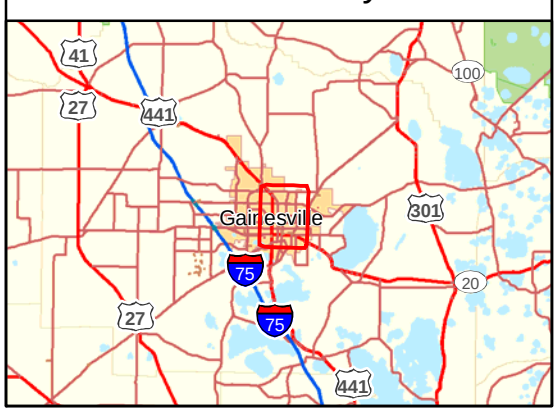


Figure 2-19. PCA 3-Dimensional Plot: PC1, PC3 and PC4
Cabot Carbon/Koppers Superfund Site



North Main St
15th St
23rd Ave
441
24
26
20
710 SE
2nd St.

Location of Study Area



Proposed Background Sampling Areas

Cabot Carbon/Koppers
Gainesville, Florida

Beazer East, Inc.
Pittsburgh, Pennsylvania

Notes & Sources

Aerial imagery from GeoTrans, Inc.
Street data from ESRI.

Legend

- 2010 Residential Busy Street Background Sample Location
- 2010 Background Industrial Soil Sample Location
- Property Boundary
- One Mile Site Radius
- Proposed Industrial Background Sampling Area
- Proposed Residential Busy Street Background Sampling Area
- Streets
- Highways

0 2,000 Feet

N

amec
AMEC Earth & Environmental, Inc.
2 Robbins Road
Westford, Massachusetts
(678) 692-9090

FIGURE 3-1

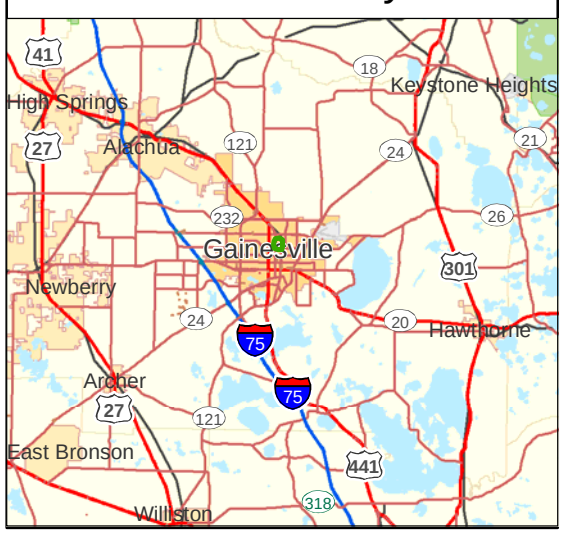
H:\Beazer\Gainesville\Task35\MXD\ProposedResidentialBusyStreetBackgroundSamplingArea.mxd H:\Beazer\Gainesville\Task35\Export\ProposedResidentialBusyStreetBackgroundSamplingArea.pdf March 24, 2011 DWN: JDP DJK CHKD: AKN

NW 4th St
NW 3rd St
NW 2nd St
NW 33rd Ave
NW 32nd Ave
NW 31st Lane
NW 31st Ave
NW 30th Ave
NW 29th Ave
NW 28th Ave
NW 27th Ave
NW 26th Ave
NW 6th St
NE 33rd Ave
NE 28th Pl
NE 1st Blvd
NW 23rd Ave
State Hwy 120
NW 3rd Terrace
NW 2nd St

SS270 SS271 SS272 SS273 SS274 SS275 SS276 SS277 SS278 SS279 SS280 SS281 SS282 SS283 SS284

Former KI Facility Property

Location of Study Area



Proposed Off-Site Soil Sampling Locations and TCDD TEQ Results

Cabot Carbon/Koppers
Gainesville, Florida

Beazer East, Inc.
Pittsburgh, Pennsylvania

Notes & Sources

Parcel Data: Alachua County, FL
TCDD TEQ results for the September 2010 samples are unvalidated and thus preliminary.

Legend

- Dioxin (ng/kg)
- Proposed Soil Sampling Location
- Boundary of Former Koppers Facility
- Parcels
- 46 — Sample result for 2,3,7,8 tetrachloro dibenzo(p)dioxin toxic (TCDD-TEQ) equivalent calculated using the 2005 World Health Organization toxic equivalency factors; Depth = 0.0 - 0.5 ft
- 13 — Sample result for 2,3,7,8 tetrachloro dibenzo(p)dioxin toxic (TCDD-TEQ) equivalent calculated using the 2005 World Health Organization toxic equivalency factors; Depth = 0.5 - 2.0 ft

Feet
0 100 200

N

amec
AMEC Earth & Environmental, Inc.
2 Robbins Road
Westford, MA 01886
(978) 692-9090

FIGURE
3-2

H:\Beazer\Gainsville\Task35\MXD\Gainesville\ProposedOffSiteSoilSamplingLocations.mxd March 24, 2011 DWN: JDP APC CHKD: AKN

ARCADIS

Attachment **1**

Transmittal of September 2010 Off-Site Data (email from Paul Anderson to Scott Miller)

Attachment 1

From: Anderson, Paul
Sent: Tuesday, December 28, 2010 5:43 PM
To: 'Miller.Scott@epamail.epa.gov'
Cc: Brourman, Mitch (Pittsburgh) NA; McChesney, Charles E. (Pittsburgh) NA; Wolfson, Timothy C.; 'Council, Greg'; 'Robb, Joe'
Subject: Transmittal of September 2010 Off-Site Data

Dear Mr. Miller:

Attached please find three Excel files with spreadsheets containing all of the validated results and four PDF files of figures summarizing the results of the off-Site soil sampling program Beazer conducted during September 2010. The September 2010 off-Site sampling program had three elements.

- Fifty-two additional surface and fifty-two subsurface soil samples were collected to the west of the Cabot Carbon/Koppers Superfund Site in Gainesville, Florida (Site) to delineate dioxin and furan concentrations to the either default SCTLs or background concentrations. This email refers to these as the "Off-Site West Samples."
- An initial round of 10 surface soil samples were collected from rights of way (ROWs) to the north, east and south of the Site (referred to as the "Near-Site North, East and South Samples"). These samples were within 100 to 400 feet of the Site, depending upon the locations of the ROW and were analyzed for arsenic, polynuclear aromatic hydrocarbons (PAHs) and dioxin and furans.
- A pilot study of the background concentrations of arsenic, PAHs and dioxins and furans in Gainesville surface soils was conducted. Background surface soils were collected from two types of land uses. Three samples were collected from ROWs in a commercial/industrial area (referred to as the "Industrial Background Samples"). Five samples were collected from residential and mixed use areas along busy streets ("referred to as the "Residential Busy Street Background Samples"). With the concurrence of EPA and FDEP, all pilot background sample locations were located more than a mile from the Site, to ensure that none of the reported results could be attributed to the former Koppers wood-treating plant.

Beazer is providing the validated results from the September 2010 field effort to EPA in advance of delivering a formal data summary report. The goal of this preliminary data submittal is to provide EPA the validated results as soon as practically possible following receipt of those results by Beazer, as well as to provide an initial summary of the results of this latest phase of sampling, This email also describes the anticipated content of the final data summary report that will be submitted to EPA in mid-January 2011, including the types of data analyses that will be included therein.

Overall Findings

The detected concentrations of 2,3,7,8-tetrachlorodibenzo-p-dioxin toxic equivalents (TCDD-TEQ) in all soil samples collected to the west of the Site were below EPA's current residential PRG of 1000 ng/kg (parts per trillion, ppt). Though EPA's proposed interim PRG of 72 ng/kg for TCDD-TEQ has not been adopted by the agency, all concentrations to the west of the Site were less than this proposed PRG as well. All TCDD-TEQ concentrations were also less than the Site-specific residential Soil Cleanup Target Level (SCTL) of 95 ng/kg (ARCADIS 2010) which is based on Florida's statutory allowable risk level of one in one million ($1x10^{-6}$). These results continue to suggest that TCDD-TEQ concentrations measured in soils collected from 100 feet and further to the west of the Site do not pose an unacceptable risk to residents. In addition, as described in one of the bullets below, comparison of the Residential Busy Street

background data to data collected 100' to the west of the Site in the Stephen Foster neighborhood, suggests that, given the assumptions of the default FDEP SCTLs, residents potentially exposed to concentrations of constituents measured 100 feet from the Site have a lower potential cancer risk than do Gainesville residents living near busy streets who are exposed to those same constituents well above default SCTLs associated with non-Site-related sources.

The TCCD-TEQ concentrations in all subsurface soil samples analyzed from west of the Site were less than the above mentioned benchmarks as well as the Florida Department of Environmental Protection (FDEP) default residential SCTL of 7 ng/kg. When comparing results to Florida's default SCTLs, it is important to keep in mind that the very conservative default SCTLs assume a stringent allowable risk level and are derived using: deterministic calculations; overestimates of likely bioavailability; a combination of conservative exposure parameters that overestimate exposure for most people; and, in the case of TCDD-TEQ, a cancer slope factor that substantially overestimates potential risk and is subject to considerable scientific criticism. In other words, exceedance of a FDEP default SCTL does not, by itself, indicate a potentially unacceptable human health risk exists. Keeping those critical considerations in mind, the concentrations of TCDD-TEQ in 13 of 52 September 2010 surface soil sampling locations were equal to or below the FDEP default SCTL. Further, slightly more than a quarter of the 89 surface soils samples analyzed to date to the west of the Site were below the FDEP default SCTL. Furthermore, some of the detected concentrations that are higher than the default SCTL appear to be due to another (non-Site-related) dioxin/furan source along NW 6th Street, potentially associated with an electronic repair shop or other industrial/commercial activity in that area.

The concentration of arsenic in all Near-Site (north, east and south) samples was less than the default FDEP industrial SCTL. Most samples also had concentrations less than the default residential SCTL. The concentration of PAHs (expressed as benzo(a)pyrene toxic equivalents, BaP-TE) was less than the default FDEP industrial SCTL at most Near-Site locations but was greater than the default residential SCTL in the three Near-Site sampling locations to the south of the Site, one of which was located near the Genesis Preparatory School. TCDD-TEQ concentrations in all Near-Site samples were less than EPA's current residential and commercial/industrial PRGs and also less than EPA's proposed interim residential and commercial/industrial PRGs. All Near-Site TCDD-TEQ concentrations were also less than the Site-specific residential PRG of 95 ng/kg. Comparison of Near-Site samples collected to the north and east of the Site must take into consideration that that the current land use in those areas is commercial/industrial. Most Near-Site samples have TCDD-TEQ concentrations below FDEP's default commercial/industrial SCTL of 30 ng/kg. TCDD-TEQ concentrations in Near-Site sample locations to the south of the Site, including the sample located near the Genesis Preparatory School, exceed the FDEP's default residential SCTL. However, as described in more detail below, the overall potential cancer risk combined from arsenic, PAHs and dioxins and furans associated with Near-Site samples to the south is consistent with or less than that found in other areas of Gainesville with comparable land use.

The concentration of arsenic exceeded the default FDEP commercial/industrial SCTL in one of three Industrial background samples while the concentration of BaP-TE exceeded its FDEP default commercial/industrial SCTL at two of three Industrial background locations, TCDD-TEQ concentrations exceeded the FDEP default industrial SCTL at one of three Industrial background locations but were less than EPA's current and proposed interim commercial/industrial PRGs.

The arsenic concentration at all Residential Busy Street background locations was less than the default FDEP residential SCTL. However, the concentration of BaP-TE was greater than the default FDEP residential SCTL at all Residential Busy Street background locations. In addition, TCDD-TEQ concentrations exceeded the default FDEP residential SCTL at 40% of Residential Busy Street background locations, though TCDD-TEQ concentrations were less than EPA's current and proposed interim PRGs. When Residential Busy Street background concentrations are compared to FDEP default residential STCLs, the average background potential excess lifetime cancer risk of a resident living near a

busy street is about 14 times higher than FDEP's allowable risk limit of $1x10^{-6}$ using FDEP exposure and toxicity assumptions for arsenic, TCDD-TEQ and BaP-TE.

Summary of Findings

The bullets below present an expanded summary of the key findings of the 2010 off-Site soil sampling program.

- **Industrial Background.** Three surface soil samples were collected from a commercial/industrial area approximately 1.5 miles to the east of the Site. The samples were analyzed for arsenic, PAHs and dioxins and furans.
    - Arsenic exceeded its default FDEP commercial/industrial SCTL at 1 of 3 sample locations. The arithmetic average concentration of arsenic was below its default commercial/industrial SCTL.
    - BaP-TE exceeded its default FDEP commercial/industrial SCTL at all 3 sample locations. The arithmetic average concentration of BaP-TE was nearly two times higher than its default commercial/industrial SCTL. These data suggest Site-specific industrial background concentrations and not default FDEP SCTLs may be appropriate delineation criteria for BaP-TE.
    - TCDD-TEQ exceeded its default FDEP commercial/industrial SCTL at 1 of 3 sample locations. The arithmetic average concentration of TCDD-TEQ was below the commercial/industrial SCTL.

- **Residential Busy Street Background.** Five surface soil samples were collected from a residential and mixed use area approximately one and one half miles to the south of the Site just off of East University Avenue.
    - Arsenic was below its default FDEP residential SCTL at all locations. Thus, the arithmetic average concentration of arsenic was also below its default residential SCTL.
    - BaP-TE exceeded its default FDEP residential SCTL at all 5 sample locations. The arithmetic average concentration of BaP-TE was approximately 13 times higher than its default residential SCTL. These data suggest that for samples collected near busy streets, Site-specific residential background concentrations, and not default FDEP SCTLs, may be appropriate delineation criteria for BaP-TE.
    - TCDD-TEQ exceeded its default FDEP residential SCTL at 2 of 5 sample locations. The arithmetic average concentration of TCDD-TEQ is about 75% of the default residential SCTL. These data suggest that for some samples collected near busy streets, Site-specific residential background concentrations and not default FDEP SCTLs may be appropriate delineation criteria for TCDD-TEQ.

- **Comparison of Residential Busy Street Background Concentrations to 100 foot Near-Site West Sample Concentrations.** Both the recent residential busy street samples and the samples collected 100 feet to the west of the Site during the first phase of off-Site sampling were analyzed for arsenic, PAHs and dioxins and furans. Knowing that the default FDEP residential SCTLs are based upon an allowable excess lifetime cancer risk of $1x10^{-6}$, comparison of the concentrations of each of the constituents to their respective SCTL allows estimation of the potential risk associated with those three constituents in each soil sample (using conservative, FDEP assumptions). For example, if BaP-TE exceeds its SCTL by a factor of two in a sample, the associated potential cancer risk, based on the default SCTL assumptions is calculated as two times one in one million or $2x10^{-6}$. The potential risks associated with residential busy street samples can then be compared to the potential risks associated with concentrations in near-Site (100') soil samples. However, note that for the reasons described above, given their very conservative nature of the default SCTLs, any potential risks potentially experienced by residents

are likely to be much lower than predicted using the default SCTLs. Nevertheless when such a comparison is conducted, the average background potential excess lifetime cancer risk of a resident living near a busy street is about 14 times higher than FDEP's allowable risk limit of $1x10^{-6}$ and is about 4 times higher than the average potential excess lifetime cancer risk associated with samples 100' from the Site. These results suggest residents living near the Site have a lower potential risk from arsenic, PAHs and dioxins and furans than residents living in other areas of Gainesville not affected by the Site.

- **Off-Site West.** During the most recent phase of off-Site sampling, 52 surface (0-6" depth) and 52 subsurface (6-24" depth) samples were collected west of the Site. All surface soil samples were analyzed for dioxins and furans. Five subsurface samples close to the Site were also analyzed for dioxins and furans.
    - TCDD-TEQ concentrations in all surface and subsurface samples were less than the current EPA residential PRG of 1000 ng/kg.
    - TCDD-TEQ concentrations in all surface and subsurface samples were less than the EPA interim proposed residential PRG of 72 ng/kg.
    - TCDD-TEQ concentrations in all surface and subsurface samples were less than the Site-specific residential SCTL of 95 ng/kg.
    - TCDD-TEQ concentrations in all subsurface samples were substantially (on average by about 15-fold) lower than the surface soil sample taken at the same location. All subsurface samples were also less than the FDEP's default residential SCTL. These results indicate that analysis of additional subsurface samples collected to the west of the Site is not necessary.
    - TCDD-TEQ concentrations in 13 of 52 surface soil samples were equal to or less than the FDEP default residential SCTL of 7 ng/kg. The TCDD-TEQ concentrations were above the SCTL in 39 samples. Several of the higher TCDD-TEQ concentrations occur on properties along NW 6th Street, where there may be an alternative source. The current land use of some of those properties is not residential. TCDD-TEQ concentrations of several such samples were below FDEP's default commercial/industrial SCTL of 30 ng/kg.
    - While we are still evaluating the data, some of the relatively high concentration results near NW 6th Street strongly suggest the presence of another source of dioxins/furans. We will elaborate on this preliminary conclusion in the forthcoming Data Summary Report.

- **Near-Site, North and East.** Seven surface soil samples were collected from commercial/industrial areas 100 to 400 feet from the Site. Five of the samples were on ROWs and two were collected from the Gainesville Public works property. All samples were analyzed for arsenic, PAHs and dioxin and furans.
    - Arsenic was below its default FDEP commercial/industrial SCTL at all locations.
    - BaP-TE was below its default FDEP commercial/industrial SCTL at 6 of 7 sample locations. The arithmetic average concentration of BaP-TE was approximately 40% higher than its default commercial/industrial SCTL and was driven up by the results from a single sample location (SS310) on NE 1st Boulevard near the intersection with NW 23rd Avenue. The arithmetic average BaP-TE concentration was less than the arithmetic average found for Industrial Background samples in the pilot background study (see bullets above). These results suggest Near-Site concentrations of BaP-TE to the north and east of the Site may be consistent with or less than concentrations found in areas of Gainesville with comparable land use.
    - TCDD-TEQ concentrations at all locations were less than the current EPA commercial/industrial PRG of 5000 to 20,000 ng/kg.

- TCDD-TEQ concentrations at all locations were less than the EPA interim proposed commercial/industrial PRG of 950 ng/kg.
- TCDD-TEQ concentrations were less than the default FDEP commercial/industrial SCTL at 5 of 7 sample locations. Exceedances at the other two locations were slight, by about 17% and 26%. The arithmetic average concentration of TCDD-TEQ was below the FDEP default commercial/industrial SCTL. These results suggest that, on average, Near-Site concentrations of TCDD-TEQ to the north and east of the Site meet Florida's allowable risk limit.

- **Near-Site, South.** Three surface soil samples were collected from south of NW 23rd Avenue in ROWs situated in residential and mixed use areas. All samples were analyzed for arsenic, PAHs and dioxin and furans. Because both residential and commercial/industrial benchmarks may be applicable, comparisons to both types of benchmarks are discussed.
  - Arsenic was below its default FDEP commercial/industrial SCTL at all sampling locations and was below its default FDEP residential SCTL at 2 of 3 locations. The arithmetic average concentration of arsenic was below the FDEP default residential SCTL. In addition, the single exceedance of the default SCTL was slight (by about 50%). A substantially greater exceedance was reported in the original residential background study conducted in 2009. These results suggest that the average Near-Site concentrations of arsenic to the south of the Site meet the Florida allowable risk limit and are consistent with background concentrations.
  - BaP-TE was below its default FDEP commercial/industrial SCTL at 2 of 3 sample locations but exceeded the default FDEP residential SCTL at all locations. The arithmetic average concentration of BaP-TE was higher than the FDEP default commercial/industrial and residential SCTLs and was also almost two times higher than the average of Residential Busy Street background samples. The arithmetic average is driven by a single sample location (SS307) collected from a landscaped area in front of small shopping center on NW 23rd Avenue. The BaP-TE concentration at this location is almost 90 times greater than the FDEP default residential SCTL and is inconsistent with any other off-Site BaP-TE concentration. Based upon its location, it seems possible that this sample may have been influenced by runoff from the small shopping center parking area. BaP-TE concentrations in the other two samples to the south of the Site are consistent with the low end of concentrations measured in the Residential Busy Street background samples, suggesting Near-Site concentrations of BaP-TE to the south of the Site at most sampling locations may be consistent with or less than concentrations found in areas of Gainesville with comparable land use.
  - TCDD-TEQ concentrations at all locations were less than the current EPA residential and commercial/industrial PRGs.
  - TCDD-TEQ concentrations at all locations were less than the EPA interim proposed residential and commercial/industrial PRGs.
  - TCDD-TEQ concentrations at all locations were less than the Site-specific residential SCTL.
  - TCDD-TEQ concentrations at all locations were less than the default FDEP commercial/industrial SCTL.
  - TCDD-TEQ concentrations at all locations were greater than the default FDEP residential SCTL. Given the very conservative nature of the FDEP default SCTLs, and the finding that off-Site concentrations to the south of the Site are substantially below all other residential TCDD-TEQ benchmarks, these results suggest Near-Site concentrations of TCDD-TEQ to the south of the Site do not pose an unacceptable risk.
  - Finally, note that the potential excess lifetime cancer risks (estimated by comparing measured constituent concentrations to their respective FDEP default residential SCTLs) associated with the two samples (SS308 and SS309) not located in front of the small shopping mall are lower than the average potential excess lifetime cancer risk associated

with Residential Busy Street background samples. This comparison suggests that the overall potential cancer risk associated with these samples is consistent with or less than that found in other areas of Gainesville with comparable land use.

Forthcoming Data Summary Report

The full data summary report, anticipated to be submitted to EPA in mid-January 2011 will include a more detailed statistical summary of the off-Site and pilot background data as well as a comparison of all near-Site data to recently collected pilot background data. The data summary report will also present quantitative statistical analyses designed to determine whether the dioxins and furans and PAHs detected in off-Site soil samples appear consistent with a potential on-Site origin or whether other, non-Site-related, sources are contributing to, or potentially dominating, the concentration detected in off-Site samples. Finally, based on the statistical analyses presented in the data summary report, it will recommend whether or not to conduct additional off-Site sampling. If any additional sampling is recommended, the report will also present the proposed number and locations of additional off-Site sampling locations.

We hope that you find this quick introduction to the results of the most recent off-Site sampling program to be helpful. Please call me or Mitchell Brourman at your convenience if you have any questions about this data submittal or wish to discuss the content of the forthcoming data summary report.

Best Regards,

Paul Anderson

Paul D. Anderson | Vice President/Principal Scientist | paul.anderson@arcadis-us.com

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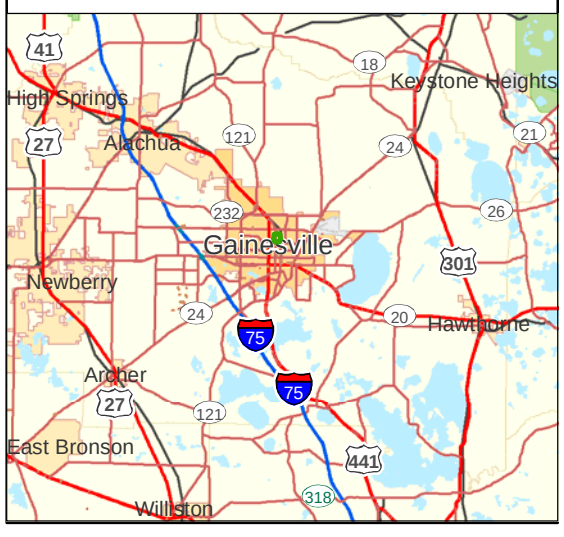
NW 33rd Ave
NW 32nd Ave
NW 31st Lane
NW 31st Ave
NW 30th Ave
NW 29th Ave
NW 28th Ave
NW 27th Ave
NW 26th Ave
NW 4th St
NW 3rd St
NW 2nd St
NW 6th St.
NW 6th St.
NW 6th St.
3203
3139
431
444
430
536
549
535
518
500
444
529
523
527
511
501
2913
532
516
510
2903
533
519
507
2853
2833
528
2807
404
2803
2721
531
523
517
509
441
526
510
519
517
2615
540
520
512
444
2601
2523
573
535
2514
2511
2504
2505
2431
2301
Former KI Facility

Location of Study Area



All TCDD-TEQ Results
Off-Site Samples to the West

Cabot Carbon/Koppers
Gainesville, Florida

Beazer East, Inc.
Pittsburgh, Pennsylvania

Notes & Sources

Parcel Data: Alachua County, FL
Results from samples collected in February, June, and December 2009 and September 2010 for 2,3,7,8 tetrachlorodibenzo(p)dioxin toxic equivalents (TCDD-TEQ) estimated using the 2005 World Health Organization toxic equivalency factors.

Legend

- Location of surface soil sample (collected from 0 to 6 inches below ground surface) and measured TCDD-TEQ concentration (ng/kg)
- Location of surface soil sample (collected from 0 to 6 inches below ground surface) and subsurface soil sample (collected from 6 to 24 inches below ground surface) and measured TCDD-TEQ concentration (ng/kg)
- Lot lines of properties to the west of the Site from which samples were collected
- 539 Street Number of properties to the west of the Site from which samples were collected
- Boundary of Former Koppers Facility

Feet
0 125 250

N

amec
AMEC Earth & Environmental, Inc.
2 Robbins Road
Westford, MA 01886
(978) 692-9090

FIGURE
1

H:\Beazer\Gainsville\Task35\MXD\Gainesville\OffsiteSampleTCDDTEQResults.mxd December 22, 2010 DWN: JDP CHKD: AKN

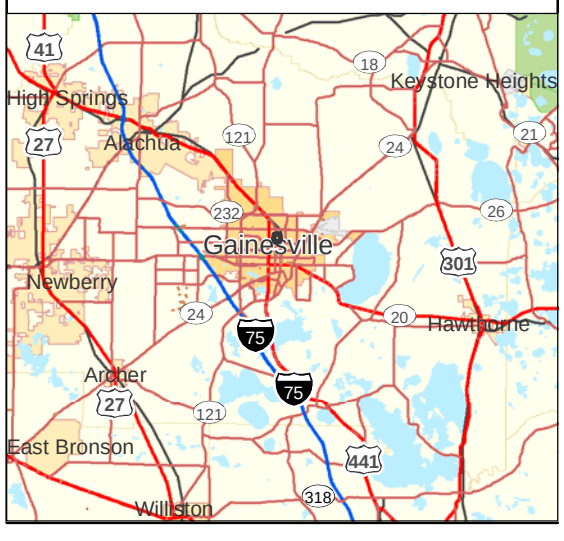
NW 33rd Ave
NW 4th St
NW 3rd St
NW 2nd St
NW 32nd Ave
NW 6th St.
NW 31st Lane
NW 31st Ave
NW 30th Ave
NW 29th Ave
NW 28th Ave
NW 27th Ave
NW 26th Ave

3203
431
3139
444
430
536
549
535
518
500
444
512
501
523
527
511
510
2913
532
516
2903
519
533
507
2833
528
2807
404
2803
2721
531
529
523
517
509
441
526
2523
573
535
2514
2511
2504
2505
2431
2615
540
520
2601
2853
2301

SS201 8 4
SS202
SS204 14
SS207 23 1
SS208 7
SS209 11
SS210 14
SS211 39
SS212 17 1
SS213 11
SS216 10
SS217 11
SS218 11
SS219 17
SS220 17 11
SS221 10
SS222 5
SS223 11
SS224 9
SS227 14
SS228 33
SS229 20
SS230 60
SS231 6
SS232 12
SS233 26 1
SS234 15
SS235
SS236 34
SS237 28
SS238 6
SS239 15
SS240
SS241 5 14
SS242 12
SS243 25 3
SS244 13
SS245 13
SS247 9
SS249 11
SS250 10
SS251
SS252 6 11
SS254 9 5
SS255 7
SS256 16
SS257 4
SS258 6
SS259 5
SS261 3
SS262 8
SS263 8

Former KI Facility

Location of Study Area



September 2010 TCDD-TEQ Results Off-Site Samples to the West

Cabot Carbon/Koppers
Gainesville, Florida

Beazer East, Inc.
Pittsburgh, Pennsylvania

Notes & Sources

Parcel Data: Alachua County, FL

Results from samples collected in between 9/10/2010 and 9/15/2010 for 2,3,7,8 tetrachlorodibenzo(p)dioxin toxic equivalents (TCDD-TEQ) estimated using the 2005 World Health Organization toxic equivalency factors.

Legend

SS201 Sampling Location

46 Location of surface soil sample (collected from 0 to 6 inches below ground surface) and measured TCDD-TEQ concentration (ng/kg)

46/13 Location of surface soil sample (collected from 0 to 6 inches below ground surface) and subsurface soil sample (collected from 6 to 24 inches below ground surface) and measured TCDD-TEQ concentration (ng/kg)

Lot lines of properties to the west of the Site from which samples were collected

539 Street Number of properties to the west of the Site from which samples were collected

Boundary of Former Koppers Facility

0 125 250 Feet

N

amec
AMEC Earth & Environmental, Inc.
2 Robbins Road
Westford, MA 01886
(978) 692-9090

FIGURE 2

H:\Beazer\Gainsville\Task35\MXD\Gainesville\OffsiteSampleTCDDTEQResults.mxd December 22, 2010 DWN: JDP CHKD: AKN

SS300AA	
ARSENIC	0.5 J
BAPTE	0.072
TCDD TEQ	0.0000379

SS301AA	
ARSENIC	1.3
BAPTE	0.082
TCDD TEQ	0.0000042

SS302AA	
ARSENIC	0.7
BAPTE	0.333
TCDD TEQ	0.0000088

SS303AA	
ARSENIC	2.1
BAPTE	0.495
TCDD TEQ	0.0000350

SS305AA	
ARSENIC	1.4
BAPTE	0.136
TCDD TEQ	0.0000110

SS306AA	
ARSENIC	1.2
BAPTE	0.264
TCDD TEQ	0.0000094

SS307AA	
ARSENIC	1.4
BAPTE	8.733
TCDD TEQ	0.0000141

SS308AA	
ARSENIC	1.0
BAPTE	0.154
TCDD TEQ	0.0000147

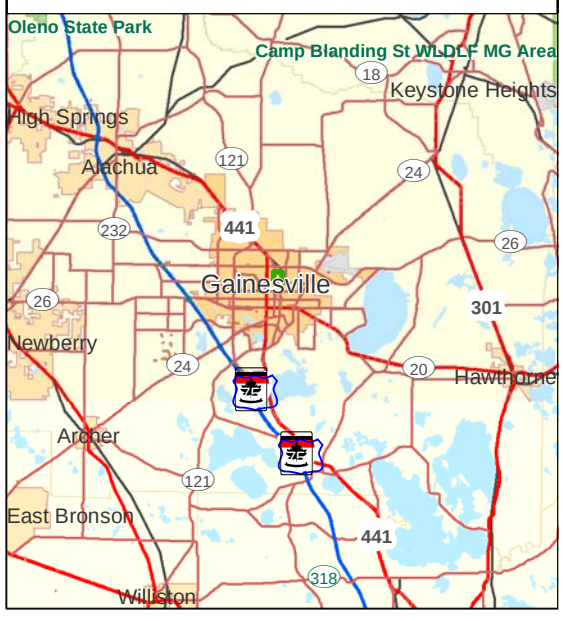
SS309AA	
ARSENIC	3.2
BAPTE	0.350
TCDD TEQ	0.0000266

SS309 (DUP24)	
ARSENIC	3.1
BAPTE	0.253
TCDD TEQ	0.0000252

SS310AA	
ARSENIC	2.0
BAPTE	5.502
TCDD TEQ	0.0000231

NW 33rd Ave
NW 32nd Ave
NW 31st Lane
NW 31st Ave
NW 30th Ave
NW 29th Ave
NW 28th Ave
NW 27th Ave
NW 26th Ave
NW 6th St
N Main Ter
NE 33rd Ave
NE 28th Pl
NE 1st Blvd
Former KI Facility
NW 23rd Ave
NW 22nd Ave
NW 3 Terrace
NW 2nd St

Location of Study Area



September 2010 Off-Site Sample Results to the South, East, and North

Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

Beazer East, Inc.
Pittsburgh, Pennsylvania

Notes & Sources

Aerial Imagery source: http://nikos.alachua.fl.us, 2005.

All samples collected between 9/12/2010 and 9/14/2010 from 0 to 6 inch depth interval.

Legend

Sample Location	
Analyte	Concentration of analyte in mg/kg

J Estimated Value

Off-Site Soil Sampling Location

Parcel Boundary

Boundary of Former KI Facility

0 300
Feet

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2 Robbins Road
Westford, MA 01886
(978) 692-9090

FIGURE
3

H:\Beazer\Gainsville\Task35\MXD\OffsiteSamplesResults_SouthEastNortheast.mxd December 22, 2010 DWN: JDP APC CHKD: AKN

September 2010 Background Sample Results

Cabot Carbon / Koppers Superfund Site
Gainesville, Florida

Beazer East, Inc.
Pittsburgh, Pennsylvania

Legend

Sample Location	
Analyte	Concentration of analyte in mg/kg

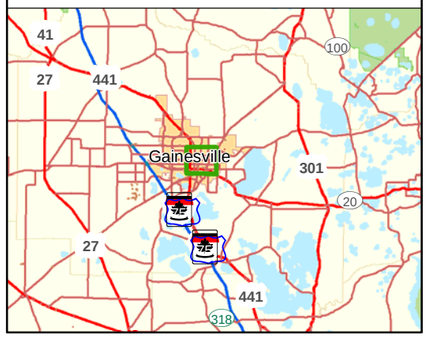
J Estimated value

Off-Site Soil Sampling Location

Boundary of Former KI Facility

1 mile Radius

Location of Study Area



Notes & Sources

Aerial Imagery source: http://nikos.alachua.fl.us, 2005. All soil samples collected from 0-0.5 ft below ground surface.

All samples collected on 9/12/2010 from 0 to 6 inch depth intervals.

SS313AA	
ARSENIC	1.0
BAPTE	0.520
TCDD TEQ	0.0000015

SS311AA	
ARSENIC	13.4
BAPTE	1.803
TCDD TEQ	0.0000302

SS312AA	
ARSENIC	0.8
BAPTE	1.297
TCDD TEQ	0.0000025

SS318	
ARSENIC	1.0
BAPTE	2.238
TCDD TEQ	0.0000096

SS318 (DUP25)	
ARSENIC	1.0
BAPTE	2.449
TCDD TEQ	0.0000099

SS317AA	
ARSENIC	1.1
BAPTE	0.962
TCDD TEQ	0.0000036

SS316AA	
ARSENIC	1.2
BAPTE	2.689
TCDD TEQ	0.0000100

SS314AA	
ARSENIC	0.5 J
BAPTE	0.161
TCDD TEQ	0.0000010

SS315AA	
ARSENIC	0.4 J
BAPTE	0.310
TCDD TEQ	0.0000024

0 1,500
Feet

AMEC Earth & Environmental, Inc.
2 Robbins Road
Westford, MA 01886
(978) 692-9090

FIGURE 4

H:\Beazer\Gainsville\Task35\Export\Background\Non_resSampleResults.pdf December 22, 2010 DWN: JDP APC CHKD: AKN

Table 1
Beazer Gainesville
Dioxin Results - Western Grid Data Summary Table

		Location:	SS201	SS202	SS202	SS204	SS207	SS207	SS208	SS208	SS209	SS210	SS211	SS212	SS212
		Sample ID:	SS201AA	DUP9	SS202AA	SS204AA	SS207AA	SS207BA	DUP10	SS208AA	SS209AA	SS210AA	SS211AA	DUP11	SS212AA
		Sample Date:	9/10/2010	9/10/2010	9/10/2010	9/10/2010	9/10/2010	9/10/2010	9/11/2010	9/11/2010	9/11/2010	9/11/2010	9/13/2010	9/14/2010	9/14/2010
Method	Analyte	Units													
E1613	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	mg/kg	0.0000401	0.0000236	0.0000245	0.0000715	0.000119	0.00000301	0.0000349	0.0000358	0.000063	0.0000829	0.000275	0.0000941	0.000091
E1613	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	mg/kg	0.00032	0.000177	0.00018	0.000587 J	0.000936	0.0000253	0.000292	0.000304	0.000514	0.00061	0.00169	0.000802	0.000705
E1613	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	mg/kg	0.00000218 J	0.00000117 J	0.00000117 J	0.00000412	0.00000725	0.000000151 U	0.00000184 J	0.00000224 J	0.00000313 J	0.00000432	0.0000168	0.00000554	0.0000049
E1613	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.00000112 J	0.000000744 J	0.000000752 J	0.00000217 J	0.00000311	0.0000000864 J	0.00000118 J	0.00000152 J	0.00000193 J	0.00000211 J	0.0000066	0.00000284 J	0.00000257 J
E1613	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000323	0.00000164 J	0.00000166 J	0.00000559	0.0000107	0.00000031 J	0.00000267 J	0.0000024 U	0.00000468	0.00000528	0.0000148	0.00000662 U	0.00000699
E1613	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.000000914 J	0.000000534 J	0.000000522 J	0.00000166 J	0.00000308	0.0000000928 J	0.000000622 U	0.00000104 U	0.00000092 U	0.00000172 J	0.0000058	0.00000203 U	0.00000227 J
E1613	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000919	0.00000425	0.00000421	0.0000132	0.0000222	0.000000571 J	0.0000075	0.00000731	0.000011	0.0000138	0.0000362	0.0000169	0.0000157
E1613	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	mg/kg	0.00000037 U	0.000000289 J	0.000000287 J	0.000000589 J	0.000000903 J	0.0000000986 U	0.00000026 U	0.000000322 U	0.000000328 U	0.000000216 U*	0.000000695 U	0.000000724 J	0.0000007 U
E1613	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000497	0.00000266	0.00000256	0.00000879	0.0000159	0.000000383 J	0.00000394	0.00000393 U	0.00000735	0.00000813	0.0000229	0.0000116	0.00000984
E1613	1,2,3,7,8-PENTACHLORODIBENZOFURAN	mg/kg	0.000000228 J	0.000000146 J	0.000000151 J	0.000000362 J	0.000000461 J	0.00000006 U	0.000000283 J	0.000000358 U	0.000000235 U	0.000000356 J	0.000000797 J	0.000000267 U	0.000000404 U
E1613	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	mg/kg	0.000000985 J	0.000000542 J	0.00000055 J	0.0000016 J	0.0000031	0.000000103 U	0.000000787 J	0.00000104 J	0.0000012 J	0.00000176 J	0.00000361	0.00000254 J	0.00000186 U
E1613	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.00000168 J	0.000000894 J	0.000000873 J	0.00000305	0.00000519	0.000000146 J	0.00000149 J	0.00000164 U	0.00000253 J	0.00000288 J	0.00000973	0.00000401	0.00000386
E1613	2,3,4,7,8-PENTACHLORODIBENZOFURAN	mg/kg	0.000000572 J	0.000000143 J	0.000000317 J	0.00000042 J	0.000000424 J	0.0000000666 U	0.000000575 J	0.000000658 U	0.000000179 U	0.00000114 J	0.00000284 J	0.000000801 J	0.000000196 U
E1613	2,3,7,8-TETRACHLORODIBENZOFURAN	mg/kg	0.000000271 JN	0.000000158 JN	0.000000159 JN	0.000000285 JN	0.000000273 JN	0.0000000628 U	0.000000589 U	0.000000569 JN	0.000000206 U	0.000000313 JN	0.000000516 JN	0.000000369 U	0.000000439 U
E1613	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000012 J	0.000000072 U	0.0000000713 U	0.000000171 J	0.000000304 J	0.0000000604 U	0.000000216 U	0.000000234 U	0.000000211 U	0.000000177 U	0.000000318 J	0.00000022 U	0.000000331 U
E1613	OCTACHLORODIBENZOFURAN	mg/kg	0.000138	0.0000793	0.0000805	0.000263	0.000439	0.0000112	0.00013	0.000136	0.000242	0.000324	0.00104	0.000379	0.000351
E1613	OCTACHLORODIBENZO-P-DIOXIN	mg/kg	0.00269	0.00163	0.00161	0.00516	0.00842	0.000233	0.00276	0.00284	0.00479	0.00557 J	0.015 J	0.00773 J	0.00718 J
E1613	TOTAL HEPTACHLORINATED DIBENZOFURANS	mg/kg	0.000124 J	0.0000719 J	0.0000722 J	0.000223	0.000397	0.00000901	0.000105 J	0.00011 J	0.000197 J	0.000263	0.000978	0.00029	0.000284
E1613	TOTAL HEPTACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.00122	0.000692	0.000694	0.00244 J	0.00379	0.0000952	0.0011	0.00114	0.00216	0.00229	0.00692	0.00306	0.00314
E1613	TOTAL HEXACHLORINATED DIBENZOFURANS	mg/kg	0.0000409 J	0.0000214 J	0.000021 J	0.0000685 J	0.000114 J	0.00000271 J	0.0000337 J	0.0000336 J	0.0000581 J	0.0000686 J	0.000222	0.0000881 J	0.0000842 J
E1613	TOTAL HEXACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.000133	0.0000658 J	0.0000646 J	0.000232 J	0.000377	0.00000871 J	0.0000949 J	0.0000863	0.000177	0.000212	0.000656	0.000293	0.000253
E1613	TOTAL PENTACHLORINATED DIBENZOFURANS	mg/kg	0.0000134 J	0.00000601 J	0.00000597 J	0.0000218 J	0.000036 J	0.000000999	0.00001 J	0.00000694	0.00000973	0.00002 J	0.000046 J	0.0000196 J	0.0000177
E1613	TOTAL PENTACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.0000137 J	0.00000626 J	0.0000069 J	0.0000228 J	0.0000339	0.000000561	0.00000359 J	0.00000231 J	0.0000123 J	0.0000211 J	0.0000444	0.0000197 J	0.0000131
E1613	TOTAL TETRACHLORINATED DIBENZOFURANS	mg/kg	0.00000427 J	0.00000231 J	0.00000221 J	0.0000104 J	0.00000839 J	0.000000192	0.00000198	0.00000279 J	0.00000159	0.00000775 J	0.00000855 J	0.00000492	0.000000973
E1613	TOTAL TETRACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.00000232 J	0.00000077	0.000000797	0.00000307 J	0.00000445 J	0.000000175	0.000000383 U	0.000000295 U	0.000000643	0.00000466	0.00000441 J	0.000000236	0.000000331 U
E1613	TCDD-TEQ	mg/kg	7.91064E-06	4.27267E-06	4.35143E-06	1.36944E-05	2.29608E-05	6.16695E-07	6.98194E-06	6.98077E-06	1.14685E-05	1.43865E-05	3.91233E-05	1.84018E-05	1.55792E-05

Notes: mg/kg = milligrams per kilogram
TCDD-TEQ = 2,3,7,8-Tetrachlorodibenzo-p-dioxin Toxic Equivalents
J = Estimated Detect
JN = Presence of an analyte tentatively identified
U = Not Detected at Reporting Limit or EMPC value

Table 1
Beazer Gainesville
Dioxin Results - Western Grid Data Summary Table

		Location:	SS212	SS213	SS216	SS217	SS218	SS219	SS220	SS220	SS221	SS222	SS223	SS224	SS224
		Sample ID:	SS212BA	SS213AA	SS216AA	SS217AA	SS218AA	SS219AA	DUP13	SS220AA	SS221AA	SS222AA	SS223AA	DUP14	SS224AA
		Sample Date:	9/14/2010	9/11/2010	9/15/2010	9/11/2010	9/14/2010	9/14/2010	9/11/2010	9/11/2010	9/11/2010	9/11/2010	9/11/2010	9/11/2010	9/11/2010
Method	Analyte	Units													
E1613	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	mg/kg	0.00000438	0.0000732	0.0000572	0.0000669	0.0000986	0.0000999	0.0000593	0.0000691	0.000057	0.0000268	0.0000565	0.0000485	0.0000529
E1613	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	mg/kg	0.000028	0.000454	0.000385	0.000459	0.000801	0.000802	0.000459	0.000453 J	0.000439	0.000196	0.00044	0.000344	0.00033
E1613	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	mg/kg	0.000000269 J	0.00000428	0.00000343	0.00000411	0.0000054	0.00000561	0.00000285 J	0.00000394	0.00000325 J	0.00000171 J	0.00000343	0.00000274 J	0.00000327 J
E1613	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.000000137 U	0.0000017 J	0.00000159 J	0.00000357	0.00000278 J	0.00000245 U	0.00000156 U	0.00000186 J	0.0000015 J	0.000000704 J	0.00000168 J	0.00000205 J	0.00000192 J
E1613	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.000000847 U	0.0000049	0.0000039	0.00000399	0.00000774	0.00000812	0.00000477	0.00000472	0.00000424	0.00000204 J	0.00000434	0.00000349	0.00000358
E1613	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.000000255 U	0.00000163 J	0.00000149 J	0.00000355	0.00000265 J	0.00000211 J	0.00000115 U	0.00000156 J	0.00000111 J	0.000000735 J	0.00000149 J	0.0000022 J	0.00000194 J
E1613	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.000000615 J	0.0000112	0.00000843	0.00001	0.0000181	0.0000174	0.0000106	0.0000107	0.00000982	0.00000468	0.0000103	0.00000786	0.00000764
E1613	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	mg/kg	0.000000196 U	0.000000893 U	0.000000486 U	0.000000982 U	0.00000111 U	0.000000483 U	0.000000288 U	0.000000522 U	0.000000489 U	0.0000000899 U*	0.000000247 U	0.000000544 U	0.000000468 U
E1613	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.000000842 U	0.0000074	0.00000657	0.00000661	0.0000109	0.0000115	0.0000064	0.00000721	0.00000579	0.00000352	0.00000629	0.00000527	0.00000552
E1613	1,2,3,7,8-PENTACHLORODIBENZOFURAN	mg/kg	0.000000322 U	0.000000278 J	0.000000276 J	0.00000109 U	0.000000508 U	0.000000341 U	0.00000015 U	0.000000274 J	0.000000161 U	0.000000131 J	0.000000213 U	0.000000261 U	0.000000465 J
E1613	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	mg/kg	0.000000319 U	0.00000114 J	0.00000131 J	0.00000105 U	0.00000193 U	0.00000195 U	0.0000012 J	0.00000117 J	0.00000118 U	0.000000644 J	0.00000128 J	0.00000126 U	0.00000117 J
E1613	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.0000002 U	0.00000254 U	0.00000227 J	0.00000491	0.00000475	0.00000447	0.00000262 J	0.00000262 J	0.00000226 J	0.00000134 J	0.00000265 J	0.00000389	0.00000301 J
E1613	2,3,4,7,8-PENTACHLORODIBENZOFURAN	mg/kg	0.000000305 U	0.000000398 J	0.000000892 U	0.00000237 J	0.000000792 U	0.000000785 U	0.000000227 U	0.000000421 J	0.000000279 U	0.000000392 J	0.000000274 J	0.000000911 J	0.00000118 J
E1613	2,3,7,8-TETRACHLORODIBENZOFURAN	mg/kg	0.000000169 U	0.00000023 U	0.000000202 JN	0.00000102	0.000000375 U	0.000000319 U	0.000000214 U	0.000000286 U	0.000000204 U	0.0000000657 U	0.000000267 U	0.000000463 U	0.000000348 JN
E1613	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	mg/kg	0.000000196 U	0.000000167 U	0.000000312 U	0.000000254 U	0.000000372 U	0.000000267 U	0.000000186 U	0.000000129 J	0.000000199 U	0.000000082 U	0.000000243 U	0.000000217 U	0.000000155 U
E1613	OCTACHLORODIBENZOFURAN	mg/kg	0.0000161	0.000233	0.000195	0.000236	0.000397	0.000394	0.000225	0.000229	0.000216	0.0000892	0.000235	0.000162	0.000159
E1613	OCTACHLORODIBENZO-P-DIOXIN	mg/kg	0.000261	0.00408	0.00386	0.00445	0.00721 J	0.00771 J	0.00438	0.00414	0.0044	0.00191	0.00439	0.00353	0.00297
E1613	TOTAL HEPTACHLORINATED DIBENZOFURANS	mg/kg	0.0000137 J	0.000223	0.000181	0.000195	0.0003	0.000301	0.00018 J	0.000221	0.000167 J	0.0000765 J	0.000172	0.000132 J	0.000154 J
E1613	TOTAL HEPTACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.000118	0.00173	0.00142	0.00153	0.00318	0.00298	0.0018	0.00168	0.00184	0.000647	0.0016	0.0013	0.00124
E1613	TOTAL HEXACHLORINATED DIBENZOFURANS	mg/kg	0.00000316	0.0000537 J	0.0000462 J	0.0000676	0.0000972 J	0.0000882 J	0.0000492 J	0.0000542 J	0.0000484 J	0.0000226 J	0.0000514 J	0.0000496 J	0.0000456 J
E1613	TOTAL HEXACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.00000943 J	0.000169	0.000149	0.000129	0.000271	0.000289	0.00015	0.000165	0.000174	0.0000675 J	0.000151	0.000123	0.000138
E1613	TOTAL PENTACHLORINATED DIBENZOFURANS	mg/kg	0.00000106	0.0000127 J	0.00000872 J	0.0000383 J	0.0000324	0.0000196	0.0000093	0.0000126 J	0.00000768	0.00000752 J	0.0000148 J	0.0000173 J	0.0000137 J
E1613	TOTAL PENTACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.000000186	0.00000978 J	0.00001 J	0.00000565	0.00002	0.0000239	0.0000108 J	0.0000108 J	0.00000932	0.00000786 J	0.0000161 J	0.0000109	0.0000103 J
E1613	TOTAL TETRACHLORINATED DIBENZOFURANS	mg/kg	0.000000418	0.00000327	0.00000229 J	0.0000174	0.00000772	0.00000326 U	0.00000178	0.00000184	0.000000749 U	0.00000138	0.00000294	0.00000457	0.00000529 J
E1613	TOTAL TETRACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.000000297 U	0.00000036	0.000000318 U	0.00000211	0.00000132	0.000000612 U	0.000000651	0.000000689 J	0.000000241 U	0.000000666	0.000000482	0.000000678	0.00000126
E1613	TCDD-TEQ	mg/kg	9.115E-07	1.08261E-05	9.75038E-06	1.14994E-05	1.73758E-05	1.72603E-05	1.05219E-05	1.0912E-05	9.61772E-06	4.96557E-06	1.05744E-05	8.60207E-06	8.83505E-06

Notes: mg/kg = milligrams per kilogram
TCDD-TEQ = 2,3,7,8-Tetrachlorodibenzo-p-dioxin Toxic Equivalents
J = Estimated Detect
JN = Presence of an analyte tentatively identified
U = Not Detected at Reporting Limit or EMPC value

Table 1
Beazer Gainesville
Dioxin Results - Western Grid Data Summary Table

		Location:	SS227	SS228	SS228	SS229	SS230	SS231	SS232	SS233	SS233	SS234	SS235	SS236	SS236	SS237
		Sample ID:	SS227AA	DUP15	SS228AA	SS229AA	SS230AA	SS231AA	SS232AA	SS233AA	SS233BA	SS234AA	SS235AA	DUP17	SS236AA	SS237AA
		Sample Date:	9/11/2010	9/14/2010	9/14/2010	9/12/2010	9/15/2010	9/11/2010	9/15/2010	9/15/2010	9/15/2010	9/14/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010
Method	Analyte	Units														
E1613	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	mg/kg	0.0000831	0.000222	0.000197	0.0000764	0.000212	0.0000282	0.0000701	0.00017	0.00000754	0.0000653	0.000368	0.000211	0.000195	0.000103
E1613	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	mg/kg	0.000541	0.00146	0.00139	0.000677	0.000379	0.000216	0.000476	0.00108	0.0000514	0.000459	0.00226 J	0.000882	0.000807	0.00059
E1613	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	mg/kg	0.00000492	0.00000957	0.00000927	0.00000422	0.00000488	0.00000162 J	0.00000387	0.00000868	0.00000056 J	0.00000374	0.0000203	0.0000129	0.00000989	0.00000538
E1613	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.00000234 J	0.00000554	0.00000541	0.00000233 J	0.00000347	0.00000078 U	0.00000204 J	0.00000354	0.000000177 U	0.00000252	0.0000114	0.0000112	0.00000928	0.00000711
E1613	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000639	0.0000138	0.0000137	0.0000119	0.0000044	0.00000216 J	0.00000564	0.0000118	0.000000817 U	0.00000725	0.0000309	0.00000958	0.00000935	0.00000722
E1613	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.00000184 J	0.00000482	0.00000441 U	0.00000205 J	0.00000312 J	0.000000811 J	0.00000156 J	0.00000354	0.00000018 J	0.0000025	0.0000119	0.00000954	0.00000903	0.0000074
E1613	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.000013	0.0000314	0.0000302	0.0000208	0.0000109	0.00000555	0.0000108	0.0000249	0.00000113 J	0.0000151	0.0000285	0.000028	0.0000243	0.0000394
E1613	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	mg/kg	0.000000933 U	0.000000589 U	0.000000862 U	0.00000028 U*	0.000000838 U	0.000000367 U	0.000000605 U	0.000000545 U	0.00000025 U	0.000000248 J	0.00000242 J	0.00000237 J	0.00000204 J	0.00000153 J
E1613	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000937	0.000021	0.000019	0.0000173	0.00000668	0.00000367	0.00000789	0.0000175	0.00000208 U	0.0000106	0.0000457	0.0000171	0.0000169	0.0000301
E1613	1,2,3,7,8-PENTACHLORODIBENZOFURAN	mg/kg	0.000000221 U	0.000000577 U	0.000000446 U	0.000000438 J	0.000000833 U	0.000000348 U	0.000000204 U	0.000000398 U	0.000000411 U	0.000000402 J	0.00000187 J	0.00000238 J	0.00000229 J	0.00000342
E1613	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000187 J	0.00000419	0.00000377	0.00000431	0.00000129 U	0.000000893 J	0.00000144 J	0.0000029 J	0.00000049 U	0.00000301	0.0000105	0.0000039	0.00000369	0.00000847
E1613	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.00000317 J	0.00000858	0.00000756	0.00000338	0.00000502	0.00000114 U	0.00000263 U	0.00000592	0.000000304 J	0.00000418	0.0000201	0.000014	0.0000137	0.000013
E1613	2,3,4,7,8-PENTACHLORODIBENZOFURAN	mg/kg	0.000000474 J	0.0000013 J	0.000000967 U	0.000000903 U	0.000000971 J	0.000000354 U	0.000000425 J	0.000000713 J	0.000000359 U	0.000002 J	0.00000548	0.00000473	0.00000299 J	0.0000149
E1613	2,3,7,8-TETRACHLORODIBENZOFURAN	mg/kg	0.000000166 U	0.000000324 U	0.000000383 U	0.000000327 JN	0.000000642 U	0.000000239 U	0.00000024 U	0.000000111 U	0.000000335 U	0.0000003 JN	0.00000139	0.00000328	0.00000274	0.00000373
E1613	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	mg/kg	0.000000376 U	0.00000028 U	0.000000467 J	0.00000057 U	0.000000253 J	0.000000226 U	0.000000256 U	0.000000313 J	0.000000181 U	0.00000041 J	0.000000908	0.000000505 U	0.000000441 U	0.00000177
E1613	OCTACHLORODIBENZOFURAN	mg/kg	0.000266	0.000658	0.000659	0.000262	0.000252	0.0000977	0.000222	0.000556	0.0000268	0.000191	0.00101	0.000637	0.000569	0.000245
E1613	OCTACHLORODIBENZO-P-DIOXIN	mg/kg	0.0049	0.0132 J	0.013 J	0.00547 J	0.00369	0.00208	0.00469	0.0104	0.00048	0.00347	0.0162 J	0.00812 J	0.00771 J	0.00439 J
E1613	TOTAL HEPTACHLORINATED DIBENZOFURANS	mg/kg	0.000256	0.000633	0.000583	0.000229	0.000442	0.000082 J	0.000216	0.00054	0.0000227 J	0.000196 J	0.00108	0.000693	0.000616	0.00027
E1613	TOTAL HEPTACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.00204	0.00556	0.00542	0.00255	0.00142	0.00082	0.00177	0.00431	0.000185	0.0016	0.00764 J	0.00242	0.00234	0.00179
E1613	TOTAL HEXACHLORINATED DIBENZOFURANS	mg/kg	0.0000642 J	0.000204	0.000182	0.0000737 J	0.000121 J	0.0000209 J	0.0000496 J	0.000133	0.00000535 J	0.0000727 J	0.000383 J	0.000238 J	0.000232 J	0.000181 J
E1613	TOTAL HEXACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.000225	0.000535	0.000492	0.000516	0.000166	0.0000806 J	0.000194	0.000432	0.0000163 J	0.000313	0.00117	0.000364	0.000344	0.000458
E1613	TOTAL PENTACHLORINATED DIBENZOFURANS	mg/kg	0.0000138 J	0.0000529 J	0.000046	0.00001872 J	0.0000559 J	0.00000567	0.00000974 J	0.0000228 J	0.000000514 J	0.0000289 J	0.000104 J	0.00016 J	0.000159 J	0.000155 J
E1613	TOTAL PENTACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.0000182 J	0.0000472	0.000031	0.000144	0.00000931	0.0000052 J	0.0000109 J	0.0000309 J	0.000000654 U	0.0000714	0.000201	0.0000556	0.0000543	0.0000522
E1613	TOTAL TETRACHLORINATED DIBENZOFURANS	mg/kg	0.000000826	0.00000689	0.0000051	0.00000737 J	0.0000366	0.000000296	0.00000114	0.00000393	0.000000936 U	0.00000811 J	0.0000312	0.0000533	0.0000586	0.0000619
E1613	TOTAL TETRACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.000000578 U	0.00000212	0.00000149 J	0.0000372	0.00000307	0.000000226 U	0.000000812 U	0.00000157 J	0.000000506 U	0.0000184 J	0.0000359	0.0000107	0.0000109	0.0000119
E1613	TCDD-TEQ	mg/kg	1.37095E-05	3.43614E-05	3.23189E-05	1.98761E-05	1.17762E-05	5.52123E-06	1.16386E-05	2.60593E-05	1.48691E-06	1.46806E-05	5.99851E-05	0.000028836	2.62128E-05	3.41359E-05

Notes: mg/kg = milligrams per kilogram
TCDD-TEQ = 2,3,7,8-Tetrachlorodibenzo-p-dioxin Toxic Equivalents
J = Estimated Detect
JN = Presence of an analyte tentatively identified
U = Not Detected at Reporting Limit or EMPC value

Table 1
Beazer Gainesville
Dioxin Results - Western Grid Data Summary Table

		Location:	SS238	SS239	SS240	SS240	SS241	SS242	SS243	SS243	SS244	SS245	SS245	SS247	SS249
		Sample ID:	SS238AA	SS239AA	DUP18	SS240AA	SS241AA	SS242AA	SS243AA	SS243BA	SS244AA	DUP19	SS245AA	SS247AA	SS249AA
		Sample Date:	9/13/2010	9/13/2010	9/13/2010	9/13/2010	9/14/2010	9/13/2010	9/13/2010	9/13/2010	9/13/2010	9/13/2010	9/13/2010	9/13/2010	9/13/2010
Method	Analyte	Units													
E1613	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	mg/kg	0.0000398	0.000102	0.0000358	0.0000361	0.0000848	0.0000654	0.000143	0.0000155	0.000086	0.0000861	0.0000821	0.0000508	0.0000787
E1613	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	mg/kg	0.000193	0.000636	0.000223	0.000231	0.00055	0.000479	0.00092	0.000113	0.000503	0.000564	0.000575	0.000336	0.000456
E1613	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	mg/kg	0.00000242 J	0.00000561	0.00000136 U	0.00000181 J	0.00000453	0.00000408	0.00000894	0.00000104 J	0.00000446	0.00000506	0.00000495	0.00000321 J	0.0000053
E1613	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.00000266 J	0.00000433	0.000000936 U	0.000000882 U	0.00000196 J	0.00000231 J	0.00000434	0.000000499 J	0.00000231 J	0.00000228 J	0.00000289 J	0.00000168 J	0.0000019 J
E1613	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000243 J	0.00000706	0.00000265 U	0.00000264 J	0.00000642	0.00000529	0.0000106	0.00000145 J	0.00000551	0.00000674	0.00000617	0.000004	0.00000395
E1613	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.00000217 J	0.00000327 J	0.000000934 U	0.000000985 J	0.00000175 J	0.00000168 J	0.00000404	0.000000445 J	0.00000219 J	0.00000214 J	0.00000234 J	0.00000146 J	0.00000203 J
E1613	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000514	0.0000165	0.00000553	0.00000569	0.0000127	0.000014	0.0000239	0.000003 J	0.0000116	0.0000139	0.0000129	0.00000856	0.0000115
E1613	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	mg/kg	0.000000609 U	0.00000107 U	0.000000879 U	0.000000656 U	0.000000755 U	0.000000759 U	0.00000119 J	0.000000346 U	0.000000521 U	0.000000478 J	0.000000496 U	0.000000504 U	0.000000739 U
E1613	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000426	0.0000116	0.00000384	0.00000397	0.00000959	0.0000102	0.000017	0.00000195 J	0.00000822	0.00000996	0.00000919	0.00000558	0.00000692
E1613	1,2,3,7,8-PENTACHLORODIBENZOFURAN	mg/kg	0.000000748 U	0.000000665 J	0.000000567 U	0.000000345 U	0.000000397 J	0.00000038 U	0.000000685 J	0.000000161 U	0.000000383 J	0.000000536 J	0.000000401 J	0.000000297 J	0.000000259 J
E1613	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	mg/kg	0.000000673 J	0.00000179 U	0.000000536 U	0.000000528 U	0.00000193 J	0.00000189 U	0.00000356	0.000000789 U	0.00000151 J	0.00000162 U	0.00000141 U	0.000000949 J	0.00000086 U
E1613	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.00000312 J	0.00000447	0.00000162 U	0.00000193 J	0.00000303 J	0.00000306 J	0.00000738	0.000000911 J	0.0000037	0.00000394	0.00000317 J	0.00000294 J	0.00000356
E1613	2,3,4,7,8-PENTACHLORODIBENZOFURAN	mg/kg	0.00000109 J	0.00000148 J	0.000000357 U	0.00000033 U	0.000000666 J	0.000000545 U	0.00000185 J	0.000000201 J	0.000000525 U	0.000000422 U	0.000000559 J	0.00000077 J	0.000000675 J
E1613	2,3,7,8-TETRACHLORODIBENZOFURAN	mg/kg	0.000000318 JN	0.00000044 U	0.000000245 U	0.000000207 JN	0.000000398 JN	0.00000044 JN	0.000000482 JN	0.000000232 U	0.000000301 JN	0.000000489 U	0.000000405 U	0.000000219 JN	0.000000281 JN
E1613	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	mg/kg	0.000000164 U	0.000000166 U	0.000000242 U	0.000000129 U	0.000000268 J	0.000000385 U	0.000000414 U	0.000000281 U	0.000000267 U	0.00000017 U	0.000000226 U	0.000000105 U	0.000000215 J
E1613	OCTACHLORODIBENZOFURAN	mg/kg	0.0000868	0.000294	0.000105	0.000101	0.000306	0.000199	0.000436	0.000046	0.000251	0.000264	0.000258	0.000147	0.000239
E1613	OCTACHLORODIBENZO-P-DIOXIN	mg/kg	0.0017	0.00571 J	0.00223	0.00213	0.00629 J	0.00434	0.00839 J	0.00104	0.00463	0.00528	0.00527	0.003	0.00431
E1613	TOTAL HEPTACHLORINATED DIBENZOFURANS	mg/kg	0.000102 J	0.000296	0.000101	0.000101 J	0.000261	0.000189	0.000435	0.000047 J	0.000255	0.000262	0.000249	0.000152 J	0.00024
E1613	TOTAL HEPTACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.000691	0.00229	0.000807	0.000821	0.00197	0.00169	0.00322	0.000388	0.0017	0.00196	0.00196	0.00118	0.00138
E1613	TOTAL HEXACHLORINATED DIBENZOFURANS	mg/kg	0.0000484 J	0.000084 J	0.0000279	0.0000293 J	0.0000612 J	0.000056 J	0.000124 J	0.000015 J	0.0000678 J	0.0000632 J	0.0000602 J	0.0000502 J	0.0000627 J
E1613	TOTAL HEXACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.0000918 J	0.000259	0.000091	0.0000882 J	0.000201	0.000192	0.000349	0.0000404 J	0.000198	0.000217	0.000206	0.00014	0.000139
E1613	TOTAL PENTACHLORINATED DIBENZOFURANS	mg/kg	0.0000342 J	0.0000273 J	0.0000134	0.0000142	0.0000108 J	0.0000135	0.000042 J	0.00000772 J	0.0000217 J	0.0000166 J	0.0000151 J	0.0000219 J	0.0000204 J
E1613	TOTAL PENTACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.00000939 J	0.0000158	0.00000551	0.00000471	0.0000155 J	0.00000967	0.0000294	0.00000271	0.0000177 J	0.0000149	0.0000101	0.00000647 J	0.0000103
E1613	TOTAL TETRACHLORINATED DIBENZOFURANS	mg/kg	0.00000397 J	0.00000324	0.00000426	0.00000378 J	0.00000456 J	0.00000607 J	0.00000441 J	0.0000013	0.00000508 J	0.00000405	0.00000281	0.00000455 J	0.00000365 J
E1613	TOTAL TETRACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.000000733	0.00000403	0.000000687	0.000000341 U	0.00000154 J	0.00000226	0.00000253	0.000000388 U	0.00000141	0.000000949	0.000000226 U	0.00000101	0.00000111 J
E1613	TCDD-TEQ	mg/kg	6.02171E-06	1.54778E-05	5.04656E-06	5.36068E-06	1.44044E-05	1.18074E-05	2.4603E-05	3.07332E-06	1.25418E-05	1.31574E-05	1.29877E-05	8.55471E-06	1.0671E-05

Notes: mg/kg = milligrams per kilogram
TCDD-TEQ = 2,3,7,8-Tetrachlorodibenzo-p-dioxin Toxic Equivalents
J = Estimated Detect
JN = Presence of an analyte tentatively identified
U = Not Detected at Reporting Limit or EMPC value

Table 1
Beazer Gainesville
Dioxin Results - Western Grid Data Summary Table

		Location:	SS250	SS251	SS251	SS252	SS254	SS254	SS255	SS256	SS256	SS257	SS258	SS259	SS261
		Sample ID:	SS250AA	DUP20	SS251AA	SS252AA	SS254AA	SS254BA	SS255AA	DUP21	SS256AA	SS257AA	SS258AA	SS259AA	SS261AA
		Sample Date:	9/13/2010	9/15/2010	9/15/2010	9/14/2010	9/14/2010	9/14/2010	9/13/2010	9/14/2010	9/14/2010	9/14/2010	9/14/2010	9/14/2010	9/14/2010
Method	Analyte	Units													
E1613	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	mg/kg	0.0000617	0.0000355	0.0000369	0.0000587	0.0000577	0.0000245	0.00005	0.000079	0.000099	0.0000356	0.0000412	0.0000288	0.0000181
E1613	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	mg/kg	0.00039	0.000249	0.000248	0.000358	0.000347	0.000233	0.000267	0.000613	0.000587	0.000131	0.000265	0.000193	0.000162
E1613	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	mg/kg	0.00000371	0.00000219 J	0.00000215 J	0.00000309 J	0.00000332 J	0.00000163 J	0.00000288 J	0.00000443	0.00000592	0.00000147 J	0.00000217 J	0.00000168 J	0.000000854 J
E1613	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.00000207 J	0.00000103 J	0.00000115 J	0.00000139 U	0.00000202 J	0.000000819 U	0.00000151 J	0.00000288 J	0.00000314 J	0.00000126 U	0.0000012 J	0.000000835 J	0.000000259 U
E1613	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000466	0.0000025 J	0.00000294 J	0.0000033 U	0.00000413	0.00000215 J	0.0000031 J	0.00000623	0.00000769	0.00000224 J	0.00000322 J	0.00000182 U	0.00000209 J
E1613	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.00000153 J	0.000000724 U	0.000000909 J	0.00000126 U	0.00000118 J	0.000000552 U	0.00000141 J	0.00000265 J	0.00000327 J	0.0000012 U	0.000000998 J	0.000000677 J	0.000000268 U
E1613	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.00001	0.00000561	0.00000587	0.00000859	0.00000827	0.0000043 U	0.0000068	0.0000149	0.0000159	0.00000436	0.0000065	0.00000446	0.00000314 U
E1613	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	mg/kg	0.000000811 U	0.000000444 U	0.000000291 U	0.000000387 U	0.000000357 U	0.000000327 U	0.00000079 U	0.000000627 U	0.000000969 U	0.000000393 U	0.000000599 U	0.000000331 U	0.000000387 U
E1613	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000763	0.00000421	0.00000408	0.00000633	0.00000614	0.00000355	0.00000445	0.00000964	0.0000107	0.00000326 J	0.00000467	0.00000332	0.00000288 J
E1613	1,2,3,7,8-PENTACHLORODIBENZOFURAN	mg/kg	0.000000317 U	0.000000241 U	0.000000346 U	0.000000257 U	0.0000005 U	0.000000335 U	0.000000415 J	0.000000478 U	0.000000725 J	0.000000567 U	0.000000188 U	0.000000201 U	0.000000183 U
E1613	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000116 J	0.00000065 J	0.000000663 U	0.00000101 U	0.000000965 J	0.000000597 U	0.00000107 U	0.00000247 J	0.00000223 J	0.000000975 U	0.000000776 U	0.000000577 J	0.000000358 U
E1613	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.00000322 J	0.00000137 J	0.00000158 J	0.00000237 J	0.00000233 J	0.000000936 J	0.00000245 J	0.00000483	0.00000641	0.00000172 J	0.00000164 J	0.00000099 J	0.000000561 J
E1613	2,3,4,7,8-PENTACHLORODIBENZOFURAN	mg/kg	0.000000683 U	0.000000469 U	0.000000212 U	0.000000333 U	0.000000455 J	0.000000332 U	0.00000101 J	0.0000014 J	0.00000222 J	0.000000532 J	0.000000332 J	0.000000282 J	0.000000176 U
E1613	2,3,7,8-TETRACHLORODIBENZOFURAN	mg/kg	0.000000382 U	0.000000292 U	0.000000246 U	0.000000429 U	0.000000136 JN	0.000000206 U	0.000000303 U	0.000000991	0.00000107	0.000000406 U	0.00000014 U	0.000000203 U	0.000000222 U
E1613	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	mg/kg	0.000000452 U	0.000000176 U	0.000000153 U	0.00000296	0.000000157 U	0.000000223 U	0.000000162 U	0.00000029 U	0.000000285 U	0.000000215 U	0.000000223 U	0.000000243 U	0.000000207 U
E1613	OCTACHLORODIBENZOFURAN	mg/kg	0.000177	0.000104	0.00011	0.000171 J	0.00017	0.0000988	0.000142	0.000271	0.000289	0.0000844	0.000125	0.0000892	0.0000682
E1613	OCTACHLORODIBENZO-P-DIOXIN	mg/kg	0.0038	0.00243	0.00239	0.00338	0.00334	0.0022	0.00248	0.00546 J	0.00503	0.00119	0.00242	0.00183	0.00177
E1613	TOTAL HEPTACHLORINATED DIBENZOFURANS	mg/kg	0.00018	0.000104 J	0.000106 J	0.00017 J	0.000166 J	0.000077 J	0.000142 J	0.000232	0.000305	0.0000905 J	0.000122 J	0.000088 J	0.0000535 J
E1613	TOTAL HEPTACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.00134	0.000847	0.000833	0.00121	0.00126	0.00098	0.000903	0.00203	0.00189	0.000383	0.000892	0.000689	0.000618
E1613	TOTAL HEXACHLORINATED DIBENZOFURANS	mg/kg	0.0000523 J	0.0000256 J	0.000026 J	0.0000422 J	0.0000401 J	0.00000923 J	0.000043 J	0.0000893 J	0.0000948 J	0.0000284 J	0.0000325 J	0.0000218 J	0.0000142 J
E1613	TOTAL HEXACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.000157	0.00009 J	0.0000888 J	0.000137	0.000149	0.0000894 J	0.000106 J	0.000234	0.000254	0.0000499 J	0.000103 J	0.0000805	0.0000561 J
E1613	TOTAL PENTACHLORINATED DIBENZOFURANS	mg/kg	0.0000174	0.0000046	0.00000511	0.0000111	0.00000841 J	0.000000498	0.0000173 J	0.0000387 J	0.000051 J	0.000012 J	0.00000209 J	0.00000275 J	0.00000153
E1613	TOTAL PENTACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.00000738 J	0.00000597 J	0.00000364	0.0000099	0.00000919 J	0.00000496	0.00000655	0.0000275 J	0.0000301 J	0.00000382	0.00000659	0.00000688 J	0.00000551
E1613	TOTAL TETRACHLORINATED DIBENZOFURANS	mg/kg	0.00000785	0.000000527	0.00000119	0.00000352	0.000000517 J	0.000000588	0.00000734	0.00000848	0.000014	0.00000198	0.00000277	0.000000675	0.00000208
E1613	TOTAL TETRACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.00000171	0.000000459	0.000000253	0.00000461	0.000000395	0.000000223 U	0.000000916	0.00000178	0.00000513	0.000000528	0.000000616	0.000000259 U	0.0000003 U
E1613	TCDD-TEQ	mg/kg	1.02111E-05	5.98407E-06	5.74524E-06	1.08493E-05	8.75915E-06	4.71957E-06	6.9435E-06	1.59692E-05	1.64416E-05	4.14708E-06	6.30887E-06	4.74258E-06	3.43955E-06

Notes: mg/kg = milligrams per kilogram
TCDD-TEQ = 2,3,7,8-Tetrachlorodibenzo-p-dioxin Toxic Equivalents
J = Estimated Detect
JN = Presence of an analyte tentatively identified
U = Not Detected at Reporting Limit or EMPC value

Table 1
Beazer Gainesville
Dioxin Results - Western Grid Data Summary Table

		Location:	SS262	SS263
		Sample ID:	SS262AA	SS263AA
		Sample Date:	9/14/2010	9/15/2010
Method	Analyte	Units		
E1613	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	mg/kg	0.0000465	0.0000465
E1613	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	mg/kg	0.000302	0.000283
E1613	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	mg/kg	0.00000317 J	0.00000306 J
E1613	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.00000111 J	0.00000137 J
E1613	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000331	0.00000341
E1613	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.00000103 J	0.00000124 U
E1613	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000744	0.00000754
E1613	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	mg/kg	0.000000313 U	0.000000609 U
E1613	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000506	0.00000506
E1613	1,2,3,7,8-PENTACHLORODIBENZOFURAN	mg/kg	0.000000231 U	0.000000252 J
E1613	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000104 J	0.00000103 J
E1613	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.00000193 J	0.0000024 J
E1613	2,3,4,7,8-PENTACHLORODIBENZOFURAN	mg/kg	0.000000416 U	0.000000961 J
E1613	2,3,7,8-TETRACHLORODIBENZOFURAN	mg/kg	0.000000282 JN	0.000000148 JN
E1613	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	mg/kg	0.000000198 U	0.00000029 U
E1613	OCTACHLORODIBENZOFURAN	mg/kg	0.000156	0.000149
E1613	OCTACHLORODIBENZO-P-DIOXIN	mg/kg	0.00287	0.00253
E1613	TOTAL HEPTACHLORINATED DIBENZOFURANS	mg/kg	0.000152 J	0.000149 J
E1613	TOTAL HEPTACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.00106	0.000889
E1613	TOTAL HEXACHLORINATED DIBENZOFURANS	mg/kg	0.000035 J	0.0000412 J
E1613	TOTAL HEXACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.000122	0.000106
E1613	TOTAL PENTACHLORINATED DIBENZOFURANS	mg/kg	0.00000722	0.0000152 J
E1613	TOTAL PENTACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.0000109 J	0.00000893 J
E1613	TOTAL TETRACHLORINATED DIBENZOFURANS	mg/kg	0.00000132 J	0.00000586
E1613	TOTAL TETRACHLORINATED DIBENZO-P-DIOXINS	mg/kg	0.000000602	0.00000097
E1613	TCDD-TEQ	mg/kg	7.66122E-06	7.68541E-06

Notes: mg/kg = milligrams per kilogram
TCDD-TEQ = 2,3,7,8-Tetrachlorodibenzo-p-dioxin Toxic Equivalents
J = Estimated Detect
JN = Presence of an analyte tentatively identified
U = Not Detected at Reporting Limit or EMPC value

Table 2
Beazer Gainesville
Dioxin, PAH, Pentachlorophenol and Arsenic Results - North, South, and East of the Former KI Facility
Data Summary Table

		Location:	SS300	SS301	SS302	SS303	SS305	SS306	SS307	SS308	SS309	SS309	SS310
		Sample ID:	SS300AA	SS301AA	SS302AA	SS303AA	SS305AA	SS306AA	SS307AA	SS308AA	DUP24	SS309AA	SS310AA
		Sample Date:	9/14/2010	9/14/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010
Method	Analyte	Units											
BNASIM	1-METHYLNAPHTHALENE	mg/kg	0.0022 J	0.0021 J	0.0013 J	0.0051	0.016	0.015	0.013	0.0026 J	0.0034	0.0047	0.013
BNASIM	2-METHYLNAPHTHALENE	mg/kg	0.0035	0.0029	0.002 J	0.0073	0.018	0.017	0.018	0.0045	0.0053	0.0062	0.017
BNASIM	ACENAPHTHENE	mg/kg	0.0017 J	0.0015 J	0.0013 J	0.0079	0.0023 J	0.0028	0.13	0.0021 J	0.0025 J	0.0043	0.061
BNASIM	ACENAPHTHYLENE	mg/kg	0.036	0.032	0.011	0.069	0.013	0.011	0.18	0.011	0.022	0.019	0.1
BNASIM	ANTHRACENE	mg/kg	0.21	0.03	0.018	0.091	0.017	0.014	0.45	0.014	0.029	0.025	0.2
BNASIM	BENZO(A)ANTHRACENE	mg/kg	0.03	0.03	0.16	0.23	0.064	0.11	4.3	0.068	0.11	0.16	2.6
BNASIM	BENZO(A)PYRENE	mg/kg	0.028	0.047	0.2	0.3	0.081	0.16	5.4	0.093	0.15	0.21	3.5
BNASIM	BENZO(B)FLUORANTHENE	mg/kg	0.16	0.067	0.37	0.53	0.14	0.29	8.1	0.16	0.28	0.4	5.8
BNASIM	BENZO(G,H,I)PERYLENE	mg/kg	0.043	0.086	0.19	0.29	0.088	0.17	5.8	0.11	0.15 J	0.24 J	2.8
BNASIM	BENZO(K)FLUORANTHENE	mg/kg	0.028	0.018	0.12	0.16	0.046	0.095	2.7	0.052	0.086	0.12	1.8
BNASIM	C1-Chrysenes	mg/kg	0.035	0.049	0.084	0.15	0.12	0.1	2.1	0.041	0.071	0.093	1.5
BNASIM	C1-Dibenzothiophenes	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U	0.05	0.024	0.011	0.005 U	0.005 U	0.005 U	0.039
BNASIM	C1-Fluoranthenes/Pyrenes	mg/kg	0.037	0.042	0.093	0.17	0.28	0.12	2.2	0.039	0.07	0.099	1.7
BNASIM	C1-Fluorenes	mg/kg	0.005 U	0.005 U	0.005 U	0.012	0.0089	0.0092	0.052	0.005 U	0.005 U	0.005 U	0.034
BNASIM	C1-Phenanthrenes/Anthracenes	mg/kg	0.048	0.016	0.043	0.085	0.37	0.15	0.8	0.02	0.032	0.043	0.97
BNASIM	C2-Chrysenes	mg/kg	0.041	0.07	0.031	0.081	0.2	0.16	0.82	0.018	0.031	0.046	1.1
BNASIM	C2-Dibenzothiophenes	mg/kg	0.005 U	0.014	0.0068	0.023	0.005 U	0.005 U	0.13	0.005 U	0.005 U	0.005 U	0.13
BNASIM	C2-Fluorenes	mg/kg	0.005 U	0.0074	0.005 U	0.016	0.0088	0.019	0.072	0.005 U	0.005 U	0.0057	0.08
BNASIM	C2-Naphthalenes	mg/kg	0.0054	0.0061	0.005 U	0.011	0.035	0.036	0.027	0.005 U	0.0059	0.0082	0.033
BNASIM	C2-Phenanthrenes/Anthracenes	mg/kg	0.052	0.021	0.032	0.051	1.4	0.35	0.56	0.019	0.031	0.041	2.3
BNASIM	C3-Chrysenes	mg/kg	0.052	0.14	0.044	0.096	0.11	0.1	0.66	0.016	0.04	0.046	0.95
BNASIM	C3-Dibenzothiophenes	mg/kg	0.005 U	0.022	0.005 U	0.02	0.005 U	0.005 U	0.18	0.005 U	0.005 U	0.005 U	0.15
BNASIM	C3-Fluorenes	mg/kg	0.005 U	0.005 U	0.005 U	0.022	0.11	0.018	0.089	0.005 U	0.005 U	0.0075	0.1
BNASIM	C3-Naphthalenes	mg/kg	0.005 U	0.005 U	0.005 U	0.0087	0.069	0.022	0.04	0.005 U	0.005 U	0.0062	0.028
BNASIM	C3-Phenanthrenes/Anthracenes	mg/kg	0.062	0.022	0.017	0.04	1.7	0.57	0.36	0.015	0.017	0.027	2.8
BNASIM	C4-Chrysenes	mg/kg	0.005 U	0.16	0.005 U	0.085	0.073	0.061	0.25	0.005 U	0.017 J	0.005 UJ	0.38
BNASIM	C4-Naphthalenes	mg/kg	0.005 U	0.005 U	0.005 U	0.0088	0.066	0.045	0.019	0.005 U	0.005 U	0.0052	0.056
BNASIM	C4-Phenanthrenes/Anthracenes	mg/kg	0.014	0.019	0.005 U	0.043	3.1	1.2	0.2	0.005 U	0.0063	0.016	3.9
BNASIM	CHRYSENE	mg/kg	0.074	0.024	0.28	0.35	0.086	0.18	5.7	0.1	0.16	0.24	4.1
BNASIM	DIBENZO(A,H)ANTHRACENE	mg/kg	0.018	0.018	0.055	0.079	0.024	0.043	1.4	0.025	0.042	0.055	0.74
BNASIM	DIBENZOFURAN	mg/kg	0.0049	0.0014 J	0.0023 J	0.0053	0.0089	0.0039	0.049	0.0041	0.0056	0.0072	0.047
BNASIM	Dibenzothiophene	mg/kg	0.0023 J	0.0013 J	0.0044	0.0081	0.0014 J	0.0025 J	0.12	0.0027	0.0043	0.0058	0.11
BNASIM	FLUORANTHENE	mg/kg	0.049	0.044	0.45	0.4	0.12	0.24	9.3	0.14	0.23	0.32	6.7
BNASIM	FLUORENE	mg/kg	0.0043	0.0031	0.0032	0.012	0.0035	0.0026	0.14	0.0025 J	0.0034	0.0045	0.082
BNASIM	INDENO(1,2,3-CD)PYRENE	mg/kg	0.065	0.072	0.24	0.38	0.098	0.2	6.6	0.13	0.21	0.28	4
BNASIM	NAPHTHALENE	mg/kg	0.0052	0.0033	0.0035	0.015	0.028	0.017	0.031	0.011	0.01	0.014	0.037
BNASIM	PENTACHLOROPHENOL	mg/kg	0.0093 J	0.053 U	0.052 U	0.019 J	0.054 U	0.051 U	0.0076 J	0.014 J	0.017 J	0.024 J	0.0098 J
BNASIM	PHENANTHRENE	mg/kg	0.029	0.012	0.092	0.085	0.1	0.087	3	0.041	0.062 J	0.1 J	2.2
BNASIM	PYRENE	mg/kg	0.047	0.048	0.33	0.36	0.091	0.19	7.1	0.11	0.18 J	0.28 J	5.5
BNASIM	BAPTE	mg/kg	0.071854	0.082104	0.33348	0.49495	0.135746	0.26413	8.7327	0.15442	0.25302	0.35044	5.5021
BNASIM	TPAH16	mg/kg	0.8282	0.5359	2.524	3.3589	1.0018	1.8124	60.331	1.0696	1.7269	2.4718	40.22
E1613	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	mg/kg	0.000206	0.000024	0.0000467	0.000183	0.0000614	0.0000493	0.0000954	0.0000774	0.000149	0.000155	0.000136
E1613	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	mg/kg	0.00216 J	0.000175	0.00034	0.00119	0.000427	0.000391	0.00049	0.000619	0.001	0.00104	0.000822
E1613	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	mg/kg	0.00000937	0.0000015 J	0.00000278	0.0000111	0.00000347	0.00000294	0.00000641	0.00000451	0.00000767	0.0000082	0.00000758
E1613	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.00000305	0.00000136 J	0.00000126 J	0.00000593	0.00000203 J	0.00000123 J	0.00000271 J	0.00000182 J	0.00000333	0.00000364	0.00000325
E1613	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg	0.00000827	0.00000101 U	0.00000393	0.0000166	0.00000449	0.00000362	0.00000585	0.00000694	0.0000113	0.0000129	0.0000104
E1613	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg	0.00000189 J	0.00000128 J	0.00000147 J	0.00000661	0.0000017 J	0.00000113 J	0.00000271 J	0.0000017 J	0.00000337	0.00000364	0.00000363

Table 2
Beazer Gainesville
Dioxin, PAH, Pentachlorophenol and Arsenic Results - North, South, and East of the Former KI Facility
Data Summary Table

			Location: Sample ID: Sample Date:	SS300 SS300AA 9/14/2010	SS301 SS301AA 9/14/2010	SS302 SS302AA 9/12/2010	SS303 SS303AA 9/12/2010	SS305 SS305AA 9/12/2010	SS306 SS306AA 9/12/2010	SS307 SS307AA 9/12/2010	SS308 SS308AA 9/12/2010	SS309 DUP24 9/12/2010	SS309 SS309AA 9/12/2010	SS310 SS310AA 9/12/2010
E1613	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg		0.0000273	0.00000407	0.00000935	0.000038	0.0000106	0.00000997	0.0000151	0.000015	0.0000268	0.0000276	0.0000226
E1613	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	mg/kg		0.000000622 U	0.000000424 U	0.000000306 J	0.000000377 J	0.000000202 J	0.00000016 J	0.000000791 J	0.000000477 J	0.000000376 J	0.000000219 J	0.000000804 J
E1613	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	mg/kg		0.00000949	0.00000207 J	0.00000674	0.000027	0.0000065	0.00000555	0.0000107	0.0000101	0.0000171	0.0000188	0.0000159
E1613	1,2,3,7,8-PENTACHLORODIBENZOFURAN	mg/kg		0.000000214 U	0.000000202 U	0.000000183 J	0.000000926 J	0.00000043 J	0.000000137 U	0.000000435 J	0.000000193 J	0.000000382 J	0.000000382 J	0.000000469 J
E1613	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	mg/kg		0.00000137 U	0.000000382 U	0.00000125 J	0.00000615	0.00000141 J	0.00000105 J	0.0000023 U	0.00000179 J	0.0000035	0.00000389	0.00000374
E1613	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg		0.00000303 U	0.0000022 J	0.00000248 J	0.0000108	0.00000324	0.00000231 J	0.00000515	0.00000314 J	0.00000626	0.00000663	0.00000631
E1613	2,3,4,7,8-PENTACHLORODIBENZOFURAN	mg/kg		0.000000422 U	0.000000847 U	0.000000396 J	0.00000224 J	0.0000013 J	0.000000476 J	0.000000669 J	0.000000196 U	0.00000124 J	0.00000129 J	0.00000174 J
E1613	2,3,7,8-TETRACHLORODIBENZOFURAN	mg/kg		0.000000246 U	0.000000258 U	0.0000000441 U	0.000000557	0.000000262 JN	0.0000000758 JN	0.000000277 U	0.000000132 JN	0.000000233 JN	0.000000217 U	0.000000324 JN
E1613	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	mg/kg		0.000000272 U	0.000000165 U	0.000000101 U	0.000000418 J	0.0000000864 U	0.000000125 J	0.000000779	0.0000000774 U	0.00000017 U	0.000000185 U	0.000000524
E1613	OCTACHLORODIBENZOFURAN	mg/kg		0.0012	0.0000965	0.000142	0.000574	0.000213	0.000192	0.000377	0.000299	0.000483	0.000513	0.000455
E1613	OCTACHLORODIBENZO-P-DIOXIN	mg/kg		0.0256 J	0.00181	0.00283	0.0103 J	0.00406 J	0.00384	0.00533	0.00595 J	0.00894 J	0.00909 J	0.00714 J
E1613	TOTAL HEPTACHLORINATED DIBENZOFURANS	mg/kg		0.000769	0.0000817 J	0.000138	0.000567	0.000196	0.000164	0.000306	0.000253	0.000473	0.000483	0.00042
E1613	TOTAL HEPTACHLORINATED DIBENZO-P-DIOXINS	mg/kg		0.0184 J	0.000749	0.000863	0.00403	0.00129	0.00116	0.0013	0.00187	0.00309	0.00313	0.00256
E1613	TOTAL HEXACHLORINATED DIBENZOFURANS	mg/kg		0.00014 J	0.0000364 J	0.0000409 J	0.000196 J	0.0000565 J	0.0000442 J	0.0000864 J	0.0000683 J	0.000123 J	0.000132 J	0.000123 J
E1613	TOTAL HEXACHLORINATED DIBENZO-P-DIOXINS	mg/kg		0.00073	0.0000538 J	0.000118	0.000531	0.000137	0.000117	0.000173	0.000205	0.000358	0.000382	0.0003
E1613	TOTAL PENTACHLORINATED DIBENZOFURANS	mg/kg		0.00000345	0.0000085	0.0000077 J	0.0000462 J	0.0000175 J	0.00000668 J	0.0000381 J	0.000017 J	0.0000223 J	0.0000205 J	0.0000268 J
E1613	TOTAL PENTACHLORINATED DIBENZO-P-DIOXINS	mg/kg		0.0000231	0.00000373	0.0000191 J	0.000065	0.000013 J	0.0000102 J	0.0000197	0.0000211	0.0000352	0.0000363	0.0000322
E1613	TOTAL TETRACHLORINATED DIBENZOFURANS	mg/kg		0.00000322	0.00000366	0.00000163	0.0000142	0.00000527 J	0.000000956 J	0.0000145	0.00000284 J	0.00000501 J	0.00000455	0.00000709 J
E1613	TOTAL TETRACHLORINATED DIBENZO-P-DIOXINS	mg/kg		0.00000444	0.000000165 U	0.00000439	0.00000701 J	0.00000146	0.000000708 J	0.00000622	0.00000133	0.00000349	0.00000312	0.00000604
E1613	TCDD-TEQ	mg/kg		3.78761E-05	4.16313E-06	8.767E-06	3.49584E-05	1.09591E-05	9.36644E-06	1.40879E-05	1.46786E-05	2.5239E-05	2.66476E-05	2.30562E-05
SW6020	ARSENIC	mg/kg		0.5 J	1.29	0.73	2.07	1.39	1.24	1.41	1.03	3.09	3.19	1.98

Notes: mg/kg = milligrams per kilogram
BAPTE = Benzo(a)pyrene Toxic Equivalents
TPAH16 = Total Polycyclic Aromatic Hydrocarbons 16 value
TCDD-TEQ = 2,3,7,8-Tetrachlorodibenzo-p-dioxin Toxic Equivalents
J = Estimated Detect
U = Not Detected at Reporting Limit value
UJ = Estimated Non-detect
UR = Rejected Data

Table 3
Beazer Gainesville
Dioxin, PAH, Pentachlorophenol and Arsenic Results
Industrial Background and Residential Busy Street Background Data Summary Table

		Location:	SS311	SS312	SS313	SS314	SS315	SS316	SS317	SS318	SS318
		Sample ID:	SS311AA	SS312AA	SS313AA	SS314AA	SS315AA	SS316AA	SS317AA	DUP25	SS318AA
		Sample Date:	9/12/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010
Method	Analyte	Units									
BNASIM	1-METHYLNAPHTHALENE	mg/kg	0.0078	0.0062	0.0019 J	0.00098 J	0.01	0.0054	0.0029	0.005 J	0.0049
BNASIM	2-METHYLNAPHTHALENE	mg/kg	0.0099	0.0065	0.0032	0.0019 J	0.011	0.0076	0.0036	0.0076	0.0067
BNASIM	ACENAPHTHENE	mg/kg	0.076	0.065	0.0061	0.0026	0.0056	0.034	0.017	0.029	0.03
BNASIM	ACENAPHTHYLENE	mg/kg	0.075	0.023	0.0096	0.0044	0.039	0.1	0.031	0.087 J	0.09 J
BNASIM	ANTHRACENE	mg/kg	0.2	0.11	0.018	0.0064	0.043	0.25	0.065	0.15	0.17
BNASIM	BENZO(A)ANTHRACENE	mg/kg	0.87	0.72	0.24	0.071	0.18	1.5	0.47	1.1	1.1
BNASIM	BENZO(A)PYRENE	mg/kg	1.1	0.79	0.31	0.095	0.2	1.7	0.59	1.5	1.4
BNASIM	BENZO(B)FLUORANTHENE	mg/kg	1.8	1.2	0.51	0.17	0.26	2.6	0.85	2.4	2.3
BNASIM	BENZO(G,H,I)PERYLENE	mg/kg	1	0.73	0.33	0.11	0.18	1.4	0.54	1.5	1.3
BNASIM	BENZO(K)FLUORANTHENE	mg/kg	0.53	0.38	0.17	0.05	0.091	0.67	0.3	0.7 J	0.65 J
BNASIM	C1-Chrysenes	mg/kg	0.47	0.32	0.12	0.043	0.095	0.71	0.27	0.57	0.53
BNASIM	C1-Dibenzothiophenes	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.0084	0.005 U	0.0051 U	0.005 U
BNASIM	C1-Fluoranthenes/Pyrenes	mg/kg	1.3	0.35	0.12	0.043	0.13	0.8	0.27	0.58	0.51
BNASIM	C1-Fluorenes	mg/kg	0.03	0.012	0.005 U	0.005 U	0.024	0.036	0.0082	0.012	0.011
BNASIM	C1-Phenanthrenes/Anthracenes	mg/kg	0.26	0.18	0.048	0.019	0.13	0.32	0.16	0.25	0.23
BNASIM	C2-Chrysenes	mg/kg	0.21	0.14	0.059	0.026	0.04	0.4	0.16	0.28	0.24
BNASIM	C2-Dibenzothiophenes	mg/kg	0.027	0.016	0.005 U	0.005 U	0.0098	0.043	0.021	0.036 J	0.005 UJ
BNASIM	C2-Fluorenes	mg/kg	0.028	0.022	0.005 U	0.005 U	0.018	0.041	0.02	0.024	0.025
BNASIM	C2-Naphthalenes	mg/kg	0.022	0.012	0.005 U	0.005 U	0.038	0.012	0.0073	0.012	0.011
BNASIM	C2-Phenanthrenes/Anthracenes	mg/kg	0.15	0.093	0.027	0.019	0.056	0.24	0.11	0.19	0.18
BNASIM	C3-Chrysenes	mg/kg	0.16	0.11	0.064	0.02	0.018	0.18	0.15	0.27	0.22
BNASIM	C3-Dibenzothiophenes	mg/kg	0.02	0.011	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.041 J	0.005 UJ
BNASIM	C3-Fluorenes	mg/kg	0.034	0.02	0.005 U	0.005 U	0.015	0.042	0.02	0.031	0.03
BNASIM	C3-Naphthalenes	mg/kg	0.017	0.0081	0.005 U	0.005 U	0.016	0.014	0.007	0.0098	0.0082
BNASIM	C3-Phenanthrenes/Anthracenes	mg/kg	0.086	0.055	0.016	0.014	0.044	0.18	0.067	0.1	0.11
BNASIM	C4-Chrysenes	mg/kg	0.058	0.056	0.005 U	0.005 U	0.046	0.1	0.089	0.12 J	0.096 J
BNASIM	C4-Naphthalenes	mg/kg	0.02	0.0059	0.005 U	0.005 U	0.019	0.012	0.0056	0.0075	0.011
BNASIM	C4-Phenanthrenes/Anthracenes	mg/kg	0.005 U	0.024	0.005 U	0.005 U	0.013	0.08	0.035	0.054 J	0.029 J
BNASIM	CHRYSENE	mg/kg	1	0.77	0.32	0.11	0.2	1.8	0.59	1.5	1.5
BNASIM	DIBENZO(A,H)ANTHRACENE	mg/kg	0.3	0.22	0.093	0.028	0.044	0.38	0.17	0.41	0.33
BNASIM	DIBENZOFURAN	mg/kg	0.034	0.02	0.0032	0.0013 J	0.014	0.014	0.01	0.014 J	0.014 J
BNASIM	Dibenzothiophene	mg/kg	0.045	0.029	0.0081	0.0025 J	0.011	0.035	0.022	0.031 J	0.029 J
BNASIM	FLUORANTHENE	mg/kg	2.2	1.4	0.51	0.16	0.45	2.6	1.1	2.3	2.6
BNASIM	FLUORENE	mg/kg	0.072	0.038	0.0067	0.0019 J	0.011	0.042	0.017	0.028	0.031
BNASIM	INDENO(1,2,3-CD)PYRENE	mg/kg	1.3	0.9	0.4	0.13	0.21	1.9	0.66	1.8	1.6
BNASIM	NAPHTHALENE	mg/kg	0.013	0.0072	0.0051	0.0034	0.023	0.011	0.0047	0.011	0.01
BNASIM	PENTACHLOROPHENOL	mg/kg	0.055 U	0.052 U	0.053 U	0.051 U	0.052 U	0.057 U	0.051 U	0.11 U	0.051 U
BNASIM	PHENANTHRENE	mg/kg	0.71	0.53	0.14	0.045	0.31	0.72	0.42	0.63 J	0.56 J
BNASIM	PYRENE	mg/kg	1.5	1.1	0.41	0.13	0.36	2.2	0.89	2	2
BNASIM	BAPTE	mg/kg	1.8033	1.29657	0.52002	0.16071	0.31011	2.6885	0.96159	2.4485	2.238
BNASIM	TPAH16	mg/kg	15.6112	10.4039	3.9576	1.32458	3.3296	21.087	8.1003	18.6679	17.9238

Table 3
Beazer Gainesville
Dioxin, PAH, Pentachlorophenol and Arsenic Results
Industrial Background and Residential Busy Street Background Data Summary Table

			Location:	SS311	SS312	SS313	SS314	SS315	SS316	SS317	SS318	SS318
			Sample ID:	SS311AA	SS312AA	SS313AA	SS314AA	SS315AA	SS316AA	SS317AA	DUP25	SS318AA
			Sample Date:	9/12/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010	9/12/2010
E1613	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	mg/kg		0.00018	0.0000124	0.00000735	0.00000518	0.0000086	0.0000499	0.000018	0.0000335	0.0000328
E1613	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	mg/kg		0.000812	0.000061	0.0000399	0.0000187	0.0000402	0.000269	0.0000396	0.000239	0.000236 J
E1613	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	mg/kg		0.0000172	0.000000828 U	0.000000457 J	0.000000263 U*	0.00000052 J	0.0000021 J	0.000000613 J	0.00000177 J	0.00000177 J
E1613	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	mg/kg		0.0000129	0.000000834 J	0.000000435 J	0.000000387 J	0.00000083 J	0.00000217 J	0.00000129 J	0.00000185 J	0.00000187 J
E1613	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg		0.00000975	0.000000957 J	0.000000588 J	0.000000347 J	0.000000543 J	0.00000202 J	0.000000573 J	0.00000268	0.00000266
E1613	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg		0.0000135	0.00000165 J	0.000000475 J	0.000000752 J	0.00000141 J	0.00000368	0.00000206 J	0.00000351	0.00000345
E1613	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	mg/kg		0.0000376	0.00000211 J	0.00000145 J	0.000000641 U	0.00000162 J	0.00000682	0.00000374	0.00000681	0.00000651
E1613	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	mg/kg		0.00000139 J	0.000000438 U	0.000000137 U*	0.000000115 U	0.000000287 J	0.000000233 J	0.000000146 J	0.00000026 J	0.000000734 J
E1613	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	mg/kg		0.0000188	0.00000185 J	0.00000123 J	0.000000554 J	0.00000134 J	0.00000368	0.00000191 J	0.00000466	0.00000426
E1613	1,2,3,7,8-PENTACHLORODIBENZOFURAN	mg/kg		0.00000319	0.000000787 U	0.00000022 J	0.000000175 J	0.000000389 J	0.000000726 J	0.00000038 J	0.000000555 J	0.000000525 J
E1613	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	mg/kg		0.00000399	0.000000341 U	0.000000331 J	0.000000164 U	0.000000344 J	0.0000011 J	0.000000522 J	0.00000136 J	0.00000119 J
E1613	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	mg/kg		0.000016	0.00000301 J	0.000000686 J	0.00000169 J	0.00000304 J	0.00000837	0.00000417	0.00000757	0.00000722
E1613	2,3,4,7,8-PENTACHLORODIBENZOFURAN	mg/kg		0.00000973	0.000000673 J	0.000000202 U	0.000000359 J	0.00000078 J	0.00000672	0.00000311	0.00000685	0.000007
E1613	2,3,7,8-TETRACHLORODIBENZOFURAN	mg/kg		0.00000153	0.000000302 JN	0.000000255 JN	0.000000269 JN	0.000000408 JN	0.000000942	0.000000465 JN	0.000000652	0.000000594
E1613	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	mg/kg		0.000000187 U	0.000000247 U	0.000000104 U	0.000000089 U	0.000000267 J	0.000000194 J	0.0000000623 U	0.000000256 J	0.000000247 J
E1613	OCTACHLORODIBENZOFURAN	mg/kg		0.000309	0.0000271	0.0000212	0.00000959	0.0000235	0.000167	0.0000182	0.0000962	0.0000915
E1613	OCTACHLORODIBENZO-P-DIOXIN	mg/kg		0.00582 J	0.000563	0.00035	0.000174	0.000405	0.00198	0.000296	0.00211	0.00196
E1613	TOTAL HEPTACHLORINATED DIBENZOFURANS	mg/kg		0.000457	0.0000311	0.0000193 J	0.0000115 J	0.000018 J	0.000162 J	0.000036 J	0.000101 J	0.000101 J
E1613	TOTAL HEPTACHLORINATED DIBENZO-P-DIOXINS	mg/kg		0.00195	0.000207	0.0000912	0.00005	0.0000873	0.00125	0.000129	0.00111	0.00105 J
E1613	TOTAL HEXACHLORINATED DIBENZOFURANS	mg/kg		0.000294 J	0.0000381 J	0.0000101 J	0.0000199 J	0.0000355 J	0.000114 J	0.0000517 J	0.0001 J	0.000099 J
E1613	TOTAL HEXACHLORINATED DIBENZO-P-DIOXINS	mg/kg		0.0003	0.0000334 J	0.0000218 J	0.00000786 J	0.0000178 J	0.000121 J	0.0000349 J	0.000132	0.000125
E1613	TOTAL PENTACHLORINATED DIBENZOFURANS	mg/kg		0.000124	0.0000567 J	0.00000756 J	0.0000238 J	0.0000464 J	0.0000904 J	0.0000445 J	0.000118 J	0.000109 J
E1613	TOTAL PENTACHLORINATED DIBENZO-P-DIOXINS	mg/kg		0.0000385	0.00000419	0.00000576 J	0.00000153	0.00000341 J	0.0000136 J	0.00000526 J	0.0000192 J	0.0000187 J
E1613	TOTAL TETRACHLORINATED DIBENZOFURANS	mg/kg		0.0000408	0.0000156	0.00000271 J	0.00000567 J	0.00000912 J	0.0000171	0.00000888	0.0000278	0.0000285
E1613	TOTAL TETRACHLORINATED DIBENZO-P-DIOXINS	mg/kg		0.00000322	0.000000246	0.00000119	0.000000266	0.00000127 J	0.00000258 J	0.000000958	0.0000043 J	0.00000419 J
E1613	TCDD-TEQ	mg/kg		3.01759E-05	2.51608E-06	1.53393E-06	9.73657E-07	2.42622E-06	9.97738E-06	3.60934E-06	9.89141E-06	9.6037E-06
SW6020	ARSENIC	mg/kg		13.4	0.77	1.01	0.5 J	0.42 J	1.15	1.05	0.97	0.96

Notes:
mg/kg = milligrams per kilogram
BAPTE = Benzo(a)pyrene Toxic Equivalents
TPAH16 = Total Polycyclic Aromatic Hydrocarbons 16 value
TCDD-TEQ = 2,3,7,8-Tetrachlorodibenzo-p-dioxin Toxic Equivalents
J = Estimated Detect
U = Not Detected at Reporting Limit value
UJ = Estimated Non-detect
UR = Rejected Data