ONONDAGA LAKE PRE-DESIGN INVESTIGATION
PHASE VI GAC ADSORPTION
ISOTHERM STUDY FINAL REPORT

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LIST OF ACRONYMS

BOD	Biochemical Oxygen Demand
BTEX	Benzene/Toluene/Ethylbenzene/Xylene
COD	Chemical Oxygen Demand
DOC	Dissolved Organic Carbon
GAC	Granular Activated Carbon
HCl	Hydrochloric Acid
Honeywell	Honeywell International Inc.
IRM	Interim Remedial Measure
NOM	Natural Organic Matter
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter
ORP	Oxidation-Reduction Potential
NYSDEC	New York State Department of Environmental Conservation
PAH	Polyaromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PDI	Preliminary Design Investigation
PEC	Probable Effects Concentration
SMU	Sediment Management Unit
SSE	sum of square error
SVOC	Semivolatile Organic Compound
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
VOC	Volatile Organic Compound
WBB/HB	Wastebed B/Harbor Brook

EXECUTIVE SUMMARY

Parsons Commercial Technology Group, Inc. (Parsons) conducted a series of granular activated carbon (GAC) adsorption isotherm studies as part of on-going remedial design investigations for Onondaga Lake. This report presents complete results from all GAC isotherm studies including the lake Remediation Area D and the Wastebed B/Harbor Brook (WBB/HB) Outboard area.

APPROACH

Test Areas and Conditions

Parsons conducted full-scale isotherm studies as follows:

- Remediation Area D
  - Native pH
  - Adjusted pH to Neutral
- Outboard Area
  - WBB/HB West area
  - WBB/HB East area
  - Adjusted pH to Neutral

An *in situ* temperature side study was also conducted for Remediation Area D. The isotherm studies were completed as described in the March 22, 2010 Wastebed B/Harbor Brook Interim Remedial Measure (IRM) Outboard Area Isotherm Work Plan, and May 10, 2010 Phase VI Addendum 1 Carbon Isotherm Study Work Plan – Revised. The Adjusted pH studies were performed in addition to the testing described in the work plans.

Target Constituents

The constituents of interest included the following:

- Volatile Organic Compounds (VOCs)
  - BTEX (benzene, toluene, ethylbenzene, and xylenes)
  - Chlorinated aromatics (chlorobenzene, dichlorobenzenes, and trichlorobenzenes)
- Semivolatile Organic Compounds (SVOCs)
  - Naphthalene
  - Phenol and 4-methylphenol (*p*-cresol)
  - Polyaromatic hydrocarbons (PAHs)
- Total Mercury

Experimental Procedure Overview

Forty 2-liter test bottles were prepared for each study, including three bottles at each of twelve different target carbon doses (36) plus four control bottles prepared identically to test bottles but to which no carbon was added. The *in situ* temperature study involved eight test bottles plus two controls. Bulk test water was collected from the following wells:

- Remediation Area D: TR-05B
- WBB/HB West: PMW-1, PMW-2, and PMW-3
- WBB/HB East: HB-19S and HB-20S

Pulverized Filtrasorb F400 GAC (Calgon Carbon Corporation) was used in all tests.

Test water for each study was prepared by amending bulk sample with methanol-based spiking solutions to target historical 95th percentile concentrations of the target VOCs and SVOCs, to accommodate potential competitive sorption among target compounds. Test water background conditions were preserved to the maximum practicable extent during preparation, including sampling and preparation under nitrogen head and lack of sparging prior to spiking, to preserve *in situ* matrix effects that may affect bulk sorption and sorption affinity of individual compounds. The Adjusted pH test for Remediation Area D and WBB/HB West was performed to support evaluations of GAC performance following application of a cap pH amendment which would result in decreased pH levels upgradient of the GAC cap amendment.

Spiked batch test water was dispensed to individual test bottles containing a range of carbon doses, which were then mixed for one week to achieve sorption equilibrium. Following the one-week mixing period, the test bottles were filtered under positive pressure through 1 µm nominal pore size glass fiber syringe, using a glass syringe to minimize sorption to sampling equipment. All isotherm test samples were analyzed by independent certified analytical laboratories for target VOCs and SVOCs, total mercury, dissolved organic carbon, and chemical oxygen demand.

Analysis

The Freundlich adsorption isotherm model was applied to target VOCs and SVOCs. The model is summarized by the equation $x/m = K_f C_e^{1/n}$, where x/m is the mass of adsorbate per mass of adsorbent (synonymous with q_e); C_e = equilibrium concentration of adsorbate, and K_f and 1/n are the empirical Freundlich model parameters. Freundlich isotherms were developed by calculating the x/m values across the range of carbon doses tested, preparing plots of x/m versus C_e, and applying spreadsheet calculation tools to determine the bivariate best-fit values and 95% joint confidence intervals for the K_f and 1/n pairs. Simulated carbon dose response adsorption curves were prepared to illustrate the relative effects of the resulting best-fit K_f and 1/n to assist in comparisons of adsorption capacity of each compound between different test areas and conditions.

RESULTS

A summary of Freundlich parameters for the studies is provided in Table ES-1. The following generalizations were made with regard to these results:

- The relative affinity of individual compounds to sorb to Filtrasorb F400 that had been observed in previous tests was observed.
- Phenol appeared to have a higher sorption affinity to Filtrasorb F400 at neutral pH than native pH. The hydroxyl group on phenol confers a degree of polarity which may make sorption affinity a function of pH. The trichlorobenzenes were more highly sorbed at native pH, although sorption affinity of trichlorobenzenes at either native or adjusted pH was greater than most compounds studied. Sorption of the other target compounds in Remediation Area D did not appear to be appreciably affected by pH.
- No significant difference in adsorption performance was observed at tests run at *in situ* versus room temperature.
- Sorption affinity for most compounds in the current study was lower than that implied by the results reported from Phase IV Preliminary Design Investigation (PDI) isotherm testing (Lowry et al., 2010). The following factors may have contributed to these differences:
  - Starting (C_0) concentrations for the current study were based on analyzed concentrations in the undosed control bottles to account for losses not attributable to sorption, rather than on calculations based on amount of compound added.
  - The current study did not include a sparging step so that all potential sources of interference to sorption (e.g., matrix effects; competitive sorption) were preserved.
- TIGG F400 "or Equivalent" and NORIT GAC 400 were tested in a limited number of test bottles to determine the potential efficacy of alternative GAC products, overall these results indicate consistent performance between the alternative carbon sources.

The results from these experiments are expected to support cap modeling and design efforts for Onondaga Lake and WBB/HB.

TABLE ES.1

SUMMARY OF BEST-FIT FREUNDLICH MODEL PARAMETER PAIRS K_F AND 1/N FOR PHASE VI GAC ISOTHERM STUDIES

Target Constituent	Remediation Area D				Outboard Area						Phase IV PDI	
	Adjusted pH		Native pH		West Area Adjusted pH		West Area Native pH		East Area			
	1/n	K_f	1/n	K_f	1/n	K_f	1/n	K_f	1/n	K_f	1/n	K_f
Benzene	0.28	3.06	0.31	2.87	0.23	2.76	0.24	1.17	0.25	2.28	0.49	14.0
Chlorobenzene	0.28	18.9	0.30	15.6	0.32	6.16	0.19	1.95	0.17	3.78	0.37	13.6
Total Dichlorobenzene	0.32	28.7	0.40	31.5	0.28	24.9	0.24	12.1	0.05	11.2	0.36	61.2
Ethylbenzene	0.30	3.30	0.32	3.18	0.45	10.3	0.19	2.20	0.14	4.43	0.30	18.3
Toluene	0.25	7.70	0.35	7.59	0.24	5.73	0.28	3.08	0.17	3.10	0.35	14.4
Total Trichlorobenzene	0.35	43.4	0.70	102.8	--	--	--	--	--	--	--	--
Total Xylene	0.26	19.0	0.32	17.1	0.41	26.4	0.24	10.3	0.14	12.4	0.30	43.3
Phenol	0.29	1.24	0.71	0.76	0.19	2.49	0.21	0.76	0.16	1.47	--	--
Naphthalene	0.30	65.0	0.41	56.0	0.20	63.2	0.22	36.4	0.34	87.5	0.65	24.6
4-Methylphenol	--	--	--	--	0.08	4.18	0.22	1.85	0.09	1.95	--	--
Acenathylene	0.73	43.9	0.70	30.8	--	--	--	--	--	--	--	--
Phenanthrene	0.51	0.31	0.56	0.51	--	--	--	--	--	--	--	--

SECTION 1

INTRODUCTION AND DESIGN PROCESS OVERVIEW

1.1 PROJECT BACKGROUND

The remediation strategy for Onondaga Lake includes placement of a sediment isolation cap. The cap will include carbon as an added layer of protection to achieve long-term compliance with the cap performance criteria (Parsons, 2009). An isolation cap is also a component of the conceptual remedy for the WBB/HB remediation area on the lake side (outboard) of the proposed West and East barrier walls.

Cap performance will be affected by the *in situ* adsorptive capacity of the selected activated carbon for target porewater constituents, the loading rates of these constituents in upwelling water, and the allowable exit concentration of these constituents from the carbon layer. Initial isotherm data was generated as part of the Phase IV Preliminary Design Investigation (Lowry et al., 2010 and Reible et al., 2010) to support initial cap performance modeling efforts. These data included Freundlich parameters reported by Lowry et al. (2010) for benzene, chlorobenzene, dichlorobenzenes (1,2-, 1,3-, and 1,4-), ethylbenzene, toluene, total xylenes, and naphthalene.

The lake and WBB/HB caps may both incorporate siderite for pH adjustment into the neutral range. Therefore pH was identified as a variable to be considered within the context of isotherm testing performed as part of this study.

1.2 PROJECT OBJECTIVES

The primary objective of this study was to experimentally determine *in situ* Freundlich carbon adsorption isotherm parameters for the target constituents expected to impact the design of the sediment isolation cap for the lake and for the WBB/HB outboard areas. The site-specific isotherm testing was designed to improve cap design efforts by verifying the initial isotherm results and providing a robust data set for characterizing site-specific GAC performance parameters for use in cap modeling and design.

The studies were designed to build on the study reported by Lowry et al. (2010) as follows:

1. A single spiked test water was exposed to a range of activated carbon doses, rather than preparing a series of spiked concentrations.
2. Test samples were not sparged before testing, in order to retain potential competitive adsorption effects caused by target and non-target volatile and semivolatile compounds.
3. Sampling and testing was conducted in a manner designed to maintain oxidation-reduction potential (ORP) as close to *in situ* conditions as possible, to minimize transformations of *in situ* matrix characteristics that could impact GAC adsorption of target constituents.
4. The study for Remediation Area D included tests conducted at both *in situ* pH (11.7) and adjusted pH (7.0 ± 0.1).

5. The study for WBB/HB West Outboard Area included tests conducted at both *in situ* pH (11.6) and adjusted pH (7.0 ± 0.1).
6. Testing was conducted at room temperature (approximately 24°C/75°F), which was assumed to provide slightly conservative results. However, a limited test conducted at *in situ* temperature (approximately 14.5°C/58°F) was also performed to confirm this.
7. The list of target constituents was expanded to include trichlorobenzenes (1,2,3,-, 1,2,4-, and 1,3,5-), phenol, and total mercury).
8. Starting (C_0) concentrations were as measured in controls prepared identically to dosed test bottles to account for losses not attributable to adsorption, rather than calculating starting concentrations based on mass of compound added during spiking step.

The tests were completed as described in the following work plans as submitted to the New York State Department of Environmental Conservation (NYSDEC), Division of Environmental Remediation, Remedial Bureau D:

- March 22, 2010 Wastebed B/Harbor Brook IRM Outboard Area Isotherm Study Work Plan
- May 10, 2010 Phase VI Addendum 1 Carbon Isotherm Study Work Plan – Revised.

The adjusted pH test for Remediation Area D was conducted as an extension of the May 10, 2010 work plan to evaluate possible effects of introducing a pH amendment (siderite) upgradient of the GAC cap layer. The adjusted pH test for WBB/HB West Outboard Area was conducted as an extension of the March 22, 2010 work plan to evaluate possible effects of introducing a pH amendment layer in this area.

To meet the overall objective of this study, the following specific objectives were satisfied:

- Bulk porewater samples were collected directly from the field, under nitrogen head to minimize changes in ORP during sampling;
- Test waters were spiked with methanol-based solutions of target VOC and SVOCs, to target historical 95th percentile concentrations of these compounds or otherwise provide sufficiently high concentrations to provide meaningful isotherm data across a range of carbon doses while generally maintaining *in situ* relative ratios of target constituents;
- Test waters were prepared in batches under nitrogen head to minimize changes in ORP during test set up, and distributed to individual isotherm test bottles containing a range of carbon doses;
- Following one week of mixing, isotherm test bottle contents were filtered, under positive pressure to minimize volatilization of target compounds, into analytical sample containers for independent certified analytical laboratory analysis; and
- Equilibrium concentrations measured in the filtered supernatant were used for calculating Freundlich adsorption isotherm parameters K_f and 1/n for each target constituent.

1.3 REPORT ORGANIZATION

This report is organized into four sections and seven attachments. A summary of each section is provided below.

- Section 1: Introduction – Describes the project background and project objectives, and presents the report organization.
- Section 2: Methods and Materials – Presents the methods and materials used for conducting each isotherm test. This section presents the constituents of interest and bulk test water sampling procedures, and also presents the detailed experimental procedures followed during the laboratory phase of the isotherm studies. The analytical approach for applying the Freundlich isotherm model to adsorption data is also discussed.
- Section 3: Results and Discussion – Summarizes the experimental data obtained from the GAC isotherm tests, describes the approach used for applying the Freundlich Model to the experimental data, and presents the results of Freundlich modeling including development of Best-Fit estimates and 95% joint confidence intervals for the Freundlich isotherm parameters K_f and 1/n. A discussion of results is presented.
- Section 4: Conclusions – Summarizes the major findings from the GAC isotherm experiments.
- Section 5: References – Lists the references used to prepare this report.

SECTION 2

METHODS AND MATERIALS

2.1 OVERVIEW

Five (5) detailed isotherm tests were completed for this study:

- Remediation Area D
  - Native pH
  - Adjusted pH
- WBB/HB Outboard Area
  - West Wall Area – Native pH
  - West Wall Area – Adjusted pH
  - East Wall Area

In addition, a limited screening study was conducted for Remediation Area D at *in situ* temperatures. The isotherm studies were completed as described in the March 22, 2010 Wastebed B/Harbor Brook IRM Outboard Area Isotherm Work Plan, and May 10, 2010 Phase VI Addendum 1 Carbon Isotherm Study Work Plan – Revised.

The GAC adsorption isotherm experiments were designed to quantify adsorption of individual target constituents to activated carbon while:

- Capturing potential matrix effects
- Capturing potential competitive adsorption effects between different compounds
- Obtaining meaningful isotherm data for each target constituent to allow for calculation of adsorption isotherm parameters
- Accounting for non-adsorption losses that could potentially lead to erroneously inflated calculations of adsorption to GAC
- Providing information directly relevant to isolation cap modeling and design efforts

In summary, the experiments were conducted with porewater collected from the areas of interest, and spiked to levels that reasonably represented concentrations in the most highly contaminated areas of the respective study areas based on historical data. Constituents with low historical concentrations were spiked at high enough levels so that detectable concentrations could be measured across a range of carbon doses, while maintaining general *in situ* relative ratios of constituents. Test water was prepared in large batches so that identical test water was exposed to a range of carbon doses. The preparation of non-dosed controls separated out non-adsorption losses. All testing was performed in the Parsons Syracuse, New York Treatability Laboratory.

2.2 CONSTITUENTS OF INTEREST

2.2.1 Target Constituents

Target constituents included a set of VOCs, SVOCs, and mercury as listed below. All target constituent analyses were performed by independent certified analytical laboratories in accordance with the cited analytical methods.

Category	Parameter	Area Studied[1]		Analytical Method
		Lake	WBB/HB	
VOCs	Benzene	✓	✓	EPA 8260
	Chlorobenzene	✓	✓	
	1,2-Dichlorobenzene	✓	✓	
	1,3-Dichlorobenzene	✓	✓	
	1,4-Dichlorobenzene	✓	✓	
	1,2,3-Trichlorobenzene	✓	--	
	1,2,4-Trichlorobenzene	✓	--	
	1,3,5-Trichlorobenzene	✓	--	
	Ethylbenzene	✓	✓	
	Toluene	✓	✓	
	m+p-Xylene	✓	✓	
	o-Xylene	✓	✓	
SVOCs	Naphthalene	✓	✓	EPA 8270[3]
	Phenol	✓	✓	
	4-Methylphenol	--	✓	
	PAHs[2]	✓	--	
Mercury	Mercury, Total	✓	✓	EPA 245.1 (Lake)/ EPA 1631E (WBB/HB)

[1] Lake = Remediation Area D (Phase VI PDI); WBB/HB = Wastebed B – Harbor Brook outboard area.

[2] PAHs comprise list for which Probable Effects Concentrations (PECs) have been established including acenaphthene, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, flourene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene. Naphthalene is listed separately as a constituent of primary concern in both the Remediation Area D and WBB/HB remediation areas.

[3] EPA Method 8270 – SIMS Modification was specified for Remediation Area D SVOC samples to allow for measurement of phenol and PAHs from the same SVOC sample container while accommodating low detection limits for the PAHs.

2.2.2 Other Test Parameters

Additional parameters were measured to help characterize the test water. The same parameters were measured for both Remediation Area D and WBB/HB, with the addition of polychlorinated hydrocarbon (PCBs) measured in initial characterization samples from Remediation Area D to determine the potential need to track this parameter in isotherm studies. The parameters are listed below. Temperature, pH, ORP, and conductivity were measured by Parsons; all other parameters were measured by an independent certified analytical laboratory.

Category	Parameter	Analytical Method
Aggregate Organics	Chemical Oxygen Demand (COD)	EPA 410.4
	Biochemical Oxygen Demand (BOD_5)	Standard Methods 5210B
	Total Organic Carbon (TOC)	Standard Methods 5310B
	Dissolved Organic Carbon (DOC)	Standard Methods 5310B[(1)]
Cations	Total Iron (Fe)	EPA 200.7
	Sodium (Na^{+})	
	Potassium (K^{+})	
	Calcium (Ca^{+2})	
	Magnesium (Mg^{+2})	
	Manganese (Mn^{+2})	
Anions	Chloride (Cl^{-})	EPA 300.0
	Fluoride (F^{-})	EPA 300.0
	Nitrate (NO_3^{-2})	EPA 353.2[(2)]
	Nitrite (NO_2^{-2})	Standard Methods 4500 NO2B
	Sulfate (SO_4^{-2})	EPA 300.0
	Sulfide (S^{-2})	Standard Methods 4500 S2
	Total Phosphate (PO_4^{-3})	EPA 365.3
Aggregate Inorganics	pH	Standard Methods 4500-H^{+}B
	ORP	Standard Methods 2580B
	Total Hardness	Standard Methods 2340C
	Total Alkalinity	Standard Methods 2320B
	Total Dissolved Solids (TDS)	Standard Methods 2540C
PCBs	Total PCBs	SW8082

(1) Following laboratory filtration at 0.45 µm.

(2) Nitrate calculated as (Nitrate + Nitrogen, per EPA 353.2) – (Nitrite, per 4500 NO2B)

Dissolved organic carbon (DOC) and chemical oxygen demand (COD) were measured in all isotherm test samples due to their potential relevance for interpreting isotherm information (e.g.,

competitive adsorption; affiliation with certain compounds such as phenol). The remaining parameters were measured only in initial characterization samples, collected at the time of sampling or as subsamples from bulk test water samples prior to isotherm test preparation, to support general isolation cap design and modeling efforts.

2.3 FIELD SAMPLE COLLECTION

2.3.1 Remediation Area D

Bulk sample volume for all Remediation Area D isotherm tests was collected from the existing groundwater upwelling pump at location TR05-B. This location contains an existing well from which historical DOC concentrations were among the highest across Remediation Area D. Its proximity to the shoreline and integrity of its apparatus were also important considerations favoring this location.

TR-05B was sampled using the bladder pump installed in the well. The well was initially purged of three well volumes, after which sample volume was collected into 5-gallon glass carboys under nitrogen head. Approximately forty gallons was collected; ten gallons was archived on-site. Initial characterization samples for VOCs, SVOCs, total mercury, COD, and DOC were collected directly from the well. Samples for pH and ORP measurement were also collected in the field. Temperature and conductivity were measured in the field. Thirty gallons of sample volume was brought to the Parsons Treatability Laboratory, Syracuse New York for testing. Composited test water was subsampled for the non-target initial characterization parameters prior to test set up.

2.3.2 Wastebed B – Harbor Brook Outboard Area

Sample locations for the WBB/HB isotherm studies were selected as most representative of each respective cap area along with high historical DOC concentrations. Bulk water samples were collected from both existing and newly-developed wells. Samples for the West Wall isotherm study were collected from new wells PMW-1, PMW-2, and PMW-3. PMW-1 was sampled using a Grundfos positive displacement pump, while wells PMW-2 and PMW-3 were sampled using a Geopump peristaltic pump. Samples for the East Wall study were collected from existing wells HB-19S and HB-20S. Bulk water samples from both wells were collected using a Geopump peristaltic pump.

Each well was purged of three well volumes prior to collecting sample volume. Water for isotherm studies was collected in 5-gallon glass carboys under nitrogen head. Initial characterization samples for all target and non-target parameters were collected directly from the wells, except that non-target parameter samples for the East area were subsampled from bulk samples prior to isotherm test preparation.

2.4 EXPERIMENTAL DETAILS

The general GAC isotherm test methodology was in accordance with Calgon Chemical Corporation (2007) and standard practice, as detailed in the Remediation Area D and WBB/HB GAC isotherm study work plans. Details of the tests are presented in this section.

2.4.1 Isotherm Test Bottles

Twelve target carbon doses were tested in each experiment. Three replicate bottles were prepared at each target dose. In addition, four undosed controls were prepared to account for losses in target compounds not attributable to adsorption. A total of 40 test bottles were prepared for each experiment. Due to equipment limitations as described in the May 10, 2010 work plan, the Remediation Area D *in situ* temperature study was conducted with 10 bottles including four carbon doses plus control each prepared in duplicate.

All isotherm tests were conducted in two-liter amber glass bottles (Freund Container & Supply, Lisle, IL) with Teflon-lined caps. The bottles were pre-washed with Alconox laboratory cleaning agent, rinsed sequentially with tap and distilled water, and dried at room temperature. Each bottle including cap was weighted empty to allow for precise volume determinations to be made after filling.

2.4.2 Activated Carbon Dosing

Filtrasorb F400 (Calgon Carbon Corporation) was used for all testing in this study. F400 is a bituminous coal-based carbon which is commercially readily-available and which comes with a product specification. Pulverized GAC samples were obtained directly from Calgon. The samples were pulverized by Calgon to a specification of > 95 wt. % passing 325 mesh screen.

The pulverized GAC was dried at approximately 105°C for at least 12 hours, then allowed to come to room temperature. Carbon was weighed on weighing paper using a Mettler Toledo AT261 DeltaRange tabletop balance and added to the pre-weighed empty isotherm bottles. The carbon doses for the studies covered the following ranges:

Isotherm Test	Range of Carbon Doses (g/L)[(1)]
Remediation Area D	
Native pH	0.010 – 50
Adjusted pH	0.013 – 25
WBB/HB	
West Area – Native pH	0.005 – 100
West Area – Adjusted pH	0.020 - 50
East Area	0.015 – 10

[(1)] Dosing evolved from test to test to maximize the number of useable data points for as many of the target constituents as practicable.

2.4.3 Test Water Preparation

Approximately 100 liters of test water was prepared for each study. Test water was prepared in two 54-liter glass demijohns. Approximately 50 liters of sample volume was distributed from the 5-gallon bulk field sample carboys to each demijohn. For each study, the demijohns were

filled such that approximately equal volumes from each sample well were represented in each demijohn. The demijohns were filled under nitrogen head.

The demijohns were spiked with custom-blended methanol-based spiking solutions (AccuStandard Inc., New Haven, Connecticut) to augment existing concentrations of target VOCs and SVOCs. Spiking solution was gently stirred into the test water and then allowed up to three hours for all constituents to dissolve.

The basis and makeup for solutions from each study area were as described below.

2.4.3.1 Remediation Area D Spiking Solution

The Remediation Area D isotherm tests used four spiking solutions: (1) BTEX, (2) chlorobenzene, (3) dichlorobenzenes + trichlorobenzenes, and (4) naphthalene. The solutions were designed to augment *in situ* concentrations to target the highest 95th percentile concentration among the Area D subareas (West, Center, and East) for each constituent. For constituents with historical 95th percentile concentrations deemed too low to provide meaningful data across a range of carbon doses, a target concentration of 500 µg/L was selected.

The makeup of the spiking solutions, the volumes of spiking solution added per test, and the level of augmentation to the test water are summarized below. The same makeup and quantities of spiking solutions were used for both the native pH and adjusted pH (including the supplementary *in situ* temperature) studies.

Constituent	Spiking Solution Concentration (µg/mL)	Volume Spiked (mL / 100L)	Concentration Added (µg/mL)
BTEX			
Benzene	4,000	100	4,000
Toluene	4,000		4,000
Ethylbenzene	400		400
Xylenes (o + m + p)	4,000[(1)]		4,000
CHLOROBENZENE			
Chlorobenzene	9,000	100	9,000
DICHLOROBENZENES + TRICHLOROBENZENES			
Dichlorobenzene (1,2 + 1,3 + 1,4)	3,500[(2)]	100	3,500
Trichlorobenzene (1,2,3 + 1,2,4 + 1,3,5)	1,500[(3)]	100	1,500
NAPHTHALENE			
Naphthalene	6,400	87.5	5,600

[(1)] Equal concentrations of each isomer, totaling 4,000 µg/mL.
[(2)] 1,500 µg/mL of 1,2- and 1,4-dichlorobenzene, and 500 µg/mL of 1,3-dichlorobenzene.
[(3)] Equal concentrations of each isomer, totaling 1,500 µg/mL.

The pH of the spiked test-water batches for the pH adjusted study was adjusted from the native pH of 11.7 to 7.0 ± 0.1 standard pH unit following the time allotted for dissolution of spiked compounds. The pH was adjusted using 1N hydrochloric acid (HCl) solution. The *in situ* temperature side study was conducted with the pH-adjusted test water.

2.4.3.2 Wastebed B – Harbor Brook Spiking Solution

Due to the lower constituent concentrations in the WBB/HB outboard areas, all constituents were spiked to levels that would increase the probability of providing meaningful isotherm data. Two spiking solutions were used: (1) VOCs + phenol + 4-methylphenol (*p*-cresol), and (2) naphthalene.

For the West outboard area studies, naphthalene was spiked with an additional 2,500 µg/L, with all other constituents of interest spiked with an additional 500 µg/L. For the East outboard area study, naphthalene was spiked with an additional 1,000 µg/L while other constituents were spiked with an additional 250 µg/L. The level of spiking of East area isotherm test water represented a departure from the original work plan which called for spiking with 500 µg/L naphthalene and 100 µg/L of each remaining target constituent, to increase the likelihood of obtaining measurable equilibrium concentrations across a range of applied carbon doses.

Constituent	Spiking Solution Concentration (µg/mL)	Volume Spiked (mL / 100L)	Concentration Added (µg/mL)	Volume Spiked (mL / 100L)	Concentration Added (µg/mL)
		WEST AREA		EAST AREA	
VOCs + PHENOL + 4-METHYLPHENOL					
Dichlorobenzene (1,2 + 1,3 + 1,4)	12,000(1)	12.5	1,500	5.0	600
Benzene	4,000		500		200
Chlorobenzene	4,000		500		200
Ethylbenzene	4,000		500		200
Toluene	4,000		500		200
Xylene (o + m + p)	12,000(2)		1,500		600
Phenol	4,000		500		200
4-Methylphenol	4,000		500		200
NAPHTHALENE					
Naphthalene	10,000	25	2,500	10	1,000

(1) Equal concentrations of each dichlorobenzene isomer, totaling 12,000 µg/mL.

(2) Equal concentration of each xylene isomer, totaling 12,000 µg/mL.

The pH of the spiked test-water batches for the pH adjusted study was adjusted from the native pH of 11.6 to 7.0 ± 0.1 standard pH unit following the time allotted for dissolution of spiked compounds. The pH was adjusted using 1N HCl solution.

2.4.4 Distribution to Test Bottles

The spiked test water was distributed to the pre-weighed test bottles directly from the glass demijohns. Each demijohn was fitted with a glass tube fitting, to which Teflon-lined tubing was attached using a short (~ 0.1 m) section of flexible vinyl tubing. A stainless steel ball valve was affixed in-line in the Teflon tubing to control flow into the test bottles. The demijohns were kept under nitrogen head during the bottle filling process. The bottles were filled nearly headspace-free, allowing just enough headspace to allow for effective mixing. Upon filling, the bottles were immediately capped with Teflon-lined caps and agitated vigorously for approximately one minute. The filled bottles were then re-weighed to allow for precise determination of test water volume in each bottle using the test water density and accounting for the carbon added to the pre-weighed bottles.

2.4.5 Equilibration and Mixing

The filled test bottles were placed in a custom-made rotating mixing device designed and constructed specifically to accommodate the number and size of bottles used during these tests. The mixing device consisted of eight rotating 8-in. diameter PVC pipes, each able to accommodate five (5) test bottles and rotated by low rpm, high torque electric motors. The bottles were placed on their sides to keep the caps wetted, to mitigate potential volatilization losses of target VOCs and SVOCs. Building foam insulation was attached to the bottles to provide a snug fitted inside the PVC pipes to ensure the bottles rotated along with the pipes. Foam insulation was also placed between bottles to prevent movement and thereby minimize the chance of breakage.

The PVC pipes rotated at approximately 10 rpm. The test bottles were maintained at room temperature (approximately 73°F). The bottles were mixed for seven days, consistent with Lowry et al., (2010) which determined that seven days was sufficient to achieve equilibration for adsorption of VOCs and naphthalene with Filtrasorb F400 during isotherm testing.

The 10 isotherm test bottles prepared for the *in situ* temperature experiment for Remediation Area D were placed in a static temperature-controlled water bath which maintained a temperature of approximately 15°C (59 degrees F) through a custom-made carbon cooling coil. The bottles were agitated by hand several times each day over a seven day period.

2.4.6 Test Bottle Sampling and Analysis

Upon completion of mixing, each test bottle was placed upright for at least one hour to allow the carbon to gravity settle. The supernatant following settling was then be filtered under positive pressure using a 150 mL glass syringe with male luer-lok tip (NTI, Inc., Sacramento, CA) fitted with a 1.0 µm nominal pore size glass fiber syringe filter (Tisch Scientific, Cleves, OH), and dispensed to the appropriate analytical sample containers. The analytical samples were then delivered through the service centers of the contracted analytical laboratories for independent certified laboratory analysis in accordance with the analytical methods presented in Section 2.2.

2.5 DATA ANALYTICAL APPROACH

The Freundlich adsorption isotherm model was used to model carbon adsorption of target VOCs and SVOCs. The general model is described in this section. The application of this model to experimental data obtained from the GAC adsorption isotherm experiments is described in Section 3 – Results and Discussion.

2.5.1 Freundlich Adsorption Model

The Freundlich isotherm model relates the equilibrium concentration of an adsorbate (e.g., target VOC or SVOC) to the mass of adsorbate that is sorbed to the adsorbent (e.g., GAC) as follows:

$$\frac{x}{m} = K_f C_e^{1/n} \qquad \textbf{Equation 1}$$

where: x/m = mass of adsorbate per mass of adsorbent (**synonymous with q_e**)
C_e = equilibrium concentration of adsorbate in solution after adsorption
K_f = empirical constant
n = empirical constant

The parameters K_f and n can be determined through logarithmic linearization of Equation 1 and linear, least-squares graphical analysis, as follows:

$$Log\left(\frac{x}{m}\right) = LogK_f + \frac{1}{n} LogC_e \qquad \textbf{Equation 2}$$

Equation 2 is in the form of a linear equation y = mx +b, with y = $log(x/m)$, x = $LogC_e$, m (slope) = $1/n$, and b (y-$intercept$) = $logK_f$.

2.5.2 Description of Experimental Freundlich Parameter Determination

The Freundlich isotherm parameters K_f and $1/n$ are experimentally determined by obtaining the equilibrium concentration (C_e) of adsorbate resulting from a range of adsorbent doses. For each applied absorbent dose, the x/m ratio is calculated as follows:

$$\frac{x}{m} = \frac{V(C_0 - C_e)}{M} \qquad \textbf{Equation 3}$$

where: C_0 = Initial concentration of adsorbate in solution before adsorption
V = Isotherm test sample volume
M = Mass of carbon applied to sorption experiment container

Running a range of adsorbent doses provides a set of x/m ratios, each associated with a measured value of C_e. By plotting *log(x/m)* versus *log(C_e)* and fitting a line to this data using a least-squares linearization, the slope of the fitted line would be 1/n and the y-intercept Log(K_f). K_f is then calculated by raising ten to the power of the y-intercept value (i.e., $K_f = 10^{\wedge y\text{-intercept}}$).

Computational tools such as Microsoft Excel can apply a power function trendline to the original (pre log-transformed) data directly. In the case of the Freundlich adsorption isotherm model, a power function trendline applied to data plotted as *x/m* versus *C_e* returns identical values for K_f and 1/n that are returned from a least-squares linearization of *log(x/m)* versus *log(C_e)*. A modification to this approach was applied to data obtained during this isotherm study, whereby for each target constituent a "best-fit" Freundlich isotherm was calculated by minimizing the sum of squares error (SSE) between the actual and best-fit data using calculation tools available in Excel. The method by which best-fit Freundlich isotherm model parameters were calculated using this modified approach is described in Section 3.

SECTION 3

RESULTS AND DISCUSSION

3.1 OVERVIEW

The results obtained from the GAC adsorption isotherm experiments are presented in this section. The data obtained from each experiment are presented, followed by an evaluation of Freundlich parameter pairs K_f and 1/n that describe the GAC sorption affinity of each target compound in the individual test waters.

3.2 EXPERIMENTAL DATA

The experimental data obtained from the isotherm studies are presented in the following attachments:

Area	Study	Attachment
Remediation Area D	Adjusted pH	1
	Native pH	2
Outboard Area	WBB/HB West – Adjusted pH	3
	WBB/HB West – Native pH	4
	WBB/HB East	5

The experimental data presented in Attachments 1 through 5 include the analytical results for each compound obtained from independent certified analytical laboratories, and calculated x/m (q_e) ratios based on actual carbon doses and the starting concentrations for the respective test water batches.

Independent certified analytical laboratory services were provided by Accutest (Dayton, New Jersey) for the Remediation Area D isotherm studies, and Test America (Pittsburgh, Pennsylvania) for the WBB/HB isotherm studies. Analytical results for total dichlorobenzene and total trichlorobenzene presented in Attachments 1 through 5 are the sum of the individually-analyzed isomers. Analytical results for total xylene from the outboard area studies presented in Attachments D and E are the sum of the individual isomers (m+p-xylene and o-xylene).

Results from the supporting initial characterization analyses for non-target parameters are provided in Table 3.1.

3.3 APPLICATION OF FREUNDLICH MODEL TO EXPERIMENTAL DATA

Analytical lab-measured concentrations of target constituents in the carbon-dosed bottles provided the equilibrium concentrations (C_e) for those constituents in each test bottle. The average concentration measured in the undosed controls from each test water batch provided the baseline (C_0) concentrations to account for any possible non-adsorption related losses. The x/m ratio of each target compound in each test bottle was calculated as the net loss in aqueous

concentration ($C_0 - C_e$; mg/L) divided by carbon dose (g/L), giving mass adsorbed per mass of carbon (mg/g), or x/m (also represented by q_e). Each bottle was handled as an individual data point.

Data points for which $C_e/C_0 \leq 75\%$ were retained for inclusion in Freundlich isotherm model calculations. These are highlight in magenta in Attachments 1 through 5. Points for which $C_e/C_0 > 75\%$ were discarded due to analytical noise that has more of a relative effect at lower carbon doses and which therefore can have a greater effect on the calculated x/m ratio5. It also provided a consistent rule to be applied to each target constituent. In some cases, target constituents were detected in the most highly-dosed carbon bottles even if they were non-detect at lower doses; these were also discarded to avoid any artificial influence they might have posed since it may have reflected analytical error caused by carryover from analysis of samples from previous bottles. These data points are shaded in gray in Attachments 1 through 5. Additionally, on a case-by-case basis, Parsons excluded a data point if it was inconsistent with the other two replicates at a given carbon dose, likely due to analytical or experimental error, even if it met the $C_e/C_0 \leq 75\%$ criteria. These are also shaded in gray in Attachments 1 through 5. The exclusion of these data points did not appreciably change the calculated values for the Freundlich parameters, leading to the conclusion that the Freundlich model was robust for describing the data based on the above criteria for inclusion or exclusion of data points.

Best estimates of K_f and 1/n pairs were calculated by minimizing the sum of squares error between actual and best-fit model data points when incorporating the Freundlich model. This was accomplished using the SOLVER function of Microsoft Excel applied to the viable experimental data set for each compound in each study. A 95% joint confidence interval was also generated for each target compound in each study from the same viable experimental data set using joint uncertainty bounds for K_f and 1/n in the fitted Freundlich equations. The best-fit adsorption isotherms and corresponding 95% joint confidence intervals were plotted for each target VOC and SVOC across all GAC isotherm studies relevant for each compound.

3.4 RESULTS – REMEDIATION AREA D STUDIES

3.4.1 Isotherms and 95% Joint Confidence Intervals

The plots for the Remediation Area D isotherm studies are provided in Figures 3.1 through 3.22. This group of figures includes plots for target VOCs and SVOCs (Figures 3.1 through 3.18) as well as the PAHs acenapthylene and phenanthrene (Figures 3.19 through 3.22). Low *in situ* concentrations and non-detect measurements in carbon-dosed test bottles precluded development of isotherms and confidence intervals for the remaining PAHs listed in the May 10, 2010 work plan.

Table 3.2 provides a summary of the best-fit Freundlich isotherm parameter pairs K_f and 1/n obtained for each target VOC and SVOC in each of the full native pH (11.7) and adjusted pH (7.0 ± 0.1) studies. For comparison, best-fit K_f and 1/n pairs resulting from data obtained from the Phase IV PDI GAC isotherm study for sediment management unit (SMU) 1 are also presented in Table 3.2.

3.4.2 Discussion

All of the compounds tested sorbed to Filtrasorb F400 activated carbon. The relative affinity of compounds for sorption was generally similar to that seen in previous studies (e.g., Lowry et al., 2010).

The full-scale native and adjusted pH studies resulted in similar best-fit adsorption isotherms with 95% joint confidence intervals that were in close proximity, for most compounds. However, phenol exhibited greater sorption affinity for Filtrasorb F400 at adjusted pH than at native pH. It might be expected that phenol sorption is potentially affected by pH due to hydroxyl substitution on the aromatic ring, the presence of hydroxyl substitutions on component molecules comprising the natural organic matter (NOM) that contributes to TOC/DOC, and its relative solubility compared to the hydrophobic hydrocarbons and chlorinated hydrocarbons.

The other notable exception was total trichlorobenzene, which was more highly sorbed at native pH. However, the trichlorobenzenes were among the most highly sorbable target compounds, and the sorption affinity even at adjusted pH was much higher than the sorption affinity of most other target VOCs and SVOCs at either native or adjusted pH.

The *in situ* temperature study was prepared from the same pH-adjusted test water batches as the adjusted pH study but conducted at 15°C. This study was intended to supplement the primary Remediation Area D adsorption study by indicating any significant differences in GAC performance that might arise at *in situ* temperatures. The results from the *in situ* temperature study are provided in Attachment 6. Based on a comparison of equilibrium concentrations to those obtained from the pH adjusted study (conducted at room temperature) at each target dose (from similar starting concentrations), adsorption performance was generally similar for most compounds, with only minor variations observed.

3.4.3 Comparison with Phase IV PDI Study

The reported results from Phase IV PDI GAC isotherm testing on test water originating from SMU 1 (largely synonymous with Remediation Area D) implied better sorption performance than that from the current study of Remediation Area D. K_f values from the Phase IV study were generally higher, with values ranging up to five times the corresponding values from the current study.

The following factors may have contributed to the differences between the current Remediation Area D study and Phase IV PDI study:

- The current study used controls collected from the same test water batches and processed identically to the carbon-dosed test bottles to ensure any non-adsorption losses were not attributed to sorption. Starting concentrations (C_0) for the Phase IV PDI study were calculated based on the amount of compound that was added into each isotherm test bottle with the spiking solution.
- The current study did not include a sparging step as was done in the previous study, to preserve all potential sources of interference.

3.4.4 PAHs

Best-Fit isotherms were developed for acenapthylene and phenanthrene as provided in Figures 3.21 and 3.23, respectively. The corresponding joint confidence intervals are provided in

Figures 3.22 and 3.24, respectively. Naphthalene was discussed separately with target VOCs / SVOCs.

Limited data were obtained for the other PAHs during Remediation Area D testing. Several of the larger PAHs were below detection in all control and carbon-dosed bottles, with additional compounds detected in control bottles only or in controls plus a limited number of carbon-dosed bottles. The paucity of data reflects the low starting concentrations and general affinity for these carbon-rich, largely non-polar compounds to GAC.

3.5 RESULTS - OUTBOARD AREA

3.5.1 Isotherms and 95% Joint Confidence Intervals

Plots for the WBB/HB isotherm studies are provided in Figures 3.23 through 3.40. A summary of the best-fit Freundlich isotherm parameter pairs K_f and 1/n obtained from the native pH (11.6) and adjusted pH (7.0 ± 0.1) WBB/HB West area isotherm studies and the WBB/HB East area isotherm study is provided in Table 3.3.

3.5.2 Discussion

The same relative affinity of the individual target VOCs and SVOCs for sorption to Filtrasorb that was exhibited in other studies was observed in the WBB/HB studies. Sorption of the target VOCs and SVOCs was higher for all compounds in the adjusted pH study (pH 7.0) versus native pH WBB/HB West study (pH 11.7).

The East area study water was characterized by lower overall DOC and COD. However, there was not a conclusive relationship between DOC or COD and sorption characteristics. It should be noted that compositing of test waters from recovery wells HB-19S and HB-20S during preparation of East area test water batches resulted in development of a precipitated solid. The formation of solid precipitate when combining waters is not expected to have an effect on the assessment of carbon performance in the WBB/HB East locations. Starting concentrations measured in controls reflected spiked concentrations following compositing of the test water sourced from the two wells following a period of time to allow for homogenization and dissolution of the spiked concentrations.

3.6 DEVIATIONS FROM WORK PLANS

The following side studies were conducted in addition to the testing described in the Onondaga Lake Remediation Area D and WBB/HB isotherm study work plans:

- Preliminary adjusted pH study
- Full adjusted pH studies
  - Remediation Area D
  - WBB/HB West Outboard Area
- Alternative GAC brands

The objectives and results from each study are described in this section.

3.6.1 Preliminary Adjusted pH Study

The objective of the preliminary adjusted pH study was to determine whether the placement of pH amendment upgradient from GAC would potentially affect sorption of target compounds to Filtrasorb F-400. A single test bottle was prepared at each of five target carbon doses ranging from 0.063 to 5.0 g/L, as well as a single undosed control.

An aliquot of test water batch volume from the Remediation Area D native pH study was pH-adjusted using 1N sulfuric acid (H_2SO_4) to an endpoint pH of 7.5. The five carbon-dosed and one control bottle were prepared, mixed, and processed with the pH adjusted test water similarly to the main study test bottles and analyzed with the same group of samples.

The results from this side study are presented in Attachment 7. Best-fit Freundlich isotherm pairs K_f and 1/n were calculated to provide a basis for comparison, since the test water used had been altered from that used in the native pH study. It should be noted that isotherm modeling was based on a limited number of data points and as such is intended only to represent potential deviations from parameters developed from the main native pH study. The results demonstrated that pH potentially affected sorption of the target VOCs and SVOCs. The effect of pH on mercury in this study was not preliminarily demonstrated. Based on the concentration in the side study control, approximately 99% of the total mercury in the test water was removed upon adjustment of pH with sulfuric acid, before test water had been exposed to GAC.

3.6.2 Full Adjusted pH Studies

3.6.2.1 Remediation Area D

Based on the results from the preliminary adjusted pH isotherm study, a full adjusted pH study for Remediation Area D was conducted. The full adjusted pH study also represents an addition to the testing described in the May 10, 2010 work plan. The full adjusted pH study was conducted as a stand-alone study with 40 test bottles, including twelve target carbon doses tested in triplicate plus four undosed controls, using test water collected and prepared specifically for this test. As such, the full adjusted pH study was conducted similarly to the native pH study except that the pH in the spiked test water batches was adjusted to a target pH of 7.0 using 1N HCl prior to dispensing to isotherm test bottles. The results for the full adjusted pH study were presented in Section 3.4.

The full adjusted pH study differed from the preliminary study in scale (dedicated test water batches; 40 test bottles) and in the use of HCl instead of H_2SO_4 that was used in the preliminary adjusted pH study. The mercury concentration in the preliminary adjusted pH test water aliquot following application of H_2SO_4 but prior to exposure to GAC was considerably lower than that in the test water batches prior to pH adjustment. HCl was therefore substituted in the full study as a means to mitigate the loss of mercury possibly due to formation of highly insoluble mercuric sulfate ($MgSO_4$) which would significant lower the starting mercury concentration prior to exposure to GAC.

3.6.2.2 WBB/HB West Area

A full adjusted pH study was also conducted for the WBB/HB West outboard area. The full adjusted pH study was conducted as a stand-alone study with 40 test bottles, including twelve target carbon doses tested in triplicate plus four undosed controls using test water collected and

prepared specifically for this test. The pH was adjusted to 7.0 ± 0.1 using 1N HCl. The WBB/HB West outboard area adjusted pH isotherm study represents an addition to the March 22, 2010 work plan. The results for this study were discussed in Section 3.5.

3.6.3 Alternative GAC Screening Study

TIGG F400 "or Equivalent" and NORIT GAC 400 were tested in a limited number of test bottles to determine the potential efficacy of alternative GAC products for adsorbing the target VOCs, SVOCs, and total mercury from a representative isotherm study test water. Each carbon was received in granular form and was pulverized using a mortar and pestle. Each of the alternative GAC products was tested at target doses of 0.05, 0.2, and 0.8 g/L. A single test bottle was prepared for each of the two alternative GACs at each dose, except for replicate bottles prepared for the 0.2 g/L dose of TIGG GAC.

The alternative GAC Study was performed with test water prepared for the WBB/HB East area isotherm study. The bottles were prepared, mixed, processed, and analyzed identically to the other bottles prepared for the WBB/HB East Area study.

A comparison of Best-fit Freundlich parameters was not made since any isotherms developed for each alternative carbon would be based on data sets with as few as two viable data points. However, since all bottles for a given GAC dose originated from the same test water batch, a direct comparison of sorption at each carbon dose can be made based on the resulting equilibrium concentrations for each carbon. These comparisons for the three carbon doses where all three GAC products tested are provided in the table and figures presented in Attachment 8. Based on the direct comparisons of equilibrium concentrations at each carbon dose from the analytical data provided, the alternative GAC products resulted in lower equilibrium concentrations relative to Filtrasorb F400 at the lowest dose tested, but similar equilibrium concentrations relative to Filtrasorb F400 at the higher tested doses. Overall these results indicate consistent performance between the alternative carbon sources.

SECTION 4

CONCLUSIONS

The results from Phase VI PDI GAC isotherm studies conducted for Remediation Area D and the WBB/HB Outboard Area were presented in this report. The studies investigated sorption affinity for target VOCs and SVOCs to Calgon Filtrasorb F400 activated carbon. The studies were designed to preserve matrix effects as closely as practicable to *in situ* conditions as well as to investigate competitive sorption between target compounds at reasonably conservative levels potentially encountered in the field.

Remediation Area D and WBB/HB West studies were conducted both at native pH and at pH adjusted to approximately 7.0 to reflect the potential effect of a pH adjustment layer upgradient from GAC cap amendment. A screening study was also conducted at *in situ* temperature to determine if there was a significant effect of temperature on sorption affinity to F400 within the test water matrix. GAC isotherm testing for Wastebed B included separate studies conducted on test water collected from the West and East outboard areas, to assist in design and modeling efforts in each of these areas.

Experimental results for each compound from each study were quantified using the non-linear, bivariate Freundlich adsorption isotherm model summarized by the equation $x/m = K_f C_e^{1/n}$, where x/m is the mass of adsorbate per mass of adsorbent (synonymous with q_e); C_e = equilibrium concentration of adsorbate, and K_f and 1/n are empirical parameters. Best-fit estimated K_f and 1/n pairs were calculated for each compound in each study, and were presented in Table 3.2. The following briefly summarizes the major findings based on these results:

- The relative affinity of individual compounds to sorb to F400 that had been observed in previous tests was observed. The current studies considered additional compounds including phenol, 4-methylphenol (Outboard area only), and trichlorobenzenes (Remediation Area D only).
- Phenol appeared to have a higher sorption affinity to Filtrasorb F400 at neutral pH than native pH. The hydroxyl group on phenol confers a degree of polarity which may make sorption affinity a function of pH. The trichlorobenzenes were more highly sorbed at native pH, although sorption affinity of trichlorobenzenes at either native or adjusted pH was greater than most compounds studied. Sorption of the other target compounds in Remediation Area D did not appear to be appreciably affected by pH.
- No significant difference in adsorption performance was observed at tests run at *in situ* versus room temperature.
- Sorption affinity for most compounds in the current study was lower than that implied by the results reported from Phase IV isotherm testing. The following factors may have contributed to these differences:
  - Starting (C_0) concentrations for the current study were based on analyzed concentrations in the undosed control bottles to account for losses not attributable to sorption, rather than on calculations based on amount of compound added.

  - The current study did not include a sparging step so that all potential sources of interference to sorption (e.g., matrix effects; competitive sorption) were preserved.
- TIGG F400 "or Equivalent" and NORIT GAC 400 were tested in a limited number of test bottles to determine the potential efficacy of alternative GAC products, overall these results indicate consistent performance between the alternative carbon sources.

The results from these experiments are expected to support cap modeling and design efforts, but do not in and of themselves demonstrate the compound(s) that may govern cap design. Because the studies evaluated sorption of all target compounds simultaneously to evaluate competitive sorption effects, the results may help determine which compound(s) governs design and modeling by incorporating estimated *in situ* concentration (based on historical data collection) and allowable exit concentrations of each compound.

SECTION 5

REFERENCES

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TABLES

TABLE 3.1
INITIAL CHARACTERIZATION OF NON-TARGET PARAMETERS

Category	Parameter	Units	Remediation Area D		Outboard Area	
			Native pH	Adjusted pH	WBB/HB West	WBB/HB East
Aggregate Organics	Chemical Oxygen Demand (COD)	mg/L	2685	--	1265	718
	Biochemical Oxygen Demand (BOD_5)	mg/L	745	1690	157	22.0
	Total Organic Carbon (TOC)	mg/L	--	753	124	9.7
	Dissolved Organic Carbon (DOC)	mg/L	718	849	115	9.8
Cations	Total Iron (Fe)	µg/L	25.5	299	333	20600
	Sodium (Na^+)	µg/L	1245000	1345000	4275000	2450000
	Potassium (K^+)	µg/L	139000	159500	222000	82750
	Calcium (Ca^{+2})	µg/L	793000	886500	3850000	1062000
	Magnesium (Mg^{+2})	µg/L	56.4	32	596	63800
	Manganese (Mn^{+2})	µg/L	1.75	0.92	24.9	1309
Anions	Chloride (Cl^-)	mg/L	2595	2415	17400	6450
	Fluoride (F^-)	mg/L	< 0.022	0.017	< 7.0	1.5
	Nitrate (NO_3^-)	mg/L	0.054	< 0.009	< 7.0	2.5
	Nitrite (NO_2^-)	mg/L	< 0.001	0.00935	--	--
	Sulfate (SO_4^{-2})	mg/L	334	342	437	115
	Sulfide (S^{-2})	mg/L	17.1	20.9	< 0.59	< 0.59
	Total Phosphate (PO_4^{-3})	mg/L	< 0.009	0.011	< 26.6	< 1.6

TABLE 3.1
INITIAL CHARACTERIZATION OF NON-TARGET PARAMETERS (CONTINUED)

Category	Parameter	Units	Remediation Area D		Outboard Area	
			Native pH	Adjusted pH	WBB/HB West	WBB/HB East
Aggregate Inorganics	pH	Std. Units	11.68	11.7[(1)]	11.71	7.23
	ORP	mV	-231.5	-230[(2)]	-221.4	-24.3
	Total Hardness	mg/L	2135	2380	9615	2915
	Total Alkalinity	mg/L	1790	1845	812	258
	Total Dissolved Solids (TDS)	mg/L	5735	5970	27850	14335
PCBs	Total PCBs	µg/L	< 0.050	< 0.056	--	--

(1) Estimated. pH for test subsequently adjusted to 6.95 ± 0.05 std. units

(2) Estimated.

TABLE 3.2
SUMMARY OF BEST-FIT FREUNDLICH MODEL PARAMETER PAIRS K_F AND 1/N FOR REMEDIATION AREA D

Target Constituent	Remediation Area D (Phase VI PDI)				Phase IV PDI	
	Adjusted pH		Native pH			
	1/n	K_f	1/n	K_f	1/n	K_f
Benzene	0.28	3.06	0.31	2.87	0.49	14.0
Chlorobenzene	0.28	18.9	0.30	15.6	0.37	13.6
Total Dichlorobenzene	0.32	28.7	0.40	31.5	0.36	61.2
Ethylbenzene	0.30	3.30	0.32	3.18	0.30	18.3
Toluene	0.25	7.70	0.35	7.59	0.35	14.4
Total Trichlorobenzene	0.35	43.4	0.70	102.8	--	--
Total Xylene	0.26	19.0	0.32	17.1	0.30	43.3
Phenol	0.29	1.24	0.71	0.76	--	--
Naphthalene	0.30	65.0	0.41	56.0	0.65	24.6
4-Methylphenol	--	--	--	--	--	--
Acenathylene(1)	0.73	43.9	0.70	30.8	--	--
Phenanthrene(1)	0.51	0.31	0.56	0.51	--	--

(1) The data sets used for calculation of K_f and 1/n for these compounds are not considered as robust as those for the other compounds. The data sets used for calculating best-fit Freundlich parameters for these compounds were based on very low starting concentrations. Due to the size and structure of these compounds, sample carryover between analyses is greater. At the low detection limits used in the 8270/SIM method, any sample carryover between analyses would have a greater relative effect on the calculated parameters. The structure (fused benzene rings) and insolubility in water of these compounds would be expected to confer an affinity for GAC similar to naphthalene.

TABLE 3.3
SUMMARY OF BEST-FIT FREUNDLICH MODEL PARAMETER PAIRS K_F AND 1/N FOR WBB/HB

Target Constituent	WBB/HB West					
	Adjusted pH		Native pH		WBB/HB East	
	1/n	K_f	1/n	K_f	1/n	K_f
Benzene	0.23	2.76	0.24	1.17	0.25	2.28
Chlorobenzene	0.32	6.16	0.19	1.95	0.17	3.78
Total Dichlorobenzene	0.28	24.9	0.24	12.1	0.05	11.2
Ethylbenzene	0.45	10.3	0.19	2.20	0.14	4.43
Toluene	0.24	5.73	0.28	3.08	0.17	3.10
Total Trichlorobenzene	--	--	--	--	--	--
Total Xylene	0.41	26.4	0.24	10.3	0.14	12.4
Phenol	0.19	2.49	0.21	0.76	0.16	1.47
Naphthalene	0.20	63.2	0.22	36.4	0.34	87.5
4-Methylphenol	0.08	4.18	0.22	1.85	0.09	1.95
Acenathylene	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--

FIGURES

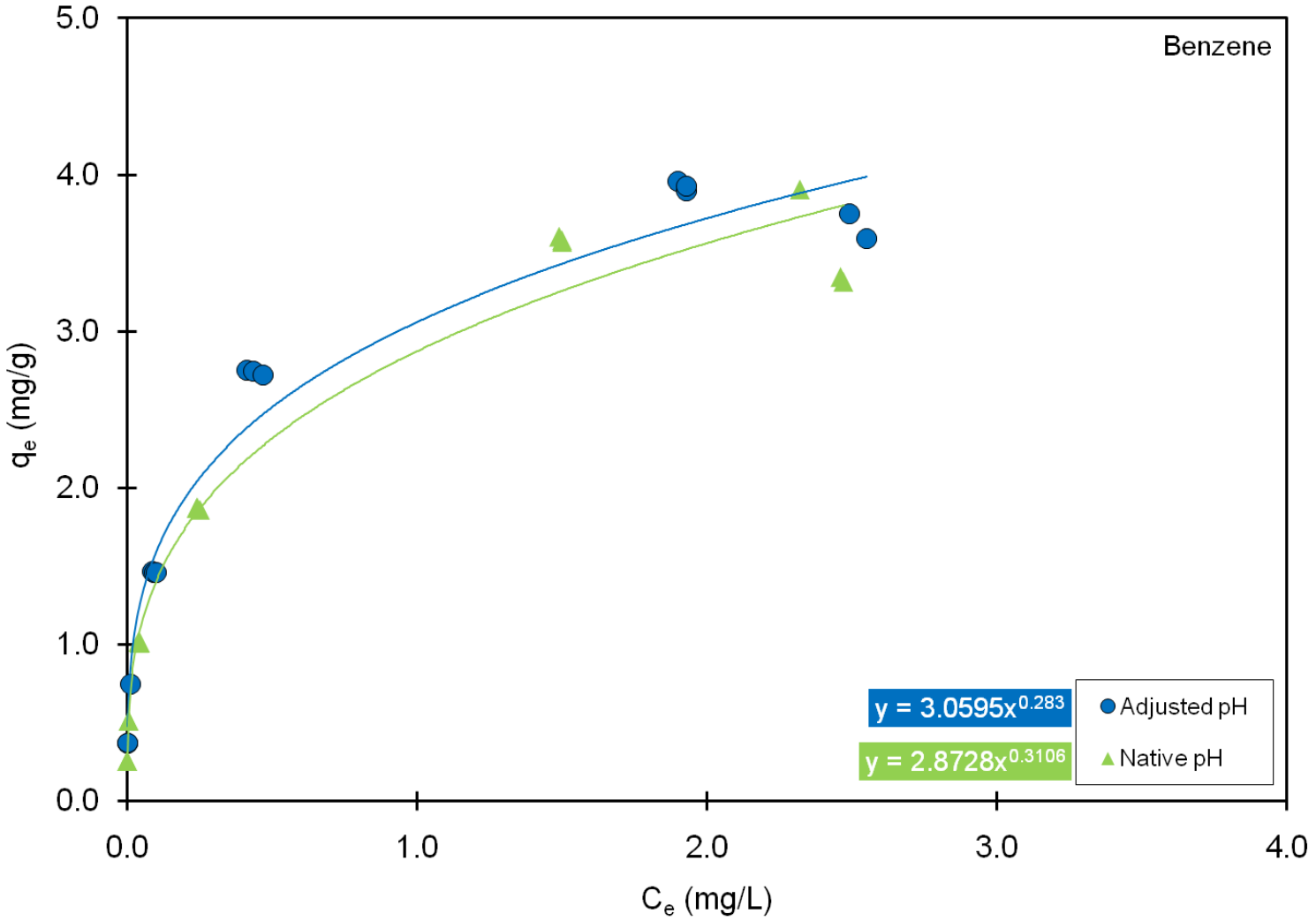


Figure 3.1 Benzene Adsorption Data and Best-Fit Freundlich Isotherms – Remediation Area D

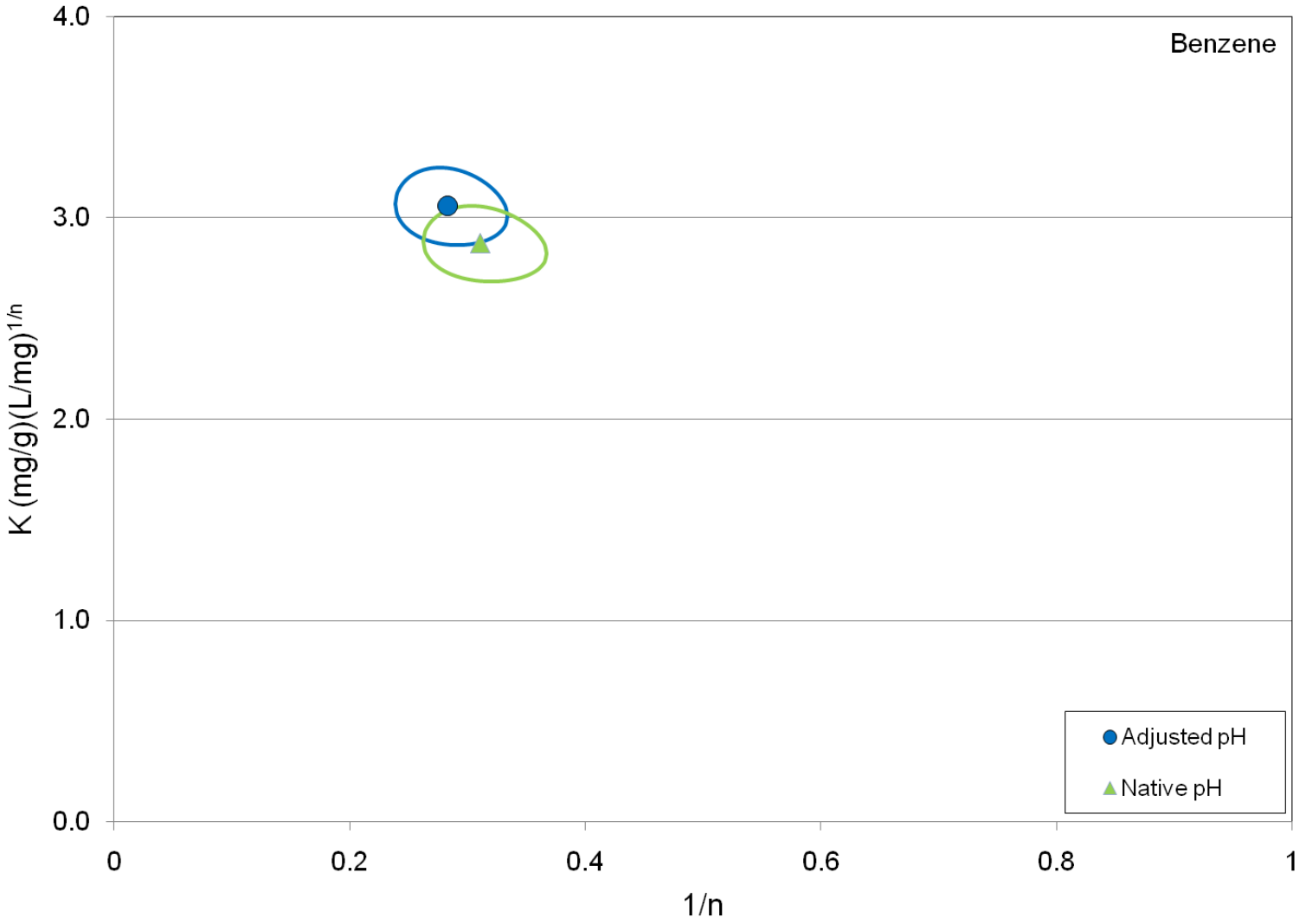


Figure 3.2 Benzene Freundlich 95% Joint Confidence Intervals – Remediation Area D

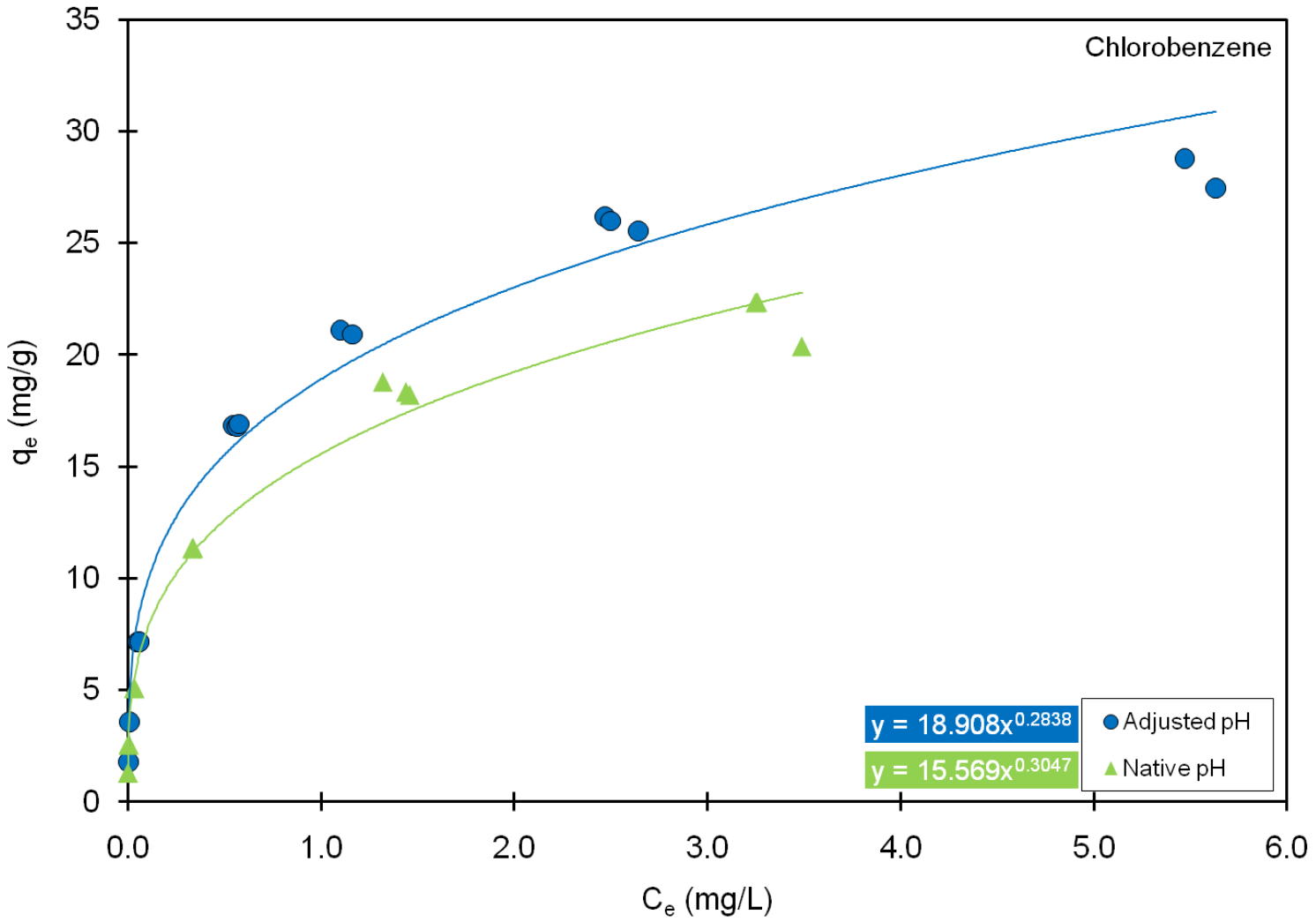


Figure 3.3 Chlorobenzene Adsorption Data and Best-Fit Freundlich Isotherms – Remediation Area D

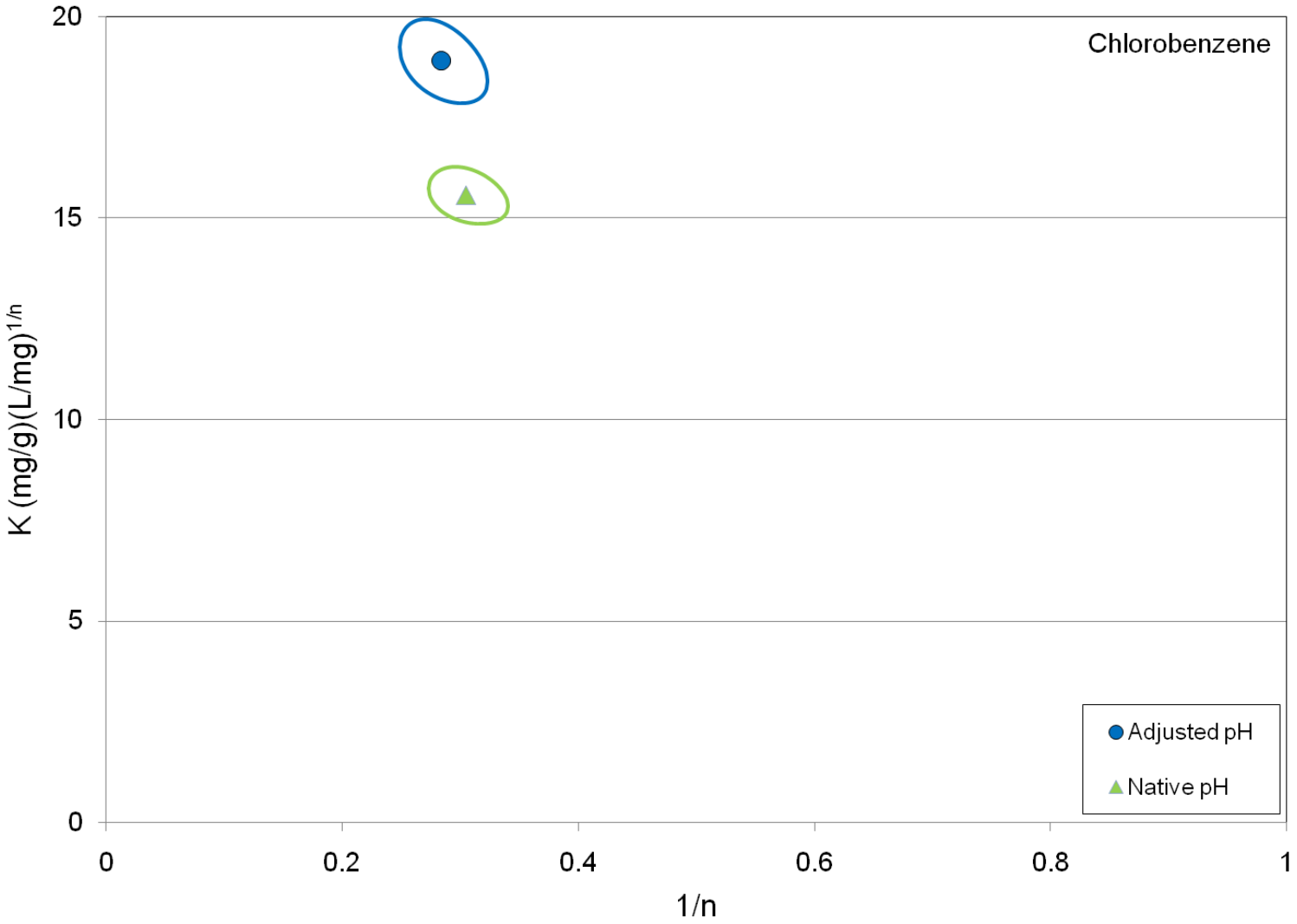


Figure 3.4 Chlorobenzene Freundlich 95% Joint Confidence Intervals – Remediation Area D

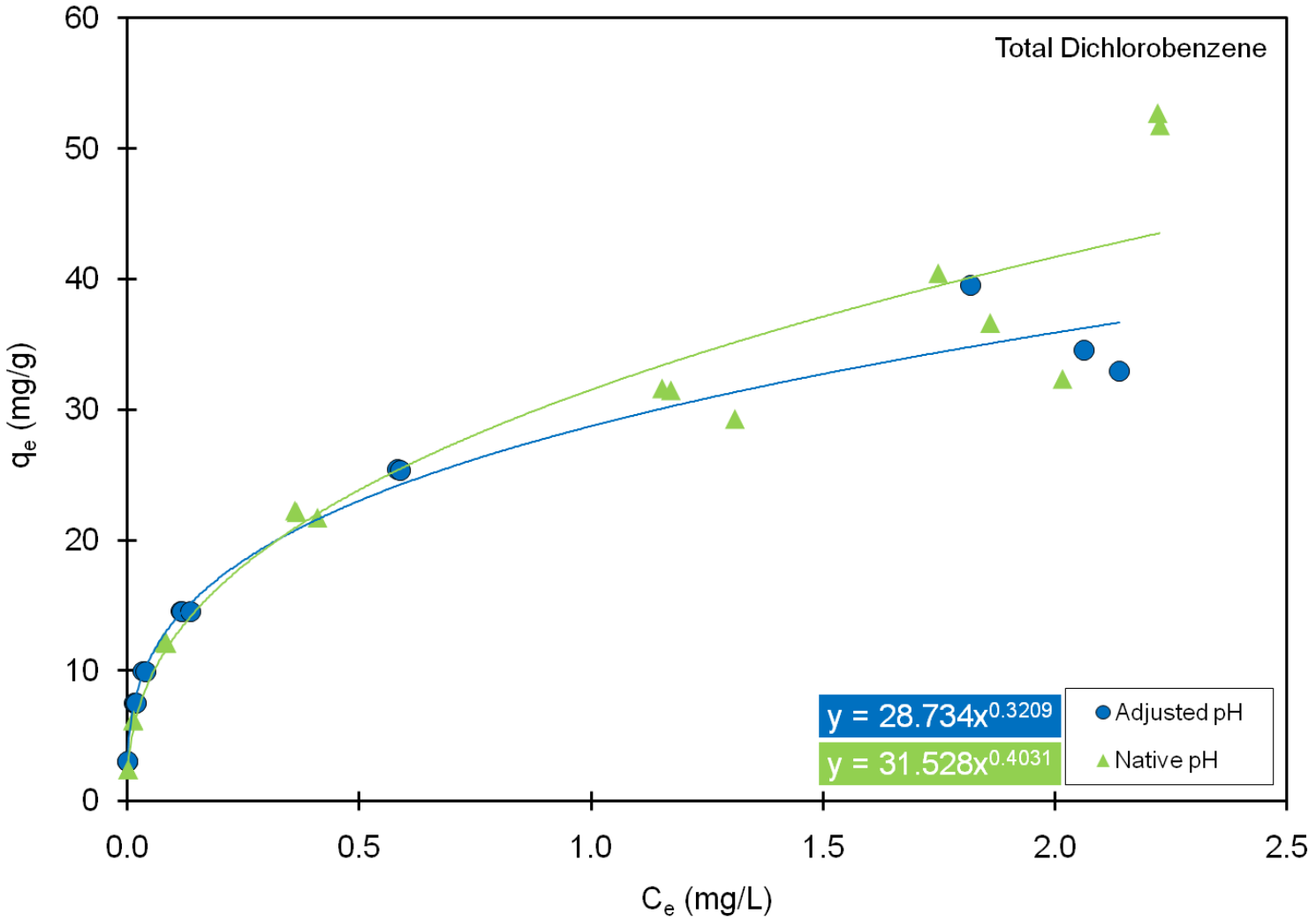


Figure 3.5 Total Dichlorobenzene Adsorption Data and Best-Fit Freundlich Isotherms – Remediation Area D

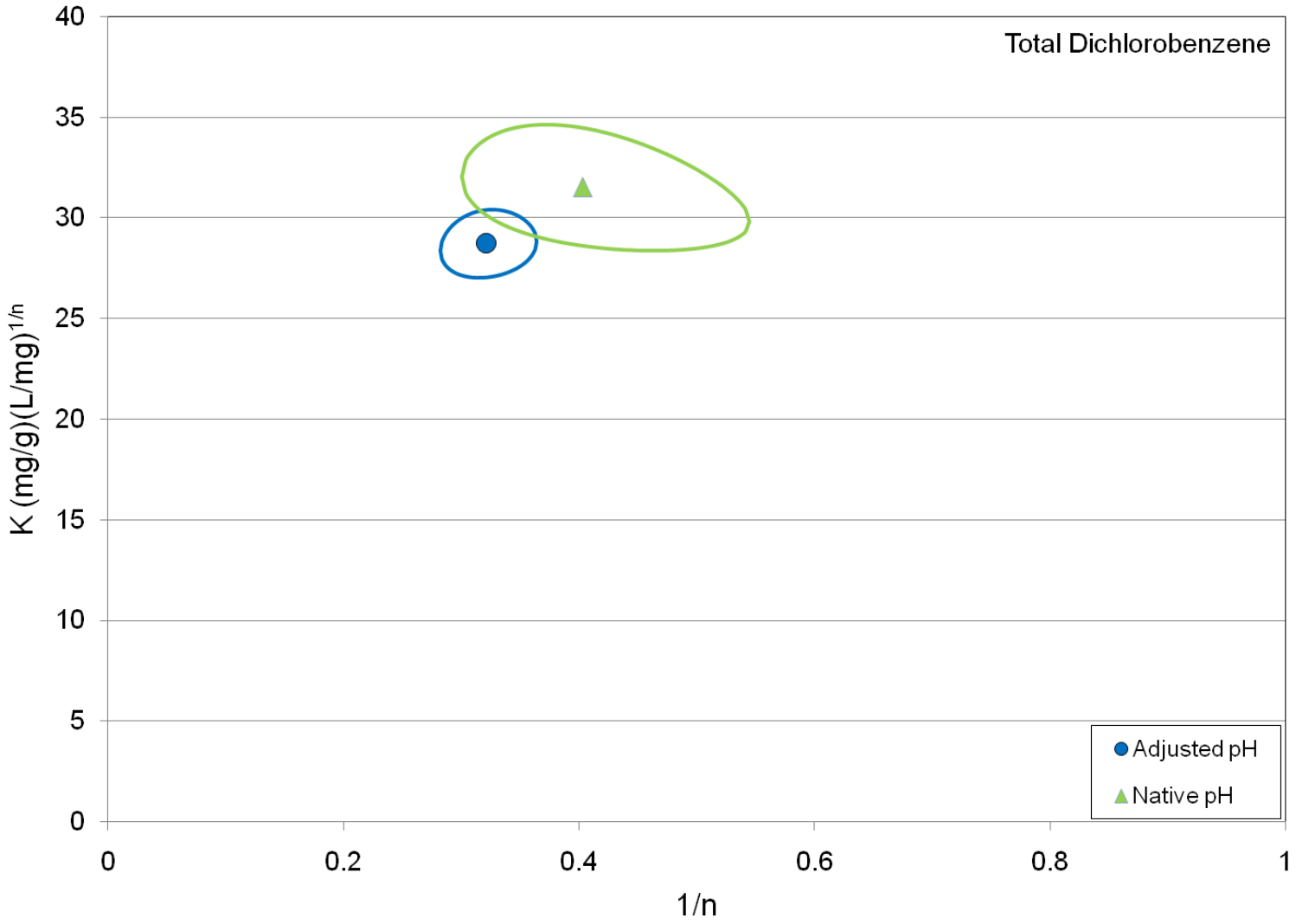


Figure 3.6 Total Dichlorobenzene Freundlich 95% Joint Confidence Intervals – Remediation Area D

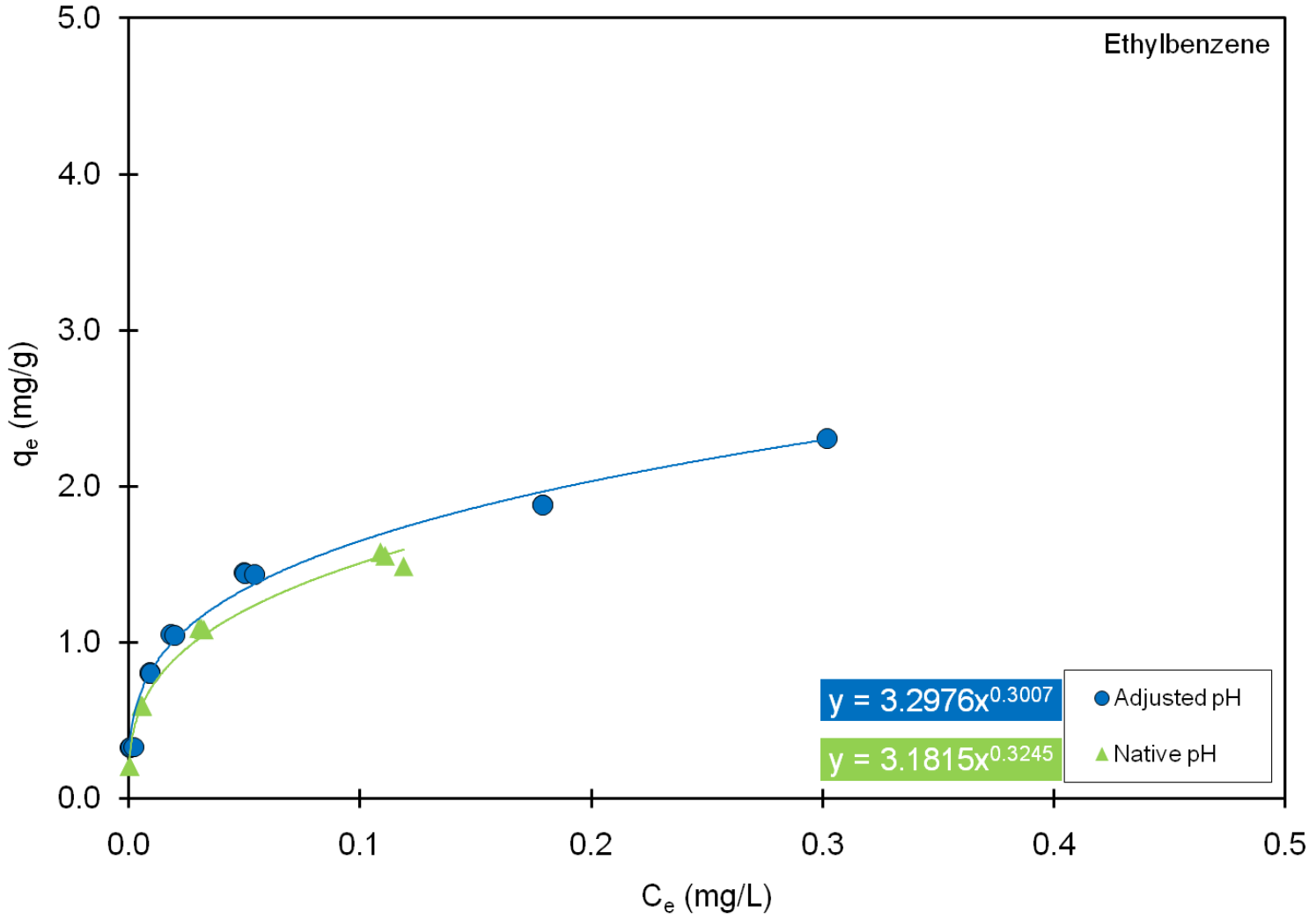


Figure 3.7 Ethylbenzene Adsorption Data and Best-Fit Freundlich Isotherms – Remediation Area D

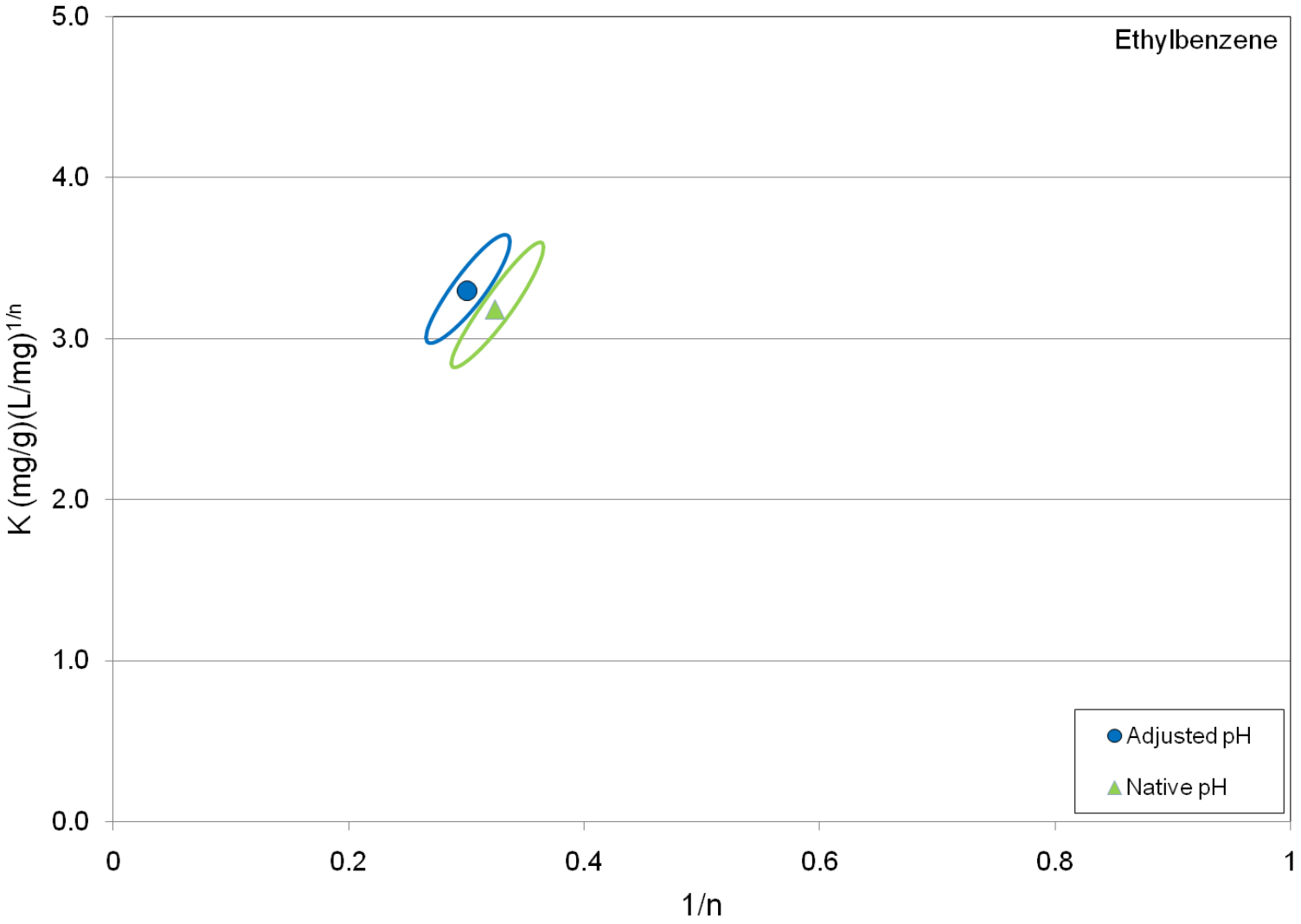


Figure 3.8 Ethylbenzene Freundlich 95% Joint Confidence Intervals – Remediation Area D

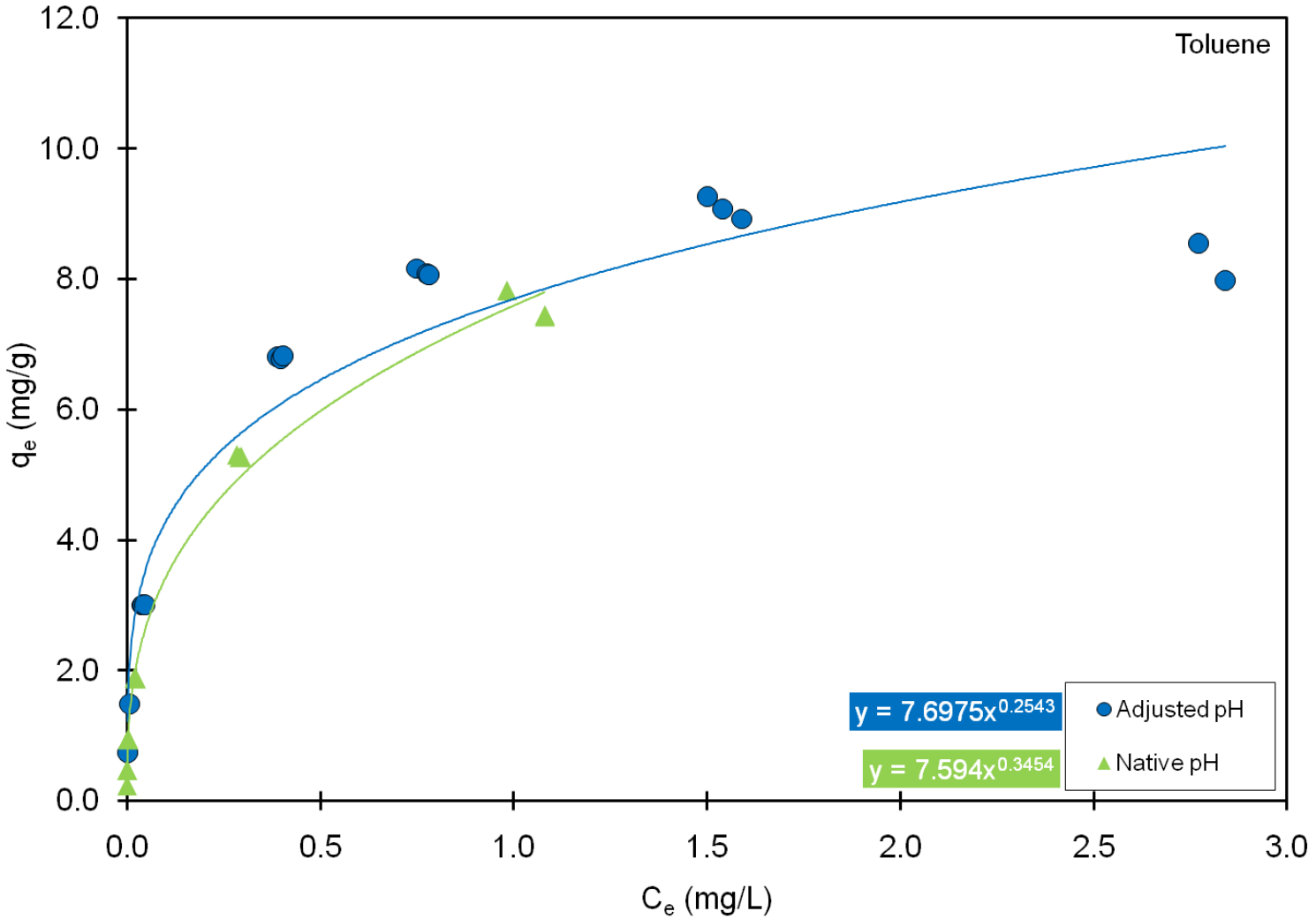


Figure 3.9 Toluene Adsorption Data and Best-Fit Freundlich Isotherms – Remediation Area D

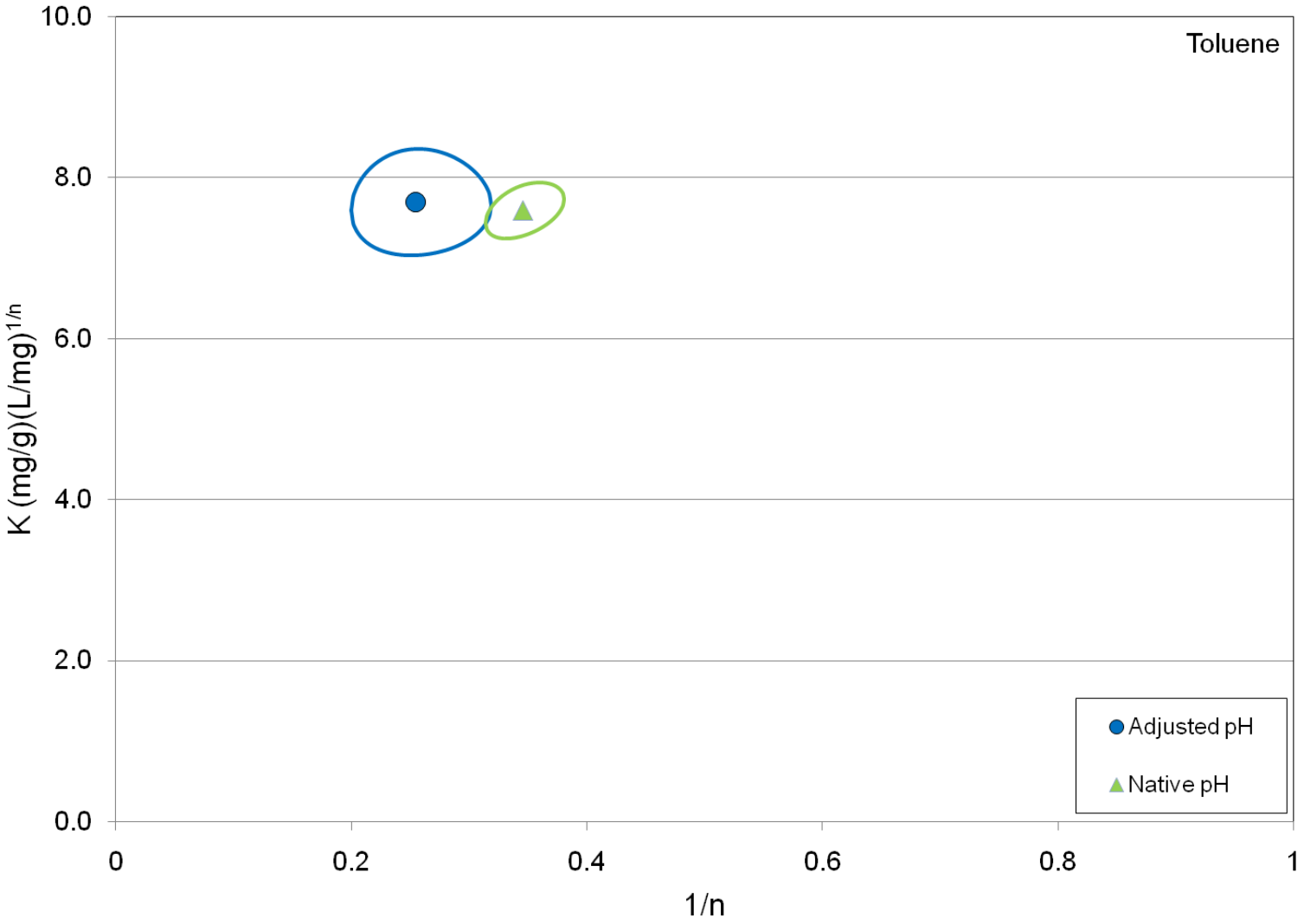


Figure 3.10 Toluene Freundlich 95% Joint Confidence Intervals – Remediation Area D

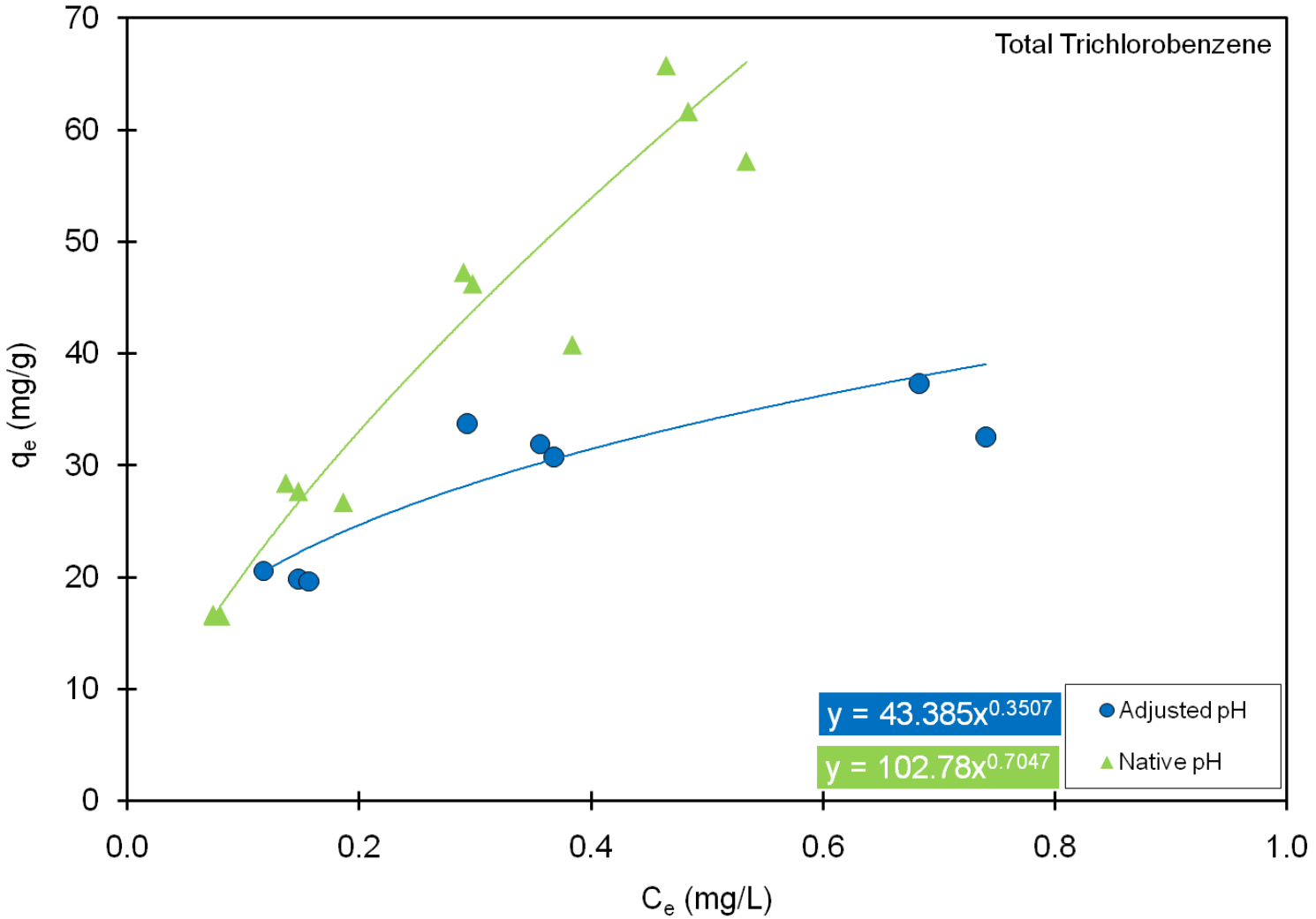


Figure 3.11 Total Trichlorobenzene Adsorption Data and Best-Fit Freundlich Isotherms – Remediation Area D

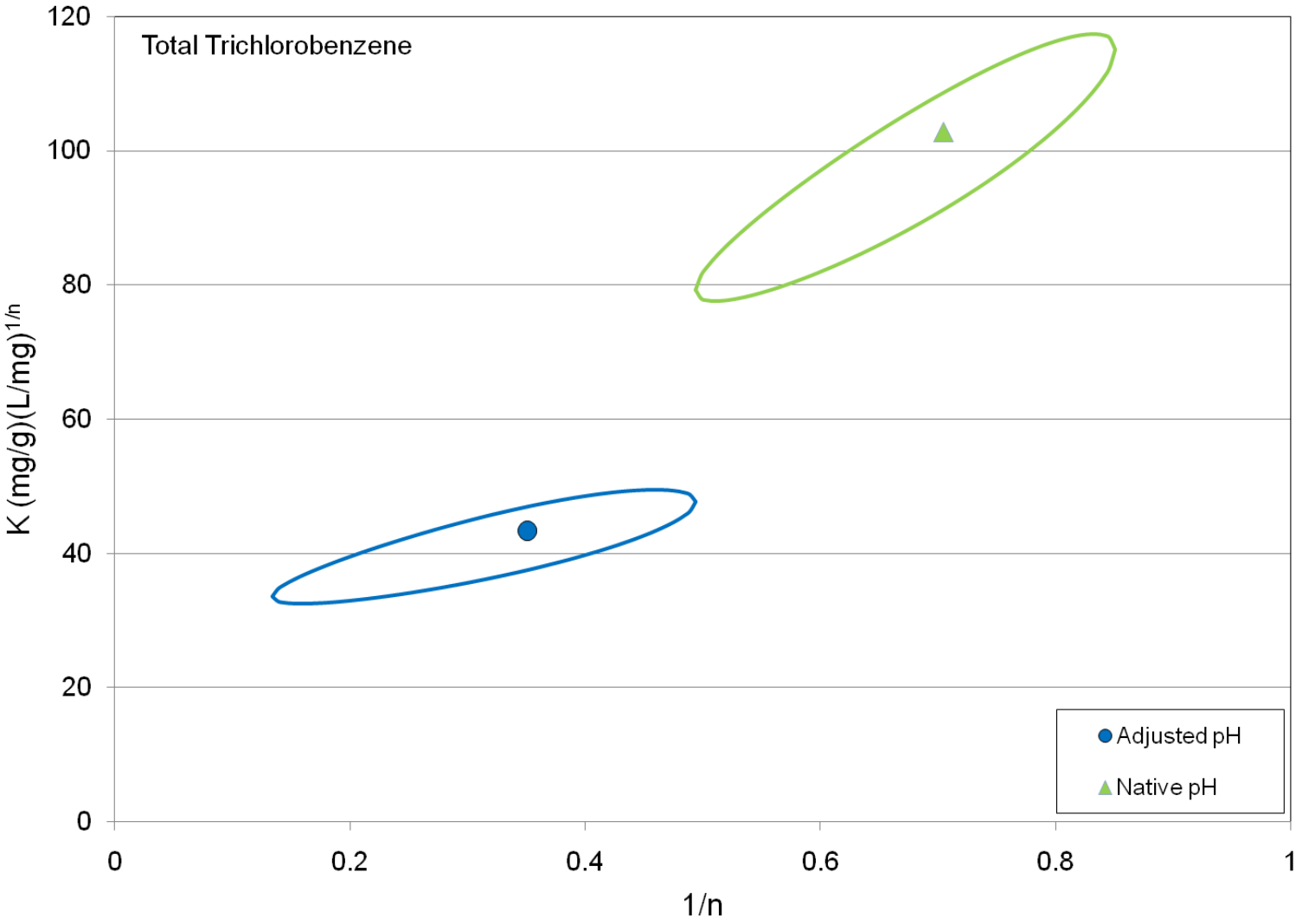


Figure 3.12 Total Trichlorobenzene Freundlich 95% Joint Confidence Intervals – Remediation Area D

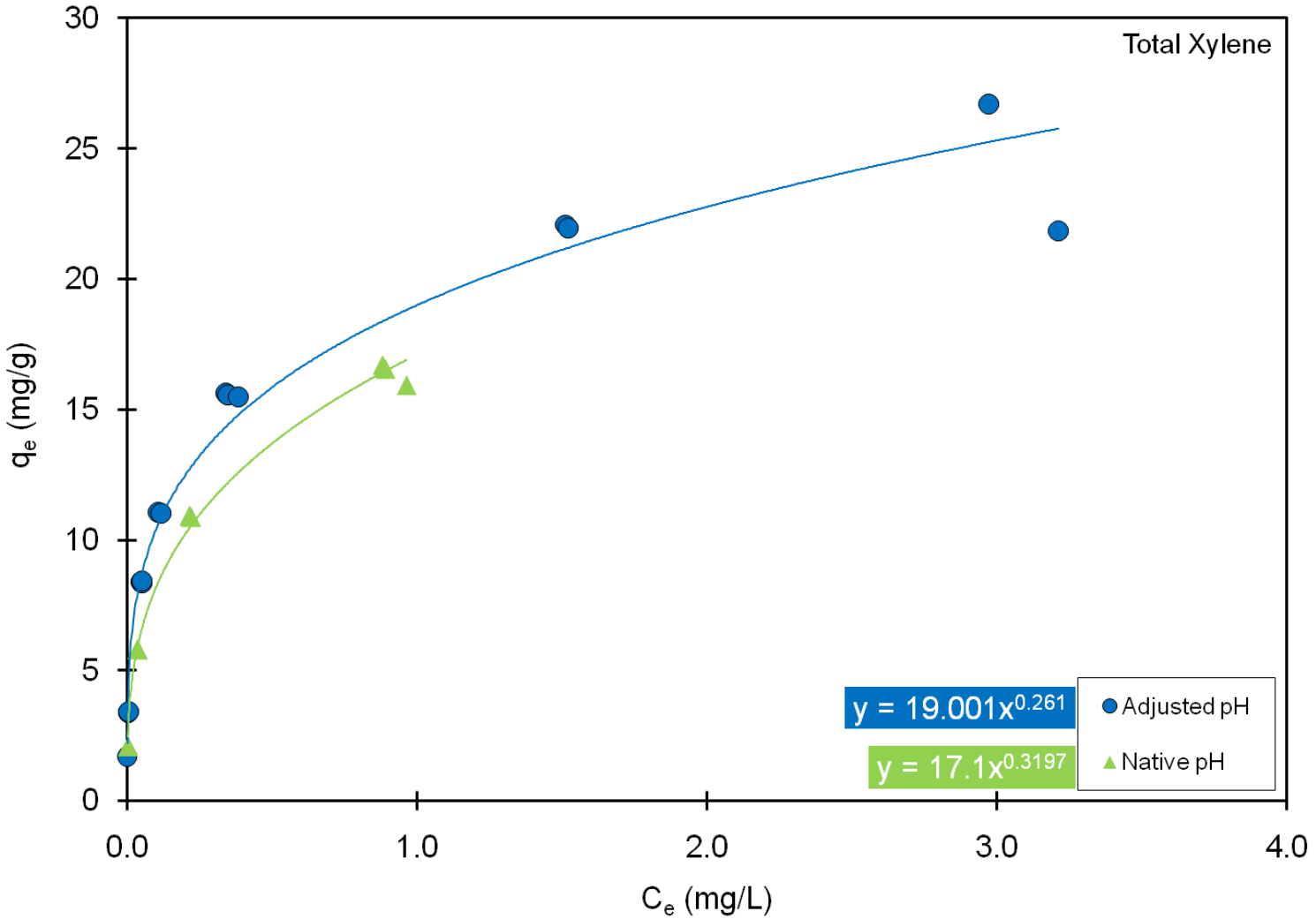


Figure 3.13 Total Xylene Adsorption Data and Best-Fit Freundlich Isotherms – Remediation Area D

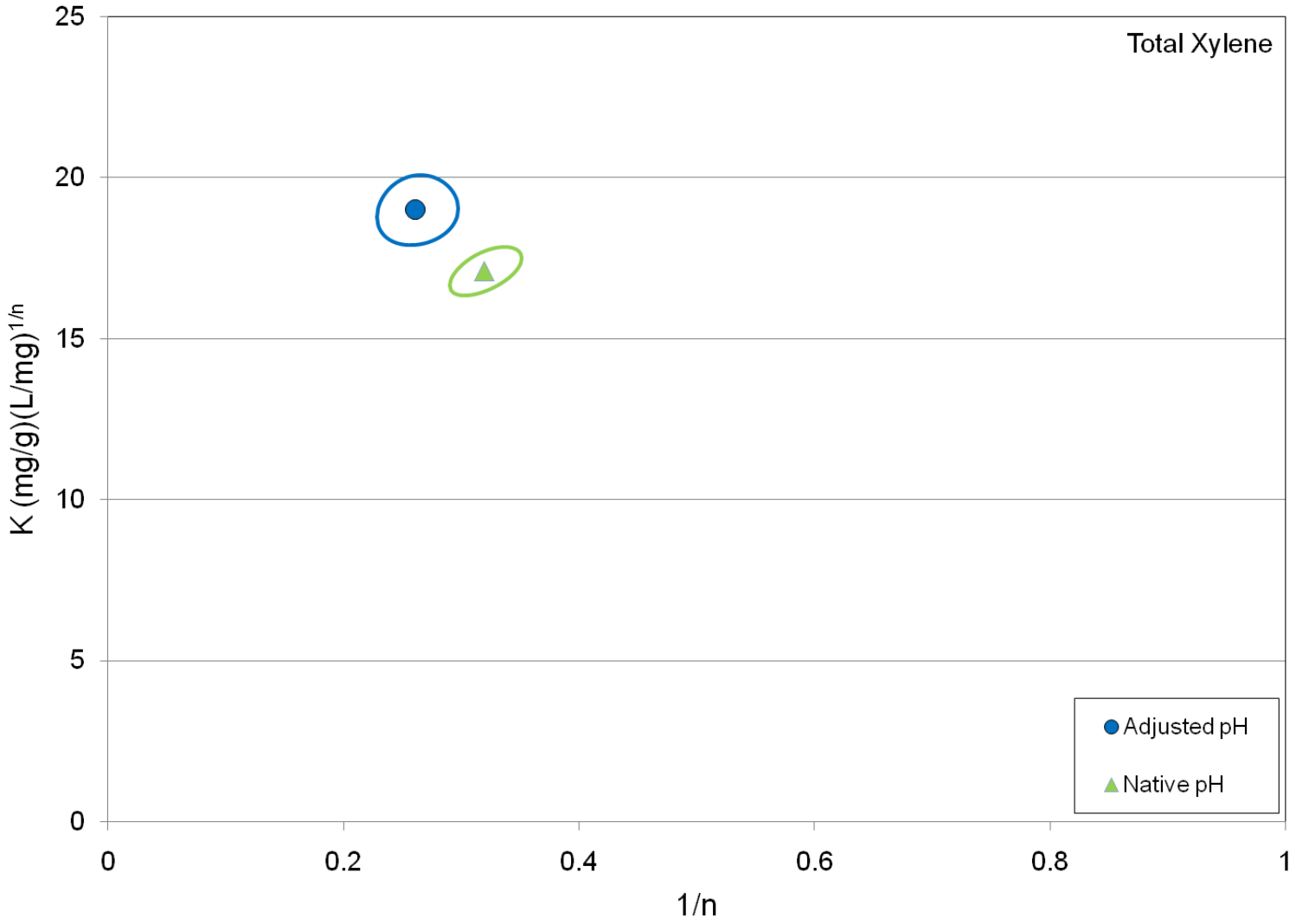


Figure 3.14 Total Xylene Freundlich 95% Joint Confidence Intervals – Remediation Area D

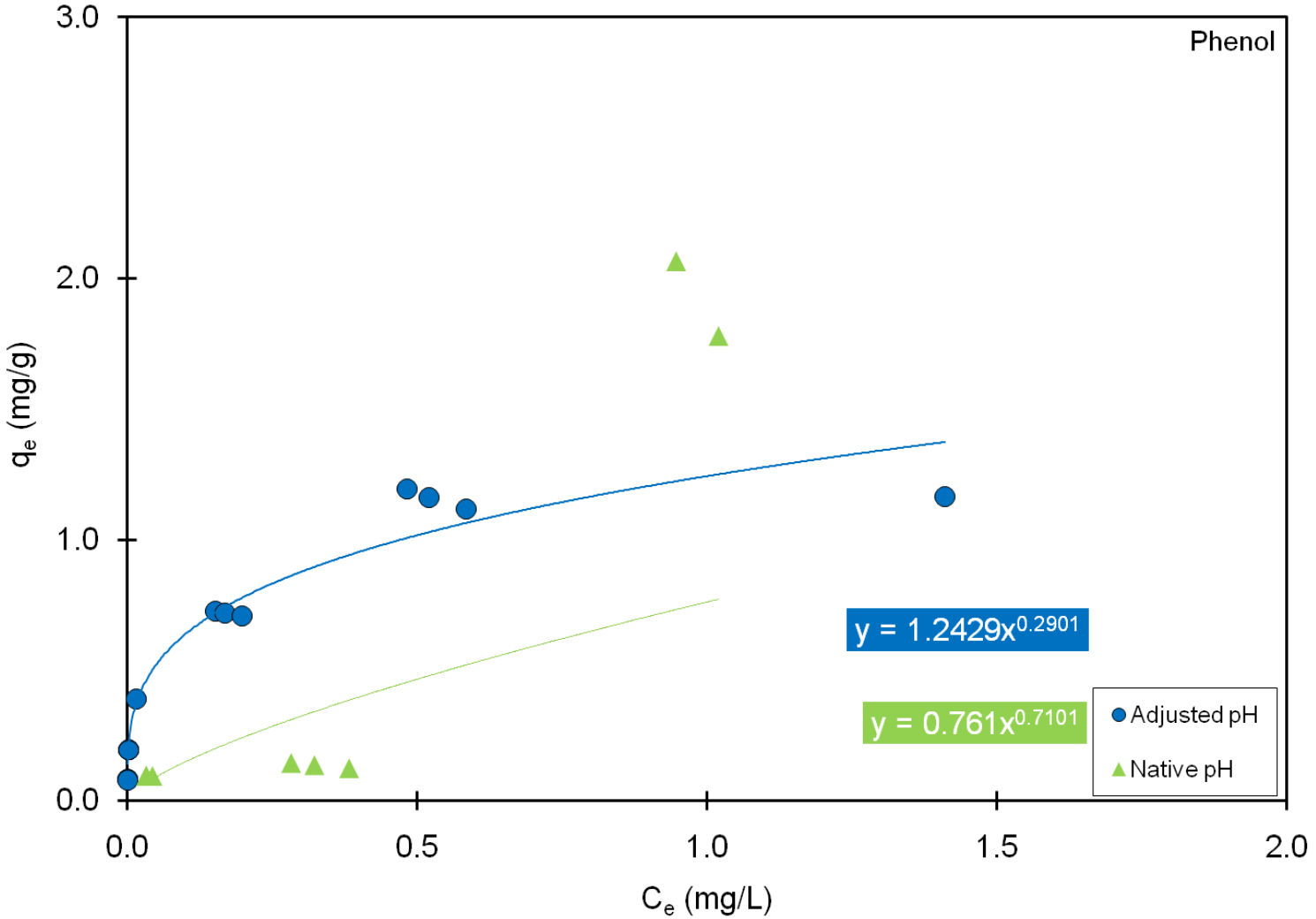


Figure 3.15 Phenol Adsorption Data and Best-Fit Freundlich Isotherms – Remediation Area D

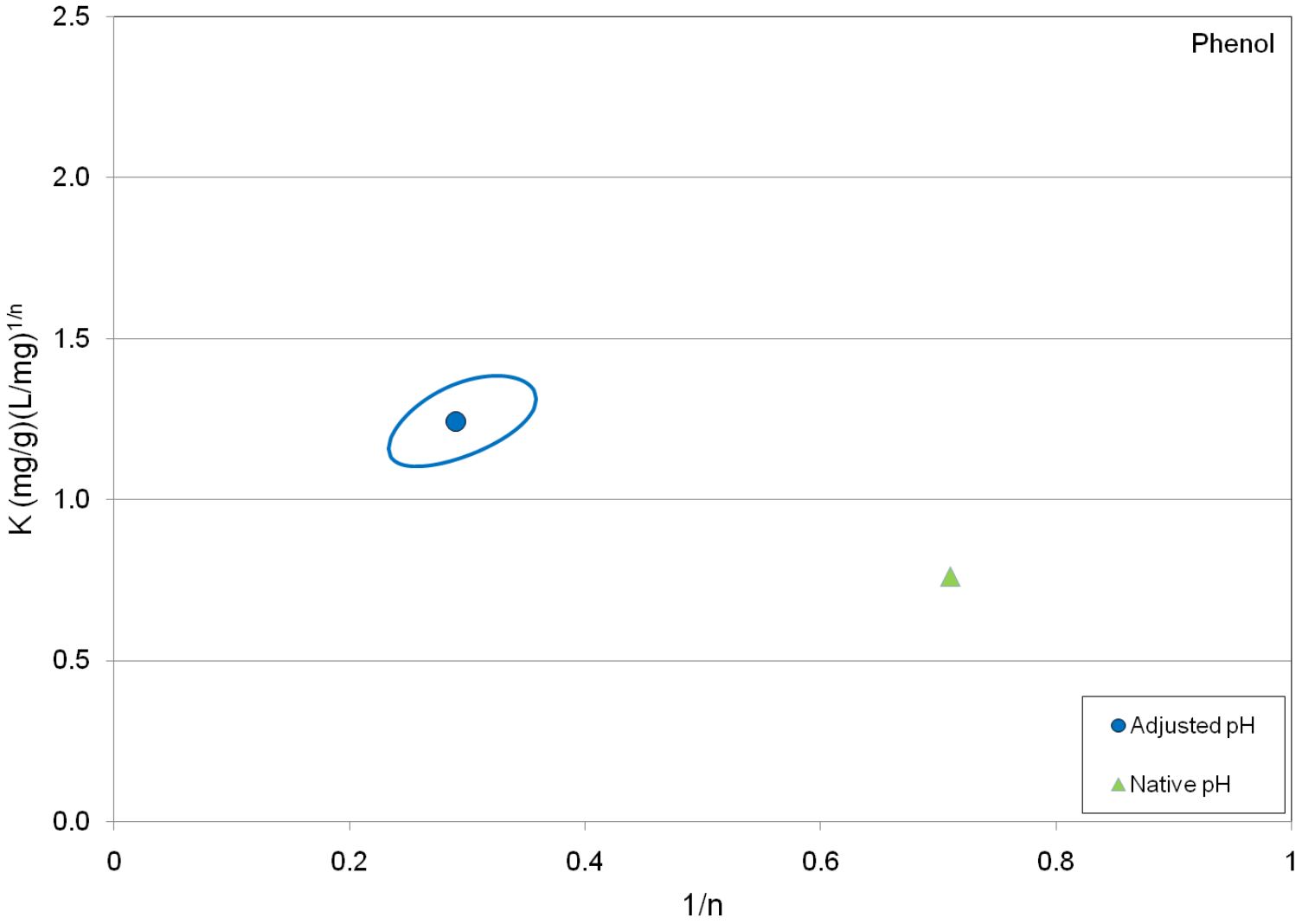


Figure 3.16 Phenol Freundlich 95% Joint Confidence Intervals – Remediation Area D

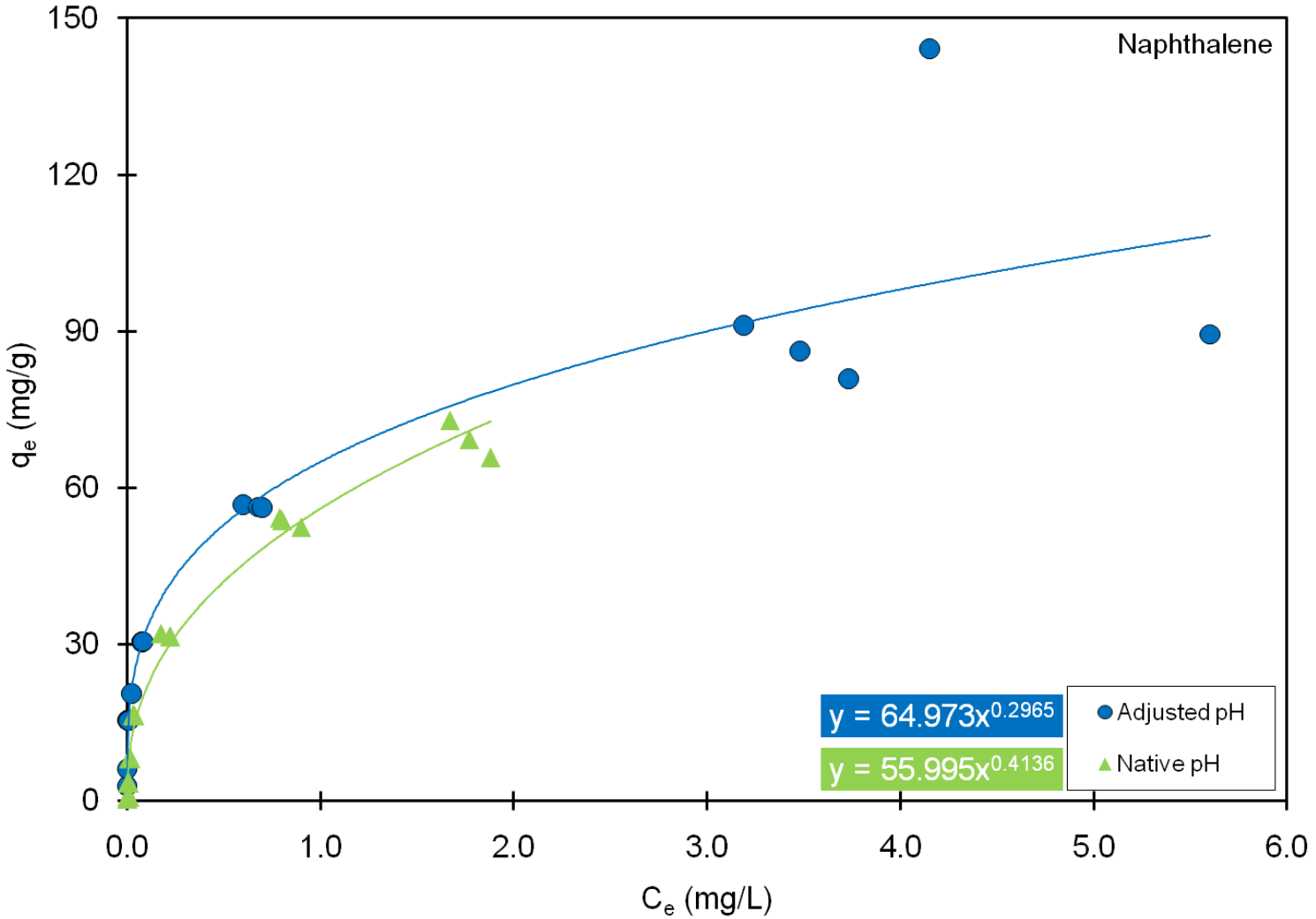


Figure 3.17 Naphthalene Adsorption Data and Best-Fit Freundlich Isotherms – Remediation Area D

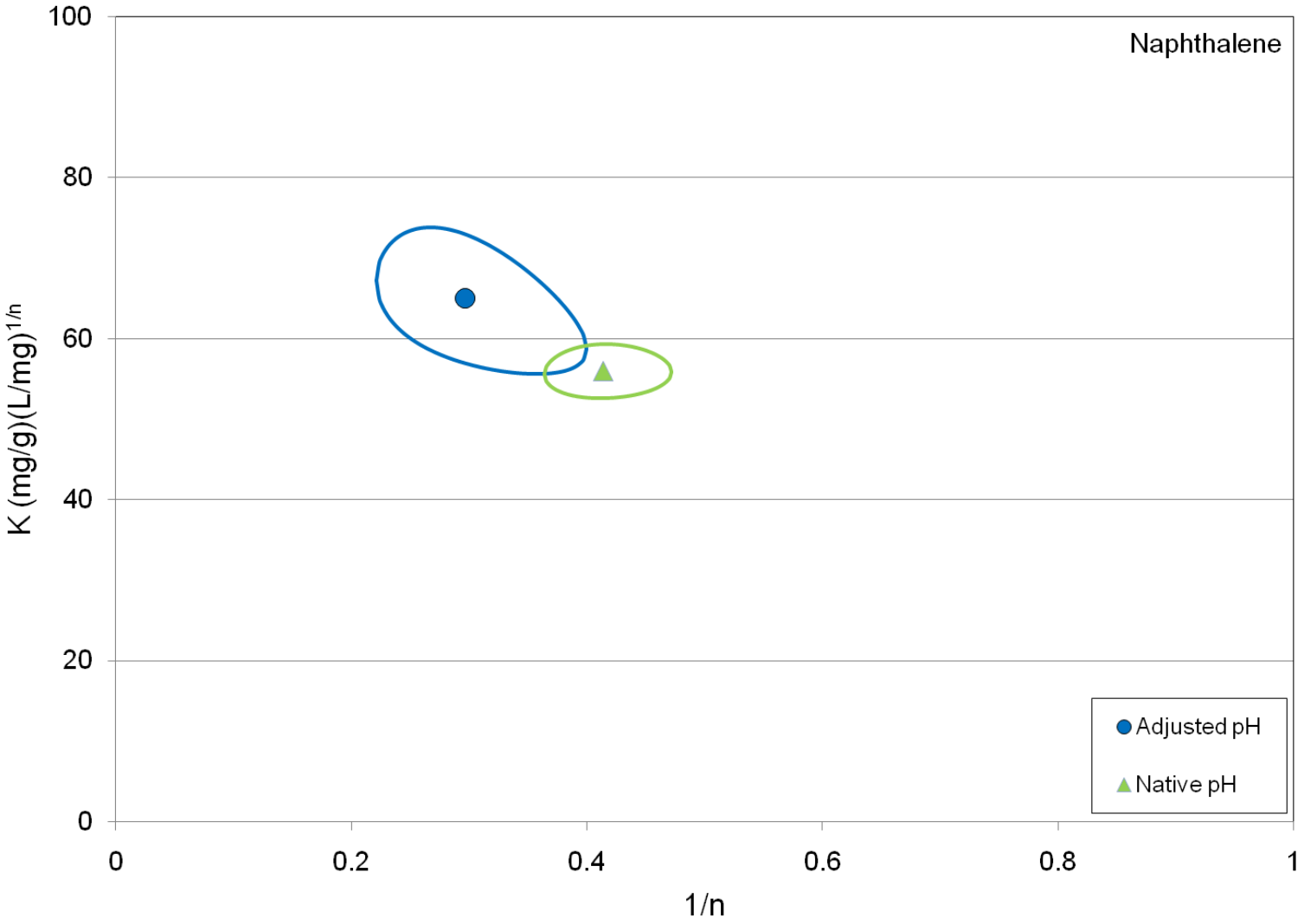


Figure 3.18 Naphthalene Freundlich 95% Joint Confidence Intervals – Remediation Area D

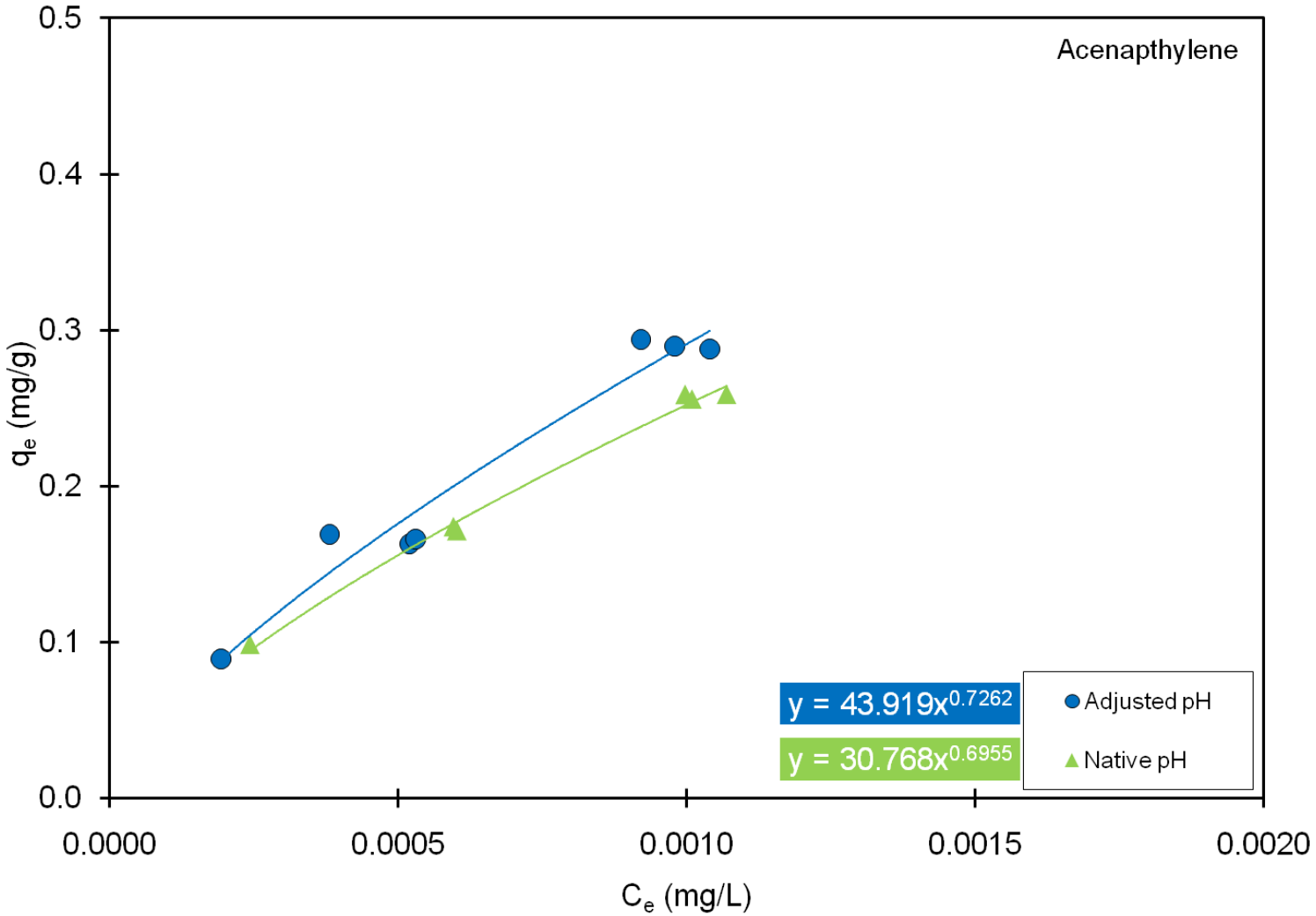


Figure 3.19 Acenapthylene Adsorption Data and Best-Fit Freundlich Isotherms – Remediation Area D

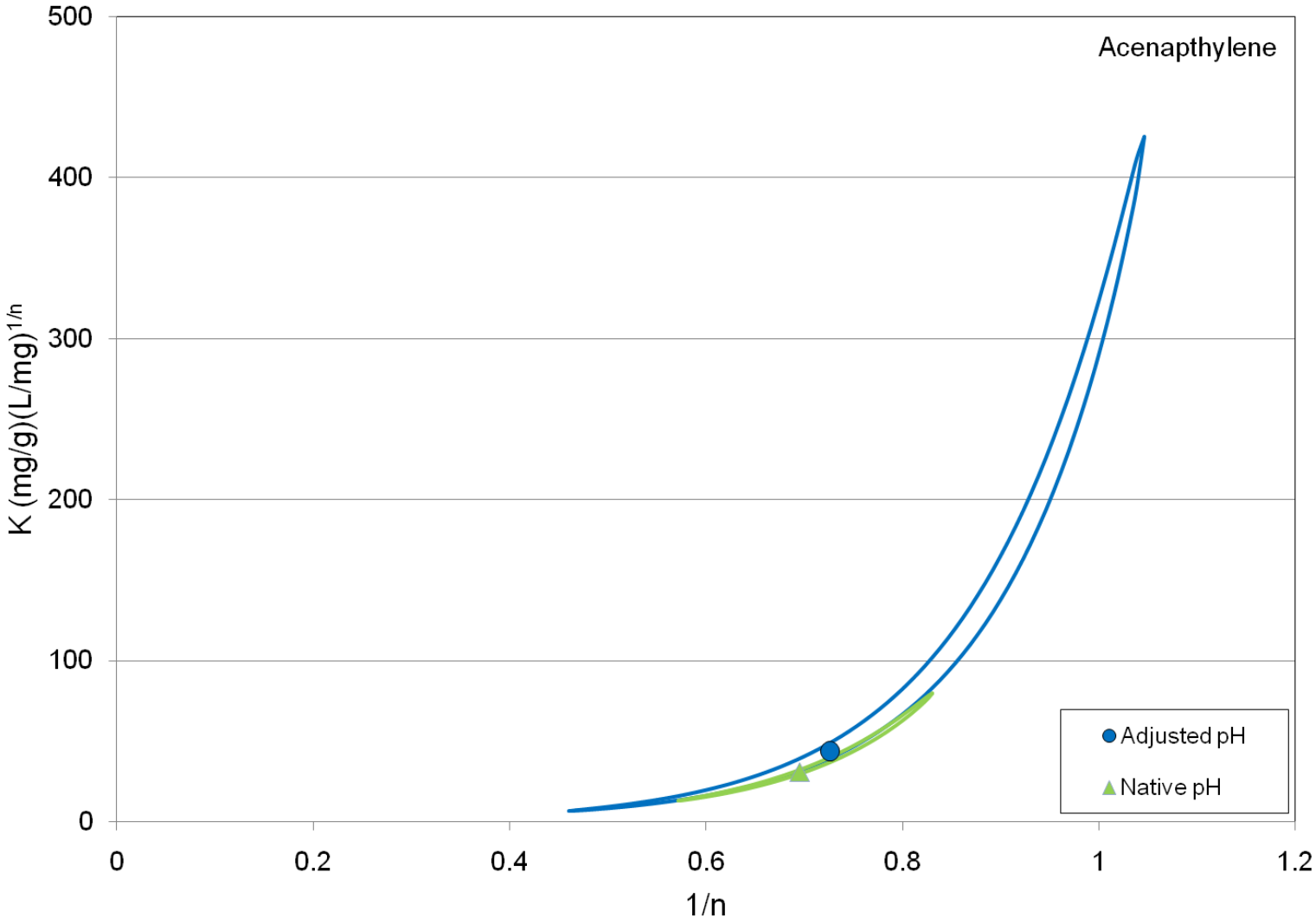


Figure 3.20 Acenapthylene Freundlich 95% Joint Confidence Intervals – Remediation Area D

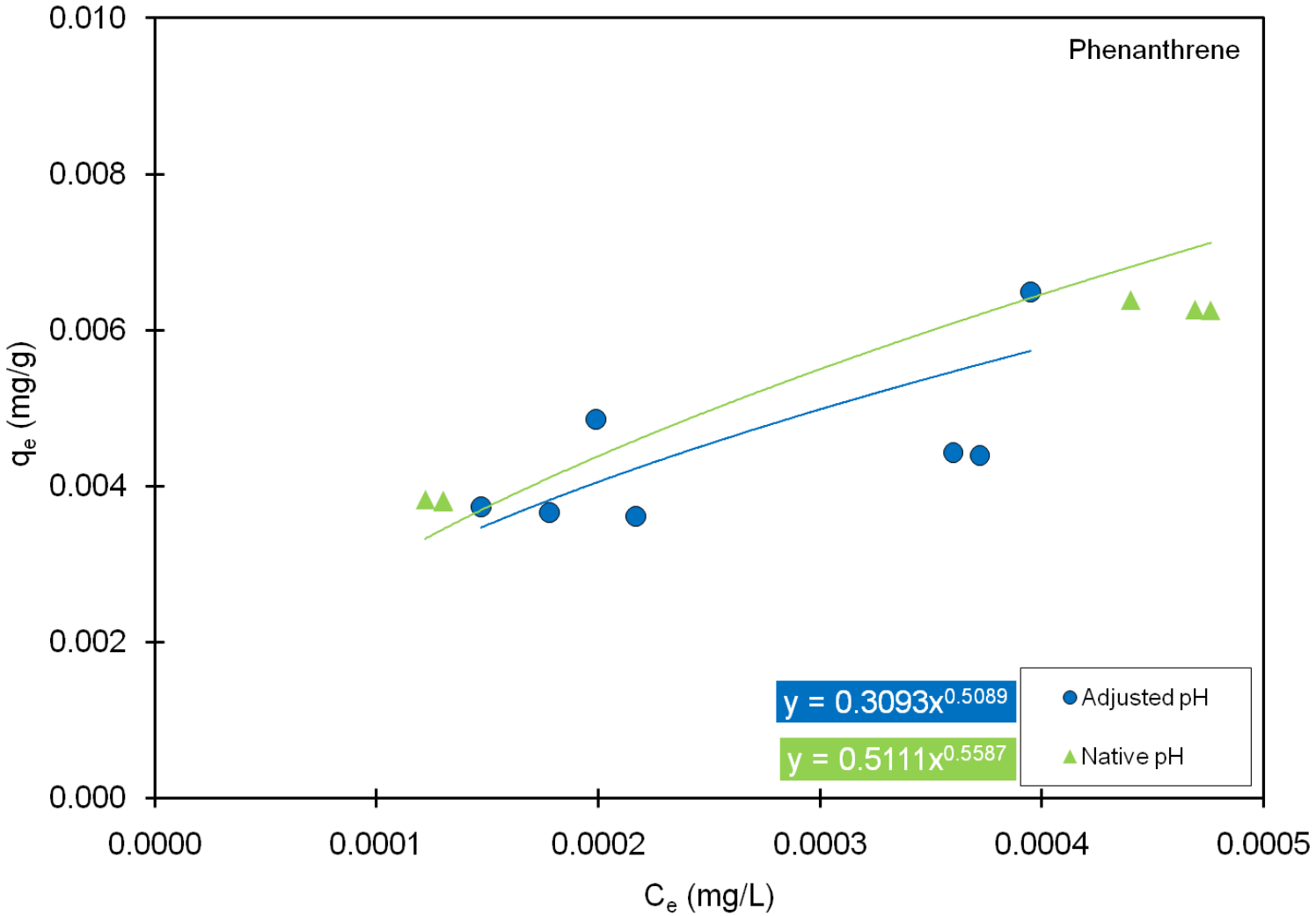


Figure 3.21 Phenanthrene Adsorption Data and Best-Fit Freundlich Isotherms – Remediation Area D

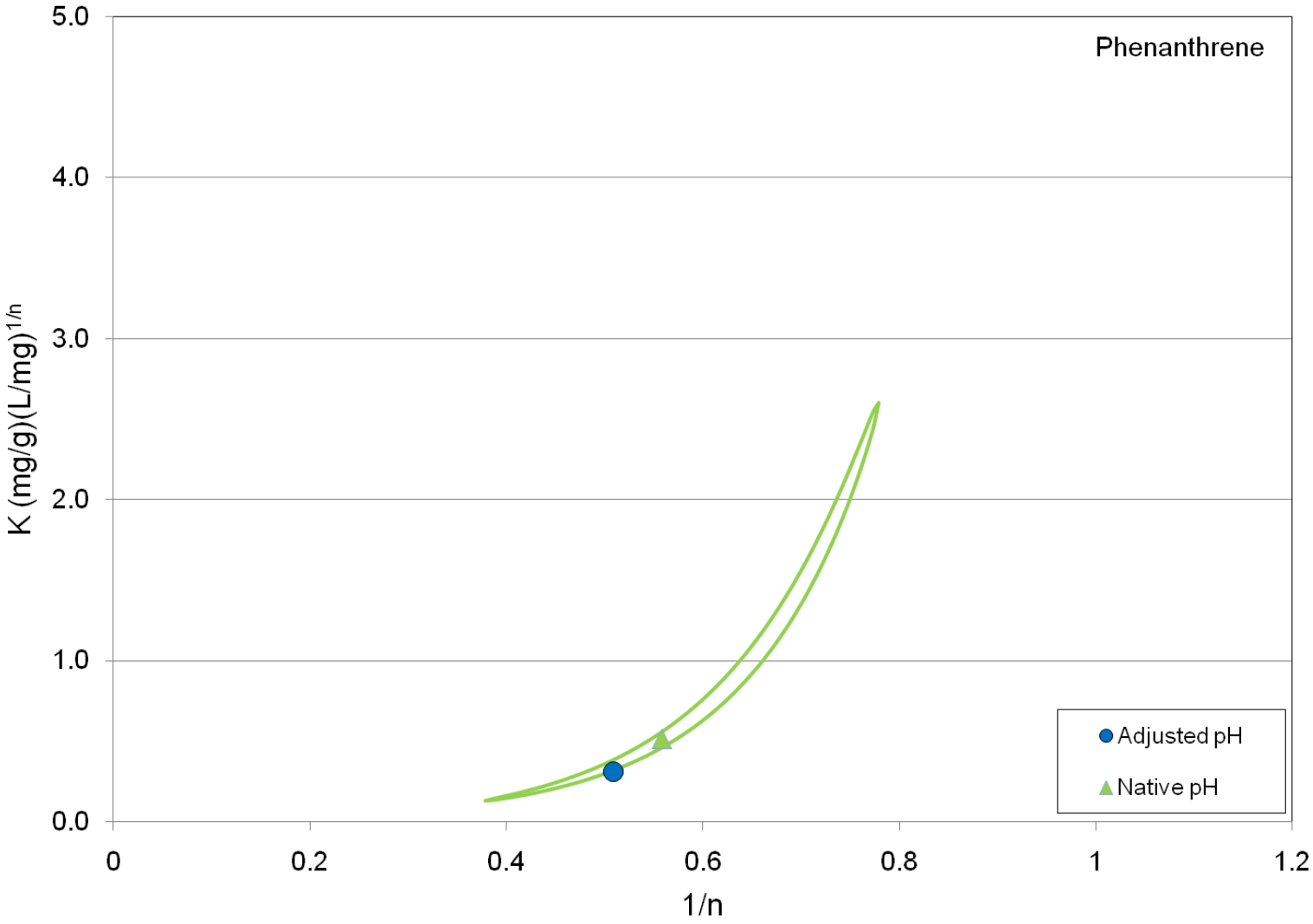


Figure 3.22 Phenanthrene Freundlich 95% Joint Confidence Intervals – Remediation Area D

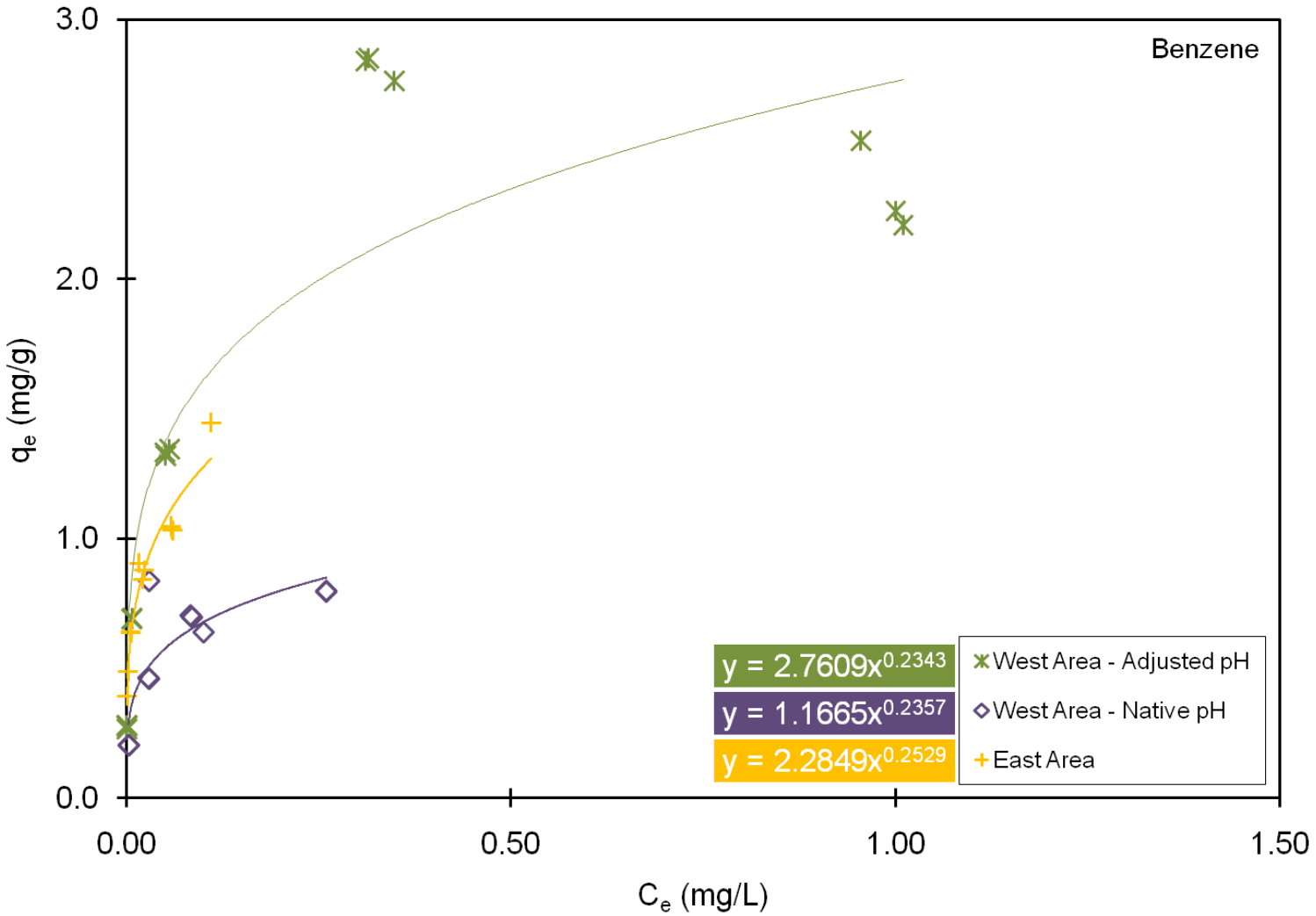


Figure 3.23 Benzene Adsorption Data and Best-Fit Freundlich Isotherms – WBB/HB

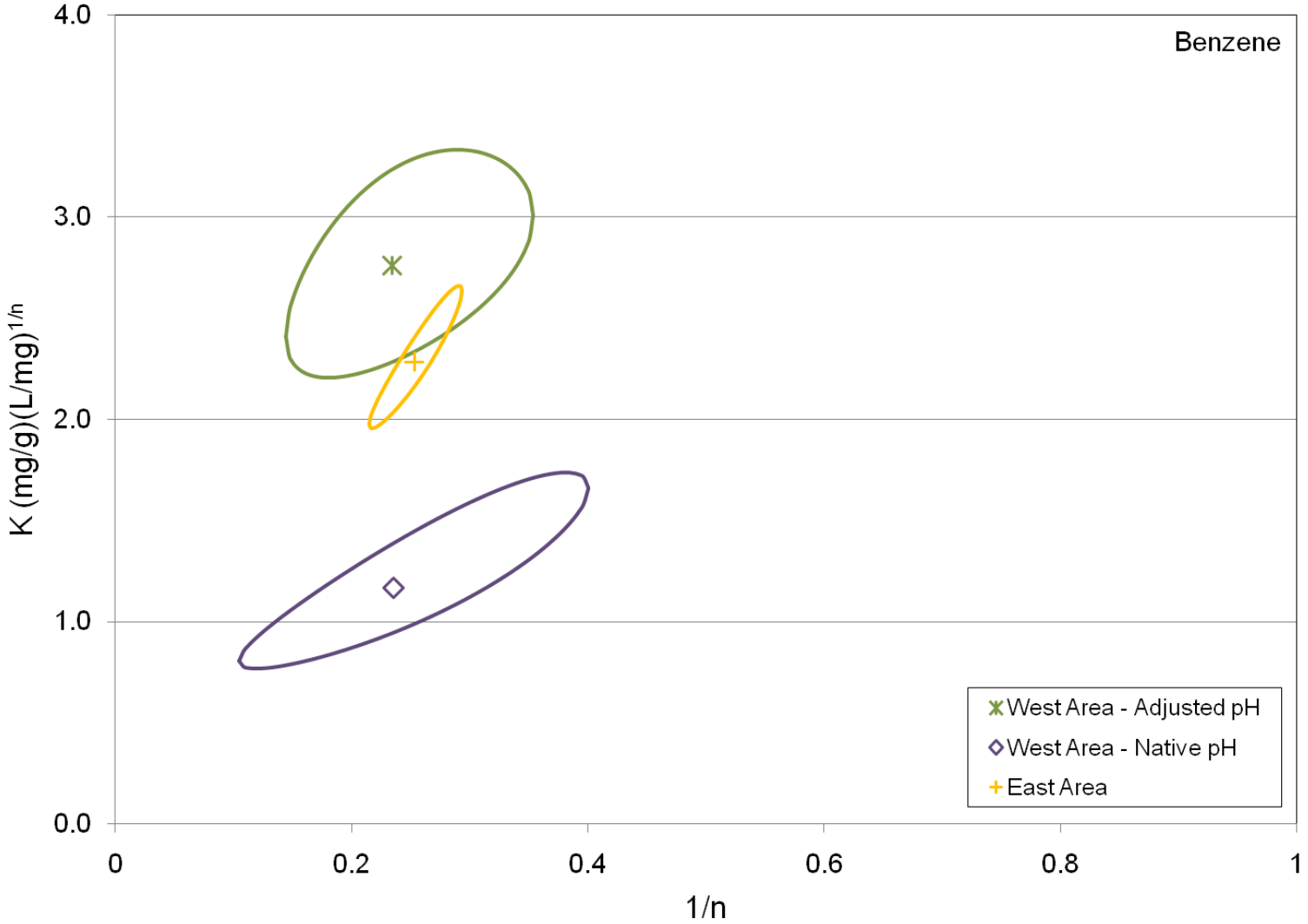


Figure 3.24 Benzene Freundlich 95% Joint Confidence Intervals – WBB/HB

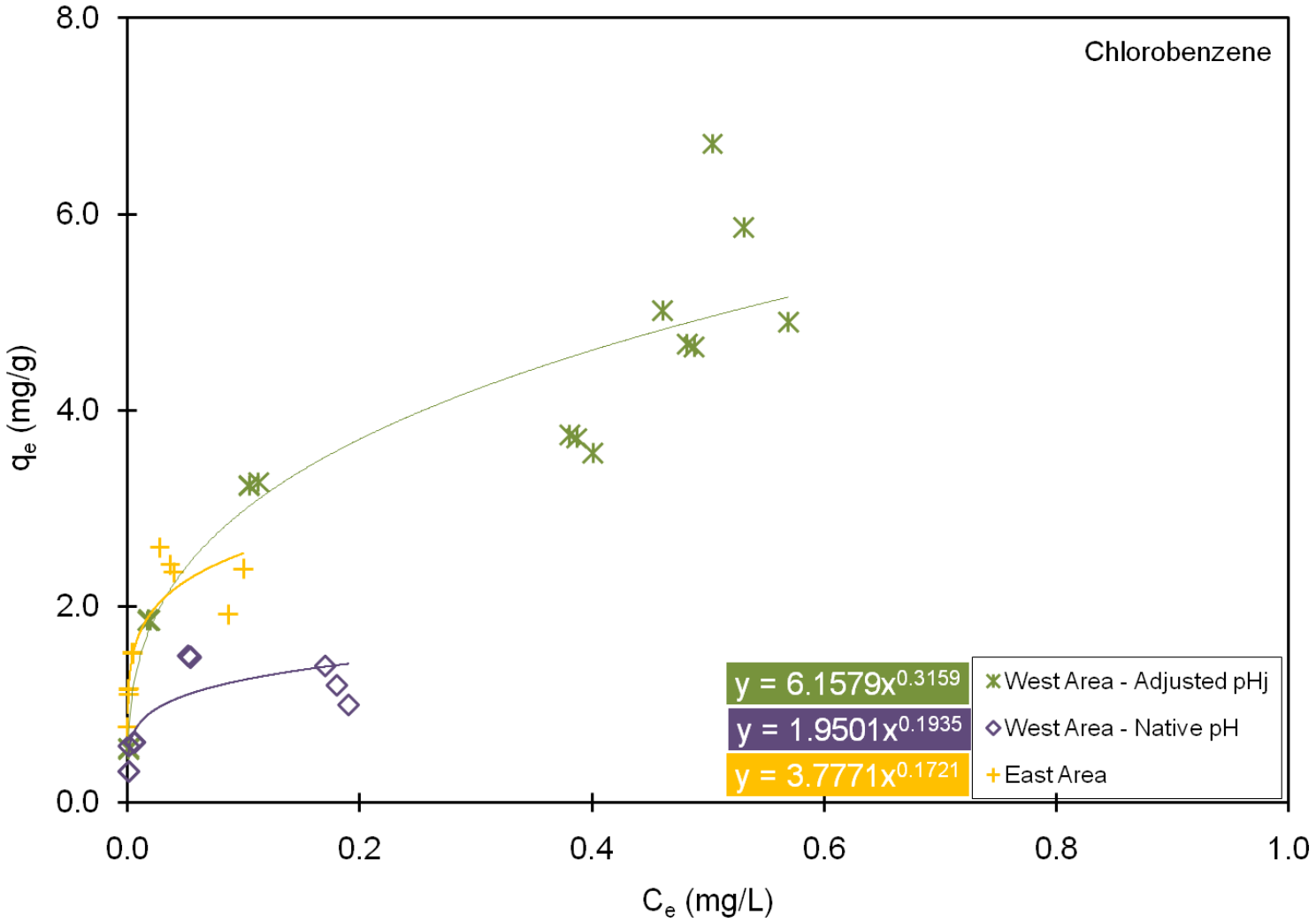


Figure 3.25 Chlorobenzene Adsorption Data and Best-Fit Freundlich Isotherms – WBB/HB

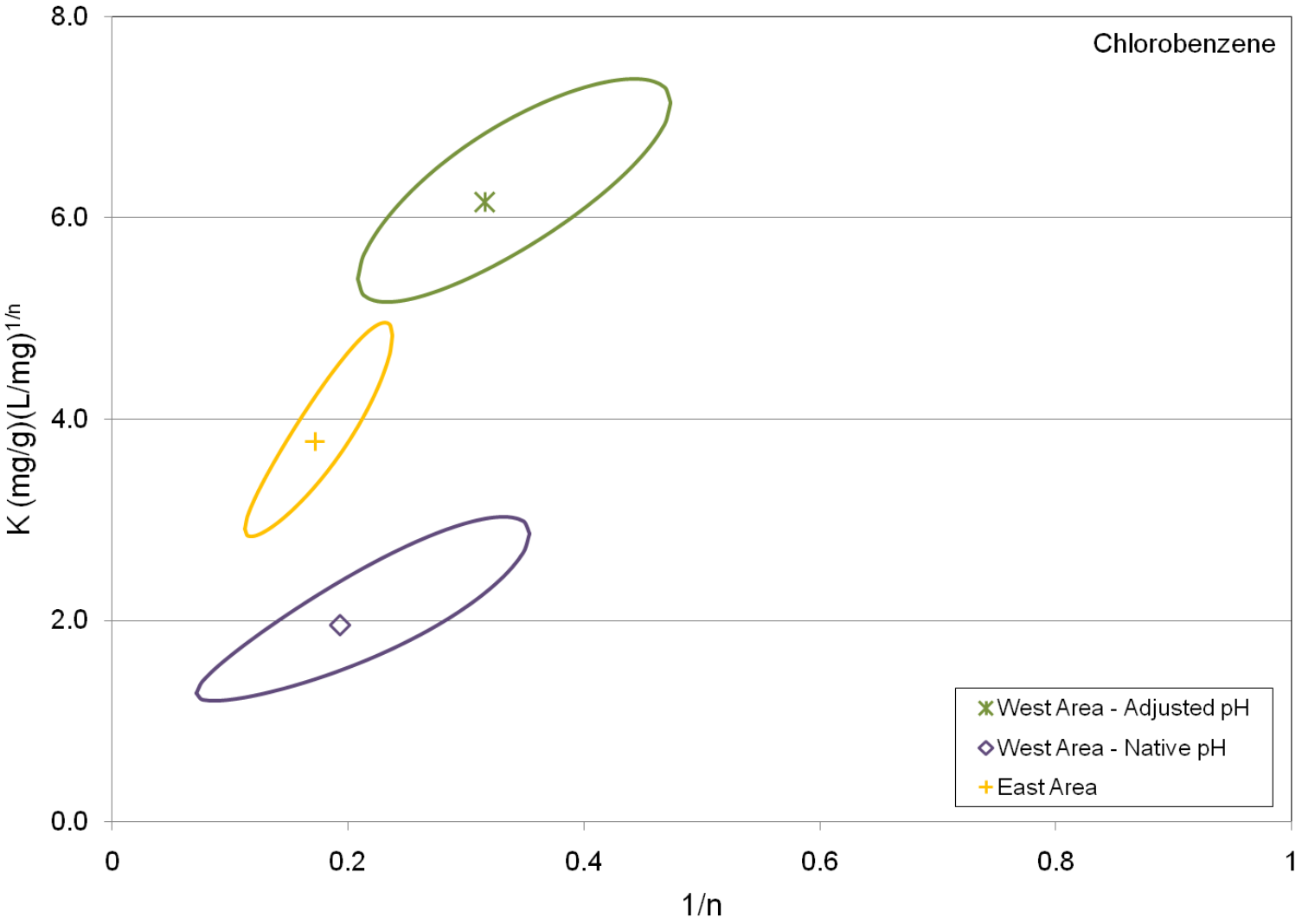


Figure 3.26 Chlorobenzene Freundlich 95% Joint Confidence Intervals – WBB/HB

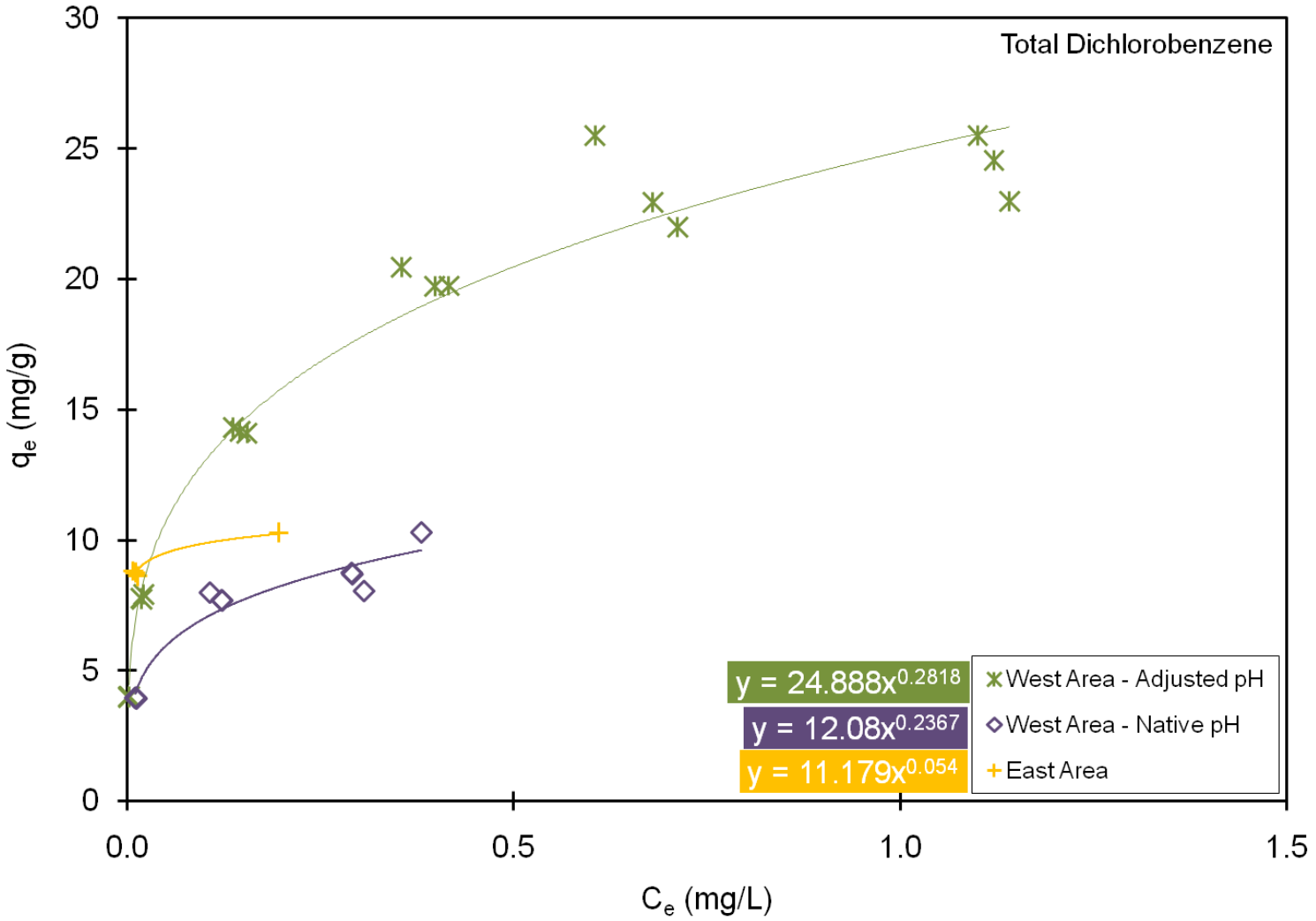


Figure 3.27 Total Dichlorobenzene Adsorption Data and Best-Fit Freundlich Isotherms – WBB/HB

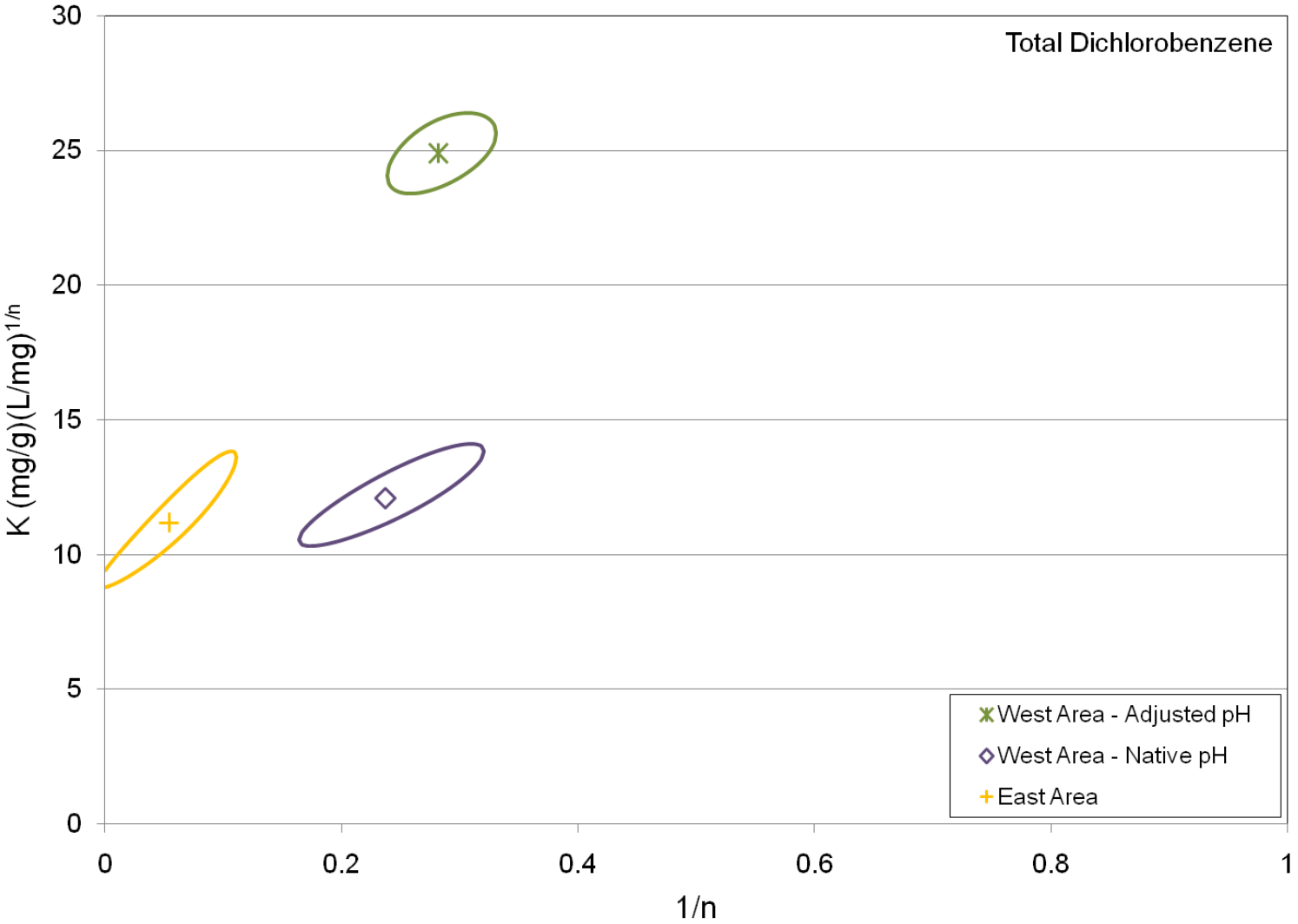


Figure 3.28 Total Dichlorobenzene Freundlich 95% Joint Confidence Intervals – WBB/HB

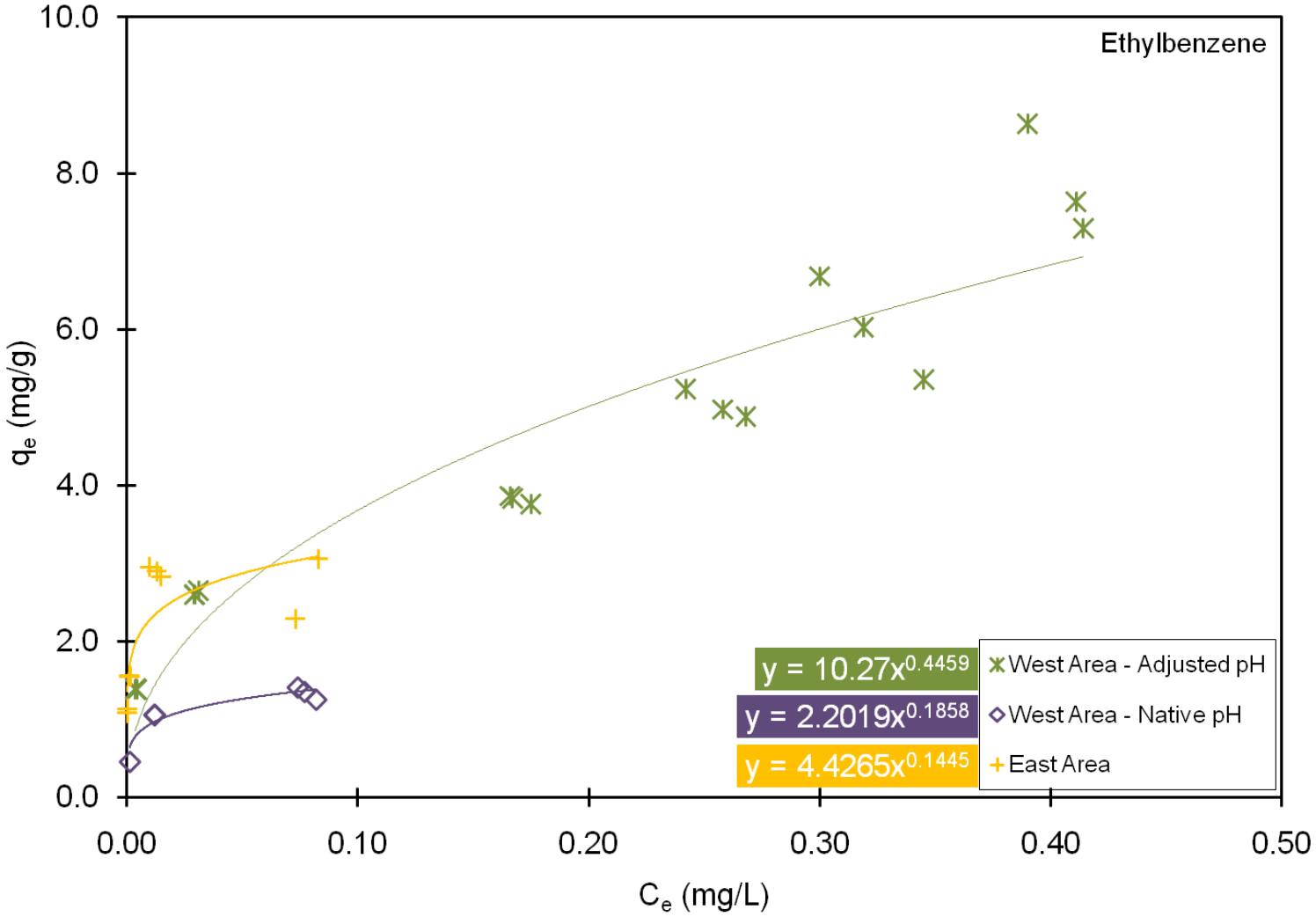


Figure 3.29 Ethylbenzene Adsorption Data and Best-Fit Freundlich Isotherms – WBB/HB

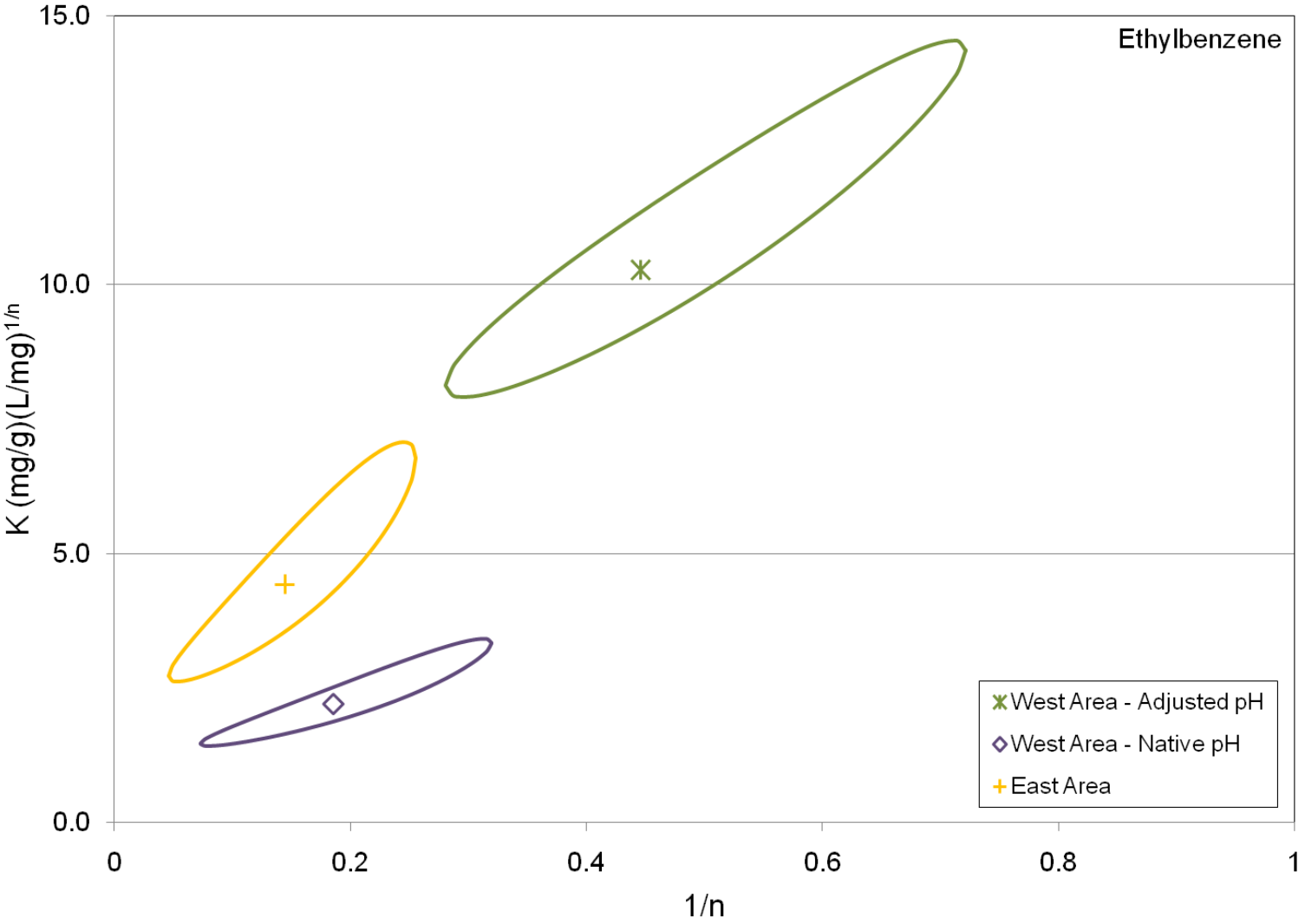


Figure 3.30 Ethylbenzene Freundlich 95% Joint Confidence Intervals – WBB/HB

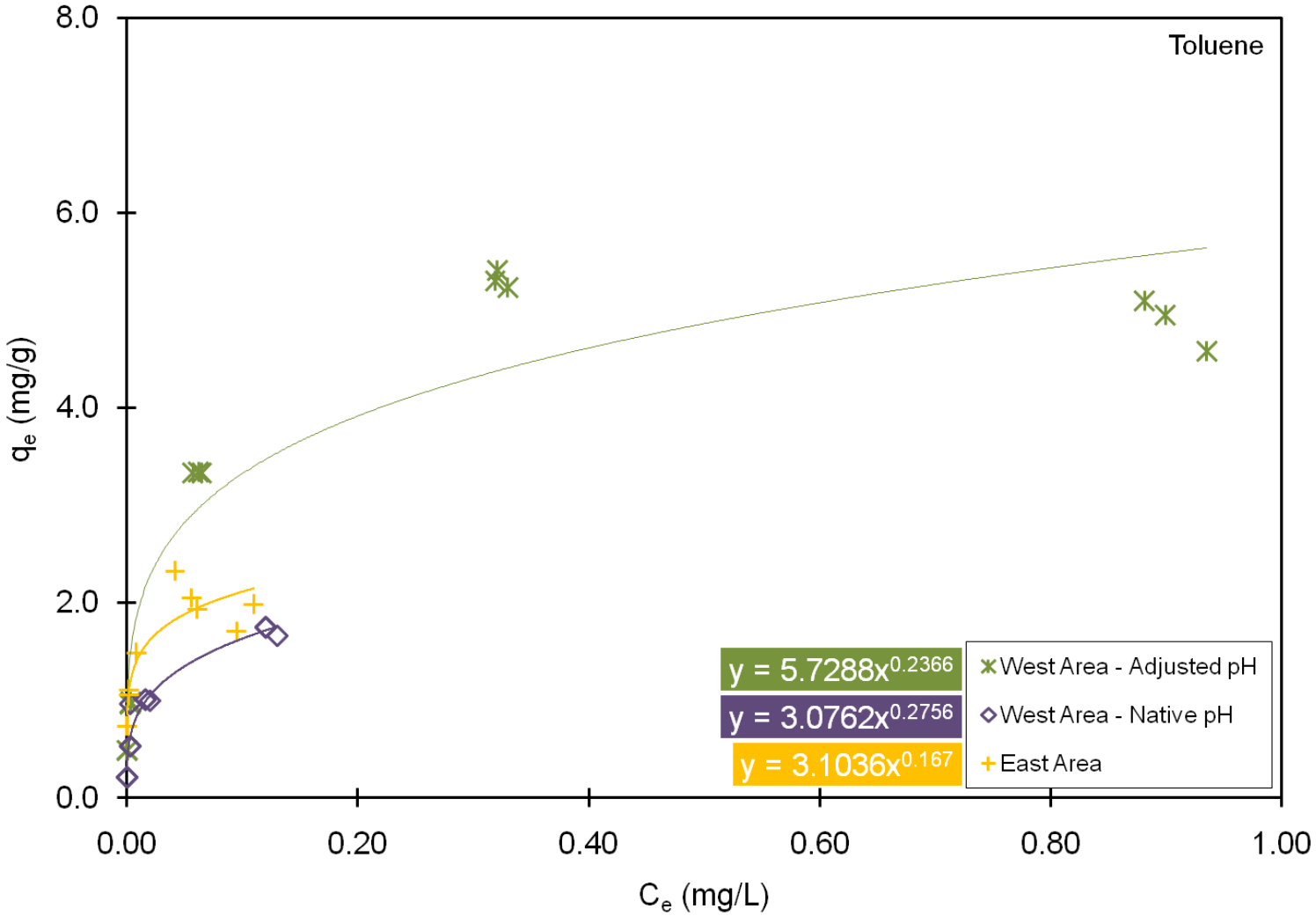


Figure 3.31 Toluene Adsorption Data and Best-Fit Freundlich Isotherms – WBB/HB

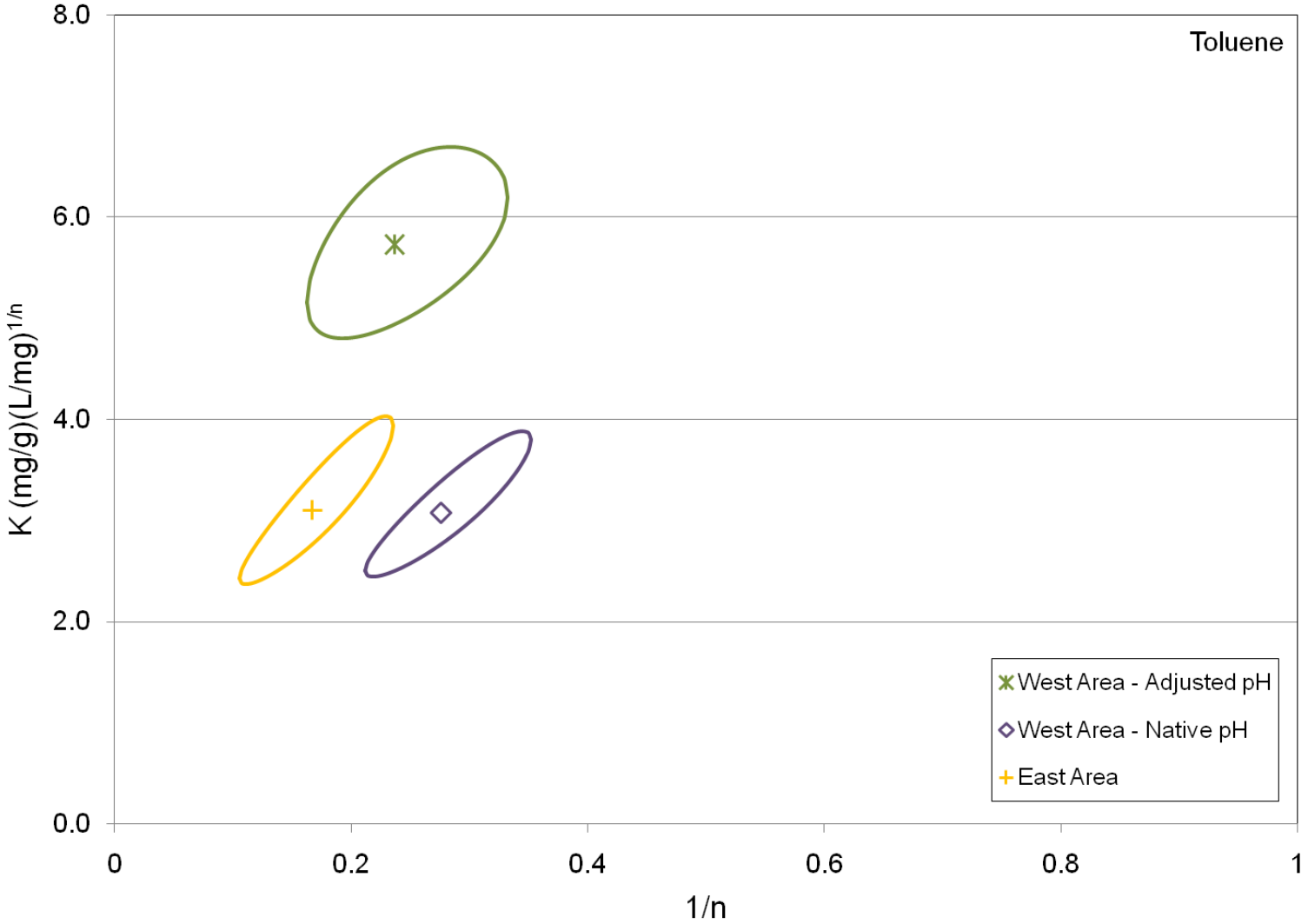


Figure 3.32 Toluene Freundlich 95% Joint Confidence Intervals – WBB/HB

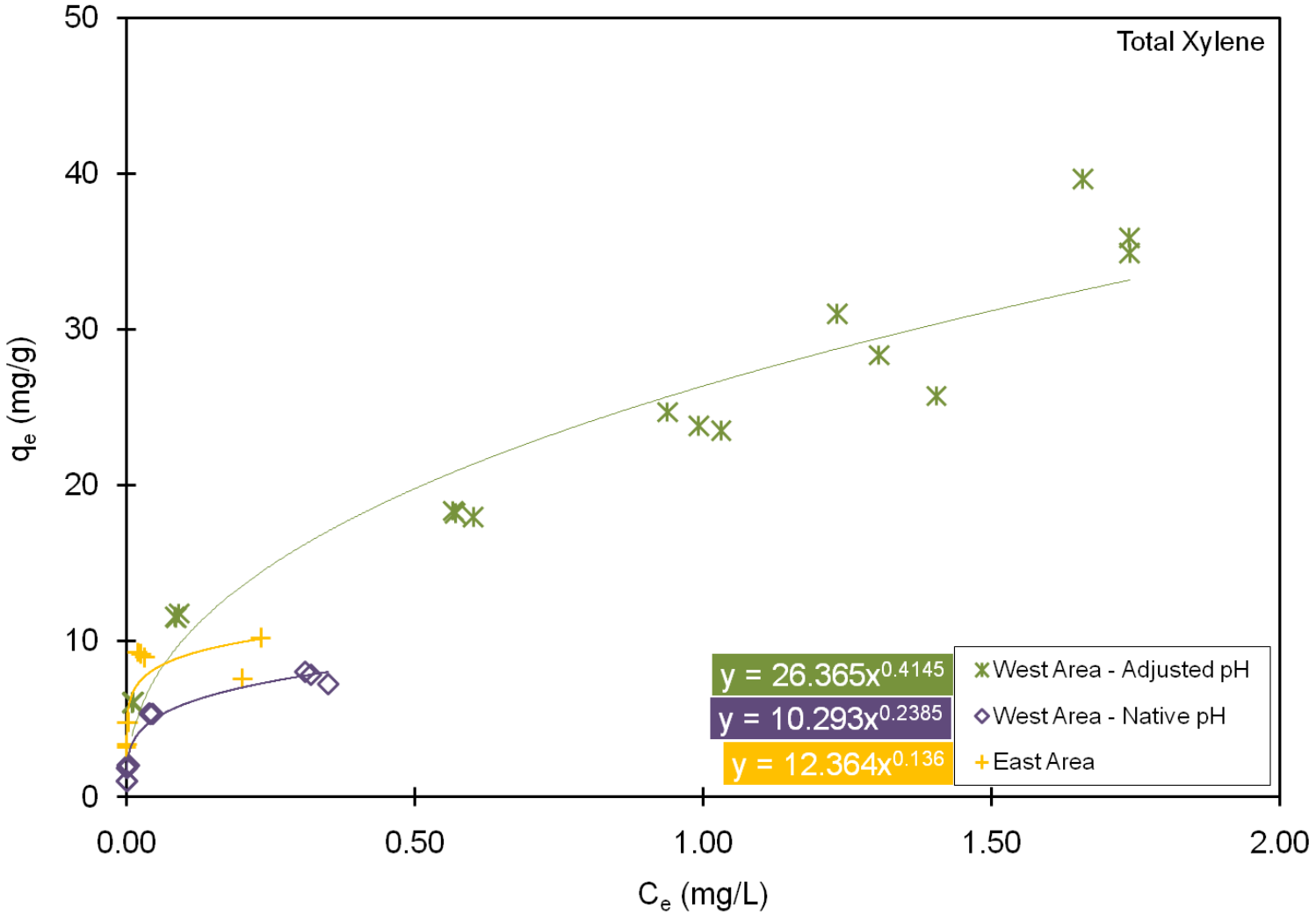


Figure 3.33 Total Xylene Adsorption Data and Best-Fit Freundlich Isotherms – WBB/HB

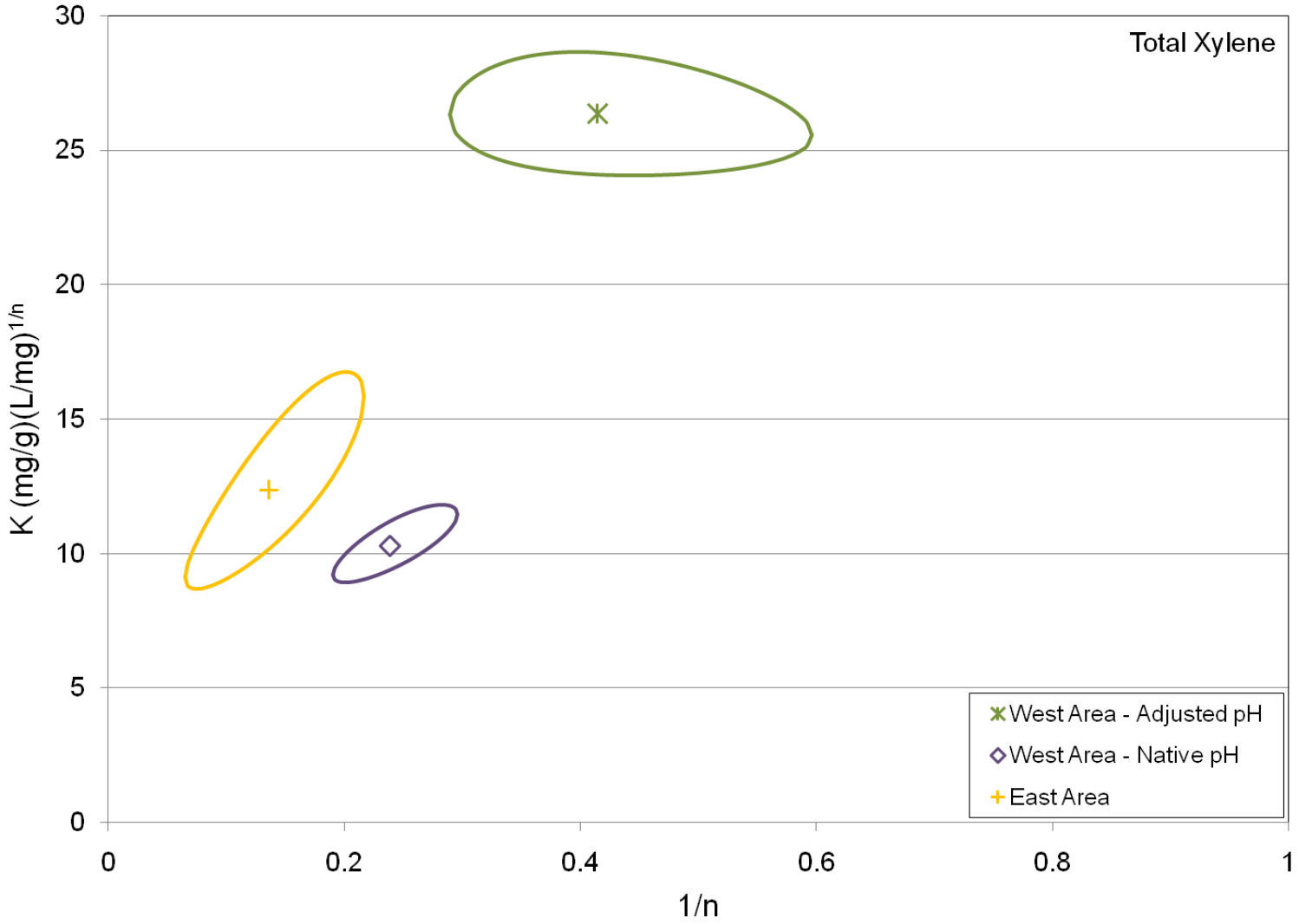


Figure 3.34 Total Xylene Freundlich 95% Joint Confidence Intervals – WBB/HB

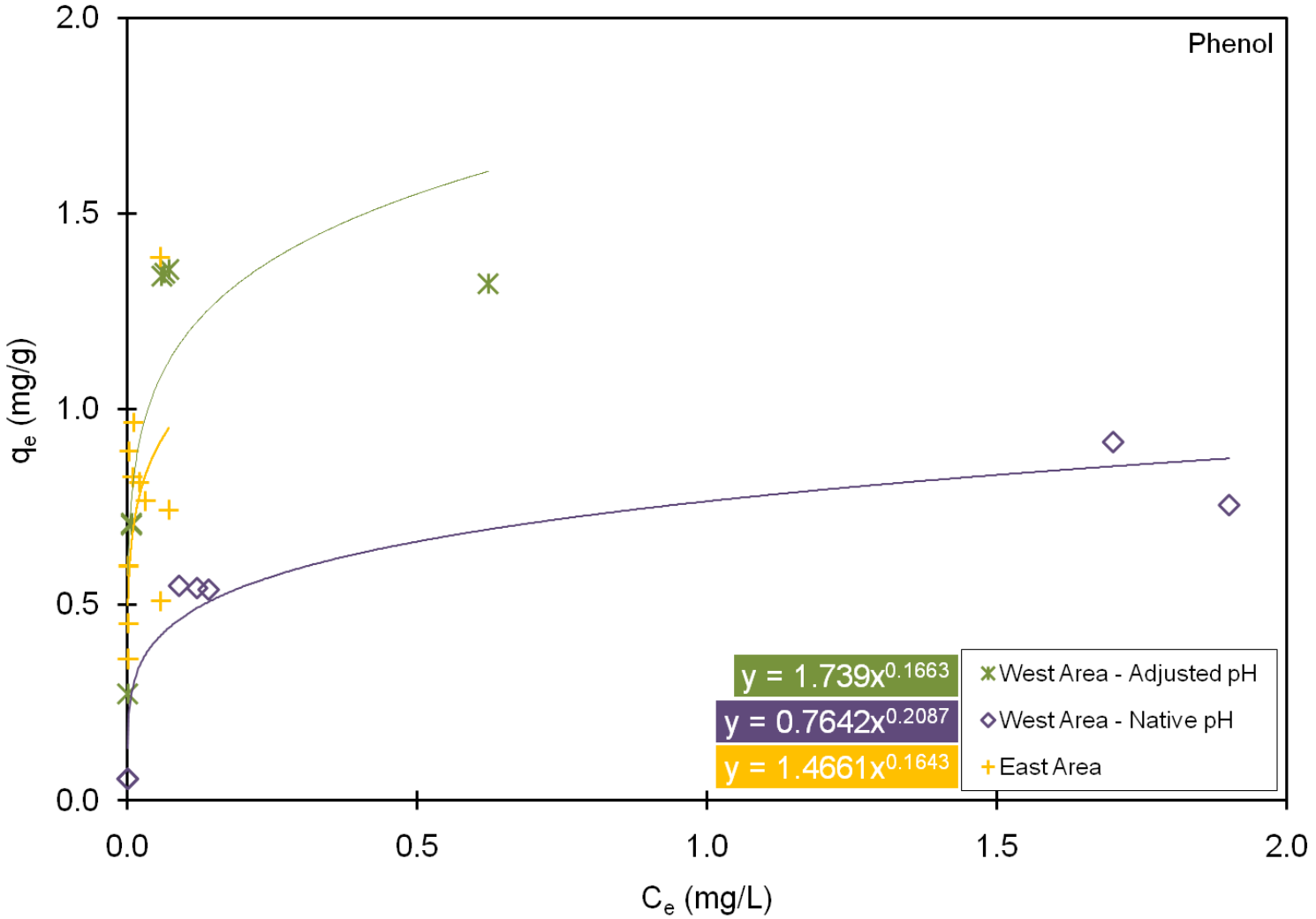


Figure 3.35 Phenol Adsorption Data and Best-Fit Freundlich Isotherms – WBB/HB

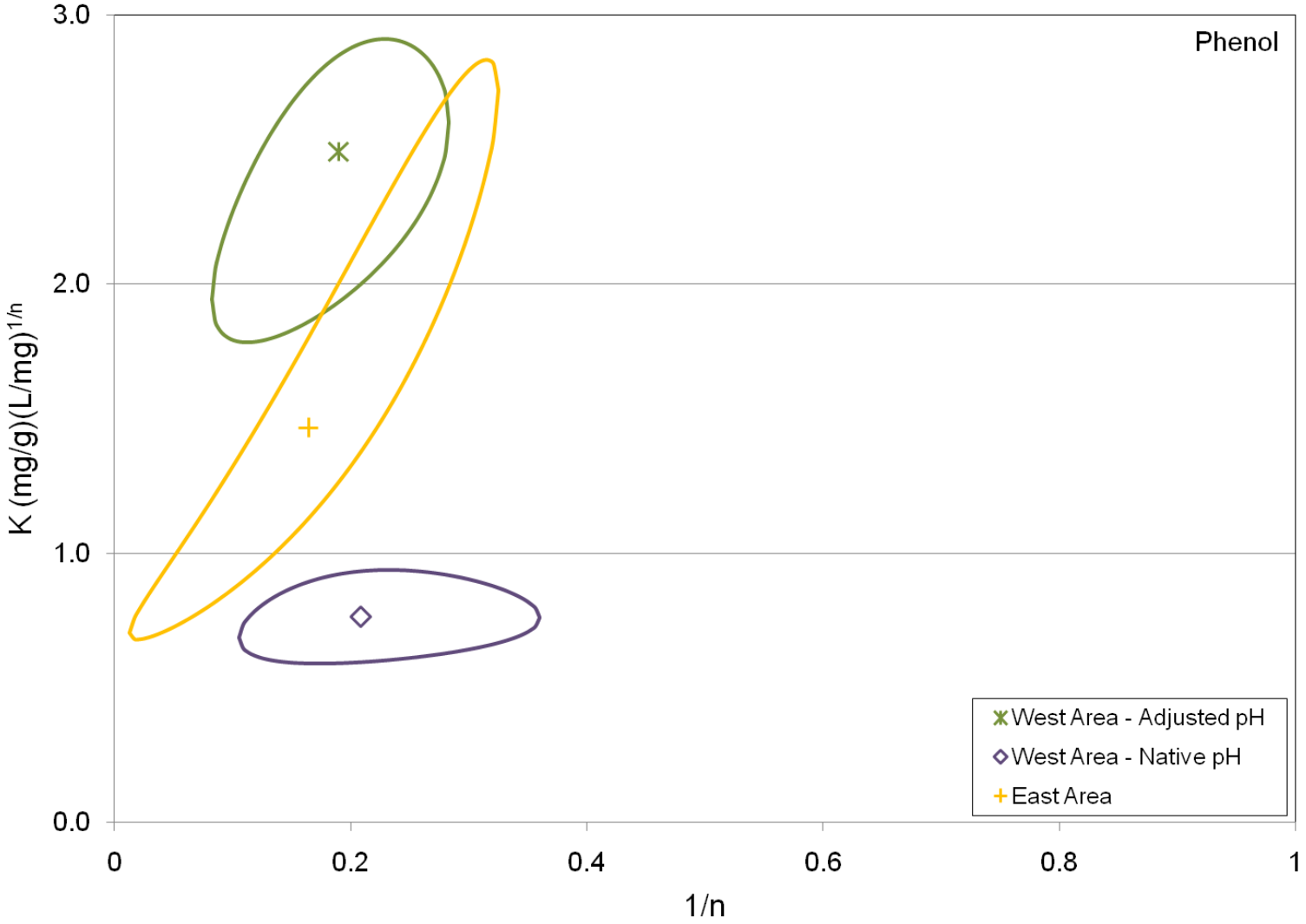


Figure 3.36 Phenol Freundlich 95% Joint Confidence Intervals – WBB/HB

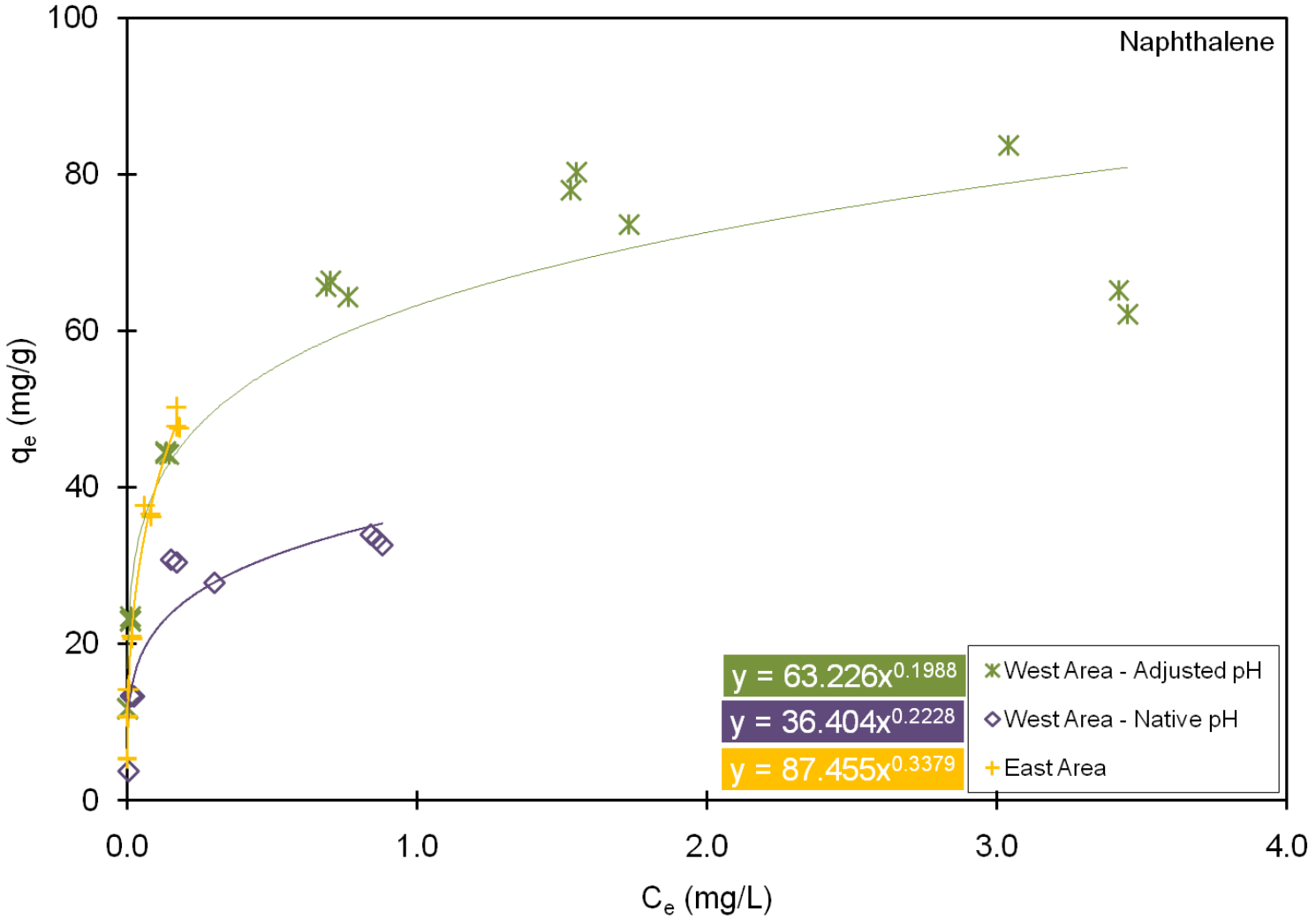


Figure 3.37 Naphthalene Adsorption Data and Best-Fit Freundlich Isotherms – WBB/HB

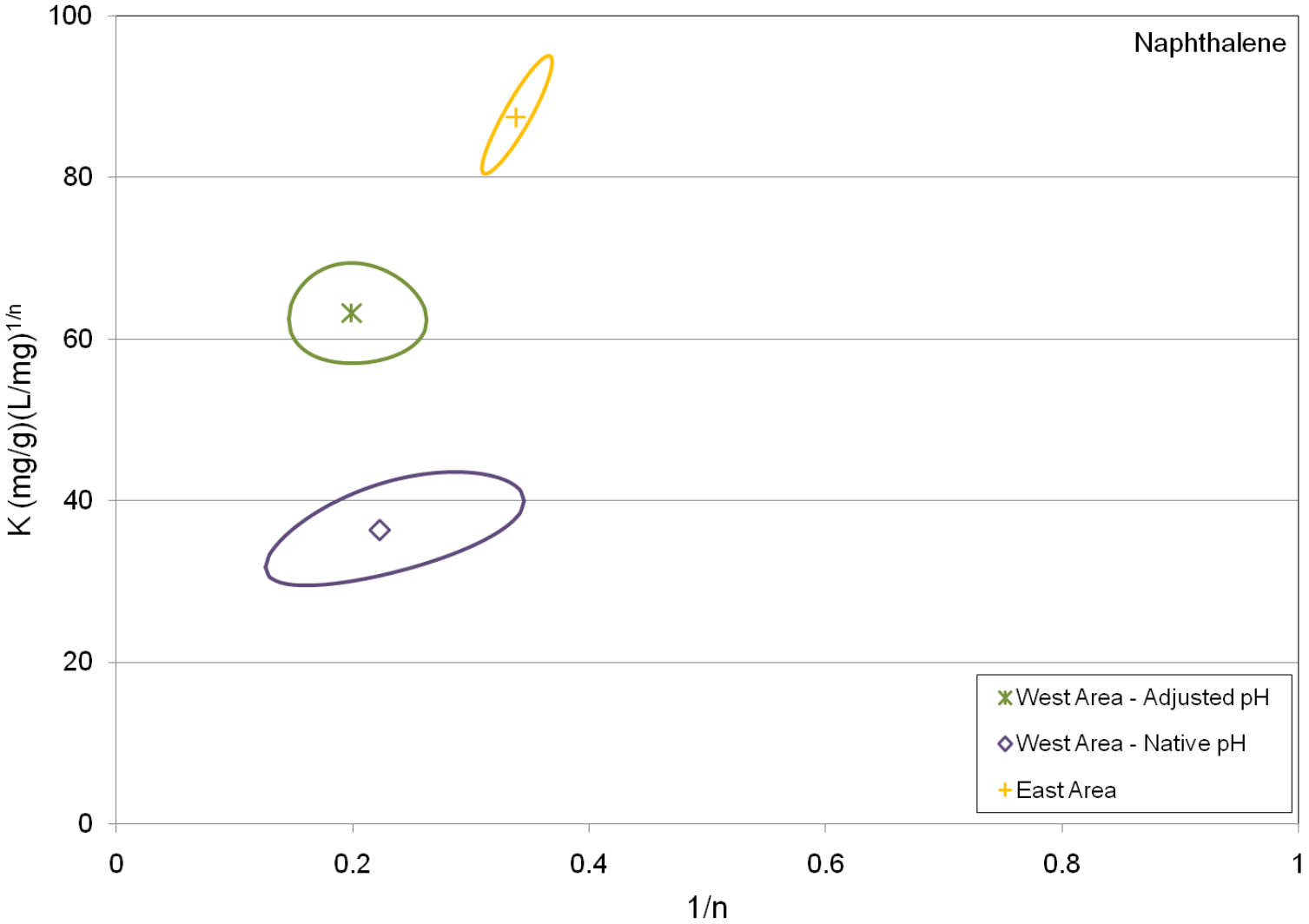


Figure 3.38 Naphthalene Freundlich 95% Joint Confidence Intervals – WBB/HB

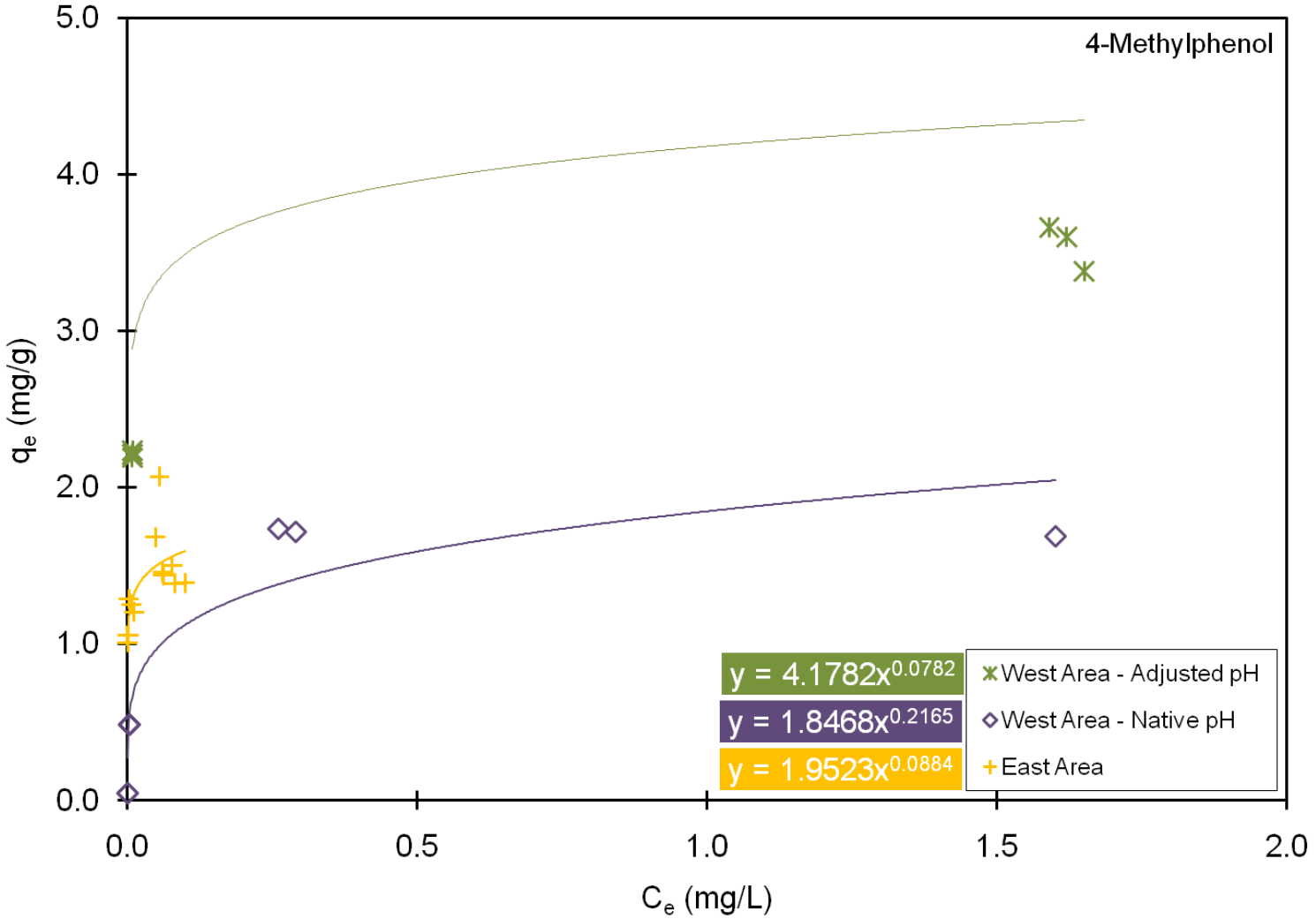


Figure 3.39 4-Methylphenol Adsorption Data and Best-Fit Freundlich Isotherms – WBB/HB

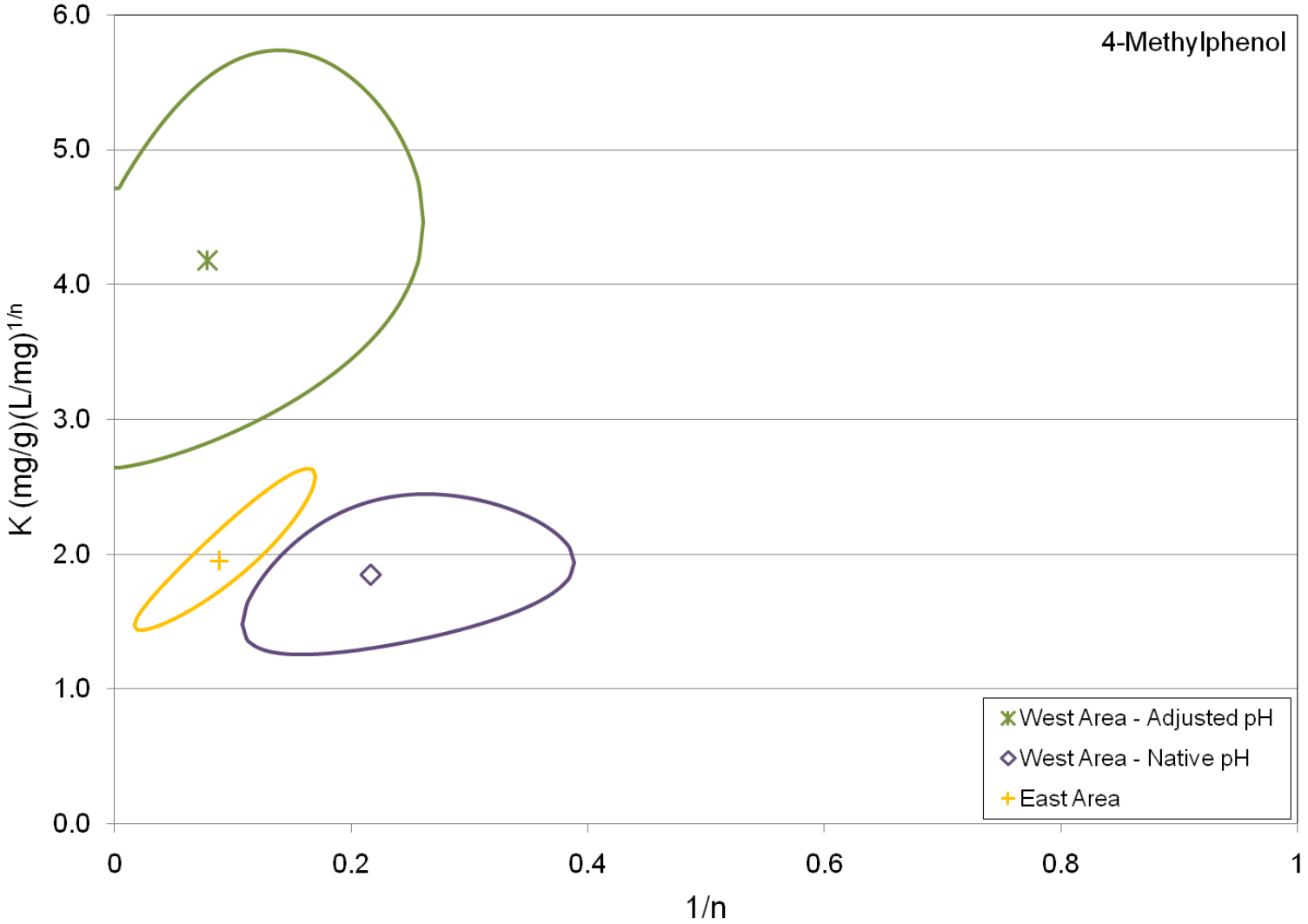


Figure 3.40 4-Methylphenol Freundlich 95% Joint Confidence Intervals – WBB/HB

ATTACHMENT 1

EXPERIMENTAL DATA
REMEDIATION AREA D – ADJUSTED PH

(PROVIDED ON CD ON ATTACHMENT TAB)

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	**3860**	3.86	3.920	0.085
1352-38	1	0	3980	3.98		
1352-39	**2**	0	**3940**	3.94	3.815	0.177
1352-40	**2**	0	3690	3.69		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	3770	3.77	96%	0.150	11.6015
1352-02	**1**	0.013	3940	3.94	101%	-0.020	-1.5467
1352-03	**1**	0.013	3940	3.94	101%	-0.020	-1.5614
1352-04	1	0.026	4010	4.01	102%	-0.090	-3.4921
1352-05	**1**	0.025	3640	3.64	93%	0.280	11.1000
1352-06	**1**	0.026	4030	4.03	103%	-0.110	-4.2788
1352-07	**1**	0.051	3770	3.77	96%	0.150	2.9302
1352-08	**1**	0.051	3670	3.67	94%	0.250	4.8984
1352-09	**1**	0.051	3450	3.45	88%	0.470	9.2599
1352-10	**1**	0.127	3540	3.54	90%	0.380	2.9807
1352-11	**1**	0.127	1470	1.47	38%	2.450	19.2352
1352-12	**1**	0.128	3640	3.64	93%	0.280	2.1911
1352-13	**1**	0.254	3200	3.20	82%	0.720	2.8297
1352-14	**1**	0.255	3090	3.09	79%	0.830	3.2568
1352-15	**1**	0.256	3170	3.17	81%	0.750	2.9346
1352-16	**1**	0.38	2490	2.49	64%	1.430	3.7505
1352-17	**1**	0.38	2550	2.55	65%	1.370	3.5899
1352-18	**1**	0.38	2550	2.55	65%	1.370	3.5900
1352-19	**1**	0.51	1930	1.93	49%	1.990	3.8974
1352-20	**1**	0.51	1900	1.90	48%	2.020	3.9601
1351-21	**1**	0.51	1930	1.93	49%	1.990	3.9260
1352-22	**1**	1.27	414	0.41	11%	3.506	2.7501
1352-23	**1**	1.27	436	0.44	11%	3.484	2.7437
1352-24	**1**	1.27	470	0.47	12%	3.450	2.7226
1352-25	**2**	2.5	92.2	0.092	2.4%	3.723	1.4616
1352-26	**2**	2.5	101	0.101	2.6%	3.714	1.4592
1352-27	**2**	2.5	87.8	0.088	2.3%	3.727	1.4646
1352-28	**2**	5.1	12.8	0.0128	0.34%	3.802	0.7455
1352-29	**2**	5.1	12.3	0.0123	0.32%	3.803	0.7467
1352-30	**2**	5.1	12.1	0.0121	0.32%	3.803	0.7451
1352-31	**2**	10.3	1.5	0.0015	0.04%	3.814	0.3702
1352-32	2	10.3	1.4	0.0014	0.04%	3.814	0.3705
1352-33	2	10.2	1.6	0.0016	0.04%	3.813	0.3721
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	**8850**	8.85	9.140	0.410
1352-38	1	0	9430	9.43		
1352-39	**2**	0	**9380**	9.38	9.085	0.417
1352-40	**2**	0	8790	8.79		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	8400	8.40	92%	0.740	57.2340
1352-02	**1**	0.013	9050	9.05	99%	0.090	6.9602
1352-03	**1**	0.013	8950	8.95	98%	0.190	14.8328
1352-04	1	0.026	9180	9.18	100%	-0.040	-1.5520
1352-05	**1**	0.025	8310	8.31	91%	0.830	32.9035
1352-06	**1**	0.026	8810	8.81	96%	0.330	12.8365
1352-07	**1**	0.051	8110	8.11	89%	1.030	20.1208
1352-08	**1**	0.051	7890	7.89	86%	1.250	24.4921
1352-09	**1**	0.051	7310	7.31	80%	1.830	36.0544
1352-10	**1**	0.127	5470	5.47	60%	3.670	28.7876
1352-11	**1**	0.127	2350	2.35	26%	6.790	53.3090
1352-12	**1**	0.128	5630	5.63	62%	3.510	27.4669
1352-13	**1**	0.254	2640	2.64	29%	6.500	25.5459
1352-14	**1**	0.255	2470	2.47	27%	6.670	26.1717
1352-15	**1**	0.256	2500	2.50	27%	6.640	25.9813
1352-16	**1**	0.38	1100	1.10	12%	8.040	21.0868
1352-17	**1**	0.38	1160	1.16	13%	7.980	20.9105
1352-18	**1**	0.38	1160	1.16	13%	7.980	20.9108
1352-19	**1**	0.51	563	0.56	6.2%	8.577	16.7981
1352-20	**1**	0.51	545	0.55	6.0%	8.595	16.8502
1351-21	**1**	0.51	573	0.57	6.3%	8.567	16.9016
1352-22	**1**	1.27	49.7	0.05	0.54%	9.090	7.1304
1352-23	**1**	1.27	52.6	0.05	0.58%	9.087	7.1566
1352-24	**1**	1.27	59.5	0.06	0.65%	9.081	7.1659
1352-25	**2**	2.5	7.8	0.008	0.09%	9.077	3.5637
1352-26	**2**	2.5	8	0.008	0.09%	9.077	3.5664
1352-27	**2**	2.5	7.5	0.008	0.08%	9.078	3.5670
1352-28	**2**	5.1	0.94	0.0009	0.010%	9.084	1.7812
1352-29	**2**	5.1	0.79	0.0008	0.009%	9.084	1.7837
1352-30	**2**	5.1	0.86	0.0009	0.009%	9.084	1.7800
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	**3516**	3.52	3.825	0.437
1352-38	1	0	4134	4.13		
1352-39	**2**	0	**4020**	4.02	3.888	0.187
1352-40	**2**	0	3756	3.76		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	3102	3.10	81%	0.723	55.9191
1352-02	**1**	0.013	3644	3.64	95%	0.181	13.9978
1352-03	**1**	0.013	3545	3.55	93%	0.280	21.8589
1352-04	1	0.026	3170	3.17	83%	0.655	25.4145
1352-05	**1**	0.025	2883	2.88	75%	0.942	37.3435
1352-06	**1**	0.026	2879	2.88	75%	0.946	36.7980
1352-07	**1**	0.051	2139	2.14	56%	1.686	32.9356
1352-08	**1**	0.051	2062	2.06	54%	1.763	34.5437
1352-09	**1**	0.051	1818	1.82	48%	2.007	39.5417
1352-10	**1**	0.127	583.3	0.58	15%	3.242	25.4280
1352-11	**1**	0.127	241.2	0.24	6.3%	3.584	28.1368
1352-12	**1**	0.128	588.7	0.59	15%	3.236	25.3251
1352-13	**1**	0.254	136.5	0.14	3.6%	3.689	14.4963
1352-14	**1**	0.255	115.3	0.12	3.0%	3.710	14.5561
1352-15	**1**	0.256	118.4	0.12	3.1%	3.707	14.5034
1352-16	**1**	0.38	34	0.034	0.89%	3.791	9.9428
1352-17	**1**	0.38	39.5	0.040	1.03%	3.786	9.9194
1352-18	**1**	0.38	39.4	0.039	1.03%	3.786	9.9198
1352-19	**1**	0.51	17.7	0.018	0.46%	3.807	7.4566
1352-20	**1**	0.51	15.9	0.016	0.42%	3.809	7.4676
1351-21	**1**	0.51	19.4	0.019	0.51%	3.806	7.5080
1352-22	**1**	1.27	1.13	0.0011	0.030%	3.824	2.9994
1352-23	**1**	1.27	1.14	0.0011	0.030%	3.824	3.0114
1352-24	**1**	1.27	1.3	0.0013	0.034%	3.824	3.0175
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	**406**	0.41	0.419	0.018
1352-38	1	0	432	0.43		
1352-39	**2**	0	**426**	0.43	0.412	0.020
1352-40	**2**	0	398	0.40		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	375	0.38	89%	0.044	3.4031
1352-02	**1**	0.013	407	0.41	97%	0.012	0.9280
1352-03	**1**	0.013	404	0.40	96%	0.015	1.1710
1352-04	1	0.026	400	0.40	95%	0.019	0.7372
1352-05	**1**	0.025	366	0.37	87%	0.053	2.1011
1352-06	**1**	0.026	385	0.39	92%	0.034	1.3226
1352-07	**1**	0.051	342	0.34	82%	0.077	1.5042
1352-08	**1**	0.051	329	0.33	79%	0.090	1.7634
1352-09	**1**	0.051	302	0.30	72%	0.117	2.3051
1352-10	**1**	0.127	179	0.18	43%	0.240	1.8826
1352-11	**1**	0.127	70.6	0.07	17%	0.348	2.7353
1352-12	**1**	0.128	179	0.18	43%	0.240	1.8781
1352-13	**1**	0.254	54.4	0.054	13%	0.365	1.4329
1352-14	**1**	0.255	50.1	0.050	12%	0.369	1.4475
1352-15	**1**	0.256	50.5	0.051	12%	0.369	1.4419
1352-16	**1**	0.38	18.2	0.018	4.3%	0.401	1.0512
1352-17	**1**	0.38	19.9	0.020	4.7%	0.399	1.0458
1352-18	**1**	0.38	20	0.020	4.8%	0.399	1.0455
1352-19	**1**	0.51	9.1	0.0091	2.2%	0.410	0.8028
1352-20	**1**	0.51	9.5	0.0095	2.3%	0.410	0.8028
1351-21	**1**	0.51	9.1	0.0091	2.2%	0.410	0.8087
1352-22	**1**	1.27	0.77	0.00077	0.18%	0.418	0.3281
1352-23	**1**	1.27	0.83	0.00083	0.20%	0.418	0.3293
1352-24	**1**	1.27	2.3	0.00230	0.55%	0.417	0.3288
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	**3760**	3.76	3.860	0.141
1352-38	1	0	3960	3.96		
1352-39	**2**	0	**3920**	3.92	3.795	0.177
1352-40	**2**	0	3670	3.67		

Carbon-Based Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	3570	3.57	92%	0.290	22.4295
1352-02	**1**	0.013	3790	3.79	98%	0.070	5.4135
1352-03	**1**	0.013	3790	3.79	98%	0.070	5.4647
1352-04	1	0.026	3890	3.89	101%	-0.030	-1.1640
1352-05	**1**	0.025	3490	3.49	90%	0.370	14.6678
1352-06	**1**	0.026	3790	3.79	98%	0.070	2.7229
1352-07	**1**	0.051	3540	3.54	92%	0.320	6.2511
1352-08	**1**	0.051	3430	3.43	89%	0.430	8.4253
1352-09	**1**	0.051	3210	3.21	83%	0.650	12.8062
1352-10	**1**	0.127	2770	2.77	72%	1.090	8.5500
1352-11	**1**	0.127	1160	1.16	30%	2.700	21.1980
1352-12	**1**	0.128	2840	2.84	74%	1.020	7.9818
1352-13	**1**	0.254	1590	1.59	41%	2.270	8.9214
1352-14	**1**	0.255	1500	1.50	39%	2.360	9.2602
1352-15	**1**	0.256	1540	1.54	40%	2.320	9.0778
1352-16	**1**	0.38	749	0.75	19%	3.111	8.1593
1352-17	**1**	0.38	781	0.78	20%	3.079	8.0681
1352-18	**1**	0.38	776	0.78	20%	3.084	8.0813
1352-19	**1**	0.51	397	0.40	10%	3.463	6.7823
1352-20	**1**	0.51	389	0.39	10%	3.471	6.8048
1351-21	**1**	0.51	404	0.40	10%	3.456	6.8182
1352-22	**1**	1.27	39	0.039	1.0%	3.821	2.9972
1352-23	**1**	1.27	40.7	0.041	1.1%	3.819	3.0078
1352-24	**1**	1.27	46.6	0.047	1.2%	3.813	3.0094
1352-25	**2**	2.5	6.7	0.0067	0.18%	3.788	1.4873
1352-26	**2**	2.5	6.5	0.0065	0.17%	3.789	1.4885
1352-27	**2**	2.5	6.2	0.0062	0.16%	3.789	1.4888
1352-28	**2**	5.1	0.76	0.00076	0.020%	3.794	0.7440
1352-29	**2**	5.1	0.71	0.00071	0.019%	3.794	0.7450
1352-30	**2**	5.1	0.72	0.00072	0.019%	3.794	0.7435
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	**987**	0.99	1.161	0.246
1352-38	1	0	1335	1.34		
1352-39	**2**	0	**1297**	1.30	1.242	0.078
1352-40	**2**	0	1187	1.19		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	496	0.50	43%	0.665	51.4332
1352-02	**1**	0.013	740	0.74	64%	0.421	32.5584
1352-03	**1**	0.013	683	0.68	59%	0.478	37.3163
1352-04	1	0.026	368	0.37	32%	0.793	30.7690
1352-05	**1**	0.025	356	0.36	31%	0.805	31.9125
1352-06	**1**	0.026	293	0.29	25%	0.868	33.7484
1352-07	**1**	0.051	156	0.16	13%	1.005	19.6265
1352-08	**1**	0.051	148	0.15	13%	1.013	19.8543
1352-09	**1**	0.051	118	0.12	10%	1.043	20.5569
1352-10	**1**	0.127	ND	--	--	--	--
1352-11	**1**	0.127	ND	--	--	--	--
1352-12	**1**	0.128	ND	--	--	--	--
1352-13	**1**	0.254	ND	--	--	--	--
1352-14	**1**	0.255	ND	--	--	--	--
1352-15	**1**	0.256	ND	--	--	--	--
1352-16	**1**	0.38	ND	--	--	--	--
1352-17	**1**	0.38	ND	--	--	--	--
1352-18	**1**	0.38	ND	--	--	--	--
1352-19	**1**	0.51	ND	--	--	--	--
1352-20	**1**	0.51	ND	--	--	--	--
1351-21	**1**	0.51	ND	--	--	--	--
1352-22	**1**	1.27	ND	--	--	--	--
1352-23	**1**	1.27	ND	--	--	--	--
1352-24	**1**	1.27	ND	--	--	--	--
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	**4140**	4.14	4.325	0.262
1352-38	1	0	4510	4.51		
1352-39	**2**	0	**4460**	4.46	4.310	0.212
1352-40	**2**	0	4160	4.16		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	3830	3.83	89%	0.495	38.2849
1352-02	**1**	0.013	4180	4.18	97%	0.145	11.2137
1352-03	**1**	0.013	4180	4.18	97%	0.145	11.3198
1352-04	1	0.026	4110	4.11	95%	0.215	8.3422
1352-05	**1**	0.025	3720	3.72	86%	0.605	23.9839
1352-06	**1**	0.026	3900	3.90	90%	0.425	16.5319
1352-07	**1**	0.051	3320	3.32	77%	1.005	19.6324
1352-08	**1**	0.051	3210	3.21	74%	1.115	21.8470
1352-09	**1**	0.051	2970	2.97	69%	1.355	26.6960
1352-10	**1**	0.127	1510	1.51	35%	2.815	22.0810
1352-11	**1**	0.127	594	0.59	14%	3.731	29.2925
1352-12	**1**	0.128	1520	1.52	35%	2.805	21.9500
1352-13	**1**	0.254	382	0.38	8.8%	3.943	15.4965
1352-14	**1**	0.255	341	0.34	7.9%	3.984	15.6324
1352-15	**1**	0.256	347	0.35	8.0%	3.978	15.5653
1352-16	**1**	0.38	106	0.11	2.5%	4.219	11.0653
1352-17	**1**	0.38	117	0.12	2.7%	4.208	11.0265
1352-18	**1**	0.38	117	0.12	2.7%	4.208	11.0267
1352-19	**1**	0.51	51.5	0.052	1.2%	4.274	8.3697
1352-20	**1**	0.51	48.8	0.049	1.1%	4.276	8.3833
1351-21	**1**	0.51	52.3	0.052	1.2%	4.273	8.4295
1352-22	**1**	1.27	3.3	0.0033	0.076%	4.322	3.3899
1352-23	**1**	1.27	3.5	0.0035	0.081%	4.322	3.4033
1352-24	**1**	1.27	4.3	0.0043	0.099%	4.321	3.4097
1352-25	**2**	2.5	0.29	0.00029	0.007%	4.310	1.6920
1352-26	**2**	2.5	0.28	0.00028	0.006%	4.310	1.6933
1352-27	**2**	2.5	0.26	0.00026	0.006%	4.310	1.6935
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Controls **Control concentration ~ 2,000 µg/L based on measurements across lowest five carbon doses**

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	**1370**	1.37	2.000	0.134
1352-38	1	0	1560	1.56		
1352-39	**2**	0	**1500**	1.50	2.000	0.106
1352-40	**2**	0	1350	1.35		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	1840	1.84	92%	0.160	12.3749
1352-02	**1**	0.013	1920	1.92	96%	0.080	6.1869
1352-03	**1**	0.013	2210	2.21	111%	-0.210	-16.3942
1352-04	1	0.026	2080	2.08	104%	-0.080	-3.1041
1352-05	**1**	0.025	2040	2.04	102%	-0.040	-1.5857
1352-06	**1**	0.026	2190	2.19	110%	-0.190	-7.3907
1352-07	**1**	0.051	1880	1.88	94%	0.120	2.3442
1352-08	**1**	0.051	2360	2.36	118%	-0.360	-7.0537
1352-09	**1**	0.051	2000	2.00	100%	0.000	0.0000
1352-10	**1**	0.127	2310	2.31	116%	-0.310	-2.4317
1352-11	**1**	0.127	2350	2.35	118%	-0.350	-2.7479
1352-12	**1**	0.128	2190	2.19	110%	-0.190	-1.4868
1352-13	**1**	0.254	1680	1.68	84%	0.320	1.2576
1352-14	**1**	0.255	2060	2.06	103%	-0.060	-0.2354
1352-15	**1**	0.256	2250	2.25	113%	-0.250	-0.9782
1352-16	**1**	0.38	1750	1.75	88%	0.250	0.6557
1352-17	**1**	0.38	1980	1.98	99%	0.020	0.0524
1352-18	**1**	0.38	1790	1.79	90%	0.210	0.5503
1352-19	**1**	0.51	1880	1.88	94%	0.120	0.2350
1352-20	**1**	0.51	1680	1.68	84%	0.320	0.6273
1351-21	**1**	0.51	1410	1.41	71%	0.590	1.1640
1352-22	**1**	1.27	521	0.52	26%	1.479	1.1601
1352-23	**1**	1.27	483	0.48	24%	1.517	1.1947
1352-24	**1**	1.27	584	0.58	29%	1.416	1.1174
1352-25	**2**	2.5	169	0.169	8.5%	1.831	0.7188
1352-26	**2**	2.5	198	0.198	9.9%	1.802	0.7080
1352-27	**2**	2.5	152	0.152	7.6%	1.848	0.7262
1352-28	**2**	5.1	15.8	0.0158	0.8%	1.984	0.3891
1352-29	**2**	5.1	15.9	0.0159	0.8%	1.984	0.3896
1352-30	**2**	5.1	15.7	0.0157	0.8%	1.984	0.3888
1352-31	**2**	10.3	2.03	0.0020	0.10%	1.998	0.1940
1352-32	2	10.3	2.65	0.0027	0.13%	1.997	0.1940
1352-33	2	10.2	2.36	0.0024	0.12%	1.998	0.1949
1352-34	2	25.8	0.788	0.00079	0.04%	1.999	0.0776
1352-35	2	23.8	0.531	0.00053	0.03%	1.999	0.0841
1352-36	2	25.8	0.905	0.00091	0.05%	1.999	0.0776

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	**7860**	7.86	7.855	0.007
1352-38	1	0	7850	7.85		
1352-39	**2**	0	**7380**	7.38	7.395	0.021
1352-40	**2**	0	7410	7.41		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	7090	7.09	90%	0.765	59.1676
1352-02	**1**	0.013	7410	7.41	94%	0.445	34.4145
1352-03	**1**	0.013	7860	7.86	100%	-0.005	-0.3903
1352-04	1	0.026	6180	6.18	79%	1.675	64.9912
1352-05	**1**	0.025	5600	5.60	71%	2.255	89.3945
1352-06	**1**	0.026	4150	4.15	53%	3.705	144.1191
1352-07	**1**	0.051	3190	3.19	41%	4.665	91.1295
1352-08	**1**	0.051	3730	3.73	47%	4.125	80.8240
1352-09	**1**	0.051	3480	3.48	44%	4.375	86.1957
1352-10	**1**	0.127	678	0.68	8.6%	7.177	56.2966
1352-11	**1**	0.127	699	0.70	8.9%	7.156	56.1825
1352-12	**1**	0.128	600	0.60	7.6%	7.255	56.7727
1352-13	**1**	0.254	82.5	0.083	1.1%	7.773	30.5470
1352-14	**1**	0.255	74.9	0.075	1.0%	7.780	30.5275
1352-15	**1**	0.256	75.9	0.076	1.0%	7.779	30.4385
1352-16	**1**	0.38	21.4	0.02140	0.27%	7.834	20.5454
1352-17	**1**	0.38	21.1	0.02110	0.27%	7.834	20.5277
1352-18	**1**	0.38	23	0.02300	0.29%	7.832	20.5230
1352-19	**1**	0.51	8.87	0.00887	0.11%	7.846	15.3667
1352-20	**1**	0.51	8.25	0.00825	0.11%	7.847	15.3833
1351-21	**1**	0.51	1.82	0.00182	0.02%	7.853	15.4933
1352-22	**1**	1.27	0.363	0.00036	0.0046%	7.855	6.1611
1352-23	**1**	1.27	0.465	0.00047	0.0059%	7.855	6.1856
1352-24	**1**	1.27	0.482	0.00048	0.0061%	7.855	6.1985
1352-25	**2**	2.5	0.116	0.00012	0.0016%	7.395	2.9032
1352-26	**2**	2.5	0.169	0.00017	0.0023%	7.395	2.9055
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	0.149	0.00015	0.0020%	7.395	1.4490
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	0.925	0.00093	0.013%	7.394	0.7215
1352-34	2	25.8	1.6	0.0016	0.022%	7.393	0.2868
1352-35	2	23.8	0.934	0.0009	0.013%	7.394	0.3109
1352-36	2	25.8	2.52	0.0025	0.034%	7.392	0.2871

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		Average Ce	St Dev
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	**140**	0.14	0.139	0.002
1352-38	1	0	137	0.14		
1352-39	**2**	0	**221**	0.22	0.148	0.103
1352-40	**2**	0	75	0.08		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	119	0.12	86%	0.020	1.5082
1352-02	**1**	0.013	87.6	0.09	63%	0.051	3.9364
1352-03	**1**	0.013	91.4	0.09	66%	0.047	3.6770
1352-04	1	0.026	129	0.13	93%	0.010	0.3686
1352-05	**1**	0.025	116	0.12	84%	0.023	0.8920
1352-06	**1**	0.026	71.5	0.07	52%	0.067	2.6062
1352-07	**1**	0.051	76.7	0.08	55%	0.062	1.2072
1352-08	**1**	0.051	125	0.13	90%	0.014	0.2645
1352-09	**1**	0.051	94.8	0.09	68%	0.044	0.8610
1352-10	**1**	0.127	171	0.17	123%	-0.033	-0.2549
1352-11	**1**	0.127	157	0.16	113%	-0.019	-0.1452
1352-12	**1**	0.128	172	0.17	124%	-0.034	-0.2621
1352-13	**1**	0.254	50	0.050	36%	0.089	0.3478
1352-14	**1**	0.255	47.6	0.048	34%	0.091	0.3567
1352-15	**1**	0.256	38.2	0.038	28%	0.100	0.3925
1352-16	**1**	0.38	2.7	0.0027	1.9%	0.136	0.3562
1352-17	**1**	0.38	2.1	0.0021	1.5%	0.136	0.3574
1352-18	**1**	0.38	2.6	0.0026	1.9%	0.136	0.3561
1352-19	**1**	0.51	1.0	0.0010	0.72%	0.138	0.2693
1352-20	**1**	0.51	1.1	0.0011	0.79%	0.137	0.2694
1351-21	**1**	0.51	0.62	0.0006	0.45%	0.138	0.2720
1352-22	**1**	1.27	0.10	0.00010	0.07%	0.138	0.1086
1352-23	**1**	1.27	0.23	0.00023	0.17%	0.138	0.1089
1352-24	**1**	1.27	0.20	0.00020	0.14%	0.138	0.1091
1352-25	**2**	2.5	0.14	0.00014	0.09%	0.148	0.0580
1352-26	**2**	2.5	0.46	0.00046	0.31%	0.148	0.0580
1352-27	**2**	2.5	0.20	0.00020	0.14%	0.148	0.0581
1352-28	**2**	5.1	0.093	0.000093	0.063%	0.148	0.0290
1352-29	**2**	5.1	0.088	0.000088	0.059%	0.148	0.0290
1352-30	**2**	5.1	0.088	0.000088	0.059%	0.148	0.0290
1352-31	**2**	10.3	< MDL	--	--	--	--
1352-32	2	10.3	< MDL	--	--	--	--
1352-33	2	10.2	< MDL	--	--	--	--
1352-34	2	25.8	< MDL	--	--	--	--
1352-35	2	23.8	< MDL	--	--	--	--
1352-36	2	25.8	< MDL	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	**0.730**	0.00073	0.00073	0.000004
1352-38	1	0	0.735	0.00074		
1352-39	**2**	0	**0.716**	0.00072	0.00071	0.000009
1352-40	**2**	0	0.703	0.00070		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	ND	--	--	--	--
1352-02	**1**	0.013	ND	--	--	--	--
1352-03	**1**	0.013	ND	--	--	--	--
1352-04	1	0.026	ND	--	--	--	--
1352-05	**1**	0.025	ND	--	--	--	--
1352-06	**1**	0.026	ND	--	--	--	--
1352-07	**1**	0.051	ND	--	--	--	--
1352-08	**1**	0.051	ND	--	--	--	--
1352-09	**1**	0.051	ND	--	--	--	--
1352-10	**1**	0.127	ND	--	--	--	--
1352-11	**1**	0.127	ND	--	--	--	--
1352-12	**1**	0.128	ND	--	--	--	--
1352-13	**1**	0.254	ND	--	--	--	--
1352-14	**1**	0.255	ND	--	--	--	--
1352-15	**1**	0.256	ND	--	--	--	--
1352-16	**1**	0.38	ND	--	--	--	--
1352-17	**1**	0.38	ND	--	--	--	--
1352-18	**1**	0.38	ND	--	--	--	--
1352-19	**1**	0.51	ND	--	--	--	--
1352-20	**1**	0.51	ND	--	--	--	--
1351-21	**1**	0.51	ND	--	--	--	--
1352-22	**1**	1.27	ND	--	--	--	--
1352-23	**1**	1.27	ND	--	--	--	--
1352-24	**1**	1.27	ND	--	--	--	--
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Non-detect in all carbon-dosed bottles.

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	**4.95**	0.00495	0.00473	0.000318
1352-38	1	0	4.50	0.00450		
1352-39	**2**	0	**4.47**	0.00447	0.00438	0.000127
1352-40	**2**	0	4.29	0.00429		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	0.979	0.00	21%	0.004	0.2897
1352-02	**1**	0.013	0.921	0.00	19%	0.004	0.2942
1352-03	**1**	0.013	1.04	0.00	22%	0.004	0.2877
1352-04	1	0.026	0.52	0.00	11%	0.004	0.1632
1352-05	**1**	0.025	0.531	0.00	11%	0.004	0.1663
1352-06	**1**	0.026	0.382	0.00	8.1%	0.004	0.1689
1352-07	**1**	0.051	ND	--	--	--	--
1352-08	**1**	0.051	ND	--	--	--	--
1352-09	**1**	0.051	0.193	0.00	4.1%	0.005	0.0893
1352-10	**1**	0.127	ND	--	--	--	--
1352-11	**1**	0.127	ND	--	--	--	--
1352-12	**1**	0.128	ND	--	--	--	--
1352-13	**1**	0.254	ND	--	--	--	--
1352-14	**1**	0.255	ND	--	--	--	--
1352-15	**1**	0.256	ND	--	--	--	--
1352-16	**1**	0.38	ND	--	--	--	--
1352-17	**1**	0.38	ND	--	--	--	--
1352-18	**1**	0.38	ND	--	--	--	--
1352-19	**1**	0.51	ND	--	--	--	--
1352-20	**1**	0.51	ND	--	--	--	--
1351-21	**1**	0.51	ND	--	--	--	--
1352-22	**1**	1.27	ND	--	--	--	--
1352-23	**1**	1.27	ND	--	--	--	--
1352-24	**1**	1.27	ND	--	--	--	--
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	ND	--	--	--
1352-38	1	0	ND	--		
1352-39	**2**	0	ND	--	--	--
1352-40	**2**	0	ND	--		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	ND	--	--	--	--
1352-02	**1**	0.013	ND	--	--	--	--
1352-03	**1**	0.013	ND	--	--	--	--
1352-04	1	0.026	ND	--	--	--	--
1352-05	**1**	0.025	ND	--	--	--	--
1352-06	**1**	0.026	ND	--	--	--	--
1352-07	**1**	0.051	ND	--	--	--	--
1352-08	**1**	0.051	ND	--	--	--	--
1352-09	**1**	0.051	ND	--	--	--	--
1352-10	**1**	0.127	ND	--	--	--	--
1352-11	**1**	0.127	ND	--	--	--	--
1352-12	**1**	0.128	ND	--	--	--	--
1352-13	**1**	0.254	ND	--	--	--	--
1352-14	**1**	0.255	ND	--	--	--	--
1352-15	**1**	0.256	ND	--	--	--	--
1352-16	**1**	0.38	ND	--	--	--	--
1352-17	**1**	0.38	ND	--	--	--	--
1352-18	**1**	0.38	ND	--	--	--	--
1352-19	**1**	0.51	ND	--	--	--	--
1352-20	**1**	0.51	ND	--	--	--	--
1351-21	**1**	0.51	ND	--	--	--	--
1352-22	**1**	1.27	ND	--	--	--	--
1352-23	**1**	1.27	ND	--	--	--	--
1352-24	**1**	1.27	ND	--	--	--	--
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Non-detect in all test bottles and controls

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	ND	--	--	--
1352-38	1	0	ND	--		
1352-39	**2**	0	ND	--	--	--
1352-40	**2**	0	ND	--		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	ND	--	--	--	--
1352-02	**1**	0.013	ND	--	--	--	--
1352-03	**1**	0.013	ND	--	--	--	--
1352-04	1	0.026	ND	--	--	--	--
1352-05	**1**	0.025	ND	--	--	--	--
1352-06	**1**	0.026	ND	--	--	--	--
1352-07	**1**	0.051	ND	--	--	--	--
1352-08	**1**	0.051	ND	--	--	--	--
1352-09	**1**	0.051	ND	--	--	--	--
1352-10	**1**	0.127	ND	--	--	--	--
1352-11	**1**	0.127	ND	--	--	--	--
1352-12	**1**	0.128	ND	--	--	--	--
1352-13	**1**	0.254	ND	--	--	--	--
1352-14	**1**	0.255	ND	--	--	--	--
1352-15	**1**	0.256	ND	--	--	--	--
1352-16	**1**	0.38	ND	--	--	--	--
1352-17	**1**	0.38	ND	--	--	--	--
1352-18	**1**	0.38	ND	--	--	--	--
1352-19	**1**	0.51	ND	--	--	--	--
1352-20	**1**	0.51	ND	--	--	--	--
1351-21	**1**	0.51	ND	--	--	--	--
1352-22	**1**	1.27	ND	--	--	--	--
1352-23	**1**	1.27	ND	--	--	--	--
1352-24	**1**	1.27	ND	--	--	--	--
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Non-detect in all test bottles and controls

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	ND	--	--	--
1352-38	1	0	ND	--		
1352-39	**2**	0	ND	--	--	--
1352-40	**2**	0	ND	--		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	ND	--	--	--	--
1352-02	**1**	0.013	ND	--	--	--	--
1352-03	**1**	0.013	ND	--	--	--	--
1352-04	1	0.026	ND	--	--	--	--
1352-05	**1**	0.025	ND	--	--	--	--
1352-06	**1**	0.026	ND	--	--	--	--
1352-07	**1**	0.051	ND	--	--	--	--
1352-08	**1**	0.051	ND	--	--	--	--
1352-09	**1**	0.051	ND	--	--	--	--
1352-10	**1**	0.127	ND	--	--	--	--
1352-11	**1**	0.127	ND	--	--	--	--
1352-12	**1**	0.128	ND	--	--	--	--
1352-13	**1**	0.254	ND	--	--	--	--
1352-14	**1**	0.255	ND	--	--	--	--
1352-15	**1**	0.256	ND	--	--	--	--
1352-16	**1**	0.38	ND	--	--	--	--
1352-17	**1**	0.38	ND	--	--	--	--
1352-18	**1**	0.38	ND	--	--	--	--
1352-19	**1**	0.51	ND	--	--	--	--
1352-20	**1**	0.51	ND	--	--	--	--
1351-21	**1**	0.51	ND	--	--	--	--
1352-22	**1**	1.27	ND	--	--	--	--
1352-23	**1**	1.27	ND	--	--	--	--
1352-24	**1**	1.27	ND	--	--	--	--
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Non-detect in all test bottles and controls

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	ND	--	--	--
1352-38	1	0	ND	--		
1352-39	**2**	0	ND	--	--	--
1352-40	**2**	0	ND	--		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	ND	--	--	--	--
1352-02	**1**	0.013	ND	--	--	--	--
1352-03	**1**	0.013	ND	--	--	--	--
1352-04	1	0.026	ND	--	--	--	--
1352-05	**1**	0.025	ND	--	--	--	--
1352-06	**1**	0.026	ND	--	--	--	--
1352-07	**1**	0.051	ND	--	--	--	--
1352-08	**1**	0.051	ND	--	--	--	--
1352-09	**1**	0.051	ND	--	--	--	--
1352-10	**1**	0.127	ND	--	--	--	--
1352-11	**1**	0.127	ND	--	--	--	--
1352-12	**1**	0.128	ND	--	--	--	--
1352-13	**1**	0.254	ND	--	--	--	--
1352-14	**1**	0.255	ND	--	--	--	--
1352-15	**1**	0.256	ND	--	--	--	--
1352-16	**1**	0.38	ND	--	--	--	--
1352-17	**1**	0.38	ND	--	--	--	--
1352-18	**1**	0.38	ND	--	--	--	--
1352-19	**1**	0.51	ND	--	--	--	--
1352-20	**1**	0.51	ND	--	--	--	--
1351-21	**1**	0.51	ND	--	--	--	--
1352-22	**1**	1.27	ND	--	--	--	--
1352-23	**1**	1.27	ND	--	--	--	--
1352-24	**1**	1.27	ND	--	--	--	--
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Non-detect in all test bottles and controls

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	ND	--	--	--
1352-38	1	0	ND	--		
1352-39	**2**	0	ND	--	--	--
1352-40	**2**	0	ND	--		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	ND	--	--	--	--
1352-02	**1**	0.013	ND	--	--	--	--
1352-03	**1**	0.013	ND	--	--	--	--
1352-04	1	0.026	ND	--	--	--	--
1352-05	**1**	0.025	ND	--	--	--	--
1352-06	**1**	0.026	ND	--	--	--	--
1352-07	**1**	0.051	ND	--	--	--	--
1352-08	**1**	0.051	ND	--	--	--	--
1352-09	**1**	0.051	ND	--	--	--	--
1352-10	**1**	0.127	ND	--	--	--	--
1352-11	**1**	0.127	ND	--	--	--	--
1352-12	**1**	0.128	ND	--	--	--	--
1352-13	**1**	0.254	ND	--	--	--	--
1352-14	**1**	0.255	ND	--	--	--	--
1352-15	**1**	0.256	ND	--	--	--	--
1352-16	**1**	0.38	ND	--	--	--	--
1352-17	**1**	0.38	ND	--	--	--	--
1352-18	**1**	0.38	ND	--	--	--	--
1352-19	**1**	0.51	ND	--	--	--	--
1352-20	**1**	0.51	ND	--	--	--	--
1351-21	**1**	0.51	ND	--	--	--	--
1352-22	**1**	1.27	ND	--	--	--	--
1352-23	**1**	1.27	ND	--	--	--	--
1352-24	**1**	1.27	ND	--	--	--	--
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Non-detect in all test bottles and controls

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	ND	--	--	--
1352-38	1	0	ND	--		
1352-39	**2**	0	ND	--	--	--
1352-40	**2**	0	ND	--		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	ND	--	--	--	--
1352-02	**1**	0.013	ND	--	--	--	--
1352-03	**1**	0.013	ND	--	--	--	--
1352-04	1	0.026	ND	--	--	--	--
1352-05	**1**	0.025	ND	--	--	--	--
1352-06	**1**	0.026	ND	--	--	--	--
1352-07	**1**	0.051	ND	--	--	--	--
1352-08	**1**	0.051	ND	--	--	--	--
1352-09	**1**	0.051	ND	--	--	--	--
1352-10	**1**	0.127	ND	--	--	--	--
1352-11	**1**	0.127	ND	--	--	--	--
1352-12	**1**	0.128	ND	--	--	--	--
1352-13	**1**	0.254	ND	--	--	--	--
1352-14	**1**	0.255	ND	--	--	--	--
1352-15	**1**	0.256	ND	--	--	--	--
1352-16	**1**	0.38	ND	--	--	--	--
1352-17	**1**	0.38	ND	--	--	--	--
1352-18	**1**	0.38	ND	--	--	--	--
1352-19	**1**	0.51	ND	--	--	--	--
1352-20	**1**	0.51	ND	--	--	--	--
1351-21	**1**	0.51	ND	--	--	--	--
1352-22	**1**	1.27	ND	--	--	--	--
1352-23	**1**	1.27	ND	--	--	--	--
1352-24	**1**	1.27	ND	--	--	--	--
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Non-detect in all test bottles and controls

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	ND	--	--	--
1352-38	1	0	ND	--		
1352-39	**2**	0	ND	--	--	--
1352-40	**2**	0	ND	--		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	ND	--	--	--	--
1352-02	**1**	0.013	ND	--	--	--	--
1352-03	**1**	0.013	ND	--	--	--	--
1352-04	1	0.026	ND	--	--	--	--
1352-05	**1**	0.025	ND	--	--	--	--
1352-06	**1**	0.026	ND	--	--	--	--
1352-07	**1**	0.051	ND	--	--	--	--
1352-08	**1**	0.051	ND	--	--	--	--
1352-09	**1**	0.051	ND	--	--	--	--
1352-10	**1**	0.127	ND	--	--	--	--
1352-11	**1**	0.127	ND	--	--	--	--
1352-12	**1**	0.128	ND	--	--	--	--
1352-13	**1**	0.254	ND	--	--	--	--
1352-14	**1**	0.255	ND	--	--	--	--
1352-15	**1**	0.256	ND	--	--	--	--
1352-16	**1**	0.38	ND	--	--	--	--
1352-17	**1**	0.38	ND	--	--	--	--
1352-18	**1**	0.38	ND	--	--	--	--
1352-19	**1**	0.51	ND	--	--	--	--
1352-20	**1**	0.51	ND	--	--	--	--
1351-21	**1**	0.51	ND	--	--	--	--
1352-22	**1**	1.27	ND	--	--	--	--
1352-23	**1**	1.27	ND	--	--	--	--
1352-24	**1**	1.27	ND	--	--	--	--
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Non-detect in all test bottles and controls

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	0.153	0.00015	0.000152	0.000002
1352-38	1	0	0.150	0.00015		
1352-39	**2**	0	ND	--	0.000149	--
1352-40	**2**	0	0.149	0.00015		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	ND	--	--	--	--
1352-02	**1**	0.013	ND	--	--	--	--
1352-03	**1**	0.013	ND	--	--	--	--
1352-04	1	0.026	ND	--	--	--	--
1352-05	**1**	0.025	ND	--	--	--	--
1352-06	**1**	0.026	ND	--	--	--	--
1352-07	**1**	0.051	ND	--	--	--	--
1352-08	**1**	0.051	ND	--	--	--	--
1352-09	**1**	0.051	ND	--	--	--	--
1352-10	**1**	0.127	ND	--	--	--	--
1352-11	**1**	0.127	ND	--	--	--	--
1352-12	**1**	0.128	ND	--	--	--	--
1352-13	**1**	0.254	ND	--	--	--	--
1352-14	**1**	0.255	ND	--	--	--	--
1352-15	**1**	0.256	ND	--	--	--	--
1352-16	**1**	0.38	ND	--	--	--	--
1352-17	**1**	0.38	ND	--	--	--	--
1352-18	**1**	0.38	ND	--	--	--	--
1352-19	**1**	0.51	ND	--	--	--	--
1352-20	**1**	0.51	ND	--	--	--	--
1351-21	**1**	0.51	ND	--	--	--	--
1352-22	**1**	1.27	ND	--	--	--	--
1352-23	**1**	1.27	ND	--	--	--	--
1352-24	**1**	1.27	ND	--	--	--	--
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Non-detect in all carbon-dosed bottles.

Fluorene

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	**2.10**	0.00210	0.00220	0.00013
1352-38	1	0	2.29	0.00229		
1352-39	**2**	0	**2.09**	0.00209	0.00208	0.00001
1352-40	**2**	0	2.07	0.00207		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	0.233	0.00	11%	0.002	0.1517
1352-02	**1**	0.013	0.206	0.00	9.4%	0.002	0.1538
1352-03	**1**	0.013	0.22	0.00	10%	0.002	0.1542
1352-04	1	0.026	ND	--	--	--	--
1352-05	**1**	0.025	ND	--	--	--	--
1352-06	**1**	0.026	ND	--	--	--	--
1352-07	**1**	0.051	ND	--	--	--	--
1352-08	**1**	0.051	ND	--	--	--	--
1352-09	**1**	0.051	ND	--	--	--	--
1352-10	**1**	0.127	ND	--	--	--	--
1352-11	**1**	0.127	ND	--	--	--	--
1352-12	**1**	0.128	ND	--	--	--	--
1352-13	**1**	0.254	ND	--	--	--	--
1352-14	**1**	0.255	ND	--	--	--	--
1352-15	**1**	0.256	ND	--	--	--	--
1352-16	**1**	0.38	ND	--	--	--	--
1352-17	**1**	0.38	ND	--	--	--	--
1352-18	**1**	0.38	ND	--	--	--	--
1352-19	**1**	0.51	ND	--	--	--	--
1352-20	**1**	0.51	ND	--	--	--	--
1351-21	**1**	0.51	ND	--	--	--	--
1352-22	**1**	1.27	ND	--	--	--	--
1352-23	**1**	1.27	ND	--	--	--	--
1352-24	**1**	1.27	ND	--	--	--	--
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Limited range of measured concentrations precludes isotherm development.

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	ND	--	--	--
1352-38	1	0	ND	--		
1352-39	**2**	0	ND	--	--	--
1352-40	**2**	0	ND	--		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	ND	--	--	--	--
1352-02	**1**	0.013	ND	--	--	--	--
1352-03	**1**	0.013	ND	--	--	--	--
1352-04	1	0.026	ND	--	--	--	--
1352-05	**1**	0.025	ND	--	--	--	--
1352-06	**1**	0.026	ND	--	--	--	--
1352-07	**1**	0.051	ND	--	--	--	--
1352-08	**1**	0.051	ND	--	--	--	--
1352-09	**1**	0.051	ND	--	--	--	--
1352-10	**1**	0.127	ND	--	--	--	--
1352-11	**1**	0.127	ND	--	--	--	--
1352-12	**1**	0.128	ND	--	--	--	--
1352-13	**1**	0.254	ND	--	--	--	--
1352-14	**1**	0.255	ND	--	--	--	--
1352-15	**1**	0.256	ND	--	--	--	--
1352-16	**1**	0.38	ND	--	--	--	--
1352-17	**1**	0.38	ND	--	--	--	--
1352-18	**1**	0.38	ND	--	--	--	--
1352-19	**1**	0.51	ND	--	--	--	--
1352-20	**1**	0.51	ND	--	--	--	--
1351-21	**1**	0.51	ND	--	--	--	--
1352-22	**1**	1.27	ND	--	--	--	--
1352-23	**1**	1.27	ND	--	--	--	--
1352-24	**1**	1.27	ND	--	--	--	--
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Non-detect in all test bottles and controls

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	**1.95**	0.00	0.002	0.000
1352-38	1	0	2.15	0.00		
1352-39	**2**	0	**1.95**	0.00	0.002	0.000
1352-40	**2**	0	2.05	0.00		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	0.581	0.00	28%	0.001	0.1136
1352-02	**1**	0.013	0.551	0.00	27%	0.001	0.1159
1352-03	**1**	0.013	0.595	0.00	29%	0.001	0.1136
1352-04	1	0.026	0.572	0.00	28%	0.001	0.0573
1352-05	**1**	0.025	0.552	0.00	27%	0.001	0.0594
1352-06	**1**	0.026	0.529	0.00	26%	0.002	0.0592
1352-07	**1**	0.051	0.509	0.00	25%	0.002	0.0301
1352-08	**1**	0.051	0.563	0.00	27%	0.001	0.0291
1352-09	**1**	0.051	0.545	0.00	27%	0.002	0.0297
1352-10	**1**	0.127	0.513	0.00	25%	0.002	0.0121
1352-11	**1**	0.127	0.529	0.00	26%	0.002	0.0119
1352-12	**1**	0.128	0.5	0.00	24%	0.002	0.0121
1352-13	**1**	0.254	0.399	0.00	19%	0.002	0.0065
1352-14	**1**	0.255	0.395	0.00	19%	0.002	0.0065
1352-15	**1**	0.256	0.422	0.00	21%	0.002	0.0064
1352-16	**1**	0.38	0.199	0.00	10%	0.002	0.0049
1352-17	**1**	0.38	0.36	0.00	18%	0.002	0.0044
1352-18	**1**	0.38	0.372	0.00	18%	0.002	0.0044
1352-19	**1**	0.51	0.178	0.00	9%	0.002	0.0037
1352-20	**1**	0.51	0.147	0.00	7.2%	0.002	0.0037
1351-21	**1**	0.51	0.217	0.00	11%	0.002	0.0036
1352-22	**1**	1.27	ND	--	--	--	--
1352-23	**1**	1.27	ND	--	--	--	--
1352-24	**1**	1.27	ND	--	--	--	--
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	ND	--	--	--
1352-38	1	0	ND	--		
1352-39	**2**	0	ND	--	--	--
1352-40	**2**	0	ND	--		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	ND	--	--	--	--
1352-02	**1**	0.013	ND	--	--	--	--
1352-03	**1**	0.013	ND	--	--	--	--
1352-04	1	0.026	ND	--	--	--	--
1352-05	**1**	0.025	ND	--	--	--	--
1352-06	**1**	0.026	ND	--	--	--	--
1352-07	**1**	0.051	ND	--	--	--	--
1352-08	**1**	0.051	ND	--	--	--	--
1352-09	**1**	0.051	ND	--	--	--	--
1352-10	**1**	0.127	ND	--	--	--	--
1352-11	**1**	0.127	ND	--	--	--	--
1352-12	**1**	0.128	ND	--	--	--	--
1352-13	**1**	0.254	ND	--	--	--	--
1352-14	**1**	0.255	ND	--	--	--	--
1352-15	**1**	0.256	ND	--	--	--	--
1352-16	**1**	0.38	ND	--	--	--	--
1352-17	**1**	0.38	ND	--	--	--	--
1352-18	**1**	0.38	ND	--	--	--	--
1352-19	**1**	0.51	ND	--	--	--	--
1352-20	**1**	0.51	ND	--	--	--	--
1351-21	**1**	0.51	ND	--	--	--	--
1352-22	**1**	1.27	ND	--	--	--	--
1352-23	**1**	1.27	ND	--	--	--	--
1352-24	**1**	1.27	ND	--	--	--	--
1352-25	**2**	2.5	ND	--	--	--	--
1352-26	**2**	2.5	ND	--	--	--	--
1352-27	**2**	2.5	ND	--	--	--	--
1352-28	**2**	5.1	ND	--	--	--	--
1352-29	**2**	5.1	ND	--	--	--	--
1352-30	**2**	5.1	ND	--	--	--	--
1352-31	**2**	10.3	ND	--	--	--	--
1352-32	2	10.3	ND	--	--	--	--
1352-33	2	10.2	ND	--	--	--	--
1352-34	2	25.8	ND	--	--	--	--
1352-35	2	23.8	ND	--	--	--	--
1352-36	2	25.8	ND	--	--	--	--

Non-detect in all test bottles and controls

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	**1770**	1730	56.6
1352-38	1	0	1690		
1352-39	**2**	0	**1610**	1650	56.6
1352-40	**2**	0	1690		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	1770	102%	-40	-3094
1352-02	**1**	0.013	1770	102%	-40	-3093
1352-03	**1**	0.013	1720	99%	10	781
1352-04	1	0.026	1730	100%	0	0
1352-05	**1**	0.025	1730	100%	0	0
1352-06	**1**	0.026	1720	99%	10	389
1352-07	**1**	0.051	1720	99%	10	195
1352-08	**1**	0.051	1710	99%	20	392
1352-09	**1**	0.051	1700	98%	30	591
1352-10	**1**	0.127	1730	100%	0	0
1352-11	**1**	0.127	1790	103%	-60	-471
1352-12	**1**	0.128	1760	102%	-30	-235
1352-13	**1**	0.254	1750	101%	-20	-79
1352-14	**1**	0.255	1800	104%	-70	-275
1352-15	**1**	0.256	1760	102%	-30	-117
1352-16	**1**	0.38	1710	99%	20	52
1352-17	**1**	0.38	1730	100%	0	0
1352-18	**1**	0.38	1720	99%	10	26
1352-19	**1**	0.51	1680	97%	50	98
1352-20	**1**	0.51	1720	99%	10	20
1351-21	**1**	0.51	1690	98%	40	79
1352-22	**1**	1.27	1650	95%	80	63
1352-23	**1**	1.27	1640	95%	90	71
1352-24	**1**	1.27	1600	92%	130	103
1352-25	**2**	2.5	1540	93%	110	43
1352-26	**2**	2.5	1550	94%	100	39
1352-27	**2**	2.5	1560	95%	90	35
1352-28	**2**	5.1	1480	90%	170	33
1352-29	**2**	5.1	1480	90%	170	33
1352-30	**2**	5.1	1480	90%	170	33
1352-31	**2**	10.3	1420	86%	230	22
1352-32	2	10.3	1460	88%	190	18
1352-33	2	10.2	1430	87%	220	21
1352-34	2	25.8	1330	81%	320	12
1352-35	2	23.8	1330	81%	320	13
1352-36	2	25.8	1350	82%	300	12

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		
(Bottle) #	**Batch #**	**m (g/L)**	**C_0 (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1352-37	**1**	0	6510	6270	339
1352-38	1	0	6030		
1352-39	**2**	0	6030	6270	339
1352-40	**2**	0	6510		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1351-01	1	0.013	6510	104%	-240	-18562
1352-02	**1**	0.013	6750	108%	-480	-37121
1352-03	**1**	0.013	6030	96%	240	18736
1352-04	1	0.026	6030	96%	240	9312
1352-05	**1**	0.025	6270	100%	0	0
1352-06	**1**	0.026	7230	115%	-960	-37343
1352-07	**1**	0.051	7710	123%	-1440	-28130
1352-08	**1**	0.051	6270	100%	0	0
1352-09	**1**	0.051	6270	100%	0	0
1352-10	**1**	0.127	6990	111%	-720	-5648
1352-11	**1**	0.127	6510	104%	-240	-1884
1352-12	**1**	0.128	6510	104%	-240	-1878
1352-13	**1**	0.254	6750	108%	-480	-1886
1352-14	**1**	0.255	6030	96%	240	942
1352-15	**1**	0.256	7470	119%	-1200	-4695
1352-16	**1**	0.38	6270	100%	0	0
1352-17	**1**	0.38	6030	96%	240	629
1352-18	**1**	0.38	6270	100%	0	0
1352-19	**1**	0.51	6750	108%	-480	-940
1352-20	**1**	0.51	6270	100%	0	0
1351-21	**1**	0.51	6270	100%	0	0
1352-22	**1**	1.27	5780	92%	490	384
1352-23	**1**	1.27	6510	104%	-240	-189
1352-24	**1**	1.27	6750	108%	-480	-379
1352-25	**2**	2.5	5540	88%	730	287
1352-26	**2**	2.5	6030	96%	240	94
1352-27	**2**	2.5	6510	104%	-240	-94
1352-28	**2**	5.1	6270	100%	0	0
1352-29	**2**	5.1	6030	96%	240	47
1352-30	**2**	5.1	5060	81%	1210	237
1352-31	**2**	10.3	5780	92%	490	48
1352-32	2	10.3	5300	85%	970	94
1352-33	2	10.2	5780	92%	490	48
1352-34	2	25.8	4820	77%	1450	56
1352-35	2	23.8	4340	69%	1930	81
1352-36	2	25.8	4340	69%	1930	75

Controls

Sample ID	Spiked Batch	Bottle Weight		Carbon Mass	Gross Weight	Net Weight	Water Volume	Carbon Dose
(Bottle) #	**Batch #**	**Empty (g)**	**Full (g)**	**M (g)**	**Water + Carbon (g)**	**Water (g)**	**V (L)**	**m (g/L)**
1352-37	**1**	1109	3107	0	1998	1998.00	1.978	0
1352-38	1	1109	3105	0	1996	1996.00	1.976	0
1352-39	**2**	1108	3100	0	1992	1992.00	1.972	0
1352-40	**2**	1109	3101	0	1992	1992.00	1.972	0

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Bottle Weight		Carbon Mass	Gross Weight	Net Weight	Water Volume	Carbon Dose
(Bottle) #	**Batch #**	**Empty (g)**	**Full (g)**	**M (g)**	**Water + Carbon (g)**	**Water (g)**	**V (L)**	**m (g/L)**
1351-01	1	1110	3102	0.026	1992	1991.97	1.972	0.013
1352-02	**1**	1111	3095	0.025	1984	1983.97	1.964	0.013
1352-03	**1**	1111	3098	0.025	1987	1986.97	1.967	0.013
1352-04	1	1108	3091	0.051	1983	1982.95	1.963	0.026
1352-05	**1**	1110	3100	0.050	1990	1989.95	1.970	0.025
1352-06	**1**	1110	3098	0.051	1988	1987.95	1.968	0.026
1352-07	**1**	1110	3091	0.100	1981	1980.90	1.961	0.051
1352-08	**1**	1109	3094	0.100	1985	1984.90	1.965	0.051
1352-09	**1**	1109	3097	0.100	1988	1987.90	1.968	0.051
1352-10	**1**	1110	3098	0.251	1988	1987.75	1.968	0.127
1352-11	**1**	1109	3098	0.251	1989	1988.75	1.969	0.127
1352-12	**1**	1110	3098	0.252	1988	1987.75	1.968	0.128
1352-13	**1**	1108	3096	0.50	1988	1987.50	1.968	0.254
1352-14	**1**	1109	3093	0.50	1984	1983.50	1.964	0.255
1352-15	**1**	1109	3093	0.50	1984	1983.50	1.964	0.256
1352-16	**1**	1110	3098	0.75	1988	1987.25	1.968	0.381
1352-17	**1**	1110	3097	0.75	1987	1986.25	1.967	0.382
1352-18	**1**	1111	3102	0.75	1991	1990.25	1.971	0.382
1352-19	**1**	1110	3098	1.0	1988	1987.00	1.967	0.511
1352-20	**1**	1110	3098	1.0	1988	1987.00	1.967	0.510
1351-21	**1**	1110	3104	1.0	1994	1993.00	1.973	0.507
1352-22	**1**	1110	3095	2.5	1985	1982.50	1.963	1.275
1352-23	**1**	1109	3100	2.5	1991	1988.50	1.969	1.270
1352-24	**1**	1109	3105	2.5	1996	1993.50	1.974	1.267
1352-25	**2**	1110	3098	5.0	1988	1983.00	1.963	2.547
1352-26	**2**	1110	3100	5.0	1990	1985.00	1.965	2.545
1352-27	**2**	1110	3100	5.0	1990	1985.00	1.965	2.545
1352-28	**2**	1109	3100	10.0	1991	1981.00	1.961	5.100
1352-29	**2**	1109	3103	10.0	1994	1984.00	1.964	5.093
1352-30	**2**	1110	3100	10.0	1990	1980.00	1.960	5.104
1352-31	**2**	1110	3091	20.0	1981	1961.00	1.942	10.300
1352-32	2	1110	3092	20.0	1982	1962.00	1.943	10.294
1352-33	2	1110	3101	20.0	1991	1971.00	1.951	10.249
1352-34	2	1109	3118	50	2009	1959.01	1.940	25.775
1352-35	2	1108	3107	46	1999	1953.00	1.934	23.786
1352-36	2	1109	3120	50	2011	1961.00	1.942	25.752

Test Water Density	**1010 g/L**

ATTACHMENT 2

EXPERIMENTAL DATA
REMEDIATION AREA D – NATIVE PH

(PROVIDED ON CD ON ATTACHMENT TAB)

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**3350**	3.35	3.305	0.064
1310-78	1	0	3260	3.26		
1309-79	**2**	0	**2510**	2.51	2.595	0.120
1310-80	**2**	0	2680	2.68		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	2940	2.94	89%	0.365	35.6323
1310-42	**1**	0.010	3040	3.04	92%	0.265	26.6065
1310-43	**1**	0.010	2970	2.97	90%	0.335	32.4723
1309-44	1	0.018	3120	3.12	94%	0.185	10.2583
1310-45	**1**	0.018	3130	3.13	95%	0.175	9.9739
1310-46	**1**	0.018	3080	3.08	93%	0.225	12.6656
1310-47	**1**	0.035	3150	3.15	95%	0.155	4.4852
1310-48	**1**	0.035	3280	3.28	99%	0.025	0.7124
1310-49	**1**	0.035	3000	3.00	91%	0.305	8.7328
1309-50	**1**	0.063	3040	3.04	92%	0.265	4.2057
1310-51	**1**	0.063	3300	3.30	100%	0.005	0.0798
1310-52	**1**	0.063	3170	3.17	96%	0.135	2.1539
1310-53	**1**	0.126	3020	3.02	91%	0.285	2.2635
1310-54	**1**	0.125	2880	2.88	87%	0.425	3.3990
1310-55	**1**	0.126	2880	2.88	87%	0.425	3.3838
1309-56	**1**	0.25	2320	2.32	70%	0.985	3.9051
1310-57	**1**	0.25	2460	2.46	74%	0.845	3.3457
1310-58	**1**	0.25	2470	2.47	75%	0.835	3.3160
1310-59	**1**	0.51	1500	1.50	45%	1.805	3.5693
1310-60	**1**	0.50	1490	1.49	45%	1.815	3.6037
1310-61	**1**	0.50	1500	1.50	45%	1.805	3.5803
1309-62	**2**	1.26	240	0.24	9.2%	2.355	1.8701
1310-63	**2**	1.25	242	0.24	9.3%	2.353	1.8769
1310-64	**2**	1.26	252	0.25	10%	2.343	1.8600
1310-65	**2**	2.5	45.1	0.045	1.7%	2.550	1.0124
1310-66	**2**	2.5	41.9	0.042	1.6%	2.553	1.0105
1310-67	**2**	2.5	39.9	0.040	1.5%	2.555	1.0184
1309-68	**2**	5.0	5.6	0.0056	0.22%	2.589	0.5131
1310-69	**2**	5.1	5.5	0.0055	0.21%	2.590	0.5125
1310-70	**2**	5.1	5.7	0.0057	0.22%	2.589	0.5118
1309-71	**2**	10.1	0.69	0.0007	0.03%	2.594	0.2560
1310-72	2	10.1	0.78	0.0008	0.03%	2.594	0.2564
1310-73	2	10.1	0.73	0.0007	0.03%	2.594	0.2560
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**5770**	5.77	6.055	0.403
1310-78	1	0	6340	6.34		
1309-79	**2**	0	**6130**	6.13	6.400	0.382
1310-80	**2**	0	6670	6.67		

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	5340	5.34	88%	0.715	69.8003
1310-42	**1**	0.010	5410	5.41	89%	0.645	64.7593
1310-43	**1**	0.010	5360	5.36	89%	0.695	67.3678
1309-44	1	0.018	5510	5.51	91%	0.545	30.2203
1310-45	**1**	0.018	5520	5.52	91%	0.535	30.4915
1310-46	**1**	0.018	5360	5.36	89%	0.695	39.1227
1310-47	**1**	0.035	5280	5.28	87%	0.775	22.4262
1310-48	**1**	0.035	5600	5.60	92%	0.455	12.9650
1310-49	**1**	0.035	4700	4.70	78%	1.355	38.7963
1309-50	**1**	0.063	4930	4.93	81%	1.125	17.8545
1310-51	**1**	0.063	5050	5.05	83%	1.005	16.0299
1310-52	**1**	0.063	4910	4.91	81%	1.145	18.2685
1310-53	**1**	0.126	3490	3.49	58%	2.565	20.3712
1310-54	**1**	0.125	3260	3.26	54%	2.795	22.3534
1310-55	**1**	0.126	3250	3.25	54%	2.805	22.3331
1309-56	**1**	0.25	1320	1.32	22%	4.735	18.7721
1310-57	**1**	0.25	1460	1.46	24%	4.595	18.1935
1310-58	**1**	0.25	1440	1.44	24%	4.615	18.3275
1310-59	**1**	0.51	334	0.33	6%	5.721	11.3129
1310-60	**1**	0.50	338	0.34	6%	5.717	11.3513
1310-61	**1**	0.50	335	0.34	6%	5.720	11.3460
1309-62	**2**	1.26	32.5	0.03	0.5%	6.368	5.0563
1310-63	**2**	1.25	32.1	0.03	0.5%	6.368	5.0794
1310-64	**2**	1.26	35.6	0.04	0.6%	6.364	5.0525
1310-65	**2**	2.5	4.4	0.004	0.07%	6.396	2.5392
1310-66	**2**	2.5	4	0.004	0.06%	6.396	2.5315
1310-67	**2**	2.5	3.6	0.004	0.06%	6.396	2.5495
1309-68	**2**	5.0	0.53	0.0005	0.01%	6.399	1.2681
1310-69	**2**	5.1	0.55	0.0006	0.01%	6.399	1.2664
1310-70	**2**	5.1	0.53	0.0005	0.01%	6.399	1.2648
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	ND	--	--	--	--
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**2879**	2.88	3.145	0.376
1310-78	1	0	3411	3.41		
1309-79	**2**	0	**2868**	2.87	3.050	0.257
1310-80	**2**	0	3231	3.23		

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	2534	2.53	81%	0.611	59.6475
1310-42	**1**	0.010	2469	2.47	79%	0.676	67.8718
1310-43	**1**	0.010	2510	2.51	80%	0.635	61.5519
1309-44	1	0.018	2410	2.41	77%	0.735	40.7558
1310-45	**1**	0.018	2220	2.22	71%	0.925	52.7190
1310-46	**1**	0.018	2225	2.23	71%	0.920	51.7883
1310-47	**1**	0.035	1747	1.75	56%	1.398	40.4540
1310-48	**1**	0.035	1859	1.86	59%	1.286	36.6440
1310-49	**1**	0.035	2015	2.02	64%	1.130	32.3541
1309-50	**1**	0.063	1152	1.15	37%	1.993	31.6302
1310-51	**1**	0.063	1171	1.17	37%	1.974	31.4856
1310-52	**1**	0.063	1309	1.31	42%	1.836	29.2934
1310-53	**1**	0.126	409.3	0.41	13%	2.736	21.7269
1310-54	**1**	0.125	360.6	0.36	11%	2.784	22.2686
1310-55	**1**	0.126	364.2	0.36	12%	2.781	22.1405
1309-56	**1**	0.25	83.5	0.08	2.7%	3.062	12.1374
1310-57	**1**	0.25	83.2	0.08	2.6%	3.062	12.1229
1310-58	**1**	0.25	77.9	0.08	2.5%	3.067	12.1803
1310-59	**1**	0.51	11.9	0.01	0.38%	3.133	6.1955
1310-60	**1**	0.50	12.6	0.01	0.40%	3.132	6.2195
1310-61	**1**	0.50	12.3	0.01	0.39%	3.133	6.2139
1309-62	**2**	1.26	1.17	0.00	0.038%	3.048	2.4206
1310-63	**2**	1.25	1.19	0.00	0.039%	3.048	2.4315
1310-64	**2**	1.26	1.23	0.00	0.040%	3.048	2.4199
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	ND	--	--	--	--
1310-70	**2**	5.1	ND	--	--	--	--
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	ND	--	--	--	--
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**279**	0.28	0.307	0.039
1310-78	1	0	334	0.33		
1309-79	**2**	0	**252**	0.25	0.263	0.016
1310-80	**2**	0	274	0.27		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	276	0.28	90%	0.031	2.9775
1310-42	**1**	0.010	276	0.28	90%	0.031	3.0623
1310-43	**1**	0.010	273	0.27	89%	0.034	3.2472
1309-44	1	0.018	279	0.28	91%	0.028	1.5249
1310-45	**1**	0.018	276	0.28	90%	0.031	1.7383
1310-46	**1**	0.018	268	0.27	87%	0.039	2.1672
1310-47	**1**	0.035	256	0.26	84%	0.051	1.4613
1310-48	**1**	0.035	268	0.27	87%	0.039	1.0970
1310-49	**1**	0.035	276	0.28	90%	0.031	0.8733
1309-50	**1**	0.063	218	0.22	71%	0.089	1.4046
1310-51	**1**	0.063	229	0.23	75%	0.078	1.2361
1310-52	**1**	0.063	245	0.25	80%	0.062	0.9812
1310-53	**1**	0.126	119	0.12	39%	0.188	1.4891
1310-54	**1**	0.125	109	0.11	36%	0.198	1.5795
1310-55	**1**	0.126	111	0.11	36%	0.196	1.5566
1309-56	**1**	0.25	30.5	0.03	10%	0.276	1.0942
1310-57	**1**	0.25	32.6	0.03	11%	0.274	1.0845
1310-58	**1**	0.25	31.5	0.03	10%	0.275	1.0921
1310-59	**1**	0.51	5.8	0.01	1.9%	0.301	0.5946
1310-60	**1**	0.50	5.5	0.01	1.8%	0.301	0.5976
1310-61	**1**	0.50	5.9	0.01	1.9%	0.301	0.5963
1309-62	**2**	1.26	0.42	0.00	0.16%	0.263	0.2085
1310-63	**2**	1.25	0.43	0.00	0.16%	0.263	0.2094
1310-64	**2**	1.26	0.5	0.00	0.19%	0.263	0.2084
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	ND	--	--	--	--
1310-70	**2**	5.1	ND	--	--	--	--
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	ND	--	--	--	--
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**2980**	2.98	2.955	0.035
1310-78	1	0	2930	2.93		
1309-79	**2**	0	**2320**	2.32	2.390	0.099
1310-80	**2**	0	2460	2.46		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	2700	2.70	91%	0.255	24.8938
1310-42	**1**	0.010	2740	2.74	93%	0.215	21.5864
1310-43	**1**	0.010	2740	2.74	93%	0.215	20.8404
1309-44	1	0.018	2800	2.80	95%	0.155	8.5948
1310-45	**1**	0.018	2810	2.81	95%	0.145	8.2641
1310-46	**1**	0.018	2680	2.68	91%	0.275	15.4802
1310-47	**1**	0.035	2790	2.79	94%	0.165	4.7746
1310-48	**1**	0.035	2910	2.91	98%	0.045	1.2823
1310-49	**1**	0.035	2680	2.68	91%	0.275	7.8738
1309-50	**1**	0.063	2530	2.53	86%	0.425	6.7450
1310-51	**1**	0.063	2790	2.79	94%	0.165	2.6318
1310-52	**1**	0.063	2720	2.72	92%	0.235	3.7494
1310-53	**1**	0.126	2160	2.16	73%	0.795	6.3139
1310-54	**1**	0.125	2000	2.00	68%	0.955	7.6377
1310-55	**1**	0.126	2000	2.00	68%	0.955	7.6036
1309-56	**1**	0.25	982	0.98	33%	1.973	7.8220
1310-57	**1**	0.25	1080	1.08	37%	1.875	7.4239
1310-58	**1**	0.25	1080	1.08	37%	1.875	7.4462
1310-59	**1**	0.51	291	0.29	9.8%	2.664	5.2679
1310-60	**1**	0.50	284	0.28	9.6%	2.671	5.3034
1310-61	**1**	0.50	295	0.30	10.0%	2.660	5.2763
1309-62	**2**	1.26	22.7	0.02	0.95%	2.367	1.8798
1310-63	**2**	1.25	19.5	0.02	0.82%	2.371	1.8908
1310-64	**2**	1.26	22.5	0.02	0.94%	2.368	1.8795
1310-65	**2**	2.5	3	0.00	0.13%	2.387	0.9477
1310-66	**2**	2.5	2.8	0.00	0.12%	2.387	0.9449
1310-67	**2**	2.5	2.9	0.00	0.12%	2.387	0.9515
1309-68	**2**	5.0	0.72	0.00	0.03%	2.389	0.4735
1310-69	**2**	5.1	0.55	0.00	0.02%	2.389	0.4729
1310-70	**2**	5.1	0.43	0.00	0.02%	2.390	0.4723
1309-71	**2**	10.1	0.39	0.00	0.02%	2.390	0.2358
1310-72	2	10.1	ND	--	--	--	--
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	0.36	0.00	0.015%	2.390	0.0454

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**971**	0.97	1.121	0.211
1310-78	1	0	1270	1.27		
1309-79	**2**	0	**1068**	1.07	1.093	0.035
1310-80	**2**	0	1118	1.12		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	534	0.53	48%	0.587	57.2558
1310-42	**1**	0.010	465	0.47	41%	0.656	65.8135
1310-43	**1**	0.010	484	0.48	43%	0.637	61.6973
1309-44	1	0.018	384	0.38	34%	0.737	40.8390
1310-45	**1**	0.018	290	0.29	26%	0.830	47.3217
1310-46	**1**	0.018	298	0.30	27%	0.823	46.2998
1310-47	**1**	0.035	137	0.14	12%	0.984	28.4654
1310-48	**1**	0.035	148	0.15	13%	0.973	27.7195
1310-49	**1**	0.035	186	0.19	17%	0.934	26.7451
1309-50	**1**	0.063	75	0.07	6.7%	1.046	16.5991
1310-51	**1**	0.063	81	0.08	7.2%	1.040	16.5850
1310-52	**1**	0.063	74	0.07	6.6%	1.047	16.6969
1310-53	**1**	0.126	ND	--	--	--	--
1310-54	**1**	0.125	ND	--	--	--	--
1310-55	**1**	0.126	ND	--	--	--	--
1309-56	**1**	0.25	ND	--	--	--	--
1310-57	**1**	0.25	ND	--	--	--	--
1310-58	**1**	0.25	ND	--	--	--	--
1310-59	**1**	0.51	ND	--	--	--	--
1310-60	**1**	0.50	ND	--	--	--	--
1310-61	**1**	0.50	ND	--	--	--	--
1309-62	**2**	1.26	ND	--	--	--	--
1310-63	**2**	1.25	ND	--	--	--	--
1310-64	**2**	1.26	ND	--	--	--	--
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	ND	--	--	--	--
1310-70	**2**	5.1	ND	--	--	--	--
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	ND	--	--	--	--
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**2610**	2.61	2.970	0.509
1310-78	1	0	3330	3.33		
1309-79	**2**	0	**2480**	2.48	2.640	0.226
1310-80	**2**	0	2800	2.80		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	2730	2.73	92%	0.240	23.4295
1310-42	**1**	0.010	2750	2.75	93%	0.220	22.0884
1310-43	**1**	0.010	2740	2.74	92%	0.230	22.2944
1309-44	1	0.018	2740	2.74	92%	0.230	12.7535
1310-45	**1**	0.018	2740	2.74	92%	0.230	13.1085
1310-46	**1**	0.018	2620	2.62	88%	0.350	19.7021
1310-47	**1**	0.035	2440	2.44	82%	0.530	15.3366
1310-48	**1**	0.035	2570	2.57	87%	0.400	11.3978
1310-49	**1**	0.035	2620	2.62	88%	0.350	10.0212
1309-50	**1**	0.063	1950	1.95	66%	1.020	16.1881
1310-51	**1**	0.063	2040	2.04	69%	0.930	14.8337
1310-52	**1**	0.063	2220	2.22	75%	0.750	11.9663
1310-53	**1**	0.126	963	0.96	32%	2.007	15.9396
1310-54	**1**	0.125	880	0.88	30%	2.090	16.7151
1310-55	**1**	0.126	890	0.89	30%	2.080	16.5608
1309-56	**1**	0.25	216	0.22	7.3%	2.754	10.9184
1310-57	**1**	0.25	220	0.22	7.4%	2.750	10.8884
1310-58	**1**	0.25	214	0.21	7.2%	2.756	10.9449
1310-59	**1**	0.51	34.7	0.03	1.2%	2.935	5.8043
1310-60	**1**	0.50	35.7	0.04	1.2%	2.934	5.8262
1310-61	**1**	0.50	34.3	0.03	1.2%	2.936	5.8232
1309-62	**2**	1.26	2.5	0.00	0.09%	2.638	2.0944
1310-63	**2**	1.25	2.3	0.00	0.09%	2.638	2.1040
1310-64	**2**	1.26	2.7	0.00	0.10%	2.637	2.0937
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	ND	--	--	--	--
1310-70	**2**	5.1	ND	--	--	--	--
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	ND	--	--	--	--
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**937**	0.94	1.469	0.752
1310-78	1	0	2000	2.00		
1309-79	**2**	0	**985**	0.99	1.023	0.053
1310-80	**2**	0	1060	1.06		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	1460	1.46	99%	0.009	0.8298
1310-42	**1**	0.010	1410	1.41	96%	0.059	5.8735
1310-43	**1**	0.010	1730	1.73	118%	-0.262	-25.3477
1309-44	1	0.018	1120	1.12	76%	0.349	19.3244
1310-45	**1**	0.018	1690	1.69	115%	-0.222	-12.6241
1310-46	**1**	0.018	1730	1.73	118%	-0.262	-14.7203
1310-47	**1**	0.035	1130	1.13	77%	0.339	9.7952
1310-48	**1**	0.035	1260	1.26	86%	0.209	5.9411
1310-49	**1**	0.035	1250	1.25	85%	0.219	6.2561
1309-50	**1**	0.063	918	0.92	63%	0.551	8.7368
1310-51	**1**	0.063	1200	1.20	82%	0.269	4.2826
1310-52	**1**	0.063	1260	1.26	86%	0.209	3.3266
1310-53	**1**	0.126	1070	1.07	73%	0.399	3.1649
1310-54	**1**	0.125	913	0.91	62%	0.556	4.4427
1310-55	**1**	0.126	1330	1.33	91%	0.139	1.1027
1309-56	**1**	0.25	947	0.95	64%	0.522	2.0675
1310-57	**1**	0.25	1170	1.17	80%	0.299	1.1819
1310-58	**1**	0.25	1020	1.02	69%	0.449	1.7811
1310-59	**1**	0.51	1490	1.49	101%	-0.021	-0.0425
1310-60	**1**	0.50	1510	1.51	103%	-0.041	-0.0824
1310-61	**1**	0.50	1500	1.50	102%	-0.031	-0.0625
1309-62	**2**	1.26	975	0.98	95%	0.048	0.0377
1310-63	**2**	1.25	1560	1.56	153%	-0.538	-0.4287
1310-64	**2**	1.26	1450	1.45	142%	-0.428	-0.3394
1310-65	**2**	2.5	1170	1.170	114%	-0.148	-0.0586
1310-66	**2**	2.5	1150	1.150	112%	-0.128	-0.0505
1310-67	**2**	2.5	1070	1.070	105%	-0.048	-0.0189
1309-68	**2**	5.0	283	0.2830	28%	0.740	0.1465
1310-69	**2**	5.1	323	0.3230	32%	0.700	0.1384
1310-70	**2**	5.1	383	0.3830	37%	0.640	0.1264
1309-71	**2**	10.1	33.2	0.0332	3.2%	0.989	0.0976
1310-72	2	10.1	33.0	0.0330	3.2%	0.990	0.0978
1310-73	2	10.1	43.8	0.0438	4.3%	0.979	0.0966
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**3970**	3.97	4.190	0.311
1310-78	1	0	4410	4.41		
1309-79	**2**	0	**4280**	4.28	4.495	0.304
1310-80	**2**	0	4710	4.71		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	3780	3.78	90%	0.410	40.0253
1310-42	**1**	0.010	4160	4.16	99%	0.030	3.0121
1310-43	**1**	0.010	4470	4.47	107%	-0.280	-27.1410
1309-44	1	0.018	3030	3.03	72%	1.160	64.3221
1310-45	**1**	0.018	4080	4.08	97%	0.110	6.2693
1310-46	**1**	0.018	3910	3.91	93%	0.280	15.7617
1310-47	**1**	0.035	1670	1.67	40%	2.520	72.9213
1310-48	**1**	0.035	1880	1.88	45%	2.310	65.8224
1310-49	**1**	0.035	1770	1.77	42%	2.420	69.2894
1309-50	**1**	0.063	802	0.80	19%	3.388	53.7697
1310-51	**1**	0.063	901	0.90	22%	3.289	52.4601
1310-52	**1**	0.063	790	0.79	19%	3.400	54.2471
1310-53	**1**	0.126	221	0.22	5.3%	3.969	31.5218
1310-54	**1**	0.125	175	0.18	4.2%	4.015	32.1105
1310-55	**1**	0.126	224	0.22	5.3%	3.966	31.5769
1309-56	**1**	0.25	34.7	0.03	0.8%	4.155	16.4739
1310-57	**1**	0.25	38.5	0.04	0.9%	4.152	16.4375
1310-58	**1**	0.25	29.8	0.03	0.7%	4.160	16.5213
1310-59	**1**	0.51	10.5	0.01	0.25%	4.180	8.2647
1310-60	**1**	0.50	17.6	0.02	0.42%	4.172	8.2845
1310-61	**1**	0.50	13.4	0.01	0.32%	4.177	8.2846
1309-62	**2**	1.26	2.8	0.00	0.06%	4.492	3.5672
1310-63	**2**	1.25	10.0	0.01	0.22%	4.485	3.5775
1310-64	**2**	1.26	7.57	0.01	0.17%	4.487	3.5624
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	12.5	0.0125	0.28%	4.483	0.8882
1310-69	**2**	5.1	ND	--	--	--	--
1310-70	**2**	5.1	0.921	0.0009	0.02%	4.494	0.8882
1309-71	**2**	10.1	2.51	0.0025	0.06%	4.492	0.4434
1310-72	2	10.1	0.459	0.0005	0.01%	4.495	0.4442
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	1.24	0.0012	0.028%	4.494	0.0853

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**659**	0.66	0.786	0.180
1310-78	1	0	913	0.91		
1309-79	**2**	0	**835**	0.84	0.840	0.006
1310-80	**2**	0	844	0.84		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	706	0.71	90%	0.080	7.8098
1310-42	**1**	0.010	742	0.74	94%	0.044	4.4177
1310-43	**1**	0.010	570	0.57	73%	0.216	20.9373
1309-44	1	0.018	556	0.56	71%	0.230	12.7535
1310-45	**1**	0.018	745	0.75	95%	0.041	2.3367
1310-46	**1**	0.018	733	0.73	93%	0.053	2.9835
1310-47	**1**	0.035	722	0.72	92%	0.064	1.8520
1310-48	**1**	0.035	798	0.80	102%	-0.012	-0.3419
1310-49	**1**	0.035	816	0.82	104%	-0.030	-0.8590
1309-50	**1**	0.063	626	0.63	80%	0.160	2.5393
1310-51	**1**	0.063	791	0.79	101%	-0.005	-0.0798
1310-52	**1**	0.063	757	0.76	96%	0.029	0.4627
1310-53	**1**	0.126	753	0.75	96%	0.033	0.2621
1310-54	**1**	0.125	628	0.63	80%	0.158	1.2636
1310-55	**1**	0.126	659	0.66	84%	0.127	1.0112
1309-56	**1**	0.25	612	0.61	78%	0.174	0.6898
1310-57	**1**	0.25	697	0.70	89%	0.089	0.3524
1310-58	**1**	0.25	669	0.67	85%	0.117	0.4646
1310-59	**1**	0.51	399	0.40	51%	0.387	0.7653
1310-60	**1**	0.50	415	0.42	53%	0.371	0.7366
1310-61	**1**	0.50	525	0.53	67%	0.261	0.5177
1309-62	**2**	1.26	1.4	0.00	0.2%	0.838	0.6655
1310-63	**2**	1.25	12.9	0.01	1.5%	0.827	0.6593
1310-64	**2**	1.26	12.2	0.01	1.5%	0.827	0.6568
1310-65	**2**	2.5	7.2	0.007	0.9%	0.832	0.3304
1310-66	**2**	2.5	6.4	0.006	0.8%	0.833	0.3297
1310-67	**2**	2.5	2.3	0.002	0.27%	0.837	0.3337
1309-68	**2**	5.0	0.16	0.0002	0.02%	0.839	0.1663
1310-69	**2**	5.1	0.11	0.0001	0.01%	0.839	0.1661
1310-70	**2**	5.1	0.58	0.0006	0.07%	0.839	0.1658
1309-71	**2**	10.1	<MDL	--	--	--	--
1310-72	2	10.1	<MDL	--	--	--	--
1310-73	2	10.1	<MDL	--	--	--	--
1310-74	2	51.8	<MDL	--	--	--	--
1310-75	2	51.9	<MDL	--	--	--	--
1310-76	2	52.7	<MDL	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**0.631**	0.00063	0.00064	0.000006
1310-78	1	0	0.639	0.00064		
1309-79	**2**	0	**0.642**	0.00064	0.00068	0.000050
1310-80	**2**	0	0.713	0.00071		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	ND	--	--	--	--
1310-42	**1**	0.010	ND	--	--	--	--
1310-43	**1**	0.010	ND	--	--	--	--
1309-44	1	0.018	ND	--	--	--	--
1310-45	**1**	0.018	ND	--	--	--	--
1310-46	**1**	0.018	ND	--	--	--	--
1310-47	**1**	0.035	ND	--	--	--	--
1310-48	**1**	0.035	ND	--	--	--	--
1310-49	**1**	0.035	ND	--	--	--	--
1309-50	**1**	0.063	ND	--	--	--	--
1310-51	**1**	0.063	ND	--	--	--	--
1310-52	**1**	0.063	ND	--	--	--	--
1310-53	**1**	0.126	ND	--	--	--	--
1310-54	**1**	0.125	ND	--	--	--	--
1310-55	**1**	0.126	ND	--	--	--	--
1309-56	**1**	0.25	ND	--	--	--	--
1310-57	**1**	0.25	ND	--	--	--	--
1310-58	**1**	0.25	ND	--	--	--	--
1310-59	**1**	0.51	ND	--	--	--	--
1310-60	**1**	0.50	ND	--	--	--	--
1310-61	**1**	0.50	ND	--	--	--	--
1309-62	**2**	1.26	ND	--	--	--	--
1310-63	**2**	1.25	ND	--	--	--	--
1310-64	**2**	1.26	ND	--	--	--	--
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	0.57	0.00	84%	0.000	0.0000
1310-70	**2**	5.1	0.299	0.00	44%	0.000	0.0001
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	0.187	0.00	28%	0.000	0.0000
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Detection at higher doses only may reflect analytical carryover.

Acenapthylene

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**3.70**	0.00370	0.00365	0.000071
1310-78	1	0	3.60	0.00360		
1309-79	**2**	0	**3.54**	0.00354	0.00362	0.000106
1310-80	**2**	0	3.69	0.00369		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	0.998	0.00100	27%	0.003	0.2589
1310-42	**1**	0.010	1.07	0.00107	29%	0.003	0.2590
1310-43	**1**	0.010	1.01	0.00101	28%	0.003	0.2559
1309-44	1	0.018	ND	--	--	--	--
1310-45	**1**	0.018	0.596	0.00060	16%	0.003	0.1741
1310-46	**1**	0.018	0.602	0.00060	16%	0.003	0.1716
1310-47	**1**	0.035	0.243	0.00024	7%	0.003	0.0986
1310-48	**1**	0.035	ND	--	--	--	--
1310-49	**1**	0.035	ND	--	--	--	--
1309-50	**1**	0.063	ND	--	--	--	--
1310-51	**1**	0.063	ND	--	--	--	--
1310-52	**1**	0.063	ND	--	--	--	--
1310-53	**1**	0.126	ND	--	--	--	--
1310-54	**1**	0.125	ND	--	--	--	--
1310-55	**1**	0.126	ND	--	--	--	--
1309-56	**1**	0.25	ND	--	--	--	--
1310-57	**1**	0.25	ND	--	--	--	--
1310-58	**1**	0.25	ND	--	--	--	--
1310-59	**1**	0.51	ND	--	--	--	--
1310-60	**1**	0.50	ND	--	--	--	--
1310-61	**1**	0.50	ND	--	--	--	--
1309-62	**2**	1.26	ND	--	--	--	--
1310-63	**2**	1.25	ND	--	--	--	--
1310-64	**2**	1.26	ND	--	--	--	--
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	ND	--	--	--	--
1310-70	**2**	5.1	ND	--	--	--	--
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	ND	--	--	--	--
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Anthracene

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	0.315	0.00032	0.00034	0.00003
1310-78	1	0	0.356	0.00036		
1309-79	**2**	0	ND	**--**	0.00081	--
1310-80	**2**	0	1.61	0.00161		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	ND	--	--	--	--
1310-42	**1**	0.010	0.107	0.00011	32%	0.00023	0.0229
1310-43	**1**	0.010	ND	--	--	--	--
1309-44	1	0.018	ND	--	--	--	--
1310-45	**1**	0.018	ND	--	--	--	--
1310-46	**1**	0.018	ND	--	--	--	--
1310-47	**1**	0.035	ND	--	--	--	--
1310-48	**1**	0.035	ND	--	--	--	--
1310-49	**1**	0.035	ND	--	--	--	--
1309-50	**1**	0.063	ND	--	--	--	--
1310-51	**1**	0.063	ND	--	--	--	--
1310-52	**1**	0.063	ND	--	--	--	--
1310-53	**1**	0.126	ND	--	--	--	--
1310-54	**1**	0.125	ND	--	--	--	--
1310-55	**1**	0.126	ND	--	--	--	--
1309-56	**1**	0.25	ND	--	--	--	--
1310-57	**1**	0.25	ND	--	--	--	--
1310-58	**1**	0.25	ND	--	--	--	--
1310-59	**1**	0.51	ND	--	--	--	--
1310-60	**1**	0.50	ND	--	--	--	--
1310-61	**1**	0.50	ND	--	--	--	--
1309-62	**2**	1.26	ND	--	--	--	--
1310-63	**2**	1.25	ND	--	--	--	--
1310-64	**2**	1.26	ND	--	--	--	--
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	ND	--	--	--	--
1310-70	**2**	5.1	ND	--	--	--	--
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	ND	--	--	--	--
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Low starting concentrations → non-detect at lowest carbon doses

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	ND	--	--	--
1310-78	1	0	ND	--		
1309-79	**2**	0	ND	--	--	--
1310-80	**2**	0	ND	--		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	ND	--	--	--	--
1310-42	**1**	0.010	ND	--	--	--	--
1310-43	**1**	0.010	ND	--	--	--	--
1309-44	1	0.018	ND	--	--	--	--
1310-45	**1**	0.018	ND	--	--	--	--
1310-46	**1**	0.018	ND	--	--	--	--
1310-47	**1**	0.035	ND	--	--	--	--
1310-48	**1**	0.035	ND	--	--	--	--
1310-49	**1**	0.035	ND	--	--	--	--
1309-50	**1**	0.063	ND	--	--	--	--
1310-51	**1**	0.063	ND	--	--	--	--
1310-52	**1**	0.063	ND	--	--	--	--
1310-53	**1**	0.126	ND	--	--	--	--
1310-54	**1**	0.125	ND	--	--	--	--
1310-55	**1**	0.126	ND	--	--	--	--
1309-56	**1**	0.25	ND	--	--	--	--
1310-57	**1**	0.25	ND	--	--	--	--
1310-58	**1**	0.25	ND	--	--	--	--
1310-59	**1**	0.51	ND	--	--	--	--
1310-60	**1**	0.50	ND	--	--	--	--
1310-61	**1**	0.50	ND	--	--	--	--
1309-62	**2**	1.26	ND	--	--	--	--
1310-63	**2**	1.25	ND	--	--	--	--
1310-64	**2**	1.26	ND	--	--	--	--
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	ND	--	--	--	--
1310-70	**2**	5.1	ND	--	--	--	--
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	ND	--	--	--	--
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Non-detect in all test bottles and controls

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	ND	--	--	--
1310-78	1	0	ND	--		
1309-79	**2**	0	ND	--	--	--
1310-80	**2**	0	ND	--		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	ND	--	--	--	--
1310-42	**1**	0.010	ND	--	--	--	--
1310-43	**1**	0.010	ND	--	--	--	--
1309-44	1	0.018	ND	--	--	--	--
1310-45	**1**	0.018	ND	--	--	--	--
1310-46	**1**	0.018	ND	--	--	--	--
1310-47	**1**	0.035	ND	--	--	--	--
1310-48	**1**	0.035	ND	--	--	--	--
1310-49	**1**	0.035	ND	--	--	--	--
1309-50	**1**	0.063	ND	--	--	--	--
1310-51	**1**	0.063	ND	--	--	--	--
1310-52	**1**	0.063	ND	--	--	--	--
1310-53	**1**	0.126	ND	--	--	--	--
1310-54	**1**	0.125	ND	--	--	--	--
1310-55	**1**	0.126	ND	--	--	--	--
1309-56	**1**	0.25	ND	--	--	--	--
1310-57	**1**	0.25	ND	--	--	--	--
1310-58	**1**	0.25	ND	--	--	--	--
1310-59	**1**	0.51	ND	--	--	--	--
1310-60	**1**	0.50	ND	--	--	--	--
1310-61	**1**	0.50	ND	--	--	--	--
1309-62	**2**	1.26	ND	--	--	--	--
1310-63	**2**	1.25	ND	--	--	--	--
1310-64	**2**	1.26	ND	--	--	--	--
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	ND	--	--	--	--
1310-70	**2**	5.1	ND	--	--	--	--
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	ND	--	--	--	--
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Non-detect in all test bottles and controls

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	ND	--	--	--
1310-78	1	0	ND	--		
1309-79	**2**	0	ND	--	--	--
1310-80	**2**	0	ND	--		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	ND	--	--	--	--
1310-42	**1**	0.010	ND	--	--	--	--
1310-43	**1**	0.010	ND	--	--	--	--
1309-44	1	0.018	ND	--	--	--	--
1310-45	**1**	0.018	ND	--	--	--	--
1310-46	**1**	0.018	ND	--	--	--	--
1310-47	**1**	0.035	ND	--	--	--	--
1310-48	**1**	0.035	ND	--	--	--	--
1310-49	**1**	0.035	ND	--	--	--	--
1309-50	**1**	0.063	ND	--	--	--	--
1310-51	**1**	0.063	ND	--	--	--	--
1310-52	**1**	0.063	ND	--	--	--	--
1310-53	**1**	0.126	ND	--	--	--	--
1310-54	**1**	0.125	ND	--	--	--	--
1310-55	**1**	0.126	ND	--	--	--	--
1309-56	**1**	0.25	ND	--	--	--	--
1310-57	**1**	0.25	ND	--	--	--	--
1310-58	**1**	0.25	ND	--	--	--	--
1310-59	**1**	0.51	ND	--	--	--	--
1310-60	**1**	0.50	ND	--	--	--	--
1310-61	**1**	0.50	ND	--	--	--	--
1309-62	**2**	1.26	ND	--	--	--	--
1310-63	**2**	1.25	ND	--	--	--	--
1310-64	**2**	1.26	ND	--	--	--	--
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	ND	--	--	--	--
1310-70	**2**	5.1	ND	--	--	--	--
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	ND	--	--	--	--
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Non-detect in all test bottles and controls

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	ND	--	--	--
1310-78	1	0	ND	--		
1309-79	**2**	0	ND	--	--	--
1310-80	**2**	0	ND	--		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	ND	--	--	--	--
1310-42	**1**	0.010	ND	--	--	--	--
1310-43	**1**	0.010	ND	--	--	--	--
1309-44	1	0.018	ND	--	--	--	--
1310-45	**1**	0.018	ND	--	--	--	--
1310-46	**1**	0.018	ND	--	--	--	--
1310-47	**1**	0.035	ND	--	--	--	--
1310-48	**1**	0.035	ND	--	--	--	--
1310-49	**1**	0.035	ND	--	--	--	--
1309-50	**1**	0.063	ND	--	--	--	--
1310-51	**1**	0.063	ND	--	--	--	--
1310-52	**1**	0.063	ND	--	--	--	--
1310-53	**1**	0.126	ND	--	--	--	--
1310-54	**1**	0.125	ND	--	--	--	--
1310-55	**1**	0.126	ND	--	--	--	--
1309-56	**1**	0.25	ND	--	--	--	--
1310-57	**1**	0.25	ND	--	--	--	--
1310-58	**1**	0.25	ND	--	--	--	--
1310-59	**1**	0.51	ND	--	--	--	--
1310-60	**1**	0.50	ND	--	--	--	--
1310-61	**1**	0.50	ND	--	--	--	--
1309-62	**2**	1.26	ND	--	--	--	--
1310-63	**2**	1.25	ND	--	--	--	--
1310-64	**2**	1.26	ND	--	--	--	--
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	ND	--	--	--	--
1310-70	**2**	5.1	ND	--	--	--	--
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	ND	--	--	--	--
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Non-detect in all test bottles and controls

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	ND	--	--	--
1310-78	1	0	ND	--		
1309-79	**2**	0	ND	--	--	--
1310-80	**2**	0	ND	--		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	ND	--	--	--	--
1310-42	**1**	0.010	ND	--	--	--	--
1310-43	**1**	0.010	ND	--	--	--	--
1309-44	1	0.018	ND	--	--	--	--
1310-45	**1**	0.018	ND	--	--	--	--
1310-46	**1**	0.018	ND	--	--	--	--
1310-47	**1**	0.035	ND	--	--	--	--
1310-48	**1**	0.035	ND	--	--	--	--
1310-49	**1**	0.035	ND	--	--	--	--
1309-50	**1**	0.063	ND	--	--	--	--
1310-51	**1**	0.063	ND	--	--	--	--
1310-52	**1**	0.063	ND	--	--	--	--
1310-53	**1**	0.126	ND	--	--	--	--
1310-54	**1**	0.125	ND	--	--	--	--
1310-55	**1**	0.126	ND	--	--	--	--
1309-56	**1**	0.25	ND	--	--	--	--
1310-57	**1**	0.25	ND	--	--	--	--
1310-58	**1**	0.25	ND	--	--	--	--
1310-59	**1**	0.51	ND	--	--	--	--
1310-60	**1**	0.50	ND	--	--	--	--
1310-61	**1**	0.50	ND	--	--	--	--
1309-62	**2**	1.26	ND	--	--	--	--
1310-63	**2**	1.25	ND	--	--	--	--
1310-64	**2**	1.26	ND	--	--	--	--
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	ND	--	--	--	--
1310-70	**2**	5.1	ND	--	--	--	--
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	ND	--	--	--	--
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Non-detect in all test bottles and controls

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**0.163**	0.00	0.000	0.000
1310-78	1	0	0.163	0.00		
1309-79	**2**	0	**0.162**	0.00	0.000	0.000
1310-80	**2**	0	0.236	0.00		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	ND	--	--	--	--
1310-42	**1**	0.010	ND	--	--	--	--
1310-43	**1**	0.010	ND	--	--	--	--
1309-44	1	0.018	ND	--	--	--	--
1310-45	**1**	0.018	ND	--	--	--	--
1310-46	**1**	0.018	ND	--	--	--	--
1310-47	**1**	0.035	ND	--	--	--	--
1310-48	**1**	0.035	ND	--	--	--	--
1310-49	**1**	0.035	ND	--	--	--	--
1309-50	**1**	0.063	ND	--	--	--	--
1310-51	**1**	0.063	ND	--	--	--	--
1310-52	**1**	0.063	ND	--	--	--	--
1310-53	**1**	0.126	ND	--	--	--	--
1310-54	**1**	0.125	ND	--	--	--	--
1310-55	**1**	0.126	ND	--	--	--	--
1309-56	**1**	0.25	ND	--	--	--	--
1310-57	**1**	0.25	ND	--	--	--	--
1310-58	**1**	0.25	ND	--	--	--	--
1310-59	**1**	0.51	ND	--	--	--	--
1310-60	**1**	0.50	ND	--	--	--	--
1310-61	**1**	0.50	ND	--	--	--	--
1309-62	**2**	1.26	ND	--	--	--	--
1310-63	**2**	1.25	ND	--	--	--	--
1310-64	**2**	1.26	ND	--	--	--	--
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	0.215	0.00022	108%	-0.000016	-0.000003
1310-70	**2**	5.1	0.175	0.00018	88%	0.000024	0.000005
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	0.124	0.00012	62%	0.000075	0.000007
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Detection at higher doses only may reflect analytical carryover.

Fluorene

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**1.62**	0.00162	0.00165	0.00004
1310-78	1	0	1.68	0.00168		
1309-79	**2**	0	**1.66**	0.00166	0.00171	0.00007
1310-80	**2**	0	1.76	0.00176		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	0.172	0.0002	10%	0.00148	0.1443
1310-42	**1**	0.010	0.213	0.0002	13%	0.00144	0.1443
1310-43	**1**	0.010	0.201	0.0002	12%	0.00145	0.1405
1309-44	1	0.018	ND	--	--	--	--
1310-45	**1**	0.018	ND	--	--	--	--
1310-46	**1**	0.018	ND	--	--	--	--
1310-47	**1**	0.035	ND	--	--	--	--
1310-48	**1**	0.035	ND	--	--	--	--
1310-49	**1**	0.035	ND	--	--	--	--
1309-50	**1**	0.063	ND	--	--	--	--
1310-51	**1**	0.063	ND	--	--	--	--
1310-52	**1**	0.063	ND	--	--	--	--
1310-53	**1**	0.126	ND	--	--	--	--
1310-54	**1**	0.125	ND	--	--	--	--
1310-55	**1**	0.126	ND	--	--	--	--
1309-56	**1**	0.25	ND	--	--	--	--
1310-57	**1**	0.25	ND	--	--	--	--
1310-58	**1**	0.25	ND	--	--	--	--
1310-59	**1**	0.51	ND	--	--	--	--
1310-60	**1**	0.50	ND	--	--	--	--
1310-61	**1**	0.50	ND	--	--	--	--
1309-62	**2**	1.26	ND	--	--	--	--
1310-63	**2**	1.25	ND	--	--	--	--
1310-64	**2**	1.26	ND	--	--	--	--
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	0.444	0.0004	26%	0.001	0.0003
1310-70	**2**	5.1	0.248	0.0002	15%	0.001	0.0003
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	0.166	0.0002	10%	0.002	0.0002
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	ND	--	--	--
1310-78	1	0	ND	--		
1309-79	**2**	0	ND	--	--	--
1310-80	**2**	0	ND	--		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	ND	--	--	--	--
1310-42	**1**	0.010	ND	--	--	--	--
1310-43	**1**	0.010	ND	--	--	--	--
1309-44	1	0.018	ND	--	--	--	--
1310-45	**1**	0.018	ND	--	--	--	--
1310-46	**1**	0.018	ND	--	--	--	--
1310-47	**1**	0.035	ND	--	--	--	--
1310-48	**1**	0.035	ND	--	--	--	--
1310-49	**1**	0.035	ND	--	--	--	--
1309-50	**1**	0.063	ND	--	--	--	--
1310-51	**1**	0.063	ND	--	--	--	--
1310-52	**1**	0.063	ND	--	--	--	--
1310-53	**1**	0.126	ND	--	--	--	--
1310-54	**1**	0.125	ND	--	--	--	--
1310-55	**1**	0.126	ND	--	--	--	--
1309-56	**1**	0.25	ND	--	--	--	--
1310-57	**1**	0.25	ND	--	--	--	--
1310-58	**1**	0.25	ND	--	--	--	--
1310-59	**1**	0.51	ND	--	--	--	--
1310-60	**1**	0.50	ND	--	--	--	--
1310-61	**1**	0.50	ND	--	--	--	--
1309-62	**2**	1.26	ND	--	--	--	--
1310-63	**2**	1.25	ND	--	--	--	--
1310-64	**2**	1.26	ND	--	--	--	--
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	ND	--	--	--	--
1310-70	**2**	5.1	ND	--	--	--	--
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	ND	--	--	--	--
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Non-detect in all test bottles and controls

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**1.98**	0.00	0.002	0.000
1310-78	1	0	2.12	0.00		
1309-79	**2**	0	**2.02**	0.00	0.001	0.001
1310-80	**2**	0	0.647	0.00		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	0.992	0.0010	48%	0.001	0.1033
1310-42	**1**	0.010	1.03	0.0010	50%	0.001	0.1024
1310-43	**1**	0.010	1.01	0.0010	49%	0.001	0.1008
1309-44	1	0.018	0.84	0.0008	41%	0.001	0.0671
1310-45	**1**	0.018	0.927	0.0009	45%	0.001	0.0640
1310-46	**1**	0.018	0.958	0.0010	47%	0.001	0.0615
1310-47	**1**	0.035	0.893	0.0009	44%	0.001	0.0335
1310-48	**1**	0.035	0.954	0.0010	47%	0.001	0.0312
1310-49	**1**	0.035	0.94	0.0009	46%	0.001	0.0318
1309-50	**1**	0.063	0.85	0.0009	41%	0.001	0.0190
1310-51	**1**	0.063	0.921	0.0009	45%	0.001	0.0180
1310-52	**1**	0.063	0.9	0.0009	44%	0.001	0.0183
1310-53	**1**	0.126	0.825	0.0008	40%	0.001	0.0097
1310-54	**1**	0.125	0.765	0.0008	37%	0.001	0.0103
1310-55	**1**	0.126	0.824	0.0008	40%	0.001	0.0098
1309-56	**1**	0.25	0.44	0.0004	21%	0.002	0.0064
1310-57	**1**	0.25	0.469	0.0005	23%	0.002	0.0063
1310-58	**1**	0.25	0.476	0.0005	23%	0.002	0.0063
1310-59	**1**	0.51	0.13	0.0001	6.3%	0.002	0.0038
1310-60	**1**	0.50	0.13	0.0001	6.3%	0.002	0.0038
1310-61	**1**	0.50	0.122	0.0001	6.0%	0.002	0.0038
1309-62	**2**	1.26	ND	--	--	--	--
1310-63	**2**	1.25	ND	--	--	--	--
1310-64	**2**	1.26	ND	--	--	--	--
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	0.793	0.0008	59%	0.001	0.0001
1310-70	**2**	5.1	0.512	0.0005	38%	0.001	0.0002
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	0.372	0.0004	28%	0.001	0.0001
1310-73	2	10.1	0.365	0.0004	27%	0.001	0.0001
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	0.267	0.0003	20%	0.001	0.0000
1310-76	2	52.7	0.249	0.0002	19%	0.001	0.0000

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**0.0953**	0.000095	0.000101	0.000008
1310-78	1	0	0.106	0.000106		
1309-79	**2**	0	**ND**	--	0.000161	--
1310-80	**2**	0	0.161	0.000161		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	ND	--	--	--	--
1310-42	**1**	0.010	ND	--	--	--	--
1310-43	**1**	0.010	ND	--	--	--	--
1309-44	1	0.018	ND	--	--	--	--
1310-45	**1**	0.018	ND	--	--	--	--
1310-46	**1**	0.018	ND	--	--	--	--
1310-47	**1**	0.035	ND	--	--	--	--
1310-48	**1**	0.035	ND	--	--	--	--
1310-49	**1**	0.035	ND	--	--	--	--
1309-50	**1**	0.063	ND	--	--	--	--
1310-51	**1**	0.063	ND	--	--	--	--
1310-52	**1**	0.063	ND	--	--	--	--
1310-53	**1**	0.126	ND	--	--	--	--
1310-54	**1**	0.125	ND	--	--	--	--
1310-55	**1**	0.126	ND	--	--	--	--
1309-56	**1**	0.25	ND	--	--	--	--
1310-57	**1**	0.25	ND	--	--	--	--
1310-58	**1**	0.25	ND	--	--	--	--
1310-59	**1**	0.51	ND	--	--	--	--
1310-60	**1**	0.50	ND	--	--	--	--
1310-61	**1**	0.50	ND	--	--	--	--
1309-62	**2**	1.26	ND	--	--	--	--
1310-63	**2**	1.25	ND	--	--	--	--
1310-64	**2**	1.26	ND	--	--	--	--
1310-65	**2**	2.5	ND	--	--	--	--
1310-66	**2**	2.5	ND	--	--	--	--
1310-67	**2**	2.5	ND	--	--	--	--
1309-68	**2**	5.0	ND	--	--	--	--
1310-69	**2**	5.1	0.176	0.000176	109.32%	-0.000015	-0.000003
1310-70	**2**	5.1	0.121	0.000121	75.16%	0.000040	0.000008
1309-71	**2**	10.1	ND	--	--	--	--
1310-72	2	10.1	0.101	0.000101	62.73%	0.000060	0.000006
1310-73	2	10.1	ND	--	--	--	--
1310-74	2	51.8	ND	--	--	--	--
1310-75	2	51.9	ND	--	--	--	--
1310-76	2	52.7	ND	--	--	--	--

Detection at higher doses only may reflect analytical carryover.

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**1660**	1580	113
1310-78	1	0	**1500**		
1309-79	**2**	0	**1610**	1545	92
1310-80	**2**	0	**1480**		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	1790	113%	-210	-20501
1310-42	**1**	0.010	1740	110%	-160	-16064
1310-43	**1**	0.010	1730	109%	-150	-14540
1309-44	1	0.018	1730	109%	-150	-8318
1310-45	**1**	0.018	1720	109%	-140	-7979
1310-46	**1**	0.018	1710	108%	-130	-7318
1310-47	**1**	0.035	1750	111%	-170	-4919
1310-48	**1**	0.035	1710	108%	-130	-3704
1310-49	**1**	0.035	1720	109%	-140	-4008
1309-50	**1**	0.063	1660	105%	-80	-1270
1310-51	**1**	0.063	1800	114%	-220	-3509
1310-52	**1**	0.063	1820	115%	-240	-3829
1310-53	**1**	0.126	1570	99%	10	79
1310-54	**1**	0.125	1640	104%	-60	-480
1310-55	**1**	0.126	1720	109%	-140	-1115
1309-56	**1**	0.25	1670	106%	-90	-357
1310-57	**1**	0.25	1570	99%	10	40
1310-58	**1**	0.25	1710	108%	-130	-516
1310-59	**1**	0.51	1720	109%	-140	-277
1310-60	**1**	0.50	1800	114%	-220	-437
1310-61	**1**	0.50	1670	106%	-90	-179
1309-62	**2**	1.26	1550	100%	-5	-4
1310-63	**2**	1.25	1540	100%	5	4
1310-64	**2**	1.26	1550	100%	-5	-4
1310-65	**2**	2.5	1420	92%	125	50
1310-66	**2**	2.5	1400	91%	145	57
1310-67	**2**	2.5	1410	91%	135	54
1309-68	**2**	5.0	1440	93%	105	21
1310-69	**2**	5.1	1360	88%	185	37
1310-70	**2**	5.1	1340	87%	205	41
1309-71	**2**	10.1	1350	87%	195	19
1310-72	2	10.1	1290	83%	255	25
1310-73	2	10.1	1230	80%	315	31
1310-74	2	51.8	1110	72%	435	8
1310-75	2	51.9	1160	75%	385	7
1310-76	2	52.7	1130	73%	415	8

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
1309-77	**1**	0	**6610**	6480	184
1310-78	1	0	6350		
1309-79	**2**	0	**6370**	6245	177
1310-80	**2**	0	6120		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1310-41	1	0.010	6820	105%	-340	-33192
1310-42	**1**	0.010	6590	102%	-110	-11044
1310-43	**1**	0.010	6590	102%	-110	-10663
1309-44	1	0.018	6140	95%	340	18853
1310-45	**1**	0.018	6590	102%	-110	-6269
1310-46	**1**	0.018	6590	102%	-110	-6192
1310-47	**1**	0.035	6120	94%	360	10417
1310-48	**1**	0.035	6350	98%	130	3704
1310-49	**1**	0.035	6350	98%	130	3722
1309-50	**1**	0.063	6140	95%	340	5396
1310-51	**1**	0.063	6120	94%	360	5742
1310-52	**1**	0.063	6350	98%	130	2074
1310-53	**1**	0.126	5880	91%	600	4765
1310-54	**1**	0.125	6120	94%	360	2879
1310-55	**1**	0.126	5880	91%	600	4777
1309-56	**1**	0.25	5660	87%	820	3251
1310-57	**1**	0.25	6350	98%	130	515
1310-58	**1**	0.25	6350	98%	130	516
1310-59	**1**	0.51	6120	94%	360	712
1310-60	**1**	0.50	6120	94%	360	715
1310-61	**1**	0.50	6350	98%	130	258
1309-62	**2**	1.26	5660	91%	585	465
1310-63	**2**	1.25	5640	90%	605	483
1310-64	**2**	1.26	5410	87%	835	663
1310-65	**2**	2.5	5410	87%	835	332
1310-66	**2**	2.5	5640	90%	605	239
1310-67	**2**	2.5	6120	98%	125	50
1309-68	**2**	5.0	4960	79%	1285	255
1310-69	**2**	5.1	5410	87%	835	165
1310-70	**2**	5.1	5410	87%	835	165
1309-71	**2**	10.1	5190	83%	1055	104
1310-72	2	10.1	5170	83%	1075	106
1310-73	2	10.1	5170	83%	1075	106
1310-74	2	51.8	4700	75%	1545	30
1310-75	2	51.9	4700	75%	1545	30
1310-76	2	52.7	4940	79%	1305	25

Controls

Sample ID	Spiked Batch	Bottle Weight		Carbon Mass	Gross Weight	Net Weight	Water Volume	Carbon Dose
(Bottle) #	**Batch #**	**Empty (g)**	**Full (g)**	**M (g)**	**Water + Carbon (g)**	**Water (g)**	**V (L)**	**m (g/L)**
1309-77	**1**	1109	3120	0	2011	2011.00	1.991	0
1310-78	1	1108	3121	0	2013	2013.00	1.993	0
1309-79	**2**	1110	3117	0	2007	2007.00	1.987	0
1310-80	**2**	1108	3122	0	2014	2014.00	1.994	0

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Bottle Weight		Carbon Mass	Gross Weight	Net Weight	Water Volume	Carbon Dose
(Bottle) #	**Batch #**	**Empty (g)**	**Full (g)**	**M (g)**	**Water + Carbon (g)**	**Water (g)**	**V (L)**	**m (g/L)**
1310-41	1	1110	3082	0.020	1972	1971.98	1.952	0.010
1310-42	**1**	1109	3127	0.020	2018	2017.98	1.998	0.010
1310-43	**1**	1109	3116	0.020	2007	2006.98	1.987	0.010
1309-44	1	1110	3115	0.036	2005	2004.96	1.985	0.018
1310-45	**1**	1109	3118	0.035	2009	2008.97	1.989	0.018
1310-46	**1**	1110	3117	0.035	2007	2006.96	1.987	0.018
1310-47	**1**	1110	3115	0.069	2005	2004.93	1.985	0.035
1310-48	**1**	1110	3116	0.070	2006	2005.93	1.986	0.035
1310-49	**1**	1110	3117	0.069	2007	2006.93	1.987	0.035
1309-50	**1**	1109	3116	0.125	2007	2006.87	1.987	0.063
1310-51	**1**	1109	3118	0.125	2009	2008.88	1.989	0.063
1310-52	**1**	1110	3118	0.125	2008	2007.88	1.988	0.063
1310-53	**1**	1108	3112	0.25	2004	2003.75	1.984	0.126
1310-54	**1**	1110	3124	0.25	2014	2013.75	1.994	0.125
1310-55	**1**	1109	3114	0.25	2005	2004.75	1.985	0.126
1309-56	**1**	1109	3116	0.50	2007	2006.50	1.987	0.252
1310-57	**1**	1110	3114	0.50	2004	2003.50	1.984	0.253
1310-58	**1**	1109	3115	0.50	2006	2005.50	1.986	0.252
1310-59	**1**	1108	3109	1.0	2001	2000.00	1.980	0.506
1310-60	**1**	1108	3117	1.0	2009	2008.00	1.988	0.504
1310-61	**1**	1110	3112	1.0	2002	2001.00	1.981	0.504
1309-62	**2**	1108	3117	2.5	2009	2006.50	1.987	1.259
1310-63	**2**	1109	3125	2.5	2016	2013.50	1.994	1.254
1310-64	**2**	1108	3115	2.5	2007	2004.50	1.985	1.260
1310-65	**2**	1110	3118	5.0	2008	2003.00	1.983	2.519
1310-66	**2**	1109	3117	5.0	2008	2002.99	1.983	2.527
1310-67	**2**	1108	3126	5.0	2018	2013.00	1.993	2.509
1309-68	**2**	1109	3121	10.0	2012	2002.00	1.982	5.046
1310-69	**2**	1109	3118	10.0	2009	1999.00	1.979	5.053
1310-70	**2**	1110	3116	10.0	2006	1996.00	1.976	5.060
1309-71	**2**	1110	3123	20.0	2013	1993.01	1.973	10.133
1310-72	2	1110	3126	20.0	2016	1996.01	1.976	10.117
1310-73	2	1109	3122	20.0	2013	1993.00	1.973	10.135
1310-74	2	1110	3161	100	2051	1951.00	1.932	51.769
1310-75	2	1109	3155	100	2046	1946.01	1.927	51.898
1310-76	2	1110	3161	102	2051	1949.31	1.930	52.687

Test Water Density	**1010 g/L**

ATTACHMENT 3

EXPERIMENTAL DATA
WASTEBED B – HARBOR BROOK WEST AREA – ADJUSTED PH

(PROVIDED ON CD ON ATTACHMENT TAB)

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration				
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**	
HB-5165-37	**1**	0	**1490**	1.49	1.465	0.035	
HB-5165-38	1	0	1440	1.44			
HB-5166-39	**2**	0	**1340**	1.34	1.410	0.099	#DIV/0!
HB-5166-40	**2**	0	1480	1.48			

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5165-01	1	0.0104	1480	1.48	101%	-0.015	-1.4460
HB-5165-02	**1**	0.0107	1530	1.53	104%	-0.065	-6.1031
HB-5165-03	**1**	0.0107	1490	1.49	102%	-0.025	-2.3445
HB-5165-04	1	0.0207	1450	1.45	99%	0.015	0.7248
HB-5165-05	**1**	0.0202	1430	1.43	98%	0.035	1.7344
HB-5165-06	**1**	0.0203	1430	1.43	98%	0.035	1.7275
HB-5165-07	**1**	0.0408	1420	1.42	97%	0.045	1.1020
HB-5165-08	**1**	0.0411	1420	1.42	97%	0.045	1.0947
HB-5165-09	**1**	0.0397	995	0.995	68%	0.470	11.8463
HB-5165-10	**1**	0.0617	1400	1.4	96%	0.065	1.0529
HB-5165-11	**1**	0.0617	1440	1.44	98%	0.025	0.4051
HB-5165-12	**1**	0.0608	1420	1.42	97%	0.045	0.7401
HB-5165-13	**1**	0.104	1310	1.31	89%	0.155	1.4943
HB-5165-14	**1**	0.104	1260	1.26	86%	0.205	1.9744
HB-5165-15	**1**	0.103	1300	1.3	89%	0.165	1.5977
HB-5165-16	**1**	0.201	955	0.955	65%	0.510	2.5331
HB-5165-17	**1**	0.206	1000	1.00	68%	0.465	2.2609
HB-5165-18	**1**	0.206	1010	1.01	69%	0.455	2.2058
HB-5165-19	**1**	0.403	315	0.315	22%	1.150	2.8518
HB-5165-20	**1**	0.404	348	0.35	24%	1.117	2.7637
HB-5165-21	**1**	0.407	311	0.311	21%	1.154	2.8386
HB-5166-22	**2**	1.008	55.9	0.056	4.0%	1.354	1.3428
HB-5166-23	**2**	1.031	50.7	0.051	3.6%	1.359	1.3188
HB-5166-24	**2**	1.021	50.2	0.050	3.6%	1.360	1.3312
HB-5166-25	**2**	2.03	7.4	0.0074	0.52%	1.403	0.6900
HB-5166-26	**2**	2.02	7.5	0.0075	0.53%	1.403	0.6934
HB-5166-27	**2**	2.03	7.0	0.0070	0.50%	1.403	0.6905
HB-5166-28	**2**	5.08	0.53	0.00053	0.04%	1.409	0.2773
HB-5166-29	**2**	5.28	0.49	0.00049	0.03%	1.410	0.2669
HB-5166-30	**2**	5.04	0.51	0.00051	0.04%	1.409	0.2794
HB-5166-31	**2**	10.15	ND	--	--	--	--
HB-5166-32	2	10.16	ND	--	--	--	--
HB-5166-33	2	10.13	ND	--	--	--	--
HB-5166-34	2	25.6	ND	--	--	--	--
HB-5166-35	2	25.6	ND	--	--	--	--
HB-5166-36	2	25.5	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration				
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**	
HB-5165-37	**1**	0	**778**	0.778	0.771	0.011	
HB-5165-38	1	0	763	0.763			
HB-5166-39	**2**	0	**555**	0.555	0.561	0.008	#DIV/0!
HB-5166-40	**2**	0	566	0.566			

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5165-01	1	0.0104	800	0.8	104%	-0.030	-2.8438
HB-5165-02	**1**	0.0107	791	0.791	103%	-0.021	-1.9248
HB-5165-03	**1**	0.0107	796	0.796	103%	-0.026	-2.3913
HB-5165-04	1	0.0207	636	0.636	83%	0.135	6.4991
HB-5165-05	**1**	0.0202	646	0.646	84%	0.125	6.1694
HB-5165-06	**1**	0.0203	607	0.607	79%	0.164	8.0697
HB-5165-07	**1**	0.0408	531	0.531	69%	0.240	5.8650
HB-5165-08	**1**	0.0411	569	0.569	74%	0.202	4.9019
HB-5165-09	**1**	0.0397	504	0.504	65%	0.267	6.7171
HB-5165-10	**1**	0.0617	482	0.482	63%	0.289	4.6730
HB-5165-11	**1**	0.0617	461	0.461	60%	0.310	5.0152
HB-5165-12	**1**	0.0608	488	0.488	63%	0.283	4.6460
HB-5165-13	**1**	0.104	401	0.401	52%	0.370	3.5622
HB-5165-14	**1**	0.104	381	0.38	49%	0.390	3.7514
HB-5165-15	**1**	0.103	387	0.387	50%	0.384	3.7135
HB-5165-16	**1**	0.201	113	0.113	15%	0.658	3.2657
HB-5165-17	**1**	0.206	105	0.11	14%	0.666	3.2358
HB-5165-18	**1**	0.206	105	0.105	14%	0.666	3.2263
HB-5165-19	**1**	0.403	18.1	0.0181	2.3%	0.752	1.8658
HB-5165-20	**1**	0.404	19.5	0.02	2.5%	0.751	1.8582
HB-5165-21	**1**	0.407	17.4	0.0174	2.3%	0.753	1.8525
HB-5166-22	**2**	1.008	0.94	0.00094	0.17%	0.560	0.5549
HB-5166-23	**2**	1.031	0.92	0.0009	0.16%	0.560	0.5429
HB-5166-24	**2**	1.021	0.89	0.00089	0.16%	0.560	0.5478
HB-5166-25	**2**	2.03	ND	--	--	--	--
HB-5166-26	**2**	2.02	ND	--	--	--	--
HB-5166-27	**2**	2.03	ND	--	--	--	--
HB-5166-28	**2**	5.08	ND	--	--	--	--
HB-5166-29	**2**	5.28	ND	--	--	--	--
HB-5166-30	**2**	5.04	ND	--	--	--	--
HB-5166-31	**2**	10.15	ND	--	--	--	--
HB-5166-32	2	10.16	ND	--	--	--	--
HB-5166-33	2	10.13	ND	--	--	--	--
HB-5166-34	2	25.6	ND	--	--	--	--
HB-5166-35	2	25.6	ND	--	--	--	--
HB-5166-36	2	25.5	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration				
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**	
HB-5165-37	**1**	0	**1592**	1.592	1.617	0.035	
HB-5165-38	1	0	1641	1.641			
HB-5166-39	**2**	0	**1256**	1.256	1.291	0.049	#DIV/0!
HB-5166-40	**2**	0	1326	1.326			

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5165-01	1	0.0104	1569	1.569	97%	0.048	4.5790
HB-5165-02	**1**	0.0107	1480	1.48	92%	0.137	12.8166
HB-5165-03	**1**	0.0107	1572	1.572	97%	0.045	4.1731
HB-5165-04	1	0.0207	1141	1.141	71%	0.476	22.9765
HB-5165-05	**1**	0.0202	1121	1.121	69%	0.496	24.5537
HB-5165-06	**1**	0.0203	1100	1.1	68%	0.517	25.4925
HB-5165-07	**1**	0.0408	680	0.68	42%	0.937	22.9333
HB-5165-08	**1**	0.0411	712	0.712	44%	0.905	22.0036
HB-5165-09	**1**	0.0397	605	0.605	37%	1.012	25.4948
HB-5165-10	**1**	0.0617	398	0.398	25%	1.219	19.7369
HB-5165-11	**1**	0.0617	355	0.355	22%	1.262	20.4417
HB-5165-12	**1**	0.0608	416	0.416	26%	1.201	19.7434
HB-5165-13	**1**	0.104	154.9	0.1549	9.6%	1.462	14.0907
HB-5165-14	**1**	0.104	145.7	0.15	9.0%	1.471	14.1656
HB-5165-15	**1**	0.103	137.4	0.1374	8.5%	1.479	14.3223
HB-5165-16	**1**	0.201	21.5	0.0215	1.3%	1.595	7.9220
HB-5165-17	**1**	0.206	18.3	0.02	1.1%	1.598	7.7707
HB-5165-18	**1**	0.206	18.7	0.0187	1.2%	1.598	7.7460
HB-5165-19	**1**	0.403	2.3	0.00225	0.14%	1.614	4.0030
HB-5165-20	**1**	0.404	2.64	0.00264	0.16%	1.614	3.9931
HB-5165-21	**1**	0.407	2.32	0.00232	0.14%	1.614	3.9705
HB-5166-22	**2**	1.008	ND	--	--	--	--
HB-5166-23	**2**	1.031	ND	--	--	--	--
HB-5166-24	**2**	1.021	ND	--	--	--	--
HB-5166-25	**2**	2.03	ND	--	--	--	--
HB-5166-26	**2**	2.02	ND	--	--	--	--
HB-5166-27	**2**	2.03	ND	--	--	--	--
HB-5166-28	**2**	5.08	ND	--	--	--	--
HB-5166-29	**2**	5.28	ND	--	--	--	--
HB-5166-30	**2**	5.04	ND	--	--	--	--
HB-5166-31	**2**	10.15	ND	--	--	--	--
HB-5166-32	2	10.16	ND	--	--	--	--
HB-5166-33	2	10.13	ND	--	--	--	--
HB-5166-34	2	25.6	ND	--	--	--	--
HB-5166-35	2	25.6	ND	--	--	--	--
HB-5166-36	2	25.5	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration				
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**	
HB-5165-37	**1**	0	**564**	0.564	0.565	0.001	
HB-5165-38	1	0	566	0.566			
HB-5166-39	**2**	0	**390**	0.39	0.392	0.003	#DIV/0!
HB-5166-40	**2**	0	394	0.394			

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5165-01	1	0.0104	548	0.548	97%	0.017	1.6388
HB-5165-02	**1**	0.0107	537	0.537	95%	0.028	2.6290
HB-5165-03	**1**	0.0107	542	0.542	96%	0.023	2.1569
HB-5165-04	1	0.0207	414	0.414	73%	0.151	7.2964
HB-5165-05	**1**	0.0202	411	0.411	73%	0.154	7.6312
HB-5165-06	**1**	0.0203	390	0.39	69%	0.175	8.6373
HB-5165-07	**1**	0.0408	319	0.319	56%	0.246	6.0241
HB-5165-08	**1**	0.0411	345	0.345	61%	0.220	5.3519
HB-5165-09	**1**	0.0397	300	0.3	53%	0.265	6.6793
HB-5165-10	**1**	0.0617	258	0.258	46%	0.307	4.9727
HB-5165-11	**1**	0.0617	242	0.242	43%	0.323	5.2340
HB-5165-12	**1**	0.0608	268	0.268	47%	0.297	4.8845
HB-5165-13	**1**	0.104	175	0.175	31%	0.390	3.7598
HB-5165-14	**1**	0.104	167	0.17	30%	0.398	3.8332
HB-5165-15	**1**	0.103	166	0.166	29%	0.399	3.8636
HB-5165-16	**1**	0.201	31.1	0.0311	5.5%	0.534	2.6518
HB-5165-17	**1**	0.206	29.2	0.03	5.2%	0.536	2.6051
HB-5165-18	**1**	0.206	29.5	0.0295	5.2%	0.536	2.5961
HB-5165-19	**1**	0.403	4	0.004	0.7%	0.561	1.3912
HB-5165-20	**1**	0.404	4.4	0.00	0.8%	0.561	1.3871
HB-5165-21	**1**	0.407	3.8	0.0038	0.7%	0.561	1.3804
HB-5166-22	**2**	1.008	ND	--	--	--	--
HB-5166-23	**2**	1.031	ND	--	--	--	--
HB-5166-24	**2**	1.021	ND	--	--	--	--
HB-5166-25	**2**	2.03	ND	--	--	--	--
HB-5166-26	**2**	2.02	ND	--	--	--	--
HB-5166-27	**2**	2.03	ND	--	--	--	--
HB-5166-28	**2**	5.08	ND	--	--	--	--
HB-5166-29	**2**	5.28	ND	--	--	--	--
HB-5166-30	**2**	5.04	ND	--	--	--	--
HB-5166-31	**2**	10.15	ND	--	--	--	--
HB-5166-32	2	10.16	ND	--	--	--	--
HB-5166-33	2	10.13	ND	--	--	--	--
HB-5166-34	2	25.6	ND	--	--	--	--
HB-5166-35	2	25.6	ND	--	--	--	--
HB-5166-36	2	25.5	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration				
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**	
HB-5165-37	**1**	0	**1410**	1.41	1.410	0.000	
HB-5165-38	1	0	1410	1.41			
HB-5166-39	**2**	0	**994**	0.994	0.991	0.005	#DIV/0!
HB-5166-40	**2**	0	987	0.987			

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5165-01	1	0.0104	1400	1.4	99%	0.010	0.9640
HB-5165-02	**1**	0.0107	1420	1.42	101%	-0.010	-0.9389
HB-5165-03	**1**	0.0107	1390	1.39	99%	0.020	1.8756
HB-5165-04	1	0.0207	1300	1.3	92%	0.110	5.3153
HB-5165-05	**1**	0.0202	1290	1.29	91%	0.120	5.9464
HB-5165-06	**1**	0.0203	1250	1.25	89%	0.160	7.8970
HB-5165-07	**1**	0.0408	903	0.903	64%	0.507	12.4156
HB-5165-08	**1**	0.0411	990	0.99	70%	0.420	10.2173
HB-5165-09	**1**	0.0397	878	0.878	62%	0.532	13.4090
HB-5165-10	**1**	0.0617	880	0.88	62%	0.530	8.5848
HB-5165-11	**1**	0.0617	851	0.851	60%	0.559	9.0582
HB-5165-12	**1**	0.0608	884	0.884	63%	0.526	8.6506
HB-5165-13	**1**	0.104	935	0.935	66%	0.475	4.5793
HB-5165-14	**1**	0.104	881	0.88	62%	0.529	5.0949
HB-5165-15	**1**	0.103	899	0.899	64%	0.511	4.9481
HB-5165-16	**1**	0.201	321	0.321	23%	1.089	5.4088
HB-5165-17	**1**	0.206	319	0.32	23%	1.091	5.3046
HB-5165-18	**1**	0.206	330	0.33	23%	1.080	5.2358
HB-5165-19	**1**	0.403	62.1	0.0621	4.4%	1.348	3.3425
HB-5165-20	**1**	0.404	64.9	0.06	4.6%	1.345	3.3281
HB-5165-21	**1**	0.407	57.3	0.0573	4.1%	1.353	3.3273
HB-5166-22	**2**	1.008	3.5	0.0035	0.35%	0.987	0.9788
HB-5166-23	**2**	1.031	3.2	0.00	0.32%	0.987	0.9579
HB-5166-24	**2**	1.021	3.2	0.0032	0.32%	0.987	0.9665
HB-5166-25	**2**	2.03	0.44	0.00044	0.044%	0.990	0.4871
HB-5166-26	**2**	2.02	0.42	0.00042	0.042%	0.990	0.4895
HB-5166-27	**2**	2.03	0.39	0.00039	0.039%	0.990	0.4873
HB-5166-28	**2**	5.08	ND	--	--	--	--
HB-5166-29	**2**	5.28	ND	--	--	--	--
HB-5166-30	**2**	5.04	ND	--	--	--	--
HB-5166-31	**2**	10.15	ND	--	--	--	--
HB-5166-32	2	10.16	ND	--	--	--	--
HB-5166-33	2	10.13	ND	--	--	--	--
HB-5166-34	2	25.6	ND	--	--	--	--
HB-5166-35	2	25.6	ND	--	--	--	--
HB-5166-36	2	25.5	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration				
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**	
HB-5165-37	**1**	0	**2462**	2.462	2.462	0.001	
HB-5165-38	1	0	2461	2.461			
HB-5166-39	**2**	0	**1677**	1.677	1.693	0.022	#DIV/0!
HB-5166-40	**2**	0	1708	1.708			

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5165-01	1	0.0104	2285	2.285	93%	0.177	17.0147
HB-5165-02	**1**	0.0107	2258	2.258	92%	0.204	19.1075
HB-5165-03	**1**	0.0107	2295	2.295	93%	0.167	15.6141
HB-5165-04	1	0.0207	1739	1.739	71%	0.723	34.9117
HB-5165-05	**1**	0.0202	1738	1.738	71%	0.724	35.8519
HB-5165-06	**1**	0.0203	1658	1.658	67%	0.804	39.6577
HB-5165-07	**1**	0.0408	1304	1.304	53%	1.158	28.3453
HB-5165-08	**1**	0.0411	1404	1.404	57%	1.058	25.7256
HB-5165-09	**1**	0.0397	1232	1.232	50%	1.230	30.9895
HB-5165-10	**1**	0.0617	992	0.992	40%	1.470	23.8025
HB-5165-11	**1**	0.0617	938	0.938	38%	1.524	24.6873
HB-5165-12	**1**	0.0608	1031	1.031	42%	1.431	23.5260
HB-5165-13	**1**	0.104	601	0.601	24%	1.861	17.9363
HB-5165-14	**1**	0.104	570	0.57	23%	1.892	18.2175
HB-5165-15	**1**	0.103	566	0.566	23%	1.896	18.3543
HB-5165-16	**1**	0.201	91	0.091	3.7%	2.371	11.7738
HB-5165-17	**1**	0.206	84	0.08	3.4%	2.378	11.5597
HB-5165-18	**1**	0.206	86.1	0.0861	3.5%	2.375	11.5158
HB-5165-19	**1**	0.403	10.5	0.0105	0.43%	2.451	6.0780
HB-5165-20	**1**	0.404	11.8	0.012	0.48%	2.450	6.0612
HB-5165-21	**1**	0.407	10.1	0.0101	0.41%	2.451	6.0299
HB-5166-22	**2**	1.008	ND	--	--	--	--
HB-5166-23	**2**	1.031	ND	--	--	--	--
HB-5166-24	**2**	1.021	ND	--	--	--	--
HB-5166-25	**2**	2.03	ND	--	--	--	--
HB-5166-26	**2**	2.02	ND	--	--	--	--
HB-5166-27	**2**	2.03	ND	--	--	--	--
HB-5166-28	**2**	5.08	ND	--	--	--	--
HB-5166-29	**2**	5.28	ND	--	--	--	--
HB-5166-30	**2**	5.04	ND	--	--	--	--
HB-5166-31	**2**	10.15	ND	--	--	--	--
HB-5166-32	2	10.16	ND	--	--	--	--
HB-5166-33	2	10.13	ND	--	--	--	--
HB-5166-34	2	25.6	ND	--	--	--	--
HB-5166-35	2	25.6	ND	--	--	--	--
HB-5166-36	2	25.5	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration				
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**	
HB-5165-37	**1**	0	**2500**	2.50	2.345	0.219	
HB-5165-38	1	0	2190	2.19			
HB-5166-39	**2**	0	**2410**	2.41	2.265	0.205	#DIV/0!
HB-5166-40	**2**	0	2120	2.12			

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5165-01	1	0.0104	2650	2.65	113%	-0.305	-29.4023
HB-5165-02	**1**	0.0107	2800	2.80	119%	-0.455	-42.7219
HB-5165-03	**1**	0.0107	2380	2.38	101%	-0.035	-3.2822
HB-5165-04	1	0.0207	2580	2.58	110%	-0.235	-11.3554
HB-5165-05	**1**	0.0202	2600	2.60	111%	-0.255	-12.6361
HB-5165-06	**1**	0.0203	2380	2.38	101%	-0.035	-1.7275
HB-5165-07	**1**	0.0408	2640	2.64	113%	-0.295	-7.2241
HB-5165-08	**1**	0.0411	2420	2.42	103%	-0.075	-1.8245
HB-5165-09	**1**	0.0397	2330	2.33	99%	0.015	0.3781
HB-5165-10	**1**	0.0617	2590	2.59	110%	-0.245	-3.9684
HB-5165-11	**1**	0.0617	2670	2.67	114%	-0.325	-5.2664
HB-5165-12	**1**	0.0608	2730	2.73	116%	-0.385	-6.3317
HB-5165-13	**1**	0.104	2410	2.41	103%	-0.065	-0.6266
HB-5165-14	**1**	0.104	1990	1.99	85%	0.355	3.4191
HB-5165-15	**1**	0.103	2080	2.08	89%	0.265	2.5660
HB-5165-16	**1**	0.201	1620	1.62	69%	0.725	3.6009
HB-5165-17	**1**	0.206	1650	1.65	70%	0.695	3.3792
HB-5165-18	**1**	0.206	1590	1.59	68%	0.755	3.6602
HB-5165-19	**1**	0.403	248	0.248	11%	2.097	5.2002
HB-5165-20	**1**	0.404	237	0.237	10%	2.108	5.2157
HB-5165-21	**1**	0.407	251	0.251	11%	2.094	5.1508
HB-5166-22	**2**	1.008	9.7	0.0097	0.43%	2.255	2.2365
HB-5166-23	**2**	1.031	8.8	0.0088	0.39%	2.256	2.1890
HB-5166-24	**2**	1.021	8.9	0.0089	0.39%	2.256	2.2086
HB-5166-25	**2**	2.03	ND	--	--	--	--
HB-5166-26	**2**	2.02	ND	--	--	--	--
HB-5166-27	**2**	2.03	ND	--	--	--	--
HB-5166-28	**2**	5.08	ND	--	--	--	--
HB-5166-29	**2**	5.28	ND	--	--	--	--
HB-5166-30	**2**	5.04	ND	--	--	--	--
HB-5166-31	**2**	10.15	ND	--	--	--	--
HB-5166-32	2	10.16	ND	--	--	--	--
HB-5166-33	2	10.13	ND	--	--	--	--
HB-5166-34	2	25.6	ND	--	--	--	--
HB-5166-35	2	25.6	ND	--	--	--	--
HB-5166-36	2	25.5	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration				
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**	
HB-5165-37	**1**	0	**4800**	4.8	4.735	0.092	
HB-5165-38	1	0	4670	4.67			
HB-5166-39	**2**	0	**4290**	4.29	3.955	0.474	#DIV/0!
HB-5166-40	**2**	0	3620	3.62			

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5165-01	1	0.0104	4430	4.43	94%	0.305	29.4023
HB-5165-02	**1**	0.0107	4530	4.53	96%	0.205	19.2483
HB-5165-03	**1**	0.0107	4330	4.33	91%	0.405	37.9802
HB-5165-04	1	0.0207	3450	3.45	73%	1.285	62.0921
HB-5165-05	**1**	0.0202	3420	3.42	72%	1.315	65.1628
HB-5165-06	**1**	0.0203	3040	3.04	64%	1.695	83.6587
HB-5165-07	**1**	0.0408	1730	1.73	37%	3.005	73.5875
HB-5165-08	**1**	0.0411	1530	1.53	32%	3.205	77.9674
HB-5165-09	**1**	0.0397	1550	1.55	33%	3.185	80.2778
HB-5165-10	**1**	0.0617	762	0.762	16%	3.973	64.3535
HB-5165-11	**1**	0.0617	687	0.687	15%	4.048	65.5950
HB-5165-12	**1**	0.0608	701	0.701	15%	4.034	66.3431
HB-5165-13	**1**	0.104	145	0.145	3.1%	4.590	44.2503
HB-5165-14	**1**	0.104	132	0.13	2.8%	4.603	44.3326
HB-5165-15	**1**	0.103	134	0.134	2.8%	4.601	44.5519
HB-5165-16	**1**	0.201	12.4	0.0124	0.26%	4.723	23.4561
HB-5165-17	**1**	0.206	11.5	0.0115	0.24%	4.724	22.9663
HB-5165-18	**1**	0.206	12.8	0.0128	0.27%	4.722	22.8929
HB-5165-19	**1**	0.403	1.3	0.0013	0.027%	4.734	11.7387
HB-5165-20	**1**	0.404	1.4	0.0014	0.030%	4.734	11.7121
HB-5165-21	**1**	0.407	2.2	0.0022	0.046%	4.733	11.6416
HB-5166-22	**2**	1.008	ND	--	--	--	--
HB-5166-23	**2**	1.031	ND	--	--	--	--
HB-5166-24	**2**	1.021	ND	--	--	--	--
HB-5166-25	**2**	2.03	ND	--	--	--	--
HB-5166-26	**2**	2.02	ND	--	--	--	--
HB-5166-27	**2**	2.03	ND	--	--	--	--
HB-5166-28	**2**	5.08	ND	--	--	--	--
HB-5166-29	**2**	5.28	1.4	0.0014	0.035%	3.954	0.7487
HB-5166-30	**2**	5.04	ND	--	--	--	--
HB-5166-31	**2**	10.15	ND	--	--	--	--
HB-5166-32	2	10.16	ND	--	--	--	--
HB-5166-33	2	10.13	ND	--	--	--	--
HB-5166-34	2	25.6	ND	--	--	--	--
HB-5166-35	2	25.6	ND	--	--	--	--
HB-5166-36	2	25.5	1.5	0.0015	0.038%	3.954	0.1548

Controls **Control concentration ~ 1,800 µg/L based on measurements across lowest four carbon doses**

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration				
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**	
HB-5165-37	**1**	0	**1260**	1.26	1.800	0.141	
HB-5165-38	1	0	1060	1.06			
HB-5166-39	**2**	0	**1400**	1.40	1.800	0.057	1.057
HB-5166-40	**2**	0	1480	1.48			

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5165-01	1	0.0104	1810	1.81	101%	-0.010	-0.9640
HB-5165-02	**1**	0.0107	1740	1.74	97%	0.060	5.6337
HB-5165-03	**1**	0.0107	1890	1.89	105%	-0.090	-8.4400
HB-5165-04	1	0.0207	1810	1.81	101%	-0.010	-0.4832
HB-5165-05	**1**	0.0202	1770	1.77	98%	0.030	1.4866
HB-5165-06	**1**	0.0203	1910	1.91	106%	-0.110	-5.4292
HB-5165-07	**1**	0.0408	1950	1.95	108%	-0.150	-3.6733
HB-5165-08	**1**	0.0411	1890	1.89	105%	-0.090	-2.1894
HB-5165-09	**1**	0.0397	1690	1.69	94%	0.110	2.7725
HB-5165-10	**1**	0.0617	1880	1.88	104%	-0.080	-1.2958
HB-5165-11	**1**	0.0617	1680	1.68	93%	0.120	1.9445
HB-5165-12	**1**	0.0608	1700	1.70	94%	--	--
HB-5165-13	**1**	0.104	1680	1.68	93%	0.120	1.1569
HB-5165-14	**1**	0.104	1440	1.44	80%	0.360	3.4672
HB-5165-15	**1**	0.103	1440	1.44	80%	0.360	3.4859
HB-5165-16	**1**	0.201	1750	1.75	97%	0.050	0.2483
HB-5165-17	**1**	0.206	1890	1.89	105%	-0.090	-0.4376
HB-5165-18	**1**	0.206	1590	1.59	88%	0.210	1.0181
HB-5165-19	**1**	0.403	1120	1.12	62%	0.680	1.6863
HB-5165-20	**1**	0.404	920	0.92	51%	0.880	2.1773
HB-5165-21	**1**	0.407	623	0.623	35%	1.177	2.8952
HB-5166-22	**2**	1.008	72.4	0.0724	4.0%	1.728	1.7132
HB-5166-23	**2**	1.031	59.4	0.06	3.3%	1.741	1.6887
HB-5166-24	**2**	1.021	64.6	0.0646	3.6%	1.735	1.6989
HB-5166-25	**2**	2.03	8.0	0.008	0.44%	1.792	0.8816
HB-5166-26	**2**	2.02	8.0	0.01	0.44%	1.792	0.8860
HB-5166-27	**2**	2.03	7.9	0.0079	0.44%	1.792	0.8820
HB-5166-28	**2**	5.08	ND	--	--	--	--
HB-5166-29	**2**	5.28	1.3	0.0013	0.072%	1.799	0.3406
HB-5166-30	**2**	5.04	ND	--	--	--	--
HB-5166-31	**2**	10.15	ND	--	--	--	--
HB-5166-32	2	10.16	ND	--	--	--	--
HB-5166-33	2	10.13	ND	--	--	--	--
HB-5166-34	2	25.6	ND	--	--	--	--
HB-5166-35	2	25.6	ND	--	--	--	--
HB-5166-36	2	25.5	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration				
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**	
HB-5165-37	**1**	0	**263**	0.263	0.261	0.003	
HB-5165-38	1	0	259	0.259			
HB-5166-39	**2**	0	**275**	0.275	0.278	0.004	#DIV/0!
HB-5166-40	**2**	0	281	0.281			

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5165-01	1	0.0104	260	0.260	100%	0.001	0.0964
HB-5165-02	**1**	0.0107	257	0.257	98%	0.004	0.3756
HB-5165-03	**1**	0.0107	252	0.252	97%	0.009	0.8440
HB-5165-04	1	0.0207	259	0.259	99%	0.002	0.0966
HB-5165-05	**1**	0.0202	249	0.249	95%	0.012	0.5946
HB-5165-06	**1**	0.0203	264	0.264	101%	-0.003	-0.1481
HB-5165-07	**1**	0.0408	227	0.227	87%	0.034	0.8326
HB-5165-08	**1**	0.0411	255	0.255	98%	0.006	0.1460
HB-5165-09	**1**	0.0397	254	0.254	97%	0.007	0.1764
HB-5165-10	**1**	0.0617	253	0.253	97%	0.008	0.1296
HB-5165-11	**1**	0.0617	249	0.249	95%	0.012	0.1945
HB-5165-12	**1**	0.0608	243	0.243	93%	0.018	0.2960
HB-5165-13	**1**	0.104	245	0.245	94%	0.016	0.1542
HB-5165-14	**1**	0.104	246	0.246	94%	0.015	0.1445
HB-5165-15	**1**	0.103	242	0.242	93%	0.019	0.1840
HB-5165-16	**1**	0.201	232	0.232	89%	0.029	0.1440
HB-5165-17	**1**	0.206	226	0.226	87%	0.035	0.1702
HB-5165-18	**1**	0.206	220	0.220	84%	0.041	0.1988
HB-5165-19	**1**	0.403	195	0.195	75%	0.066	0.1637
HB-5165-20	**1**	0.404	212	0.212	81%	0.049	0.1212
HB-5165-21	**1**	0.407	232	0.232	89%	0.029	0.0713
HB-5166-22	**2**	1.008	237	0.237	85%	0.041	0.0407
HB-5166-23	**2**	1.031	223	0.223	80%	0.055	0.0534
HB-5166-24	**2**	1.021	210	0.210	76%	0.068	0.0666
HB-5166-25	**2**	2.03	218	0.218	78%	0.060	0.0295
HB-5166-26	**2**	2.02	220	0.220	79%	0.058	0.0287
HB-5166-27	**2**	2.03	216	0.216	78%	0.062	0.0305
HB-5166-28	**2**	5.08	211	0.211	76%	0.067	0.0132
HB-5166-29	**2**	5.28	223	0.223	80%	0.055	0.0104
HB-5166-30	**2**	5.04	216	0.216	78%	0.062	0.0123
HB-5166-31	**2**	10.2	214	0.214	77%	0.064	0.0063
HB-5166-32	2	10.2	206	0.21	74%	0.072	0.0071
HB-5166-33	2	10.1	202	0.202	73%	0.076	0.0075
HB-5166-34	2	25.6	211	0.211	76%	0.067	0.0026
HB-5166-35	2	25.6	204	0.20	73%	0.074	0.0029
HB-5166-36	2	25.5	200	0.2	72%	0.078	0.0031

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration				
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**	
HB-5165-37	**1**	0	**1510**	1.51	1.565	0.078	
HB-5165-38	1	0	1620	1.62			
HB-5166-39	**2**	0	**1310**	1.31	1.525	0.304	#DIV/0!
HB-5166-40	**2**	0	1740	1.74			

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5165-37	**1**	0	**1510**	1.51	96%	**--**	**--**
HB-5165-02	**1**	0.0107	1510	1.51	96%	0.055	5.1642
HB-5165-03	**1**	0.0107	1620	1.62	104%	-0.055	-5.1578
HB-5165-04	1	0.0207	1510	1.51	96%	0.055	2.6576
HB-5165-05	**1**	0.0202	1620	1.62	104%	-0.055	-2.7254
HB-5165-06	**1**	0.0203	1730	1.73	111%	-0.165	-8.1438
HB-5165-07	**1**	0.0408	1620	1.62	104%	-0.055	-1.3469
HB-5165-08	**1**	0.0411	1510	1.51	96%	0.055	1.3380
HB-5165-09	**1**	0.0397	1620	1.62	104%	-0.055	-1.3863
HB-5165-10	**1**	0.0617	1620	1.62	104%	-0.055	-0.8909
HB-5165-11	**1**	0.0617	1510	1.51	96%	0.055	0.8912
HB-5165-12	**1**	0.0608	1620	1.62	104%	-0.055	-0.9045
HB-5165-13	**1**	0.104	1400	1.40	89%	0.165	1.5907
HB-5165-14	**1**	0.104	1400	1.40	89%	0.165	1.5892
HB-5165-15	**1**	0.103	1730	1.73	111%	-0.165	-1.5977
HB-5165-16	**1**	0.201	1620	1.62	104%	-0.055	-0.2732
HB-5165-17	**1**	0.206	1510	1.51	96%	0.055	0.2674
HB-5165-18	**1**	0.206	1400	1.40	89%	0.165	0.7999
HB-5165-19	**1**	0.403	1400	1.40	89%	0.165	0.4092
HB-5165-20	**1**	0.404	1620	1.62	104%	-0.055	-0.1361
HB-5165-21	**1**	0.407	1400	1.40	89%	0.165	0.4059
HB-5166-22	**2**	1.008	1200	1.20	79%	0.325	0.3223
HB-5166-23	**2**	1.031	1090	1.09	71%	0.435	0.4220
HB-5166-24	**2**	1.021	1090	1.09	71%	0.435	0.4258
HB-5166-25	**2**	2.03	1310	1.31	86%	0.215	0.1058
HB-5166-26	**2**	2.02	1090	1.09	71%	0.435	0.2151
HB-5166-27	**2**	2.03	981.0	0.98	64%	0.544	0.2677
HB-5166-28	**2**	5.08	1310	1.31	86%	0.215	0.0423
HB-5166-29	**2**	5.28	1200	1.20	79%	0.325	0.0615
HB-5166-30	**2**	5.04	1200	1.20	79%	0.325	0.0644
HB-5166-31	**2**	10.2	1090	1.09	71%	0.435	0.0429
HB-5166-32	2	10.2	1310	1.31	86%	0.215	0.0212
HB-5166-33	2	10.1	1200	1.20	79%	0.325	0.0321
HB-5166-34	2	25.6	1420	1.42	93%	0.105	0.0041
HB-5166-35	2	25.6	1200	1.20	79%	0.325	0.0127
HB-5166-36	2	25.5	1090	1.09	71%	0.435	0.0170

Controls

Sample ID	Spiked Batch	Bottle Weight		Carbon Mass	Gross Weight	Net Weight	Water Volume	Carbon Dose
(Bottle) #	**Batch #**	**Empty (g)**	**Full (g)**	**M (mg)**	**Water + Carbon (g)**	**Water (g)**	**V (L)**	**m (g/L)**
HB-5165-37	**1**	1110	3119	0	2009	2009	1.989	0
HB-5165-38	**1**	1110	3124	0	2014	2014	1.994	0
HB-5166-39	**2**	1111	3127	0	2016	2016	2016	0
HB-5166-40	**2**	1108	3118	0	2010	2010	2010	0

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Bottle Weight		Carbon Mass	Gross Weight	Net Weight	Water Volume	Carbon Dose
(Bottle) #	**Batch #**	**Empty (g)**	**Full (g)**	**M (mg)**	**Water + Carbon (g)**	**Water (g)**	**V (L)**	**m (g/L)**
HB-5165-01	**1**	1111	3107	0.021	1996	1996	1.976	0.010
HB-5165-02	**1**	1110	3111	0.021	2001	2001	1.981	0.011
HB-5165-03	**1**	1110	3118	0.021	2008	2008	1.988	0.011
HB-5165-04	**1**	1109	3110	0.041	2001	2001	1.981	0.021
HB-5165-05	**1**	1110	3112	0.040	2002	2002	1.982	0.020
HB-5165-06	**1**	1111	3115	0.040	2004	2004	1.984	0.020
HB-5165-07	**1**	1108	3109	0.081	2001	2001	1.981	0.041
HB-5165-08	**1**	1110	3115	0.082	2005	2005	1.985	0.041
HB-5165-09	**1**	1111	3112	0.079	2001	2001	1.981	0.040
HB-5165-10	**1**	1109	3123	0.123	2014	2014	1.994	0.062
HB-5165-11	**1**	1108	3113	0.123	2005	2005	1.985	0.062
HB-5165-12	**1**	1109	3114	0.121	2005	2005	1.985	0.061
HB-5165-13	**1**	1108	3115	0.206	2007	2007	1.987	0.104
HB-5165-14	**1**	1109	3116	0.206	2007	2007	1.987	0.104
HB-5165-15	**1**	1108	3117	0.205	2009	2009	1.989	0.103
HB-5165-16	**1**	1110	3123	0.401	2013	2013	1.993	0.201
HB-5165-17	**1**	1109	3113	0.408	2004	2004	1.984	0.206
HB-5165-18	**1**	1110	3115	0.409	2005	2005	1.985	0.206
HB-5165-19	**1**	1110	3121	0.80	2011	2010	1.990	0.403
HB-5165-20	**1**	1110	3118	0.80	2008	2007	1.987	0.404
HB-5165-21	**1**	1111	3108	0.80	1997	1996	1.976	0.407
HB-5166-22	**2**	1109	3113	2.00	2004	2002	1.982	1.008
HB-5166-23	**2**	1109	3113	2.04	2004	2002	1.982	1.031
HB-5166-24	**2**	1109	3117	2.03	2008	2006	1.986	1.021
HB-5166-25	**2**	1110	3117	4.04	2008	2006	1.986	2.033
HB-5166-26	**2**	1109	3112	4.00	2003	1999	1.979	2.023
HB-5166-27	**2**	1109	3116	4.03	2007	2003	1.983	2.032
HB-5166-28	**2**	1108	3108	10.0	2000	1990	1.970	5.082
HB-5166-29	**2**	1109	3117	10.4	2008	1998	1.978	5.281
HB-5166-30	**2**	1110	3124	10.0	2014	2004	1.984	5.044
HB-5166-31	**2**	1109	3127	20.1	2018	1998	1.978	10.152
HB-5166-32	**2**	1108	3126	20.1	2018	1998	1.978	10.162
HB-5166-33	**2**	1110	3126	20.0	2016	1996	1.976	10.134
HB-5166-34	**2**	1109	3130	50.0	2021	1971	1.951	25.640
HB-5166-35	**2**	1109	3138	50.1	2029	1979	1.959	25.560
HB-5166-36	**2**	1110	3138	50.0	2028	1978	1.958	25.538

Test Water Density	**1010 g/L**

ATTACHMENT 4

EXPERIMENTAL DATA
WASTEBED B – HARBOR BROOK WEST AREA – NATIVE PH

(PROVIDED ON CD ON ATTACHMENT TAB)

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
HB-5141-37	**1**	0	**380**	0.38	0.360	0.028
HB-5142-38	1	0	340	0.34		
HB-5141-39	**2**	0	**290**	0.29	0.260	0.042
HB-5142-40	**2**	0	230	0.23		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5142-01	1	0.0026	380	0.38	106%	-0.020	-7.6504
HB-5142-02	**1**	0.0025	380	0.38	106%	-0.020	-7.9921
HB-5142-03	**1**	0.0025	370	0.37	103%	-0.010	-3.9742
HB-5141-04	1	0.0051	390	0.39	108%	-0.030	-5.8965
HB-5141-05	**1**	0.0050	390	0.39	108%	-0.030	-5.9673
HB-5142-06	**1**	0.0050	370	0.37	103%	-0.010	-1.9871
HB-5142-34	**1**	0.0088	380	0.38	106%	-0.020	-2.2687
HB-5142-35	**1**	0.0087	350	0.35	97%	0.010	1.1480
HB-5142-36	**1**	0.0088	360	0.36	100%	0.000	0.0000
HB-5142-07	**1**	0.0126	360	0.36	100%	0.000	0.0000
HB-5142-08	**1**	0.0125	370	0.37	103%	-0.010	-0.7988
HB-5142-09	**1**	0.0126	360	0.36	100%	0.000	0.0000
HB-5142-10	**1**	0.025	330	0.33	92%	0.030	1.1929
HB-5142-11	**1**	0.025	400	0.40	111%	-0.040	-1.5794
HB-5142-12	**1**	0.025	390	0.39	108%	-0.030	-1.1911
HB-5141-13	**1**	0.050	380	0.38	106%	-0.020	-0.3974
HB-5141-14	**1**	0.050	370	0.37	103%	-0.010	-0.1984
HB-5142-15	**1**	0.050	370	0.37	103%	-0.010	-0.1986
HB-5142-16	**1**	0.126	280	0.28	78%	0.080	0.6331
HB-5142-17	**1**	0.125	260	0.26	72%	0.100	0.7968
HB-5142-18	**1**	0.126	260	0.26	72%	0.100	0.7937
HB-5142-19	**2**	0.252	85	0.085	33%	0.175	0.6955
HB-5142-20	**2**	0.251	100	0.100	38%	0.160	0.6382
HB-5142-21	**2**	0.252	83	0.083	32%	0.177	0.7028
HB-5141-22	**2**	0.28	29	0.029	11.2%	0.231	0.8348
HB-5141-23	**2**	0.50	29	0.029	11.2%	0.231	0.4593
HB-5142-24	**2**	0.50	28	0.028	10.8%	0.232	0.4632
HB-5142-25	**2**	1.26	2.5	0.0025	0.96%	0.258	0.2049
HB-5142-26	**2**	1.26	2.5	0.0025	0.96%	0.258	0.2045
HB-5142-27	**2**	1.26	2.5	0.0025	0.96%	0.258	0.2044
HB-5141-28	**2**	5.04	ND	--	--	--	--
HB-5141-29	2	5.04	ND	--	--	--	--
HB-5142-30	2	5.04	ND	--	--	--	--
HB-5142-31	2	51.8	ND	--	--	--	--
HB-5142-32	2	51.9	ND	--	--	--	--
HB-5142-33	2	51.8	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
HB-5141-37	**1**	0	**240**	0.24	0.240	0.000
HB-5142-38	1	0	240	0.24		
HB-5141-39	**2**	0	**160**	0.16	0.160	0.000
HB-5142-40	**2**	0	160	0.16		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5141-37	**1**	0	**240**	0.24	100%	**--**	**--**
HB-5142-38	1	0	240	0.24	100%	--	--
HB-5141-39	**2**	0	**160**	0.16	100%	**--**	**--**
HB-5142-40	**2**	0	160	0.16	100%	--	--
HB-5141-05	**1**	0.0050	240	0.24	100%	0.000	0.0000
HB-5142-06	**1**	0.0050	260	0.26	108%	-0.020	-3.9742
HB-5142-34	**1**	0.0088	240	0.24	100%	0.000	0.0000
HB-5142-35	**1**	0.0087	250	0.25	104%	-0.010	-1.1480
HB-5142-36	**1**	0.0088	270	0.27	113%	-0.030	-3.4065
HB-5142-07	**1**	0.0126	250	0.25	104%	-0.010	-0.7948
HB-5142-08	**1**	0.0125	260	0.26	108%	-0.020	-1.5977
HB-5142-09	**1**	0.0126	240	0.24	100%	0.000	0.0000
HB-5142-10	**1**	0.025	230	0.23	96%	0.010	0.3976
HB-5142-11	**1**	0.025	240	0.24	100%	0.000	0.0000
HB-5142-12	**1**	0.025	240	0.24	100%	0.000	0.0000
HB-5141-13	**1**	0.050	180	0.18	75%	0.060	1.1922
HB-5141-14	**1**	0.050	170	0.17	71%	0.070	1.3888
HB-5142-15	**1**	0.050	190	0.19	79%	0.050	0.9930
HB-5142-16	**1**	0.126	54	0.054	23%	0.186	1.4721
HB-5142-17	**1**	0.125	54	0.054	23%	0.186	1.4821
HB-5142-18	**1**	0.126	52	0.052	22%	0.188	1.4922
HB-5142-19	**2**	0.252	5.4	0.0054	3.4%	0.155	0.6144
HB-5142-20	**2**	0.251	6.2	0.0062	3.9%	0.154	0.6135
HB-5142-21	**2**	0.252	5.4	0.0054	3.4%	0.155	0.6139
HB-5141-22	**2**	0.28	0.92	0.00092	0.58%	0.159	0.5749
HB-5141-23	**2**	0.50	0.84	0.00084	0.53%	0.159	0.3164
HB-5142-24	**2**	0.50	0.94	0.00094	0.59%	0.159	0.3176
HB-5142-25	**2**	1.26	ND	--	--	--	--
HB-5142-26	**2**	1.26	ND	--	--	--	--
HB-5142-27	**2**	1.26	ND	--	--	--	--
HB-5141-28	**2**	5.04	ND	--	--	--	--
HB-5141-29	2	5.04	ND	--	--	--	--
HB-5142-30	2	5.04	ND	--	--	--	--
HB-5142-31	2	51.8	ND	--	--	--	--
HB-5142-32	2	51.9	ND	--	--	--	--
HB-5142-33	2	51.8	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
HB-5141-37	**1**	0	**490**	0.49	0.510	0.028
HB-5142-38	1	0	530	0.53		
HB-5141-39	**2**	0	**440**	0.44	0.420	0.028
HB-5142-40	**2**	0	400	0.4		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5142-01	1	0.0026	550	0.55	108%	-0.040	-15.3008
HB-5142-02	**1**	0.0025	550	0.55	108%	-0.040	-15.9841
HB-5142-03	**1**	0.0025	540	0.54	106%	-0.030	-11.9227
HB-5141-04	1	0.0051	470	0.47	92%	0.040	7.8619
HB-5141-05	**1**	0.0050	490	0.49	96%	0.020	3.9782
HB-5142-06	**1**	0.0050	520	0.52	102%	-0.010	-1.9871
HB-5142-34	**1**	0.0088	460	0.46	90%	0.050	5.6718
HB-5142-35	**1**	0.0087	420	0.42	82%	0.090	10.3324
HB-5142-36	**1**	0.0088	460	0.46	90%	0.050	5.6775
HB-5142-07	**1**	0.0126	400	0.40	78%	0.110	8.7433
HB-5142-08	**1**	0.0125	430	0.43	84%	0.080	6.3906
HB-5142-09	**1**	0.0126	380	0.38	75%	0.130	10.2969
HB-5142-10	**1**	0.025	290	0.29	57%	0.220	8.7476
HB-5142-11	**1**	0.025	306	0.31	60%	0.204	8.0550
HB-5142-12	**1**	0.025	291	0.29	57%	0.219	8.6947
HB-5141-13	**1**	0.050	123	0.12	24%	0.387	7.6898
HB-5141-14	**1**	0.050	107	0.11	21%	0.403	7.9958
HB-5142-15	**1**	0.050	122	0.12	24%	0.388	7.7058
HB-5142-16	**1**	0.126	12.3	0.012	2.4%	0.498	3.9389
HB-5142-17	**1**	0.125	11.3	0.011	2.2%	0.499	3.9737
HB-5142-18	**1**	0.126	10.7	0.011	2.1%	0.499	3.9631
HB-5142-19	**2**	0.252	ND	--	--	--	--
HB-5142-20	**2**	0.251	ND	--	--	--	--
HB-5142-21	**2**	0.252	ND	--	--	--	--
HB-5141-22	**2**	0.28	ND	--	--	--	--
HB-5141-23	**2**	0.50	ND	--	--	--	--
HB-5142-24	**2**	0.50	ND	--	--	--	--
HB-5142-25	**2**	1.26	ND	--	--	--	--
HB-5142-26	**2**	1.26	ND	--	--	--	--
HB-5142-27	**2**	1.26	ND	--	--	--	--
HB-5141-28	**2**	5.04	ND	--	--	--	--
HB-5141-29	2	5.04	ND	--	--	--	--
HB-5142-30	2	5.04	ND	--	--	--	--
HB-5142-31	2	51.8	ND	--	--	--	--
HB-5142-32	2	51.9	ND	--	--	--	--
HB-5142-33	2	51.8	ND	--	--	--	--

Ethylbenzene

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
HB-5141-37	**1**	0	**140**	0.14	0.145	0.007
HB-5142-38	1	0	150	0.15		
HB-5141-39	**2**	0	**120**	0.12	0.115	0.007
HB-5142-40	**2**	0	110	0.11		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5142-01	1	0.0026	150	0.15	103%	-0.005	-1.9126
HB-5142-02	**1**	0.0025	150	0.15	103%	-0.005	-1.9980
HB-5142-03	**1**	0.0025	160	0.16	110%	-0.015	-5.9614
HB-5141-04	1	0.0051	140	0.14	97%	0.005	0.9827
HB-5141-05	**1**	0.0050	150	0.15	103%	-0.005	-0.9945
HB-5142-06	**1**	0.0050	160	0.16	110%	-0.015	-2.9807
HB-5142-34	**1**	0.0088	140	0.14	97%	0.005	0.5672
HB-5142-35	**1**	0.0087	140	0.14	97%	0.005	0.5740
HB-5142-36	**1**	0.0088	150	0.15	103%	-0.005	-0.5677
HB-5142-07	**1**	0.0126	140	0.14	97%	0.005	0.3974
HB-5142-08	**1**	0.0125	160	0.16	110%	-0.015	-1.1982
HB-5142-09	**1**	0.0126	140	0.14	97%	0.005	0.3960
HB-5142-10	**1**	0.025	120	0.12	83%	0.025	0.9940
HB-5142-11	**1**	0.025	140	0.14	97%	0.005	0.1974
HB-5142-12	**1**	0.025	130	0.13	90%	0.015	0.5955
HB-5141-13	**1**	0.050	77	0.077	53%	0.068	1.3512
HB-5141-14	**1**	0.050	74	0.074	51%	0.071	1.4087
HB-5142-15	**1**	0.050	82	0.082	57%	0.063	1.2512
HB-5142-16	**1**	0.126	12	0.012	8.3%	0.133	1.0526
HB-5142-17	**1**	0.125	12	0.012	8.3%	0.133	1.0598
HB-5142-18	**1**	0.126	12	0.012	8.3%	0.133	1.0557
HB-5142-19	**2**	0.252	ND	--	--	--	--
HB-5142-20	**2**	0.251	1.3	0.0013	1.1%	0.114	0.4535
HB-5142-21	**2**	0.252	ND	--	--	--	--
HB-5141-22	**2**	0.28	ND	--	--	--	--
HB-5141-23	**2**	0.50	ND	--	--	--	--
HB-5142-24	**2**	0.50	ND	--	--	--	--
HB-5142-25	**2**	1.26	ND	--	--	--	--
HB-5142-26	**2**	1.26	ND	--	--	--	--
HB-5142-27	**2**	1.26	ND	--	--	--	--
HB-5141-28	**2**	5.04	ND	--	--	--	--
HB-5141-29	2	5.04	ND	--	--	--	--
HB-5142-30	2	5.04	ND	--	--	--	--
HB-5142-31	2	51.8	ND	--	--	--	--
HB-5142-32	2	51.9	ND	--	--	--	--
HB-5142-33	2	51.8	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
HB-5141-37	**1**	0	**340**	0.34	0.340	0.000
HB-5142-38	1	0	340	0.34		
HB-5141-39	**2**	0	**280**	0.28	0.270	0.014
HB-5142-40	**2**	0	260	0.26		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5142-01	1	0.0026	370	0.37	109%	-0.030	-11.4756
HB-5142-02	**1**	0.0025	380	0.38	112%	-0.040	-15.9841
HB-5142-03	**1**	0.0025	370	0.37	109%	-0.030	-11.9227
HB-5141-04	1	0.0051	350	0.35	103%	-0.010	-1.9655
HB-5141-05	**1**	0.0050	340	0.34	100%	0.000	0.0000
HB-5142-06	**1**	0.0050	380	0.38	112%	-0.040	-7.9485
HB-5142-34	**1**	0.0088	380	0.38	112%	-0.040	-4.5374
HB-5142-35	**1**	0.0087	360	0.36	106%	-0.020	-2.2961
HB-5142-36	**1**	0.0088	400	0.40	118%	-0.060	-6.8130
HB-5142-07	**1**	0.0126	360	0.36	106%	-0.020	-1.5897
HB-5142-08	**1**	0.0125	400	0.40	118%	-0.060	-4.7930
HB-5142-09	**1**	0.0126	360	0.36	106%	-0.020	-1.5841
HB-5142-10	**1**	0.025	340	0.34	100%	0.000	0.0000
HB-5142-11	**1**	0.025	370	0.37	109%	-0.030	-1.1846
HB-5142-12	**1**	0.025	370	0.37	109%	-0.030	-1.1911
HB-5141-13	**1**	0.050	290	0.29	85%	0.050	0.9935
HB-5141-14	**1**	0.050	280	0.28	82%	0.060	1.1904
HB-5142-15	**1**	0.050	320	0.32	94%	0.020	0.3972
HB-5142-16	**1**	0.126	130	0.13	38%	0.210	1.6620
HB-5142-17	**1**	0.125	120	0.12	35%	0.220	1.7530
HB-5142-18	**1**	0.126	120	0.12	35%	0.220	1.7462
HB-5142-19	**2**	0.252	16	0.016	5.9%	0.254	1.0094
HB-5142-20	**2**	0.251	20	0.020	7.4%	0.250	0.9972
HB-5142-21	**2**	0.252	16	0.016	5.9%	0.254	1.0086
HB-5141-22	**2**	0.28	2.9	0.0029	1.1%	0.267	0.9652
HB-5141-23	**2**	0.50	2.7	0.0027	1.0%	0.267	0.5314
HB-5142-24	**2**	0.50	3.1	0.0031	1.1%	0.267	0.5329
HB-5142-25	**2**	1.26	0.2	0.00020	0.07%	0.270	0.2147
HB-5142-26	**2**	1.26	0.2	0.00020	0.07%	0.270	0.2143
HB-5142-27	**2**	1.26	0.19	0.00019	0.07%	0.270	0.2141
HB-5141-28	**2**	5.04	ND	--	--	--	--
HB-5141-29	2	5.04	ND	--	--	--	--
HB-5142-30	2	5.04	ND	--	--	--	--
HB-5142-31	2	51.8	ND	--	--	--	--
HB-5142-32	2	51.9	ND	--	--	--	--
HB-5142-33	2	51.8	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
HB-5141-37	**1**	0	**690**	0.69	0.715	0.035
HB-5142-38	1	0	740	0.74		
HB-5141-39	**2**	0	**530**	0.53	0.515	0.021
HB-5142-40	**2**	0	500	0.50		

Carbon-Based Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5142-01	1	0.0026	750	0.75	105%	-0.035	-13.3882
HB-5142-02	**1**	0.0025	740	0.74	103%	-0.025	-9.9901
HB-5142-03	**1**	0.0025	760	0.76	106%	-0.045	-17.8841
HB-5141-04	1	0.0051	720	0.72	101%	-0.005	-0.9827
HB-5141-05	**1**	0.0050	700	0.70	98%	0.015	2.9836
HB-5142-06	**1**	0.0050	790	0.79	110%	-0.075	-14.9034
HB-5142-34	**1**	0.0088	690	0.69	97%	0.025	2.8359
HB-5142-35	**1**	0.0087	700	0.70	98%	0.015	1.7221
HB-5142-36	**1**	0.0088	790	0.79	110%	-0.075	-8.5162
HB-5142-07	**1**	0.0126	700	0.70	98%	0.015	1.1923
HB-5142-08	**1**	0.0125	770	0.77	108%	-0.055	-4.3936
HB-5142-09	**1**	0.0126	690	0.69	97%	0.025	1.9802
HB-5142-10	**1**	0.025	610	0.61	85%	0.105	4.1750
HB-5142-11	**1**	0.025	610	0.61	85%	0.105	4.1460
HB-5142-12	**1**	0.025	600	0.60	84%	0.115	4.5657
HB-5141-13	**1**	0.050	320	0.32	45%	0.395	7.8488
HB-5141-14	**1**	0.050	310	0.31	43%	0.405	8.0354
HB-5142-15	**1**	0.050	350	0.35	49%	0.365	7.2490
HB-5142-16	**1**	0.126	41	0.041	5.7%	0.674	5.3342
HB-5142-17	**1**	0.125	45	0.045	6.3%	0.670	5.3387
HB-5142-18	**1**	0.126	39	0.039	5.5%	0.676	5.3656
HB-5142-19	**2**	0.252	3.4	0.0034	0.66%	0.512	2.0331
HB-5142-20	**2**	0.251	3.4	0.0034	0.66%	0.512	2.0406
HB-5142-21	**2**	0.252	1.2	0.0012	0.23%	0.514	2.0402
HB-5141-22	**2**	0.28	0.22	0.00022	0.043%	0.515	1.8603
HB-5141-23	**2**	0.50	0.17	0.00017	0.033%	0.515	1.0235
HB-5142-24	**2**	0.50	0.19	0.00019	0.037%	0.515	1.0279
HB-5142-25	**2**	1.26	ND	--	--	--	--
HB-5142-26	**2**	1.26	ND	--	--	--	--
HB-5142-27	**2**	1.26	ND	--	--	--	--
HB-5141-28	**2**	5.04	ND	--	--	--	--
HB-5141-29	2	5.04	ND	--	--	--	--
HB-5142-30	2	5.04	ND	--	--	--	--
HB-5142-31	2	51.8	ND	--	--	--	--
HB-5142-32	2	51.9	ND	--	--	--	--
HB-5142-33	2	51.8	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
HB-5141-37	**1**	0	**2200**	2.20	2.450	0.354
HB-5142-38	1	0	2700	2.70		
HB-5141-39	**2**	0	**3000**	3.00	2.850	0.212
HB-5142-40	**2**	0	2700	2.70		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5142-01	1	0.0026	5600	5.60	229%	-3.150	-1204.9379
HB-5142-02	**1**	0.0025	4700	4.70	192%	-2.250	-899.1067
HB-5142-03	**1**	0.0025	4700	4.70	192%	-2.250	-894.2057
HB-5141-04	1	0.0051	2800	2.80	114%	-0.350	-68.7919
HB-5141-05	**1**	0.0050	2500	2.50	102%	-0.050	-9.9455
HB-5142-06	**1**	0.0050	4800	4.80	196%	-2.350	-466.9729
HB-5142-34	**1**	0.0088	3900	3.90	159%	-1.450	-164.4823
HB-5142-35	**1**	0.0087	4100	4.10	167%	-1.650	-189.4278
HB-5142-36	**1**	0.0088	5000	5.00	204%	-2.550	-289.5505
HB-5142-07	**1**	0.0126	4800	4.80	196%	-2.350	-186.7878
HB-5142-08	**1**	0.0125	4700	4.70	192%	-2.250	-179.7365
HB-5142-09	**1**	0.0126	6000	6.00	245%	--	--
HB-5142-10	**1**	0.025	3300	3.30	135%	-0.850	-33.7974
HB-5142-11	**1**	0.025	3300	3.30	135%	-0.850	-33.5625
HB-5142-12	**1**	0.025	3000	3.00	122%	-0.550	-21.8361
HB-5141-13	**1**	0.050	2400	2.40	98%	0.050	0.9935
HB-5141-14	**1**	0.050	2200	2.20	90%	0.250	4.9601
HB-5142-15	**1**	0.050	3800	3.80	155%	-1.350	-26.8115
HB-5142-16	**1**	0.126	2500	2.50	102%	-0.050	-0.3957
HB-5142-17	**1**	0.125	2800	2.80	114%	-0.350	-2.7889
HB-5142-18	**1**	0.126	4200	4.20	171%	--	--
HB-5142-19	**2**	0.252	2800	2.80	98%	0.050	0.1987
HB-5142-20	**2**	0.251	2900	2.90	102%	-0.050	-0.1994
HB-5142-21	**2**	0.252	2500	2.50	88%	0.350	1.3898
HB-5141-22	**2**	0.28	3500	3.50	123%	-0.650	-2.3490
HB-5141-23	**2**	0.50	3000	3.00	105%	-0.150	-0.2982
HB-5142-24	**2**	0.50	3100	3.10	109%	-0.250	-0.4992
HB-5142-25	**2**	1.26	1700	1.70	60%	1.150	0.9150
HB-5142-26	**2**	1.26	2400	2.40	84%	0.450	0.3574
HB-5142-27	**2**	1.26	1900	1.90	67%	0.950	0.7540
HB-5141-28	**2**	5.04	140	0.14	4.9%	2.710	0.5380
HB-5141-29	2	5.04	120	0.12	4.2%	2.730	0.5421
HB-5142-30	2	5.04	89	0.089	3.1%	2.761	0.5478
HB-5142-31	2	51.8	0.24	0.00024	0.008%	2.850	0.0550
HB-5142-32	2	51.9	0.62	0.00062	0.022%	2.849	0.0549
HB-5142-33	2	51.8	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
HB-5141-37	**1**	0	**1700**	1.70	1.700	0.000
HB-5142-38	1	0	1700	1.70		
HB-5141-39	**2**	0	**2000**	2.00	1.900	0.141
HB-5142-40	**2**	0	1800	1.80		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5142-01	1	0.0026	3500	3.50	206%	-1.800	-688.5359
HB-5142-02	**1**	0.0025	3000	3.00	176%	-1.300	-519.4839
HB-5142-03	**1**	0.0025	2900	2.90	171%	-1.200	-476.9097
HB-5141-04	1	0.0051	1600	1.60	94%	0.100	19.6548
HB-5141-05	**1**	0.0050	1600	1.60	94%	0.100	19.8910
HB-5142-06	**1**	0.0050	3000	3.00	176%	-1.300	-258.3254
HB-5142-34	**1**	0.0088	2100	2.10	124%	-0.400	-45.3744
HB-5142-35	**1**	0.0087	2200	2.20	129%	-0.500	-57.4024
HB-5142-36	**1**	0.0088	2600	2.60	153%	-0.900	-102.1943
HB-5142-07	**1**	0.0126	2200	2.20	129%	-0.500	-39.7421
HB-5142-08	**1**	0.0125	2200	2.20	129%	-0.500	-39.9415
HB-5142-09	**1**	0.0126	2700	2.70	159%	-1.000	-79.2069
HB-5142-10	**1**	0.025	880	0.88	52%	0.820	32.6046
HB-5142-11	**1**	0.025	840	0.84	49%	0.860	33.9574
HB-5142-12	**1**	0.025	860	0.86	51%	0.840	33.3497
HB-5141-13	**1**	0.050	170	0.17	10%	1.530	30.4016
HB-5141-14	**1**	0.050	150	0.15	8.8%	1.550	30.7529
HB-5142-15	**1**	0.050	300	0.30	18%	1.400	27.8046
HB-5142-16	**1**	0.126	12	0.012	0.71%	1.688	13.3593
HB-5142-17	**1**	0.125	13	0.013	0.76%	1.687	13.4423
HB-5142-18	**1**	0.126	22	0.022	1.3%	1.678	13.3187
HB-5142-19	**2**	0.252	ND	--	--	--	--
HB-5142-20	**2**	0.251	ND	--	--	--	--
HB-5142-21	**2**	0.252	ND	--	--	--	--
HB-5141-22	**2**	0.28	ND	--	--	--	--
HB-5141-23	**2**	0.50	ND	--	--	--	--
HB-5142-24	**2**	0.50	3.2	0.0032	0.17%	1.897	3.7872
HB-5142-25	**2**	1.26	ND	--	--	--	--
HB-5142-26	**2**	1.26	ND	--	--	--	--
HB-5142-27	**2**	1.26	ND	--	--	--	--
HB-5141-28	**2**	5.04	ND	--	--	--	--
HB-5141-29	2	5.04	ND	--	--	--	--
HB-5142-30	2	5.04	ND	--	--	--	--
HB-5142-31	2	51.8	ND	--	--	--	--
HB-5142-32	2	51.9	0.14	0.00014	0.007%	1.900	0.0366
HB-5142-33	2	51.8	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
HB-5141-37	**1**	0	**1.66**	0.00166	0.00190	0.00033
HB-5142-38	1	0	2.13	0.00213		
HB-5141-39	**2**	0	**2.15**	0.00215	0.00231	0.00023
HB-5142-40	**2**	0	2.47	0.00247		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**Ce (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5142-01	1	0.0026	2.14	0.00214	113%	0.000	-0.0937
HB-5142-02	**1**	0.0025	2.1	0.00210	111%	0.000	-0.0819
HB-5142-03	**1**	0.0025	2.2	0.00220	116%	0.000	-0.1212
HB-5141-04	1	0.0051	1.87	0.00187	99%	0.000	0.0049
HB-5141-05	**1**	0.0050	1.86	0.00186	98%	0.000	0.0070
HB-5142-06	**1**	0.0050	1.97	0.00197	104%	0.000	-0.0149
HB-5142-34	**1**	0.0088	1.98	0.00198	104%	0.000	-0.0096
HB-5142-35	**1**	0.0087	2.08	0.00208	110%	0.000	-0.0212
HB-5142-36	**1**	0.0088	2.02	0.00202	107%	0.000	-0.0142
HB-5142-07	**1**	0.0126	2.21	0.00221	117%	0.000	-0.0250
HB-5142-08	**1**	0.0125	2.18	0.00218	115%	0.000	-0.0228
HB-5142-09	**1**	0.0126	2.21	0.00221	117%	0.000	-0.0250
HB-5142-10	**1**	0.025	2.11	0.00211	111%	0.000	-0.0085
HB-5142-11	**1**	0.025	2.17	0.00217	115%	0.000	-0.0109
HB-5142-12	**1**	0.025	2.15	0.00215	113%	0.000	-0.0101
HB-5141-13	**1**	0.050	1.89	0.00189	100%	0.000	0.0001
HB-5141-14	**1**	0.050	1.84	0.00184	97%	0.000	0.0011
HB-5142-15	**1**	0.050	2.15	0.00215	113%	0.000	-0.0051
HB-5142-16	**1**	0.126	1.69	0.00169	89%	0.000	0.0016
HB-5142-17	**1**	0.125	2.08	0.00208	110%	0.000	-0.0015
HB-5142-18	**1**	0.126	1.98	0.00198	104%	0.000	-0.0007
HB-5142-19	**2**	0.252	2.07	0.00207	90%	0.000	0.0010
HB-5142-20	**2**	0.251	2.64	0.00264	114%	0.000	-0.0013
HB-5142-21	**2**	0.252	1.65	0.00165	71%	0.001	0.0026
HB-5141-22	**2**	0.28	0.041	0.00004	1.8%	0.002	0.0082
HB-5141-23	**2**	0.50	0.0241	0.00002	1.0%	0.002	0.0045
HB-5142-24	**2**	0.50	1.99	0.00199	86%	0.000	0.0006
HB-5142-25	**2**	1.26	0.0531	0.000053	2.30%	0.002	0.0018
HB-5142-26	**2**	1.26	0.0242	0.000024	1.05%	0.002	0.0018
HB-5142-27	**2**	1.26	0.0226	0.000023	0.98%	0.002	0.0018
HB-5141-28	**2**	5.04	0.0036	0.0000036	0.16%	0.002	0.0005
HB-5141-29	2	5.04	0.0012	0.0000012	0.05%	0.002	0.0005
HB-5142-30	2	5.04	0.0028	0.0000028	0.12%	0.002	0.0005
HB-5142-31	2	51.8	0.00068	6.8E-07	0.029%	0.002	0.0000
HB-5142-32	2	51.9	0.00066	0.00000066	0.029%	0.002	0.0000
HB-5142-33	2	51.8	0.00042	4.2E-07	0.018%	0.002	0.0000

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
HB-5141-37	**1**	0	**1800**	1.80	1.950	0.212
HB-5142-38	1	0	2100	2.10		
HB-5141-39	**2**	0	**2400**	2.40	2.450	0.071
HB-5142-40	**2**	0	2500	2.50		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5141-37	**1**	0	**1800**	1.80	92%	**--**	**--**
HB-5142-38	1	0	2100	2.10	108%	--	--
HB-5141-39	**2**	0	**2400**	2.40	98%	**--**	**--**
HB-5142-40	**2**	0	2500	2.50	102%	--	--
HB-5141-05	**1**	0.0050	1900	1.90	97%	0.050	9.9455
HB-5142-06	**1**	0.0050	4000	4.00	205%	-2.050	-407.3594
HB-5142-34	**1**	0.0088	3100	3.10	159%	-1.150	-130.4515
HB-5142-35	**1**	0.0087	3300	3.30	169%	-1.350	-154.9864
HB-5142-36	**1**	0.0088	4100	4.10	210%	-2.150	-244.1308
HB-5142-07	**1**	0.0126	3900	3.90	200%	-1.950	-154.9941
HB-5142-08	**1**	0.0125	3800	3.80	195%	-1.850	-147.7834
HB-5142-09	**1**	0.0126	4900	4.90	251%	--	--
HB-5142-10	**1**	0.025	2700	2.70	138%	-0.750	-29.8213
HB-5142-11	**1**	0.025	2900	2.90	149%	-0.950	-37.5111
HB-5142-12	**1**	0.025	2500	2.50	128%	-0.550	-21.8361
HB-5141-13	**1**	0.050	1800	1.80	92%	0.150	2.9805
HB-5141-14	**1**	0.050	1700	1.70	87%	0.250	4.9601
HB-5142-15	**1**	0.050	3000	3.00	154%	-1.050	-20.8534
HB-5142-16	**1**	0.126	2000	2.00	103%	-0.050	-0.3957
HB-5142-17	**1**	0.125	2200	2.20	113%	-0.250	-1.9920
HB-5142-18	**1**	0.126	3500	3.50	179%	--	--
HB-5142-19	**2**	0.252	2300	2.30	94%	0.150	0.5961
HB-5142-20	**2**	0.251	2500	2.50	102%	-0.050	-0.1994
HB-5142-21	**2**	0.252	2200	2.20	90%	0.250	0.9927
HB-5141-22	**2**	0.28	1900	1.90	78%	0.550	1.9876
HB-5141-23	**2**	0.50	1600	1.60	65%	0.850	1.6899
HB-5142-24	**2**	0.50	2000	2.00	82%	0.450	0.8985
HB-5142-25	**2**	1.26	290	0.29	12%	2.160	1.7185
HB-5142-26	**2**	1.26	330	0.33	13%	2.120	1.6839
HB-5142-27	**2**	1.26	260	0.26	11%	2.190	1.7381
HB-5141-28	**2**	5.04	3.8	0.0038	0.16%	2.446	0.4856
HB-5141-29	2	5.04	2.9	0.0029	0.12%	2.447	0.4859
HB-5142-30	2	5.04	2.7	0.0027	0.11%	2.447	0.4856
HB-5142-31	2	51.8	ND	--	--	--	--
HB-5142-32	2	51.9	0.20	0.00020	0.008%	2.450	0.0472
HB-5142-33	2	51.8	0.14	0.00014	0.006%	2.450	0.0473

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
HB-5141-37	**1**	0	**168**	172	4.9
HB-5142-38	1	0	175		
HB-5141-39	**2**	0	**169**	171	2.8
HB-5142-40	**2**	0	173		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5142-01	1	0.0026	177	103%	-6	-2104
HB-5142-02	**1**	0.0025	180	105%	-9	-3397
HB-5142-03	**1**	0.0025	176	103%	-5	-1788
HB-5141-04	1	0.0051	167	97%	4	884
HB-5141-05	**1**	0.0050	173	101%	-2	-298
HB-5142-06	**1**	0.0050	178	104%	-7	-1292
HB-5142-34	**1**	0.0088	175	102%	-4	-397
HB-5142-35	**1**	0.0087	176	103%	-5	-517
HB-5142-36	**1**	0.0088	174	101%	-3	-284
HB-5142-07	**1**	0.0126	177	103%	-6	-437
HB-5142-08	**1**	0.0125	175	102%	-4	-280
HB-5142-09	**1**	0.0126	174	101%	-3	-198
HB-5142-10	**1**	0.025	174	101%	-3	-99
HB-5142-11	**1**	0.025	131	76%	41	1599
HB-5142-12	**1**	0.025	174	101%	-3	-99
HB-5141-13	**1**	0.050	166	97%	5	109
HB-5141-14	**1**	0.050	169	99%	2	50
HB-5142-15	**1**	0.050	170	99%	1	30
HB-5142-16	**1**	0.126	161	94%	11	83
HB-5142-17	**1**	0.125	166	97%	5	44
HB-5142-18	**1**	0.126	165	96%	6	52
HB-5142-19	**2**	0.252	156	91%	15	60
HB-5142-20	**2**	0.251	155	91%	16	64
HB-5142-21	**2**	0.252	157	92%	14	56
HB-5141-22	**2**	0.28	146	85%	25	90
HB-5141-23	**2**	0.50	142	83%	29	58
HB-5142-24	**2**	0.50	151	88%	20	40
HB-5142-25	**2**	1.26	142	83%	29	23
HB-5142-26	**2**	1.26	140	82%	31	25
HB-5142-27	**2**	1.26	137	80%	34	27
HB-5141-28	**2**	5.04	126	74%	45	8.9
HB-5141-29	2	5.04	124	73%	47	9.3
HB-5142-30	2	5.04	134	78%	37	7.3
HB-5142-31	2	51.8	111	65%	60	1.2
HB-5142-32	2	51.9	108	63%	63	1.2
HB-5142-33	2	51.8	113	66%	58	1.1

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
HB-5141-37	**1**	0	**1190**	1230	56.6
HB-5142-38	1	0	1270		
HB-5141-39	**2**	0	**982**	1051	97.6
HB-5142-40	**2**	0	1120		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**Ce (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
HB-5142-01	1	0.0026	932	76%	298	113991
HB-5142-02	**1**	0.0025	942	77%	288	115086
HB-5142-03	**1**	0.0025	1000	81%	230	91408
HB-5141-04	1	0.0051	1280	104%	-50	-9827
HB-5141-05	**1**	0.0050	1270	103%	-40	-7956
HB-5142-06	**1**	0.0050	879	71%	351	69748
HB-5142-34	**1**	0.0088	798	65%	432	49004
HB-5142-35	**1**	0.0087	967	79%	263	30194
HB-5142-36	**1**	0.0088	932	76%	298	33838
HB-5142-07	**1**	0.0126	922	75%	308	24481
HB-5142-08	**1**	0.0125	1020	83%	210	16775
HB-5142-09	**1**	0.0126	1180	96%	50	3960
HB-5142-10	**1**	0.025	1370	111%	-140	-5567
HB-5142-11	**1**	0.025	1160	94%	70	2764
HB-5142-12	**1**	0.025	900	73%	330	13102
HB-5141-13	**1**	0.050	1210	98%	20	397
HB-5141-14	**1**	0.050	1690	137%	-460	-9127
HB-5142-15	**1**	0.050	1390	113%	-160	-3178
HB-5142-16	**1**	0.126	1420	115%	-190	-1504
HB-5142-17	**1**	0.125	1210	98%	20	159
HB-5142-18	**1**	0.126	1260	102%	-30	-238
HB-5142-19	**2**	0.252	1130	108%	-79	-314
HB-5142-20	**2**	0.251	961	91%	90	359
HB-5142-21	**2**	0.252	999	95%	52	206
HB-5141-22	**2**	0.28	902	86%	149	538
HB-5141-23	**2**	0.50	622	59%	429	853
HB-5142-24	**2**	0.50	919	87%	132	264
HB-5142-25	**2**	1.26	993	94%	58	46
HB-5142-26	**2**	1.26	1160	110%	-109	-87
HB-5142-27	**2**	1.26	1100	105%	-49	-39
HB-5141-28	**2**	5.04	723	69%	328	65
HB-5141-29	2	5.04	830	79%	221	44
HB-5142-30	2	5.04	1280	122%	-229	-45
HB-5142-31	2	51.8	836	80%	215	4
HB-5142-32	2	51.9	1400	133%	-349	-7
HB-5142-33	2	51.8	1350	128%	-299	-6

Controls

Sample ID	Spiked Batch	Bottle Weight		Carbon Mass	Gross Weight	Net Weight	Water Volume
(Bottle) #	**Batch #**	**Empty (g)**	**Full (g)**	**M (mg)**	**Water + Carbon (g)**	**Water (g)**	**V (L)**
HB-5141-37	**1**	1109	3120	0	2011	2011.00	1.991
HB-5142-38	1	1108	3121	0	2013	2013.00	1.993
HB-5141-39	**2**	1110	3117	0	2007	2007.00	1.987
HB-5142-40	**2**	1108	3122	0	2014	2014.00	1.994

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Bottle Weight		Carbon Mass	Gross Weight	Net Weight	Water Volume
(Bottle) #	**Batch #**	**Empty (g)**	**Full (g)**	**M (mg)**	**Water + Carbon (g)**	**Water (g)**	**V (L)**
HB-5142-01	1	1109	3118	0.005	2009	2008.99	1.989
HB-5142-02	**1**	1109	3127	0.005	2018	2018.00	1.998
HB-5142-03	**1**	1109	3116	0.005	2007	2007.00	1.987
HB-5141-04	1	1110	3115	0.010	2005	2004.99	1.985
HB-5141-05	**1**	1109	3118	0.010	2009	2008.99	1.989
HB-5142-06	**1**	1110	3117	0.010	2007	2006.99	1.987
HB-5142-34	**1**	1110	3115	0.018	2005	2004.98	1.985
HB-5142-35	**1**	1110	3116	0.017	2006	2005.98	1.986
HB-5142-36	**1**	1110	3117	0.018	2007	2006.98	1.987
HB-5142-07	**1**	1109	3116	0.025	2007	2006.98	1.987
HB-5142-08	**1**	1109	3118	0.025	2009	2008.98	1.989
HB-5142-09	**1**	1110	3118	0.025	2008	2007.97	1.988
HB-5142-10	**1**	1108	3112	0.050	2004	2003.95	1.984
HB-5142-11	**1**	1110	3124	0.051	2014	2013.95	1.994
HB-5142-12	**1**	1109	3114	0.050	2005	2004.95	1.985
HB-5141-13	**1**	1109	3116	0.100	2007	2006.90	1.987
HB-5141-14	**1**	1110	3114	0.100	2004	2003.90	1.984
HB-5142-15	**1**	1109	3115	0.100	2006	2005.90	1.986
HB-5142-16	**1**	1108	3109	0.25	2001	2000.75	1.981
HB-5142-17	**1**	1108	3117	0.25	2009	2008.75	1.989
HB-5142-18	**1**	1110	3112	0.25	2002	2001.75	1.982
HB-5142-19	**2**	1108	3117	0.50	2009	2008.50	1.989
HB-5142-20	**2**	1109	3125	0.50	2016	2015.50	1.996
HB-5142-21	**2**	1108	3115	0.50	2007	2006.50	1.987
HB-5141-22	**2**	1110	3118	0.55	2008	2007.45	1.988
HB-5141-23	**2**	1109	3117	1.00	2008	2007.00	1.987
HB-5142-24	**2**	1108	3126	1.00	2018	2017.00	1.997
HB-5142-25	**2**	1109	3121	2.50	2012	2009.50	1.990
HB-5142-26	**2**	1109	3118	2.50	2009	2006.50	1.987
HB-5142-27	**2**	1110	3116	2.50	2006	2003.50	1.984
HB-5141-28	**2**	1110	3123	9.99	2013	2003.01	1.983
HB-5141-29	2	1110	3126	10.00	2016	2006.00	1.986
HB-5142-30	2	1109	3122	10.00	2013	2003.00	1.983
HB-5142-31	2	1110	3161	100.0	2051	1950.98	1.932
HB-5142-32	2	1109	3155	100.0	2046	1945.98	1.927
HB-5142-33	2	1110	3161	100.1	2051	1950.92	1.932

Test Water Density	**1010 g/L**

ATTACHMENT 5

EXPERIMENTAL DATA
WASTEBED B – HARBOR BROOK EAST AREA

(PROVIDED ON CD ON ATTACHMENT TAB)

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
5144-37	**1**	0	170	0.17	0.165	0.007
5144-38	1	0	160	0.16		
5144-39	**2**	0	210	0.21	0.200	0.014
5144-40	**2**	0	190	0.19		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
5144-01	1	0.007	530	0.53	321%	-0.365	-48.9333
5144-02	**1**	0.008	270	0.27	164%	-0.105	-13.3662
5144-03	**1**	0.008	540	0.54	327%	-0.375	-48.9105
5144-04	1	0.013	530	0.53	321%	-0.365	-28.3414
5144-05	**1**	0.013	640	0.64	388%	-0.475	-37.4164
5144-06	**1**	0.013	420	0.42	255%	-0.255	-20.0059
5144-07	**1**	0.026	640	0.64	388%	-0.475	-18.6053
5144-08	**1**	0.025	420	0.42	255%	-0.255	-10.0281
5144-09	**1**	0.025	130	0.13	79%	0.035	1.3889
5144-10	**1**	0.038	110	0.11	67%	0.055	1.4458
5144-11	**1**	0.038	260	0.26	158%	-0.095	-2.4860
5144-12	**1**	0.038	210	0.21	127%	-0.045	-1.1784
5144-13	**1**	0.051	180	0.18	109%	-0.015	-0.2930
5144-14	**1**	0.051	160	0.16	97%	0.005	0.0986
5144-15	**1**	0.051	130	0.13	79%	0.035	0.6892
5144-16	**1**	0.10	60	0.060	36%	0.105	1.0302
5144-17	**1**	0.10	59	0.059	36%	0.106	1.0338
5144-18	**1**	0.10	58	0.058	35%	0.107	1.0477
5144-19	**2**	0.20	16	0.016	8.0%	0.184	0.9041
5144-20	**2**	0.20	23	0.023	12%	0.177	0.8774
5144-21	**2**	0.21	21	0.021	11%	0.179	0.8424
5144-22	**2**	0.30	5.9	0.0059	3.0%	0.194	0.6371
5144-23	**2**	0.31	5.6	0.0056	2.8%	0.194	0.6371
5144-24	**2**	0.31	5.0	0.0050	2.5%	0.195	0.6390
5144-25	**2**	0.40	2.5	0.0025	1.3%	0.198	0.4881
5144-26	**2**	0.41	2.5	0.0025	1.3%	0.198	0.4870
5144-27	**2**	0.40	2.2	0.0022	1.1%	0.198	0.4887
5144-28	**2**	0.51	1.0	0.0010	0.50%	0.199	0.3920
5144-29	**2**	0.51	1.0	0.0010	0.50%	0.199	0.3920
5144-30	**2**	0.51	1.1	0.0011	0.55%	0.199	0.3921
5144-31	**2**	1.3	ND	--	--	--	--
5144-32	2	1.3	ND	--	--	--	--
5144-33	2	1.3	ND	--	--	--	--
5144-34	2	5.1	ND	--	--	--	--
5144-35	2	5.1	ND	--	--	--	--
5144-36	2	5.1	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
5144-37	**1**	0	170	0.17	0.160	0.014
5144-38	1	0	150	0.15		
5144-39	**2**	0	240	0.24	0.235	0.007
5144-40	**2**	0	230	0.23		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
5144-01	1	0.007	420	0.42	263%	-0.260	-34.8566
5144-02	**1**	0.008	220	0.22	138%	-0.060	-7.6378
5144-03	**1**	0.008	430	0.43	269%	-0.270	-35.2156
5144-04	1	0.013	430	0.43	269%	-0.270	-20.9649
5144-05	**1**	0.013	520	0.52	325%	-0.360	-28.3577
5144-06	**1**	0.013	340	0.34	213%	-0.180	-14.1218
5144-07	**1**	0.026	520	0.52	325%	-0.360	-14.1009
5144-08	**1**	0.025	340	0.34	213%	-0.180	-7.0786
5144-09	**1**	0.025	100	0.10	63%	0.060	2.3810
5144-10	**1**	0.038	87	0.09	54%	0.073	1.9189
5144-11	**1**	0.038	200	0.20	125%	-0.040	-1.0467
5144-12	**1**	0.038	190	0.19	119%	-0.030	-0.7856
5144-13	**1**	0.051	40	0.040	25%	0.120	2.3443
5144-14	**1**	0.051	37	0.037	23%	0.123	2.4246
5144-15	**1**	0.051	28	0.028	18%	0.132	2.5994
5144-16	**1**	0.10	4.4	0.0044	2.8%	0.156	1.5266
5144-17	**1**	0.10	4.6	0.0046	2.9%	0.155	1.5155
5144-18	**1**	0.10	4.6	0.0046	2.9%	0.155	1.5216
5144-19	**2**	0.20	1	0.0008	0.35%	0.234	1.1507
5144-20	**2**	0.20	1.2	0.0012	0.51%	0.234	1.1589
5144-21	**2**	0.21	0.97	0.0010	0.41%	0.234	1.1014
5144-22	**2**	0.30	0.3	0.00027	0.11%	0.235	0.7705
5144-23	**2**	0.31	0.29	0.00029	0.12%	0.235	0.7692
5144-24	**2**	0.31	0.3	0.00026	0.11%	0.235	0.7692
5144-25	**2**	0.40	ND	--	--	--	--
5144-26	**2**	0.41	ND	--	--	--	--
5144-27	**2**	0.40	ND	--	--	--	--
5144-28	**2**	0.51	ND	--	--	--	--
5144-29	**2**	0.51	ND	--	--	--	--
5144-30	**2**	0.51	ND	--	--	--	--
5144-31	**2**	1.3	ND	--	--	--	--
5144-32	2	1.3	ND	--	--	--	--
5144-33	2	1.3	ND	--	--	--	--
5144-34	2	5.1	ND	--	--	--	--
5144-35	2	5.1	ND	--	--	--	--
5144-36	2	5.1	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
5144-37	**1**	0	470	0.47	0.455	0.021
5144-38	1	0	440	0.44		
5144-39	**2**	0	680	0.68	0.690	0.014
5144-40	**2**	0	700	0.70		

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
5144-01	1	0.007	800	0.80	176%	-0.345	-46.2520
5144-02	**1**	0.008	410	0.41	90%	0.045	5.7284
5144-03	**1**	0.008	850	0.85	187%	-0.395	-51.5191
5144-04	1	0.013	820	0.82	180%	-0.365	-28.3414
5144-05	**1**	0.013	980	0.98	215%	-0.525	-41.3549
5144-06	**1**	0.013	640	0.64	141%	-0.185	-14.5141
5144-07	**1**	0.026	980	0.98	215%	-0.525	-20.5638
5144-08	**1**	0.025	660	0.66	145%	-0.205	-8.0618
5144-09	**1**	0.025	196	0.20	43%	0.259	10.2778
5144-10	**1**	0.038	165	0.17	36%	0.290	7.6232
5144-11	**1**	0.038	380	0.38	84%	0.075	1.9627
5144-12	**1**	0.038	308	0.31	68%	0.147	3.8494
5144-13	**1**	0.051	13.7	0.014	3.0%	0.441	8.6211
5144-14	**1**	0.051	11	0.011	2.4%	0.444	8.7521
5144-15	**1**	0.051	7.6	0.008	1.7%	0.447	8.8102
5144-16	**1**	0.10	ND	--	--	--	--
5144-17	**1**	0.10	ND	--	--	--	--
5144-18	**1**	0.10	ND	--	--	--	--
5144-19	**2**	0.20	ND	--	--	--	--
5144-20	**2**	0.20	ND	--	--	--	--
5144-21	**2**	0.21	ND	--	--	--	--
5144-22	**2**	0.30	ND	--	--	--	--
5144-23	**2**	0.31	ND	--	--	--	--
5144-24	**2**	0.31	ND	--	--	--	--
5144-25	**2**	0.40	ND	--	--	--	--
5144-26	**2**	0.41	ND	--	--	--	--
5144-27	**2**	0.40	ND	--	--	--	--
5144-28	**2**	0.51	ND	--	--	--	--
5144-29	**2**	0.51	ND	--	--	--	--
5144-30	**2**	0.51	ND	--	--	--	--
5144-31	**2**	1.3	ND	--	--	--	--
5144-32	2	1.3	ND	--	--	--	--
5144-33	2	1.3	ND	--	--	--	--
5144-34	2	5.1	ND	--	--	--	--
5144-35	2	5.1	ND	--	--	--	--
5144-36	2	5.1	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
5144-37	**1**	0	170	0.17	0.160	0.014
5144-38	1	0	150	0.15		
5144-39	**2**	0	230	0.23	0.230	0.000
5144-40	**2**	0	230	0.23		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
5144-01	1	0.007	370	0.37	231%	-0.210	-28.1534
5144-02	**1**	0.008	180	0.18	113%	-0.020	-2.5459
5144-03	**1**	0.008	370	0.37	231%	-0.210	-27.3899
5144-04	1	0.013	370	0.37	231%	-0.210	-16.3060
5144-05	**1**	0.013	440	0.44	275%	-0.280	-22.0560
5144-06	**1**	0.013	280	0.28	175%	-0.120	-9.4145
5144-07	**1**	0.026	440	0.44	275%	-0.280	-10.9673
5144-08	**1**	0.025	280	0.28	175%	-0.120	-4.7191
5144-09	**1**	0.025	83	0.08	52%	0.077	3.0556
5144-10	**1**	0.038	73	0.07	46%	0.087	2.2870
5144-11	**1**	0.038	170	0.17	106%	-0.010	-0.2617
5144-12	**1**	0.038	140	0.14	88%	0.020	0.5237
5144-13	**1**	0.051	15	0.015	9.4%	0.145	2.8327
5144-14	**1**	0.051	13	0.013	8.1%	0.147	2.8977
5144-15	**1**	0.051	10	0.010	6.3%	0.150	2.9538
5144-16	**1**	0.10	1.6	0.0016	1.0%	0.158	1.5541
5144-17	**1**	0.10	1.2	0.0012	0.8%	0.159	1.5487
5144-18	**1**	0.10	1.2	0.0012	0.8%	0.159	1.5549
5144-19	**2**	0.20	ND	--	--	--	--
5144-20	**2**	0.20	0.31	0.00031	0.13%	0.230	1.1386
5144-21	**2**	0.21	0.28	0.00028	0.12%	0.230	1.0811
5144-22	**2**	0.30	ND	--	--	--	--
5144-23	**2**	0.31	ND	--	--	--	--
5144-24	**2**	0.31	ND	--	--	--	--
5144-25	**2**	0.40	ND	--	--	--	--
5144-26	**2**	0.41	ND	--	--	--	--
5144-27	**2**	0.40	ND	--	--	--	--
5144-28	**2**	0.51	ND	--	--	--	--
5144-29	**2**	0.51	ND	--	--	--	--
5144-30	**2**	0.51	ND	--	--	--	--
5144-31	**2**	1.3	ND	--	--	--	--
5144-32	2	1.3	ND	--	--	--	--
5144-33	2	1.3	ND	--	--	--	--
5144-34	2	5.1	ND	--	--	--	--
5144-35	2	5.1	ND	--	--	--	--
5144-36	2	5.1	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
5144-37	**1**	0	170	0.17	0.160	0.014
5144-38	1	0	150	0.15		
5144-39	**2**	0	230	0.23	0.225	0.007
5144-40	**2**	0	220	0.22		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
5144-01	1	0.007	470	0.47	294%	-0.310	-41.5598
5144-02	**1**	0.008	240	0.24	150%	-0.080	-10.1838
5144-03	**1**	0.008	470	0.47	294%	-0.310	-40.4327
5144-04	1	0.013	480	0.48	300%	-0.320	-24.8473
5144-05	**1**	0.013	570	0.57	356%	-0.410	-32.2962
5144-06	**1**	0.013	360	0.36	225%	-0.200	-15.6909
5144-07	**1**	0.026	570	0.57	356%	-0.410	-16.0593
5144-08	**1**	0.025	370	0.37	231%	-0.210	-8.2584
5144-09	**1**	0.025	110	0.11	69%	0.050	1.9841
5144-10	**1**	0.038	95	0.10	59%	0.065	1.7087
5144-11	**1**	0.038	220	0.22	138%	-0.060	-1.5701
5144-12	**1**	0.038	180	0.18	113%	-0.020	-0.5237
5144-13	**1**	0.051	61	0.061	38%	0.099	1.9340
5144-14	**1**	0.051	56	0.056	35%	0.104	2.0500
5144-15	**1**	0.051	42	0.042	26%	0.118	2.3237
5144-16	**1**	0.10	8.6	0.0086	5.4%	0.151	1.4854
5144-17	**1**	0.10	8.3	0.0083	5.2%	0.152	1.4795
5144-18	**1**	0.10	8.2	0.0082	5.1%	0.152	1.4864
5144-19	**2**	0.20	1.6	0.0016	0.71%	0.223	1.0977
5144-20	**2**	0.20	2.0	0.0020	0.89%	0.223	1.1054
5144-21	**2**	0.21	1.8	0.0018	0.80%	0.223	1.0504
5144-22	**2**	0.30	0.5	0.0005	0.21%	0.225	0.7369
5144-23	**2**	0.31	0.47	0.0005	0.21%	0.225	0.7359
5144-24	**2**	0.31	0.4	0.0004	0.19%	0.225	0.7359
5144-25	**2**	0.40	ND	--	--	--	--
5144-26	**2**	0.41	ND	--	--	--	--
5144-27	**2**	0.40	ND	--	--	--	--
5144-28	**2**	0.51	ND	--	--	--	--
5144-29	**2**	0.51	ND	--	--	--	--
5144-30	**2**	0.51	ND	--	--	--	--
5144-31	**2**	1.3	ND	--	--	--	--
5144-32	2	1.3	ND	--	--	--	--
5144-33	2	1.3	ND	--	--	--	--
5144-34	2	5.1	ND	--	--	--	--
5144-35	2	5.1	ND	--	--	--	--
5144-36	2	5.1	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
5144-37	**1**	0	510	0.51	0.490	0.028
5144-38	1	0	470	0.47		
5144-39	**2**	0	690	0.69	0.680	0.014
5144-40	**2**	0	670	0.67		

Carbon-Based Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
5144-01	1	0.007	1000	1.00	204%	-0.510	-68.3725
5144-02	**1**	0.008	510	0.51	104%	-0.020	-2.5459
5144-03	**1**	0.008	1010	1.01	206%	-0.520	-67.8226
5144-04	1	0.013	1010	1.01	206%	-0.520	-40.3768
5144-05	**1**	0.013	1220	1.22	249%	-0.730	-57.5030
5144-06	**1**	0.013	790	0.79	161%	-0.300	-23.5363
5144-07	**1**	0.026	1220	1.22	249%	-0.730	-28.5934
5144-08	**1**	0.025	800	0.80	163%	-0.310	-12.1910
5144-09	**1**	0.025	233	0.23	48%	0.257	10.1984
5144-10	**1**	0.038	201	0.20	41%	0.289	7.5969
5144-11	**1**	0.038	480	0.48	98%	0.010	0.2617
5144-12	**1**	0.038	420	0.42	86%	0.070	1.8331
5144-13	**1**	0.051	32	0.032	6.5%	0.458	8.9474
5144-14	**1**	0.051	25.4	0.0254	5.2%	0.465	9.1582
5144-15	**1**	0.051	19.0	0.0190	3.9%	0.471	9.2750
5144-16	**1**	0.10	3.0	0.0030	0.61%	0.487	4.7780
5144-17	**1**	0.10	0.92	0.0009	0.19%	0.489	4.7698
5144-18	**1**	0.10	1.0	0.0010	0.20%	0.489	4.7881
5144-19	**2**	0.20	0.14	0.00014	0.02%	0.680	3.3406
5144-20	**2**	0.20	0.62	0.00062	0.09%	0.679	3.3676
5144-21	**2**	0.21	0.18	0.00018	0.03%	0.680	3.1993
5144-22	**2**	0.30	ND	--	--	--	--
5144-23	**2**	0.31	ND	--	--	--	--
5144-24	**2**	0.31	ND	--	--	--	--
5144-25	**2**	0.40	ND	--	--	--	--
5144-26	**2**	0.41	ND	--	--	--	--
5144-27	**2**	0.40	ND	--	--	--	--
5144-28	**2**	0.51	ND	--	--	--	--
5144-29	**2**	0.51	ND	--	--	--	--
5144-30	**2**	0.51	ND	--	--	--	--
5144-31	**2**	1.3	ND	--	--	--	--
5144-32	2	1.3	ND	--	--	--	--
5144-33	2	1.3	ND	--	--	--	--
5144-34	2	5.1	ND	--	--	--	--
5144-35	2	5.1	ND	--	--	--	--
5144-36	2	5.1	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
5144-37	**1**	0	110	0.11	0.110	0.000
5144-38	1	0	110	0.11		
5144-39	**2**	0	170	0.17	0.185	0.021
5144-40	**2**	0	200	0.20		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
5144-01	1	0.007	45	0.05	41%	0.065	8.7141
5144-02	**1**	0.008	95	0.10	86%	0.015	1.9095
5144-03	**1**	0.008	49	0.05	45%	0.061	7.9561
5144-04	1	0.013	45	0.05	41%	0.065	5.0471
5144-05	**1**	0.013	44	0.04	40%	0.066	5.1989
5144-06	**1**	0.013	130	0.13	118%	-0.020	-1.5691
5144-07	**1**	0.026	140	0.14	127%	-0.030	-1.1751
5144-08	**1**	0.025	110	0.11	100%	0.000	0.0000
5144-09	**1**	0.025	85	0.09	77%	0.025	0.9921
5144-10	**1**	0.038	87	0.09	79%	0.023	0.6046
5144-11	**1**	0.038	94	0.09	85%	0.016	0.4187
5144-12	**1**	0.038	57	0.06	52%	0.053	1.3879
5144-13	**1**	0.051	72	0.072	65%	0.038	0.7424
5144-14	**1**	0.051	87	0.0870	79%	0.023	0.4534
5144-15	**1**	0.051	92	0.0920	84%	0.018	0.3545
5144-16	**1**	0.10	32	0.0320	29%	0.078	0.7653
5144-17	**1**	0.10	11	0.0110	10%	0.099	0.9655
5144-18	**1**	0.10	58	0.0580	53%	0.052	0.5092
5144-19	**2**	0.20	3.4	0.00340	1.8%	0.182	0.8923
5144-20	**2**	0.20	21	0.02100	11%	0.164	0.8129
5144-21	**2**	0.21	9.4	0.00940	5.1%	0.176	0.8264
5144-22	**2**	0.30	2.3	0.00230	1.2%	0.183	0.5997
5144-23	**2**	0.31	ND	--	--	--	--
5144-24	**2**	0.31	2.8	0.0028	1.5%	0.182	0.5970
5144-25	**2**	0.40	2.0	0.00197	1.1%	0.183	0.4524
5144-26	**2**	0.41	2.0	0.00198	1.1%	0.183	0.4513
5144-27	**2**	0.40	1.9	0.00189	1.0%	0.183	0.4524
5144-28	**2**	0.51	2.0	0.00200	1.1%	0.183	0.3605
5144-29	**2**	0.51	1.7	0.00170	0.9%	0.183	0.3611
5144-30	**2**	0.51	1.4	0.00140	0.8%	0.184	0.3620
5144-31	**2**	1.3	ND	--	--	--	--
5144-32	2	1.3	ND	--	--	--	--
5144-33	2	1.3	ND	--	--	--	--
5144-34	2	5.1	ND	--	--	--	--
5144-35	2	5.1	ND	--	--	--	--
5144-36	2	5.1	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
5144-37	**1**	0	590	0.59	0.545	0.064
5144-38	1	0	500	0.50		
5144-39	**2**	0	580	0.58	0.590	0.014
5144-40	**2**	0	600	0.60		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
5144-01	1	0.007	170	0.17	31%	0.375	50.2739
5144-02	**1**	0.008	170	0.17	31%	0.375	47.7365
5144-03	**1**	0.008	180	0.18	33%	0.365	47.6062
5144-04	1	0.013	60	0.060	11%	0.485	37.6591
5144-05	**1**	0.013	81	0.081	15%	0.464	36.5499
5144-06	**1**	0.013	83	0.083	15%	0.462	36.2460
5144-07	**1**	0.026	18	0.018	3.3%	0.527	20.6421
5144-08	**1**	0.025	18	0.018	3.3%	0.527	20.7247
5144-09	**1**	0.025	16	0.016	2.9%	0.529	20.9921
5144-10	**1**	0.038	4.4	0.0044	0.8%	0.541	14.2107
5144-11	**1**	0.038	5.5	0.0055	1.0%	0.540	14.1180
5144-12	**1**	0.038	3.0	0.0030	0.6%	0.542	14.1931
5144-13	**1**	0.051	1.8	0.0018	0.3%	0.543	10.6118
5144-14	**1**	0.051	1.6	0.0016	0.3%	0.543	10.7115
5144-15	**1**	0.051	1.7	0.0017	0.3%	0.543	10.6987
5144-16	**1**	0.10	0.21	0.00021	0.04%	0.545	5.3450
5144-17	**1**	0.10	0.24	0.00024	0.04%	0.545	5.3128
5144-18	**1**	0.10	0.28	0.00028	0.05%	0.545	5.3337
5144-19	**2**	0.20	ND	--	--	--	--
5144-20	**2**	0.20	ND	--	--	--	--
5144-21	**2**	0.21	ND	--	--	--	--
5144-22	**2**	0.30	ND	--	--	--	--
5144-23	**2**	0.31	ND	--	--	--	--
5144-24	**2**	0.31	ND	--	--	--	--
5144-25	**2**	0.40	ND	--	--	--	--
5144-26	**2**	0.41	ND	--	--	--	--
5144-27	**2**	0.40	ND	--	--	--	--
5144-28	**2**	0.51	ND	--	--	--	--
5144-29	**2**	0.51	ND	--	--	--	--
5144-30	**2**	0.51	ND	--	--	--	--
5144-31	**2**	1.3	ND	--	--	--	--
5144-32	2	1.3	ND	--	--	--	--
5144-33	2	1.3	ND	--	--	--	--
5144-34	2	5.1	ND	--	--	--	--
5144-35	2	5.1	ND	--	--	--	--
5144-36	2	5.1	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
5144-37	**1**	0	0.02870	0.0000287	0.0000287	0.000
5144-38	1	0	0.02860	0.0000286		
5144-39	**2**	0	0.01040	0.0000104	0.0000178	0.000
5144-40	**2**	0	0.02520	0.0000252		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
5144-01	1	0.007	0.00340	0.0000034	12%	0.000025	0.0033851
5144-02	**1**	0.008	0.00570	0.0000057	20%	0.000023	0.0029215
5144-03	**1**	0.008	0.00550	0.0000055	19%	0.000023	0.0030194
5144-04	1	0.013	0.00250	0.0000025	8.7%	0.000026	0.0020305
5144-05	**1**	0.013	0.00200	0.0000020	7.0%	0.000027	0.0020993
5144-06	**1**	0.013	0.00350	0.0000035	12%	0.000025	0.0019731
5144-07	**1**	0.026	0.00210	0.0000021	7.3%	0.000027	0.0010399
5144-08	**1**	0.025	0.00900	0.0000090	31%	0.000020	0.0007728
5144-09	**1**	0.025	0.01160	0.0000116	40%	0.000017	0.0006766
5144-10	**1**	0.038	0.00150	0.0000015	5.2%	0.000027	0.0007137
5144-11	**1**	0.038	0.00280	0.0000028	9.8%	0.000026	0.0006765
5144-12	**1**	0.038	0.00150	0.0000015	5.2%	0.000027	0.0007110
5144-13	**1**	0.051	0.00180	0.0000018	6.3%	0.000027	0.0005245
5144-14	**1**	0.051	0.00420	0.0000042	15%	0.000024	0.0004820
5144-15	**1**	0.051	0.00330	0.0000033	12%	0.000025	0.0004992
5144-16	**1**	0.10	0.00110	0.0000011	3.8%	0.000028	0.0002703
5144-17	**1**	0.10	0.00130	0.0000013	4.5%	0.000027	0.0002667
5144-18	**1**	0.10	0.00170	0.0000017	5.9%	0.000027	0.0002639
5144-19	**2**	0.20	0.00120	0.0000012	6.7%	0.000017	0.0000816
5144-20	**2**	0.20	0.00180	0.0000018	10%	0.000016	0.0000793
5144-21	**2**	0.21	0.00120	0.0000012	6.7%	0.000017	0.0000781
5144-22	**2**	0.30	0.00076	0.0000008	4.3%	0.000017	0.0000559
5144-23	**2**	0.31	0.00110	0.0000011	6.2%	0.000017	0.0000547
5144-24	**2**	0.31	0.00069	0.0000007	3.9%	0.000017	0.0000561
5144-25	**2**	0.40	0.00130	0.0000013	7.3%	0.000017	0.0000408
5144-26	**2**	0.41	0.00100	0.0000010	5.6%	0.000017	0.0000414
5144-27	**2**	0.40	0.00100	0.0000010	5.6%	0.000017	0.0000415
5144-28	**2**	0.51	0.00120	0.0000012	6.7%	0.000017	0.0000327
5144-29	**2**	0.51	0.00130	0.0000013	7.3%	0.000017	0.0000325
5144-30	**2**	0.51	0.00094	0.0000009	5.3%	0.000017	0.0000332
5144-31	**2**	1.3	0.00250	0.0000025	14%	0.000015	0.0000121
5144-32	2	1.3	0.00230	0.0000023	13%	0.000016	0.0000122
5144-33	2	1.3	0.00190	0.0000019	11%	0.000016	0.0000126
5144-34	2	5.1	0.00110	0.0000011	6.2%	0.000017	0.0000033
5144-35	2	5.1	0.00099	0.0000010	5.6%	0.000017	0.0000033
5144-36	2	5.1	0.00090	0.0000009	5.1%	0.000017	0.0000033

4-Methylphenol

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
5144-37	**1**	0	140	0.14	0.135	0.007
5144-38	1	0	130	0.13		
5144-39	**2**	0	200	0.20	0.215	0.021
5144-40	**2**	0	230	0.23		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
5144-01	1	0.007	69	0.069	51%	0.066	8.8482
5144-02	**1**	0.008	120	0.120	89%	0.015	1.9095
5144-03	**1**	0.008	72	0.072	53%	0.063	8.2170
5144-04	1	0.013	64	0.064	47%	0.071	5.5130
5144-05	**1**	0.013	68	0.068	50%	0.067	5.2777
5144-06	**1**	0.013	150	0.150	111%	-0.015	-1.1768
5144-07	**1**	0.026	150	0.150	111%	-0.015	-0.5875
5144-08	**1**	0.025	120	0.120	89%	0.015	0.5899
5144-09	**1**	0.025	100	0.100	74%	0.035	1.3889
5144-10	**1**	0.038	78	0.078	58%	0.057	1.4984
5144-11	**1**	0.038	82	0.082	61%	0.053	1.3869
5144-12	**1**	0.038	56	0.056	41%	0.079	2.0687
5144-13	**1**	0.051	49	0.049	36%	0.086	1.6801
5144-14	**1**	0.051	61	0.0610	45%	0.074	1.4587
5144-15	**1**	0.051	62	0.0620	46%	0.073	1.4375
5144-16	**1**	0.10	7.3	0.0073	5.4%	0.128	1.2529
5144-17	**1**	0.10	3.2	0.0032	2.4%	0.132	1.2854
5144-18	**1**	0.10	12	0.0120	8.9%	0.123	1.2044
5144-19	**2**	0.20	0.72	0.00072	0.3%	0.214	1.0529
5144-20	**2**	0.20	2.2	0.00220	1.0%	0.213	1.0548
5144-21	**2**	0.21	1.2	0.00120	0.6%	0.214	1.0062
5144-22	**2**	0.30	ND	--	--	--	--
5144-23	**2**	0.31	ND	--	--	--	--
5144-24	**2**	0.31	ND	--	--	--	--
5144-25	**2**	0.40	ND	--	--	--	--
5144-26	**2**	0.41	ND	--	--	--	--
5144-27	**2**	0.40	ND	--	--	--	--
5144-28	**2**	0.51	ND	--	--	--	--
5144-29	**2**	0.51	ND	--	--	--	--
5144-30	**2**	0.51	ND	--	--	--	--
5144-31	**2**	1.3	ND	--	--	--	--
5144-32	2	1.3	ND	--	--	--	--
5144-33	2	1.3	ND	--	--	--	--
5144-34	2	5.1	ND	--	--	--	--
5144-35	2	5.1	ND	--	--	--	--
5144-36	2	5.1	ND	--	--	--	--

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
5144-37	**1**	0	36.4	36.8	0.49
5144-38	1	0	37.1		
5144-39	**2**	0	19.9	23.1	4.45
5144-40	**2**	0	26.2		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
5144-01	1	0.007	27.4	75%	9.4	1253
5144-02	**1**	0.008	42.4	115%	-5.7	-719
5144-03	**1**	0.008	42.6	116%	-5.8	-763
5144-04	1	0.013	38.4	104%	-1.6	-128
5144-05	**1**	0.013	39.4	107%	-2.6	-209
5144-06	**1**	0.013	42.2	115%	-5.5	-428
5144-07	**1**	0.026	42.2	115%	-5.5	-213
5144-08	**1**	0.025	38.9	106%	-2.1	-84.6
5144-09	**1**	0.025	28.4	77%	8.4	331
5144-10	**1**	0.038	31.3	85%	5.5	143
5144-11	**1**	0.038	36.4	99%	0.4	9.2
5144-12	**1**	0.038	33.9	92%	2.9	74.6
5144-13	**1**	0.051	30.6	83%	6.2	120
5144-14	**1**	0.051	27.1	74%	9.7	190
5144-15	**1**	0.051	25.8	70%	11.0	216
5144-16	**1**	0.10	26.8	73%	10.0	97.6
5144-17	**1**	0.10	31.7	86%	5.1	49.3
5144-18	**1**	0.10	31.6	86%	5.2	50.4
5144-19	**2**	0.20	42	180%	-18.5	-90.7
5144-20	**2**	0.20	36.1	157%	-13.1	-64.7
5144-21	**2**	0.21	40.4	175%	-17.4	-81.7
5144-22	**2**	0.30	41.5	180%	-18.5	-60.6
5144-23	**2**	0.31	38.1	165%	-15.1	-49.3
5144-24	**2**	0.31	37.8	164%	-14.8	-48.3
5144-25	**2**	0.40	37	161%	-14.0	-34.5
5144-26	**2**	0.41	38.3	166%	-15.3	-37.6
5144-27	**2**	0.40	37.5	163%	-14.5	-35.7
5144-28	**2**	0.51	40.7	177%	-17.7	-34.8
5144-29	**2**	0.51	41.3	179%	-18.3	-36.0
5144-30	**2**	0.51	41	178%	-18.0	-35.4
5144-31	**2**	1.3	40.7	177%	-17.7	-13.9
5144-32	2	1.3	40.6	176%	-17.6	-13.8
5144-33	2	1.3	40.9	177%	-17.9	-14.1
5144-34	2	5.1	40.1	174%	-17.1	-3.4
5144-35	2	5.1	40.4	175%	-17.4	-3.4
5144-36	2	5.1	37.2	161%	-14.2	-2.8

Controls

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (mg/L)**	**Average (mg/L)**	**St Dev (mg/L)**
5144-37	**1**	0	991	1396	572.0
5144-38	1	0	1800		
5144-39	**2**	0	822	752	99.0
5144-40	**2**	0	682		

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration		Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
5144-01	1	0.007	574	41%	822	110133
5144-02	**1**	0.008	584	42%	812	103302
5144-03	**1**	0.008	309	22%	1087	141710
5144-04	1	0.013	327	23%	1069	82967
5144-05	**1**	0.013	358	26%	1038	81725
5144-06	**1**	0.013	320	23%	1076	84378
5144-07	**1**	0.026	366	26%	1030	40325
5144-08	**1**	0.025	341	24%	1055	41469
5144-09	**1**	0.025	271	19%	1125	44623
5144-10	**1**	0.038	254	18%	1142	30007
5144-11	**1**	0.038	351	25%	1045	27333
5144-12	**1**	0.038	335	24%	1061	27771
5144-13	**1**	0.051	389	28%	1007	19663
5144-14	**1**	0.051	374	27%	1022	20136
5144-15	**1**	0.051	305	22%	1091	21474
5144-16	**1**	0.10	347	25%	1049	10287
5144-17	**1**	0.10	394	28%	1002	9767
5144-18	**1**	0.10	370	27%	1026	10041
5144-19	**2**	0.20	410	55%	342	1680
5144-20	**2**	0.20	280	37%	472	2340
5144-21	**2**	0.21	2560	340%	-1808	-8509
5144-22	**2**	0.30	780	104%	-28	-92
5144-23	**2**	0.31	902	120%	-150	-492
5144-24	**2**	0.31	1150	153%	-398	-1304
5144-25	**2**	0.40	732	97%	20	49
5144-26	**2**	0.41	853	113%	-101	-249
5144-27	**2**	0.40	1200	160%	-448	-1107
5144-28	**2**	0.51	1130	150%	-378	-745
5144-29	**2**	0.51	5030	669%	-4278	-8428
5144-30	**2**	0.51	8280	1101%	-7528	-14841
5144-31	**2**	1.3	973	129%	-221	-174
5144-32	2	1.3	769	102%	-17	-13
5144-33	2	1.3	698	93%	54	43
5144-34	2	5.1	3460	460%	-2708	-533
5144-35	2	5.1	916	122%	-164	-32
5144-36	2	5.1	818	109%	-66	-13

Controls

Sample ID	Spiked Batch	Bottle Weight		Carbon Mass	Gross Weight	Net Weight	Water Volume	Carbon Dose
(Bottle) #	**Batch #**	**Empty (g)**	**Full (g)**	**M (g)**	**Water + Carbon (g)**	**Water (g)**	**V (L)**	**m (g/L)**
5144-37	**1**	1110	3097	0	1987	1987.00	1.967	0
5144-38	1	1110	3097	0	1987	1987.00	1.967	0
5144-39	**2**	1111	3101	0	1990	1990.00	1.970	0
5144-40	**2**	1110	3114	0	2004	2004.00	1.984	0

Carbon-Dosed Bottles

Sample ID	Spiked Batch	Bottle Weight		Carbon Mass	Gross Weight	Net Weight	Water Volume	Carbon Dose
(Bottle) #	**Batch #**	**Empty (g)**	**Full (g)**	**M (g)**	**Water + Carbon (g)**	**Water (g)**	**V (L)**	**m (g/L)**
5144-01	1	1110	3114	0.015	2004	2003.99	1.984	0.007
5144-02	**1**	1109	3089	0.015	1980	1979.98	1.960	0.008
5144-03	**1**	1109	3085	0.015	1976	1975.99	1.956	0.008
5144-04	1	1109	3101	0.025	1992	1991.97	1.972	0.013
5144-05	**1**	1110	3099	0.025	1989	1988.98	1.969	0.013
5144-06	**1**	1110	3091	0.025	1981	1980.98	1.961	0.013
5144-07	**1**	1109	3095	0.050	1986	1985.95	1.966	0.026
5144-08	**1**	1110	3096	0.050	1986	1985.95	1.966	0.025
5144-09	**1**	1110	3102	0.050	1992	1991.95	1.972	0.025
5144-10	**1**	1109	3095	0.075	1986	1985.93	1.966	0.038
5144-11	**1**	1109	3094	0.075	1985	1984.92	1.965	0.038
5144-12	**1**	1109	3098	0.075	1989	1988.92	1.969	0.038
5144-13	**1**	1109	3098	0.10	1989	1988.90	1.969	0.051
5144-14	**1**	1110	3103	0.10	1993	1992.90	1.973	0.051
5144-15	**1**	1110	3099	0.10	1989	1988.90	1.969	0.051
5144-16	**1**	1110	3098	0.20	1988	1987.80	1.968	0.10
5144-17	**1**	1109	3093	0.20	1984	1983.80	1.964	0.10
5144-18	**1**	1108	3095	0.20	1987	1986.80	1.967	0.10
5144-19	**2**	1109	3099	0.4	1990	1989.60	1.970	0.20
5144-20	**2**	1109	3110	0.4	2001	2000.60	1.981	0.20
5144-21	**2**	1110	3015	0.4	1905	1904.60	1.886	0.21
5144-22	**2**	1109	3100	0.6	1991	1990.40	1.971	0.30
5144-23	**2**	1110	3098	0.6	1988	1987.40	1.968	0.31
5144-24	**2**	1111	3101	0.6	1990	1989.40	1.970	0.31
5144-25	**2**	1108	3104	0.8	1996	1995.20	1.975	0.40
5144-26	**2**	1109	3101	0.8	1992	1991.20	1.971	0.41
5144-27	**2**	1109	3105	0.8	1996	1995.20	1.975	0.40
5144-28	**2**	1109	3100	1.0	1991	1990.00	1.970	0.51
5144-29	**2**	1110	3100	1.0	1990	1989.00	1.969	0.51
5144-30	**2**	1109	3099	1.0	1990	1989.00	1.969	0.51
5144-31	**2**	1110	3103	2.5	1993	1990.50	1.971	1.3
5144-32	2	1109	3100	2.5	1991	1988.50	1.969	1.3
5144-33	2	1110	3108	2.5	1998	1995.50	1.976	1.3
5144-34	2	1109	3106	10	1997	1987.00	1.967	5.1
5144-35	2	1110	3104	10	1994	1984.00	1.964	5.1
5144-36	2	1109	3105	10	1996	1986.00	1.966	5.1

Test Water Density	**1010 g/L**

ATTACHMENT 6

IN SITU TEMPERATURE SCREENING STUDY RESULTS

(PROVIDED ON CD ON ATTACHMENT TAB)

Attachment 6

Equilibrium Concentrations at Room Temperature and *In Situ* Temperature Adsorption for Remediation Area D

Parameter	Units	Room Temperature at Carbon Dose (g/L):					In Situ Temperature at Carbon Dose:				
		0.0	**0.05**	**0.25**	**0.50**	**2.5**	**0.0**	**0.05**	**0.25**	**0.5**	**0.25**
Benzene	mg/L	3.87	3.63	3.15	1.92	0.094	3.76	3.67	3.12	1.85	0.084
	% Removed	--	6.1%	18%	50%	98%	--	5.1%	19%	52%	98%
Chlorobenzene	mg/L	9.11	7.77	2.54	0.560	0.0078	8.44	7.68	2.54	0.557	0.0067
	% Removed	--	15%	72%	94%	99.9%	--	16%	72%	94%	99.9%
Total Dichlorobenzene	mg/L	3.83	2.01	0.12	0.018	--	3.66	2.17	0.13	0.018	--
	% Removed	--	48%	97%	99.5%	--	--	43%	97%	99.5%	--
Ethylbenzene	mg/L	0.42	0.32	0.052	0.0092	--	0.39	0.34	0.059	0.0124	0.00034
	% Removed	--	22%	88%	98%	--	--	17%	86%	97%	99.9%
Toluene	mg/L	3.83	3.39	1.54	0.40	0.0065	3.67	3.45	1.62	0.41	0.0056
	% Removed	--	11%	60%	90%	99.8%	--	9.9%	58%	89%	99.9%
Total Trichlorobenzene	mg/L	1.16	0.14	--	--	--	1.03	0.18	--	--	--
	% Removed	--	88%	--	--	--	--	84%	--	--	--
Total Xylene	mg/L	4.32	3.17	0.36	0.051	0.00028	4.06	3.30	0.40	0.057	0.00053
	% Removed	--	26.7%	92%	99%	99.99%	--	23.6%	91%	99%	99.99%
Phenol	mg/L	1.45	2.08	2.00	1.66	0.173	1.72	1.53	1.42	2.79	0.132
	% Removed	--	-44%	-38%	-15%	88%	--	-5.9%	2.1%	-93%	91%
Naphthalene	mg/L	7.63	3.47	0.078	0.0063	0.00014	5.89	2.14	0.077	0.0095	--
	% Removed	--	54.5%	99.0%	99.9%	99.998%	--	72.0%	99.0%	99.9%	--
Total Mercury	mg/L	0.143	0.10	0.05	0.00091	0.00027	0.004	0.007	0.014	0.0023	--
	% Removed	--	31.0%	68%	99%	100%	--	95.3%	90%	98%	--

Room temperature values represent average equilibrium concentrations from three test bottles at each dose. In situ temperature values represent average equilibrium concentrations from two test bottles at each dose. Separate sets of controls were prepared and processed for each study; these concentrations are also presented. Percent removals therefore also provided. For most compounds, control concentrations were similar so that direct comparison between equilibrium concentrations at each given dose can be made. For total mercury, starting concentrations measured in *in situ* control test bottles were significantly lower than in the room temperature control test bottles.

ATTACHMENT 7

PRELIMINARY ADJUSTED PH STUDY RESULTS

(PROVIDED ON CD ON ATTACHMENT TAB)

Benzene

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**C_e (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1309-89	2	0.000	2050	2.05	--	--	--
1309-81	**2**	0.063	1900	1.90	93%	0.150	2.3894
1309-83	**2**	0.252	1520	1.52	74%	0.530	2.1040
1309-85	2	0.504	1140	1.14	56%	0.910	1.8069
1309-87	**2**	2.518	34.6	0.035	2%	2.015	0.8004
1309-88	**2**	5.053	4.1	0.0041	0%	2.046	0.4049

Best-Fit Freundlich Parameters	K_f	1.83
	1/n	0.26

Chlorobenzene

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**C_e (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1309-89	2	0.000	4590	4.59	--	--	--
1309-81	**2**	0.063	3800	3.80	83%	0.790	12.5843
1309-83	**2**	0.252	929	0.93	20%	3.661	14.5336
1309-85	2	0.504	416	0.42	9.1%	4.174	8.2877
1309-87	**2**	2.518	3.2	0.0032	0.07%	4.587	1.8216
1309-88	**2**	5.053	ND	--	--	--	--

Best-Fit Freundlich Parameters	K_f	10.99
	1/n	0.20

Total Dichlorobenzene

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**C_e (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1309-89	2	0.000	1030	1.03	--	--	--
1309-81	**2**	0.063	375	0.38	36%	0.655	10.4338
1309-83	**2**	0.252	25.2	0.025	2.4%	1.005	3.9889
1309-85	2	0.504	8.1	0.0081	0.8%	1.022	2.0290
1309-87	**2**	2.518	ND	--	--	--	--
1309-88	**2**	5.053	ND	--	--	--	--

Best-Fit Freundlich Parameters	K_f	15.30
	1/n	0.39

Ethylbenzene

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**C_e (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1309-89	2	0.000	197	0.20	--	--	--
1309-81	**2**	0.063	128	0.13	65%	0.069	1.0991
1309-83	**2**	0.252	16.2	0.016	8.2%	0.181	0.7177
1309-85	2	0.504	5.9	0.0059	3.0%	0.191	0.3794
1309-87	**2**	2.518	ND	--	--	--	--
1309-88	**2**	5.053	ND	--	--	--	--

Best-Fit Freundlich Parameters	K_f	2.00
	1/n	0.28

Toluene

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**C_e (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1309-89	2	0.000	1880	1.88	--	--	--
1309-81	**2**	0.063	1620	1.62	86%	0.260	4.1417
1309-83	**2**	0.252	568	0.57	30%	1.312	5.2084
1309-85	2	0.504	268	0.27	14%	1.612	3.2007
1309-87	**2**	2.518	2.7	0.0027	0.14%	1.877	0.7456
1309-88	**2**	5.053	0.67	0.00067	0.04%	1.879	0.3719

Best-Fit Freundlich Parameters	K_f	4.45
	1/n	0.24

Total Trichlorobenzene

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**C_e (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1309-89	2	0.000	316	0.32	--	--	--
1309-81	**2**	0.063	18.7	0.019	5.9%	0.297	4.7358
1309-83	**2**	0.252	ND	--	--	--	--
1309-85	2	0.504	ND	--	--	--	--
1309-87	**2**	2.518	ND	--	--	--	--
1309-88	**2**	5.053	ND	--	--	--	--

Best-Fit Freundlich Parameters	K_f	--	Only one viable data point
	1/n	--	

Total Xylene

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**C_e (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1309-89	2	0.000	1980	1.98	--	--	--
1309-81	**2**	0.063	1160	1.16	59%	0.820	13.0621
1309-83	**2**	0.252	114	0.11	5.8%	1.866	7.4077
1309-85	2	0.504	34.9	0.035	1.8%	1.945	3.8621
1309-87	**2**	2.518	ND	--	--	--	--
1309-88	**2**	5.053	ND	--	--	--	--

Best-Fit Freundlich Parameters	K_f	12.63
	1/n	0.30

Phenol

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**C_e (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1309-89	2	0.000	984	0.98	--	--	--
1309-81	**2**	0.063	1090	1.09	111%	-0.106	2.3894
1309-83	**2**	0.252	930	0.93	95%	0.054	2.1040
1309-85	2	0.504	978	0.98	99%	0.006	1.8069
1309-87	**2**	2.518	46.1	0.046	4.7%	0.938	0.8004
1309-88	**2**	5.053	8.92	0.0089	0.9%	0.975	0.4049

Best-Fit Freundlich Parameters	K_f	1.28	Based on two (2) data points
	1/n	0.40	

Naphthalene

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**C_e (mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1309-89	2	0.000	3630	3.63	--	--	--
1309-81	**2**	0.063	730	0.73	20%	2.900	46.1954
1309-83	**2**	0.252	26.5	0.027	0.73%	3.604	14.3053
1309-85	2	0.504	6.37	0.0064	0.18%	3.624	7.1949
1309-87	**2**	2.518	1.39	0.0014	0.04%	3.629	1.4411
1309-88	**2**	5.053	1.21	0.0012	0.03%	3.629	0.7181

Best-Fit Freundlich Parameters	K_f	52.9
	1/n	0.41

Total Mercury

Sample ID	Spiked Batch	Carbon Dose	Equilibrium Concentration			Mass Adsorbed	x-to-m
(Bottle) #	**Batch #**	**m (g/L)**	**C_e (µg/L)**	**(mg/L)**	**C_e/C_0 (%)**	**[x] (mg/L)**	**x/m (mg/g)**
1309-89	2	0.000	8.1	0.01	--	--	--
1309-81	**2**	0.063	7.9	0.0079	98%	0.000	0.0032
1309-83	**2**	0.252	1.6	0.0016	20%	0.007	0.0258
1309-85	2	0.504	3.4	0.0034	42%	0.005	0.0093
1309-87	**2**	2.518	1.9	0.0019	23%	0.006	0.0025
1309-88	**2**	5.053	0.17	0.00017	2.1%	0.008	0.0016

Best-Fit Freundlich Parameters	K_f	0.95
	1/n	0.85

Starting concentration only 1% of pre-pH adjusted concentration.

ATTACHMENT 8

ALTERNATIVE GAC SCREENING STUDY RESULTS

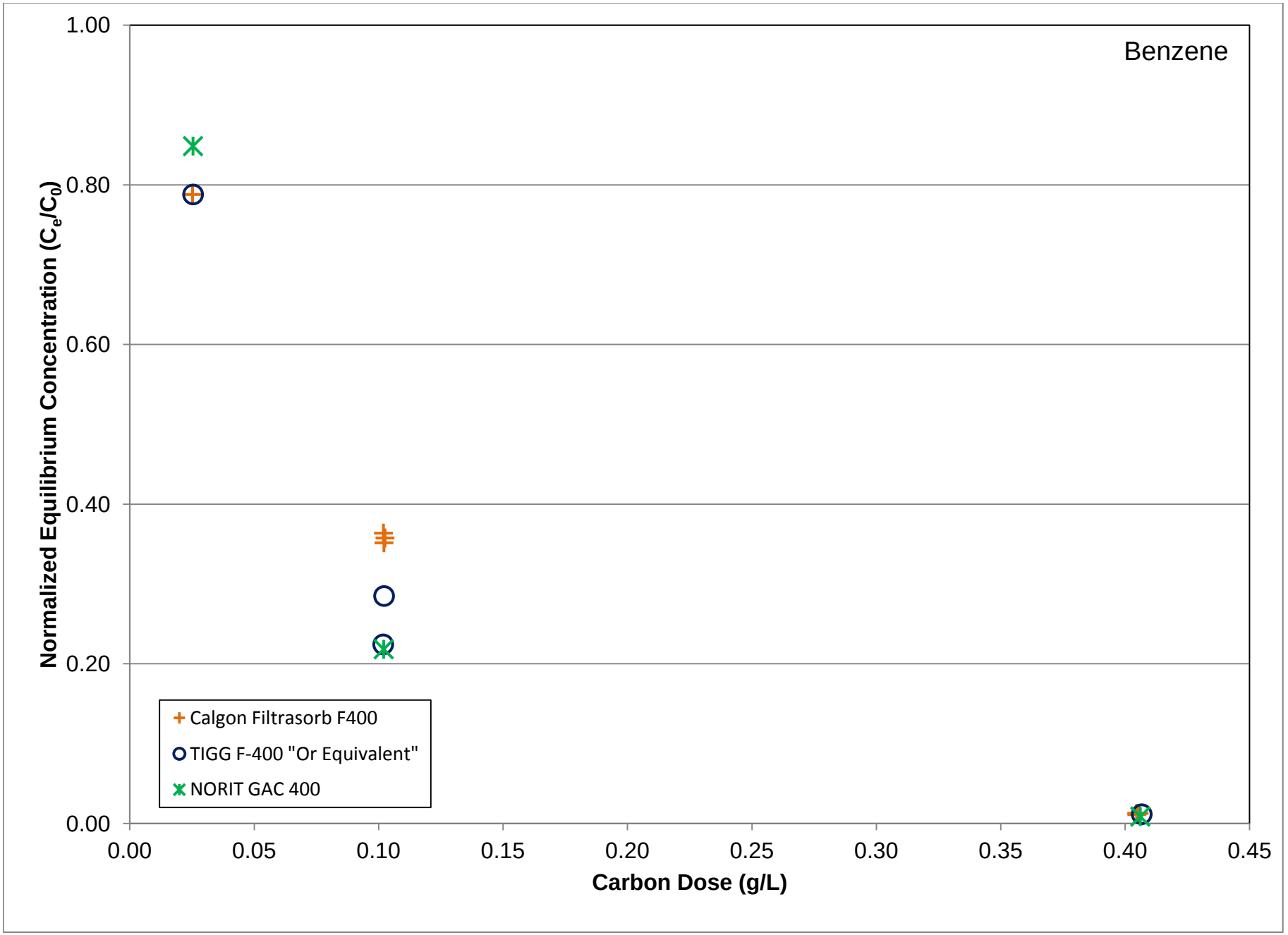
(PROVIDED ON CD ON ATTACHMENT TAB)

Attachment 8
Alternative GAC Adsorption Results for WB-B/HB East Area Isotherm Study Test Water

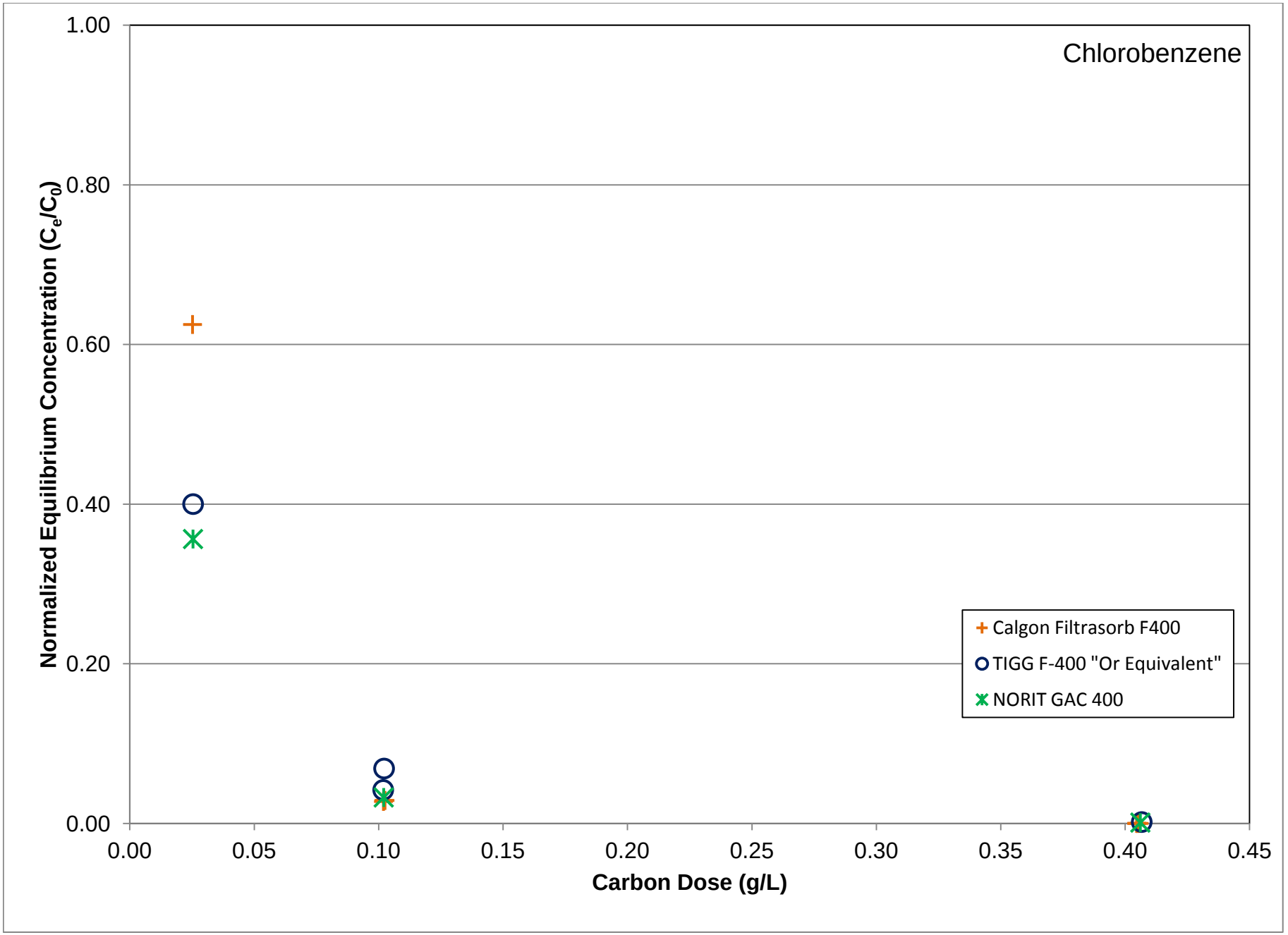
Parameter	Units	Calgon Filtrasorb F-400			TIGG F400 "or Equivalent"			NORIT GAC 400		
		0.05 g/L	0.2 g/L	0.8 g/L	0.05 g/L	0.2 g/L	0.8 g/L	0.05 g/L	0.2 g/L	0.8 g/L
Benzene	mg/L	0.13	0.059	0.0024	0.14	0.042	0.0023	0.13	0.036	0.0017
Chlorobenzene	mg/L	0.10	0.0045	ND	0.064	0.0089	0.00040	0.057	0.0052	0.00024
Total Dichlorobenzene	mg/L	0.20	ND	ND	0.055	0.004	ND	0.040	0.002	ND
Ethylbenzene	mg/L	0.083	0.0013	ND	0.041	0.0042	ND	0.034	0.0023	ND
Toluene	mg/L	0.11	0.0084	ND	0.081	0.0135	0.00057	0.077	0.0087	0.00036
Total Xylene	mg/L	0.23	0.0016	ND	0.11	0.0090	0.00014	0.088	0.0049	ND
Phenol	mg/L	0.085	0.034	0.0019	0.11	0.032	0.0004	0.13	0.030	0.0017
Naphthalene	mg/L	0.016	0.0002	ND	0.025	0.0015	ND	0.019	0.0007	0.00007
4-Methylphenol	mg/L	0.10	0.008	ND	0.10	0.017	0.0002	0.11	0.011	0.0004
Total Mercury	mg/L	$1.2x10^{-5}$	$1.4x10^{-6}$	$1.1x10^{-6}$	$3.2x10^{-6}$	$1.8x10^{-6}$	$6.7x10^{-7}$	$7.1x10^{-6}$	$3.0x10^{-5}$	$5.6x10^{-7}$

Calgon Filtrasorb F-400 values represent average equilibrium concentrations from three test bottles at each dose, except for 0.05 g/L dose for which data from test bottle 5144-09 only was used. Data from 0.2 g/L TIGG F400 "or Equivalent" dose represents average from replicate test bottles. All other data are from singly-prepared bottles.

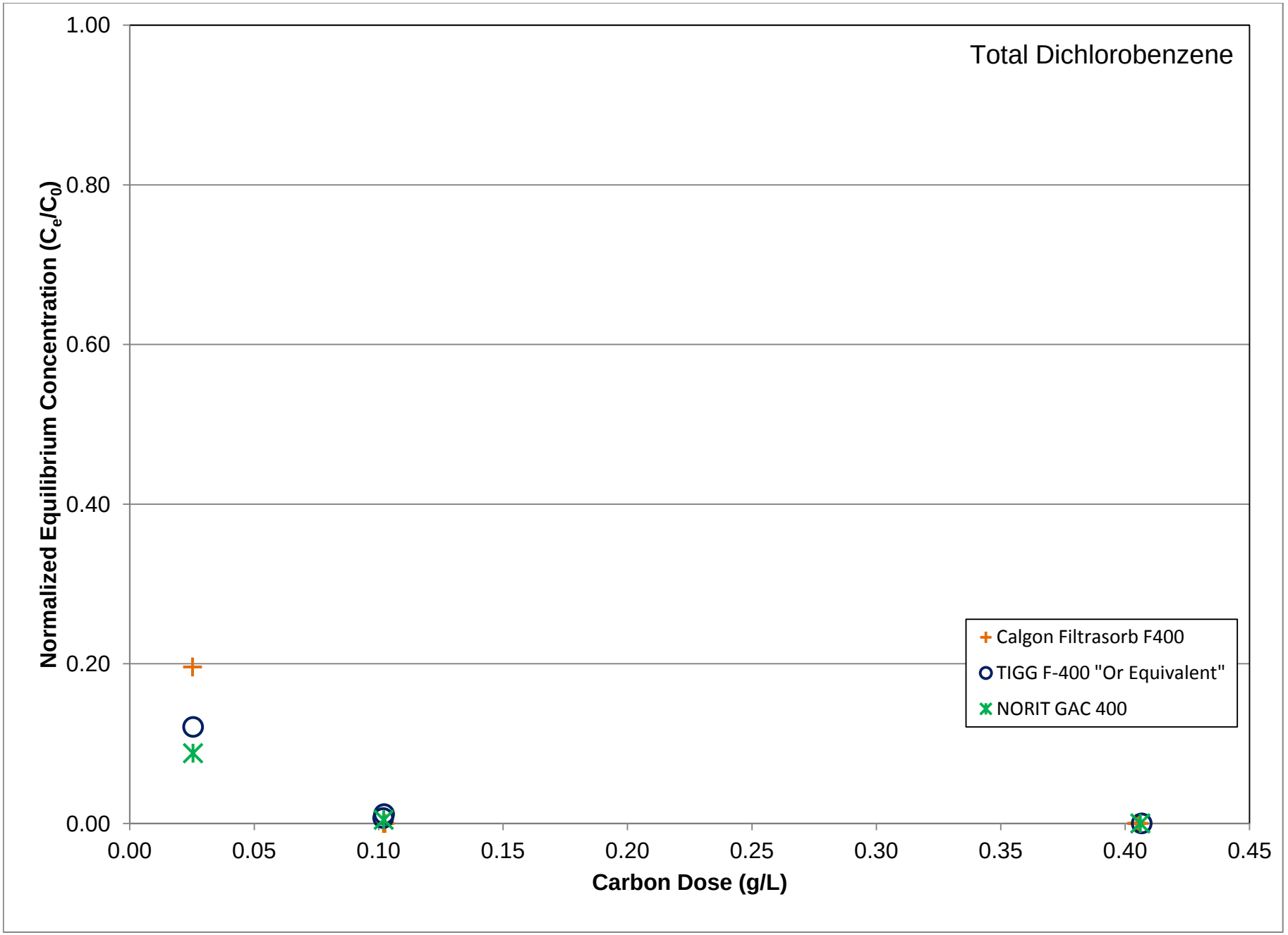
Attachment 8_Alternative GAC Plots WB-B HB East.xls
Benzene Comparison Plots



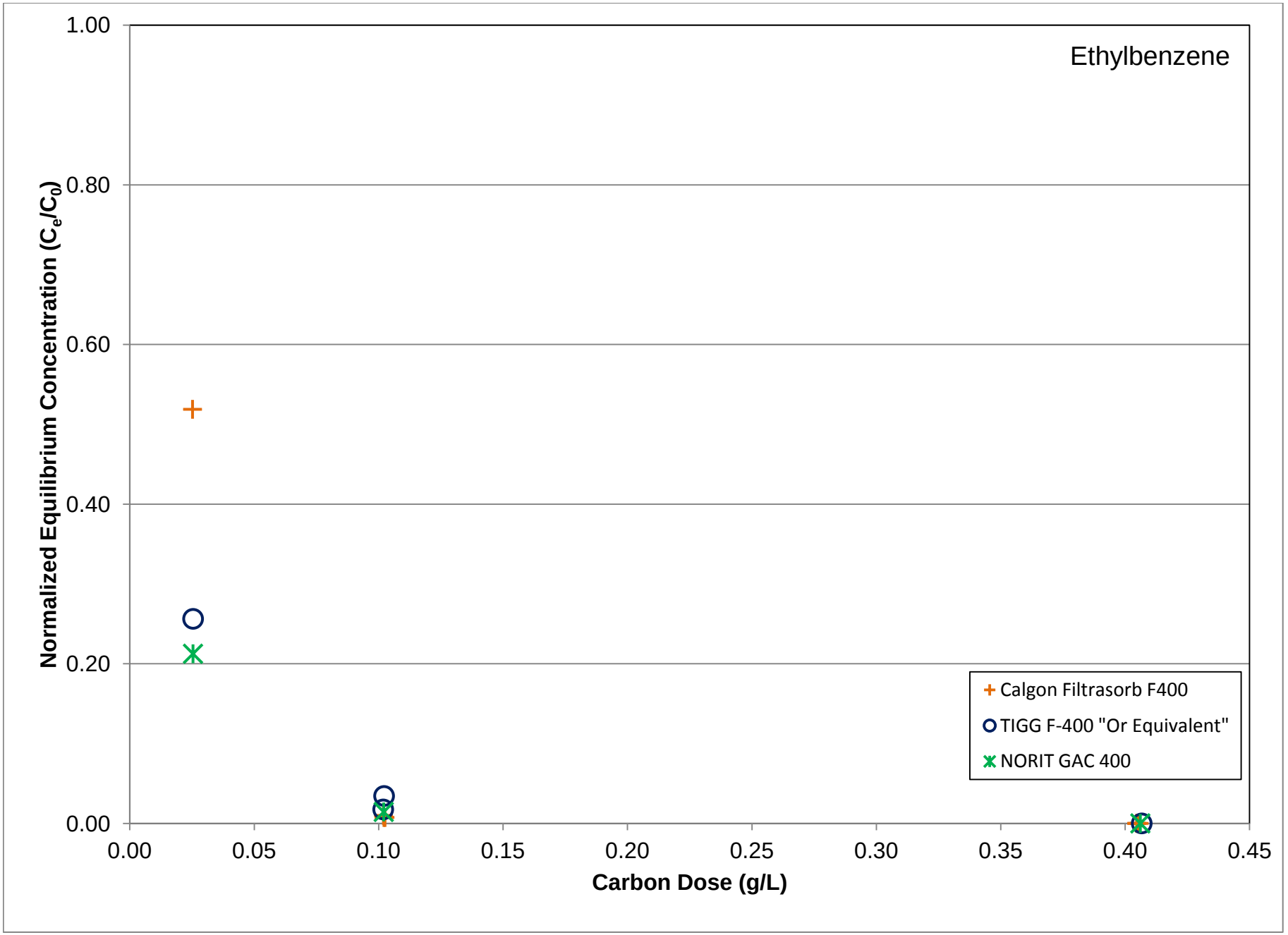
Attachment 8_Alternative GAC Plots WB-B HB East.xls
Chlorobenzene Comparison Plots



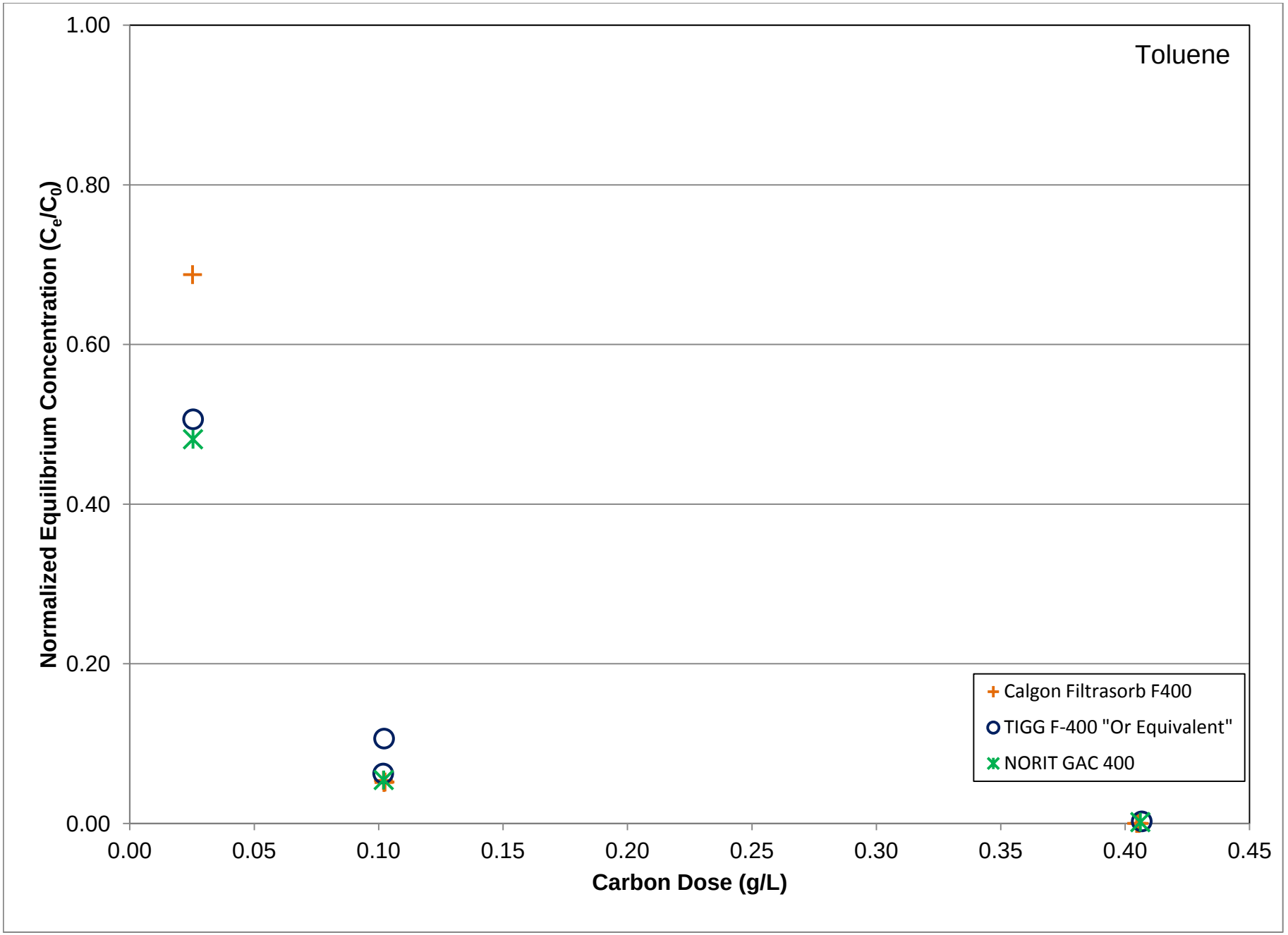
Attachment 8_Alternative GAC Plots WB-B HB East.xls
Total DCB Comparison Plots



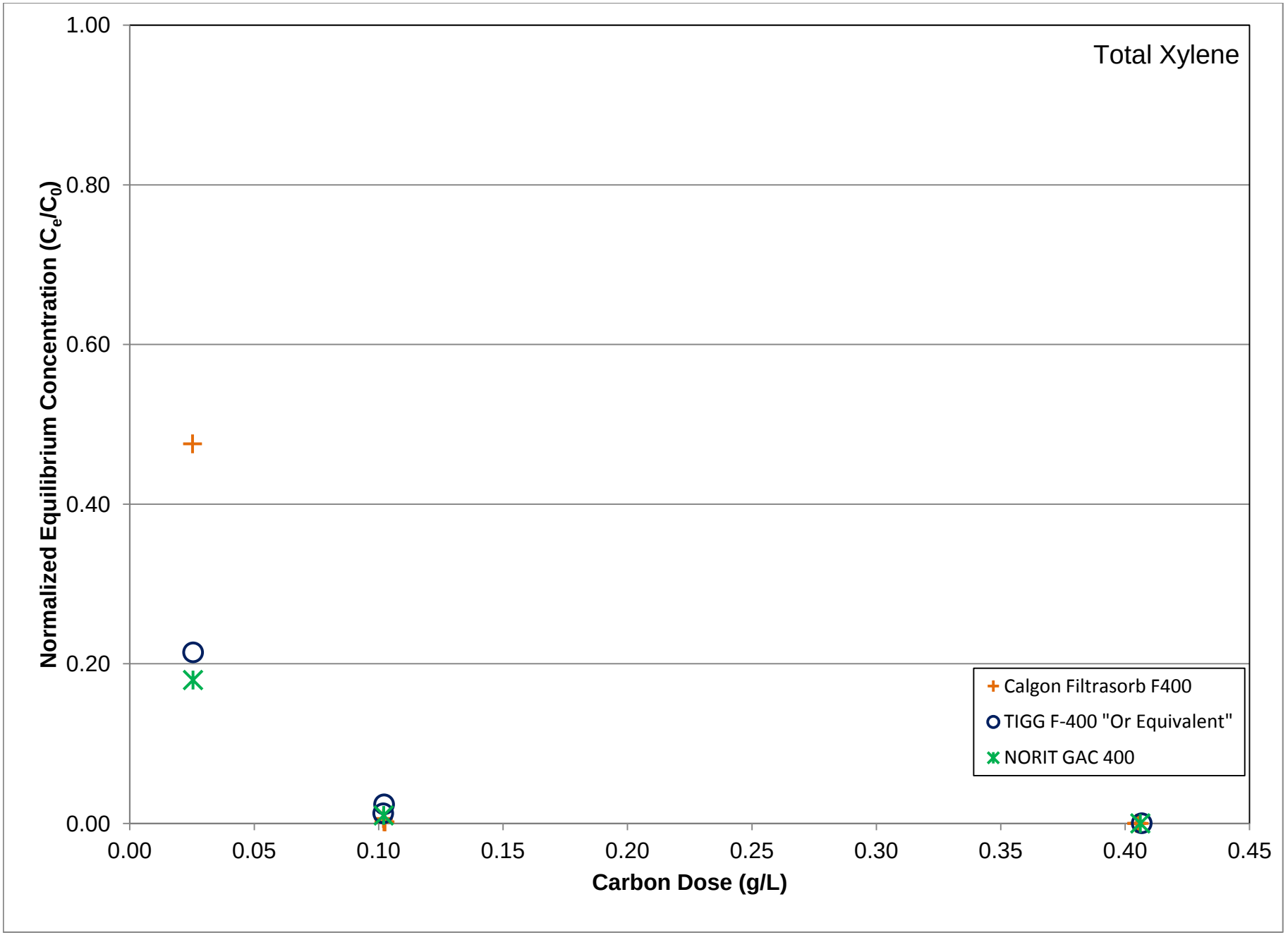
Attachment 8_Alternative GAC Plots WB-B HB East.xls
Ethylbenzene Comparison Plots



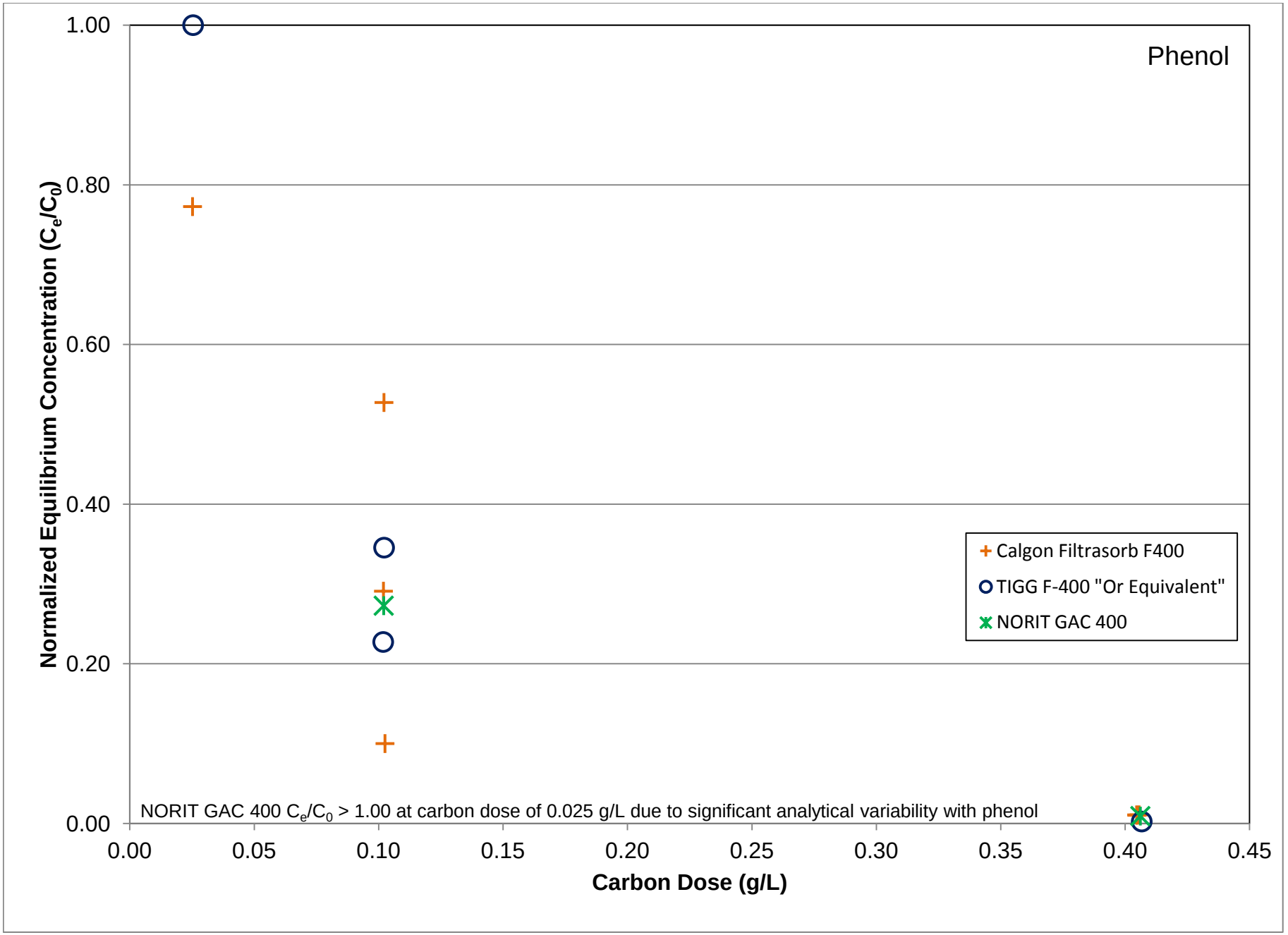
Attachment 8_Alternative GAC Plots WB-B HB East.xls
Toluene Comparison Plots



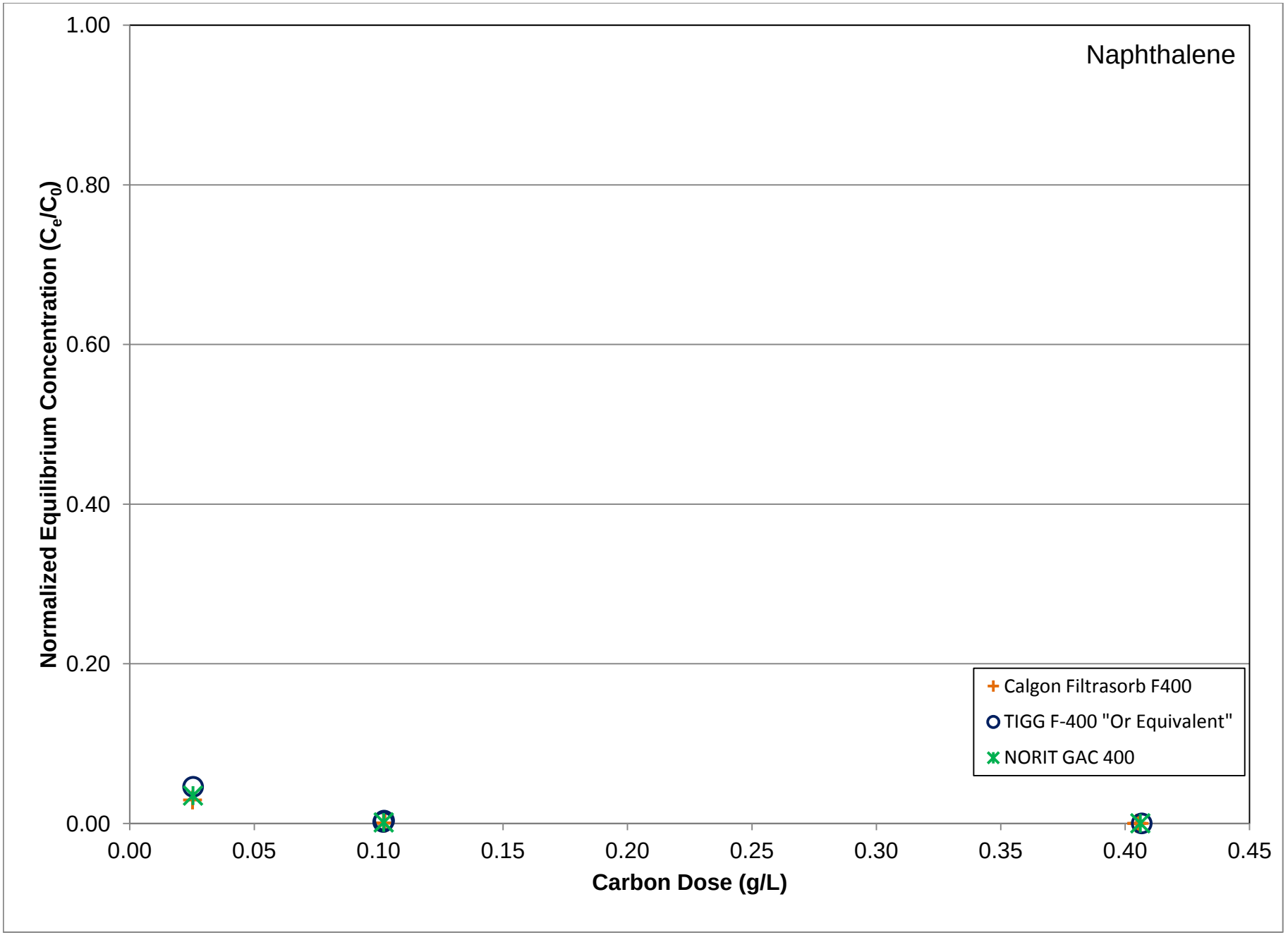
Attachment 8_Alternative GAC Plots WB-B HB East.xls
Total Xylene Comparison Plots



Attachment 8_Alternative GAC Plots WB-B HB East.xls
Phenol Comparison Plots



Attachment 8_Alternative GAC Plots WB-B HB East.xls
Naphthalene Comparison Plots



ATTACHMENT 9

OUTLIER ANALYSIS (RESPONSE TO COMMENT #7 ON DRAFT REPORT)

(PROVIDED ON CD ON ATTACHMENT TAB)

Cap 30i
DEC Response to Parsons' Response to Comment 7 on Draft Report (via e-mail, 12/13/11):

> The response states "that the exclusion of these data points did not appreciably change the calculated values for the Freundlich parameters refers to the exclusion of points resulting from analytical noise and / or analytical carryover between analyses." As stated in the comment, the calculated Freundlich parameters with outliers included should be presented for comparison to the final results used in the model with the outliers excluded (this can be done for select contaminants in one area).

Parsons Response (4/2/12):

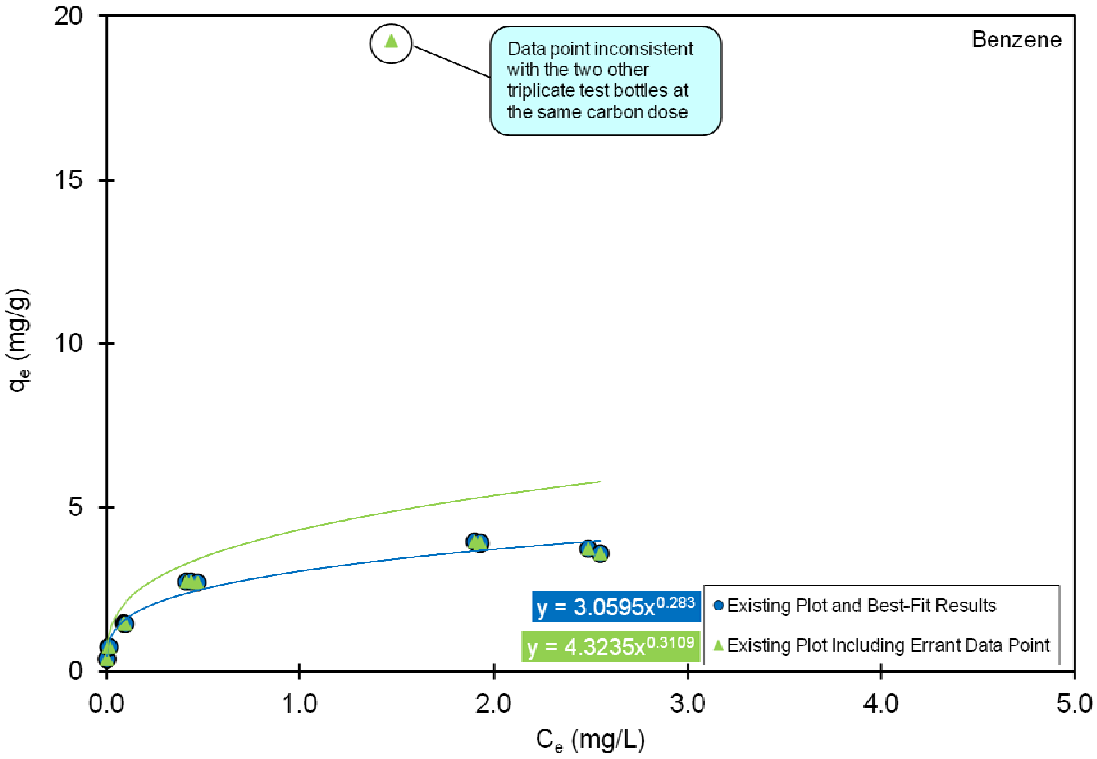
The following discussion and supporting plots demonstrate the effects of outliers on the calculated Freundlich parameters. The discussion is organized around the three types of outliers encountered during the study: (1) errant data points; (2) data points at very low GAC doses; and (3) analytical carryover / error. Details on the basis for, and results of, the data treatment steps applied by Parsons are provided. Plots presented here were prepared from data obtained from the Phase VI PDI (Remediation Area D) - pH adjusted isotherm study performed in September 2010. Recall that q_e (mg/g) is calculated as $(C_0-C_e)/m$, where C_0 = starting concentration (mg/L); C_e = equilibrium concentration after exposure to GAC (mg/L); and m = GAC dose (g/L).

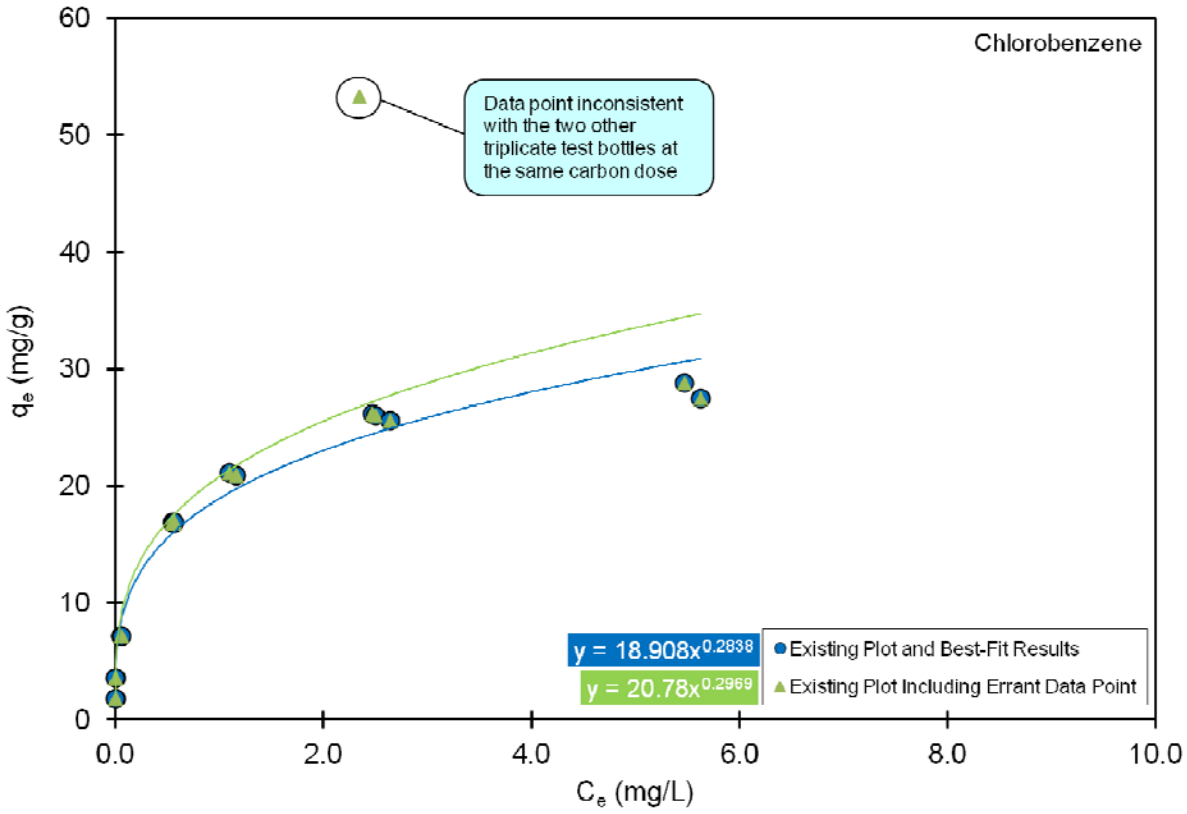
1. Errant Data Points

Errant data points were not included in the calculated Freundlich parameters. If the data from one of the three test bottles at a given GAC dose was inconsistent with the data from the two other test bottles, then the data from the errant test bottle was not included.

Supporting plots: Plots for benzene (a BTEX VOC) and chlorobenzene (a chlorinated BTEX VOC) each show the reported isotherm plot (blue data series), plus the same data set including the errant data point (green data series) to visually demonstrate the reason for excluding this data point. An isotherm was calculated to show the departure from the reported isotherm when including the errant data point. The reported isotherm resulted in a more conservative estimate of required GAC since the errant data point would have implied better sorption (better q_e at given C_e).

1. Plots Illustrating Inclusion of Errant Data Points





2. Establishing GAC Dose Range for Each Compound

Parsons ran 12 different GAC doses to increase the probability that a sufficient number of data points was obtained within the appropriate dose range for each target VOC/SVOC compound in a single test setup.

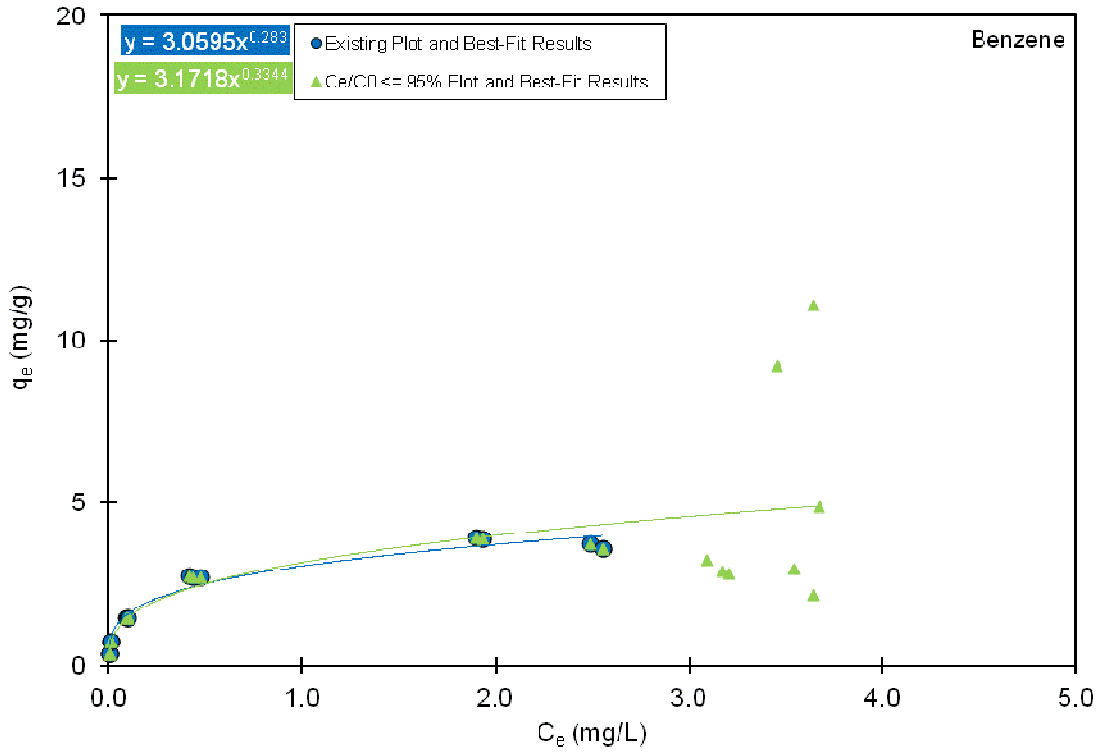
- For the most sorptive compounds, the Freundlich isotherm was calculated using data obtained from the lowest GAC doses; data at higher GAC doses were non-detect.
- For most compounds, the middle to high GAC doses in the test setup provided the useable data range. For these compounds, the lowest doses in the test setup reflected negligible sorption ($C_e \sim C_0$).
    - Including these equally weighted points would systematically trend the calculated Freundlich isotherm downwards; they were not in the appropriate GAC dose range
    - Due to the proximity of C_e to C_0 at doses that are too low for a given compound, random analytical variation would haves a larger relative effect on the calculated q_e value, including the possibility of a calculated $q_e < 0$. Since the points are weighted equally, they bias the Freundlich isotherm curve. Inclusion of data in the zone of negligible sorption is not consistent with the application of a Freundlich model.

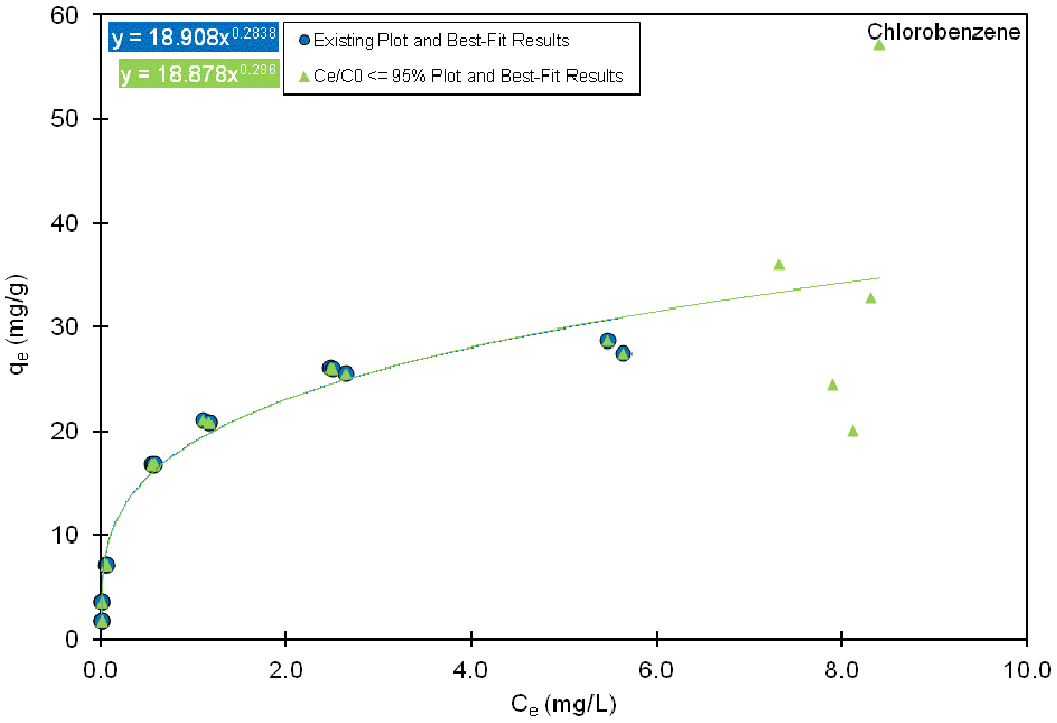
Data was selected within the $C_e/C_0 \leq 75\%$ range which is consistent with standard practice and results in a consistent definition of the GAC range that was applied for each compound to avoid the effects described above while still providing a sufficient number of data points to calculate robust Freundlich isotherm parameters and confidence intervals.

Expanding the range to include $C_e/C_0 \leq 95\%$ generally does not have a very large effect on the calculated Freundlich parameters; however, for some compounds the use of data points up to $C_e/C_0 \leq 95\%$ approaches the range where $C_e \rightarrow C_0$; at this point GAC doses become too low to be useful as described above, and analytical noise has a larger relative effect which can result in either an upward or downward influence on the Freundlich isotherm.

Supporting Plots: Plots for benzene (a BTEX VOC) and chlorobenzene (a chlorinated BTEX VOC) each show the reported isotherm plot (using $C_e/C_0 \leq 75\%$) and associated Freundlich parameters (blue data series), as well as the same data set extended up to $C_e/C_0 \leq 95\%$ (green data series).

2. Plots Illustrating C_e/C_0 Range up to 95%





3. Analytical Carryover / Error at High GAC Doses

At times, measurable concentrations of a given compound were reported by the analytical laboratory when it appeared that a non-detect threshold had been reached at lower GAC doses. Inclusion of these additional data points did not appreciably affect the calculated Freundlich isotherm parameters.

Supporting plots: Two plots are presented for naphthalene to demonstrate the effect of including data points that likely reflect analytical carryover / error in the naphthalene analyses.

- 1st Plot. The data used for calculating the best-fit Freundlich parameters for naphthalene included data at GAC doses as high as 2.5 g/L. At this dose, two of the three bottles had measureable concentrations (averaging ~ 0.14 mg/L). At a GAC dose of 5.0 g/L, there was one measureable concentration of 0.15 mg/L. Therefore it was assumed that there was analytical carryover in the samples from the 5.0 g/L GAC dose, since similar concentrations were measured at 2.5 g/L. The 1st plot shows that the inclusion of this one additional data point at the 5.0 g/L GAC dose has a minimal effect on the calculated parameters.

- 2nd Plot. At a GAC dose of 10 g/L, there was one bottle with a measured concentration of 0.93 mg/L (substantially higher than those measured at GAC doses of 1.25, 2.5, and 5.0 g/L. At a GAC dose of 25 g/L, all three test bottles had measureable concentrations including 1.6, 0.93, and 2.5 mg/L, which were even more inconsistent than the measured concentration in the one bottle at the 10 g/L dose. However, even including these data points has only a minor effect on the calculated Freundlich parameters since these are still relatively close together and near the origin of the isotherm plot axes, as opposed to the points on the far end of the C_e axis. In any case, these data points were excluded from the reported calculated isotherm since in Parsons judgment they were clearly a departure from the trend established at the doses up to 2.5 g/L.

3. Plots illustrating Inclusion of Analytical Carryover / Error