



**CAPITOL CITY PLUME
SUPERFUND SITE
CONCEPTUAL SITE MODEL
PRESENTATION**

March 15, 2012

By The Advertiser Company and State of Alabama

Introductions: State of Alabama

- **Office of the Attorney General**
 - Robert Tambling
- **Office of the Governor**
 - Anne Elizabeth McGowin
- **Alabama Department of Transportation**
 - Buddy Cox
- **Environmental Solutions and Strategies, LLC**
 - Ashley Cousins
- **Banbridge Mims Rogers & Smith, LLP**
 - Alfred F. (“Buddy”) Smith

Introductions: The Advertiser Company

- **The Advertiser Company**
 - Shelley Lucas, Legal Consultant
- **Geosyntec Consultants, Inc.**
 - Bob Veenstra
 - Robbie Ettinger
 - Chriso Petropoulou
 - Pete de Haven
 - Dr. Joel Burken (PhytoForensics, LLC)
- **FTI Consulting, Inc.**
 - A.J. Gravel
- **Latham & Watkins LLP**
 - Gary Gengel
 - Matt Thurlow

Goals for Today's Meeting

- Present a clear conceptual site model based on the data
- Discuss The Advertiser's and the State of Alabama's ("State's") potential liability at the Site
- Answer EPA's questions and develop a strategy going forward with EPA

Conceptual Site Model: Steps In Development

- **Relational database (RDBMS)**
- **GIS features**
- **Lithology/stratigraphy**
- **CSM Overview**

Data Sources Reviewed

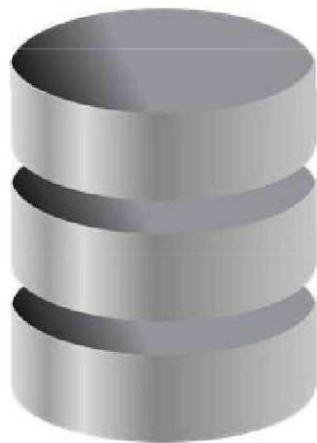
- 1995 ADEM Preliminary Assessment Report
- 1999 CH2M Hill Downtown Sewer Study
- 2001 Angelica Health Services response to RFI
- 2002 Black & Veatch Remedial Investigation Report
- 2003 Soil & Gas Phase II ESA 200 Washington Avenue
- 2007 Ground Water Monitoring Report (JM Hall)
- 2009 USEPA test data of MW-09W
- 2010 EPA GW Sampling
- 2010 Bridgestone response to RFI
- 2011 MW Groundwater Results (October)
- 2011 USGS Scientific Investigations Report
- 2011 Gore Gas Report

Relational Database Building

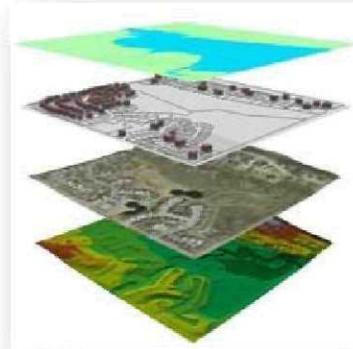
- **Data inventory**
 - 40 reports available in *.pdf format (1995-2011)
 - 260 tables and 175 figures reviewed
 - 99 tables/figures deemed relevant
- **Each relevant table/figure tracked**
 - Digitization step
 - QC of digitization
 - Import to RDBMS
 - QC of import
- **Chemical data paired with location information**
 - Survey coordinates if available
 - GIS-based estimates from maps as needed
 - Sampling depth/well construction data from reports
- **Post-upload data QC checks**
 - Completeness, units, duplicate checks

The Result: RDBMS/GIS

- Relational database: 300 sampling locations, 1,000 samples, 23,500 records
- GIS: compilation of spatial data (lines, polygons, photographs) that can be linked to RDMS
- GIS contains aerial photographs, roads, parcels, potential source areas, sewers, and analytical data

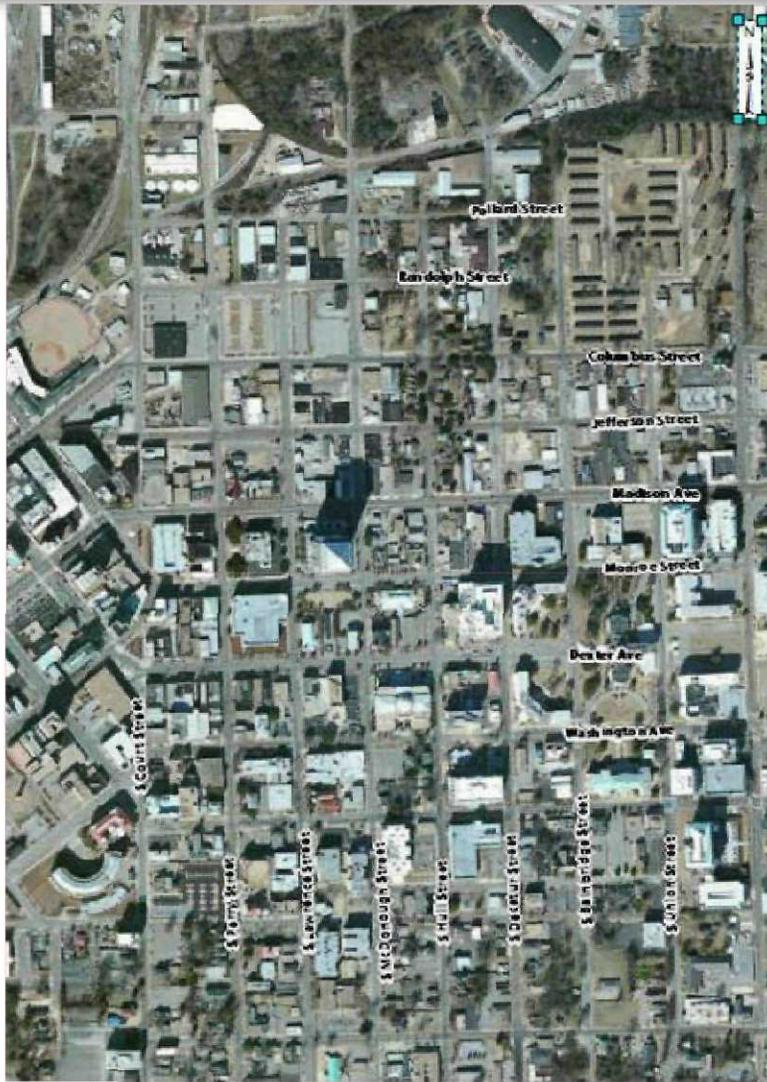


RDBMS



GIS

GIS Features: Site Setting



Aerial



Area Topography

Lithology/Stratigraphy

▪ Reference materials

- Historical Papers
- Boring Logs from the Remedial Investigation (RI) Report

▪ Terrace deposits (ancestral river channels)

- Medium-to very coarse-grained, poorly sorted, ferruginous, quartzose sand; sandy clay; and lenses of well-rounded gravel
- Quaternary period

▪ Eutaw formation (marine sands and clay)

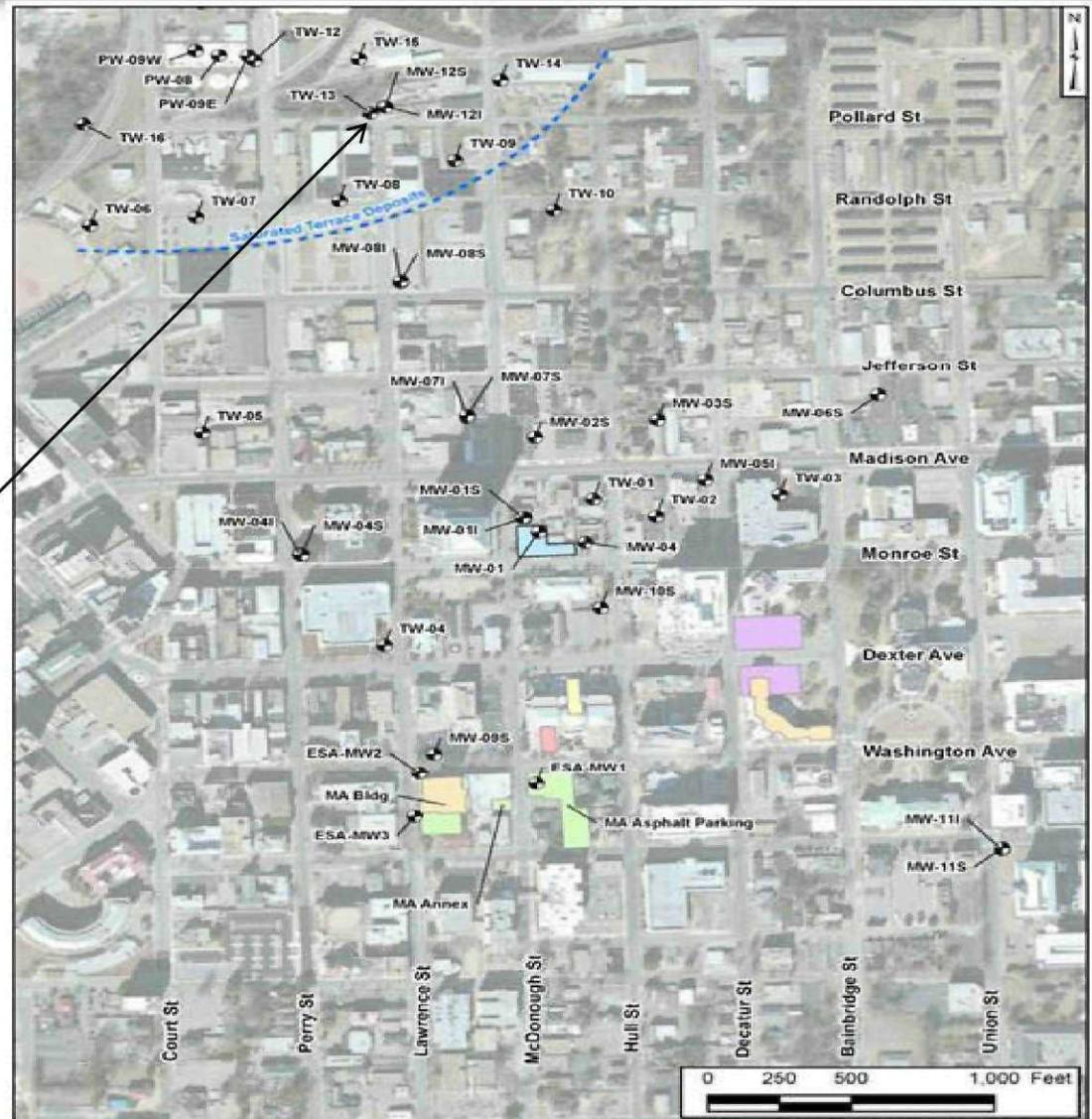
- Two water-bearing zones separated by a clay layer
- Fine-to medium-grained, well sorted, micaceous, fossiliferous, glauconitic sand
- Cretaceous period
- In Water-Bearing Zone #1, grain size fining with depth and decreasing hydraulic conductivity (K) with depth

Ground Surface



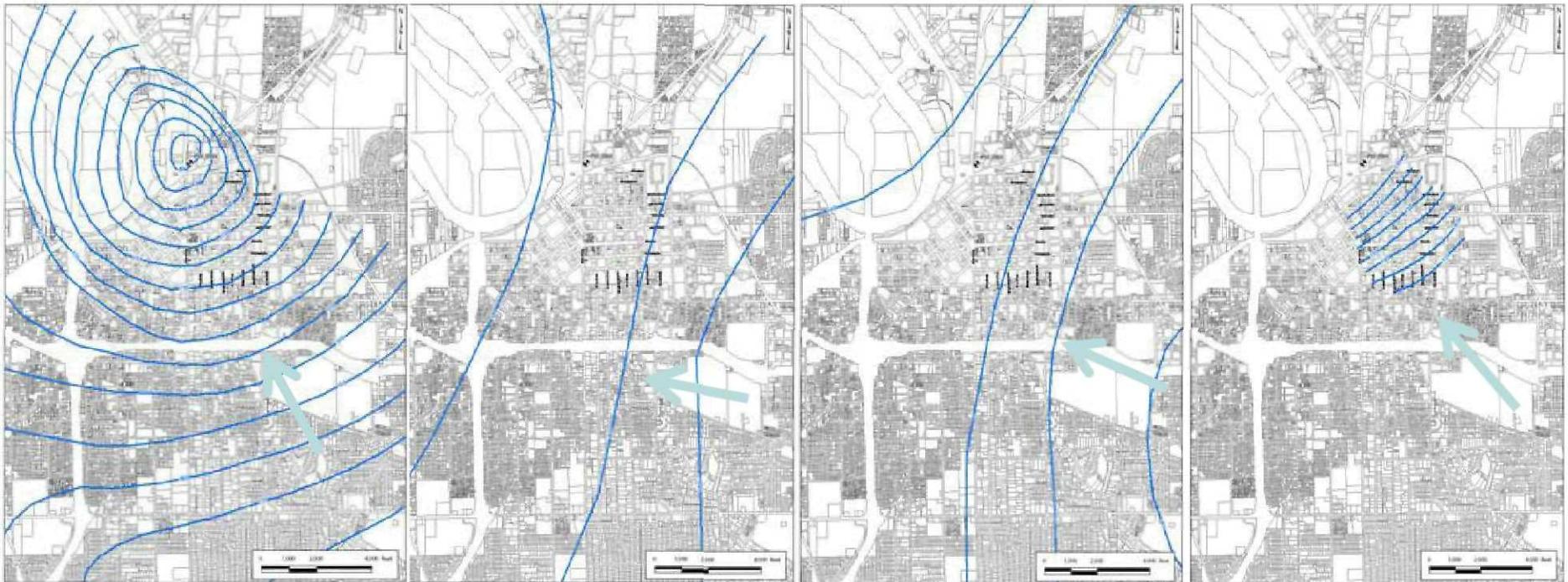
Lithology/Stratigraphy

- Terrace deposits generally limited to vadose zone
- Saturated terrace deposits downgradient in study area near the Alabama River
- MW-12S is screened in a highly permeable gravel layer of the terrace deposits



Hydrogeology

Groundwater flow direction over time



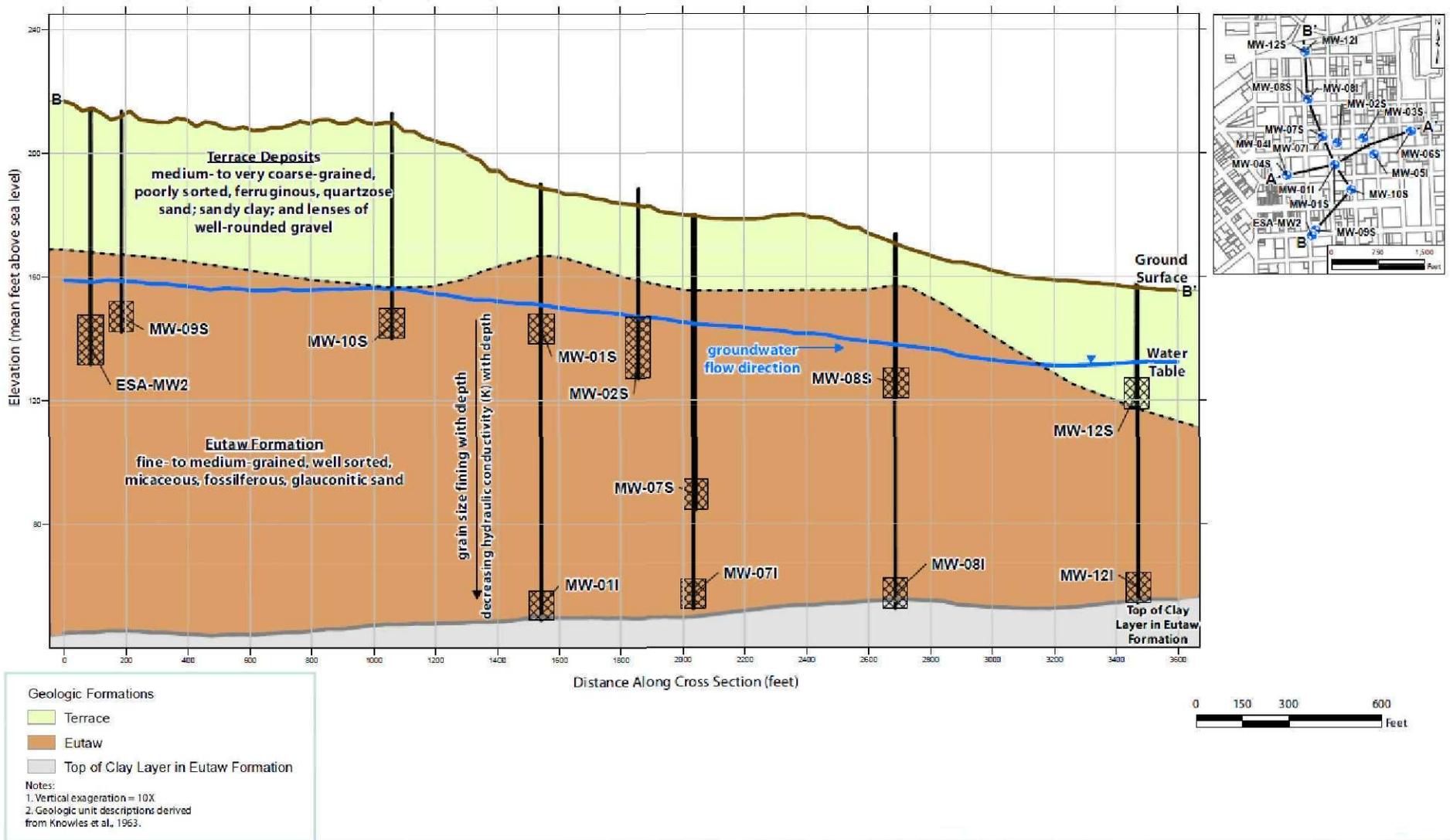
1953
(Powell et al., 1957)

1957
(Knowles et al., 1963)

1985
(Scott et al., 1987)

2002
(Black and Veatch, 2002)

Hydrogeology



Data Types

- **Groundwater data from the mid-1990s to now**
- **Soil data from the mid-1990s to 2003**
- **Soil Gas data in mid-1990s**
- **Tree core data in 2008**
- **Gore Air data in 2011**

Groundwater Sampling

- **ADEM Phase I Investigation**

- MW-1 sampled in October 1993 (abandoned prior to Phase II in November 1993)

- **ADEM Phase II Investigation**

- MW-2S and MW-3S installed in late 1993 and sampled in December 1993, March 1994, and June 1994
- MW-04 installed in early 1994 and sampled in March 1994 and June 1994

- **USEPA Remedial Investigation**

- MW-01S/I through MW-11S/I (March-April 2000)
- TW-1 through TW-13 (January 2001)
- TW-14 through TW-16 and MW-12I/S (February 2002)
- IW-01 and IW-02 – industrial wells sampled during RI (February 2002)

- **“CH2” prefix samples are from the 1999 CH2M Hill Sewer Study report**

- CH2-SB1 through CH2-SB18

- **“CSX” prefix samples are from the 2006 CSX groundwater monitoring**

- CSX-MW-2 through CSX-MW-9

Groundwater Sampling (continued)

- **Production well MWWSB PW-9W**
 - Sampled by MWWSB and others in 1991, 1992, 1997, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2008, 2009

- **2003 Limited Phase II ESA by the County at 200 Washington**
 - Groundwater data from temporary wells ESA-MW1 through ESA-MW3

- **July 2007 (J.M. Hall, on behalf of the City)**
 - Sampling at all shallow permanent wells used in RI (MW-1S through MW-12S), except MW-1S and MW-11S that are inaccessible; (note there was no MW-5S); as well as MW-5I and MW-7I

Groundwater Sampling (continued)

- **April-May 2009 by the USGS from 13 CCP Site**

- Groundwater monitoring-groundwater samples were collected monitoring wells (MW-1S, 2S, 4S, 7S, 8S, 9S, 10S, 12S, 1I, 5I, 7I, 8I, and 12I)

- **May 2010 by EPA/USGS**

- Groundwater monitoring groundwater samples were collected (MW-1S, 2S, 4S, 7S, 8S, 9S, 10S, 12S, 1I, 5I, 7I, 8I, and 12I)

- **October 2011 by EPA (Water Board Splits)**

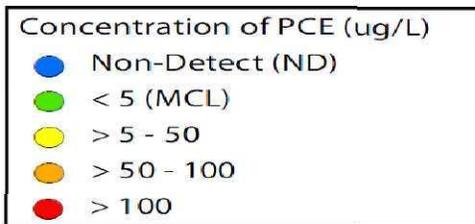
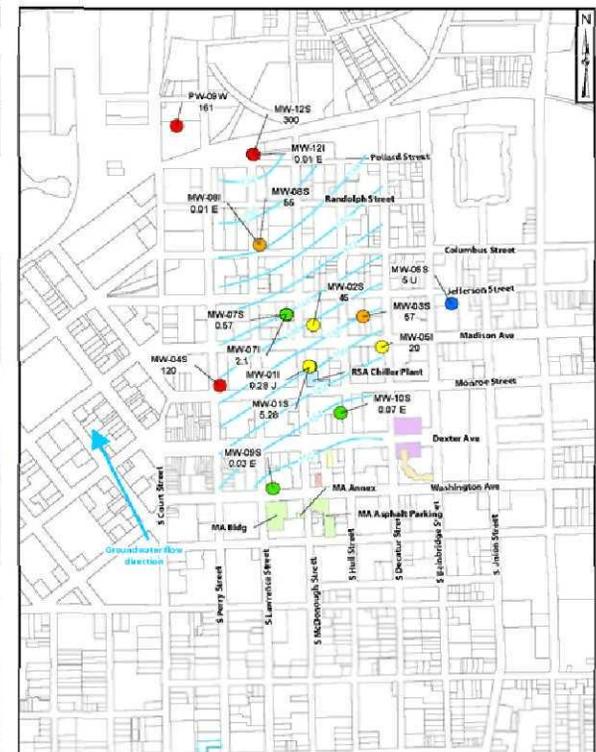
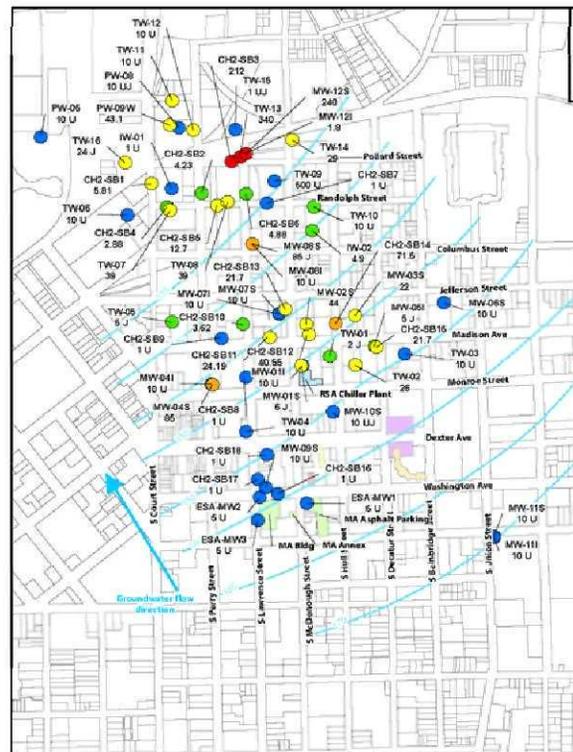
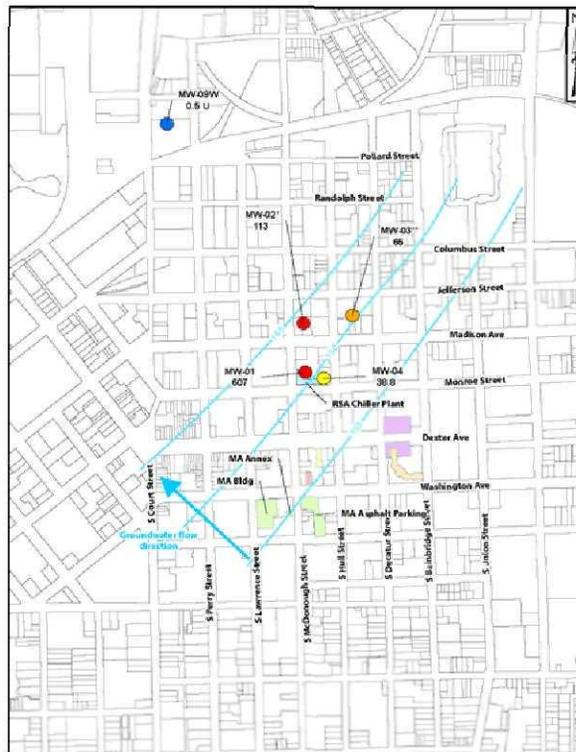
- Groundwater monitoring - groundwater samples were collected (MW-1S, 2S, 4S, 7S, 8S, 9S, 10S, 12S, 1I, 5I, 7I, 8I, and 12I)

Groundwater PCE Data

1993-1994

1999-2003

2007-2011

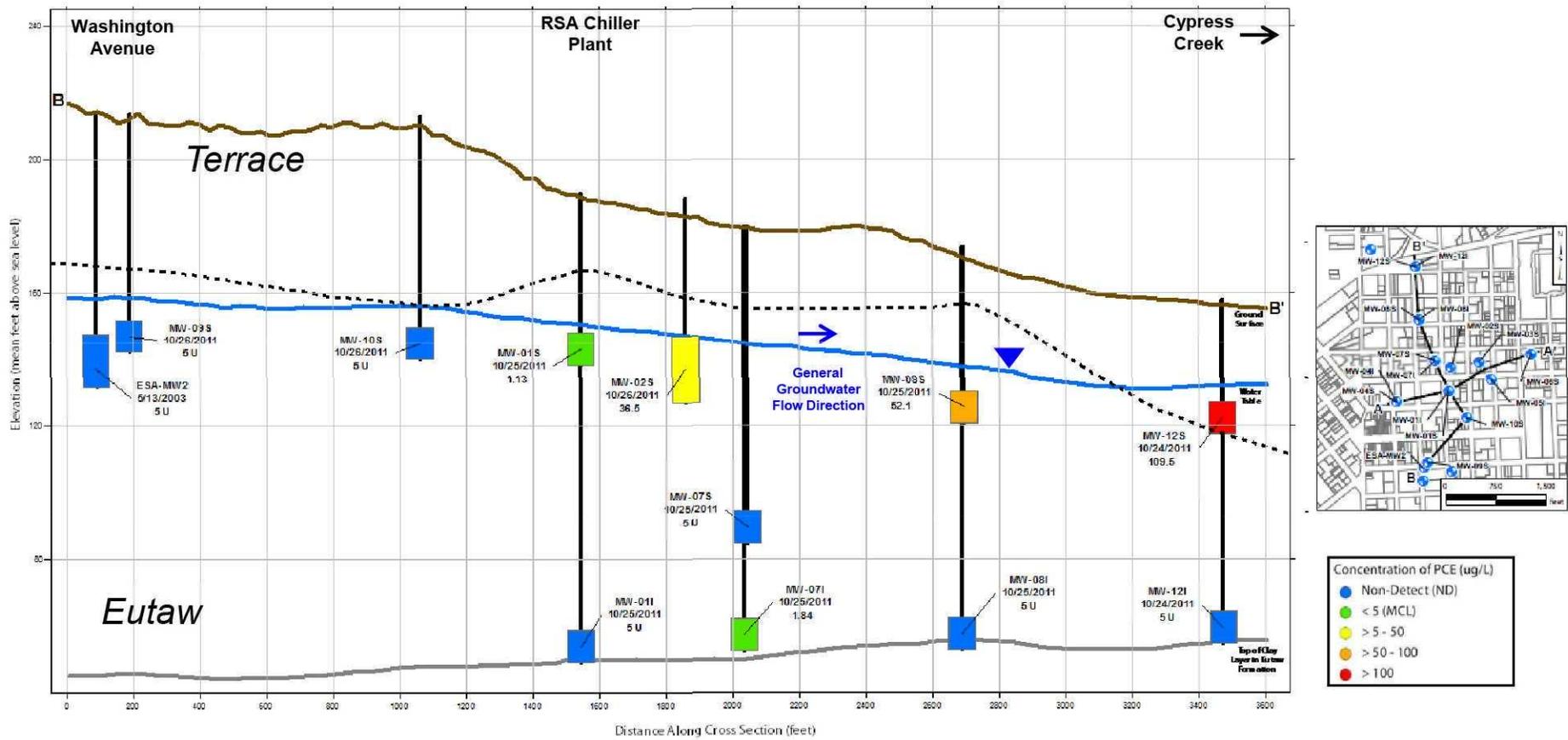


PCE never detected
south of
Monroe Street or east
of Decatur Street

Exception: One estimated value
of 0.03 ug/L at MW-9S (below
calibration range and 4/27/2009)

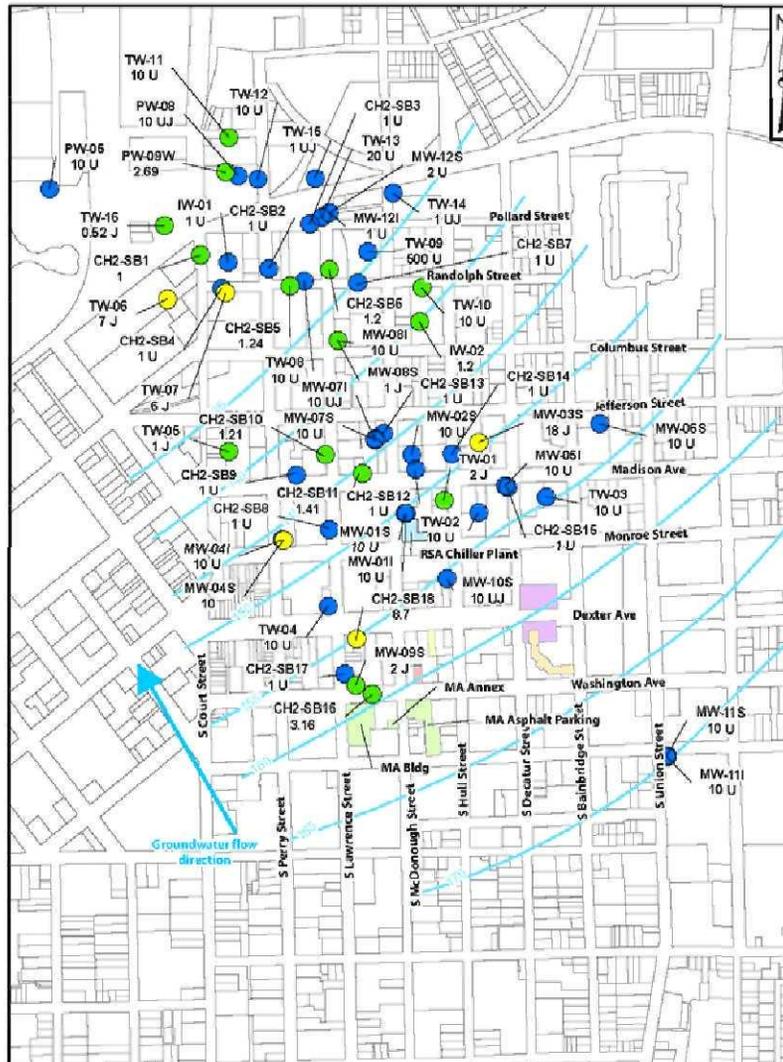
PCE in Groundwater

Section B-B'



Groundwater TCE Data

1999-2003



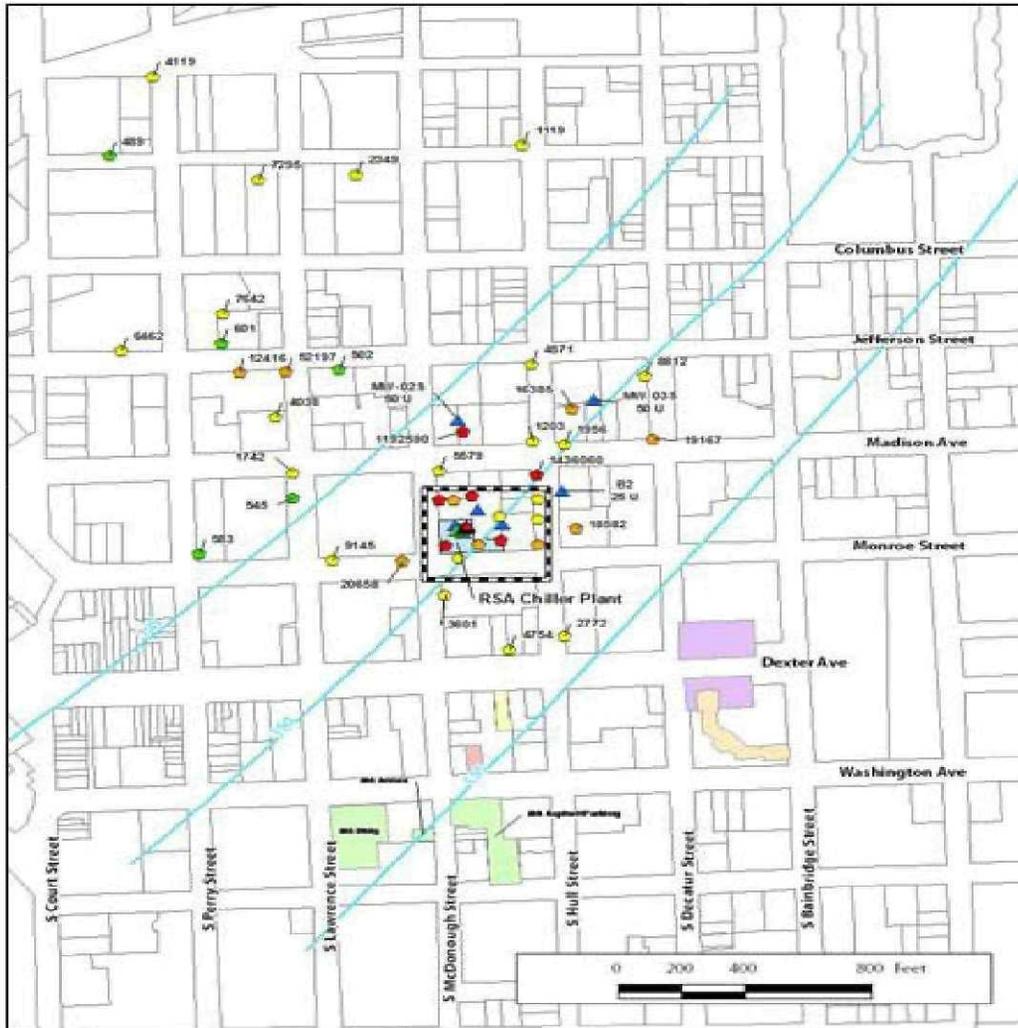
- TCE never detected above MCL south of Monroe Street
 - Exception: one sample from a temporary boring (8.7 $\mu\text{g/L}$) (2/25/1999)

Concentration of TCE ($\mu\text{g/L}$)

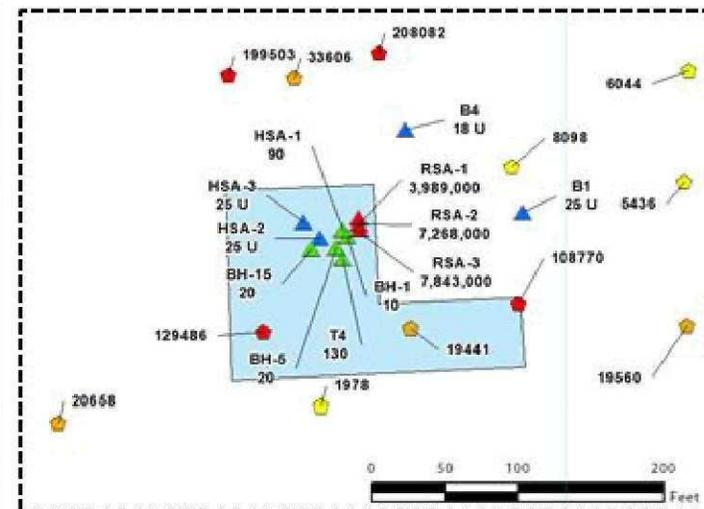
- Non-Detect (ND)
- < 5 (MCL)
- > 5

Soil and Soil Gas Data

1993-1994



Elevated PCE concentrations near RSA Chiller Plant

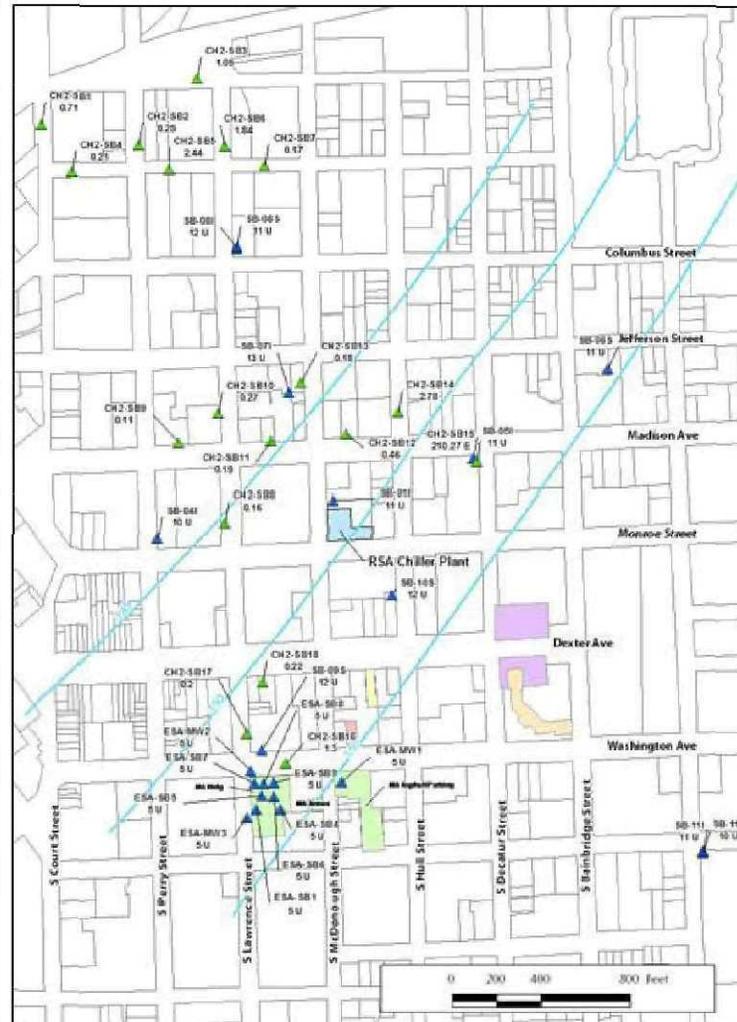
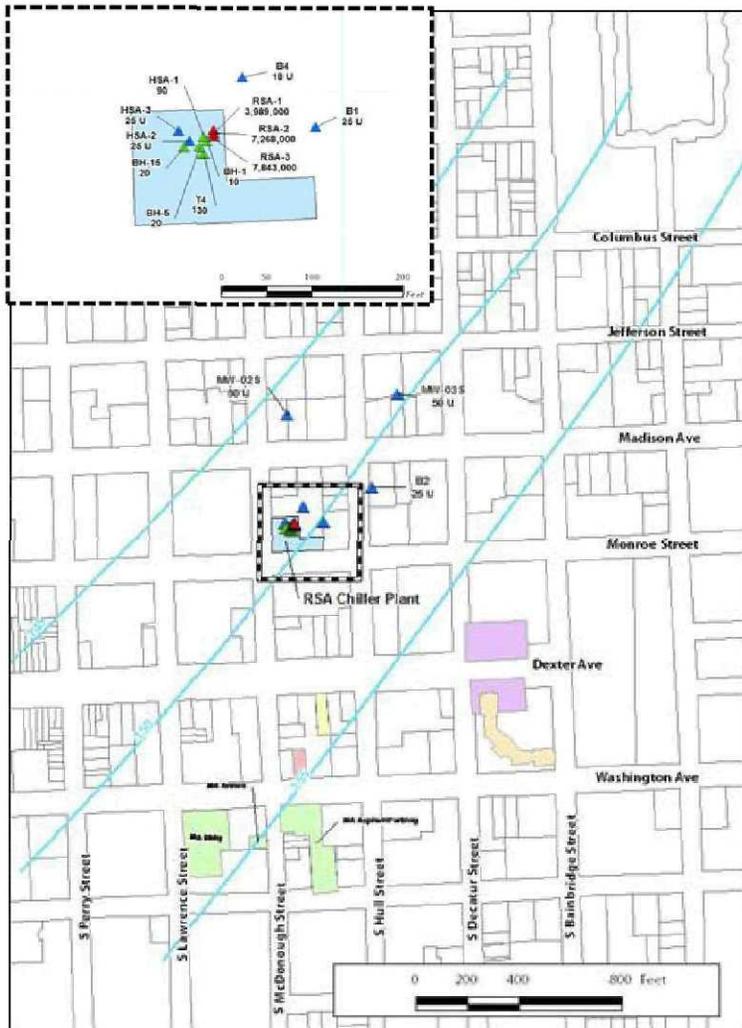


- PCE in Soil (ug/kg)
- ▲ Non-Detect (ND)
 - ▲ < 550 (Residential Soil SL)
 - ▲ > 550 - 2,600 (Industrial Soil SL)
 - ▲ > 2,600 - 10,000
 - ▲ > 10,000
- PCE in Soil Gas (ion counts)
- Non-Detect (ND)
 - < 1,000
 - > 1,000 - 10,000
 - > 10,000 - 100,000
 - > 100,000

Soil Data

1993-1994

1999-2003

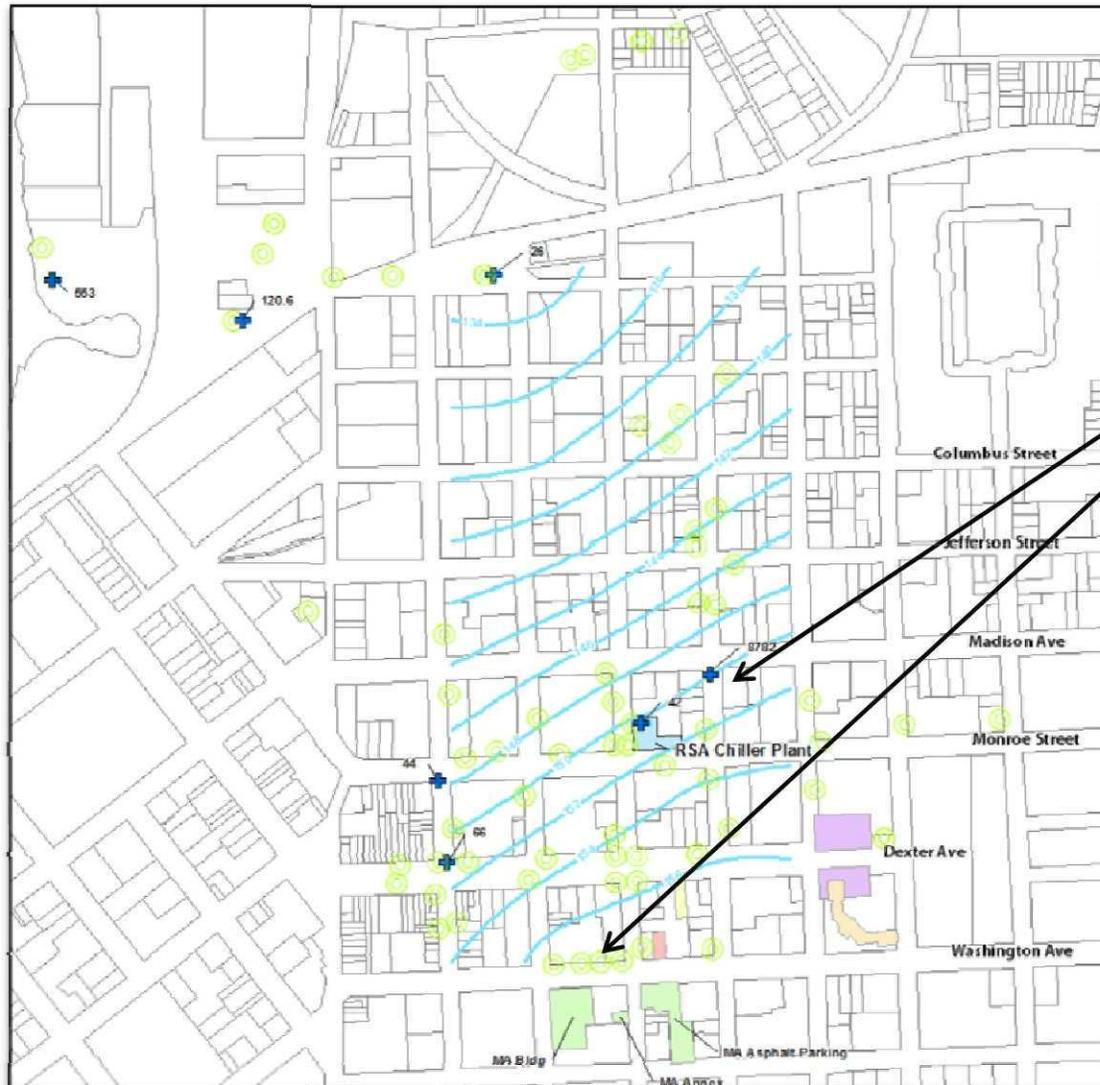


Elevated concentrations of PCE in vicinity of RSA Chiller Plant

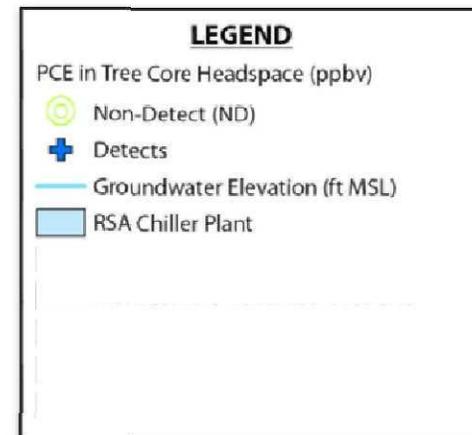
PCE in Soil (ug/kg)

- ▲ Non-Detect (ND)
- ▲ < 550 (Residential Soil SL)
- ▲ > 550 - 2,600 (Industrial Soil SL)
- ▲ > 2,600 - 10,000
- ▲ > 10,000

Tree Core Data: 2008



No PCE near
Washington Avenue or
east of Hull Street



Phytoforensics

- **Dr. Joel Burken retained**
- **Phytoforensics is a screening tool, for semi-quantitative data**
- **The depth to groundwater at the Site (30 to almost 60 feet) limits the potential for phytoforensics to mimic groundwater concentrations**
 - No established correlation shown between groundwater and tree core data
- **Quantitative results are variable including for tree-64**
 - variability of more than an order of magnitude raises concern about the confidence of contaminant quantification, but not presence

Phytoforensics

- **The assertion made in the 2011 USGS Report that the Washington Avenue area is the probable source area was tied to the analysis of tree 64 and the hypothesis that: (i) the sewer system transported PCE and TCE, and (ii) then leaked the majority of the PCE and TCE in the Monroe Street area.**
 - As presented, these hypotheses were not confirmed in the report provided, particularly: (i) no sewer system connection to the Monroe Street area, and (ii) lack of closely correlated patterns of PCE and TCE contamination
 - Tree coring does not support the hypothesis of a single source area for both TCE and PCE.
- **Aerobic conditions, high redox potential in the groundwater, and the prevalence of electron acceptors (O_2 and NO_3^-) indicate that TCE was not produced from PCE reductive dechlorination.**
- **Dendrochemistry analysis at the Site provides little insight to potential dating of release events at the Site**
 - Insufficient number of samples outside the suspected plume area to adequately assess the presence of chloride in the broader area or relationship of sodium and chloride

Contaminant of Potential Concern Identification And Analysis

- **Identify areas of the highest contaminant concentrations in soil and groundwater**
- **Work with FTI to identify current and historical operations that may have caused releases in these areas**

Information Gathering and Evaluation

- EPA FOIA documents, including 104(e) responses
- FTI Findings
- Summaries of Previous Investigations
- Technical and Trade Literature
- City of Montgomery Sewer Drawings
- Groundwater Sampling Data
- EPA and ADEM Guidance Documents
- Additional sources

Analyte	Units	Maximum Concentration	Location with Max Conc	Primary MCL	EPA Screening Value	Screening units
1,1,2-trichloroethane	µg/L	1.64	CH2-SB15	5	0.24	µg/L
1,1-dichloroethene	µg/L	10	MW-01S	7	7	µg/L
1,2,3-trichloropropane	µg/L	3.06	CH2-SB11		0.00072	µg/L
1,2,4-trimethylbenzene	µg/L	120 J	TW-09		15	µg/L
1,2-dichloroethane	µg/L	31	MW-11S	5	0.15	µg/L
Benzene	µg/L	4500	TW-09	5	0.41	µg/L
Bromodichloromethane	µg/L	4.2	TW-14		0.12	µg/L
Chlorodibromomethane	µg/L	1.86	5237		0.15	µg/L
Chloroform	µg/L	37.3	MW-01S		0.19	µg/L
cis-1,2-dichloroethene	µg/L	510	AHS_GW-2	70	70	µg/L
Ethylbenzene	µg/L	780	TW-09	700	1.5	µg/L
Tetrachloroethene	µg/L	607	MW-01	5	0.11	µg/L
Toluene	µg/L	3800	TW-09	1000	1000	µg/L
Trichloroethene	µg/L	18 J	MW-03S	5	2	µg/L
Vinyl chloride	µg/L	0.08	MW-01S	2	0.016	µg/L
Xylene Total	µg/L	2300	TW-09	10000	200	µg/L
1,1-Biphenyl	µg/L	1 J	TW-09		0.83	µg/L
1,2,3-trimethylbenzene	µg/L	710 J	TW-09		10	µg/L
1,4-dichlorobenzene	µg/L	11.2	5171	75	0.43	µg/L
1-Methylnaphthalene	µg/L	32 J	TW-09		2.3	µg/L
Benzo(a) pyrene	µg/L	4.63	5173	0.2	0.0029	µg/L
Benzo(b)fluoranthene	µg/L	1.2 J	TW-16		0.029	µg/L
Bis(2-ethylhexyl) phthalate	µg/L	600 J	MW-01I	6	4.8	µg/L
Naphthalene	µg/L	230	TW-09		0.14	µg/L
Aluminium	mg/L	130 J	MW-05I		37	mg/L
Arsenic	mg/L	0.036	TW-15	0.01	0.000045	mg/L
Barium	mg/L	2.2	MW-11S	2	2	mg/L
Beryllium	mg/L	0.013	TW-15	0.004	0.004	mg/L
Cadmium	mg/L	0.032	MW-08I	0.005	0.005	mg/L
Chromium (III+VI)	mg/L	1.2	TW-02	0.1	0.1	mg/L
Cobalt	mg/L	0.14	TW-15		0.011	mg/L
Copper	mg/L	1.6	IW-01	1.3	1.3	mg/L
Iron	mg/L	160	TW-15		26	mg/L
Manganese	mg/L	14	TW-09		0.88	mg/L
Mercury	mg/L	0.00094 J	MW-02S	0.002	0.00063	mg/L
Nickel	mg/L	0.74	MW-12S		0.73	mg/L
Thallium	mg/L	0.021	TW-13	0.002	0.00037	mg/L
Lead	mg/L	0.32	TW-16	0.015	0.015	mg/L
b-BHC	µg/L	0.051	TW-04		0.037	µg/L
Dieldrin	µg/L	0.38 J	MW-09S		0.0042	µg/L
g-BHC (Lindane)	µg/L	1.71	5190	0.2	0.061	µg/L
Heptachlor	µg/L	3.5	CH2-SB17	0.4	0.015	µg/L
Heptachlor epoxide	µg/L	0.27 J	MW-02S	0.2	0.0074	µg/L

Constituents above the MCL and/or EPA Screening Values

- Site is Urban
- Numerous Constituents are Present

Site Geochemical Conditions

- Overall, Site conditions are not supportive of reductive dechlorination of chlorinated solvents; TCE is not present as a degradation product of PCE at this Site
- Dissolved Oxygen (DO) concentrations are above the 5 mg/L, inhibitory level for anaerobic biodegradation at several monitoring wells
- The pH at most monitoring wells is near or below 5; the minimum optimal value for anaerobic biodegradation (optimal range $5 < \text{pH} < 9$)
- At most monitoring wells the oxidation/reduction potential (ORP) is above 100mV suggesting that the reductive degradation pathway is unlikely

Metals Data Quality Issues

- **Metals results, especially chromium, are suspect because of high turbidity values and high analytical variability**
- **October 24-27, 2011 Sampling Event: EPA and Water Board splits**
- **Metals had significant variability**
 - RPDs up to 176%
 - Data outside acceptance criteria (i.e. RPD > 20%) for at least one metal at each well location
- **Chromium results are highly questionable**

Metals Data Quality Issues

- Final turbidity measurements presented by SESD were not representative of final turbidity in samples (collected with a bailer at each monitoring well)

Monitoring Well	EPA Reported Turbidity (NTU)	Turbidity measured in metals sample (NTU)
MW-01S	1.16	268
MW-01I	1.24	11.7
MW-02S	8.31	>1000
MW-04S	0.25	42.6 / 46.3
MW-05I	0.57	20.7
MW-07S	1.24	2.24
MW-07I	0.1	4.75
MW-08S	0.48	15
MW-08I	1.72	27
MW-09S	1.32	64.3
MW-10S	0.54	95.7
MW-12S	4.71	174
MW-12S (Resample)	N/A	12
MW-12I	35.1	12.5

Shading indicates Turbidity is greater than 10 NTU.

MW-12SR was collected at MW-12S the day after purging was conducted, due to the elevated turbidity observed at MW-12S.

Sample turbidity measurements as provided by ACESS.

Metals Data Quality Issues

- Results from monitoring well 12S and 12SR (resample) indicate that elevated turbidity biases samples results high

Analyte	MW-12S 10/24/2011	MW-12S 10/24/2011	MW-12SR 10/25/2011
	MWWSS	USEPA	USEPA
Aluminum	6.27	5.1	0.4
Arsenic	< 0.02	0.0018	< 0.0013
Barium	0.115	0.1	0.079
Calcium	11	12	12
Chromium (III+VI)	0.0409	0.034	0.0057
Iron	8.6	8.9	0.59
Lead	< 0.02	0.0074	< 0.001
Magnesium	3.77	3.8	3.4
Manganese	0.177	0.19	0.021
Mercury	NA	0.00048	< 0.0001
Potassium	5.12	4.1	3.8
Selenium	< 0.02	0.002	0.0021
Sodium	18.7	19	18
Strontium	NA	0.087	0.082
Titanium	NA	0.068	0.0062
Vanadium	< 0.02	0.0093	< 0.005
Zinc	0.0767	0.066	0.034

Up to an order of magnitude difference between MW-12S and MW-12SR

Shading indicates an exceedance of respective USEPA screening level. (All results mg/L)
 NA = Not analyzed in sample collected by MWWSS

Likely Contaminants of Concern for the Site

- **PCE :**

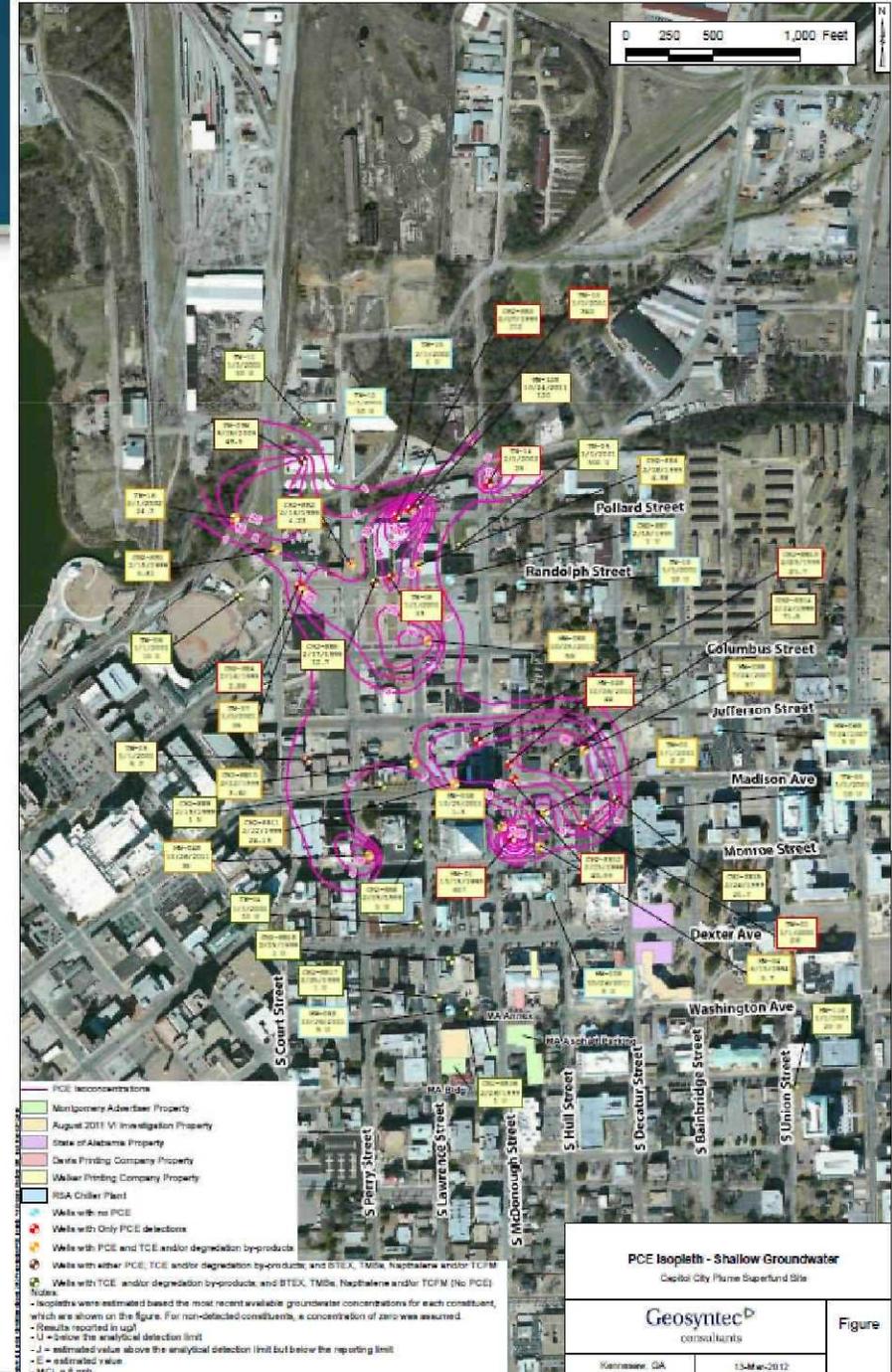
- Exceeds the MCL at several wells north of Monroe Street
- PCE never detected south of Monroe Street or east of Decatur Street

- **BTEX:**

- Benzene, toluene and ethyl benzene exceed MCLs at several locations north of Monroe Street and at the intersection of South Union Street and Adams Avenue
- Xylene concentrations are below the MCL
- BTEX concentrations are below the MCL south of Monroe Street and west of South Union Street

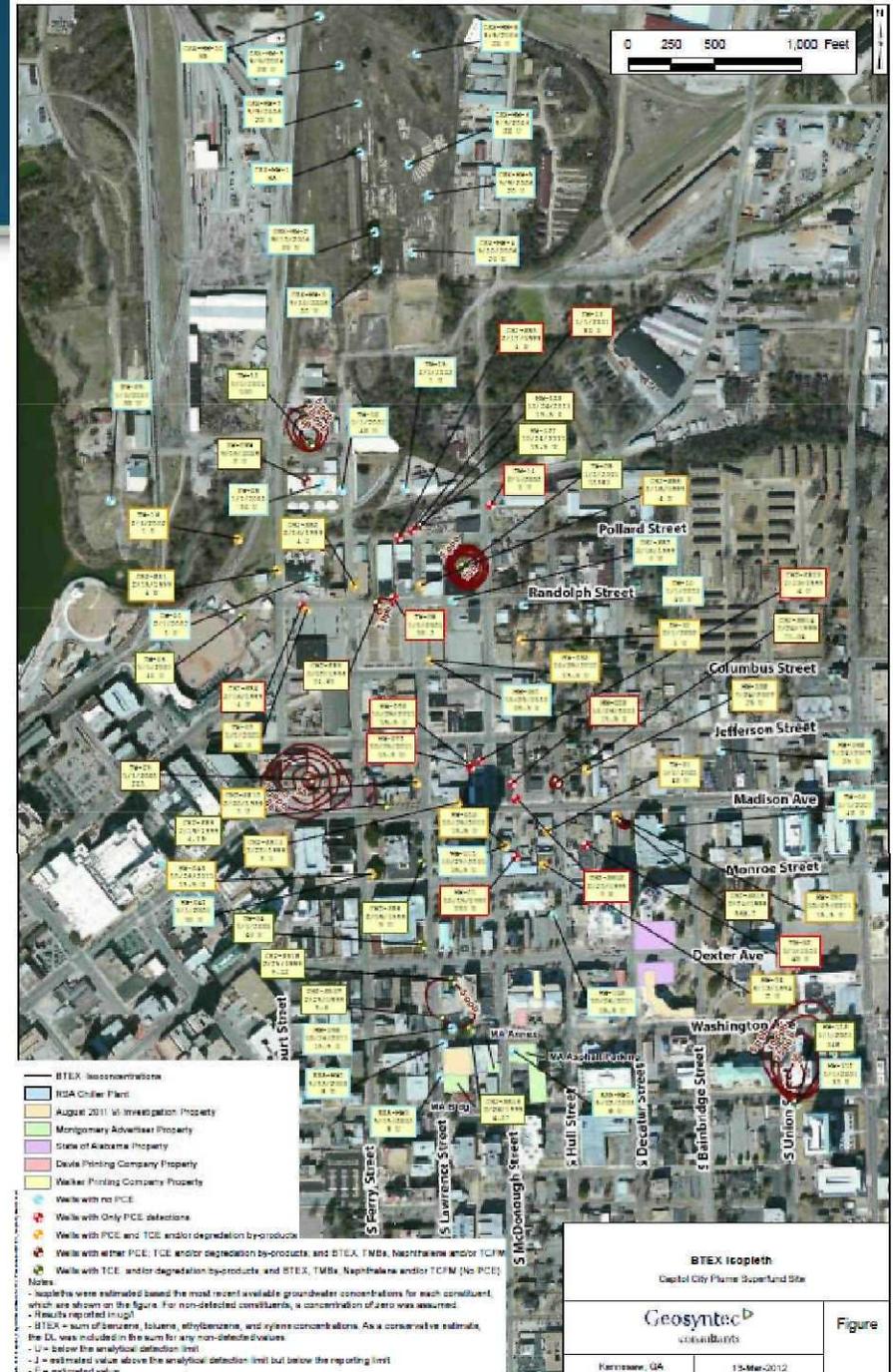
PCE PLUMES AT THE SITE

- Large plume area
- All concentrations at parts per billion levels
- Multiple source areas



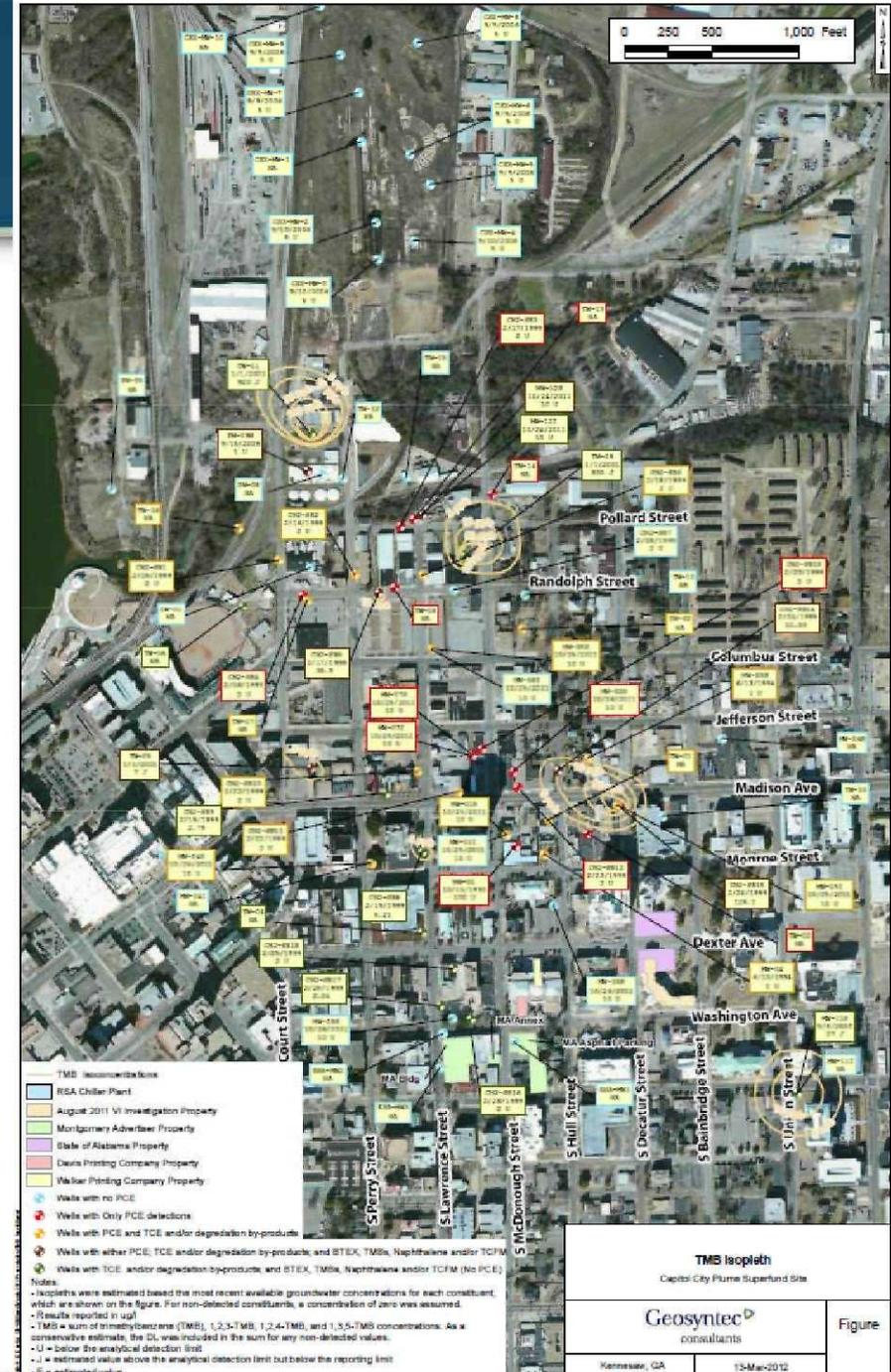
BTEX PLUMES AT THE SITE

- Multiple source areas
- No discernible broad plume
- Not co-located with PCE plumes
- No recent data



TMB PLUMES AT THE SITE

- Generally co-located with BTEX plumes
- TMBs (C-9 fraction) indicative of gasoline release source areas



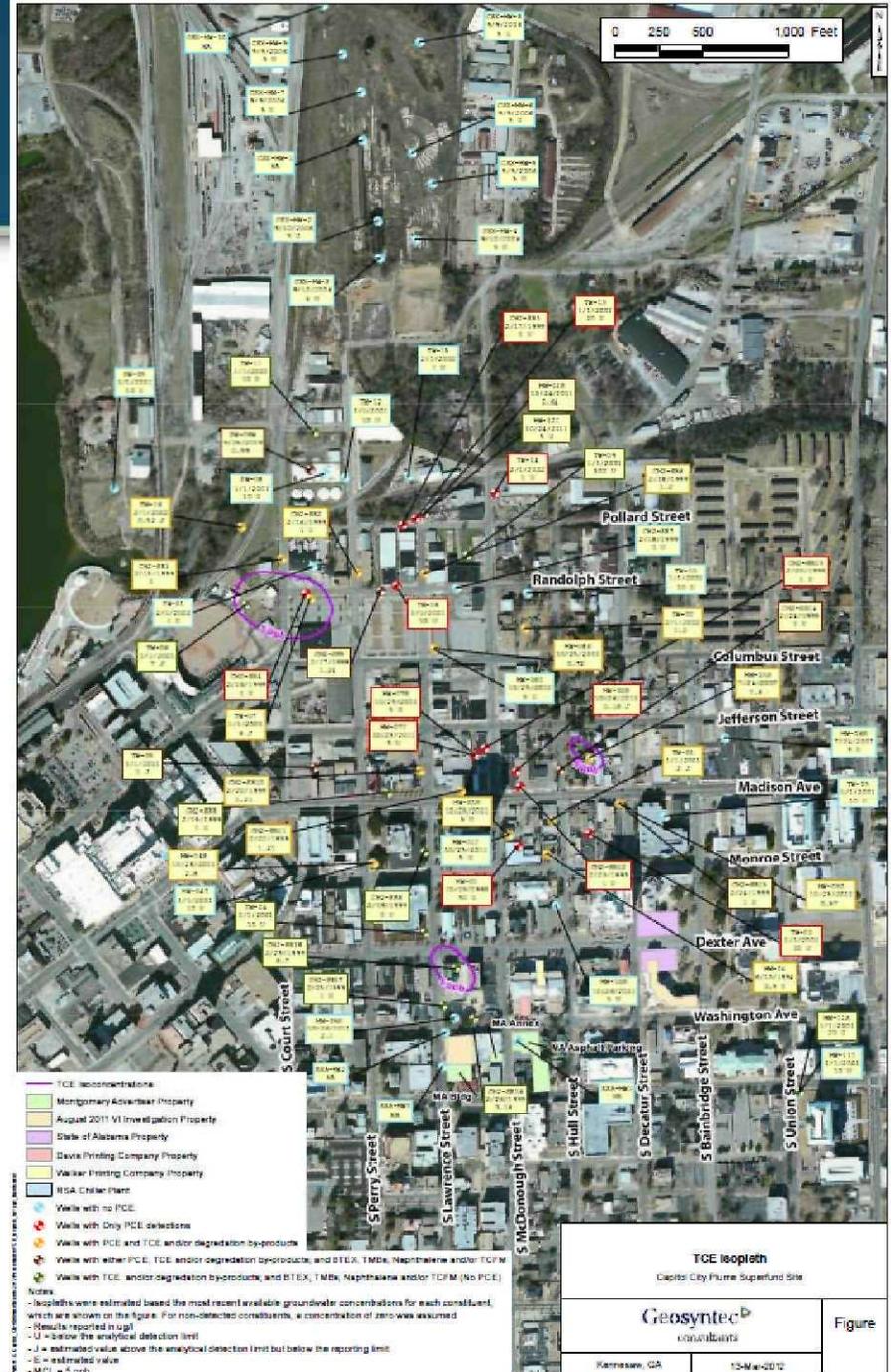


BENZENE PLUMES AT THE SITE

- Predominant BTEX constituent
- Multiple Source Areas
- Co-located with BTEX and TMB plumes

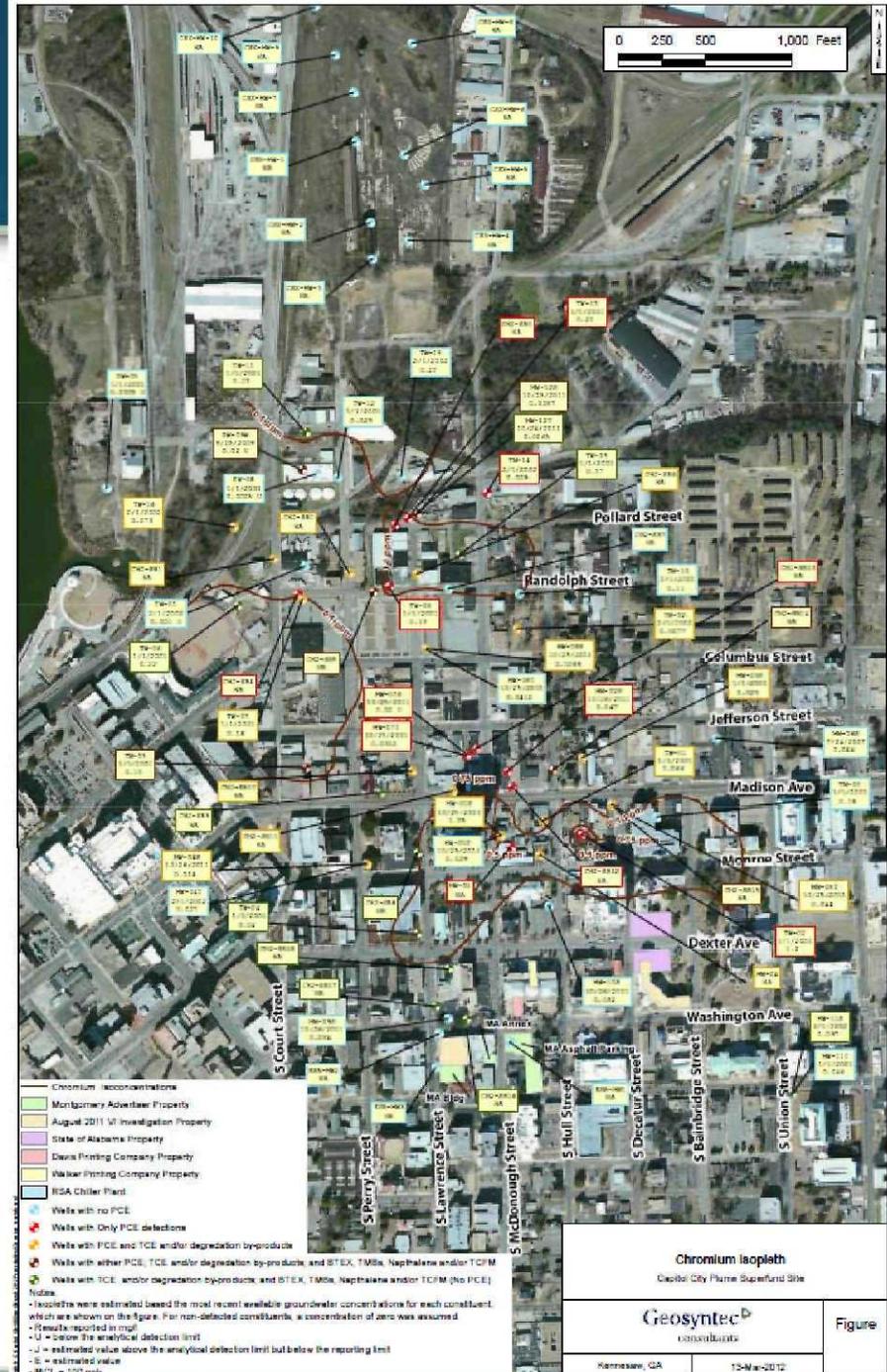
TCE PLUMES AT THE SITE

- Multiple source areas
- Not co-located with PCE plumes



CHROMIUM AT THE SITE?

- Reported detections above the MCL at MW-1S and 1I
- Results throughout the Site are highly suspect due to high sample turbidity



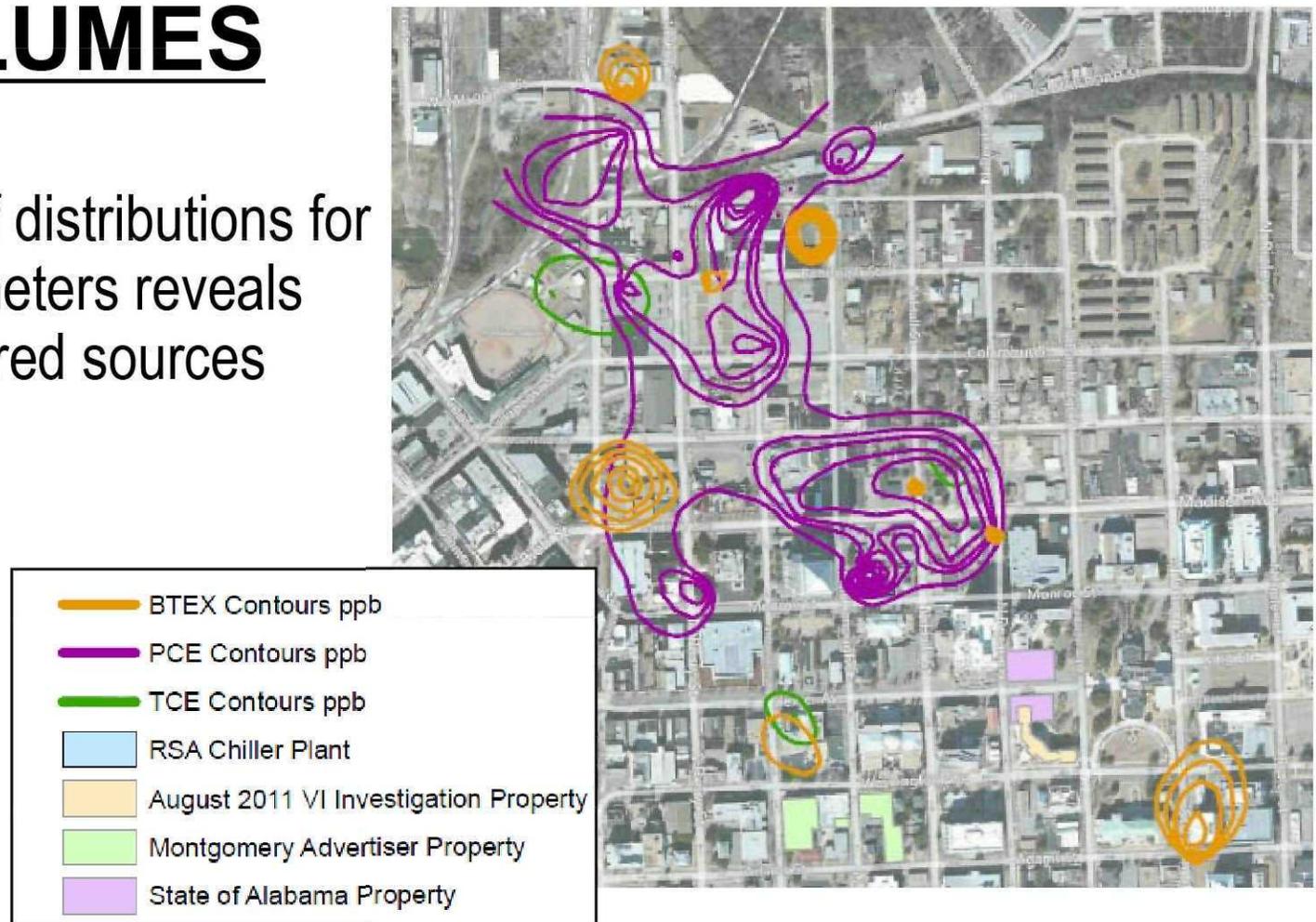
CHLOROFORM AT THE SITE

- Localized detections
- Not co-located with PCE plumes
- Not co-located with other THMs, indicating a source other than drinking water or leaking sewers
- No detections above MCL – Goal (MCLG) of 70 µg/L



OVERVIEW OF PCE, BTEX, AND TCE PLUMES

- Comparison of distributions for multiple parameters reveals disparate inferred sources



Potential Human Exposures

- **Potential exposure scenarios identified in 2004 ADPH/ATSDR Public Health Assessment**

- **Water Supply Wells**
 - Currently incomplete exposure pathway (impacted well taken out of service in 1992)

- **Vapor Intrusion**
 - Data do not indicate that the vapor intrusion pathway is complete at the Site

- **Direct Contact/Inhalation during Construction**
 - Future construction work exposures can be addressed with institutional control

Vapor Intrusion Evaluation

Question: *Does the data indicate that the vapor intrusion pathway is complete at the Site?*

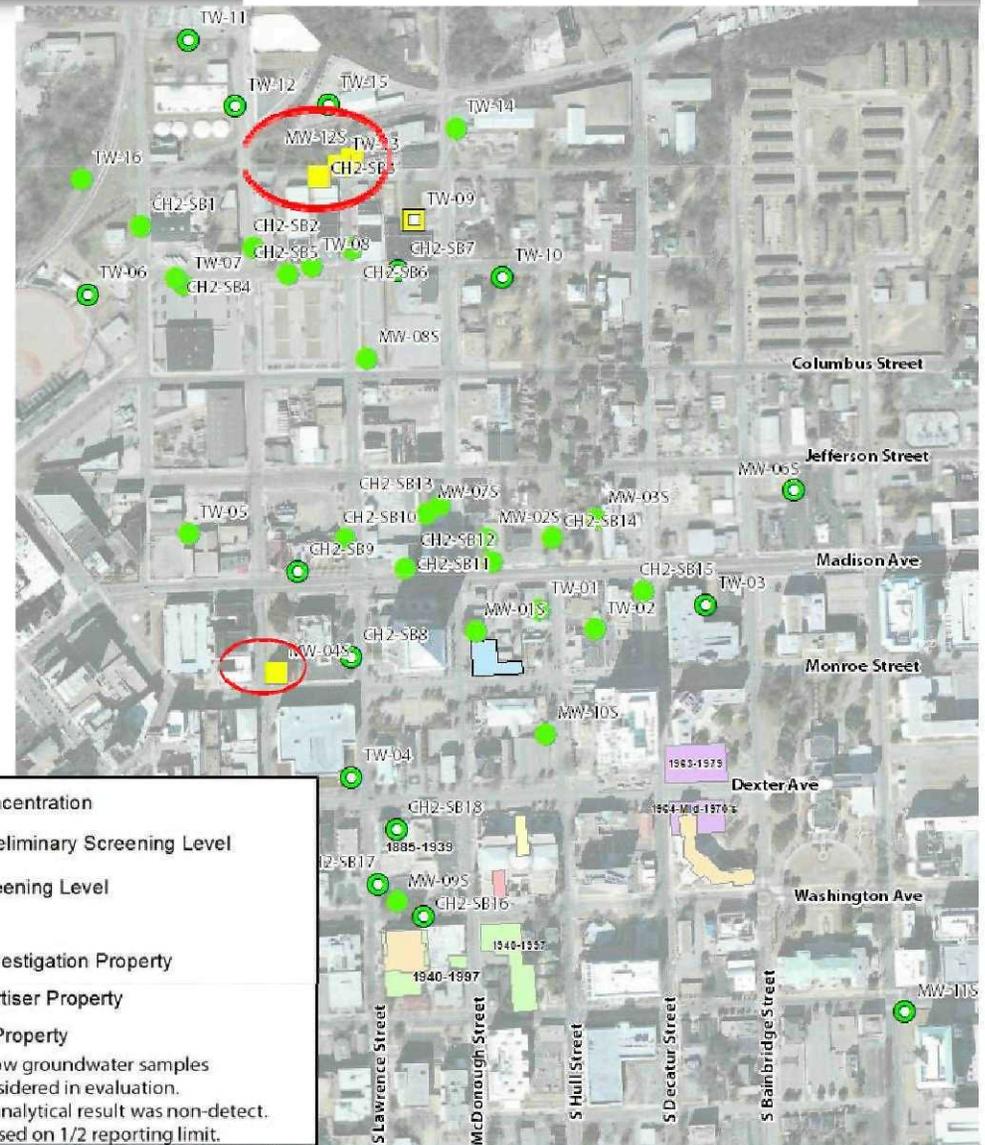
Lines Of Evidence

- **Groundwater screening evaluation: Compare groundwater data to generic and Site-specific screening levels**
- **Review of 2011 USGS Vapor Intrusion Investigation**
 - Methods
 - Soil gas
 - Indoor air data

Groundwater Screening Evaluation Results

Vapor Intrusion Screening Evaluation

- PCE groundwater concentrations are below generic screening levels, except for area near MW-04S and area around MW-12S
- PCE concentrations across Site are below Site-specific screening levels
- Current evaluation does not consider decreasing concentration trends



2011 Vapor Intrusion Investigation

- **USGS Conducted Vapor Intrusion investigation of AG Building and Annex III in August 2011**

- **Several deficiencies in the USGS investigation identified:**
 - Insufficient documentation of field activities and observations

 - Inadequate assessment of background sources (i.e., chemical inventories and outdoor air sampling)

 - Insufficient demonstration that Gore® Modules meet DQOs for indoor air or soil vapor sampling

August 2011 Soil Gas Results

- Soil gas concentrations are below risk-based levels.
- Low detection frequencies for petroleum hydrocarbons in soil gas

All table concentrations in ug/m3

Compound	AG Building		Annex III		Screening RBSL
	Det. Freq.	Range	Det. Freq.	Range	
PCE	4/5	1.8 - 58	5/7	2.3-8.2	470
TCE	0/5	ND	2/7	2.4 - 11	30
1,4 DCB	0/5	ND	0/7	ND	11
Benzene	1/5	ND – 3.1	2/7	0.97 – 1.0	16
Toluene	4/5	0.63 - 18	3/7	1.0 - 19	220,000
Ethylbenzene	0/5	ND	1/7	ND - 3.3	49
Xylenes	1/5	ND – 0.44	1/7	ND – 11.1	4400

Screening RBSL – Risk-based screening level for soil gas = ambient air RSL / 0.1

August 2011 Indoor Air Results

Indoor Air Results Are:

- Below risk-based levels
- Below odor thresholds, and
- Similar to typical background levels

* Dry-cleaned clothes may substantially increase background indoor PCE concentrations

All table concentrations in ug/m³

Compound	AG Building		Annex III		Comparison Values		
	Det. Freq.	Range	Det. Freq.	Range	RSL	Background	Odor
PCE	0/7	ND	13/13	0.36 – 1.91	47	2.2 – 7.0 *	7,000
TCE	0/7	ND	1/13	0.99	3.0	1.1 – 2.1	150,000
1,4 DCB	7/7	0.17 – 0.75	11/13	0.06 – 0.25	1.1	0.54 – 28	1,100
Benzene	0/7	ND	0/13	ND	1.6	4.7 - 15	5,000
Toluene	7/7	0.2 – 0.93	13/13	0.17 – 1.04	22,000	24 - 77	11,000
Ethylbenzene	7/7	0.29 – 0.85	13/13	0.5 – 1.72	4.9	3.7 - 13	10,000
Xylenes	7/7	0.95 – 3.81	13/13	1.94 – 6.39	440	18 - 72	5,000

Vapor Intrusion Evaluation Summary

- Soil and groundwater data do not indicate AG Building or Annex III would be of concern for vapor intrusion pathway or that the vapor intrusion pathway is complete
- Two areas not evaluated by USGS exceed EPA generic screening levels, but not Site-specific levels
- August 2011 soil gas data is below conservative soil gas screening levels
- August 2011 indoor air data is below risk-based levels, odor thresholds, and background levels

Evaluation of Odors in State SubBasement

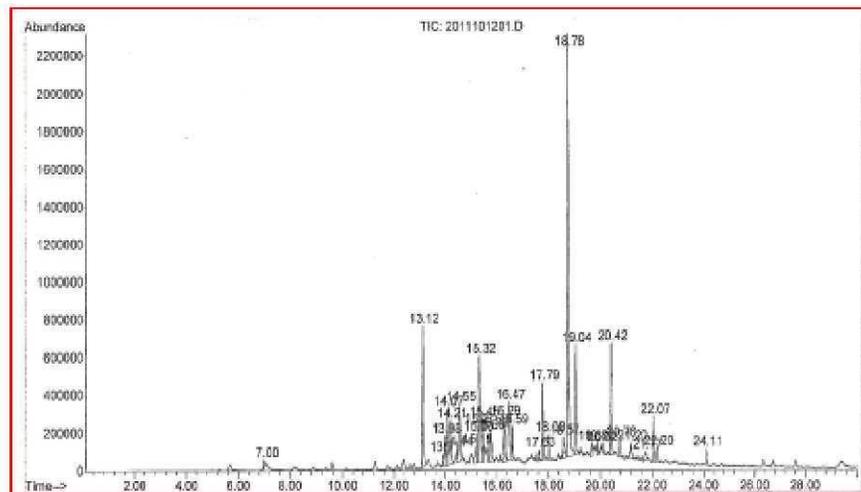
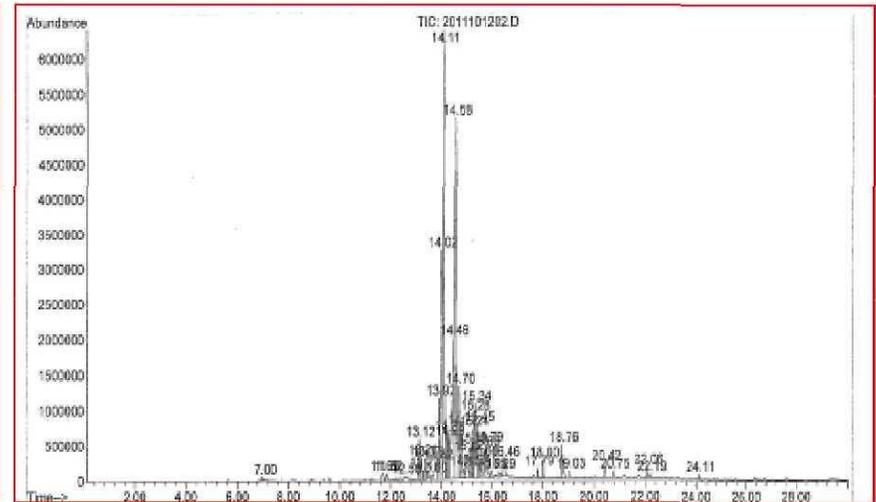
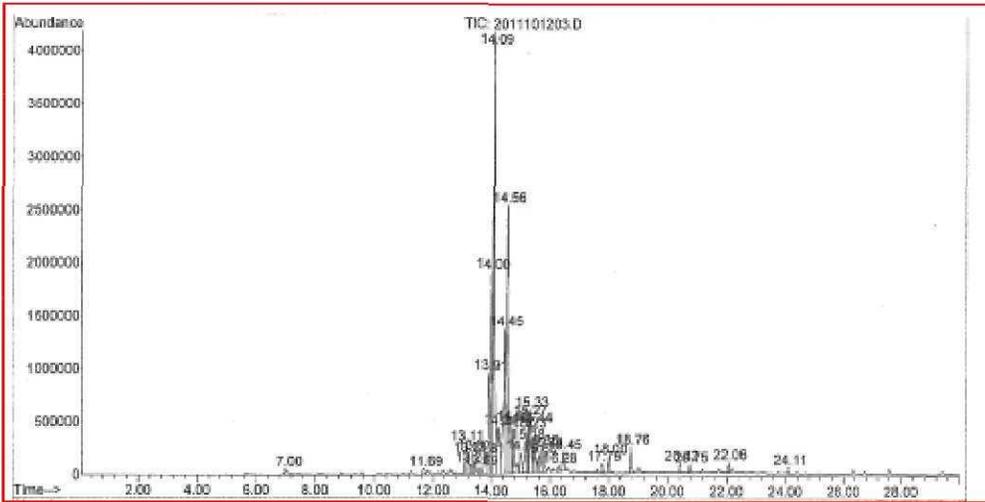
- Indoor air samples do not correlate with soil vapor samples
- Soil vapor samples do not exceed screening levels for indoor vapor intrusion risk
- Vapor barrier constructed in SubBasement during building renovation/addition
- Sewer clean out is not the source of odors
- Testing of carpet from SubBasement indicates carpet is emitting volatile organic compounds (VOCs)
- Concentrations of Total Petroleum Hydrocarbons in indoor air are most likely related to VOC emissions from carpet in the SubBasement
- VOC emissions are likely caused by plasticizer degradation of the vinyl carpet backing
- Moisture and pH testing did not meet pre-installation requirements
- On-going testing
 - Reason for carpet emissions
 - Alternatives for remedy

Results of Carpet Vapor Emissions

Major VOC Components	VOC ($\mu\text{g}/\text{m}^2/\text{hr}$)	VOC ($\mu\text{g}/\text{m}^2/\text{hr}$)	VOC ($\mu\text{g}/\text{m}^2/\text{hr}$)
2-ethyl-1-Hexanol	3.2	9.4	11.8
3,7,11-trimethyl-1-Dodecanol	13.2		
3-methyl-1-Hexene*	30.8		
3,3,5-trimethyl-1-Hexene*		69.5	
6-methyl-1-Octanol	61.3	108.6	
2-ethyl-Hexanoic acid*			4.8
3-ethyl-1-Pentene*	24.2		
3,4-dimethyl-1-Pentanol		47.5	
2,3-dimethyl-1-Pentene*	40.2	96.6	
2-(2-butoxyethoxy)-Ethanol*			9.0
Caprolactam		26.0	31.5
Cyclododecane			18.3
Total VOC's ($\mu\text{g}/\text{m}^2/\text{hr}$)	190.1	492.8	92.4

* Best
Library Fit

Chromatograms of Carpet Square Samples



Moisture and Alkalinity Testing

- **Calcium Chloride Test (ASTM 1869)**
 - 2 of 7 equal maximum manufacture's recommendation of 3.0 lb/1000sq ft/hour
 - 4 of 7 exceed maximum manufacture's recommendation of 3.0 lb/1000sq ft/hour

- **Relative Humidity (ASTM 2170)**
 - 11 of 13 samples exceed relative humidity of 75% (maximum manufacturer's recommendation)

- **pH**
 - 5 of 7 equal maximum pH of 9
 - 1 of 7 exceeds maximum pH of 9

The Advertiser Company

- **1829: The Planter's Gazette is founded; eventually owned by The Advertiser Company**
- **March 7, 1963: The Advertiser Company is dissolved**
- **March 7, 1963: A new The Advertiser Company is formed**
- **January 1969: Multimedia, Inc. acquires The Advertiser Company**
- **December 1995: Gannett Co., Inc. acquires Multimedia, Inc.**
 - **The Advertiser Company, an Alabama corporation, remains a subsidiary of Multimedia, Inc.**

The Advertiser Company was Dissolved on March 7, 1963

Dissolution record also
available at Alabama
Secretary of State website:
[http://arc-
sos.state.al.us/cgi/corpdetail
.mbr/detail?corp=780297&
page=name&file=D](http://arc-sos.state.al.us/cgi/corpdetail.mbr/detail?corp=780297&page=name&file=D)

STATE OF ALABAMA
MONTGOMERY COUNTY 29725

DISSOLUTION
OF
THE ADVERTISER COMPANY

THIS AGREEMENT, with respect to the dissolution of THE
ADVERTISER COMPANY:

WITNESSETH:

(1) The undersigned, constituting the sole stockholder of The
Advertiser Company, an Alabama corporation having its principal place
of business in the City of Montgomery, and organized in Montgomery
County, Alabama, on December 1, 1927, and recorded in Corporate Record
Volume "N", Pages 84 to 95, Office of the Secretary of State, Ala.,
hereinafter called the "Corporation", pursuant to the applicable
provision of law, and especially of Section 21(76), Title 10 of
the Code of Alabama Recompiled, 1958, as amended by the statute appear-
ing in the 1959 General Acts of Alabama, at page 1093, consents and
directs that this agreement be forthwith recorded in the Office of the
Judge of Probate of Montgomery County, Alabama, and that the Board of
Directors of said corporation shall then proceed to wind up its busi-
ness and affairs as soon as possible thereafter.

(2) The undersigned corporation certifies that it is the sole
holder of the outstanding stock of said corporation, and that by these
presents, does consent and agree to the immediate dissolution of said
corporation.

IN WITNESS WHEREOF, The Advertiser-Journal, Inc., a corporation,
has caused this agreement to be executed by its duly authorized officers,
in the presence of two witnesses on this the 7th day of March,
1963.

ATTEST:
James C. Hall, Jr.
Its Secretary

THE ADVERTISER-JOURNAL, INC.
BY Carmage Walls
Its President

John B. Hensley
Witness

John B. Hensley
Witness

STATE OF ALABAMA MONTGOMERY COUNTY
I certify that this instrument was filed on 7 day
March, 1963 at 12:00 P. M. and recorded in
Book of Copies 55 Page 270 The Seal
John B. Hensley
Judge of Probate

STATE OF ALABAMA I
COUNTY OF MONTGOMERY I

I, Carmage Walls, do hereby certify that I am President of
The Advertiser Company, the corporation to be dissolved in pursuance
to the foregoing agreement, and do hereby certify that the persons
whose names are signed thereto constitute duly authorized officers of
The Advertiser-Journal, Inc., the sole stockholder of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand as President
of said corporation on this the 7th day of March,
1963.

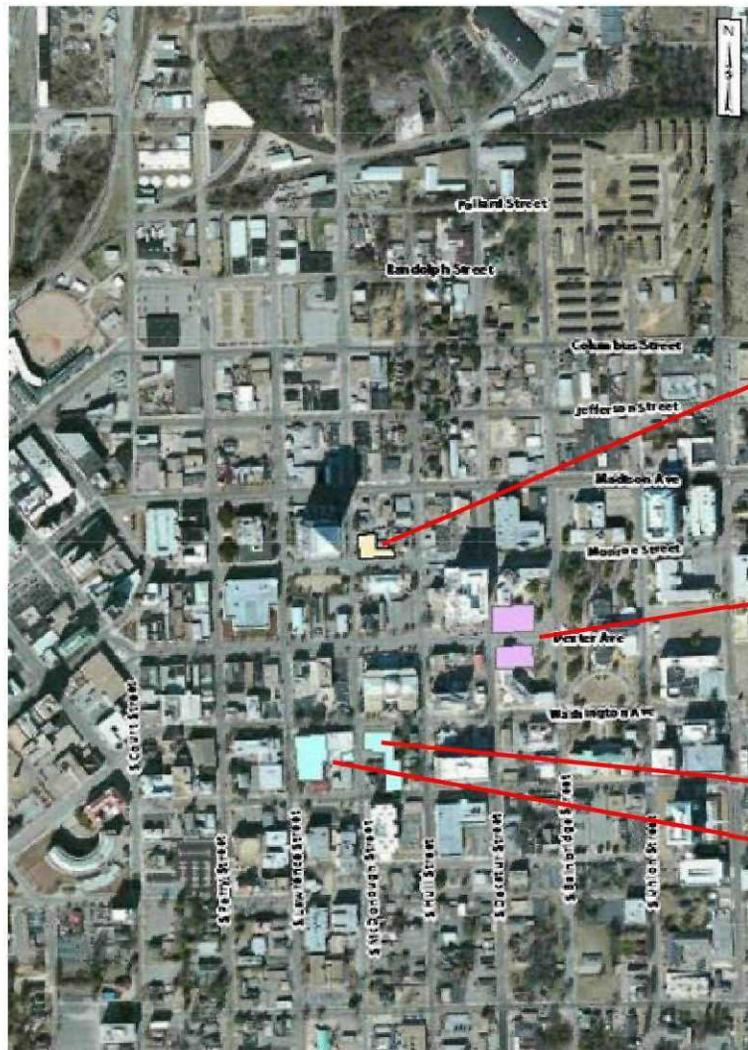
Carmage Walls
Carmage Walls, President

Sworn to and subscribed before
me on this the 7th day of
March, 1963.
Marian H. Eckhard
Notary Public
My commission expires on the 29
day of September, 1963.

200 Washington Avenue Location

- **The Advertiser Company operates at 200 Washington Avenue from March 1963 until 1997**
- **Also operates in the Associated Press (Annex) Building and the parking lot at 115-116 South McDonough Street between 1980s-1997**
- **In 2003, The Advertiser Company sells all three properties to the Montgomery County Commission**

Historic Locations



Aerial



Historic Locations

Phase 2 Sampling: 2003

- **Phase 2 Sampling Performed at 200 Washington Avenue prior to sale to Montgomery County Commission**
- **Seven sub-surface soil samples taken from beneath the floor of 200 Washington Avenue**
- **Three monitoring wells installed (ESA-MW1; ESA-MW2; and ESA-MW3)**
- **All samples of PCE and BTEX are below detection limits (TCE not analyzed by lab)**

Sale of 200 Washington Avenue

**“I understand from comments made by EPA personnel that EPA has a policy of only pursuing owners of properties that are known to be the source of contamination. This assessment did not identify any information that leads me to believe the subject sites are a source of any environmental contamination.”
(Phase 2, p. 21).**

(Environmental Materials Consultants, Haines Kelley, P.E., signatory)

The Advertiser Company

- Based on a thorough review, there is no evidence that The Advertiser Company ever used PCE
- Trade Literature: PCE was rarely used in the printing industry
- Presses were cleaned with mineral spirits until 1964, kerosene from 1964 until 1977, and petroleum-based blanket wash from 1977 until 1997
- There is no evidence of spills or improper disposal
- The Advertiser Company never used TCE to clean its presses
 - TCE was only used in very limited quantities from the late 1950s or early 1960s until 1977 in an automated process that misted the edge of paper rolls (approx. 30 gallons/year)

Alabama: Background/Activities

- **501 Washington Avenue**

- Highway Department 1937-1964
- Department of Public Safety 1964-2004
- Attorney General 2008-Present

- **501 Dexter Avenue**

- State Department of Education Print Shop 1963-1976

History of Printing Operations at SDE and DPS

- Both departments conducted printing operations and film developing
- Both departments had very small printing operations
- Printing for the State was consolidated in 1976 at the Department of Printing and Publications, distant from the CCP site area
- Employees reported the use of petroleum-based blanket wash in limited quantities
- There is no evidence that PCE or TCE was used at either of the printing operations
- There were no reported spills or releases

History of Printing Operations at SDE and DPS Continued

- Former SDE and DPS employees report that blanket wash was applied to rags that were disposed in plastic liners in the garbage cans when they were soiled or were sent out to a laundry service
- Based on employee interviews, cleaning chemicals (solvents) for the printing operation were not poured down the drain
- Film developing chemicals were diluted and poured down the drain following silver recovery
 - Film development chemicals were acetic water-based waste and did not contain chlorinated or petroleum solvents

History of Laboratory at Highway Department

- During 1937-1964, laboratory asphalt testing was performed at a Highway Department Laboratory located on High Street, outside of Site area
- Most of the asphalt extraction testing was performed at the asphalt plant sites using carbon tetrachloride, which was disposed on aggregate piles
- Carbon tetrachloride was stored in 55-gallon drums and dispensed to field test members in 5-gallon buckets at the 501 Washington Avenue basement
- ALDOT relocated laboratory to Fairground Road in 1964, after which time they began using TCE
- Out of 23 employees interviewed, only one thought that TCE might have been used before the laboratory relocated. Most of the interviewees specifically named carbon tetrachloride as the solvent used for extractions.

Contaminants of Potential Concern and the State of Alabama

- **There is no evidence that the State of Alabama used PCE or TCE in blanket wash**
- **Blanket wash chemicals were petroleum based**
 - The State of Alabama had to accept low bid for chemical purchases
 - Petroleum solvents cost 3 times less than chlorinated solvents
- **The Highway Department used carbon tetrachloride (which is not a COPC for the Site) as a solvent for asphalt extraction testing**
- **The Highway Department did not begin using TCE until the laboratory relocated to the current location on Fairgrounds Rd.**

Plausibility Analysis

Question: Is it plausible that observed PCE contamination in Well 9W could have migrated from 200 Washington Avenue, 501 Washington Avenue, or 501 Dexter Avenue?

Lines of evidence (LOEs):

1. Use of PCE: Did The Advertiser Company or Alabama use PCE?
2. Sewer network: Could sewers have served as the conduit for PCE to travel from the properties to the area around the RSA Chiller Plant?
3. Travel times: Could PCE have migrated in groundwater from Washington Avenue to Well 9W in a reasonable timeframe?
4. Transported plume magnitude: Could PCE have migrated from the properties to Well 9W in the observed concentration?
5. Plume morphology: Could the Site have arisen in its current configuration from one, monolithic source?
6. RSA Chiller Plant data: What does data indicate about likely Site source(s)?
7. Source variability: How consistent are source signatures?

Plausibility Analysis LOE 1 (PCE Use)

- Extensive investigation: No documents or knowledge of PCE use, or PCE in any product used by The Advertiser Company or the State
- No evidence of PCE contamination in the area near 200 Washington Avenue or 501 Washington Avenue and 501 Dexter Avenue

Freedom Wash
Effective Date: 8/06/94

MATERIAL SAFETY DATA SHEET

SECTION I - PRODUCT IDENTIFICATION AND PREPARATION INFORMATION

Product Name: Freedom Wash

Manufacturer Name and Address: NENSCO
49 Railroad Avenue
Milbury, MA 01527
Phone #: (508) 865-5205

MSDS Prepared by: Dell Tech Laboratories Ltd.
UWO Research Park
London, Ontario
Phone #: (519) 858-5021

HMIS RATING	
Health	0
Flammability	0
Reactivity	0
Personal Protection	4

SECTION IIa - HAZARDOUS INGREDIENTS
(as per OSHA Hazard Communication Standard, CFR 29 1910.1200 and Canadian WHMIS Regulations)

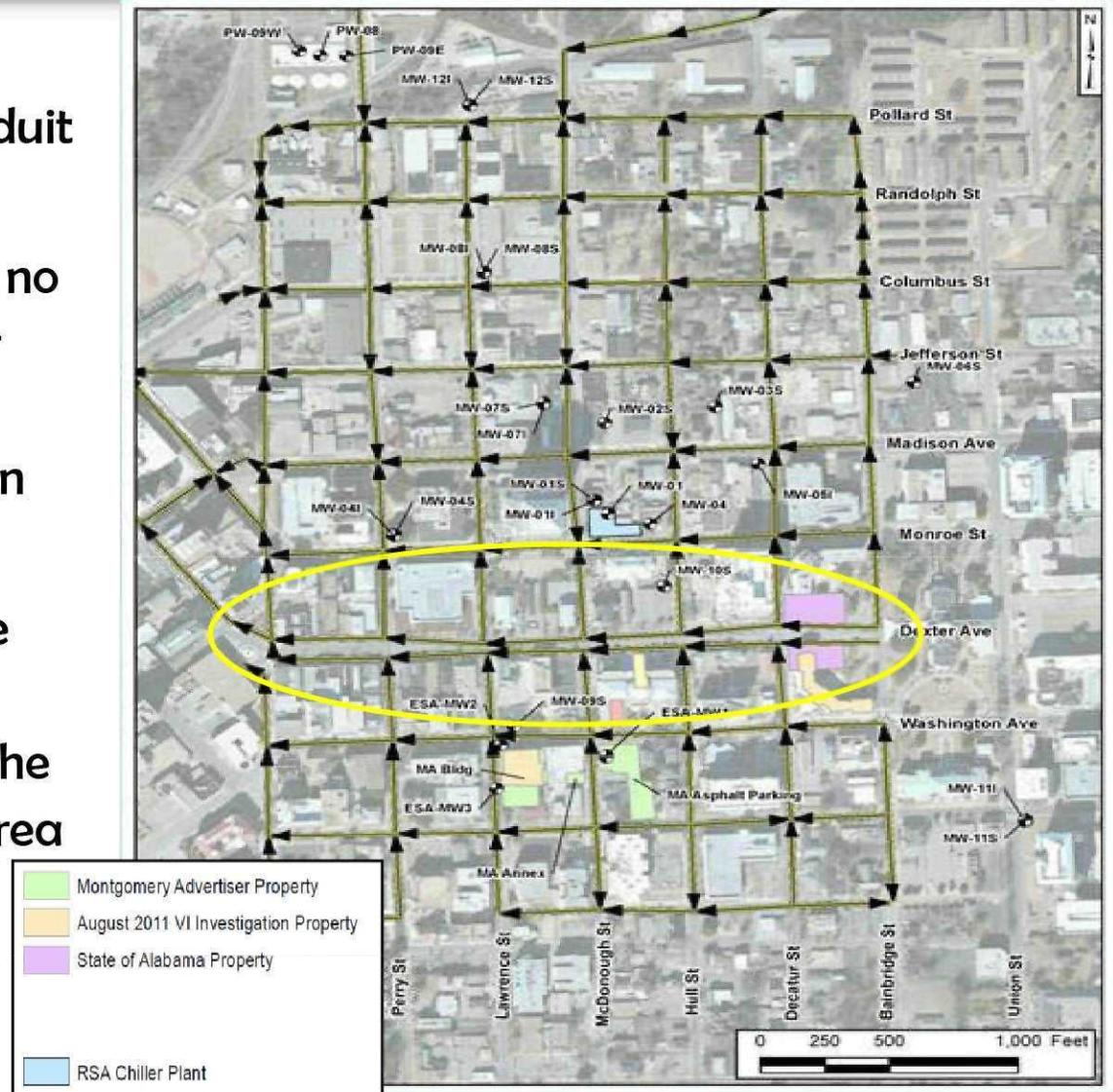
Does not contain any hazardous ingredients

SECTION IIb - NON-HAZARDOUS INGREDIENTS
(as per OSHA Hazard Communication Standard, CFR 29 1910.1200 and Canadian WHMIS Regulations)

Chemical Name	Wt%	ACGIH-TLV	NIOSH-REL	OSHA-PEL	LD ₅₀
White dispersant	75-100	5mg/m ³ (mist)	n/a	5mg/m ³ (mist)	n/a

Plausibility Analysis LOE 2 (Sewer Network)

- USGS 2011 report asserts that sewers in the area are the conduit for contamination
- Sanitary sewer network shows no cross-connections along Dexter Avenue, preventing flow from traveling from 200 Washington Avenue to RSA Chiller Plant
- Contamination could not have traveled from 200 or 501 Washington Avenue through the sanitary sewer system to the area of the RSA Energy Plant



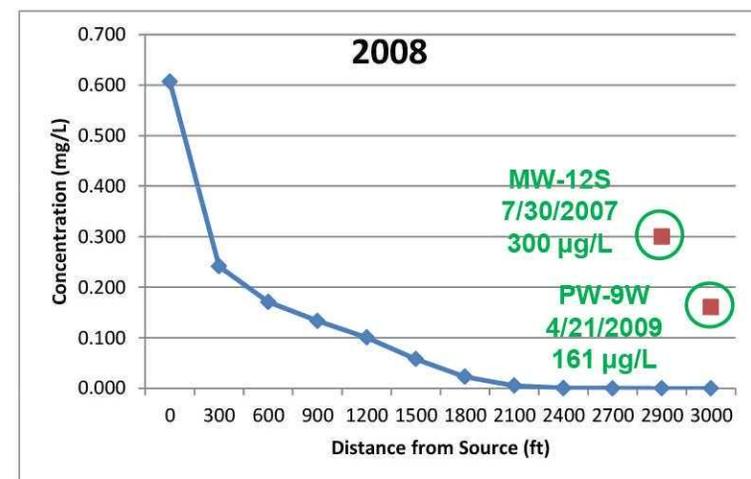
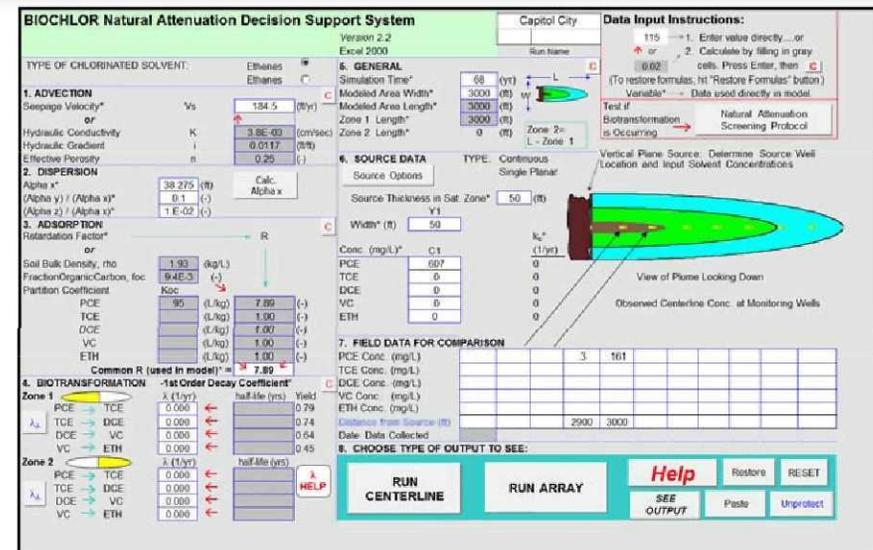
Plausibility Analysis LOE 4 (Plume Magnitude)

- BIOCHLOR used to model plume concentrations in transport scenario

- Highest observed sitewide concentration (607 µg/L, near RSA Chiller) used as hypothetical, continuous, single planar “source”
- Hydraulic Conductivity for shallow zone was used (3.8E-03 cm/sec)
- Gradient from recent sampling events was used (0.0117)
- Calculated longitudinal dispersion from Xu and Eckstein (38.3 ft)
- PCE retardation factor of 7.89 (calculated using measured Foc values)
- Simulation time = 68 years
 - Corresponds to a hypothetical contaminant release date of 1940

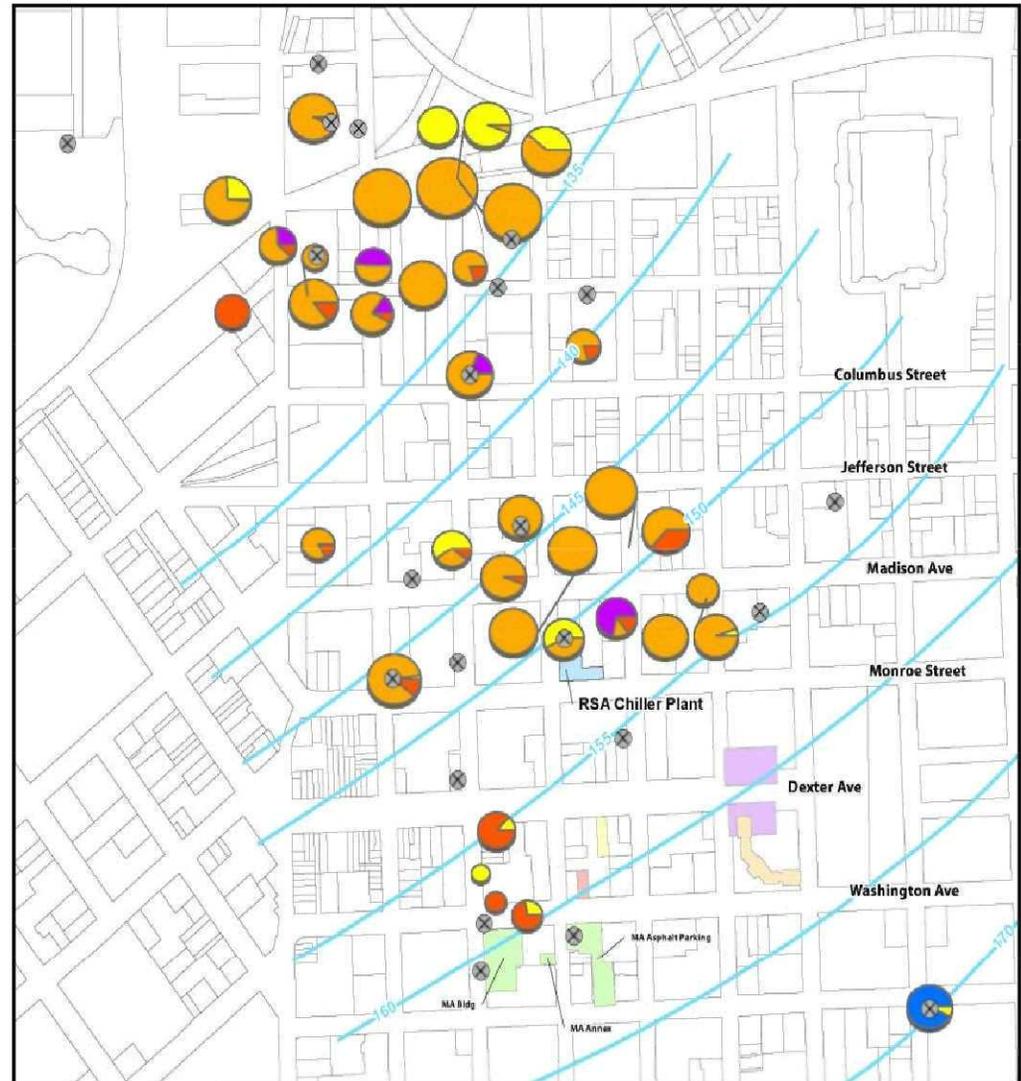
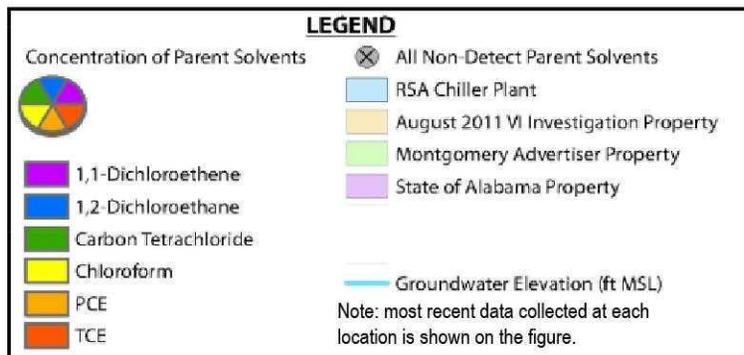
- Observed concentrations in Well 9W (161 µg/L) are not plausible

- Higher, nearby concentrations (>100 µg/L) are not plausible



Plausibility Analysis LOE 7 (Plume Fingerprints)

- Variable fingerprints indicate multiple source areas



Plausibility Analysis

200 Washington Avenue, 501 Washington Avenue, and 501 Dexter Avenue could not have been the PCE source for the following reasons:

1. No PCE used by Alabama or The Advertiser Company
2. Transport via sewers to RSA Chiller Plant is not possible
3. PCE could not have migrated from 200 Washington Avenue to Well 9W
4. Hypothetical source could not have caused higher concentrations observed at pumping well (9W) and nearby MW-12S
5. Plume morphology is too complex to be explained by a single, monolithic source
6. RSA Chiller Plant data in multiple media provide strong indication of localized source, among other sources
7. Chemical fingerprints (parameter fractions) are too variable to be explained by one source

EPA/USGS Statement of Work FY 2012

- EPA should revise the Statement of Work to follow appropriate guidance and to ensure consistency with the NCP
 - EPA's proposed Statement of Work regarding the Site appears to be focused on the collection of general screening-level data rather than NCP-quality data
 - EPA should target likely sources of contamination for soil gas sampling guided by a comprehensive CSM rather than conduct a 47-block survey of the downtown area

Key Summary Points

- There are multiple source areas; the area of the plumes is large but the concentrations are low
- The contaminants of concern are PCE and BTEX
- There is no drinking water pathway
- Site-specific screening analysis shows no areas with a potential soil vapor risk
- Two areas of the Site are above EPA's generic conservative screening levels, but these areas do not include 200 Washington or the State buildings
- There is no evidence of vapor intrusion occurring at 200 Washington Avenue or the State buildings
- The indoor air concentrations found in the County and State building are consistent with typical urban background conditions
- EPA's historic and proposed soil vapor sampling plan is not warranted based on the data, and is inconsistent with guidance and the NCP
- Viable PRPs should be pursued
- The Advertiser Company and the State are not PRPs

Questions and Answers

