

Rochester, NY NATTS Network Assessment Review

- Established 2004: VOCs and Carbonyls
 - Chromium VI added in 2007; ended in in 2013
 - PM₁₀ Metals added in 2007
 - PAHs added in 2008
- For the NATTS Network Assessment (2004-2018):
 - 17 of 18 Method Quality Objective (MQO) Core HAPs were included in the national trends
 - Chromium VI: Did not have six consecutive years of data
 - 212 of 244 pollutant datasets were suitable for trends analysis.
 - Annual Average and 3-Year Rolling Average Concentrations were generally decreasing over time for the majority of pollutants (benzene, 1,3-butadiene, cadmium (PM₁₀), lead (PM₁₀), naphthalene, and tetrachloroethylene).
 - ~92% Reporting of Datasets
- Method Quality Objectives (MQO): 2004-2018
 - Completeness: Met 85% completeness in 195 of 244 pollutant datasets
 - Method Detection Limits: Met MDL Target Ratio of 1.00 in 226 of 256 pollutant datasets
 - Bias: Met ±25% for 192 of 208 pollutant datasets
 - Overall Method Precision: Met ≤15% CV for 2 of 4 pollutant datasets
 - Analytical Method Precision: Met ≤15% CV for 69 of 135 pollutant datasets

- Analytical Laboratories for 2018

VOC	Carbonyl	PM ₁₀ Metals	Chromium VI	PAHs
NYSDEC	NYSDEC	RTI	NA	ERG

- Equipment Year Deployed

Equipment Type	VOC	Carbonyl	PM ₁₀ Metals	Chromium VI	PAHs
Sampler	2015	2015	2016	2008	2008
Analytical	2016	2008	2016	2001	2014
Preconcentrator	2016	NA	NA	NA	NA
Standards Preparation	2015	NA	NA	NA	NA
Canister Cleaning	2010	NA	NA	NA	NA
Extraction	NA	NA	2015	2011	2004

National Summary: NATTS data were collected at 27 locations across the United States, with sites beginning in 2003 or later (Figure 1) for 19 core HAPs. Over 528,000 concentrations (primary, secondary, and replicate) were generated and analyzed for this assessment. Pollutant datasets were scored to assess whether they were suitable for trends analysis. Each pollutant dataset was evaluated against four MQOs: Completeness; Sensitivity; Bias; and Precision. Datasets that were suitable (A- or B-rated) for six consecutive years were used for national trends analysis (Table 1).

National trends were determined by comparing the most recent 3-year blocked averages (e.g., 2013-2015 vs. 2016-2018) to determine if the NATTS Trends DQO was being met:

To be able to detect a 15 percent difference (trend) between the annual mean concentrations of successive 3-year periods within acceptable levels of decision error.

Of the 19 core HAPs, 18 were assessed for the NATTS Trends DQO. Due to sampling and analytical issues, acrolein was not considered for trends analysis (Table 2). This assessment showed that across the network, 15 of those 18 pollutants were decreasing between the 3-year blocks, while two of those pollutants were increasing between the 3-year blocks. One pollutant did not exhibit a trend.

Figure 1. NATTS Site and Year Established

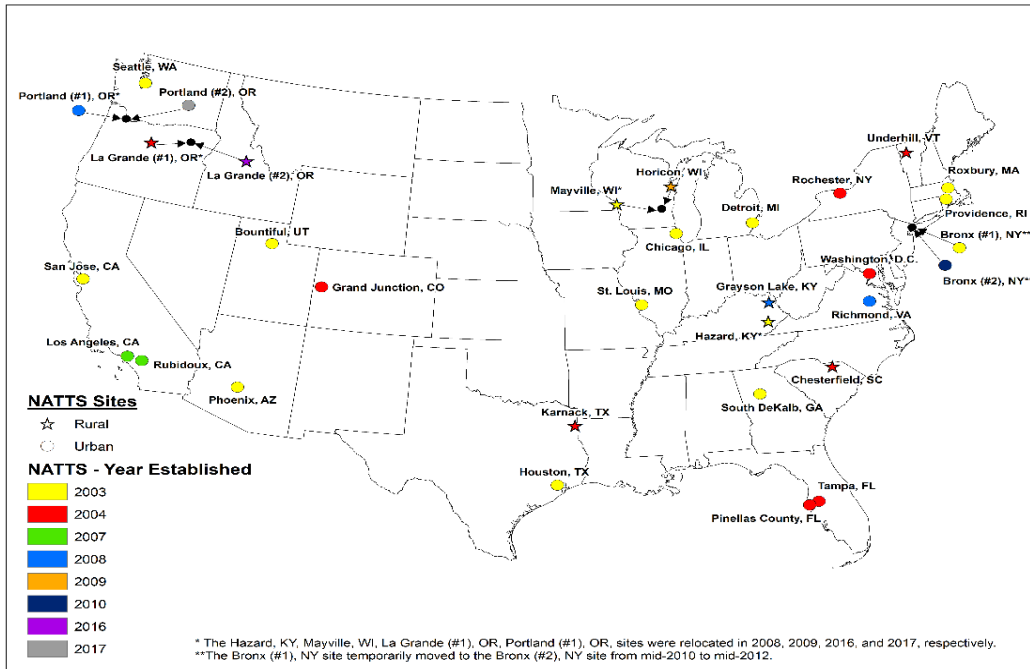


Table 1. NATTS Network Assessment: Count and Percentage of Suitable Datasets by Pollutant Group

Pollutant Group	A-rated		B-rated		Does Not Meet	
	#	%	#	%	#	%
VOCs	1,452	53%	737	27%	555	20%
Carbonyls	523	67%	193	25%	66	8%
PM ₁₀ Metals	1,418	61%	685	30%	213	9%
Chromium VI	159	74%	29	13%	27	13%
PAHs	410	74%	124	22%	18	3%
Total = 6,609	3,962	60%	1,768	27%	879	13%

Table 2. Three-Year Block Averages for National Trends

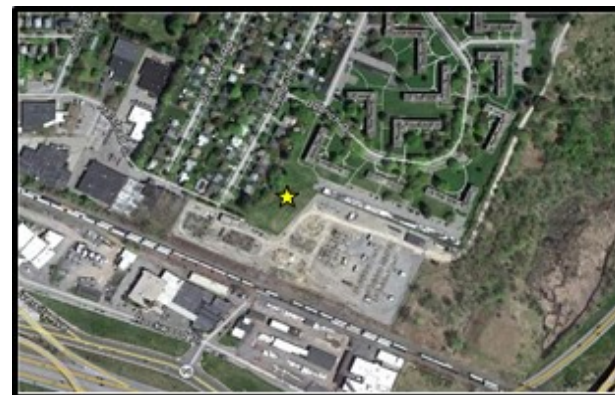
Pollutant	Units	# Sites	Block 1	Block 2	% Difference
Acetaldehyde	µg/m ³	19	1.51	1.39	-7.7%
Arsenic (PM ₁₀)	ng/m ³	21	0.71	0.68	-3.2%
Benzene	µg/m ³	19	0.65	0.59	-10.2%
Benzo(a)pyrene	ng/m ³	21	0.113	0.087	-23.2%
Beryllium (PM ₁₀)	ng/m ³	20	0.012	0.009	-26.4%
Butadiene, 1,3-	µg/m ³	19	0.071	0.063	-10.9%
Cadmium (PM ₁₀)	ng/m ³	21	0.170	0.097	-43.0%
Carbon Tetrachloride	µg/m ³	15	0.59	0.56	-4.7%
Chloroform	µg/m ³	20	0.256	0.255	-0.4%
Chromium VI	ng/m ³	18	0.029	0.026	-7.7%
Formaldehyde	µg/m ³	19	2.77	2.68	-3.3%
Lead (PM ₁₀)	ng/m ³	21	3.08	2.81	-8.9%
Manganese (PM ₁₀)	ng/m ³	20	8.06	7.93	-1.6%
Naphthalene	ng/m ³	20	66.70	51.08	-23.4%
Nickel (PM ₁₀)	ng/m ³	19	1.28	1.05	-18.0%
Tetrachloroethylene	µg/m ³	19	0.149	0.174	17.2%
Trichloroethylene	µg/m ³	19	0.020	0.022	10.7%
Vinyl Chloride	µg/m ³	17	0.0051	0.0048	-5.5%

NATTS Monitoring Site Report: Rochester, NY

Site Information

Region	2
NATTS Site Type	Urban
County	Monroe
AQS Site Code	36-055-1007
NATTS Operating Agency	NY State Dept. Of Env. Conserv.
Latitude	43.146198
Longitude	-77.54813
AQS Land Use	Residential
AQS Location Setting	Urban/City Center
10-Mile Population	15,963

Figure 2. NATTS Site Location



Pollutant Datasets Evaluation: Suitable for Trends (Y=yes; Y(T)=yes, and used for DQO Trends; N=No; "--"=not rated)

Final Pollutant Name	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Acetaldehyde	--	Y	Y	N ^a	Y	N ^a	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Arsenic (PM ₁₀)	N ^b	N ^b	N ^b	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Benzene	--	Y	Y	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Benzo(a)pyrene	--	--	--	--	--	N ^a	N ^a	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Beryllium (PM ₁₀)	N ^b	N ^b	N ^b	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Butadiene, 1,3-	--	Y	N ^c	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Cadmium (PM ₁₀)	N ^b	N ^b	N ^b	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Carbon tetrachloride	--	Y	N ^c	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Chloroform	--	Y	Y	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Chromium VI	--	N ^b	N ^b	N ^b	Y	Y	Y	Y	Y	--	--	--	--	--	--
Formaldehyde	--	Y	Y	N ^a	Y	N ^a	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Lead (PM ₁₀)	N ^b	N ^b	N ^b	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Manganese (PM ₁₀)	N ^b	N ^b	N ^b	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Naphthalene	--	--	--	--	--	N ^a	N ^a	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Nickel (PM ₁₀)	N ^b	N ^b	N ^b	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Tetrachloroethylene	--	Y	Y	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Trichloroethylene	--	Y	Y	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Vinyl chloride	--	Y	N ^c	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)

^a: Completeness was less than 75% based on 1-in-6 day sampling.

^b: Pollutant was expected, but not sampled at this site for this year.

^c: Reported MDL to NATTS Target Ratio greater than 2.0.

Table 3. NATTS Network Assessment Data (2003-2018) - National Distribution Statistics By Type^a

Analyte	Units	Site Type	# Data Records	% Detections	Arithmetic Mean ^b	Percentile Value ^c						
						5th	10th	25th	50th	75th	90th	95th
Acetaldehyde	µg/m ³	Urban	15,704	100%	1.77 ± 0.02	0.50	0.66	0.97	1.45	2.19	3.24	4.04
	µg/m ³	Rural	4,930	100%	1.20 ± 0.04	0.36	0.46	0.65	0.93	1.38	2.02	2.76
	µg/m ³	All Sites	20,634	100%	1.63 ± 0.02	0.44	0.58	0.86	1.31	2.00	3.02	3.86
Arsenic (PM ₁₀)	ng/m ³	Urban	14,968	97%	0.89 ± 0.04	0.10	0.19	0.34	0.58	0.99	1.70	2.41
	ng/m ³	Rural	4,622	96%	0.49 ± 0.02	0.04	0.08	0.17	0.35	0.59	0.94	1.28
	ng/m ³	All Sites	19,590	97%	0.79 ± 0.03	0.06	0.14	0.29	0.52	0.89	1.54	2.19
Benzene	µg/m ³	Urban	15,984	99%	0.86 ± 0.01	0.25	0.30	0.43	0.66	1.05	1.64	2.21
	µg/m ³	Rural	2,494	95%	0.43 ± 0.02	0.04	0.13	0.21	0.33	0.52	0.78	1.01
	µg/m ³	All Sites	18,478	99%	0.81 ± 0.01	0.19	0.26	0.39	0.61	0.98	1.55	2.09
Benzo(a)pyrene	ng/m ³	Urban	12,336	70%	0.096 ± 0.004	ND	ND	ND	0.04	0.11	0.24	0.37
	ng/m ³	Rural	3,179	36%	0.067 ± 0.009	ND	ND	ND	ND	0.02	0.13	0.37
	ng/m ³	All Sites	15,515	63%	0.090 ± 0.004	ND	ND	ND	0.03	0.10	0.23	0.37
Beryllium (PM ₁₀)	ng/m ³	Urban	15,783	75%	0.051 ± 0.006	ND	ND	0.00003	0.005	0.018	0.050	0.101
	ng/m ³	Rural	4,687	49%	0.023 ± 0.003	ND	ND	ND	ND	0.005	0.017	0.072
	ng/m ³	All Sites	20,470	69%	0.045 ± 0.005	ND	ND	ND	0.003	0.012	0.049	0.100
Butadiene, 1,3-	µg/m ³	Urban	15,388	81%	0.092 ± 0.002	ND	ND	0.025	0.058	0.114	0.215	0.302
	µg/m ³	Rural	2,185	29%	0.012 ± 0.001	ND	ND	ND	ND	0.017	0.046	0.059
	µg/m ³	All Sites	17,573	75%	0.082 ± 0.002	ND	ND	ND	0.049	0.104	0.199	0.287
Cadmium (PM ₁₀)	ng/m ³	Urban	16,360	92%	0.21 ± 0.02	ND	0.01	0.05	0.09	0.17	0.42	0.63
	ng/m ³	Rural	4,684	87%	0.10 ± 0.01	ND	ND	0.03	0.06	0.11	0.20	0.29
	ng/m ³	All Sites	21,044	91%	0.18 ± 0.01	ND	0.01	0.04	0.08	0.16	0.35	0.56
Carbon Tetrachloride	µg/m ³	Urban	14,713	99%	0.569 ± 0.003	0.361	0.433	0.496	0.562	0.651	0.737	0.798
	µg/m ³	Rural	2,189	92%	0.534 ± 0.016	ND	0.180	0.402	0.537	0.633	0.727	0.798
	µg/m ³	All Sites	16,902	98%	0.565 ± 0.003	0.304	0.408	0.490	0.559	0.649	0.736	0.798
Chloroform	µg/m ³	Urban	16,068	87%	0.265 ± 0.022	ND	ND	0.093	0.132	0.217	0.420	0.668
	µg/m ³	Rural	3,802	43%	0.052 ± 0.003	ND	ND	ND	ND	0.095	0.144	0.230
	µg/m ³	All Sites	19,870	79%	0.224 ± 0.018	ND	ND	0.064	0.113	0.196	0.364	0.586
Chromium VI	ng/m ³	Urban	8,414	74%	0.036 ± 0.002	ND	ND	ND	0.020	0.042	0.081	0.120
	ng/m ³	Rural	2,586	41%	0.018 ± 0.004	ND	ND	ND	ND	0.017	0.031	0.051
	ng/m ³	All Sites	11,000	66%	0.032 ± 0.001	ND	ND	ND	0.016	0.036	0.073	0.114

Table 3. NATTS Network Assessment Data (2003-2018) - National Distribution Statistics By Type^a

Analyte	Units	Site Type	# Data Records	% Detections	Arithmetic Mean ^b	Percentile Value ^c						
						5th	10th	25th	50th	75th	90th	95th
Formaldehyde	µg/m ³	Urban	16,118	100%	3.11 ± 0.04	0.66	0.99	1.60	2.47	3.84	5.63	7.25
	µg/m ³	Rural	5,002	100%	2.22 ± 0.05	0.53	0.68	1.06	1.69	2.74	4.19	5.45
	µg/m ³	All Sites	21,120	100%	2.90 ± 0.04	0.61	0.86	1.43	2.29	3.59	5.38	6.96
Lead (PM ₁₀)	ng/m ³	Urban	16,366	100%	4.21 ± 0.13	0.72	0.98	1.55	2.64	4.56	8.35	11.90
	ng/m ³	Rural	4,680	99%	2.10 ± 0.16	0.37	0.50	0.84	1.41	2.37	3.91	5.36
	ng/m ³	All Sites	21,046	99%	3.74 ± 0.11	0.55	0.80	1.31	2.31	4.04	7.41	10.56
Manganese (PM ₁₀)	ng/m ³	Urban	16,141	100%	9.80 ± 0.32	1.09	1.51	2.52	4.92	10.21	20.10	30.08
	ng/m ³	Rural	4,627	99%	3.96 ± 0.14	0.46	0.73	1.36	2.57	4.75	8.54	12.13
	ng/m ³	All Sites	20,768	100%	8.50 ± 0.25	0.85	1.23	2.15	4.18	8.89	17.98	26.70
Naphthalene	ng/m ³	Urban	12,332	100%	74.63 ± 1.14	15.62	21.27	33.55	55.89	94.64	150.05	196.16
	ng/m ³	Rural	3,301	100%	24.47 ± 1.38	3.74	4.73	7.74	13.86	26.25	50.88	79.17
	ng/m ³	All Sites	15,633	100%	64.04 ± 1.00	6.58	10.92	23.37	45.59	83.31	137.54	181.75
Nickel (PM ₁₀)	ng/m ³	Urban	16,125	97%	1.85 ± 0.05	0.25	0.41	0.67	1.11	2.00	3.52	5.27
	ng/m ³	Rural	4,623	85%	0.65 ± 0.08	ND	ND	0.10	0.28	0.64	1.15	1.89
	ng/m ³	All Sites	20,748	94%	1.58 ± 0.04	ND	0.15	0.47	0.92	1.73	3.14	4.74
Tetrachloroethylene	µg/m ³	Urban	15,612	86%	0.25 ± 0.01	ND	ND	0.06	0.13	0.25	0.48	0.74
	µg/m ³	Rural	2,272	36%	0.09 ± 0.04	ND	ND	ND	ND	0.04	0.08	0.16
	µg/m ³	All Sites	17,884	79%	0.23 ± 0.01	ND	ND	0.04	0.11	0.22	0.44	0.70
Trichloroethylene	µg/m ³	Urban	15,843	41%	0.040 ± 0.002	ND	ND	ND	ND	0.051	0.107	0.164
	µg/m ³	Rural	3,388	13%	0.021 ± 0.003	ND	ND	ND	ND	ND	0.017	0.250
	µg/m ³	All Sites	19,231	36%	0.037 ± 0.002	ND	ND	ND	ND	0.041	0.105	0.167
Vinyl Chloride	µg/m ³	Urban	14,778	19%	0.0044 ± 0.0003	ND	ND	ND	ND	ND	0.0137	0.0257
	µg/m ³	Rural	2,444	8%	0.0040 ± 0.0009	ND	ND	ND	ND	ND	ND	0.0156
	µg/m ³	All Sites	17,222	17%	0.0043 ± 0.0003	ND	ND	ND	ND	ND	0.0126	0.0254

^a Statistics presented are from pollutant datasets which were suitable for trends.

^b The arithmetic mean is the average of all samples results which include actual measured values. If no chemical was registered, then a value of zero is used when calculating the mean.

^c ND: No results of this chemical were registered by the laboratory analytical equipment.

Table 4. Summary Statistics for Rochester, NY

Analyte	Units	# Data Records	% Detection	Arithmetic Mean ^a	Percentile Value ^b						
					5th	10th	25th	50th	75th	90th	95th
Acetaldehyde	µg/m ³	769	100%	0.98 ± 0.04	0.37	0.47	0.66	0.89	1.17	1.57	1.82
Arsenic (PM ₁₀)	ng/m ³	657	99%	0.66 ± 0.04	0.15	0.20	0.33	0.56	0.86	1.17	1.49
Benzene	µg/m ³	824	100%	0.58 ± 0.02	0.23	0.26	0.36	0.51	0.73	0.97	1.17
Benzo(a)pyrene	ng/m ³	524	90%	0.12 ± 0.02	ND	0.02	0.05	0.08	0.14	0.24	0.31
Beryllium (PM ₁₀)	ng/m ³	657	72%	0.003 ± 0.000	ND	ND	ND	0.0021	0.005	0.008	0.011
Butadiene, 1,3-	µg/m ³	824	84%	0.042 ± 0.003	ND	ND	0.017	0.031	0.055	0.095	0.120
Cadmium (PM ₁₀)	ng/m ³	657	100%	0.08 ± 0.00	0.02	0.03	0.04	0.07	0.10	0.14	0.16
Carbon Tetrachloride	µg/m ³	824	100%	0.60 ± 0.01	0.46	0.48	0.52	0.57	0.65	0.74	0.79
Chloroform	µg/m ³	824	100%	0.120 ± 0.003	0.071	0.078	0.091	0.109	0.135	0.179	0.202
Chromium VI	ng/m ³	330	48%	0.010 ± 0.002	ND	ND	ND	ND	0.015	0.025	0.034
Formaldehyde	µg/m ³	768	100%	1.79 ± 0.11	0.55	0.69	1.02	1.48	2.14	2.97	3.65
Lead (PM ₁₀)	ng/m ³	657	100%	2.27 ± 0.13	0.62	0.84	1.26	1.86	2.79	3.96	4.95
Manganese (PM ₁₀)	ng/m ³	657	100%	3.61 ± 0.17	1.05	1.33	2.04	3.15	4.66	6.31	7.64
Naphthalene	ng/m ³	524	100%	55.46 ± 3.16	17.03	21.64	28.41	45.35	70.97	101.83	128.01
Nickel (PM ₁₀)	ng/m ³	657	100%	0.88 ± 0.08	0.30	0.35	0.48	0.65	0.97	1.52	1.98
Tetrachloroethylene	µg/m ³	824	98%	0.13 ± 0.01	0.034	0.04	0.06	0.10	0.15	0.23	0.30
Trichloroethylene	µg/m ³	824	90%	0.060 ± 0.013	ND	0.002	0.016	0.037	0.070	0.110	0.147
Vinyl Chloride	µg/m ³	824	48%	0.011 ± 0.001	ND	ND	ND	ND	0.018	0.031	0.040

^a: The arithmetic mean is the average of all samples results which included actual measured values. If no chemical was registered, then a value of zero is used.

^b ND: No results of this chemical were registered by the laboratory analytical equipment.

Table 5. Analytical Labs Supporting this Site

Pollutant Group	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
VOCs	--	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC
Carbonyls	--	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC	NYSDEC
PM ₁₀ Metals	--	--	--	--	RTI	RTI	RTI	RTI	RTI	RTI	RTI	RTI	RTI	RTI	RTI	RTI
Chromium VI	--	--	--	--	ERG	ERG	ERG	ERG	ERG	ERG	ERG	--	--	--	--	--
PAHs	--	--	--	--	--	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG

--: Not Applicable

NYSDEC: New York State Department of Environmental Conservation

ERG: Eastern Research Group, Inc.

RTI: RTI International

Figure 3. Rochester, NY Annual Average Concentrations

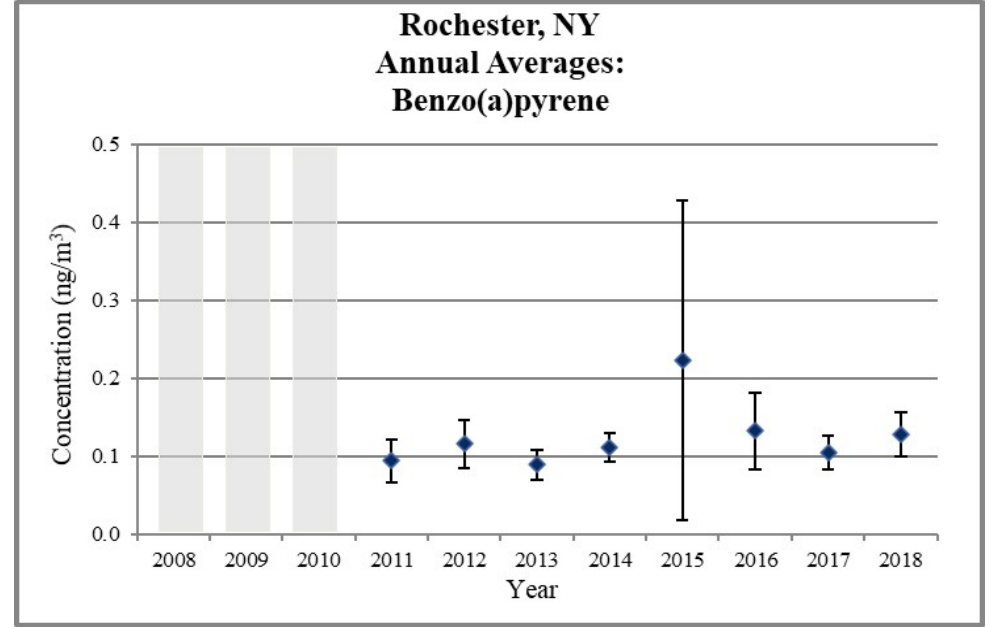
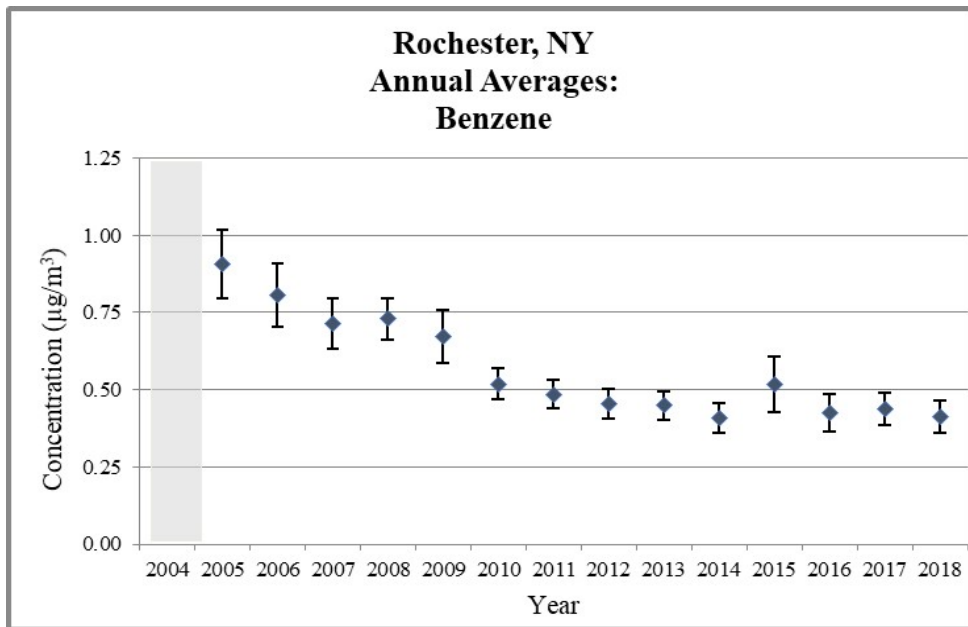
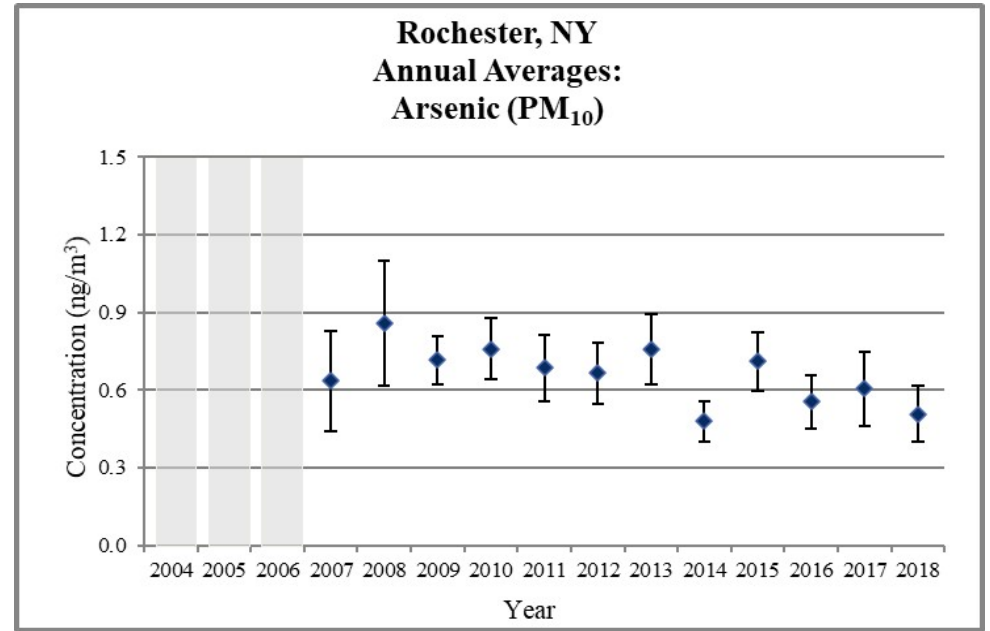
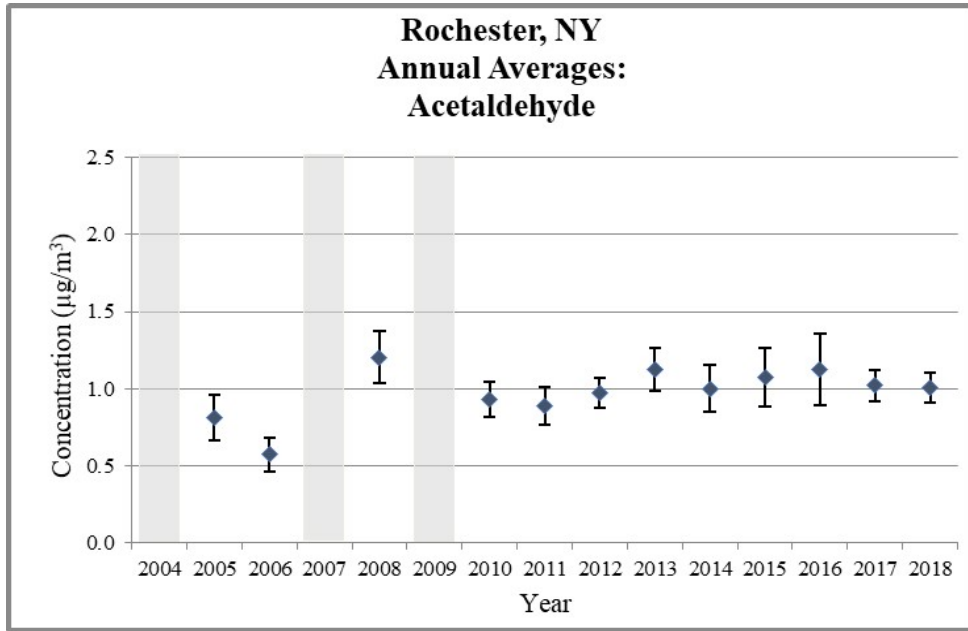


Figure 3. Rochester, NY Annual Average Concentrations

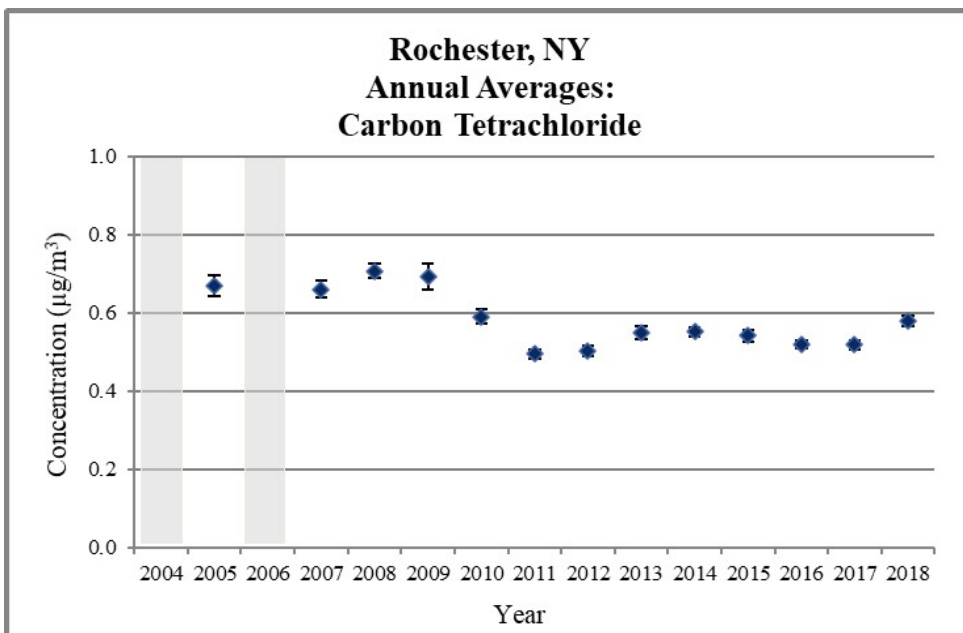
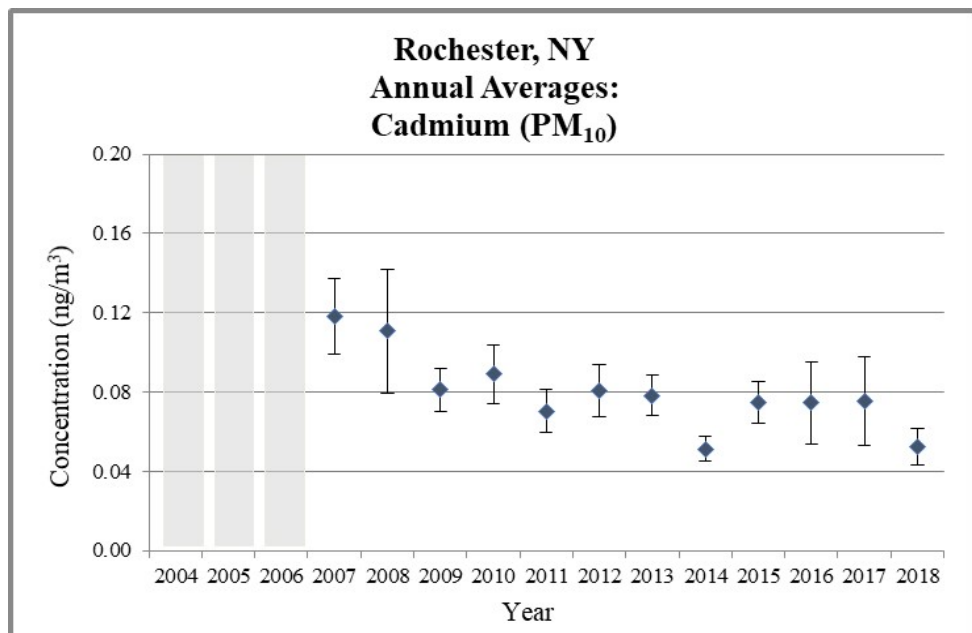
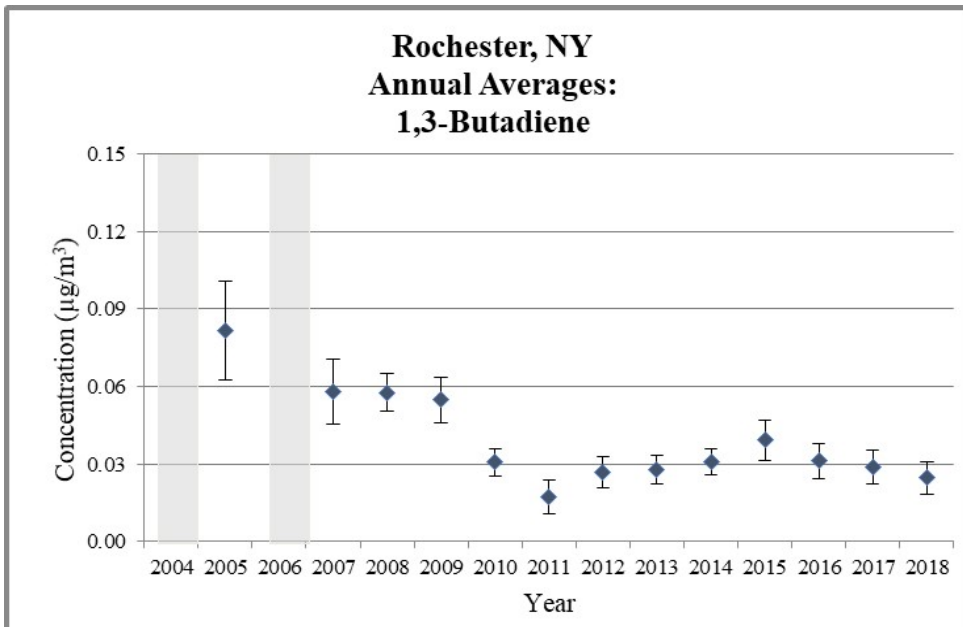
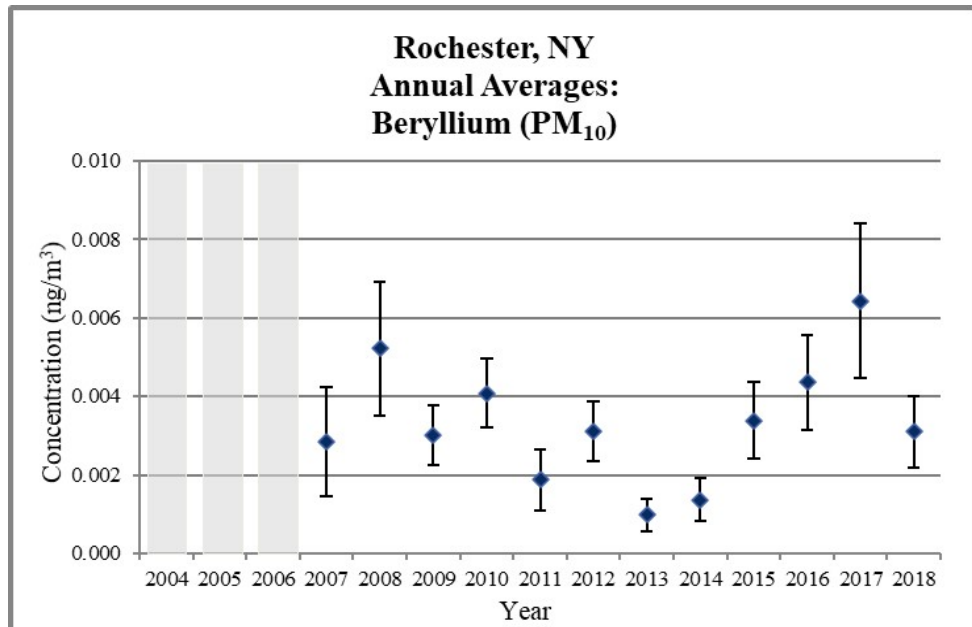


Figure 3. Rochester, NY Annual Average Concentrations

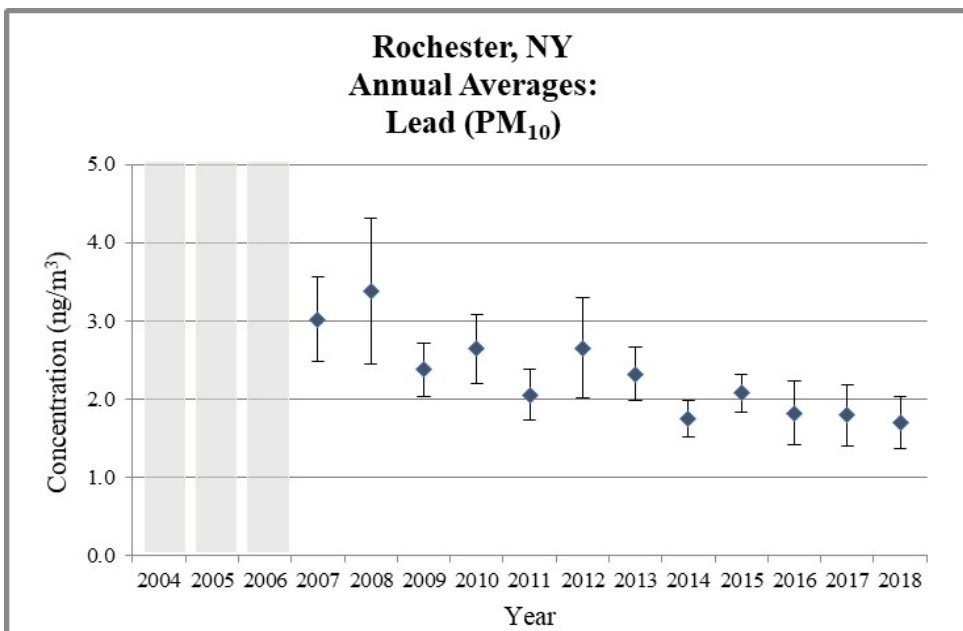
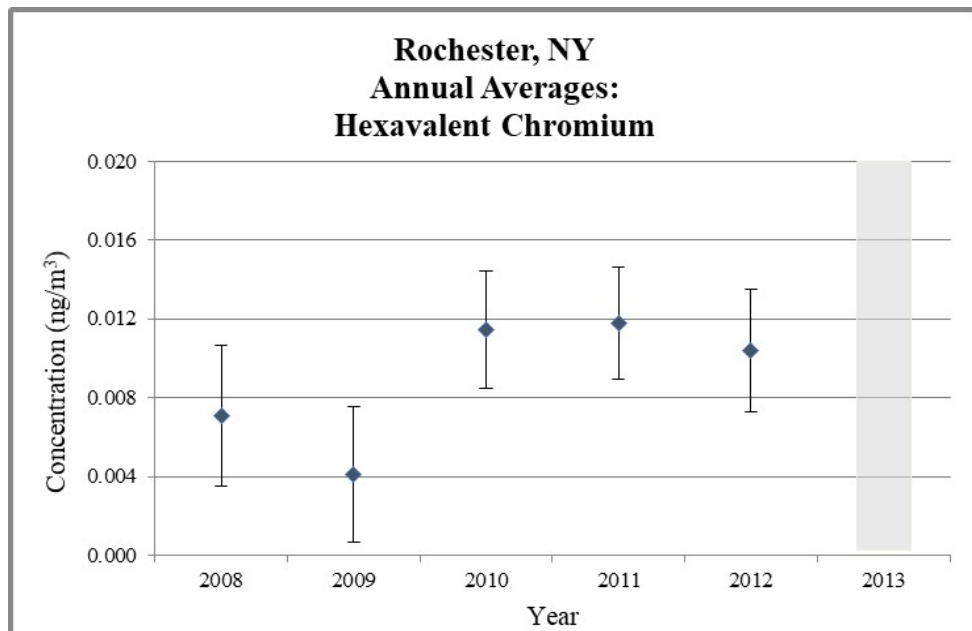
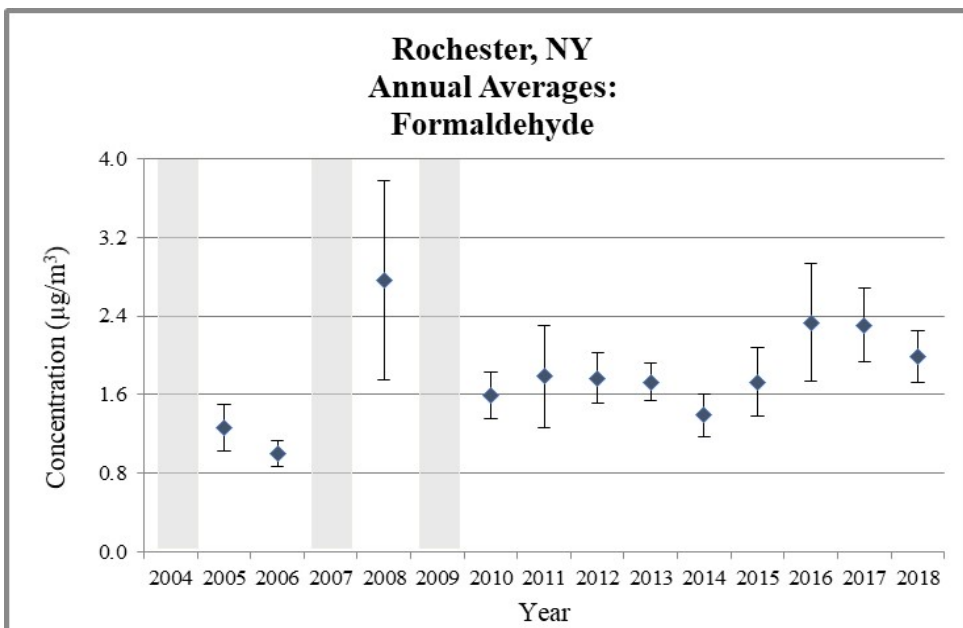
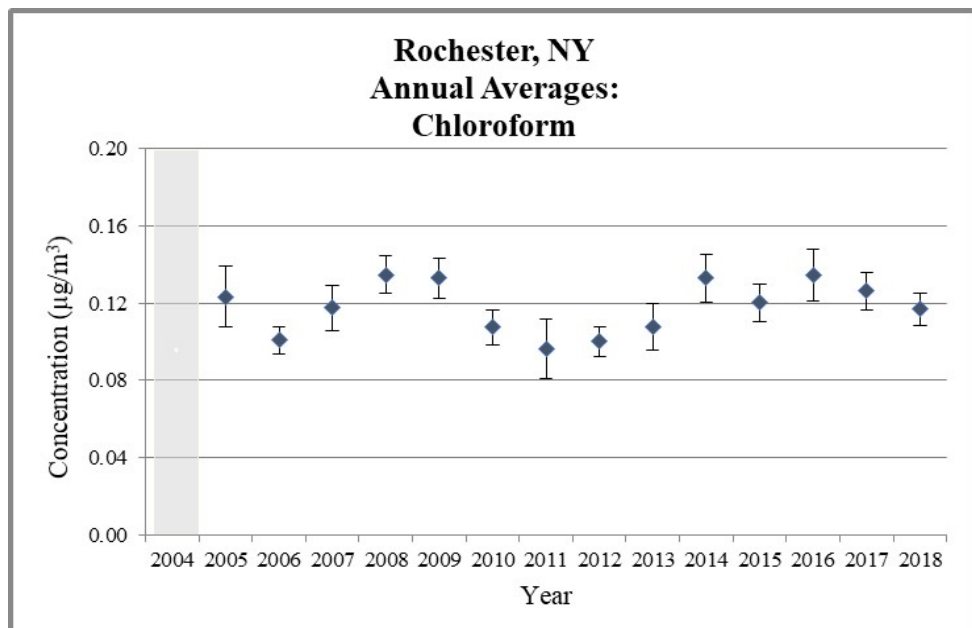


Figure 3. Rochester, NY Annual Average Concentrations

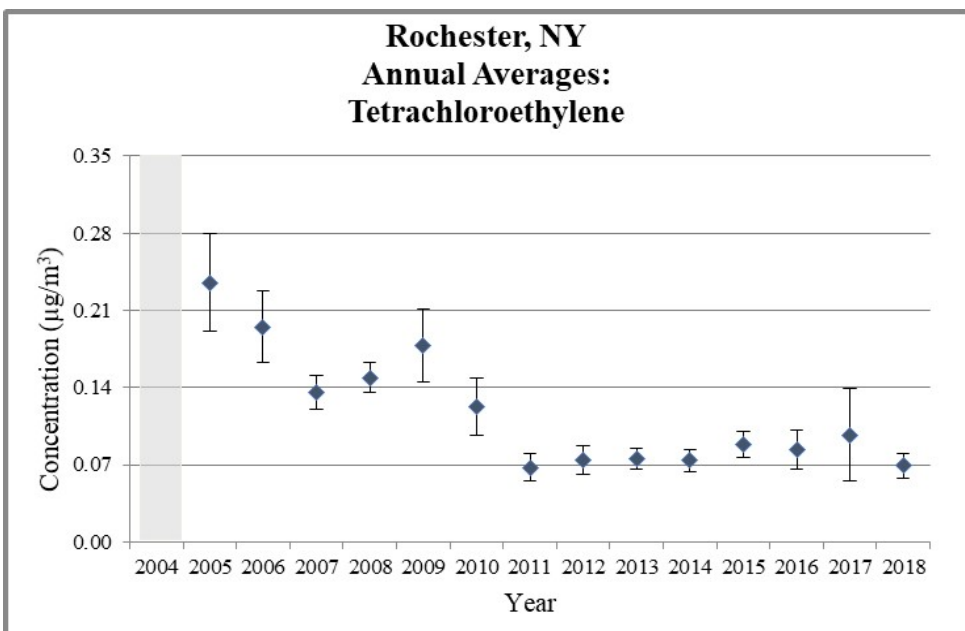
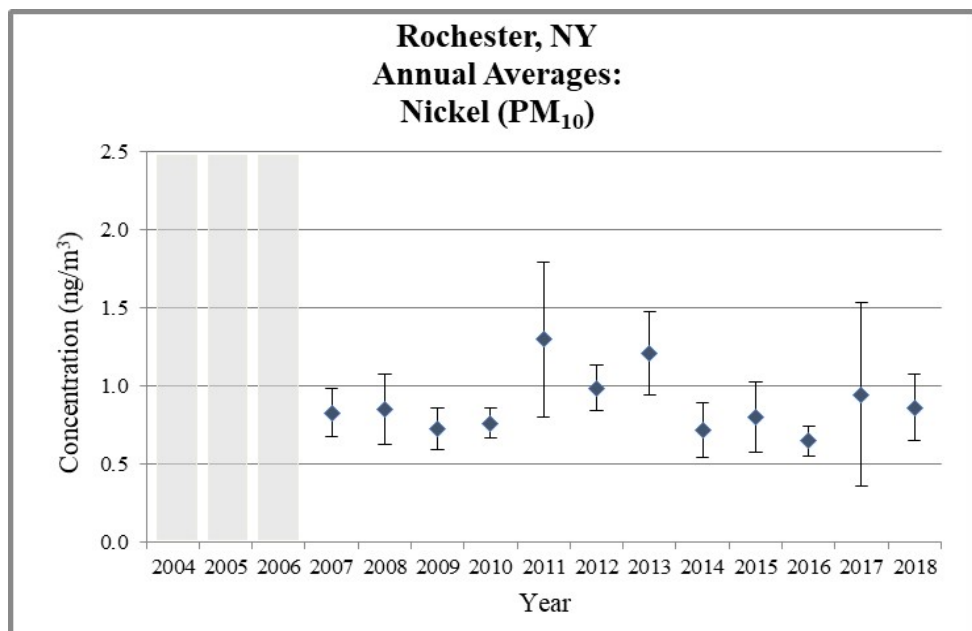
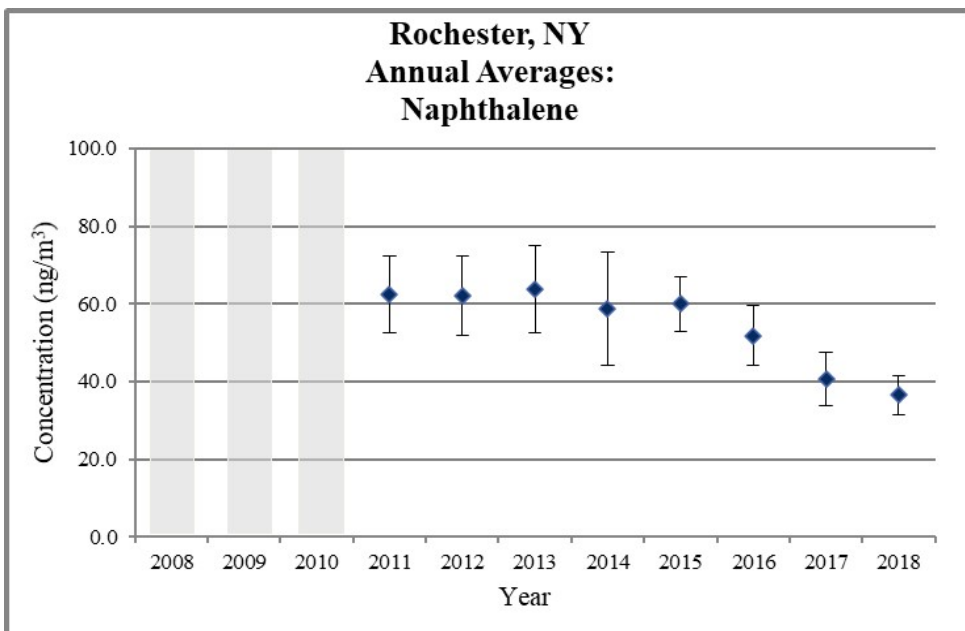
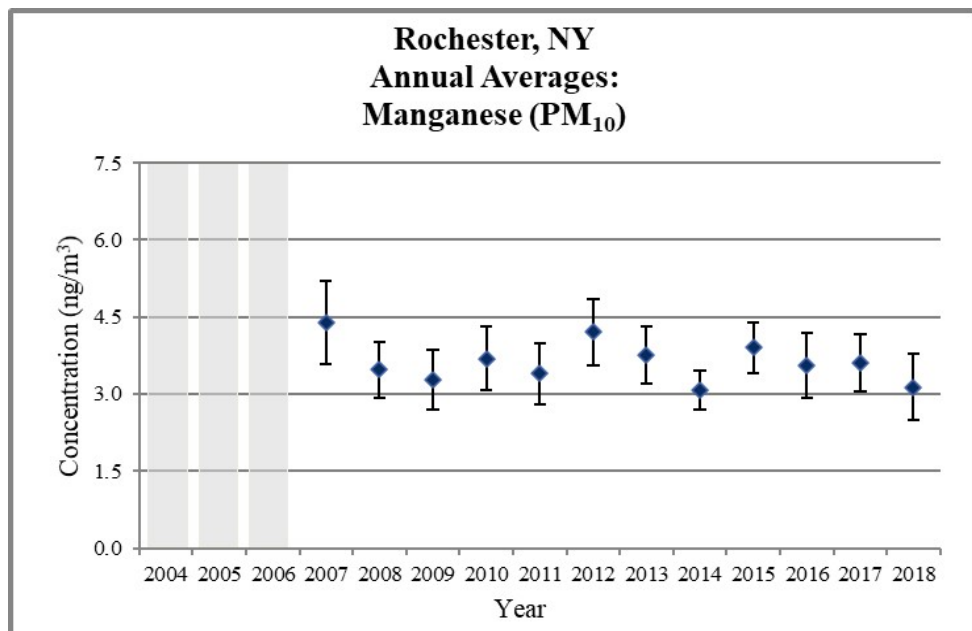
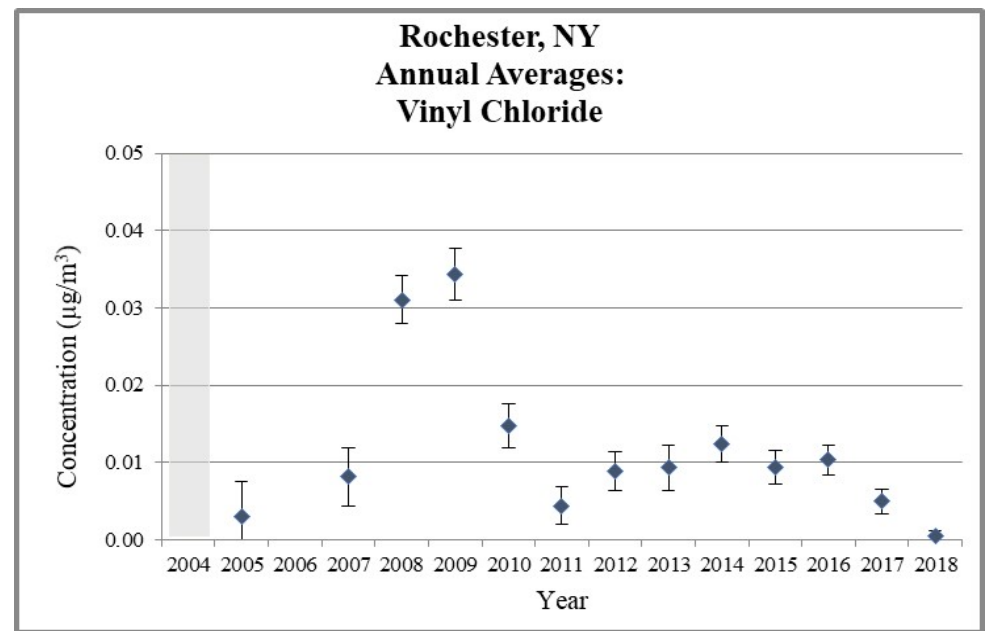
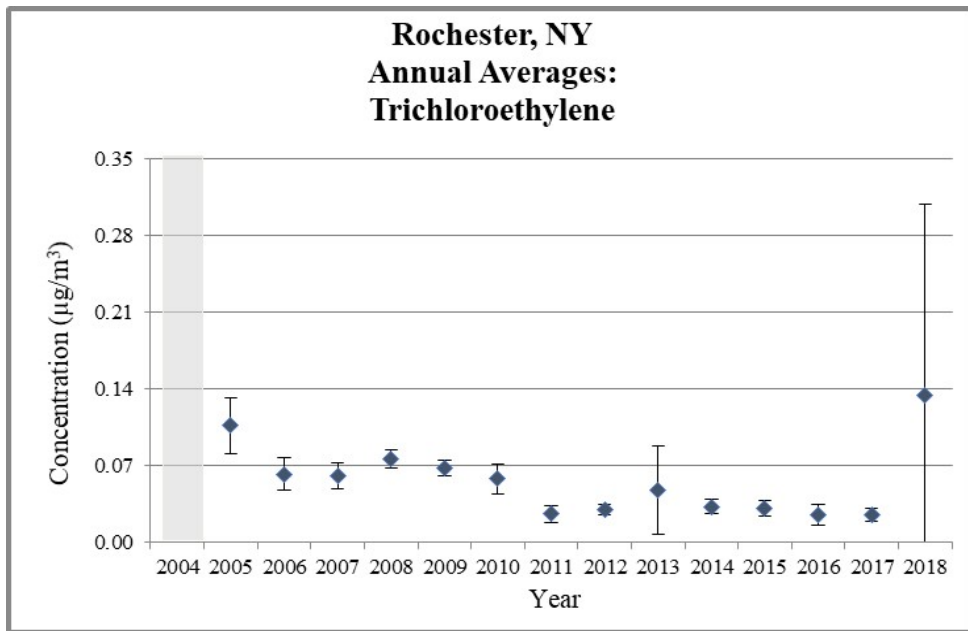


Figure 3. Rochester, NY Annual Average Concentrations



 Does not meet MQO

Figure 4. Rochester, NY - 3-Year Rolling Average Concentrations

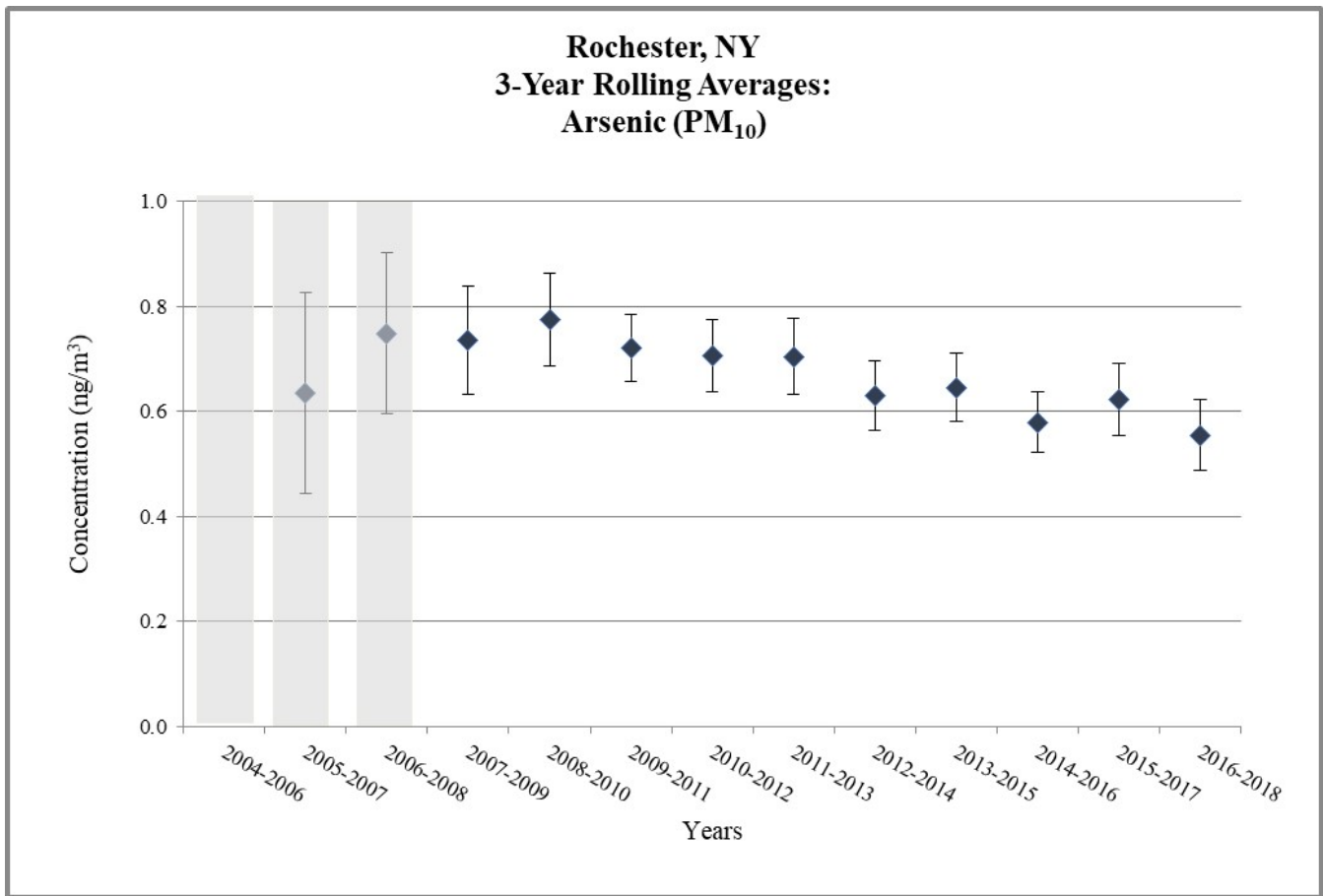
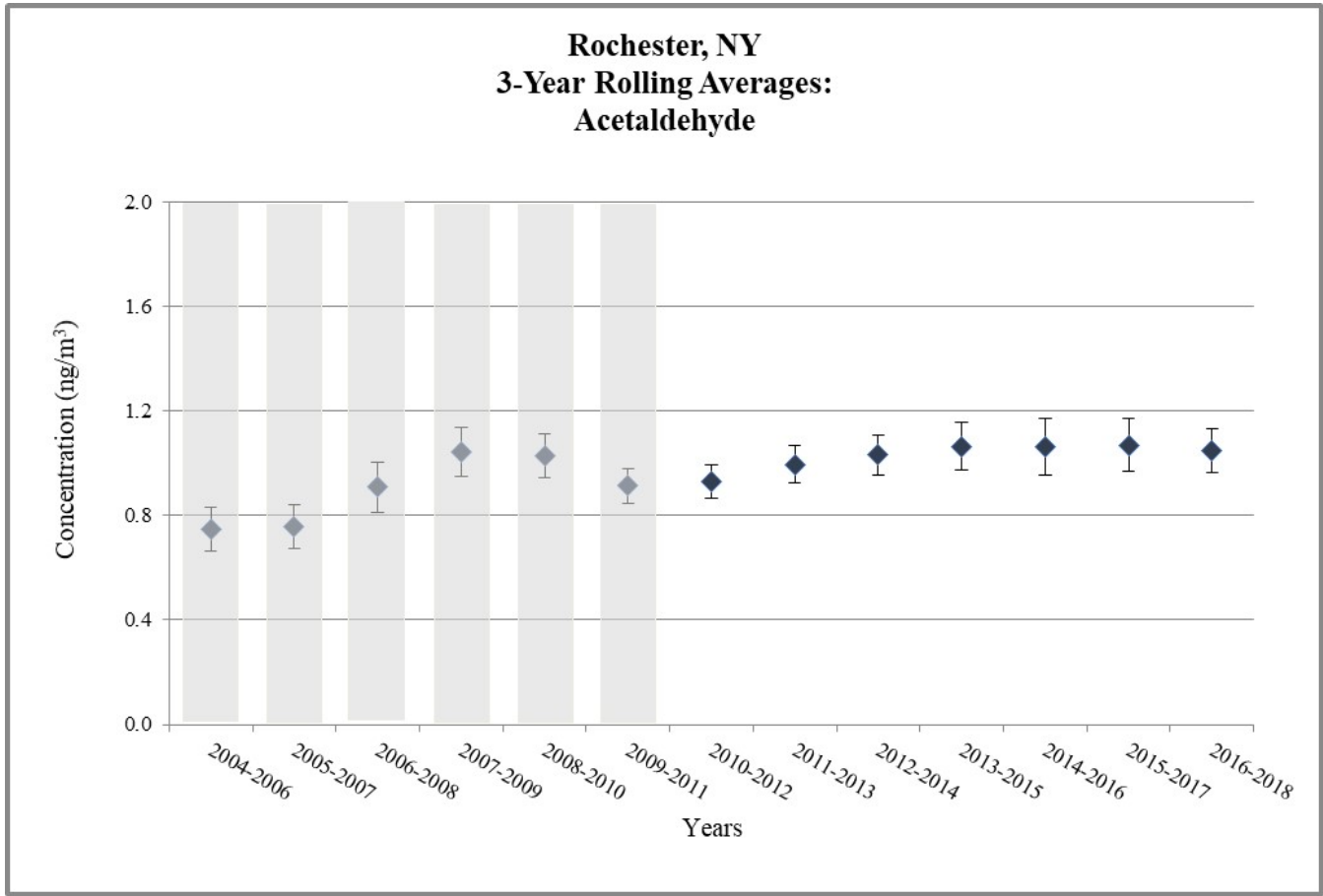


Figure 4. Rochester, NY - 3-Year Rolling Average Concentrations

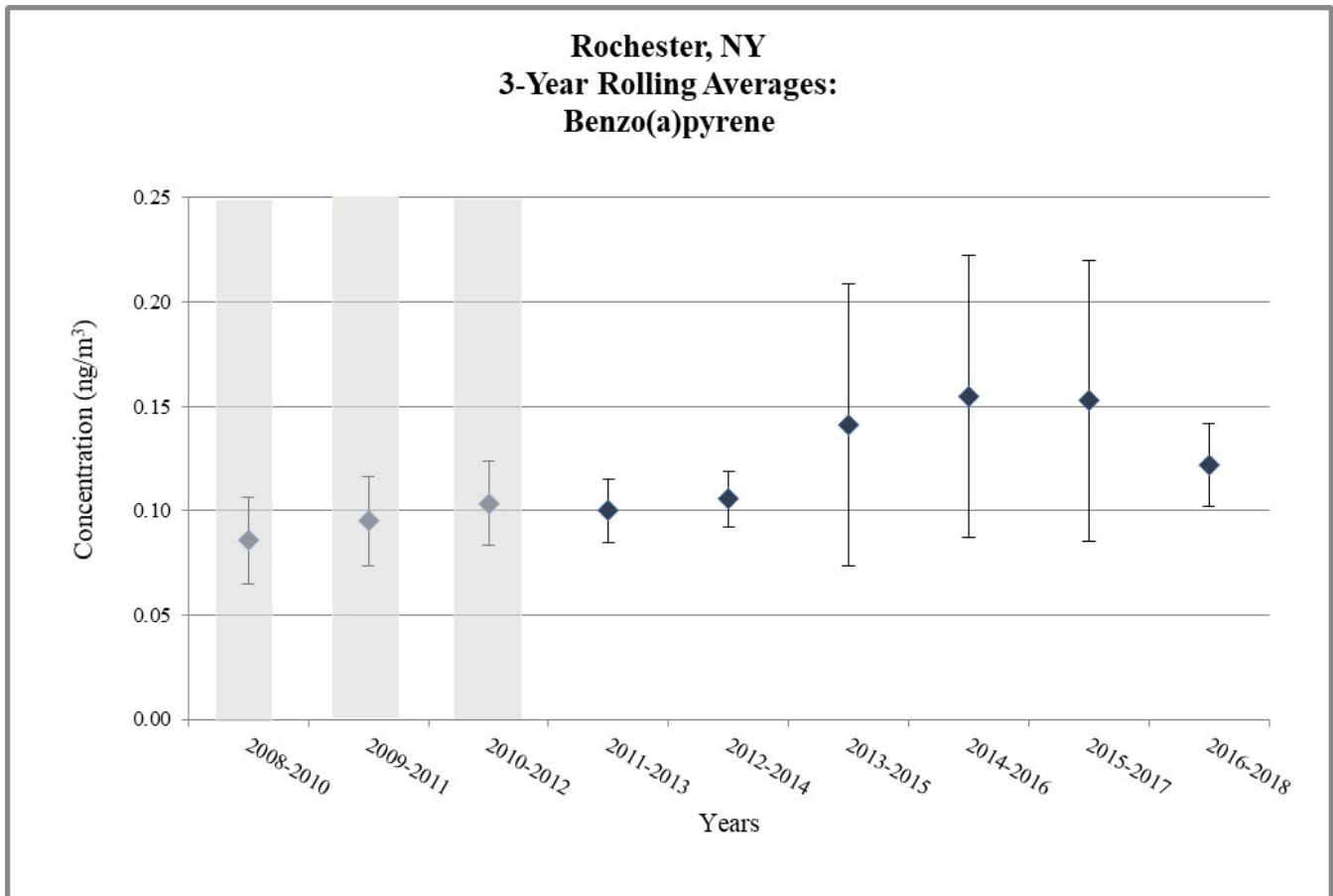
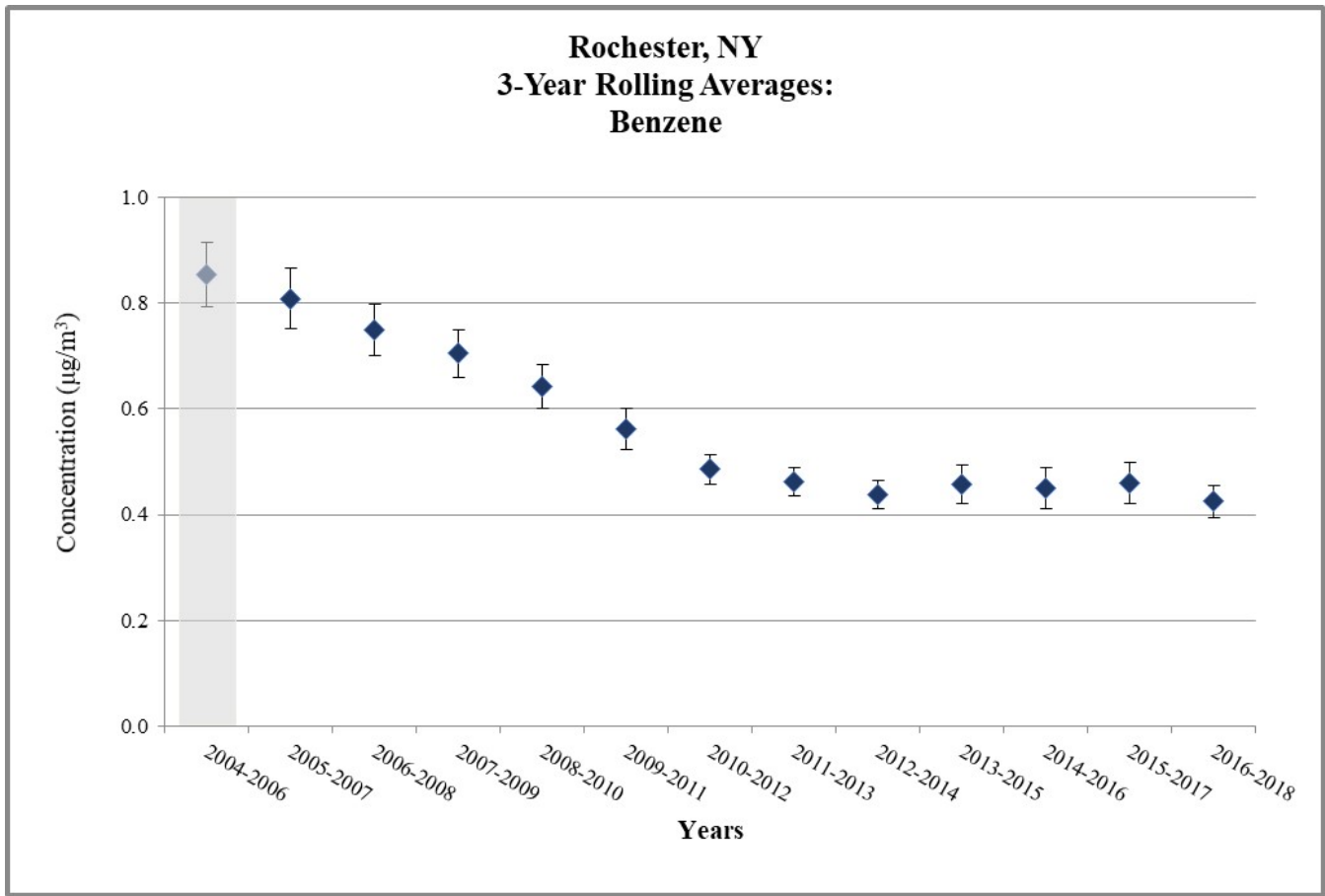


Figure 4. Rochester, NY - 3-Year Rolling Average Concentrations

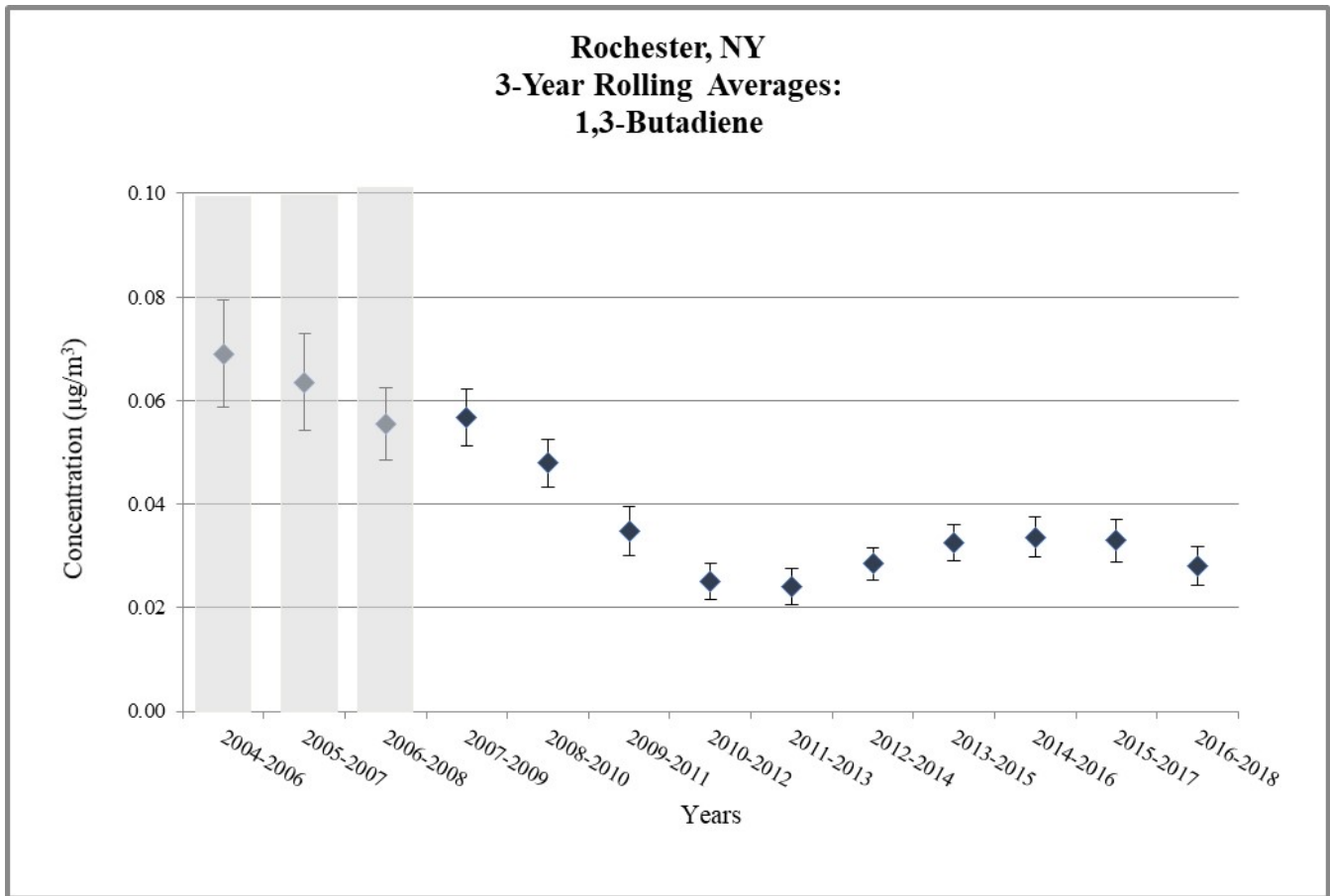
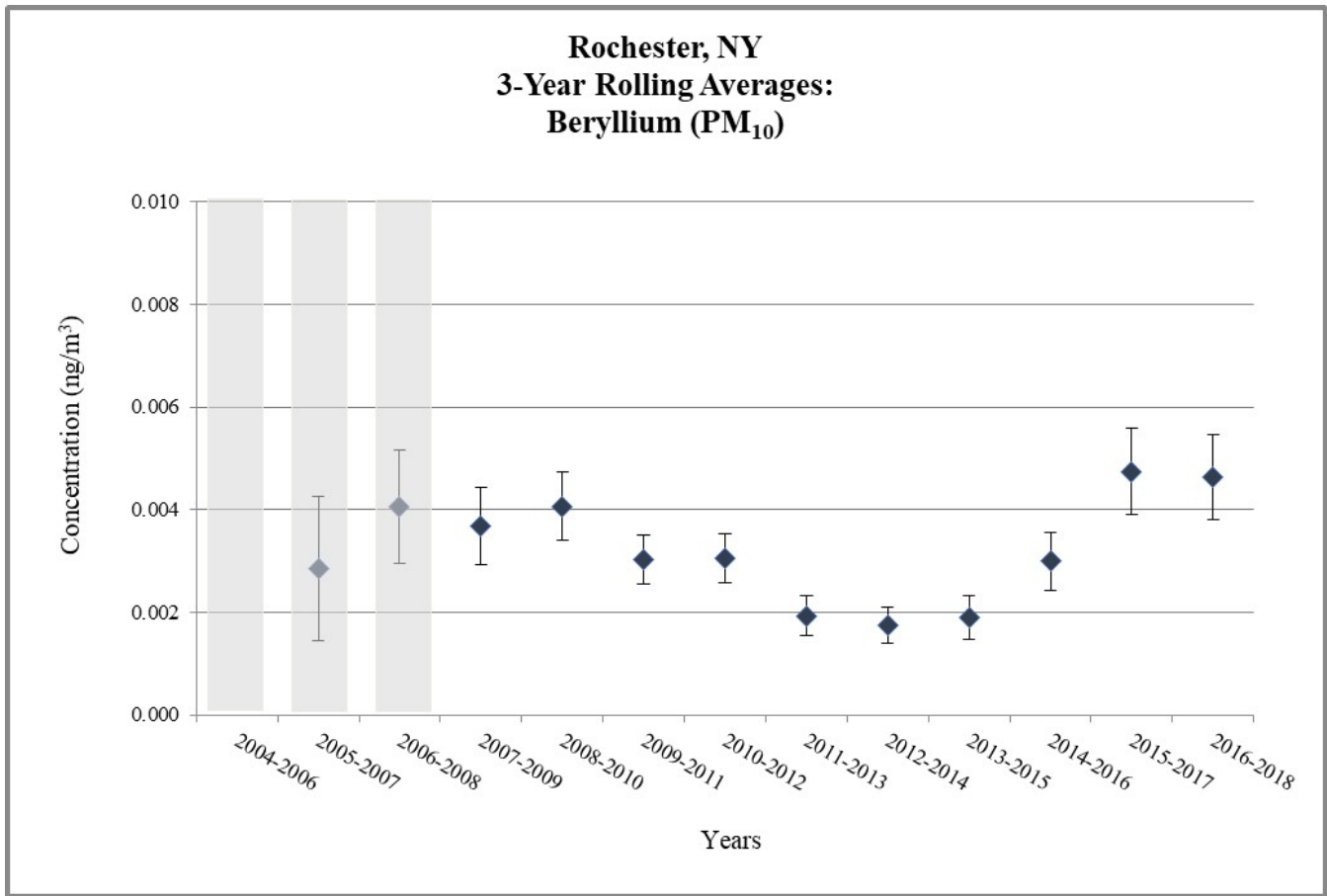


Figure 4. Rochester, NY - 3-Year Rolling Average Concentrations

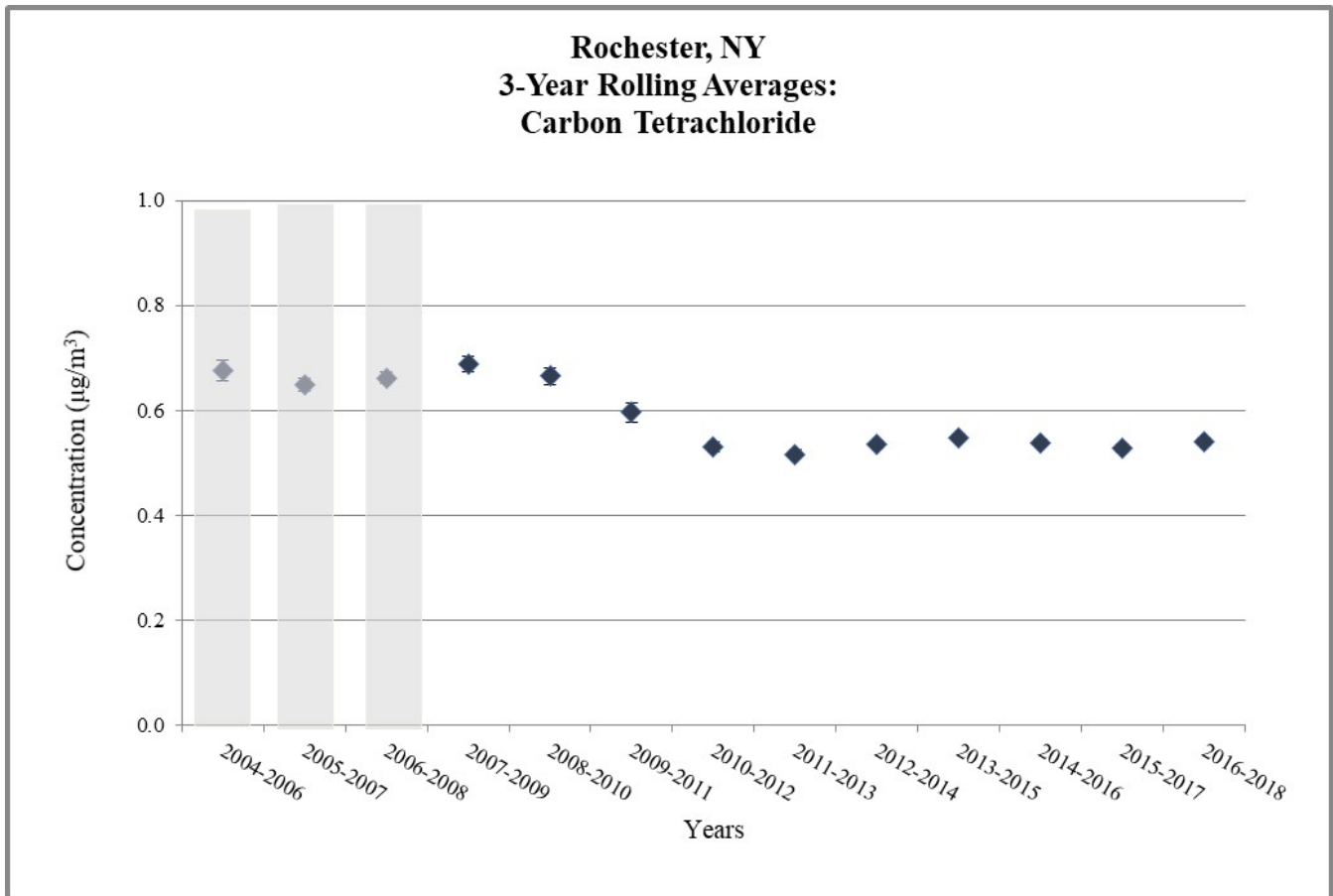
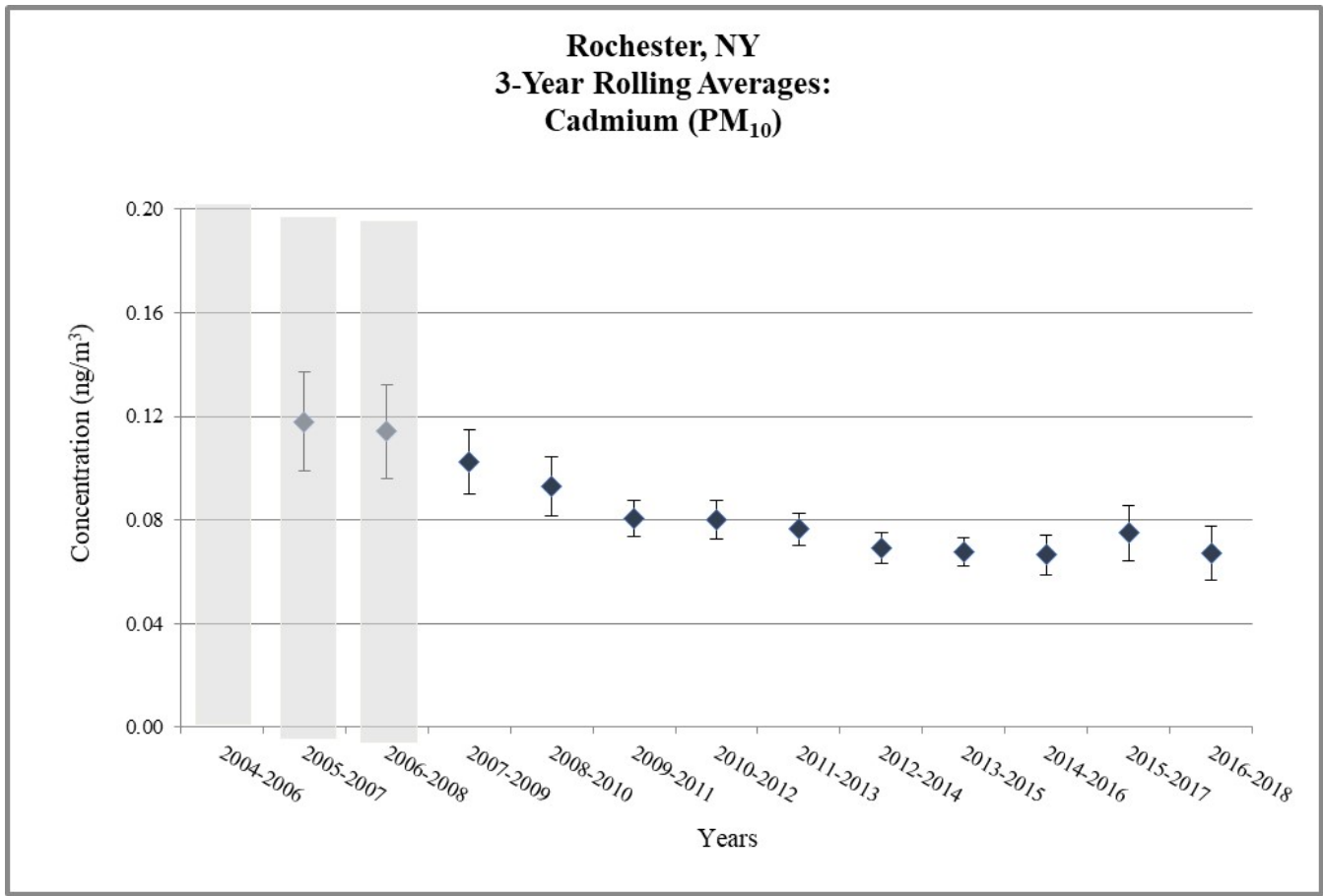


Figure 4. Rochester, NY - 3-Year Rolling Average Concentrations

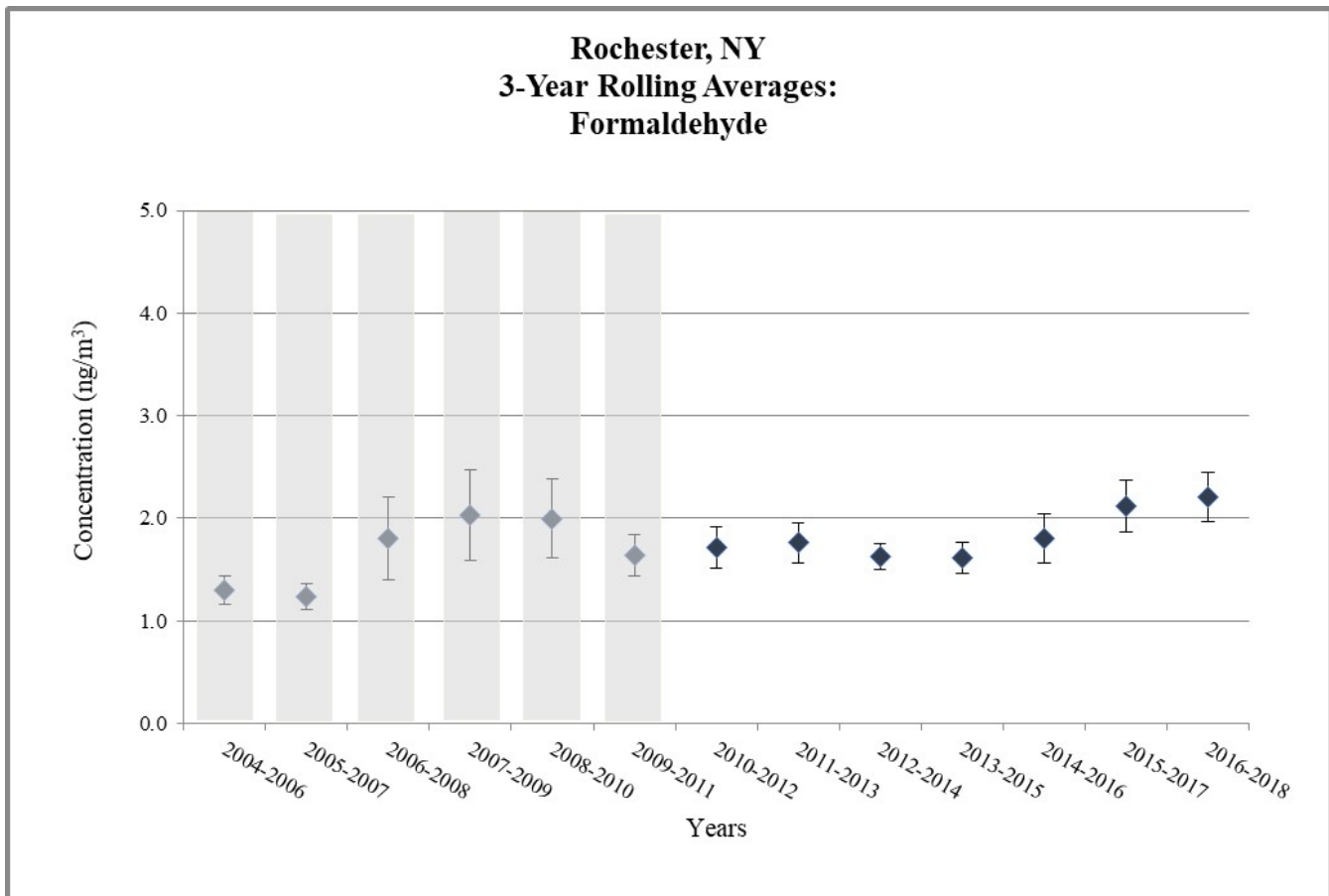
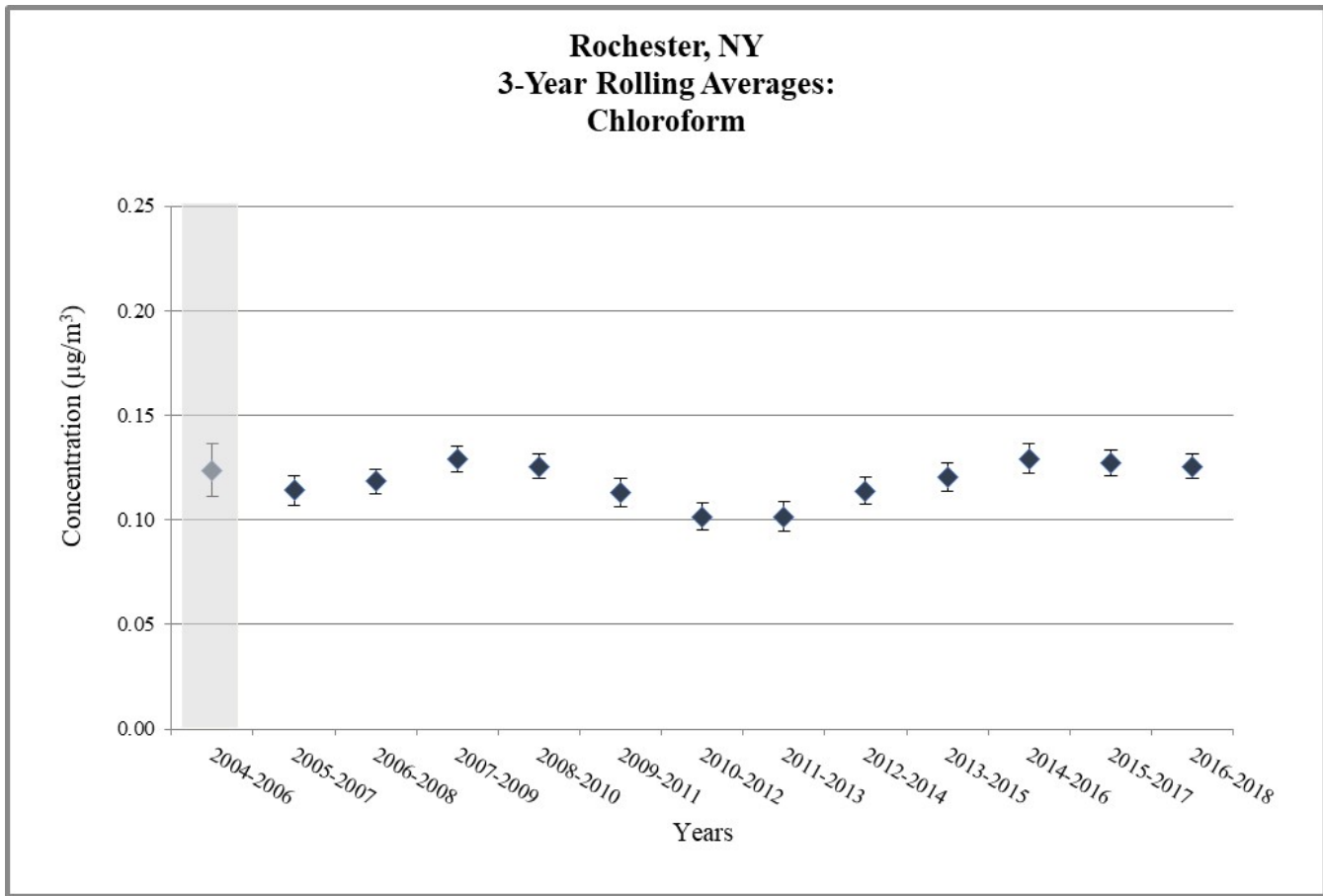


Figure 4. Rochester, NY - 3-Year Rolling Average Concentrations

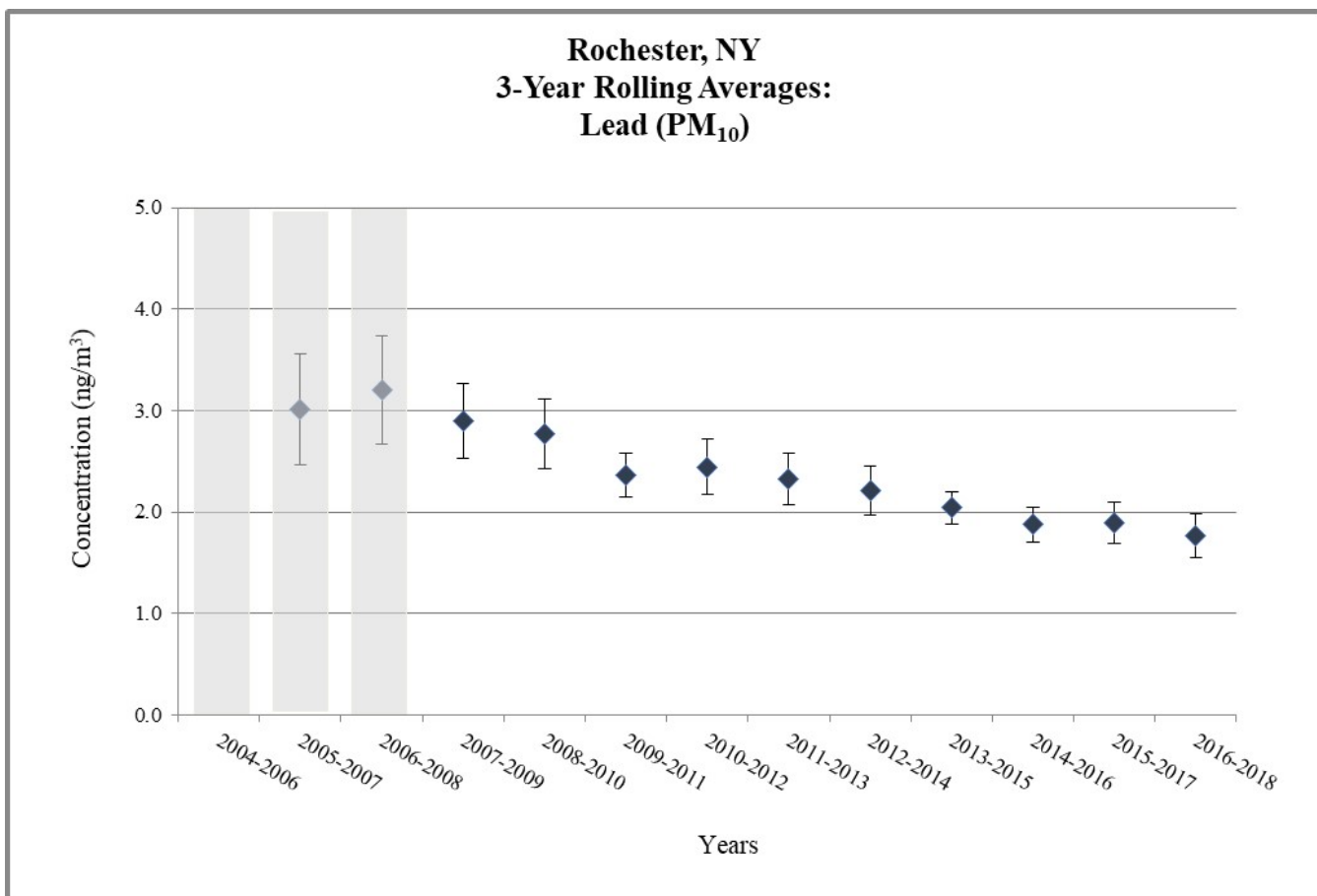
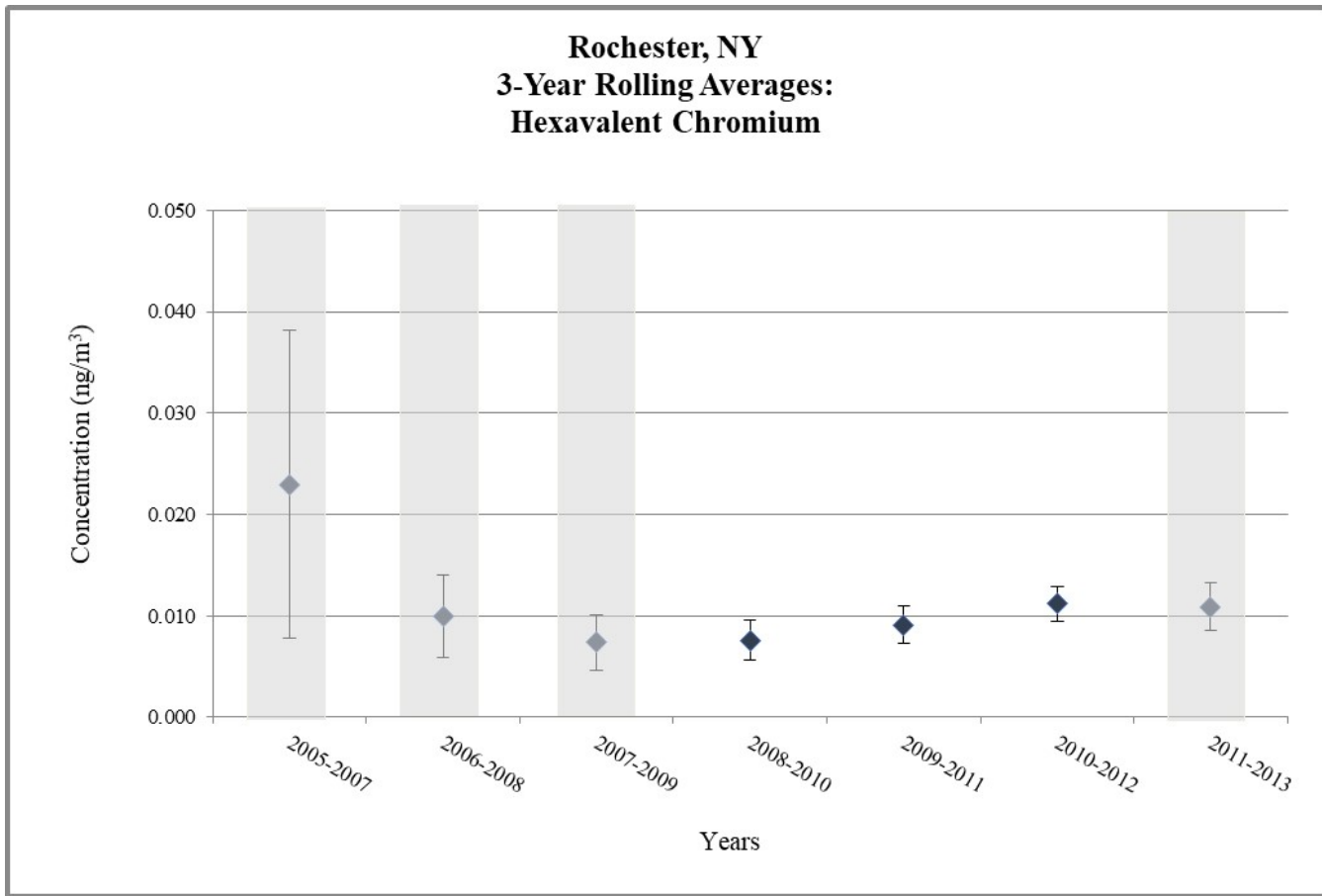


Figure 4. Rochester, NY - 3-Year Rolling Average Concentrations

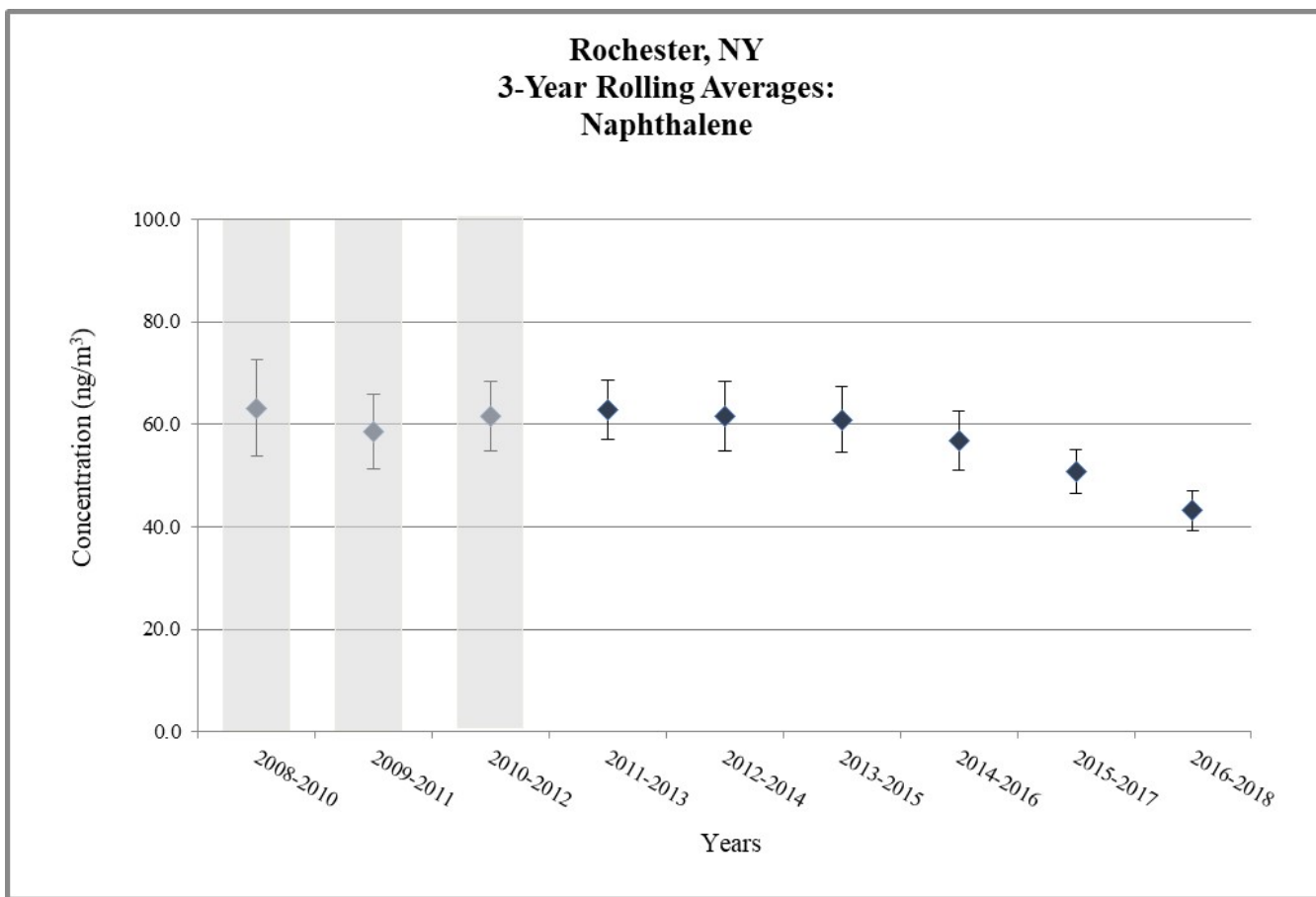
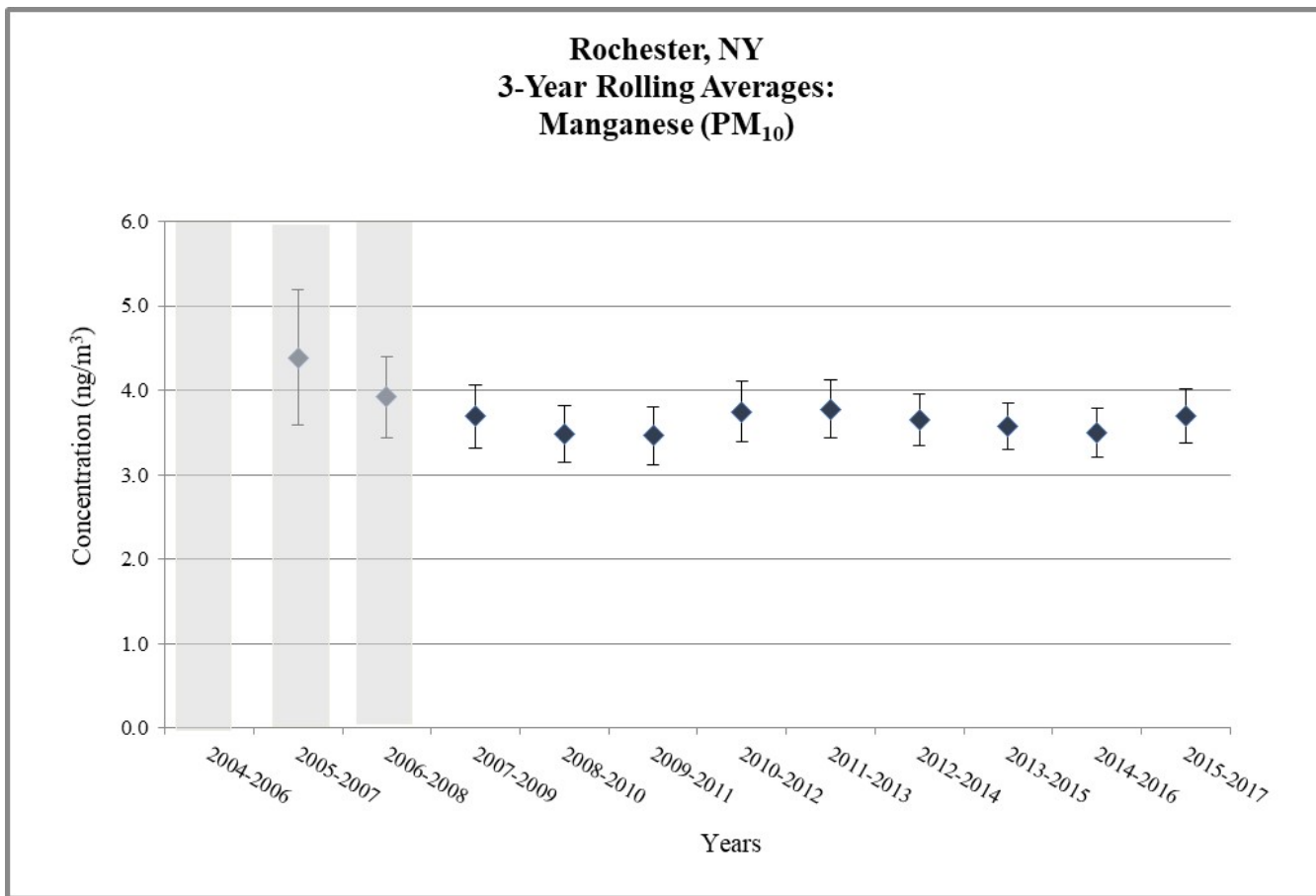


Figure 4. Rochester, NY - 3-Year Rolling Average Concentrations

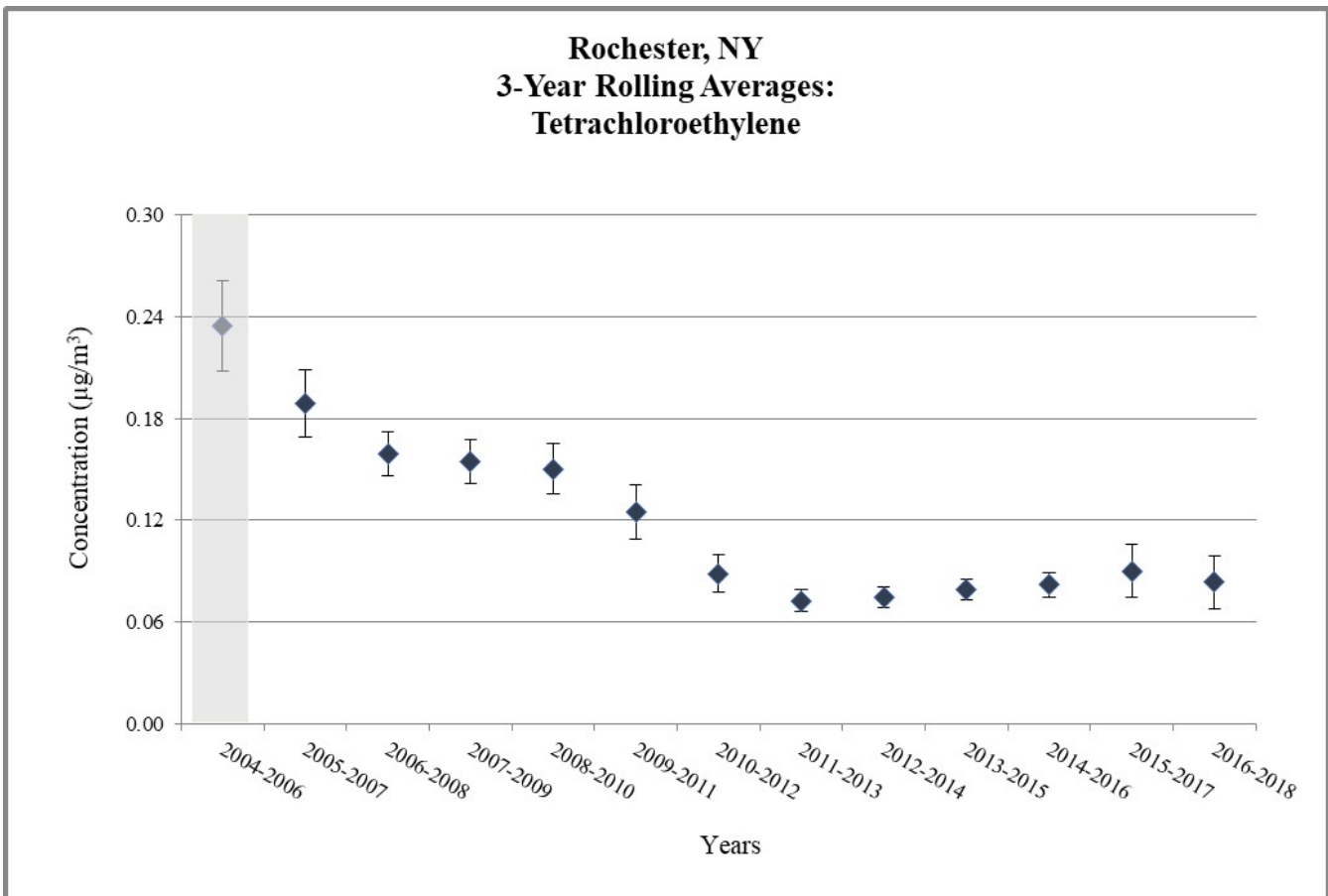
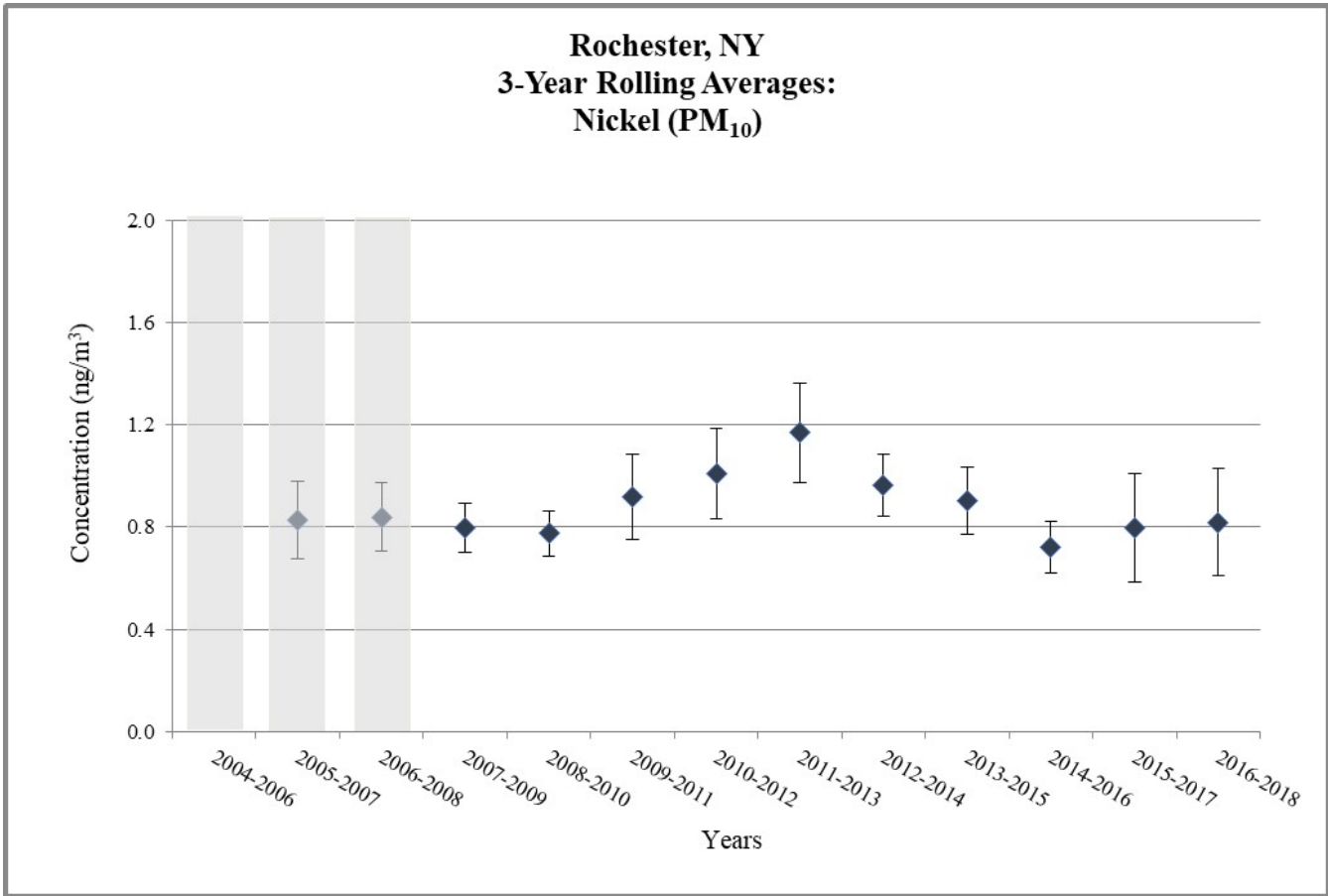
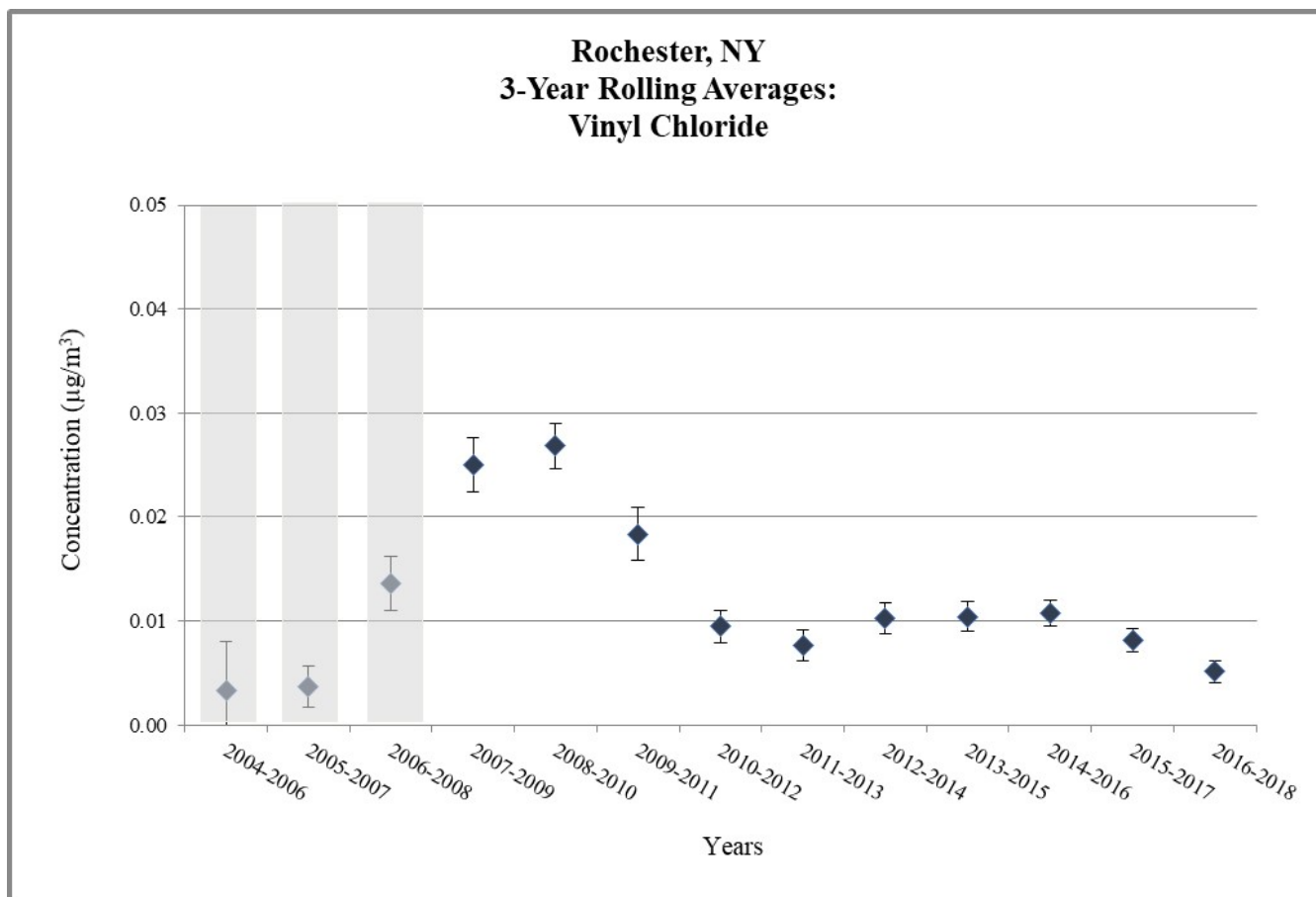
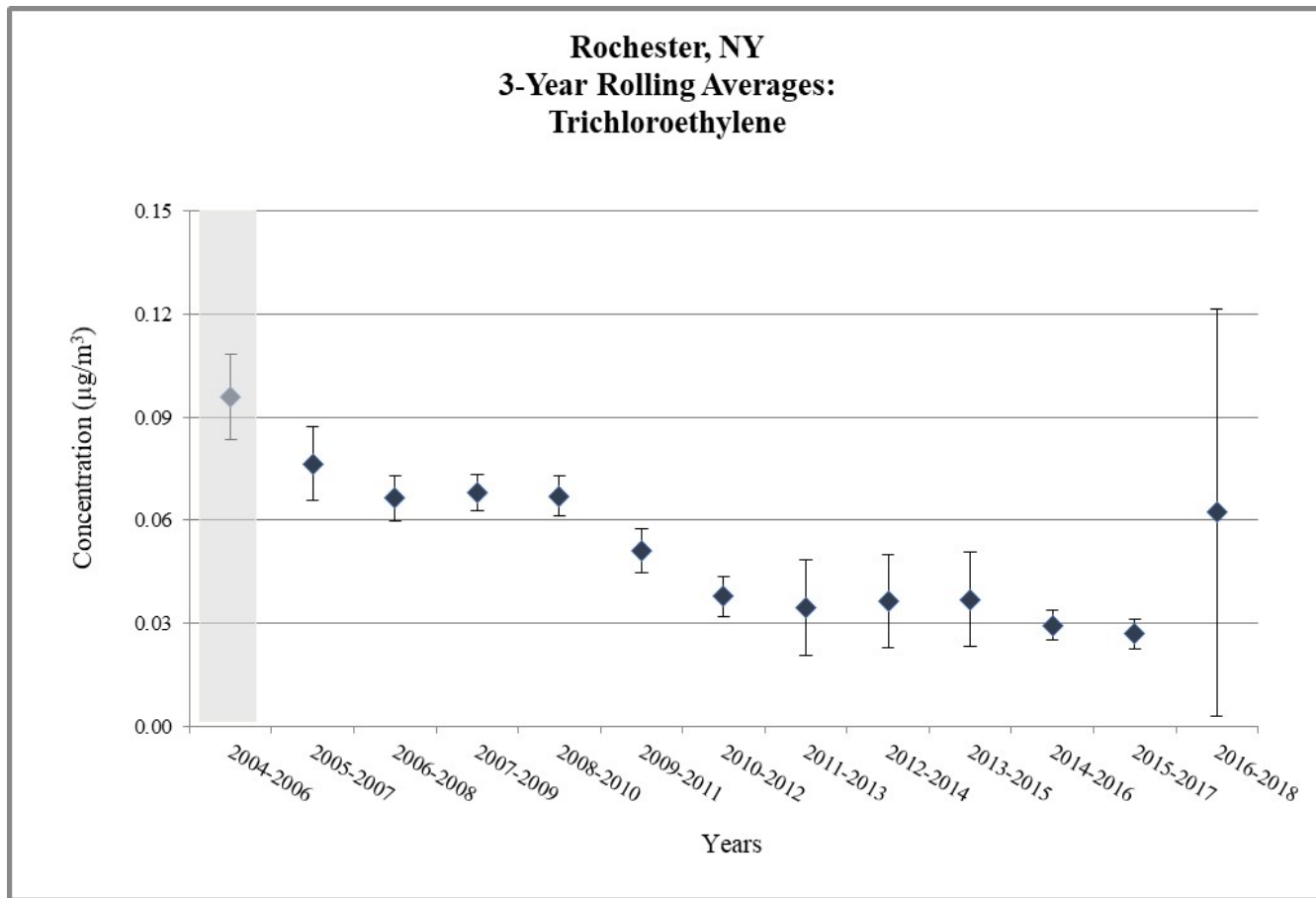


Figure 4. Rochester, NY - 3-Year Rolling Average Concentrations



Does not meet MQO or wasn't able to collect enough samples

Table 6. NATTS Network Assessment: MQO#1 - Completeness Percentage at Rochester, NY

Pollutant Group	Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Carbonyl	Acetaldehyde	--	82	90	63	93	70	92	85	87	89	95	97	87	97	98
Carbonyl	Formaldehyde	--	82	90	63	93	70	92	85	87	89	95	97	87	97	98
Chromium VI	Chromium VI	--	a	a	22	95	93	97	92	93	--	--	--	--	--	--
PAH	Benzo(a)pyrene	--	--	--	--	--	49	5	95	95	92	93	93	98	95	97
PAH	Naphthalene	--	--	--	--	--	49	5	95	95	92	93	93	98	95	97
PM ₁₀ Metals	Arsenic (PM ₁₀)	a	a	a	82	84	93	95	89	79	92	97	93	89	93	95
PM ₁₀ Metals	Beryllium (PM ₁₀)	a	a	a	82	84	93	95	89	79	92	97	93	89	93	95
PM ₁₀ Metals	Cadmium (PM ₁₀)	a	a	a	82	84	93	95	89	79	92	97	93	89	93	95
PM ₁₀ Metals	Lead (PM ₁₀)	a	a	a	82	84	93	95	89	79	92	97	93	89	93	95
PM ₁₀ Metals	Manganese (PM ₁₀)	a	a	a	82	84	93	95	89	79	92	97	93	89	93	95
PM ₁₀ Metals	Nickel (PM ₁₀)	a	a	a	82	84	93	95	89	79	92	97	93	89	93	95
VOC	Benzene	--	89	89	88	97	95	92	85	92	95	97	90	85	95	93
VOC	Butadiene, 1,3-	--	89	89	88	97	95	92	85	92	95	97	90	85	95	93
VOC	Carbon tetrachloride	--	89	89	88	97	95	92	85	92	95	97	90	85	95	93
VOC	Chloroform	--	89	89	88	97	95	92	85	92	95	97	90	85	95	93
VOC	Tetrachloroethylene	--	89	89	88	97	95	92	85	92	95	97	90	85	95	93
VOC	Trichloroethylene	--	89	89	88	97	95	92	85	92	95	97	90	85	95	93
VOC	Vinyl chloride	--	89	89	88	97	95	92	85	92	95	97	90	85	95	93

A-rated: ≥85%

B-rated: Between 75% to 85%

Does not meet: ≤75%

-- No data available

^a: Pollutant was expected, but not sampled at this site for this year.

Table 7. NATTS Network Assessment: MQO#2 - Reported Method Detection Limits (MDLs) at Rochester, NY

Pollutant Group	Pollutant Name	Target MDL	Units	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Carbonyl	Acetaldehyde	0.45	µg/m ³	0.07	0.02	0.02	0.03	0.02	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Carbonyl	Formaldehyde	0.98/0.08 ^a	µg/m ³	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.02	0.02	0.23	0.23	0.23	0.23	0.23	0.23
Chromium VI	Chromium VI	0.08	ng/m ³	--	b	b	0.09	0.08	0.05	0.01	0.05	0.04	0.05	--	--	--	--	--
PAH	Benzo(a)pyrene	0.91	ng/m ³	--	--	--	--	0.07	0.05	0.04	0.03	0.05	0.05	0.02	0.12	0.06	0.02	0.01
PAH	Naphthalene	29.00	ng/m ³	--	--	--	--	0.01	0.01	0.03	0.00	0.00	0.01	0.01	0.00	0.02	0.06	0.05
PM ₁₀ Metals	Arsenic (PM ₁₀)	0.23	ng/m ³	b	b	b	0.23	0.10	0.10	0.20	0.62	0.49	0.60	0.60	0.05	0.02	0.28	0.16
PM ₁₀ Metals	Beryllium (PM ₁₀)	0.42	ng/m ³	b	b	b	0.06	0.06	0.05	0.11	0.11	0.12	0.11	0.11	0.01	0.01	0.08	0.04
PM ₁₀ Metals	Cadmium (PM ₁₀)	0.56	ng/m ³	b	b	b	0.05	0.56	0.46	0.42	0.05	0.051	0.066	0.065	0.014	0.009	0.004	0.002
PM ₁₀ Metals	Lead (PM ₁₀)	15.0	ng/m ³	b	b	b	0.002	0.017	0.017	0.016	0.00	0.001	0.002	0.002	0.000	0.000	0.003	0.002
PM ₁₀ Metals	Manganese (PM ₁₀)	5.0	ng/m ³	b	b	b	0.01	0.10	0.10	0.09	0.01	0.004	0.006	0.006	0.004	0.004	0.016	0.009
PM ₁₀ Metals	Nickel (PM ₁₀)	2.1	ng/m ³	b	b	b	0.01	0.25	0.25	0.22	0.03	0.018	0.018	0.017	0.003	0.003	0.057	0.033
VOC	Benzene	0.13	µg/m ³	0.74	0.74	0.74	0.41	0.06	0.25	0.25	0.25	0.12	0.12	0.10	0.09	0.44	0.21	0.16
VOC	Butadiene, 1,3-	0.10	µg/m ³	0.88	0.88	1.10	0.37	0.19	0.44	0.44	0.44	0.13	0.13	0.24	0.23	0.12	0.11	0.15
VOC	Carbon tetrachloride	0.17	µg/m ³	1.12	1.12	1.12	0.37	0.05	0.37	0.37	0.37	0.26	0.26	0.22	0.20	0.23	0.22	0.32
VOC	Chloroform	0.50	µg/m ³	0.30	0.30	0.30	0.09	0.01	0.10	0.10	0.10	0.06	0.05	0.07	0.06	0.05	0.05	0.05
VOC	Tetrachloroethylene	0.17	µg/m ³	1.18	1.18	1.18	0.37	0.05	0.40	0.40	0.40	0.16	0.16	0.16	0.15	0.33	0.32	0.22
VOC	Trichloroethylene	0.5/0.2 ^a	µg/m ³	0.32	0.32	0.42	0.12	0.01	0.11	0.11	0.11	0.05	0.13	0.13	0.13	0.20	0.21	0.14
VOC	Vinyl chloride	0.11	µg/m ³	1.18	1.18	2.82	0.24	0.14	0.24	0.23	0.23	0.12	0.12	0.07	0.08	0.20	0.19	0.12

	A-rated: MDL to Target MDL ratio ≤ 1
	B-rated" MDL to Target MDL ratio between 1 and 2
	Does Not Meet MDL to Target MDL ratio>2
--	No data available

^a: For the 2012 sampling year, the Target MDL for this pollutant was reduced.

^b: Pollutant was expected, but not sampled at this site for this year.

Table 8. NATTS Network Assessment: MQO#3 - Bias Percent Difference at Rochester, NY

Pollutant Group	Pollutant Name	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Carbonyls	Acetaldehyde	-22.5	25.3	4.8	-17.6	7.4	-15.4	-2.4	-22.8	a	5.7	9.5	a	-13.9	14.6	2.6
Carbonyls	Formaldehyde	-24.2	10.2	-16.1	-23.1	10.4	-13.4	-3.1	-25.5	a	13.7	2.7	a	-14.8	14.6	6.9
Chromium VI	Chromium VI	--	b	b	a	a	-5.6 ^c	10.5 ^c	a	19.5	-6.5	--	--	--	--	--
PAH	Benzo(a)pyrene	--	--	--	--	a	-1.7	-2.3	-2.1	25.2	-5.7	-16.3	-14.2	-10.5	-22.4	-14.8
PAH	Naphthalene	--	--	--	--	a	-7.7	-17.1	-13.9	21.4	25.5	0.7	-11.4	-9.5	-11.6	-20.7
PM ₁₀ Metals	Arsenic (PM ₁₀)	b	19.6	b	19.8	9.1	-1.4	23.1	d	6.2	1.9	0.6	a	7.7	3.8	3.7
PM ₁₀ Metals	Beryllium (PM ₁₀)	b	-21.7	b	21.4	6.7	3.5	18.6	d	14.5	5.8	e	a	8.7	1.8	4.3
PM ₁₀ Metals	Cadmium (PM ₁₀)	b	-15.0	b	9.1	7.3	-4.7	9.8	d	7.1	-1.3	e	a	7.4	5.4	-1.5
PM ₁₀ Metals	Lead (PM ₁₀)	b	-1.1	b	-2.5	1.5	-24.5	4.0	d	7.9	-5.4	-1.8	a	-0.5	1.2	-6.6
PM ₁₀ Metals	Manganese (PM ₁₀)	b	-6.1	b	-14.0	-27.0	-34.8	1.6	d	5.1	-12.3	5.8	a	5.8	2.6	-0.8
PM ₁₀ Metals	Nickel (PM ₁₀)	b	-7.3	b	-6.2	-2.5	-29.3	10.4	d	-7.4	3.3	f	a	11.4	16.7	5.5
VOC	Benzene	2.7	4.2	32.2	0.6	9.2	-0.8	-8.8	12.4	a	3.7	-0.7	-10.4	-2.6	-9.9	0.8
VOC	Butadiene, 1,3-	g	-1.5	42.6	4.8	-29.3	-12.2	15.9	6.4	a	4.8	-23.2	-22.2	-10.6	-5.9	-5.6
VOC	Carbon tetrachloride	g	8.7	37.1	11.8	28.6	0.3	-11.2	2.6	a	-0.8	7.9	5.1	30.2	4.1	24.1
VOC	Chloroform	4.3	2.5	29.0	4.2	2.9	-15.4	-22.7	-11.8	a	-5.6	10.2	-12.7	-3.8	-4.5	-0.7
VOC	Tetrachloroethylene	0.1	-5.4	18.8	-2.8	3.0	-9.6	-11.8	6.0	a	5.1	0.0	-11.6	-6.8	-12.7	2.3
VOC	Trichloroethylene	g	-4.1	49.4	0.3	10.5	-15.9	-15.6	-3.6	a	5.7	12.6	-15.8	-5.8	-9.8	-1.3
VOC	Vinyl chloride	-16.7	-9.9	26.4	3.7	0.0	-9.8	-12.9	-4.1	a	3.4	3.4	-10.6	-7.1	-4.2	-6.1

	A-rated: ±25%
	B-rated: Between 25% to 35% or between -25% to -35%
	Does not meet: >35% or <-35%
	-- No data available

^a: Although this pollutant was sampled for at this site and year, the laboratory equipment was not operating at the time the Proficiency Test sample was sent.

^b: Pollutant was expected, but not sampled at this site for this year.

^c: Proficiency Test results are from the National Contract Lab for EPA's School Air Toxics Monitoring Program. The %Difference was -5.55% in 2009 and 10.53% in 2010.

^d: Pollutant was sampled at this site and year, but no bias data were reported.

^e: The Proficiency Test sample for this pollutant was 0; the site reported a concentration as "< MDL", rather than 0. EPA accepted this result.

^f: Although a Proficiency Test sample was sent to the lab supporting this site and year, the results were nullified by EPA due to QA issues.

Table 9. NATTS Network Assessment: MQO#4 - Overall Method Precision %CV at Rochester, NY

Pollutant Group	Pollutant Name	Overall Method precision % CV														
		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Carbonyls	Acetaldehyde	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbonyls	Formaldehyde	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium VI	Chromium VI	--	--	--	--	19.3	a	12.9	19.6	13.9	a	--	--	--	--	--
PAH	Benzo(a)pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PAH	Naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PM ₁₀ Metals	Arsenic (PM ₁₀)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PM ₁₀ Metals	Beryllium (PM ₁₀)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PM ₁₀ Metals	Cadmium (PM ₁₀)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PM ₁₀ Metals	Lead (PM ₁₀)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PM ₁₀ Metals	Manganese (PM ₁₀)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PM ₁₀ Metals	Nickel (PM ₁₀)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VOC	Benzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VOC	Butadiene, 1,3-	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VOC	Carbon tetrachloride	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VOC	Chloroform	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VOC	Tetrachloroethylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VOC	Trichloroethylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VOC	Vinyl chloride	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

	A-rated: ≤ 15% CV
	B-rated: Between 15%CV to 25% CV
	Does Not Meet: >25% CV or did not report Precision (required in the NATTS Workplan Template since 2012)
	-- No data available

^a: Although both primary and secondary data were reported, both sets of values were less than the MDL. Thus no %CV was calculated.

Table 10. NATTS Network Assessment: MQO#4 - Analytical Precision %CV at Rochester, NY

Pollutant Group	Pollutant Name	Analytical Method precision % CV														
		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Carbonyls	Acetaldehyde	--	--	--	--	--	--	--	--	a	a	a	a	a	a	a
Carbonyls	Formaldehyde	--	--	--	--	--	--	--	--	a	a	a	a	a	a	a
Chromium VI	Chromium VI	--	--	--	--	13.4	10.2	6.3	7.1	4.8	a	--	--	--	--	--
PAH	Benzo(a)pyrene	--	--	--	--	--	--	--	--	2.0	0.6	3.5	1.6	1.3	1.1	1.6
PAH	Naphthalene	--	--	--	--	--	--	--	--	1.9	1.9	4.9	1.8	1.2	2.2	1.3
PM ₁₀ Metals	Arsenic (PM ₁₀)	--	--	--	--	2.7	4.6	2.8	5.3	7.7	2.3	9.0	3.0	2.7	14.4	1.4
PM ₁₀ Metals	Beryllium (PM ₁₀)	--	--	--	--	b	b	b	b	b	b	b	b	28.8	b	b
PM ₁₀ Metals	Cadmium (PM ₁₀)	--	--	--	--	b	b	b	2.3	2.1	2.1	4.4	4.9	28.3	2.2	2.7
PM ₁₀ Metals	Lead (PM ₁₀)	--	--	--	--	0.2	0.5	0.2	2.4	1.0	0.5	0.5	0.5	3.4	2.4	0.7
PM ₁₀ Metals	Manganese (PM ₁₀)	--	--	--	--	1.3	0.4	0.4	2.3	1.3	1.0	0.6	4.1	1.9	0.8	1.0
PM ₁₀ Metals	Nickel (PM ₁₀)	--	--	--	--	1.5	1.8	2.0	3.6	2.2	1.9	2.8	18.1	3.9	0.8	1.6
VOC	Benzene	--	--	--	--	--	--	--	--	a	a	a	a	a	a	a
VOC	Butadiene, 1,3-	--	--	--	--	--	--	--	--	a	a	a	a	a	a	a
VOC	Carbon tetrachloride	--	--	--	--	--	--	--	--	a	a	a	a	a	a	a
VOC	Chloroform	--	--	--	--	--	--	--	--	a	a	a	a	a	a	a
VOC	Tetrachloroethylene	--	--	--	--	--	--	--	--	a	a	a	a	a	a	a
VOC	Trichloroethylene	--	--	--	--	--	--	--	--	a	a	a	a	a	a	a
VOC	Vinyl chloride	--	--	--	--	--	--	--	--	a	a	a	a	a	a	a

	A-rated: ≤ 15% CV
	B-rated: Between 15%CV to 25% CV
	Does Not Meet: >25% CV or did not report Precision (required in the NATTS Workplan Template since 2012)
	-- No data available

^a: Per the NATTS Workplan template, analytical replicates were required to be reported to AQS for this sampling year

^b: The primary and/or replicate value were less than the MDL, so no calculation could be made.

Appendix A. Equipment Inventory

Pollutant Type	Year(s)	Manufacturer/Model, Extraction Type, and Year
<i>Sampling Equipment</i>		
Carbonyls	2004-2014	ATEC 800 Sequential Sampler (Year Deployed: unknown)
	2015-2018	ATEC 2200 (Year Deployed: 2015)
Chromium VI	2005-2006	NONE
	2007-2010	ERG Chromium VI sampler (Year Deployed: 2005)
	2011-2013	ERG Chromium VI sampler (Year Deployed: 2008)
PAHs	2008-2014	General Metal Works Hi-Volume Sampler (Year Deployed: <1993)
	2015-2018	Tisch Environmental TE-1000 PUF Sampler (Year Deployed: 2008)
PM ₁₀ Metals	2004-2006	NONE
	2007-2012	Thermo R&P Parisol-Plus 2025 Sequential Air Sampler (Year Deployed: <1997)
	2013-2015	Thermo R&P Parisol-Plus 2025 Sequential Air Sampler (Year Deployed: 2013)
	2016-2018	Thermo Patrisol-Plus 2025i Sequential Air Sampler (2) (Year Deployed: 2016)
VOCs	2004-2010	Xontech 910A Canister Sampler (Year Deployed: Unknown)
	2011	Xontech 910A Canister Sampler (Year Deployed: 2002)
	2012-2014	Xontech 910PC Canister Sampler (Year Deployed: 2002)
	2015-2018	Xontech 910PC Canister Sampler (Year Deployed: 2015)
<i>Analytical Equipment</i>		
Carbonyls	2004-2007	Waters 717 HPLC/model 996 PDA (Year Deployed: unknown)
	2008-2018	Waters Alliance 2695 HPLC /model 2487 Dual Absorbance (Year Deployed: 2008)
Chromium VI	2005-2006	NONE
	2007-2013	Dionex 300 ion chromatography system (Year Deployed: 2001)
PAHs	2008-2014	HP/Agilent 5890/5971 GC/MS (Year Deployed: 2008)
	2014-2018	HP/Agilent 7890B/5975C GC/MS (Year Deployed: 2014)
PM ₁₀ Metals	2004-2006	NONE
	2007-2015	Thermo/VG Elemental X Series II ICP-MS (Year Deployed: 2006)
	2016-2018	Thermo Q Series ICP-MS (Year Deployed: 2016)
VOCs	2004	Varian 3800 GC/Varian Saturn 2000 MS Ion Trap (Year Deployed: unknown)
	2005-2014	Varian 3800 GC/Varian Saturn 2000 MS Ion Trap (Year Deployed: 2005)
	2015	Varian CP-3800 and Saturn 2000 Ion Trap MS Year Deployed: 2005)
	2016-2018	Agilent 7895GC/5977B MSD (Year Deployed: 2016)
<i>Preconcentrator Equipment</i>		
VOCs	2004-2004	Entech 7000 (Year Deployed: <2000)
	2005-2005	Entech 7100 (1), Entech 7016A (2) (Year Deployed: 2005)
	2006-2015	Entech 7100A (Year Deployed: 2005)
	2016-2018	Entech 7200 (Year Deployed: 2016)
<i>Standards Preparation Equipment</i>		
VOCs	2004-2012	Custom built (dynamic dilution) (Year Deployed: unknown)
	2013-2014	Entech 4600 (dynamic dilution) (Year Deployed: 2013)
	2015-2018	Entech 4700 (dynamic dilution) (Year Deployed: 2015)
<i>Canister Cleaning Equipment</i>		
VOCs	2004-2008	Entech 1000 (Hot) (Year Deployed: <1999)
	2009-2009	Entech 3100A (Hot) (Year Deployed: 2009)
	2010-2015	Entech 3100A (Hot) (Year Deployed: 2010)

Appendix A. Equipment Inventory

Pollutant Type	Year(s)	Manufacturer/Model, Extraction Type, and Year
	2016-2018	Entech 3100A/3112D (Hot) (Year Deployed: 2010)

Appendix A. Equipment Inventory

Pollutant Type	Year(s)	Manufacturer/Model, Extraction Type, and Year
<i>PM₁₀ Extraction Equipment</i>		
PM ₁₀ Metals	2004-2006	NONE
	2007-2014	VWR Scientific (Sonicator) (Year Deployed: 2004)
	2015-2018	Crest Genesis (Sonicator) (Year Deployed: 2015)
<i>Chromium VI Extraction Equipment</i>		
Chromium VI	2005-2006	NONE
	2007-2010	Branson 8510 (Sonicator) (Year Deployed: 2001)
	2012-2013	Branson Shaker (Year Deployed: 2011)
<i>PAHs Extraction Equipment</i>		
PAHs	2008-2018	Dionex -300 (ASE) (Year Deployed: 2004)