

Chicago, IL NATTS Network Assessment Review

- Established 2003: Carbonyls and VOCs
 - Added PM₁₀ Metals in 2005
 - Added Chromium VI in 2005, completed in 2013
 - Added PAHs in 2008
 - Added Ethylene oxide in 2020
- For the NATTS Network Assessment (2003-2022):
 - 8 of 17 Method Quality Objective (MQO) Core HAPs were included in the national trends
 - Carbonyls and VOCs: Sample results in 2021 and 2022 were voided due to contamination.
 - 287 of 315 pollutant datasets were suitable for trends analysis
 - Annual Average and 3-Year Rolling Average Concentrations were decreasing for benzene, beryllium (PM₁₀), and lead (PM₁₀).
 - 100% Reporting of Datasets
- Method Quality Objectives (MQO): 2003-2022
 - Completeness: Met 85% completeness in 280 of 315 pollutant datasets
 - Method Detection Limits: Met MDL Target Ratio of 1.00 in 303 of 324 pollutant datasets
 - Bias: Met ±25% for 264 of 279 pollutant datasets
 - Overall Method Precision: Met ≤15% CV for 87 of 147 pollutant datasets
 - Analytical Method Precision: Met ≤15% CV for 226 of 249 pollutant datasets
- Analytical Laboratories for 2022

VOC	Carbonyl	PM ₁₀ Metals	PAHs
ERG	ERG	ERG	ERG

- Equipment Year Deployed

Equipment Type	VOC	Carbonyl	PM ₁₀ Metals	PAHs
Sampler	2021	2021	2009	2022
Analytical	2019	2018	2017	2021
Preconcentrator	2019	NA	NA	NA
Standards Preparation	1985	NA	NA	NA
Canister Cleaning	2010	NA	NA	NA
Extraction	NA	NA	2014	2022

National Summary: NATTS data were collected at 27 locations across the United States, with sites beginning in 2003 or later (Figure 1) for 20 core HAPs. Over 670,000 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., 2017-2019 vs. 2020-2022) 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 20 core HAPs, 17 were assessed for the NATTS Trends DQO. Due to sampling and analytical issues, acrolein and ethylene were not considered for trends analysis (Table 2).

Additionally, hexavalent chromium was discontinued as a required pollutant. The assessment showed that across the network, 11 of those 17 pollutants were decreasing between the 3-year blocks, while four of those pollutants were increasing between the 3-year blocks. Two pollutants did not exhibit a noticeable trend.

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

Pollutant Group	A-rated		B-rated		Does Not Meet	
	#	%	#	%	#	%
VOCs	1,968	58%	864	25%	572	17%
Carbonyls	668	68%	231	24%	77	8%
PM ₁₀ Metals	1,906	66%	775	27%	217	7%
PAHs	571	77%	144	19%	29	4%
Total = 8,704	5,113	64%	2,014	25%	895	11%

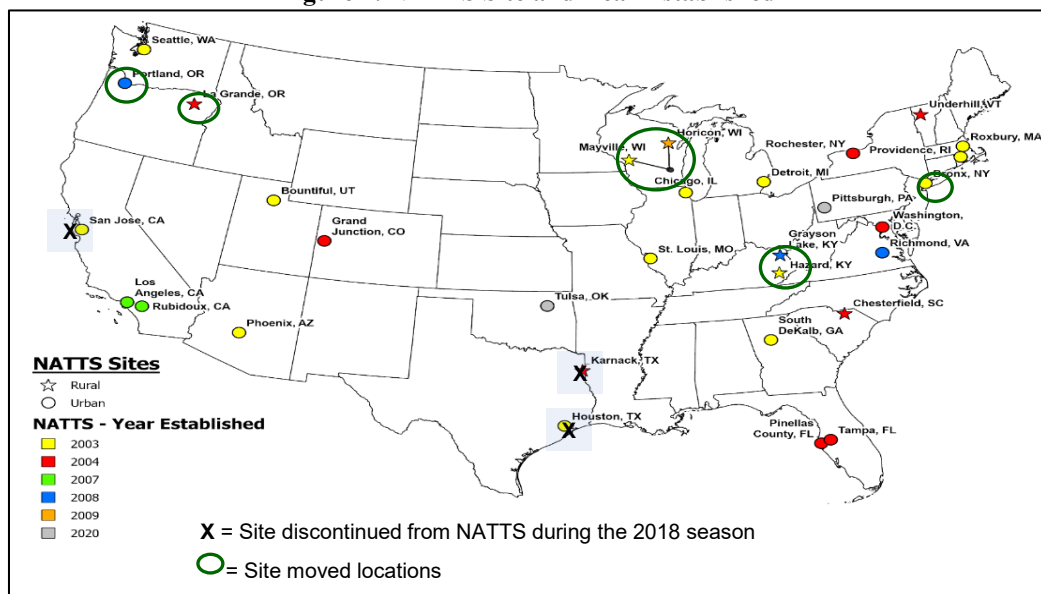
Table 2. Three-Year Block Averages for National Trends

Pollutant ^{a,b}	Units	# Sites	Block 1	Block 2	% Difference
Acetaldehyde	µg/m ³	16	1.48	1.34	-9.2%
Arsenic (PM ₁₀)	ng/m ³	18	0.68	0.64	-6.6%
Benzene	µg/m ³	16	0.529	0.525	-0.8%
Benzo(a)pyrene	ng/m ³	18	0.086	0.072	-16.6%
Beryllium (PM ₁₀)	ng/m ³	18	0.008	0.010	15.0%
Butadiene, 1,3-	µg/m ³	15	0.057	0.054	-5.1%
Cadmium (PM ₁₀)	ng/m ³	20	0.087	0.090	3.7%
Carbon Tetrachloride	µg/m ³	15	0.53	0.50	-5.3%
Chloroform	µg/m ³	16	0.173	0.165	-4.8%
Formaldehyde	µg/m ³	15	2.809	2.482	-11.7%
Lead (PM ₁₀)	ng/m ³	20	2.44	2.43	-0.5%
Manganese (PM ₁₀)	ng/m ³	20	6.69	7.31	9.2%
Naphthalene	ng/m ³	17	42.00	35.10	-16.4%
Nickel (PM ₁₀)	ng/m ³	19	0.87	0.83	-3.7%
Tetrachloroethylene	µg/m ³	15	0.12	0.12	1.5%
Trichloroethylene	µg/m ³	14	0.019	0.022	16.3%
Vinyl Chloride	µg/m ³	16	0.004	0.001	-69.0%

^a Acrolein and ethylene oxide were not assessed due to sampling and analytical issues

^b Hexavalent chromium (not assessed) was discontinued in 2013

Figure 1. NATTS Site and Year Established



Site Information

Region	5
NATTS Site Type	Urban
County	Cook
AQS Site Code	17-031-4201
NATTS Operating Agency	IL Enviromental Protection Agency
Latitude	42.139996
Longitude	-87.799227
AQS Land Use	Residential
AQS Location Setting	Suburban
County Population (2023)	5,087,072

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	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Acetaldehyde	N(a)	N(b)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N(c)	N(c)
Arsenic (PM ₁₀)	--	N(d)	Y	Y	Y	Y	Y	Y	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	Y	Y	Y	Y	Y	Y	Y	Y	N(c)	N(c)
Benzo(a)pyrene	--	--	--	--	--	--	Y	Y	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Beryllium (PM ₁₀)	--	N(d)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Butadiene, 1,3-	--	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N(c)	N(c)
Cadmium (PM ₁₀)	--	N(d)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Carbon tetrachloride	--	N(a)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N(c)	N(c)
Chloroform	--	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N(c)	N(c)
Formaldehyde	N(a)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N(c)	N(c)
Lead (PM ₁₀)	--	N(d)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Manganese (PM ₁₀)	--	N(d)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Naphthalene	--	--	--	--	--	--	Y	Y	Y	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Nickel (PM ₁₀)	--	N(d)	Y	Y	Y	Y	Y	Y	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	Y	Y	Y	Y	Y	Y	Y	Y	N(c)	N(c)
Trichloroethylene	--	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N(c)	N(c)
Vinyl chloride	--	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N(c)	N(c)

^a: No MDL reported to EPA

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

^c: Sample results were voided due to contamination at the site.

^d: Reported MDL to NATTS Target Ratio greater than 2.0

Table 3. NATTS Network Assessment Data (2003-2022) - 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	22,000	100%	1.73 ± 0.02	0.50	0.65	0.95	1.42	2.15	3.19	3.96
	µg/m ³	Rural	6,392	100%	1.17 ± 0.03	0.36	0.45	0.65	0.92	1.35	1.98	2.67
	µg/m ³	All Sites	28,392	100%	1.61 ± 0.02	0.45	0.58	0.85	1.29	1.97	2.99	3.79
Arsenic (PM ₁₀)	ng/m ³	Urban	21,944	95%	0.87 ± 0.03	0.03	0.16	0.32	0.56	0.96	1.65	2.37
	ng/m ³	Rural	6,385	96%	0.49 ± 0.02	0.03	0.08	0.16	0.35	0.58	0.93	1.30
	ng/m ³	All Sites	28,329	96%	0.78 ± 0.02	0.03	0.13	0.27	0.51	0.87	1.51	2.16
Benzene	µg/m ³	Urban	22,246	99%	0.85 ± 0.01	0.23	0.29	0.42	0.64	1.02	1.62	2.20
	µg/m ³	Rural	5,932	90%	0.52 ± 0.01	ND	0.06	0.20	0.38	0.67	1.08	1.51
	µg/m ³	All Sites	28,178	97%	0.78 ± 0.01	0.16	0.23	0.36	0.58	0.95	1.52	2.07
Benzo(a)pyrene	ng/m ³	Urban	17,810	73%	0.10 ± 0.01	ND	ND	ND	0.04	0.10	0.23	0.35
	ng/m ³	Rural	4,735	37%	0.07 ± 0.01	ND	ND	ND	ND	0.02	0.19	0.38
	ng/m ³	All Sites	22,545	65%	0.09 ± 0.01	ND	ND	ND	0.03	0.09	0.22	0.35
Beryllium (PM ₁₀)	ng/m ³	Urban	21,786	77%	0.042 ± 0.004	ND	ND	0.0005	0.005	0.015	0.043	0.098
	ng/m ³	Rural	6,062	49%	0.018 ± 0.002	ND	ND	ND	ND	0.004	0.012	0.041
	ng/m ³	All Sites	27,848	71%	0.037 ± 0.003	ND	ND	ND	0.003	0.011	0.038	0.083
Butadiene, 1,3-	µg/m ³	Urban	22,220	78%	0.092 ± 0.002	ND	ND	0.018	0.051	0.110	0.215	0.317
	µg/m ³	Rural	5,940	29%	0.017 ± 0.001	ND	ND	ND	ND	0.011	0.054	0.104
	µg/m ³	All Sites	28,160	68%	0.076 ± 0.002	ND	ND	ND	0.039	0.092	0.190	0.283
Cadmium (PM ₁₀)	ng/m ³	Urban	21,954	93%	0.184 ± 0.014	ND	0.019	0.043	0.081	0.160	0.354	0.572
	ng/m ³	Rural	6,067	89%	0.092 ± 0.005	ND	ND	0.026	0.055	0.099	0.179	0.270
	ng/m ³	All Sites	28,021	92%	0.164 ± 0.011	ND	0.012	0.039	0.075	0.143	0.300	0.518
Carbon Tetrachloride	µg/m ³	Urban	22,202	98%	0.556 ± 0.002	0.336	0.423	0.486	0.550	0.638	0.725	0.784
	µg/m ³	Rural	5,909	84%	0.494 ± 0.010	ND	ND	0.342	0.533	0.629	0.728	0.807
	µg/m ³	All Sites	28,111	95%	0.543 ± 0.003	ND	0.363	0.475	0.547	0.636	0.726	0.788
Chloroform	µg/m ³	Urban	22,218	88%	0.243 ± 0.016	ND	ND	0.094	0.129	0.205	0.398	0.630
	µg/m ³	Rural	5,942	56%	0.062 ± 0.002	ND	ND	ND	0.049	0.098	0.134	0.228
	µg/m ³	All Sites	28,160	82%	0.205 ± 0.013	ND	ND	0.076	0.110	0.187	0.342	0.543

Table 3. NATTS Network Assessment Data (2003-2022) - 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	22,024	100%	3.03 ± 0.04	0.69	1.00	1.57	2.42	3.72	5.47	6.95
	µg/m ³	Rural	6,432	100%	2.16 ± 0.04	0.49	0.64	1.03	1.67	2.69	4.12	5.34
	µg/m ³	All Sites	28,456	100%	2.83 ± 0.03	0.61	0.86	1.42	2.25	3.50	5.22	6.65
Lead (PM ₁₀)	ng/m ³	Urban	21,955	100%	3.97 ± 0.10	0.70	0.95	1.46	2.49	4.34	7.87	11.16
	ng/m ³	Rural	6,066	99%	1.93 ± 0.14	0.34	0.45	0.75	1.27	2.14	3.59	4.96
	ng/m ³	All Sites	28,021	100%	3.53 ± 0.09	0.53	0.75	1.22	2.17	3.88	6.99	10.10
Manganese (PM ₁₀)	ng/m ³	Urban	21,906	100%	9.76 ± 0.25	1.06	1.49	2.53	4.96	10.43	20.40	30.79
	ng/m ³	Rural	6,067	99%	3.79 ± 0.12	0.48	0.74	1.34	2.48	4.49	8.08	11.64
	ng/m ³	All Sites	27,973	100%	8.47 ± 0.20	0.84	1.22	2.16	4.19	8.99	18.13	27.27
Naphthalene	ng/m ³	Urban	17,811	100%	67.25 ± 0.97	13.42	18.03	28.73	49.00	84.13	136.42	180.00
	ng/m ³	Rural	4,732	98%	21.76 ± 1.02	2.79	4.04	6.84	12.47	23.51	45.68	69.01
	ng/m ³	All Sites	22,543	100%	57.70 ± 0.83	5.92	9.77	20.41	40.15	74.11	124.40	167.26
Nickel (PM ₁₀)	ng/m ³	Urban	21,958	98%	1.76 ± 0.05	0.29	0.40	0.62	1.02	1.86	3.32	5.05
	ng/m ³	Rural	5,989	85%	0.56 ± 0.07	ND	ND	0.10	0.26	0.53	0.96	1.63
	ng/m ³	All Sites	27,947	95%	1.50 ± 0.04	0.00	0.17	0.45	0.84	1.59	2.92	4.47
Tetrachloroethylene	µg/m ³	Urban	22,209	84%	0.24 ± 0.05	ND	ND	0.05	0.12	0.22	0.43	0.68
	µg/m ³	Rural	5,936	38%	0.07 ± 0.02	ND	ND	ND	ND	0.04	0.12	0.31
	µg/m ³	All Sites	28,145	75%	0.21 ± 0.04	ND	ND	ND	0.08	0.20	0.38	0.61
Trichloroethylene	µg/m ³	Urban	22,204	43%	0.040 ± 0.008	ND	ND	ND	ND	0.043	0.096	0.152
	µg/m ³	Rural	5,922	19%	0.019 ± 0.003	ND	ND	ND	ND	ND	0.029	0.124
	µg/m ³	All Sites	28,126	38%	0.036 ± 0.006	ND	ND	ND	ND	0.033	0.085	0.148
Vinyl Chloride	µg/m ³	Urban	22,021	18%	0.0046 ± 0.0003	ND	ND	ND	ND	ND	0.0126	0.0251
	µg/m ³	Rural	5,940	13%	0.0070 ± 0.0008	ND	ND	ND	ND	ND	0.0125	0.0304
	µg/m ³	All Sites	27,961	17%	0.0051 ± 0.0003	ND	ND	ND	ND	ND	0.0126	0.0253

^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 Chicago, IL

Analyte	Units	# Data Records	% Detection	Arithmetic Mean ^a	Percentile Value ^b						
					5th	10th	25th	50th	75th	90th	95th
Acetaldehyde	µg/m ³	1,081	100%	1.34 ± 0.06	0.38	0.52	0.76	1.13	1.66	2.31	2.98
Arsenic (PM ₁₀)	ng/m ³	1,049	100%	0.75 ± 0.04	0.18	0.23	0.36	0.62	0.98	1.43	1.74
Benzene	µg/m ³	1,051	100%	0.59 ± 0.02	0.22	0.27	0.36	0.50	0.70	0.99	1.21
Benzo(a)pyrene	ng/m ³	849	96%	0.12 ± 0.01	0.01	0.03	0.05	0.08	0.14	0.24	0.32
Beryllium (PM ₁₀)	ng/m ³	1,049	97%	0.0056 ± 0.0004	0.001	0.001	0.002	0.004	0.01	0.01	0.01
Butadiene, 1,3-	µg/m ³	1,051	76%	0.05 ± 0.01	ND	ND	0.01	0.03	0.05	0.09	0.13
Cadmium (PM ₁₀)	ng/m ³	1,049	100%	0.14 ± 0.01	0.03	0.04	0.07	0.10	0.17	0.25	0.35
Carbon Tetrachloride	µg/m ³	1,051	99%	0.65 ± 0.01	0.43	0.49	0.56	0.63	0.73	0.85	0.95
Chloroform	µg/m ³	1,051	96%	1.57 ± 0.33	0.11	0.15	0.24	0.44	0.95	2.23	4.27
Formaldehyde	µg/m ³	1,082	100%	2.18 ± 0.23	0.39	0.56	0.99	1.62	2.56	3.76	4.84
Lead (PM ₁₀)	ng/m ³	1,049	100%	3.61 ± 0.31	0.88	1.08	1.72	2.69	4.31	6.73	8.64
Manganese (PM ₁₀)	ng/m ³	1,049	100%	8.23 ± 0.45	1.90	2.48	3.64	5.89	9.87	16.73	22.54
Naphthalene	ng/m ³	849	100%	80.01 ± 6.23	12.76	17.17	27.22	48.32	97.21	178.22	243.58
Nickel (PM ₁₀)	ng/m ³	1,049	100%	1.16 ± 0.04	0.54	0.61	0.76	0.99	1.34	1.81	2.35
Tetrachloroethylene	µg/m ³	1,051	85%	0.31 ± 0.09	ND	ND	0.08	0.13	0.24	0.44	0.67
Trichloroethylene	µg/m ³	1,051	46%	0.16 ± 0.17	ND	ND	ND	ND	0.08	0.20	0.34
Vinyl Chloride	µg/m ³	1,051	10%	0.0021 ± 0.0005	ND	ND	ND	ND	ND	ND	0.02

^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

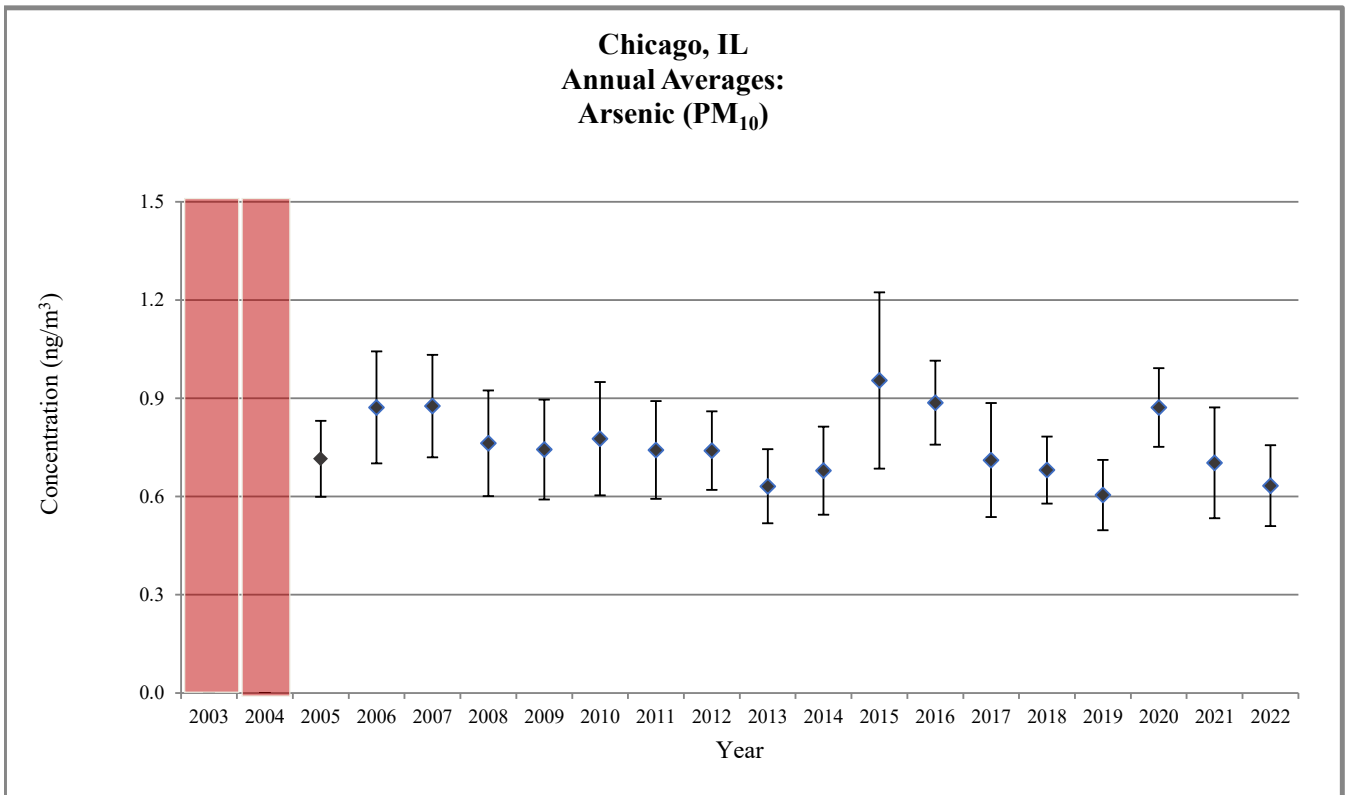
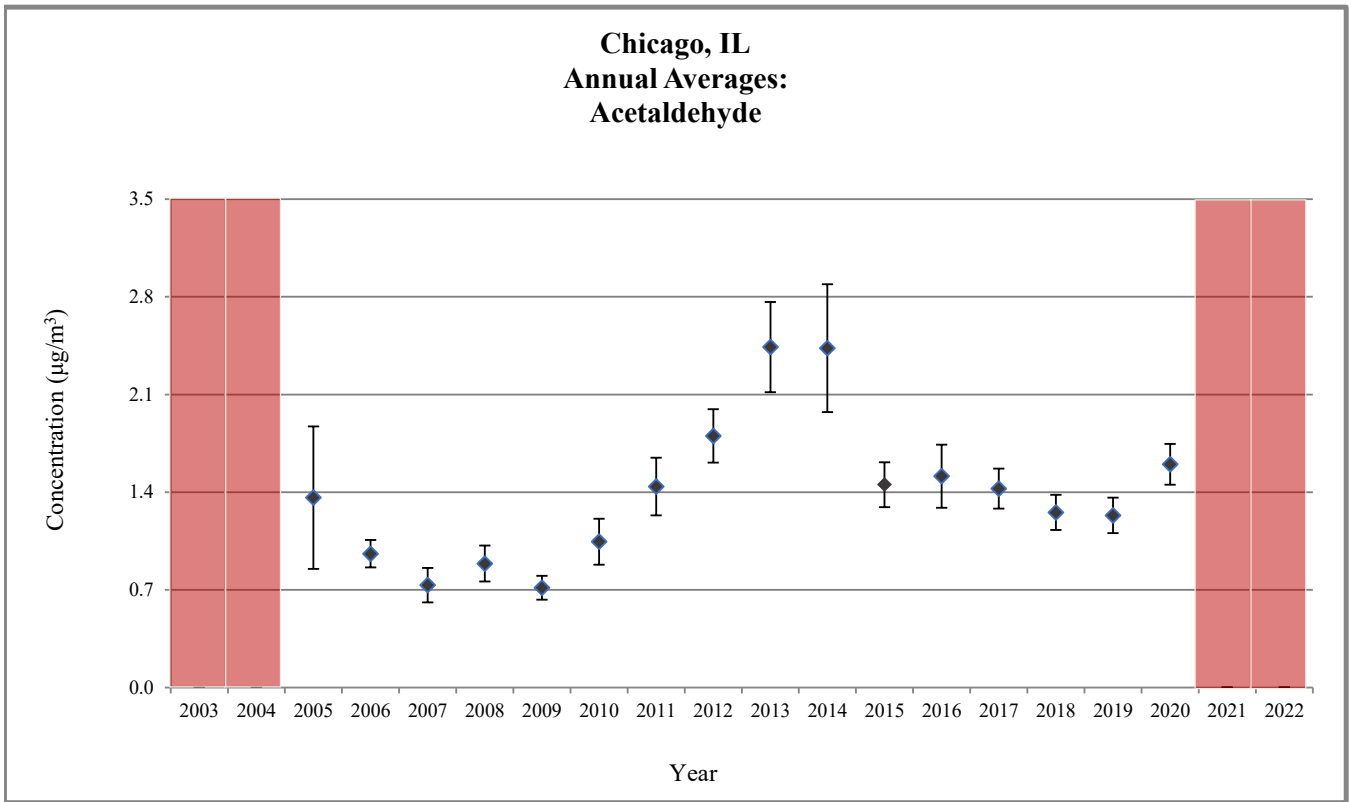
Pollutant Group	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
VOCs	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG
Carbonyls	IEPA	IEPA	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG
PM ₁₀ Metals	--	--	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG
PAHs	--	--	--	--	--	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG

--: Not Applicable

ERG: Eastern Research Group, Inc.

IPA: Illinois Environmental Protection Agency

Figure 3. Chicago, IL Annual Average Concentrations





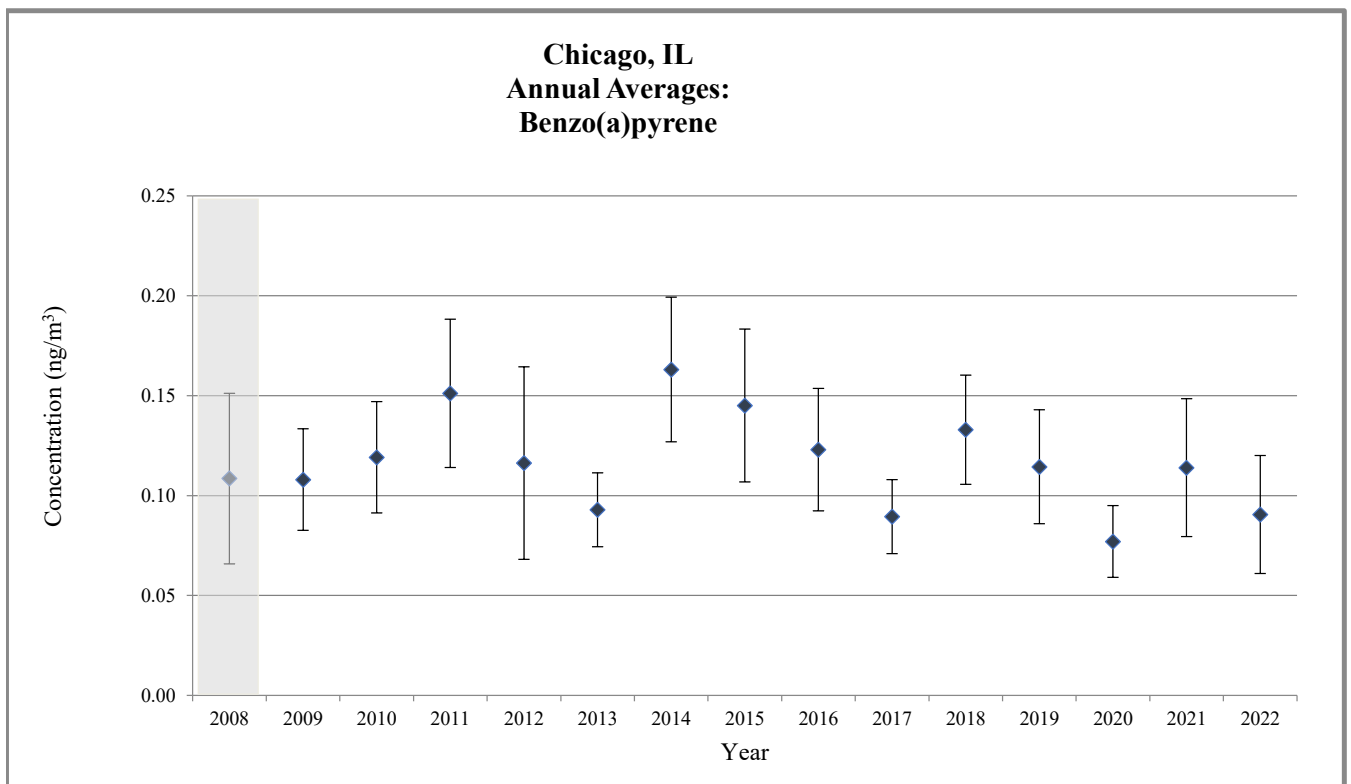
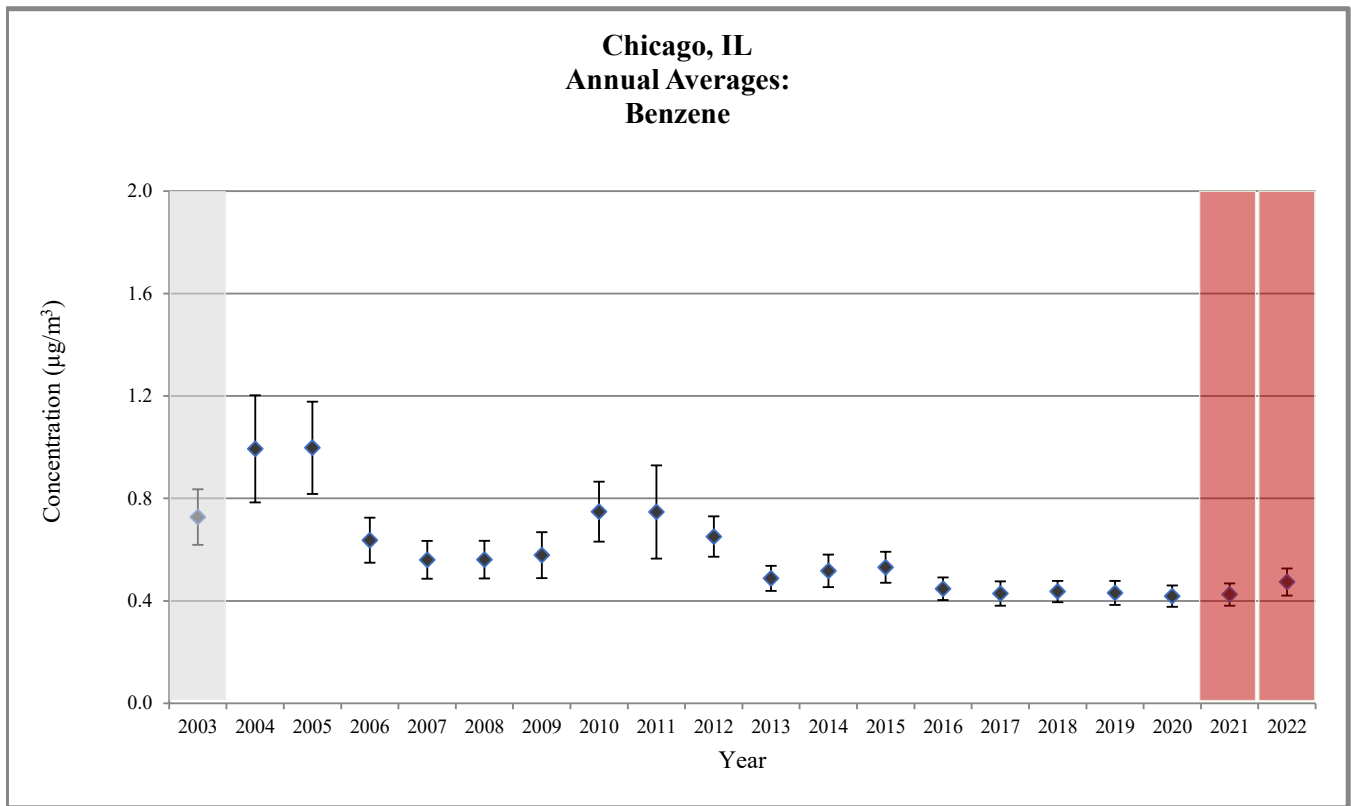
 Sampling began midway through the year.
 Does not meet MQO

Figure 3. Chicago, IL Annual Average Concentrations





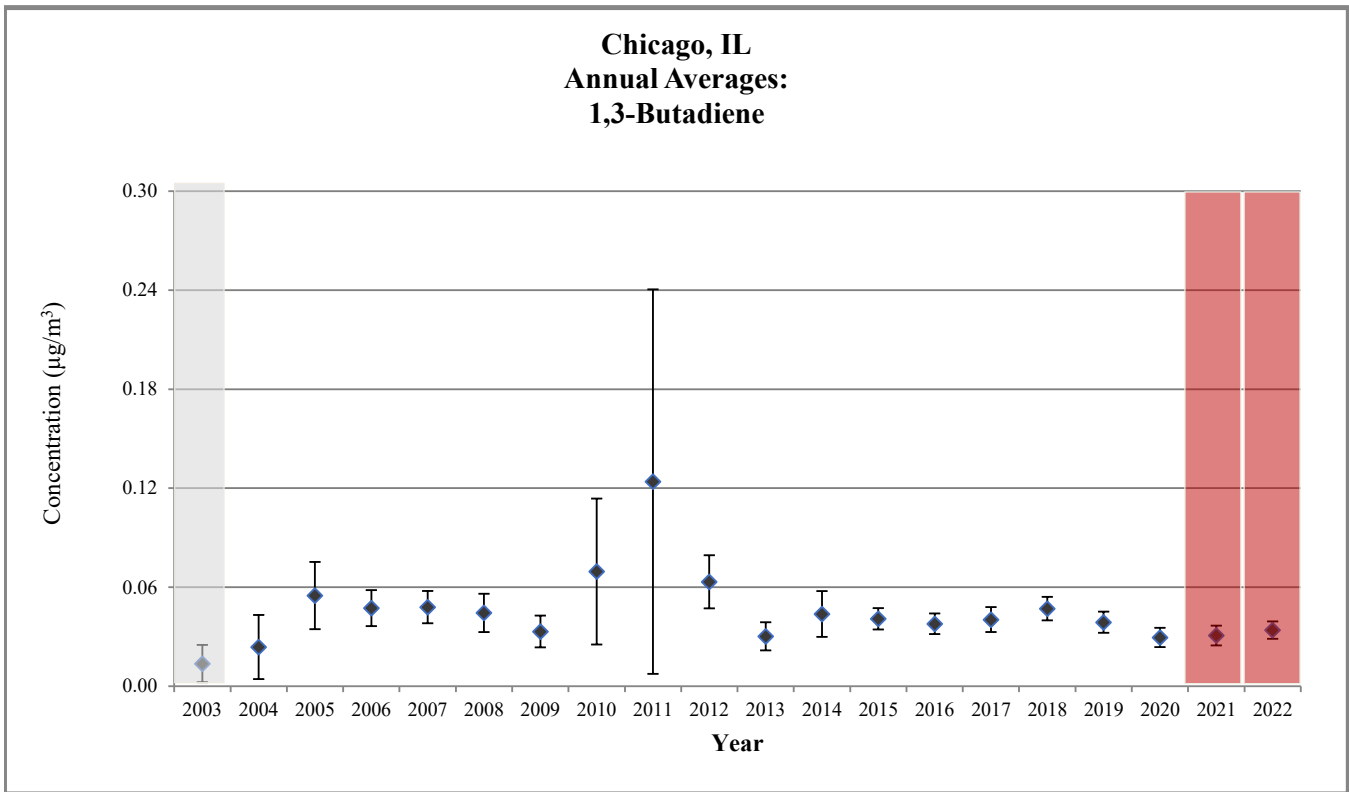
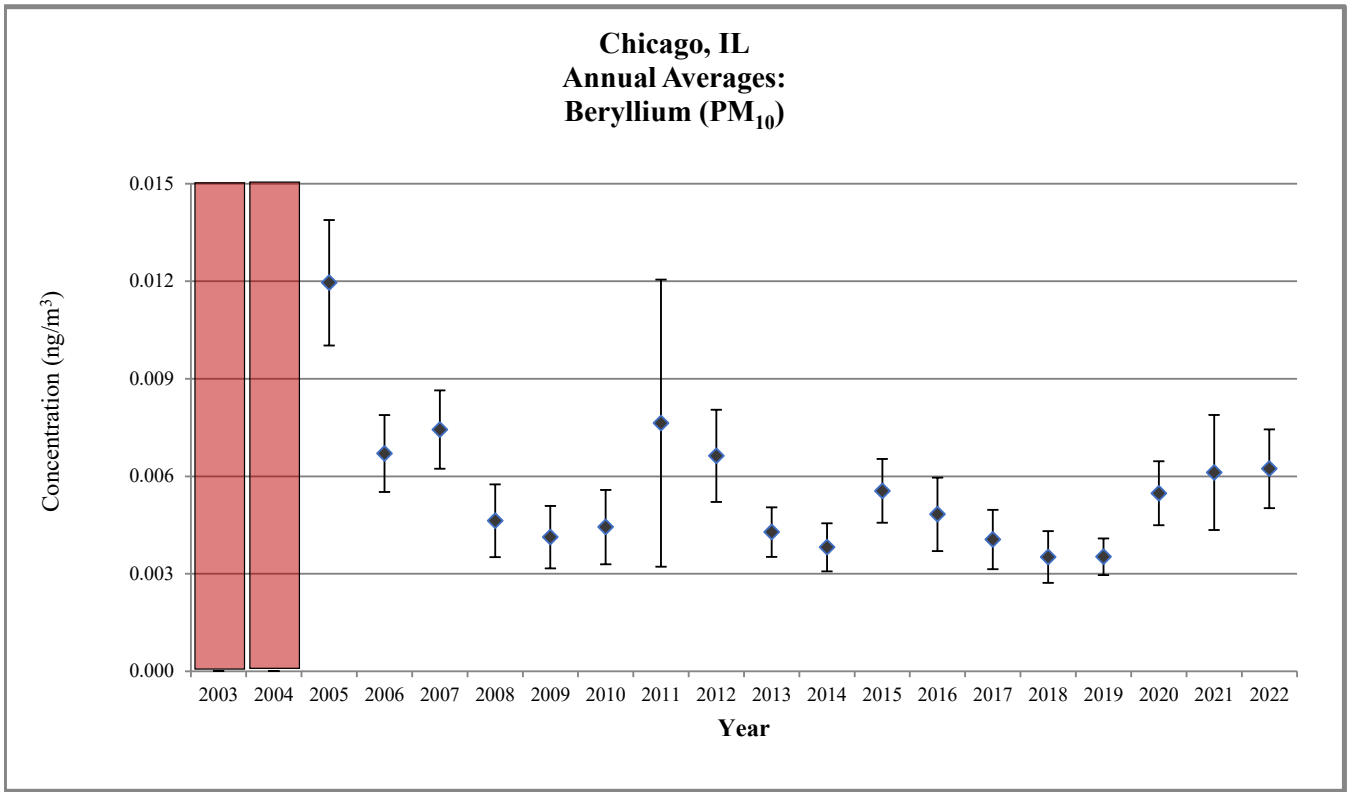
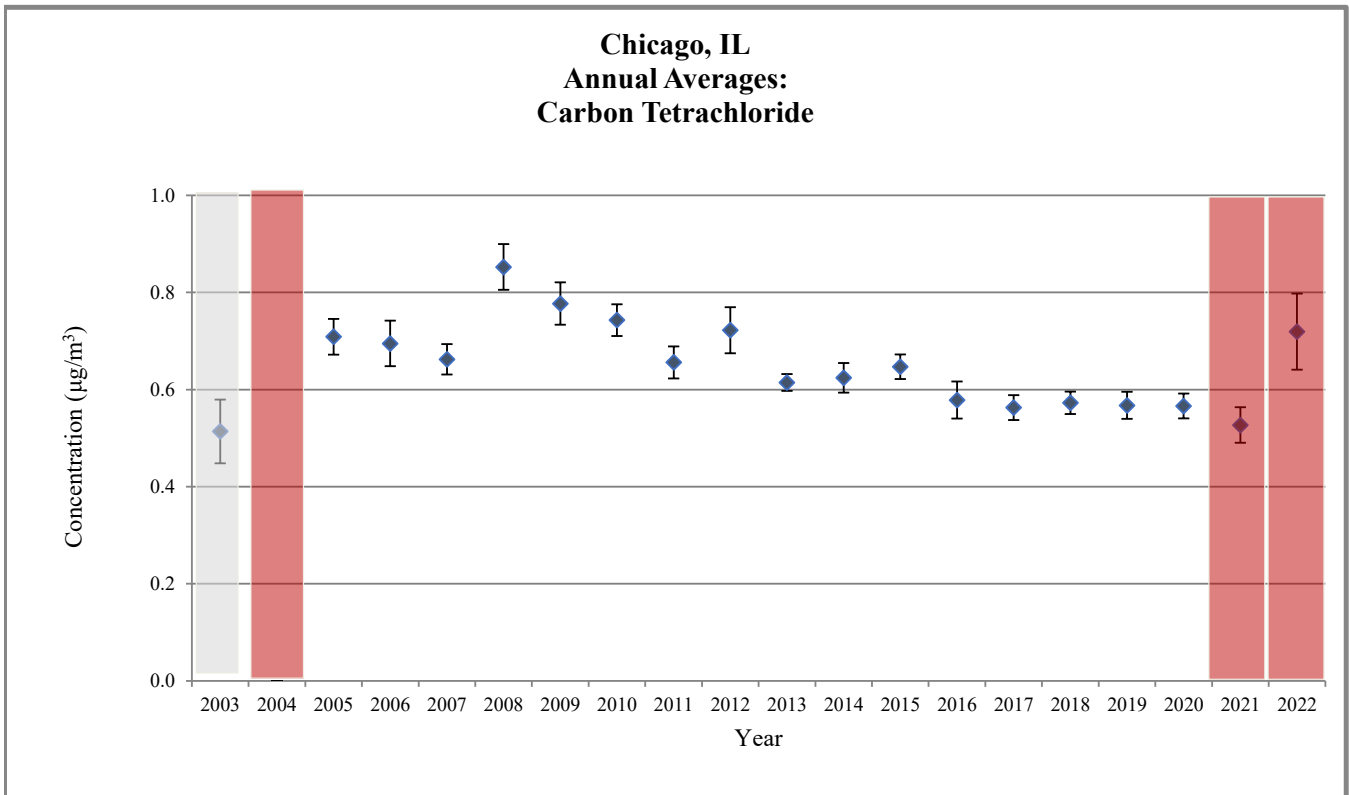
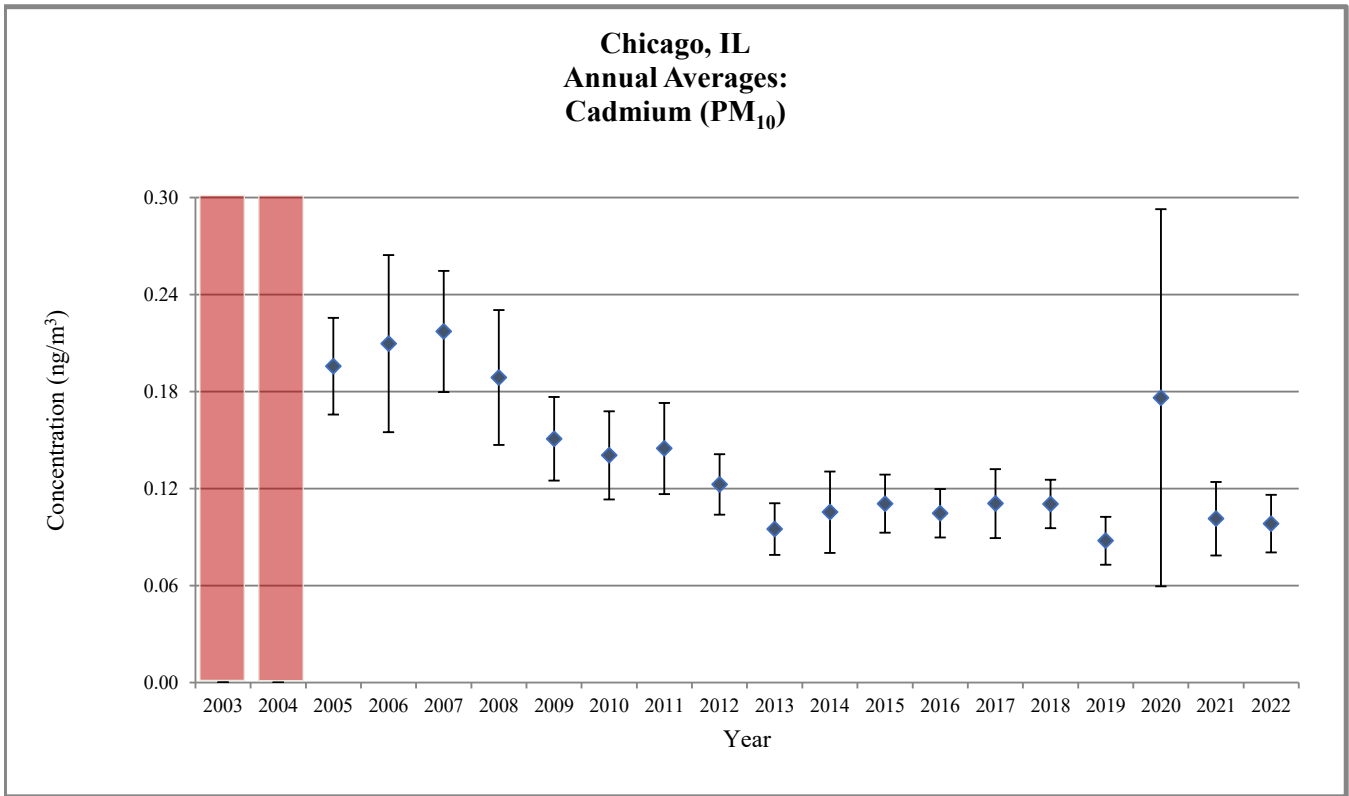
 Sampling began midway through the year.
 Does not meet MQO

Figure 3. Chicago, IL Annual Average Concentrations



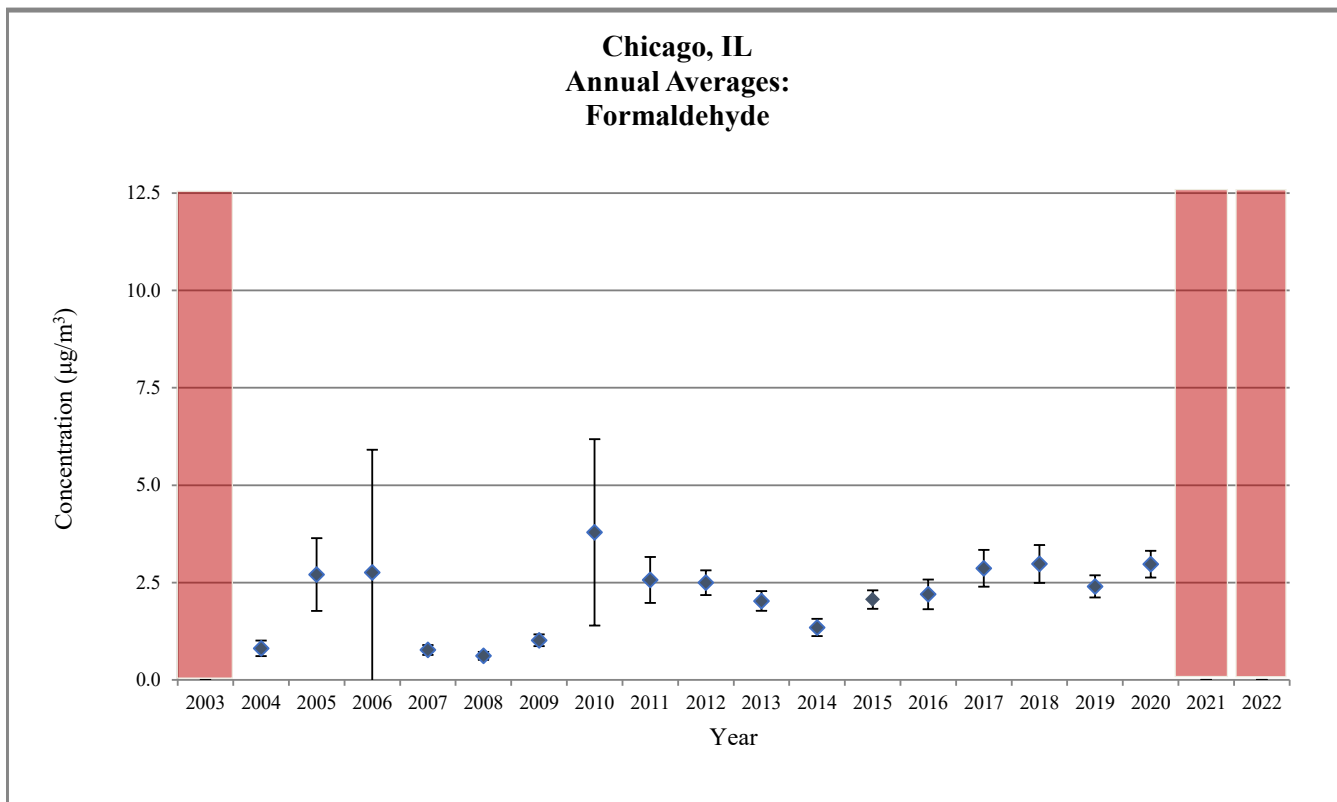
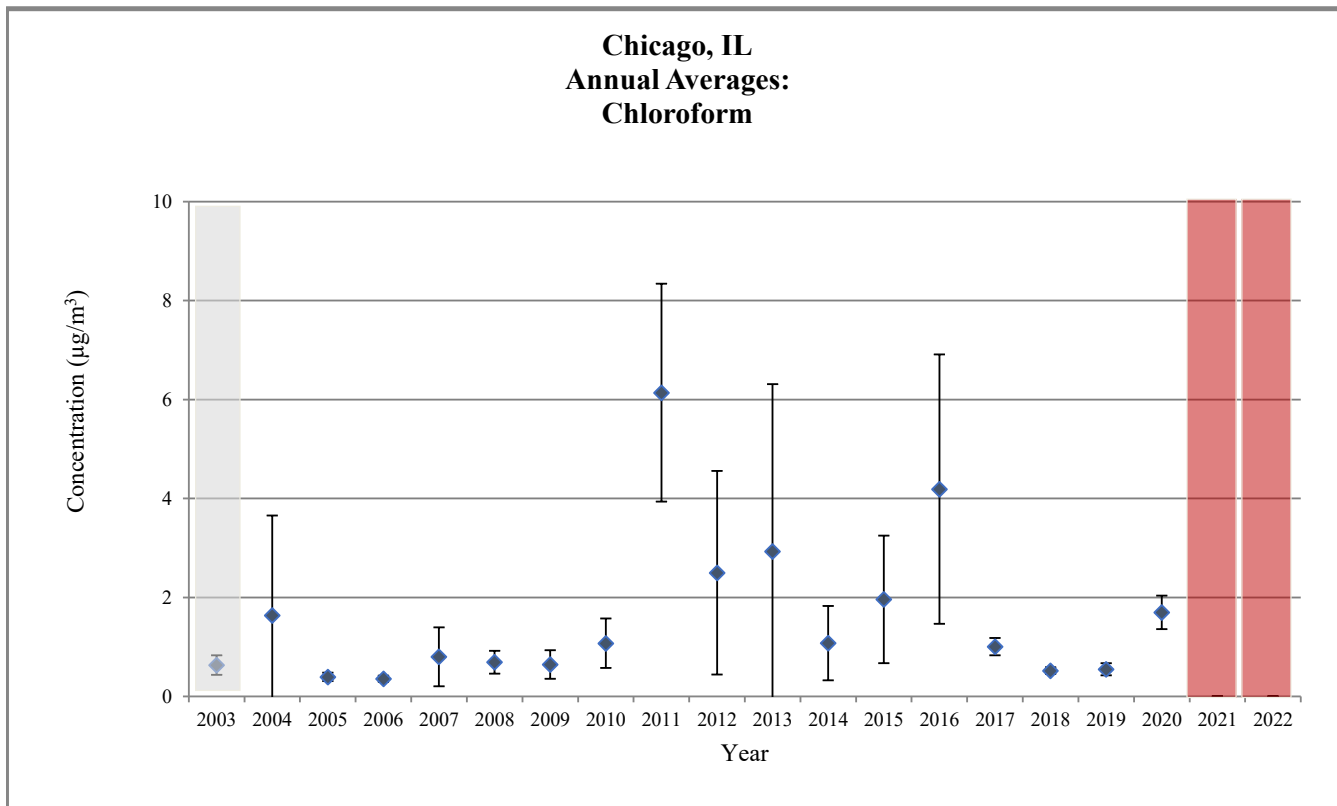
Sampling began midway through the year.
 Does not meet MQO

Figure 3. Chicago, IL Annual Average Concentrations



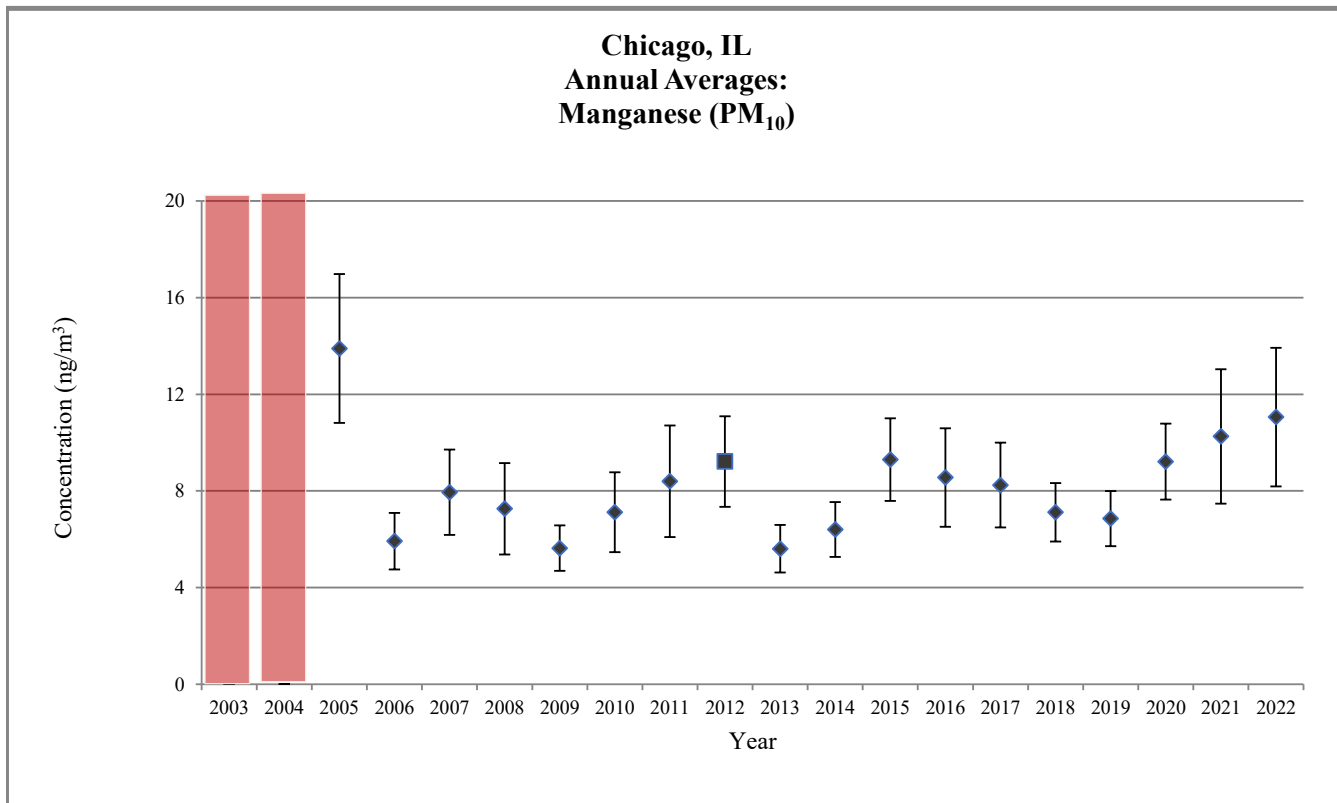
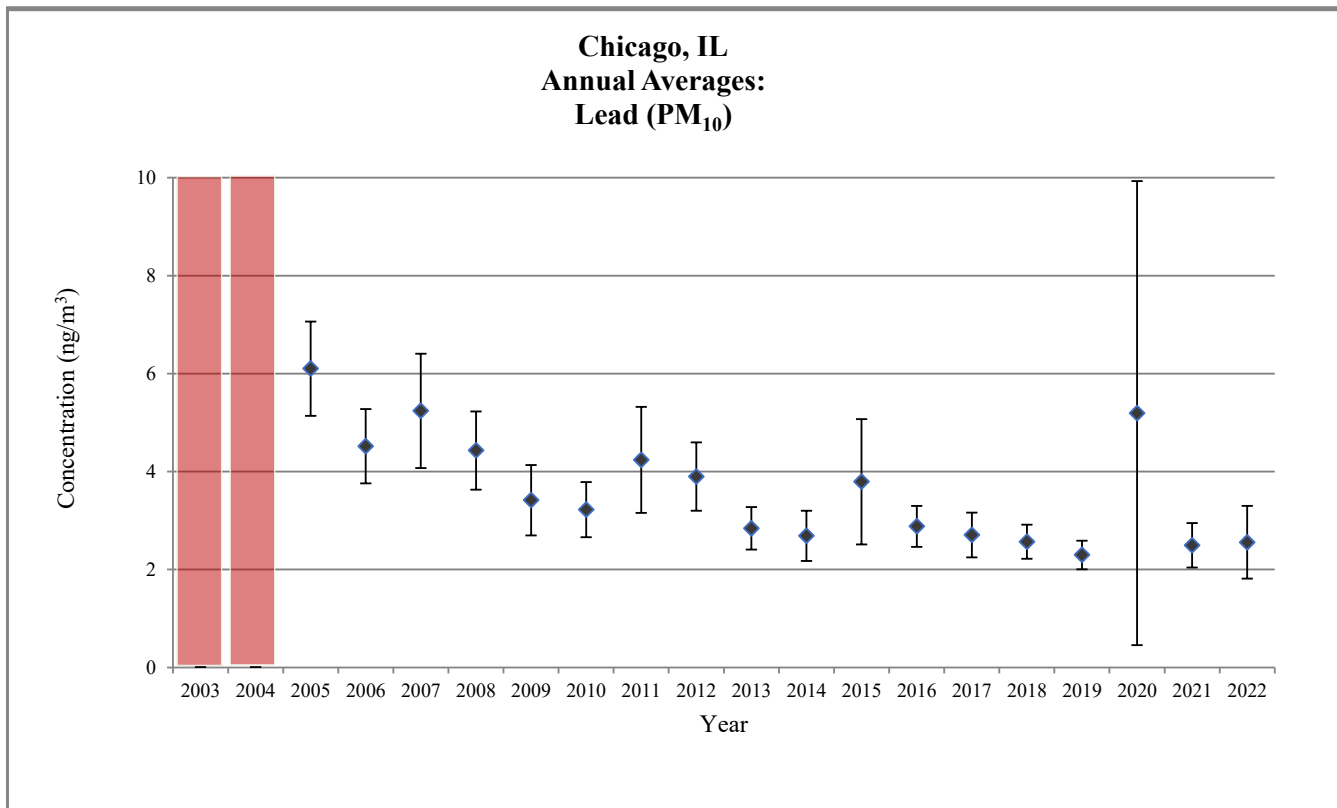
Sampling began midway through the year.
 Does not meet MQO

Figure 3. Chicago, IL Annual Average Concentrations



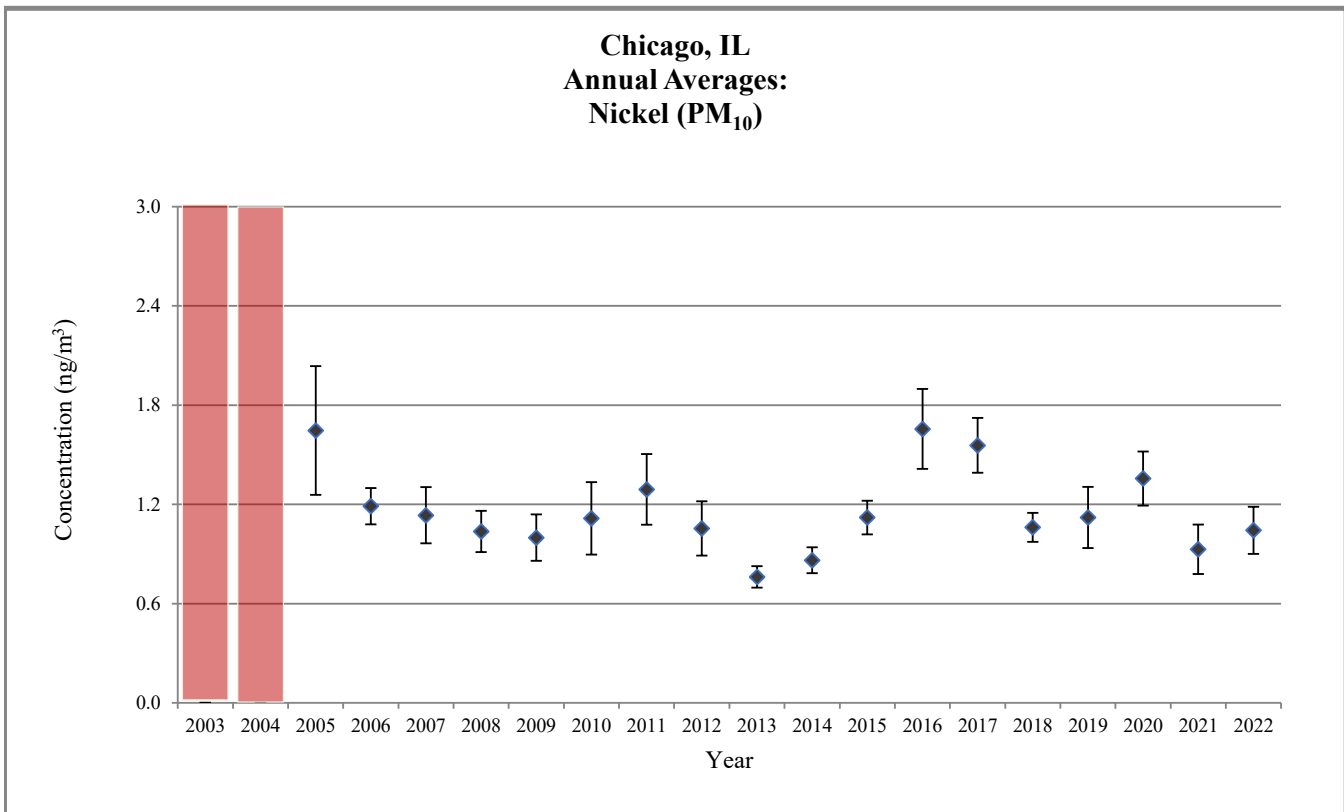
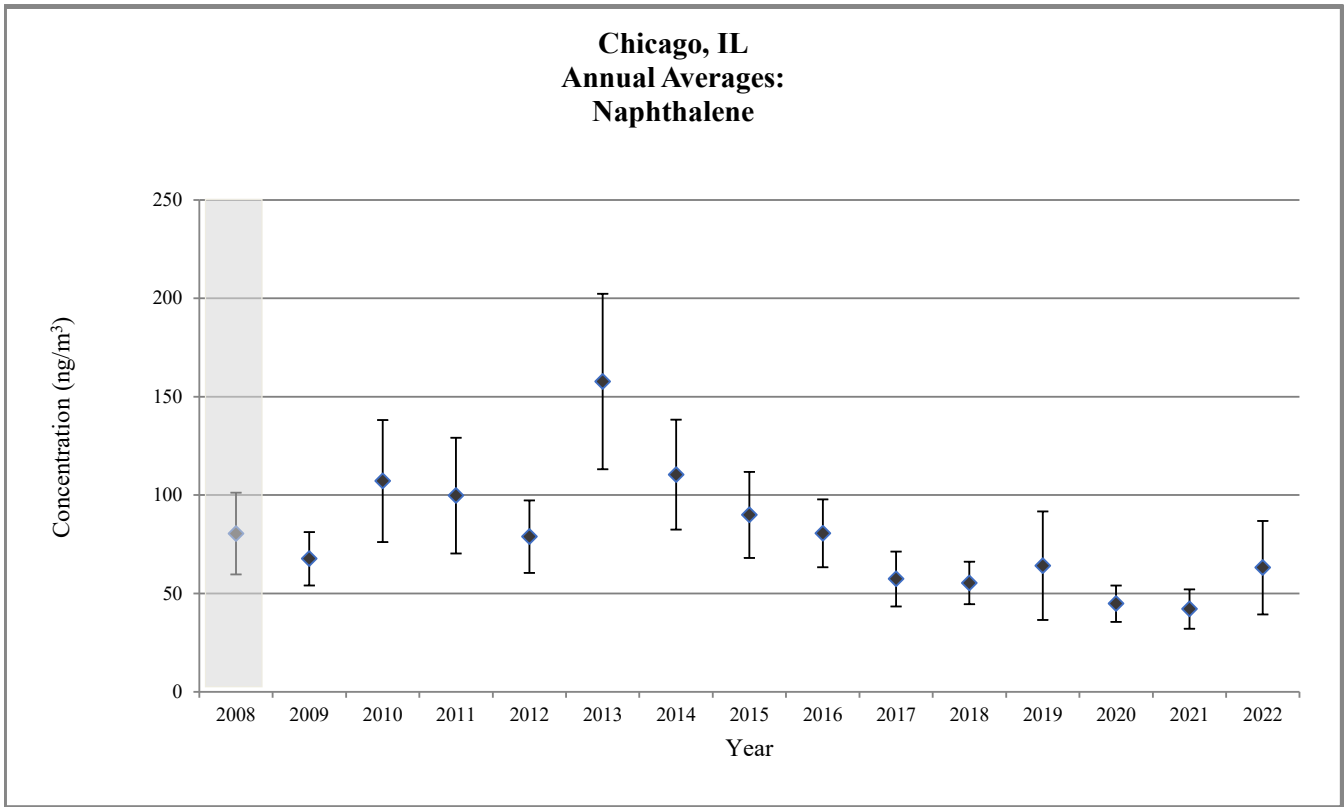
Sampling began midway through the year.
 Does not meet MQO

Figure 3. Chicago, IL Annual Average Concentrations



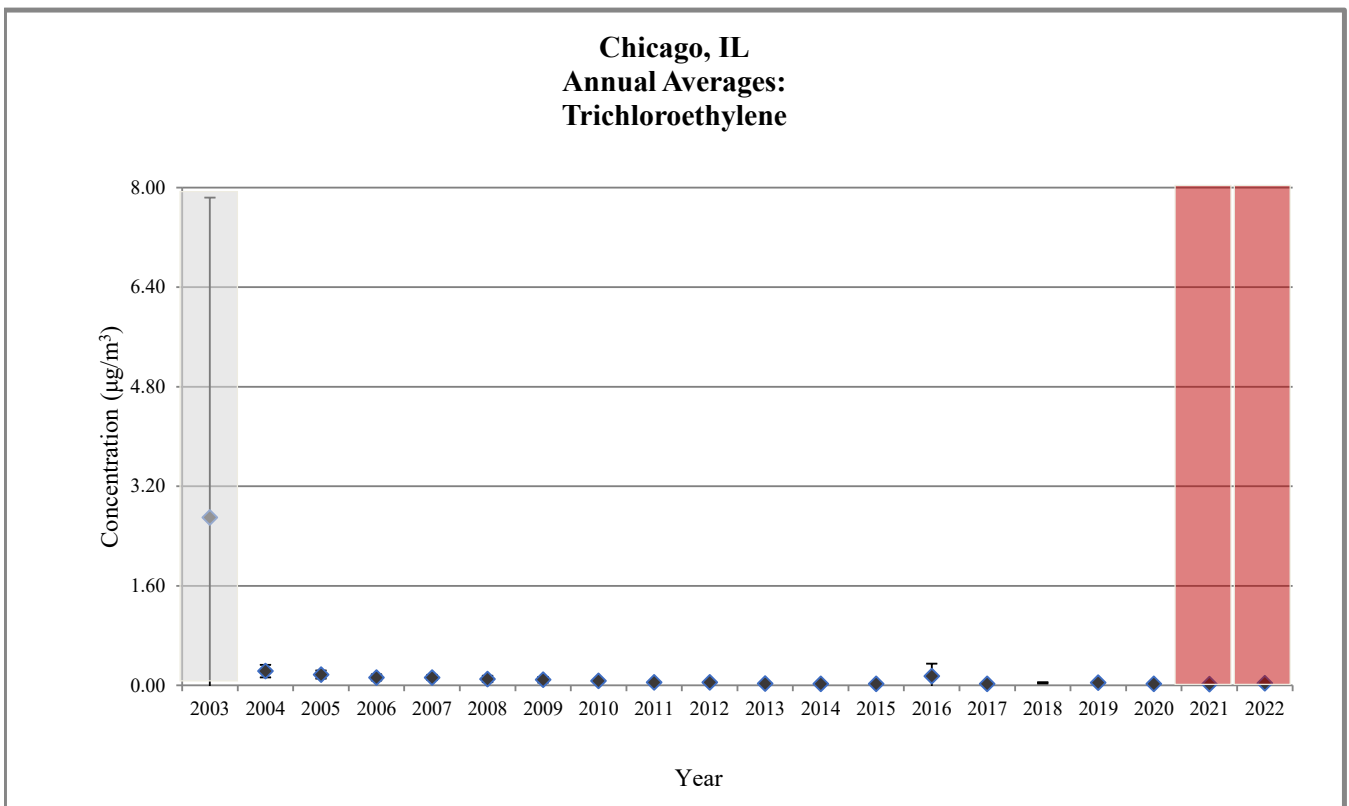
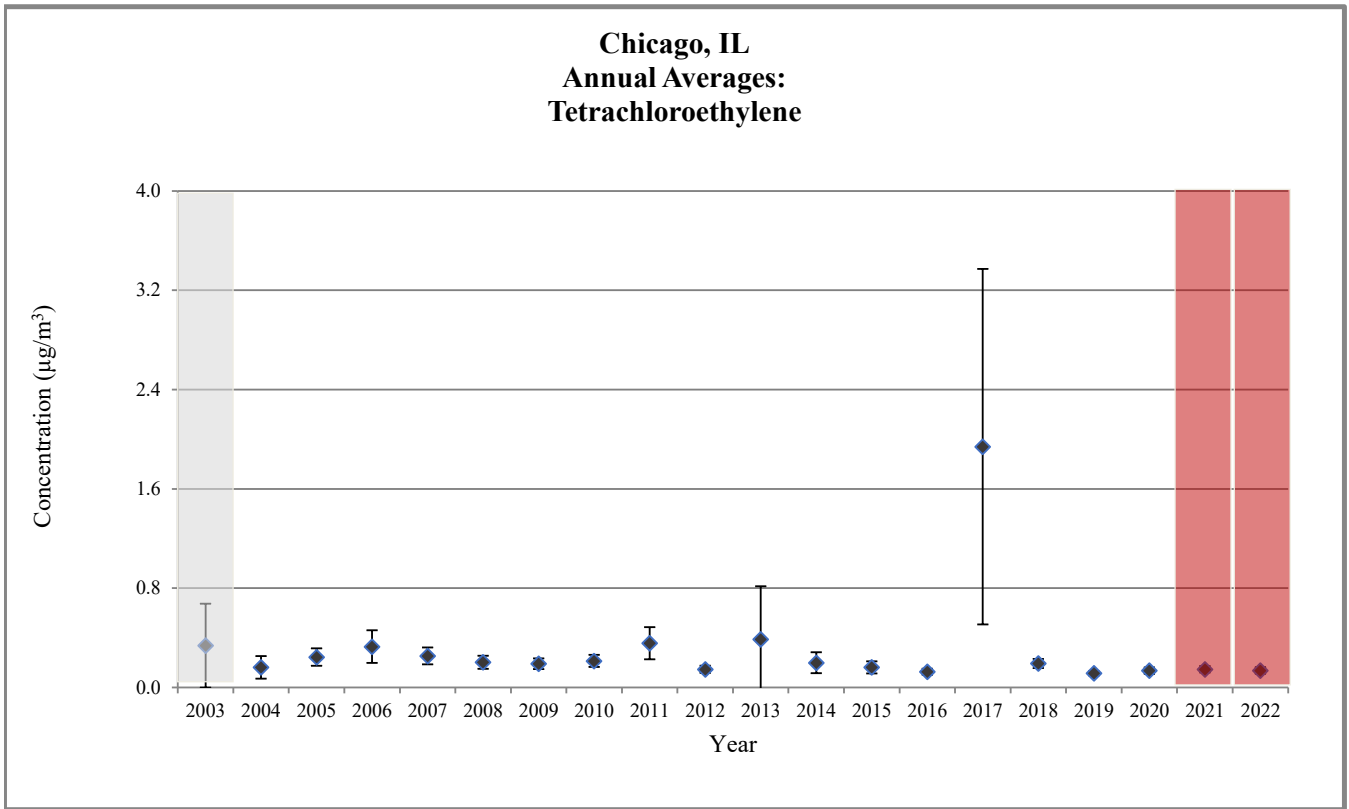
Sampling began midway through the year.
 Does not meet MQO

Figure 3. Chicago, IL Annual Average Concentrations



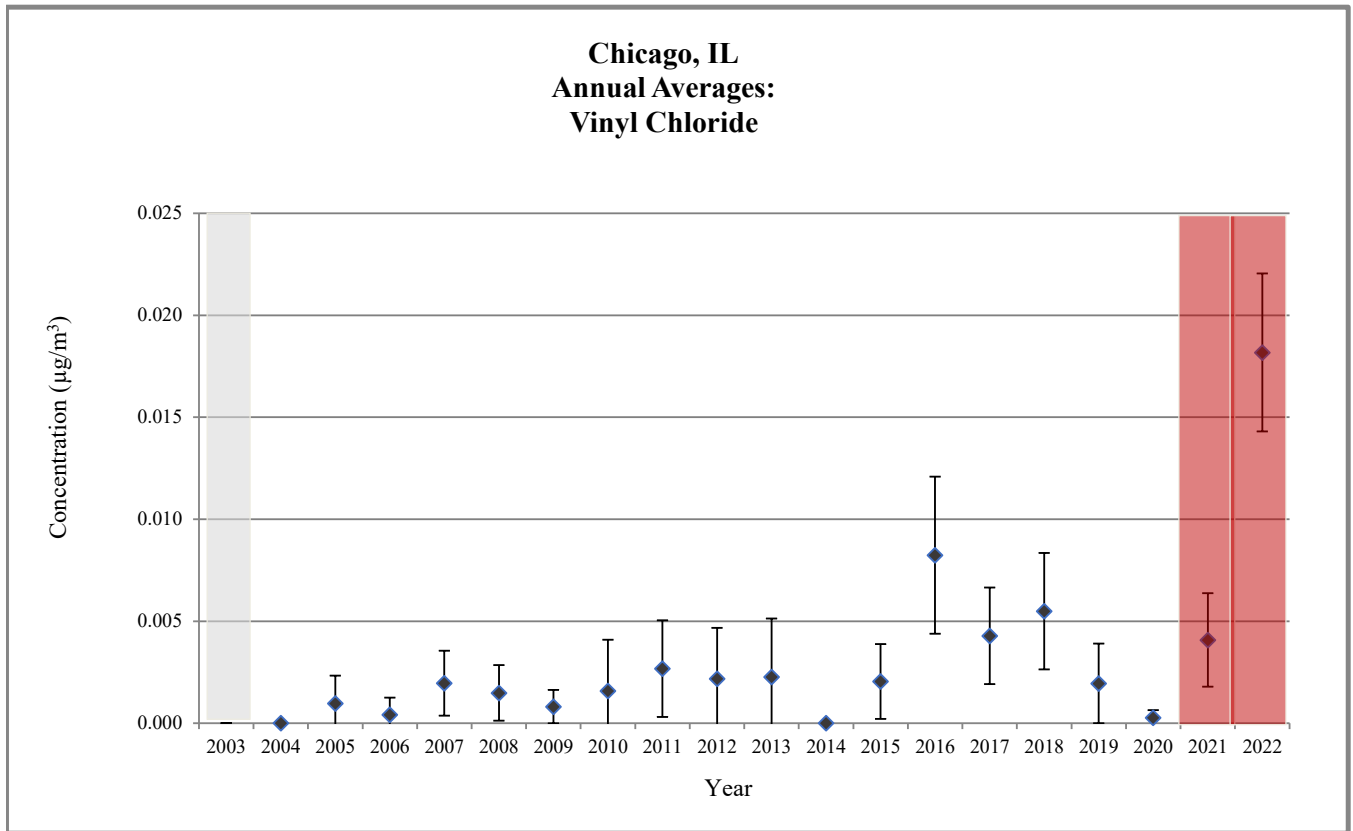
Sampling began midway through the year.
 Does not meet MQO


Figure 3. Chicago, IL Annual Average Concentrations



Sampling began midway through the year.
 Does not meet MQO

Figure 3. Chicago, IL Annual Average Concentrations



 Sampling began midway through the year.


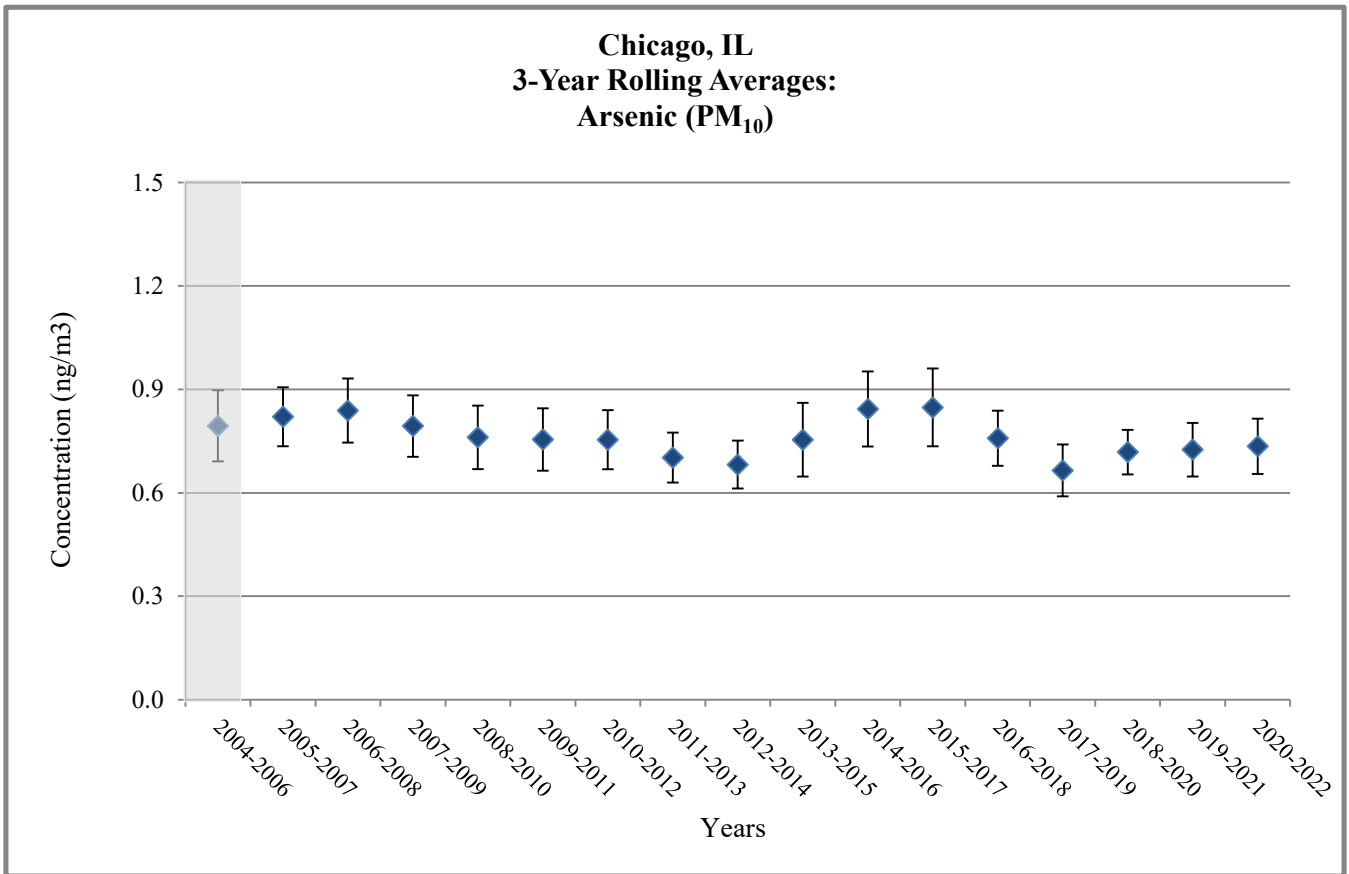
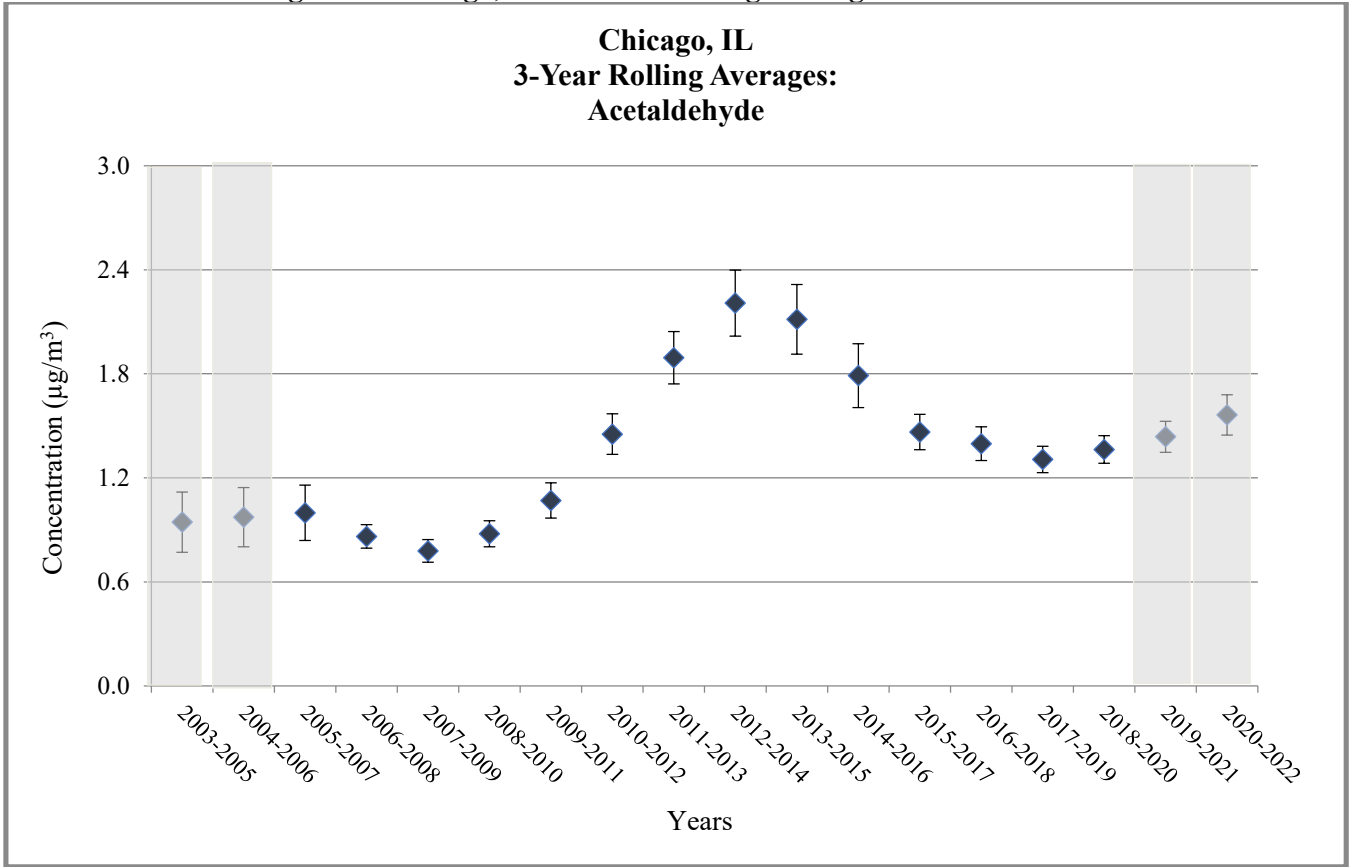
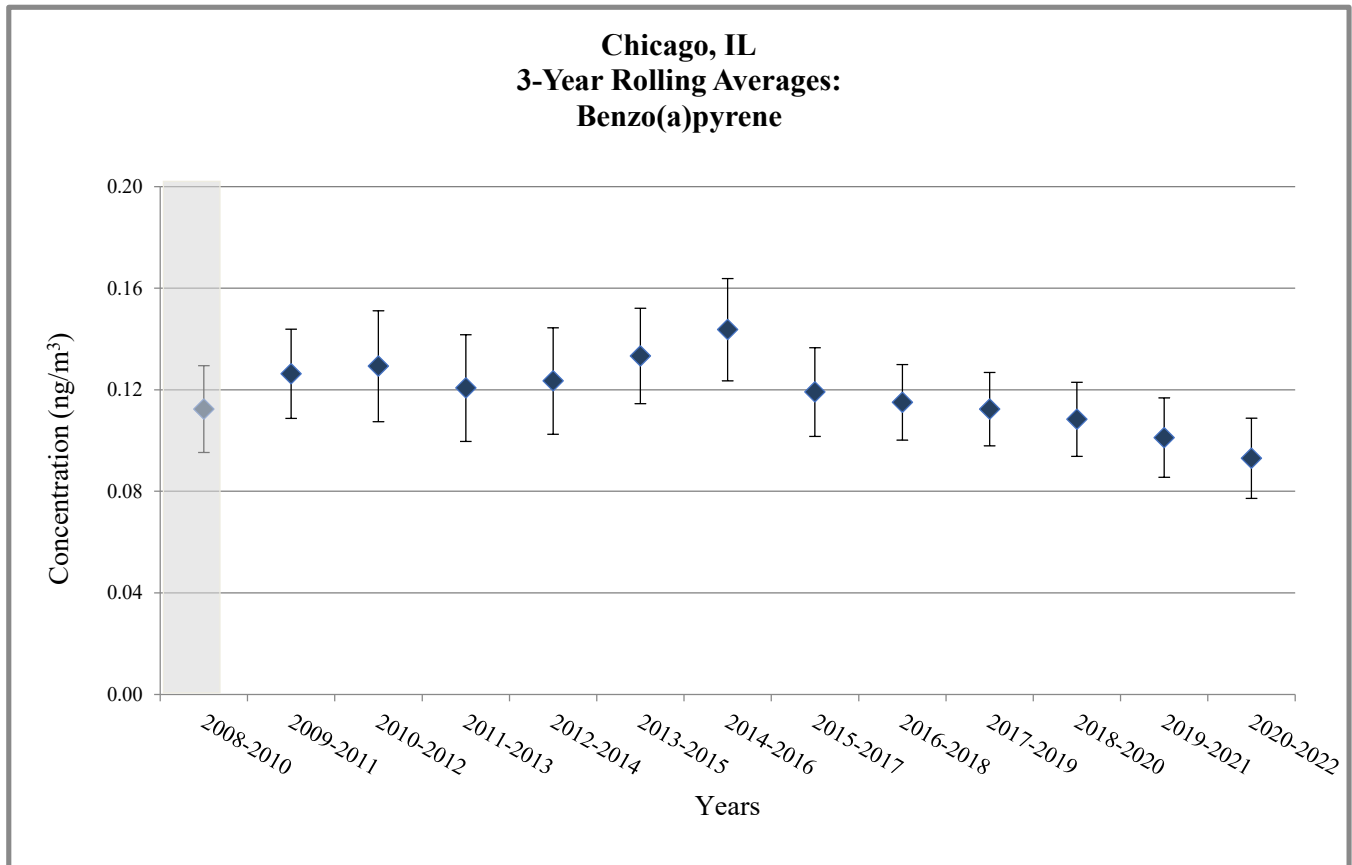
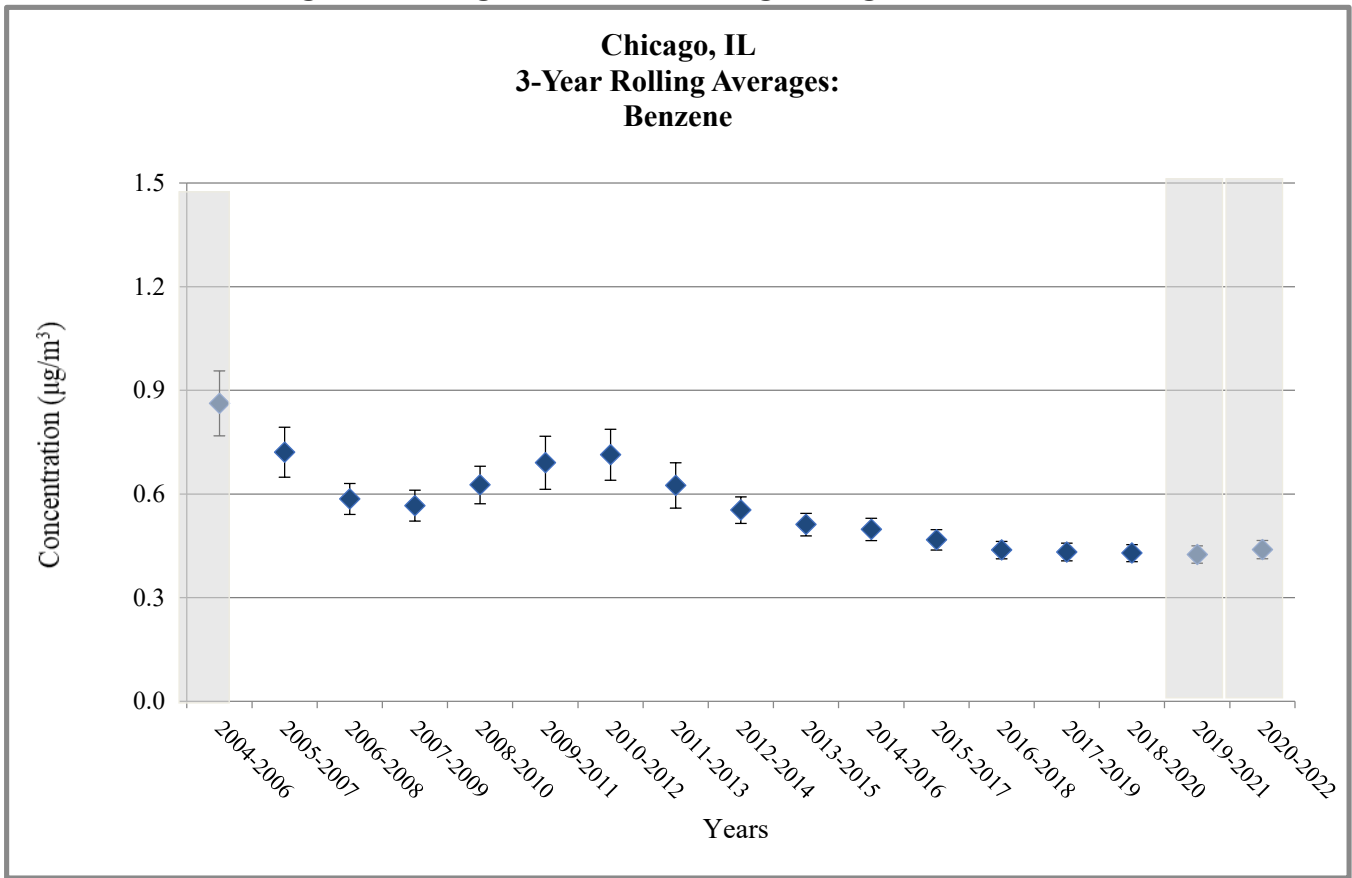
 Does not meet MQO

Figure 4. Chicago, IL - 3-Year Rolling Average Concentrations



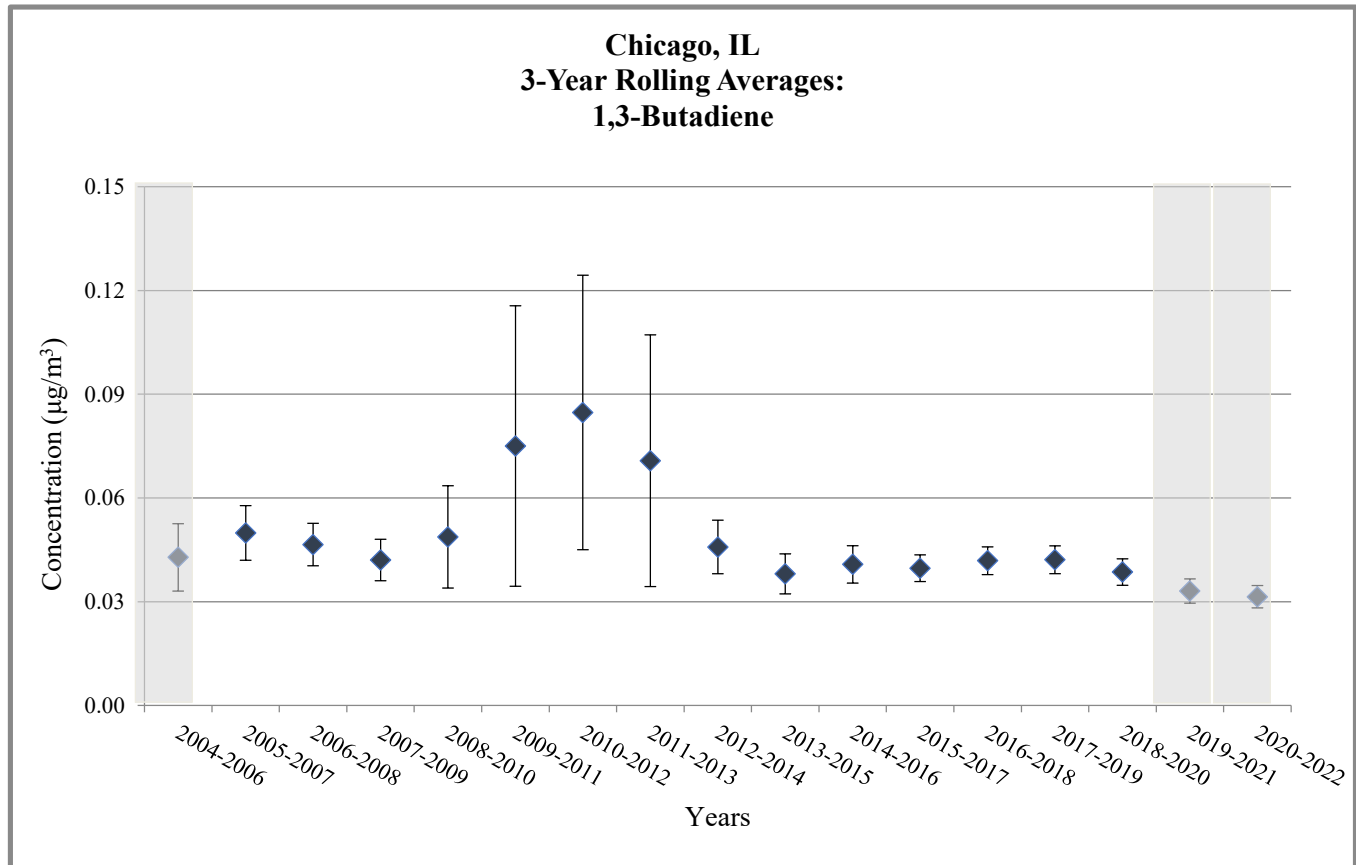
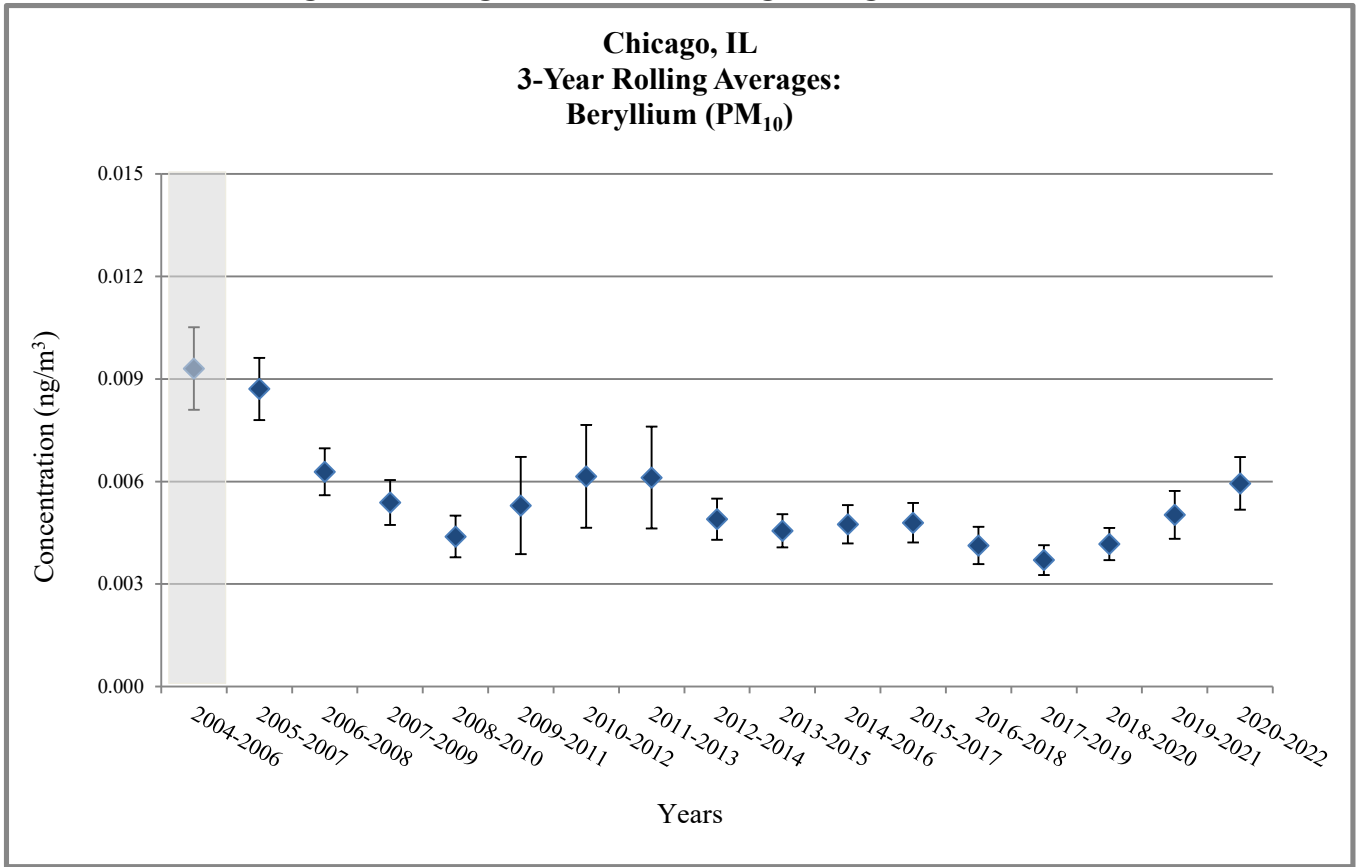
Does not meet MQO or wasn't able to collect enough samples

Figure 4. Chicago, IL - 3-Year Rolling Average Concentrations



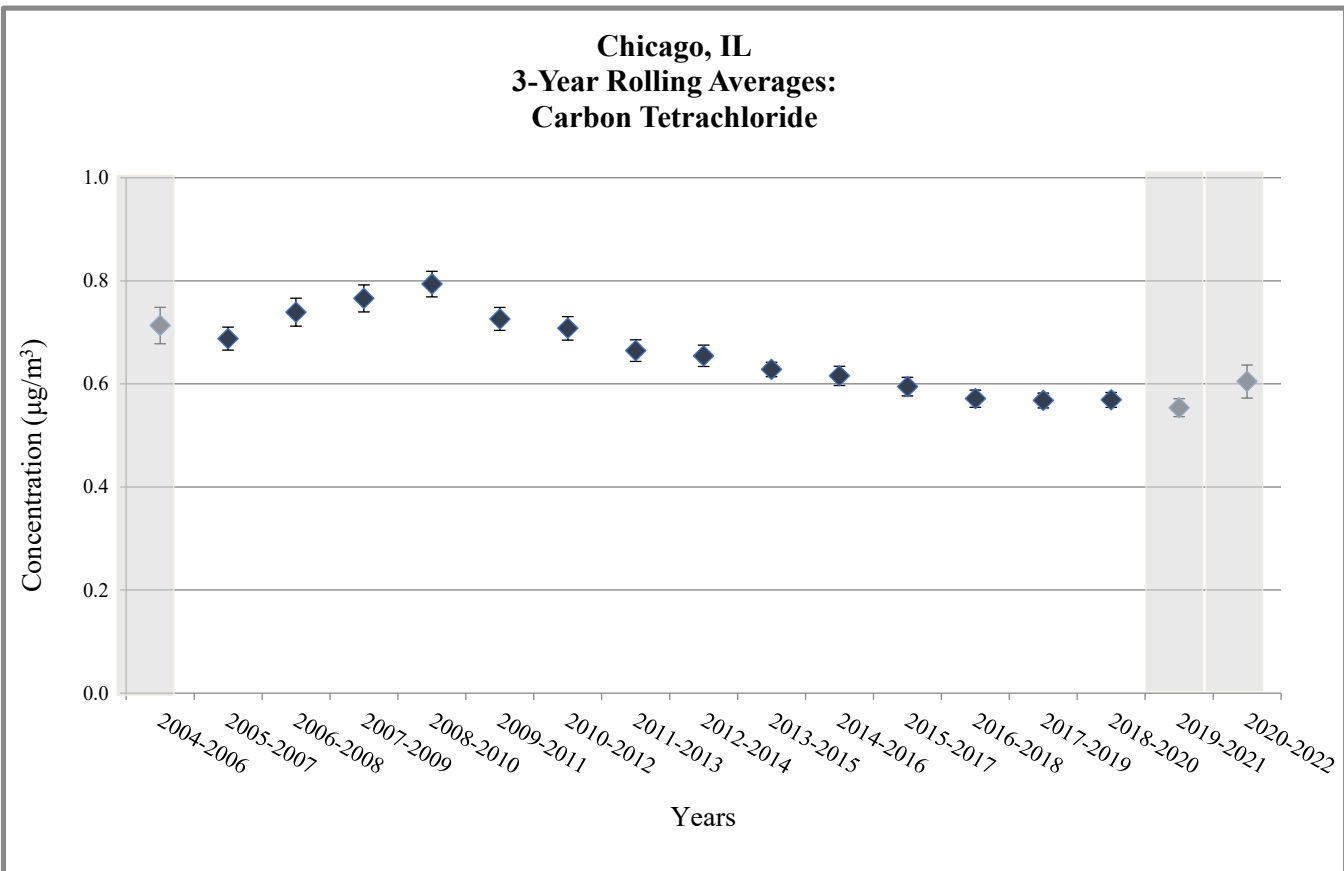
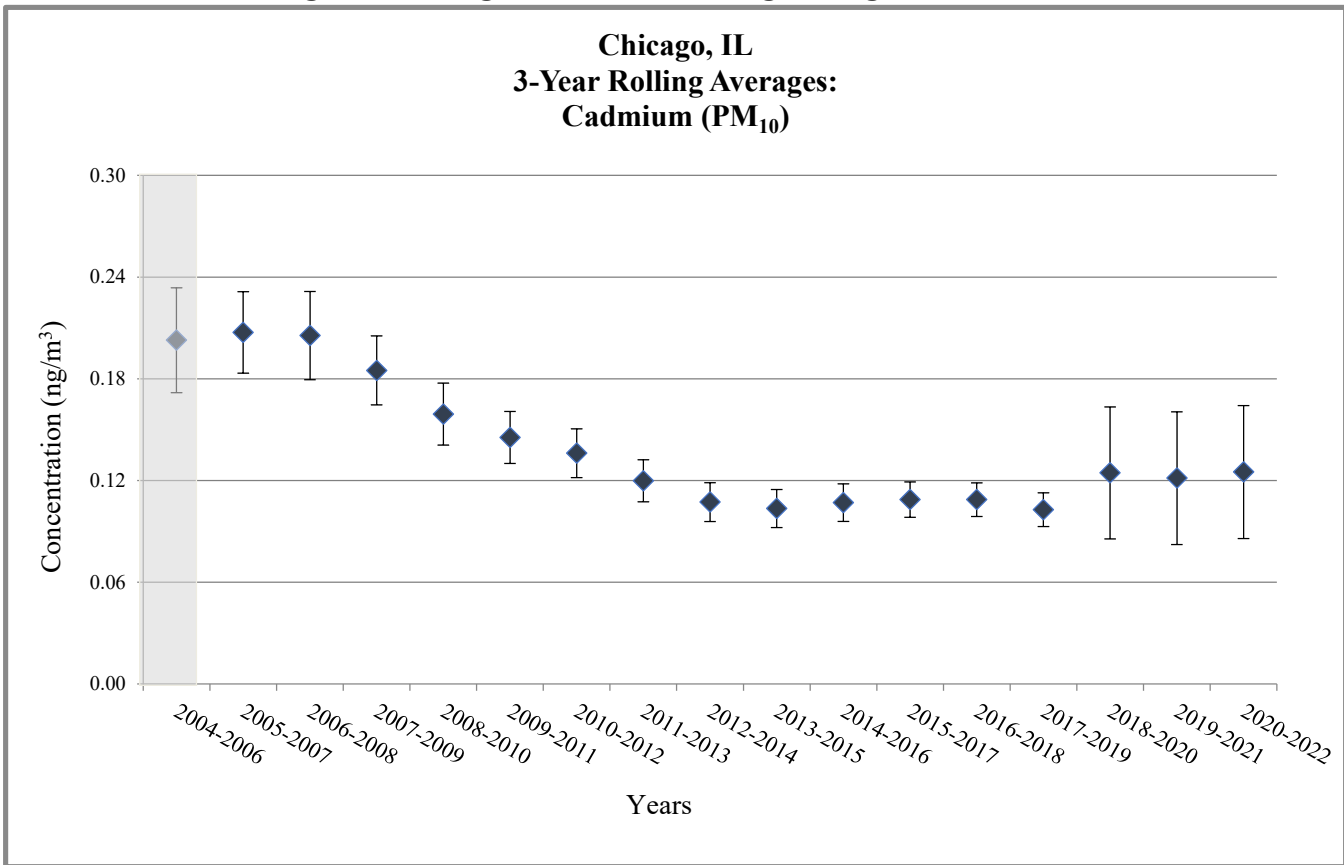
Does not meet MQO or wasn't able to collect enough samples

Figure 4. Chicago, IL - 3-Year Rolling Average Concentrations



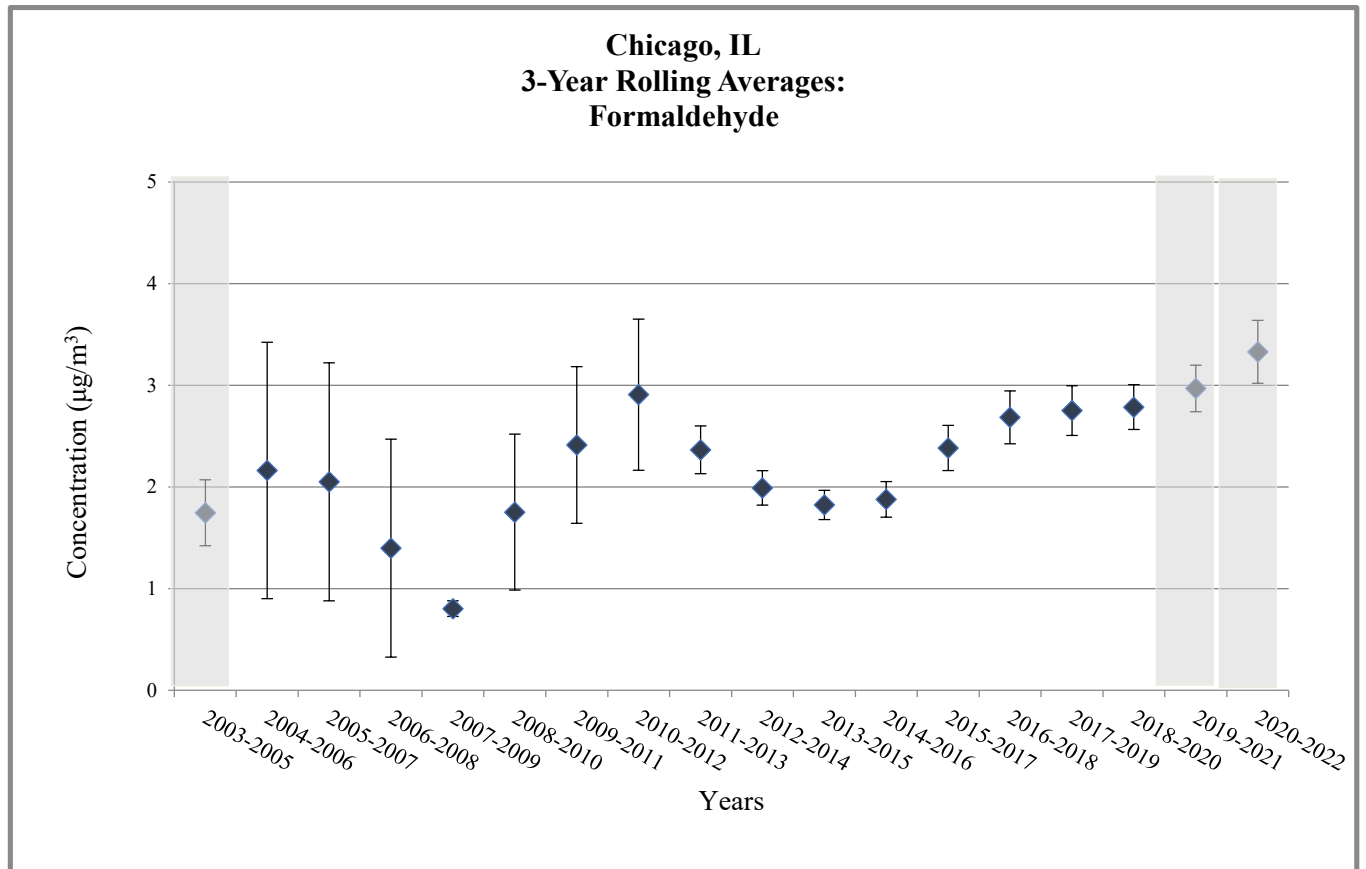
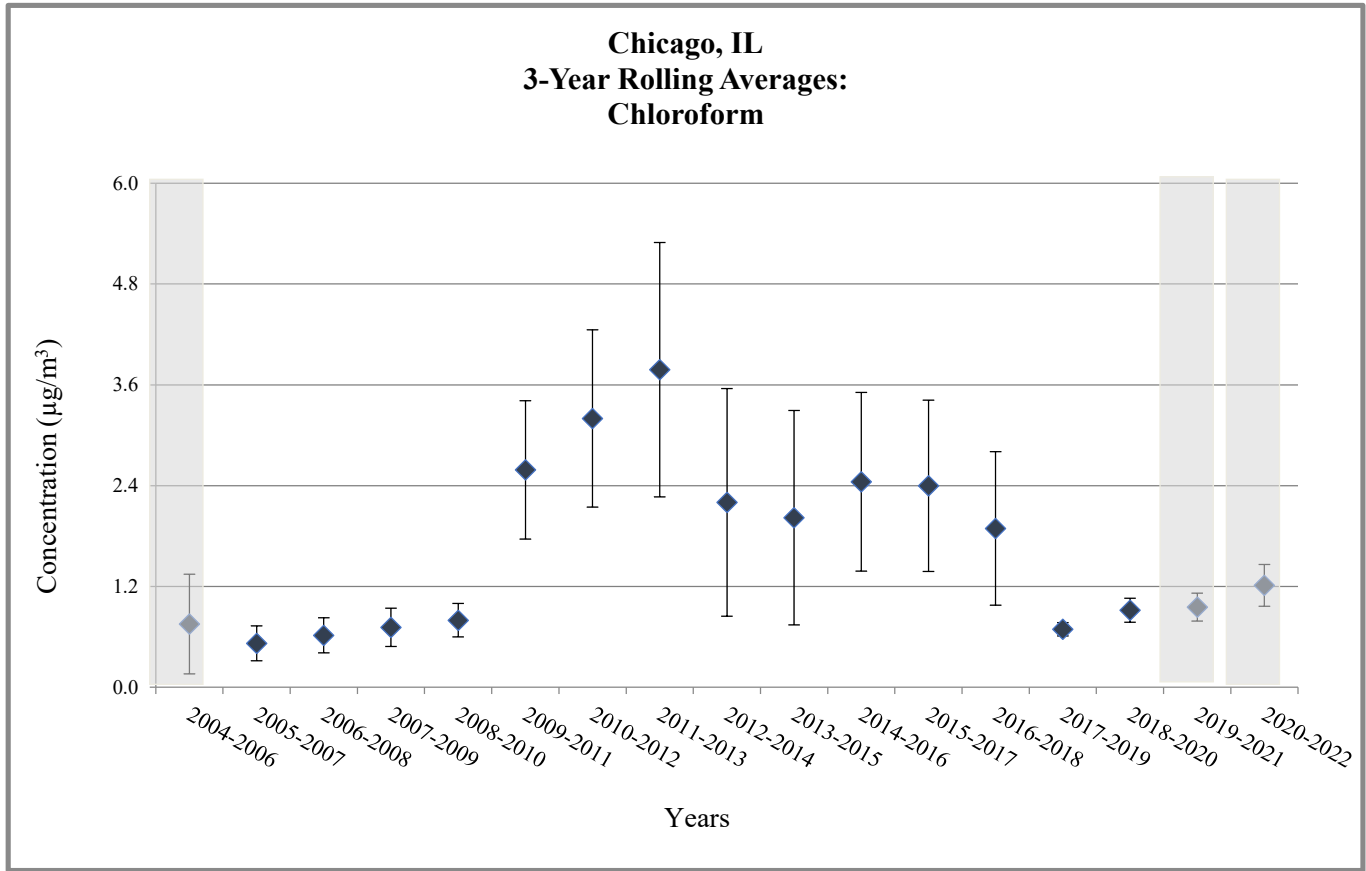
Does not meet MQO or wasn't able to collect enough samples

Figure 4. Chicago, IL - 3-Year Rolling Average Concentrations



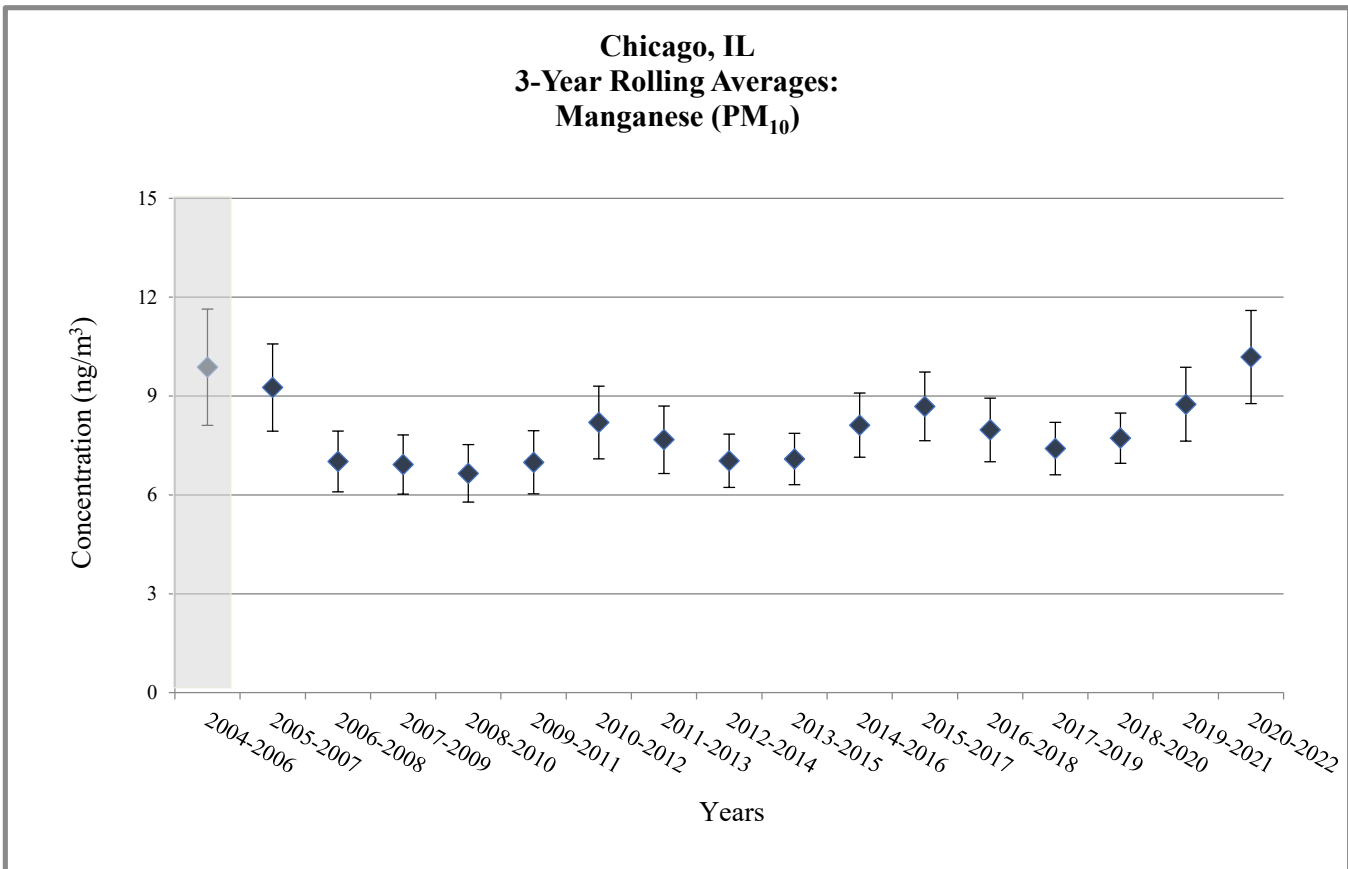
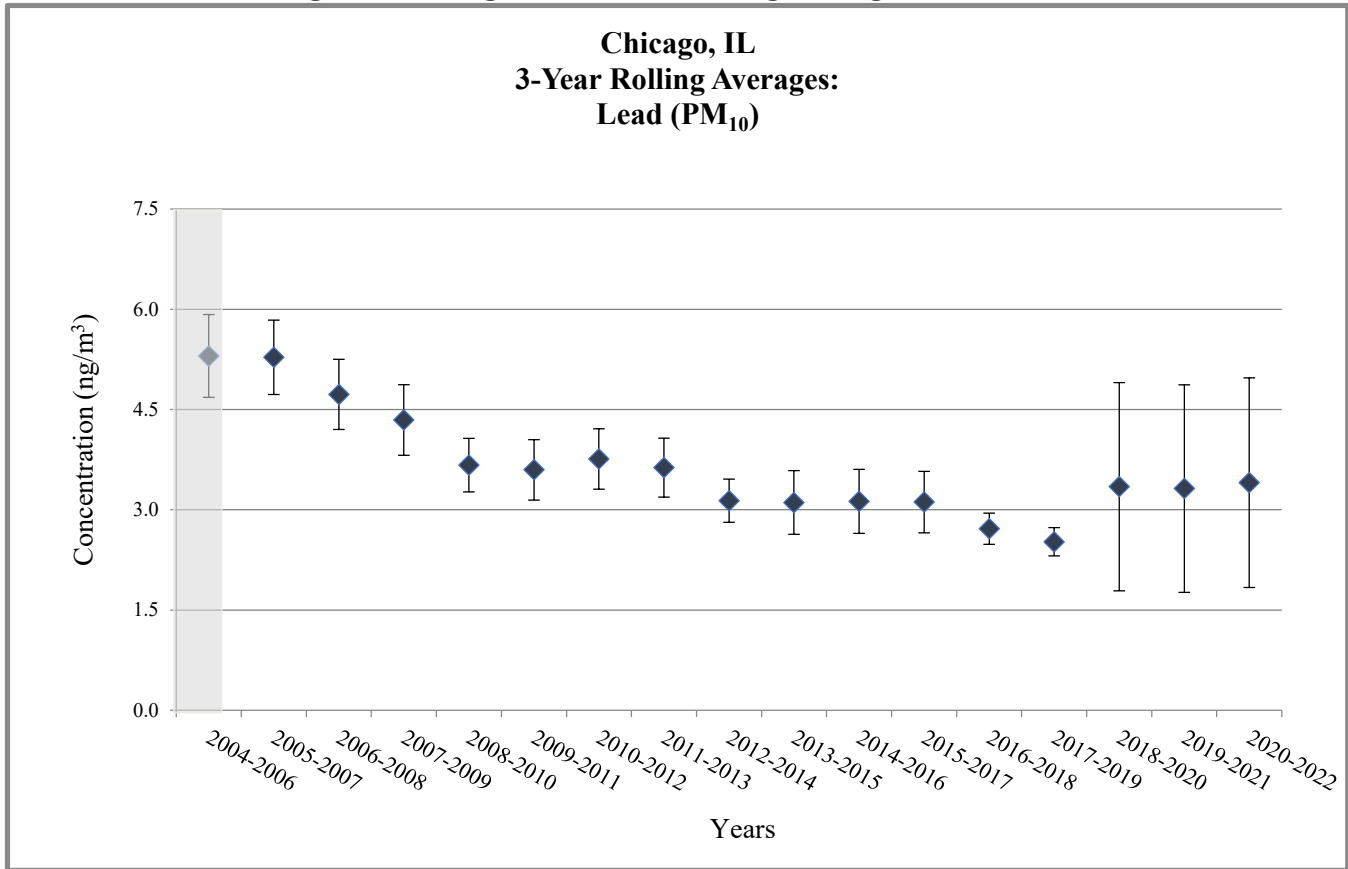
Does not meet MQO or wasn't able to collect enough samples

Figure 4. Chicago, IL - 3-Year Rolling Average Concentrations



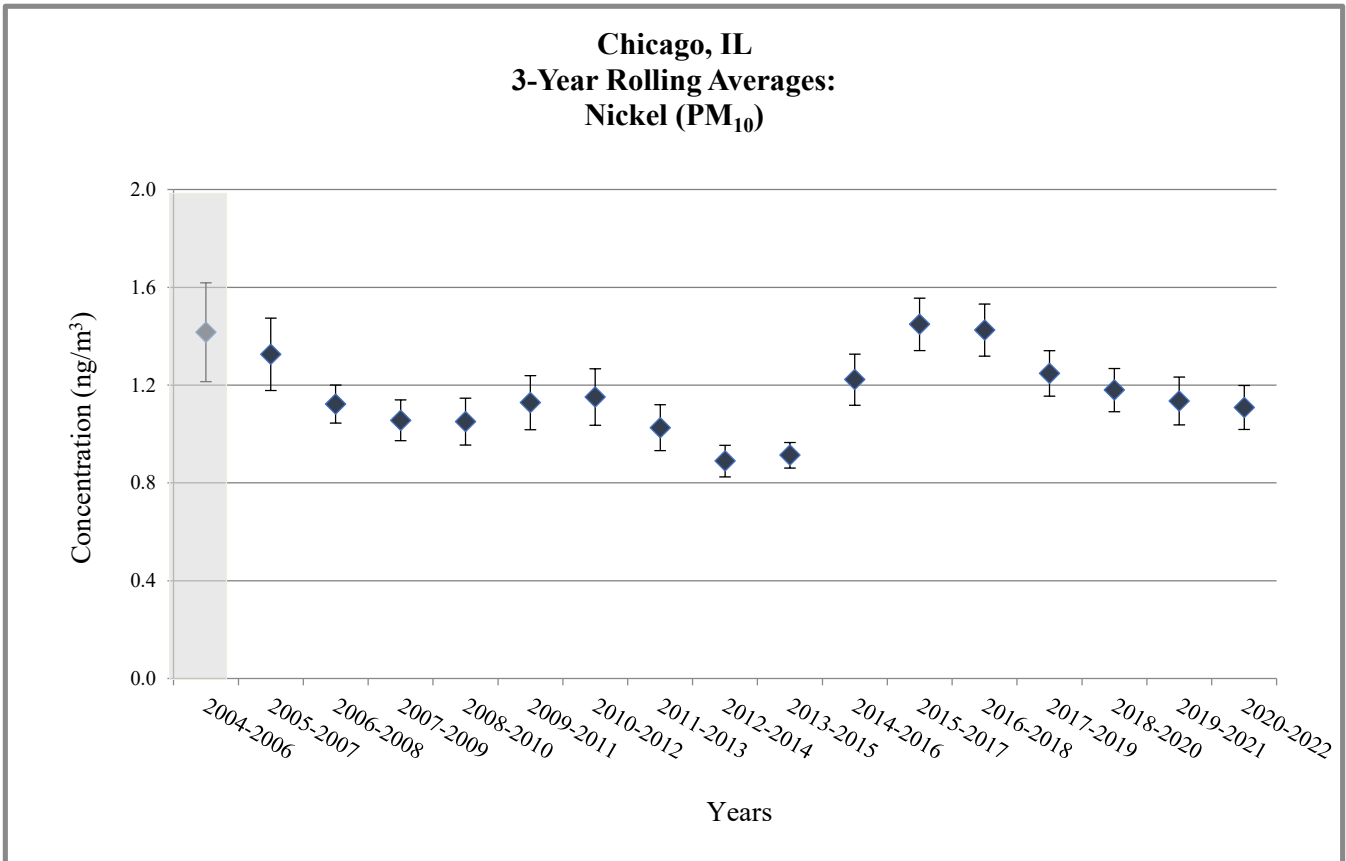
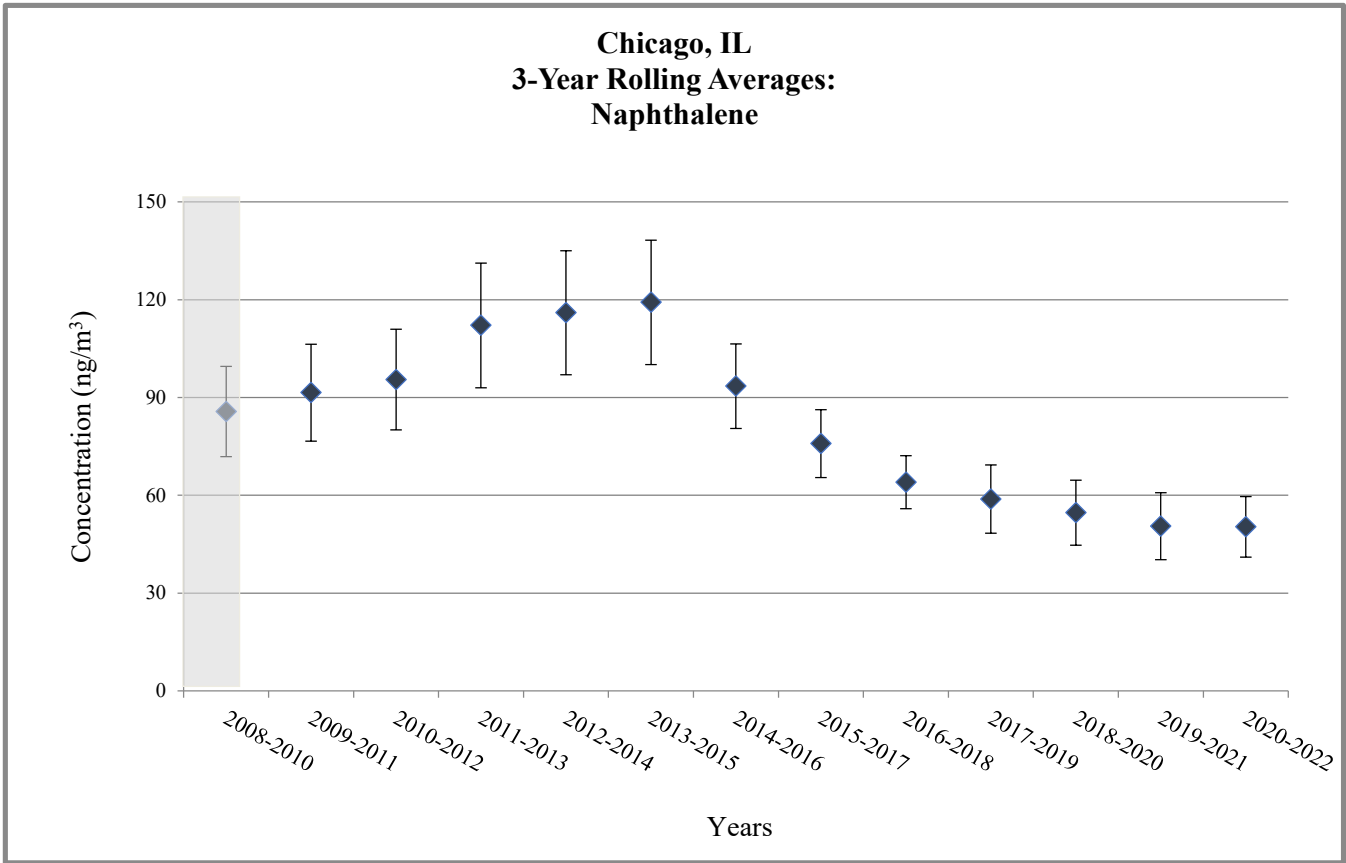
Does not meet MQO or wasn't able to collect enough samples

Figure 4. Chicago, IL - 3-Year Rolling Average Concentrations



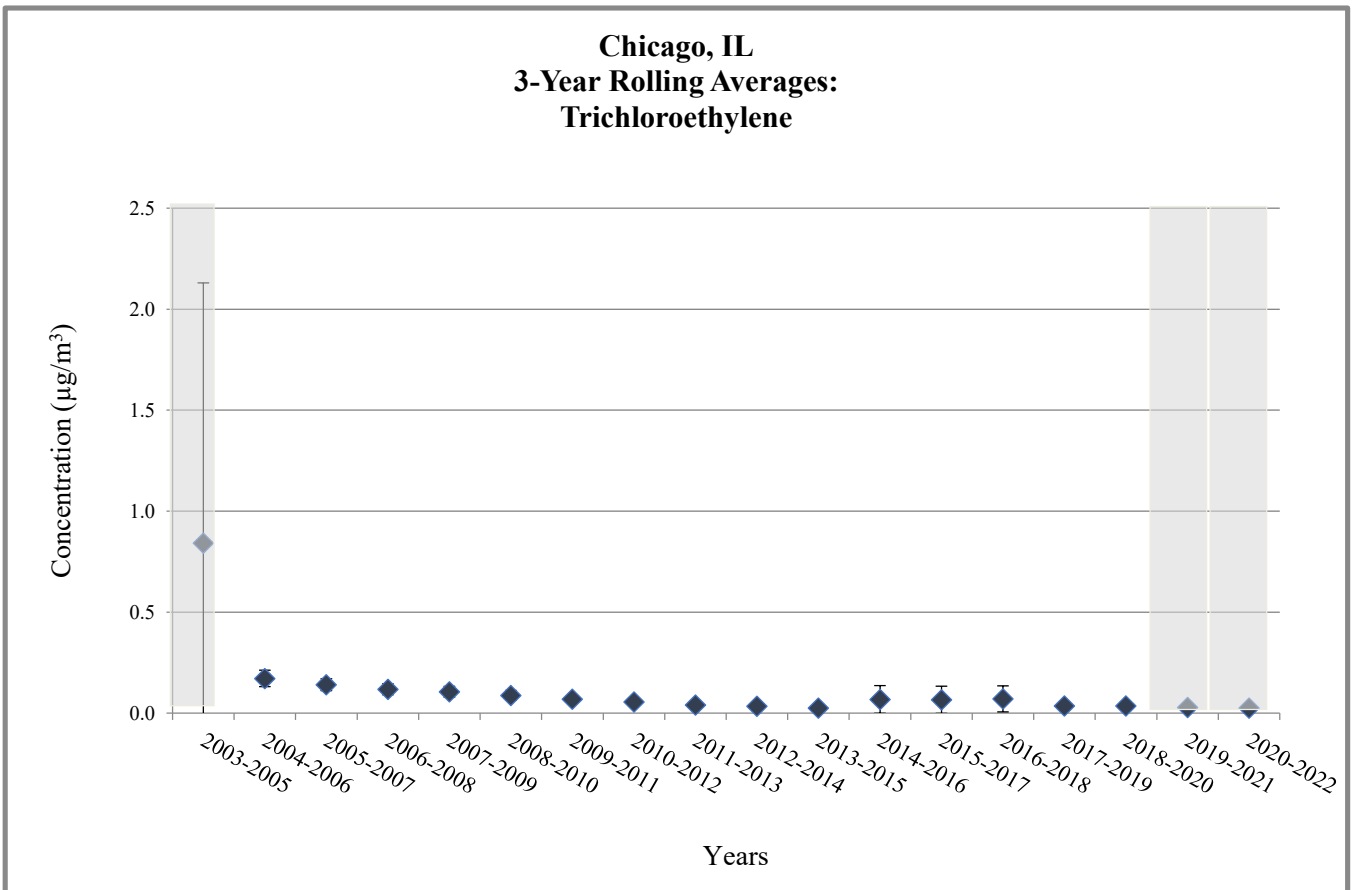
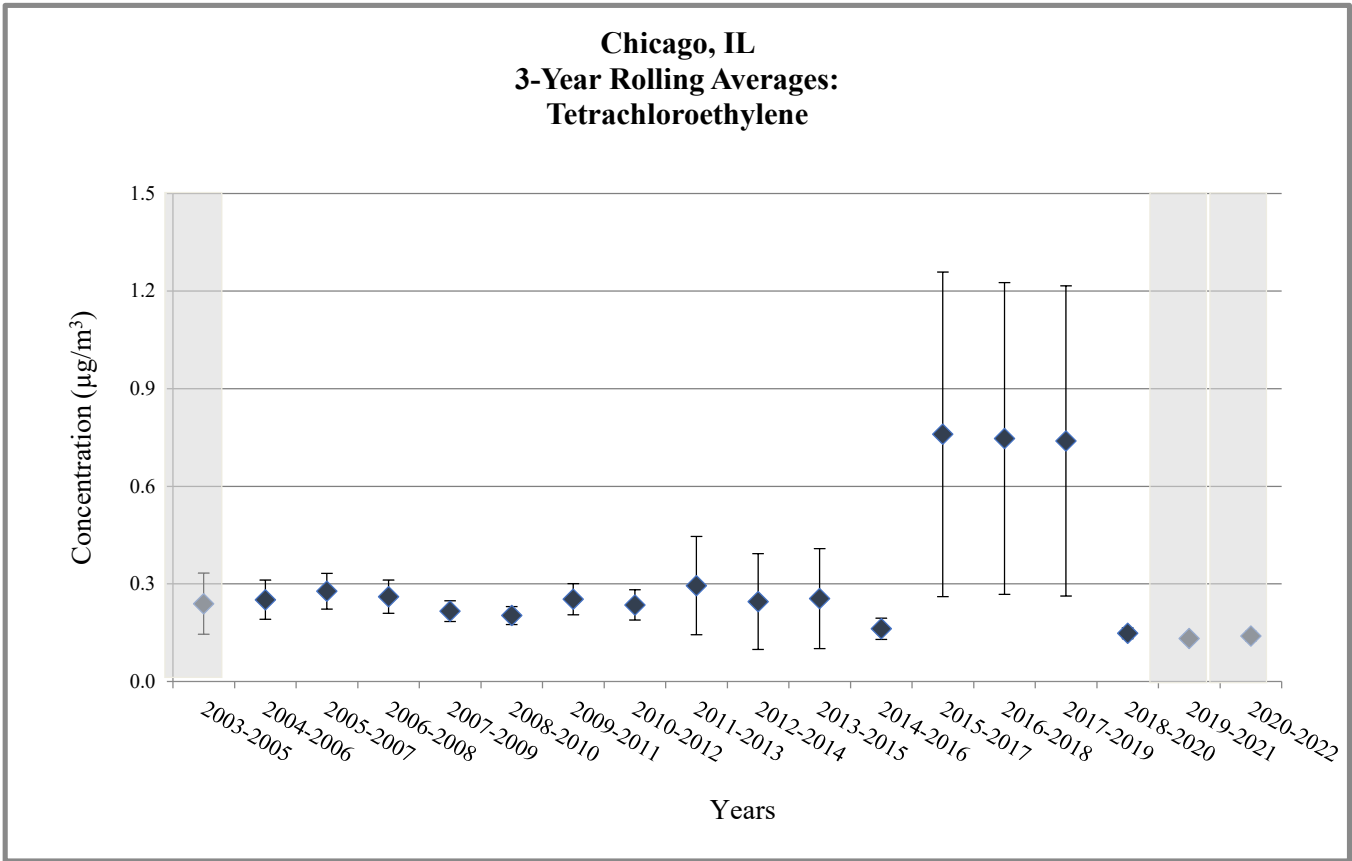
Does not meet MQO or wasn't able to collect enough samples

Figure 4. Chicago, IL - 3-Year Rolling Average Concentrations



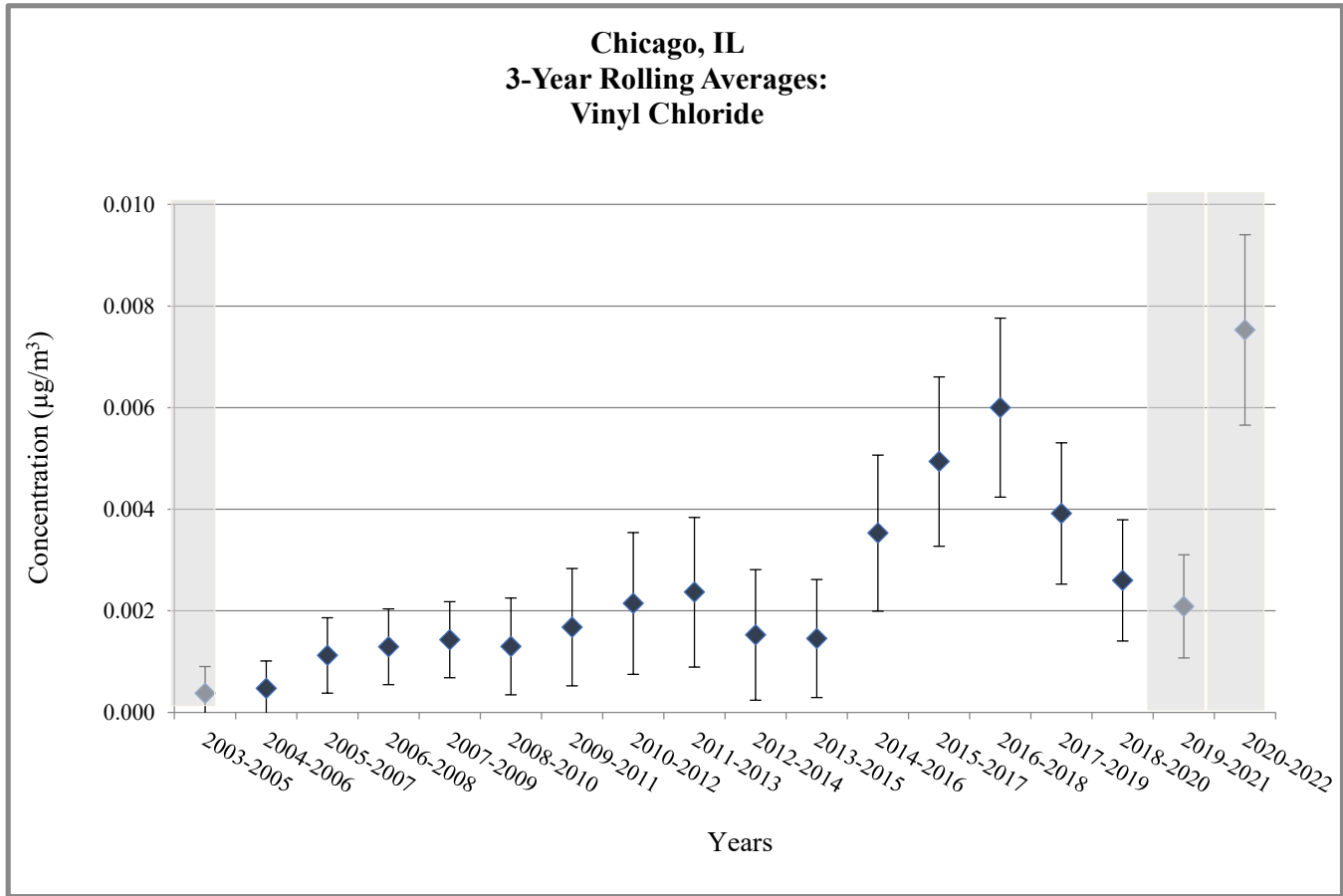
Does not meet MQO or wasn't able to collect enough samples

Figure 4. Chicago, IL - 3-Year Rolling Average Concentrations



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

Figure 4. Chicago, IL - 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 Chicago, IL

Year	Benzene	Butadiene, 1,3-	Carbon tetrachloride	Chloroform	Tetrachloroethylene	Trichloroethylene	Vinyl chloride	Acetaldehyde	Formaldehyde	Arsenic (PM10)	Beryllium (PM10)	Cadmium (PM10)	Lead (PM10)	Manganese (PM10)	Nickel (PM10)	Benzo(a)pyrene	Naphthalene	
	VOCs							Carbonyls		PM10 Metals						PAHs		
<i>Chicago, IL (AQS Site Code: 17-031-4201)</i>																		
2003	--a	--a	--a	--a	--a	--a	--a	98	98	--	--	--	--	--	--	--	--	
2004	79	79	79	79	79	79	79	74	75	--b	--b	--b	--b	--b	--b	--	--	
2005	87	87	87	87	87	87	87	80	79	100	100	100	100	100	100	--	--	
2006	98	98	98	98	98	98	98	100	100	102	102	102	102	102	102	--	--	
2007	100	100	100	100	100	100	100	97	97	97	97	97	97	97	97	--	--	
2008	105	105	105	105	105	105	105	97	97	92	92	92	92	92	92	--a	--a	
2009	93	93	93	93	93	93	93	100	100	100	100	100	100	100	100	98	98	
2010	92	92	92	92	92	92	92	90	90	100	100	100	100	100	100	97	97	
2011	90	90	90	90	90	90	90	102	102	87	87	87	87	87	87	87	100	100
2012	100	100	100	100	100	100	100	108	108	89	89	89	89	89	89	89	93	93
2013	100	100	100	100	100	100	100	102	102	97	97	97	97	97	97	97	95	95
2014	92	92	92	92	92	92	92	90	90	87	87	87	87	87	87	87	90	90
2015	90	90	90	90	90	90	90	95	95	93	93	93	93	93	93	93	100	100
2016	97	97	97	97	97	97	97	97	97	93	93	93	93	93	93	93	92	92
2017	97	97	97	97	97	97	97	100	100	98	98	98	98	98	98	98	98	98
2018	100	100	100	100	100	100	100	100	100	95	95	95	95	95	95	95	100	100
2019	98	98	98	98	98	98	98	95	97	100	100	100	100	100	100	100	93	93
2020	97	97	97	97	97	97	97	98	98	97	97	97	97	97	97	97	97	97
2021	57	57	57	57	57	57	57	54	54	97	97	97	97	97	97	97	85	85
2022	--c	--c	--c	--c	--c	--c	--c	--c	--c	100	100	100	100	100	100	100	97	97

	A-rated: ≥85%
	B-rated: Between 75% to 85%
	Does not meet: ≤75%
	No data available

^a: Scheduled sampling began midway through the year, thus, the site did not have the opportunity to collect enough samples to meet the 85% MQO.

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

^c: Samples were voided due to contamination at the site

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

Year	Benzene	Butadiene, 1,3-	Carbon tetrachloride	Chloroform	Tetrachloroethylene	Trichloroethylene	Vinyl chloride	Acetaldehyde	Formaldehyde	Arsenic (PM10)	Beryllium (PM10)	Cadmium (PM10)	Lead (PM10)	Manganese (PM10)	Nickel (PM10)	Benzo(a)pyrene	Naphthalene
	VOCs							Carbonyls		PM10 Metals						PAHs	
<i>Chicago, IL (AQS Site Code: 17-031-4201)</i>																	
2003	1.23	2.21	4.07	0.59	3.59	0.64	1.39	--a	--a	--	--	--	--	--	--	--	--
2004	1.23	1.33	2.22	0.39	1.99	0.54	0.93	0.16	0.08	--b	--b	--b	--b	--b	--b	--	--
2005	0.49	1.02	1.48	0.27	0.80	0.43	0.93	0.02	0.01	0.09	0.05	0.03	0.00	0.03	0.09	--	--
2006	0.12	0.13	0.33	0.04	0.44	0.11	0.19	0.01	0.00	0.039	0.048	0.014	0.0012	0.003	0.042	--	--
2007	0.59	0.40	0.56	0.17	0.44	0.19	0.56	0.01	0.00	0.04	0.03	0.01	0.001	0.00	0.04	--	--
2008	0.25	0.11	0.15	0.07	0.24	0.04	0.12	0.02	0.01	0.04	0.03	0.01	0.007	0.00	0.05	0.07	0.014
2009	0.15	0.07	0.07	0.02	0.12	0.02	0.05	0.01	0.01	0.04	0.00	0.05	0.004	0.01	0.06	0.05	0.006
2010	0.47	0.22	0.89	0.17	0.44	0.18	0.30	0.01	0.00	0.21	0.00	0.13	0.050	0.06	0.73	0.04	0.010
2011	0.71	0.15	0.89	0.09	0.72	0.27	0.19	0.02	0.01	0.23	0.01	0.01	0.006	0.02	0.17	0.05	0.003
2012	1.50	0.24	0.89	0.14	0.80	0.24	0.26	0.02	0.01	0.28	0.01	0.01	0.008	0.07	0.22	0.05	0.004
2013	0.47	0.24	0.59	0.15	0.56	0.43	0.26	0.04	0.23	0.36	0.01	0.02	0.010	0.03	0.70	0.05	0.006
2014	0.37	0.29	0.63	0.14	0.52	0.46	0.28	0.02	0.12	0.29	0.00	0.01	0.006	0.05	0.39	0.03	0.011
2015	0.96	0.31	0.37	0.16	0.56	0.46	0.19	0.02	0.17	0.03	0.001	0.011	0.007	0.05	0.25	0.12	0.005
2016	0.52	0.58	0.59	0.12	0.64	0.43	0.74	0.02	0.12	0.03	0.001	0.011	0.007	0.06	0.26	0.05	0.020
2017	0.64	0.44	0.85	0.19	1.24	0.94	0.40	0.08	0.68	0.04	0.001	0.014	0.006	0.07	0.25	0.02	0.054
2018	0.36	0.43	0.49	0.13	0.58	0.40	0.30	0.07	0.72	0.04	0.004	0.011	0.006	0.18	0.23	0.01	0.049
2019	0.24	0.24	0.40	0.08	0.35	0.33	0.24	0.07	0.58	0.04	0.004	0.012	0.007	0.20	0.26	0.01	0.032
2020	0.24	0.24	0.40	0.08	0.49	0.24	0.24	0.07	0.53	0.04	0.004	0.009	0.010	0.11	0.18	0.01	0.028
2021	0.25	0.26	0.41	0.07	0.49	0.24	0.20	0.06	0.52	0.04	0.004	0.010	0.011	0.11	0.19	0.01	0.026
2022	0.25	0.37	0.41	0.07	0.73	0.33	0.18	0.07	0.53	0.04	0.005	0.052	0.014	0.13	0.27	0.01	0.026

- 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: Pollutant was sampled, but no MDL data were reported to AQS.

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

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

Year	Benzene	Butadiene, 1,3-	Carbon tetrachloride	Chloroform	Tetrachloroethylene	Trichloroethylene	Vinyl chloride	Acetaldehyde	Formaldehyde	Arsenic (PM10)	Beryllium (PM10)	Cadmium (PM10)	Lead (PM10)	Manganese (PM10)	Nickel (PM10)	Benzo(a)pyrene	Naphthalene
	VOCs							Carbonyls		PM10 Metals						PAHs	
<i>Chicago, IL (AQS Site Code: 17-031-4201)</i>																	
2004	-5.6	10.4	32.2	-6.4	-2.1	10.7	-5.4	1.0	-0.9	--	--	--	--	--	--	--	--
2005	23.6	4.4	26.5	15.5	11.5	13.5	2.0	8.9	0.8	8.1	13.6	-1.1	-1.9	-2.8	-12.9	--	--
2006	-12.9	5.9	-5.0	3.9	-14.3	16.6	-11.0	-0.8	-13.2	5.2	6.4	-0.2	-2.4	-10.2	-6.3	--	--
2007	-5.8	2.5	10.4	9.1	-3.7	5.5	1.1	-1.9	-3.2	11.5	18.9	5.3	-1.5	-13.8	-8.5	--	--
2008	-1.5	7.8	16.5	4.3	0.0	5.3	-14.1	24.6	14.4	8.4	4.8	5.1	4.7	-25.3	8.6	--a	--a
2009	6.2	-0.5	1.9	5.4	1.1	2.7	-0.1	-10.1	-7.8	-14.8	-5.5	-16.2	-30.6	-37.7	-28.9	-1.7	-7.7
2010	-13.2	-3.7	31.6	1.0	-16.1	-6.4	-14.1	0.7	-2.8	7.3	11.2	4.9	-3.5	0.6	4.7	-2.3	-17.1
2011	10.2	10.9	25.4	-9.7	0.8	-8.3	0.3	3.0	-3.4	1.4	-8.2	-5.7	-6.3	-3.8	-6.8	-2.1	-13.9
2012	--a	--a	--a	--a	--a	--a	--a	--a	--a	15.7	17.5	16.6	19.9	21.5	11.4	25.2	21.4
2013	-3.3	0.6	13.3	-2.4	-9.5	3.0	-8.1	0.1	-0.5	-3.0	-2.0	1.4	0.1	-6.2	-1.2	-5.7	25.5
2014	18.1	-8.1	24.2	8.5	-1.8	-0.3	10.0	-4.3	-2.2	1.9	--b	--b	2.2	13.2	--c	-16.3	0.7
2015	-5.3	-22.0	40.2	10.3	-14.6	-10.0	-7.1	--a	--a	--a	--a	--a	--a	--a	--a	-14.2	-11.4
2016	5.2	-10.1	53.5	8.1	-5.5	-9.5	1.5	-5.4	-19.1	-2.3	-0.4	3.9	-1.6	3.9	26.5	-10.5	-9.5
2017	14.6	3.9	26.5	9.2	13.0	9.6	-3.3	3.6	-5.3	-1.4	3.7	2.8	-0.4	1.3	21.2	-22.4	-11.6
2018	-11.8	-6.6	0.0	-7.5	-3.8	-14.6	-2.7	-8.7	-3.7	-3.4	0.5	3.0	-1.9	2.6	10.6	-14.8	-20.7
2019	18.5	2.2	23.8	11.2	13.5	8.4	3.5	-3.1	-5.8	3.4	6.9	4.6	3.2	6.5	1.6	29.3	18.5
2020	-1.6	-11.6	16.4	4.9	6.8	-4.9	-3.7	1.6	-1.9	4.4	-0.2	4.6	-3.5	2.2	5.1	13.1	15.8
2021	1.5	1.2	12.1	9.0	10.3	5.9	6.7	-9.5	-11.2	6.8	2.7	7.7	0.0	5.8	3.1	0.1	-2.0
2022	9.7	-19.3	6.9	2.0	5.6	-1.0	-8.6	-1.5	-1.0	--a	--a	--a	--a	--a	--a	--a	--a

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

^a: No Proficiency Test samples were sent for this pollutant and year.

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

^c: 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 Chicago, IL

Year	Benzene	Butadiene, 1,3-	Carbon tetrachlorid	Chloroform	Tetrachloroethylene	Trichloroethylene	Vinyl chloride	Acetaldehyde	Formaldehyde	Arsenic (PM10)	Beryllium (PM10)	Cadmium (PM10)	Lead (PM10)	Manganese (PM10)	Nickel (PM10)	Benzo(a)pyrene	Naphthalene
	VOCs							Carbonyls		PM10 Metals						PAHs	
<i>Chicago, IL (AQS Site Code: 17-031-4201)</i>																	
2003	16.5	--a	6.1	25.7	--a	--a	--	--	--	--	--	--	--	--	--	--	--
2004	32.1	--a	72.3	138.5	0.0	--a	--a	--	--	--	--	--	--	--	--	--	--
2005	13.6	--a	10.3	18.7	0.0	--a	--a	18.5	22.9	--	--	--	--	--	--	--	--
2006	46.9	33.6	4.7	36.4	36.0	47.8	--a	37.4	71.0	--	--	--	--	--	--	--	--
2007	18.5	50.5	18.8	92.2	30.6	--a	--a	78.3	75.7	--	--	--	--	--	--	--	--
2008	9.9	30.4	8.8	33.0	36.6	30.8	--a	26.8	20.8	--	--	--	--	--	--	--	--
2009	25.8	--a	9.1	23.6	34.4	31.4	--a	2.5	4.9	17.3	12.4	24.2	19.0	10.7	23.8	--	--
2010	5.5	22.5	3.2	66.1	11.4	2.0	6.1	6.9	7.7	18.3	27.6	28.8	25.9	22.1	14.3	--	--
2011	15.0	6.2	20.7	34.5	5.2	--a	--	2.2	2.9	--	--	--	--	--	--	--	--
2012	10.9	9.0	9.3	20.8	6.4	10.5	--	2.6	3.9	3.6	9.4	5.0	0.3	0.1	16.5	--	--
2013	6.8	7.2	6.3	28.7	22.6	--	4.0	1.4	1.8	6.3	28.3	4.9	12.3	7.2	--a	--	--
2014	8.4	3.3	6.3	9.8	8.5	--a	--a	1.8	1.1	--	--	--	--	--	--	--	--
2015	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2016	--	--	--	--	--	--	--a	--	--	--	--	--	--	--	--	--	--
2017	6.5	2.2	6.7	6.4	2.8	--a	--a	5.0	5.1	--	--	--	--	--	--	--	--
2018	3.6	6.6	9.9	4.6	3.5	--a	--a	2.1	2.0	--	--	--	--	--	--	--	--
2019	5.2	5.4	15.8	23.7	6.3	--a	--a	4.5	2.7	--	--	--	--	--	--	--	--
2020	1.7	13.6	13.1	3.3	6.5	15.2	--a	3.1	4.1	--	--	--	--	--	--	--	--
2021	1.9	0.3	7.1	18.9	2.6	--a	--a	1.8	2.3	--	--	--	--	--	--	--	--
2022	--b	--b	--b	--b	--b	--b	--b	--b	--b	13.4	16.9	16.1	16.6	17.8	21.7	--	--

- Green = precision ≤ 15%
- Yellow = precision > 15% to ≤ 25%
- Red = precision > 25%
- Gray = dataset was not rated

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

^b: Data were voided due to sampling contamination.

Table 10. NATTS Network Assessment: MQO#4 - Analytical Method Precision %CV at Chicago, IL

Year	Benzene	Butadiene, 1,3-	Carbon tetrachlorid	Chloroform	Tetrachloroethylene	Trichloroethylene	Vinyl chloride	Acetaldehyde	Formaldehyde	Arsenic (PM10)	Beryllium (PM10)	Cadmium (PM10)	Lead (PM10)	Manganese (PM10)	Nickel (PM10)	Benzo(a)pyrene	Naphthalene
	VOCs						Carbonyls			PM10 Metals					PAHs		
<i>Chicago, IL (AQS Site Code: 17-031-4201)</i>																	
2003	9.5	--a	10.9	6.5	--a	--a	--	--	--	--	--	--	--	--	--	--	--
2004	7.5	--	4.2	4.2	12.9	--	--	--	--	--	--	--	--	--	--	--	--
2005	3.5	--a	3.0	4.3	0.0	--a	--	0.4	0.2	--	--	--	--	--	--	--	--
2006	7.7	10.2	6.7	4.8	5.3	9.0	--	0.3	0.4	--	--	--	--	--	--	--	--
2007	2.3	3.0	5.6	5.3	3.1	8.9	--a	0.4	1.1	--	--	--	--	--	--	--	--
2008	6.6	14.0	6.5	7.2	13.5	8.1	40.4	1.1	0.9	--	--	--	--	--	--	--	--
2009	1.4	13.2	3.2	3.3	6.6	13.9	--	0.5	0.4	1.2	12.2	8.0	1.2	1.2	1.9	--	--
2010	5.9	13.9	5.4	3.6	3.7	4.8	2.9	0.6	1.0	1.4	15.8	7.6	5.4	4.9	2.4	--	--
2011	4.2	9.4	12.8	3.1	4.7	--a	--	1.3	0.4	--	--	--	--	--	--	--	--
2012	4.0	11.0	7.8	4.8	9.2	14.7	--b	1.4	2.4	1.6	7.8	1.6	2.5	1.4	0.8	--b	--b
2013	5.4	10.1	5.9	4.2	7.3	--b	0.0	0.9	0.9	4.4	8.3	2.9	2.1	1.5	--a	2.5	3.5
2014	1.4	16.2	2.6	3.4	6.3	--a	--b	0.3	0.6	4.8	15.2	18.2	3.8	4.8	0.9	6.0	6.0
2015	2.0	13.7	8.6	17.2	6.4	--a	7.1	2.8	4.0	1.2	11.9	4.9	1.6	1.3	16.5	1.7	0.8
2016	15.4	--a	6.6	20.4	7.7	12.3	0.0	2.9	3.3	2.6	24.2	3.8	3.0	2.7	5.0	1.2	2.5
2017	3.5	--a	3.9	7.1	3.0	--a	--a	0.5	0.4	4.1	18.5	5.7	5.1	1.8	10.8	1.5	1.1
2018	3.2	5.1	3.1	4.2	4.2	--a	2.1	0.9	1.0	3.3	5.5	10.6	2.7	2.8	9.4	2.0	1.1
2019	3.9	8.6	4.2	4.6	7.9	6.2	--a	0.3	0.2	8.1	2.9	21.0	22.2	30.4	14.2	1.6	0.6
2020	5.4	5.4	7.3	5.4	5.1	10.4	--a	0.7	0.5	11.2	6.6	5.5	19.0	2.2	20.0	1.2	5.2
2021	3.7	4.2	3.9	3.8	5.0	4.4	--a	0.6	0.3	1.6	3.8	6.7	4.2	1.8	11.0	1.2	0.4
2022	--c	--c	--c	--c	--c	--c	--c	--c	--c	15.8	4.7	21.1	7.1	2.0	2.0	1.1	0.9

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: The primary and/or replicate value were less than the MDL, so no calculation could be made.
^b: Per the NATTS Workplan template, analytical replicates were required to be reported to AQS for this sampling year.
^c: Replicates were analyzed and reported, but were voided due to sample contamination.

Appendix A. Equipment Inventory

Method	Year(s)	Manufacturer/Model, Extraction Type, and Year
<i>Sampling Equipment</i>		
Carbonyls	2003-2008	Custom-built C-24 (Year Deployed: 2003)
	2009-2009	Custom-built C-2 (Year Deployed: 2009)
	2010-2011	Custom-built C-24 (Year Deployed: 2010)
	2012-2014	ERG AT/C-5 (Year Deployed: 2010)
	2015-2018	ERG AT/C-11 (Year Deployed: 2015)
	2019	ERG AT/C-12 (Year Deployed: 2019)
	2020	ERG AT/C-12,ERG AT/C-4,ERG AT/C-9 (Year Deployed: 2020)
	2021-2022	ERG AT/C-9 (Year Deployed: 2021)
PAHs	2008-2018	General Metal Works PS-1 Sampler (Year Deployed: <1998)
	2019	General Metal Works PS-1 Sampler (PUF#4,PUF#2,PUF#0)
	2020	General Metal Works PS-1 Sampler (PUF#0,PUF#3,FAPUF01)
	2021	General Metal Works PS-1 Sampler (FAPUF01,PUF#3,PUF#1,PUF#0)
	2022	General Metal Works PS-1 Sampler (PUF#0,PUF#3)
PM ₁₀ Metals	2005-2008	General Metal Works Hi-Volume Sampler (Year Deployed: <1995)
	2009-2018	Andersen Hi-Volume PM10 Sampler (Year Deployed: 2009)
	2009-2022	Andersen Hi-Volume PM10 Sampler (Year Deployed: 2009)
VOCs	2003-2008	Custom-built C-24 (Year Deployed: 2003)
	2009-2009	Custom-built C-2 (Year Deployed: 2009)
	2010-2011	Custom-built C-24 (Year Deployed: 2010)
	2012-2014	ERG AT/C-5 (Year Deployed: 2010)
	2015-2018	ERG AT/C-11 (Year Deployed: 2015)
	2019	ERG AT/C-12 (Year Deployed: 2019)
	2020	ERG AT/C-12,ERG AT/C-4,ERG AT/C-9 (Year Deployed: 2020)
	2021-2022	ERG AT/C-9 (Year Deployed: 2021)
<i>Analytical Equipment</i>		
Carbonyls	2003-2004	Unknown
	2005-2017	Waters Alliance 2695 HPLC /model 2487 Dual Absorbance (Year Deployed: 2003)
	2018-2022	Waters Alliance e2695 HPLC /model 2489 Dual Absorbance (Year Deployed: 2018)
PAHs	2008-2014	HP/Agilent 5890/5971 GC/MS (Year Deployed: 2008)
	2015-2020	HP/Agilent 7890B/5975C GC/MS (Year Deployed: 2015)
	2021-2022	HP/Agilent 7890B/5975C GC/MS (Year Deployed: 2015); HP/Agilent 6890/5973 GC/MS (Year Deployed: 2021)
PM ₁₀ Metals	2005-2014	PE ELAN 9000 ICP-MS (Year Deployed: 2003)
	2015-2018	Thermo iCAP Q ICP-MS (Year Deployed: 2015)
	2019-2022	Thermo iCAP Q ICP-MS (Year Deployed: 2015); Thermo iCAP rQ ICP-MS (Year Deployed: 2017)
VOCs	2003	HP/Agilent 5890/5971 GC/MS, HP/Agilent model 6890/5973 GC/MS (Year Deployed: 1990)
	2004-2005	HP/Agilent 5890/5971 GC/MS (Year Deployed: 1990)
	2006	HP/Agilent 6890/5973 GC/MS (Year Deployed: 2005); UNKNOWN (Year Deployed: UNKNOWN)
	2007-2009	HP/Agilent 6890/5973 GC/MS (Year Deployed: 2005)
	2010	HP/Agilent 5890/5971 GC/MS (Year Deployed: 2008)
	2011-2018	HP/Agilent 6890/5975 GC/MS (Year Deployed: 2010)
	2019-2022	HP/Agilent 6890/5975 GC/MS (Year Deployed: 2010); HP/Agilent 8890/5977B GC/MS (Year Deployed: 2019)

Appendix A. Equipment Inventory

Method	Year(s)	Manufacturer/Model, Extraction Type, and Year
<i>Preconcentrator Equipment</i>		
VOCs	2003	Entech 7000 (Year Deployed: 2003)
	2004-2006	Entech 7100 (Dynamic Dilution) (Year Deployed: 2003)
	2007-2018	Entech 7100A (Year Deployed: 2007)
	2019	Entech 7100A (Year Deployed: 2007); Entech 7200A (Year Deployed: 2019)
	2020-2022	Entech 7200A (Year Deployed: 2019)
<i>Standards Preparation Equipment</i>		
VOCs	2003-2022	Custom-built (dynamic dilution) (Year Deployed: 1985)
<i>Canister Cleaning Equipment</i>		
VOCs	2003-2010	Custom-built (Cold) (Year Deployed: 2003)
	2011-2022	Wasson-ECE TO Clean (Hot) (Year Deployed: 2010)
<i>PM₁₀ Extraction Equipment</i>		
PM ₁₀ Metals	2006-2013	Branson 8510 (Sonicator) (Year Deployed: 2004)
	2014-2022	Environmental Express (Hotblock) (Year Deployed: 2014)
<i>PAHs Extraction Equipment</i>		
PAHs	2008-2018	Dionex -300 (ASE) (Year Deployed: 2004)
	2019-2022	Dionex -350 (ASE) (Year Deployed: 2019)