Appendix B: 2018
Fine Particulate Speciation Summary

New Jersey Department of Environmental Protection

Table B-1
2018 Fine Particulate Speciation Concentrations
CAMDEN SPRUCE STREET NJ
Micrograms per Cubic Meter (µg/m^3)

	Species	Annual Average*	Maximum Daily Average	% Samples Detected
1	Aluminum	0.034	0.200	75
2	Ammonium Ion	0.479	1.669	100
3	Antimony	0.006	0.059	57
4	Arsenic	*0.001*	0.006	48
5	Barium	0.004	0.072	53
6	Bromine	0.002	0.021	72
7	Cadmium	*0.0004*	0.017	48
8	Calcium	0.045	0.232	100
9	Carbon, Elemental	0.748	2.592	100
10	Carbon, Organic	2.108	5.280	100
11	Cerium	0.008	0.103	55
12	Cesium	*0.001*	0.061	48
13	Chlorine	0.167	1.905	77
14	Chromium	0.002	0.018	82
15	Cobalt	*0.0001*	0.009	47
16	Copper	0.008	0.065	90
17	Indium	0	0.021	45
18	Iron	0.216	3.354	100
19	Lead	0.005	0.092	63
20	Magnesium	0.018	0.268	65
21	Manganese	0.003	0.020	70
22	Nickel	0.001	0.021	67
23	Nitrate	0.946	4.364	100
24	Phosphorus	0.001	0.053	75
25	Potassium	0.116	1.044	100
26	Potassium Ion	0.079	0.975	98
27	Rubidium	0.0003	0.008	52
28	Selenium	*0.0002*	0.007	48
29	Silicon	0.056	0.298	97
30	Silver	*0.001*	0.026	43
31	Sodium	0.100	0.902	73
32	Sodium Ion	0.103	0.862	98
33	Strontium	0.001	0.007	75
34	Sulfate	1.018	3.246	100
35	Sulfur	0.383	1.344	100
36	Tin	0.002	0.047	55
37	Titanium	0.003	0.010	85
38	Vanadium	*0.0003*	0.002	48
39	Zinc	0.035	0.278	100
40	Zirconium	0	0.025	55

Table B-2
2018 Fine Particulate Speciation Concentrations
CHESTER NJ
Micrograms per Cubic Meter (µg/m^3)

	Species	Annual Average*	Maximum Daily Average	% Samples Detected
1	Aluminum	0.019	0.163	64
2	Ammonium Ion	0.268	1.387	96
3	Antimony	0.002	0.043	66
4	Arsenic	*0.0001*	0.003	36
5	Barium	*0.001*	0.109	48
6	Bromine	0.001	0.005	67
7	Cadmium	0.002	0.017	62
8	Calcium	0.015	0.094	97
9	Carbon, Elemental	0.334	0.857	100
10	Carbon, Organic	1.587	4.270	100
11	Cerium	*0.001*	0.103	47
12	Cesium	*0*	0.061	47
13	Chlorine	*0.001*	0.019	40
14	Chromium	0.003	0.014	74
15	Cobalt	0	0.002	50
16	Copper	0.004	0.014	90
17	Indium	*0.0003*	0.020	47
18	Iron	0.034	0.140	100
19	Lead	0.002	0.016	64
20	Magnesium	0.014	0.112	66
21	Manganese	0.0004	0.005	62
22	Nickel	0.001	0.006	81
23	Nitrate	0.631	4.528	100
24	Phosphorus	0.0002	0.008	71
25	Potassium	0.032	0.115	100
26	Potassium Ion	0.016	0.057	96
27	Rubidium	0.0003	0.007	52
28	Selenium	0.0003	0.006	53
29	Silicon	0.033	0.274	95
30	Silver	0.002	0.024	57
31	Sodium	0.031	0.157	66
32	Sodium Ion	0.027	0.210	96
33	Strontium	*0.0002*	0.006	43
34	Sulfate	0.789	3.269	100
35	Sulfur	0.296	1.372	100
36	Tin	*0*	0.026	45
37	Titanium	0.001	0.009	72
38	Vanadium	*0.0002*	0.002	47
39	Zinc	0.006	0.020	100
40	Zirconium	*0*	0.026	47

Table B-3
2018 Fine Particulate Speciation Concentrations
ELIZABETH LAB NJ
Micrograms per Cubic Meter (µg/m^3)

	Species	Annual Average*	Maximum Daily Average	% Samples Detected
1	Aluminum	0.033	0.168	76
2	Ammonium Ion	0.443	1.916	99
3	Antimony	*0.002*	0.061	49
4	Arsenic	*0.0001*	0.004	27
5	Barium	0.014	0.119	58
6	Bromine	0.002	0.011	72
7	Cadmium	*0.0001*	0.020	45
8	Calcium	0.043	0.127	100
9	Carbon, Elemental	1.195	3.829	100
10	Carbon, Organic	2.452	7.068	100
11	Cerium	*0*	0.110	47
12	Cesium	*0.004*	0.089	48
13	Chlorine	0.017	0.535	76
14	Chromium	0.004	0.017	88
15	Cobalt	*0*	0.002	28
16	Copper	0.008	0.045	99
17	Indium	*0*	0.029	44
18	Iron	0.154	0.361	100
19	Lead	0.003	0.017	61
20	Magnesium	0.017	0.207	68
21	Manganese	0.002	0.009	79
22	Nickel	0.002	0.010	87
23	Nitrate	1.165	5.452	100
24	Phosphorus	0.001	0.012	74
25	Potassium	0.055	1.088	100
26	Potassium Ion	0.031	1.051	100
27	Rubidium	0.0003	0.009	54
28	Selenium	0.0004	0.005	54
29	Silicon	0.080	0.316	98
30	Silver	*0.001*	0.032	49
31	Sodium	0.062	0.719	74
32	Sodium Ion	0.068	0.629	98
33	Strontium	0.001	0.027	55
34	Sulfate	1.032	3.496	100
35	Sulfur	0.392	1.568	100
36	Tin	0.003	0.048	53
37	Titanium	0.006	0.016	98
38	Vanadium	*0.0002*	0.005	41
39	Zinc	0.016	0.097	100
40	Zirconium	0.001	0.040	51

Table B-4
2018 Fine Particulate Speciation Data
NEWARK FIREHOUSE NJ
Concentrations in Micrograms per Cubic Meter (µg/m^3)

	Species	Annual Average*	Maximum Daily Average	% Samples Detected
1	Aluminum	0.028	0.433	69
2	Ammonium Ion	0.399	2.079	100
3	Antimony	0.005	0.055	61
4	Arsenic	*0.0002*	0.008	31
5	Barium	0.007	0.068	63
6	Bromine	0.002	0.014	68
7	Cadmium	0.001	0.016	54
8	Calcium	0.039	0.211	100
9	Carbon, Elemental	0.709	2.262	100
10	Carbon, Organic	2.199	6.794	100
11	Cerium	0.005	0.088	57
12	Cesium	0.002	0.051	50
13	Chlorine	0.016	0.404	70
14	Chromium	0.002	0.043	73
15	Cobalt	*0*	0.002	36
16	Copper	0.008	0.049	95
17	Indium	*0*	0.025	40
18	Iron	0.091	0.357	100
19	Lead	0.002	0.018	64
20	Magnesium	0.013	0.199	61
21	Manganese	0.001	0.010	69
22	Nickel	0.001	0.012	69
23	Nitrate	1.244	5.653	100
24	Phosphorus	0.001	0.017	78
25	Potassium	0.054	1.144	100
26	Potassium Ion	0.030	1.128	99
27	Rubidium	*0*	0.007	47
28	Selenium	0.0003	0.005	50
29	Silicon	0.065	0.550	98
30	Silver	*0.001*	0.024	47
31	Sodium	0.063	0.446	68
32	Sodium Ion	0.073	0.571	98
33	Strontium	0.001	0.027	55
34	Sulfate	0.892	3.538	100
35	Sulfur	0.334	1.505	100
36	Tin	0.005	0.054	60
37	Titanium	0.005	0.016	96
38	Vanadium	*0.0003*	0.003	43
39	Zinc	0.015	0.110	100
40	Zirconium	0.004	0.037	60

Table B-5
2018 Fine Particulate Speciation Data
RUTGERS UNIVERSITY NJ
Concentrations in Micrograms per Cubic Meter (µg/m^3)

	Species	Annual Average*	Maximum Daily Average	% Samples Detected
1	Aluminum	0.017	0.194	68
2	Ammonium Ion	0.308	1.407	98
3	Antimony	0.005	0.042	60
4	Arsenic	*0.0003*	0.007	27
5	Barium	0.006	0.093	55
6	Bromine	0.001	0.008	70
7	Cadmium	*0.001*	0.030	46
8	Calcium	0.020	0.123	99
9	Carbon, Elemental	0.535	1.723	100
10	Carbon, Organic	2.055	5.951	100
11	Cerium	*0.001*	0.088	49
12	Cesium	0.004	0.074	54
13	Chlorine	0.009	0.227	58
14	Chromium	0.004	0.035	88
15	Cobalt	*0*	0.004	38
16	Copper	0.005	0.075	91
17	Indium	*0.0002*	0.029	41
18	Iron	0.053	0.179	100
19	Lead	0.002	0.014	68
20	Magnesium	0.015	0.297	64
21	Manganese	0.001	0.016	69
22	Nickel	0.001	0.011	73
23	Nitrate	0.841	4.332	100
24	Phosphorus	0.0003	0.010	72
25	Potassium	0.056	1.863	100
26	Potassium Ion	0.037	1.898	97
27	Rubidium	0.0005	0.007	51
28	Selenium	*0.0002*	0.006	46
29	Silicon	0.041	0.328	98
30	Silver	0.001	0.021	50
31	Sodium	0.054	0.339	68
32	Sodium Ion	0.045	0.383	99
33	Strontium	0.001	0.043	53
34	Sulfate	0.916	3.690	100
35	Sulfur	0.332	1.368	100
36	Tin	0.004	0.047	54
37	Titanium	0.003	0.021	84
38	Vanadium	*0.0003*	0.002	48
39	Zinc	0.010	0.052	99
40	Zirconium	0.001	0.032	55

*Annual averages in italics are arithmetic means calculated with fewer than 50% of the samples above detectable levels.

Chemical Speciation Network information can be found at https://www.epa.gov/amtic/chemical-speciation-network-csn.

Average minimum detection limits in Table B-6 are provided by the Air Quality Research Center, University of California, Davis (7/22/19).

Table B-6. Average Minimum Detection Limits (MDL) (µg/m^3)

	Species	MDL (µg/m^3)
1	Aluminum	0.038
2	Ammonium	0.006
3	Antimony	0.04
4	Arsenic	0.003
5	Barium	0.081
6	Bromine	0.005
7	Cadmium	0.016
8	Calcium	0.034
9	Carbon, Elemental	0.012
10	Carbon, Organic	0.081
11	Cerium	0.096
12	Cesium	0.056
13	Chlorine	0.007
14	Chromium	0.004
15	Cobalt	0.003
16	Copper	0.011
17	Indium	0.037
18	Iron	0.027
19	Lead	0.012
20	Magnesium	0.042
21	Manganese	0.006
22	Nickel	0.002
23	Nitrate	0.036
24	Phosphorus	0.002
25	Potassium	0.012
26	Potassium Ion	0.047
27	Rubidium	0.009
28	Selenium	0.005
29	Silicon	0.02
30	Silver	0.017
31	Sodium	0.088
32	Sodium Ion	0.016
33	Strontium	0.007
34	Sulfate	0.047
35	Sulfur	0.005
36	Tin	0.05
37	Titanium	0.003
38	Vanadium	0.002
39	Zinc	0.003
40	Zirconium	0.036