

**Appendix K: HACR1 and HAVO1  
Haze Index Methodology  
Volcano Adjustment  
Haleakala National Park and  
Hawaii Volcanoes National Park**

# **HACR1 and HAVO1 Haze Index Methodology Sulfate Adjustment**

DOH-CAB adjusted IMPROVE data for the HACR1 (Haleakala National Park) and HAVO1 (Hawaii Volcanoes National Park) visibility monitors to determine the haze index for glidepath graphs in Chapter 7 of the progress report. The adjustment was made to screen out high sulfate light extinction due to impacts from volcanic activity.

The tables below provide the baseline, current, and projected haze index estimates for the HACR1 and HAVO1 visibility monitors. Adjustments were based on 2019 sulfate light extinction when there were no volcanic eruptions, SO<sub>2</sub> emission from sources contributing most to visibility impairment from sulfates in the national parks, and WRAP TSS IMPROVE data of annual light extinction without volcanic adjustment for sulfates. The 2019 sulfate light extinction values were scaled using (2005/baseline – 2022) SO<sub>2</sub> emission ratios from large SO<sub>2</sub> point sources which had the greatest impacts on visibility in each national park. The ratios included volcanic SO<sub>2</sub> emissions from 2019. The scaled sulfate light extinction was substituted for those values measured at the IMPROVE monitor for each year. Haze index was then calculated in deciviews for the clearest and most impaired days using the  $b_{ext}$  values for each species for each affected day of the year, including value of 9 Mm<sup>-1</sup> and 10 Mm for Rayleigh scattering in Haleakala National Park and Hawaii Volcanoes National Park, respectively. The deciview equation (i.e.,  $dv = 10\ln(b_{ext}/10)$ ) was used to determine the haze index value for each year. Data from Appendix V from Revision 1 of the RH-SIP was used to estimate the haze index with new methodology of screening out volcanic impacts, The haze index for each year is the average deciview value from all affected most impaired and clearest days of the year. Spreadsheet calculations are shown on the following pages of this appendix.

HACR1 HI (dv) Estimates			
Days	HACR1 HI (dv) Estimate		
	Baseline	Current Visibility	Reasonable Progress Goal
Clearest Days	0.81	0.46 - 1.10	0.39
Most Impaired Days	6.51	5.23 – 6.33	4.89

HACR1 HI (dv) Estimates			
Days	HACR1 HI (dv) Estimate		
	Baseline	Current Visibility	Reasonable Progress Goal
Clearest Days	4.05	3.42 – 3.78	3.51
Most Impaired Days	11.39	10.68 – 11.47	9.93

**Spreadsheet Calculations  
HACR1 Haze Index  
Volcano Adjustment for  
Clearest Days  
(Baseline - 2022)**

Sulfate Adjustments (Clearest Days) Haleakala National Park								
Year	Emissions (TPY)					Scale	Light Extinction ( $B_{ext} \text{ Mm}^{-1}$ )	
	Kahului	Maalaea	Kanoelehua-Hill	Volcanic (2019)	Total		2019 Sulfate	Sulfate Adjusted
2005	3,198	913	2,822	17,301	24,234	1.089	0.78	0.850
2007	2,872	634	2,813	17,301	23,620	1.062	0.78	0.828
2008	2,876	697	2,886	17,301	23,760	1.068	0.78	0.833
2009	2,964	702	2,786	17,301	23,753	1.068	0.78	0.833
2010	2,173	639	1,939	17,301	22,052	0.991	0.78	0.773
2011	2,230	688	2,252	17,301	22,471	1.010	0.78	0.788
2012	1,912	509	1,798	17,301	21,520	0.967	0.78	0.755
2013	1,400	465	1,795	17,301	20,961	0.942	0.78	0.735
2014	1,634	549	1,852	17,301	21,336	0.959	0.78	0.748
2015	1,311	600	2,079	17,301	21,291	0.957	0.78	0.747
2016	1,701	557	2,770	17,301	22,329	1.004	0.78	0.783
2017	2,221	235	2,167	17,301	21,924	0.986	0.78	0.769
2018	1,953	202	1,819	17,301	21,275	0.956	0.78	0.746
2019	2,316	428	2,199	17,301	22,244	1.000	0.78	0.780
2020	1,798	411	2,134	17,301	21,644	0.973	0.78	0.759
2021	1,827	396	1,779	17,301	21,303	0.958	0.78	0.747
2022	2,238	411	2,130	17,301	22,080	0.993	0.78	0.774
Baseline	2005 SO <sub>2</sub> /2019 SO <sub>2</sub> (2019 Sulfate)					1.089	0.78	0.85

**Spreadsheet Calculations  
HACR1 Haze Index  
Volcano Adjustment  
Baseline for Clearest Days  
(2007 - 2009)**

SULFATE ADJUSTMENT FOR 2007 CLEAREST DAYS

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007
Julian Day	54	69	72	108	159	195	201	207	225	231	243	255	261	267	273
Adj dv	1.590	0.729	1.132	1.533	1.240	0.156	0.278	0.695	1.199	0.152	0.608	1.257	0.785	0.669	0.797
AmmNO <sub>3</sub> Scale	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772
Adj AmmNO <sub>3</sub>	0.171	0.148	0.266	0.279	0.380	0.096	0.052	0.416	0.242	0.031	0.122	0.525	0.168	0.228	0.320
AmmNO <sub>3</sub>	0.132	0.114	0.205	0.215	0.293	0.074	0.040	0.321	0.187	0.024	0.094	0.405	0.130	0.176	0.247
AmmSO <sub>4</sub> Scale	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089
Adj AmmSO <sub>4</sub>	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
AmmSO <sub>4</sub>	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
CM Scale	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828
Adj CM	0.120	0.181	0.393	0.249	0.389	0.146	0.254	0.163	0.321	0.168	0.464	0.540	0.321	0.339	0.344
CM	0.099	0.150	0.325	0.206	0.322	0.121	0.210	0.135	0.266	0.139	0.384	0.447	0.266	0.281	0.285
EC Scale	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809
Adj EC	0.113	0.000	0.053	0.000	0.067	0.000	0.000	0.000	0.122	0.000	0.088	0.000	0.000	0.000	0.082
EC	0.091		0.043		0.054				0.099		0.071				0.066
POM Scale	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774
Adj POM	1.222	0.451	0.465	0.855	0.289	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
POM	0.946	0.349	0.360	0.662	0.224										
Sea Salt Scale	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387
Adj Sea Salt	0.184	0.107	0.057	0.363	0.145	0.001	0.075	0.213	0.698	0.061	0.097	0.389	0.465	0.229	0.184
Sea Salt	0.255	0.149	0.079	0.504	0.201	0.001	0.104	0.295	0.968	0.085	0.134	0.540	0.645	0.317	0.255
Soil Scale	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898
Adj Soil	0.066	0.020	0.116	0.061	0.202	0.065	0.052	0.079	0.040	0.043	0.008	0.036	0.012	0.047	0.050
Soil	0.059	0.018	0.104	0.055	0.181	0.058	0.047	0.071	0.036	0.039	0.007	0.032	0.011	0.042	0.045
Rayleigh	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9

SULFATE ADJUSTMENT FOR 2007 CLEAREST DAYS (CONTINUOUS)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2007	2007	2007	2007	2007	2007
Julian Day	279	285	312	327	336	357
Adj dv	0.638	0.836	0.707	1.041	0.078	0.567
AmmNO <sub>3</sub> Scale	0.772	0.772	0.772	0.772	0.772	0.772
Adj AmmNO <sub>3</sub>	0.170	0.170	0.257	0.306	0.027	0.298
AmmNO <sub>3</sub>	0.131	0.131	0.198	0.236	0.021	0.230
AmmSO <sub>4</sub> Scale	1.089	1.089	1.089	1.089	1.089	1.089
Adj AmmSO <sub>4</sub>	0.85	0.85	0.85	0.85	0.85	0.85
AmmSO <sub>4</sub>	0.78	0.78	0.78	0.78	0.78	0.78
CM Scale	0.828	0.828	0.828	0.828	0.828	0.828
Adj CM	0.228	0.256	0.374	0.424	0.128	0.115
CM	0.189	0.212	0.310	0.351	0.106	0.095
EC Scale	0.809	0.809	0.809	0.809	0.809	0.809
Adj EC	0.036	0.141	0.026	0.033	0.000	0.000
EC	0.029	0.114	0.021	0.027		
POM Scale	0.774	0.774	0.774	0.774	0.774	0.774
Adj POM	0.000	0.251	0.000	0.000	0.000	0.000
POM		0.194				
Sea Salt Scale	1.387	1.387	1.387	1.387	1.387	1.387
Adj Sea Salt	0.355	0.172	0.209	0.384	0.069	0.303
Sea Salt	0.492	0.238	0.290	0.532	0.096	0.420
Soil Scale	0.898	0.898	0.898	0.898	0.898	0.898
Adj Soil	0.021	0.033	0.017	0.101	0.004	0.018
Soil	0.019	0.030	0.015	0.091	0.004	0.016
Rayleigh	9	9	9	9	9	9

Average Adjusted dv / Light Extinction
0.795
0.222
0.849
0.282
0.036
0.168
0.227
0.052



SULFATE ADJUSTMENT FOR 2008 CLEAREST DAYS

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008
Julian Day	1	4	25	28	31	34	37	40	97	175	205	220	223	232	235
Adj dv	0.537	0.258	1.730	1.078	0.071	0.173	0.236	0.618	0.668	0.337	-0.027	0.645	1.015	0.356	0.791
AmmNO <sub>3</sub> Scale	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772
Adj AmmNO <sub>3</sub>	0.102	0.064	0.211	0.148	0.030	0.131	0.171	0.034	0.162	0.073	0.000	0.226	0.140	0.000	0.135
AmmNO <sub>3</sub>	0.079	0.049	0.163	0.114	0.023	0.101	0.132	0.026	0.125	0.056		0.174	0.108		0.104
AmmSO <sub>4</sub> Scale	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089
Adj AmmSO <sub>4</sub>	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
AmmSO <sub>4</sub>	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
CM Scale	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828
Adj CM	0.421	0.277	1.066	0.403	0.046	0.128	0.047	0.000	0.198	0.240	0.035	0.287	0.355	0.252	0.263
CM	0.349	0.229	0.883	0.334	0.038	0.106	0.039		0.164	0.199	0.029	0.238	0.294	0.209	0.218
EC Scale	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809
Adj EC	0.000	0.002	0.057	0.000	0.000	0.000	0.000	0.114	0.068	0.000	0.000	0.000	0.077	0.077	0.000
EC		0.002	0.046					0.092	0.055				0.062	0.062	
POM Scale	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774
Adj POM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.433	0.000	0.000	0.000	0.065	0.000	0.000	0.000
POM								0.335				0.050			
Sea Salt Scale	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387
Adj Sea Salt	0.155	0.011	0.273	0.673	0.142	0.061	0.158	0.141	0.231	0.110	0.057	0.200	0.605	0.157	0.550
Sea Salt	0.215	0.015	0.378	0.933	0.197	0.085	0.219	0.195	0.321	0.152	0.079	0.278	0.839	0.218	0.763
Soil Scale	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898
Adj Soil	0.023	0.059	0.432	0.065	0.004	0.004	0.013	0.068	0.181	0.071	0.031	0.039	0.042	0.027	0.026
Soil	0.021	0.053	0.388	0.058	0.004	0.004	0.012	0.061	0.163	0.064	0.028	0.035	0.038	0.024	0.023
Rayleigh	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9

SULFATE ADJUSTMENT FOR 2008 CLEAREST DAYS (CONTINUOUS)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2008	2008	2008	2008	2008	2008	2008	2008	2008
Julian Day	238	298	313	316	334	340	346	358	361
Adj dv	0.313	0.649	0.348	0.346	0.512	0.178	0.700	-0.092	0.690
AmmNO <sub>3</sub> Scale	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772
Adj AmmNO <sub>3</sub>	0.023	0.254	0.035	0.060	0.158	0.039	0.026	0.000	0.027
AmmNO <sub>3</sub>	0.018	0.196	0.027	0.046	0.122	0.030	0.020		0.021
AmmSO <sub>4</sub> Scale	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089
Adj AmmSO <sub>4</sub>	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
AmmSO <sub>4</sub>	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
CM Scale	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828
Adj CM	0.174	0.428	0.205	0.219	0.289	0.238	0.389	0.025	0.000
CM	0.144	0.354	0.170	0.181	0.239	0.197	0.322	0.021	
EC Scale	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809
Adj EC	0.000	0.035	0.063	0.000	0.000	0.000	0.105	0.002	0.000
EC		0.028	0.051				0.085	0.002	
POM Scale	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774
Adj POM	0.000	0.000	0.000	0.000	0.000	0.000	0.287	0.009	0.000
POM							0.222	0.007	
Sea Salt Scale	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387
Adj Sea Salt	0.197	0.045	0.169	0.190	0.151	0.024	0.043	0.012	0.227
Sea Salt	0.273	0.063	0.235	0.263	0.210	0.033	0.059	0.017	0.315
Soil Scale	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898
Adj Soil	0.075	0.059	0.032	0.035	0.078	0.030	0.027	0.010	0.610
Soil	0.067	0.053	0.029	0.031	0.070	0.027	0.024	0.009	0.548
Rayleigh	9	9	9	9	9	9	9	9	9

Average Adjusted dv / Light Extinction
0.505
0.094
0.849
0.249
0.025
0.033
0.191
0.085

SULFATE ADJUSTMENT FOR 2009 CLEAREST DAYS

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009
Julian Day	4	7	16	22	34	49	67	91	121	157	160	169	196	223	238
Adj dv	1.187	1.110	1.486	1.544	0.212	1.116	0.677	1.682	1.309	1.480	1.415	1.602	1.171	0.125	1.056
AmmNO <sub>3</sub> Scale	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772
Adj AmmNO <sub>3</sub>	0.499	0.533	0.048	0.228	0.135	0.092	0.000	0.442	0.288	0.187	0.294	0.192	0.373	0.000	0.215
AmmNO <sub>3</sub>	0.385	0.411	0.037	0.176	0.104	0.071		0.341	0.222	0.144	0.227	0.148	0.288		0.166
AmmSO <sub>4</sub> Scale	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089
Adj AmmSO <sub>4</sub>	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
AmmSO <sub>4</sub>	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
CM Scale	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828
Adj CM	0.234	0.278	0.472	0.742	0.058	0.568	0.590	0.660	0.639	0.586	1.025	1.218	0.604	0.222	0.656
CM	0.194	0.230	0.391	0.614	0.048	0.470	0.488	0.546	0.529	0.485	0.848	1.008	0.500	0.184	0.543
EC Scale	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809
Adj EC	0.000	0.184	0.668	0.216	0.000	0.141	0.163	0.066	0.208	0.000	0.000	0.000	0.000	0.000	0.064
EC		0.149	0.540	0.175		0.114	0.132	0.053	0.168						0.052
POM Scale	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774
Adj POM	0.346	0.230	0.343	0.098	0.000	0.000	0.059	0.000	0.000	0.478	0.000	0.000	0.000	0.000	0.000
POM	0.268	0.178	0.266	0.076			0.046			0.370					
Sea Salt Scale	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387
Adj Sea Salt	0.304	0.078	0.198	0.221	0.143	0.084	0.001	0.655	0.177	0.252	0.073	0.270	0.368	0.012	0.290
Sea Salt	0.421	0.108	0.275	0.306	0.199	0.117	0.001	0.909	0.246	0.349	0.101	0.374	0.511	0.017	0.402
Soil Scale	0.898	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
Adj Soil	0.028	0.022	0.023	0.316	0.029	0.446	0.038	0.160	0.237	0.243	0.279	0.209	0.047	0.042	0.039
Soil	0.025	0.020	0.021	0.284	0.026	0.401	0.034	0.144	0.213	0.219	0.251	0.188	0.042	0.038	0.035
Rayleigh	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9

SULFATE ADJUSTMENT FOR 2009 CLEAREST DAYS (CONTINUOUS)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2009	2009	2009	2009	2009	2009	2009	2009	2009
Julian Day	262	286	289	295	307	322	331	334	343
Adj dv	1.300	0.836	1.481	0.827	0.304	1.229	1.429	1.286	1.337
AmmNO <sub>3</sub> Scale	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772	0.772
Adj AmmNO <sub>3</sub>	0.183	0.231	0.369	0.119	0.043	0.154	0.302	0.377	0.443
AmmNO <sub>3</sub>	0.141	0.178	0.285	0.092	0.033	0.119	0.233	0.291	0.342
AmmSO <sub>4</sub> Scale	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089
Adj AmmSO <sub>4</sub>	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
AmmSO <sub>4</sub>	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
CM Scale	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828
Adj CM	0.783	0.594	0.991	0.487	0.255	0.752	0.685	0.546	0.847
CM	0.648	0.492	0.820	0.403	0.211	0.622	0.567	0.452	0.701
EC Scale	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809	0.809
Adj EC	0.125	0.000	0.163	0.030	0.000	0.014	0.032	0.048	0.042
EC	0.101		0.132	0.024		0.011	0.026	0.039	0.034
POM Scale	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774
Adj POM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
POM									
Sea Salt Scale	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387	1.387
Adj Sea Salt	0.384	0.131	0.139	0.365	0.141	0.480	0.655	0.520	0.202
Sea Salt	0.533	0.181	0.193	0.506	0.195	0.666	0.909	0.721	0.280
Soil Scale	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
Adj Soil	0.064	0.067	0.084	0.012	0.021	0.059	0.012	0.031	0.047
Soil	0.058	0.060	0.076	0.011	0.019	0.053	0.011	0.028	0.042
Rayleigh	9	9	9	9	9	9	9	9	9

Average Adjusted dv / Light Extinction
1.133
0.239
0.849
0.604
0.090
0.065
0.256
0.106

**Spreadsheet Calculations  
HACR1 Haze Index  
Volcano Adjustment  
Visibility Conditions for  
Clearest Days  
(2007 - 2022)**

SULFATE SCREENED CLEAREST DAYS (2007)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007
Julian Day	54	69	72	108	159	195	201	207	225	231	243	255	261	267	273
AmmNO <sub>3</sub>	0.132	0.114	0.205	0.215	0.293	0.074	0.04	0.321	0.187	0.024	0.094	0.405	0.13	0.176	0.247
AmmSO <sub>4</sub>	0.487	0.269	1.461	0.768	1.248	1.089	1.372	1.516	0.822	1.431	0.479	0.987	0.662	0.722	1.343
Adjusted SO <sub>4</sub>	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828
CM	0.099	0.15	0.325	0.206	0.322	0.121	0.21	0.135	0.266	0.139	0.384	0.447	0.266	0.281	0.285
EC	0.091		0.043		0.054				0.099		0.071				0.066
POM	0.946	0.349	0.36	0.662	0.224										
Sea Salt	0.255	0.149	0.079	0.504	0.201	0.001	0.104	0.295	0.968	0.085	0.134	0.54	0.645	0.317	0.255
Soil	0.059	0.018	0.104	0.055	0.181	0.058	0.047	0.071	0.036	0.039	0.007	0.032	0.011	0.042	0.045
Rayleigh	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
dv w/o Sulfates	0.566	-0.222	0.115	0.622	0.271	-0.775	-0.618	-0.180	0.541	-0.740	-0.315	0.415	0.052	-0.186	-0.103
dv w screened SO <sub>4</sub>	1.319	0.590	0.902	1.371	1.046	0.082	0.226	0.630	1.296	0.114	0.505	1.180	0.843	0.624	0.701

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2007	2007	2007	2007	2007	2007
Julian Day	279	285	312	327	336	357
AmmNO <sub>3</sub>	0.131	0.131	0.198	0.236	0.021	0.23
AmmSO <sub>4</sub>	0.934	0.658	1.751	1.2	0.462	0.723
Adjusted SO <sub>4</sub>	0.828	0.828	0.828	0.828	0.828	0.828
CM	0.189	0.212	0.31	0.351	0.106	0.095
EC	0.029	0.114	0.021	0.027		
POM		0.194				
Sea Salt	0.492	0.238	0.29	0.532	0.096	0.42
Soil	0.019	0.03	0.015	0.091	0.004	0.016
Rayleigh	9	9	9	9	9	9
dv w/o Sulfates	-0.141	-0.081	-0.167	0.234	-0.805	-0.242
dv w screened SO <sub>4</sub>	0.665	0.720	0.641	1.012	0.055	0.572

<b>Average dv in 2007</b>
<b>-0.084 (Excluding SO<sub>4</sub>)</b>
<b>0.719 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED CLEAREST DAYS (2008)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008
Julian Day	1	4	25	28	31	34	37	40	97	175	205	220	223	232	235
AmmNO <sub>3</sub>	0.079	0.049	0.163	0.114	0.023	0.101	0.132	0.026	0.125	0.056	0.174	0.108	0.104		
AmmSO <sub>4</sub>	0.636	0.43	0.81	0.509	0.214	1.292	1.041	0.505	1.01	1.222	1.171	1.919	0.976	0.888	0.939
Adjusted SO <sub>4</sub>	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833
CM	0.349	0.229	0.883	0.334	0.038	0.106	0.039		0.164	0.199	0.029	0.238	0.294	0.209	0.218
EC		0.002	0.046					0.092	0.055			0.062	0.062		
POM								0.335				0.05			
Sea Salt	0.215	0.015	0.378	0.933	0.197	0.085	0.219	0.195	0.321	0.152	0.079	0.278	0.839	0.218	0.763
Soil	0.021	0.053	0.388	0.058	0.004	0.004	0.012	0.061	0.163	0.064	0.028	0.035	0.038	0.024	0.023
Rayleigh	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
dv w/o Sulfates	-0.342	-0.674	0.823	0.430	-0.767	-0.730	-0.617	-0.295	-0.173	-0.544	-0.904	-0.228	0.335	-0.499	0.107
dv w screened SO <sub>4</sub>	0.485	0.179	1.562	1.197	0.095	0.128	0.232	0.528	0.640	0.299	-0.031	0.590	1.110	0.340	0.899

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2008	2008	2008	2008	2008	2008	2008	2008	2008
Julian Day	238	298	313	316	334	340	346	358	361
AmmNO <sub>3</sub>	0.018	0.196	0.027	0.046	0.122	0.03	0.02	0.021	
AmmSO <sub>4</sub>	1.489	0.984	0.991	1.457	1.857	1.177	0.789	0.258	0.579
Adjusted SO <sub>4</sub>	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833
CM	0.144	0.354	0.17	0.181	0.239	0.197	0.322	0.021	
EC		0.028	0.051				0.085	0.002	
POM							0.222	0.007	
Sea Salt	0.273	0.063	0.235	0.263	0.21	0.033	0.059	0.017	0.315
Soil	0.067	0.053	0.029	0.031	0.07	0.027	0.024	0.009	0.548
Rayleigh	9	9	9	9	9	9	9	9	9
dv w/o Sulfates	-0.511	-0.311	-0.500	-0.491	-0.366	-0.740	-0.272	-0.992	-0.117
dv w screened SO <sub>4</sub>	0.330	0.514	0.339	0.348	0.463	0.119	0.550	-0.112	0.692

**Average dv in 2008**  
**-0.349 (Excluding SO<sub>4</sub>)**  
**0.479 (Including Screened SO<sub>4</sub>)**

SULFATE SCREENED CLEAREST DAYS (2009)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009
Julian Day	4	7	16	22	34	49	67	91	121	157	160	169	196	223	238
AmmNO <sub>3</sub>	0.385	0.411	0.037	0.176	0.104	0.071		0.341	0.222	0.144	0.227	0.148	0.288		0.166
AmmSO <sub>4</sub>	1.43	1.441	0.592	1.197	0.404	1.259	1.745	1.339	1.114	0.996	1.414	1.025	1.475	0.313	1.548
Adjusted SO <sub>4</sub>	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833
CM	0.194	0.23	0.391	0.614	0.048	0.47	0.488	0.546	0.529	0.485	0.848	1.008	0.5	0.184	0.543
EC		0.149	0.54	0.175		0.114	0.132	0.053	0.168						0.052
POM	0.268	0.178	0.266	0.076			0.046			0.37					
Sea Salt	0.421	0.108	0.275	0.306	0.199	0.117	0.001	0.909	0.246	0.349	0.101	0.374	0.511	0.017	0.402
Soil	0.025	0.02	0.021	0.284	0.026	0.401	0.034	0.144	0.213	0.219	0.251	0.188	0.042	0.038	0.035
Rayleigh	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
dv w/o Sulfates	0.289	0.096	0.516	0.612	-0.643	0.172	-0.304	0.947	0.371	0.552	0.418	0.693	0.335	-0.792	0.196
dv w screened SO <sub>4</sub>	1.067	0.888	1.278	1.366	0.208	0.959	0.520	1.677	1.143	1.310	1.187	1.442	1.110	0.072	0.981

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2009	2009	2009	2009	2009	2009	2009	2009	2009
Julian Day	262	286	289	295	307	322	331	334	343
AmmNO <sub>3</sub>	0.141	0.178	0.285	0.092	0.033	0.119	0.233	0.291	0.342
AmmSO <sub>4</sub>	1.811	0.795	1.412	1.422	0.437	1.548	0.959	0.734	1.617
Adjusted SO <sub>4</sub>	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833
CM	0.648	0.492	0.82	0.403	0.211	0.622	0.567	0.452	0.701
EC	0.101		0.132	0.024		0.011	0.026	0.039	0.034
POM									
Sea Salt	0.533	0.181	0.193	0.506	0.195	0.666	0.909	0.721	0.28
Soil	0.058	0.06	0.076	0.011	0.019	0.053	0.011	0.028	0.042
Rayleigh	9	9	9	9	9	9	9	9	9
dv w/o Sulfates	0.470	-0.089	0.494	0.036	-0.557	0.460	0.719	0.517	0.391
dv w screened SO <sub>4</sub>	1.235	0.718	1.257	0.833	0.287	1.226	1.466	1.279	1.162

<b>Average dv in 2009</b>
<b>0.246 (Excluding SO<sub>4</sub>)</b>
<b>1.028 (Including Screened SO<sub>4</sub>)</b>



SULFATE SCREENED CLEAREST DAYS (2010)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010
Julian Day	5	20	59	65	74	143	161	176	209	215	224	239	245	248	263
AmmNO <sub>3</sub>		0.017	0.098	0.103	0.049	0.158	0.017	0.106	0.031	0.024	0.001	0.164	0.152	0.232	0.135
AmmSO <sub>4</sub>	0.974	0.857	1.098	0.506	0.392	0.79	1.043	1.301	1.39	0.354	0.854	0.822	1.084	0.907	0.935
Adjusted SO <sub>4</sub>	0.773	0.773	0.773	0.773	0.773	0.773	0.773	0.773	0.773	0.773	0.773	0.773	0.773	0.773	0.773
CM	0.295	0.201	0.331	0.322	0.113	0.355	0.37	0.184			0.086	0.338	0.35	0.409	0.196
EC			0.072		0.106		0.094	0.021	0.105		0.003				0.062
POM					0.117		0.066								
Sea Salt	0.034	0.074	0.001	0.488	0.17	0.729	0.075	0.072	0.239	0.048	0.121	0.194	0.183	0.41	0.19
Soil	0.016	0.063	0.196	0.053	0.021	0.081	0.155	0.096	0.043	0.019	0.05	0.031	0.07	0.054	0.048
dv w/o Sulfates	-0.677	-0.667	-0.307	-0.034	-0.433	0.318	-0.226	-0.535	-0.600	-0.953	-0.768	-0.277	-0.248	0.104	-0.376
dv w screened SO <sub>4</sub>	0.117	0.127	0.460	0.713	0.343	1.040	0.535	0.249	0.189	-0.137	0.034	0.488	0.515	0.842	0.396

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2010	2010	2010	2010	2010	2010	2010	2010
Julian Day	299	302	305	308	329	332	335	344
AmmNO <sub>3</sub>	0.067	0.113	0.133	0.001	0.052	0.036	0.117	0.121
AmmSO <sub>4</sub>	0.286	0.376	1.727	0.033	0.656	0.531	0.668	0.919
Adjusted SO <sub>4</sub>	0.773	0.773	0.773	0.773	0.773	0.773	0.773	0.773
CM	0.264	0.036	0.166	0.194	0.21	0.237	0.348	0.115
EC		0.119	0.01		0.075	0.011	0.078	0.07
POM		0.022			0.05	0.236	0.363	0.199
Sea Salt	0.166	0.051	0.001	0.001	0.541	0.04	0.539	0.186
Soil	0.019	0.019	0.051	0.007	0.036	0.007	0.012	0.024
dv w/o Sulfates	-0.496	-0.661	-0.660	-0.831	-0.036	-0.443	0.447	-0.289
dv w screened SO <sub>4</sub>	0.285	0.132	0.133	-0.024	0.711	0.334	1.160	0.476

<b>Average dv in 2010</b>
<b>-0.376 (Excluding SO<sub>4</sub>)</b>
<b>0.396 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED CLEAREST DAYS (2011)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011
Julian Day	3	6	12	15	27	81	171	177	210	237	252	273	282	303	306
AmmNO <sub>3</sub>	0.152	0.052	0.03	0.102	0.002	0.111	0.12		0.032	0.033	0.175	0.159	0.011	0.329	0.179
AmmSO <sub>4</sub>	1.039	0.525	1.34	1.878	0.851	0.745	0.984	1.803	0.906	1.491	1.535	0.81	1.15	0.873	1.543
Adjusted SO <sub>4</sub>	0.788	0.788	0.788	0.788	0.788	0.788	0.788	0.788	0.788	0.788	0.788	0.788	0.788	0.788	0.788
CM	0.387	0.164	0.26	0.069	0.103	0.244	0.239	0.055	0.187	0.31	0.276	0.422	0.157	0.17	0.211
EC			0.018		0.01	0.071	0.07	0.044		0.054		0.03	0.01	0.066	0.014
POM			0.068			0.063						0.169	0.008	0.319	
Sea Salt	0.597	0.172	0.447	0.446	0.022	0.392	0.443	0.148	0.107	0.178	0.108	0.206	0.216	0.753	0.766
Soil	0.019	0.033	0.023	0.01	0.072	0.063	0.027	0.027	0.008	0.079	0.014	0.042	0.029	0.016	0.016
dv w/o Sulfates	0.154	-0.596	-0.155	-0.380	-0.824	-0.056	-0.102	-0.754	-0.689	-0.352	-0.436	0.028	-0.586	0.633	0.184
dv w screened SO <sub>4</sub>	0.901	0.207	0.615	0.407	-0.003	0.706	0.664	0.062	0.121	0.433	0.355	0.784	0.217	1.346	0.929

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2011	2011	2011	2011	2011	2011	2011
Julian Day	324	330	345	351	354	357	363
AmmNO <sub>3</sub>	0.154	0.004	0.022	0.045		0.009	
AmmSO <sub>4</sub>	0.586	1.765	0.317	0.66	0.138	0.421	0.862
Adjusted SO <sub>4</sub>	0.788	0.788	0.788	0.788	0.788	0.788	0.788
CM	0.115	0.16	0.103	0.19	0.076	0.159	0.22
EC	0.04	0.038			0.098	0.04	
POM				0.078	0.227	0.123	
Sea Salt	0.45	0.306	0.282	0.434	0.095	0.441	0.149
Soil	0.006	0.039	0.019	0.046	0.005	0.022	0.082
dv w/o Sulfates	-0.238	-0.464	-0.591	-0.209	-0.512	-0.208	-0.565
dv w screened SO <sub>4</sub>	0.538	0.330	0.212	0.565	0.285	0.566	0.236

Average dv in 2011
-0.305 (Excluding SO <sub>4</sub> )
0.476 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED CLEAREST DAYS (2012)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012
Julian Day	7	22	31	37	49	52	127	136	145	148	178	211	241	268	289
AmmNO <sub>3</sub>	0.059		0.602	0.202	0.011	0.223	0.108	0.328	0.178	0.09	0.105	0.282	0.007		0.067
AmmSO <sub>4</sub>	1.017	0.832	1.482	0.854	0.234	1.13	1.455	1.281	1.621	0.814	1.787	1.238	0.236	0.937	0.733
Adjusted SO <sub>4</sub>	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
CM	0.282	0.217	0.344	0.224	0.084	0.319	0.148	0.235	0.278	0.193	0.015	0.316	0.119	0.753	0.212
EC	0.214	0.139		0.003	0.027		0.051	0.194	0.005	0.178	0.079	0.056			0.192
POM	0.411	0.145	0.115	0.085	0.252			0.084		0.287					
Sea Salt	0.215	0.16	0.474	0.092	0.156	1.201	0.082	0.224	0.549	0.398	0.447	0.188	0.177	0.1	0.162
Soil	0.022	0.013	0.007	0.004	0.019	0.05	0.143	0.188	0.082	0.039	0.057	0.01	0.003	0.007	0.046
dv w/o Sulfates	0.201	-0.331	0.528	-0.398	-0.461	0.763	-0.479	0.250	0.092	0.183	-0.301	-0.149	-0.719	-0.141	-0.326
dv w screened SO <sub>4</sub>	0.915	0.420	1.220	0.358	0.299	1.439	0.283	0.960	0.813	0.898	0.448	0.589	0.061	0.597	0.425

Site Code	HACR1	HACR1	HACR1	HACR1
Year	2012	2012	2012	2012
Julian Day	304	313	343	355
AmmNO <sub>3</sub>		0.115	0.007	0.033
AmmSO <sub>4</sub>	0.788	0.741	0.975	0.154
Adjusted SO <sub>4</sub>	0.755	0.755	0.755	0.755
CM	0.652	0.463		0.127
EC	0.102	0.043		
POM	0.118	0.179		0.371
Sea Salt	0.041	0.4	0.067	0.299
Soil	0.029	0.013	0.027	0.01
dv w/o Sulfates	-0.058	0.211	-0.942	-0.161
dv w screened SO <sub>4</sub>	0.674	0.924	-0.145	0.578

<b>Average dv in 2012</b>
<b>-0.118 (Excluding SO<sub>4</sub>)</b>
<b>0.619 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED CLEAREST DAYS (2014)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014
Julian Day	26	56	68	74	92	110	134	173	194	248	266	290	296	305	317
AmmNO <sub>3</sub>	0.078	0.05	0.102	0.047	0.115	0.055	0.206	0.127	0.097	0.141			0.229	0.214	0.007
AmmSO <sub>4</sub>	1.016	1.038	0.659	0.178	0.715	0.531	0.983	0.945	1.9	0.909	1.236	1.661	1.05	0.8	0.606
Adjusted SO <sub>4</sub>	0.748	0.748	0.748	0.748	0.748	0.748	0.748	0.748	0.748	0.748	0.748	0.748	0.748	0.748	0.748
CM	0.047	0.117	0.243	0.155	0.091	0.119	0.336	0.194	0.227	0.332	0.22	0.246	0.272	0.229	0.104
EC	0.126	0.104	0.088			0.11							0.018	0.009	0.105
POM	0.585	0.211	0.274						0.134	0.629	0.073	0.028	0.062	0.09	0.245
Sea Salt	0.266	0.147	0.001	0.093	0.263	0.222	0.014	0.156	0.01	0.121	0.214	0.024	0.197	0.856	0.076
Soil	0.006	0.027	0.139	0.011	0.005	0.06	0.284	0.093	0.026	0.018	0.01	0.005	0.037	0.026	
dv w/o Sulfates	0.107	-0.350	-0.154	-0.719	-0.540	-0.444	-0.161	-0.440	-0.519	0.238	-0.495	-0.722	-0.187	0.415	-0.474
dv w screened SO <sub>4</sub>	0.821	0.396	0.578	0.054	0.220	0.309	0.571	0.313	0.239	0.943	0.262	0.051	0.548	1.108	0.281

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2014	2014	2014	2014	2014
Julian Day	338	344	347	350	353
AmmNO <sub>3</sub>	0.385				
AmmSO <sub>4</sub>	1.18	0.76	0.729	0.53	0.719
Adjusted SO <sub>4</sub>	0.748	0.748	0.748	0.748	0.748
CM	0.251	0.29	0.221	0.201	0.015
EC	0.105				0.083
POM	0.195		0.056		0.09
Sea Salt	0.213	0.011	0.08	0.008	0.256
Soil	0.034	0.114	0.087	0.13	0.055
dv w/o Sulfates	0.181	-0.603	-0.572	-0.684	-0.514
dv w screened SO <sub>4</sub>	0.890	0.162	0.190	0.087	0.244

Average dv in 2014
-0.332 (Excluding SO <sub>4</sub> )
0.413 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED CLEAREST DAYS (2015)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	
Year	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	
Julian Day	21	24	33	117	150	168	216	225	243	258	261	264	267	270	297	
AmmNO <sub>3</sub>					0.202	0.227	0.141	0.168	0.149	0.171	0.182	0.15	0.131		0.236	
AmmSO <sub>4</sub>	0.919	0.454	1.468	0.019	0.796	0.908	0.47	0.812	0.648	0.552	0.847	0.415	0.701	0.158	0.929	
Adjusted SO <sub>4</sub>	0.747	0.747	0.747	0.747	0.747	0.747	0.747	0.747	0.747	0.747	0.747	0.747	0.747	0.747	0.747	
CM	0.098	0.092	0.661	0.069	0.261	0.233	0.231	0.26	0.299	0.315	0.554	0.26	0.081	0.283	0.247	
EC					0.025				0.002				0.089		0.022	0.072
POM		0.163			0.219				0.336							0.228
Sea Salt	0.106	0.057	0.069	0.001	0.104	0.007	0.102	0.144	0.151	0.166	0.536	0.273	0.276	0.121	0.37	
Soil	0.006		0.025	0.001	0.059	0.039	0.002	0.004	0.003	0.003	0.006		0.01		0.048	
dv w/o Sulfates	-0.823	-0.713	-0.248	-0.975	-0.131	-0.507	-0.538	-0.433	-0.062	-0.349	0.274	-0.231	-0.492	-0.614	0.199	
dv w screened SO <sub>4</sub>	-0.043	0.059	0.490	-0.184	0.599	0.250	0.221	0.318	0.663	0.396	0.976	0.506	0.263	0.150	0.906	

Site Code	HACR1	HACR1	HACR1	HACR1
Year	2015	2015	2015	2015
Julian Day	327	330	342	360
AmmNO <sub>3</sub>		0.165	0.117	0.16
AmmSO <sub>4</sub>	0.6	0.849	0.722	0.493
Adjusted SO <sub>4</sub>	0.747	0.747	0.747	0.747
CM	0.084	0.058	0.137	0.307
EC	0.049			
POM	0.39		0.456	0.306
Sea Salt	0.016	0.034	0.042	0.379
Soil		0.013	0.007	0.004
dv w/o Sulfates	-0.472	-0.758	-0.244	0.155
dv w screened SO <sub>4</sub>	0.282	0.017	0.494	0.865

Average dv in 2015
-0.366 (Excluding SO <sub>4</sub> )
0.380 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED CLEAREST DAYS (2016)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016
Julian Day	4	97	130	163	166	169	175	226	241	247	253	265	295	304	310
AmmNO <sub>3</sub>	0.276			0.337	0.076	0.178	0.152	0.066		0.077	0.137	0.116	0.131	0.198	0.093
AmmSO <sub>4</sub>	1.151	0.173	0.087	0.786	0.336	0.862	0.457	0.233	0.059	0.485	0.447	0.245	0.965	0.674	1.502
Adjusted SO <sub>4</sub>	0.783	0.783	0.783	0.783	0.783	0.783	0.783	0.783	0.783	0.783	0.783	0.783	0.783	0.783	0.783
CM	0.459	0.197	0.204	0.4	0.388	0.352	0.33	0.217	0.229	0.272	0.232	0.077	0.449	0.357	
EC	0.045		0.136	0.069	0.013	0.005	0.136							0.317	0.106
POM	0.053	0.19	0.489	0.295	0.218	0.017	0.489	0.174	0.273				0.198	0.116	0.017
Sea Salt	0.119	0.008	0.001	0.329	0.233	0.327	0.326	0.058	0.006	0.128	0.334	0.128	0.168	0.571	0.135
Soil	0.215	0.009	0.005	0.068	0.022	0.08	0.034	0.004	0.002		0.001	0.002	0.003	0.071	0.073
dv w/o Sulfates	0.166	-0.614	-0.166	0.486	-0.050	-0.041	0.456	-0.493	-0.502	-0.537	-0.300	-0.701	-0.051	0.611	-0.593
dv w screened SO <sub>4</sub>	0.908	0.185	0.600	1.205	0.707	0.716	1.178	0.298	0.289	0.257	0.476	0.105	0.706	1.322	0.205

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2016	2016	2016	2016	2016	2016	2016	2016
Julian Day	319	328	334	340	346	352	355	358
AmmNO <sub>3</sub>	0.141	0.357	0.204	0.14	0.129	0.119	0.071	0.209
AmmSO <sub>4</sub>	0.858	0.517	0.637	1.001	0.739	0.553	0.808	0.942
Adjusted SO <sub>4</sub>	0.783	0.783	0.783	0.783	0.783	0.783	0.783	0.783
CM	0.32	0.162	0.086	0.086	0.274	0.382	0.454	0.215
EC			0.019	0.141	0.044			0.015
POM	0.434			0.281	0.762			
Sea Salt	0.412	0.891	0.797		0.251	0.165	0.001	0.001
Soil	0.033	0.078	0.047		0.001	0.05	0.002	0.139
dv w/o Sulfates	0.334	0.476	0.152	-0.358	0.451	-0.288	-0.484	-0.430
dv w screened SO <sub>4</sub>	1.064	1.196	0.895	0.422	1.172	0.487	0.306	0.356

Average dv in 2016
<b>-0.108 (Excluding SO<sub>4</sub>)</b>
<b>0.655 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED CLEAREST DAYS (2017)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017
Julian Day	1	16	19	37	46	61	79	133	154	163	211	223	268	271	277
AmmNO <sub>3</sub>				0.13	0.072	0.256	0.163	0.326	0.128	0.066	0.237	0.175	0.287	0.11	0.241
AmmSO <sub>4</sub>	0.691	0.787	0.658	0.595	0.47	1.252	1.142	0.841	0.63	0.442	1.405	0.571	0.858	0.429	0.724
Adjusted SO <sub>4</sub>	0.769	0.769	0.769	0.769	0.769	0.769	0.769	0.769	0.769	0.769	0.769	0.769	0.769	0.769	0.769
CM	0.254	0.209	0.299	0.308		0.207	0.324	0.397	0.178	0.195	0.211	0.192	0.05	0.141	0.265
EC	0.272	0.006	0.051		0.099		0.144	0.065	0.073		0.123			0.338	0.006
POM	0.023		0.081		0.355		0.192		0.486	0.466		0.174	0.703	1.228	0.206
Sea Salt		0.025	0.002	0.209	0.015	0.302	0.143	0.706	0.168	0.042	0.549	0.49	0.456	0.191	0.621
Soil	0.017	0.022	0.015	0.024	0.007	0.042	0.028	0.22	0.077	0.037	0.027	0.011	0.01	0.004	0.008
dv w/o Sulfates	-0.444	-0.767	-0.568	-0.335	-0.463	-0.195	-0.006	0.690	0.109	-0.196	0.146	0.042	0.494	0.964	0.341
dv w screened SO <sub>4</sub>	0.330	0.031	0.215	0.431	0.312	0.560	0.735	1.383	0.842	0.559	0.876	0.780	1.200	1.639	1.058

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2017	2017	2017	2017	2017	2017	2017	2017
Julian Day	283	307	319	322	331	334	355	358
AmmNO <sub>3</sub>	0.182	0.2	0.1	0.416	0.082	0.123	0.145	0.122
AmmSO <sub>4</sub>	0.98	1.398	0.224	1.169	0.137	0.891	0.233	0.638
Adjusted SO <sub>4</sub>	0.769	0.769	0.769	0.769	0.769	0.769	0.769	0.769
CM	0.144	0.103	0.097	0.056	0.156	0.408	0.1	0.209
EC	0.463	0.129		0.052	0.081	0.146		0.034
POM	0.444	0.184	0.263	0.315	0.372	0.35	0.095	
Sea Salt	0.007	0.22	0.494	0.425	0.136	0.116	0.093	0.264
Soil	0.018		0.004	0.028	0.002	0.04	0.008	0.028
dv w/o Sulfates	0.255	-0.165	-0.042	0.288	-0.172	0.181	-0.575	-0.349
dv w screened SO <sub>4</sub>	0.978	0.587	0.702	1.008	0.581	0.909	0.208	0.417

Average dv in 2017
-0.033 (Excluding SO <sub>4</sub> )
0.710 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED CLEAREST DAYS (2018)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018
Julian Day	8	23	47	77	95	101	119	158	170	176	188	233	254	293	299
AmmNO <sub>3</sub>	0.094	0.392	0.076	0.141	0.138	0.198	0.209	0.291	0.051	0.058	0.036	0.156	0.024	0.189	0.177
AmmSO <sub>4</sub>	0.783	0.508	0.323	0.791	0.333	1.143	0.756	1.204	0.875	0.909	0.397	0.554	0.441	0.686	0.721
Adjusted SO <sub>4</sub>	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746
CM	0.161	0.092		0.188	0.202	0.065	0.161	0.203	0.383	0.078	0.323	0.002	0.261	0.383	0.263
EC		0.112	0.156	0.177	0.058	0.075			0.142		0.107		0.035		0.055
POM		0.202	0.298	0.279	0.085		0.61	0.008	0.401	0.006	0.154	0.771	0.122		
Sea Salt	0.154	0.045	0.003	0.115	0.133	0.1	0.09	0.118	0.123	0.142	0.169	0.107	0.104	0.067	0.258
Soil	0.005	0.015	0.014	0.004		0.153	0.104	0.184	0.041	0.066		0.018		0.038	0.006
dv w/o Sulfates	-0.604	-0.143	-0.464	-0.096	-0.392	-0.418	0.173	-0.198	0.140	-0.672	-0.213	0.054	-0.465	-0.328	-0.244
dv w screened SO <sub>4</sub>	0.159	0.586	0.289	0.630	0.356	0.331	0.880	0.535	0.850	0.096	0.521	0.770	0.288	0.414	0.493

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2018	2018	2018	2018	2018	2018	2018
Julian Day	314	332	335	344	350	353	356
AmmNO <sub>3</sub>	0.063	0.32	0.164	0.067	0.066	0.02	0.191
AmmSO <sub>4</sub>	0.458	0.975	0.339	0.242	0.987	0.244	0.763
Adjusted SO <sub>4</sub>	0.746	0.746	0.746	0.746	0.746	0.746	0.746
CM	0.226	0.281	0.03	0.075	0.299	0.052	0.175
EC	0.313	0.092		0.047	0.055	0.094	0.006
POM	0.243		0.156	0.133		0.098	
Sea Salt	0.089	0.374	0.004	0.185	0.013	0.158	0.343
Soil	0.012	0.031		0.012	0.025	0.006	0.015
dv w/o Sulfates	-0.054	0.098	-0.668	-0.493	-0.557	-0.589	-0.274
dv w screened SO <sub>4</sub>	0.669	0.810	0.100	0.262	0.202	0.173	0.465

<b>Average dv in 2018</b>
<b>-0.291 (Excluding SO<sub>4</sub>)</b>
<b>0.449 (Including Screened SO<sub>4</sub>)</b>



SULFATE SCREENED CLEAREST DAYS (2019)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
Julian Day	30	33	45	48	66	69	72	132	135	201	270	273	276	279	327
AmmNO <sub>3</sub>	0.126	0.197	0.17	0.183	0.17	0.232	0.253	0.302	0.343	0.045	0.123	0.14	0.11	0.386	0.162
AmmSO <sub>4</sub>	0.677	0.049	0.553	0.775	1.363	0.712	0.921	0.696	1.227	0.578	0.81	0.426	0.426	1.334	0.635
Adjusted SO <sub>4</sub>	0.780	0.780	0.780	0.780	0.780	0.780	0.780	0.780	0.780	0.780	0.780	0.780	0.780	0.780	0.780
CM		0.204	0.523	0.357	0.204	0.318	0.099	0.474	0.492	0.21	0.152	0.129	0.294	0.079	0.029
EC	0.07		0.136	0.193	0.081	0.004	0.165	0.06							
POM	0.043	0.262	0.089	0.143		0.022	0.408	0.205	0.065	0.151			0.014	0.069	0.174
Sea Salt	0.47	0.078	0.193	0.264	0.234	0.686	0.415	0.133	0.259	0.182	0.008	0.291	0.545	0.368	0.613
Soil	0.007		0.246	0.114	0.074	0.024	0.06	0.179	0.09	0.011	0.018	0.012	0.01	0.009	0.02
dv w/o Sulfates	-0.288	-0.262	0.351	0.251	-0.240	0.282	0.392	0.347	0.246	-0.409	-0.725	-0.437	-0.027	-0.089	-0.002
dv w screened SO <sub>4</sub>	0.484	0.508	1.077	0.984	0.529	1.013	1.115	1.073	0.979	0.372	0.081	0.346	0.726	0.668	0.749

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2019	2019	2019	2019	2019	2019
Julian Day	330	342	348	351	354	363
AmmNO <sub>3</sub>	0.118	0.393	0.09	0.087	0.058	0.358
AmmSO <sub>4</sub>	1.149	1.229	0.484	0.476	0.618	1.151
Adjusted SO <sub>4</sub>	0.780	0.780	0.780	0.780	0.780	0.780
CM	0.115	0.354	0.174	0.485	0.206	0.261
EC		0.168	0.162			0.131
POM	0.008	0.069		0.013		
Sea Salt	0.22	0.211	0.311	0.651	0.305	0.55
Soil	0.009	0.034		0.001	0.01	0.011
dv w/o Sulfates	-0.545	0.226	-0.267	0.234	-0.430	0.306
dv w screened SO <sub>4</sub>	0.247	0.961	0.504	0.969	0.353	1.035

Average dv in 2019
-0.052 (Excluding SO <sub>4</sub> )
0.704 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED CLEAREST DAYS (2020)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020
Julian Day	4	10	37	49	73	79	103	139	142	208	241	265	274	304	313
AmmNO <sub>3</sub>	0.078	0.002	0.168	0.005	0.157	0.209	0.197	0.161	0.158		0.24	0.212	0.07	0.132	0.174
AmmSO <sub>4</sub>	0.273	0.123	0.886	0.446	0.672	0.912	0.761	0.503	0.626	0.156	1.195	0.791	0.298	0.816	0.661
Adjusted SO <sub>4</sub>	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759
CM	0.233	0.076	0.094	0.174	0.129	0.234	0.205	0.063	0.198	0.202	0.297	0.171	0.053	0.286	0.333
EC			0.058	0.187	0.151	0.214	0.235	0.514	0.036	0.057	0.061	0.09		0.017	
POM	0.096		0.06	0.205		0.345	0.627	0.805	0.061	0.129		0.65		0.006	
Sea Salt	0.24	0.176	0.268	0.13	0.091	0.12	0.104	0.062	0.086	0.012	0.438	0.362	0.052	0.13	1.017
Soil			0.006	0.001	0.012	0.02	0.048	0.106	0.094		0.05	0.027	0.001	0.104	0.043
dv w/o Sulfates	-0.359	-0.775	-0.352	-0.303	-0.471	0.141	0.408	0.687	-0.374	-0.619	0.086	0.499	-0.860	-0.330	0.552
dv w screened SO <sub>4</sub>	0.398	0.013	0.405	0.451	0.295	0.863	1.111	1.371	0.385	0.158	0.811	1.196	-0.065	0.425	1.245

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2020	2020	2020	2020	2020	2020	2020
Julian Day	322	325	328	334	346	352	361
AmmNO <sub>3</sub>	0.166	0.243	0.099	0.126	0.055	0.072	0.097
AmmSO <sub>4</sub>	0.941	0.708	0.283	0.643	0.926	0.388	0.425
Adjusted SO <sub>4</sub>	0.759	0.759	0.759	0.759	0.759	0.759	0.759
CM	0.385	0.287	0.203	0.157	0.031		0.106
EC					0.137		0.095
POM	0.278	0.261	0.372	0.108	0.121		0.222
Sea Salt	0.205	0.302	0.223	0.343	0.136	0.235	0.295
Soil	0.002	0.011	0.008	0.048	0.029	0.019	0.033
dv w/o Sulfates	0.036	0.103	-0.095	-0.220	-0.503	-0.698	-0.153
dv w screened SO <sub>4</sub>	0.765	0.828	0.643	0.527	0.264	0.085	0.589

Average dv in 2020
-0.164 (Excluding SO <sub>4</sub> )
0.580 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED CLEAREST DAYS (2021)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021
Julian Day	1	19	25	49	58	64	67	76	94	154	184	226	235	247
AmmNO <sub>3</sub>		0.031	0.023	0.079	0.078	0.143	0.075		0.057	0.145	0.067	0.067	0.079	0.145
AmmSO <sub>4</sub>	0.181	0.697	0.192	0.475	0.248	0.585	0.795	0.132	0.307	0.986	0.495	0.893	0.233	0.694
SO <sub>4</sub> Adjusted	0.747	0.747	0.747	0.747	0.747	0.747	0.747	0.747	0.747	0.747	0.747	0.747	0.747	0.747
CM	0.081	0.23	0.201	0.225	0.178		0.138	0.19	0.746	0.166	0.162	0.118	0.26	0.16
EC	0.187	0.165	0.069	0.15		0.16	0.183	0.057	0.155	0.111		0.204		
POM	0.232	0.151		0.139	0.03	0.216	0.031			0.046		0.035		
Sea Salt	0.14	0.074	0.301	0.292	0.408	0.333	0.206	0.054	0.124	0.137	0.132	0.085	0.116	0.471
Soil	0.024	0.019	0.016	0.024		0.036	0.014	0.017	0.077	0.16	0.021	0.023	0.003	0.02
dv w/o Sulfates	-0.342	-0.336	-0.398	-0.091	-0.311	-0.113	-0.359	-0.706	0.158	-0.238	-0.638	-0.479	-0.557	-0.206
dv w screened SO <sub>4</sub>	0.403	0.409	0.351	0.635	0.432	0.616	0.386	0.065	0.867	0.499	0.128	0.275	0.203	0.529

<b>Average dv in 2021</b>
<b>-0.330 (Excluding SO<sub>4</sub>)</b>
<b>0.414 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED CLEAREST DAYS (2022)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022
Julian Day	23	26	53	83	122	164	167	176	185	194	197	200	248	263	272
AmmNO <sub>3</sub>	0.064	0.079	0.094	0.077	0.175	0.265	0.133	0.01	0.094	0.025	0.03	0.02	0.304	0.235	0.094
AmmSO <sub>4</sub>	0.635	1.023	0.989	1.127	1.114	1.074	0.552	0.238	0.917	0.899	1.867	0.758	1.256	1.201	0.764
Adjusted SO <sub>4</sub>	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774
CM	0.191		0.016	0.184	0.248	0.408	0.115	0.121	0.063	0.119	0.086	0.087	0.209	0.224	0.103
EC	0.017	0.085	0.197	0.26	0.086		0.331	0.32	0.074			0.064	0.046		
POM	1.26		0.221	0.209		0.127	0.196	0.549					0.026		
Sea Salt	0.197	0.168	0.106	0.135	0.088	0.41	0.132			0.243	0.108	0.014	0.227	0.248	0.23
Soil	0.015	0.017	0.017	0.125	0.123	0.261	0.086	0.004	0.078	0.006	0.023	0.037	0.032	0.024	0.04
dv w/o Sulfates	0.718	-0.673	-0.355	-0.010	-0.284	0.460	-0.007	0.004	-0.716	-0.626	-0.783	-0.810	-0.157	-0.273	-0.548
dv w screened SO <sub>4</sub>	1.413	0.122	0.416	0.736	0.482	1.173	0.739	0.749	0.083	0.166	0.021	-0.004	0.600	0.493	0.238

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2022	2022	2022	2022	2022	2022	2022	2022
Julian Day	275	281	299	302	314	332	335	344
sAmmNO <sub>3</sub>	0.008	0.237	0.017	0.249	0.105	0.009	0.09	0.102
AmmSO <sub>4</sub>	0.165	1.547	0.095	0.784	0.905	1.591	0.758	0.594
Adjusted SO <sub>4</sub>	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774
CM	0.182	0.172	0.088	0.14	0.134	0.225	0.103	0.425
EC		0.044		0.009	0.022			
POM						0.685	0.13	0.366
Sea Salt		0.217	0.073	0.403	0.312	0.038	0.197	0.484
Soil	0.002	0.007		0.011	0.012	0.001	0.018	0.083
dv w/o Sulfates	-0.843	-0.328	-0.858	-0.190	-0.424	-0.042	-0.473	0.450
dv w screened SO <sub>4</sub>	-0.034	0.441	-0.048	0.569	0.353	0.706	0.307	1.164

Average dv in 2022
<b>-0.294 (Excluding SO<sub>4</sub>)</b>
<b>0.473 (Including Screened SO<sub>4</sub>)</b>

**Spreadsheet Calculations  
HACR1 Haze Index  
Volcano Adjustment  
Most Impaired Days  
(2007-2022)**

Sulfate Adjustments (Most Impaired Days) Haleakala National Park								
Year	Emissions (TPY)					Scale	Light Extinction ( $B_{ext} \text{ Mm}^{-1}$ )	
	Kahului	Maalaea	Kanoelehua-Hill	Volcanic (2019)	Total		2019 Sulfate	Sulfate Adjusted
2005	3,198	913	2,822	17,301	24,234	1.089	5.47	5.957
2007	2,872	634	2,813	17,301	23,620	1.062	5.47	5.808
2008	2,876	697	2,886	17,301	23,760	1.068	5.47	5.843
2009	2,964	702	2,786	17,301	23,753	1.068	5.47	5.841
2010	2,173	639	1,939	17,301	22,052	0.991	5.47	5.423
2011	2,230	688	2,252	17,301	22,471	1.010	5.47	5.526
2012	1,912	509	1,798	17,301	21,520	0.967	5.47	5.292
2013	1,400	465	1,795	17,301	20,961	0.942	5.47	5.154
2014	1,634	549	1,852	17,301	21,336	0.959	5.47	5.247
2015	1,311	600	2,079	17,301	21,291	0.957	5.47	5.236
2016	1,701	557	2,770	17,301	22,329	1.004	5.47	5.491
2017	2,221	235	2,167	17,301	21,924	0.986	5.47	5.391
2018	1,953	202	1,819	17,301	21,275	0.956	5.47	5.232
2019	2,316	428	2,199	17,301	22,244	1.000	5.47	5.470
2020	1,798	411	2,134	17,301	21,644	0.973	5.47	5.322
2021	1,827	396	1,779	17,301	21,303	0.958	5.47	5.239
2022	2,238	411	2,130	17,301	22,080	0.993	5.47	5.430
Baseline	2005 SO <sub>2</sub> /2019 SO <sub>2</sub> (2019 Sulfate)					1.089	5.47	5.96

**Spreadsheet Calculations  
HACR1 Haze Index  
Volcano Adjustment Baseline  
for Most Impaired Days  
(2007-2009)**

SULFATE ADJUSTMENT FOR 2007 MOST IMPAIRED DAYS

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007
Julian Day	63	66	75	87	96	132	135	138	141	177	186	189	192	234	237
Adj dv	6.260	5.713	6.315	6.919	12.504	5.949	9.160	6.683	7.101	7.999	5.035	6.790	5.555	6.343	4.899
AmmNO <sub>3</sub> Scale	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777
Adj AmmNO <sub>3</sub>	0.746	0.563	0.754	1.285	3.073	0.925	3.323	1.276	1.252	2.709	0.379	1.773	0.315	1.209	0.396
AmmNO <sub>3</sub>	0.580	0.438	0.586	0.999	2.389	0.719	2.583	0.992	0.973	2.106	0.295	1.378	0.245	0.940	0.308
AmmSO <sub>4</sub> Scale	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089
Adj AmmSO <sub>4</sub>	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96
AmmSO <sub>4</sub>	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47
CM Scale	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746
Adj CM	0.741	0.944	1.230	0.559	2.638	0.555	2.644	0.938	1.166	2.077	0.795	2.187	1.228	1.943	0.555
CM	0.553	0.704	0.918	0.417	1.968	0.414	1.973	0.700	0.870	1.550	0.593	1.632	0.916	1.450	0.414
EC Scale	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847
Adj EC	0.659	0.390	0.338	1.238	4.351	0.156	0.665	0.672	0.938	0.576	0.233	0.035	0.288	0.197	0.364
EC	0.558	0.330	0.286	1.048	3.683	0.132	0.563	0.569	0.794	0.488	0.197	0.030	0.244	0.167	0.308
POM Scale	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745
Adj POM	1.318	0.591	1.068	1.710	7.723	1.144	2.206	1.246	1.680	1.089	0.000	0.085	0.365	0.034	0.000
POM	0.981	0.440	0.795	1.273	5.750	0.852	1.642	0.928	1.251	0.811		0.063	0.272	0.025	
Sea Salt Scale	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090
Adj Sea Salt	0.122	0.097	0.365	0.138	0.603	0.109	0.388	0.196	0.196	0.590	0.065	0.481	0.066	0.376	0.000
Sea Salt	0.255	0.202	0.764	0.289	1.260	0.227	0.812	0.409	0.410	1.234	0.135	1.006	0.138	0.785	0.001
Soil Scale	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135
Adj Soil	0.159	0.164	0.093	0.088	1.571	0.284	0.810	0.223	0.152	0.253	0.116	0.202	0.208	0.141	0.049
Soil	0.180	0.186	0.105	0.100	1.783	0.322	0.919	0.253	0.173	0.287	0.132	0.229	0.236	0.160	0.056
Rayleigh	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9



SULFATE ADJUSTMENT FOR 2007 MOST IMPAIRED DAYS (CONTINUOUS)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2007	2007	2007	2007	2007	2007	2007
Julian Day	249	294	303	306	309	315	330
Adj dv	6.921	5.775	7.306	6.784	5.124	6.363	5.977
AmmNO <sub>3</sub> Scale	0.777	0.777	0.777	0.777	0.777	0.777	0.777
Adj AmmNO <sub>3</sub>	1.253	0.841	1.243	1.172	0.683	1.397	0.688
AmmNO <sub>3</sub>	0.974	0.654	0.966	0.911	0.531	1.086	0.535
AmmSO <sub>4</sub> Scale	1.089	1.089	1.089	1.089	1.089	1.089	1.089
Adj AmmSO <sub>4</sub>	5.96	5.96	5.96	5.96	5.96	5.96	5.96
AmmSO <sub>4</sub>	5.47	5.47	5.47	5.47	5.47	5.47	5.47
CM Scale	0.746	0.746	0.746	0.746	0.746	0.746	0.746
Adj CM	1.104	1.177	1.852	0.654	0.654	1.537	0.367
CM	0.824	0.878	1.382	0.488	0.488	1.147	0.274
EC Scale	0.847	0.847	0.847	0.847	0.847	0.847	0.847
Adj EC	0.697	0.193	0.248	0.486	0.118	0.250	0.691
EC	0.590	0.163	0.210	0.411	0.100	0.212	0.585
POM Scale	0.745	0.745	0.745	0.745	0.745	0.745	0.745
Adj POM	1.566	0.145	0.986	2.175	0.089	0.313	1.279
POM	1.166	0.108	0.734	1.619	0.066	0.233	0.952
Sea Salt Scale	2.090	2.090	2.090	2.090	2.090	2.090	2.090
Adj Sea Salt	0.317	0.357	1.384	0.228	0.182	0.381	0.121
Sea Salt	0.663	0.746	2.893	0.476	0.380	0.797	0.253
Soil Scale	1.135	1.135	1.135	1.135	1.135	1.135	1.135
Adj Soil	0.084	0.146	0.093	0.037	0.011	0.058	0.076
Soil	0.095	0.166	0.106	0.042	0.012	0.066	0.086
Rayleigh	9	9	9	9	9	9	9

Average Adjusted dv / Light Extinction
6.703
1.239
5.957
1.252
0.627
1.219
0.307
0.228

SULFATE ADJUSTMENT FOR 2008 MOST IMPAIRED DAYS

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008
Julian Day	10	16	49	58	70	100	109	115	118	136	142	169	178	181	196
Adj dv	7.468	6.380	5.835	8.857	5.663	5.227	7.603	6.971	6.290	7.584	7.592	7.002	6.247	7.190	6.528
AmmNO <sub>3</sub> Scale	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777
Adj AmmNO <sub>3</sub>	1.917	0.969	0.444	0.984	0.578	0.165	2.079	1.553	0.960	1.334	1.726	1.213	0.349	1.360	0.678
AmmNO <sub>3</sub>	1.490	0.753	0.345	0.765	0.449	0.128	1.616	1.207	0.746	1.037	1.342	0.943	0.271	1.057	0.527
AmmSO <sub>4</sub> Scale	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089
Adj AmmSO <sub>4</sub>	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96
AmmSO <sub>4</sub>	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47
CM Scale	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746
Adj CM	2.207	1.647	0.663	1.509	0.879	0.658	2.157	2.485	1.409	3.268	2.337	1.667	1.691	2.153	2.127
CM	1.647	1.229	0.495	1.126	0.656	0.491	1.609	1.854	1.051	2.438	1.744	1.244	1.262	1.606	1.587
EC Scale	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847
Adj EC	0.212	0.334	0.739	1.005	0.293	0.804	0.260	0.302	0.640	0.087	0.175	0.784	0.632	0.172	0.259
EC	0.349	0.411	0.366	1.132	0.192	0.395	0.419	0.560	0.673	0.213	0.306	0.975	0.797	0.277	0.411
POM Scale	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745
Adj POM	1.049	0.568	0.868	5.416	0.627	0.203	0.747	0.395	0.400	0.000	0.999	1.143	0.711	0.887	1.065
POM	0.781	0.423	0.646	4.032	0.467	0.151	0.556	0.294	0.298		0.744	0.851	0.529	0.660	0.793
Sea Salt Scale	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090
Adj Sea Salt	0.651	0.360	0.234	0.209	0.170	0.060	1.062	0.173	0.214	0.194	0.233	0.208	0.165	0.276	0.001
Sea Salt	1.361	0.753	0.490	0.436	0.355	0.126	2.220	0.361	0.447	0.405	0.488	0.434	0.344	0.576	0.002
Soil Scale	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135
Adj Soil	0.109	0.091	0.018	0.167	0.114	0.018	0.128	0.215	0.178	1.509	0.936	0.169	0.174	0.720	0.122
Soil	0.124	0.103	0.020	0.189	0.129	0.020	0.145	0.244	0.202	1.712	1.062	0.192	0.197	0.817	0.139
Rayleigh	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9

SULFATE ADJUSTMENT FOR 2008 MOST IMPAIRED DAYS (CONTINUOUS)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008
Julian Day	256	259	277	289	295	301	310	319	337	349
Adj dv	5.245	5.562	5.437	6.697	6.134	5.622	5.405	5.890	4.584	4.923
AmmNO <sub>3</sub> Scale	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777
Adj AmmNO <sub>3</sub>	0.612	0.292	0.376	0.780	0.828	0.976	0.904	1.403	0.234	0.293
AmmNO <sub>3</sub>	0.476	0.227	0.292	0.606	0.644	0.759	0.703	1.091	0.182	0.228
AmmSO <sub>4</sub> Scale	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089
Adj AmmSO <sub>4</sub>	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96
AmmSO <sub>4</sub>	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47
CM Scale	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746
Adj CM	1.052	0.275	1.446	1.482	0.726	1.016	0.587	0.913	0.264	0.533
CM	0.785	0.205	1.079	1.106	0.542	0.758	0.438	0.681	0.197	0.398
EC Scale	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847
Adj EC	0.079	1.893	0.082	0.877	1.218	0.359	0.418	0.129	0.234	0.136
EC	0.062	0.388	0.088	0.970	0.660	0.272	0.183	0.088	0.046	0.054
POM Scale	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745
Adj POM	0.000	0.000	0.113	1.061	0.584	0.042	0.000	0.113	0.000	0.000
POM			0.084	0.790	0.435	0.031		0.084		
Sea Salt Scale	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090
Adj Sea Salt	0.088	0.001	0.069	0.001	0.001	0.000	0.244	0.081	0.115	0.432
Sea Salt	0.184	0.002	0.145	0.002	0.002	0.001	0.511	0.169	0.240	0.903
Soil Scale	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135
Adj Soil	0.107	0.022	0.182	0.377	0.152	0.195	0.057	0.425	0.011	0.009
Soil	0.121	0.025	0.206	0.428	0.173	0.221	0.065	0.482	0.013	0.010
Rayleigh	9	9	9	9	9	9	9	9	9	9

Average Adjusted dv / Light Extinction
6.317
0.920
5.957
1.406
0.485
0.680
0.210
0.248

SULFATE ADJUSTMENT FOR 2009 MOST IMPAIRED DAYS

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009
Julian Day	1	10	13	37	55	109	112	115	124	127	136	148	151	184	205
Adj dv	4.654	5.001	4.699	5.423	5.448	8.064	6.346	6.607	7.134	9.467	9.371	6.394	6.599	6.034	5.320
AmmNO <sub>3</sub> Scale	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777
Adj AmmNO <sub>3</sub>	0.431	0.593	0.105	0.893	0.502	0.349	0.753	0.907	0.701	2.362	1.020	0.318	0.666	0.629	0.399
AmmNO <sub>3</sub>	0.335	0.461	0.082	0.694	0.390	0.271	0.585	0.705	0.545	1.836	0.793	0.247	0.518	0.489	0.310
AmmSO <sub>4</sub> Scale	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089
Adj AmmSO <sub>4</sub>	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96
AmmSO <sub>4</sub>	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47
CM Scale	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746
Adj CM	0.504	0.669	0.253	0.828	0.611	4.600	2.120	2.309	3.963	5.861	6.041	2.493	2.028	2.071	1.279
CM	0.376	0.499	0.189	0.618	0.456	3.432	1.582	1.723	2.957	4.373	4.507	1.860	1.513	1.545	0.954
EC Scale	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847
Adj EC	0.024	0.144	0.203	0.108	0.306	0.764	0.056	0.370	0.240	0.763	1.084	0.366	0.391	0.517	0.152
EC	0.020	0.122	0.172	0.091	0.259	0.647	0.047	0.313	0.203	0.646	0.918	0.310	0.331	0.438	0.129
POM Scale	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745
Adj POM	0.000	0.000	0.177	0.000	0.661	1.179	0.484	0.000	0.121	1.267	1.902	0.587	0.989	0.000	0.000
POM			0.132		0.492	0.878	0.360		0.090	0.943	1.416	0.437	0.736		
Sea Salt Scale	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090
Adj Sea Salt	0.000	0.109	0.204	0.299	0.000	0.127	0.173	0.056	0.001	0.067	0.001	0.001	0.115	0.000	0.097
Sea Salt	0.001	0.227	0.427	0.625	0.001	0.266	0.362	0.117	0.002	0.140	0.002	0.002	0.240	0.001	0.203
Soil Scale	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135
Adj Soil	0.011	0.017	0.099	0.115	0.206	0.421	0.321	0.763	0.427	0.496	0.522	0.231	0.201	0.109	0.139
Soil	0.012	0.019	0.112	0.131	0.234	0.478	0.364	0.866	0.485	0.563	0.592	0.262	0.228	0.124	0.158

SULFATE ADJUSTMENT FOR 2009 MOST IMPAIRED DAYS (CONTINUOUS)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2009	2009	2009	2009	2009	2009	2009	2009	2009
Julian Day	214	226	253	280	301	316	355	358	361
Adj dv	9.041	6.878	7.523	7.380	7.235	5.208	6.093	5.108	5.172
AmmNO <sub>3</sub> Scale	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777	0.777
Adj AmmNO <sub>3</sub>	2.061	0.759	0.714	1.290	1.270	0.190	1.200	0.293	0.208
AmmNO <sub>3</sub>	1.602	0.590	0.555	1.003	0.987	0.148	0.933	0.228	0.162
AmmSO <sub>4</sub> Scale	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089
Adj AmmSO <sub>4</sub>	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96
AmmSO <sub>4</sub>	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47
CM Scale	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746
Adj CM	4.812	2.536	2.872	3.033	3.584	1.434	1.595	1.188	1.280
CM	3.590	1.892	2.143	2.263	2.674	1.070	1.190	0.886	0.955
EC Scale	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847
Adj EC	0.271	0.925	1.107	0.495	0.155	0.235	0.274	0.095	0.000
EC	0.229	0.783	0.937	0.419	0.131	0.199	0.232	0.080	
POM Scale	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745
Adj POM	0.801	0.595	1.277	0.744	0.047	0.000	0.093	0.000	0.000
POM	0.596	0.443	0.951	0.554	0.035		0.069		
Sea Salt Scale	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090	2.090
Adj Sea Salt	0.468	0.000	0.176	0.221	0.487	0.000	0.205	0.088	0.286
Sea Salt	0.979	0.001	0.367	0.461	1.018	0.001	0.428	0.183	0.598
Soil Scale	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135	1.135
Adj Soil	1.329	0.121	0.116	0.177	0.118	0.017	0.069	0.047	0.042
Soil	1.508	0.137	0.132	0.201	0.134	0.019	0.078	0.053	0.048

<b>Average Adjusted dv / Light Extinction</b>
<b>6.508</b>
<b>0.776</b>
<b>5.957</b>
<b>2.415</b>
<b>0.377</b>
<b>0.455</b>
<b>0.133</b>
<b>0.255</b>

**Spreadsheet Calculations  
HACR1 Haze Index  
Volcano Adjustment  
Visibility Conditions for  
Most Impaired Days  
(2007 - 2022)**

SULFATE SCREENED MOST IMPAIRED DAYS (2007)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007
Julian Day	63	66	75	87	96	132	135	138	141	177	186	189	192	234	237
AmmNO <sub>3</sub>	0.58	0.438	0.586	0.999	2.389	0.719	2.583	0.992	0.973	2.106	0.295	1.378	0.245	0.94	0.308
AmmSO <sub>4</sub>	11.612	8.297	6.345	14.825	12.012	4.375	10.022	8.688	24.35	6.306	5.726	4.82	8.977	4.794	5.581
Adjusted SO <sub>4</sub>	5.808	5.808	5.808	5.808	5.808	5.808	5.808	5.808	5.808	5.808	5.808	5.808	5.808	5.808	5.808
CM	0.553	0.704	0.918	0.417	1.968	0.414	1.973	0.7	0.87	1.55	0.593	1.632	0.916	1.45	0.414
EC	0.558	0.33	0.286	1.048	3.683	0.132	0.563	0.569	0.794	0.488	0.197	0.03	0.244	0.167	0.308
POM	0.981	0.44	0.795	1.273	5.75	0.852	1.642	0.928	1.251	0.811		0.063	0.272	0.025	
Sea Salt	0.255	0.202	0.764	0.289	1.26	0.227	0.812	0.409	0.41	1.234	0.135	1.006	0.138	0.785	0.001
Soil	0.18	0.186	0.105	0.1	1.783	0.322	0.919	0.253	0.173	0.287	0.132	0.229	0.236	0.16	0.056
Rayleigh	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
dv w/o Sulfates	1.912	1.222	2.195	2.720	9.491	1.541	5.592	2.508	2.980	4.367	0.346	2.880	0.999	2.253	0.087
dv w screened SO <sub>4</sub>	5.831	5.370	6.023	6.384	11.519	5.582	8.459	6.238	6.565	7.554	4.800	6.495	5.223	6.062	4.634

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2007	2007	2007	2007	2007	2007	2007
Julian Day	249	294	303	306	309	315	330
AmmNO <sub>3</sub>	0.974	0.654	0.966	0.911	0.531	1.086	0.535
AmmSO <sub>4</sub>	5.562	21.785	8.952	17.114	4.618	4.554	8.694
Adjusted SO <sub>4</sub>	5.808	5.808	5.808	5.808	5.808	5.808	5.808
CM	0.824	0.878	1.382	0.488	0.488	1.147	0.274
EC	0.59	0.163	0.21	0.411	0.1	0.212	0.585
POM	1.166	0.108	0.734	1.619	0.066	0.233	0.952
Sea Salt	0.663	0.746	2.893	0.476	0.38	0.797	0.253
Soil	0.095	0.166	0.106	0.042	0.012	0.066	0.086
Rayleigh	9	9	9	9	9	9	9
dv w/o Sulfates	2.861	1.583	4.247	2.583	0.561	2.264	1.557
dv w screened SO <sub>4</sub>	6.482	5.610	7.467	6.289	4.938	6.070	5.592

<b>Average dv in 2007</b>
<b>2.579 (Excluding SO<sub>4</sub>)</b>
<b>6.327 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED MOST IMPAIRED DAYS (2008)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008
Julian Day	10	16	49	58	70	100	109	115	118	136	142	169	178	181	196
AmmNO <sub>3</sub>	1.49	0.753	0.345	0.765	0.449	0.128	1.616	1.207	0.746	1.037	1.342	0.943	0.271	1.057	0.527
AmmSO <sub>4</sub>	15.647	15.175	11.414	34.696	12.75	26.286	20.663	50.15	33.03	57.68	11.497	7.882	11.019	19.396	13.214
Adjusted SO <sub>4</sub>	5.843	5.843	5.843	5.843	5.843	5.843	5.843	5.843	5.843	5.843	5.843	5.843	5.843	5.843	5.843
CM	1.647	1.229	0.495	1.126	0.656	0.491	1.609	1.854	1.051	2.438	1.744	1.244	1.262	1.606	1.587
EC	0.349	0.411	0.366	1.132	0.192	0.395	0.419	0.56	0.673	0.213	0.306	0.975	0.797	0.277	0.411
POM	0.781	0.423	0.646	4.032	0.467	0.151	0.556	0.294	0.298		0.744	0.851	0.529	0.66	0.793
Sea Salt	1.361	0.753	0.49	0.436	0.355	0.126	2.22	0.361	0.447	0.405	0.488	0.434	0.344	0.576	0.002
Soil	0.124	0.103	0.02	0.189	0.129	0.02	0.145	0.244	0.202	1.712	1.062	0.192	0.197	0.817	0.139
Rayleigh	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
dv w/o Sulfates	3.888	2.368	1.277	5.116	1.176	0.306	4.424	3.016	2.165	3.924	3.843	3.103	2.151	3.360	2.199
dv w screened SO <sub>4</sub>	7.225	6.160	5.426	8.119	5.360	4.796	7.612	6.608	6.021	7.250	7.192	6.669	6.012	6.849	6.044

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008
Julian Day	256	259	277	289	295	301	310	319	337	349
AmmNO <sub>3</sub>	0.476	0.227	0.292	0.606	0.644	0.759	0.703	1.091	0.182	0.228
AmmSO <sub>4</sub>	9.753	25.812	8.047	50.082	18.589	15.606	7.27	61.873	26.468	9.022
Adjusted SO <sub>4</sub>	5.843	5.843	5.843	5.843	5.843	5.843	5.843	5.843	5.843	5.843
CM	0.785	0.205	1.079	1.106	0.542	0.758	0.438	0.681	0.197	0.398
EC	0.062	0.388	0.088	0.97	0.66	0.272	0.183	0.088	0.046	0.054
POM			0.084	0.79	0.435	0.031		0.084		
Sea Salt	0.184	0.002	0.145	0.002	0.002	0.001	0.511	0.169	0.24	0.903
Soil	0.121	0.025	0.206	0.428	0.173	0.221	0.065	0.482	0.013	0.01
Rayleigh	9	9	9	9	9	9	9	9	9	9
dv w/o Sulfates	0.609	-0.154	0.856	2.548	1.359	0.991	0.862	1.480	-0.327	0.576
dv w screened SO <sub>4</sub>	4.990	4.504	5.150	6.283	5.481	5.238	5.154	5.561	4.396	4.969

<b>Average dv in 2008</b>
<b>2.045 (Excluding SO<sub>4</sub>)</b>
<b>5.963 (Including Screened SO<sub>4</sub>)</b>



SULFATE SCREENED MOST IMPAIRED DAYS (2009)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009
Julian Day	1	10	13	37	55	109	112	115	124	127	136	148	151	184	205
AmmNO <sub>3</sub>	0.335	0.461	0.082	0.694	0.39	0.271	0.585	0.705	0.545	1.836	0.793	0.247	0.518	0.489	0.31
AmmSO <sub>4</sub>	15.252	14.614	10.364	7.892	7.653	57.943	11.184	17.43	28.01	26.99	69.125	24.69	9.536	11.81	7.3
Adjusted SO <sub>4</sub>	5.841	5.841	5.841	5.841	5.841	5.841	5.841	5.841	5.841	5.841	5.841	5.841	5.841	5.841	5.841
CM	0.376	0.499	0.189	0.618	0.456	3.432	1.582	1.723	2.957	4.373	4.507	1.86	1.513	1.545	0.954
EC	0.02	0.122	0.172	0.091	0.259	0.647	0.047	0.313	0.203	0.646	0.918	0.31	0.331	0.438	0.129
POM			0.132		0.492	0.878	0.36		0.09	0.943	1.416	0.437	0.736		
Sea Salt	0.001	0.227	0.427	0.625	0.001	0.266	0.362	0.117	0.002	0.14	0.002	0.002	0.24	0.001	0.203
Soil	0.012	0.019	0.112	0.131	0.234	0.478	0.364	0.866	0.485	0.563	0.592	0.262	0.228	0.124	0.158
dv w/o Sulfates	-0.259	0.323	0.113	1.097	0.799	4.036	2.070	2.409	2.838	5.597	5.440	1.921	2.284	1.482	0.727
dv w screened SO <sub>4</sub>	4.437	4.805	4.672	5.306	5.112	7.330	5.956	6.187	6.483	8.477	8.359	5.855	6.102	5.561	5.065

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2009	2009	2009	2009	2009	2009	2009	2009	2009
Julian Day	214	226	253	280	301	316	355	358	361
AmmNO <sub>3</sub>	1.602	0.59	0.555	1.003	0.987	0.148	0.933	0.228	0.162
AmmSO <sub>4</sub>	14.553	15.701	14.065	23.237	17.62	11.225	9.299	7.184	7.53
Adjusted SO <sub>4</sub>	5.841	5.841	5.841	5.841	5.841	5.841	5.841	5.841	5.841
CM	3.59	1.892	2.143	2.263	2.674	1.07	1.19	0.886	0.955
EC	0.229	0.783	0.937	0.419	0.131	0.199	0.232	0.08	
POM	0.596	0.443	0.951	0.554	0.035		0.069		
Sea Salt	0.979	0.001	0.367	0.461	1.018	0.001	0.428	0.183	0.598
Soil	1.508	0.137	0.132	0.201	0.134	0.019	0.078	0.053	0.048
dv w/o Sulfates	5.598	2.504	3.425	3.294	3.350	0.428	1.765	0.421	0.735
dv w screened SO <sub>4</sub>	8.478	6.252	6.894	6.802	6.841	4.872	5.750	4.868	5.071

Average dv in 2009
2.183 (Excluding SO <sub>4</sub> )
6.064 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2010)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010
Julian Day	2	8	23	29	32	56	80	122	131	137	173	179	194	206	254
AmmNO <sub>3</sub>	0.153	0.754	0.233	0.274	0.466	0.272	0.508	0.513	1.268	1.747	0.109	0.62	0.529	0.251	0.252
AmmSO <sub>4</sub>	18.973	5.757	26.517	20.301	21.387	10.988	19.543	43.009	8.954	12.986	7.296	29.411	8.994	5.547	5.745
Adjusted SO <sub>4</sub>	5.423	5.423	5.423	5.423	5.423	5.423	5.423	5.423	5.423	5.423	5.423	5.423	5.423	5.423	5.423
CM	1.651	1.424	2.38	1.346	1.745	1.81	0.473	0.546	0.628	1.198	0.555	0.686	0.714	0.176	0.358
EC	0.392	0.17	0.092	0.712	0.226	0.252	0.118	0.713	0.35	0.482	0.196	0.564	0.421	0.221	0.177
POM	1.303	0.121	0.986	0.715	0.371	0.321	0.383	0.605	0.735	0.406	0.102	0.664	0.265		
Sea Salt	0.473	0.585	0.822	0.001	0.001	0.259	0.323	0.002	0.697	0.219	0.45	0.165	0.164	0.205	0.31
Soil	0.12	0.089	0.151	0.014	0.017	0.163	0.37	0.434	0.183	2.279	0.145	0.281	0.177	0.241	0.092
dv w/o Sulfates	2.694	1.942	3.122	1.875	1.677	1.887	1.111	1.666	2.516	4.273	0.542	1.807	1.196	0.094	0.187
dv w screened SO <sub>4</sub>	6.160	5.634	6.464	5.587	5.452	5.596	5.067	5.444	6.034	7.301	4.687	5.540	5.124	4.393	4.454

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2010	2010	2010	2010	2010	2010	2010	2010	2010
Julian Day	275	278	284	287	293	341	347	350	359
AmmNO <sub>3</sub>	0.172	1.713	1.225	1.088	0.162	1.289	0.308	1.164	0.047
AmmSO <sub>4</sub>	8.169	6.288	6.628	8.492	6.51	8.44	33.707	9.085	17.64
Adjusted SO <sub>4</sub>	5.423	5.423	5.423	5.423	5.423	5.423	5.423	5.423	5.423
CM		0.709	1.01	1.218	0.38	0.976	0.295	0.42	0.444
EC	0.199	0.13	0.014	0.259	0.033	0.211	0.323	0.311	0.263
POM	0.136	0.005		0.393	0.113	0.448	0.707	0.837	0.243
Sea Salt	0.104	0.576	1.099	0.536	0.001	0.001	0.002	0.673	0.001
Soil	0.653	0.107	0.165	0.157	0.009	0.186	0.014	0.069	0.026
dv w/o Sulfates	0.261	2.021	2.242	2.352	-0.307	1.915	0.629	2.211	0.024
dv w screened SO <sub>4</sub>	4.502	5.689	5.842	5.919	4.135	5.615	4.745	5.820	4.348

Average dv in 2010
1.581 (Excluding SO <sub>4</sub> )
5.398 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2011)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011
Julian Day	30	36	42	45	48	51	54	57	93	105	111	132	138	144	153
AmmNO <sub>3</sub>	0.175	0.464	0.25	0.621	0.813	0.7	0.319	0.466	1.639	0.622	1.462	1.042	1.216	1.054	0.995
AmmSO <sub>4</sub>	17.514	50.904	16.228	29.482	22.64	14.28	6.496	22.711	7.962	9.318	10.562	7.445	7.158	7.719	8.725
Adjusted SO <sub>4</sub>	5.526	5.526	5.526	5.526	5.526	5.526	5.526	5.526	5.526	5.526	5.526	5.526	5.526	5.526	5.526
CM	0.398	0.236	0.223	0.193	0.397	0.414	0.124	0.106	0.862	0.406	1.1	0.855	0.891	0.76	0.981
EC	0.186	0.386	0.179	0.34	0.254	0.12	0.092	0.304	0.388	0.361	0.666	0.126	0.554	0.385	0.648
POM		0.704	0.086	0.39	0.757	0.106	0.265	0.738	1.1	0.501	1.267	0.18	0.482	0.195	1.827
Sea Salt	0.377	1.065	1.649	1.818	1.592	1.692	0.075	0.001	1.324	0.563	0.945	0.905	0.615	1.219	0.757
Soil	0.141	0.065	0.014	0.034	0.034	0.059	0.059	0.036	0.4	0.119	0.364	0.155	0.554	0.886	0.161
dv w/o Sulfates	0.273	1.756	1.311	2.148	2.505	1.899	-0.066	0.631	3.861	1.460	3.923	2.040	2.861	3.000	3.625
dv w screened SO <sub>4</sub>	4.576	5.565	5.263	5.834	6.083	5.663	4.357	4.810	7.050	5.364	7.095	5.760	6.333	6.432	6.879

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2011	2011	2011	2011	2011	2011	2011	2011
Julian Day	156	165	219	225	291	300	318	336
AmmNO <sub>3</sub>	0.694	1.523	0.624	0.077	0.999	1.08	1.23	0.069
AmmSO <sub>4</sub>	8.108	13.704	17.608	9.175	10.068	6.599	6.694	7.238
Adjusted SO <sub>4</sub>	5.526	5.526	5.526	5.526	5.526	5.526	5.526	5.526
CM	0.646	1.225	0.287	0.297	0.992	0.899	0.699	0.535
EC	0.246	0.56	0.282	0.418	0.713	0.168	0.114	0.006
POM	0.442	0.79		0.69	1.571	0.73	0.001	0.136
Sea Salt	0.472	0.571	0.226	0.16	0.392	0.795	0.467	0.242
Soil	0.195	0.169	0.068	0.117	0.2	0.079	0.045	0.013
dv w/o Sulfates	1.566	3.248	0.476	0.732	3.269	2.430	1.446	0.001
dv w screened SO <sub>4</sub>	5.435	6.608	4.708	4.876	6.623	6.030	5.354	4.400

Average dv in 2011
1.930 (Excluding SO <sub>4</sub> )
5.700 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2012)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012
Julian Day	1	4	13	25	55	61	64	103	157	166	187	196	205	265	277
AmmNO <sub>3</sub>	0.16	0.089	0.098	1.082	0.913	1.436	0.07	1.432	0.06	0.907	0.569	0.089	1.005	0.824	0.923
AmmSO <sub>4</sub>	15.845	12.45	6.162	41.379	13.697	14.424	13.871	10.185	6.15	11.108	10.513	9.642	11.315	25.808	9.702
Adjusted SO <sub>4</sub>	5.292	5.292	5.292	5.292	5.292	5.292	5.292	5.292	5.292	5.292	5.292	5.292	5.292	5.292	5.292
CM	0.254	0.167	0.226	1.045	0.783	1.659	0.135	1.14	0.23	1.101	0.778		1.248	0.753	0.811
EC	0.144	0.12	0.354	0.574	0.251	0.242	0.284	0.978	0.253	0.747	0.253	0.19	0.238	0.161	0.426
POM	0.275	0.083	0.153	0.765	0.569	0.596	0.096	1.946	0.467	1.21			0.26	0.011	0.491
Sea Salt	0.276	0.235	0.139	2.833	0.53	0.969	0.077	0.81	0.141	0.573	0.232	0.233	0.94	0.45	0.375
Soil	0.035	0.029	0.066	0.041	0.109	0.048	0.009	0.547	0.065	0.123	0.146	0.022	0.108	0.054	0.102
dv w/o Sulfates	0.143	-0.281	0.036	4.279	1.952	3.329	-0.335	4.608	0.214	3.120	0.933	-0.477	2.468	1.180	1.929
dv w screened SO <sub>4</sub>	4.341	4.065	4.271	7.243	5.566	6.545	4.030	7.488	4.388	6.394	4.867	3.938	5.928	5.035	5.550

Site Code	HACR1	HACR1	HACR1	HACR1
Year	2012	2012	2012	2012
Julian Day	280	283	310	340
AmmNO <sub>3</sub>	0.566	0.412	0.459	0.372
AmmSO <sub>4</sub>	7.087	24.26	14.022	22.588
Adjusted SO <sub>4</sub>	5.292	5.292	5.292	5.292
CM	0.48	1.004	1.104	0.549
EC	0.105	0.383	0.1	0.327
POM		0.042	0.208	0.153
Sea Salt	0.189	0.162	0.45	0.842
Soil	0.072	0.215	0.053	0.05
dv w/o Sulfates	0.404	1.149	1.287	1.216
dv w screened SO <sub>4</sub>	4.513	5.014	5.108	5.059

<b>Average dv in 2012</b>
<b>1.429 (Excluding SO<sub>4</sub>)</b>
<b>5.229 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED MOST IMPAIRED DAYS (2014)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014
Julian Day	2	11	14	23	35	41	53	122	125	128	131	140	278	314	356
AmmNO <sub>3</sub>	0.41	0.425	0.365	0.179	0.104	0.346	0.536	0.196	2.007	2.442	0.275	2.32	0.211	0.464	0.326
AmmSO <sub>4</sub>	11.673	12.022	13.236	7.668	7.463	11.997	19.077	9.059	8.848	12.079	5.956	11.862	7.546	10.961	13.529
Adjusted SO <sub>4</sub>	5.247	5.247	5.247	5.247	5.247	5.247	5.247	5.247	5.247	5.247	5.247	5.247	5.247	5.247	5.247
CM	1.224	0.358	0.468	0.514	0.402	0.5	0.576	0.529	1.669	1.722	0.462	2.061	0.435	0.36	0.474
EC	0.21	0.125	0.035	0.402	0.019	0.214	0.32		0.183	0.134	0.067	0.275	0.058	0.089	0.035
POM	0.628	0.563	0.444	0.969	0.586	1.024	0.792	0.002	0.766	0.88	0.533	0.662	0.316	0.342	0.265
Sea Salt	1.097	0.403	1.077	0.502	0.087	0.882	0.729	0.16	0.856	1.911	0.314	1.425	0.214	0.449	0.881
Soil	0.467	0.032	0.025	0.22	0.005	0.013	0.05	0.101	1.712	0.826	0.103	0.639	0.006	0.066	0.037
dv w/o Sulfates	2.651	0.867	1.323	1.643	0.201	1.806	1.826	-0.012	4.820	5.256	0.727	4.936	0.237	0.742	0.969
dv w screened SO <sub>4</sub>	6.034	4.795	5.105	5.326	4.350	5.438	5.452	4.210	7.627	7.958	4.700	7.714	4.374	4.710	4.864

<b>Average dv in 2014</b>
<b>1.866 (Excluding SO<sub>4</sub>)</b>
<b>5.510 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED MOST IMPAIRED DAYS (2015)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015
Julian Day	12	15	18	30	39	57	114	144	153	180	183	210	231	234	240
AmmNO <sub>3</sub>			0.403	0.367	0.582	0.799	2.032	0.603	0.734	2.019	1.574	0.814	0.195	0.567	0.399
AmmSO <sub>4</sub>	4.597	5.938	8.934	9.802	19.96	7.971	12.725	7.963	9.42	6.871	21.505	6.672	6.573	15.642	4.287
Adjusted SO <sub>4</sub>	5.236	5.236	5.236	5.236	5.236	5.236	5.236	5.236	5.236	5.236	5.236	5.236	5.236	5.236	5.236
CM	0.117	0.087	0.574	1.438	1.598	0.713	1.768	1.141	0.97	1.641	1.479	0.779	0.538	0.712	0.615
EC	0.003	0.08	0.238		0.199	0.138	0.091	0.209	0.394	0.131	0.112	0.208	0.062	0.008	0.187
POM	0.014	0.514	0.348	0.259	0.398	0.587	0.736	1.424	0.594	0.32	0.904	0.104	0.331	0.483	0.338
Sea Salt	0.058		0.476	0.583	1.75	1.225	2.244	0.849	0.503	1.023	1.309	0.478		0.002	0.002
Soil	0.025	0.008	0.017	0.025	0.256	0.11	0.348	0.286	0.115	0.11	0.297	0.028	0.002	0.023	0.05
dv w/o Sulfates	-0.815	-0.316	1.004	1.546	3.209	2.289	4.836	3.010	2.078	3.538	3.836	1.320	0.127	0.765	0.574
dv w screened SO <sub>4</sub>	3.683	4.004	4.881	5.252	6.428	5.770	7.634	6.285	5.622	6.668	6.887	5.096	4.294	4.719	4.591

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2015	2015	2015	2015	2015
Julian Day	246	249	255	282	363
AmmNO <sub>3</sub>	0.404	0.721	0.384	0.563	0.436
AmmSO <sub>4</sub>	11.816	5.864	4.409	22.295	13.689
Adjusted SO <sub>4</sub>	5.236	5.236	5.236	5.236	5.236
CM	0.279	0.532	0.418	0.833	0.195
EC	0.459	0.181	0.036	0.336	0.133
POM	0.546	0.125	0.527	1.854	0.211
Sea Salt	0.198	0.405	0.322	0.558	0.464
Soil	0.03	0.036	0.017	0.087	0.031
dv w/o Sulfates	0.876	0.953	0.680	2.800	0.459
dv w screened SO <sub>4</sub>	4.794	4.846	4.662	6.134	4.514

Average dv in 2015
1.638 (Excluding SO <sub>4</sub> )
5.338 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2016)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016
Julian Day	7	10	13	25	28	37	40	55	58	61	64	67	82	85	94
AmmNO <sub>3</sub>	0.468	0.459	0.613	0.365	0.447	0.347	1.659	0.559	0.72	0.6	0.551	0.834	0.781	0.545	1.602
AmmSO <sub>4</sub>	5.467	10.363	8.024	4.573	33.274	11.949	7.148	4.577	22.351	8.047	17.674	38.861	64.79	26.609	10.431
Adjusted SO <sub>4</sub>	5.491	5.491	5.491	5.491	5.491	5.491	5.491	5.491	5.491	5.491	5.491	5.491	5.491	5.491	5.491
CM	0.728	0.547	0.671	0.398	1.126	0.441	1.672	0.819	0.966	0.739	0.834	0.894	0.874	0.729	1.097
EC		0.107		0.029	0.312	0.105	0.034		0.04	0.138	0.142	0.309	0.435	0.031	1.288
POM		0.162	1.473	0.419	0.635	0.446	0.123	0.105	0.546	0.841	0.475	0.597	0.813	1.063	2.349
Sea Salt	0.607	0.445	0.467	0.524	0.592	0.253	0.912	1.41	0.443	0.879	0.931	0.5	0.885	0.578	1.951
Soil	0.016	0.024	0.045	0.021	0.057	0.059	0.518	0.125	0.173	0.467	0.061	0.088	0.131	0.077	0.515
dv w/o Sulfates	0.787	0.718	2.045	0.729	1.963	0.631	3.306	1.838	1.729	2.362	1.818	2.007	2.561	1.842	5.767
dv w screened SO <sub>4</sub>	4.892	4.846	5.744	4.853	5.687	4.788	6.631	5.601	5.527	5.964	5.588	5.717	6.103	5.604	8.456

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2016	2016	2016	2016	2016	2016	2016	2016	2016
Julian Day	127	202	208	235	238	256	259	313	343
AmmNO <sub>3</sub>	0.847	0.339	0.468	0.038	0.07	0.127	0.629	0.434	0.079
AmmSO <sub>4</sub>	15.204	5.559	9.231	7.405	8.405	10.967	8.907	5.085	6.407
Adjusted SO <sub>4</sub>	5.491	5.491	5.491	5.491	5.491	5.491	5.491	5.491	5.491
CM	0.516	0.344	0.794	0.785	0.229	0.499	0.781	0.493	0.448
EC	0.208	0.049	0.187	0.236	0.46	0.38	0.164	0.225	0.362
POM	0.427			1.331	0.16	0.152	0.39	1.443	0.382
Sea Salt	0.64	0.267	0.237		0.196	0.076	0.506	0.1	0.057
Soil	0.336	0.017	0.271		0.008	0.008	0.021	0.418	
dv w/o Sulfates	1.802	0.016	0.914	1.302	0.122	0.239	1.390	1.917	0.323
dv w screened SO <sub>4</sub>	5.576	4.387	4.976	5.236	4.456	4.532	5.296	5.655	4.586

Average dv in 2016
1.589 (Excluding SO <sub>4</sub> )
5.446 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2017)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017
Julian Day	10	34	49	58	67	70	100	109	118	121	148	151	184	214	247
AmmNO <sub>3</sub>	0.414	0.911	0.198	0.275	0.176	0.867	1.916	0.601	0.564	0.473	0.757	1.912	1.402	0.51	0.562
AmmSO <sub>4</sub>	8.298	10.022	4.672	11.6	10.218	14.777	14.983	31.196	5.919	12.02	12.257	7.25	7.389	21.725	12.028
Adjusted SO <sub>4</sub>	5.391	5.391	5.391	5.391	5.391	5.391	5.391	5.391	5.391	5.391	5.391	5.391	5.391	5.391	5.391
CM	0.513	1.588	0.184	0.445	0.351	0.642	1.087	0.655	0.219	0.518	0.768	1.351	0.48	0.947	0.738
EC	0.148	0.668	0.065	0.341	0.257	0.129	0.313	0.669	0.186	0.421	0.192	0.811	0.054	0.06	
POM	0.186	0.727	0.507	0.446	0.485	0.22	0.946	0.454	0.505	0.533	0.317	0.53	3.074	0.962	0.696
Sea Salt	0.26	1.603	0.289	0.155	0.156	0.651	1.706	0.401	0.333	0.721	0.402	1.945	0.718	0.458	0.27
Soil	0.021	0.524	0.023	0.055	0.055	0.022	0.227	0.383	0.123	0.075	0.342	0.463	0.238	0.061	0.042
dv w/o Sulfates	0.528	4.069	0.263	0.692	0.469	1.425	4.184	1.958	0.889	1.605	1.636	4.188	4.525	1.817	1.282
dv w screened SO <sub>4</sub>	4.658	7.135	4.483	4.767	4.619	5.260	7.220	5.627	4.899	5.384	5.405	7.223	7.474	5.529	5.164

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2017	2017	2017	2017	2017	2017	2017	2017
Julian Day	250	253	256	274	286	295	304	352
AmmNO <sub>3</sub>	0.701	0.413	0.686	0.607	0.526	0.432	0.162	0.351
AmmSO <sub>4</sub>	17.817	5.686	7.896	20.278	26.72	5.025	18.061	4.996
Adjusted SO <sub>4</sub>	5.391	5.391	5.391	5.391	5.391	5.391	5.391	5.391
CM	0.921	0.325	0.392	0.551	0.487	0.486	0.476	0.131
EC	0.128	0.186	0.152	0.384	0.272	0.15	0.723	0.199
POM	0.427	0.348	0.401	0.577	0.742	0.127	0.981	0.477
Sea Salt	0.511	0.222	0.348	0.492	0.416	0.474	0.169	0.16
Soil	0.075	0.019	0.012	0.014	0.025	0.02	0.012	0.021
dv w/o Sulfates	1.624	0.500	0.945	1.506	1.370	0.666	1.418	0.333
dv w screened SO <sub>4</sub>	5.396	4.640	4.936	5.316	5.223	4.750	5.256	4.530

<b>Average dv in 2017</b>
<b>1.647 (Excluding SO<sub>4</sub>)</b>
<b>5.430 (Including Screened SO<sub>4</sub>)</b>



SULFATE SCREENED MOST IMPAIRED DAYS (2018)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018
Julian Day	11	26	35	44	53	56	80	89	92	116	125	131	137	149	161
AmmNO <sub>3</sub>	0.392	0.784	0.297	0.53	0.269	0.159	0.166	1.435	0.371	1.43	0.2	0.307	0.128	0.321	0.645
AmmSO <sub>4</sub>	7.375	16.444	18.816	45.255	5.885	3.989	5.312	20.804	15.052	4.598	12.744	5.251	56.217	8.033	13.499
Adjusted SO <sub>4</sub>	5.232	5.232	5.232	5.232	5.232	5.232	5.232	5.232	5.232	5.232	5.232	5.232	5.232	5.232	5.232
CM	0.561	0.844	0.748	0.637	0.224	0.449	0.216	0.439	0.163	0.618	0.099	0.629	0.777	0.287	1.268
EC	0.351	0.232	0.383	0.985	0.258		0.55	0.932	0.57	0.256	0.01	0.342	0.806		1.276
POM	0.56	2.628	1.717	0.698	0.378	0.55	0.106	0.73	0.325	0.522	0.213	0.65	1.171	0.614	2.149
Sea Salt	0.428	0.855	0.971	0.469	0.123	0.225	0.141	0.614	0.34	0.499	0.295	0.484	0.189	0.294	0.091
Soil	0.033	0.101	0.036	0.164	0.035	0.013	0.014	0.055	0.027	0.214	0.063	0.276	0.297	0.199	0.336
dv w/o Sulfates	1.244	3.677	2.740	2.218	0.283	0.388	0.191	2.780	0.766	2.263	-0.121	1.560	2.125	0.691	3.897
dv w screened SO <sub>4</sub>	5.042	6.768	6.089	5.718	4.395	4.465	4.334	6.118	4.718	5.750	4.129	5.259	5.653	4.667	6.930

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2018	2018	2018	2018	2018	2018	2018	2018
Julian Day	167	182	191	194	197	209	212	224
AmmNO <sub>3</sub>	0.603	0.594	0.517	0.34	0.463	0.795	0.876	1.927
AmmSO <sub>4</sub>	86.005	15.134	48.763	8.891	7.947	8.164	23.084	7.838
Adjusted SO <sub>4</sub>	5.232	5.232	5.232	5.232	5.232	5.232	5.232	5.232
CM	0.367	0.723	0.518	0.249	0.443	1.036	1.286	1.38
EC	0.433	0.236	0.422	0.148	0.177	0.055	0.639	0.379
POM	2.91	0.182	0.317	0.224	0.327	0.62	0.296	1.516
Sea Salt	0.483	0.64	0.541	1.216	0.526	2.043	1.252	1.621
Soil	0.172	0.041	0.066	0.077	0.44	0.137	0.701	0.153
dv w/o Sulfates	3.342	1.324	1.294	1.181	1.289	3.138	3.400	4.685
dv w screened SO <sub>4</sub>	6.523	5.097	5.076	4.999	5.073	6.375	6.566	7.518

Average dv in 2018
1.928 (Excluding SO <sub>4</sub> )
5.533 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2019)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
Julian Day	96	117	141	147	150	159	171	174	183	186	192	204	216	219	222
AmmNO <sub>3</sub>	1.904	1.251	2.173	1.669	2.246	1.105	0.851	0.49	0.955	0.918	1.198	2.699	1.324	0.831	0.966
AmmSO <sub>4</sub>	4.598	4.299	5.441	5.628	5.682	4.09	3.85	3.889	4.338	6.427	5.217	4.927	9.204	5.551	7.831
Adjusted SO <sub>4</sub>	5.470	5.470	5.470	5.470	5.470	5.470	5.470	5.470	5.470	5.470	5.470	5.470	5.470	5.470	5.470
CM	1.685	0.644	1.369	1.312	1.789	1.251	1.001	0.471	0.93	0.724	1.082	1.915	0.634	0.971	0.68
EC	0.156		0.077	0.538	0.166		0.042	0.342	0.22		0.785	0.479			
POM	0.412	0.86	1.097	0.461	0.677	0.389	0.165	0.425	0.775	1.047	1.017	0.854	0.237	0.49	0.614
Sea Salt	1.611	0.449	1.332	0.796	1.168	1.239	0.8	0.271	0.947	0.333	0.852	2.397	0.779	0.848	0.613
Soil	0.568	0.158	0.2	0.915	0.814	0.287	0.142	0.009	0.095	0.08	0.34	0.117	0.053	0.052	0.058
dv w/o Sulfates	4.276	2.120	4.219	3.846	4.612	2.830	1.824	0.960	2.563	1.908	3.559	5.574	1.846	1.982	1.766
dv w screened SO <sub>4</sub>	7.327	5.784	7.284	7.012	7.575	6.281	5.580	4.994	6.093	5.637	6.803	8.299	5.594	5.688	5.539

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2019	2019	2019	2019	2019	2019	2019
Julian Day	225	228	237	258	261	297	318
AmmNO <sub>3</sub>	0.872	0.738	0.064	1.592	1.173	1.8	0.542
AmmSO <sub>4</sub>	3.757	4.163	10.326	5.845	5.18	5.095	5.064
Adjusted SO <sub>4</sub>	5.470	5.470	5.470	5.470	5.470	5.470	5.470
CM	0.742	0.568	0.33	0.601	0.851	1.376	0.652
EC	0.356	0.376	0.226		0.383	0.245	0.174
POM	0.279	0.141		0.172	0.224	1.056	0.445
Sea Salt	0.722	0.88	0.14	1.096	0.804	1.438	0.262
Soil	0.049	0.043	0.066	0.032	0.077	0.079	0.05
dv w/o Sulfates	1.840	1.609	-0.176	2.226	2.241	4.051	1.066
dv w screened SO <sub>4</sub>	5.590	5.433	4.250	5.857	5.868	7.161	5.065

Average dv in 2019
2.579 (Excluding SO <sub>4</sub> )
6.123 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2020)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020
Julian Day	22	169	178	181	187	193	199	202	205	211	214	220	223	229	238
AmmNO <sub>3</sub>	1.389	0.86	0.61	0.757	0.846	0.705	0.87	0.584	0.646	0.309	0.278	0.248	0.301	0.209	0.927
AmmSO <sub>4</sub>	4.271	3.375	9.163	6.693	4.643	13.645	6.046	9.061	9.267	4.099	3.546	5.844	2.828	6.342	6.685
Adjusted SO <sub>4</sub>	5.322	5.322	5.322	5.322	5.322	5.322	5.322	5.322	5.322	5.322	5.322	5.322	5.322	5.322	5.322
CM	0.753	0.991	0.835	0.619	0.703	0.741	0.823	1.571	0.68	0.43	0.621	0.434	0.352	0.371	0.769
EC	0.118	0.229	0.721	0.347		0.298	0.784	0.166	0.084	0.097	1.163	0.146	0.142	0.223	1.286
POM	0.452	0.689	1.101	0.66	1.647	0.001	0.329	0.452	0.088	0.033	0.822	0.151	0.283	0.337	4.889
Sea Salt	1.33	1.258	0.573	0.366	0.507	0.876	0.384	1.967	0.881	0.516	0.802	0.283	0.377	0.377	0.111
Soil	0.056	0.191	0.179	0.115	0.027	0.709	0.323	0.196	0.077	0.037	0.057	0.067	0.041	0.021	0.398
dv w/o Sulfates	2.699	2.790	2.638	1.709	2.414	2.095	2.242	3.319	1.359	0.413	2.424	0.324	0.484	0.524	5.527
dv w screened SO <sub>4</sub>	6.109	6.173	6.066	5.415	5.907	5.683	5.786	6.553	5.175	4.539	5.914	4.479	4.586	4.612	8.199

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2020	2020	2020	2020	2020	2020	2020	2020
Julian Day	247	280	283	292	298	301	349	358
AmmNO <sub>3</sub>	0.688	0.79	1.569	0.791	0.832	0.613	1.072	0.923
AmmSO <sub>4</sub>	3.204	4.044	5.835	3.245	4.053	2.846	2.984	5.809
Adjusted SO <sub>4</sub>	5.322	5.322	5.322	5.322	5.322	5.322	5.322	5.322
CM	1.01	0.721	1.641	0.465	0.466	0.364	0.521	0.634
EC	0.47	0.344	0.51	0.165	0.278		0.117	0.139
POM	0.285	0.941	1.792	0.042	0.391	0.091		0.361
Sea Salt	0.71	0.73	0.868	1.163	0.662	0.617	1.072	0.85
Soil	0.119	0.144	0.565	0.04	0.072	0.04	0.025	0.074
dv w/o Sulfates	2.055	2.367	4.666	1.541	1.571	0.700	1.661	1.807
dv w screened SO <sub>4</sub>	5.655	5.873	7.546	5.299	5.320	4.729	5.382	5.483

<b>Average dv in 2020</b>
<b>2.058 (Excluding SO<sub>4</sub>)</b>
<b>5.673 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED MOST IMPAIRED DAYS (2021)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021
Julian Day	13	16	46	82	106	109	112	118	124	145	148	151	157	169	172
AmmNO <sub>3</sub>	0.519	1.47	0.519	1.153	1.018	1.137	1.55	0.954	0.912	1.567	0.828	0.751	0.922	0.579	0.579
AmmSO <sub>4</sub>	7.504	4.445	22.159	4.518	3.853	5.878	4.579	3.32	4.529	4.732	3.527	4.045	3.571	8.269	2.792
Adjusted SO <sub>4</sub>	5.239	5.239	5.239	5.239	5.239	5.239	5.239	5.239	5.239	5.239	5.239	5.239	5.239	5.239	5.239
CM	0.355	0.983	0.357	0.648	0.712	0.787	1.067	0.599	0.528	0.923	1.109	0.829	1.013	1.725	0.478
EC	0.112	0.055	0.586	0.035	0.603	0.462	0.363	0.289	0.075	0.192			0.078	1.04	
POM	0.144		0.443	0.08	0.394	0.703	0.561	0.194	0.053	0.991	0.531	0.567	0.264	0.567	0.193
Sea Salt	0.958	2.514	0.803	1.187	0.544	1.362	2.183	0.446	0.898	0.972	0.926	0.71	1.867	0.361	0.146
Soil	0.048	0.056	0.058	0.295	0.379	0.224	0.351	0.419	0.143	0.197	0.34	0.207	0.239	0.246	0.074
dv w/o Sulfates	1.076	3.420	1.626	2.150	2.351	3.130	4.105	1.740	1.492	3.251	2.417	1.876	2.914	3.014	0.459
dv w screened SO <sub>4</sub>	4.932	6.584	5.309	5.674	5.816	6.373	7.087	5.388	5.216	6.461	5.863	5.483	6.218	6.290	4.516

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2021	2021	2021	2021	2021	2021	2021	2021
Julian Day	190	199	208	211	244	313	319	322
AmmNO <sub>3</sub>	0.987	0.485	0.878	0.269	0.418	0.968	0.378	0.162
AmmSO <sub>4</sub>	3.654	3.621	4	3.79	3.781	3.501	20.319	6.21
Adjusted SO <sub>4</sub>	5.239	5.239	5.239	5.239	5.239	5.239	5.239	5.239
CM	0.715	0.536	1.468	0.524	0.589	0.882	0.367	0.432
EC	0.328	0.24	0.222	0.198	0.321	0.054		0.017
POM	1.051	0.626	0.151	0.126	0.315	0.783	1.05	0.443
Sea Salt	0.729	0.096	1.111	0.322	0.089	0.408	0.274	0.243
Soil	0.107	0.134	0.306	0.094	0.047	0.075	0.038	0.022
dv w/o Sulfates	2.560	1.059	2.728	0.519	0.750	1.964	1.050	0.314
dv w screened SO <sub>4</sub>	5.964	4.920	6.084	4.557	4.711	5.544	4.914	4.420

Average dv in 2021
1.998 (Excluding SO <sub>4</sub> )
5.579 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2022)

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022
Julian Day	2	14	17	41	50	59	65	68	74	89	131	137	140	149	158
AmmNO <sub>3</sub>	0.427	1.192	0.939	0.576	1.175	0.589	0.85	1.084	1.022	0.469	2.296	0.717	1.352	0.382	1.449
AmmSO <sub>4</sub>	12.461	5.055	11.253	4.047	6.861	5.261	7.816	9.342	7.215	14.745	6.613	13.585	18.881	9.771	5.245
Adjusted SO <sub>4</sub>	5.430	5.430	5.430	5.430	5.430	5.430	5.430	5.430	5.430	5.430	5.430	5.430	5.430	5.430	5.430
CM	0.077	0.619	0.337	0.461	0.335	0.315	0.593	0.48	0.788	0.594	1.653	0.492	0.816	0.403	1.099
EC	0.201	0.175	0.169	0.023	0.126	0.296	0.423	0.269	0.547	0.211	0.253	0.263	0.789	0.301	0.218
POM	0.287	0.612	0.648	0.623	0.687	0.845	1.058	0.436	0.775	0.397	1.163	0.37	1.37	0.821	0.719
Sea Salt	0.243	1.205	0.455	0.237	0.957	0.659	0.387	1.894	1.098	0.289	2.605	0.831	1.352	0.216	1.133
Soil	0.017	0.038	0.061	0.041	0.019	0.06	0.347	0.145	0.23	0.365	0.795	0.2	0.206	0.125	0.325
dv w/o Sulfates	0.249	2.501	1.492	0.918	2.069	1.625	2.357	2.858	2.971	1.244	5.746	1.717	3.978	1.176	3.324
dv w screened SO <sub>4</sub>	4.499	6.027	5.329	4.941	5.726	5.420	5.927	6.280	6.360	5.161	8.414	5.483	7.088	5.115	6.613

Site Code	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1	HACR1
Year	2022	2022	2022	2022	2022	2022	2022	2022
Julian Day	170	218	266	284	293	320	341	350
AmmNO <sub>3</sub>	1.266	1.931	1.349	0.424	0.734	0.688	0.067	0.441
AmmSO <sub>4</sub>	10.111	10.016	4.821	6.041	5.774	5.556	13.689	8.061
Adjusted SO <sub>4</sub>	5.430	5.430	5.430	5.430	5.430	5.430	5.430	5.430
CM	1.13	1.335	0.431	0.454	0.587	0.855	1.757	0.296
EC	0.31	0.319	0.11	0.328	0.413	0.069	1.089	0.187
POM	0.396	0.506	0.443	0.214	0.316	0.849	0.995	0.239
Sea Salt	1.22	0.82	0.41	0.352	0.416	0.892	0.655	0.235
Soil	0.235	0.063	0.093	0.015	0.064	0.281	0.024	0.02
dv w/o Sulfates	3.043	3.346	1.686	0.758	1.424	2.338	3.065	0.409
dv w screened SO <sub>4</sub>	6.412	6.629	5.462	4.835	5.283	5.913	6.427	4.605

Average dv in 2022
2.187 (Excluding SO <sub>4</sub> )
5.824 (Including Screened SO <sub>4</sub> )

**Spreadsheet Calculations  
HAVO1 Haze Index  
Volcano Adjustment  
Clearest Days  
(2005-2022)**

Sulfate Adjustments (Clearest Days) Hawaii Volcanoes National Park							
Year	Emissions (TPY)				Scale	Light Extinction ( $B_{ext}$ Mm <sup>-1</sup> )	
	Puna	Kanoelehua-Hill	Volcanic (2019)	Total		2019 Sulfate	Sulfate Adjusted
2005	1,345	2,822	17,301	21,468	1.072	1.97	2.112
2006	No Data	No Data	No Data	No Data	No Data	N/A	N/A
2007	1,251	2,813	17,301	21,365	1.067	1.97	2.102
2008	1,392	2,886	17,301	21,579	1.077	1.97	2.123
2009	1,489	2,786	17,301	21,576	1.077	1.97	2.122
2010	793	1,939	17,301	20,033	1.000	1.97	1.971
2011	890	2,252	17,301	20,443	1.021	1.97	2.011
2012	822	1,798	17,301	19,921	0.995	1.97	1.960
2013	876	1,795	17,301	19,972	0.997	1.97	1.965
2014	524	1,852	17,301	19,677	0.983	1.97	1.936
2015	70	2,079	17,301	19,450	0.971	1.97	1.913
2016	160	2,770	17,301	20,231	1.010	1.97	1.990
2017	187	2,167	17,301	19,655	0.981	1.97	1.933
2018	288	1,819	17,301	19,408	Not Operating		
2019	527	2,199	17,301	20,027	1.000	1.97	1.970
2020	444	2,134	17,301	19,879	0.993	1.97	1.955
2021	564	1,779	17,301	19,644	0.981	1.97	1.932
2022	54	2,130	17,301	19,485	0.973	1.97	1.917
Baseline	2005 SO <sub>2</sub> /2019 SO <sub>2</sub> (2019 Sulfate)				1.072	1.97	2.11

**Spreadsheet Calculations  
HAVO1 Haze Index  
Volcano Adjustment  
Baseline for Clearest  
Days (2001-2004)**



SULFATE ADJUSTMENT FOR 2001 CLEAREST DAYS

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001
Julian Day	46	100	106	112	136	163	169	193	199	208	214	232	244	283	286
dv w Adj SO <sub>4</sub>	4.923	4.839	4.749	5.091	4.418	4.012	3.780	4.117	3.952	3.108	3.834	3.967	4.486	4.688	4.975
AmmNO <sub>3</sub>	0.462	0.151	0.127	0.290		0.295	0.404	0.281	0.397	0.346	0.262	0.417	0.170	0.573	0.456
AmmSO <sub>4</sub> Scale	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072
Adj AmmSO <sub>4</sub>	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112
AmmSO <sub>4</sub>	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970
CM	0.052	0.997	0.881	0.567	0.806	0.375	0.213	0.428	0.273	0.272	0.193	0.669	0.362	0.373	0.319
EC	0.488	0.034	0.171	0.205	0.338			0.055					0.264	0.074	0.136
POM	1.814	1.759	2.451	2.641	2.203	1.406	1.100	1.098	1.386	0.868	1.848	1.168	1.730	1.485	1.676
Sea Salt	1.346	0.956	0.260	0.735	0.008	0.558	0.568	0.889	0.518	0.011	0.012	0.482	0.989	1.273	1.704
Soil	0.087	0.215	0.077	0.088	0.088	0.190	0.197	0.231	0.161	0.036	0.246	0.021	0.035	0.091	0.044

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2001	2001	2001	2001	2001	2001	2001
Julian Day	289	301	304	313	331	349	352
dv w Adj SO <sub>4</sub>	3.964	4.372	4.033	3.743	4.281	4.667	4.400
AmmNO <sub>3</sub>	0.320	0.369				0.206	0.422
AmmSO <sub>4</sub> Scale	1.072	1.072	1.072	1.072	1.072	1.072	1.072
Adj AmmSO <sub>4</sub>	2.112	2.112	2.112	2.112	2.112	2.112	2.112
AmmSO <sub>4</sub>	1.970	1.970	1.970	1.970	1.970	1.970	1.970
CM	0.246	0.323	0.360	0.082		0.338	0.224
EC	0.167	0.105	0.078	0.294	0.625	0.183	0.216
POM	1.486	1.061	1.523	1.798	2.580	1.971	1.767
Sea Salt	0.508	1.475	0.860	0.219	0.012	1.071	0.774
Soil	0.026	0.039	0.034	0.035	0.014	0.066	0.012

Average Adjusted dv / Light Extinction
4.291
0.330
2.112
0.398
0.215
1.674
0.692
0.092

SULFATE ADJUSTMENT FOR 2002 CLEAREST DAYS

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002
Julian Day	20	26	29	32	44	56	62	68	77	92	107	119	128	140	167
dv w Adj SO <sub>4</sub>	4.730	3.912	5.097	4.727	3.982	4.285	3.837	4.960	3.039	4.550	4.594	4.597	4.869	5.045	4.724
AmmNO <sub>3</sub>		0.020			0.501	0.526	0.233	0.478	0.017	0.097	0.235	0.279	0.229	0.429	0.494
AmmSO <sub>4</sub> Scale	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072
Adj AmmSO <sub>4</sub>	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112
AmmSO <sub>4</sub>	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970
CM	0.274	0.175		0.275	0.147	0.322		0.395		0.395	0.176	0.263	0.033	0.220	0.420
EC	0.213	0.153	1.794	0.030	0.091		0.179	0.210	0.212	0.429	0.214	0.366	0.181	0.302	0.271
POM	1.922	2.004	2.735	1.814	1.693	0.927	1.221	2.348	1.153	2.719	2.526	2.499	2.577	2.143	1.782
Sea Salt	1.510	0.314	0.002	1.795	0.328	1.409	0.917	0.853	0.053	0.002	0.477	0.223	1.069	1.334	0.903
Soil	0.017	0.010	0.005	0.017	0.019	0.053	0.015	0.025	0.005	0.008	0.091	0.094	0.072	0.021	0.056

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1		Average Adjusted dv / Light Extinction
Year	2002	2002	2002	2002	2002	2002	2002	2002	2002		
Julian Day	182	185	191	203	206	236	239	251	344		
dv w Adj SO <sub>4</sub>	4.050	3.122	3.891	3.731	3.128	3.766	4.258	4.845	4.208		4.248
AmmNO <sub>3</sub>			0.359			0.046	0.360	0.275	0.282		0.286
AmmSO <sub>4</sub> Scale	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072		
Adj AmmSO <sub>4</sub>	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112		2.112
AmmSO <sub>4</sub>	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970		
CM	0.180	0.093	0.092	0.077	0.112	0.251	0.484	0.252	0.316		0.236
EC	0.181	0.183	0.301	0.151	0.030		0.031	0.030	0.447		0.273
POM	2.492	1.147	1.612	2.170	0.887	1.994	1.670	1.642	0.824		1.854
Sea Salt	0.002	0.107	0.265	0.002	0.522	0.155	0.635	1.910	1.153		0.664
Soil	0.026	0.022	0.016	0.010	0.010	0.016	0.016	0.012	0.098		0.031

SULFATE ADJUSTMENT FOR 2003 CLEAREST DAYS

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003
Julian Day	42	54	57	99	114	129	132	135	165	168	186	201	213	216	225
dv w Adj SO <sub>4</sub>	3.808	4.377	3.438	3.630	4.393	3.215	3.610	4.255	3.771	3.579	2.932	2.746	4.056	2.736	3.829
AmmNO <sub>3</sub>	0.621	0.493	0.250	0.359	0.264	0.228	0.604	1.068	0.366	0.349	0.310	0.458	0.344	0.396	0.166
AmmSO <sub>4</sub> Scale	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072
Adj AmmSO <sub>4</sub>	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112
AmmSO <sub>4</sub>	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970
CM	0.342	0.012	0.200	0.477	0.479	0.495	0.749	0.948	0.745	0.590	0.705	0.433	0.690	0.453	0.265
EC	0.178	0.210	0.177	0.029	0.029	0.319	0.385	0.169	0.196	0.075	0.078	0.052		0.159	0.211
POM	0.179	1.396	0.799	0.667	0.302	0.066	0.398								0.053
Sea Salt	1.189	1.250	0.547	0.604	2.137	0.526	0.003	0.867	1.003	1.155	0.175	0.002	1.845	0.015	1.846
Soil	0.014	0.018	0.018	0.128	0.194	0.046	0.097	0.140	0.158	0.022	0.027	0.103	0.011	0.012	0.013

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2003	2003	2003	2003	2003	2003	2003	2003
Julian Day	228	240	258	261	285	294	339	342
dv w Adj SO <sub>4</sub>	4.002	3.820	4.774	4.221	3.370	3.207	3.448	3.265
AmmNO <sub>3</sub>	0.359	0.377	0.575	0.605	0.203	0.592	0.125	0.235
AmmSO <sub>4</sub> Scale	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072
Adj AmmSO <sub>4</sub>	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112
AmmSO <sub>4</sub>	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970
CM	0.153	0.584	0.696	0.680	0.562	0.443	0.409	0.494
EC	0.106	0.079	0.063		0.169	0.261	0.265	0.124
POM	0.040		0.996	0.007		0.324	0.895	0.287
Sea Salt	2.110	1.476	1.663	1.830	0.948	0.002	0.304	0.575
Soil	0.042	0.025	0.014	0.018	0.013	0.047	0.007	0.034

Average Adjusted dv / Light Extinction
3.673
0.406
2.112
0.505
0.159
0.458
0.960
0.052

SULFATE ADJUSTMENT FOR 2004 CLEAREST DAYS

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004
Julian Day	1	4	67	76	91	103	118	136	148	151	154	157	172	175	181
dv w Adj SO <sub>4</sub>	4.399	3.700	4.469	3.131	4.124	2.808	3.042	4.108	4.364	3.664	4.198	4.506	3.899	4.936	4.479
AmmNO <sub>3</sub>	0.240	0.062	0.337	0.209	0.309	0.059	0.061	0.129	0.312	0.207	0.203	0.356	0.313	0.504	0.425
AmmSO <sub>4</sub> Scale	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072	1.072
Adj AmmSO <sub>4</sub>	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112
AmmSO <sub>4</sub>	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970
CM	0.768	0.768	0.270	0.150	0.295	0.283	0.211	0.270	0.775	0.295	0.556	0.604	0.362	0.575	0.502
EC	0.482	0.238	0.151	0.244	0.091	0.030	0.306	0.403	0.061	0.061	0.124	0.211		0.184	
POM	1.634	1.283	0.726	0.232	0.572	0.061	0.531	1.168	0.062	0.435	1.255	0.444		0.783	0.331
Sea Salt	0.279	0.001	1.962	0.700	1.688	0.625	0.290	0.990	2.003	1.257	0.918	1.818	1.927	2.184	2.252
Soil	0.010	0.013	0.076	0.030	0.038	0.072	0.045	0.009	0.147	0.058	0.049	0.148	0.055	0.041	0.028

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2004	2004	2004	2004	2004	2004	2004
Julian Day	184	226	229	235	247	274	352
dv w Adj SO <sub>4</sub>	4.533	3.514	2.699	3.958	4.711	4.886	3.615
AmmNO <sub>3</sub>	0.427	0.356	0.178	0.357	0.701	0.515	0.258
AmmSO <sub>4</sub> Scale	1.072	1.072	1.072	1.072	1.072	1.072	1.072
Adj AmmSO <sub>4</sub>	2.112	2.112	2.112	2.112	2.112	2.112	2.112
AmmSO <sub>4</sub>	1.970	1.970	1.970	1.970	1.970	1.970	1.970
CM	0.609	0.349	0.290	0.394	0.797	0.917	0.368
EC				0.758	0.403		0.125
POM		0.367	0.016	0.144	0.730	0.016	0.303
Sea Salt	2.556	1.017	0.472	1.070	1.221	2.703	1.181
Soil	0.031	0.010	0.030	0.021	0.053	0.038	0.008

Average Adjusted dv / Light Extinction
3.988
0.296
2.112
1.970
0.473
0.242
0.555
1.323
0.046

**Spreadsheet Calculations  
HAVO1 Haze Index  
Volcano Adjustment  
Visibility Conditions for  
Clearest Days  
(2005 - 2022)**

SULFATE SCREENED CLEAREST DAYS (2005)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2005	2005	2005	2005	2005	2005	2005	2005	2005	2005	2005	2005	2005	2005	2005
Julian Day	88	91	106	151	163	172	175	178	181	184	196	202	205	220	235
AmmNO <sub>3</sub>	0.003	0.423	0.232	0.516	0.06	0.279	0.232	0.24	0.208	0.286	0.279	0.285	0.334	0.105	0.332
AmmSO <sub>4</sub>	0.6	2.567	1.315	2.369	0.923	2.116	1.97	2.578	4.38	2.691	2.506	3.293	4.366	0.884	2.881
SO <sub>4</sub> Adjusted	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112
CM	0.089	0.376	0.337	0.993	0.275	0.176	0.512	0.469	0.432	0.408	0.459	0.433	0.392	0.596	0.47
EC	0.003	0.069	0.103	0.163	0.113	0.174						0.102		0.105	
POM	0.222	0.044	0.242			0.135								0.269	
Sea Salt	0.881	2.731	1.929	2.755	1.2	2.182	1.877	2.03	0.671	1.185	1.133	1.227	0.964	0.432	0.517
Soil	0.005	0.029	0.042	0.049	0.007	0.023	0.017	0.027	0.01	0.019	0.029	0.016	0.008	0.009	0.016
dv w/o Sulfates	1.136	3.128	2.535	3.699	1.532	2.600	2.341	2.442	1.241	1.738	1.740	1.876	1.568	1.412	1.253
dv w screened SO <sub>4</sub>	2.863	4.564	4.053	5.061	3.197	4.109	3.887	3.973	2.951	3.372	3.373	3.489	3.228	3.095	2.962

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2005	2005	2005	2005	2005	2005	2005	2005
Julian Day	244	256	271	274	295	301	304	322
AmmNO <sub>3</sub>	0.427	0.158	0.175	0.144	0.259	0.038	0.021	0.451
AmmSO <sub>4</sub>	2.495	1.264	1.509	2.006	1.392	0.757	1.038	1.806
SO <sub>4</sub> Adjusted	2.112	2.112	2.112	2.112	2.112	2.112	2.112	2.112
CM	0.549	0.55	0.388	0.132	0.511	0.2	0.333	0.483
EC						0.413	0.14	0.021
POM	0.027							1.067
Sea Salt	1.786	1.262	1.82	1.327	2.744	0.647	0.639	2.162
Soil	0.013	0.006	0.015	0.007	0.012	0.024	0.013	0.011
dv w/o Sulfates	2.470	1.803	2.150	1.493	3.020	1.242	1.085	3.503
dv w screened SO <sub>4</sub>	3.997	3.427	3.723	3.164	4.471	2.952	2.820	4.890

<b>Average dv in 2005</b>
<b>2.044 (Excluding SO<sub>4</sub>)</b>
<b>3.636 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED CLEAREST DAYS (2007)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007
Julian Day	3	6	57	60	81	108	156	159	165	180	183	195	201	222	228
AmmNO <sub>3</sub>		0.136	0.355	0.367	0.304	0.195	1.398	0.369	0.103	0.188	0.131	0.174	0.379	0.51	0.374
AmmSO <sub>4</sub>	0.564	1.328	3.14	1.152	0.698	0.702	2.325	2.242	1.274	2.201	1.388	1.502	1.812	3.42	2.406
SO <sub>4</sub> Adjusted	2.102	2.102	2.102	2.102	2.102	2.102	2.102	2.102	2.102	2.102	2.102	2.102	2.102	2.102	2.102
CM	0.389	0.63	0.544	0.257	0.196	0.169	0.61	0.754	0.261	0.536	0.53	0.339	0.795	0.927	0.538
EC	0.197	0.08	0.124				0.086	0.137	0.008						0.074
POM	0.466	0.465	1.034		0.302			0.121	0.067						
Sea Salt	0.776	4.104	1.515	2.15	1.463	1.59	1.976	1.835	1.338	1.451	1.665	0.837	0.974	1.919	1.43
Soil	0.006	0.014	0.008	0.011	0.024	0.022	0.121	0.085	0.024	0.015	0.014	0.031	0.041	0.013	0.012
dv w/o Sulfates	1.684	4.337	3.060	2.457	2.061	1.803	3.500	2.853	1.656	1.980	2.103	1.294	2.040	2.904	2.114
dv w screened SO <sub>4</sub>	3.319	5.614	4.499	3.979	3.640	3.420	4.882	4.320	3.295	3.571	3.676	2.988	3.622	4.364	3.685

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2007	2007	2007	2007	2007	2007	2007	2007	2007
Julian Day	240	243	264	273	282	285	339	345	357
AmmNO <sub>3</sub>	0.584	0.465	0.311	0.202	0.56	0.617	0.14	0.401	0.536
AmmSO <sub>4</sub>	3.974	2.704	2.043	4.047	3.218	2.511	3.52	1.665	2.122
SO <sub>4</sub> Adjusted	2.102	2.102	2.102	2.102	2.102	2.102	2.102	2.102	2.102
CM	0.363	0.898	0.604	0.449	0.57	0.582	0.309	0.471	0.265
EC	0.117			0.022	0.107	0.402	0.09	0.006	0.143
POM	0.446	0.087			0.236	0.609	0.747	0.192	0.262
Sea Salt	0.892	1.974	2.653	0.857	2.251	1.03	1.22	2.231	2.926
Soil	0.009	0.018	0.012	0.012	0.024	0.064	0.36	0.023	0.016
dv w/o Sulfates	2.160	2.958	3.060	1.434	3.183	2.855	2.520	2.870	3.470
dv w screened SO <sub>4</sub>	3.725	4.411	4.499	3.107	4.606	4.322	4.033	4.335	4.855

<b>Average dv in 2007</b>
<b>2.515 (Excluding SO<sub>4</sub>)</b>
<b>4.032 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED CLEAREST DAYS (2008)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008
Julian Day	1	4	31	79	82	97	106	124	166	172	175	178	184	205	229
AmmNO <sub>3</sub>	0.25	0.35	0.316	0.239	0.265	0.632	0.374	0.293	0.326	0.131	0.331	0.381	0.245	0.023	0.184
AmmSO <sub>4</sub>	1.274	3.702	1.101	2.158	1.066	2.64	2.731	1.836	2.262	2.635	2.484	3.955	3.115	0.674	2.089
SO <sub>4</sub> Adjusted	2.123	2.123	2.123	2.123	2.123	2.123	2.123	2.123	2.123	2.123	2.123	2.123	2.123	2.123	2.123
CM	0.374	0.506	0.536	0.125	0.191	0.506	0.388	0.408	0.239	0.896	0.68	0.767	0.318	0.156	0.375
EC	0.017	0.116		0.158	0.213	0.05	0.092	0.031		0.185					
POM	0.429	0.175	0.201	0.122	0.344	0.048	0.169	0.089			0.267		0.334		
Sea Salt	1.62	0.684	2.129	1.847	1.835	2.718	2.957	1.394	1.345	1.244	1.865	1.992	1.23	1.458	2.066
Soil	0.015	0.053	0.019	0.028	0.007	0.142	0.176	0.182	0.139	0.015	0.023	0.019	0.045	0.055	0.012
dv w/o Sulfates	2.394	1.726	2.777	2.247	2.511	3.433	3.476	2.149	1.864	2.208	2.751	2.745	1.966	1.563	2.340
dv w screened SO <sub>4</sub>	3.939	3.370	4.268	3.813	4.040	4.836	4.873	3.729	3.487	3.780	4.245	4.241	3.573	3.232	3.893

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2008	2008	2008	2008	2008	2008	2008	2008
Julian Day	241	244	274	304	331	340	355	358
AmmNO <sub>3</sub>	0.414	0.214	0.098	0.356	0.451	0.419	0.179	0.439
AmmSO <sub>4</sub>	3.225	3.094	1.159	3.586	2.571	1.63	1.526	2.071
SO <sub>4</sub> Adjusted	2.123	2.123	2.123	2.123	2.123	2.123	2.123	2.123
CM	0.499	0.226	0.223	0.307	0.592	0.707	0.334	0.462
EC		0.067	0.028	0.325	0.021	0.008		
POM				0.073		0.512	0.577	
Sea Salt	2.057	1.606	0.738	0.436	3.1	2.263	3.148	1.958
Soil	0.034	0.029	0.012	0.032	0.028	0.021	0.032	0.012
dv w/o Sulfates	2.627	1.941	1.043	1.423	3.501	3.315	3.556	2.524
dv w screened SO <sub>4</sub>	4.139	3.552	2.793	3.113	4.895	4.733	4.943	4.051

<b>Average dv in 2008</b>
<b>2.438 (Excluding SO<sub>4</sub>)</b>
<b>3.980 (Including Screened SO<sub>4</sub>)</b>



SULFATE SCREENED CLEAREST DAYS (2009)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009
Julian Day	34	52	64	97	103	169	175	193	199	208	211	220	235	241	244
AmmNO <sub>3</sub>	0.071	0.15	0.32	0.42	0.458	0.165	0.199	0.154	0.068	0.698	0.646	0.296	0.102	0.032	0.172
AmmSO <sub>4</sub>	0.11	2.718	2.526	3.064	3.567	1.603	2.449	3.233	1.579	3.766	3.722	4.227	2.37	1.741	4.005
SO <sub>4</sub> Adjusted	2.122	2.122	2.122	2.122	2.122	2.122	2.122	2.122	2.122	2.122	2.122	2.122	2.122	2.122	2.122
CM		0.06	0.486	0.295	0.605	0.177	0.262	0.209	0.018	0.471	0.616	0.455	0.177	0.187	
EC	0.035	0.023		0.311	0.135	0.109	0.108		0.02	0.259	0.048	0.013	0.014	0.208	0.049
POM	0.023	0.255	1.257	0.213	0.097										
Sea Salt	0.254	1.759	1.069	2.011	2.197	1.506	1.94	1.127	0.718	1.298	1.542	1.852	0.946	0.227	1.09
Soil	0.023	0.123	0.06	0.132	0.194	0.06	0.037	0.044	0.026	0.084	0.071	0.047	0.009	0.01	0.022
dv w/o Sulfates	0.398	2.127	2.770	2.913	3.138	1.837	2.268	1.427	0.816	2.476	2.564	2.361	1.176	0.643	1.251
dv w screened SO <sub>4</sub>	2.254	3.710	4.262	4.385	4.579	3.464	3.831	3.116	2.602	4.009	4.085	3.910	2.904	2.458	2.968

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2009	2009	2009	2009	2009	2009	2009	2009
Julian Day	253	259	268	286	310	319	331	334
AmmNO <sub>3</sub>	0.174	0.325	0.221	0.116	0.379	0.162	0.32	0.536
AmmSO <sub>4</sub>	1.804	2.838	1.426	4.871	3.778	1.943	2.339	1.607
SO <sub>4</sub> Adjusted	2.122	2.122	2.122	2.122	2.122	2.122	2.122	2.122
CM	0.412	0.375	0.902	0.367	0.387	0.101	0.181	
EC	0.058	0.01	0.044	0.077	0.124	0.256		0.081
POM			0.024					
Sea Salt	1.311	0.964	1.784	0.382	1.216	2.029	3.051	2.874
Soil	0.014	0.032	0.009	0.042	0.018	0.021	0.017	0.021
dv w/o Sulfates	1.797	1.575	2.611	0.939	1.926	2.286	3.052	3.010
dv w screened SO <sub>4</sub>	3.430	3.241	4.125	2.705	3.539	3.846	4.505	4.469

<b>Average dv in 2009</b>
<b>1.972 (Excluding SO<sub>4</sub>)</b>
<b>3.582 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED CLEAREST DAYS (2010)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010
Julian Day	86	95	104	113	140	143	161	167	170	173	176	191	212	215	218
AmmNO <sub>3</sub>	0.416	0.029	0.102	0.181	0.286	0.148	0.337	0.192	0.168	0.457	0.472	0.284	0.305	0.43	0.422
AmmSO <sub>4</sub>	2.081	2.159	0.784	1.69	2.111	2.038	2.219	1.583	1.752	2.502	2.03	1.994	1.448	1.804	3.233
SO <sub>4</sub> Adjusted	1.971	1.971	1.971	1.971	1.971	1.971	1.971	1.971	1.971	1.971	1.971	1.971	1.971	1.971	1.971
CM	0.368	0.231		0.312	0.54	0.303	0.867	0.313	0.509	0.434	0.828	0.538	0.522	0.445	1.081
EC	0.054	0.368	0.109	0.048	0.042	0.03	0.162	0.119	0.128	0.008	0.112	0.048	0.06	0.218	0.049
POM	0.083	0.304	0.275	0.234			0.4	0.089	0.543	0.145	0.26		0.207	0.225	
Sea Salt	1.752	0.877	1.073	0.578	1.756	2.141	1.516	1.096	0.95	1.883	1.378	1.91	1.532	1.813	0.94
Soil	0.253	0.141	0.066	0.042	0.131	0.047	0.07	0.037	0.023	0.032	0.027	0.035	0.014	0.023	0.008
dv w/o Sulfates	2.567	1.781	1.506	1.306	2.433	2.366	2.891	1.694	2.087	2.592	2.683	2.480	2.343	2.741	2.231
dv w screened SO <sub>4</sub>	3.986	3.308	3.072	2.901	3.870	3.812	4.268	3.233	3.571	4.008	4.087	3.911	3.792	4.138	3.696

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2010	2010	2010	2010	2010	2010	2010	2010	2010
Julian Day	233	242	245	248	251	263	299	302	308
AmmNO <sub>3</sub>	0.318	0.532	0.237	0.322	0.463	0.285	0.352	0.635	0.051
AmmSO <sub>4</sub>	1.938	2.836	1.777	2.057	2.293	2.142	1.278	2.63	0.616
SO <sub>4</sub> Adjusted	1.971	1.971	1.971	1.971	1.971	1.971	1.971	1.971	1.971
CM	0.515	0.38	0.384	0.431	0.706	0.593	0.393	0.785	0.201
EC	0.085	0.397	0.099	0.021		0.023	0.111	0.045	
POM		0.221	0.488				0.044		
Sea Salt	1.235	1.58	0.532	1.501	0.874	1.987	1.745	1.023	0.082
Soil	0.021	0.033	0.017	0.021	0.02	0.024	0.026	0.023	0.016
dv w/o Sulfates	1.967	2.733	1.619	2.067	1.876	2.556	2.367	2.240	0.344
dv w screened SO <sub>4</sub>	3.468	4.130	3.169	3.554	3.389	3.976	3.813	3.703	2.087

<b>Average dv in 2010</b>
<b>2.145 (Excluding SO<sub>4</sub>)</b>
<b>3.623 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED CLEAREST DAYS (2011)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011
Julian Day	159	162	168	174	183	198	219	225	228	246	255	273	288	312	315
AmmNO <sub>3</sub>	0.242	0.087	0.62	0.447	0.238	0.377	0.194		0.097	0.254	0.071	0.131	0.27	0.257	0.2
AmmSO <sub>4</sub>	1.365	0.858	1.571	1.687	1.968	2.636	2.067	1.542	1.854	1.372	2.119	2.155	1.751	1.286	1.043
SO <sub>4</sub> Adjusted	2.011	2.011	2.011	2.011	2.011	2.011	2.011	2.011	2.011	2.011	2.011	2.011	2.011	2.011	2.011
CM	0.901	0.471	0.9	0.871	0.305	0.645	0.605	0.147	0.518	0.432	0.449	0.991	0.546	0.394	0.51
EC	0.368	0.147	0.251	0.204	0.04		0.31	0.024	0.032	0.172	0.103	0.205	0.048	0.422	0.041
POM	0.459	0.836	0.111	0.025			0.474			0.362	0.304	0.343	0.438	0.415	0.011
Sea Salt	1.895	1.681	0.452	0.96	0.847	1.643	0.594	0.393	1.37	1.058	0.397	0.281	1.466	1.697	0.983
Soil	0.008			0.006	0.01	0.018			0.003	0.005	0.014	0.006	0.036	0.014	0.016
dv w/o Sulfates	3.274	2.793	2.098	2.242	1.345	2.377	1.970	0.549	1.840	2.056	1.256	1.787	2.472	2.776	1.622
dv w screened SO <sub>4</sub>	4.627	4.209	3.608	3.732	2.965	3.849	3.498	2.291	3.387	3.573	2.889	3.342	3.931	4.194	3.201

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2011	2011	2011	2011	2011	2011	2011	2011	2011
Julian Day	321	324	333	342	345	348	351	354	357
AmmNO <sub>3</sub>	0.203	0.057	0.375	0.15			0.421	0.357	0.15
AmmSO <sub>4</sub>	2.637	0.903	1.411	1.07	0.242	0.52	1.726	1.357	0.873
SO <sub>4</sub> Adjusted	2.011	2.011	2.011	2.011	2.011	2.011	2.011	2.011	2.011
CM	0.403	0.127	0.694	0.573	0.153	0.179	0.861	0.57	0.666
EC	0.142	0.12	0.088	0.269		0.055		0.132	0.154
POM	0.067	0.262				0.084		0.233	0.145
Sea Salt	1.231	1.076	2.735	1.369	0.197	0.222	2.048	2.363	1.967
Soil	0.006	0.013	0.02	0.02	0.003	0.011	0.059	0.023	0.013
dv w/o Sulfates	1.866	1.532	3.302	2.136	0.347	0.536	2.918	3.132	2.696
dv w screened SO <sub>4</sub>	3.410	3.123	4.652	3.641	2.122	2.281	4.318	4.504	4.125

Average dv in 2011
2.038 (Excluding SO <sub>4</sub> )
3.561 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED CLEAREST DAYS (2012)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012
Julian Day	43	64	100	112	148	154	172	175	178	187	199	223	232	241	244
AmmNO <sub>3</sub>	0.101	0.179	0.12	0.158	0.099	0.243		0.015	0.114	0.32	0.507	0.389	0.34	0.312	0.339
AmmSO <sub>4</sub>	1.429	2.413	2.177	1.765	0.928	1.123	0.069	0.705	0.882	2.109	2.236	2.07	1.826	1.996	2.226
SO <sub>4</sub> Adjusted	1.960	1.960	1.960	1.960	1.960	1.960	1.960	1.960	1.960	1.960	1.960	1.960	1.960	1.960	1.960
CM	0.619	0.404	0.173	0.357	0.281	0.444	0.305	0.235	0.208	0.48	0.342	0.203	0.54	0.225	0.942
EC		0.138	0.065	0.068	0.039	0.202	0.114	0.041	0.032	0.046	0.057	0.077	0.027	0.034	0.014
POM	0.234		0.328	0.77	0.218	0.277	0.131						0.057	0.213	
Sea Salt	1.702	1.46	0.808	0.993	1.036	1.242	0.297	0.55	1.09	1.27	0.082	2.098	0.886	0.756	1.436
Soil	0.104	0.029	0.122	0.054	0.025	0.015	0.014	0.014	0.003	0.033	0.028	0.006	0.008	0.007	0.006
dv w/o Sulfates	2.437	1.997	1.498	2.151	1.568	2.170	0.826	0.820	1.351	1.947	0.968	2.447	1.704	1.438	2.419
dv w screened SO <sub>4</sub>	3.866	3.485	3.057	3.619	3.117	3.635	2.485	2.480	2.932	3.442	2.605	3.875	3.234	3.006	3.851

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2012	2012	2012	2012	2012	2012	2012	2012	2012
Julian Day	253	259	271	289	304	325	331	352	355
AmmNO <sub>3</sub>	0.348	0.176	0.247	0.154	0.399	0.013	0.555	0.128	
AmmSO <sub>4</sub>	2.42	1.413	1.268	1.417	2.114	0.523	2.103	0.776	0.17
SO <sub>4</sub> Adjusted	1.960	1.960	1.960	1.960	1.960	1.960	1.960	1.960	1.960
CM	0.562	0.374	0.599	0.213	0.536	0.173	0.433	0.665	0.108
EC		0.165	0.148	0.051	0.084		0.121	0.052	0.042
POM	0.002	0.082	0.267	0.816	0.03		0.178	0.024	
Sea Salt	1.192	1.098	1.178	0.683	1.703	0.557	0.975	2.277	0.385
Soil	0.001	0.011	0.012	0.026	0.016	0.009	0.036	0.02	0.015
dv w/o Sulfates	1.910	1.745	2.192	1.776	2.444	0.725	2.069	2.751	0.535
dv w screened SO <sub>4</sub>	3.411	3.269	3.654	3.295	3.872	2.400	3.547	4.138	2.239

Average dv in 2012
1.745 (Excluding SO <sub>4</sub> )
3.271 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED CLEAREST DAYS (2013)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013
Julian Day	4	37	43	46	49	52	55	151	172	187	199	202	205	208	241
AmmNO <sub>3</sub>	0.092	0.274	0.455	0.328	0.226	0.322	0.141	0.049	0.264	0.233	0.148	0.481	0.392	0.063	0.595
AmmSO <sub>4</sub>	0.726	1.85	1.834	2.596	1.074	2.046	1.247	0.478	1.339	4.844	4.252	2.787	2.917	0.811	3.164
SO <sub>4</sub> Adjusted	1.965	1.965	1.965	1.965	1.965	1.965	1.965	1.965	1.965	1.965	1.965	1.965	1.965	1.965	1.965
CM	0.361	0.592	1.019	0.677	0.389	0.383	0.196	0.186	0.602	0.644	0.718	1.15	1.283	0.4	0.585
EC		0.071	0.016		0.147	0.085		0.035	0.074	0.139	0.069	0.101	0.101	0.047	0.068
POM		0.291			0.198	0.194		0.179		0.297					0.131
Sea Salt	1.195	2.624	2.383	1.692	2.078	1.096	1.163	0.574	1.201	0.579	1.043	2.043	2.042	0.638	0.522
Soil	0.018	0.015	0.066	0.046	0.048	0.012	0.029	0.012	0.019	0.008	0.004	0.026	0.016	0.004	0.041
dv w/o Sulfates	1.541	3.269	3.321	2.424	2.690	1.900	1.423	0.985	1.956	1.740	1.808	3.222	3.245	1.090	1.775
dv w screened SO <sub>4</sub>	3.098	4.594	4.640	3.858	4.089	3.405	2.997	2.624	3.454	3.268	3.327	4.553	4.574	2.713	3.298

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2013	2013	2013	2013	2013	2013	2013	2013	2013
Julian Day	247	250	253	256	259	265	268	313	361
AmmNO <sub>3</sub>	0.712	0.29	0.622	0.596	0.665	0.425	0.485	0.266	0.547
AmmSO <sub>4</sub>	3.007	1.188	2.888	3.31	2.684	3.135	1.917	1.517	0.91
SO <sub>4</sub> Adjusted	1.965	1.965	1.965	1.965	1.965	1.965	1.965	1.965	1.965
CM	0.571	0.141	0.413	0.547	0.823	0.792	0.894	0.311	0.494
EC	0.221	0.097	0.123	0.052	0.079	0.007	0.169	0.074	0.074
POM	0.529	0.227	0.267	0.572	0.255	0.395	0.315	0.952	0.232
Sea Salt	0.718	1.121	1.101	1.195	2.187	1.306	2.616	0.836	2.395
Soil	0.036	0.011	0.015	0.032	0.031	0.013	0.02	0.011	0.016
dv w/o Sulfates	2.458	1.729	2.264	2.619	3.393	2.576	3.715	2.191	3.190
dv w screened SO <sub>4</sub>	3.888	3.258	3.720	4.027	4.703	3.990	4.986	3.657	4.525

Average dv in 2013
2.355 (Excluding SO <sub>4</sub> )
3.802 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED CLEAREST DAYS (2014)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014
Julian Day	5	110	116	176	179	182	188	194	197	221	224	230	233	248	296
AmmNO <sub>3</sub>	0.434	0.422	0.267	0.289	0.4	0.191	0.012	0.039	0.404	0.254	0.263	0.437	0.203	0.261	0.295
AmmSO <sub>4</sub>	2.557	2.085	1.934	1.964	2.203	0.991	0.821	3.264	1.987	2.742	2.202	2.408	2.246	2.874	1.566
SO <sub>4</sub> Adjusted	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936
CM		0.764	0.458	0.996	0.996	0.854	0.854	0.854	0.854	0.854	0.854	0.854	0.854	0.854	0.694
EC	0.04		0.088	0.027	0.021	0.147	0.026	0.003	0.007	0.089	0.222	0.001	0.143	0.038	0.025
POM	0.66		0.228	0.432	0.57	0.532	0.121		0.501	0.873	0.343		0.191	0.396	0.078
Sea Salt	1.64	2.245	1.87	2.001	0.699	0.888	0.405	0.626	1.968	1.037	0.595	1.947	1.263	0.51	1.228
Soil	0.021	0.291	0.061	0.068	0.01	0.014	0.007	0.004	0.015	0.056	0.003	0.036	0.007	0.025	0.019
dv w/o Sulfates	2.465	3.164	2.602	3.230	2.387	2.332	1.332	1.420	3.184	2.748	2.054	2.833	2.359	1.893	2.102
dv w screened SO <sub>4</sub>	3.874	4.484	3.993	4.542	3.806	3.758	2.898	2.973	4.501	4.120	3.518	4.194	3.782	3.379	3.559

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2014	2014	2014	2014	2014	2014	2014	2014
Julian Day	299	302	323	332	335	338	347	350
AmmNO <sub>3</sub>	0.048	0.237	0.135		0.196	0.039	0.261	0.117
AmmSO <sub>4</sub>	0.884	1.278	1.265	0.572	1.049	1.084	1.27	0.737
SO <sub>4</sub> Adjusted	1.936	1.936	1.936	1.936	1.936	1.936	1.936	1.936
CM	0.694	0.694	0.694	0.694	0.694	0.694	0.694	0.694
EC	0.008		0.101		0.021			0.059
POM	0.118						0.054	0.128
Sea Salt	0.466	0.737	1.847	0.599	1.217	0.371	1.722	1.069
Soil		0.005	0.019		0.022	0.006	0.017	0.009
dv w/o Sulfates	1.252	1.547	2.465	1.216	1.947	1.053	2.428	1.886
dv w screened SO <sub>4</sub>	2.829	3.081	3.874	2.798	3.426	2.659	3.842	3.373

<b>Average dv in 2014</b>
<b>2.170 (Excluding SO<sub>4</sub>)</b>
<b>3.620 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED CLEAREST DAYS (2015)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015
Julian Day	27	60	63	66	99	102	165	168	186	195	204	213	225	258	264
AmmNO <sub>3</sub>	0.561	0.306	0.302	0.401	0.332	0.198	0.633	0.167	0.395	0.555	0.547	0.338	0.14	0.337	0.241
AmmSO <sub>4</sub>	2.1	4.923	1.781	0.875	3.28	1.187	3.672	0.895	4.156	3.433	2.574	1.396	0.589	1.762	1.627
SO <sub>4</sub> Adjusted	1.913	1.913	1.913	1.913	1.913	1.913	1.913	1.913	1.913	1.913	1.913	1.913	1.913	1.913	1.913
CM	0.653	0.653	0.653	0.653	1.01	1.01	1.01	1.01	0.829	0.829	0.829	0.829	0.829	0.829	0.829
EC		0.081	0.003		0.08	0.057	0.059		0.299	0.18	0.164	0.104	0.002	0.045	
POM	1.177	0.232			0.009		0.162		0.299	0.647	0.734	0.624		0.714	
Sea Salt	2.786	1.11	0.242	0.778	1.956	0.527	1.159	0.539	0.625	1.527	1.178	1.512	1.268	1.573	1.713
Soil	0.031	0.023	0.174	0.024	0.239	0.06	0.129	0.004	0.167	0.022	0.211	0.019	0.006	0.014	0.01
dv w/o Sulfates	4.192	2.155	1.287	1.702	3.094	1.699	2.740	1.587	2.322	3.192	3.121	2.946	2.025	3.010	2.463
dv w screened SO <sub>4</sub>	5.377	3.589	2.842	3.198	4.408	3.195	4.098	3.099	3.734	4.494	4.431	4.278	3.477	4.334	3.857

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2015	2015	2015	2015	2015	2015
Julian Day	288	294	309	312	321	330
AmmNO <sub>3</sub>	0.115	0.294	0.227	0.498	0.446	0.383
AmmSO <sub>4</sub>	1.654	1.402	0.779	1.463	1.735	1.724
SO <sub>4</sub> Adjusted	1.913	1.913	1.913	1.913	1.913	1.913
CM	0.296	0.561	0.257	0.767	0.593	0.473
EC	0.085	0.145	0.071	0.025	0.266	
POM	0.868	0.731	0.437	1.04	0.489	
Sea Salt	0.679	1.563	1.291	2.922	2.856	0.711
Soil	0.01	0.015	0.008	0.022	0.019	0.005
dv w/o Sulfates	1.867	2.859	2.063	4.236	3.832	1.460
dv w screened SO <sub>4</sub>	3.340	4.202	3.509	5.416	5.057	2.990

<b>Average dv in 2015</b>
<b>2.564 (Excluding SO<sub>4</sub>)</b>
<b>3.949 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED CLEAREST DAYS (2016)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016
Julian Day	22	73	79	109	115	154	187	205	226	232	241	244	265	268	286
AmmNO <sub>3</sub>	0.414	0.207		0.099	0.28	0.115	0.137		0.042	0.293	0.138	0.071	0.417	0.21	0.265
AmmSO <sub>4</sub>	1.307	1.469	0.523	0.254	1.559	1.773	1.297	2.183	0.243	2.233	3.964	0.394	2.02	1.408	2.019
SO <sub>4</sub> Adjusted	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990
CM	0.361	0.375	0.042	0.174	0.659	0.354	0.343	0.252	0.244	0.47	0.436	0.461	0.595	0.229	0.487
EC	0.033		0.004		0.01	0.164	0.016	0.273		0.346		0.064		0.075	0.306
POM	0.081	0.364	0.145	0.587	0.575	0.448		0.653		0.289				0.487	0.114
Sea Salt	1.81	1.33	0.176	1.343	1.477	0.487	0.682	0.173	0.257	0.835	0.452	0.535	1.248	0.776	0.713
Soil	0.016	0.113	0.005	0.011	0.071	0.015	0.006			0.004	0.008		0.005	0.003	0.058
dv w/o Sulfates	2.402	2.142	0.365	2.000	2.679	1.470	1.119	1.267	0.529	2.019	0.984	1.071	2.042	1.638	1.776
dv w screened SO <sub>4</sub>	3.856	3.632	2.120	3.509	4.096	3.055	2.757	2.883	2.258	3.526	2.642	2.716	3.545	3.199	3.317

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2016	2016	2016	2016	2016	2016	2016
Julian Day	289	292	304	313	319	325	358
AmmNO <sub>3</sub>	0.28	0.295	0.339	0.219	0.224	0.246	0.129
AmmSO <sub>4</sub>	1.314	2.262	1.708	1.246	0.77	0.912	0.313
SO <sub>4</sub> Adjusted	1.990	1.990	1.990	1.990	1.990	1.990	1.990
CM	0.39	0.645	0.792	0.18	0.214	0.427	0.17
EC	0.156	0.126	0.057	0.323	0.133	0.198	
POM	0.201	0.116		0.288			
Sea Salt	1.68	1.457	1.949	1.255	0.535	1.915	0.871
Soil	0.036	0.003	0.054	0.02	0.013	0.024	0.011
dv w/o Sulfates	2.424	2.344	2.769	2.058	1.061	2.476	1.116
dv w screened SO <sub>4</sub>	3.875	3.806	4.175	3.559	2.707	3.920	2.754

Average dv in 2016
1.716 (Excluding SO <sub>4</sub> )
3.269 (Including Screened SO <sub>4</sub> )



SULFATE SCREENED CLEAREST DAYS (2017)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017
Julian Day	4	7	10	13	34	37	40	46	49	64	67	70	118	247	256
AmmNO <sub>3</sub>	0.221	0.095	0.343	0.555	0.291	0.686	0.264	0.456	0.540	0.434	0.207	0.303	0.335	0.373	0.648
AmmSO <sub>4</sub>	1.434	0.311	1.366	2.495	2.938	2.165	1.465	2.822	3.072	1.411	0.690	2.485	2.174	1.629	3.020
SO <sub>4</sub> Adjusted	1.933	1.933	1.933	1.933	1.933	1.933	1.933	1.933	1.933	1.933	1.933	1.933	1.933	1.933	1.933
CM	0.257	0.079	0.492	0.583	0.567	0.855	0.300	0.690	0.908	0.827	0.623	0.807	0.518	0.661	0.595
EC	0.195	0.093	0.000	0.262	0.062	0.175	0.000	0.158	0.035	0.000	0.000	0.059	0.000	0.000	0.048
POM	0.427	0.000	0.283	0.655	0.000	0.308	0.105	0.932	0.283	0.062	0.000	0.108	0.433	0.315	1.489
Sea Salt	1.92	0.639	1.345	1.576	0.884	2.645	0.915	1.185	1.922	1.2	0.894	1.483	0.366	1.451	0.997
Soil	0.000	0.004	0.020	0.087	0.035	0.044	0.029	0.027	0.021	0.012	0.003	0.014	0.004	0.010	0.012
dv w/o Sulfates	2.639	0.871	2.218	3.161	1.688	3.861	1.495	2.962	3.155	2.259	1.593	2.448	1.532	2.476	3.213
dv w screened SO <sub>4</sub>	4.023	2.502	3.658	4.479	3.201	5.096	3.035	4.305	4.474	3.694	3.119	3.857	3.067	3.882	4.525

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2017	2017	2017	2017	2017	2017
Julian Day	274	280	295	301	322	325
AmmNO <sub>3</sub>	0.433	0.754	0.339	0.309	0.190	0.185
AmmSO <sub>4</sub>	1.676	2.586	1.473	0.992	0.548	1.429
SO <sub>4</sub> Adjusted	1.933	1.933	1.933	1.933	1.933	1.933
CM	0.702	0.731	0.378	0.512	0.229	0.359
EC	0.164	0.405	0.000	0.077	0.138	0.000
POM	1.188	0.341	0.000	0.139	0.148	1.081
Sea Salt	1.563	2.297	1.499	1.821	1.356	0.305
Soil	0.005	0.024	0.014	0.026	0.018	0.011
dv w/o Sulfates	3.404	3.751	2.013	2.534	1.889	1.774
dv w screened SO <sub>4</sub>	4.693	4.999	3.480	3.932	3.373	3.274

<b>Average dv in 2017</b>
<b>2.426 (Excluding SO<sub>4</sub>)</b>
<b>3.841 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED CLEAREST DAYS (2019)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
Julian Day	4	7	10	13	34	37	40	46	49	64	67	70	118	247	256
AmmNO <sub>3</sub>	0.208	0.107	0.084	0.335	0.316	0.215	0.442	0.469	0.227	0.743	0.436	0.304	0.283	0.122	0.417
AmmSO <sub>4</sub>	2.958	0.642	3.314	1.772	1.683	2.076	1.668	2.496	1.265	2.769	1.827	2.137	1.162	3.037	2.539
SO <sub>4</sub> Adjusted	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970	1.970
CM	0.428	0.401	0.216	0.486	0.676	0.723	1.121	0.585	0.047	1.066	0.624	0.595	0.397	0.19	1.284
EC	0.054	0.195	0.151	0.307	0.08	0.157	0.274		0.105	0.017		0.061		0.558	
POM	0.262	0.021	0.303	0.36	0.342	0.596	0.58	0.342	0.155	0.393	0.438	0.557	0.044	0.646	0.018
Sea Salt	0.474	0.346	0.428	1.863	1.869	0.872	1.862	1.785	0.6	0.801	1.627	1.037	1.188	0.528	1.248
Soil	0.001	0.077	0.024	0.039	0.056		0.097	0.137		0.217	0.127	0.241	0.015	0.02	0.006
dv w/o Sulfates	1.334	1.086	1.139	2.919	2.881	2.282	3.630	2.865	1.074	2.804	2.816	2.465	1.762	1.876	2.603
dv w screened SO <sub>4</sub>	2.924	2.713	2.758	4.292	4.259	3.738	4.914	4.245	2.703	4.192	4.202	3.897	3.291	3.389	4.017

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2019	2019	2019	2019	2019	2019
Julian Day	274	280	295	301	322	325
AmmNO <sub>3</sub>	0.262	0.194	0.421	0.142	0.325	0.077
AmmSO <sub>4</sub>	3.665	1.655	2.193	0.558	1.441	0.471
SO <sub>4</sub> Adjusted	1.970	1.970	1.970	1.970	1.970	1.970
CM	1.141	0.886	1.487	0.414	0.471	0.365
EC			0.097	0.549	0.106	0.095
POM	0.729	0.649	0.657	1.632	1.188	1.339
Sea Salt	0.316	1.01	0.952	0.666	1.124	0.301
Soil	0.006	0.006	0.009	0.001		
dv w/o Sulfates	2.195	2.426	3.092	2.930	2.787	1.970
dv w screened SO <sub>4</sub>	3.663	3.863	4.442	4.301	4.177	3.469

Average dv in 2019
2.330 (Excluding SO <sub>4</sub> )
3.783 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED CLEAREST DAYS (2020)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020
Julian Day	4	10	16	19	25	52	64	70	82	85	91	124	139	142	151
AmmNO <sub>3</sub>	0.192	0.039	0.087	0.247	0.268	0.156	0.144	0.088	0.31	0.144	0.241	0.156	0.168	0.111	0.081
AmmSO <sub>4</sub>	1.533	0.336	1.683	0.993	2.051	0.869	0.792	1.132	1.502	0.788	0.814	0.575	1.521	1.205	0.435
SO <sub>4</sub> Adjusted	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955	1.955
CM	0.217	0.178	0.393	0.589	0.388	0.45	0.391		0.398	0.182	0.604	0.208	0.338	0.478	0.299
EC	0.427	0.046	0.271	0.078	0.038	0.107	0.448	0.128	0.242			0.245	0.504	0.454	0.048
POM	0.728	0.808	1.177	0.425	0.868	1.071	0.972	0.963	0.457	0.254	0.937	0.625	0.847	0.827	0.344
Sea Salt	1.083	0.477	0.688	1.275	0.644	1.347	1.203	0.601	1.315	1.283	0.329	0.369	0.414	0.421	0.181
Soil	0.022	0.005		0.032	0.002	0.021			0.059	0.018	0.011	0.011	0.049	0.025	0.016
dv w/o Sulfates	2.366	1.444	2.324	2.348	1.995	2.740	2.744	1.638	2.454	1.724	1.924	1.496	2.086	2.083	0.925
dv w screened SO <sub>4</sub>	3.801	3.007	3.764	3.785	3.480	4.126	4.130	3.174	3.877	3.247	3.420	3.052	3.559	3.556	2.565

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2020	2020	2020	2020	2020	2020	2020
Julian Day	187	220	235	274	328	352	355
AmmNO <sub>3</sub>	0.036	0.077	0.203	0.095	0.128	0.187	0.104
AmmSO <sub>4</sub>	1.243	1.01	2.637	2.085	0.706	0.659	0.698
SO <sub>4</sub> Adjusted	1.955	1.955	1.955	1.955	1.955	1.955	1.955
CM	0.347	0.412	0.424	0.351	0.355	0.652	0.507
EC	0.354	0.126	0.109				0.081
POM	0.382	0.367	0.615	0.726	0.519	0.903	0.963
Sea Salt	0.223	0.098	0.388	0.263	0.761	1.148	1.041
Soil	0.001	0.002	0.015	0.012			
dv w/o Sulfates	1.260	1.027	1.616	1.351	1.624	2.539	2.387
dv w screened SO <sub>4</sub>	2.850	2.652	3.155	2.928	3.161	3.951	3.819

Average dv in 2020
1.913 (Excluding SO <sub>4</sub> )
3.412 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED CLEAREST DAYS (2021)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021
Julian Day	58	64	76	88	94	115	130	133	175	181	184	199	205	208	223
AmmNO <sub>3</sub>	0.17	0.335	0.199	0.077	0.181	0.162	0.081	0.126	0.123	0.151	0.164	0.222	0.135	0.026	0.225
AmmSO <sub>4</sub>	0.743	1.3	1.523	0.624	1.263	1.163	1.07	1.535	3.006	1.918	0.912	2.725	1.062	0.557	2.059
SO <sub>4</sub> Adjusted	1.932	1.932	1.932	1.932	1.932	1.932	1.932	1.932	1.932	1.932	1.932	1.932	1.932	1.932	1.932
CM	0.414	0.425	0.538	0.187	0.504	0.343	0.525	0.829	0.587	0.593	0.477	0.361	0.978	0.213	0.707
EC		0.024	0.114	0.064	0.394	0.458	0.056	0.036	0.062						0.339
POM	0.768	0.489	0.687	0.326	0.178	0.448	0.714	0.822	0.667	0.604	0.644	0.593	0.437	0.429	0.677
Sea Salt	1.69	1.22	0.966	1.082	0.496	1.011	0.621	0.662	0.568	0.576	0.634	0.378	0.178	0.352	0.165
Soil	0.003	0.056	0.035	0.076	0.068	0.074	0.024	0.146	0.023	0.016	0.004	0.013	0.029	0.025	0.004
dv w/o Sulfates	2.658	2.271	2.263	1.665	1.673	2.228	1.841	2.328	1.848	1.773	1.759	1.456	1.903	0.994	1.636
dv w screened SO <sub>4</sub>	4.039	3.703	3.696	3.180	3.187	3.666	3.331	3.752	3.338	3.273	3.261	3.000	3.385	2.606	3.155

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2021	2021	2021	2021	2021	2021	2021	2021
Julian Day	226	253	271	283	286	289	346	355
AmmNO <sub>3</sub>	0.378	0.412	0.125	0.225	0.127	0.289	0.382	0.057
AmmSO <sub>4</sub>	1.247	2.006	0.794	1.597	1.063	1.338	1.232	0.26
SO <sub>4</sub> Adjusted	1.932	1.932	1.932	1.932	1.932	1.932	1.932	1.932
CM	0.931	0.874	0.352	0.372	0.417	0.959	0.765	0.25
EC	0.054		0.238		0.243		0.257	0.037
POM	0.348	0.81	0.393	0.168	0.339	0.835	0.342	0.168
Sea Salt	0.752	0.802	0.536	2.215	0.381	1.218	1.748	0.395
Soil	0.014	0.015		0.045	0.004	0.069	0.008	
dv w/o Sulfates	2.213	2.556	1.522	2.643	1.407	2.904	3.003	0.868
dv w screened SO <sub>4</sub>	3.653	3.951	3.057	4.026	2.959	4.254	4.340	2.499

<b>Average dv in 2021</b>
<b>1.974 (Excluding SO<sub>4</sub>)</b>
<b>3.448 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED CLEAREST DAYS (2022)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022
Julian Day	32	35	44	77	95	101	107	116	122	125	155	167	173	176	191
AmmNO <sub>3</sub>	0.429	0.376	0.411	0.694	0.095	0.376	0.337	0.299	0.55	0.052	0.011	0.454	0.184	0.072	0.308
AmmSO <sub>4</sub>	2.008	2.413	1.533	2.016	1.099	1.379	0.873	1.888	0.751	0.243	0.282	1.832	1.193	1.022	1.399
SO <sub>4</sub> Adjusted	1.917	1.917	1.917	1.917	1.917	1.917	1.917	1.917	1.917	1.917	1.917	1.917	1.917	1.917	1.917
CM	0.594	0.184	0.398	0.349	0.645	0.743	0.76	0.452	0.647	0.273	0.39	0.591	0.553	0.501	0.684
EC	0.086	0.155	0.168	0.289	0.458	0.1	0.116	0.03	0.022	0.042	0.085	0.028	0.381		
POM	0.513	0.497	0.248	0.358	0.334	0.358	0.021	0.068	0.635	0.837	0.415	0.841			
Sea Salt	1.715	1.081	0.607	1.172	0.869	2.012	0.859	0.833	0.679	0.226	0.137	0.876	1.148	0.213	1.413
Soil	0.009	0.007	0.051	0.018	0.139	0.22	0.066	0.013	0.024	0.035	0.002	0.082	0.01	0.006	0.017
dv w/o Sulfates	2.886	2.070	1.725	2.531	2.263	3.227	1.955	1.507	1.797	0.590	1.148	2.566	2.078	1.537	2.471
dv w screened SO <sub>4</sub>	4.228	3.519	3.221	3.918	3.686	4.527	3.419	3.034	3.282	2.251	2.726	3.949	3.526	3.059	3.866

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2022	2022	2022	2022	2022	2022	2022	2022
Julian Day	194	197	206	272	299	302	305	317
sAmmNO <sub>3</sub>	0.041	0.071	0.825	0.246	0.161	0.376	0.282	0.393
AmmSO <sub>4</sub>	0.18	0.436	1.004	1.678	0.977	2.865	1.211	1.125
SO <sub>4</sub> Adjusted	1.917	1.917	1.917	1.917	1.917	1.917	1.917	1.917
CM	0.289	0.302	0.512	0.774	0.396	0.695	0.846	0.541
EC	0.551	0.214	0.086	0.321	0.125	0.091	0.151	0.073
POM	0.786	0.192	0.062	0.546	0.494	0.312	0.642	0.112
Sea Salt	0.451	0.104	0.685	1.328	0.655	0.836	0.823	0.734
Soil		0.008	0.023	0.029	0.004		0.008	0.007
dv w/o Sulfates	1.921	0.854	1.983	2.810	1.685	2.078	2.431	1.706
dv w screened SO <sub>4</sub>	3.390	2.475	3.443	4.161	3.186	3.526	3.832	3.204

<b>Average dv in 2022</b>
<b>1.992 (Excluding SO<sub>4</sub>)</b>
<b>3.453 (Including Screened SO<sub>4</sub>)</b>

**Spreadsheet Calculations  
HAVO1 Haze Index  
Volcano Adjustment  
Most Impaired Days  
(2005-2022)**

Sulfate Adjustments (Most Impaired Days) Hawaii Volcanoes National Park							
Year	Emissions (TPY)				Scale	Light Extinction ( $B_{ext} \text{ Mm}^{-1}$ )	
	Puna	Kanoelehua-Hill	Volcanic (2019)	Total		2019 Sulfate	Sulfate Adjusted
2005	1,345	2,822	17,301	21,468	1.072	14.720	15.779
2006	No Data	No Data	No Data	No Data	No Data	N/A	N/A
2007	1,251	2,813	17,301	21,365	1.067	14.720	15.703
2008	1,392	2,886	17,301	21,579	1.077	14.720	15.861
2009	1,489	2,786	17,301	21,576	1.077	14.720	15.859
2010	793	1,939	17,301	20,033	1.000	14.720	14.724
2011	890	2,252	17,301	20,443	1.021	14.720	15.026
2012	822	1,798	17,301	19,921	0.995	14.720	14.642
2013	876	1,795	17,301	19,972	0.997	14.720	14.680
2014	524	1,852	17,301	19,677	0.983	14.720	14.463
2015	70	2,079	17,301	19,450	0.971	14.720	14.296
2016	160	2,770	17,301	20,231	1.010	14.720	14.870
2017	187	2,167	17,301	19,655	0.981	14.720	14.447
2018	288	1,819	17,301	19,408	Not Operating		
2019	527	2,199	17,301	20,027	1.000	14.720	14.720
2020	444	2,134	17,301	19,879	0.993	14.720	14.611
2021	564	1,779	17,301	19,644	0.981	14.720	14.438
2022	54	2,130	17,301	19,485	0.973	14.720	14.322
Baseline	2005 SO <sub>2</sub> /2019 SO <sub>2</sub> (2019 Sulfate)					14.720	15.78

**Spreadsheet Calculations  
HAVO1 Haze Index  
Volcano Adjustment  
Baseline for Most Impaired  
Days (2001-2004)**



SULFATE ADJUSTMENT FOR 2001 MOST IMPAIRED DAYS

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001	2001
Julian Day	37	43	52	55	58	64	76	79	139	148	166	220	229	238	253
dv w Adj SO <sub>4</sub>	12.333	12.398	12.072	11.768	10.954	11.649	11.265	11.519	11.456	11.157	11.697	10.841	11.363	10.767	13.005
AmmNO <sub>3</sub>	1.028	0.713	0.359	0.480	1.199	0.842	0.404	0.715	0.196	0.696	1.315	1.348	1.993	0.416	2.795
Adj AmmSO <sub>4</sub>	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780
AmmSO <sub>4</sub>	61.783	36.772	130.565	84.872	15.802	11.992	37.322	12.707	29.947	81.836	10.487	12.227	11.702	8.970	12.885
CM	1.494	0.815	0.971	1.018	0.443	1.364	0.605	1.197	0.427	0.936	1.363	0.223	1.335	0.254	1.375
EC	1.746	2.210	1.319	0.898	0.173	0.410	0.483	0.486	0.610	0.236	0.101	0.333	0.091	0.394	0.581
POM	3.997	4.882	4.664	4.049	2.267	3.531	3.391	3.331	4.321	2.639	1.669	1.675	1.741	2.487	3.839
Sea Salt	0.018	0.017	0.026	0.021	0.010	0.011	0.011	0.010	0.013	0.015	1.775	0.011	0.012	0.010	2.203
Soil	0.261	0.133	0.323	0.194	0.031	0.118	0.173	0.122	0.097	0.215	0.208	0.197	0.200	0.008	0.139

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2001	2001	2001	2001	2001	2001	2001
Julian Day	274	319	322	328	358	361	364
dv w Adj SO <sub>4</sub>	13.516	11.057	12.474	11.538	12.474	11.946	12.233
AmmNO <sub>3</sub>	0.953	0.276	0.748	0.805	1.367	1.336	0.618
Adj AmmSO <sub>4</sub>	15.780	15.780	15.780	15.780	15.780	15.780	15.780
AmmSO <sub>4</sub>	15.254	26.390	156.441	73.250	12.942	54.349	49.298
CM	0.475	0.188	3.056		0.853	0.066	
EC	1.091	0.633	0.876	0.841	1.922	1.240	3.021
POM	3.501	3.306	4.052	4.087	4.218	4.419	4.514
Sea Salt	6.738	0.014	0.026	0.020	0.632	0.004	0.004
Soil	0.097	0.015	0.276	0.168	0.041	0.177	0.046

Average Adjusted dv / Light Extinction
11.795
0.936
15.780
43.082
0.923
0.895
3.481
0.527
0.147

SULFATE ADJUSTMENT FOR 2002 MOST IMPAIRED DAYS

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002
Julian Day	5	8	14	50	71	83	89	95	98	101	104	143	242	263	266
dv w Adj SO <sub>4</sub>	11.490	11.668	10.999	10.866	10.884	12.047	11.497	11.350	11.726	12.060	11.030	12.244	10.747	11.065	11.542
AmmNO <sub>3</sub>	1.261	0.682	0.398	0.26	0.329	0.897	0.967	0.125	0.478	1.759	0.539	1.942	0.129	1.08	0.276
Adj AmmSO <sub>4</sub>	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780
AmmSO <sub>4</sub>	24.728	40.344	40.219	67.656	22.736	16.741	57.415	72.023	36.974	18.888	28.929	33.263	55.797	15.09	258.087
CM	0.302					1.06				0.966				0.28	
EC	0.523	1.608	0.673	0.608	0.671	0.576	1.071	1.553	0.974	0.387	0.238	1.189	0.546	0.272	1.209
POM	3.133	4.007	3.154	2.942	2.758	3.635	3.458	3.6	4.869	3.638	3.347	4.85	2.808	2.728	4.046
Sea Salt	0.458	0.004	0.003	0.004	0.004	1.193	0.005	0.004	0.003	0.626	0.004	0.004	0.003	0.003	0.005
Soil	0.093	0.036	0.03	0.048	0.152	0.215	0.29	0.049	0.199	0.244	0.225	0.255	0.025	0.096	0.398

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2002	2002	2002	2002	2002	2002	2002	2002	2002
Julian Day	269	287	290	314	329	332	353	356	365
dv w Adj SO <sub>4</sub>	10.837	11.805	12.253	13.166	12.819	11.448	11.362	10.249	11.612
AmmNO <sub>3</sub>	0.558	0.42	0.489	1.256	1.152	2.22	0.756	0.527	1.086
Adj AmmSO <sub>4</sub>	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780	15.780
AmmSO <sub>4</sub>	60.533	32.709	103.084	27.892	19.42	82.259	25.377	30.935	93.091
CM			0.089	1.042	1.521	0.302	1.236	0.134	1.242
EC	0.272	0.667	0.665	0.522	0.599	0.89	0.669	0.73	1.038
POM	2.644	5.32	6.886	6.46	3.948	1.734	1.901	0.671	2.168
Sea Salt	0.003	0.34	0.003	2.062	2.983	0.003	0.627	0.002	0.003
Soil	0.298	0.032	0.139	0.185	0.05	0.49	0.181	0.024	0.622

Average Adjusted dv / Light Extinction
11.532
0.816
15.780
52.675
0.743
0.756
3.529
0.348
0.182

SULFATE ADJUSTMENT FOR 2003 MOST IMPAIRED DAYS

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003
Julian Day	3	9	21	27	30	66	69	72	75	84	93	96	153	264	267
dv w Adj SO <sub>4</sub>	11.236	10.981	12.469	11.124	10.636	11.726	11.373	11.392	11.411	11.795	10.854	10.489	11.340	10.135	10.727
AmmNO <sub>3</sub>	1.186	0.724	2.082	1.001	0.624	0.671	0.689	0.96	0.494	1.938	1.656	0.866	0.197	0.183	0.238
Adj AmmSO <sub>4</sub>	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78
AmmSO <sub>4</sub>	102.191	129.626	64.685	60.915	48.986	201.01	99.377	58.015	81.974	133.606	109.792	39.253	287.135	46.379	115.792
CM	0.415	0.24	1.459	0.745	0.199	0.095	0.451	0.613	0.989	0.878	0.671			0.811	0.995
EC	0.689	1.198	1.769	1.368	0.925	1.943	2.028	1.611	2.118	1.421	0.804	0.75	2.175	0.463	0.671
POM	2.061	1.675	2.421	1.168	1.084	2.655	1.598	1.791	1.263	1.507	0.623	1.076	2.801		0.784
Sea Salt	0.003	0.003	0.854	0.003	0.002	0.003	0.003	0.002	0.003	0.003	0.003	0.003	0.004	0.002	0.003
Soil	0.624	0.364	0.429	0.353	0.353	1.158	0.634	0.485	0.654	1	0.068	0.069	0.125	0.314	0.762

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2003	2003	2003	2003	2003	2003	2003	2003	2003
Julian Day	291	300	303	327	330	333	351	354	360
dv w Adj SO <sub>4</sub>	11.036	11.214	10.733	10.621	10.456	10.290	10.386	10.526	10.556
AmmNO <sub>3</sub>	0.447	0.796	0.69	1.03	0.32	0.078	0.41	0.329	0.141
Adj AmmSO <sub>4</sub>	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78
AmmSO <sub>4</sub>	80.707	180.538	29.453	50.663	31.417	46.562	48.074	43.118	51.621
CM	1.044	1.139	1.644	0.315	0.619	0.37	0.46	0.586	1.094
EC	1.55	1.1	0.486	0.743	0.788	0.753	0.67	1.201	0.673
POM	0.794	0.786	0.101	1.015	0.924	0.684	0.422	0.723	0.477
Sea Salt	0.003	0.004	0.396	0.003	0.002	0.002	0.003	0.003	0.003
Soil	0.532	1.085	0.153	0.037	0.019	0.317	0.508	0.03	0.569

Average Adjusted dv / Light Extinction
10.979
0.740
15.780
89.204
0.720
1.162
1.236
0.055
0.443

SULFATE ADJUSTMENT FOR 2004 MOST IMPAIRED DAYS

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004
Julian Day	7	10	13	16	25	43	46	49	70	73	79	82	85	121	130
dv w Adj SO <sub>4</sub>	11.357	10.946	10.907	11.705	11.311	10.657	11.311	10.667	11.884	11.163	11.920	11.554	10.980	10.884	11.481
AmmNO <sub>3</sub>	0.669	0.646	0.442	0.711	0.412	0.592	0.76	0.189	1.276	0.968	0.822	0.404	0.476	0.374	0.553
Adj AmmSO <sub>4</sub>	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78
AmmSO <sub>4</sub>	74.356	63.359	54.162	124.052	29.933	110.276	53.01	54.967	23.028	28.351	41.473	44.521	23.954	66.407	56.626
CM	0.828	0.765	0.556	0.987	1.488		0.335		1.45	0.754	0.97	1.824	0.719	0.809	1.36
EC	0.881	0.532	0.783	1.336	0.748	0.838	1.287	0.619	0.665	0.667	2.295	1.274	0.718	0.875	1.194
POM	1.003	0.776	0.887	1.271	0.877	1.107	1.325	0.849	1.026	0.966	1.461	1.448	0.534	0.947	1.118
Sea Salt	1.497	0.927	0.951	1.344	1.533	0.622	1.465	1.208	2.326	1.168	1.026	0.693	1.569	0.446	0.981
Soil	0.476	0.454	0.364	0.808	0.153	0.091	0.038	0.413	0.294	0.233	0.584	0.329	0.187	0.464	0.537

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2004	2004	2004	2004	2004	2004	2004	2004
Julian Day	139	286	310	313	325	328	349	361
dv w Adj SO <sub>4</sub>	11.484	10.676	11.895	11.316	10.670	12.106	11.341	10.715
AmmNO <sub>3</sub>	0.197	0.305	0.713	0.31	0.622	0.609	0.447	0.297
Adj AmmSO <sub>4</sub>	15.78	15.78	15.78	15.78	15.78	15.78	15.78	15.78
AmmSO <sub>4</sub>	83.31	98.148	39.257	31.275	35.512	58.773	81.493	19.067
CM	1.023	0.83	0.725	0.622	0.718	0.863	1.165	0.492
EC	1.51	0.532	1.189	1.388	0.682	1.131	1.373	1.041
POM	1.741	0.948	1.612	1.628	0.794	1.603	1.357	0.514
Sea Salt	0.606	0.64	2.638	1.205	0.437	3.519	0.543	0.999
Soil	0.673	0.05	0.197	0.072	0.034	0.049	0.418	0.074

Average Adjusted dv / Light Extinction
11.258
0.556
15.780
56.318
0.918
1.024
1.121
1.232
0.304

**Spreadsheet Calculations  
HAVO1 Haze Index  
Volcano Adjustment  
Visibility Conditions for  
Most Impaired Days  
(2005 - 2022)**

SULFATE SCREENED MOST IMPAIRED DAYS (2005)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2005	2005	2005	2005	2005	2005	2005	2005	2005	2005	2005	2005	2005	2005
Julian Day	4	7	13	19	22	25	31	73	76	79	82	85	118	121
AmmNO <sub>3</sub>	0.399	0.348	1.377	1.073	0.434	0.533	0.995	1.089	0.237	0.808	0.274	0.005	0.469	0.447
AmmSO <sub>4</sub>	60.488	32.115	50.897	57.358	92.099	216.769	46.44	133.787	142.372	48.472	120.552	231.358	43.319	113.756
SO <sub>4</sub> Adjusted	15.779	15.779	15.779	15.779	15.779	15.779	15.779	15.779	15.779	15.779	15.779	15.779	15.779	15.779
CM	1.776	0.765	2.487	1.225	0.825	0.663	1.624	0.171	1.186	0.012	0.047		1.042	0.719
EC	1.385	0.554	0.973	0.891	1.257	0.67	0.438	0.979	0.666	0.567	0.514	0.606	1.083	1.836
POM	3.041	0.651	1.402	1.706	1.495	1.553	0.559	0.94	1.012	0.617	1.693	1.949	1.943	2.356
Sea Salt	1.195	0.462	2.698	1.912	1.669	0.942	3.978	1.223	0.003	0.311	0.829	0.003	0.796	0.46
Soil	0.085	0.017	0.19	0.039	0.038	0.097	0.183	0.563	0.443	0.205	0.381	0.434	0.259	0.571
dv w/o Sulfates	5.812	2.466	6.485	5.215	4.522	3.687	5.753	4.031	3.036	2.247	3.176	2.621	4.442	4.940
dv w screened SO <sub>4</sub>	12.137	10.500	12.501	11.825	11.473	11.065	12.106	11.231	10.759	10.402	10.824	10.570	11.433	11.684

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2005	2005	2005	2005	2005	2005	2005	2005	2005
Julian Day	241	292	316	325	331	334	352	355	361
AmmNO <sub>3</sub>	0.178	0.19	0.186	0.207	0.957	0.496	0.95	0.604	0.753
AmmSO <sub>4</sub>	229.878	86.241	35.732	83.977	47.362	81.31	76.273	55.765	55.982
SO <sub>4</sub> Adjusted	15.779	15.779	15.779	15.779	15.779	15.779	15.779	15.779	15.779
CM	0.757	0.742	0.442	0.151	0.864	0.909	0.911	1.112	1.357
EC	0.13	0.974	0.763	1.005	0.162	1.067	0.671	2.063	0.764
POM		1.479	0.44	0.731	0.291	1.334	1.217	1.352	0.97
Sea Salt	0.907	1.738	0.812	1.061	2.087	1.78	1.637	1.976	1.085
Soil	0.065	0.435	0.024	0.035	0.041	0.045	0.59	0.318	0.363
dv w/o Sulfates	1.854	4.420	2.364	2.769	3.648	4.467	4.685	5.553	4.247
dv w screened SO <sub>4</sub>	10.230	11.422	10.454	10.636	11.046	11.445	11.555	12.001	11.337

<b>Average dv in 2005</b>
<b>4.019 (Excluding SO<sub>4</sub>)</b>
<b>11.245 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED MOST IMPAIRED DAYS (2007)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007
Julian Day	33	36	39	63	66	72	75	87	90	96	102	132	135	138
AmmNO <sub>3</sub>	0.387	0.801	1.036	0.595	0.988	0.314	0.625	0.674	1.223	1.133	0.892	0.445	1.146	0.766
AmmSO <sub>4</sub>	56.311	113.188	73.924	81.135	58.851	143.518	58.585	92.177	49.743	189.13	73.661	37.541	35.747	37.517
SO <sub>4</sub> Adjusted	15.703	15.703	15.703	15.703	15.703	15.703	15.703	15.703	15.703	15.703	15.703	15.703	15.703	15.703
CM					0.816				0.356	0.016			1.306	1.189
EC	2.412	1.659	1.55	0.305	0.999	1.395	0.716	1.614	0.938	1.569	0.676	0.529	0.582	0.342
POM	2.964	1.961	4.418	1.611	2.476	2.125	1.182	2.044	2.785	2.018	0.44	0.011		0.081
Sea Salt	1.47	2.366	1.02	1.275	2.775	0.195	0.943	0.905	0.752	0.661	1.253	1.046	2.066	2.316
Soil	0.396	0.765	0.459	0.041	0.223	0.059	0.231	0.065	0.181	1.458	0.485	0.231	0.331	0.176
dv w/o Sulfates	5.670	5.626	6.143	3.240	6.031	3.427	3.146	4.254	4.846	5.221	3.182	2.039	4.338	3.968
dv w screened SO <sub>4</sub>	12.039	12.016	12.292	10.828	12.232	10.916	10.784	11.316	11.612	11.804	10.801	10.284	11.357	11.175

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007
Julian Day	141	237	249	258	294	309	315	321	333	336
AmmNO <sub>3</sub>	0.527	0.178	0.7	0.171	0.357	0.547	1.066	1.312	0.747	0.545
AmmSO <sub>4</sub>	112.973	232.527	119.741	104.375	90.588	124.954	284.756	52.192	282.776	100.791
SO <sub>4</sub> Adjusted	15.703	15.703	15.703	15.703	15.703	15.703	15.703	15.703	15.703	15.703
CM		0.56	3.307	0.171	1.04	2.054	3.815	0.778	2.362	1.3
EC	1.004	1.246	0.518	0.099	0.422	0.712	0.758	0.203	0.336	0.151
POM	1.131	2.739	1.301	2.264	0.596	1.14	2.038	0.531	0.473	0.723
Sea Salt	2.008	0.003	0.685	0.462	0.941	1.057	1.599	2.145	1.104	0.663
Soil	0.387	0.068	0.035	0.022	0.496	0.023	0.083	0.036	0.548	0.027
dv w/o Sulfates	4.093	3.916	5.036	2.768	3.258	4.404	6.606	4.058	4.428	2.933
dv w screened SO <sub>4</sub>	11.236	11.150	11.709	10.610	10.837	11.390	12.545	11.219	11.402	10.686

Average dv in 2007
4.276 (Excluding SO <sub>4</sub> )
11.343 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2008)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008
Julian Day	7	10	52	55	58	61	67	70	100	136	142	163	169	181
AmmNO <sub>3</sub>	0.437	1.041	0.659	0.389	0.832	0.998	0.784	1.107	0.59	0.42	0.651	0.112	0.057	1.714
AmmSO <sub>4</sub>	172.174	112.553	93.556	83.439	449.361	398.469	262.979	270.608	120.828	186.954	238.859	268.347	652.894	157.212
SO <sub>4</sub> Adjusted	15.861	15.861	15.861	15.861	15.861	15.861	15.861	15.861	15.861	15.861	15.861	15.861	15.861	15.861
CM	0.734	1.42	2.034	0.438	4.559	8.549	11.864	6.388	0.951	1.119	3.614	7.451	0.812	0.333
EC	0.424	0.568	1.028	0.765	5.481	1.706	0.87	0.573	0.81	1.297	0.703	0.709	0.331	0.855
POM	0.905	1.284	1.127	0.861	12.88	4.063	1.656	1.332	0.799	1.727	0.892	0.568	0.51	1.278
Sea Salt	0.822	2.545	1.638	0.743	0.605	1.912	1.224	1.469	1.408	1.465	0.914	1.469		2.201
Soil	0.885	0.637	0.284	0.026	0.087	1.978	1.449	1.339	0.058	1.089	2.142	0.066	0.169	0.453
dv w/o Sulfates	3.511	5.593	5.170	2.793	12.367	10.718	10.241	7.979	3.795	5.375	6.374	7.117	1.722	5.208
dv w screened SO <sub>4</sub>	11.009	12.047	11.827	10.676	16.155	15.056	14.749	13.368	11.144	11.933	12.464	12.875	10.203	11.846

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008
Julian Day	196	226	256	259	289	295	301	319	325	337
AmmNO <sub>3</sub>	0.423	0.286	0.179	0.233	0.017	0.218	0.091	0.423	0.506	0.407
AmmSO <sub>4</sub>	39.192	52.229	86.083	61.193	51.536	73.828	595.832	56.000	172.301	143.177
SO <sub>4</sub> Adjusted	15.861	15.861	15.861	15.861	15.861	15.861	15.861	15.861	15.861	15.861
CM	0.672		0.952	0.175	0.72			0.466	0.602	
EC	0.29	0.398	0.257	0.338	0.45	0.743	0.969	0.424	0.213	0.375
POM	0.53		0.004		0.499	1.503	2.056	0.265	0.18	1.056
Sea Salt	0.706	0.457	0.002	0.002	0.002	0.002	0.006	3.408	1.35	0.556
Soil	0.287	0.065	0.564	0.026	0.024	0.432	2.832	0.348	0.9	0.814
dv w/o Sulfates	2.553	1.139	1.788	0.746	1.580	2.545	4.671	4.275	3.185	2.782
dv w screened SO <sub>4</sub>	10.567	9.957	10.231	9.796	10.143	10.564	11.574	11.377	10.856	10.671

Average dv in 2008
4.718 (Excluding SO <sub>4</sub> )
11.712 (Including Screened SO <sub>4</sub> )



SULFATE SCREENED MOST IMPAIRED DAYS (2009)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009
Julian Day	1	13	16	19	28	37	40	73	76	109	112	118	124	136
AmmNO <sub>3</sub>	0.241	0.408	0.837	1.043	0.264	0.12	0.174	0.216	0.031	0.404	0.008	0.286	0.967	0.228
AmmSO <sub>4</sub>	128.865	297.779	479.864	298.061	185.086	99.354	163.893	320.822	407.027	257.103	68.943	197.308	127.111	355.061
SO <sub>4</sub> Adjusted	15.859	15.859	15.859	15.859	15.859	15.859	15.859	15.859	15.859	15.859	15.859	15.859	15.859	15.859
CM	1.133		1.755		0.161	0.873		0.869	1.777		0.057	0.846	0.955	0.822
EC	0.236	0.611	1.159	0.59	0.878	0.431	0.361	0.381	0.941	0.487	0.079	0.888	1.162	0.545
POM	0.757	1.199	1.437	0.893	1.171	0.105	0.016	1.654	1.073	1.171	0.189	1.273	0.177	1.86
Sea Salt	1.474	0.387	0.253	2.984	0.808	0.221	0.198	0.212	0.004	0.982	0.236	0.003	0.544	0.004
Soil	0.636	1.381	2.3	1.539	0.848	0.53	0.046	1.857	2.15	1.35	0.487	1.497	1.801	1.809
dv w/o Sulfates	3.700	3.355	5.733	5.335	3.457	2.054	0.765	4.180	4.685	3.642	1.004	3.916	4.451	4.232
dv w screened SO <sub>4</sub>	11.098	10.934	12.119	11.911	10.982	10.346	9.804	11.329	11.580	11.070	9.901	11.201	11.463	11.355

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009
Julian Day	139	145	148	223	280	301	337	343	361	364
AmmNO <sub>3</sub>	0.135	0.245	0.628	0.077	0.307	0.46	0.391	1.378	0.422	0.646
AmmSO <sub>4</sub>	79.026	138.265	281.41	247.558	214.736	130.187	174.09	142.398	268.067	154.521
SO <sub>4</sub> Adjusted	15.859	15.859	15.859	15.859	15.859	15.859	15.859	15.859	15.859	15.859
CM		0.854	1.617	0.097	0.897	0.978	0.572	0.371	1.368	1.143
EC	0.859	0.44	0.711	0.547	0.324	0.68	0.328	0.408	0.253	0.55
POM	1.111	0.987	1.852	1.25	0.461	0.586		1.176	0.265	0.721
Sea Salt	0.002	0.003	0.004	0.004	0.403	1.764	0.003	1.664	2.609	3.064
Soil	0.538	0.895	1.351	1.241	1.118	0.074	0.927	1.103	1.292	0.895
dv w/o Sulfates	2.347	2.945	4.801	2.788	3.008	3.745	2.006	4.762	4.830	5.317
dv w screened SO <sub>4</sub>	10.475	10.744	11.638	10.673	10.774	11.119	10.325	11.619	11.653	11.902

Average dv in 2009
3.627 (Excluding SO <sub>4</sub> )
11.084 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2010)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010
Julian Day	2	5	8	11	14	17	23	26	29	32	47	53	56	77
AmmNO <sub>3</sub>	0.385	0.366	0.515	0.788	0.368	0.131	0.571	0.379	0.189	0.143	0.375	0.312	0.287	
AmmSO <sub>4</sub>	539.921	253.555	87.797	44.649	135.091	297.106	310.67	126.573	140.976	135.903	143.681	128.807	54.222	77.902
SO <sub>4</sub> Adjusted	14.724	14.724	14.724	14.724	14.724	14.724	14.724	14.724	14.724	14.724	14.724	14.724	14.724	14.724
CM		0.363	0.489	0.273	0.581		0.474	0.081	2.19	2.041	0.895	0.335	0.352	0.312
EC	1.004	0.656	0.863	0.474	0.459	0.681	0.44	0.482	0.625	0.471	0.96	0.724	0.537	0.395
POM	1.488	2.082	0.739	0.474	0.952	1.141	1.814	1.157	0.685	1.171	1.055	0.823	0.59	0.53
Sea Salt	0.006	0.259	0.649	0.836	1.387	0.004	0.959	0.265	0.559	0.791	0.412	0.791	0.645	0.111
Soil	2.886	1.484	0.535	0.025	0.814	1.387	1.795	0.897	0.734	0.706	1.08	0.801	0.394	0.604
dv w/o Sulfates	4.555	4.194	3.214	2.523	3.758	2.885	4.733	2.822	4.043	4.268	3.905	3.211	2.473	1.783
dv w screened SO <sub>4</sub>	11.149	10.964	10.478	10.150	10.745	10.320	11.242	10.291	10.888	11.002	10.818	10.477	10.127	9.812

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010
Julian Day	122	272	305	323	326	332	341	344	347	350	365
AmmNO <sub>3</sub>	0.401	0.294	0.051	0.26	0.149	0.248	0.27	0.327	0.732	0.215	0.025
AmmSO <sub>4</sub>	182.073	59.959	27.233	119.376	46.628	33.968	121.7	44.249	41.789	107.717	40.141
SO <sub>4</sub> Adjusted	14.724	14.724	14.724	14.724	14.724	14.724	14.724	14.724	14.724	14.724	14.724
CM	0.188	1.726		1.035		0.101	0.135	1.118	0.43	0.859	0.153
EC	0.551	0.491	0.238	0.396	0.624	0.298	1.32	1.217	0.298	0.634	0.186
POM	0.68	0.343		0.361	1.018	0.042	1.304	4.648	0.317	0.701	0.356
Sea Salt	1.57	0.002	0.002	0.003	0.002	1.765	0.003	0.601	2.555	0.002	0.002
Soil	1.121	0.396	0.038	0.592	0.28	0.133	0.618	0.281	0.231	0.579	0.016
dv w/o Sulfates	3.723	2.816	0.324	2.348	1.884	2.301	3.112	5.984	3.759	2.616	0.712
dv w screened SO <sub>4</sub>	10.728	10.288	9.184	10.069	9.857	10.047	10.429	11.914	10.746	10.194	9.346

Average dv in 2010
3.118 (Excluding SO <sub>4</sub> )
10.451 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2011)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011
Julian Day	6	9	12	15	18	30	42	45	48	51	57	60	63	99
AmmNO <sub>3</sub>	0.284	1.001	0.35	0.46	0.662	0.139	0.513	0.689	0.233	0.652	0.184	0.017	0.648	0.128
AmmSO <sub>4</sub>	77.587	108.534	43.504	20.529	51.271	38.155	44.87	40.836	52.203	51.708	41.627	23.956	26.657	13.961
SO <sub>4</sub> Adjusted	15.026	15.026	15.026	15.026	15.026	15.026	15.026	15.026	15.026	15.026	15.026	15.026	15.026	15.026
CM	0.091	0.764	0.624	0.53	0.615	0.094	0.193		0.023	0.702	0.107		1.198	0.299
EC	1.038	0.565	0.454	0.295	0.532	0.482	0.668	0.2	0.378	0.65	0.069	0.455	0.229	0.186
POM	1.075	1.323	1.616	0.348	1.201	0.778	1.358	0.242	0.476	0.642	0.443	0.651	0.417	0.268
Sea Salt	0.002	0.249	1.036	0.879	0.343		1.269	3.293	2.429	3.951	2.959	1.176	3.855	2.354
Soil	0.104	0.537	0.088	0.02	0.112	0.048	0.065	0.095	0.063	0.34	0.055	0.024	0.049	0.043
dv w/o Sulfates	2.306	3.673	3.484	2.257	2.975	1.433	3.412	3.729	3.076	5.269	3.233	2.089	4.945	2.835
dv w screened SO <sub>4</sub>	10.160	10.806	10.714	10.137	10.470	9.771	10.679	10.833	10.518	11.620	10.593	10.061	11.449	10.404

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011
Julian Day	105	111	120	135	138	234	270	291	318	336
AmmNO <sub>3</sub>	0.024	0.935	0.782	1.054	0.462	0.27	0.159	0.338	0.432	0.014
AmmSO <sub>4</sub>	15.473	22.309	26.08	23.117	12.693	13.108	22.909	54.481	14.81	43.393
SO <sub>4</sub> Adjusted	15.026	15.026	15.026	15.026	15.026	15.026	15.026	15.026	15.026	15.026
CM	0.014	1.699	0.941		0.638	0.162	0.385	0.668	0.32	0.421
EC	0.339	0.425	0.273	0.284	0.178	0.306	0.451	0.294	0.142	0.407
POM	0.314	0.649	0.697	0.397	0.166	0.289	0.214	0.72		0.092
Sea Salt	1.152	2.39	2.985	3.195	1.904	0.516	1.083	0.959	1.739	0.624
Soil	0.018	0.345	0.295	0.52	0.4	0.016	0.052	0.041	0.012	0.17
dv w/o Sulfates	1.707	4.973	4.683	4.350	3.183	1.449	2.106	2.639	2.347	1.594
dv w screened SO <sub>4</sub>	9.891	11.464	11.314	11.144	10.569	9.778	10.069	10.313	10.178	9.841

<b>Average dv in 2011</b>
<b>3.073 (Excluding SO<sub>4</sub>)</b>
<b>10.532 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED MOST IMPAIRED DAYS (2012)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012
Julian Day	1	7	13	25	34	37	40	55	67	103	142	214	235	274
AmmNO <sub>3</sub>		0.632	0.454	0.401	0.014	0.356	0.713	0.124	0.879	0.512	2.367	0.528	1.186	0.111
AmmSO <sub>4</sub>	30.754	25.685	132.191	47.939	53.914	82.692	25.163	34.77	47.279	66.935	35.929	14.846	18.144	14.986
SO <sub>4</sub> Adjusted	14.642	14.642	14.642	14.642	14.642	14.642	14.642	14.642	14.642	14.642	14.642	14.642	14.642	14.642
CM		0.511	0.311	0.814	0.068		1.435	2.15	0.1	0.401	1.755	0.441	1.17	0.219
EC	0.311	0.199	0.584	0.876	0.418	0.466	0.126	0.522	0.553	0.719	1.322	0.27	0.255	0.031
POM		0.55	1.071	0.565	0.532	0.445	0.424	0.687	0.376	0.981	1.651	0.491	0.44	
Sea Salt	0.278	1.894	0.831	2.364	0.891	0.691	5.09	0.812	2.21	2.039	1.697	0.585	2.117	1.116
Soil	0.02	0.057	0.442	0.112	0.097	0.141	0.127	0.1	0.194	0.519	0.397	0.053	0.334	0.049
dv w/o Sulfates	0.591	3.252	3.143	4.142	1.840	1.905	5.831	3.643	3.585	4.168	6.518	2.125	4.384	1.420
dv w screened SO <sub>4</sub>	9.263	10.468	10.415	10.911	9.807	9.836	11.804	10.660	10.631	10.924	12.188	9.936	11.034	9.620

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012
Julian Day	277	280	283	298	307	328	334	337	340	358	364
AmmNO <sub>3</sub>	0.11	0.07			0.33	0.104	0.119		0.64	0.187	0.174
AmmSO <sub>4</sub>	27.998	90.401	23.128	22.655	28.649	39.902	129.904	27.277	20.22	27.322	16.734
SO <sub>4</sub> Adjusted	14.642	14.642	14.642	14.642	14.642	14.642	14.642	14.642	14.642	14.642	14.642
CM	0.211	0.444	0.077	1.591	1.581	0.6	1.464		1.122	0.825	0.358
EC	0.317	1.061	0.474	0.216	0.142	0.26	0.488	0.413	0.162	0.52	0.016
POM	0.876	1.537	0.87		0.238	0.195	0.593	0.182	0.365	0.297	0.087
Sea Salt	1.093	0.681	0.264	0.264	1.301	0.263	0.866	0.459	4.313	2.083	1.316
Soil	0.073	0.147	0.06	0.038	0.075	0.082	0.292	0.026	0.069	0.123	0.014
dv w/o Sulfates	2.374	3.322	1.608	1.914	3.124	1.401	3.237	1.026	5.111	3.390	1.794
dv w screened SO <sub>4</sub>	10.051	10.502	9.703	9.840	10.406	9.611	10.461	9.448	11.414	10.535	9.786

Average dv in 2012
2.994 (Excluding SO <sub>4</sub> )
10.370 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2013)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013
Julian Day	19	31	67	73	82	91	94	103	106	112	127	130	139	142
AmmNO <sub>3</sub>	0.514	0.234	0.999	0.748	0.806	2.157	0.32	0.472	0.453	0.855	0.391	0.207	0.171	0.753
AmmSO <sub>4</sub>	87.753	28.156	45.229	41.843	62.711	55.051	84.158	102.879	60.363	64.431	96.086	40.041	59.648	46.59
SO <sub>4</sub> Adjusted	14.680	14.680	14.680	14.680	14.680	14.680	14.680	14.680	14.680	14.680	14.680	14.680	14.680	14.680
CM	0.515	0.488	2.071	0.682	0.984	1.3	1.354	0.406	0.881	0.069	0.755	0.7	0.732	0.792
EC	0.517	0.257	0.477	0.704	0.651	0.846	0.392	0.465	0.203	0.254	0.437	0.259	0.501	0.145
POM	0.483	0.319	0.542	0.067	0.907	0.778	0.629	0.929	0.083	1.767	0.723	0.91	0.695	0.547
Sea Salt	1.279	1.433	4.152	1.522	1.896	2.41	1.105	1.614	0.858	2.831	0.676	0.981	1.102	2.294
Soil	0.248	0.062	0.498	0.316	0.216	0.923	0.366	0.255	0.161	0.165	0.306	0.09	0.116	0.191
dv w/o Sulfates	3.042	2.463	6.280	3.393	4.357	6.105	3.483	3.465	2.342	4.663	2.843	2.736	2.865	3.868
dv w screened SO <sub>4</sub>	10.380	10.106	12.065	10.550	11.033	11.968	10.594	10.585	10.050	11.191	10.285	10.234	10.295	10.785

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013
Julian Day	148	232	283	292	295	298	316	319	322	325	349
AmmNO <sub>3</sub>	0.34	0.538	0.535	0.169	0.313	0.411	0.354	0.691	0.406	0.5	0.27
AmmSO <sub>4</sub>	31.897	37.264	35.786	96.039	99.81	52.718	51.195	40.645	117.435	89.315	43.142
SO <sub>4</sub> Adjusted	14.680	14.680	14.680	14.680	14.680	14.680	14.680	14.680	14.680	14.680	14.680
CM	0.613	0.429	0.764	0.588	0.752	0.442	0.176	1.035		0.092	0.234
EC	0.332	0.214	0.26	0.556	0.637	0.47	0.818	0.367	0.949	0.935	0.648
POM	1.298	0.495	0.098	1.851	0.898	1.601	1.208	1.959	2.791	1.864	0.933
Sea Salt	1.586	1.076	2.005	0.327	0.489	0.769	1.14	4.103	1.458	1.3	1.708
Soil	0.08	0.039	0.034	0.092	0.073	0.035	0.053	0.063	0.103	0.076	0.035
dv w/o Sulfates	3.541	2.462	3.145	3.062	2.747	3.169	3.184	5.998	4.515	3.898	3.241
dv w screened SO <sub>4</sub>	10.623	10.105	10.430	10.390	10.240	10.441	10.448	11.908	11.114	10.800	10.476

Average dv in 2013
3.635 (Excluding SO <sub>4</sub> )
10.684 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2014)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014
Julian Day	14	17	20	26	35	38	44	47	50	53	56	59	62	122
AmmNO <sub>3</sub>	0.683	0.865	0.385	1.058	0.037	0.395	0.221	0.231	0.607	0.456	0.353	0.734	0.067	0.447
AmmSO <sub>4</sub>	54.609	49.202	76.384	86.31	35.914	45.733	32.364	37.428	39.959	65.785	55.387	44.701	22.677	34.785
SO <sub>4</sub> Adjusted	14.463	14.463	14.463	14.463	14.463	14.463	14.463	14.463	14.463	14.463	14.463	14.463	14.463	14.463
CM	0.2	0.819	0.036	0.549	0.278	0.381	0.44	0.526	0.714	0.149	0.003	0.687		0.781
EC	0.42	2.015	0.539	0.938	0.324	0.644	0.591	0.635	0.823	0.427	0.643	0.717	1.296	0.489
POM	1.099	5.557	1.089	0.854	0.432	2.787	1.599	1.356	4.677	1.723	0.689	0.773	1.703	1.46
Sea Salt	1.322	1.369	0.737	2.076	0.723	1.781	2.561	2.951	2.484	1.294	0.847	2.396	0.611	1.934
Soil	0.094	0.08	0.072	0.158	0.041	0.051	0.055	0.052	0.071	0.065	0.068	0.277	0.059	0.225
dv w/o Sulfates	3.234	7.278	2.514	4.468	1.685	4.724	4.361	4.543	6.615	3.446	2.313	4.437	3.174	4.276
dv w screened SO <sub>4</sub>	10.396	12.576	10.051	11.018	9.669	11.152	10.963	11.057	12.190	10.500	9.957	11.002	10.367	10.919

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014
Julian Day	128	134	263	272	278	308	314	320	356	365
AmmNO <sub>3</sub>	2.24	0.246	0.337	0.446	0.301	0.31	0.281	0.192	0.662	0.337
AmmSO <sub>4</sub>	57.521	39.843	28.202	70.977	87.358	44.88	114.647	43.629	88.161	57.139
SO <sub>4</sub> Adjusted	14.463	14.463	14.463	14.463	14.463	14.463	14.463	14.463	14.463	14.463
CM	3.661	0.627	0.854	0.854	0.694	0.694	0.694	0.694	0.694	0.694
EC	0.426	2.039	0.808	0.285	0.699	0.512	0.52	0.3	0.662	0.507
POM	0.613	2.606	2.387	1.301	3.145	1.469	2.241	0.579	3.041	1.274
Sea Salt	7.006	1.081	1.291	1.43	0.872	1.91	0.728	0.754	2.055	0.02
Soil	1.335	0.264	0.023	0.047	0.111	0.059	0.09	0.025	0.144	0.07
dv w/o Sulfates	9.275	5.225	4.511	3.621	4.588	4.024	3.753	2.267	5.457	2.548
dv w screened SO <sub>4</sub>	13.799	11.419	11.040	10.587	11.081	10.790	10.653	9.935	11.544	10.067

Average dv in 2013
4.264 (Excluding SO <sub>4</sub> )
10.947 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2015)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015
Julian Day	6	12	15	24	30	36	39	42	45	57	75	78	84	90
AmmNO <sub>3</sub>	0.545	0.207	0.16	0.408	0.304	0.673	1.054	0.753	0.782	0.677	0.277	0.77	1.461	0.391
AmmSO <sub>4</sub>	37.276	41.961	31.149	47.869	38.761	71.975	57.66	103.294	50.245	53.149	63.837	61.735	49.595	36.57
SO <sub>4</sub> Adjusted	14.296	14.296	14.296	14.296	14.296	14.296	14.296	14.296	14.296	14.296	14.296	14.296	14.296	14.296
CM	0.653	0.653	0.653	0.653	0.653	0.653	0.653	0.653	0.653	0.653	0.653	0.653	0.653	0.653
EC	0.812	1.227	0.81	0.66	0.897	0.352	0.953	0.687	0.279	0.72	0.276	0.24	0.397	0.138
POM	2.099	1.751	1.564	1.757	1.497	1.03	1.613	2.116	0.836	0.831	0.739	0.274	0.484	1.031
Sea Salt	0.009	0.373	0.356	0.867	1.017	3.066	4.089	1.315	2.28	2.43	1.063	1.474	0.796	1.24
Soil	0.049	0.067	0.107	0.073	0.029	0.091	0.262	0.266	0.147	0.123	0.25	0.215	0.298	0.105
dv w/o Sulfates	3.483	3.561	3.112	3.659	3.644	4.615	6.219	4.568	4.039	4.340	2.820	3.094	3.428	3.044
dv w screened SO <sub>4</sub>	10.460	10.499	10.277	10.548	10.541	11.040	11.915	11.015	10.741	10.896	10.136	10.268	10.433	10.244

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2015	2015	2015	2015	2015	2015	2015	2015
Julian Day	117	141	150	183	231	237	255	282
AmmNO <sub>3</sub>	0.643	0.2	0.038	0.672	0.239	0.139	0.169	0.491
AmmSO <sub>4</sub>	50.012	40.72	39.88	131.269	50.571	45.547	41.617	90.804
SO <sub>4</sub> Adjusted	14.296	14.296	14.296	14.296	14.296	14.296	14.296	14.296
CM	1.01	1.01	1.01	0.829	0.829	0.829	0.829	0.134
EC	0.158	0.675	0.355	0.848	0.684	0.615	0.357	0.22
POM	1.099	1.289	1.056	4.229	2.102	2.296	0.471	2.427
Sea Salt	1.81	0.566	0.277	1.147	0.801	0.005	0.387	0.684
Soil	0.319	0.165	0.057	0.319	0.031	0.049	0.079	0.127
dv w/o Sulfates	4.081	3.297	2.463	5.902	3.843	3.317	2.064	3.424
dv w screened SO <sub>4</sub>	10.762	10.368	9.965	11.737	10.641	10.378	9.779	10.431

Average dv in 2015
3.728 (Excluding SO <sub>4</sub> )
10.594 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2016)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016
Julian Day	7	10	13	16	19	40	52	55	61	64	67	76	82	88
AmmNO <sub>3</sub>	0.371	0.601	0.919	0.745	0.528	0.942	0.55	0.674	0.373	0.22	0.357	0.256	0.727	0.912
AmmSO <sub>4</sub>	37.61	61.476	31.972	33.699	101.882	94.886	69.064	52.218	113.837	68.321	68.035	54.453	77.895	62.681
SO <sub>4</sub> Adjusted	14.870	14.870	14.870	14.870	14.870	14.870	14.870	14.870	14.870	14.870	14.870	14.870	14.870	14.870
CM	0.396	0.131	1.096	1.206	0.885	1.543	0.587	0.842	0.856	0.667	0.544	0.647		0.521
EC	0.744	1.326	0.488	0.433	1.204	0.978	0.396	0.226	0.757	1.129	0.85	0.631	1.097	0.728
POM	0.893	1.376	1.608	1.062	5.678	4.485	1.634	0.511	1.275	1.758	1.08	1.132	1.84	1.513
Sea Salt	1.33	1.145	1.46	0.745	1.202	2.405	1.585	1.484	0.656	0.861	1.768	0.808	2.263	1.061
Soil	0.059	0.092	0.033	0.051	0.144	0.351	0.13	0.273	0.236	0.054	0.151	0.1	0.257	0.26
dv w/o Sulfates	3.216	3.833	4.449	3.536	6.750	7.277	3.976	3.372	3.473	3.845	3.887	3.056	4.814	4.051
dv w screened SO <sub>4</sub>	10.530	10.832	11.143	10.686	12.387	12.690	10.903	10.606	10.655	10.838	10.859	10.454	11.331	10.941

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2016	2016	2016	2016	2016	2016	2016	2016	2016
Julian Day	91	127	157	199	235	247	256	316	343
AmmNO <sub>3</sub>	0.564	0.526	0.086	0.545	0.022	0.293	0.209	0.688	0.461
AmmSO <sub>4</sub>	159.318	31.558	84.015	31.668	21.908	72.471	54.542	104.373	42.054
SO <sub>4</sub> Adjusted	14.870	14.870	14.870	14.870	14.870	14.870	14.870	14.870	14.870
CM	1.06	0.549		0.23	0.373	0.001	0.923		1.259
EC	0.042	0.479	0.69		0.432	0.215	0.955	0.811	0.454
POM	0.38	0.77	1.174	0.05	0.465	0.706	0.718	1.053	1.955
Sea Salt	0.658	1.599	0.214	0.768		2.318	0.909	0.681	7.17
Soil	0.495	0.159	0.111	0.044	0.026	0.095	0.058	0.149	0.114
dv w/o Sulfates	2.776	3.423	2.050	1.516	1.238	3.095	3.201	2.913	7.614
dv w screened SO <sub>4</sub>	10.321	10.631	9.986	9.748	9.627	10.472	10.523	10.386	12.888

Average dv in 2016
3.798 (Excluding SO <sub>4</sub> )
10.845 (Including Screened SO <sub>4</sub> )



SULFATE SCREENED MOST IMPAIRED DAYS (2017)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017
Julian Day	4	7	10	13	34	37	40	46	49	64	67	70	118	247
AmmNO <sub>3</sub>	0.458	0.373	0.343	0.787	0.436	0.544	0.118	0.499	0.126	0.429	0.573	0.786	0.469	0.399
AmmSO <sub>4</sub>	79.932	48.988	65.161	38.219	149.602	44.336	29.34	61.957	51.269	63.328	91.989	34.6	40.233	57.875
SO <sub>4</sub> Adjusted	14.447	14.447	14.447	14.447	14.447	14.447	14.447	14.447	14.447	14.447	14.447	14.447	14.447	14.447
CM	0.998	0.702	0.565	1.332	1.447	0.837	1.006	1.651	0.107	0.029	0.453	1.032	1.339	0.327
EC	0.943	0.596	0.508	0.141	0.93	0.869	0.463	1.286	0.61	0.943	1.069	1.1	0.723	0.447
POM	1.358	0.854	0.989	0.115	1.199	1.269	0.479	1.664	0.92	1.787	2.729	1.598	0.736	1.239
Sea Salt	3.148	0.879	0.937	4.596	0.923	1.929	0.412	0.388	0.295	1.168	1.592	2.135	1.381	0.561
Soil	0.137	0.09	0.088	0.072	0.413	0.106	0.039	0.477	0.085	0.134	0.153	0.052	0.172	0.092
dv w/o Sulfates	5.331	2.997	2.949	5.332	4.284	4.417	2.245	4.678	1.942	3.709	5.049	5.130	3.934	2.674
dv w screened SO <sub>4</sub>	11.471	10.275	10.252	11.471	10.918	10.986	9.919	11.123	9.780	10.625	11.319	11.362	10.739	10.120

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2017	2017	2017	2017	2017	2017	2017	2017
Julian Day	256	274	280	295	301	322	325	343
AmmNO <sub>3</sub>	0.191	0.465	0.185	0.386	0.445	0.356	0.576	0.326
AmmSO <sub>4</sub>	44.55	43.727	30.895	33.32	28.616	92.907	34.625	59.473
SO <sub>4</sub> Adjusted	14.447	14.447	14.447	14.447	14.447	14.447	14.447	14.447
CM	0.753	0.477	0.077	0.179	0.626	0.084	0.216	0.706
EC	0.767	0.672	0.416		0.346	0.868	0.381	0.81
POM	0.791	2.185	0.89	0.712	0.616	0.738	0.542	1.254
Sea Salt	0.211	0.674	0.377	1.55	0.998	0.386	0.983	1.32
Soil	0.027	0.027	0.033	0.038	0.059	0.109	0.066	0.08
dv w/o Sulfates	2.422	3.716	1.805	2.519	2.693	2.264	2.440	3.713
dv w screened SO <sub>4</sub>	10.002	10.629	9.717	10.047	10.129	9.928	10.010	10.627

<b>Average dv in 2017</b>
<b>3.466 (Excluding SO<sub>4</sub>)</b>
<b>10.520 (Including Screened SO<sub>4</sub>)</b>

SULFATE SCREENED MOST IMPAIRED DAYS (2019)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
Julian Day	12	15	18	39	48	57	75	87	96	117	123	126	129	132
AmmNO <sub>3</sub>	0.57	1.177	0.804	0.778	1.055	0.11	0.534	0.625	1.016	0.347	0.417	0.884	0.475	0.552
AmmSO <sub>4</sub>	13.909	47.199	13.755	13.835	21.673	7.365	8.265	19.762	21.271	12.289	8.359	11.329	14.946	8.366
SO <sub>4</sub> Adjusted	14.720	14.720	14.720	14.720	14.720	14.720	14.720	14.720	14.720	14.720	14.720	14.720	14.720	14.720
CM	0.872	0.256	0.859	0.846	1.023	0.349	0.834	0.994	1.353	0.499	0.672	1.075	1.072	0.739
EC	0.314	0.551	0.23	0.889	0.38	0.175	0.454	0.084	0.113	0.105	0.203	0.315	0.431	0.172
POM	0.496	0.76	0.578	2.378	0.56	1.279	0.65	0.914	0.887	0.626	1.239	0.846	0.558	0.368
Sea Salt	2.752	2.537	1.295	1.503	2.509	0.821	1.139	1.166	2.608	1.136	1.045	1.682	0.53	1.944
Soil	0.019	0.119	0.028	0.059	0.123	0.062	0.019	0.269	0.289	0.072	0.126	0.106	0.088	0.086
dv w/o Sulfates	4.070	4.318	3.216	4.979	4.479	2.465	3.097	3.402	4.865	2.457	3.150	3.993	2.741	3.265
dv w screened SO <sub>4</sub>	10.900	11.026	10.478	11.370	11.109	10.122	10.420	10.568	11.310	10.118	10.446	10.861	10.251	10.502

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2019	2019	2019	2019	2019	2019	2019	2019
Julian Day	141	177	192	219	306	312	318	342
AmmNO <sub>3</sub>	0.255	0.82	1.314	1.759	0.361	0.366	0.42	0.216
AmmSO <sub>4</sub>	9.406	11.891	10.728	10.181	19.973	14.3	11.873	13.054
SO <sub>4</sub> Adjusted	14.720	14.720	14.720	14.720	14.720	14.720	14.720	14.720
CM	0.504	0.876	1.817	1.742	0.738	0.561	0.581	0.667
EC	0.146	0.348	0.853	0.532	0.186	0.22	0.056	0.175
POM	0.53	0.433	1.733	0.687	3.947	2.948	2.436	2.339
Sea Salt	1.532	1.864	2.522	3.212	0.851	0.781	1.06	0.555
Soil	0.051	0.029	0.152	0.067	0.02	0.006	0.051	0.001
dv w/o Sulfates	2.637	3.626	6.093	5.877	4.764	3.976	3.787	3.331
dv w screened SO <sub>4</sub>	10.202	10.678	11.973	11.854	11.257	10.853	10.758	10.534

Average dv in 2019
3.845 (Excluding SO <sub>4</sub> )
10.799 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2020)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020
Julian Day	22	40	73	94	97	109	112	178	181	202	205	208	214	229
AmmNO <sub>3</sub>	1.193	1.141	0.252	1.024	0.4	1.45	1.737	1.454	1.453	0.793	0.975	0.673	0.227	1.198
AmmSO <sub>4</sub>	11.65	7.99	6.18	7.056	5.953	7.29	13.873	10.141	9.905	14.171	8.599	8.332	6.466	10.16
SO <sub>4</sub> Adjusted	14.611	14.611	14.611	14.611	14.611	14.611	14.611	14.611	14.611	14.611	14.611	14.611	14.611	14.611
CM	2.288	0.781	0.576	0.693	0.586	1.585	2.618	1.227	1.35	1.031	1.399	0.775	0.612	1.621
EC	0.507	0.006	0.373	0.242	0.033	0.358	0.462	0.569	0.515	0.276	0.427	0.04	0.547	0.19
POM	1.909	0.905	1.484	1.608	0.959	1.288	1.219	0.953	1.313	1.199	1.247	1.487	0.468	0.775
Sea Salt	5.85	2.516	1.127	2.214	1.339	3.921	3.472	2.152	2.937	1.814	1.665	1.42	0.703	2.019
Soil	0.191	0.015	0.021	0.041	0.015	0.331	0.37	0.101	0.132	0.093	0.067	0.076	0.017	0.06
dv w/o Sulfates	7.856	4.294	3.245	4.588	2.876	6.383	6.870	4.981	5.710	4.191	4.562	3.696	2.290	4.614
dv w screened SO <sub>4</sub>	12.961	10.978	10.454	11.129	10.276	12.103	12.381	11.336	11.728	10.925	11.116	10.675	10.001	11.143

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2020	2020	2020	2020	2020	2020	2020	2020	2020
Julian Day	250	259	280	283	292	298	304	307	358
AmmNO <sub>3</sub>	1.502	2.028	1.998	2.857	0.25	1.235	0.384	0.4	0.542
AmmSO <sub>4</sub>	7.784	9.494	8.635	8.933	5.131	8.561	7.92	8.08	41.251
SO <sub>4</sub> Adjusted	14.611	14.611	14.611	14.611	14.611	14.611	14.611	14.611	14.611
CM	1.534	0.946	2.692	3.064	0.382	1.058	1.226	0.713	0.391
EC	0.27	1.004	0.35	0.809	0.179	0.484	0.28	0.308	1.051
POM	1.846	3.755	2.383	2.535	0.873	2.789	2.56	1.51	2.801
Sea Salt	3.663	2.72	3.682	3.233	1.63	5.469	1.441	0.764	1.185
Soil	0.063	0.035	0.388	0.549	0.045	0.092	0.021	0.028	0.123
dv w/o Sulfates	6.354	7.173	7.651	8.350	2.896	7.480	4.645	3.165	4.758
dv w screened SO <sub>4</sub>	12.086	12.556	12.838	13.260	10.285	12.736	11.159	10.415	11.218

Average dv in 2020
5.158 (Excluding SO <sub>4</sub> )
11.468 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2021)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021
Julian Day	13	34	37	40	46	67	70	73	82	85	106	118	124	235
AmmNO <sub>3</sub>	0.456	0.353	0.837	0.254	0.247	0.486	0.139	0.814	0.358	1.259	0.568	0.51	0.572	0.056
AmmSO <sub>4</sub>	61.757	21.643	25.327	26.814	21.289	8.546	7.028	15.202	13.312	21.656	26.4	45.946	7.649	12.223
SO <sub>4</sub> Adjusted	14.438	14.438	14.438	14.438	14.438	14.438	14.438	14.438	14.438	14.438	14.438	14.438	14.438	14.438
CM	0.163	0.825	0.425	0.727	0.198	0.485		0.579	0.77	1.809	1.042	0.455	0.987	0.301
EC	0.945	0.83	0.666	0.534	0.257	0.136	0.34	1.269	0.236	0.278	0.91	1.39		
POM	1.895	0.901	0.906	1.586	0.559	0.826	0.962	2.187	0.872	0.84	0.875	1.433	0.762	0.527
Sea Salt	1.055	1.648	0.829	0.712	1.598	1.298	0.956	2.6	1.995	3.353	0.702	0.645	2.545	0.383
Soil	0.176	0.06	0.045	0.063	0.04	0.027	0.01	0.1	0.059	0.141	0.203	0.177	0.095	0.019
dv w/o Sulfates	3.846	3.796	3.154	3.276	2.546	2.820	2.157	5.624	3.570	5.698	3.577	3.791	4.029	1.210
dv w screened SO <sub>4</sub>	10.691	10.666	10.348	10.408	10.057	10.187	9.875	11.627	10.553	11.668	10.556	10.664	10.784	9.448

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021
Julian Day	244	304	313	316	319	325	328	331	337	352
AmmNO <sub>3</sub>	0.085	0.21	0.623	0.908	0.307	0.876	0.568	0.532	0.243	0.243
AmmSO <sub>4</sub>	6.854	32.989	6.726	21.226	9.708	7.913	25.911	8.928	58.989	7.39
SO <sub>4</sub> Adjusted	14.438	14.438	14.438	14.438	14.438	14.438	14.438	14.438	14.438	14.438
CM	0.868		0.7	0.951	0.383	1.196	0.538	0.772	5.705	0.407
EC	0.134	0.692	0.152	0.191	0.492		0.427		0.084	0.21
POM	0.757	2.093	0.825	0.922	1.449	1.06	0.903	0.854	1.147	0.33
Sea Salt	0.176	0.532	1.577	2.194	0.536	2.445	2.382	1.149	0.364	0.899
Soil	0.007	0.062	0.028	0.038	0.019	0.015	0.047	0.023	0.079	0.007
dv w/o Sulfates	1.846	3.067	3.297	4.190	2.766	4.442	3.964	2.874	5.666	1.903
dv w screened SO <sub>4</sub>	9.732	10.306	10.418	10.866	10.161	10.996	10.751	10.213	11.650	9.758

Average dv in 2021
3.463 (Excluding SO <sub>4</sub> )
10.516 (Including Screened SO <sub>4</sub> )

SULFATE SCREENED MOST IMPAIRED DAYS (2022)

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022
Julian Day	2	5	8	11	14	17	41	50	59	62	65	140	227	278
AmmNO <sub>3</sub>	0.405	1.014	0.293	0.58	0.991	0.963	0.529	0.637	0.856	0.3	0.13	0.657	0.721	1.145
AmmSO <sub>4</sub>	13.522	18.354	52.996	46.726	31.016	15.205	15.762	20.011	28.604	23.574	32.133	103.876	34.663	17.699
SO <sub>4</sub> Adjusted	14.322	14.322	14.322	14.322	14.322	14.322	14.322	14.322	14.322	14.322	14.322	14.322	14.322	14.322
CM	0.539	0.807	3.874	3.8	0.848	0.723	0.513	0.588	0.622	0.407	4.66	4.308	1.011	0.259
EC	0.392	0.465	1.132	0.266	0.457	0.903	0.755	0.586	0.239	0.657	1.401	1.132	0.418	0.616
POM	1.36	1.082	2.305	2.557	0.783	1.846	0.687	1.325	0.754	1.106	1.481	1.742	0.523	0.653
Sea Salt	1.335	0.876	0.405	0.443	2.626	2.533	0.894	1.264	1.152	0.464	0.356	0.95	1.016	0.542
Soil	0.024	0.039	0.051	0.05	0.05	0.03	0.031	0.042	0.086	0.03	0.088	0.339	0.072	0.024
dv w/o Sulfates	3.404	3.565	5.911	5.708	4.546	5.305	2.933	3.676	3.155	2.596	5.942	6.486	3.193	2.806
dv w screened SO <sub>4</sub>	10.430	10.510	11.750	11.637	11.012	11.417	10.200	10.565	10.307	10.038	11.767	12.075	10.326	10.138

Site Code	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1	HAVO1
Year	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022
Julian Day	281	284	287	290	293	332	350	353	356	359
sAmmNO <sub>3</sub>	0.434	0.613	0.802	0.733	0.309	0.193	0.267	0.472	0.77	0.665
AmmSO <sub>4</sub>	74.536	22.364	33.023	31.84	33.968	14.332	16.183	31.719	56.644	20.128
SO <sub>4</sub> Adjusted	14.322	14.322	14.322	14.322	14.322	14.322	14.322	14.322	14.322	14.322
CM	5.73	0.764	0.567	0.487	0.382	0.3	0.391	2.083	0.668	0.67
EC	0.682	0.358	0.279	0.437	0.434	0.468	0.627	0.381	0.679	0.229
POM	1.374	0.6	0.538	0.522	0.836	0.307	0.76	1.207	1.074	0.939
Sea Salt	0.685	0.814	0.517	1.099	0.653	0.965	0.614	0.889	1.272	2.154
Soil	0.131	0.067	0.053	0.078	0.054	0.033	0.028	0.344	0.134	0.05
dv w/o Sulfates	6.437	2.788	2.434	2.894	2.365	2.042	2.380	4.302	3.782	3.857
dv w screened SO <sub>4</sub>	12.047	10.130	9.961	10.181	9.929	9.779	9.936	10.885	10.619	10.657

Average dv in 2022
3.854 (Excluding SO <sub>4</sub> )
10.679 (Including Screened SO <sub>4</sub> )