Appendix F-3: EPA/FLM/Stakeholder Outreach and Presentations: F-3a - F-3h

Table of Contents

Appendix F-3a - Consultation Record 3

Appendix F-3b - National Regional Haze Meeting Denver, Colorado December 5-7, 2017..... 5

Appendix F-3c - Presentation to FLMs, EPA Region 4 CC/TAWG, January 31, 2018 20

Appendix F-3d - VISTAS Call with FLMs August 1, 2018..... 23

Appendix F-3e - VISTAS Presentation to other RPOs, September 5, 2018..... 28

Appendix F-3f - VISTAS Regional Haze Project Update, June 3, 2019..... 32

Appendix F-3g - VISTAS Regional Haze Meeting, St. Louis, MO, October 28-30, 2019..... 60

Appendix F-3h - VISTAS Regional Haze Project Update, April 2, 2020..... 84

Appendix F-3i - VISTAS Presentation to MJOs, April 21, 2020..... 104

Appendix F-3j - VISTAS Regional Haze Project Update to FLMs, EPA OAQPS, Region 3, Region 4, MJOs May 11, 2020..... 125

Appendix F-3k - VISTAS Regional Haze Project Update Stakeholder Briefing May 20, 2020 160

Appendix F-3l - VISTAS Regional Haze Project Update to EPA Region 3, Region 4, and OAQPS -July 30, 2020 193

Appendix F-3m - VISTAS Regional Haze Project Update, August 4, 2020..... 202

Appendix F-3n - EPA Region 4 Fall 2020 Air Director's Meeting-Regional Haze Update October 26, 2020..... 213

Appendix F-3o - FLM Consultation Letters December 14, 2022.....217

Appendix F-3a - Consultation Record

VISTAS
FLM/EPA Consultation Record
As of October 26, 2020

1. December 5-7, 2017 – Denver, national RH meeting, various presentations – FLMs, EPA OAQPS, Region 3, Region 4, RPOs, various VISTAS agency attendees

2. January 31, 2018 – teleconference, presentation – FLMs, EPA Region 4, CC/TAWG

3. August 1, 2018 – teleconference, presentation – FLMs, EPA OAQPS, Region 3, Region 4, CC/TAWG

4. September 5, 2018 – teleconference, presentation – MJOs

5. June 3, 2019 – teleconference, presentation – FLMs, EPA OAQPS, Region 3, Region 4, CC/TAWG

6. October 28-30, 2019 – St Louis national RH meeting, various presentations – FLMs, EPA OAQPS, Region 3, Region 4, RPOs, various VISTAS agency attendees

7. April 2, 2020 – teleconference, presentation – FLMS, EPA OAQPS, Region 3, Region 4, CC/TAWG

8. April 21, 2020 – teleconference, presentation – MJOs

9. May 11, 2020 – teleconference, presentation – FLMs, EPA OAQPS, Region 3, Region 4, CC/TAWG

10. May 20, 2020 – webinar, presentation – stakeholders, FLMs, EPA OAQPS, Region 3, Region 4, RPOs and member states, STAD, CC/TAWG

11. July 30, 2020 – webinar, presentation – EPA Region 3, Region 4, and OAQPS

12. August 4, 2020 – webinar, presentation, FLMs, EPA OAQPS, Region 3, Region 4, RPOs and member states, CC/TAWG

13. October 26, 2020 – webinar, presentation, EPA Region 3, Region 4 during the Fall 2020 air directors' meeting

Appendix F-3b - National Regional Haze Meeting Denver, Colorado December 5-7, 2017

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Georgia's Approach for Estimating Reasonable Progress in Round 1

Jim Boylan
Manager, Planning & Support Program
Georgia EPD - Air Protection Branch

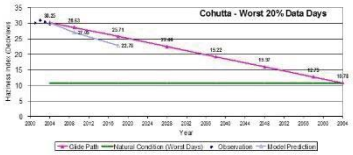
Round 2 Regional Haze Planning Workshop
Denver, CO
December 5, 2017

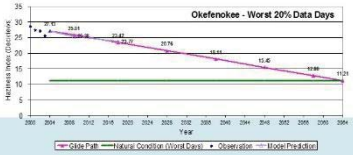
REASONABLE PROGRESS (RP)

- Area of Influence (Q/d*RT) analysis with 2002 and 2018 emissions
  - This work was performed by SESARM contractors
  - Can be used to screen sources for 4-factor analysis
    - 2018 emissions are more appropriate than 2002 since we are looking at additional controls beyond "on-the-books"
- 4-Factor Analysis
  - This work was performed by the individual SESARM states and was very time consuming (similar to BACT analysis)
    - Cost of compliance (GA EPD included visibility impacts)
    - Time necessary for compliance
    - Energy and non-air quality impacts
    - Remaining useful life of source

4

RPGs AND URP IN GEORGIA





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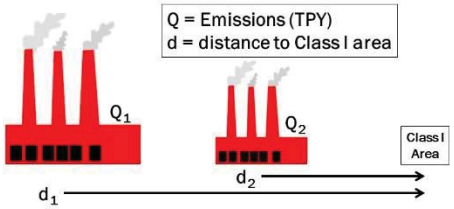
EMISSIONS AND DISTANCE

Q = Emissions (TPY)
d = distance to Class I area

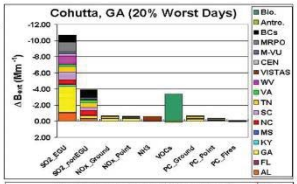


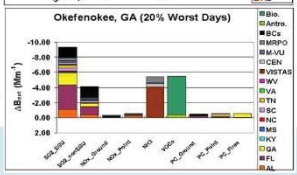
$$\frac{Q_1}{d_1} \text{ vs. } \frac{Q_2}{d_2}$$

5

EMISSION SENSITIVITIES

Based on this sensitivity analysis (30% emission reductions), SESARM states decided to focus on SO_2 emissions from point sources (both EGUs and non-EGUs).





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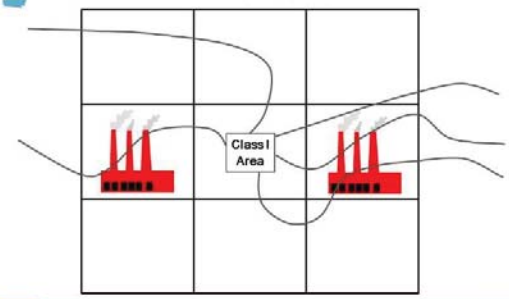
METEOROLOGY



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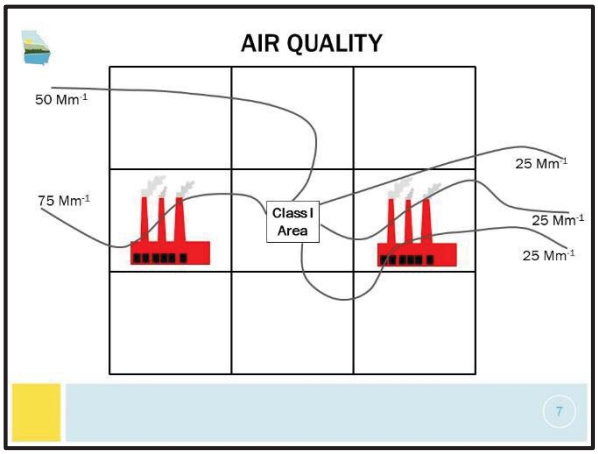
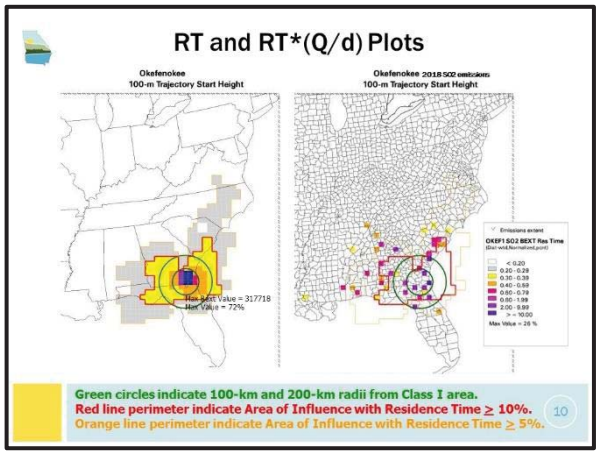
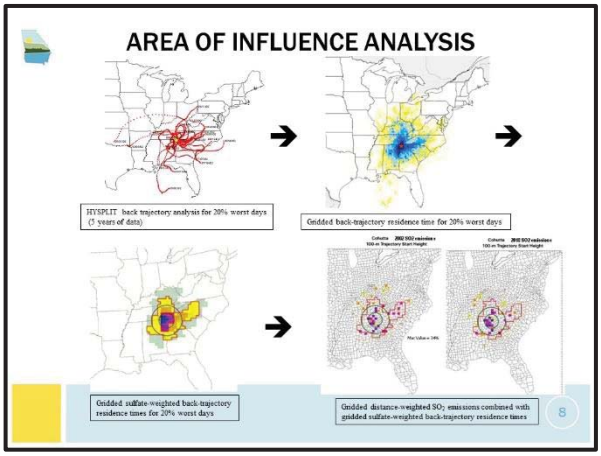
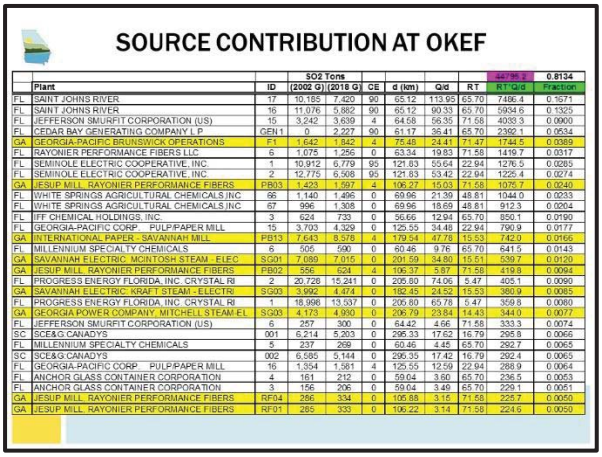


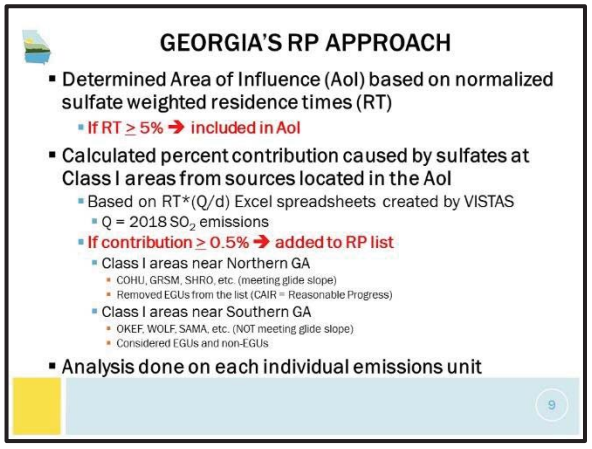


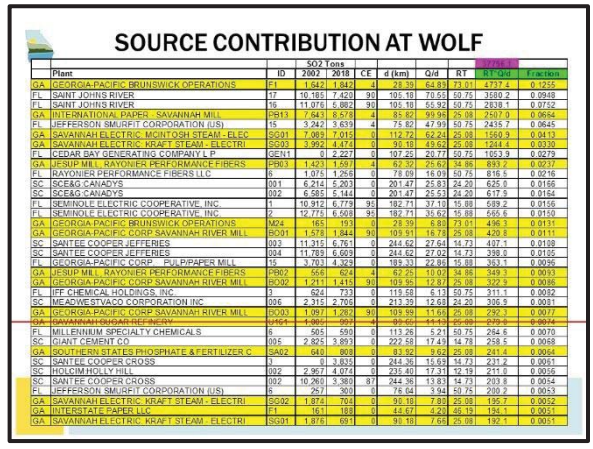




SOURCE CONTRIBUTION AT OKEF

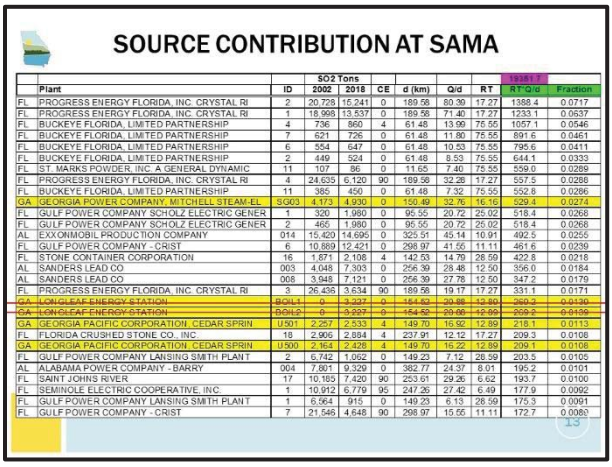
	Plant	ID	SO2 Tons (2002 Q)	SO2 Tons (2018 Q)	CE	d (km)	Q/d	RT	RT*Q/d	Fraction
FL	SAINT JOHNS RIVER	17	10,185	7,420	90	65.12	113.95	65.70	7486.4	0.1671
FL	SAINT JOHNS RIVER	16	11,076	5,882	90	65.12	90.33	65.70	5934.6	0.1325
FL	JEFFERSON SMURFIT CORPORATION (US)	15	3,242	3,639	4	64.58	56.35	71.58	4033.3	0.0900
FL	CEDAR BAY GENERATING COMPAINY L.P.	GEN1	0	2,227	90	61.17	36.41	65.70	2392.1	0.0534
GA	GEORGIA-PACIFIC BRUNSWICK OPERATIONS	F1	1,642	1,842	4	75.48	24.41	71.47	1744.5	0.0389
FL	RAYONIER PERFORMANCE FIBERS LLC	6	1,075	1,256	0	63.34	19.83	71.58	1419.7	0.0317
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	1	10,912	6,779	95	121.83	55.64	22.94	1276.5	0.0285
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	2	12,775	6,568	95	121.83	53.42	22.94	1225.4	0.0274
GA	JESUP MILL, RAYONIER PERFORMANCE FIBERS	PB03	1,423	1,597	4	106.27	15.03	71.58	1075.7	0.0240
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	66	1,140	1,496	0	69.96	21.39	48.81	1044.0	0.0233
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	67	996	1,308	0	69.96	18.69	48.81	912.3	0.0204
FL	IFF CHEMICAL HOLDINGS, INC.	3	624	733	0	56.66	12.94	65.70	850.1	0.0190
FL	GEORGIA-PACIFIC CORP. PULP/PAPER MILL	15	3,703	4,329	0	125.55	34.48	22.94	790.9	0.0177
GA	INTERNATIONAL PAPER - SAVANNAH MILL	PB13	7,643	8,578	4	179.54	47.78	15.53	742.0	0.0166
FL	MILLENNIUM SPECIALTY CHEMICALS	6	505	590	0	60.46	9.76	65.70	641.5	0.0143
GA	SAVANNAH ELECTRIC, MCINTOSH STEAM - ELEC	SG01	7,089	7,015	0	201.59	34.80	15.51	539.7	0.0120
GA	JESUP MILL, RAYONIER PERFORMANCE FIBERS	PB02	556	624	4	106.37	5.87	71.58	419.8	0.0094
FL	PROGRESS ENERGY FLORIDA, INC., CRYSTAL RI	2	20,728	15,241	0	205.80	74.06	5.47	405.1	0.0090
GA	SAVANNAH ELECTRIC, KRAFT STEAM - ELECTRI	SG03	3,992	4,474	0	182.45	24.52	15.53	380.9	0.0085
FL	PROGRESS ENERGY FLORIDA, INC., CRYSTAL RI	1	18,998	13,537	0	205.80	65.78	5.47	359.8	0.0080
GA	GEORGIA POWER COMPANY, MITCHELL STEAM-EL	SG05	4,173	4,950	0	206.79	23.84	14.43	344.0	0.0077
FL	JEFFERSON SMURFIT CORPORATION (US)	6	257	300	0	64.42	4.66	71.58	333.3	0.0074
SC	SCE&G CANADYS	001	6,214	5,203	0	295.33	17.62	16.79	295.8	0.0066
FL	MILLENNIUM SPECIALTY CHEMICALS	5	237	269	0	60.46	4.45	65.70	292.7	0.0065
SC	SCE&G CANADYS	002	6,585	5,144	0	296.35	17.42	16.79	292.4	0.0065
FL	GEORGIA-PACIFIC CORP. PULP/PAPER MILL	16	1,354	1,581	4	125.55	12.59	22.94	288.9	0.0064
FL	ANCHOR GLASS CONTAINER CORPORATION	4	161	212	0	59.04	3.60	65.70	236.5	0.0053
FL	ANCHOR GLASS CONTAINER CORPORATION	3	156	206	0	59.04	3.49	65.70	229.1	0.0051
GA	JESUP MILL, RAYONIER PERFORMANCE FIBERS	RF04	266	334	0	105.88	3.15	71.58	225.7	0.0050
GA	JESUP MILL, RAYONIER PERFORMANCE FIBERS	RF01	265	333	0	106.22	3.14	71.58	224.6	0.0050





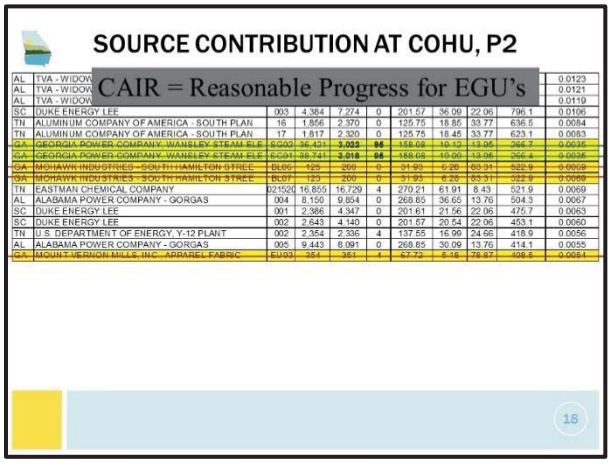
SOURCE CONTRIBUTION AT WOLF

	Plant	ID	SO2 Tons 2002	SO2 Tons 2018	CE	d (km)	Q/d	RT	RT*Q/d	Fraction
GA	GEORGIA-PACIFIC BRUNSWICK OPERATIONS	F1	1,642	1,842	4	28.39	64.89	73.01	4737.4	0.1255
FL	SAINT JOHNS RIVER	17	10,185	7,420	99	105.18	70.55	50.75	3580.2	0.0948
FL	SAINT JOHNS RIVER	16	11,076	5,882	90	105.18	55.92	50.75	2838.1	0.0752
GA	INTERNATIONAL PAPER - SAVANNAH MILL	PB13	7,643	8,578	4	85.82	99.96	25.08	2507.0	0.0664
FL	JEFFERSON SMURFIT CORPORATION (US)	15	3,242	3,639	4	75.82	47.99	50.75	2435.7	0.0645
GA	SAVANNAH ELECTRIC, MCINTOSH STEAM - ELEC	SG01	7,089	7,015	0	112.72	62.24	25.08	1560.9	0.0413
GA	SAVANNAH ELECTRIC, KRAFT STEAM - ELECTRI	SG03	3,992	4,474	0	90.18	49.62	25.08	1244.4	0.0330
FL	CEDAR BAY GENERATING COMPANY L.P.	GEN1	0	2,227	0	107.25	20.77	50.75	1053.9	0.0279
GA	JESUP MILL, RAYONIER PERFORMANCE FIBERS	PB03	1,423	1,597	4	62.32	25.62	34.86	893.2	0.0237
FL	RAYONIER PERFORMANCE FIBERS LLC	6	1,075	1,256	0	73.09	16.09	50.75	816.5	0.0216
SC	SCE&G CANADYS	001	6,214	5,203	0	201.47	25.83	24.20	625.0	0.0166
SC	SCE&G CANADYS	002	6,585	5,144	0	201.47	25.53	24.20	617.9	0.0164
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	1	10,912	6,779	93	182.71	37.10	15.88	589.2	0.0156
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	2	12,775	6,568	93	182.71	35.62	15.88	565.6	0.0150
GA	GEORGIA-PACIFIC BRUNSWICK OPERATIONS	M24	165	193	0	28.39	6.83	73.01	496.3	0.0131
GA	GEORGIA-PACIFIC CORP SAVANNAH RIVER MILL	BO01	1,578	1,844	90	109.91	16.78	25.08	420.8	0.0111
SC	SANTEE COOPER JEFFERIES	003	11,315	6,761	0	244.62	27.64	14.73	407.1	0.0108
SC	SANTEE COOPER JEFFERIES	004	11,789	6,669	0	244.62	27.02	14.73	398.0	0.0105
FL	GEORGIA-PACIFIC CORP. PULP/PAPER MILL	15	3,703	4,329	0	189.33	22.86	15.88	363.1	0.0096
GA	JESUP MILL, RAYONIER PERFORMANCE FIBERS	PB02	556	624	4	62.25	10.02	34.86	349.3	0.0093
GA	GEORGIA-PACIFIC CORP SAVANNAH RIVER MILL	BO02	1,211	1,415	90	109.95	12.87	25.08	322.9	0.0086
FL	IFF CHEMICAL HOLDINGS, INC.	3	624	733	0	119.58	6.13	50.75	311.1	0.0082
SC	MEADWESTVACO CORPORATION INC.	006	2,315	2,705	0	213.39	12.68	24.20	306.9	0.0081
GA	GEORGIA-PACIFIC CORP SAVANNAH RIVER MILL	BO03	1,097	1,282	90	103.88	11.69	25.08	292.9	0.0077
GA	SAVANNAH SUGAR REFINERY	SR01	1,080	997	0	97.60	11.13	25.08	279.0	0.0074
FL	MILLENNIUM SPECIALTY CHEMICALS	6	505	590	0	113.26	5.21	50.75	264.6	0.0070
SC	GIANT CEMENT CO.	005	2,825	3,893	0	222.58	17.49	14.78	258.5	0.0068
GA	SOUTHERN STATES PHOSPHATE & FERTILIZER C	SA02	640	808	0	83.92	9.62	25.08	241.4	0.0064
SC	SANTEE COOPER CROSS	3	0	3,835	0	244.36	15.69	14.73	231.2	0.0061
SC	HOLCIM HOLLY HILL	002	2,957	4,074	0	235.40	17.31	12.19	211.0	0.0056
SC	SANTEE COOPER CROSS	002	10,260	3,380	87	244.36	13.83	14.73	203.8	0.0054
FL	JEFFERSON SMURFIT CORPORATION (US)	6	257	300	0	76.64	3.94	50.75	200.2	0.0053
GA	SAVANNAH ELECTRIC, KRAFT STEAM - ELECTRI	SG02	1,874	704	0	90.18	7.80	25.08	195.7	0.0052
GA	INTERSTATE PAPER LLC	F1	151	189	0	44.67	4.23	45.19	191.1	0.0051
GA	SAVANNAH ELECTRIC, KRAFT STEAM - ELECTRI	SG01	1,876	691	0	90.18	7.66	25.08	192.1	0.0051



SOURCE CONTRIBUTION AT SAMA

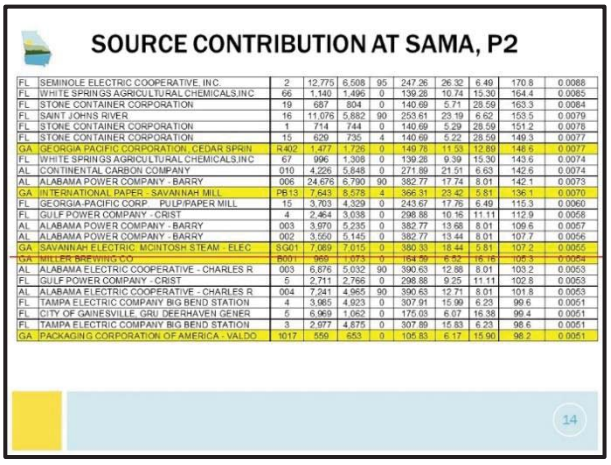
	Plant	ID	SO2 Tons 2002	SO2 Tons 2018	CE	d (km)	Q/d	RT	193817 R'T Q/d	0.7145 Fraction
FL	PROGRESS ENERGY FLORIDA, INC. CRYSTAL RI	2	20,728	16,241	0	189.58	80.39	17.27	1388.4	0.0717
FL	PROGRESS ENERGY FLORIDA, INC. CRYSTAL RI	1	18,998	13,537	0	189.58	71.40	17.27	1233.1	0.0637
FL	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	4	736	860	4	61.48	13.99	75.55	1057.1	0.0546
FL	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	7	621	726	0	61.48	11.80	75.55	891.6	0.0461
FL	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	6	554	647	0	61.48	10.53	75.55	795.6	0.0411
FL	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	2	449	524	0	61.48	8.53	75.55	644.1	0.0333
FL	ST. MARKS POWDER, INC. A GENERAL DYNAMIC	11	107	86	0	11.65	7.40	75.55	559.0	0.0289
FL	PROGRESS ENERGY FLORIDA, INC. CRYSTAL RI	4	24,635	6,120	90	189.58	32.28	17.27	557.5	0.0288
FL	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	11	385	450	0	61.48	7.32	75.55	552.8	0.0286
GA	GEORGIA POWER COMPANY, MITCHELL STEAM-EL	SG03	4,173	4,930	0	150.49	32.76	16.16	529.4	0.0274
FL	GULF POWER COMPANY SCHOLZ ELECTRIC GENER	1	320	1,980	0	95.55	20.72	25.02	518.4	0.0268
FL	GULF POWER COMPANY SCHOLZ ELECTRIC GENER	2	465	1,980	0	95.55	20.72	25.02	518.4	0.0268
AL	EXXONMOBIL PRODUCTION COMPANY	014	15,420	14,695	0	325.51	45.14	10.91	492.5	0.0255
FL	GULF POWER COMPANY - CRIST	6	10,869	12,421	0	298.97	41.55	11.11	461.6	0.0239
FL	STONE CONTAINER CORPORATION	16	1,671	2,108	4	142.53	14.79	28.59	422.8	0.0218
AL	SANDERS LEAD CO	003	4,048	7,303	0	256.39	28.48	12.50	356.0	0.0184
AL	SANDERS LEAD CO	008	3,948	7,121	0	256.39	27.78	12.50	347.2	0.0179
FL	PROGRESS ENERGY FLORIDA, INC. CRYSTAL RI	3	26,436	3,634	90	189.58	19.17	17.27	331.1	0.0171
GA	LONGLEAF ENERGY STATION	BOIL1	0	3,227	0	154.83	20.86	12.80	266.9	0.0138
GA	LONGLEAF ENERGY STATION	BOIL2	0	3,227	0	154.83	20.86	12.80	266.9	0.0138
GA	GEORGIA PACIFIC CORPORATION, CEDAR SPRIN	U501	2,257	2,533	4	149.70	16.92	12.89	218.1	0.0113
FL	FLORIDA CRUSHED STONE CO., INC.	18	2,906	2,884	4	237.91	12.12	17.27	209.3	0.0108
GA	GEORGIA PACIFIC CORPORATION, CEDAR SPRIN	U500	2,164	2,428	4	149.70	16.22	12.89	209.1	0.0108
FL	GULF POWER COMPANY LANSING SMITH PLANT	2	6,742	1,662	0	149.23	7.12	28.59	203.5	0.0105
AL	ALABAMA POWER COMPANY - BARRY	004	7,801	9,329	0	382.77	24.37	8.01	195.2	0.0101
FL	SAINT JOHNS RIVER	17	10,185	7,420	90	253.61	29.26	6.62	193.7	0.0100
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	1	10,912	6,779	95	247.26	27.42	6.49	177.9	0.0092
FL	GULF POWER COMPANY LANSING SMITH PLANT	1	6,564	915	0	149.23	6.13	28.59	175.3	0.0091
FL	GULF POWER COMPANY - CRIST	7	21,546	4,648	90	298.97	15.55	11.11	172.7	0.0089



SOURCE CONTRIBUTION AT COHU, P2

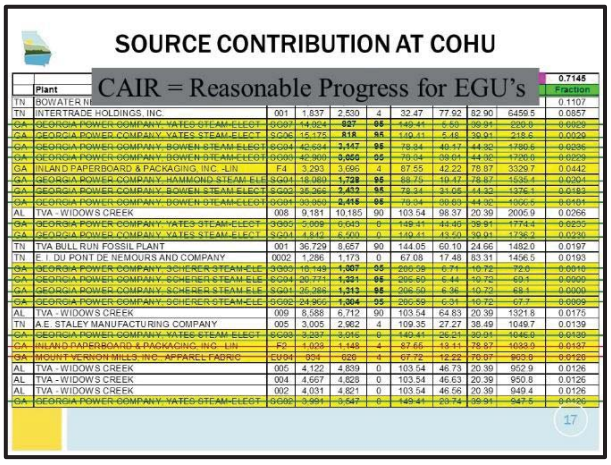
CAIR = Reasonable Progress for EGU's

AL	TVA - WIDOW									0.0123
AL	TVA - WIDOW									0.0121
AL	TVA - WIDOW									0.0119
SC	DUKE ENERGY LEE	003	4,384	7,274	0	201.57	36.09	22.06	796.1	0.0106
TN	ALUMINUM COMPANY OF AMERICA - SOUTH PLAN	16	1,856	2,370	0	125.75	18.85	33.77	636.5	0.0084
TN	ALUMINUM COMPANY OF AMERICA - SOUTH PLAN	17	1,817	2,320	0	125.75	18.45	33.77	623.1	0.0083
GA	GEORGIA POWER COMPANY, WANSLEY STEAM-ELE	SG02	36,421	3,022	95	158.08	19.12	13.95	266.7	0.0035
GA	GEORGIA POWER COMPANY, WANSLEY STEAM-ELE	SG01	38,741	3,018	95	158.08	19.09	13.95	266.4	0.0035
GA	MOHAWK INDUSTRIES - SOUTH HAMILTON STREE	BL05	125	200	0	31.93	6.26	83.31	522.9	0.0069
GA	MOHAWK INDUSTRIES - SOUTH HAMILTON STREE	BL07	125	200	0	31.93	6.26	83.31	522.9	0.0069
TN	EASTMAN CHEMICAL COMPANY	021520	16,855	16,729	4	270.21	61.91	8.43	521.9	0.0069
AL	ALABAMA POWER COMPANY - GORGAS	004	8,150	9,854	0	268.85	36.65	13.76	504.3	0.0067
SC	DUKE ENERGY LEE	001	2,386	4,347	0	201.61	21.56	22.06	475.7	0.0063
SC	DUKE ENERGY LEE	002	2,643	4,140	0	201.57	20.54	22.06	453.1	0.0060
TN	U.S. DEPARTMENT OF ENERGY, Y-12 PLANT	002	2,354	2,336	4	137.55	16.99	24.66	418.9	0.0056
AL	ALABAMA POWER COMPANY - GORGAS	005	9,443	8,091	0	268.85	30.09	13.76	414.1	0.0055
GA	MOUNT VERNON MILLS, INC., APPAREL FABRIC	EU03	354	351	4	67.72	5.18	78.87	408.5	0.0054



SOURCE CONTRIBUTION AT SAMA, P2

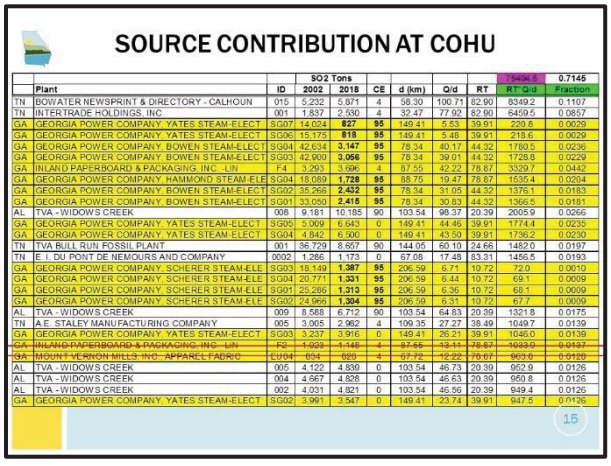
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	2	12,775	6,508	95	247.26	26.32	6.49	170.8	0.0088
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	66	1,140	1,495	0	139.28	10.74	15.30	164.4	0.0085
FL	STONE CONTAINER CORPORATION	19	687	804	0	140.69	5.71	28.59	163.3	0.0084
FL	SAINT JOHNS RIVER	16	11,076	5,882	90	253.61	23.19	6.62	153.5	0.0079
FL	STONE CONTAINER CORPORATION	1	714	744	0	140.69	5.29	28.59	151.2	0.0078
FL	STONE CONTAINER CORPORATION	15	629	735	4	140.69	5.22	28.59	149.3	0.0077
GA	GEORGIA PACIFIC CORPORATION, CEDAR SPRIN	R402	1,477	1,726	0	149.78	11.53	12.89	148.6	0.0077
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	67	996	1,308	0	139.28	9.39	15.30	143.6	0.0074
AL	CONTINENTAL CARBON COMPANY	010	4,226	5,848	0	271.89	21.51	6.63	142.6	0.0074
AL	ALABAMA POWER COMPANY - BARRY	006	24,676	6,790	90	382.77	17.74	8.01	142.1	0.0073
GA	INTERNATIONAL PAPER - SAVANNAH MILL	PB13	7,643	8,578	4	366.31	23.42	5.81	136.1	0.0070
FL	GEORGIA-PACIFIC CORP. - PULP/PAPER MILL	15	3,703	4,329	0	243.67	17.76	6.49	115.3	0.0060
FL	GULF POWER COMPANY - CRIST	4	2,464	3,038	0	298.88	10.16	11.11	112.9	0.0058
AL	ALABAMA POWER COMPANY - BARRY	003	3,970	5,235	0	382.77	13.68	8.01	109.6	0.0057
AL	ALABAMA POWER COMPANY - BARRY	002	3,550	5,145	0	382.77	13.44	8.01	107.7	0.0056
GA	SAVANNAH ELECTRIC MCINTOSH STEAM - ELEC	SG01	7,089	7,015	0	380.33	18.44	5.81	107.2	0.0055
GA	MILLER BREWING CO	B001	960	1,073	0	164.79	6.51	16.16	105.3	0.0054
AL	ALABAMA ELECTRIC COOPERATIVE - CHARLES R	003	6,876	5,032	90	390.63	12.88	8.01	103.2	0.0053
FL	GULF POWER COMPANY - CRIST	5	2,711	2,766	0	298.88	9.25	11.11	102.8	0.0053
AL	ALABAMA ELECTRIC COOPERATIVE - CHARLES R	004	7,241	4,965	90	390.63	12.71	8.01	101.8	0.0053
FL	TAMPA ELECTRIC COMPANY BIG BEND STATION	4	3,985	4,923	0	307.91	15.99	6.23	99.6	0.0051
FL	CITY OF GAINESVILLE, GRU DEERHAVEN GENER	5	6,969	1,063	0	175.03	6.07	16.36	99.4	0.0051
FL	TAMPA ELECTRIC COMPANY BIG BEND STATION	3	2,977	4,875	0	307.89	15.83	6.23	98.6	0.0051
GA	PACKAGING CORPORATION OF AMERICA - VALDO	1017	559	653	0	105.83	6.17	15.90	98.2	0.0051



SOURCE CONTRIBUTION AT COHU

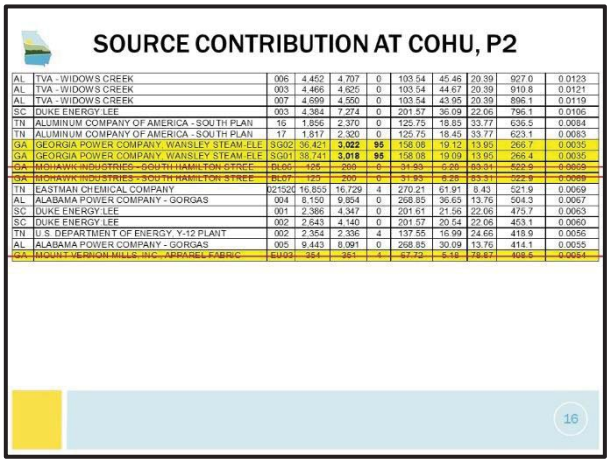
CAIR = Reasonable Progress for EGU's

	Plant								0.7145 Fraction
TN	BOWATER NE								0.1107
TN	INTERTRADE HOLDINGS, INC.	001	1,837	2,530	4	32.47	77.92	82.90	6459.5	0.0857
GA	GEORGIA POWER COMPANY, YATES STEAM-ELECT	SG07	14,054	827	95	149.41	5.53	39.91	220.8	0.0029
GA	GEORGIA POWER COMPANY, YATES STEAM-ELECT	SG06	15,175	818	95	149.41	5.48	39.91	218.6	0.0029
GA	GEORGIA POWER COMPANY, HAMMOND STEAM-ELE	SG04	18,089	1,728	95	88.75	19.47	78.87	1535.4	0.0204
GA	GEORGIA POWER COMPANY, BOWEN STEAM-ELECT	SG02	35,265	2,432	95	78.34	31.05	44.32	1376.1	0.0183
GA	GEORGIA POWER COMPANY, BOWEN STEAM-ELECT	SG01	33,050	2,415	95	78.34	30.83	44.32	1366.5	0.0181
AL	TVA - WIDOWS CREEK	008	9,181	10,185	90	103.54	98.37	20.39	2005.9	0.0266
GA	GEORGIA POWER COMPANY, YATES STEAM-ELECT	SG03	5,669	6,643	0	149.41	44.46	39.91	1774.4	0.0235
GA	GEORGIA POWER COMPANY, YATES STEAM-ELECT	SG01	4,842	6,500	0	149.41	43.50	39.91	1736.2	0.0230
TN	TVA BULL RUN FOSSIL PLANT	001	36,729	8,657	90	144.05	60.10	24.66	1482.0	0.0197
TN	E. I. DU PONT DE NEMOURS AND COMPANY	0002	1,286	1,173	0	67.08	17.48	83.31	1456.5	0.0193
GA	GEORGIA POWER COMPANY, SCHERER STEAM-ELE	SG05	18,149	1,007	95	206.59	5.71	10.72	72.0	0.0010
GA	GEORGIA POWER COMPANY, SCHERER STEAM-ELE	SG04	20,771	1,231	95	206.59	6.44	10.72	69.1	0.0009
GA	GEORGIA POWER COMPANY, SCHERER STEAM-ELE	SG01	25,289	1,313	95	206.59	6.36	10.72	68.1	0.0009
GA	GEORGIA POWER COMPANY, SCHERER STEAM-ELE	SG02	24,966	1,304	95	206.59	6.31	10.72	67.7	0.0009
AL	TVA - WIDOWS CREEK	009	8,588	6,712	90	103.54	64.83	20.39	1321.8	0.0175
TN	A.E. STALEY MANUFACTURING COMPANY	005	3,005	2,982	4	109.35	27.27	38.49	1049.7	0.0139
GA	GEORGIA POWER COMPANY, YATES STEAM-ELECT	SG03	5,237	3,016	0	149.41	20.21	39.91	1046.9	0.0139
GA	INLAND PAPERBOARD & PACKAGING, INC. -LIN	F2	1,928	1,148	4	87.65	13.11	78.87	1033.9	0.0137
GA	MOUNT VERNON MILLS, INC., APPAREL FABRIC	EU04	954	626	4	67.72	12.22	78.87	963.6	0.0128
AL	TVA - WIDOWS CREEK	005	4,122	4,839	0	103.54	46.73	20.39	952.9	0.0126
AL	TVA - WIDOWS CREEK	004	4,667	4,828	0	103.54	46.63	20.39	950.8	0.0126
AL	TVA - WIDOWS CREEK	002	4,031	4,821	0	103.54	46.56	20.39	949.4	0.0126
GA	GEORGIA POWER COMPANY, YATES STEAM-ELECT	SG02	3,961	3,547	0	149.41	23.74	39.91	947.5	0.0126



SOURCE CONTRIBUTION AT COHU

	Plant	ID	SO2 Tons 2002	SO2 Tons 2018	CE	d (km)	Q/d	RT	154961 R'T Q/d	0.7145 Fraction
TN	BOWATER NEWSPRINT & DIRECTORY - CALHOUN	015	5,232	5,871	4	58.30	100.71	82.90	8349.2	0.1107
TN	INTERTRADE HOLDINGS, INC.	001	1,837	2,530	4	32.47	77.92	82.90	6459.5	0.0857
GA	GEORGIA POWER COMPANY, YATES STEAM-ELECT	SG07	14,024	**827**	**95**	149.41	5.53	39.91	220.8	0.0029
GA	GEORGIA POWER COMPANY, YATES STEAM-ELECT	SG06	15,175	**818**	**95**	149.41	5.48	39.91	218.6	0.0029
GA	GEORGIA POWER COMPANY, BOWEN STEAM-ELECT	SG04	42,634	**3,147**	**95**	78.34	40.17	44.32	1780.5	0.0236
GA	GEORGIA POWER COMPANY, BOWEN STEAM-ELECT	SG03	42,900	**3,066**	**95**	78.34	39.01	44.32	1728.8	0.0229
GA	INLAND PAPERBOARD & PACKAGING, INC. -LIN	F4	3,293	3,696	4	87.55	42.22	78.87	3329.7	0.0442
GA	GEORGIA POWER COMPANY, HAMMOND STEAM-ELE	SG04	18,089	**1,728**	**95**	88.75	19.47	78.87	1535.4	0.0204
GA	GEORGIA POWER COMPANY, BOWEN STEAM-ELECT	SG02	35,265	**2,432**	**95**	78.34	31.05	44.32	1376.1	0.0183
GA	GEORGIA POWER COMPANY, BOWEN STEAM-ELECT	SG01	33,050	**2,415**	**95**	78.34	30.83	44.32	1366.5	0.0181
AL	TVA - WIDOWS CREEK	008	9,181	10,185	90	103.54	98.37	20.39	2005.9	0.0266
GA	GEORGIA POWER COMPANY, YATES STEAM-ELECT	SG05	5,009	6,643	0	149.41	44.46	39.91	1774.4	0.0235
GA	GEORGIA POWER COMPANY, YATES STEAM-ELECT	SG04	4,842	6,500	0	149.41	43.50	39.91	1736.2	0.0230
TN	TVA BULL RUN FOSSIL PLANT	001	36,729	8,657	90	144.05	60.10	24.66	1482.0	0.0197
TN	E. I. DU PONT DE NEMOURS AND COMPANY	0002	1,286	1,173	0	67.08	17.48	83.31	1456.5	0.0193
GA	GEORGIA POWER COMPANY, SCHERER STEAM-ELE	SG03	18,149	**1,387**	**95**	206.59	6.71	10.72	72.0	0.0010
GA	GEORGIA POWER COMPANY, SCHERER STEAM-ELE	SG04	20,771	**1,331**	**95**	206.59	6.44	10.72	69.1	0.0009
GA	GEORGIA POWER COMPANY, SCHERER STEAM-ELE	SG01	25,289	**1,313**	**95**	206.59	6.36	10.72	68.1	0.0009
GA	GEORGIA POWER COMPANY, SCHERER STEAM-ELE	SG02	24,966	**1,304**	**95**	206.59	6.31	10.72	67.7	0.0009
AL	TVA - WIDOWS CREEK	009	8,588	6,712	90	103.54	64.83	20.39	1321.8	0.0175
TN	A.E. STALEY MANUFACTURING COMPANY	005	3,005	2,982	4	109.35	27.27	38.49	1049.7	0.0139
GA	GEORGIA POWER COMPANY, YATES STEAM-ELECT	SG03	5,237	3,916	0	149.41	26.21	39.91	1046.0	0.0139
GA	INLAND PAPERBOARD & PACKAGING, INC. -LIN	F2	1,928	1,148	4	87.65	13.11	78.87	1033.9	0.0137
GA	MOUNT VERNON MILLS, INC., APPAREL FABRIC	EU04	954	626	4	67.72	12.22	78.87	963.6	0.0128
AL	TVA - WIDOWS CREEK	005	4,122	4,839	0	103.54	46.73	20.39	952.9	0.0126
AL	TVA - WIDOWS CREEK	004	4,667	4,828	0	103.54	46.63	20.39	950.8	0.0126
AL	TVA - WIDOWS CREEK	002	4,031	4,821	0	103.54	46.56	20.39	949.4	0.0126
GA	GEORGIA POWER COMPANY, YATES STEAM-ELECT	SG02	3,961	3,547	0	149.41	23.74	39.91	947.5	0.0126



SOURCE CONTRIBUTION AT COHU, P2

AL	TVA - WIDOWS CREEK	006	4,452	4,707	0	103.54	45.46	20.39	927.0	0.0123
AL	TVA - WIDOWS CREEK	003	4,466	4,625	0	103.54	44.67	20.39	910.8	0.0121
AL	TVA - WIDOWS CREEK	007	4,599	4,550	0	103.54	43.95	20.39	896.1	0.0119
SC	DUKE ENERGY LEE	003	4,384	7,274	0	201.57	36.09	22.06	796.1	0.0106
TN	ALUMINUM COMPANY OF AMERICA - SOUTH PLAN	16	1,856	2,370	0	125.75	18.85	33.77	636.5	0.0084
TN	ALUMINUM COMPANY OF AMERICA - SOUTH PLAN	17	1,817	2,320	0	125.75	18.45	33.77	623.1	0.0083
GA	GEORGIA POWER COMPANY, WANSLEY STEAM-ELE	SG02	36,421	**3,022**	**95**	158.08	19.12	13.95	266.7	0.0035
GA	GEORGIA POWER COMPANY, WANSLEY STEAM-ELE	SG01	38,741	**3,018**	**95**	158.08	19.09	13.95	266.4	0.0035
GA	MOHAWK INDUSTRIES - SOUTH HAMILTON STREE	BL05	125	200	0	31.93	6.26	83.31	522.9	0.0069
GA	MOHAWK INDUSTRIES - SOUTH HAMILTON STREE	BL07	125	200	0	31.93	6.26	83.31	522.9	0.0069
TN	EASTMAN CHEMICAL COMPANY	021520	16,855	16,729	4	270.21	61.91	8.43	521.9	0.0069
AL	ALABAMA POWER COMPANY - GORGAS	004	8,150	9,854	0	268.85	36.65	13.76	504.3	0.0067
SC	DUKE ENERGY LEE	001	2,386	4,347	0	201.61	21.56	22.06	475.7	0.0063
SC	DUKE ENERGY LEE	002	2,643	4,140	0	201.57	20.54	22.06	453.1	0.0060
TN	U.S. DEPARTMENT OF ENERGY, Y-12 PLANT	002	2,354	2,336	4	137.55	16.99	24.66	418.9	0.0056
AL	ALABAMA POWER COMPANY - GORGAS	005	9,443	8,091	0	268.85	30.09	13.76	414.1	0.0055
GA	MOUNT VERNON MILLS, INC., APPAREL FABRIC	EU03	354	351	4	67.72	5.18	78.87	408.5	0.0054

SOURCE CONTRIBUTION AT COHU

CAIR = Reasonable Progress for EGU's

	Plant									0.7145 Fraction
TN	BOWATER N									0.1107
TN	INTERTRADE HOLDINGS, INC.	001	1,837	2,530	4	32.47	77.92	82.90	6459.5	0.0857
~~GA~~	~~GEORGIA POWER COMPANY- YATES STEAM ELECT~~	~~SG07~~	~~14,024~~	~~827~~	~~95~~	~~149.41~~	~~6.55~~	~~39.91~~	~~220.6~~	~~0.0029~~
~~GA~~	~~GEORGIA POWER COMPANY- YATES STEAM ELECT~~	~~SG06~~	~~15,175~~	~~818~~	~~95~~	~~149.41~~	~~5.48~~	~~39.91~~	~~218.6~~	~~0.0029~~
~~GA~~	~~GEORGIA POWER COMPANY- BOWEN STEAM ELECT~~	~~SG04~~	~~42,634~~	~~3,147~~	~~95~~	~~78.34~~	~~40.17~~	~~44.32~~	~~1780.6~~	~~0.0236~~
~~GA~~	~~GEORGIA POWER COMPANY- BOWEN STEAM ELECT~~	~~SG03~~	~~42,900~~	~~3,050~~	~~95~~	~~78.34~~	~~39.01~~	~~44.32~~	~~1726.8~~	~~0.0229~~
GA	INLAND PAPERBOARD & PACKAGING, INC. -LIN	F4	3,293	3,696	4	87.55	42.22	78.87	3329.7	0.0442
~~GA~~	~~GEORGIA POWER COMPANY- HAMMOND STEAM ELE~~	~~SG04~~	~~18,080~~	~~1,728~~	~~90~~	~~88.75~~	~~19.47~~	~~78.87~~	~~1535.1~~	~~0.0204~~
~~GA~~	~~GEORGIA POWER COMPANY- BOWEN STEAM ELECT~~	~~SG03~~	~~35,366~~	~~3,452~~	~~90~~	~~78.34~~	~~31.05~~	~~44.32~~	~~1376.1~~	~~0.0183~~
~~GA~~	~~GEORGIA POWER COMPANY- BOWEN STEAM ELECT~~	~~SG01~~	~~93,050~~	~~9,415~~	~~90~~	~~78.34~~	~~30.80~~	~~44.32~~	~~1366.5~~	~~0.0181~~
AL	TVA - WIDOWS CREEK	008	9,161	10,185	90	103.54	98.37	20.39	2005.9	0.0266
~~GA~~	~~GEORGIA POWER COMPANY- YATES STEAM ELECT~~	~~SG05~~	~~5,069~~	~~5,645~~	~~0~~	~~149.41~~	~~44.46~~	~~39.91~~	~~1774.4~~	~~0.0235~~
~~GA~~	~~GEORGIA POWER COMPANY- YATES STEAM ELECT~~	~~SG01~~	~~5,512~~	~~5,500~~	~~0~~	~~149.41~~	~~43.56~~	~~39.91~~	~~1736.2~~	~~0.0230~~
TN	TVA BULL RUN FOSSIL PLANT	001	36,729	8,657	90	144.05	60.10	24.66	1482.0	0.0197
TN	E. I. DU PONT DE NEMOURS AND COMPANY	0002	1,286	1,173	0	67.08	17.48	83.31	1456.5	0.0193
~~GA~~	~~GEORGIA POWER COMPANY- SCHERER STEAM ELE~~	~~SG03~~	~~19,149~~	~~1,307~~	~~95~~	~~206.59~~	~~6.71~~	~~10.72~~	~~72.6~~	~~0.0010~~
~~GA~~	~~GEORGIA POWER COMPANY- SCHERER STEAM ELE~~	~~SG04~~	~~20,774~~	~~1,321~~	~~95~~	~~206.60~~	~~6.44~~	~~10.72~~	~~69.1~~	~~0.0009~~
~~GA~~	~~GEORGIA POWER COMPANY- SCHERER STEAM ELE~~	~~SG01~~	~~25,286~~	~~1,313~~	~~95~~	~~206.50~~	~~6.36~~	~~10.72~~	~~68.1~~	~~0.0009~~
~~GA~~	~~GEORGIA POWER COMPANY- SCHERER STEAM ELE~~	~~SG02~~	~~24,900~~	~~1,304~~	~~95~~	~~206.59~~	~~6.31~~	~~10.72~~	~~67.7~~	~~0.0009~~
AL	TVA - WIDOWS CREEK	009	8,568	6,712	90	103.54	64.83	20.39	1321.8	0.0175
TN	A.E. STALEY MANUFACTURING COMPANY	005	3,005	2,982	4	109.35	27.27	38.49	1049.7	0.0139
~~GA~~	~~GEORGIA POWER COMPANY- YATES STEAM ELECT~~	~~SG08~~	~~3,257~~	~~3,035~~	~~0~~	~~149.41~~	~~26.21~~	~~39.91~~	~~1046.0~~	~~0.0139~~
~~GA~~	~~INLAND PAPERBOARD & PACKAGING, INC. -LIN~~	~~F2~~	~~1,603~~	~~1,148~~	~~4~~	~~87.55~~	~~13.14~~	~~78.87~~	~~1033.0~~	~~0.0137~~
~~GA~~	~~MOUNT VERNON MILLS, INC. - APPAREL FABRIC~~	~~EU04~~	~~854~~	~~826~~	~~4~~	~~67.72~~	~~12.22~~	~~76.67~~	~~963.6~~	~~0.0128~~
AL	TVA - WIDOWS CREEK	005	4,122	4,839	0	103.54	46.73	20.39	952.9	0.0126
AL	TVA - WIDOWS CREEK	004	4,667	4,828	0	103.54	46.63	20.39	950.8	0.0126
AL	TVA - WIDOWS CREEK	002	4,031	4,821	0	103.54	46.56	20.39	949.4	0.0126
~~GA~~	~~GEORGIA POWER COMPANY- YATES STEAM ELECT~~	~~SG02~~	~~6,991~~	~~5,547~~	~~0~~	~~149.41~~	~~20.74~~	~~39.91~~	~~947.5~~	~~0.0126~~

17

GEORGIA'S RP SUMMARY

- 22 Emission Units at 12 Facilities
  - Performed single source photochemical grid modeling for each facility ➔ $/Mm^{-1}
    - ($/ton) x (ton/Mm^{-1}) = $/Mm^{-1}
  - 6 emission units at 3 facilities took voluntary limits to reduce contribution to <0.5%
  - 1 emission unit subject to BART
- Four-Factor Analysis Conducted on 15 Emission Units
  - No additional controls for 11 emission units at 6 facilities
  - Additional controls for 4 emission units at 3 facilities

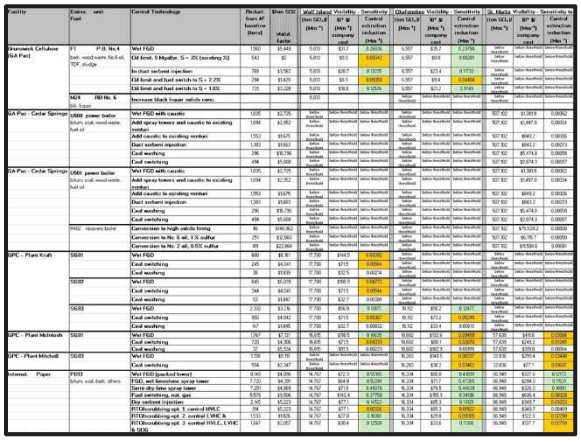
20

SOURCE CONTRIBUTION AT COHU, P2

CAIR = Reasonable Progress for EGU's

AL	TVA - WIDOW								0.0123
AL	TVA - WIDOW								0.0121
AL	TVA - WIDOW								0.0119
SC	DUKE ENERGY LEE	003	4,384	7,274	0	201.57	36.09	22.06	796.1	0.0106
TN	ALUMINUM COMPANY OF AMERICA - SOUTH PLAN	16	1,856	2,370	0	125.75	18.85	33.77	636.5	0.0084
TN	ALUMINUM COMPANY OF AMERICA - SOUTH PLAN	17	1,817	2,326	0	125.75	18.45	33.77	623.1	0.0083
~~GA~~	~~GEORGIA POWER COMPANY- WANSLEY STEAM ELE~~	~~SG02~~	~~36,121~~	~~3,023~~	~~95~~	~~158.08~~	~~16.12~~	~~13.05~~	~~266.7~~	~~0.0035~~
~~GA~~	~~GEORGIA POWER COMPANY- WANSLEY STEAM ELE~~	~~SC01~~	~~38,741~~	~~3,018~~	~~95~~	~~158.08~~	~~16.09~~	~~13.05~~	~~266.4~~	~~0.0035~~
~~GA~~	~~MOHAWK INDUSTRIES - SOUTH HAMILTON STREE~~	~~BL06~~	~~125~~	~~200~~	~~0~~	~~91.93~~	~~6.20~~	~~83.31~~	~~522.9~~	~~0.0069~~
~~GA~~	~~MOHAWK INDUSTRIES - SOUTH HAMILTON STREE~~	~~BL07~~	~~125~~	~~200~~	~~0~~	~~91.93~~	~~6.20~~	~~83.31~~	~~522.9~~	~~0.0069~~
TN	EASTMAN CHEMICAL COMPANY	021520	16,856	16,729	4	270.21	61.91	8.43	521.9	0.0069
AL	ALABAMA POWER COMPANY - GORGAS	004	8,150	9,854	0	268.85	36.65	13.76	504.3	0.0067
SC	DUKE ENERGY LEE	001	2,386	4,347	0	201.61	21.56	22.06	475.7	0.0063
SC	DUKE ENERGY LEE	002	2,643	4,140	0	201.57	20.54	22.06	453.1	0.0060
TN	U.S. DEPARTMENT OF ENERGY, Y-12 PLANT	002	2,354	2,336	4	137.55	16.99	24.66	418.9	0.0056
AL	ALABAMA POWER COMPANY - GORGAS	005	9,443	8,091	0	268.85	30.09	13.76	414.1	0.0055
~~GA~~	~~MOUNT VERNON MILLS, INC. - APPAREL FABRIC~~	~~EU03~~	~~354~~	~~351~~	~~4~~	~~67.72~~	~~5.18~~	~~76.67~~	~~408.6~~	~~0.0054~~

18



GEORGIA'S RP SOURCES

- GEORGIA PACIFIC CORPORATION, CEDAR SPRIN - UNITS R402, U500, U501
- GEORGIA-PACIFIC BRUNSWICK OPERATIONS - UNITS F1 and M24
- GEORGIA-PACIFIC CORP SAVANNAH RIVER MILL - UNITS B001, B002, B003
- INLAND PAPERBOARD & PACKAGING, INC. - UNIT F4
- INTERNATIONAL PAPER - SAVANNAH MILL - UNIT PB13
- INTERSTATE PAPER LLC - UNIT F1
- JESUP MILL, RAYONIER PERFORMANCE FIBERS - UNITS PB02, PB03, RF01, RF04
- PACKAGING CORPORATION OF AMERICA – VALDO - UNIT 1017
- SOUTHERN STATES PHOSPHATE & FERTILIZER C - UNIT SA02
- GEORGIA POWER COMPANY, MITCHELL STEAM-EL - UNIT SG03
- SAVANNAH ELECTRIC: KRAFT STEAM – ELECTRI - UNITS SG01, SG02, SG03
- SAVANNAH ELECTRIC: MCINTOSH STEAM - ELEC - UNIT SG01

19

REASONABLE PROGRESS CONTROLS

Facility	Emissions Unit	Permit limit (tpy of SO2, except as noted)	Estimated Tons Reduced
GA Pacific – Brunswick Cellulose	F1 Pwr. Boiler 4	Not more than 568 tons SO2 per 12 consecutive months, compliance date of January 1, 2012	1074
Georgia Pacific – Cedar Springs	Power Boiler U500	135 pound SO2 per hour (same as BART exemption modeling limit)	1385
	Power Boiler U501	135 pound SO2 per hour (same as BART exemption modeling limit)	1385
International Paper – Savannah	Pwr. Boiler 13, including combustion of process organic emissions	Not more than 6758 tons SO2 per 12 consecutive months, compliance date of January 1, 2016	2000
Packaging Corp. of America	CE Power Boiler	Not more than 600 tons SO2 per 12 consecutive months, compliance date of January 1, 2012	53
Rayonier Perf. Fibers	PB02 Pwr. Boiler 2	Not more than 318 tons SO2 per 12 consecutive months, compliance date of June 4, 2008	306
	PB03 Pwr. Boiler 3	Not more than 149 tons SO2 per 12 consecutive months, compliance date of June 4, 2008	1448
	RF01 No. 5 Rec. Furn.	Not more than 194 tons SO2 per 12 consecutive months, compliance date tied to facility modification	139
	RF04 No. 6 Rec. Furn.	Not more than 307 tons SO2 per 12 consecutive months, compliance date tied to facility modification	27
Southern States Phosphate and Fertilizer	SA02 Acid Plant 2	Not more than 580 tons SO2 per 12 consecutive months, compliance date of January 1, 2014	228

22

RPGs IN GEORGIA

- Adjusted future year visibility projections using facility-specific sensitivity results from the model to account for additional emission controls.
  - No need to rerun model for final RPGs.
  - Allows for multiple updates to final control limits

Facility Name	Unit	2018 SO2	COHU	GRSM	OKEF	ROMA	SAMA	SIPS	WOLF
GEORGIA PACIFIC CORPORATION, CEDAR SPHN	B402	1726.31	-0.0475	-0.0230	-0.0067	-0.0066	-0.0034	-0.0064	-0.0030
GEORGIA PACIFIC CORPORATION, CEDAR SPHN	U500	2426.38	-0.0300	-0.0323	-0.0095	-0.0093	-0.0048	-0.0091	-0.0043
GEORGIA PACIFIC CORPORATION, CEDAR SPHN	U501	2532.99	-0.0344	-0.0337	-0.0099	-0.0097	-0.0050	-0.0094	-0.0045
GEORGIA POWER COMPANY, MITCHELL STEAM-EL	S003	6920.74	-0.0494	-0.0565	-0.3028	-0.0359	-0.1701	-0.0964	-0.1492
GEORGIA-PACIFIC BRUNSWICK OPERATIONS	F1	1842.27	-0.0427	-0.0152	-0.2410	-0.1466	-0.0562	-0.0218	-0.3170
GEORGIA-PACIFIC BRUNSWICK OPERATIONS	M24	193.01	-0.0013	-0.0014	-0.0294	-0.0154	-0.0038	-0.0023	-0.0332
GEORGIA-PACIFIC CORP SAVANNAH RIVER MILL	BO01	1814.25	-0.0034	-0.0013	-0.0063	-0.0205	-0.0020	-0.0020	-0.0074
GEORGIA-PACIFIC CORP SAVANNAH RIVER MILL	BO02	1415.47	-0.0026	-0.0010	-0.0047	-0.0157	-0.0015	-0.0015	-0.0057
GEORGIA-PACIFIC CORP SAVANNAH RIVER MILL	BO03	1282.05	-0.0024	-0.0009	-0.0043	-0.0143	-0.0014	-0.0014	-0.0052
INLAND PAPERBOARD & PACKAGING, INC. -LIN	F2	1147.7	-0.0590	-0.0384	-0.0165	-0.0192	-0.0133	-0.0220	-0.0123
INLAND PAPERBOARD & PACKAGING, INC. -LIN	F4	3099.15	-0.1899	-0.1237	-0.0526	-0.0588	-0.0427	-0.0708	-0.0397
INTERNATIONAL PAPER - SAVANNAH MILL	PB13	8578.26	-0.1412	-0.0595	-0.5252	-1.1233	-0.1281	-0.0951	-0.5809
INTERSTATE PAPER LLC	F1	187.68	-0.0028	-0.0010	-0.0158	-0.0261	-0.0035	-0.0019	-0.0142
JESUP MILL, RAYONIER PERFORMANCE FIBERS	PB03	1596.95	-0.0149	-0.0110	-0.1452	-0.1506	-0.0255	-0.0229	-0.1437
JESUP MILL, RAYONIER PERFORMANCE FIBERS	PB02	623.85	-0.0058	-0.0043	-0.0568	-0.0588	-0.0092	-0.0089	-0.0561
JESUP MILL, RAYONIER PERFORMANCE FIBERS	EP01	353.28	-0.0031	-0.0023	-0.0310	-0.0314	-0.0049	-0.0048	-0.0300
JESUP MILL, RAYONIER PERFORMANCE FIBERS	EP04	353.87	-0.0031	-0.0023	-0.0304	-0.0315	-0.0049	-0.0048	-0.0301
PACKAGING CORPORATION OF AMERICA - VALDO	1017	653.55	-0.0055	-0.0063	-0.1279	-0.0299	-0.0341	-0.0096	-0.0466
SAVANNAH ELECTRIC, KRAFT STEAM - ELECTRI	S001	690.72	-0.0110	-0.0040	-0.0351	-0.0754	-0.0088	-0.0083	-0.0390
SAVANNAH ELECTRIC, KRAFT STEAM - ELECTRI	S002	703.68	-0.0112	-0.0041	-0.0369	-0.0768	-0.0090	-0.0084	-0.0398
SAVANNAH ELECTRIC, KRAFT STEAM - ELECTRI	S003	4474.37	-0.0715	-0.0260	-0.2470	-0.4882	-0.0572	-0.0486	-0.2528
SAVANNAH ELECTRIC, MCINTOSH STEAM - ELEC	S091	7017.13	-0.1005	-0.0659	-0.3771	-1.3139	-0.1217	-0.0953	-0.4222
SAVANNAH SUGAR REFINERY	U141	597.42	-0.0141	-0.0060	-0.0611	-0.1204	-0.0149	-0.0111	-0.0675
SOUTHERN STATES PHOSPHATE & FERTILIZER C	SA02	897.68	-0.0133	-0.0056	-0.0494	-0.1056	-0.0121	-0.0089	-0.0547

23

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24

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

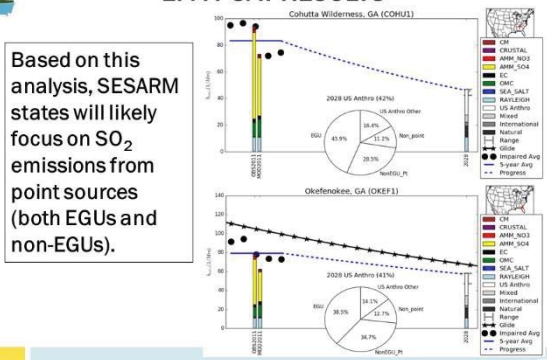
Georgia's Approach for Estimating Reasonable Progress in Round 2

Jim Boylan
Manager, Planning & Support Program
Georgia EPD - Air Protection Branch

Round 2 Regional Haze Planning Workshop
Denver, CO
December 7, 2017

EPA PSAT RESULTS

Based on this analysis, SESARM states will likely focus on SO_2 emissions from point sources (both EGUs and non-EGUs).



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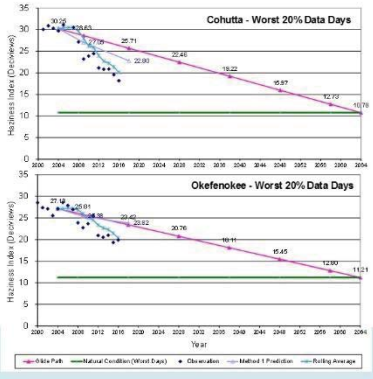
RPGs AND URP IN GEORGIA



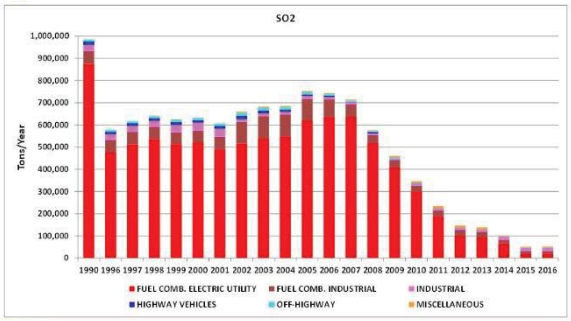
2

REASONABLE PROGRESS (RP)

- Area of Influence (Q/d*RT) analysis with 2011 and 2028 emissions
  - This work will be performed by SESARM contractor
  - Can be used to screen sources for 4-factor analysis
    - 2028 emissions are more appropriate than 2011 since we are looking at additional controls beyond "on-the-books"
    - If contribution > threshold ➔ added to list for RP analysis
    - Thresholds for areas on or below the URP should be less restrictive than areas above the URP
    - Screening analysis done at facility-level (not unit-level)
- 4-Factor Analysis - performed by SESARM states
  - May include single-source sensitivity modeling or source apportionment to calculate visibility impacts (Mm^{-1}/ton, $/$Mm^{-1}$)

5

SO_2 EMISSION TRENDS IN GEORGIA



3

SCREENING EXAMPLES

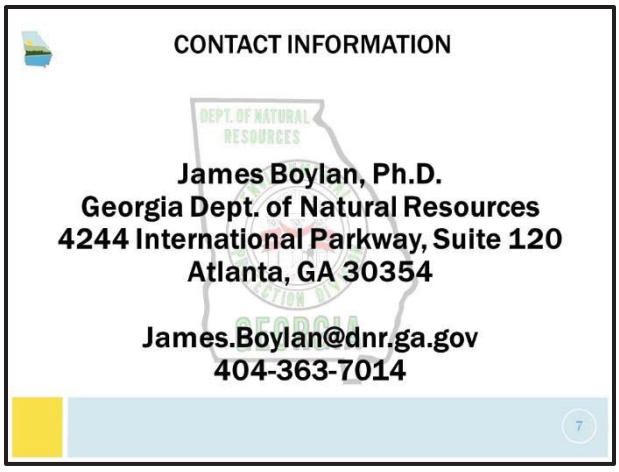
Cohutta Wilderness Area

	Plant	Fraction	Total
1	TVA - WIDOWS CREEK	12.05%	12.05%
2	ROWATEN NEWSPRINT & DIRECTORY - CALHOUN	11.45%	23.50%
3	INTERTRADE HOLDINGS, INC.	9.03%	32.54%
4	GEORGIA POWER COMPANY, BOWEN STEAM-ELECT	8.45%	40.99%
5	GEORGIA POWER COMPANY, YATES STEAM-ELECT	8.15%	49.14%
6	INLAND PAPERBOARD & PACKAGING, INC., LIN	6.15%	55.30%
7	GEORGIA POWER COMPANY, HAMMOND STEAM-ELE	3.04%	58.34%
8	DUKE ENERGY LEE	2.33%	60.67%
9	TVA BULL RUN FOSSIL PLANT	2.00%	62.67%
10	E. I. DU PONT DE NEMOURS AND COMPANY	1.97%	64.64%
11	ALUMINUM COMPANY OF AMERICA - SOUTH PLAN	1.90%	66.54%
12	TVA KINGSTON FOSSIL PLANT	1.69%	68.23%
13	A.E. STALEY MANUFACTURING COMPANY	1.64%	69.87%
14	CHEMICAL PRODUCTS CORPORATION	1.59%	71.46%
15	ALABAMA POWER COMPANY - GORGAS	1.53%	72.98%
16	BLUE RIDGE PAPER PRODUCTS - CANTON MILL	1.50%	74.49%
17	MOHAWK INDUSTRIES - SOUTH HAMILTON STREE	1.33%	75.82%
18	ROWATEN (ALABAMA), INC.	0.91%	76.78%
19	MOUNT VERNON MILLS, INC., APPAREL FABRIC	0.93%	77.71%
20	SHAW INDUSTRIES GROUP, INC. PLANT WD	0.83%	78.53%
21	DUKE ENERGY CORPORATION - RIVERBEND STEA	0.79%	79.33%
22	SHAW INDUSTRIES GROUP, INC. PLANT 20	0.79%	80.12%
	ALABAMA POWER COMPANY - E C GASTON	0.78%	80.90%
	EASTMAN CHEMICAL COMPANY	0.77%	81.67%
	SOLUTIA, INC	0.76%	82.43%
	GEORGIA POWER COMPANY, WANSLEY STEAM-ELE	0.72%	83.16%
	DUKE ENERGY CORPORATION - CLIFFSIDE STEA	0.72%	83.87%
	CHEM-TECH FINISHERS	0.68%	84.55%
	AMERICAN ELECTRIC POWER-CLINCH RIVER PLA	0.63%	85.17%
	GEORGIA POWER COMPANY, MCDONOUGH STEAM-E	0.62%	85.80%
	CONTINENTAL CARBON COMPANY	0.61%	86.40%
	LOU GAS & ELEC, MILL CREEK	0.60%	87.00%
	U.S. DEPARTMENT OF ENERGY, Y-12 PLANT	0.57%	87.57%
	DUKE ENERGY CORPORATION - BUCK STEAM STA	0.52%	88.09%
	TENNESSEE ALLOYS CORPORATION	0.43%	88.51%
	CARAUSTAR MILL GROUP, INC.	0.43%	88.94%
	SHAW INDUSTRIES GROUP, INC. PLANT 80	0.42%	89.36%
	ALABAMA POWER COMPANY (MILLER POWER PLAN	0.38%	89.75%
	PSI ENERGY - GALLAGHER	0.38%	90.12%

Okefenokee National Wildlife Refuge

	Plant	Fraction	Total
1	SAINT JOHNS RIVER	39.85%	39.85%
2	JEFFERSON SMURFIT CORPORATION (US)	1.65%	41.50%
3	SEMINOLE ELECTRIC COOPERATIVE, INC.	5.75%	47.25%
4	GEDAR BAY GENERATING COMPANY, LP	5.50%	52.75%
5	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC	4.50%	57.25%
6	GEORGIA-PACIFIC BRUNSWICK OPERATIONS	4.43%	61.68%
7	RAYONIER PERFORMANCE FIBERS, LLC	3.92%	65.28%
8	GEORGIA-PACIFIC CORP. - PULP/PAPER MILL	2.74%	68.02%
9	MILLENNIUM SPECIALTY CHEMICALS	2.53%	70.55%
10	PROGRESS ENERGY FLORIDA, INC. CRYSTAL RI	2.35%	72.90%
11	IFF CHEMICAL HOLDINGS, INC.	1.95%	74.85%
12	JESUP MILL, RAYONIER PERFORMANCE FIBERS	1.92%	76.78%
13	INTERNATIONAL PAPER - SAVANNAH MILL	1.77%	78.55%
14	SCE&G CANADYS	1.45%	80.00%
	SAVANNAH ELECTRIC, MCINTOSH STEAM - ELEC	1.24%	81.24%
	SAVANNAH ELECTRIC, KRAFT STEAM - ELECTRI	1.15%	82.39%
	ANCHOR GLASS CONTAINER CORPORATION	1.13%	83.52%
	GEORGIA POWER COMPANY, YATES STEAM-ELEC	1.08%	84.61%
	SANTEE COOPER JEFFERIES	0.96%	85.57%
	GEORGIA-PACIFIC CORP SAVANNAH RIVER MILL	0.82%	86.39%
	GEORGIA POWER COMPANY, MITCHELL STEAM-EL	0.79%	87.18%
	BUCKEYE, FLORIDA, LIMITED PARTNERSHIP	0.71%	87.89%
	SANDERS LEAD CO	0.65%	88.54%
	CONTINENTAL CARBON COMPANY	0.63%	89.16%
	GULF POWER COMPANY - CRIST	0.58%	89.75%
	SANTEE COOPER CROSS	0.57%	90.32%

6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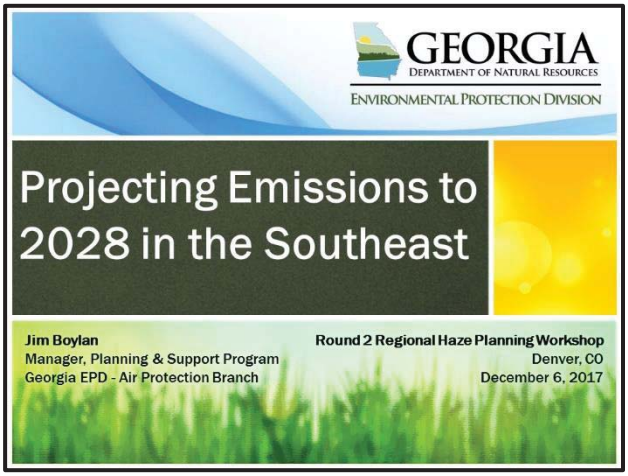
GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION
Projecting Emissions to 2028 in the Southeast
Jim Boylan
Manager, Planning & Support Program
Georgia EPD - Air Protection Branch
Round 2 Regional Haze Planning Workshop
Denver, CO
December 6, 2017


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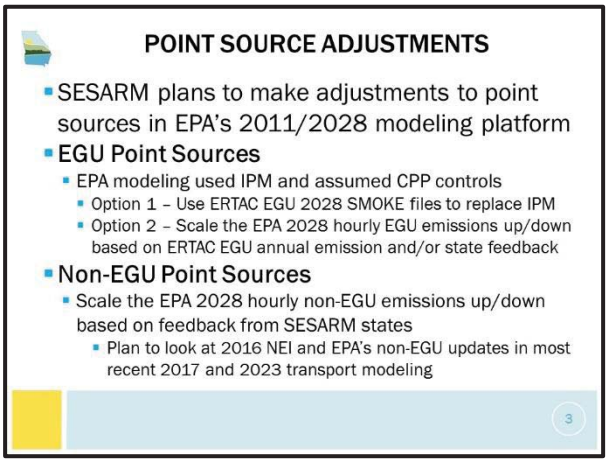
4


EPA PLATFORM
SESARM plans to use EPA's 2011/2028 modeling platform (v6.3el)
SESARM will make adjustments to 2028 point sources
Reasons for going with EPA's platform
Timing
Will not meet SIP deadline with any other option
Budget
Regional Haze budget significantly less in Round 2 compared to Round 1
Most of the sources sectors are reasonably represented in EPA's platform (i.e., SIP quality)
2


POINT SOURCE ADJUSTMENTS
SESARM plans to make adjustments to point sources in EPA's 2011/2028 modeling platform
EGU Point Sources
EPA modeling used IPM and assumed CPP controls
Option 1 – Use ERTAC EGU 2028 SMOKE files to replace IPM
Option 2 – Scale the EPA 2028 hourly EGU emissions up/down based on ERTAC EGU annual emission and/or state feedback
Non-EGU Point Sources
Scale the EPA 2028 hourly non-EGU emissions up/down based on feedback from SESARM states
Plan to look at 2016 NEI and EPA's non-EGU updates in most recent 2017 and 2023 transport modeling
3

ERTAC EGU Projection Tool: Origin and Uses

Combined cycle facility under construction, slated to begin commercial operations in 2018

Doris McLeod [1]
Julie McDill, PE [2]
Byeong-Uk Kim, PhD [3]
Jin-Sheng Lin, PhD [1]
Joseph Jakuta [4]
Mark Janssen [5]

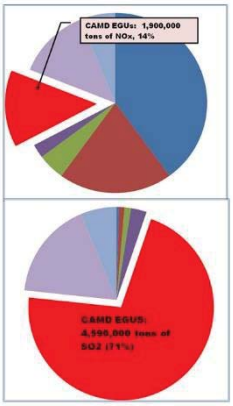
[1] Virginia Department of Environmental Quality
[2] Mid-Atlantic Regional Air Management Association
[3] Georgia Environmental Protection Division
[4] Ozone Transport Commission
[5] Lake Michigan Air Directors Consortium

Attributes of ERTAC Model

- **Conservative – no big swings in power generation.**
- **Data intensive – needs substantial state-supplied data.**
- **Regional and fuel modularity.**
- **Calculates future hourly estimates based on base year activity.**
- **Test hourly reserve capacity.**
- **Quickly evaluates various scenarios;**
  - **e.g., unit retirement, growth, and control**

CAMD EGU Data

- Clean Air Markets Division
- High quality hourly data in electronic format reported under 40 CFR Part 75 for fossil fuel fired units > 25 MWs
  - Activity (heat input, gross load)
  - Emissions (usually NO_x, SO_2, and CO_2)
- Emission contributions of the EGU sector
  - 2011 CAMD data: ≈4,800 unique units
  - 14% of the NO_x inventory
  - 71% of the SO_2 inventory



*Data from 2011 NEI v1

2

Introduction to ERTAC EGU v2.7

State and planning organization collaboration to build a model to project future EGU emissions suited to state air quality planning

Starting Points

- Base Year (BY) hourly continuous emissions monitor (CEM) data
  - BY & FY unit activity matches meteorology
  - More realistic for SIP modeling
- Regional growth rates (GRs) – EIA AEO2017 & NERC
- Information Supplied By States as of Spring 2017
  - New units, retirements,
  - Controls, fuel-switches, other

ERTAC EGU Tool Generates Future Hourly Estimates

- Regional unit capacity never exceeded
  - Unmet demand applied to other units
  - Generation deficit units (GDUs) created if demand exceeds system capacity on an hourly basis

Hourly Emissions Converted to SMOKE Format for AQ Modeling

5

Eastern Regional Technical Advisory Committee (ERTAC)

- **ERTAC EGU growth convened 2009**

Goal: **Build a low-cost, stable/stiff, fast, and transparent model to project electric generating unit (EGU) emissions including reasonable temporal profiles for activity and emissions**

Uses: **Provide EGU inventories suitable for**

- **State Implementation Plan (SIP) submittals**
- **Air quality modeling efforts**

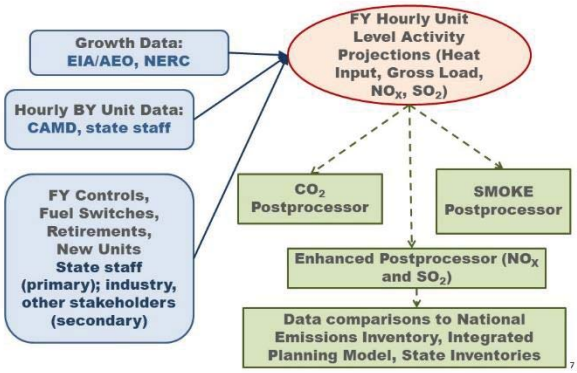
3

How the Model Works

- **Unit-level inventory of EGUs (capacity, fuel type, controls, hourly CEMs data for base year).**
- **Apply EIA-AEO growth rates by region and fuel type (model does not transfer generation between regions or between fuels).**
- **Model matches available capacity to projected demand; creates "demand deficit" units if demand exceeds capacity.**
- **For units that exceed hourly or annual capacity limits, add generation to Excess Generation Pool.**
- **Empty Excess Generation Pool to other available units.**
- **Calculate emissions and convert to SMOKE and create reports (model does not generate new controls).**

6

Information Development & Flow



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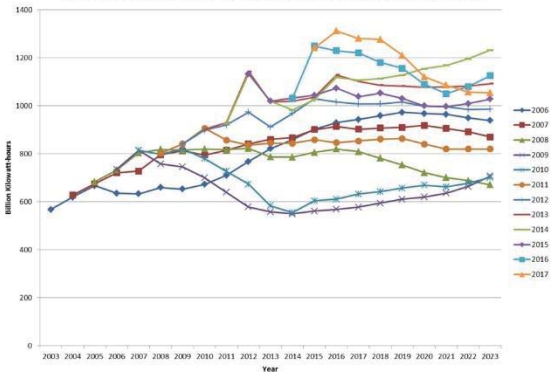
AEO Projection of Electricity Generation Using Natural Gas in CONUS



Source: EIA AEO 2006 – EIS AEO 2017, Table 8

10

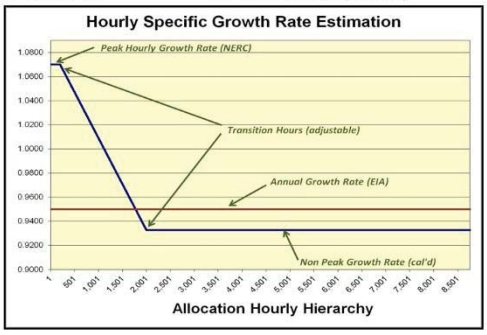
The Five Basic Files

- **Unit Availability File (UAF)**
  - Backbone of the tool
  - Unit level data
  - Sources: CAMD, EIA, NEEDS, State Staff
- **Controls File**
  - Unit level data for SO_2 and NOx
  - Emission rates or control efficiencies
  - May be supplemented with the Seasonal Controls File
- **Growth Rates File**
  - Growth rates by region and fuel unit type
  - Annual based on EIA reference case
  - Peak based on NERC
- **Input Variables File**
  - A variety of variables that can be changed for each region and fuel unit type
  - Many deal with new, planned units or GDUs
- **CAMD Hourly Base Year Data**

8

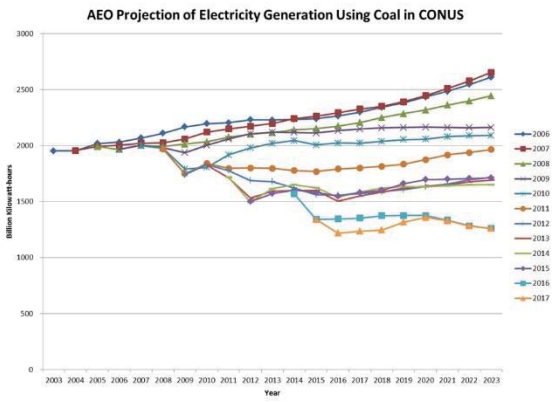
Growth Rates (GR)

- Peak GR = 1.07
- Annual GR = 0.95
- Transition hours of 200 (gas) & 2,000 (coal)
- Non Peak GR = 0.9328 (calculated)



11

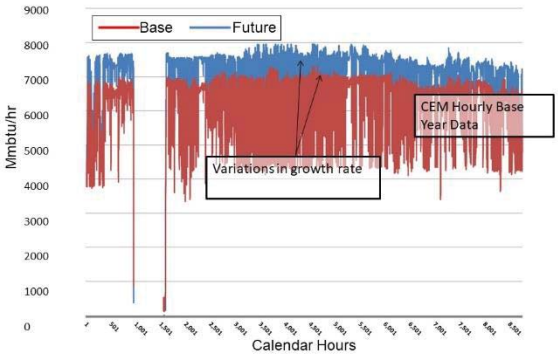
AEO Projection of Electricity Generation Using Coal in CONUS



Source: EIA AEO 2006 – EIS AEO 2017, Table 8

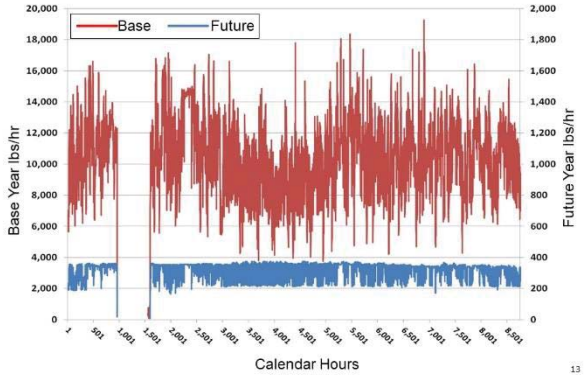
9

Unit Level Hypothetical Example #1 Coal Fired Existing Unit, 800 MW



12

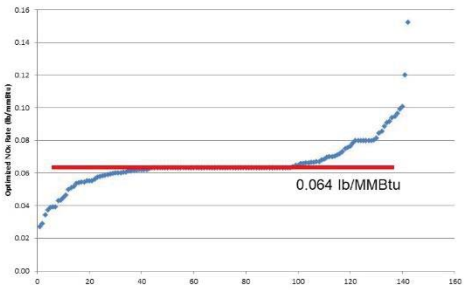
Unit Level Hypothetical Example #2
Coal Fired Existing Unit, 800 MW – SO_2 Control



13

SCR NOx Rates

Distribution of Optimized NOx rates for 141 SCR units included in MDE Study



16

ERTAC EGU v2.7

- **ERTAC v2.7 reference case (no CSAPR)**
  - AEO2017 (Annual Growth) & NERC (Peak Growth) with two exceptions
    - SRVC and NYCW use IRP derived growth factors
  - State updates as of Spring 2017
  - Generation transfers to alternate fuels to correct specific issues
    - Transfer of Indian Point nuclear power plant generation to combined cycle NG (for years after 2021)
    - Transfer of power in a few hours from coal to NG in RFCE (missing generation)
    - Transfer of power from coal to NG in FRCC/FL to alleviate coal GDU
    - Unit characteristic updates in SRDA to alleviate coal GDU (one unit at Big Cajun 2/LA)
    - Transfer of power from coal to NG in NEWE to alleviate coal GDU (2017 only)
- **ERTAC v2.7 CSAPR2 Compliant Scenario includes**
  - Emission rate adjustments on facilities with SCR & SNCR in CSAPR states for ozone season only
    - Units with SNCR's reduced to 0.125 lb/MMBtu (EPA did not reduce SNCR in their Analytics approach)
    - Units with SCR's reduced to 0.064 lb/MMBtu (EPA used 0.1 lb/MMBtu)
    - Similar to MD study of "best rates"
  - Emission rate adjustments on some facilities without post-combustion controls in OK

14

	Region	State	Budget	Assurance Level	PY OSN Ox (tons)	Over Budget?	Over Assurance?
CENSARA		AR	12,048	14,578	18,119	6,071	3,541
CENSARA		IA	11,272	13,639	7,801	(3,471)	(5,838)
CENSARA		KS	8,027	9,713	8,307	280	(1,406)
CENSARA		LA	18,639	22,553	14,426	(4,213)	(8,127)
CENSARA		MO	15,780	19,094	13,764	(2,016)	(5,330)
CENSARA		OK	11,641	14,086	16,240	4,599	2,154
CENSARA		TX	52,301	63,284	57,026	4,725	(6,258)
LADCO		IL	13,601	16,457	14,443	842	(2,014)
LADCO		IN	23,303	28,197	18,459	(4,844)	(9,738)
LADCO		MI	17,023	20,598	12,242	(4,781)	(8,356)
LADCO		OH	19,522	23,622	14,707	(4,815)	(8,915)
LADCO		WI	7,915	9,577	6,893	(1,022)	(2,684)
MANE VU		MD	3,828	4,632	3,980	152	(652)
MANE VU		NJ	2,062	2,495	1,969	(93)	(526)
MANE VU		NY	5,135	6,213	6,193	1,058	(20)
MANE VU		PA	17,952	21,722	16,840	(1,112)	(4,882)
SESARM		AL	13,211	15,985	7,148	(6,063)	(8,837)
SESARM		KY	21,115	25,549	21,329	214	(4,220)
SESARM		MS	6,315	7,641	9,077	2,762	1,436
SESARM		TN	7,736	9,361	4,806	(2,930)	(4,555)
SESARM		VA	9,223	11,160	4,765	(4,458)	(6,395)
SESARM		WV	17,815	21,556	15,667	(2,148)	(5,889)
TOTAL			**315,464**		**294,201**		
PENALTY					**14,264.07**		
TOTAL W/PENALTY			**315,464**		**308,465**		

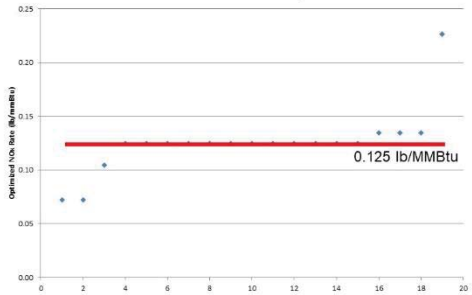
AEO2017 no CPP w/controls - Analysis

Need a 3:1 ratio for emissions above assurance level

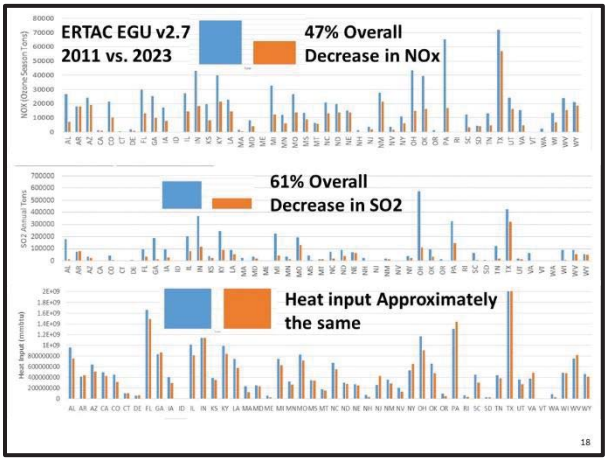
17

SNCR NOx Rates

Distribution of Optimized NOx rates for 19 SNCR units included in MDE Study

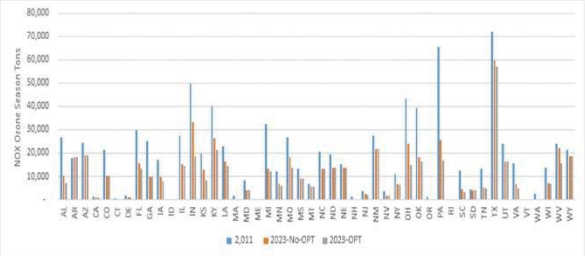


15



18

2023 Optimized vs. Non-Optimized



Note: Some states in Western USA did not provide updates to ERTAC EGU for new units and controls. Examples include AZ, NM, WY. Their 2023 emissions might be lower than was estimated. Only CSAPR states were optimized.

19

ERTAC EGU Contacts

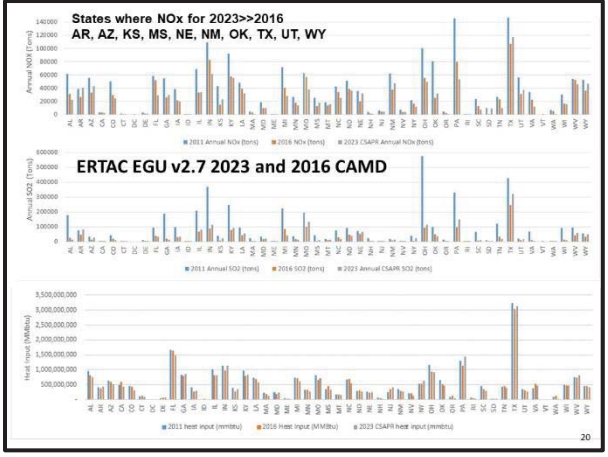
- States send comments to:
  - NE: Wendy Jacobs
    Wendy.Jacobs@ct.gov
  - Southeast: John Hornback
    Hornback@metro4-sesarm.org
  - Midwest: John Welch
    JWelch@idem.in.gov
  - CENRAP: Mark Janssen
    Janssen@ladco.org
    ertacegufeedback@gmail.com

22

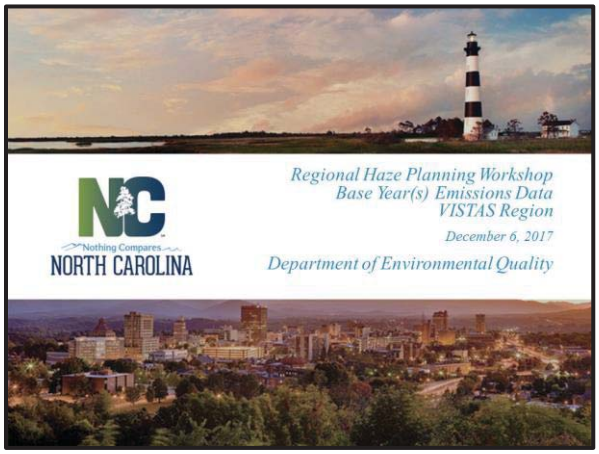
Additional Information

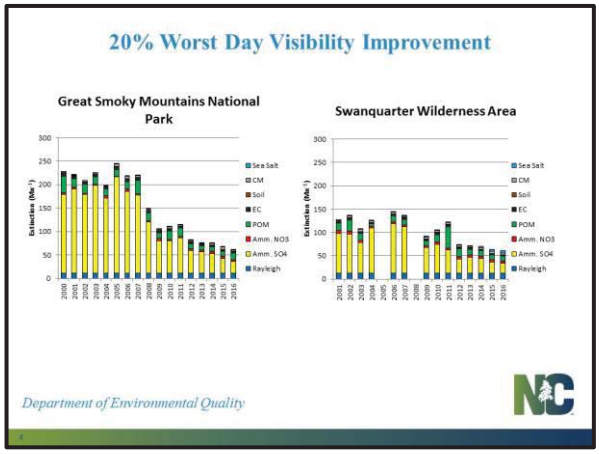
- ERTAC EGU files are located here:
  - http://www.marama.org/2013-ertac-egu-forecasting-tool-documentation
  - Currently the latest files on MARAMA webpage are v2.6
  - MARAMA expects to post v.2.7 shortly
  - Also, 2028 ERTAC EGU files are available
- Other ERTAC materials are located here:
  - Sign In URL:https://marama.sharefile.com/
  - Username:apaty@marama.org
  - Password:ERTACoutr3ach
- Next, will create a 2016 base year with new projections.

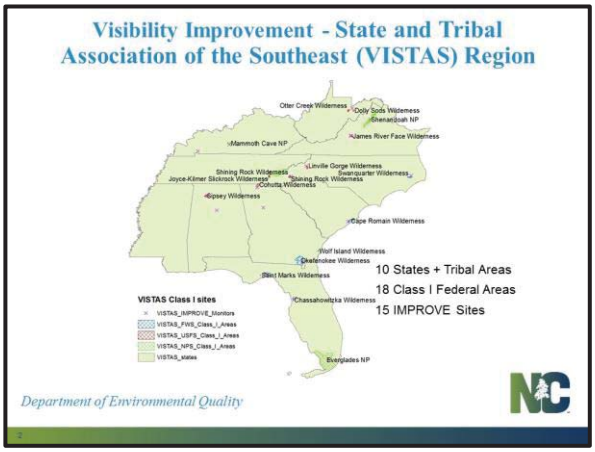
21

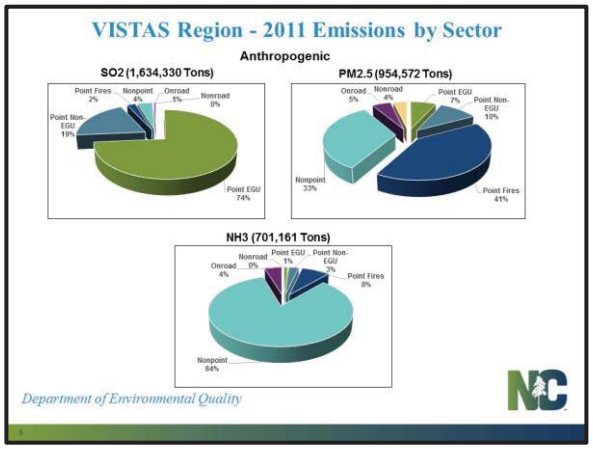


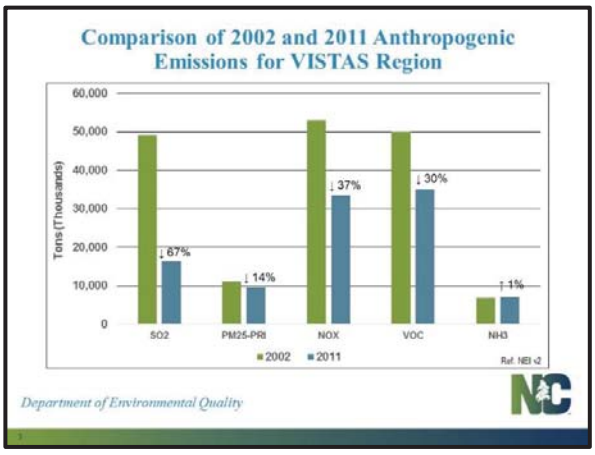
20

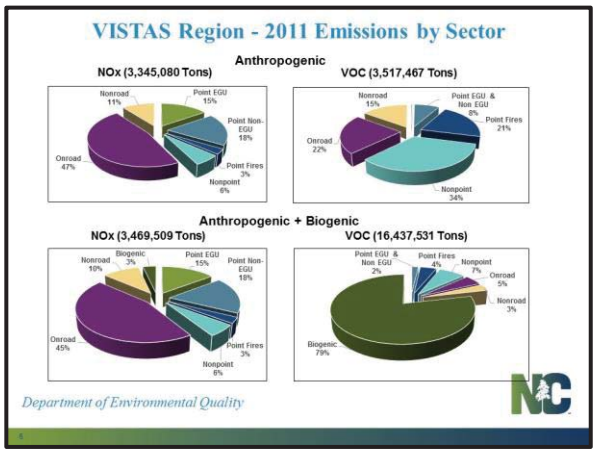

Nothing Compares
NORTH CAROLINA
Regional Haze Planning Workshop
Base Year(s) Emissions Data
VISTAS Region
December 6, 2017
Department of Environmental Quality


20% Worst Day Visibility Improvement
Great Smoky Mountains National Park
Swanquarter Wilderness Area
Sea Salt
CM
Soil
EC
POM
Amm. NO3
Amm. SO4
Rayleigh
Department of Environmental Quality


Visibility Improvement - State and Tribal Association of the Southeast (VISTAS) Region
10 States + Tribal Areas
18 Class I Federal Areas
15 IMPROVE Sites
VISTAS Class I sites
Department of Environmental Quality


VISTAS Region - 2011 Emissions by Sector
Anthropogenic
SO2 (1,634,330 Tons)
PM2.5 (954,572 Tons)
NH3 (701,161 Tons)
Department of Environmental Quality

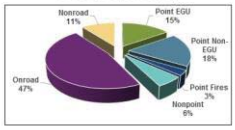

Comparison of 2002 and 2011 Anthropogenic Emissions for VISTAS Region
Tons (Thousands)
67%
14%
37%
30%
1%
SO2
PM25-PRI
NOX
VOC
NH3
2002
2011
Department of Environmental Quality


VISTAS Region - 2011 Emissions by Sector
Anthropogenic
NOx (3,345,080 Tons)
VOC (3,517,467 Tons)
Anthropogenic + Biogenic
NOx (3,469,509 Tons)
VOC (16,437,531 Tons)
Department of Environmental Quality

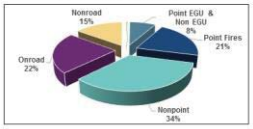
VISTAS Region - 2011 Emissions by Sector

Anthropogenic

NOx (3,345,080 Tons)

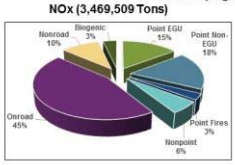


VOC (3,517,467 Tons)

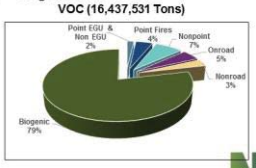


Anthropogenic + Biogenic

NOx (3,469,509 Tons)



VOC (16,437,531 Tons)



Department of Environmental Quality

Conclusions

- EPA's 2011/2028v6.3el modeling platform is a good starting point
  - Although a bit long-in-the-tooth:

- 2011 base year is well established and bench-marked
- Focus on updating 2028 inventory and bench-marking of model
- Should be able to develop reasonably accurate 2028 inventory regardless of base year starting point

Department of Environmental Quality

Thank you! Questions?

Randy Strait, randy.strait@ncdenr.gov
Division of Air Quality
North Carolina Department of Environmental Quality

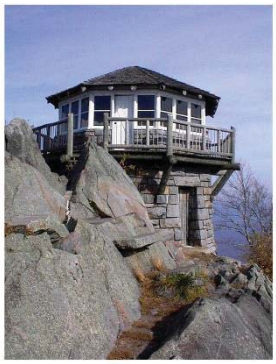
Appendix F-3c - Presentation to FLMs, EPA Region 4 CC/TAWG, January 31, 2018

VISTAS

FLM/EPA Discussion
January 31, 2018

Planned Approach (1)

- Similar to last regional haze planning effort
- About half of the time of the first project
- About 5% of the funding
- Will use EPA's 2011 base year and 2028 future year inventory and modeling platform
- Will provide slight adjustments to 2028 inventories for EGUs and some other major sources
- Will use EPA inventories for other categories



Planned Approach (2)

- Intentions
  - assess where we are currently
  - assess 2028 expected visibility and glide slope
  - evaluate progress
  - evaluate impacts on VISTAS Class I areas
  - evaluate downwind receptor impacts
  - consult with surrounding regions
  - consult with FLMs
  - interact with EPA
  - communicate with stakeholders
  - support state SIP submittals by July 31, 2021 deadline

VISTAS Organization

- STAD – State and Tribal Air Directors (policy)
- Coordinating Committee (operations)
- Technical Analysis Work Group
- Project Coordinator (John Hornback)
- EPA
- FLMs
- Stakeholders
- Other RPOs

Procurement Process

- RFP released December 21
- Proposal submittal deadline January 26
- 3 proposals received
  - 1 sole bid
  - 2 team bids
- Selection Committee formed and operating
- Recommendation goal by February 15

Contractor Arrangements

- Execute contract by March 1
- Develop concurrent work plan and QAPP
- Submit QAPP to EPA by March 15
- Receive QAPP approval from EPA by April 15
- Contractor queuing during April
- Technical work begins by May 1

Technical Project Components (2)

- Air quality modeling
- Source apportionment tagging
- Model performance evaluation
- Future year model projections
- Data handling and sharing
- Optional tasks

Technical Project Schedule

- States will begin preparing inventory updates after March 1
- Air quality modeling completed by December
- Other analysis and evaluation by next spring
- All deliverables including data and reports by June 20, 2019
- States begin developing there SIPs thereafter
- States submit SIPs by July 31, 2021

Discussion

- Q&A
- Feedback
- Next steps

Technical Project Components (1)

- Project management
- Emissions inventory updates
- Emissions processing
- Data acquisition and preparation
- Area of influence analysis

Contact Information

- Project Coordinator: John Hornback
- Phone: 404-361-4000
- E-mail: hornback@metro4-sesarm.org
- Web: www.metro4-sesarm.org
  - Technical center tab
  - Contractor web site
  - Cloud?

Appendix F-3d - VISTAS Call with FLMs August 1, 2018

VISTAS

Call with Federal Land Managers (FLMs)
August 1, 2018

Jim Boylan, Georgia EPD
John Hornback, Metro 4/SESARM

1

Presentation Outline

- Introductory comments
- VISTAS contractors
- Completed, ongoing, and future work
- Collaboration/consultation
- State SIP development
- Response to National Park Service questions
- Additional Q&A
- Concluding comments

2

VISTAS Tasks

- Determine current visibility
- Determine 2028 expected visibility and glide slopes
- Perform Area of Influence (AOI) analysis
- Perform source apportionment analysis (PSAT)
- Produce documentation
- Support state SIP submittals by July 31, 2021 deadline
- **NOTE: Individual VISTAS states will assess reasonable progress for sources in their own state**

3

VISTAS Technical Plan

- Similar to last regional haze planning effort
- EPA's 2011 el base year emissions (unchanged)
- EPA's 2028 el future year emissions with state specific adjustments for EGU and non-EGU point sources
- EPA's 2028 el inventories without adjustment for other categories
- CAMx v6.40 with PSAT

4

VISTAS Contractors

- Contractor
  - Eastern Research Group

ERG

- Subcontractor
  - Alpine Geophysics

ALPINE GEOPHYSICS

5

Progress Report
(documents)

- December 21, 2017 – RFP released
- January 26, 2018 – Proposals received
- March 1, 2018 – Contract awarded
- April 4, 2018 – QAPP (approved by EPA Region 4)
- April 19, 2018 – Work plan approved
- June 27, 2018 – Modeling protocol approved *

*(review and input from EPA OAQPS and Region 4)

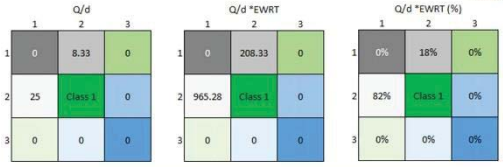
6

Progress Report
(completed/in process)

- Emission inventory updates – complete
- Emission inventory update report – nearing completion
- Emission processing/merging – complete
- 2028 simulation - running
- Benchmarking – complete (draft report rec'd)
- Base year modeling – initiated

7

(Q/d)*EWRT Calculations



Row (i)	Col (j)	ΣQ [tpy]	d [km]	Q/d [tpy km^{-1}]	Q/d*EWRT [tpy km^{-1} Mm^{-1}]	Q/d*EWRT [%]
2	1	300	12	25	965.28	82%
1	2	100	12	8.33	208.33	18%

10

Progress Report
(remaining schedule)

- September 1, 2018 – base year modeling
- September 1, 2018 – area of influence analysis
- October 1, 2018 – model performance evaluation
- December 1, 2018 – future year modeling
- December 31, 2018 – future year projections
- April 19, 2019 – PSAT modeling
- May 3, 2019 – PSAT results
- July 1, 2019 – final report and project ends

8

Consultation Plan

- Late 2017/early 2018 – initiated by MANE-VU
- December 5-7, 2017 – WESTAR Round 2 Regional Haze Planning Workshop
- January 31, 2018 – discussions with FLMs
- August 1, 2018 – discussions with FLMs
- Late summer 2018/spring 2019 – stakeholders
- Ongoing – EPA OAQPS and Regions 3 & 4
- Ongoing – FLMs – especially late-2018/early-2019
- 2019 – surrounding RPOs (to be initiated by VISTAS states)

11

Extinction Weighted Residence Time Calculations

Row (i)	Col (j)	# Trajectory hours	Trajectory (k)	Extinction (bext$_k$) [Mm^{-1}]	τ_{ijk} [hrs]	(bext$_k$)τ_{ijk} [Mm^{-1} hrs]	$\Sigma\tau_{ij}$ [hrs]	Σ(bext$_k$)τ_{ijk} [Mm^{-1} hrs]	EWRT [Mm^{-1}]
2	1	5	1 (Red)	75	5	375	18	695	38.61
		4	2 (Orange)	80	4	320			
1	2	4	1 (Yellow)	50	4	200	18	450	25
		5	2 (Purple)	50	5	250			

9

State SIP Development

- Underway via …
  - Participation in VISTAS process
  - Collaboration and consultation with all interests
- State-specific considerations/analyses have begun and will continue as project deliverables are completed/distributed
- SIP submittals due – July 31, 2021

12

Questions/Answers

- Using EPA 2011 and 2028 inventories and modeling platform with some upgrades
  - Yes
- 2011 and 2028 inventories
  - 2011 was not adjusted
  - 2028 EGU and non-EGU point updates completed June 30, 2018
  - Inventory update report – final due by mid-August

13

Questions/Answers

- Will states be on their own to evaluate control strategies?
  - Each state is ultimately responsible for determinations of the content of their SIPs, as in the last round.
  - Yet, much collaboration will occur in this project leading up to determinations of sources to evaluate and evaluations of feasible controls.

16

Questions/Answers

- Area of influence analysis and SO_2/NO_x rankings for 2011 and 2028
  - To be completed by September 1, 2018
- 2028 projections:
  - Modeling to be completed by December 1, 2018
  - Projections to be completed by December 31, 2018
- Nature of 2028 modeling
  - "on-the books / on the way" (required/enforceable)

14

Questions/Answers

- How will states use data generated to screen sources for 4-factor analysis?
  - Specific approach(es) be determined.
  - FLM input will be considered.
  - Threshold options
    - Cumulative source contribution (e.g., 80%, 60%, 40%,…)
    - Individual contributions by unit or facility (e.g., 1%, 5%, 10%,…)

17

Questions/Answers

- VISTAS states' usage of project deliverables
  - AOI review – September-December 2018
  - Will use AOI to rank and select sources
  - Start 4-factor analysis early 2019
    - Source apportionment will be part of 4-factor analysis and can be used to adjust reasonable progress goals (RPGs) if additional controls are required
    - May use CoST tool, EPA's Air Pollution Control Cost Manual, data obtained from facilities, etc.
    - Will consult with FLMs regarding screening and selection methodology and process for sources

15

Questions/Answers

- Will a best-and-final run be conducted?
  - Not in contract at this time
  - PSAT can be used to adjust RPGs for new controls at individual facilities without another CAMx run
- Use of state-specific modeling domains?
  - Possible uses include brute force sensitivities, CAMx v6.5, fine grid modeling, best and final CAMx run, etc.

18

Questions/Answers

- Opportunities for FLM input
  - Ongoing
  - AOI will be used for ranking sources.
  - Expect this to occur September-December 2018.
  - FLMs may provide thoughts at anytime
  - Early sharing of FLM concerns and reasons would be helpful

19

For Further Information
(Contact)

- Project Coordinator
  - John Hornback – Metro 4/SESARM hornback@metro4-sesarm.org
- Coord Committee Chair
  - Jim Boylan – Georgia james.boylan@dnr.ga.gov
- Tech Analysis WG Co-chairs
  - Randy Strait – North Carolina randy.strait@ncdenr.gov
  - Alanna Keller – West Virginia alanna.j.keller@wv.gov
- Web site
  - https:metro4-sesarm.org
  - Selected information will be made available from the Technical Center dropdown on this web site.
  - Other information will be made available upon request.

20

Appendix F-3e - VISTAS Presentation to other RPOs, September 5, 2018

VISTAS

Call with MJOs
September 5, 2018

John Hornback, Metro 4/SESARM

1

Presentation Outline

- Introductory comments
- VISTAS contractors
- Completed, ongoing, and future work
- Collaboration/consultation
- State SIP development
- Response to National Park Service questions
- Additional Q&A
- Concluding comments

2

VISTAS Tasks

- Determine current visibility
- Determine 2028 expected visibility and glide slopes
- Perform Area of Influence (AOI) analysis
- Perform source apportionment analysis (PSAT)
- Produce documentation
- Support state SIP submittals by July 31, 2021 deadline
- **NOTE: Individual VISTAS states will assess reasonable progress for sources in their own state**

3

VISTAS Technical Plan

- Similar to last regional haze planning effort
- EPA's 2011 el base year emissions (unchanged)
- EPA's 2028 el future year emissions with state specific adjustments for EGU and non-EGU point sources
- EPA's 2028 el inventories without adjustment for other categories
- CAMx v6.40 with PSAT

4

VISTAS Contractors

- Contractor
  - Eastern Research Group

ERG

- Subcontractor
  - Alpine Geophysics

ALPINE GEOPHYSICS

5

Progress Report
(documents)

- December 21, 2017 – RFP released
- January 26, 2018 – Proposals received
- March 1, 2018 – Contract awarded
- April 4, 2018 – QAPP (approved by EPA Region 4)
- April 19, 2018 – Work plan approved
- June 27, 2018 – Modeling protocol approved *

*(review and input from EPA OAQPS and Region 4)

6

Progress Report
(completed/in process)

- 2028 emission inventory updates and report – complete
- Conversion of 2028 point source emission files – pre-processing – complete (report – nearing completion)
- 2028 emissions SMOKE modeling – ready to begin
- 2011 base year emissions modeling - complete
- Benchmarking – ongoing (1st three reports received – one approved)
- Model performance evaluation – initiated
- Area of influence analysis – nearing completion

7

Progress Report
(remaining schedule)

- October 1, 2018 – model performance evaluation
- October 31, 2018 – AOI analysis & report
- December 1, 2018 – future year modeling (currently projected for early November)
- December 31, 2018 – future year projections
- April 19, 2019 – PSAT modeling
- May 3, 2019 – PSAT results
- July 1, 2019 – final report and project ends

8

Consultation Plan

- Late 2017/early 2018 – initiated by MANE-VU
- December 5-7, 2017 – WESTAR Round 2 Regional Haze Planning Workshop
- January 31, 2018 – discussions with FLMs
- August 1, 2018 – discussions with FLMs
- October 2018 – initial discussions with CenSARA
- Fall 2018/spring 2019 – stakeholders
- Early/mid-2019 – surrounding RPOs (to be initiated by VISTAS states)
- Ongoing – EPA OAQPS and Regions 3 & 4
- Ongoing – FLMs – especially late-2018/early-2019

9

State SIP Development

- Underway via …
  - Participation in VISTAS process
  - Collaboration and consultation with all interests
- State-specific considerations/analyses have begun and will continue as project deliverables are completed/distributed
- SIP submittals due – July 31, 2021

10

Questions/Answers

- Using EPA 2011 and 2028 inventories and modeling platform with some upgrades
  - Yes
- 2011 and 2028 inventories
  - 2011 was not adjusted
  - 2028 EGU and non-EGU point updates completed June 30, 2018
  - Inventory update report – final due by mid-August

11

Questions/Answers

- Area of influence analysis and SO_2/NO_x rankings for 2011 and 2028
  - To be completed by October 31, 2018
- 2028 projections:
  - Modeling to be completed by December 1, 2018
  - Projections to be completed by December 31, 2018
- Nature of 2028 modeling
  - "on-the books / on the way" (required/enforceable)

12

Questions/Answers

- VISTAS states' usage of project deliverables
  - AOI review – September-December 2018
  - Will use AOI to rank and select sources
  - Start 4-factor analysis early 2019
    - Source apportionment will be part of 4-factor analysis and can be used to adjust reasonable progress goals (RPGs) if additional controls are required
    - May use CoST tool, EPA's Air Pollution Control Cost Manual, data obtained from facilities, etc.
    - Will consult with FLMs regarding screening and selection methodology and process for sources

13

Questions/Answers

- Will states be on their own to evaluate control strategies?
  - Each state is ultimately responsible for determinations of the content of their SIPs, as in the last round.
  - Yet, much collaboration will occur in this project leading up to determinations of sources to evaluate and evaluations of feasible controls.

14

Questions/Answers

- How will states use data generated to screen sources for 4-factor analysis?
  - Specific approach(es) be determined.
  - FLM input will be considered.
  - Threshold options
    - Cumulative source contribution (e.g., 80%, 60%, 40%,…)
    - Individual contributions by unit or facility (e.g., 1%, 5%, 10%,…)

15

Questions/Answers

- Will a best-and-final run be conducted?
  - Not in contract at this time
  - PSAT can be used to adjust RPGs for new controls at individual facilities without another CAMx run
- Use of state-specific modeling domains?
  - Possible uses include brute force sensitivities, CAMx v6.5, fine grid modeling, best and final CAMx run, etc.

16

Questions/Answers

- Opportunities for FLM input
  - Ongoing
  - AOI will be used for ranking sources.
  - Expect this to occur September-December 2018.
  - FLMs may provide thoughts at anytime
  - Early sharing of FLM concerns and reasons would be helpful

17

For Further Information
(Contact)

- Project Coordinator
  - John Hornback – Metro 4/SESARM hornback@metro4-sesarm.org
- Coord Committee Chair
  - Jim Boylan – Georgia james.boylan@dnr.ga.gov
- Tech Analysis WG Co-chairs
  - Randy Strait – North Carolina randy.strait@ncdenr.gov
  - Alanna Keller – West Virginia alanna.j.keller@wv.gov
- Web site
  - https:metro4-sesarm.org
  - Selected information will be made available on the Technical Center page at this web site.
  - Other information will be made available upon request.

18

Appendix F-3f - VISTAS Regional Haze Project Update, June 3, 2019

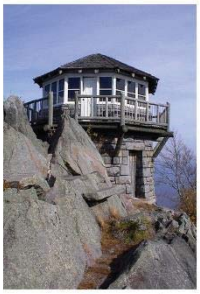
VISTAS Regional Haze Project Update

Jim Boylan (GA DNR), Randy Strait (NC DAQ), and John Hornback (Metro 4/SESARM)

FLM and EPA Consultation Conference Call
June 3, 2019

Presentation Outline

- Background
- Key VISTAS project tasks
- VISTAS technical analysis status
- What we've learned
- Consultation and communications
- Remaining work and projected schedule



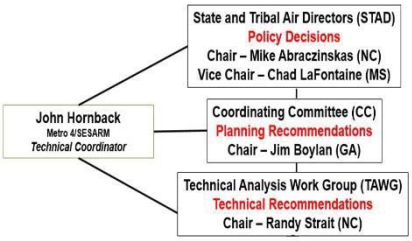
Participating Agencies in VISTAS Project

- **Visibility Improvement State and Tribal Association of the Southeast (VISTAS)**
- 10 SESARM states
- Knox County, Tennessee local agency
  - Represents the 17 local agencies in the Southeast
- Eastern Band of Cherokee Indians
  - Represents the 6 federally-recognized tribes in the Southeast

1999/2017 Regional Haze Rule

- Reduction of visibility impairment on the 20% "most impaired days" (anthropogenic impairment) in national park and wilderness (Class I) areas to natural conditions by 2064.
- No worsening of visibility on the 20% "clearest" days.
- Development of State Implementation Plans (SIPs) every 10 years to address emissions that contribute to regional haze.
- Round 2 SIP deadline extended to July 31, 2021

VISTAS Project Management Team



VISTAS Contractor Team

Primary Contractor
- **Eastern Research Group, Inc**
  - *Regi Oommen, Project Manager*

Subcontractor
- **Alpine Geophysics, LLC**
  - *Greg Stella, Subcontractor Manager*

VISTAS and Nearby Class I Areas

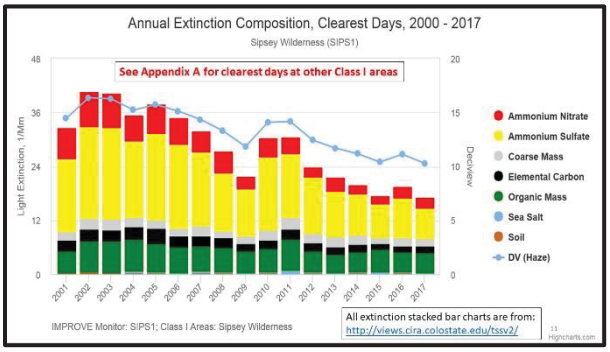
VISTAS FEDERAL CLASS I AREAS	
AL – Sipsey Wilderness Area (SIPS)	USDA Forest Service
FL – Chassahowitzka Wilderness Area (CHAS)	USDI Fish and Wildlife Service
FL – Everglades National Park (EVER)	USDI National Park Service
FL – Saint Marks Wilderness Area (SAMA)	USDI Fish and Wildlife Service
GA – Cohutta Wilderness Area (COHU)	USDA Forest Service
GA – Okefenokee Wilderness Area (OKEF)	USDI Fish and Wildlife Service
GA – Wolf Island Wilderness Area (WOLF)*	USDI Fish and Wildlife Service
KY – Mammoth Cave National Park (MACA)	USDI National Park Service
NC – Linville Gorge Wilderness Area (LIGO)	USDA Forest Service
NC – Shining Rock Wilderness Area (SHRO)	USDA Forest Service
NC – Swanquarter Wilderness Area (SWAN)	USDI Fish and Wildlife Service
SC – Cape Romain Wilderness Area (ROMA)	USDI Fish and Wildlife Service
TN/NC – Great Smoky Mountains National Park (GRSM)	USDI National Park Service
TN/NC – Joyce Kilmer-Slickrock Wilderness Area (JOYC)*	USDA Forest Service
VA – James River Face Wilderness Area (JARI)	USDA Forest Service
VA – Shenandoah National Park (SHEN)	USDI National Park Service
WV – Dolly Sods Wilderness Area (DOSO)	USDA Forest Service
WV – Otter Creek Wilderness Area (OTCR)*	USDA Forest Service

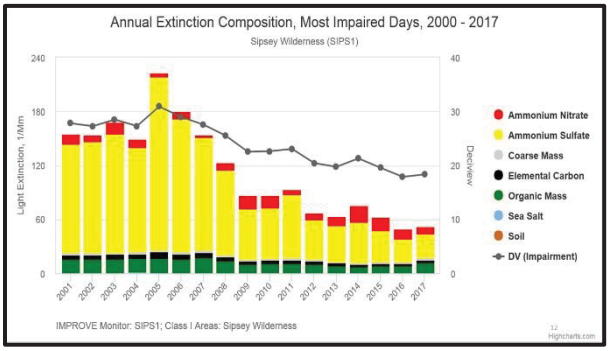
NEARBY NON-VISTAS FEDERAL CLASS I AREAS	
AR – Caney Creek Wilderness Area (CACR)	USDA Forest Service
AR – Upper Buffalo Wilderness Area (UPBU)	USDA Forest Service
LA – Breton Wilderness Area (BRIS)	USDI Fish and Wildlife Service
MO – Hercules-Glades Wilderness Area (HEGL)	USDA Forest Service
MO – Mingo Wilderness Area (MING)	USDI Fish and Wildlife Service
NJ – Brigantine Wilderness Area (BRIG)	USDI Fish and Wildlife Service

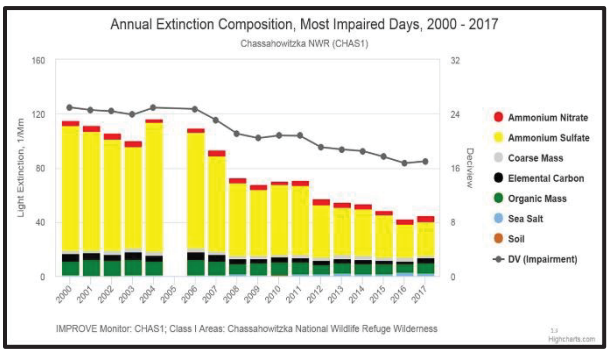
*This Class I Area does not have an IMPROVE monitor and will be represented by measurement data from a nearby Class I Area with an IMPROVE monitor.

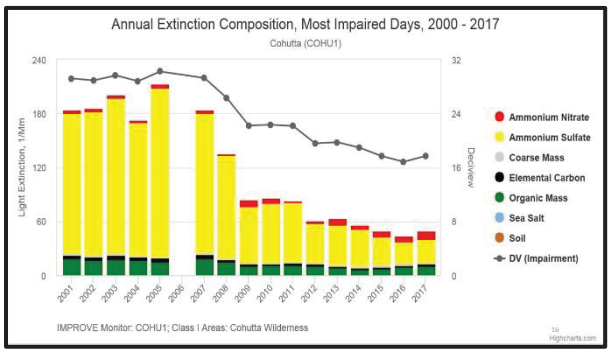
VISTAS Project Tasks

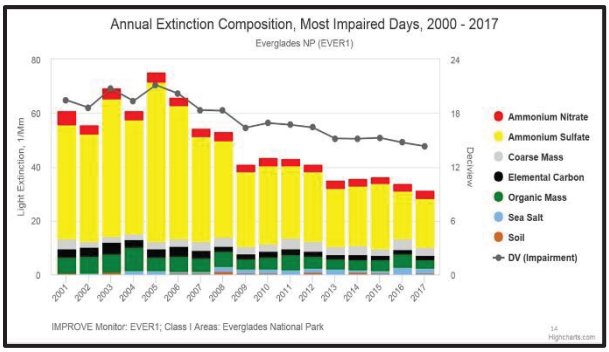
- RFP
- Bids & contractor selection
- Contract development
- Work plan and QAPP
- Modeling protocol
- Contract management
- Data acquisition/analysis
- Emission updates
- Emission processing
- Air quality modeling
- Model performance evals
- Future year projections
- Area of influence analysis
- Source apportionment tags
- Reports and archival

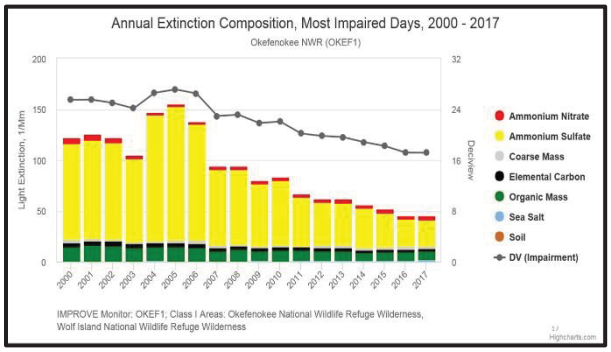


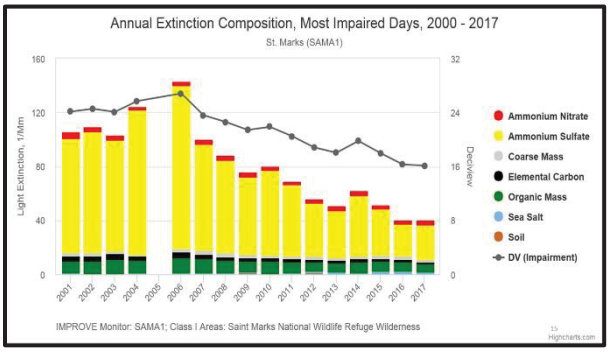


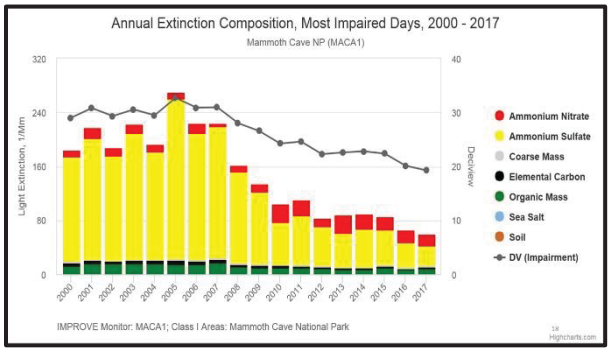

Annual Extinction Composition, Most Impaired Days, 2000 - 2017
Chassahowitzka NWR (CHAS1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: CHAS1; Class I Areas: Chassahowitzka National Wildlife Refuge Wilderness

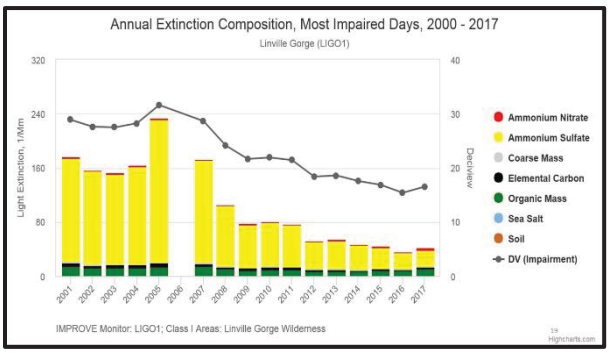

Annual Extinction Composition, Most Impaired Days, 2000 - 2017
Cohutta (COHU1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: COHU1; Class I Areas: Cohutta Wilderness

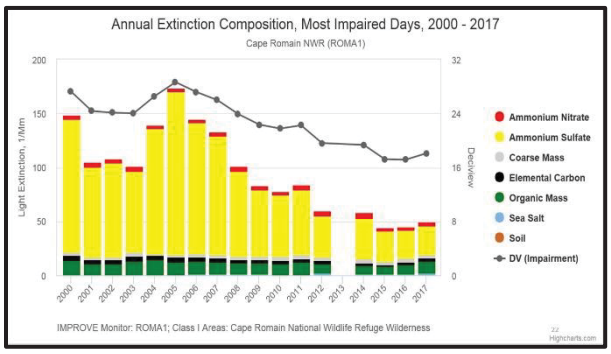

Annual Extinction Composition, Most Impaired Days, 2000 - 2017
Everglades NP (EVER1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: EVER1; Class I Areas: Everglades National Park

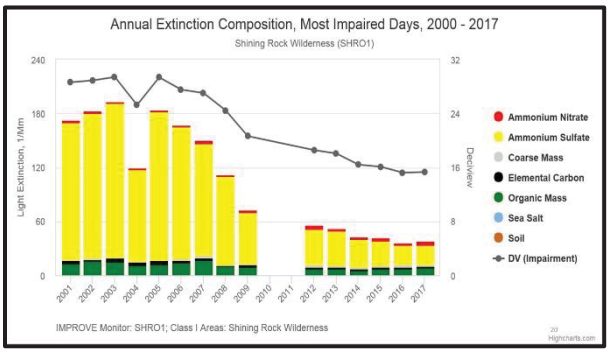

Annual Extinction Composition, Most Impaired Days, 2000 - 2017
Okefenokee NWR (OKEF1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: OKEF1; Class I Areas: Okefenokee National Wildlife Refuge Wilderness,
Wolf Island National Wildlife Refuge Wilderness

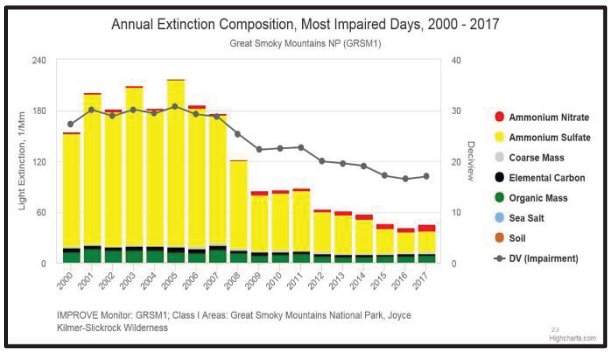

Annual Extinction Composition, Most Impaired Days, 2000 - 2017
St. Marks (SAMA1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: SAMA1; Class I Areas: Saint Marks National Wildlife Refuge Wilderness

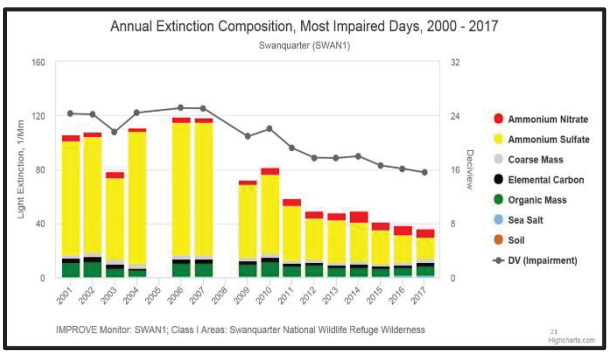

Annual Extinction Composition, Most Impaired Days, 2000 - 2017
Mammoth Cave NP (MACA1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: MACA1; Class I Areas: Mammoth Cave National Park

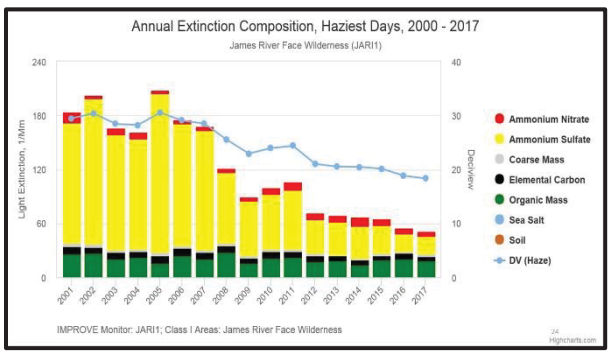

Annual Extinction Composition, Most Impaired Days, 2000 - 2017
Linville Gorge (LIGO1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: LIGO1; Class I Areas: Linville Gorge Wilderness

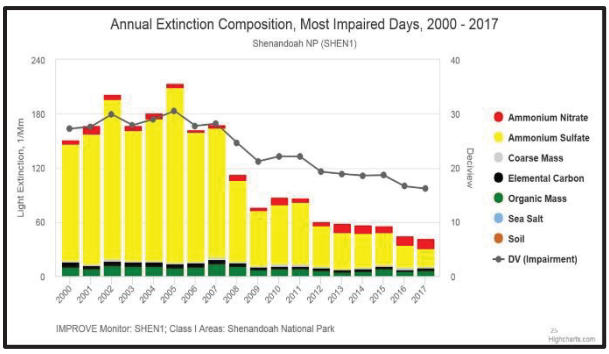

Annual Extinction Composition, Most Impaired Days, 2000 - 2017
Cape Romain NWR (ROMA1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: ROMA1; Class I Areas: Cape Romain National Wildlife Refuge Wilderness

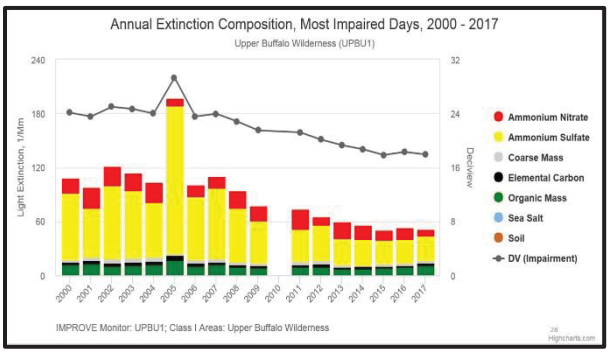

Annual Extinction Composition, Most Impaired Days, 2000 - 2017
Shining Rock Wilderness (SHRO1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: SHRO1; Class I Areas: Shining Rock Wilderness

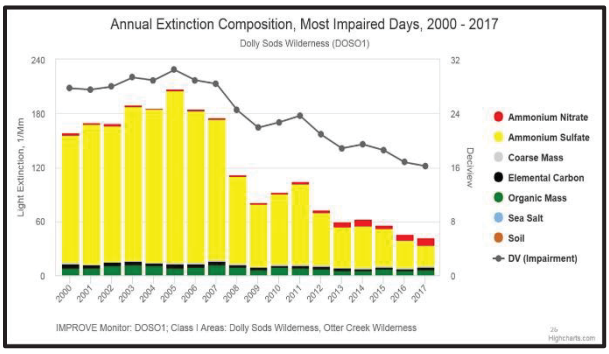

Annual Extinction Composition, Most Impaired Days, 2000 - 2017
Great Smoky Mountains NP (GRSM1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: GRSM1; Class I Areas: Great Smoky Mountains National Park, Joyce Kilmer-Slickrock Wilderness

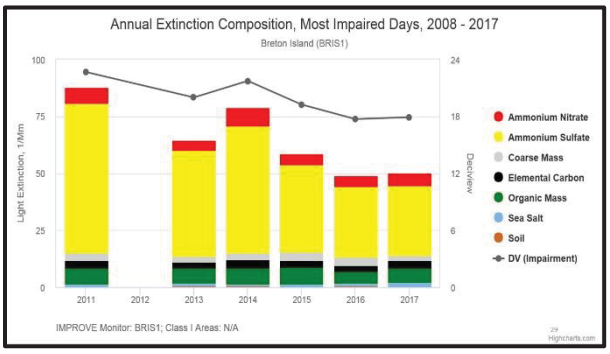

Annual Extinction Composition, Most Impaired Days, 2000 - 2017
Swanquarter (SWAN1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: SWAN1; Class I Areas: Swanquarter National Wildlife Refuge Wilderness

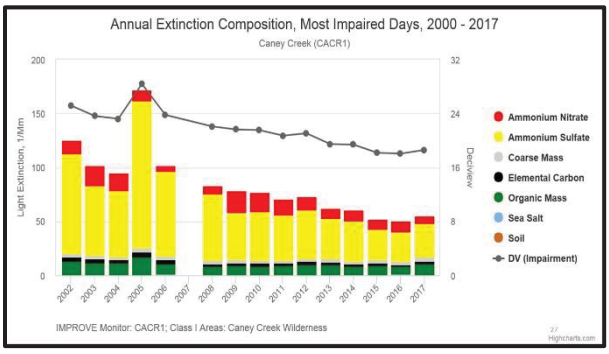

Annual Extinction Composition, Haziest Days, 2000 - 2017
James River Face Wilderness (JARI1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: JARI1; Class I Areas: James River Face Wilderness

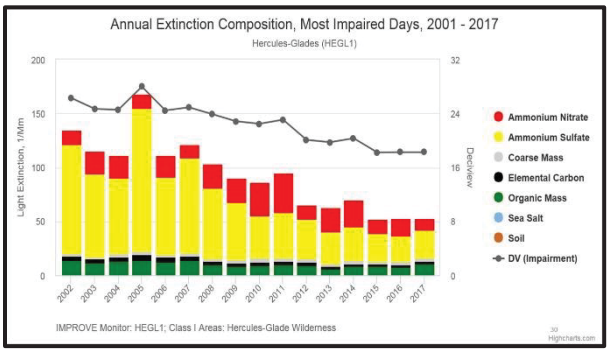

Annual Extinction Composition, Most Impaired Days, 2000 - 2017
Shenandoah NP (SHEN1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: SHEN1; Class I Areas: Shenandoah National Park

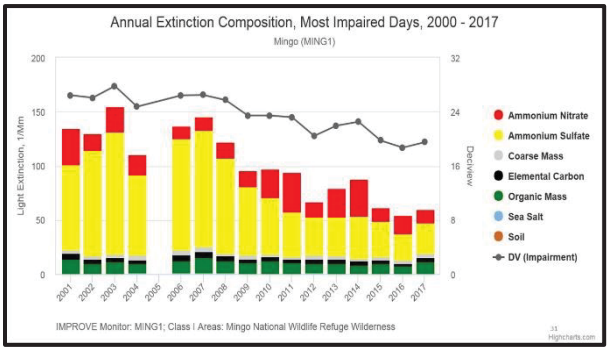

Annual Extinction Composition, Most Impaired Days, 2000 - 2017
Upper Buffalo Wilderness (UPBU1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: UPBU1; Class I Areas: Upper Buffalo Wilderness

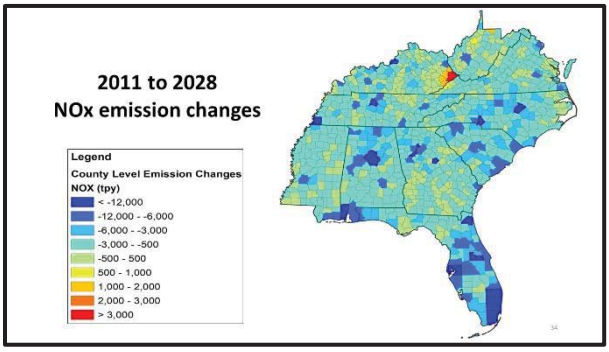

Annual Extinction Composition, Most Impaired Days, 2000 - 2017
Dolly Sods Wilderness (DOSO1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: DOSO1; Class I Areas: Dolly Sods Wilderness, Otter Creek Wilderness

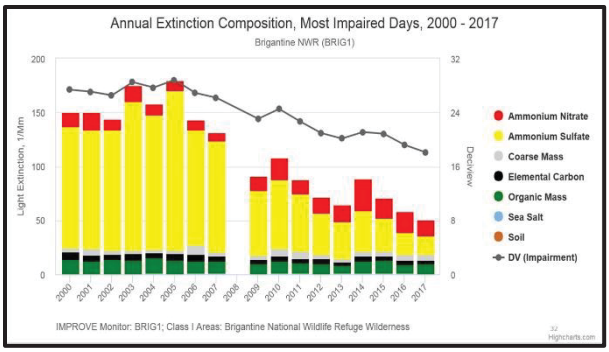

Annual Extinction Composition, Most Impaired Days, 2008 - 2017
Breton Island (BRIS1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: BRIS1; Class I Areas: N/A

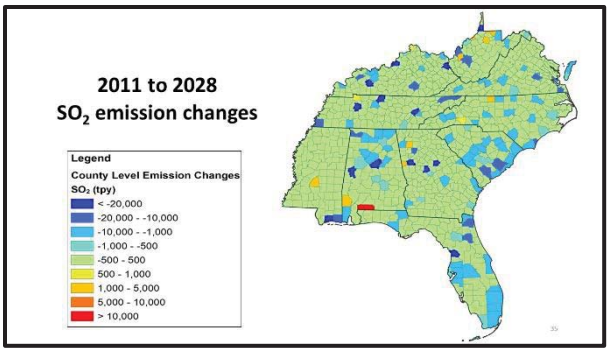

Annual Extinction Composition, Most Impaired Days, 2000 - 2017
Caney Creek (CACR1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: CACR1; Class I Areas: Caney Creek Wilderness


Annual Extinction Composition, Most Impaired Days, 2001 - 2017
Hercules-Glades (HEGL1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Impairment)
IMPROVE Monitor: HEGL1; Class I Areas: Hercules-Glade Wilderness









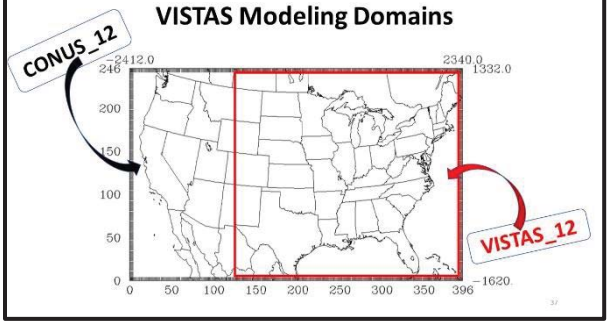
Emissions Updates

- Used EPA's 2011 base year emissions without change
- Updated EPA's 2028 projection year emissions
  - EGU and major non-EGU sources
  - Removed Clean Power Plan assumptions
  - Adjusted for changes in fuels and facility operating plans

VISTAS Air Quality Model

- Started with EPA's 2011/2028 modeling platform
  - Version 6.3el
  - CAMx v6.32
- Replaced CAMx v6.32 with CAMx v6.40
- Used 2011 meteorology
- Reasons for using EPA platform
  - Time limited
  - Budget limited
  - Most source sectors acceptably represented in EPA platform

VISTAS Modeling Domains

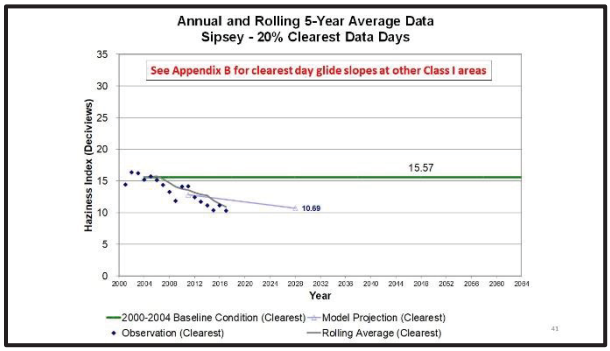


VISTAS Future Year Model Projections

- Calculation of relative response factors (RRFs)
- Gives average percent change in pollutant or species concentrations due to emission changes between 2011 and 2028
- Produces design values for 2028

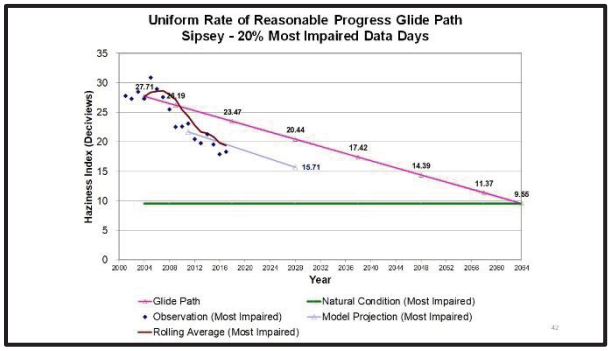
Benchmark Comparisons

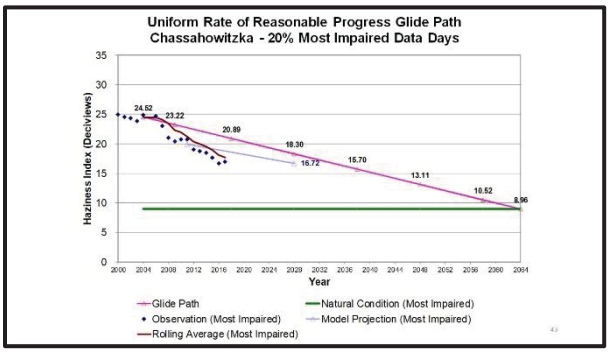
1. EPA 2011 with CAMx_6.32 (CONUS) vs. Alpine 2011 with CAMx_6.32 (CONUS)
2. Alpine 2011 with CAMx_6.32 (CONUS) vs. Alpine 2011 with CAMx_6.40 (CONUS)
3. Alpine 2011 with CAMx_6.40 (CONUS) vs. **Alpine 2011 with CAMx_6.40 (VISTAS)**
4. EPA 2028 with CAMx_6.32 (CONUS) vs. Alpine 2028 with CAMx_6.40 (CONUS)
5. Alpine 2028 with CAMx_6.40 (CONUS) vs. **Alpine 2028 with CAMx_6.40 (VISTAS)**

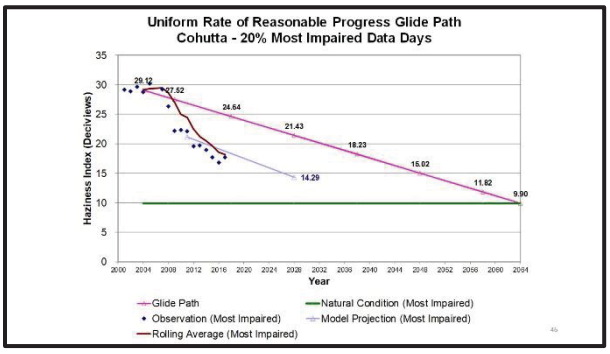


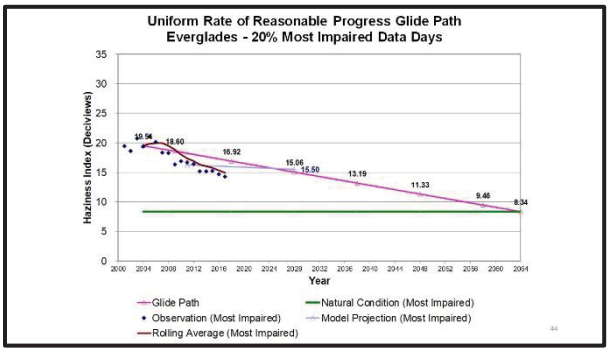
Model Performance Evaluation

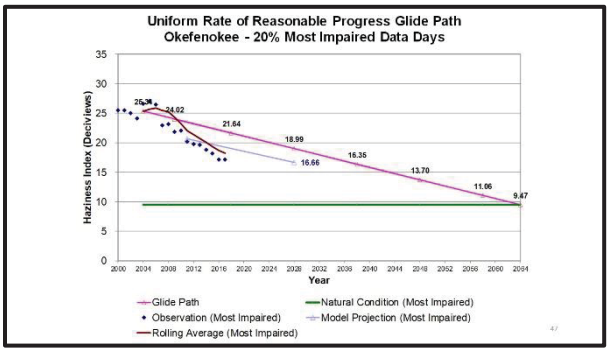
- Compared model results to observations. Looked at statistics, comparison plots, and spatial plots
  - Ozone
  - $PM_{2.5}$ and light extinction
  - Wet and dry deposition
- Overall, the model performance is generally within the range deemed acceptable for regulatory applications

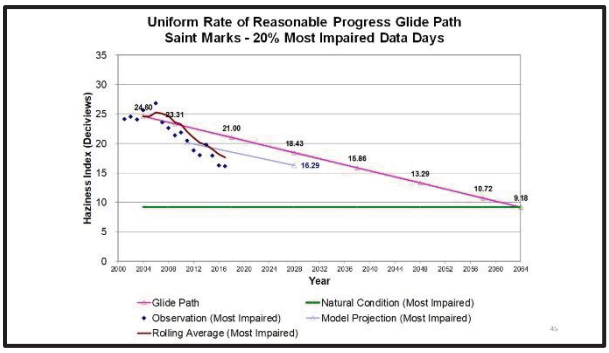


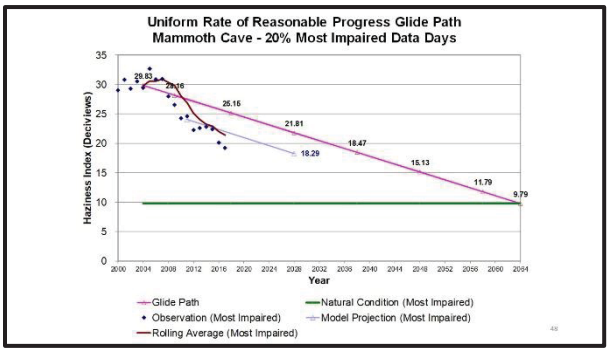

Uniform Rate of Reasonable Progress Glide Path
Chassahowitzka - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
24.52
23.22
20.89
18.30
16.72
15.70
13.11
10.52
8.96
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)

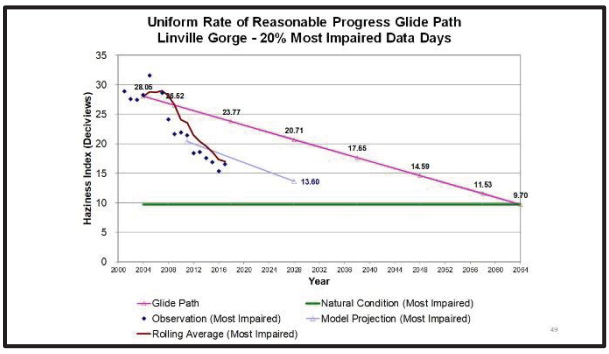

Uniform Rate of Reasonable Progress Glide Path
Cohutta - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
29.12
27.52
24.64
21.43
18.23
15.02
11.82
9.90
14.29
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)

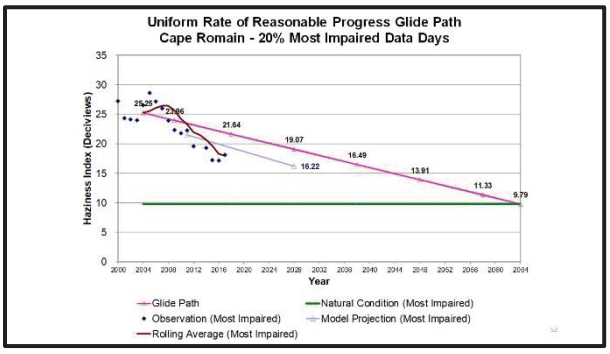

Uniform Rate of Reasonable Progress Glide Path
Everglades - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
19.94
18.60
16.92
15.00
15.50
13.19
11.33
9.46
8.34
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)

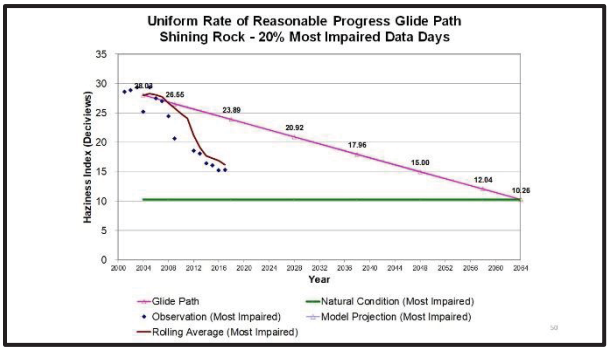

Uniform Rate of Reasonable Progress Glide Path
Okefenokee - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
25.36
24.02
21.64
18.99
16.35
13.70
11.06
9.47
16.66
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)

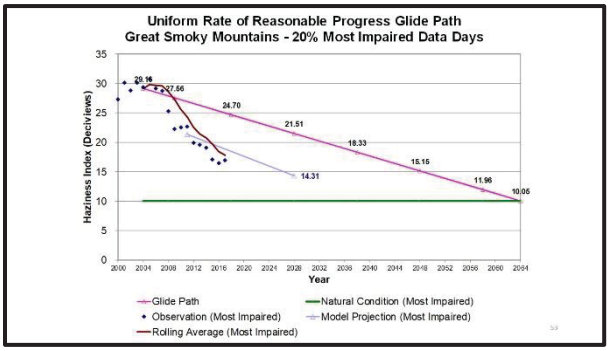

Uniform Rate of Reasonable Progress Glide Path
Saint Marks - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
24.00
23.31
21.00
18.43
16.29
15.86
13.29
10.72
9.18
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)

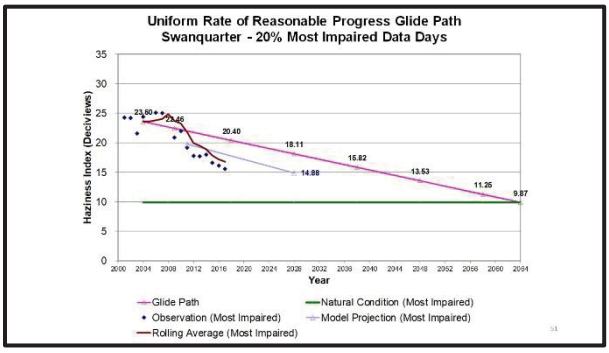

Uniform Rate of Reasonable Progress Glide Path
Mammoth Cave - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
29.83
29.16
25.15
21.81
18.47
15.13
11.79
9.79
18.29
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)

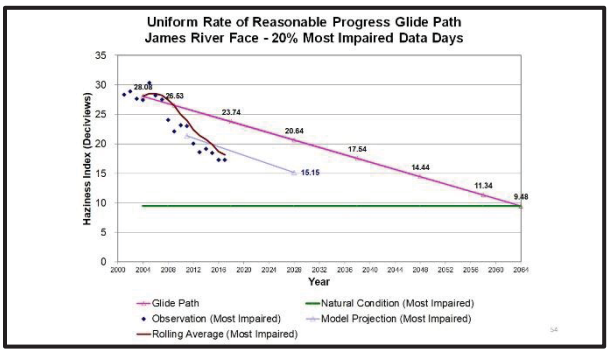

Uniform Rate of Reasonable Progress Glide Path
Linville Gorge - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
28.05
26.52
23.77
20.71
17.65
14.59
11.53
9.70
13.60
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)

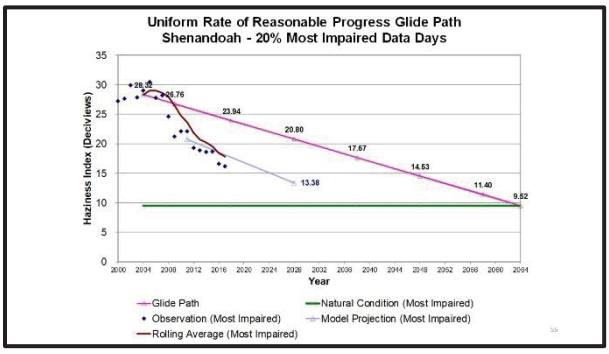

Uniform Rate of Reasonable Progress Glide Path
Cape Romain - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
25.25
23.66
21.64
19.07
16.49
13.91
11.33
9.79
16.22
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)

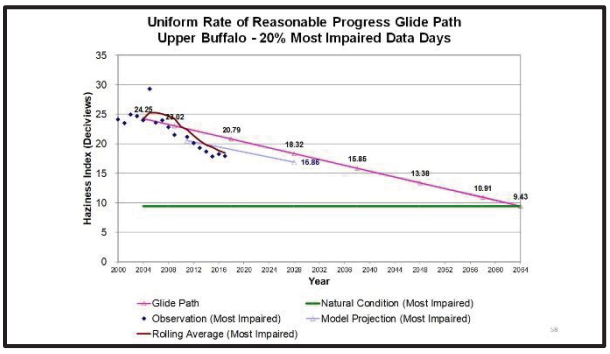

Uniform Rate of Reasonable Progress Glide Path
Shining Rock - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
28.03
26.55
23.89
20.92
17.96
15.00
12.04
10.26
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)

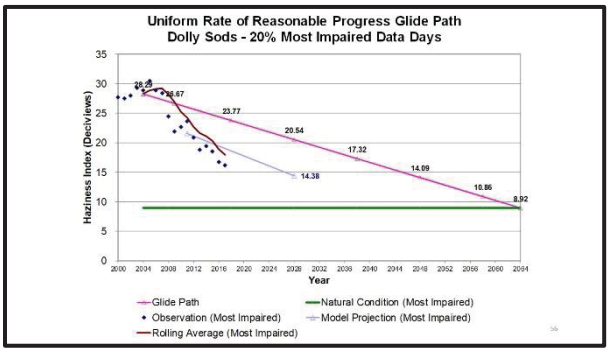

Uniform Rate of Reasonable Progress Glide Path
Great Smoky Mountains - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
29.16
27.56
24.70
21.51
18.33
15.15
11.96
10.05
14.31
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)

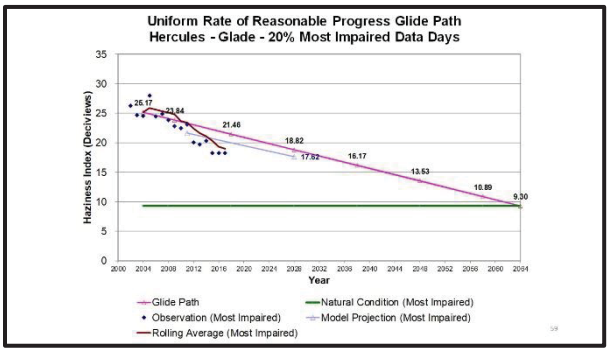

Uniform Rate of Reasonable Progress Glide Path
Swanquarter - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
23.60
23.46
20.40
18.11
15.82
13.53
11.25
9.87
14.88
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)

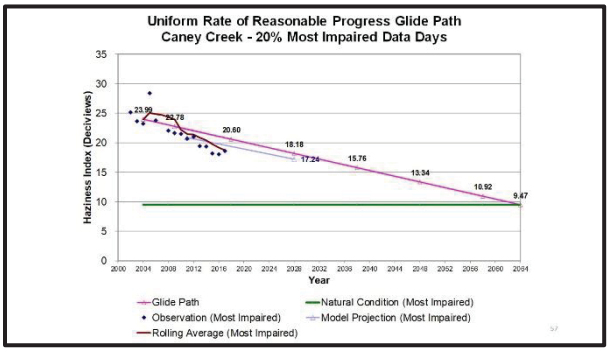

Uniform Rate of Reasonable Progress Glide Path
James River Face - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
28.03
26.53
23.74
20.84
17.54
14.44
11.34
9.68
15.15
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)

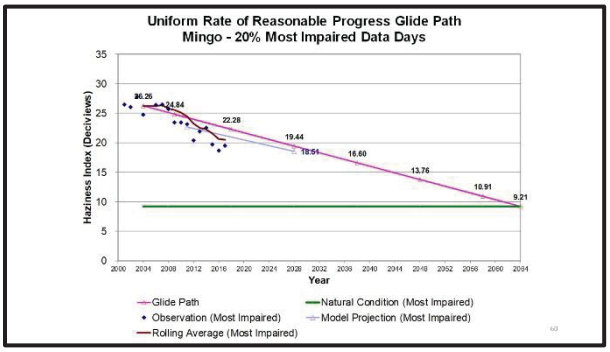

Uniform Rate of Reasonable Progress Glide Path
Shenandoah - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
28.76
23.94
20.80
17.67
14.53
11.40
9.82
13.38
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)

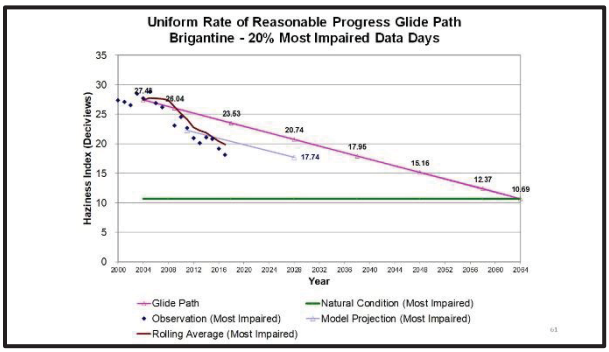

Uniform Rate of Reasonable Progress Glide Path
Upper Buffalo - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
24.25
23.22
20.79
18.32
15.86
13.39
10.91
9.43
16.86
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)


Uniform Rate of Reasonable Progress Glide Path
Dolly Sods - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
28.67
23.77
20.54
17.32
14.09
10.86
8.92
14.38
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)


Uniform Rate of Reasonable Progress Glide Path
Hercules - Glade - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
25.17
23.84
21.46
18.82
16.17
13.53
10.89
9.30
17.92
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)


Uniform Rate of Reasonable Progress Glide Path
Caney Creek - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
23.78
20.60
18.18
15.76
13.34
10.92
9.47
17.24
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)

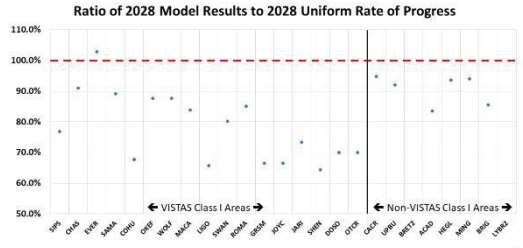

Uniform Rate of Reasonable Progress Glide Path
Mingo - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
24.84
22.28
19.44
16.60
13.76
10.91
9.21
18.51
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)



Draft AOI Source Categories for COHU

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	4.9%	3.1%	8.1%
NONROAD_MAR	0.1%	3.3%	3.4%
NONROAD_OTHER	0.2%	2.4%	2.6%
ONROAD	0.6%	6.4%	7.0%
POINT	68.0%	8.0%	75.9%
PT_FIRES_PRESCRIBED	2.5%	0.5%	3.1%
TOTAL	**76.3%**	**23.7%**	**100.0%**

Draft VISTAS 2028 Modeling Results



Draft AOI Point Contributions for COHU

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
GA	Ga Power Company - Plant Bowen	78.0	6,643.3	10,453.4	18.72%	1.10%
IN	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	410.1	8,806.8	30,536.3	4.47%	0.13%
GA	TEMPLE INLAND	87.4	1,773.4	1,791.0	4.46%	0.17%
IN	Gibson	487.1	12,280.3	23,117.2	2.20%	0.10%
IN	INDIANAPOLIS POWER & LIGHT PETERSBURG	477.0	10,665.3	18,141.9	2.09%	0.15%
KY	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	457.2	7,007.3	19,504.7	2.08%	0.07%
TN	TVA KINGSTON FOSSIL PLANT	124.0	1,687.4	1,886.1	2.08%	0.13%
GA	Ga Power Company - Plant Hammond	88.5	864.9	772.5	1.90%	0.08%
OH	General James M. Gavin Power Plant; (0627010056)	512.0	8,122.5	41,595.8	1.64%	0.02%
TN	TVA CUMBERLAND FOSSIL PLANT	327.0	4,916.5	8,427.3	1.32%	0.09%
KY	Big Rivers Electric Corp - Wilson Station	369.0	1,151.9	6,934.2	1.02%	0.01%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	454.6	7,150.0	22,133.9	1.01%	0.06%
GA	Ga Power Company - Plant Wansley	156.8	7,057.5	4,856.0	1.01%	0.04%
KY	KY Utilities Co - Ghent Station	441.5	7,939.9	10,169.3	1.00%	0.08%
IL	Joppa Steam	466.9	4,706.3	20,509.3	0.99%	0.02%
GA	Mohawk Industries Inc	32.0	66.5	77.1	0.97%	0.07%
TN	EASTMAN CHEMICAL COMPANY	269.8	6,900.3	6,420.7	0.95%	0.08%
MO	AMEREN MISSOURI-LABADIE PLANT	695.4	9,685.5	41,740.3	0.92%	0.01%
TN	TATE & LYLE, Loudon	109.0	883.3	472.8	0.89%	0.09%
IL	Newton	564.0	1,934.9	10,631.6	0.87%	0.01%

VISTAS Area of Influence (AOI) Analysis

- Evaluates emissions (Q), distance to Class I area (d), and extinction weighted residence time (EWRT) in model grid cells (point) or counties (source categories)
  - Formula: (Q/d)*EWRT
- Establishes each facility's contribution to light extinction at each Class I area on the 20% most impaired days
- Ranks facilities based on projected contributions
- Facilities with highest contributions may be subject to 4-factor analysis

Draft AOI Source Categories for WOLF

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	2.6%	1.5%	4.1%
NONROAD_MAR	1.4%	2.7%	4.1%
NONROAD_OTHER	0.3%	3.0%	3.3%
ONROAD	0.7%	5.2%	5.9%
POINT	70.4%	6.8%	77.1%
PT_FIRES_PRESCRIBED	4.7%	0.8%	5.5%
TOTAL	**79.9%**	**20.1%**	**100.0%**

See Appendix C for draft AOI source categories at other Class I areas

Draft AOI Point Contributions for WOLF

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
GA	Brunswick Cellulose Inc	27.9	1,754.5	294.2	8.61%	2.87%
FL	ROCK TENN CP, LLC	74.9	2,316.8	2,606.7	8.34%	0.38%
GA	International Paper - Savannah	85.9	1,560.7	3,945.4	7.34%	0.23%
FL	JEA	105.1	651.8	2,094.5	4.31%	0.09%
GA	Georgia Pacific Consumer Products LP (Savannah River Mill)	109.9	351.5	1,860.2	2.58%	0.03%
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	173.6	112.4	3,197.8	2.74%	0.01%
SC	ALUMAX OF SOUTH CAROLINA	223.0	108.1	3,751.7	1.79%	0.00%
FL	RAYONIER PERFORMANCE FIBERS LLC	77.4	2,327.1	567.0	1.74%	0.37%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	181.4	917.8	3,713.4	1.72%	0.02%
OH	General James M. Gavin Power Plant (06270100056)	845.3	8,122.5	41,595.8	1.67%	0.02%
SC	SANTEE COOPER CROSS GENERATING STATION	251.0	3,273.5	4,281.2	1.55%	0.08%
GA	Southern States Phosphate & Fertilizer	84.1	1.0	597.1	1.51%	0.00%
FL	JH CHEMICAL HOLDINGS, INC.	118.5	37.7	898.9	1.19%	0.00%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	296.6	2,489.8	5,306.4	1.16%	0.04%
GA	Ga Power Company - Plant Bowen	458.1	6,643.3	10,453.4	1.05%	0.03%
GA	Savannah Sugar Refinery	89.9	521.6	582.0	1.03%	0.07%
SC	INTERNATIONAL PAPER-EASTOVER	288.7	1,780.3	3,717.9	0.97%	0.05%
GA	Ga Power Company - Plant McManus	27.1	72.2	30.1	0.91%	0.14%
AL	Escambia Operating Company LLC	578.2	349.3	18,974.4	0.88%	0.00%
SC	KAPSTONE CHARLESTON KRAFT LLC	213.6	2,355.8	1,863.7	0.87%	0.09%

See Appendix C for draft AOI point contributions at other Class I areas

67

Round 1 Facility Tags

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO2 Tag
AL	VISTAS	01053-7440211	Escambia Operating Company LLC		1
AL	VISTAS	01053-985111	Escambia Operating Company LLC		1
AL	VISTAS	01073-1018711	DRUMMOND COMPANY, INC.		1
AL	VISTAS	01097-1056111	Ala Power - Barry		1
AL	VISTAS	01097-1061611	Union Oil of California - Chunchula Gas Plant		1
AL	VISTAS	01097-949811	Akzo Nobel Chemicals Inc		1
AL	VISTAS	01103-1000011	Nucor Steel Decatur LLC		1
AL	VISTAS	01109-985711	Sanders Lead Co		1
FL	VISTAS	12005-535411	ROCKTENN CP LLC		1
FL	VISTAS	12017-640611	DUKE ENERGY FLORIDA, INC. (DEF)	1	1
FL	VISTAS	12031-640711	IFA		1
FL	VISTAS	12033-752711	GULF POWER - Crist		1
FL	VISTAS	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC		1
FL	VISTAS	12057-538611	TAMPA ELECTRIC COMPANY (TEC)		1
FL	VISTAS	12057-716411	MOSAIC FERTILIZER, LLC		1
FL	VISTAS	12089-753711	ROCK TENN CP, LLC	1	1
FL	VISTAS	12089-845811	RAYONIER PERFORMANCE FIBERS LLC	1	
FL	VISTAS	12105-717711	MOSAIC FERTILIZER LLC		1
FL	VISTAS	12105-919811	MOSAIC FERTILIZER, LLC		1
FL	VISTAS	12123-752411	BUCKEYE FLORIDA, LIMITED PARTNERSHIP		1

70

VISTAS Source Apportionment Modeling

- Quantifies visibility impacts from individual point sources, source sectors, and geographic regions
- NOx and SO_2 tagging
- Used for further evaluation of AOI results
- Refines information on contributions to visibility impairment
- Can be used to adjust future year visibility projections to account for additional emission controls
- VISTAS contract with ERG allows for up to 250 tags

68

Round 1 Facility Tags

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO2 Tag
GA	VISTAS	13015-2813011	Ga Power Company - Plant Bowen		1
GA	VISTAS	13051-3679811	International Paper - Savannah		1
GA	VISTAS	13127-1721011	Brunswick Cellulose Inc		1
KY	VISTAS	21091-7352411	Century Aluminum of KY LLC		1
KY	VISTAS	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant		1
KY	VISTAS	21177-5196711	Tennessee Valley Authority - Paradise Fossil Plant		1
KY	VISTAS	21183-5561611	Big Rivers Electric Corp - Wilson Station		1
NC	VISTAS	37013-8479311	PCS Phosphate Company, Inc. - Aurora		1
NC	VISTAS	37087-7920511	Blue Ridge Paper Products - Canton Mill		1
SC	VISTAS	45015-4834911	ALUMAX OF SOUTH CAROLINA		1
SC	VISTAS	45019-4973611	KAPSTONE CHARLESTON KRAFT LLC	1	1
SC	VISTAS	45043-5698611	INTERNATIONAL PAPER GEORGETOWN MILL		1
TN	VISTAS	47001-6196011	TVA BULL RUN FOSSIL PLANT	1	1
TN	VISTAS	47009-9159211	Mc Ghee Tyson	1	1
TN	VISTAS	47093-4979911	Cornix - Knoxville Plant	1	1
TN	VISTAS	47105-4129211	TATE & LYLE, Loudon	1	1
TN	VISTAS	47145-4979111	TVA KINGSTON FOSSIL PLANT		1
TN	VISTAS	47161-4979311	TVA CUMBERLAND FOSSIL PLANT		1
TN	VISTAS	47163-3982311	EASTMAN CHEMICAL COMPANY		1

71

PSAT SO_2 and NOx Tags

Round 1 (124 tags)

- Total SO_2 tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- Total NOx tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- EGU point SO_2 tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- EGU point NOx tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- SO_2 tags for individual VISTAS facilities = 51 tags
- NOx tags for individual VISTAS facilities = 21 tags

Round 2 (45 tags identified so far…)

- Non-EGU point SO_2 for 10 individual VISTAS states + 3 MJOs = 13 tags
- Non-EGU point NOx for 10 individual VISTAS states + 3 MJOs = 13 tags
- SO_2 tags for individual non-VISTAS facilities = 13 tags
- NOx tags for individual non-VISTAS facilities = 4 tags

69

Round 1 Facility Tags

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO2 Tag
VA	VISTAS	51023-5039811	Roanoke Cement Company		1
VA	VISTAS	51027-4034811	Jewell Coke Company LLP		1
VA	VISTAS	51580-5798711	Meadwestvaco Packaging Resources Group		1
WV	VISTAS	54023-625-7011	Dominion Resources, Inc. - MOUNT STORM POWER STATION	1	1
WV	VISTAS	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC HARRISON	1	1
WV	VISTAS	54041-6900311	FOLITRANS - COPLEY RUN CS 70	1	
WV	VISTAS	54049-4864511	AMERICAN BITUMINOUS POWER-GRANT TOWN PLT	1	1
WV	VISTAS	54051-6902311	MITCHELL PLANT	1	1
WV	VISTAS	54061-16320111	LONGVIEW POWER	1	1
WV	VISTAS	54061-6773611	MONONGAHELA POWER CO. - FORT MARTIN POWER	1	1
WV	VISTAS	54061-6773811	MORGANTOWN ENERGY ASSOCIATES	1	1
WV	VISTAS	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	1	1
WV	VISTAS	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	1	1
WV	VISTAS	54083-6790511	GLADY 6C4350	1	
WV	VISTAS	54083-6790711	PILES CREEK 6C4340	1	
WV	VISTAS	54093-6327811	KINGSFORD MANUFACTURING COMPANY	1	1

72

Round 2 Facility Tags

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO2 Tag
MO	CENRAP	29143-5363811	NEW MADRID POWER PLANT-MARSTON		1
MD	MANE-VU	24001-7763811	Luke Paper Company		1
PA	MANE-VU	42005-3866111	GENON NE MGMT CO/KEYSTONE STA		1
PA	MANE-VU	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	1	1
IL	Midwest RPO	17127-7808911	Joppa Steam		1
IN	Midwest RPO	18051-7363111	Gibson		1
IN	Midwest RPO	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG		1
IN	Midwest RPO	18129-8166111	Sigeco AB Brown South Indiana Gas & Ele		1
IN	Midwest RPO	18147-8017211	INDIANA MICHIGAN POWER DBA AEP - ROCKPORT		1
OH	Midwest RPO	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)		1
OH	Midwest RPO	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	1	1
OH	Midwest RPO	39053-8148511	General James M. Gavin Power Plant (0677010056)	1	1
OH	Midwest RPO	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	1	1

What We've Learned

- The major facility landscape continues to change
  - Shutdowns, fuel switches, additional emission controls
- Emissions continue to go down
- SO_2 emissions are still the major haze contributor, but NOx emissions are becoming more important
- Regional haze levels continue to be reduced
- Visibility improvement is well ahead of schedule

4-Factor Analysis

- States will evaluate certain sources and emissions to determine if reasonable controls are in place or available
- Considers four important factors
  - Potential costs of compliance
  - Time necessary for compliance
  - Energy and non-air quality environmental impacts of compliance
  - Remaining useful life of sources subject to this analysis

VISTAS Consultation and Communications

- Sharing information with EPA OAQPS, Regions 3 and 4
- Sharing information and seeking input from Federal Land Managers (next call early June)
- Preparing for briefing to stakeholders (later this year)
- Considering a face-to-face VISTAS meeting – TBD
- Working with RPO colleagues towards a national regional haze meeting this fall
- VISTAS staff available to present information at meetings in your state upon request

VISTAS Technical Work Status

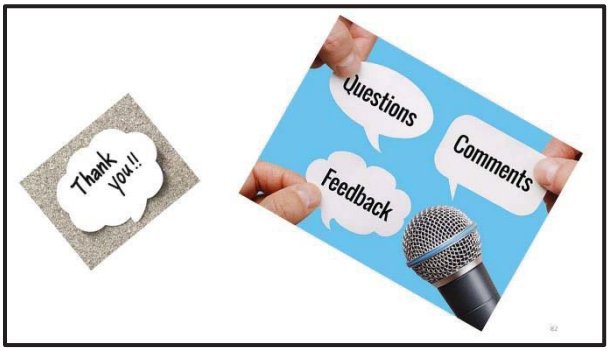
Task	Status
Data collection/analysis	nearing completion
VISTAS 2011 modeling	done
Emission updates	done
Emission processing	done
2028 modeling	done
Benchmarking	nearing completion
Area of influence analysis	nearing completion
Source apportionment modeling	beginning in May
Future year model projections	draft results available

VISTAS Remaining Work/Technical Schedule

Task	Schedule
Benchmarking	May-June 2019
Area of influence analysis	May 2019
Source apportionment (tagging)	August 2019
Data collection/analysis	May-June 2019
Future year projections (RRFs)	August 2019
Best and final run???	Necessity uncertain
Final reports and documentation	**December 2019**
Web site updates and postings	Ongoing task

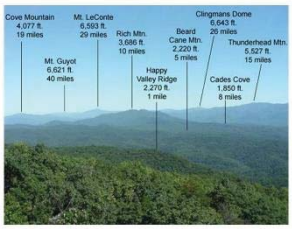
VISTAS State Responsibilities

- Perform 4-factor analysis
- Consult and communicate with state stakeholders
- Consult with in-state FLM contacts if applicable
- Consult with surrounding states if applicable
- Complete state-specific analysis and documentation
- Follow state regulatory and SIP development processes
- Seek input and respond to public comment
- Submit regional haze SIPs to EPA by July 31, 2021
- Why all of this work?



Look Rock Hazy Day

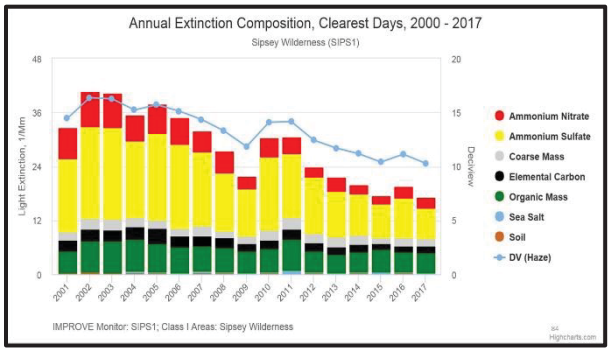
Look Rock Clear Day

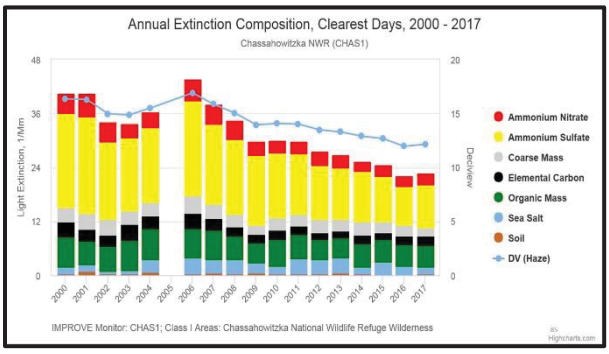


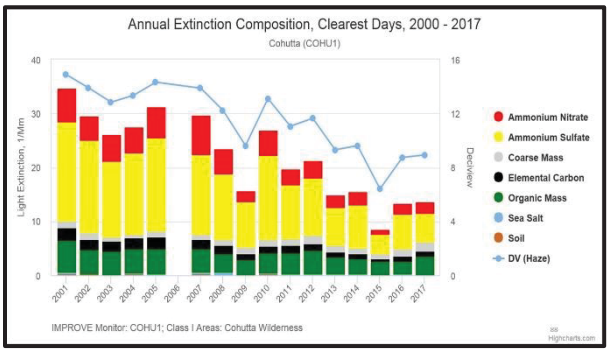
Appendix A

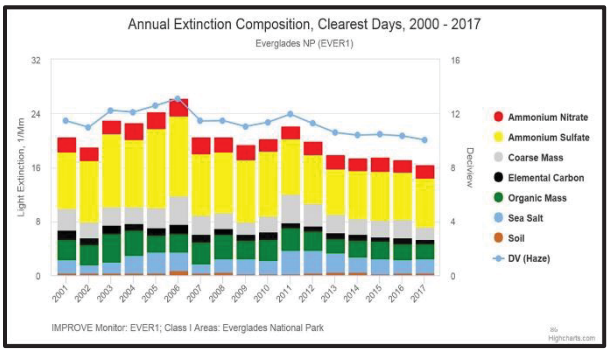
Contact Information

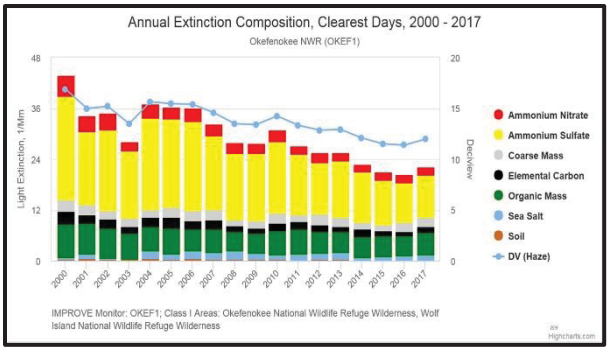
- **James Boylan, PhD., Georgia DNR**
  - Email: James.Boylan@dnr.ga.gov
  - Phone: 404-363-7014
- **Randy Strait, North Carolina DAQ**
  - Email: randy.strait@ncdenr.gov
  - Phone: 919-707-8721
- **John Hornback, Metro 4/SESARM**
  - Email: hornback@metro4-sesarm.org
  - Phone: 404-361-4000

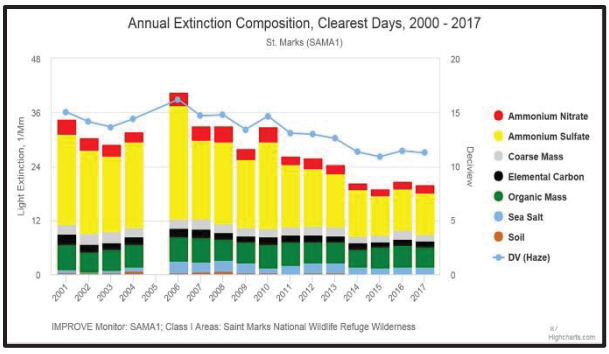


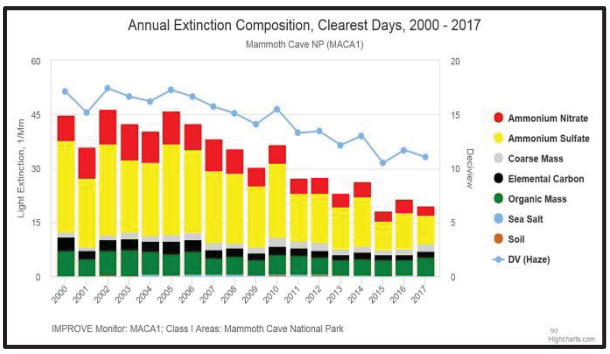

Annual Extinction Composition, Clearest Days, 2000 - 2017
Chassahowitzka NWR (CHAS1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: CHAS1; Class I Areas: Chassahowitzka National Wildlife Refuge Wilderness

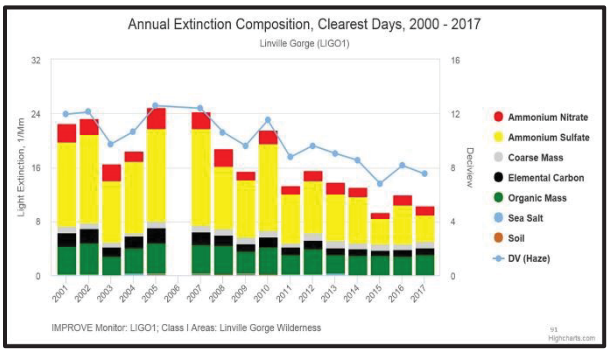

Annual Extinction Composition, Clearest Days, 2000 - 2017
Cohutta (COHU1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: COHU1; Class I Areas: Cohutta Wilderness

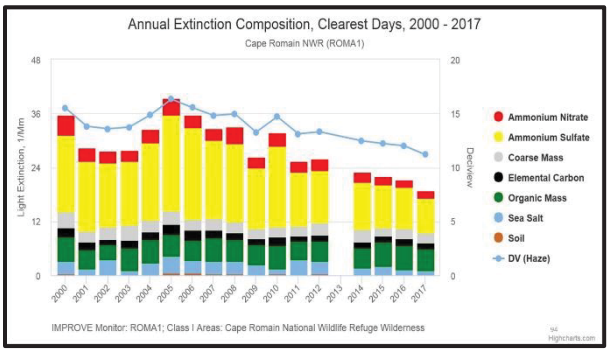

Annual Extinction Composition, Clearest Days, 2000 - 2017
Everglades NP (EVER1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: EVER1; Class I Areas: Everglades National Park

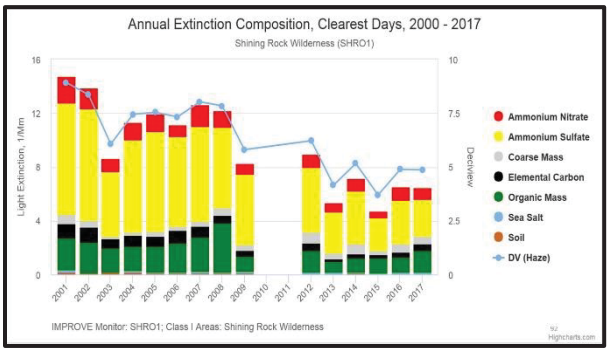

Annual Extinction Composition, Clearest Days, 2000 - 2017
Okefenokee NWR (OKEF1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: OKEF1; Class I Areas: Okefenokee National Wildlife Refuge Wilderness, Wolf Island National Wildlife Refuge Wilderness

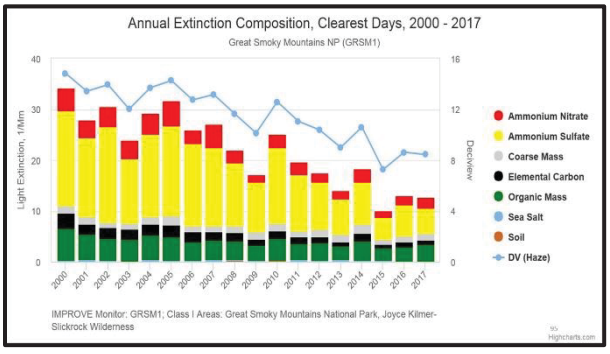

Annual Extinction Composition, Clearest Days, 2000 - 2017
St. Marks (SAMA1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: SAMA1; Class I Areas: Saint Marks National Wildlife Refuge Wilderness

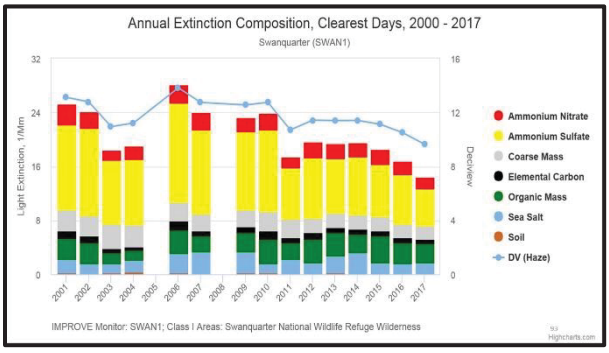

Annual Extinction Composition, Clearest Days, 2000 - 2017
Mammoth Cave NP (MACA1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: MACA1; Class I Areas: Mammoth Cave National Park

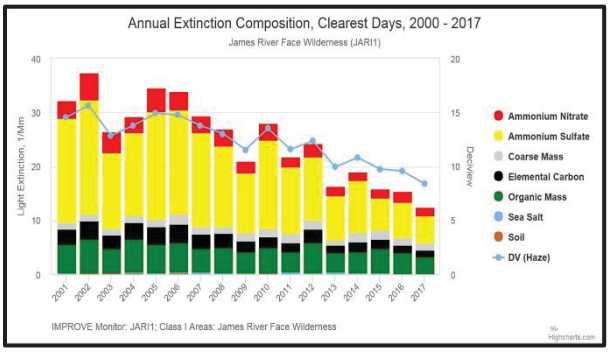

Annual Extinction Composition, Clearest Days, 2000 - 2017
Linville Gorge (LIGO1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: LIGO1; Class I Areas: Linville Gorge Wilderness

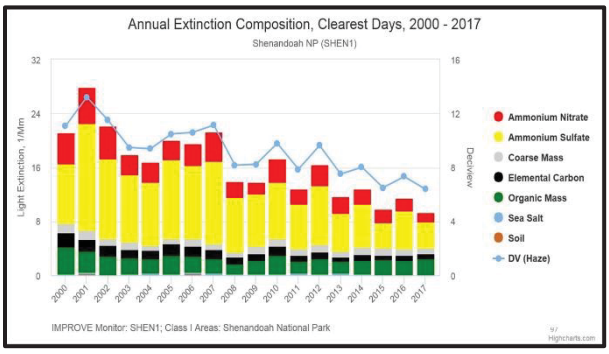

Annual Extinction Composition, Clearest Days, 2000 - 2017
Cape Romain NWR (ROMA1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: ROMA1; Class I Areas: Cape Romain National Wildlife Refuge Wilderness

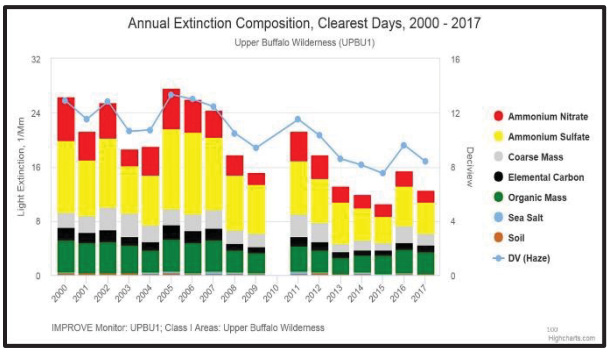

Annual Extinction Composition, Clearest Days, 2000 - 2017
Shining Rock Wilderness (SHRO1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: SHRO1; Class I Areas: Shining Rock Wilderness

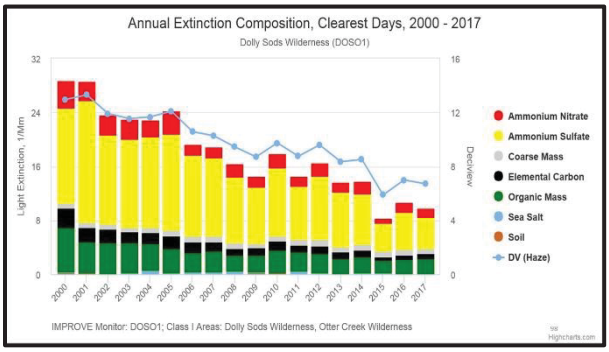

Annual Extinction Composition, Clearest Days, 2000 - 2017
Great Smoky Mountains NP (GRSM1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: GRSM1; Class I Areas: Great Smoky Mountains National Park, Joyce Kilmer-Slickrock Wilderness

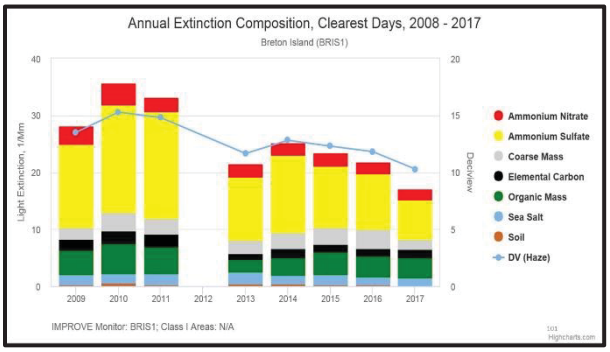

Annual Extinction Composition, Clearest Days, 2000 - 2017
Swanquarter (SWAN1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: SWAN1; Class I Areas: Swanquarter National Wildlife Refuge Wilderness

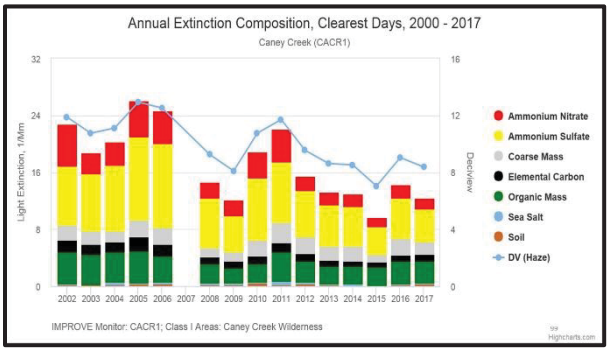

Annual Extinction Composition, Clearest Days, 2000 - 2017
James River Face Wilderness (JARI1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: JARI1; Class I Areas: James River Face Wilderness

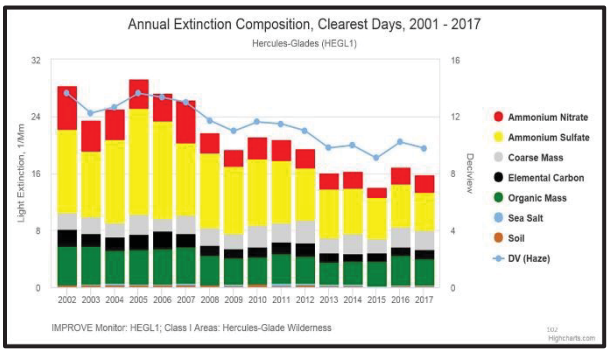

Annual Extinction Composition, Clearest Days, 2000 - 2017
Shenandoah NP (SHEN1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: SHEN1; Class I Areas: Shenandoah National Park

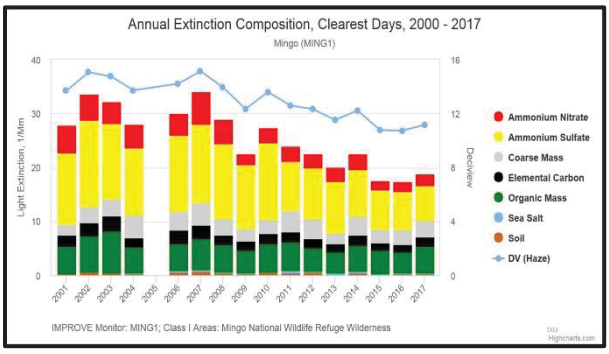

Annual Extinction Composition, Clearest Days, 2000 - 2017
Upper Buffalo Wilderness (UPBU1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: UPBU1; Class I Areas: Upper Buffalo Wilderness

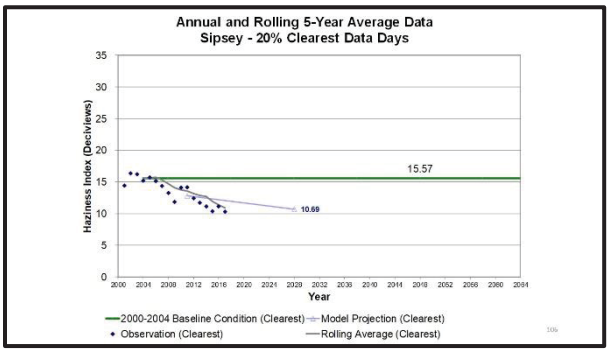

Annual Extinction Composition, Clearest Days, 2000 - 2017
Dolly Sods Wilderness (DOSO1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: DOSO1; Class I Areas: Dolly Sods Wilderness, Otter Creek Wilderness

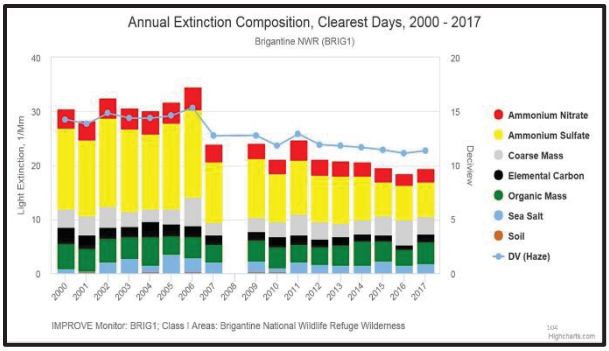

Annual Extinction Composition, Clearest Days, 2008 - 2017
Breton Island (BRIS1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: BRIS1; Class I Areas: N/A

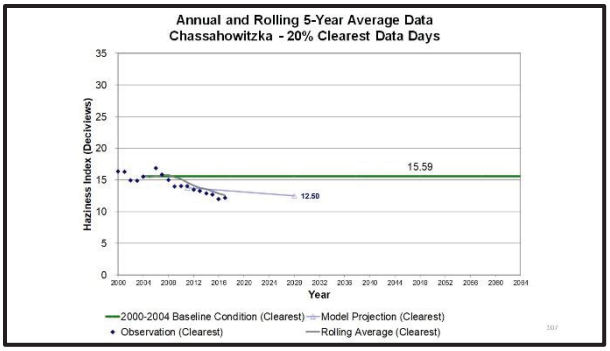

Annual Extinction Composition, Clearest Days, 2000 - 2017
Caney Creek (CACR1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: CACR1; Class I Areas: Caney Creek Wilderness


Annual Extinction Composition, Clearest Days, 2001 - 2017
Hercules-Glades (HEGL1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: HEGL1; Class I Areas: Hercules-Glade Wilderness

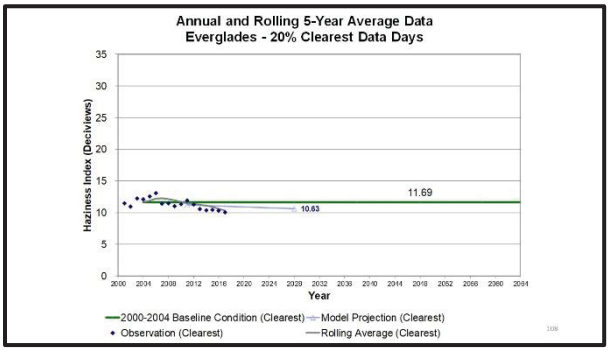

Annual Extinction Composition, Clearest Days, 2000 - 2017
Mingo (MING1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: MING1; Class I Areas: Mingo National Wildlife Refuge Wilderness

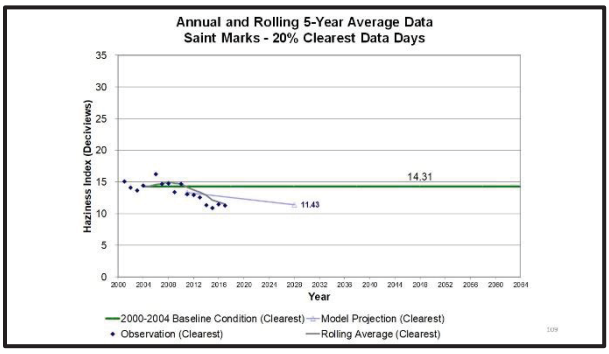

Annual and Rolling 5-Year Average Data
Sipsey - 20% Clearest Data Days
Haziness Index (Deciviews)
15.57
10.69
Year
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)

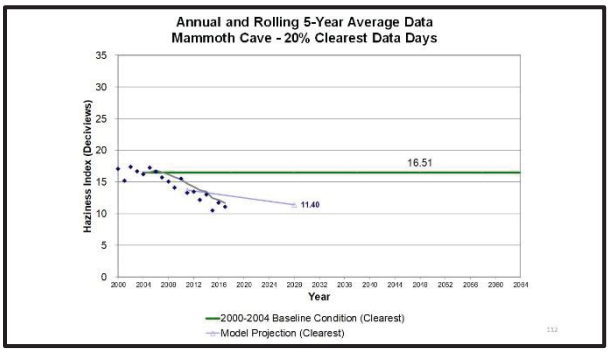

Annual Extinction Composition, Clearest Days, 2000 - 2017
Brigantine NWR (BRIG1)
Light Extinction, 1/Mm
Deciview
Ammonium Nitrate
Ammonium Sulfate
Coarse Mass
Elemental Carbon
Organic Mass
Sea Salt
Soil
DV (Haze)
IMPROVE Monitor: BRIG1; Class I Areas: Brigantine National Wildlife Refuge Wilderness

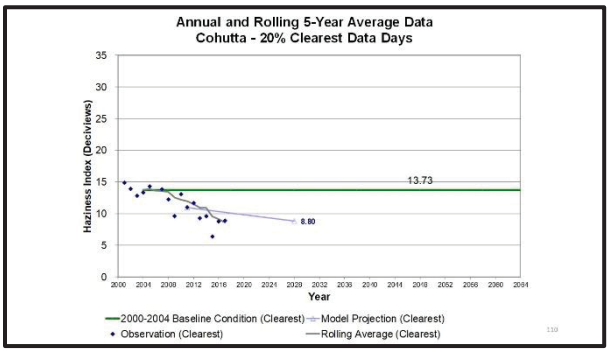

Annual and Rolling 5-Year Average Data
Chassahowitzka - 20% Clearest Data Days
Haziness Index (Deciviews)
15.59
12.50
Year
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)

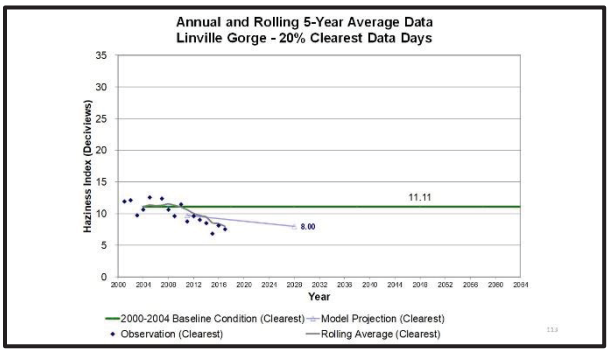
Appendix B

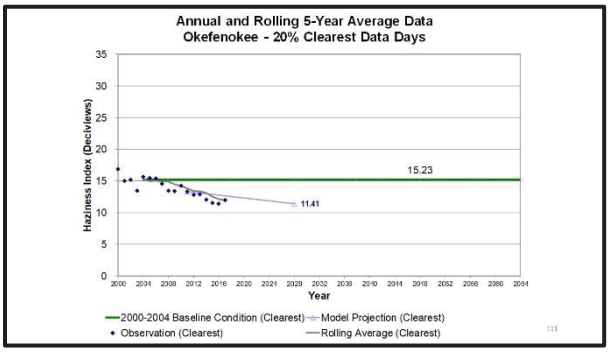

Annual and Rolling 5-Year Average Data
Everglades - 20% Clearest Data Days
Haziness Index (Deciviews)
11.69
10.63
Year
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)

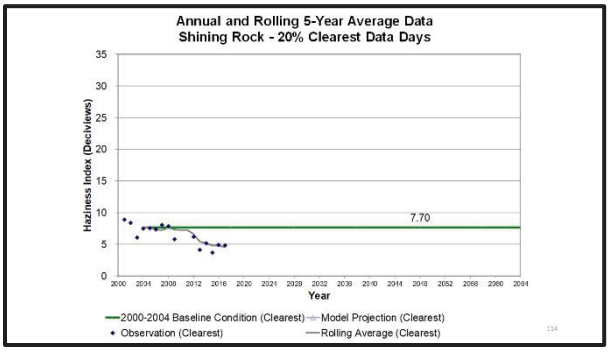

Annual and Rolling 5-Year Average Data
Saint Marks - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
14.31
11.43
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)

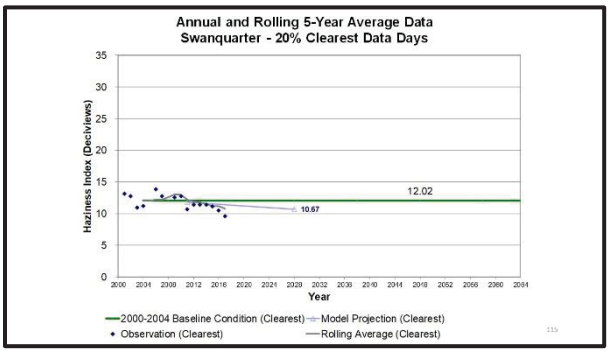

Annual and Rolling 5-Year Average Data
Mammoth Cave - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
16.51
11.40
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)

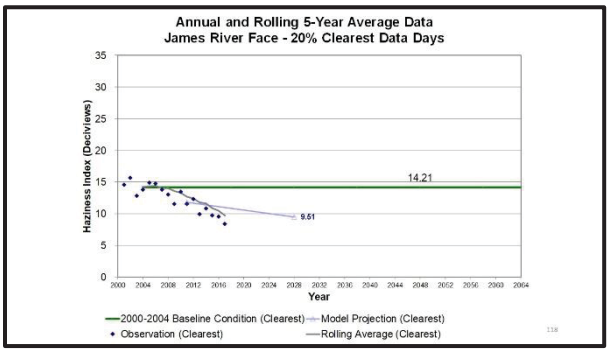

Annual and Rolling 5-Year Average Data
Cohutta - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
13.73
8.80
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)

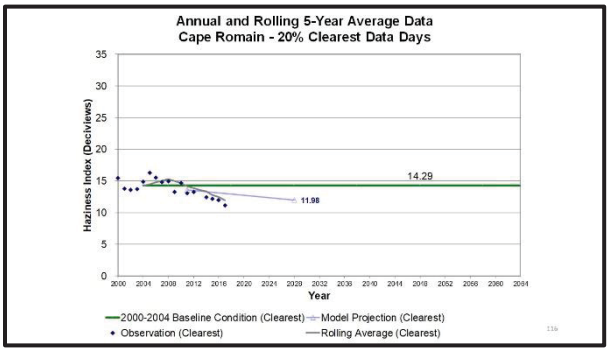

Annual and Rolling 5-Year Average Data
Linville Gorge - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
11.11
8.00
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)

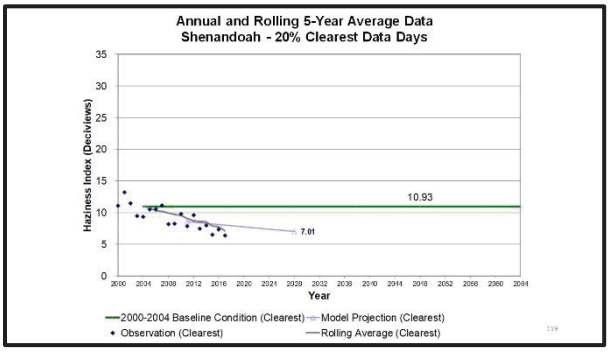

Annual and Rolling 5-Year Average Data
Okefenokee - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
15.23
11.41
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)

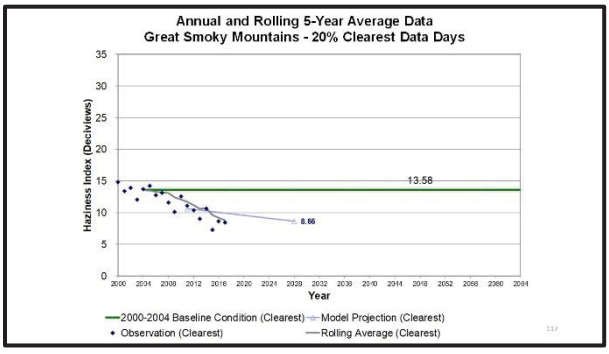

Annual and Rolling 5-Year Average Data
Shining Rock - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
7.70
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)

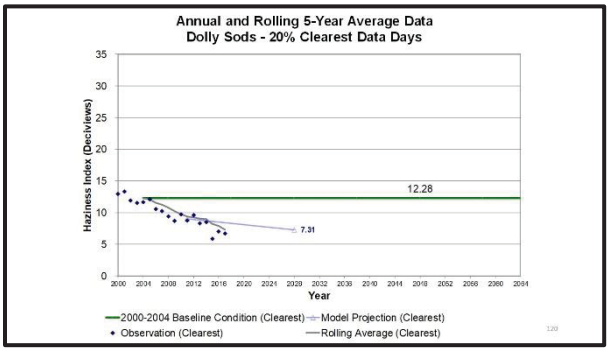

Annual and Rolling 5-Year Average Data
Swanquarter - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
12.02
10.67
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)

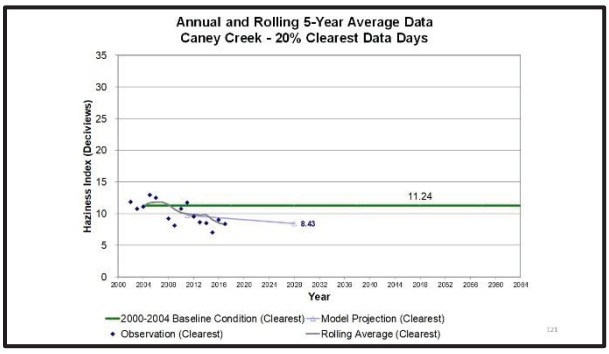

Annual and Rolling 5-Year Average Data
James River Face - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
14.21
9.51
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)

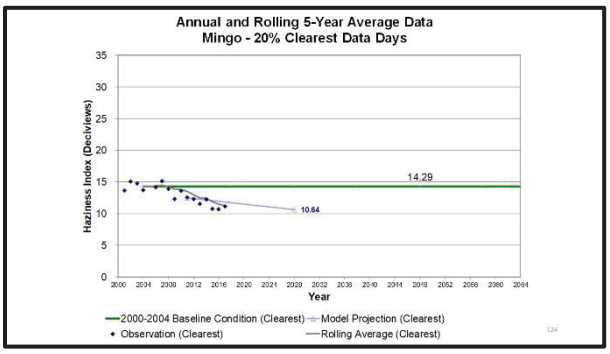

Annual and Rolling 5-Year Average Data
Cape Romain - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
14.29
11.98
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)

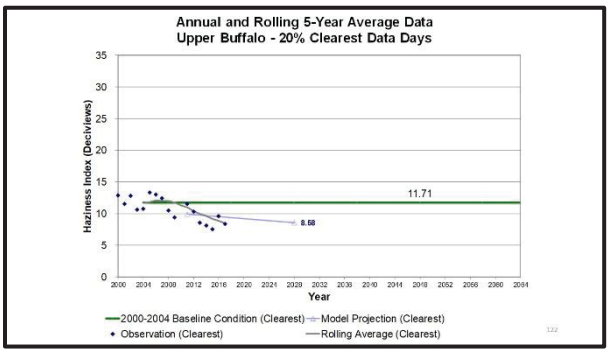

Annual and Rolling 5-Year Average Data
Shenandoah - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
10.93
7.01
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)

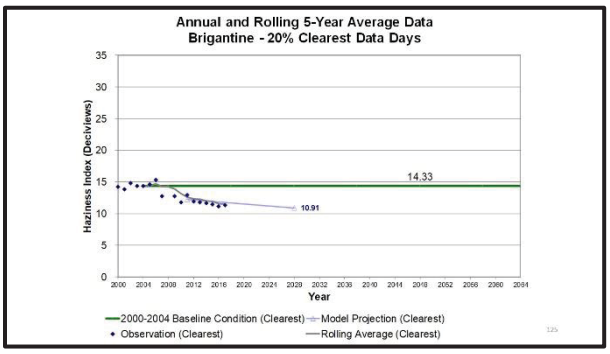

Annual and Rolling 5-Year Average Data
Great Smoky Mountains - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
13.58
8.66
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)

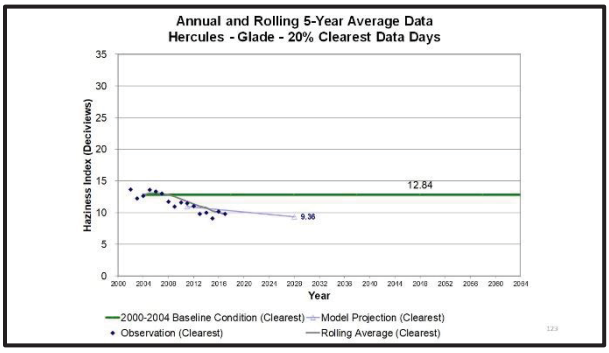

Annual and Rolling 5-Year Average Data
Dolly Sods - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
12.28
7.31
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)


Annual and Rolling 5-Year Average Data
Caney Creek - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
11.24
8.43
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)


Annual and Rolling 5-Year Average Data
Mingo - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
14.29
10.64
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)


Annual and Rolling 5-Year Average Data
Upper Buffalo - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
11.71
8.68
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)


Annual and Rolling 5-Year Average Data
Brigantine - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
14.33
10.91
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)


Annual and Rolling 5-Year Average Data
Hercules - Glade - 20% Clearest Data Days
Haziness Index (Deciviews)
Year
12.84
9.36
2000-2004 Baseline Condition (Clearest)
Model Projection (Clearest)
Observation (Clearest)
Rolling Average (Clearest)

Appendix C

Draft AOI Source Categories for SIPS

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	9.8%	5.8%	15.5%
NONROAD_MAR	0.1%	4.1%	4.2%
NONROAD_OTHER	0.2%	4.2%	4.4%
ONROAD	0.3%	8.6%	9.0%
POINT	44.4%	13.6%	58.0%
PT_FIRES_PRESCRIBED	6.2%	2.7%	8.9%
TOTAL	**61.0%**	**39.0%**	**100.0%**

127

Draft AOI Point Contributions for CHAS

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
FL	DUKE ENERGY FLORIDA, INC. (DEF)	27.4	2,489.8	5,306.4	60.69%	1.86%
FL	TAMPA ELECTRIC COMPANY (TEC)	106.8	2,665.0	6,084.9	4.51%	0.23%
FL	MOSAIC FERTILIZER LLC	112.6	310.4	7,900.7	4.40%	0.02%
FL	CEMEX CONSTRUCTION MATERIALS FLORIDA,LLC	21.5	631.6	235.0	4.11%	1.00%
FL	MOSAIC FERTILIZER, LLC	99.7	159.7	3,034.1	3.08%	0.02%
FL	C.D. MCINTOSH, JR. POWER PLANT	96.1	1,765.3	4,202.2	2.98%	0.12%
FL	MOSAIC FERTILIZER, LLC	112.2	141.0	4,425.6	2.22%	0.01%
FL	ORLANDO UTILITIES COMMISSION	138.8	4,033.4	7,690.6	1.13%	0.18%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	141.2	917.8	3,713.4	0.72%	0.02%
FL	MOSAIC FERTILIZER LLC	123.0	29.5	1,123.5	0.54%	0.00%
AL	Escambia Operating Company LLC	530.7	349.3	18,974.4	0.49%	0.00%
FL	CITY OF GAINESVILLE, GRU	113.1	410.0	881.4	0.47%	0.01%
FL	ROCK TENN CP, LLC	239.3	2,316.8	2,606.7	0.39%	0.03%
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	189.0	112.4	3,197.8	0.38%	0.00%
FL	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	174.0	1,830.7	1,520.4	0.32%	0.02%
FL	JEA	209.3	651.8	2,094.5	0.30%	0.01%
FL	GEORGIA-PACIFIC CONSUMER OPERATIONS LLC	133.7	1,187.6	755.6	0.74%	0.04%
FL	Citrus	27.1	269.2	19.1	0.22%	0.20%
FL	ROCKTENN CP LLC	335.3	1,404.9	2,590.9	0.22%	0.01%
FL	FLORIDA GAS TRANSMISSION COMPANY	13.6	7.1	4.0	0.18%	0.02%

130

Draft AOI Point Contributions for SIPS

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
IN	INDIANA MICHIGAN POWER DBA AEP - ROCKPORT	398.4	8,806.8	30,536.3	5.58%	0.30%
MO	NEW MADRID POWER PLANT-MARSTON	314.5	4,394.1	16,783.7	3.40%	0.26%
KY	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	337.7	7,007.3	19,504.7	3.23%	0.56%
TN	TVA CUMBERLAND FOSSIL PLANT	228.9	4,916.5	8,417.3	3.11%	0.46%
IN	Gibson	448.7	12,280.3	23,117.2	2.78%	0.26%
KY	Big Rivers Electric Corp - Wilson Station	345.5	1,151.9	6,934.7	1.95%	0.07%
IL	Joppa Steam	346.5	4,706.3	20,509.3	1.90%	0.24%
IN	INDIANAPOLIS POWER & LIGHT - PETERSBURG	464.4	10,665.3	18,141.9	1.68%	0.23%
AL	Nucor Steel Decatur LLC	40.0	331.2	270.2	1.66%	0.75%
AL	DRUMMOND COMPANY, INC.	98.7	1,228.5	2,562.2	1.66%	0.16%
AL	Alabama Power - Gorgas	78.5	3,976.4	1,410.8	1.47%	0.80%
AL	Walter Coke, Inc.	99.6	781.8	2,229.2	1.43%	0.10%
MO	SIKESTON POWER STATION-SIKESTON POWER STATION	349.1	1,826.0	12,252.1	1.26%	0.05%
MO	NORANDA ALUMINUM INC-NEW MADRID	314.5	39.1	5,876.5	1.19%	0.00%
IN	Sigeco AB Brown South Indiana Gas & Ele	396.7	1,578.6	7,644.7	1.17%	0.07%
AL	Ala power - MILLER	82.9	11,047.1	1,490.5	1.10%	3.03%
GA	Ga Power Company - Plant Bowen	274.1	6,643.3	10,453.4	1.04%	0.14%
AL	EC Gaston	146.7	2,625.8	2,286.9	0.98%	0.17%
IL	Newton	516.6	1,934.9	10,631.6	0.97%	0.02%
IN	ALCOA - WARRICK POWER PLT AGC DIV OF AL	396.3	11,158.6	5,071.3	0.89%	0.61%

128

Draft AOI Source Categories for EVER

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	5.4%	6.4%	11.8%
NONROAD_MAR	12.9%	23.2%	36.1%
NONROAD_OTHER	0.4%	12.5%	12.9%
ONROAD	2.0%	17.2%	19.2%
POINT	10.2%	7.5%	17.7%
PT_FIRES_PRESCRIBED	1.8%	0.4%	2.3%
TOTAL	**32.8%**	**67.2%**	**100.0%**

131

Draft AOI Source Categories for CHAS

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	0.5%	0.5%	1.0%
NONROAD_MAR	0.1%	0.3%	0.4%
NONROAD_OTHER	0.1%	1.2%	1.3%
ONROAD	0.2%	1.8%	2.0%
POINT	88.6%	4.0%	92.6%
PT_FIRES_PRESCRIBED	2.3%	0.4%	2.7%
TOTAL	**91.8%**	**8.2%**	**100.0%**

129

Draft AOI Point Contributions for EVER

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
FL	Miami Intl	58.6	4,371.9	424.9	8.75%	13.77%
FL	MOSAIC FERTILIZER LLC	303.3	310.4	7,900.7	4.70%	0.02%
FL	MIAMI- DADE WATER AND SEWER DEPARTMENT	38.1	50.5	61.1	3.73%	0.41%
FL	TAMPA ELECTRIC COMPANY (TEC)	316.6	2,665.0	6,084.9	2.85%	0.08%
FL	C.D. MCINTOSH, JR. POWER PLANT	322.8	1,765.3	4,202.2	2.68%	0.16%
FL	MOSAIC FERTILIZER, LLC	304.7	141.0	4,425.6	2.56%	0.01%
FL	MIAMI- DADE WATER AND SEWER DEPARTMENT	66.1	51.2	131.8	1.97%	0.11%
FL	Fort Lauderdale/Hollywo	92.1	1,922.6	207.7	1.91%	2.39%
FL	WASTE MANAGEMENT INC. OF FLORIDA	173.2	5.8	390.4	1.87%	0.00%
FL	FLORIDA POWER & LIGHT (PTF)	35.4	170.6	13.0	1.48%	2.35%
FL	MOSAIC FERTILIZER, LLC	322.3	159.7	3,034.1	1.47%	0.01%
FL	ORLANDO UTILITIES COMMISSION	346.1	4,033.4	7,690.6	1.33%	0.24%
TX	Martin Lake	1,552.8	12,358.5	56,110.3	1.11%	0.01%
FL	MOSAIC FERTILIZER LLC	293.1	29.5	1,123.5	1.10%	0.00%
FL	WASTE MANAGEMENT INC. OF FLORIDA	112.0	64.5	175.3	0.92%	0.05%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	443.2	2,489.8	5,306.4	0.79%	0.02%
TX	WA PARISH ELECTRIC GENERATING STATION	1,544.8	3,865.5	37,774.7	0.75%	0.00%
FL	CEMEX CONSTRUCTION MATERIALS FL, LLC.	50.8	910.4	29.5	0.69%	2.76%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	490.3	917.8	3,713.4	0.68%	0.02%
IN	INDIANA MICHIGAN POWER DBA AEP - ROCKPORT	1,513.9	8,806.8	30,536.3	0.61%	0.04%

132

Draft AOI Source Categories for SAMA

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	2.5%	1.4%	3.9%
NONROAD_MAR	0.5%	1.4%	1.8%
NONROAD_OTHER	0.3%	2.1%	2.3%
ONROAD	0.5%	3.1%	3.5%
POINT	61.5%	4.3%	65.8%
PT_FIRES_PRESCRIBED	19.9%	2.7%	22.7%
TOTAL	**85.2%**	**14.8%**	**100.0%**

Draft AOI Point Contributions for COHU

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
GA	Ga Power Company - Plant Bowen	78.0	6,643.3	10,453.4	18.72%	1.10%
IN	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	410.1	8,806.8	30,536.3	4.47%	0.13%
GA	TEMPLE INLAND	87.4	1,773.4	1,791.0	4.46%	0.17%
IN	Gibson	487.1	12,280.3	23,117.2	2.20%	0.10%
IN	INDIANAPOLIS POWER & LIGHT PETERSBURG	477.0	10,665.3	18,141.9	2.09%	0.15%
KY	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	457.2	7,007.3	19,504.7	2.08%	0.07%
TN	TVA KINGSTON FOSSIL PLANT	124.0	1,687.4	1,886.1	2.08%	0.13%
GA	Ga Power Company - Plant Hammond	88.5	864.9	772.5	1.90%	0.08%
OH	General James M. Gavin Power Plant (0627010056)	512.0	8,122.5	41,595.8	1.64%	0.02%
TN	TVA CUMBERLAND FOSSIL PLANT	327.0	4,916.5	8,417.3	1.32%	0.00%
KY	Big Rivers Electric Corp - Wilson Station	369.0	1,151.9	6,934.2	1.02%	0.01%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	454.6	7,150.0	22,133.9	1.01%	0.06%
GA	Ga Power Company - Plant Wansley	156.8	2,052.5	4,856.0	1.01%	0.04%
KY	KY Utilities Co - Ghent Station	441.5	7,939.9	10,109.3	1.00%	0.08%
IL	Joppa Steam	466.9	4,706.3	20,509.3	0.99%	0.02%
GA	Mohawk Industries Inc	32.0	66.5	77.1	0.97%	0.07%
TN	EASTMAN CHEMICAL COMPANY	269.8	6,900.3	6,420.7	0.95%	0.08%
MO	AMEREN MISSOURI-LABADIE PLANT	695.4	9,685.5	41,740.3	0.92%	0.01%
TN	TATE & LYLE, Loudon	109.0	883.3	472.8	0.89%	0.09%
IL	Newton	564.0	1,934.9	10,631.6	0.87%	0.01%

Draft AOI Point Contributions for SAMA

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
AL	Escambia Operating Company LLC	325.6	349.3	18,974.4	12.05%	0.01%
FL	ROCKTENN CP LLC	140.8	1,404.9	2,590.9	7.26%	0.20%
FL	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	61.4	1,830.7	1,520.4	5.65%	0.43%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	189.3	2,489.8	5,306.4	4.63%	0.20%
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	137.7	112.4	3,197.8	4.29%	0.01%
AL	Escambia Operating Company LLC	315.0	149.6	8,589.6	3.81%	0.00%
AL	Sanders Lead Co	255.9	121.7	7,951.1	2.60%	0.00%
FL	MOSAIC FERTILIZER LLC	323.9	310.4	7,900.7	1.70%	0.01%
FL	TAMPA ELECTRIC COMPANY (TEC)	307.1	2,665.0	6,084.9	1.62%	0.06%
AL	Ala Power - Barry	383.1	2,181.9	6,025.6	1.42%	0.03%
FL	GULF POWER - Crist	299.5	2,998.4	2,615.7	1.27%	0.06%
AL	Union Oil of California - Chunchula Gas Plant	396.3	349.2	2,573.2	0.97%	0.01%
LA	Columbian Chemicals Co - North Bend Plant	705.9	640.3	7,834.0	0.95%	0.00%
FL	JEA	253.7	651.8	2,094.5	0.91%	0.03%
MO	AMEREN MISSOURI-LABADIE PLANT	1,121.8	9,685.5	41,740.3	0.86%	0.00%
AL	Continental Carbon Company	270.8	1,260.0	2,965.5	0.83%	0.02%
FL	MOSAIC FERTILIZER, LLC	326.1	141.0	4,475.6	0.81%	0.00%
AL	Akzo Nobel Chemicals Inc	383.2	20.7	3,335.7	0.79%	0.00%
AL	PowerSouth Energy Coop - Lowman	390.7	2,910.8	4,394.9	0.76%	0.03%
GA	Georgia-Pacific Corp Cedar Springs Operation	149.2	2,884.2	510.1	0.75%	0.24%

Draft AOI Source Categories for OKEF

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	1.8%	1.6%	3.4%
NONROAD_MAR	0.6%	5.6%	6.2%
NONROAD_OTHER	0.1%	1.6%	1.7%
ONROAD	0.5%	4.2%	4.6%
POINT	65.6%	5.5%	71.1%
PT_FIRES_PRESCRIBED	10.6%	2.4%	12.9%
TOTAL	**79.3%**	**20.7%**	**100.0%**

Draft AOI Source Categories for COHU

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	4.9%	3.1%	8.1%
NONROAD_MAR	0.1%	3.3%	3.4%
NONROAD_OTHER	0.2%	2.4%	2.6%
ONROAD	0.6%	6.4%	7.0%
POINT	68.0%	8.0%	75.9%
PT_FIRES_PRESCRIBED	2.5%	0.5%	3.1%
TOTAL	**76.3%**	**23.7%**	**100.0%**

Draft AOI Point Contributions for OKEF

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	71.5	112.4	3,197.8	16.11%	0.03%
FL	ROCKTENN CP, LLC	64.8	2,316.8	2,606.7	12.12%	0.83%
FL	JEA	65.6	651.8	2,094.5	6.23%	0.17%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	121.4	917.8	3,713.4	3.08%	0.06%
FL	ITT CHEMICAL HOLDINGS, INC.	56.8	37.7	898.9	3.07%	0.01%
FL	RAYONIER PERFORMANCE FIBERS LLC	63.4	2,327.1	562.0	2.67%	0.86%
GA	International Paper - Savannah	178.9	1,560.7	3,945.4	2.66%	0.07%
FL	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	153.5	1,830.7	1,520.4	2.06%	0.13%
FL	RENESSENZ LLC	59.8	66.3	569.5	1.85%	0.02%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	205.0	2,489.8	5,306.4	1.33%	0.05%
AL	Escambia Operating Company LLC	501.9	349.3	18,974.4	1.20%	0.00%
AL	Sanders Lead Co	384.6	121.7	7,951.1	1.05%	0.00%
AL	Escambia Operating Company LLC	491.9	149.6	8,589.6	1.02%	0.00%
GA	Georgia Pacific Consumer Products LP (Savannah River Mill)	197.2	351.5	1,860.2	0.99%	0.01%
GA	Ga Power Company - Plant Bowen	458.1	6,643.3	10,453.4	0.97%	0.05%
GA	Brunswick Cellulose Inc	75.3	1,554.5	294.2	0.96%	0.32%
SC	ALUMAX OF SOUTH CAROLINA	327.7	108.1	3,751.7	0.93%	0.00%
GA	PCA Valdosta Mill	112.7	1,032.6	485.7	0.80%	0.08%
SC	SANTEE COOPER CROSS GENERATING STATION	348.1	3,273.5	4,781.2	0.80%	0.05%
FL	CITY OF GAINESVILLE, GRU	111.7	410.0	881.4	0.74%	0.03%

Draft AOI Source Categories for WOLF

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	2.6%	1.5%	4.1%
NONROAD_MAR	1.4%	2.7%	4.1%
NONROAD_OTHER	0.3%	3.0%	3.3%
ONROAD	0.7%	5.2%	5.9%
POINT	70.4%	6.8%	77.1%
PT_FIRES_PRESCRIBED	4.7%	0.8%	5.5%
TOTAL	**79.9%**	**20.1%**	**100.0%**

139

Draft AOI Point Contributions for MACA

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
IN	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	118.0	8,806.8	30,536.3	16.11%	2.49%
KY	Big Rivers Electric Corp - Wilson Station	89.9	1,151.9	6,934.2	6.42%	0.35%
IN	Gibson	198.2	12,280.3	23,117.2	4.97%	1.15%
KY	Tennessee Valley Authority - Paradise Fossil Plant	75.1	2,927.4	2,990.2	3.54%	1.15%
KY	Century Aluminum of KY LLC	106.0	197.7	5,044.2	3.43%	0.04%
IN	INDIANAPOLIS POWER & LIGHT PETERSBURG	182.9	10,665.3	18,141.9	2.95%	0.91%
IN	Sigeco AB Brown South Indiana Gas & Ele	162.9	1,578.6	7,644.7	2.60%	0.26%
IN	ALCOA WARRICK POWER PLT AGC DIV OF AL	136.1	11,158.6	5,071.3	1.91%	1.66%
IL	Joppa Steam	241.0	4,706.3	20,509.3	1.72%	0.16%
KY	Century Aluminum Sebree LLC	133.2	75.5	4,193.4	1.63%	0.01%
KY	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	233.6	7,007.3	19,504.7	1.52%	0.14%
TN	TVA CUMBERLAND FOSSIL PLANT	157.6	4,916.5	8,427.3	1.51%	0.34%
IN	ALCOA INC. - WARRICK OPERATIONS	135.9	532.8	3,897.8	1.47%	0.05%
IN	SABIC INNOVATIVE PLASTICS MT. VERNON LLC	179.3	1,751.8	4,703.4	1.38%	0.17%
OH	General James M. Gavin Power Plant (0627010056)	406.5	8,122.5	41,595.8	1.38%	0.04%
KY	Louisville Gas & Electric Co., Mill Creek Station	104.4	4,169.1	4,335.3	1.29%	0.42%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	256.1	7,150.0	72,133.9	1.16%	0.13%
KY	KY Utilities Co - Ghent Station	204.5	7,939.9	10,169.3	0.97%	0.22%
IN	ESSROC CEMENT CORP	146.5	2,365.0	4,681.2	0.96%	0.17%
MO	SIKESTON POWER STATION-SIKESTON POWER STATION	310.4	1,826.0	12,252.1	0.84%	0.03%

142

Draft AOI Point Contributions for WOLF

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
GA	Brunswick Cellulose Inc	27.9	1,554.5	294.2	8.61%	2.87%
FL	ROCKTENN CP, LLC	74.9	2,316.8	2,606.7	8.34%	0.38%
GA	International Paper - Savannah	85.9	1,560.7	3,945.4	7.34%	0.23%
FL	JEA	105.1	651.8	2,094.5	4.31%	0.09%
GA	Georgia-Pacific Consumer Products LP (Savannah River Mill)	109.9	351.5	1,840.2	2.58%	0.03%
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	173.6	112.4	3,197.8	2.24%	0.01%
SC	ALUMAX OF SOUTH CAROLINA	223.0	108.1	3,751.7	1.79%	0.00%
FL	RAYONIER PERFORMANCE FIBERS LLC	77.4	2,327.1	562.0	1.74%	0.37%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	181.4	917.8	3,713.4	1.72%	0.02%
OH	General James M. Gavin Power Plant (0627010056)	845.3	8,122.5	41,595.8	1.67%	0.02%
SC	SANTEE COOPER CROSS GENERATING STATION	251.0	3,273.5	4,281.2	1.55%	0.08%
GA	Southern States Phosphate & Fertilizer	84.1	1.0	597.1	1.51%	0.00%
FL	JH CHEMICAL HOLDINGS, INC.	118.5	37.7	898.9	1.19%	0.00%
FL	DUKE ENERGY FLORIDA, INC. (DCF)	296.6	2,489.8	5,306.4	1.16%	0.04%
GA	Ga Power Company - Plant Bowen	458.1	6,643.3	10,453.4	1.05%	0.03%
GA	Savannah Sugar Refinery	89.9	521.6	582.0	1.03%	0.07%
SC	INTERNATIONAL PAPER EASTOVER	288.7	1,780.3	3,212.9	0.92%	0.05%
GA	Ga Power Company - Plant McManus	27.1	72.2	30.1	0.91%	0.14%
AL	Escambia Operating Company LLC	578.2	349.3	18,974.4	0.88%	0.00%
SC	KAPSTONE CHARLESTON KRAFT LLC	213.6	2,355.8	1,863.7	0.87%	0.09%

140

Draft AOI Source Categories for LIGO

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	9.9%	1.7%	11.6%
NONROAD_MAR	0.1%	0.6%	0.7%
NONROAD_OTHER	0.1%	0.8%	0.9%
ONROAD	0.5%	1.9%	2.4%
POINT	80.0%	3.0%	83.1%
PT_FIRES_PRESCRIBED	1.2%	0.1%	1.3%
TOTAL	**91.9%**	**8.1%**	**100.0%**

143

Draft AOI Source Categories for MACA

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	1.0%	6.4%	7.4%
NONROAD_MAR	0.1%	3.4%	3.5%
NONROAD_OTHER	0.1%	3.3%	3.4%
ONROAD	0.2%	8.1%	8.3%
POINT	62.0%	14.1%	76.1%
PT_FIRES_PRESCRIBED	0.8%	0.5%	1.3%
TOTAL	**64.1%**	**35.9%**	**100.0%**

141

Draft AOI Point Contributions for LIGO

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
TN	EASTMAN CHEMICAL COMPANY	81.9	6,900.3	6,470.2	18.98%	0.67%
NC	Duke Energy Carolinas, LLC - Marshall Steam Station	97.2	7,511.3	4,139.2	6.25%	0.40%
OH	General James M. Gavin Power Plant (0627010056)	329.2	8,122.5	41,595.8	5.83%	0.04%
VA	Jewell Coke Company LLP	140.4	520.2	5,090.9	5.28%	0.01%
NC	SGL Carbon LLC	32.5	21.7	261.6	4.00%	0.01%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	380.3	7,150.0	72,133.9	2.79%	0.01%
NC	Duke Energy Carolinas, LLC - Cliffside Steam Station	85.3	1,947.7	1,082.3	2.35%	0.11%
WV	MONONGAHELA POWER CO PLEASANTS POWER STA	381.0	5,497.4	16,817.4	2.01%	0.03%
NC	Duke Energy Carolinas, LLC - Belews Creek Steam Station	172.2	5,264.3	4,946.1	1.91%	0.08%
WV	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	277.7	4,878.1	10,984.2	1.76%	0.02%
IN	AGC INDUSTRIES - GREENLAND PLANT	94.7	2,068.1	441.6	1.72%	0.23%
IN	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	503.5	8,806.8	30,536.3	1.16%	0.01%
PA	GENCON NE MGMT CO/KEYSTONE STA	567.5	6,578.5	56,939.2	0.93%	0.00%
NC	Broughton Hospital	35.6	15.8	65.8	0.92%	0.01%
NC	Duke Energy Progress, LLC - Roxboro Steam Electric Plant	263.4	4,527.9	6,665.5	0.91%	0.03%
WV	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	404.3	11,830.9	10,082.9	0.76%	0.03%
SC	RESOLUTE FP US INC	156.8	1,800.7	7,571.8	0.76%	0.02%
NC	Blue Ridge Paper Products - Canton Mill	95.4	2,992.4	1,127.1	0.76%	0.09%
OH	Avon Lake Power Plant (0247030013)	614.2	3,600.7	71,188.9	0.75%	0.00%
KY	KY Utilities Co - Ghent Station	412.9	7,939.9	10,169.3	0.71%	0.02%

144

Draft AOI Source Categories for SHRO

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	12.2%	4.2%	16.4%
NONROAD_MAR	0.1%	1.1%	1.2%
NONROAD_OTHER	0.2%	2.7%	2.8%
ONROAD	0.7%	5.9%	6.6%
POINT	61.8%	9.7%	71.5%
PT_FIRES_PRESCRIBED	1.4%	0.2%	1.6%
TOTAL	**76.2%**	**23.8%**	**100.0%**

145

Draft AOI Point Contributions for SWAN

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
NC	PCS Phosphate Company, Inc. - Aurora	52.5	495.6	4,845.9	37.59%	0.57%
PA	GENON NE MGMT CO/KEYSTONE STA	640.2	6,578.5	56,939.2	2.98%	0.08%
NC	Domtar Paper Company, LLC	69.0	1,796.5	687.4	2.25%	1.01%
NC	Duke Energy Progress, LLC - Roxboro Steam Electric Plant	282.6	4,527.9	6,665.5	2.03%	0.18%
OH	General James M. Gavin Power Plant (0627010056)	651.5	8,122.5	41,595.8	1.76%	0.06%
MD	Raven Power Fort Smallwood LLC	414.7	4,387.8	10,982.9	1.75%	0.16%
NC	Marine Corps Air Station - Cherry Point	88.4	201.1	607.8	1.30%	0.05%
MD	Luke Paper Company	512.5	3,607.0	22,659.8	0.99%	0.02%
WV	MONONGAHELA POWER CO-PLEASANTS POWER STA	625.7	5,497.4	16,817.4	0.83%	0.07%
MI	ST. CLAIR / BELLE RIVER POWER PLANT	977.5	9,448.2	25,225.9	0.83%	0.04%
NC	Weyerhaeuser NR Company - Vanceboro Pulp	86.8	721.6	288.2	0.74%	0.24%
MD	GenOn Energy, Inc. - Morgantown	329.9	895.4	3,737.0	0.72%	0.03%
WV	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	568.6	11,830.9	10,082.9	0.66%	0.08%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	806.7	7,150.0	22,133.9	0.65%	0.05%
WV	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	602.0	4,878.1	10,984.2	0.62%	0.04%
SC	SANTEE COOPER CROSS GENERATING STATION	426.9	3,273.5	4,281.2	0.55%	0.07%
PA	HOMER CITY GEN LP/ CENTER TWP	620.1	5,216.0	11,865.7	0.54%	0.05%
KY	KY Utilities Co - Ghent Station	865.4	7,939.9	10,169.3	0.52%	0.07%
MO	AMEREN MISSOURI-LABADIE PLANT	1,345.4	9,685.5	41,740.3	0.51%	0.03%
OH	Department of Public Utilities, City of Orrville, Ohio (0285010188)	771.9	1,901.9	13,038.0	0.46%	0.01%

148

Draft AOI Point Contributions for SHRO

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
NC	Blue Ridge Paper Products - Canton Mill	16.9	2,992.4	1,127.1	40.55%	6.53%
TN	EASTMAN CHEMICAL COMPANY	126.9	6,900.3	6,420.2	4.35%	0.39%
NC	Duke Energy Carolinas, LLC - Marshall Steam Station	166.0	7,511.3	4,139.2	2.16%	0.48%
GA	Ga Power Company - Plant Bowen	241.6	6,643.3	10,453.4	1.67%	0.07%
NC	Duke Energy Carolinas, LLC - Cliffside Steam Station	94.1	1,947.7	1,082.3	1.54%	0.28%
NC	Duke Energy Carolinas, LLC - Belews Creek Steam Station	264.4	5,264.3	4,946.1	1.40%	0.14%
TN	TVA KINGSTON FOSSIL PLANT	167.7	1,687.4	1,886.1	1.38%	0.10%
OH	General James M. Gavin Power Plant (0627010056)	397.3	8,122.5	41,595.8	1.36%	0.01%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	406.7	7,150.0	22,133.9	1.35%	0.02%
VA	Jewell Coke Company LLP	214.7	520.2	5,090.9	1.31%	0.01%
WV	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	352.1	4,878.1	10,984.2	1.20%	0.04%
IN	INDIANA MICHIGAN POWER DBA AEP - ROCKPORT	473.3	8,806.8	30,536.3	0.68%	0.01%
TN	TVA CUMBERLAND FOSSIL PLANT	454.1	4,916.5	8,427.1	0.53%	0.02%
GA	TEMPLE INLAND	265.7	1,773.4	1,791.0	0.53%	0.03%
TN	TVA BULL RUN FOSSIL PLANT	143.0	964.2	622.5	0.53%	0.05%
WV	MONONGAHELA POWER CO-PLEASANTS POWER STA	460.0	5,497.4	16,817.4	0.51%	0.01%
TN	TAET & YET, Loudon	145.2	883.3	427.8	0.49%	0.07%
PA	GENON NE MGMT CO/KEYSTONE STA	657.6	6,578.5	56,939.2	0.48%	0.00%
KY	Big Rivers Electric Corp - Wilson Station	448.4	1,151.9	6,934.2	0.47%	0.01%
MO	AMEREN MISSOURI-LABADIE PLANT	799.0	9,685.5	41,740.3	0.46%	0.01%

146

Draft AOI Source Categories for ROMA

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	1.7%	1.1%	2.9%
NONROAD_MAR	1.7%	2.4%	4.0%
NONROAD_OTHER	0.1%	1.8%	1.9%
ONROAD	0.3%	2.8%	3.2%
POINT	79.3%	5.9%	85.1%
PT_FIRES_PRESCRIBED	2.5%	0.4%	2.9%
TOTAL	**85.6%**	**14.4%**	**100.0%**

149

Draft AOI Source Categories for SWAN

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	4.2%	3.6%	7.7%
NONROAD_MAR	0.3%	3.5%	3.8%
NONROAD_OTHER	0.2%	8.7%	8.9%
ONROAD	0.2%	4.1%	4.4%
POINT	66.9%	7.2%	74.1%
PT_FIRES_PRESCRIBED	0.8%	0.3%	1.1%
TOTAL	**72.6%**	**27.4%**	**100.0%**

147

Draft AOI Point Contributions for ROMA

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
SC	KAPSTONE CHARLESTON KRAFT LLC	29.3	2,355.8	1,863.7	29.97%	2.72%
SC	ALUMAX OF SOUTH CAROLINA	39.1	108.1	3,751.7	16.95%	0.03%
SC	SANTEE COOPER CROSS GENERATING STATION	63.8	3,273.5	4,281.2	6.52%	0.45%
SC	SANTEE COOPER WINYAH GENERATING STATION	51.4	1,772.5	2,246.9	4.57%	0.38%
SC	INTERNATIONAL PAPER GEORGETOWN MILL	57.4	2,031.3	2,767.5	4.28%	0.35%
SC	SCE&G WILLIAMS	26.7	992.7	392.5	3.98%	0.79%
SC	NUCOR STEEL BERKELEY	22.1	440.0	148.3	1.82%	0.42%
GA	International Paper - Savannah	166.1	1,560.7	3,945.4	1.75%	0.04%
SC	SHOWA DENKO CARBON INC	66.1	264.6	971.2	1.70%	0.03%
GA	Georgia Pacific Consumer Products LP (Savannah River Mill)	159.9	351.5	1,860.2	1.15%	0.02%
SC	INTERNATIONAL PAPER EASTOVER	139.0	1,780.3	3,212.9	1.05%	0.04%
SC	COOPER RIVER PARTNERS LLC	25.9	58.4	58.1	0.94%	0.07%
OH	General James M. Gavin Power Plant (0627010056)	701.0	8,122.5	41,595.8	0.83%	0.00%
SC	SCE&G WATEREE	133.1	1,344.0	2,176.8	0.66%	0.03%
SC	Charleston AFB/Intl Airport	36.8	358.4	46.2	0.43%	0.24%
GA	Ga Power Company - Plant Bowen	506.2	6,643.3	10,453.4	0.35%	0.01%
SC	GIANT CEMENT CO	80.6	509.4	309.0	0.34%	0.04%
FL	ROCK-TENN CP, LLC	302.9	2,316.8	2,606.7	0.34%	0.02%
TN	EASTMAN CHEMICAL COMPANY	476.9	6,900.3	6,420.2	0.34%	0.01%
SC	SCE&G COPE	136.5	644.0	962.3	0.33%	0.02%

150

Draft AOI Source Categories for GRSM

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	10.4%	8.3%	18.7%
NONROAD_MAR	0.1%	3.1%	3.2%
NONROAD_OTHER	0.3%	4.6%	4.9%
ONROAD	1.5%	11.3%	12.7%
POINT	50.9%	7.1%	58.0%
PT_FIRES_PRESCRIBED	2.3%	0.3%	2.6%
TOTAL	**65.4%**	**34.6%**	**100.0%**

151

Draft AOI Point Contributions for JOYC

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
TN	TVA KINGSTON FOSSIL PLANT	73.7	1,687.4	1,886.1	7.35%	0.53%
TN	EASTMAN CHEMICAL COMPANY	179.2	6,900.3	6,420.2	5.51%	0.15%
OH	General James M. Gavin Power Plant (0627010056)	425.1	8,122.5	41,595.8	4.43%	0.04%
IN	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	391.2	8,806.8	30,536.3	4.05%	0.13%
TN	TATE & LYLE, Loudon	48.1	883.3	472.8	4.05%	0.58%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	385.1	7,150.0	22,133.9	3.40%	0.06%
GA	Ga Power Company - Plant Bowen	166.2	6,643.3	10,453.4	3.38%	0.09%
TN	TVA BULL RUN FOSSIL PLANT	70.3	964.2	627.5	2.33%	0.44%
IN	INDIANAPOLIS POWER & LIGHT PETERSBURG	453.0	10,665.3	18,141.9	2.02%	0.13%
IN	Gibson	471.7	12,280.3	23,117.2	1.87%	0.10%
KY	Century Aluminum of KY LLC	377.1	197.7	5,044.2	1.48%	0.01%
TN	Mc Ghee Tyson	44.3	594.7	78.6	1.25%	0.65%
KY	Louisville Gas & Electric Co., Mill Creek Station	340.9	4,169.1	4,335.3	1.14%	0.11%
KY	KY Utilities Co - Ghent Station	383.0	7,939.9	10,109.3	1.03%	0.07%
IN	INDIANA KENTUCKY ELECTRIC CORPORATION	391.6	6,188.5	9,038.1	0.99%	0.04%
IN	ESSROC CEMENT CORP	369.5	2,365.0	4,681.2	0.96%	0.04%
IL	Joppa Steam	487.1	4,706.3	20,509.3	0.96%	0.01%
VA	Jewell Coke Company LLP	267.5	520.2	5,090.9	0.93%	0.00%
KY	Big Rivers Electric Corp - Wilson Station	359.1	1,151.9	6,934.7	0.85%	0.02%
MO	AMEREN MISSOURI-LABADIE PLANT	703.9	9,685.5	41,740.3	0.84%	0.03%

154

Draft AOI Point Contributions for GRSM

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
TN	TVA KINGSTON FOSSIL PLANT	60.0	1,687.4	1,886.1	6.67%	0.64%
TN	EASTMAN CHEMICAL COMPANY	160.1	6,900.3	6,420.2	5.43%	0.17%
TN	TATE & LYLE, Loudon	36.1	883.3	472.8	4.74%	0.74%
IN	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	375.5	8,806.8	30,536.3	4.21%	0.19%
TN	Mc Ghee Tyson	19.7	594.7	78.6	3.89%	2.72%
TN	TVA BULL RUN FOSSIL PLANT	47.1	964.2	627.5	3.76%	0.58%
OH	General James M. Gavin Power Plant (0627010056)	400.5	8,122.5	41,595.8	2.03%	0.04%
GA	Ga Power Company - Plant Bowen	189.7	6,643.3	10,453.4	1.90%	0.03%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	360.0	7,150.0	22,133.9	1.66%	0.08%
TN	Cemex - Knoxville Plant	44.3	711.5	121.5	1.55%	0.82%
IL	Joppa Steam	474.4	4,706.3	20,509.3	1.47%	0.04%
IN	INDIANA KENTUCKY ELECTRIC CORPORATION	368.7	6,188.5	9,038.1	1.44%	0.11%
IN	INDIANAPOLIS POWER & LIGHT PETERSBURG	435.6	10,665.3	18,141.9	1.34%	0.11%
KY	KY Utilities Co - Ghent Station	359.2	7,939.9	10,109.3	1.29%	0.08%
KY	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	465.3	7,007.3	19,504.7	1.21%	0.02%
IN	Gibson	456.3	12,280.3	23,117.2	1.13%	0.06%
KY	Big Rivers Electric Corp - Wilson Station	345.8	1,151.9	6,934.7	1.06%	0.03%
KY	Century Aluminum of KY LLC	360.5	197.7	5,044.2	0.97%	0.00%
WV	MONONGAHELA POWER CO-PLEASANTS POWER STA	475.9	5,497.4	16,817.4	0.96%	0.01%
WV	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	367.1	4,878.1	10,984.2	0.94%	0.01%

152

Draft AOI Source Categories for JARI

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	5.7%	3.6%	9.3%
NONROAD_MAR	0.1%	2.4%	2.5%
NONROAD_OTHER	0.1%	1.7%	1.7%
ONROAD	0.4%	7.2%	7.6%
POINT	70.2%	7.4%	77.5%
PT_FIRES_PRESCRIBED	1.1%	0.2%	1.3%
TOTAL	**77.5%**	**22.5%**	**100.0%**

155

Draft AOI Source Categories for JOYC

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	7.5%	4.6%	12.1%
NONROAD_MAR	0.1%	2.2%	2.3%
NONROAD_OTHER	0.2%	2.6%	2.8%
ONROAD	0.8%	7.1%	7.9%
POINT	64.8%	6.4%	71.2%
PT_FIRES_PRESCRIBED	3.3%	0.4%	3.7%
TOTAL	**76.6%**	**23.4%**	**100.0%**

153

Draft AOI Point Contributions for JARI

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
VA	Meadwestvaco Packaging Resource Group	46.51	1,985.69	2,155.31	12.46%	1.12%
OH	General James M. Gavin Power Plant (0627010056)	270.18	8,122.51	41,595.81	7.55%	0.14%
VA	Roanoke Cement Company	46.43	1,972.97	2,290.17	6.26%	0.47%
WV	MONONGAHELA POWER CO-PLEASANTS POWER STA	247.97	5,497.37	16,817.43	3.82%	0.15%
WV	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	223.52	4,878.10	10,984.24	3.45%	0.13%
PA	GENCON NF MGMT CO/KEYSTONE STA	337.17	6,578.47	56,939.25	2.94%	0.06%
WV	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	207.56	11,830.88	10,082.94	2.72%	0.35%
MD	Luke Paper Company	208.66	3,607.00	22,659.84	2.66%	0.04%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	435.18	7,149.97	22,133.90	1.87%	0.05%
NC	Duke Energy Progress, LLC - Roxboro Steam Electric Plant	132.76	4,527.87	6,665.48	1.49%	0.15%
OH	Cardinal Power Plant (Cardinal Operating Company) (0641020002)	306.40	2,467.31	7,460.79	1.33%	0.04%
PA	HOMER CITY GEN L P/ CENTER TWP	321.57	5,215.96	11,865.70	1.19%	0.03%
NC	Duke Energy Carolinas, LLC - Belews Creek Steam Station	156.88	5,764.28	4,946.09	1.07%	0.16%
VA	GP Big Island LLC	17.13	240.68	39.67	0.92%	0.56%
MI	ST. CLAIR / BELLE RIVER POWER PLANT	625.38	9,448.19	25,225.90	0.86%	0.04%
KY	KY Utilities Co - Ghent Station	499.52	7,939.91	10,169.35	0.81%	0.05%
NC	Duke Energy Progress, LLC - Mayo Electric Generating Plant	133.86	1,394.76	1,770.36	0.81%	0.04%
WV	MONONGAHELA POWER CO. - FORT MARTIN POWER	234.03	13,743.32	4,881.87	0.80%	0.22%
VA	Jewell Coke Company LLP	227.64	520.17	5,090.95	0.77%	0.00%
PA	PPL MONTOUR LLC/MONTOUR SES	454.21	4,855.41	21,482.00	0.73%	0.02%

156

Draft AOI Source Categories for SHEN

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	7.9%	5.3%	13.2%
NONROAD_MAR	0.2%	1.8%	1.9%
NONROAD_OTHER	0.1%	2.4%	2.5%
ONROAD	0.3%	5.5%	5.8%
POINT	67.4%	8.2%	75.6%
PT_FIRES_PRESCRIBED	0.7%	0.2%	0.9%
TOTAL	**76.6%**	**23.4%**	**100.0%**

157

Draft AOI Point Contributions for DOSO

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
WV	ALLEGHENY ENERGY SUPPLY CO, LLC HARRISON	83.6	11,830.9	10,082.9	12.69%	1.27%
MD	Luke Paper Company	51.7	3,607.0	22,659.8	11.48%	0.12%
WV	Dominion Resources, Inc. - MOUNT STORM POWER STATION	17.5	1,984.1	2,123.6	9.88%	0.33%
OH	General James M. Gavin Power Plant (0627010056)	233.8	8,122.5	41,595.8	7.12%	0.09%
WV	MONONGAHELA POWER CO.- FORT MARTIN POWER	79.8	13,743.3	4,881.9	6.11%	1.00%
WV	MONONGAHELA POWER CO-PLEASANTS POWER STA	163.9	5,497.4	16,817.4	4.34%	0.15%
PA	GENON NE MGMT CO/KEYSTONE STA	172.8	6,578.5	56,939.2	3.85%	0.01%
WV	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	219.8	4,878.1	10,984.2	3.33%	0.10%
WV	LONGVIEW POWER	81.2	1,556.6	2,313.7	2.85%	0.11%
WV	AMERICAN BITUMINOUS POWER-GRANT TOWN PLT	81.3	1,245.1	2,210.3	2.32%	0.10%
OH	Avon Lake Power Plant (0247030015)	547.6	3,600.7	21,188.9	1.43%	0.01%
WV	MITCHELL PLANT	144.2	2,719.6	5,372.4	1.36%	0.06%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	416.9	7,150.0	22,133.9	1.31%	0.02%
OH	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	163.9	2,467.3	7,460.8	1.27%	0.03%
WV	MORGANTOWN ENERGY ASSOCIATES	75.1	655.6	828.6	1.10%	0.05%
PA	HOMER CITY GEN LP/ CENTER TWP	157.5	5,216.0	11,865.7	1.05%	0.02%
PA	NRG WHOLESALE GEN/SEWARD GEN STA	148.4	2,254.6	8,880.3	0.94%	0.01%
OH	Ormet Primary Aluminum Corp. (0656000001)	138.9	0.4	2,470.8	0.93%	0.00%
OH	Department of Public Utilities, City of Orrville, Ohio (0285010188)	278.2	1,901.9	13,038.0	0.93%	0.01%
OH	Conesville Power Plant (0616000000)	242.3	9,957.9	6,356.2	0.67%	0.11%

160

Draft AOI Point Contributions for SHEN

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
MD	Luke Paper Company	118.4	3,607.0	22,659.8	14.57%	0.21%
PA	GENON NE MGMT CO/KEYSTONE STA	249.8	6,578.5	56,939.2	10.85%	0.09%
OH	General James M. Gavin Power Plant (0627010056)	323.4	8,122.5	41,595.8	4.82%	0.13%
WV	MONONGAHELA POWER CO-PLEASANTS POWER STA	265.0	5,497.4	16,817.4	4.55%	0.22%
WV	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	189.7	11,830.9	10,082.9	4.21%	0.91%
PA	HOMER CITY GEN LP/ CENTER TWP	230.4	5,216.0	11,865.7	2.38%	0.12%
WV	MONONGAHELA POWER CO.- FORT MARTIN POWER	184.4	13,743.3	4,881.9	2.21%	1.16%
WV	Dominion Resources, Inc. - MOUNT STORM POWER STATION	104.2	1,984.1	2,123.6	1.93%	0.24%
WV	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	295.6	4,878.1	10,984.2	1.92%	0.09%
PA	NRG WHOLESALE GEN/SEWARD GEN STA	215.5	2,254.6	8,880.3	1.65%	0.04%
PA	GENON NE MGMT CO/CONEMAUGH PLT	213.6	6,074.9	8,655.2	1.59%	0.09%
OH	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	269.6	2,467.3	7,460.8	1.40%	0.05%
WV	MITCHELL PLANT	251.8	2,719.6	5,372.4	1.34%	0.10%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	505.4	7,150.0	22,133.9	1.20%	0.10%
MD	Raven Power Fort Smallwood LLC	180.7	4,387.8	10,942.9	1.20%	0.08%
WV	AMERICAN BITUMINOUS POWER-GRANT TOWN PLT	188.9	1,245.1	2,210.3	1.19%	0.11%
OH	Department of Public Utilities, City of Orrville, Ohio (0285010188)	385.1	1,901.9	13,038.0	1.18%	0.02%
OH	Avon Lake Power Plant (0247030015)	452.7	3,600.7	21,188.9	1.16%	0.04%
WV	LONGVIEW POWER	186.3	1,556.6	2,313.7	1.04%	0.13%
MD	AES Warrior Run	122.1	638.0	1,331.5	0.93%	0.04%

158

Draft AOI Source Categories for OTCR

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	7.4%	3.7%	11.1%
NONROAD_MAR	0.1%	0.7%	0.8%
NONROAD_OTHER	0.0%	0.7%	0.7%
ONROAD	0.2%	1.4%	1.6%
POINT	78.1%	7.0%	85.2%
PT_FIRES_PRESCRIBED	0.5%	0.1%	0.6%
TOTAL	**86.4%**	**13.6%**	**100.0%**

161

Draft AOI Source Categories for DOSO

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	6.8%	2.8%	9.6%
NONROAD_MAR	0.1%	0.6%	0.7%
NONROAD_OTHER	0.0%	0.6%	0.7%
ONROAD	0.2%	1.3%	1.4%
POINT	81.2%	5.7%	86.9%
PT_FIRES_PRESCRIBED	0.5%	0.1%	0.6%
TOTAL	**88.9%**	**11.1%**	**100.0%**

159

Draft AOI Point Contributions for OTCR

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
WV	ALLEGHENY ENERGY SUPPLY CO, LLC HARRISON	72.8	11,830.9	10,082.9	16.97%	1.77%
OH	General James M. Gavin Power Plant (0627010056)	214.2	8,122.5	41,595.8	10.22%	0.18%
WV	MONONGAHELA POWER CO-PLEASANTS POWER STA	148.3	5,497.4	16,817.4	8.00%	0.29%
WV	MONONGAHELA POWER CO.- FORT MARTIN POWER	82.7	13,743.3	4,881.9	4.86%	0.90%
WV	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	198.0	4,878.1	10,984.2	4.26%	0.12%
MD	Luke Paper Company	73.2	3,607.0	22,659.8	4.11%	0.04%
PA	GENON NE MGMT CO/KEYSTONE STA	186.5	6,578.5	56,939.2	3.64%	0.03%
WV	AMERICAN BITUMINOUS POWER-GRANT TOWN PLT	77.0	1,245.1	2,210.3	2.56%	0.09%
WV	LONGVIEW POWER	83.4	1,556.6	2,313.7	2.28%	0.10%
OH	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	162.7	2,467.3	7,460.8	1.90%	0.05%
WV	Dominion Resources, Inc. - MOUNT STORM POWER STATION	39.9	1,984.1	2,123.6	1.85%	0.06%
WV	MITCHELL PLANT	136.8	2,719.6	5,372.4	1.53%	0.06%
OH	Ormet Primary Aluminum Corp. (0656000001)	129.6	0.4	2,470.8	1.11%	0.00%
OH	Conesville Power Plant (0616000000)	232.8	9,957.9	6,356.2	1.10%	0.17%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	397.5	7,150.0	22,133.9	1.10%	0.02%
OH	Avon Lake Power Plant (0247030015)	345.6	3,600.7	21,188.9	1.09%	0.01%
OH	Kraton Polymers U.S. LLC (0684010011)	175.1	555.8	7,061.8	1.00%	0.02%
OH	Orion Engineered Carbons LLC (0684010049)	169.6	391.8	1,933.3	0.97%	0.01%
WV	MORGANTOWN ENERGY ASSOCIATES	76.3	655.6	828.6	0.89%	0.05%
PA	HOMER CITY GEN LP/ CENTER TWP	172.6	5,216.0	11,865.7	0.87%	0.04%

162

Appendix F-3g - VISTAS Regional Haze Meeting, St. Louis, MO, October 28-30, 2019

VISTAS REGION PROJECT MANAGEMENT

A Comparison of Approaches Used in Planning Periods 1 and 2

John Hornback, Executive Director
Metro 4/SESARM/VISTAS
October 29, 2019

1

PRESENTATION
Outline

- Region
- Organization
- Resources
- Technical Approaches
- Collaboration/Consultation
- Schedule
- Summary

2

THE VISTAS REGION

3

VISTAS
What is it?

- Visibility Improvement State and Tribal Association of the Southeast
- Formed in 2001

4

VISTAS
Participating Agencies

- U.S. EPA Region 3 states (2)
  - Virginia, West Virginia
- U.S. EPA Region 4 agencies (10)
  - Alabama, Florida
  - Georgia, Kentucky
  - Mississippi, North Carolina,
  - South Carolina, Tennessee
  - Eastern Band of Cherokee Indians
  - Knox County, TN local air agency

5

VISTAS
The 18 Southeastern Class I Areas

6

VISTAS PROJECT ORGANIZATION

7

VISTAS
Governance

- Southeastern States Air Resource Managers, Inc.
  - Board of Directors
- State and Tribal Air Directors (STAD)
  - States
  - Tribe
  - Local Agency
  - Governance, policy, general direction
- Similar structure for both planning periods

8

VISTAS
Policy / Operations / Analysis – 1st Planning Period

- STAD
- Coordinating Committee
- Planning Work Group
- Data Work Group
- Technical Analysis Work Group
- Various sub-groups and teams

9

VISTAS
Policy / Operations / Analysis – 2nd Planning Period

- STAD
- Coordinating Committee (CC)
- Technical Analysis Work Group (TAWG)
- Occasional sub-groups
  - (e.g., Data Collection and Analysis)
- CC/TAWG generally functioning together

10

VISTAS
Project Management - 1st Planning Period

- Project Manager – John Hornback
- Technical Coordinator – Pat Brewer
- Technical Advisors
- Contracts – 24
- MOUs - 3
- Key VISTAS agency staff

11

VISTAS
Project Management – 2nd Planning Period

- Project Manager – John Hornback (much larger role)
- Coordination and Technical Analysis – Jim Boylan
- Coordination and Technical Analysis – Randy Strait
- 1 contract with a lead contractor and a sub-contractor

12

VISTAS PROJECT
RE$OURCE$

13

VISTAS
Resources – 1st Planning Period

- Staffing – Metro 4/SESARM, coordinators, advisors
- In-kind services from SESARM states
- Contractor services – many contractors
- Shared expenses - VIEWS data warehouse, ERTAC
- Budget resources – approximately $10,000,000
- Leveraged federal work products – limited
- Federal coordination - significant

14

VISTAS
Resources – 2nd Planning Period

- Staffing – Metro 4/SESARM
- In-kind services from SESARM states
- Contractor services – 1 lead plus 1 subcontractor
- Shared expenses - none
- Budget resources … ~ 5% of first round funds
- Leveraged federal work products – significant
- Federal coordination - limited

15

VISTAS PROJECT
Technical Approaches

16

VISTAS
Technical Approaches for 1st & 2nd Rounds

ACTIVITY	1ST PLANNING PERIOD	2ND PLANNING PERIOD
Monitoring and Data Collection/Analysis	Yes	Data collect/analysis
Emissions Inventories (base and future years)	Yes	EPA with updates
Emissions Processing	Yes	Yes
International Emissions, Air Quality, BART Modeling	Yes	Air Quality
Area of Influence Analysis	Yes	Yes
Source Apportionment Modeling/Tagging/Projections/RRFs	Yes	Yes
Support – Coordination, Advice, GIS, Archival	Yes	Limited

17

VISTAS PROJECT
Collaboration/Consultation

18

VISTAS COLLABORATION/CONSULTATION
1st Planning Period

- Extensive face-to-face meetings
- Some VISTAS/FLM conference calls
- Some VISTAS/stakeholder conference calls
- MANE-VU/VISTAS consultation meeting
- Frequent federally-coordinated calls
- Weekly RPO calls during certain phases
- Resources and time were available

19

VISTAS COLLABORATION/CONSULTATION
2nd Planning Period

- No face-to-face meetings to-date
- Several VISTAS/FLM/EPA conference calls
- No VISTAS/stakeholder conference calls (to-date)
- MANE-VU/VISTAS consultation calls
- Federally-coordinated regional haze calls (limited)
- Monthly MJO calls include periodic regional haze topics
- Overall goals remains same
- Resources and time are limited for face-to-face meetings

20

VISTAS PROJECT SCHEDULE

21

VISTAS
Schedule – 1st Planning Period

- 2001 – created the VISTAS organizational plan
- 2002-2006 – focused technical work
- 2006-2007 – continued technical work and SIP development
- December 17, 2007 – SIPs were due
- At least 7 years to design and complete the project plus state SIP submittals to EPA

22

VISTAS
Schedule – 2nd Planning Period

- December 2017 – Denver – created initial plan
- April 2018 – executed contract
- December 2019 – most technical work will be completed
- 2020-2021 – completion of any remaining technical work and SIP development
- July 31, 2021 – SIPs due
- 3 ½ years for technical work and SIP development

23

VISTAS PROJECT SUMMARY

24

VISTAS PROJECT
Summary (1 of 2)

- Similar basic organizational structure but streamlined
- Similar oversight and standards of performance including QA
- Similar internal participation –
  - states, locals, tribes
- Similar external participation –
  - RPOs, FLMs, EPA

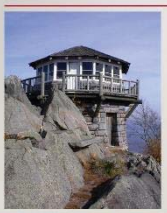
25

VISTAS PROJECT
Summary (2 of 2)

- Fewer resources (~ 5% of 1st planning period funding)
- Less time (~ 50% of 1st planning period time)
- Similar desired outcomes
  - Technically sound, credible, approvable regional SIPs
  - Maintenance of relationships developed in 1st round
  - Continued progress toward 2064 goals

26

COMMENTS / QUESTIONS?



- Jim Boylan
  - Chair, Coordinating Committee
  - james.boylan@dnr.ga.gov
- Randy Strait
  - Chair, Technical Analysis Work Group
  - randy.strait@ncdenr.gov
- John Hornback
  - Project Coordinator, VISTAS Project
  - hornback@metro4-sesarm.org

27

VISTAS 2028 Emissions and Modeling Analyses

Jim Boylan (GA DNR), Randy Strait (NC DAQ), and John Hornback (Metro 4/SESARM)

2019 National Regional Haze Meeting
St. Louis, MO - October 28, 2019

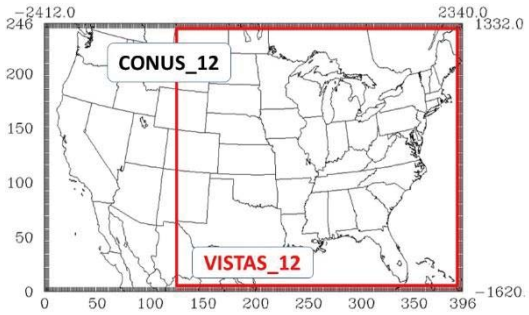
VISTAS Air Quality Model

- Started with EPA's 2011/2028 modeling platform
  - Version 6.3el
  - CAMx v6.32
- Replaced CAMx v6.32 with CAMx v6.40
- Used 2011 meteorology
- Reasons for using EPA platform
  - Time limited
  - Budget limited
  - Most source sectors acceptably represented in EPA platform

Outline

- Modeling Overview
- 2028 Emission Projections
- 2028 Model Projections
- Next Steps

VISTAS Modeling Domains



MODELING OVERVIEW

Benchmark Comparisons

1. EPA 2011 with CAMx_6.32 (CONUS) vs.
   Alpine 2011 with CAMx_6.32 (CONUS)
2. Alpine 2011 with CAMx_6.32 (CONUS) vs.
   Alpine 2011 with CAMx_6.40 (CONUS)
3. Alpine 2011 with CAMx_6.40 (CONUS) vs.
   Alpine 2011 with CAMx_6.40 (VISTAS)
4. EPA 2028 with CAMx_6.32 (CONUS) vs.
   Alpine 2028 with CAMx_6.40 (CONUS)
5. Alpine 2028 with CAMx_6.40 (CONUS) vs.
   Alpine 2028 with CAMx_6.40 (VISTAS)

Model Performance Evaluation

- Compared model results to observations. Looked at statistics, comparison plots, and spatial plots
  - Ozone
  - $PM_{2.5}$ and light extinction
  - Wet and dry deposition
- Overall, the model performance is generally within the range deemed acceptable for regulatory applications

7

Point Source Adjustments

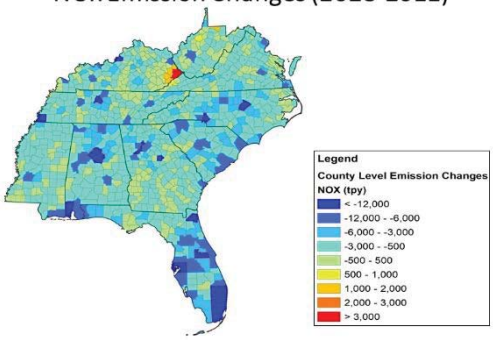
- **EGU Point Sources**
  - EPA modeling used IPM and assumed CPP controls
    - Adjust the EPA 2028 EGU emissions up/down based on ERTAC EGU annual emission, 2023 "en" emissions (based on 2016 NEI), and/or other emissions provided by individual states
- **Non-EGU Point Sources**
  - Adjust the EPA 2028 non-EGU emissions up/down based on feedback from SESARM states
    - States looked at 2014-2016 NEI and EPA's non-EGU 2023 "en" emissions

10

2028 EMISSION PROJECTIONS

8

NOx Emission Changes (2028-2011)



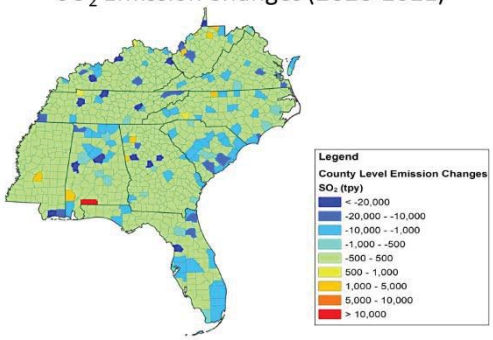
11

Emissions Updates

- Used EPA's 2011 base year emissions without change
- Updated EPA's 2028 projection year emissions
  - EGU and major non-EGU sources
  - Removed Clean Power Plan assumptions
  - Adjusted for changes in fuels and facility operating plans

9

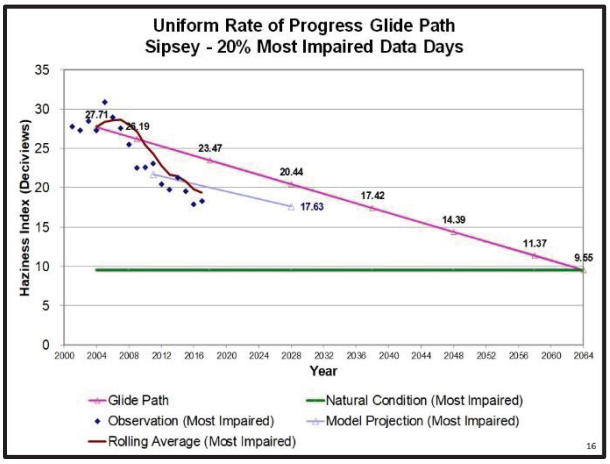
SO_2 Emission Changes (2028-2011)



12

2028 MODEL PROJECTIONS

13



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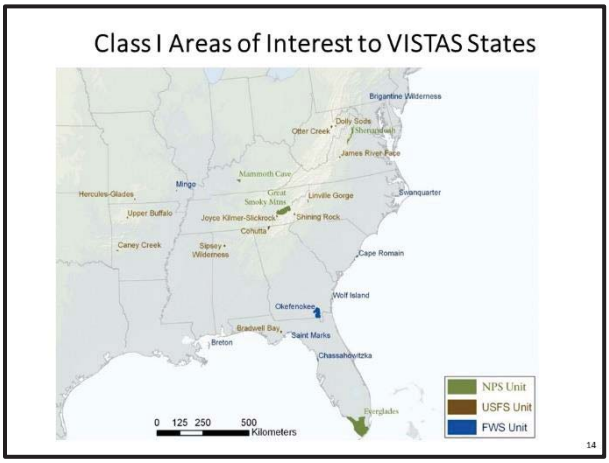

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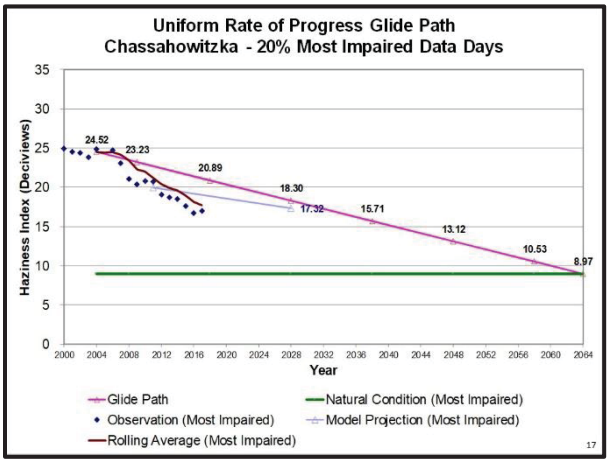


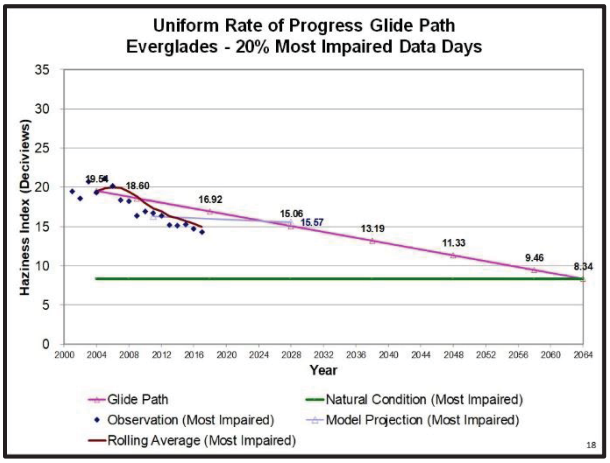
17

VISTAS Class I Areas

VISTAS FEDERAL CLASS I AREAS	
AL – Sipsey Wilderness Area (SIPS)	USDA Forest Service
FL – Chassahowitzka Wilderness Area (CHAS)	USDI Fish and Wildlife Service
FL – Everglades National Park (EVER)	USDI National Park Service
FL – Saint Marks Wilderness Area (SAMA)	USDI Fish and Wildlife Service
GA – Cohutta Wilderness Area (COHU)	USDA Forest Service
GA – Okefenokee Wilderness Area (OKEF)	USDI Fish and Wildlife Service
GA – Wolf Island Wilderness Area (WOLF)*	USDI Fish and Wildlife Service
KY – Mammoth Cave National Park (MACA)	USDI National Park Service
NC – Linville Gorge Wilderness Area (LIGO)	USDA Forest Service
NC – Shining Rock Wilderness Area (SHRO)	USDA Forest Service
NC – Swanquarter Wilderness Area (SWAN)	USDI Fish and Wildlife Service
SC – Cape Romain Wilderness Area (ROMA)	USDI Fish and Wildlife Service
TN/NC – Great Smoky Mountains National Park (GRSM)	USDI National Park Service
TN/NC – Joyce Kilmer-Slickrock Wilderness Area (JOYC)*	USDA Forest Service
VA – James River Face Wilderness Area (JARI)	USDA Forest Service
VA – Shenandoah National Park (SHEN)	USDI National Park Service
WV – Dolly Sods Wilderness Area (DOSO)	USDA Forest Service
WV – Otter Creek Wilderness Area (OTCR)*	USDA Forest Service

*This Class I Area does not have an IMPROVE monitor and will be represented by measurement data from a nearby Class I Area with an IMPROVE monitor.

15



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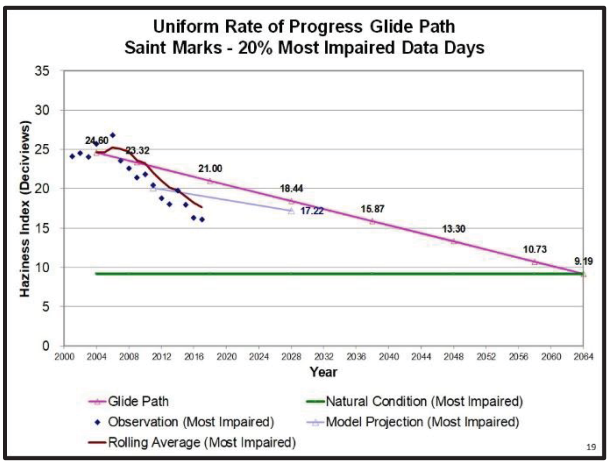
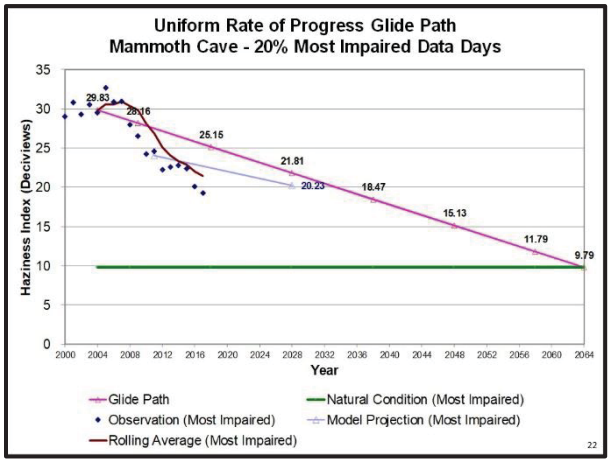
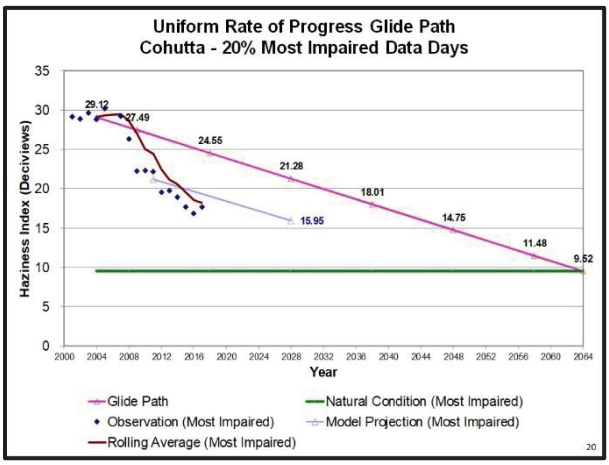
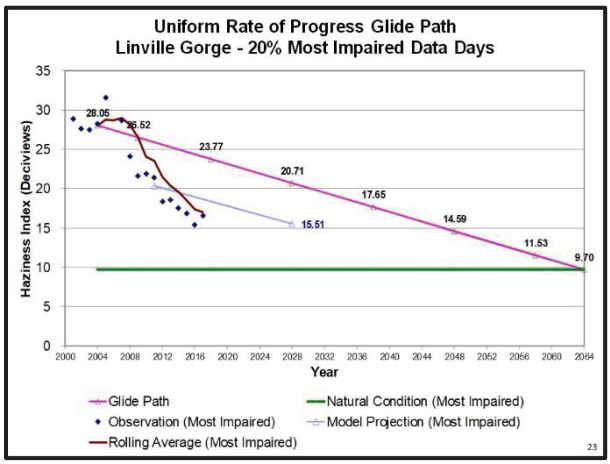
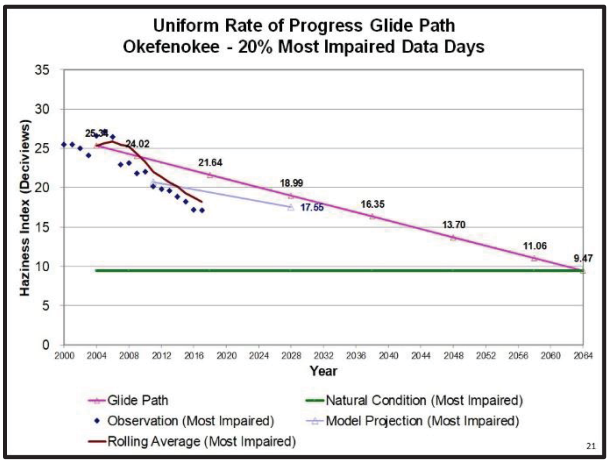
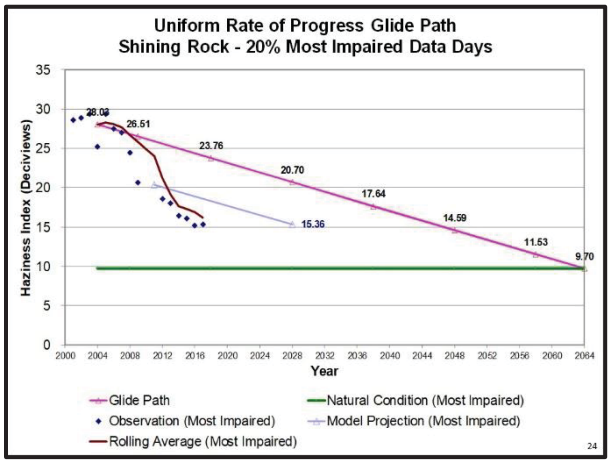

Uniform Rate of Progress Glide Path
Saint Marks - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
24.60
23.32
21.00
18.44
17.22
15.87
13.30
10.73
9.19
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
19

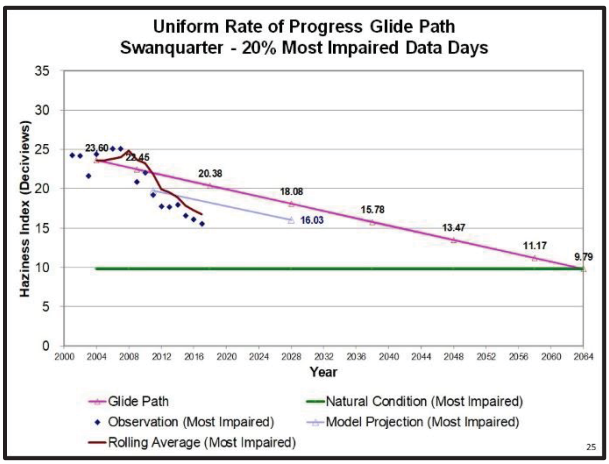

Uniform Rate of Progress Glide Path
Mammoth Cave - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
29.82
28.16
25.15
21.81
20.23
18.47
15.13
11.79
9.79
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
22

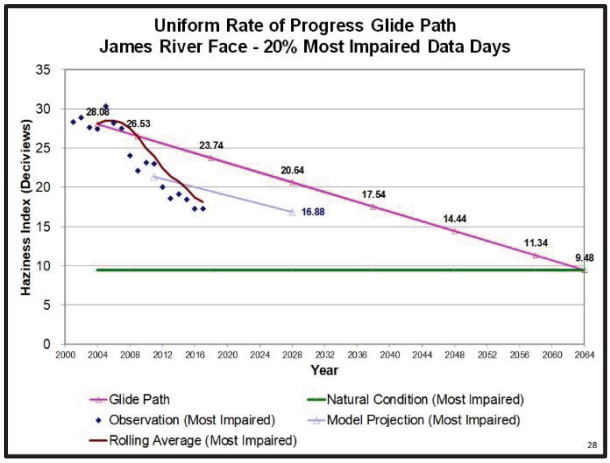

Uniform Rate of Progress Glide Path
Cohutta - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
29.12
27.49
24.55
21.28
18.01
15.95
14.75
11.48
9.52
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
20

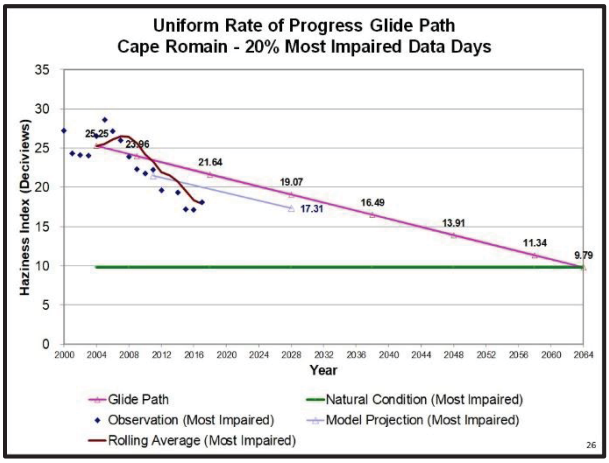

Uniform Rate of Progress Glide Path
Linville Gorge - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
28.05
26.52
23.77
20.71
17.65
15.51
14.59
11.53
9.70
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
23

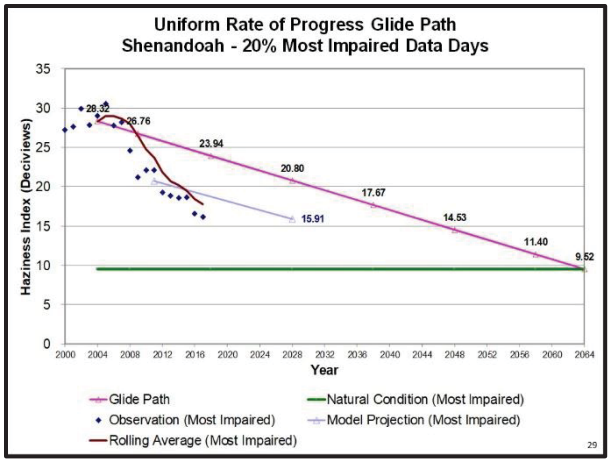

Uniform Rate of Progress Glide Path
Okefenokee - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
25.38
24.02
21.64
18.99
17.55
16.35
13.70
11.06
9.47
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
21

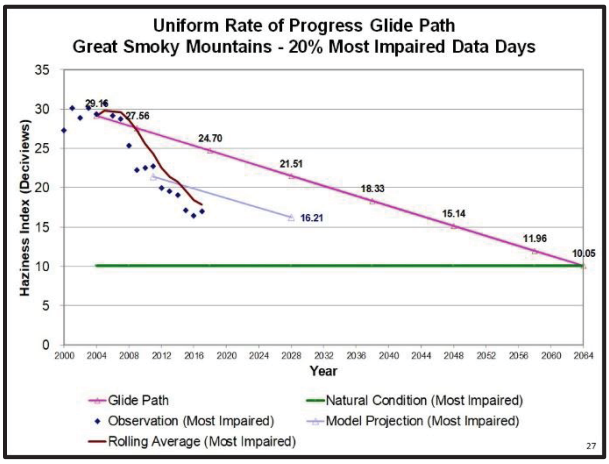

Uniform Rate of Progress Glide Path
Shining Rock - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
28.08
26.51
23.76
20.70
17.64
15.36
14.59
11.53
9.70
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
24

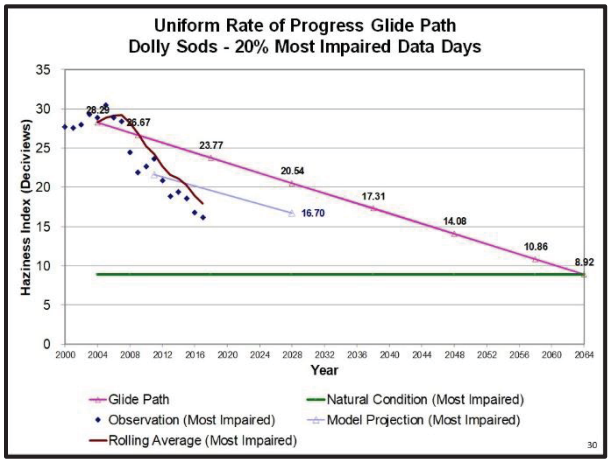

Uniform Rate of Progress Glide Path
Swanquarter - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
23.60
23.45
20.38
18.08
16.03
15.78
13.47
11.17
9.79
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
25

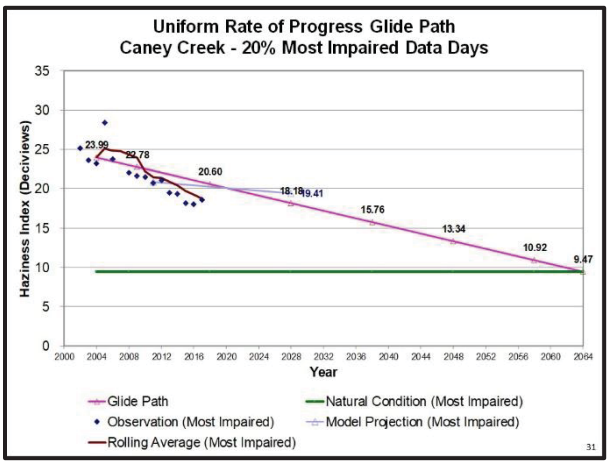

Uniform Rate of Progress Glide Path
James River Face - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
28.08
26.53
23.74
20.64
16.88
17.54
14.44
11.34
9.48
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
28

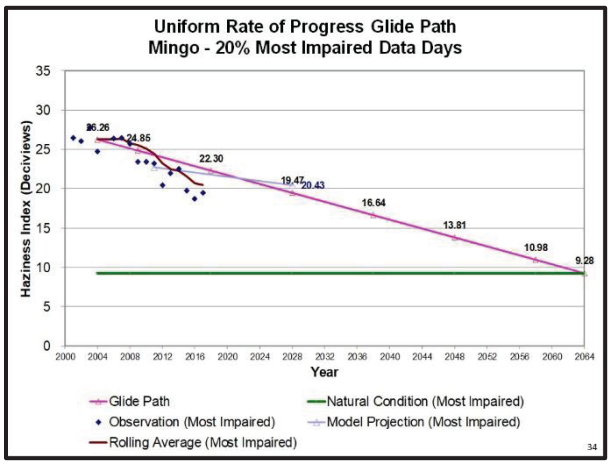

Uniform Rate of Progress Glide Path
Cape Romain - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
25.25
22.96
21.64
19.07
17.31
16.49
13.91
11.34
9.79
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
26

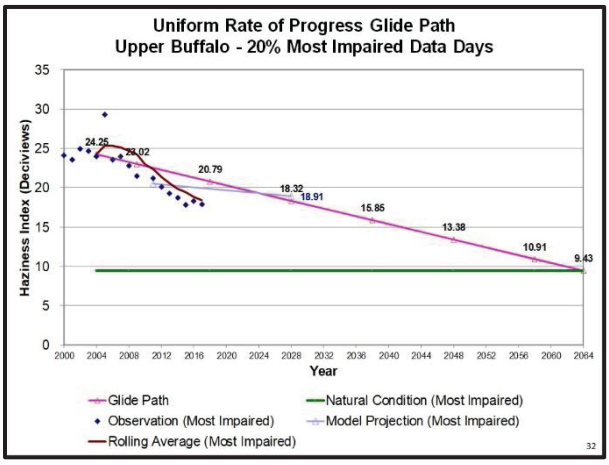

Uniform Rate of Progress Glide Path
Shenandoah - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
28.32
26.76
23.94
20.80
15.91
17.67
14.53
11.40
9.52
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
29

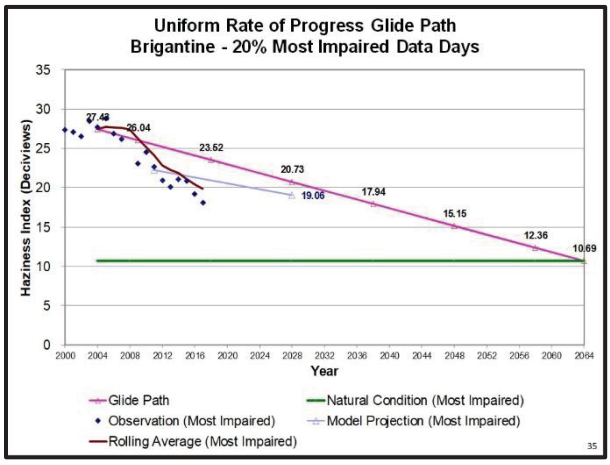

Uniform Rate of Progress Glide Path
Great Smoky Mountains - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
29.16
27.56
24.70
21.51
16.21
18.33
15.14
11.96
10.05
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
27

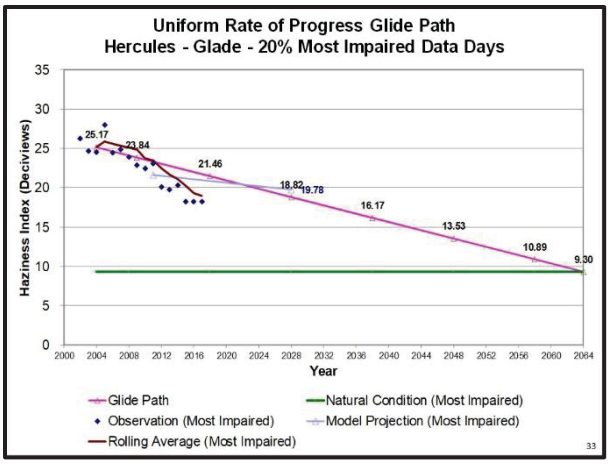

Uniform Rate of Progress Glide Path
Dolly Sods - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
28.25
26.67
23.77
20.54
16.70
17.31
14.08
10.86
8.92
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
30

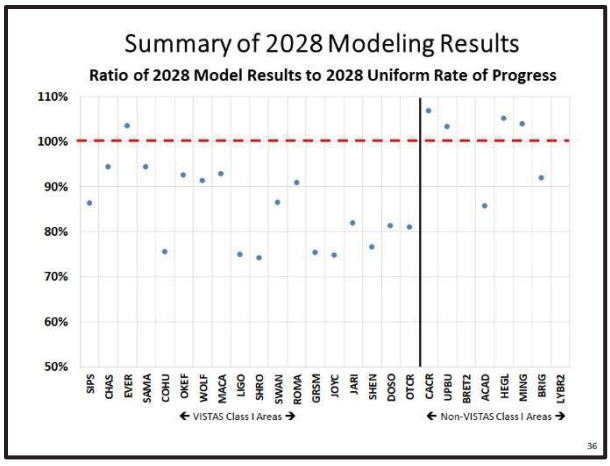

Uniform Rate of Progress Glide Path
Caney Creek - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
23.99
22.78
20.60
18.18
19.41
15.76
13.34
10.92
9.47
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
31


Uniform Rate of Progress Glide Path
Mingo - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
26.26
24.85
22.30
19.47
20.43
16.64
13.81
10.98
9.28
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
34


Uniform Rate of Progress Glide Path
Upper Buffalo - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
24.25
23.02
20.79
18.32
18.91
15.85
13.38
10.91
9.43
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
32


Uniform Rate of Progress Glide Path
Brigantine - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
27.48
26.04
23.62
20.73
19.06
17.94
15.15
12.36
10.69
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
35


Uniform Rate of Progress Glide Path
Hercules - Glade - 20% Most Impaired Data Days
Haziness Index (Deciviews)
Year
25.17
23.84
21.46
18.82
19.78
16.17
13.53
10.89
9.30
Glide Path
Natural Condition (Most Impaired)
Observation (Most Impaired)
Model Projection (Most Impaired)
Rolling Average (Most Impaired)
33


Summary of 2028 Modeling Results
Ratio of 2028 Model Results to 2028 Uniform Rate of Progress
SIPS CHAS EVER SAMA COHU OKEF WOLF MACA LIGO SHRO SWAN ROMA GRSM JOYC JARI SHEN DOSO OTCR CACR UPBU BRET2 ACAD HEGL MING BRIG LYBR2
← VISTAS Class I Areas →
← Non-VISTAS Class I Areas →
36

Remaining Work Schedule

Task	Schedule
Best and final 2028 run?	Necessity uncertain
Final reports and documentation	February 2020
Website updates and postings	Ongoing task
Regional Haze SIPs Due to EPA	**July 31, 2021**

37

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- Phone: 404-361-4000

38

VISTAS Source Selection and 4-Factor Analyses

Jim Boylan (GA DNR), Randy Strait (NC DAQ), and John Hornback (Metro 4/SESARM)

2019 National Regional Haze Meeting
St. Louis, MO - October 29, 2019

Outline

- AOI Analysis
- PSAT Analysis
- Next Steps

AOI ANALYSIS

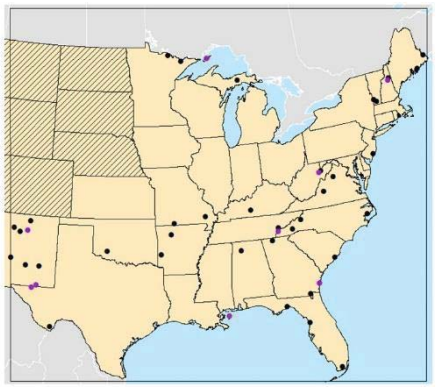
Area of Influence (AOI) Analysis

- Evaluates 2028 emissions (Q), distance to Class I area (d), and extinction weighted residence time (EWRT) in model grid cells (point) or counties (source categories)
- Formula: (Q/d)*EWRT
- Establishes each county's and each facility's contribution to light extinction at each Class I area on the 20% most impaired days
- Can use contributions to rank and screen facilities for the 4-factor analysis

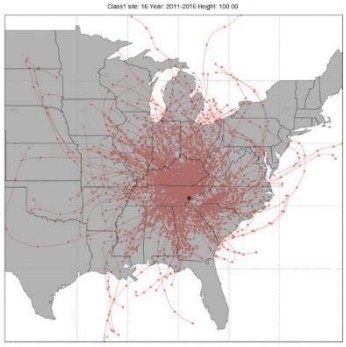
HYSPLIT Trajectories

- Trajectories were run using NAM-12 meteorology for the 20% most impaired days in 2011-2016 at 44 Class I areas.
  - Trajectories were run with starting heights of 100, 500, 1,000, and 1,500 meters.
  - Trajectories were run 72 hours backwards in time for each height at each location.
  - Trajectories were run with start times of 12AM (midnight of the start of the day), 6AM, 12PM, 6PM, and 12AM (midnight at the end of the day) local time.
- 44 Class I areas x 6 years x 24 days/year x 4 heights x 5 start times = **126,720 trajectories**

Class I Areas Analyzed

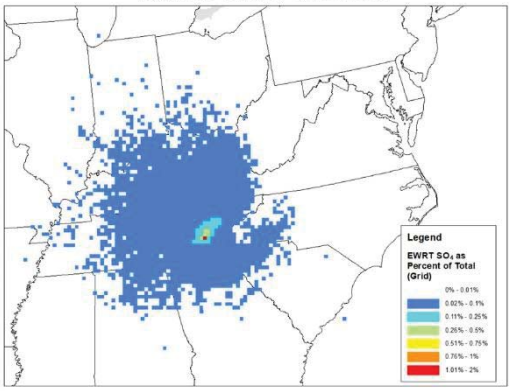


100 Meter Trajectories at GRSM



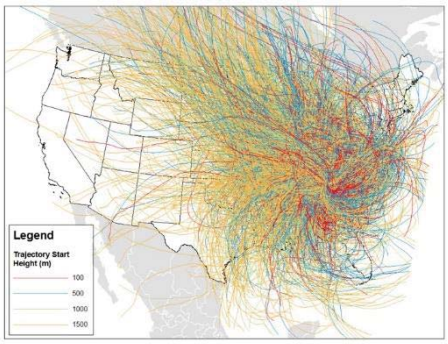
7

Sulfate EWRT at GRSM



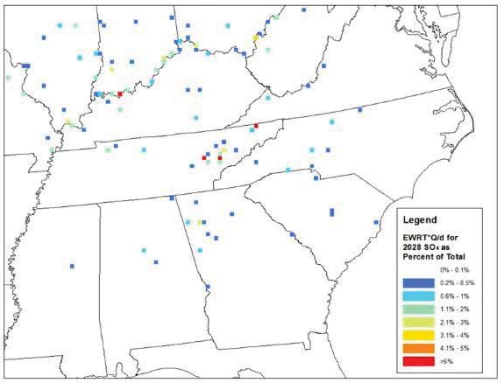
10

All Trajectories at GRSM



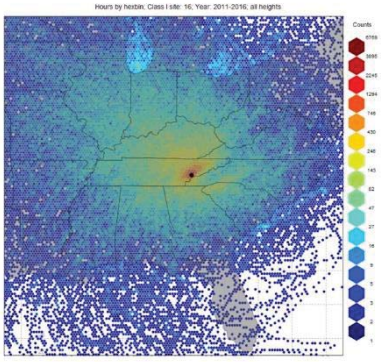
8

Sulfate Q/d*EWRT at GRSM



11

Residence Time for GRSM



9

AOI Point Contributions for GRSM

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	NOx Contribution	SO2 Contribution
TN	TVA KINGSTON FOSSIL PLANT	60.0	1,687.4	1,886.1	0.71%	5.8%
TN	EASTMAN CHEMICAL COMPANY	160.1	6,900.3	6,420.2	0.19%	5.8%
IN	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	375.5	8,806.8	30,536.3	0.21%	4.66%
TN	Mc Ghee Tyson	19.7	594.7	78.6	3.01%	4.31%
OH	General James M. Gavin Power Plant (0627010056)	400.5	8,122.5	41,595.8	0.04%	2.25%
GA	Ga Power Company - Plant Bowen	189.7	6,643.3	10,453.4	0.04%	2.10%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	360.0	7,150.0	22,133.9	0.09%	1.84%
TN	Cemex - Knoxville Plant	44.3	711.5	121.5	0.90%	1.71%
IL	Joppa Steam	474.4	4,706.3	20,509.3	0.04%	1.62%
IN	INDIANA KENTUCKY ELECTRIC CORPORATION	368.7	6,188.5	9,038.1	0.13%	1.60%
IN	INDIANAPOLIS POWER & LIGHT PETERSBURG	435.6	10,665.3	18,141.9	0.12%	1.48%
KY	KY Utilities Co - Ghent Station	359.2	7,939.9	10,169.3	0.09%	1.43%
KY	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	465.3	7,007.3	19,504.7	0.02%	1.34%
IN	Gibson	456.3	12,280.3	23,117.2	0.07%	1.25%
TN	TATE & LYLE, Loudon	36.1	252.5	110.2	0.23%	1.22%
KY	Big Rivers Electric Corp - Wilson Station	345.8	1,151.9	6,934.2	0.03%	1.17%
KY	Century Aluminum of KY LLC	360.5	197.7	5,044.2	0.00%	1.07%
WV	MONONGAHELA POWER CO-PLEASANTS POWER STA	475.9	5,497.4	16,817.4	0.02%	1.06%
WV	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	367.1	4,878.1	10,984.2	0.01%	1.05%
MO	AMEREN MISSOURI-RUSH ISLAND PLANT	628.2	3,349.3	20,151.5	0.00%	0.90%

12

AOI Source Categories for GRSM

SOURCE CATEGORY	NOx	SO_2	TOTAL
NONPOINT	8.5%	10.7%	19.2%
NONROAD_MAR	3.1%	0.1%	3.2%
NONROAD_OTHER	4.7%	0.3%	5.0%
ONROAD	11.6%	1.5%	13.1%
POINT	7.0%	49.9%	56.8%
PT_FIRES_PRESCRIBED	0.3%	2.3%	2.6%
TOTAL	**35.2%**	**64.8%**	**100.0%**

13

AOI Source Categories for OKEF

SOURCE CATEGORY	NOx	SO_2	TOTAL
NONPOINT	1.7%	2.0%	3.7%
NONROAD_MAR	6.0%	0.6%	6.6%
NONROAD_OTHER	1.7%	0.1%	1.9%
ONROAD	4.5%	0.5%	5.0%
POINT	5.9%	62.9%	68.8%
PT_FIRES_PRESCRIBED	2.6%	11.4%	13.9%
TOTAL	**22.4%**	**77.6%**	**100.0%**

16

AOI Source Categories for COHU

SOURCE CATEGORY	NOx	SO_2	TOTAL
NONPOINT	3.2%	5.1%	8.3%
NONROAD_MAR	3.4%	0.1%	3.5%
NONROAD_OTHER	2.5%	0.2%	2.7%
ONROAD	6.6%	0.6%	7.2%
POINT	8.1%	67.0%	75.1%
PT_FIRES_PRESCRIBED	0.5%	2.6%	3.2%
TOTAL	**24.3%**	**75.7%**	**100.0%**

14

AOI Point Contributions for OKEF

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	NOx Contribution	SO2 Contribution
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	71.5	112.4	2,745.0	0.03%	[illegible]
FL	ROCK TENN CP, LLC	64.8	2,316.8	2,606.7	0.88%	[illegible]
FL	JEA	65.6	651.8	2,094.5	0.18%	[illegible]
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	121.4	917.8	3,713.4	0.07%	3.25%
FL	IFF CHEMICAL HOLDINGS, INC.	56.8	37.7	898.9	0.01%	3.25%
FL	RAYONIER PERFORMANCE FIBERS LLC	63.4	2,327.1	562.0	0.90%	2.82%
GA	**International Paper - Savannah**	**178.9**	**1,560.7**	**3,945.4**	**0.08%**	**2.81%**
FL	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	153.5	1,830.7	1,520.4	0.14%	2.18%
FL	RENESSENZ LLC	59.8	66.3	569.5	0.02%	1.96%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	205.0	2,489.8	5,306.4	0.06%	1.40%
AL	Sanders Lead Co	384.6	121.7	7,951.1	0.00%	1.11%
GA	**Georgia-Pacific Consumer Products LP (Savannah River Mill)**	**197.2**	**351.5**	**1,860.2**	**0.01%**	**1.05%**
GA	**Ga Power Company - Plant Bowen**	**458.1**	**6,643.3**	**10,453.4**	**0.05%**	**1.02%**
GA	**Brunswick Cellulose Inc**	**75.3**	**1,554.5**	**294.2**	**0.34%**	**1.01%**
SC	ALUMAX OF SOUTH CAROLINA	322.7	108.1	3,751.7	0.00%	0.97%
GA	**PCA Valdosta Mill**	**112.7**	**1,032.6**	**485.7**	**0.09%**	**0.85%**
SC	SANTEE COOPER CROSS GENERATING STATION	348.1	3,273.5	4,281.2	0.05%	0.85%
FL	CITY OF GAINESVILLE, GRU	111.7	410.0	881.4	0.03%	0.79%
SC	KAPSTONE CHARLESTON KRAFT LLC	314.9	2,355.8	1,863.7	0.06%	0.65%
GA	**Ga Power Company - Plant Wansley**	**403.7**	**2,052.5**	**4,856.0**	**0.02%**	**0.65%**

17

AOI Point Contributions for COHU

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	NOx Contribution	SO2 Contribution
GA	**Ga Power Company - Plant Bowen**	**78.0**	**6,643.3**	**10,453.4**	**1.15%**	**[illegible]**
IN	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	410.1	8,806.8	30,536.3	0.13%	4.68%
GA	**International Paper – Rome**	**87.4**	**1,773.4**	**1,791.0**	**0.18%**	**4.66%**
IN	Gibson	487.1	12,280.3	23,117.2	0.10%	2.31%
IN	INDIANAPOLIS POWER & LIGHT PETERSBURG	477.0	10,665.3	18,141.9	0.16%	2.18%
KY	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	457.2	7,007.3	19,504.7	0.07%	2.18%
TN	TVA KINGSTON FOSSIL PLANT	124.0	1,687.4	1,886.1	0.13%	2.17%
OH	General James M. Gavin Power Plant (0627010056)	512.0	8,122.5	41,595.8	0.02%	1.71%
TN	TVA CUMBERLAND FOSSIL PLANT	327.0	4,916.5	8,427.3	0.09%	1.38%
KY	Big Rivers Electric Corp - Wilson Station	369.0	1,151.9	6,934.2	0.01%	1.07%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	454.6	7,150.0	22,133.9	0.06%	1.05%
GA	**Ga Power Company - Plant Wansley**	**156.8**	**2,052.5**	**4,856.0**	**0.04%**	**1.05%**
KY	KY Utilities Co - Ghent Station	441.5	7,939.9	10,169.3	0.08%	1.05%
IL	Joppa Steam	466.9	4,706.3	20,509.3	0.02%	1.04%
GA	**Mohawk Industries Inc**	**32.0**	**66.5**	**77.1**	**0.07%**	**1.02%**
TN	EASTMAN CHEMICAL COMPANY	269.8	6,900.3	6,420.2	0.09%	0.99%
MO	AMEREN MISSOURI-LABADIE PLANT	695.4	9,685.5	41,740.3	0.01%	0.96%
IL	Newton	564.0	1,934.9	10,631.6	0.01%	0.91%
GA	**Chemical Products Corporation**	**71.9**	**19.5**	**513.8**	**0.00%**	**0.89%**
IN	INDIANA KENTUCKY ELECTRIC CORPORATION	444.4	6,188.5	9,038.1	0.04%	0.76%

15

AOI Source Categories for WOLF

SOURCE CATEGORY	NOx	SO_2	TOTAL
NONPOINT	1.7%	2.8%	4.4%
NONROAD_MAR	2.9%	1.5%	4.4%
NONROAD_OTHER	3.3%	0.3%	3.6%
ONROAD	5.7%	0.7%	6.4%
POINT	7.3%	67.9%	75.2%
PT_FIRES_PRESCRIBED	0.9%	5.1%	6.0%
TOTAL	**21.8%**	**78.2%**	**100.0%**

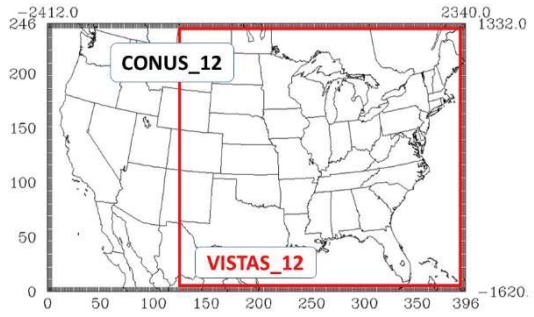
18

AOI Point Contributions for WOLF

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	NOx Contribution	SO2 Contribution
GA	**Brunswick Cellulose Inc**	**27.9**	**1,554.5**	**294.2**	**2.94%**	**8.84%**
FL	ROCK TENN CP, LLC	74.9	2,316.8	2,606.7	0.39%	9.78%
GA	**International Paper - Savannah**	**85.9**	**1,560.7**	**3,945.4**	**0.24%**	**7.58%**
FL	JEA	105.1	651.8	2,094.5	0.09%	4.43%
GA	**Georgia-Pacific Consumer Products LP (Savannah River Mill)**	**109.9**	**351.5**	**1,860.2**	**0.03%**	**2.65%**
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	173.6	112.4	2,745.0	0.01%	1.97%
SC	ALUMAX OF SOUTH CAROLINA	223.0	108.1	3,751.7	0.00%	1.84%
FL	RAYONIER PERFORMANCE FIBERS LLC	77.4	2,327.1	562.0	0.38%	1.79%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	181.4	917.8	3,713.4	0.02%	1.77%
OH	General James M. Gavin Power Plant (0627010056)	845.3	8,122.5	41,595.8	0.02%	1.71%
SC	SANTEE COOPER CROSS GENERATING STATION	251.0	3,273.5	4,281.2	0.09%	1.59%
GA	**Southern States Phosphate & Fertilizer**	**84.1**	**1.0**	**597.1**	**0.00%**	**1.55%**
FL	IFF CHEMICAL HOLDINGS, INC.	118.5	37.7	898.9	0.00%	1.22%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	296.6	2,489.8	5,306.4	0.04%	1.19%
GA	**Ga Power Company - Plant Bowen**	**458.1**	**6,643.3**	**10,453.4**	**0.03%**	**1.08%**
GA	**Savannah Sugar Refinery**	**89.9**	**521.6**	**582.0**	**0.08%**	**1.06%**
SC	INTERNATIONAL PAPER EASTOVER	288.7	1,780.3	3,212.9	0.05%	0.95%
GA	**Ga Power Company - Plant McManus**	**27.1**	**72.2**	**30.1**	**0.14%**	**0.93%**
SC	KAPSTONE CHARLESTON KRAFT LLC	213.6	2,355.8	1,863.7	0.09%	0.89%
PA	GENON NE MGMT CO/KEYSTONE STA	1,048.6	6,578.5	56,939.2	0.01%	0.84%

19

VISTAS Modeling Domains



22

PSAT ANALYSIS

20

PSAT SO_2 and NOx Tags (209)

Round 1 (122 tags)

- Total SO_2 tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- Total NOx tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- EGU point SO_2 tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- EGU point NOx tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- SO_2 tags for individual VISTAS facilities = 50 tags
- NOx tags for individual VISTAS facilities = 20 tags

Round 2 (87 tags)

- Non-EGU point SO_2 for 10 individual VISTAS states + 3 MJOs = 13 tags
- Non-EGU point NOx for 10 individual VISTAS states + 3 MJOs = 13 tags
- SO_2 and NOx for N/S/W/E boundaries = 8 tags
- SO_2 tags for individual VISTAS facilities = 10 tags
- NOx tags for individual VISTAS facilities = 16 tags
- SO_2 tags for individual non-VISTAS facilities = 17 tags
- NOx tags for individual non-VISTAS facilities = 10 tags

23

Source Apportionment Modeling

- Particulate Matter Source Apportionment Technology (PSAT) tags applied to "VISTAS_12" 2028 model projections (2011 meteorology)
- Quantifies visibility impacts from individual point sources, source sectors, and geographic regions
- Both NOx and SO_2 tagging
- Refines information on AOI contributions to visibility impairment
- Can be used to adjust future year visibility projections to account for additional emission controls
- VISTAS contract with ERG allows for up to 250 tags

21

VISTAS Round 1 Facility Tags

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO2 Tag
AL	VISTAS	01053-7440211	Escambia Operating Company LLC		1
AL	VISTAS	01053-985111	Escambia Operating Company LLC		1
AL	VISTAS	01073-1018711	DRUMMOND COMPANY, INC.		1
AL	VISTAS	01097-1056111	Ala Power - Barry		1
AL	VISTAS	01097-1061611	Union Oil of California - Chunchula Gas Plant		1
AL	VISTAS	01097-949811	Akzo Nobel Chemicals Inc		1
AL	VISTAS	01103-1000011	Nucor Steel Decatur LLC		1
AL	VISTAS	01109-985711	Sanders Lead Co		1
FL	VISTAS	12005-535411	ROCKTENN CP LLC		1
FL	VISTAS	12017-640611	DUKE ENERGY FLORIDA, INC. (DEF)	1	1
FL	VISTAS	12031-640211	JEA		1
FL	VISTAS	12033-752711	GULF POWER - Crist		1
FL	VISTAS	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC		1
FL	VISTAS	12057-538611	TAMPA ELECTRIC COMPANY (TEC)		1
FL	VISTAS	12057-716411	MOSAIC FERTILIZER, LLC		1
FL	VISTAS	12089-753711	ROCK TENN CP, LLC	1	1
FL	VISTAS	12089-845811	RAYONIER PERFORMANCE FIBERS LLC	1	
FL	VISTAS	12105-717711	MOSAIC FERTILIZER LLC		1
FL	VISTAS	12105-919811	MOSAIC FERTILIZER, LLC		1
FL	VISTAS	12123-752411	BUCKEYE FLORIDA, LIMITED PARTNERSHIP		1

24

VISTAS Round 1 Facility Tags

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO2 Tag
GA	VISTAS	13015-2813011	Ga Power Company - Plant Bowen		1
GA	VISTAS	13051-3679811	International Paper - Savannah		1
GA	VISTAS	13127-3721011	Brunswick Cellulose Inc		1
KY	VISTAS	21091-7352411	Century Aluminum of KY LLC		1
KY	VISTAS	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant		1
KY	VISTAS	21177-5196711	Tennessee Valley Authority - Paradise Fossil Plant		1
KY	VISTAS	21183-5561611	Big Rivers Electric Corp - Wilson Station		1
NC	VISTAS	37013-8479311	PCS Phosphate Company, Inc. - Aurora		1
NC	VISTAS	37087-7920511	Blue Ridge Paper Products - Canton Mill		1
SC	VISTAS	45015-4834911	ALUMAX OF SOUTH CAROLINA		1
SC	VISTAS	45019-4973611	KAPSTONE CHARLESTON KRAFT LLC	1	1
SC	VISTAS	45043-5698611	INTERNATIONAL PAPER GEORGETOWN MILL		1
TN	VISTAS	47001-6196011	TVA BULL RUN FOSSIL PLANT	1	1
TN	VISTAS	47093-4979911	Cemex - Knoxville Plant	1	1
TN	VISTAS	47105-4129211	TATE & LYLE, Loudon	1	1
TN	VISTAS	47145-4979111	TVA KINGSTON FOSSIL PLANT		1
TN	VISTAS	47161-4979311	TVA CUMBERLAND FOSSIL PLANT		1
TN	VISTAS	47163-3982311	EASTMAN CHEMICAL COMPANY		1

25

Non-VISTAS Round 2 Facility Tags

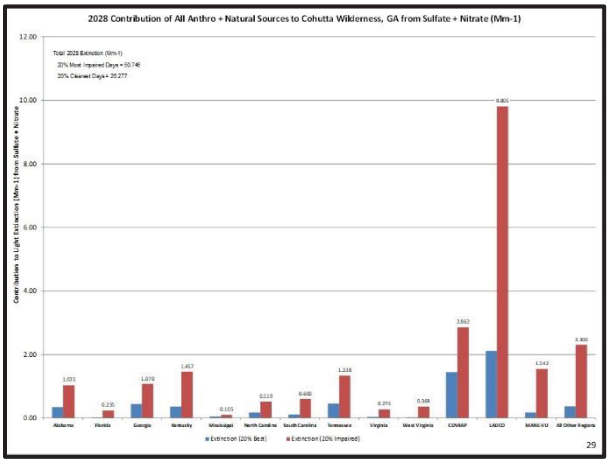
Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO2 Tag
AR	CENRAP	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT		1
MO	CENRAP	29143-5363811	NEW MADRID POWER PLANT-MARSTON		1
MD	MANE-VU	24001-7763811	Luke Paper Company	1	1
PA	MANE-VU	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	1	1
PA	MANE-VU	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	1	1
PA	MANE-VU	42063-3005111	NRG WHOLESALE GEN/SEWARD GEN STA	1	1
IL	LADCO	17127-7808911	Joppa Steam		1
IN	LADCO	18173-8183111	Alcoa Warrick Power Plt Agc Div of AL		1
IN	LADCO	18051-7363111	Gibson		1
IN	LADCO	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	1	1
IN	LADCO	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG		1
IN	LADCO	18129-8166111	Sigeco AB Brown South Indiana Gas & Ele		1
OH	LADCO	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	1	1
OH	LADCO	39031-8010811	Conesville Power Plant (0616000000)	1	1
OH	LADCO	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	1	1
OH	LADCO	39053-8148511	General James M. Gavin Power Plant (0627010056)	1	1
OH	LADCO	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	1	1

28

VISTAS Round 1 Facility Tags

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO2 Tag
VA	VISTAS	51023-5039811	Roanoke Cement Company		1
VA	VISTAS	51027-4034811	Jewell Coke Company LLP		1
VA	VISTAS	51580-5798711	Meadwestvaco Packaging Resource Group		1
WV	VISTAS	54023-6257011	Dominion Resources, Inc. - MOUNT STORM POWER STATION	1	1
WV	VISTAS	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	1	1
WV	VISTAS	54041-6900311	EQUITRANS - COPLEY RUN CS 70	1	
WV	VISTAS	54049-4864511	AMERICAN BITUMINOUS POWER-GRANT TOWN PLT	1	1
WV	VISTAS	54051-6902311	MITCHELL PLANT	1	1
WV	VISTAS	54061-16320111	LONGVIEW POWER	1	1
WV	VISTAS	54061-6773611	MONONGAHELA POWER CO.- FORT MARTIN POWER	1	1
WV	VISTAS	54061-6773811	MORGANTOWN ENERGY ASSOCIATES	1	1
WV	VISTAS	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	1	1
WV	VISTAS	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	1	1
WV	VISTAS	54083-6790511	GLADY 6C4350	1	
WV	VISTAS	54083-6790711	FILES CREEK 6C4340	1	
WV	VISTAS	54093-6327811	KINGSFORD MANUFACTURING COMPANY	1	1

26

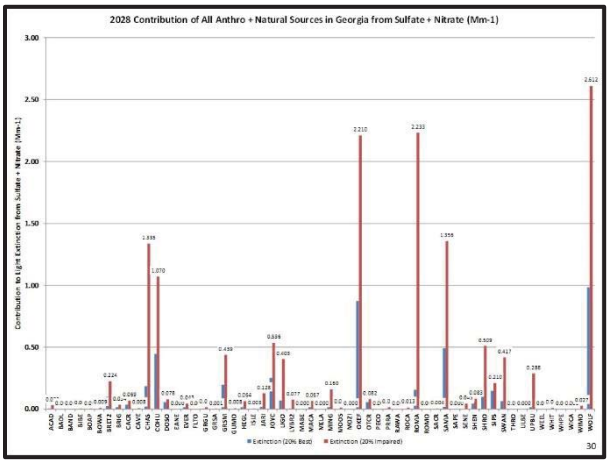


29

VISTAS Round 2 Facility Tags

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO2 Tag
AL	VISTAS	01129-1028711	American Midstream Chatom, LLC		1
FL	VISTAS	12123-752411	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	1	
FL	VISTAS	12086-900111	CEMEX CONSTRUCTION MATERIALS FL, LLC.	1	
FL	VISTAS	12086-900011	FLORIDA POWER & LIGHT (PTF)	1	
FL	VISTAS	12086-3532711	HOMESTEAD CITY UTILITIES	1	
FL	VISTAS	12129-2731711	TALLAHASSEE CITY PURDOM GENERATING STA.	1	
FL	VISTAS	12086-899911	TARMAC AMERICA LLC	1	
GA	VISTAS	13127-3721011	Brunswick Cellulose Inc	1	
GA	VISTAS	13103-536311	Georgia-Pacific Consumer Products LP (Savannah River Mill)		1
GA	VISTAS	13115-539311	International Paper – Rome		1
MS	VISTAS	28059-8384311	Chevron Products Company, Pascagoula Refinery	1	1
MS	VISTAS	28059-6251011	Mississippi Power Company, Plant Victor J Daniel	1	
NC	VISTAS	37087-7920511	Blue Ridge Paper Products - Canton Mill	1	
NC	VISTAS	37117-8049311	Domtar Paper Company, LLC	1	1
NC	VISTAS	37035-8370411	Duke Energy Carolinas, LLC - Marshall Steam Station	1	1
NC	VISTAS	37013-8479311	PCS Phosphate Company, Inc. - Aurora	1	
NC	VISTAS	37023-8513011	SGL Carbon LLC		1
SC	VISTAS	45015-4120411	SANTEE COOPER CROSS GENERATING STATION		1
SC	VISTAS	45043-6652811	SANTEE COOPER WINYAH GENERATING STATION		1
SC	VISTAS	45015-8306711	SCE&G WILLIAMS		1
VA	VISTAS	51027-4034811	Jewell Coke Company LLP	1	
VA	VISTAS	51580-5798711	Meadwestvaco Packaging Resource Group	1	
VA	VISTAS	51023-5039811	Roanoke Cement Company	1	

27



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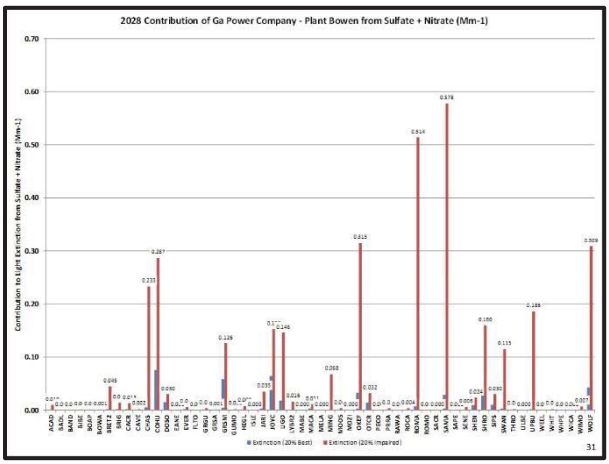
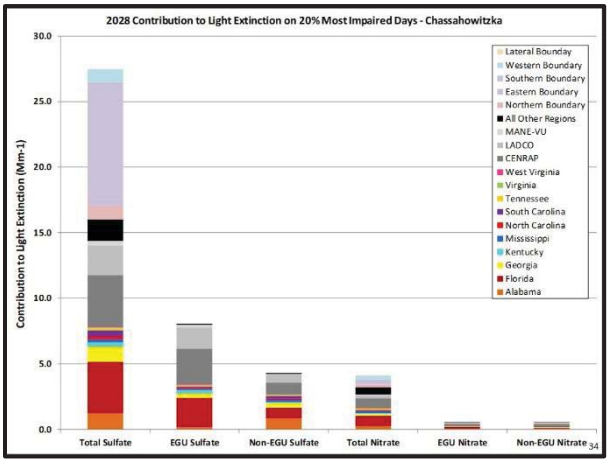
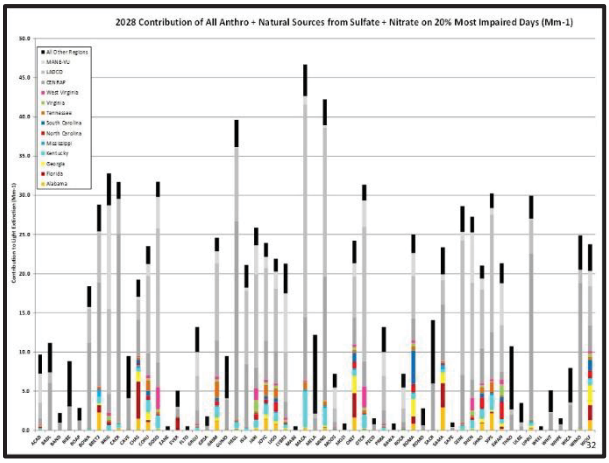
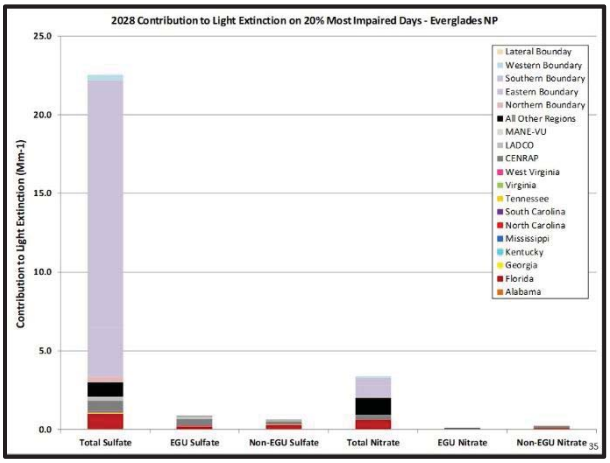
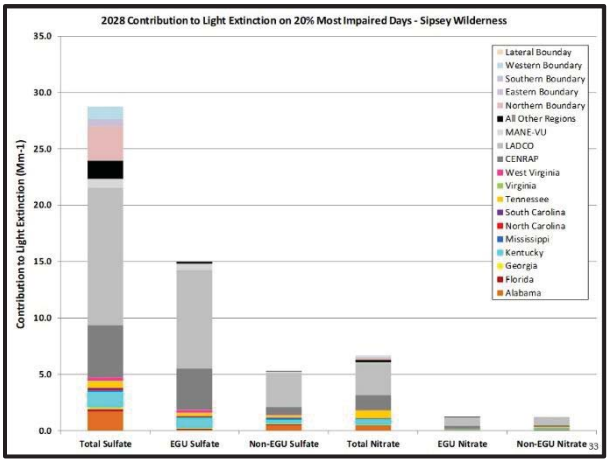
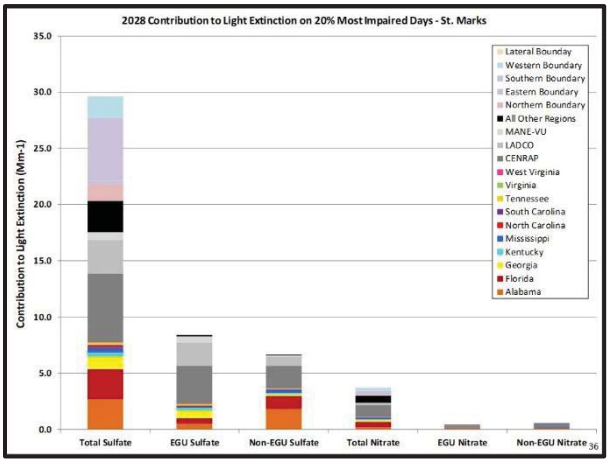

2028 Contribution of Ga Power Company - Plant Bowen from Sulfate + Nitrate (Mm-1)
Contribution to Light Extinction from Sulfate + Nitrate (Mm-1)
Extinction (20% Best)
Extinction (20% Impaired)
31

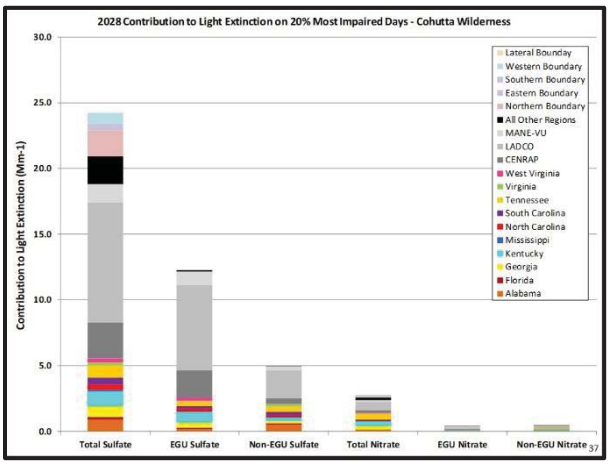

2028 Contribution to Light Extinction on 20% Most Impaired Days - Chassahowitzka
Contribution to Light Extinction (Mm-1)
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
34

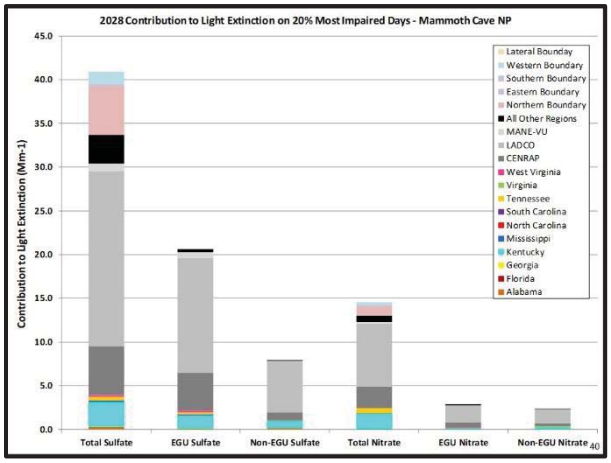

2028 Contribution of All Anthro + Natural Sources from Sulfate + Nitrate on 20% Most Impaired Days (Mm-1)
32

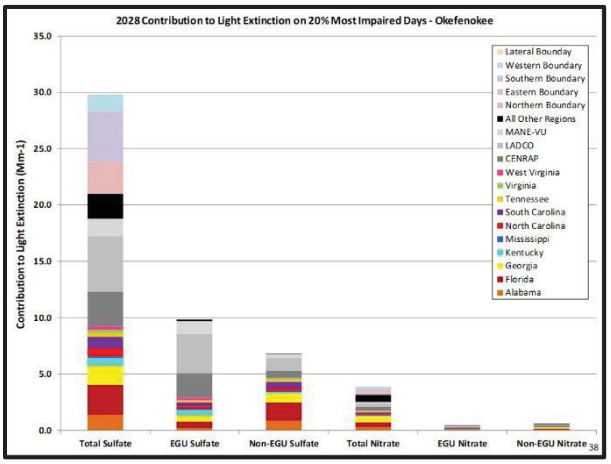

2028 Contribution to Light Extinction on 20% Most Impaired Days - Everglades NP
Contribution to Light Extinction (Mm-1)
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
35

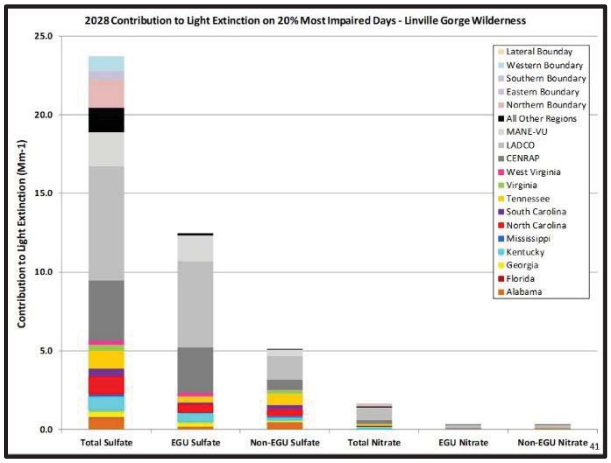

2028 Contribution to Light Extinction on 20% Most Impaired Days - Sipsey Wilderness
Contribution to Light Extinction (Mm-1)
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
33

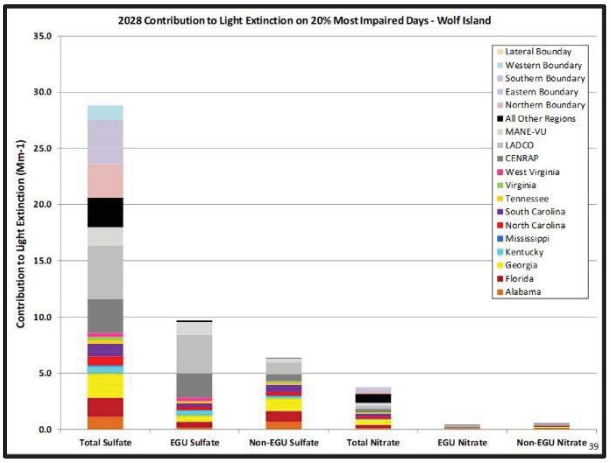

2028 Contribution to Light Extinction on 20% Most Impaired Days - St. Marks
Contribution to Light Extinction (Mm-1)
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
36

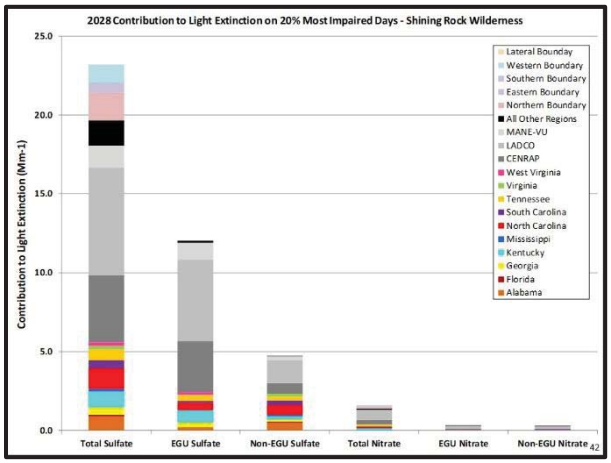

2028 Contribution to Light Extinction on 20% Most Impaired Days - Cohutta Wilderness
Contribution to Light Extinction (Mm-1)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
37

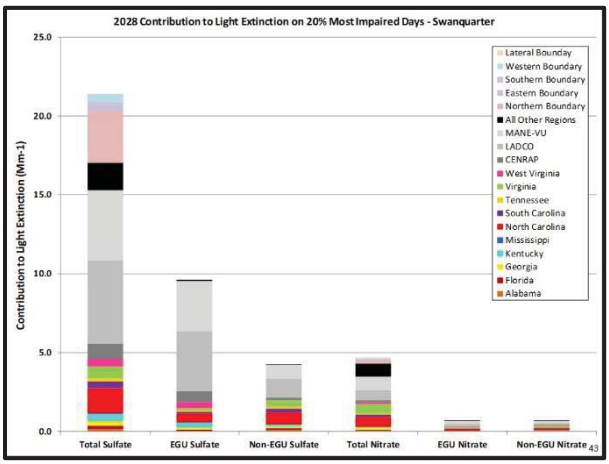

2028 Contribution to Light Extinction on 20% Most Impaired Days - Mammoth Cave NP
Contribution to Light Extinction (Mm-1)
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
40

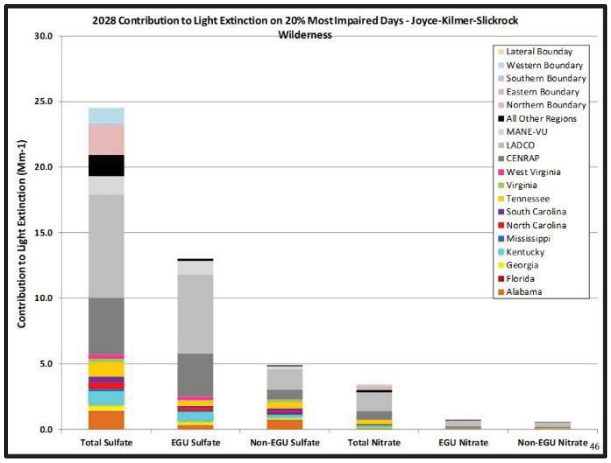

2028 Contribution to Light Extinction on 20% Most Impaired Days - Okefenokee
Contribution to Light Extinction (Mm-1)
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
38

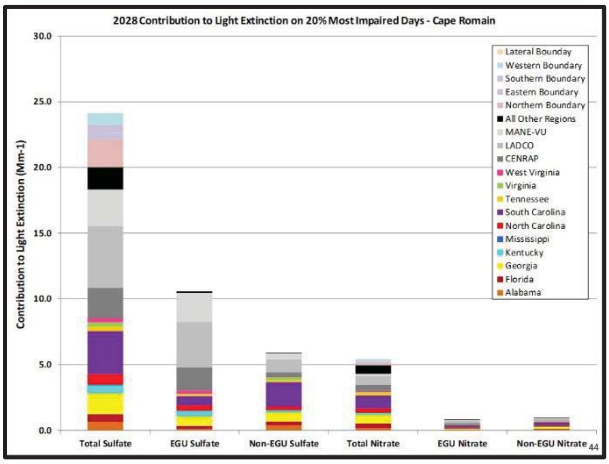

2028 Contribution to Light Extinction on 20% Most Impaired Days - Linville Gorge Wilderness
Contribution to Light Extinction (Mm-1)
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
41

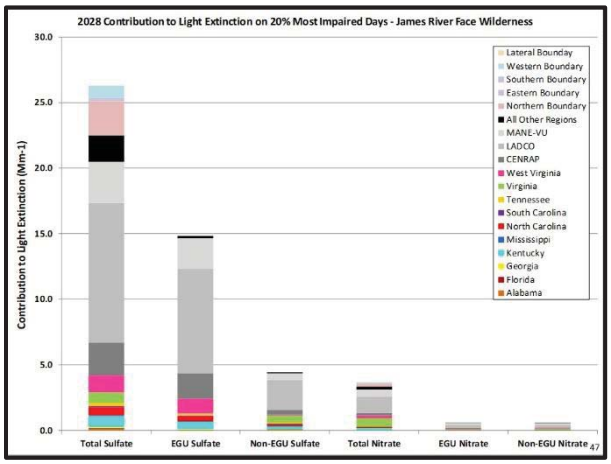

2028 Contribution to Light Extinction on 20% Most Impaired Days - Wolf Island
Contribution to Light Extinction (Mm-1)
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
39

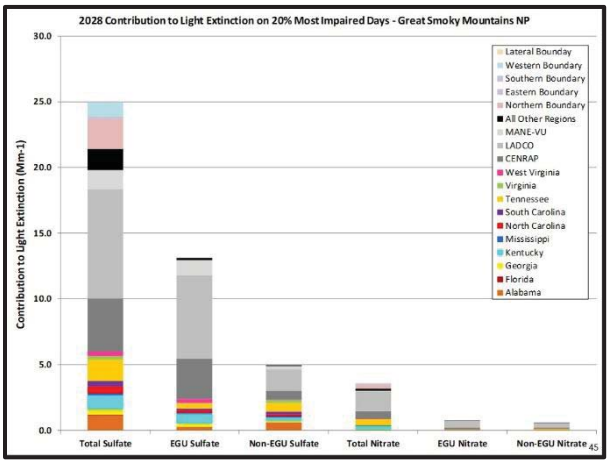

2028 Contribution to Light Extinction on 20% Most Impaired Days - Shining Rock Wilderness
Contribution to Light Extinction (Mm-1)
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
42


2028 Contribution to Light Extinction on 20% Most Impaired Days - Swanquarter
Contribution to Light Extinction (Mm-1)
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
43


2028 Contribution to Light Extinction on 20% Most Impaired Days - Joyce-Kilmer-Slickrock Wilderness
Contribution to Light Extinction (Mm-1)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
46


2028 Contribution to Light Extinction on 20% Most Impaired Days - Cape Romain
Contribution to Light Extinction (Mm-1)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
44


2028 Contribution to Light Extinction on 20% Most Impaired Days - James River Face Wilderness
Contribution to Light Extinction (Mm-1)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
47


2028 Contribution to Light Extinction on 20% Most Impaired Days - Great Smoky Mountains NP
Contribution to Light Extinction (Mm-1)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
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CENRAP
West Virginia
Virginia
Tennessee
South Carolina
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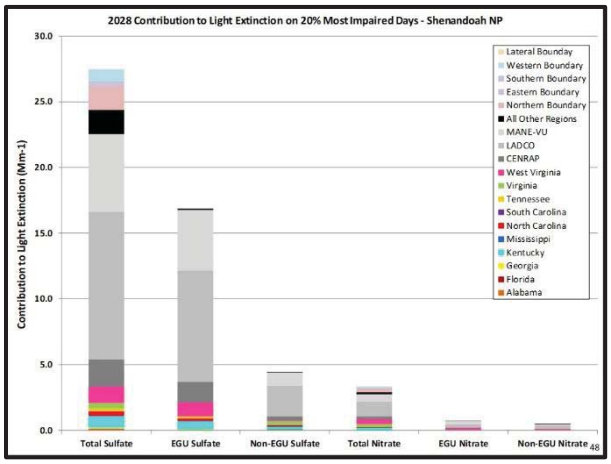
Mississippi
Kentucky
Georgia
Florida
Alabama
45


2028 Contribution to Light Extinction on 20% Most Impaired Days - Shenandoah NP
Contribution to Light Extinction (Mm-1)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
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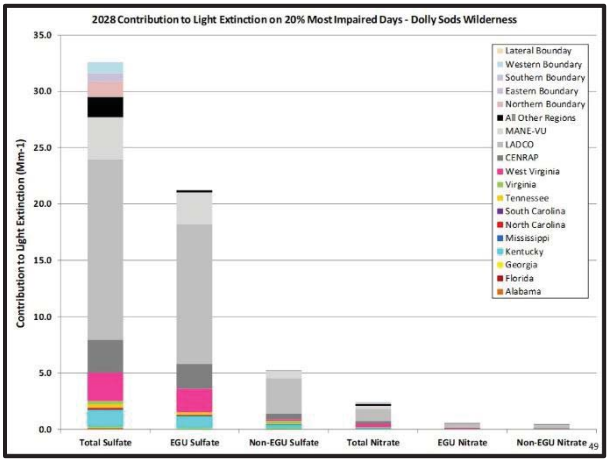
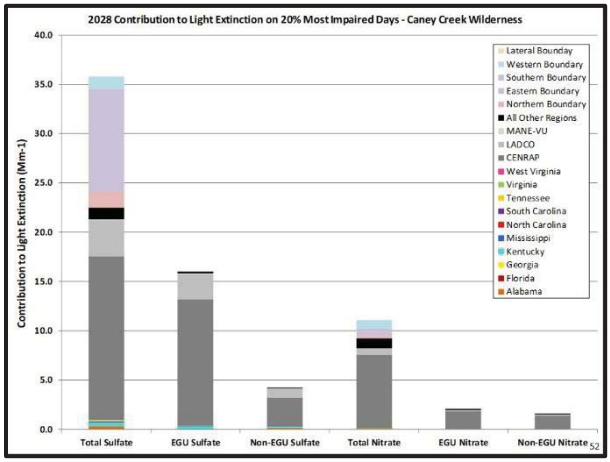
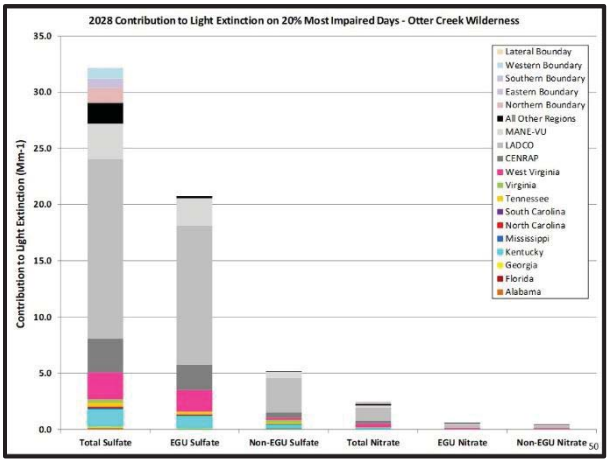
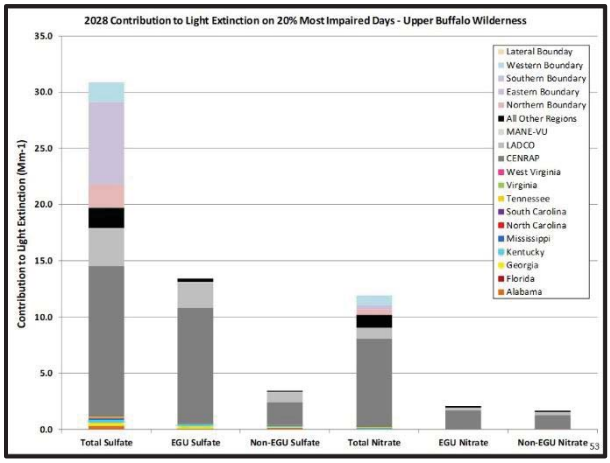
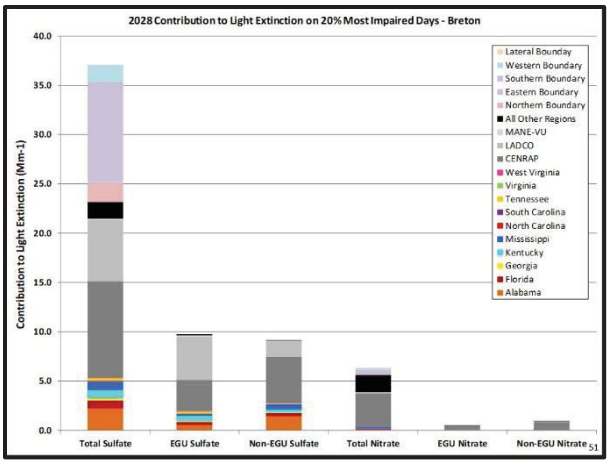
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
48

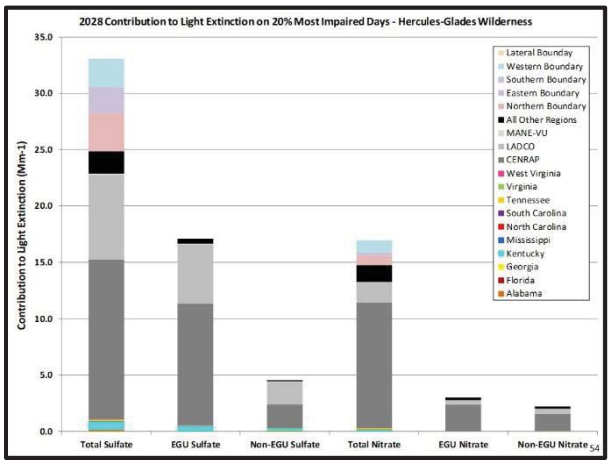

2028 Contribution to Light Extinction on 20% Most Impaired Days - Dolly Sods Wilderness
Contribution to Light Extinction (Mm-1)
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
49

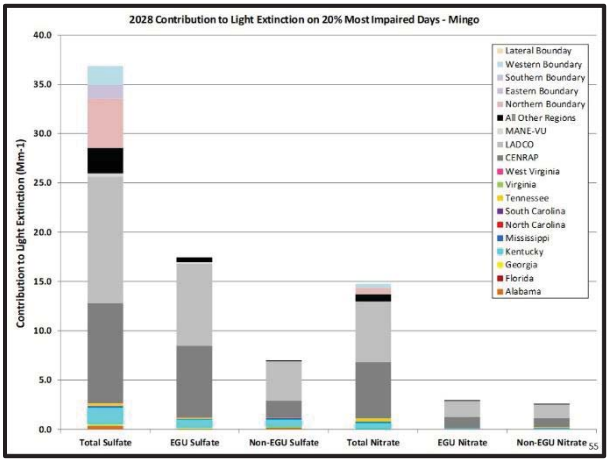

2028 Contribution to Light Extinction on 20% Most Impaired Days - Caney Creek Wilderness
Contribution to Light Extinction (Mm-1)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
52


2028 Contribution to Light Extinction on 20% Most Impaired Days - Otter Creek Wilderness
Contribution to Light Extinction (Mm-1)
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
50


2028 Contribution to Light Extinction on 20% Most Impaired Days - Upper Buffalo Wilderness
Contribution to Light Extinction (Mm-1)
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
53


2028 Contribution to Light Extinction on 20% Most Impaired Days - Breton
Contribution to Light Extinction (Mm-1)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
51

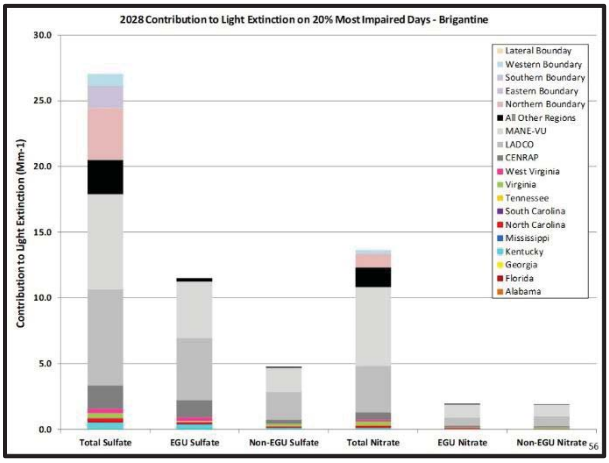

2028 Contribution to Light Extinction on 20% Most Impaired Days - Hercules-Glades Wilderness
Contribution to Light Extinction (Mm-1)
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
54



Screening for 4-Factor Analysis

- States are in the process of selecting sources for the reasonable progress 4-factor analysis
- State need to make decisions on screening thresholds:
  - Most states will likely use a screening threshold based on a facility's percent contribution to point source contributions
    - Likely range is between 2% to 5%
  - Sulfate and nitrate separately vs. combination
  - AOI contributions, PSAT contributions, or combination
    - In some cases, the AOI contributions are significantly different than the PSAT contributions

58



4-Factor Analysis

- States will evaluate certain sources and emissions to determine if reasonable controls are in place or available
- Considers four important factors
  - Potential costs of compliance
    - $/ton and $/$Mm^{-1}$
  - Time necessary for compliance
  - Energy and non-air quality environmental impacts of compliance
  - Remaining useful life of sources subject to this analysis

59

NEXT STEPS

57

Remaining Work Schedule

Task	Schedule
Additional PSAT tagging runs?	Necessity uncertain
Final reports and documentation	February 2020
Website updates and postings	Ongoing task
Regional Haze SIPs Due to EPA	**July 31, 2021**

60

Contact Information

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61

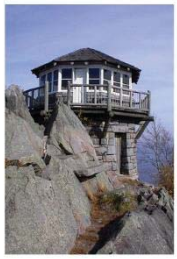
Appendix F-3h - VISTAS Regional Haze Project Update, April 2, 2020

VISTAS Regional Haze Project Update

FLM and EPA Conference Call
April 2, 2020

Outline

- Background Information
- 2028 Emissions Updates
- Revised 2028 PSAT Stacked Bar Charts
- Four Factor Analysis
- Next Steps & Schedule



VISTAS vs. EPA Emission Projections

- The table below compares the 2028 point emissions used by VISTAS vs. the latest 2028fh emissions used by EPA (projected from 2016). The emissions below are extracted from the VISTAS 12 modeling domain which covers the Eastern U.S.

Pollutant	VISTAS 2028 (tpy)	New EPA 2028 (tpy)	Change (tpy)	Change (%)
NOx	2,641,463.83	2,108,115.50	**533,348.33**	20.19%
SO2	2,574,542.02	1,400,287.10	**1,174,254.92**	45.61%

Old ERTAC (2.7opt) vs. New ERTAC (16.0)

SO2	16.0_2028	2.7opt_2028	Δ SO2	Δ SO2
CENSARA	367,683.7	760,828.2	-393,144.5	**-51.67%**
LADCO	266,047.0	379,577.5	-113,530.5	**-29.91%**
MANE-VU	78,657.0	196,672.6	-118,015.6	**-60.01%**
VISTAS	161,502.5	273,582.1	-112,079.6	**-40.97%**
TOTAL	**976,471.2**	**1,783,376.5**	**-806,905.3**	**-45.25%**

NOx	16.0_2028	2.7opt_2028	Δ NOx	Δ NOx
CENSARA	244,499.3	354,795.1	-110,295.8	**-31.09%**
LADCO	166,429.4	198,966.9	-32,537.4	**-16.35%**
MANE-VU	56,315.3	83,432.5	-27,117.2	**-32.50%**
VISTAS	200,791.1	270,615.7	-69,824.6	**-25.80%**
TOTAL	**840,973.6**	**1,166,663.1**	**-325,689.5**	**-27.92%**

VISTAS CC/TAWG Conclusions

1. 2028 emission updates are necessary
   - **VISTAS States** – States will:
     - Update 2028 major source emissions projections (SO_2, NOx, $PM_{2.5}$, PM_{10}, NH_3, CO) at the facility and unit level
     - Add any new sources of significance
   - **LADCO States** – SESARM will:
     - Replace ERTAC_2.7 with ERTAC_16.1 based on LADCO input
   - **All Other States** – SESARM will:
     - Replace ERTAC_2.7 with ERTAC_16.0
     - Verify accuracy of large SO_2 and NOx source emissions projections via contact with surrounding states/RPOs and update emissions as needed
2. Additional 2028 air quality modeling is needed

Additional Modeling-Related Tasks

- Emissions processing
- Updated 2028 CAMx modeling
- Updated 2028 visibility projections
- Documentation

Updated 2028 Point Emissions

7

Revised 2028 PSAT Stacked Bar Charts (Original and Adjusted)

10

2028 SO_2 Comparison

State/ RPO	Point_OLD (tpy)	Point_NEW (tpy)	Delta (%)	EGU_OLD (tpy)	EGU_NEW (tpy)	Delta (%)	NEGU_OLD (tpy)	NEGU_NEW (tpy)	Delta (%)
AL	87,111.28	59,056.98	-32.2%	15,480.96	8,365.96	-46.0%	71,630.32	50,691.02	-29.2%
FL	63,501.23	52,982.68	-16.6%	28,547.41	24,004.67	-15.9%	34,953.82	28,978.01	-17.1%
GA	37,065.83	36,166.09	-2.4%	18,473.28	17,573.54	-4.9%	18,592.55	18,592.55	0.0%
KY	75,140.26	65,636.83	-12.6%	56,262.06	49,585.95	-11.9%	18,878.20	16,050.88	-15.0%
MS	21,234.31	8,405.06	-60.4%	6,984.57	3,236.28	-53.7%	14,249.74	5,168.78	-63.7%
NC	35,232.88	24,347.18	-30.9%	19,734.80	9,571.47	-51.5%	15,498.08	14,775.71	-4.7%
SC	29,600.85	29,601.25	0.0%	10,693.79	10,695.34	0.0%	18,907.05	18,905.91	0.0%
TN	23,447.58	21,057.17	-10.2%	12,114.30	10,030.04	-17.2%	11,333.28	11,027.13	-2.7%
VA	19,839.18	18,551.32	-6.5%	3,264.09	1,976.23	-39.5%	16,575.09	16,575.09	0.0%
WV	63,404.07	53,715.79	-15.3%	57,828.67	47,744.49	-17.4%	5,575.41	5,971.30	7.1%
CENSARA	1,012,946.59	621,321.29	-38.7%	773,625.13	382,000.54	-50.6%	239,321.46	239,320.75	0.0%
LADCO	660,186.42	498,171.62	-24.5%	444,506.99	282,492.18	-36.4%	215,679.44	215,679.44	0.0%
MANE-VE	270,810.83	149,439.76	-44.8%	203,661.43	95,074.20	-53.3%	67,149.39	54,365.55	-19.0%
WRAP	182,121.89	135,483.18	-25.6%	136,955.17	90,316.46	-34.1%	45,166.72	45,166.73	0.0%
TOTAL	**2,581,643.20**	**1,773,936.20**	**-31.3%**	**1,788,132.63**	**1,032,667.35**	**-42.2%**	**793,510.56**	**741,268.85**	**-6.6%**

8

PSAT Source Apportionment Modeling

- Quantifies visibility impacts from individual point sources, source sectors, and geographic regions
- NOx and SO_2 tagging
- Used for further evaluation of AOI results
- Refines information on contributions to visibility impairment
- Can be used to adjust future year visibility projections to account for additional emission controls
- VISTAS contract with ERG allows for up to 250 tags

11

2028 NOx Comparison

State/ RPO	Point_OLD (tpy)	Point_NEW (tpy)	Delta (%)	EGU_OLD (tpy)	EGU_NEW (tpy)	Delta (%)	NEGU_OLD (tpy)	NEGU_NEW (tpy)	Delta (%)
AL	80,389.97	70,824.72	-11.9%	26,895.35	20,008.14	-25.6%	53,494.61	50,816.58	-5.0%
FL	68,006.19	70,010.40	2.9%	26,250.73	25,049.90	-4.6%	41,755.45	44,960.50	7.7%
GA	67,197.50	65,885.55	-2.0%	25,899.67	24,587.73	-5.1%	41,297.83	41,297.83	0.0%
KY	66,240.03	62,130.83	-6.2%	36,781.72	32,695.94	-11.1%	29,458.31	29,434.89	-0.1%
MS	52,159.32	46,853.62	-10.2%	18,279.53	12,208.89	-33.2%	33,879.79	34,644.73	2.3%
NC	65,863.97	58,933.80	-10.5%	27,842.23	20,977.65	-24.7%	38,021.74	37,956.15	-0.2%
SC	36,051.31	36,170.87	0.3%	10,522.78	10,707.42	1.8%	25,528.53	25,463.44	-0.3%
TN	45,879.07	42,954.25	-6.4%	10,086.01	7,814.13	-22.5%	35,793.06	35,140.12	-1.8%
VA	43,210.19	41,671.99	-3.6%	11,973.97	10,435.77	-12.8%	31,236.22	31,236.22	0.0%
WV	65,054.07	68,200.77	4.8%	46,721.77	49,874.15	6.7%	18,332.30	18,326.62	0.0%
CENSARA	903,979.85	791,397.59	-12.5%	382,706.66	270,182.46	-29.4%	521,273.19	521,215.14	0.0%
LADCO	548,866.74	491,345.00	-10.5%	244,035.26	186,513.52	-23.6%	304,831.49	304,831.49	0.0%
MANE-VE	244,280.15	222,991.41	-8.7%	103,465.15	82,176.41	-20.6%	140,815.00	140,815.00	0.0%
WRAP	362,819.80	301,433.41	-16.9%	187,944.97	126,558.55	-32.7%	174,874.83	174,874.86	0.0%
TOTAL	**2,649,998.14**	**2,370,804.22**	**-10.5%**	**1,159,405.80**	**879,790.66**	**-24.1%**	**1,490,592.35**	**1,491,013.55**	**0.0%**

9

PSAT SO_2 and NOx Tags (209)

Round 1 (122 tags)

- Total SO_2 tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- Total NOx tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- EGU point SO_2 tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- EGU point NOx tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- *SO_2 tags for individual VISTAS facilities = 50 tags*
- *NOx tags for individual VISTAS facilities = 20 tags*

Round 2 (87 tags)

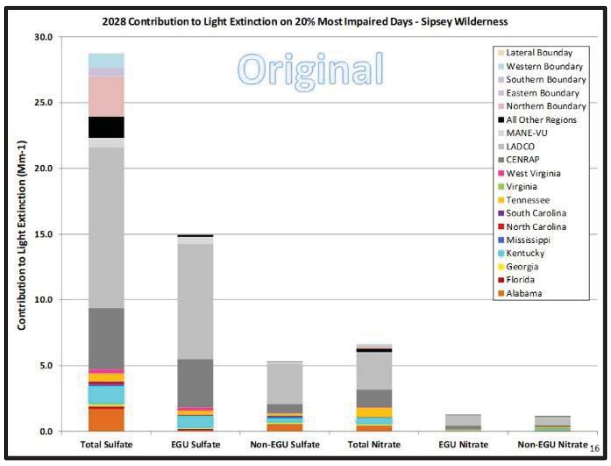
- Non-EGU point SO_2 for 10 individual VISTAS states + 3 MJOs = 13 tags
- Non-EGU point NOx for 10 individual VISTAS states + 3 MJOs = 13 tags
- SO_2 and NOx for N/S/W/E boundaries = 8 tags
- *SO_2 tags for individual VISTAS facilities = 10 tags*
- *NOx tags for individual VISTAS facilities = 16 tags*
- *SO_2 tags for individual non-VISTAS facilities = 17 tags*
- *NOx tags for individual non-VISTAS facilities = 10 tags*

12

PSAT Adjustment Ratios

State/RPO	SO_2 EGU Ratio	SO_2 NEGU Ratio	NOx EGU Ratio	NOx NEGU Ratio
AL	0.540	0.708	0.744	0.950
FL	0.841	0.829	0.954	1.077
GA	0.951	1.000	0.949	1.000
KY	0.881	0.850	0.889	0.999
MS	0.463	0.363	0.668	1.023
NC	0.485	0.953	0.753	0.998
SC	1.000	1.000	1.018	0.997
TN	0.828	0.973	0.775	0.982
VA	0.605	1.000	0.872	1.000
WV	0.826	1.071	1.067	1.000
CENSARA	0.494	1.000	0.706	1.000
LADCO	0.636	1.000	0.764	1.000
MANE-VE	0.467	0.810	0.794	1.000

13



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Revised State/RPO PSAT Results

- **Revised EGU Sulfate PSAT Results**
  = Original EGU Sulfate PSAT Results * SO_2 EGU Ratio

$$\text{where, } SO_2 \text{ EGU Ratio} = \frac{\text{(Revised EGU } SO_2 \text{ emissions)}}{\text{(Original EGU } SO_2 \text{ emissions)}}$$

- **Revised NEGU Sulfate PSAT Results**
  = Original NEGU Sulfate PSAT Results * SO_2 NEGU Ratio

$$\text{where, } SO_2 \text{ NEGU Ratio} = \frac{\text{(Revised EGU } SO_2 \text{ emissions)}}{\text{(Original EGU } SO_2 \text{ emissions)}}$$

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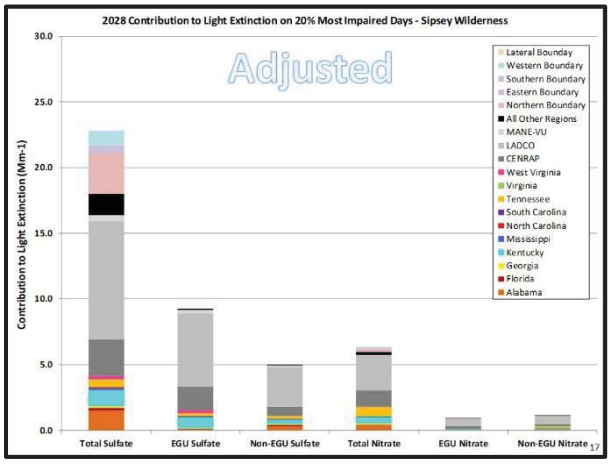


17

Revised State/RPO PSAT Results

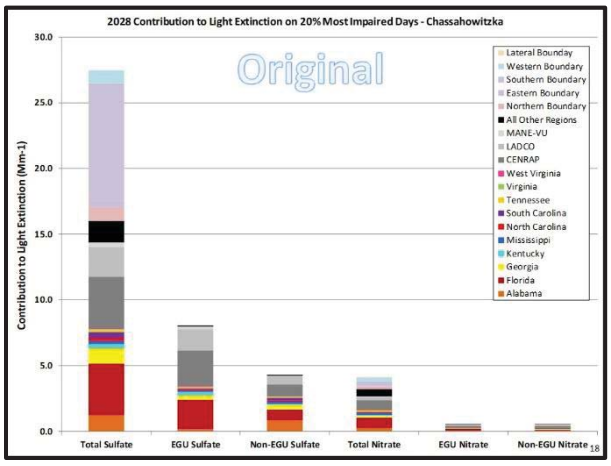
- **Revised EGU Nitrate PSAT Results**
  = Original EGU Nitrate PSAT Results * NOx EGU Ratio

$$\text{where, NOx EGU Ratio} = \frac{\text{(Revised EGU NOx emissions)}}{\text{(Original EGU NOx emissions)}}$$

- **Revised NEGU Nitrate PSAT Results**
  = Original NEGU Nitrate PSAT Results * NOx NEGU Ratio

$$\text{where, NOx NEGU Ratio} = \frac{\text{(Revised EGU NOx emissions)}}{\text{(Original EGU NOx emissions)}}$$

15



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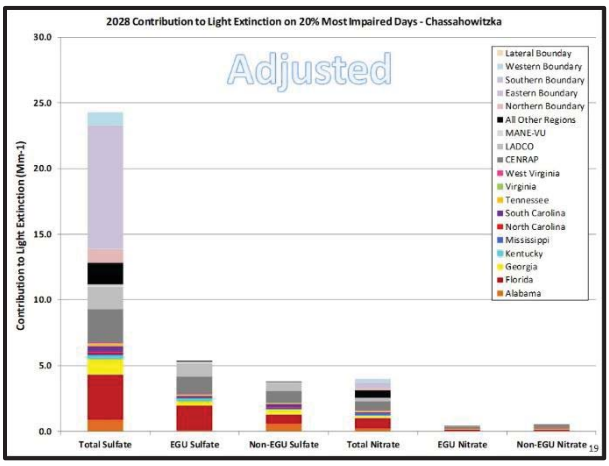
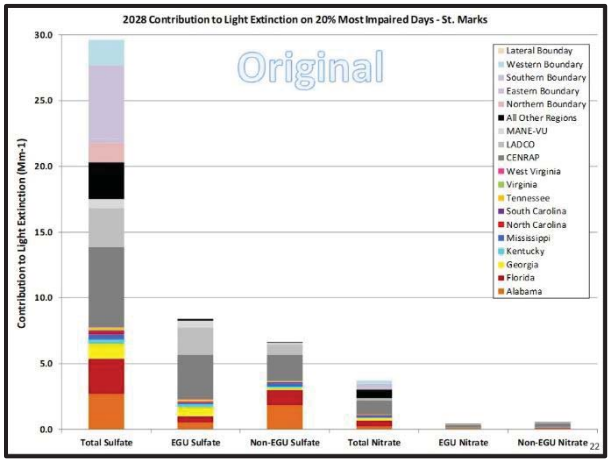
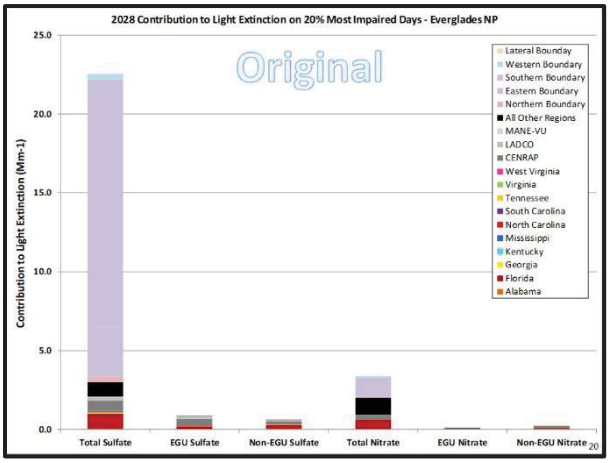

2028 Contribution to Light Extinction on 20% Most Impaired Days - Chassahowitzka
Adjusted
Contribution to Light Extinction (Mm-1)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
19


2028 Contribution to Light Extinction on 20% Most Impaired Days - St. Marks
Original
Contribution to Light Extinction (Mm-1)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
22


2028 Contribution to Light Extinction on 20% Most Impaired Days - Everglades NP
Original
Contribution to Light Extinction (Mm-1)
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20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
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Mississippi
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Georgia
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Alabama
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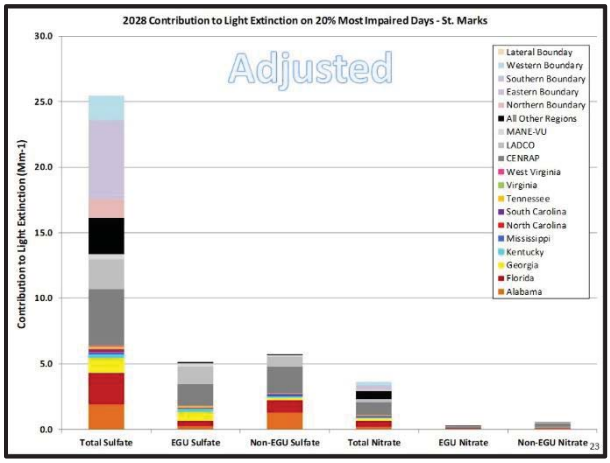
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Adjusted
Contribution to Light Extinction (Mm-1)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
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South Carolina
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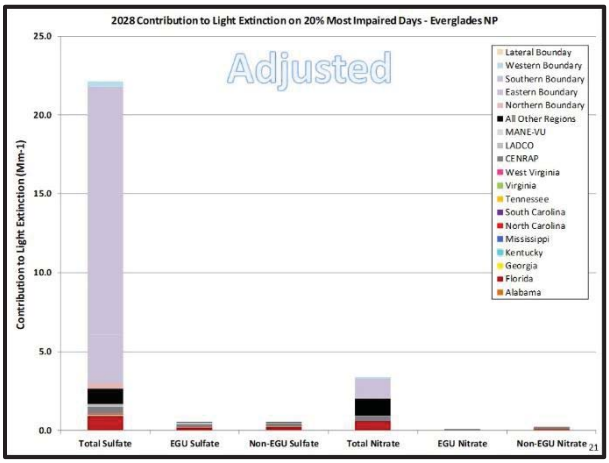
Mississippi
Kentucky
Georgia
Florida
Alabama
23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Adjusted
Contribution to Light Extinction (Mm-1)
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
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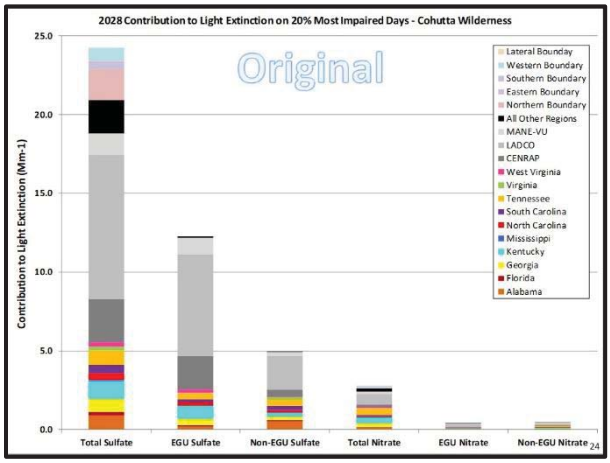
Florida
Alabama
21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Original
Contribution to Light Extinction (Mm-1)
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20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
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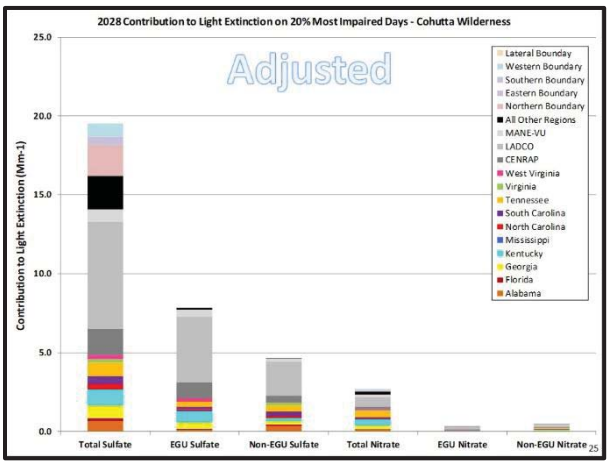
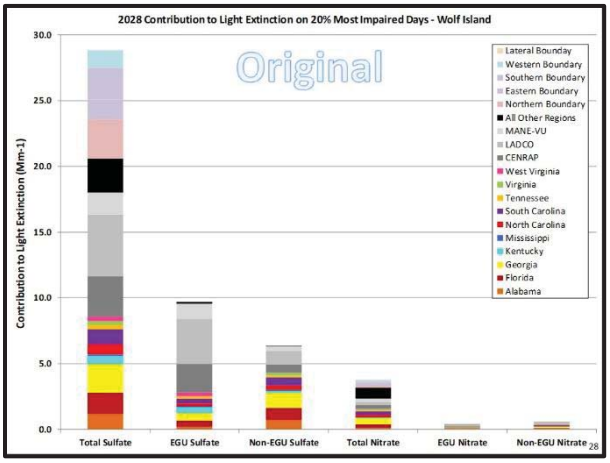

2028 Contribution to Light Extinction on 20% Most Impaired Days - Cohutta Wilderness
Adjusted
Contribution to Light Extinction (Mm-1)
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
25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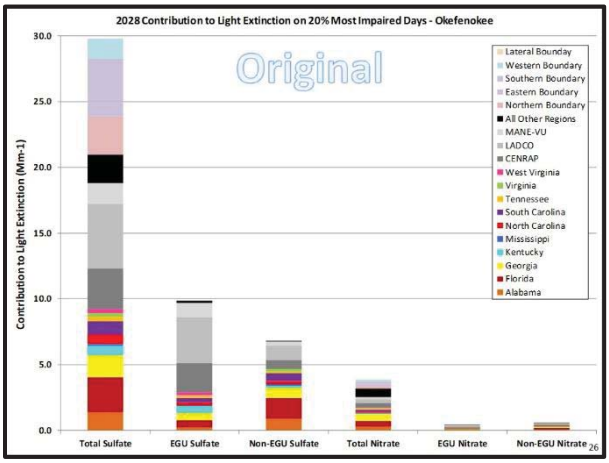
Original
Contribution to Light Extinction (Mm-1)
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
28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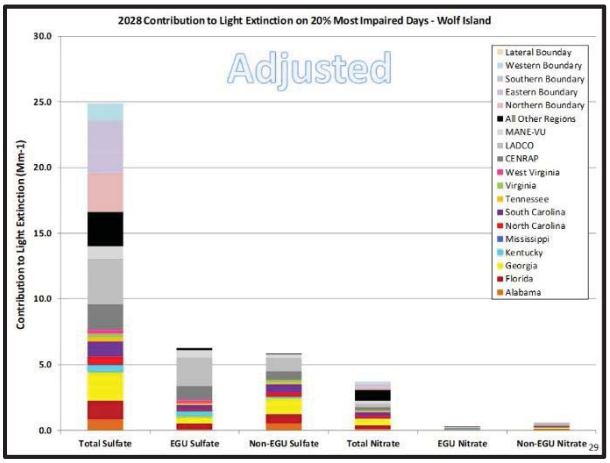
Original
Contribution to Light Extinction (Mm-1)
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
26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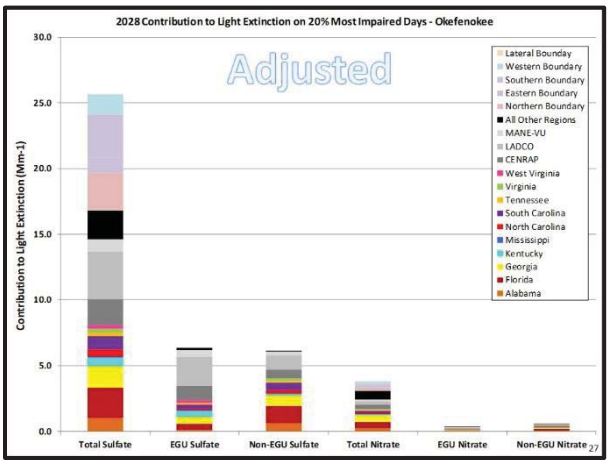
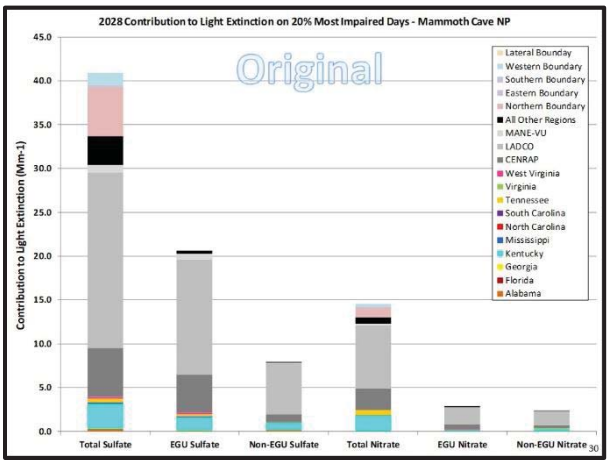
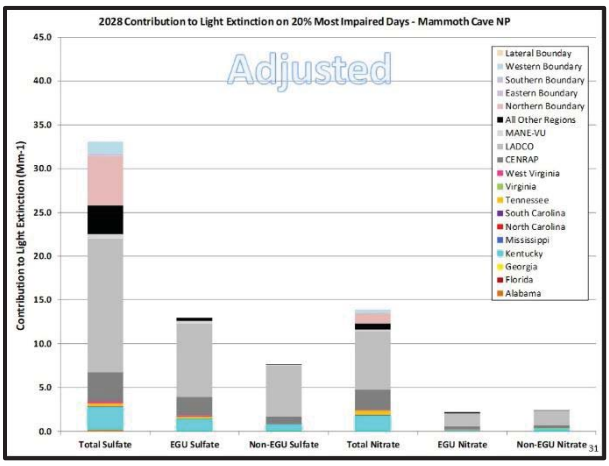
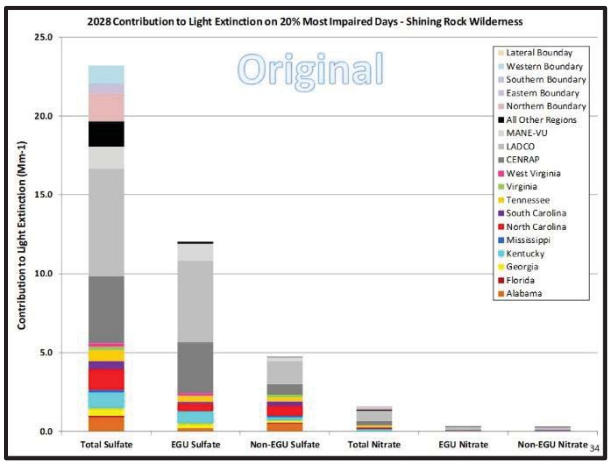
Adjusted
Contribution to Light Extinction (Mm-1)
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
29


2028 Contribution to Light Extinction on 20% Most Impaired Days - Okefenokee
Adjusted
Contribution to Light Extinction (Mm-1)
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
27


2028 Contribution to Light Extinction on 20% Most Impaired Days - Mammoth Cave NP
Original
Contribution to Light Extinction (Mm-1)
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
30


2028 Contribution to Light Extinction on 20% Most Impaired Days - Mammoth Cave NP
Adjusted
Contribution to Light Extinction (Mm-1)
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
31


2028 Contribution to Light Extinction on 20% Most Impaired Days - Shining Rock Wilderness
Original
Contribution to Light Extinction (Mm-1)
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
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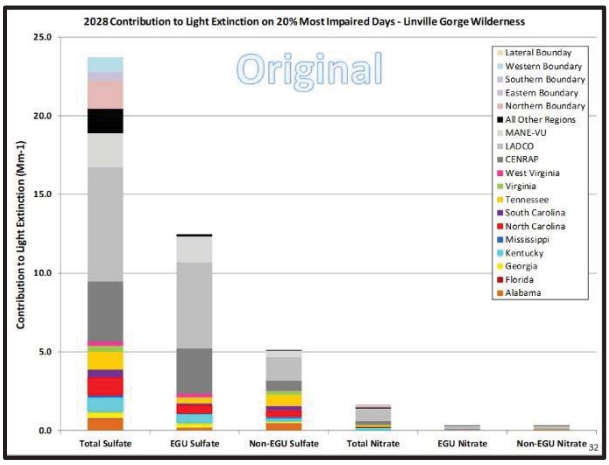
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
34


2028 Contribution to Light Extinction on 20% Most Impaired Days - Linville Gorge Wilderness
Original
Contribution to Light Extinction (Mm-1)
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
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South Carolina
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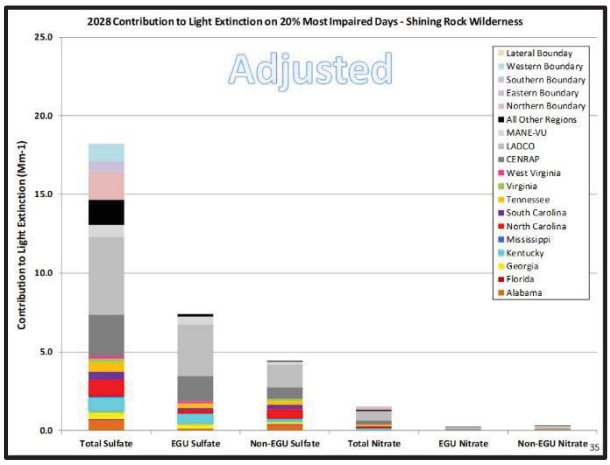
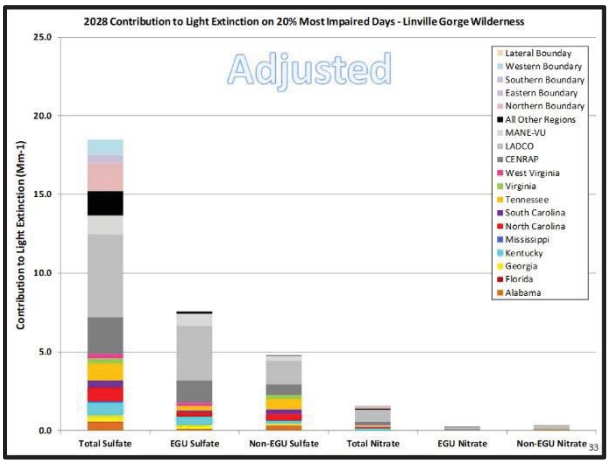
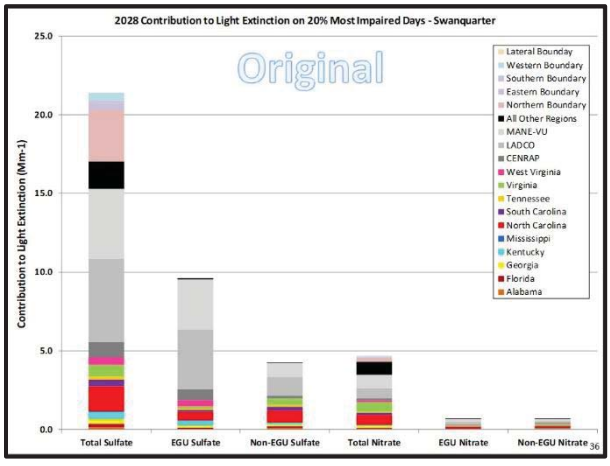
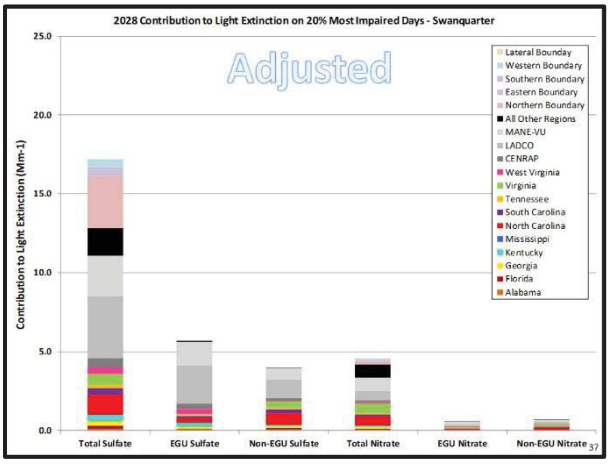
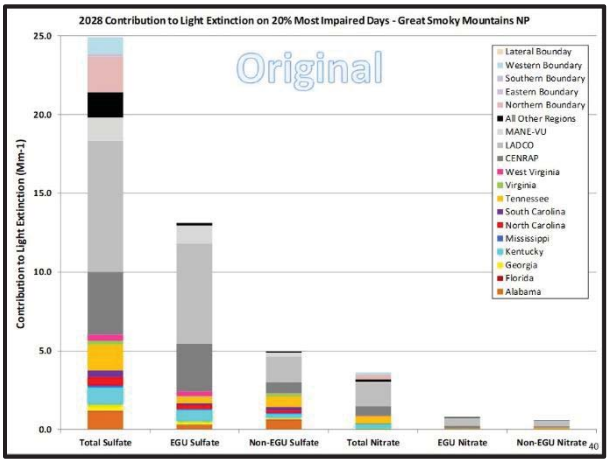
Mississippi
Kentucky
Georgia
Florida
Alabama
32

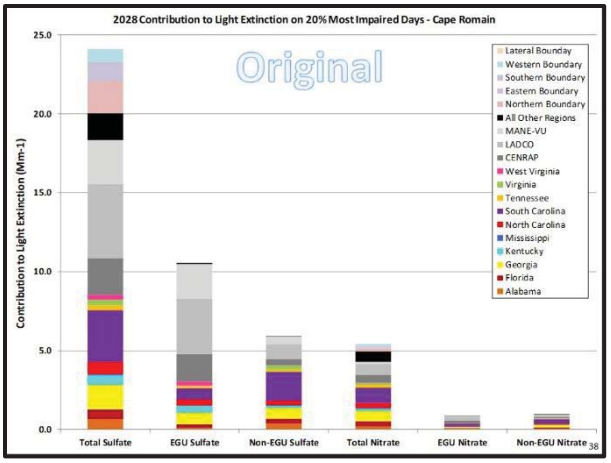

2028 Contribution to Light Extinction on 20% Most Impaired Days - Shining Rock Wilderness
Adjusted
Contribution to Light Extinction (Mm-1)
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
35

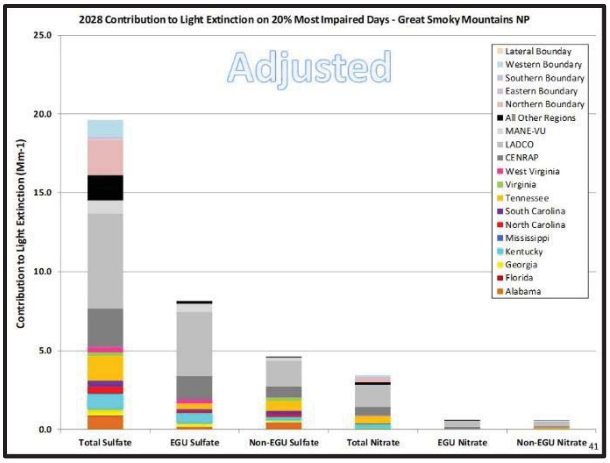

2028 Contribution to Light Extinction on 20% Most Impaired Days - Linville Gorge Wilderness
Adjusted
Contribution to Light Extinction (Mm-1)
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
33

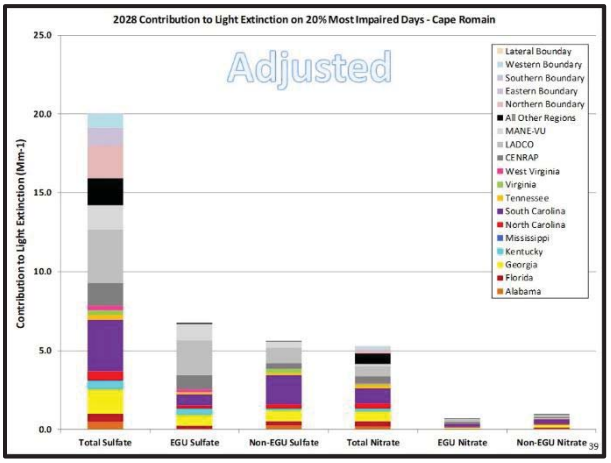

2028 Contribution to Light Extinction on 20% Most Impaired Days - Swanquarter
Original
Contribution to Light Extinction (Mm-1)
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
36

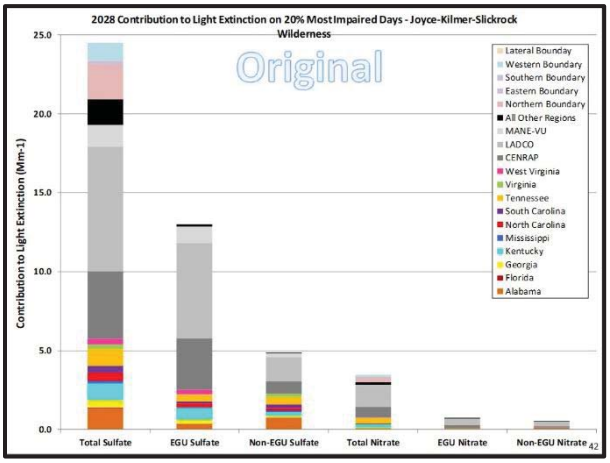

2028 Contribution to Light Extinction on 20% Most Impaired Days - Swanquarter
Adjusted
Contribution to Light Extinction (Mm-1)
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
37
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama

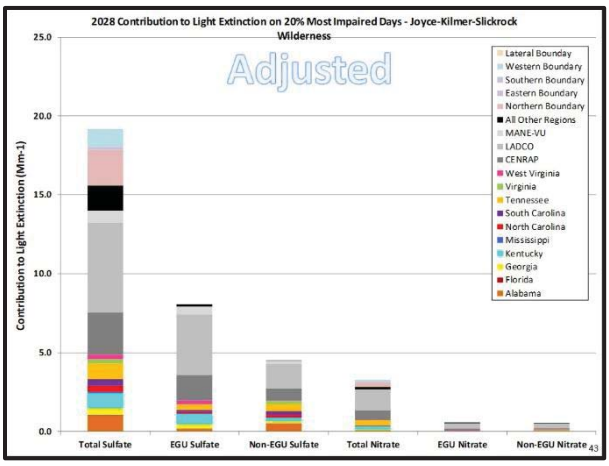

2028 Contribution to Light Extinction on 20% Most Impaired Days - Great Smoky Mountains NP
Original
Contribution to Light Extinction (Mm-1)
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
40
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama

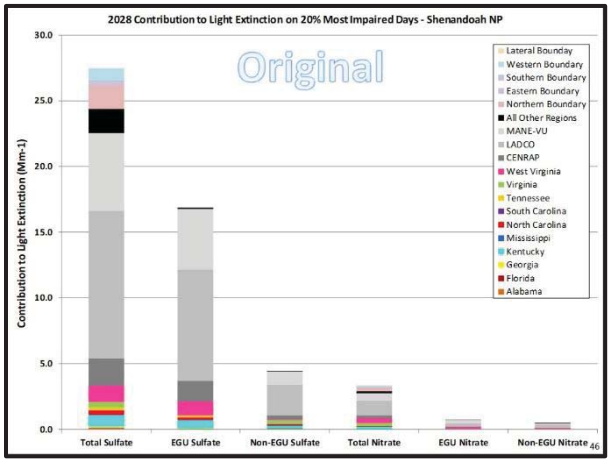

2028 Contribution to Light Extinction on 20% Most Impaired Days - Cape Romain
Original
Contribution to Light Extinction (Mm-1)
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
38
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama

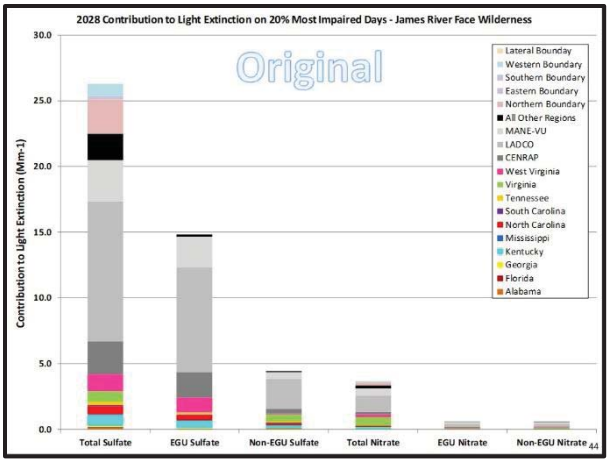

2028 Contribution to Light Extinction on 20% Most Impaired Days - Great Smoky Mountains NP
Adjusted
Contribution to Light Extinction (Mm-1)
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
41
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama

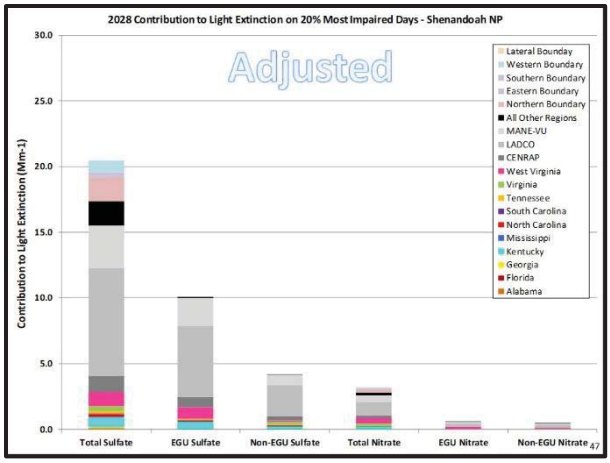

2028 Contribution to Light Extinction on 20% Most Impaired Days - Cape Romain
Adjusted
Contribution to Light Extinction (Mm-1)
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
39
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama

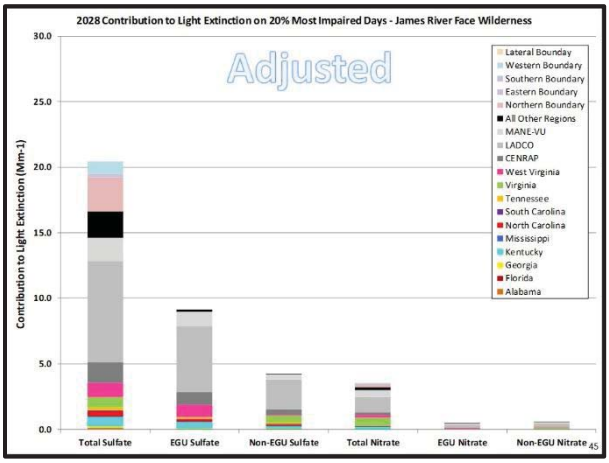

2028 Contribution to Light Extinction on 20% Most Impaired Days - Joyce-Kilmer-Slickrock Wilderness
Original
Contribution to Light Extinction (Mm-1)
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
42
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama

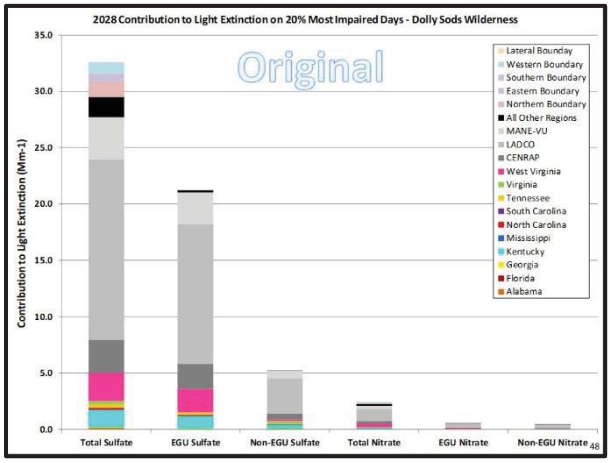

2028 Contribution to Light Extinction on 20% Most Impaired Days - Joyce-Kilmer-Slickrock Wilderness
Adjusted
Contribution to Light Extinction (Mm-1)
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
43
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama

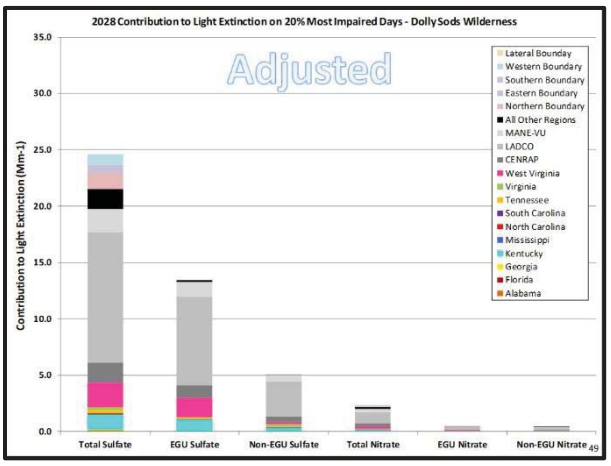

2028 Contribution to Light Extinction on 20% Most Impaired Days - Shenandoah NP
Original
Contribution to Light Extinction (Mm-1)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
46
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama

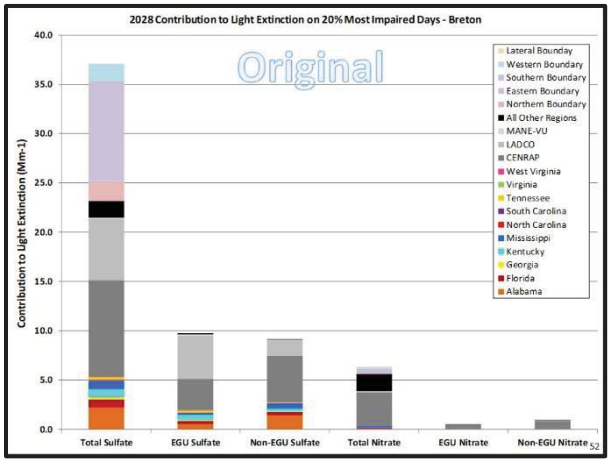

2028 Contribution to Light Extinction on 20% Most Impaired Days - James River Face Wilderness
Original
Contribution to Light Extinction (Mm-1)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
44
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama

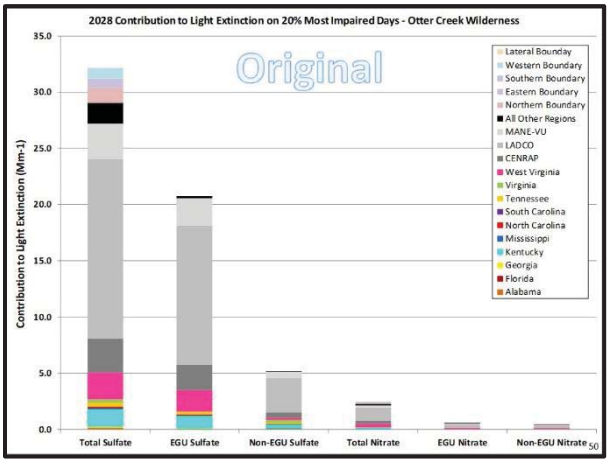

2028 Contribution to Light Extinction on 20% Most Impaired Days - Shenandoah NP
Adjusted
Contribution to Light Extinction (Mm-1)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
47
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama

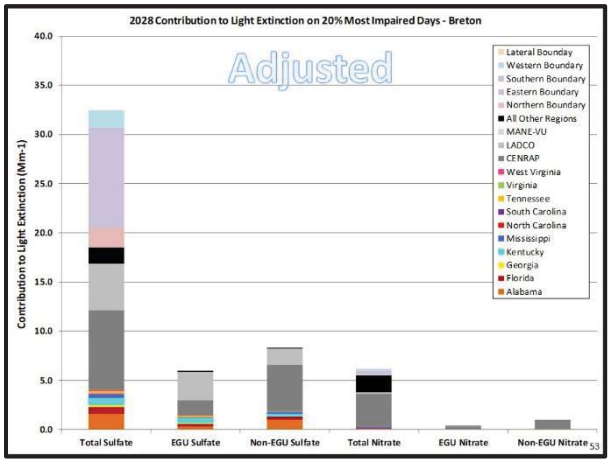

2028 Contribution to Light Extinction on 20% Most Impaired Days - James River Face Wilderness
Adjusted
Contribution to Light Extinction (Mm-1)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
45
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama

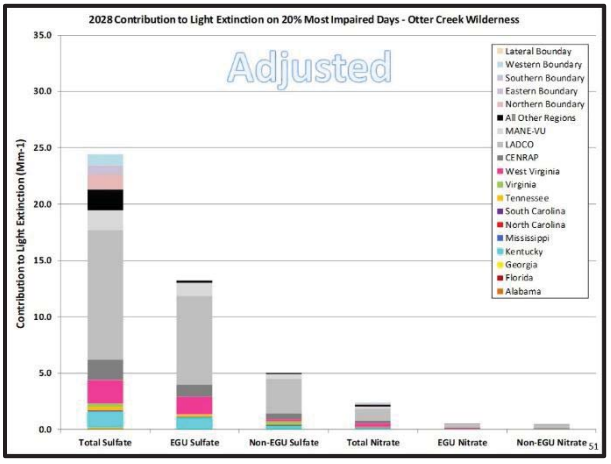

2028 Contribution to Light Extinction on 20% Most Impaired Days - Dolly Sods Wilderness
Original
Contribution to Light Extinction (Mm-1)
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
48
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama

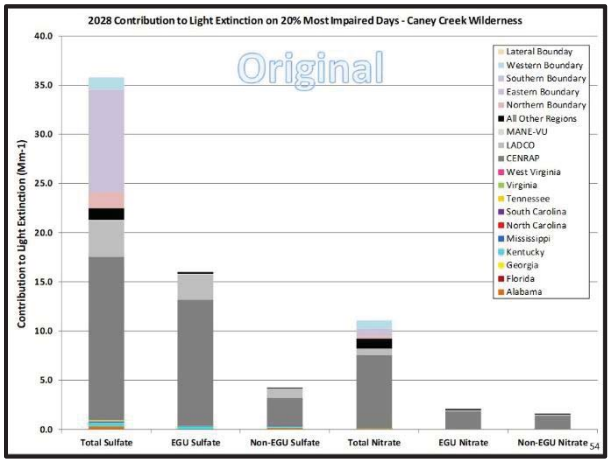

2028 Contribution to Light Extinction on 20% Most Impaired Days - Dolly Sods Wilderness
Adjusted
Contribution to Light Extinction (Mm-1)
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
49

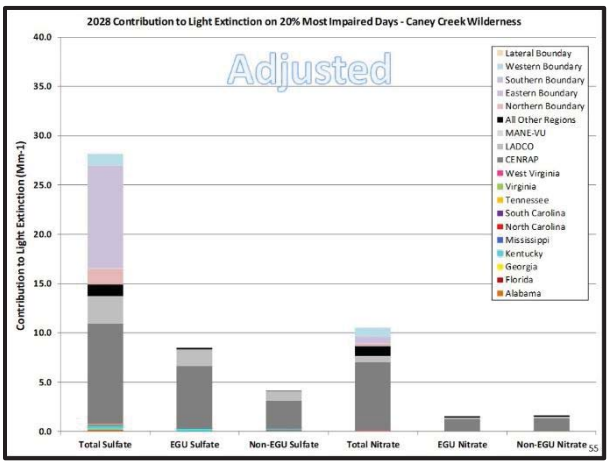

2028 Contribution to Light Extinction on 20% Most Impaired Days - Breton
Original
Contribution to Light Extinction (Mm-1)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
52

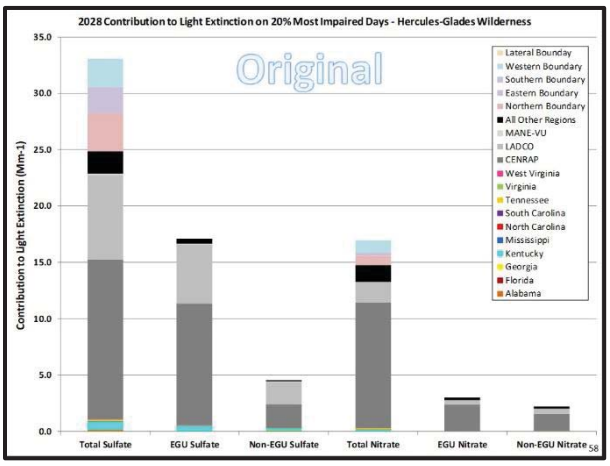

2028 Contribution to Light Extinction on 20% Most Impaired Days - Otter Creek Wilderness
Original
Contribution to Light Extinction (Mm-1)
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
50

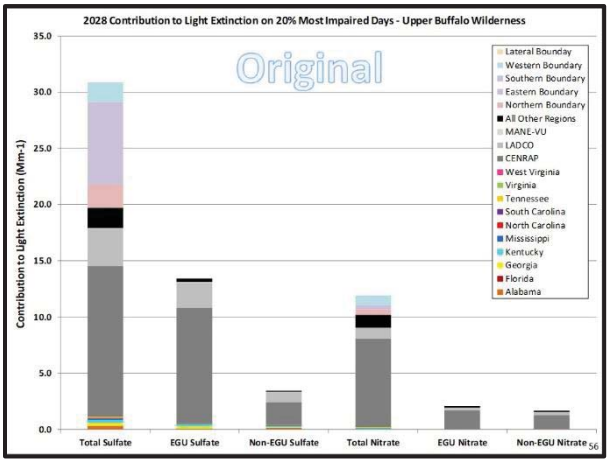

2028 Contribution to Light Extinction on 20% Most Impaired Days - Breton
Adjusted
Contribution to Light Extinction (Mm-1)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
53

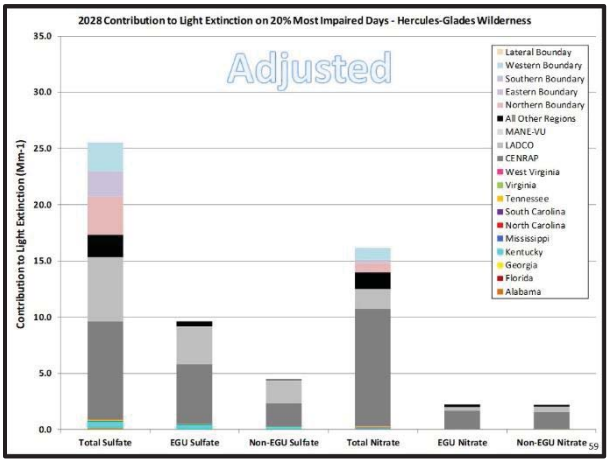

2028 Contribution to Light Extinction on 20% Most Impaired Days - Otter Creek Wilderness
Adjusted
Contribution to Light Extinction (Mm-1)
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
51

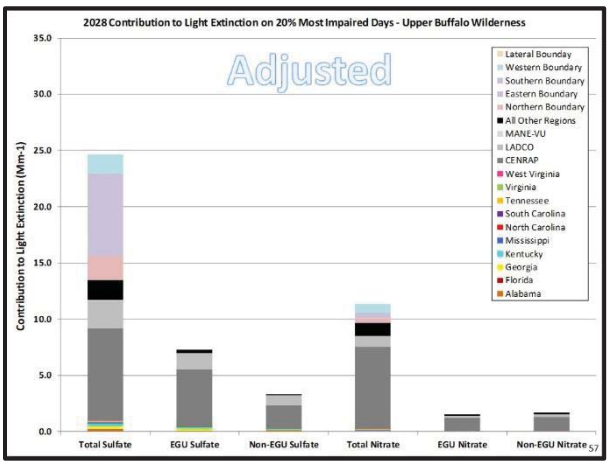

2028 Contribution to Light Extinction on 20% Most Impaired Days - Caney Creek Wilderness
Original
Contribution to Light Extinction (Mm-1)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
Lateral Boundary
Western Boundary
Southern Boundary
Eastern Boundary
Northern Boundary
All Other Regions
MANE-VU
LADCO
CENRAP
West Virginia
Virginia
Tennessee
South Carolina
North Carolina
Mississippi
Kentucky
Georgia
Florida
Alabama
54

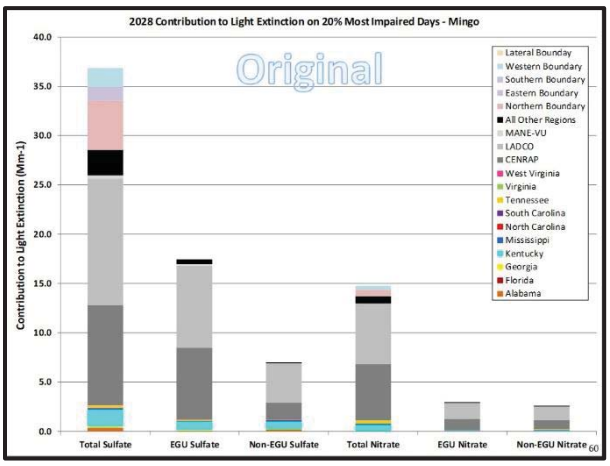

2028 Contribution to Light Extinction on 20% Most Impaired Days - Caney Creek Wilderness
Adjusted
Contribution to Light Extinction (Mm-1)
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
55

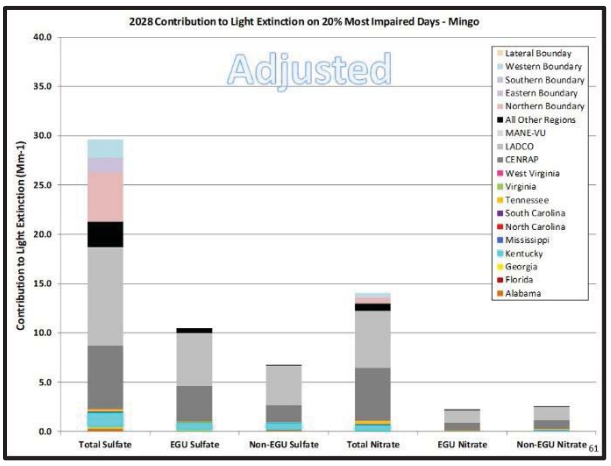

2028 Contribution to Light Extinction on 20% Most Impaired Days - Hercules-Glades Wilderness
Original
Contribution to Light Extinction (Mm-1)
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
58


2028 Contribution to Light Extinction on 20% Most Impaired Days - Upper Buffalo Wilderness
Original
Contribution to Light Extinction (Mm-1)
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
56

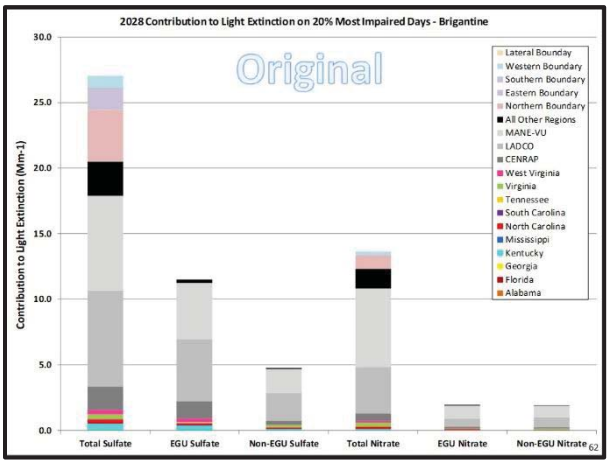

2028 Contribution to Light Extinction on 20% Most Impaired Days - Hercules-Glades Wilderness
Adjusted
Contribution to Light Extinction (Mm-1)
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
59


2028 Contribution to Light Extinction on 20% Most Impaired Days - Upper Buffalo Wilderness
Adjusted
Contribution to Light Extinction (Mm-1)
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
57


2028 Contribution to Light Extinction on 20% Most Impaired Days - Mingo
Original
Contribution to Light Extinction (Mm-1)
Total Sulfate
EGU Sulfate
Non-EGU Sulfate
Total Nitrate
EGU Nitrate
Non-EGU Nitrate
60

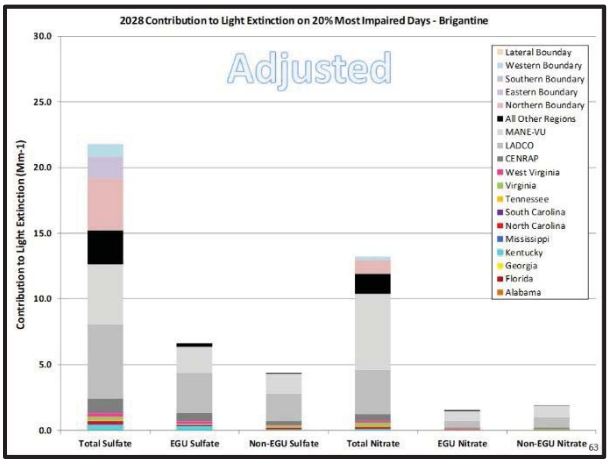


Four Factor Analysis



Four-Factor Analysis Screening Approach

1. The VISTAS four-factor analysis approach is based on an initial AOI screening (Q/d * EWRT) to rank facilities based on their sulfate and nitrate contributions at each Class I area.
2. These rankings were used to identify 87 individual facilities for PSAT tagging. PSAT tagging was used to determine the nitrate and sulfate contributions from each facility at each Class I area in the VISTAS_12 domain.
3. Each individual VISTAS state will apply a PSAT contribution threshold based on the facility sulfate or facility nitrate impacts divided by the total impact of sulfate + nitrate from all point sources to determine which sources will need to be considered for a four-factor analysis.
   - If sulfate contribution ≥ 1% ➔ SO_2 Four-Factor Analysis
   - If nitrate contribution ≥ 1% ➔ NOx Four-Factor Analysis



Why 1% Threshold?

- In the Round 1 Regional Haze SIPs, many VISTAS states used the AOI approach and a 1% threshold on a Unit basis.
  - We are using the AOI/PSAT approach and a 1% threshold based on a Facility basis. This will pull in more facilities compared to a Unit basis.
- The CSAPR interstate transport rules use a 1% contribution threshold for determining significant contributions to nonattainment and maintenance areas.
  - The use of a 1% significance threshold would be consistent with the CSAPR approach.

Area of Influence (AOI) Analysis

- Evaluates emissions (Q), distance to Class I area (d), and extinction weighted residence time (EWRT) in model grid cells (point) or counties (source categories)
- Formula: (Q/d)*EWRT
- Establishes each county's and each facility's contribution to light extinction at each Class I area on the 20% most impaired days
- Can use contributions to rank and screen facilities for the 4-factor analysis
- Georgia Example:
  - Sources in Georgia, used ≥ 2% threshold
  - Sources outside Georgia, used ≥ 4% threshold

67

AOI Point Contributions for COHU

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	NOx Contribution	SO2 Contribution
GA	**Ga Power Company - Plant Bowen**	**78.0**	**6,643.3**	**10,453.4**	**1.15%**	**19.58%**
IN	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	410.1	8,806.8	30,536.3	0.13%	4.68%
GA	**International Paper – Rome**	**87.4**	**1,773.4**	**1,791.0**	**0.18%**	**4.66%**
IN	Gibson	487.1	12,280.3	23,117.2	0.10%	2.31%
IN	INDIANAPOLIS POWER & LIGHT PETERSBURG	477.0	10,665.3	18,141.9	0.16%	2.18%
KY	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	457.2	7,007.3	19,504.7	0.07%	2.18%
TN	TVA KINGSTON FOSSIL PLANT	124.0	1,687.4	1,886.1	0.13%	2.17%
OH	General James M. Gavin Power Plant (0627010056)	512.0	8,122.5	41,595.8	0.02%	1.71%
TN	TVA CUMBERLAND FOSSIL PLANT	327.0	4,916.5	8,427.3	0.09%	1.38%
KY	Big Rivers Electric Corp - Wilson Station	369.0	1,151.9	6,934.2	0.01%	1.07%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	454.6	7,150.0	22,133.9	0.06%	1.05%
GA	**Ga Power Company - Plant Wansley**	**156.8**	**2,052.5**	**4,856.0**	**0.04%**	**1.05%**
KY	KY Utilities Co - Ghent Station	441.5	7,939.9	10,169.3	0.08%	1.05%
IL	Joppa Steam	466.9	4,706.3	20,509.3	0.02%	1.04%
GA	**Mohawk Industries Inc**	**32.0**	**66.5**	**77.1**	**0.07%**	**1.02%**
TN	EASTMAN CHEMICAL COMPANY	269.8	6,900.3	6,420.2	0.09%	0.99%
MO	AMEREN MISSOURI-LABADIE PLANT	695.4	9,685.5	41,740.3	0.01%	0.96%
IL	Newton	564.0	1,934.9	10,631.6	0.01%	0.91%
GA	**Chemical Products Corporation**	**71.9**	**19.5**	**513.8**	**0.00%**	**0.85%**
IN	INDIANA KENTUCKY ELECTRIC CORPORATION	444.4	6,188.5	9,038.1	0.04%	0.76%

68

AOI Point Contributions for OKEF

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	NOx Contribution	SO2 Contribution
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	71.5	112.4	2,745.0	0.03%	14.63%
FL	ROCK TENN CP, LLC	64.8	2,316.8	2,606.7	0.88%	12.82%
FL	JEA	65.6	651.8	2,094.5	0.18%	6.60%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	121.4	917.8	3,713.4	0.07%	3.25%
FL	IFF CHEMICAL HOLDINGS, INC.	56.8	37.7	898.9	0.01%	3.25%
FL	RAYONIER PERFORMANCE FIBERS LLC	63.4	2,327.1	562.0	0.90%	2.82%
GA	**International Paper - Savannah**	**178.9**	**1,560.7**	**3,945.4**	**0.08%**	**2.81%**
FL	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	153.5	1,830.7	1,520.4	0.14%	2.18%
FL	RENESSENZ LLC	59.8	66.3	569.5	0.02%	1.96%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	205.0	2,489.8	5,306.4	0.06%	1.40%
AL	Sanders Lead Co	384.6	121.7	7,951.1	0.00%	1.11%
GA	**Georgia-Pacific Consumer Products LP (Savannah River Mill)**	**197.2**	**351.5**	**1,860.2**	**0.01%**	**1.05%**
GA	**Ga Power Company - Plant Bowen**	**458.1**	**6,643.3**	**10,453.4**	**0.05%**	**1.02%**
GA	**Brunswick Cellulose Inc**	**75.3**	**1,554.5**	**294.2**	**0.34%**	**1.01%**
SC	ALUMAX OF SOUTH CAROLINA	322.7	108.1	3,751.7	0.00%	0.97%
GA	**PCA Valdosta Mill**	**112.7**	**1,032.6**	**485.7**	**0.09%**	**0.85%**
SC	SANTEE COOPER CROSS GENERATING STATION	348.1	3,273.5	4,281.2	0.05%	0.85%
FL	CITY OF GAINESVILLE, GRU	111.7	410.0	881.4	0.03%	0.79%
SC	KAPSTONE CHARLESTON KRAFT LLC	314.9	2,355.8	1,863.7	0.06%	0.65%
GA	**Ga Power Company - Plant Wansley**	**403.7**	**2,052.5**	**4,856.0**	**0.02%**	**0.65%**

69

AOI Point Contributions for WOLF

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	NOx Contribution	SO2 Contribution
GA	**Brunswick Cellulose Inc**	**27.9**	**1,554.5**	**294.2**	**2.94%**	**8.84%**
FL	ROCK TENN CP, LLC	74.9	2,316.8	2,606.7	0.39%	8.56%
GA	**International Paper - Savannah**	**85.9**	**1,560.7**	**3,945.4**	**0.24%**	**7.53%**
FL	JEA	105.1	651.8	2,094.5	0.09%	4.43%
GA	**Georgia-Pacific Consumer Products LP (Savannah River Mill)**	**109.9**	**351.5**	**1,860.2**	**0.03%**	**2.65%**
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	173.6	112.4	2,745.0	0.01%	1.97%
SC	ALUMAX OF SOUTH CAROLINA	223.0	108.1	3,751.7	0.00%	1.84%
FL	RAYONIER PERFORMANCE FIBERS LLC	77.4	2,327.1	562.0	0.38%	1.79%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	181.4	917.8	3,713.4	0.02%	1.77%
OH	General James M. Gavin Power Plant (0627010056)	845.3	8,122.5	41,595.8	0.02%	1.71%
SC	SANTEE COOPER CROSS GENERATING STATION	251.0	3,273.5	4,281.2	0.09%	1.59%
GA	**Southern States Phosphate & Fertilizer**	**84.1**	**1.0**	**597.1**	**0.00%**	**1.55%**
FL	IFF CHEMICAL HOLDINGS, INC.	118.5	37.7	898.9	0.00%	1.22%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	296.6	2,489.8	5,306.4	0.04%	1.19%
GA	**Ga Power Company - Plant Bowen**	**458.1**	**6,643.3**	**10,453.4**	**0.03%**	**1.08%**
GA	**Savannah Sugar Refinery**	**89.9**	**521.6**	**582.0**	**0.08%**	**1.06%**
SC	INTERNATIONAL PAPER EASTOVER	288.7	1,780.3	3,212.9	0.05%	0.95%
GA	**Ga Power Company - Plant McManus**	**27.1**	**72.2**	**30.1**	**0.14%**	**0.93%**
SC	KAPSTONE CHARLESTON KRAFT LLC	213.6	2,355.8	1,863.7	0.09%	0.89%
PA	GENON NE MGMT CO/KEYSTONE STA	1,048.6	6,578.5	56,939.2	0.01%	0.84%

70

Georgia Tagging for PSAT

- **Sources in Georgia (≥ 2% threshold)**
  - Ga Power Company – Plant Bowen
  - International Paper – Rome (aka TEMPLE INLAND)
  - International Paper – Savannah
  - Brunswick Cellulose Inc
  - Georgia-Pacific Consumer Products LP (Savannah River Mill)
- **Sources outside Georgia (≥ 4% threshold)**
  - INDIANA MICHIGAN POWER DBA AEP ROCKPORT (IN)
  - ROCK TENN CP, LLC (FL)
  - JEA (FL)

71

AOI Screening Summary

State	Threshold	Notes
AL	2%	Sulfate only
FL	5%	Sulfate or nitrate, plus Gulf Crist, Mosaic Bartow, Mosaic New Wales, and Mosaic Riverview
GA	2% - 4%	Sulfate or nitrate, 2% threshold for GA facilities, 4% threshold for facilities outside GA
KY	2%	Sulfate or nitrate
MS	2%	Sulfate or nitrate
NC	3%	Sulfate + nitrate
SC	2% - 5%	2% for sulfate, 5% for nitrate, plus Santee Cooper Winyah, International Paper Georgetown, and SCE&G Williams
TN	3%	Sulfate + nitrate, plus CEMEX
VA	2%	Sulfate + nitrate
WV	0.2%	Sulfate or nitrate

72

PSAT Source Apportionment Modeling

- Quantifies visibility impacts from individual point sources, source sectors, and geographic regions
- NOx and SO_2 tagging
- Used for further evaluation of AOI results
- Refines information on contributions to visibility impairment
- Can be used to adjust future year visibility projections to account for additional emission controls
- VISTAS contract with ERG allows for up to 250 tags

73

PSAT SO_2 and NOx Tags (209)

Round 1 (122 tags)

- *Total SO_2 tags for 10 individual VISTAS states + 3 MJOs = 13 tags*
- *Total NOx tags for 10 individual VISTAS states + 3 MJOs = 13 tags*
- *EGU point SO_2 tags for 10 individual VISTAS states + 3 MJOs = 13 tags*
- *EGU point NOx tags for 10 individual VISTAS states + 3 MJOs = 13 tags*
- SO_2 tags for individual VISTAS facilities = 50 tags
- NOx tags for individual VISTAS facilities = 20 tags

Round 2 (87 tags)

- *Non-EGU point SO_2 for 10 individual VISTAS states + 3 MJOs = 13 tags*
- *Non-EGU point NOx for 10 individual VISTAS states + 3 MJOs = 13 tags*
- *SO_2 and NOx for N/S/W/E boundaries = 8 tags*
- SO_2 tags for individual VISTAS facilities = 10 tags
- NOx tags for individual VISTAS facilities = 16 tags
- SO_2 tags for individual non-VISTAS facilities = 17 tags
- NOx tags for individual non-VISTAS facilities = 10 tags

➔ 87 Total Facility Tags (both SO_2 and NOx)

74

Facility Tags (AL, FL, GA)

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	SO2 (TPY)	NOx (TPY)
AL	VISTAS	01097-949811	Akzo Nobel Chemicals Inc	3,335.72	20.71
AL	VISTAS	01097-1056111	Ala Power - Barry	6,033.17	2,275.76
AL	VISTAS	01129-1028711	American Midstream Chatom, LLC	3,106.38	425.87
AL	VISTAS	01073-1018711	DRUMMOND COMPANY, INC.	2,562.17	1,228.55
AL	VISTAS	01053-7440211	Escambia Operating Company LLC	18,974.39	349.32
AL	VISTAS	01053-985111	Escambia Operating Company LLC	8,589.60	149.64
AL	VISTAS	01103-1000011	Nucor Steel Decatur LLC	170.23	331.24
AL	VISTAS	01105-985711	Sanders Lead Co	7,951.06	121.71
AL	VISTAS	01097-1061611	Union Oil of California - Churchula Gas Plant	2,573.15	349.23
FL	VISTAS	12123-752411	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	1,520.42	1,830.71
FL	VISTAS	12086-900111	CEMEX CONSTRUCTION MATERIALS FL, LLC.	29.51	910.36
FL	VISTAS	12017-640611	DUKE ENERGY FLORIDA, INC. (DEF)	5,306.41	2,489.85
FL	VISTAS	12086-900011	FLORIDA POWER & LIGHT (PTF)	13.05	170.61
FL	VISTAS	12033-752711	GULF POWER - Crist	2,615.65	2,998.39
FL	VISTAS	12086-3532711	HOMESTEAD CITY UTILITIES	0.00	97.09
FL	VISTAS	12031-640211	JEA	2,094.48	651.79
FL	VISTAS	12105-717711	MOSAIC FERTILIZER LLC	7,900.67	310.42
FL	VISTAS	12057-716411	MOSAIC FERTILIZER, LLC	3,034.06	159.71
FL	VISTAS	12105-919811	MOSAIC FERTILIZER, LLC	4,425.56	141.02
FL	VISTAS	12089-845811	RAYONIER PERFORMANCE FIBERS LLC	561.97	2,327.10
FL	VISTAS	12089-753711	ROCKTENN CP, LLC	2,606.72	2,316.77
FL	VISTAS	12005-535411	ROCKTENN CP LLC	2,590.88	1,404.89
FL	VISTAS	12129-2731711	TALLAHASSEE CITY PURDOM GENERATING STA.	2.86	121.46
FL	VISTAS	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	6,084.90	2,665.03
FL	VISTAS	12086-899911	TARMAC AMERICA LLC	9.38	879.70
FL	VISTAS	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	3,197.77	112.41
GA	VISTAS	13127-3721011	Brunswick Cellulose Inc	294.20	1,554.51
GA	VISTAS	13015-2813011	Ga Power Company - Plant Bowen	10,453.41	6,643.32
GA	VISTAS	13103-536311	Georgia-Pacific Consumer Products LP (Savannah River Mill)	1,860.18	351.52
GA	VISTAS	13051-3679811	International Paper--Savannah	1,945.38	1,560.73
GA	VISTAS	13115-539311	TEMPLE INLAND	1,791.00	1,773.35

75

Facility Tags (KY, MS, NC, SC, TN, VA)

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	SO2 (TPY)	NOx (TPY)
KY	VISTAS	21183-5561611	Big Rivers Electric Corp - Wilson Station	6,934.16	1,151.95
KY	VISTAS	21091-7352411	Century Aluminum of KY LLC	5,044.16	197.66
KY	VISTAS	21177-5196711	Tennessee Valley Authority - Paradise Fossil Plant	3,011.01	3,114.52
KY	VISTAS	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	19,304.75	7,007.34
MS	VISTAS	28059-8384311	Chevron Products Company, Pascagoula Refinery	741.60	1,534.12
MS	VISTAS	28059-6251011	Mississippi Power Company, Plant Victor J Daniel	231.92	3,829.72
NC	VISTAS	37087-7920511	Blue Ridge Paper Products - Canton Mill	1,127.07	2,992.37
NC	VISTAS	37117-8049311	Domtar Paper Company, LLC	687.45	1,796.49
NC	VISTAS	37035-8370411	Duke Energy Carolinas, LLC - Marshall Steam Station	4,139.21	7,511.31
NC	VISTAS	37013-8479311	PCS Phosphate Company, Inc. - Aurora	4,845.90	495.58
NC	VISTAS	37023-8513011	SGL Carbon LLC	261.64	21.69
SC	VISTAS	45015-4834911	ALUMAX OF SOUTH CAROLINA	3,751.69	108.08
SC	VISTAS	45043-5698611	INTERNATIONAL PAPER GEORGETOWN MILL	2,767.52	2,031.26
SC	VISTAS	45019-4973611	KAPSTONE CHARLESTON KRAFT LLC	1,863.65	2,355.82
SC	VISTAS	45015-4120411	SANTEE COOPER CROSS GENERATING STATION	4,281.17	3,273.47
SC	VISTAS	45043-6652811	SANTEE COOPER WINYAH GENERATING STATION	2,246.86	1,772.53
SC	VISTAS	45015-8306711	SCE&G WILLIAMS	392.48	992.73
TN	VISTAS	47093-4979911	Cemex - Knoxville Plant	121.47	711.50
TN	VISTAS	47163-3982311	EASTMAN CHEMICAL COMPANY	6,420.16	6,900.33
TN	VISTAS	47105-4129211	TATE & LYLE, Loudon	472.79	883.25
TN	VISTAS	47001-6196011	TVA BULL RUN FOSSIL PLANT	622.54	964.16
TN	VISTAS	47161-4979311	TVA CUMBERLAND FOSSIL PLANT	8,427.33	4,916.52
TN	VISTAS	47145-4979111	TVA KINGSTON FOSSIL PLANT	1,886.09	1,687.38
VA	VISTAS	51027-4034811	Jewell Coke Company LLP	5,090.95	520.17
VA	VISTAS	51580-5798711	Meadwestvaco Packaging Resource Group	2,115.31	1,985.69
VA	VISTAS	51023-5039811	Roanoke Cement Company	2,290.17	1,972.97

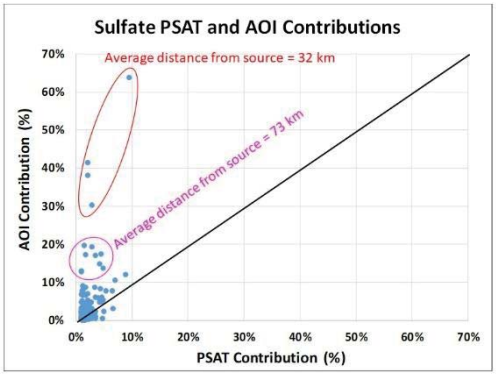
76

Facility Tags (WV, AR, MO, MD, PA, IL, IN, OH)

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	SO2 (TPY)	NOx (TPY)
WV	VISTAS	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	10,082.94	11,830.88
WV	VISTAS	54049-4864511	AMERICAN BITUMINOUS POWER-GRANT TOWN PLT	2,210.25	1,245.10
WV	VISTAS	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	10,984.24	4,878.10
WV	VISTAS	54023-6257011	Dominion Resources, Inc. - MOUNT STORM POWER STATION	2,123.64	1,984.14
WV	VISTAS	54041-6900311	EQUITRANS - COPLEY RUN CS 70	0.10	511.06
WV	VISTAS	54083-6790711	FILES CREEK 6C4340	0.15	643.35
WV	VISTAS	54083-6790511	GLADY 6C4350	0.11	343.29
WV	VISTAS	54093-6327811	KINGSFORD MANUFACTURING COMPANY	16.96	140.88
WV	VISTAS	54061-16320111	LONGVIEW POWER	2,313.73	1,556.57
WV	VISTAS	54051-6902311	MITCHELL PLANT	5,372.40	2,719.62
WV	VISTAS	54061-6773611	MONONGAHELA POWER CO.- FORT MARTIN POWER	4,881.87	13,743.32
WV	VISTAS	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	16,817.43	5,497.37
WV	VISTAS	54061-6773811	MORGANTOWN ENERGY ASSOCIATES	828.64	655.58
AR	CENRAP	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	32,050.48	14,133.10
MO	CENRAP	29143-5363811	NEW MADRID POWER PLANT-MARSTON	16,783.71	4,394.10
MD	MANE-VU	24001-7763811	Luke Paper Company	22,659.84	3,607.00
PA	MANE-VU	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	56,939.25	6,578.47
PA	MANE-VU	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	11,865.70	5,215.96
PA	MANE-VU	42063-3005111	NRG WHOLESALE GEN/SEWARD GEN STA	8,880.26	2,254.64
IL	Midwest RPO	17127-7808911	Joppa Steam	20,509.28	4,706.35
IN	Midwest RPO	18173-8183111	Alcoa Warrick Power Plt Agc Div of AL	5,071.28	11,158.55
IN	Midwest RPO	18051-7363111	Gibson	23,117.23	12,280.34
IN	Midwest RPO	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	30,536.33	8,806.77
IN	Midwest RPO	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	18,141.88	10,665.27
IN	Midwest RPO	18129-8166111	Sigeco AB Brown South Indiana Gas & Ele	7,644.70	1,578.59
OH	Midwest RPO	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	7,460.79	2,467.31
OH	Midwest RPO	39031-8010811	Conesville Power Plant (0616000000)	6,356.23	9,957.87
OH	Midwest RPO	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	22,133.90	7,149.97
OH	Midwest RPO	39053-8148511	General James M. Gavin Power Plant (0627010056)	41,595.81	8,122.51
OH	Midwest RPO	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	3,400.14	9,143.84

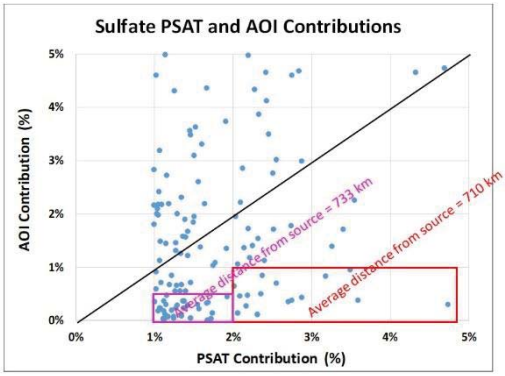
77

Sulfate AOI vs. Sulfate PSAT (≥ 1%)



78

Sulfate AOI vs. Sulfate PSAT (≥ 1%)



79

Four-Factor Analysis Screening Approach

- Due to the amount of resources already invested in the AOI and PSAT analysis, **VISTAS plans to continue with our original approach** for determining which sources will require a four-factor analysis.
- In cases where emissions decreased or increased at individual facilities being considered for a four-factor analysis, the facility contributions will be adjusted to be consistent with the lower/higher facility emissions before comparing to the PSAT contribution threshold.
- **EPA verbally stated this should be okay 2/6/2020.**

82

AOI vs. PSAT Summary

- AOI tends to overestimate impacts for facilities near the Class I area.
- AOI tends to underestimate impacts for facilities far away from the Class I area.
  - AOI uses 72-hour back trajectories, sulfate can last for weeks and travel hundreds to thousands of km.
- PSAT is the most reliable modeling tool for tracking facility contributions to visibility impairment at Class I areas.

80

Revised Facility PSAT Results

- **Revised Facility Sulfate PSAT Results = Original Facility Sulfate PSAT Results * SO_2 Ratio**

$$\textit{where, } SO_2 \textit{ Ratio} = \frac{\textit{(Revised facility } SO_2 \textit{ emissions)}}{\textit{(Original facility } SO_2 \textit{ emissions)}}$$

- **Revised Facility Nitrate PSAT Results = Original Facility Sulfate PSAT Results * NOx Ratio**

$$\textit{where, NOx Ratio} = \frac{\textit{(Revised facility NOx emissions)}}{\textit{(Original facility NOx emissions)}}$$

83

Four-Factor Analysis Screening Approach

- The updated 2028 CAMx modeling will impact the **total sulfate and total nitrate impacts** from all sources at each Class I area since the SO_2 and NOx emissions have decreased.
- However, the **individual sulfate and total nitrate impacts** from the individual 87 tagged facilities should not change unless a facility has reduced or increased SO_2 and/or NOx emissions.
- Therefore, the percent contribution (facility sulfate impact/total impact of all point sources of sulfate + nitrate) will increase since the denominator will decrease; however, the order of the rankings from largest impact to smallest impact should not change unless one of those facilities reduced or increased emissions.

81

PSAT Adjustments (AL, FL, GA)

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	SO2 Ratio	NOx Ratio
AL	VISTAS	01097-949811	Akzo Nobel Chemicals Inc	1.000	1.000
AL	VISTAS	01097-1056111	Ala Power - Barry	0.499	1.000
AL	VISTAS	01129-1028711	American Midstream Chatom, LLC	0.000	0.000
AL	VISTAS	01073-1018711	DRUMMOND COMPANY, INC.	1.000	1.000
AL	VISTAS	01053-7440211	Escambia Operating Company LLC	0.196	1.000
AL	VISTAS	01053-985111	Escambia Operating Company LLC	0.010	0.000
AL	VISTAS	01103-1000011	Nucor Steel Decatur LLC	1.000	1.000
AL	VISTAS	01109-985711	Sanders Lead Co	1.000	1.000
AL	VISTAS	01097-1061611	Union Oil of California - Chunchula Gas Plant	0.000	0.000
FL	VISTAS	12123-752411	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	1.000	1.000
FL	VISTAS	12086-900111	CEMEX CONSTRUCTION MATERIALS FL, LLC.	1.000	1.000
FL	VISTAS	12017-640611	DUKE ENERGY FLORIDA, INC. (DEF)	0.485	0.421
FL	VISTAS	12086-900011	FLORIDA POWER & LIGHT (PTF)	1.000	1.000
FL	VISTAS	12033-752711	GULF POWER - Crist	0.219	0.382
FL	VISTAS	12086-3532711	HOMESTEAD CITY UTILITIES	1.000	1.000
FL	VISTAS	12031-640211	JEA	1.000	1.000
FL	VISTAS	12105-717711	MOSAIC FERTILIZER LLC	0.568	1.000
FL	VISTAS	12057-716411	MOSAIC FERTILIZER, LLC	0.595	1.000
FL	VISTAS	12105-919811	MOSAIC FERTILIZER, LLC	0.972	1.000
FL	VISTAS	12089-845811	RAYONIER PERFORMANCE FIBERS LLC	1.000	1.000
FL	VISTAS	12089-753711	ROCKTENN CP, LLC	1.000	1.000
FL	VISTAS	12003-535411	ROCKTENN CP LLC	1.000	1.000
FL	VISTAS	12129-2731711	TALLAHASSEE CITY PURDOM GENERATING STA.	1.000	1.000
FL	VISTAS	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	1.000	1.000
FL	VISTAS	12086-899911	TARMAC AMERICA LLC	1.000	1.000
FL	VISTAS	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	0.407	0.909
GA	VISTAS	13127-3721011	Brunswick Cellulose Inc	1.000	1.000
GA	VISTAS	13015-2813011	Ga Power Company - Plant Bowen	1.000	1.000
GA	VISTAS	13103-536311	Georgia-Pacific Consumer Products LP (Savannah River Mill)	1.000	1.000
GA	VISTAS	13051-3679811	International Paper - Savannah	1.000	1.000
GA	VISTAS	13115-539311	TEMPLE INLAND	1.000	1.000

84

PSAT Adjustments (KY, MS, NC, SC, TN, VA)

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	SO2 Ratio	NOx Ratio
KY	VISTAS	21183-5561611	Big Rivers Electric Corp - Wilson Station	1.000	1.000
KY	VISTAS	21091-7352411	Century Aluminum of KY LLC	0.441	1.000
KY	VISTAS	21177-5196711	Tennessee Valley Authority - Paradise Fossil Plant	0.996	0.996
KY	VISTAS	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	1.000	1.000
MS	VISTAS	28059-8384311	Chevron Products Company, Pascagoula Refinery	1.000	1.000
MS	VISTAS	28059-6251011	Mississippi Power Company, Plant Victor J Daniel	1.000	1.000
NC	VISTAS	37087-7920511	Blue Ridge Paper Products - Canton Mill	0.359	0.978
NC	VISTAS	37117-8049311	Domtar Paper Company, LLC	1.000	1.000
NC	VISTAS	37035-8370411	Duke Energy Carolinas, LLC - Marshall Steam Station	0.841	0.971
NC	VISTAS	37013-8479311	PCS Phosphate Company, Inc. - Aurora	1.000	1.000
NC	VISTAS	37023-8513011	SGL Carbon LLC	1.000	1.000
SC	VISTAS	45015-4834911	ALUMAX OF SOUTH CAROLINA	1.000	1.000
SC	VISTAS	45043-5698611	INTERNATIONAL PAPER GEORGETOWN MILL	1.000	1.000
SC	VISTAS	45019-4973611	KAPSTONE CHARLESTON KRAFT LLC	1.000	1.000
SC	VISTAS	45015-4120411	SANTEE COOPER CROSS GENERATING STATION	1.000	1.000
SC	VISTAS	45043-6652811	SANTEE COOPER WINYAH GENERATING STATION	1.000	1.000
SC	VISTAS	45015-8306711	SCE&G WILLIAMS	1.000	1.000
TN	VISTAS	47093-4979911	Cemex - Knoxville Plant	1.000	1.000
TN	VISTAS	47163-3982311	EASTMAN CHEMICAL COMPANY	1.000	1.000
TN	VISTAS	47105-4129211	TATE & LYLE, Loudon	0.262	0.965
TN	VISTAS	47001-6196011	TVA BULL RUN FOSSIL PLANT	0.000	0.000
TN	VISTAS	47161-4979311	TVA CUMBERLAND FOSSIL PLANT	1.000	1.000
TN	VISTAS	47145-4979111	TVA KINGSTON FOSSIL PLANT	0.225	0.225
VA	VISTAS	51027-4034811	Jewell Coke Company LLP	1.000	1.000
VA	VISTAS	51580-5798711	Meadwestvaco Packaging Resource Group	1.000	1.000
VA	VISTAS	51023-5093811	Roanoke Cement Company	1.000	1.000

85

PSAT Adjustments (WV, AR, MO, MD, PA, IL, IN, OH)

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	SO2 Ratio	NOx Ratio
WV	VISTAS	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	0.847	0.847
WV	VISTAS	54049-4864511	AMERICAN BITUMINOUS POWER-GRANT TOWN PLT	0.994	0.994
WV	VISTAS	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	0.555	0.885
WV	VISTAS	54023-6257011	Dominion Resources, Inc. - MOUNT STORM POWER STATION	0.449	0.487
WV	VISTAS	54041-6900311	EQUITRANS - COPLEY RUN CS 70	1.000	1.000
WV	VISTAS	54083-6790711	FILES CREEK 6C4340	1.000	1.000
WV	VISTAS	54083-6790511	GLADY 6C4350	1.000	1.000
WV	VISTAS	54093-6327811	KINGSFORD MANUFACTURING COMPANY	1.000	1.000
WV	VISTAS	54061-16320111	LONGVIEW POWER	0.847	0.847
WV	VISTAS	54051-6902311	MITCHELL PLANT	0.787	0.885
WV	VISTAS	54061-6773611	MONONGAHELA POWER CO.- FORT MARTIN POWER	0.626	0.873
WV	VISTAS	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	0.684	0.885
WV	VISTAS	54061-6773811	MORGANTOWN ENERGY ASSOCIATES	0.004	0.330
AR	CENRAP	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	0.426	0.917
MO	CENRAP	29143-5363811	NEW MADRID POWER PLANT-MARSTON	0.665	0.923
MD	MANE-VU	24001-7763811	Luke Paper Company	0.847	1.000
PA	MANE-VU	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	0.370	0.773
PA	MANE-VU	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	0.782	0.951
PA	MANE-VU	42063-3005111	NRG WHOLESALE GEN/SEWARD GEN STA	0.767	0.724
IL	Midwest RPO	17127-7808911	Joppa Steam	0.390	0.424
IN	Midwest RPO	18173-8183111	Alcoa Warrick Power Plt Agc Div of AL	0.288	0.271
IN	Midwest RPO	18051-7363111	Gibson	0.562	0.702
IN	Midwest RPO	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	0.353	0.962
IN	Midwest RPO	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	0.316	0.502
IN	Midwest RPO	18129-8166111	Sigeco AB Brown South Indiana Gas & Ele	0.000	0.018
OH	Midwest RPO	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	0.847	0.847
OH	Midwest RPO	39031-8010811	Conesville Power Plant (0616000000)	0.000	0.000
OH	Midwest RPO	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	0.467	0.820
OH	Midwest RPO	39053-8148511	General James M. Gavin Power Plant (0627010056)	0.525	0.983
OH	Midwest RPO	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	0.847	0.685

86

Sipsey Wilderness Area

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI%	Original Sulfate PSAT%	Revised Sulfate PSAT%	Nitrate AOI%	Original Nitrate PSAT%	Revised Nitrate PSAT%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	337.7	3.31%	1.61%	1.61%	0.57%	0.04%	0.04%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	690.9	0.38%	2.75%	1.44%	0.01%	0.09%	0.09%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	398.4	5.72%	4.09%	1.44%	0.31%	0.23%	0.22%
IN	18051-7363111	Gibson	448.7	2.85%	2.12%	1.19%	0.27%	0.19%	0.13%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	464.4	1.72%	2.19%	1.14%	0.23%	0.23%	0.12%
TN	47161-4979311	TVA CUMBERLAND FOSSIL PLANT	228.9	3.18%	1.07%	1.07%	0.48%	0.12%	0.12%
		Facilities Who Dropped Off After REVISION							
MO	*29143-5363811*	*NEW MADRID POWER PLANT-MARSTON*	*314.5*	*3.48%*	*1.46%*	*0.97%*	*0.26%*	*0.06%*	*0.05%*
IL	*17127-7808911*	*Joppa Steam*	*346.5*	*1.94%*	*1.51%*	*0.59%*	*0.25%*	*0.03%*	*0.01%*
IN	*18173-8183111*	*ALCOA WARRICK POWER PLT AGC DIV OF AL*	*396.3*	*0.91%*	*1.02%*	*0.29%*	*0.62%*	*0.52%*	*0.14%*
		Additional sources if use Sulfate + Nitrate ≥ 1%							
MO	29143-5363811	NEW MADRID POWER PLANT-MARSTON	314.5	3.48%	1.46%	0.97%	0.26%	0.06%	0.05%

87

Chassahowitzka Wilderness Area

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI%	Original Sulfate PSAT%	Revised Sulfate PSAT%	Nitrate AOI%	Original Nitrate PSAT%	Revised Nitrate PSAT%
FL	12017-640611	DUKE ENERGY FLORIDA, INC. (DEF)	27.4	63.62%	9.55%	4.71%	1.95%	0.40%	0.17%
GA	13015-2813011	Ga Power Company - Plant Bowen	637.2	0.03%	1.72%	1.72%	0.00%	0.02%	0.02%
		Facilities Who Dropped Off After REVISION							
AR	*05063-1083411*	*ENTERGY ARKANSAS INC-INDEPENDENCE PLANT*	*1,133.4*	*0.05%*	*1.47%*	*0.62%*	*0.00%*	*0.09%*	*0.03%*
IN	*18147-8017211*	*INDIANA MICHIGAN POWER DBA AEP ROCKPORT*	*1,099.6*	*0.03%*	*1.13%*	*0.40%*	*0.00%*	*0.04%*	*0.04%*
AL	*01053-7440211*	*Escambia Operating Company LLC*	*530.7*	*0.21%*	*1.57%*	*0.31%*	*0.00%*	*0.01%*	*0.01%*
		Additional sources if use Sulfate + Nitrate ≥ 1%							
FL	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	106.8	4.73%	0.96%	0.96%	0.24%	0.05%	0.05%

88

Everglades NP

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI%	Original Sulfate PSAT%	Revised Sulfate PSAT%	Nitrate AOI%	Original Nitrate PSAT%	Revised Nitrate PSAT%
FL	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	316.6	3.02%	2.56%	2.56%	0.08%	0.00%	0.00%
FL	12105-919811	MOSAIC FERTILIZER, LLC	304.7	2.21%	2.09%	2.03%	0.01%	0.00%	0.00%
FL	12105-717711	MOSAIC FERTILIZER LLC	303.3	2.26%	3.55%	2.02%	0.02%	0.00%	0.00%
FL	12086-899911	TARMAC AMERICA LLC	61.7	0.16%	0.17%	0.17%	2.02%	0.76%	2.04%

89

St Marks Wilderness Area

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI%	Original Sulfate PSAT%	Revised Sulfate PSAT%	Nitrate AOI%	Original Nitrate PSAT%	Revised Nitrate PSAT%
GA	13015-2813011	Ga Power Company - Plant Bowen	452.9	0.38%	3.59%	3.59%	0.01%	0.03%	0.03%
FL	12005-535411	ROCKTENN CP LLC	140.8	8.54%	3.38%	3.38%	0.24%	0.09%	0.09%
		Facilities Who Dropped Off After REVISION							
AL	*01097-1056111*	*Ala Power - Barry*	*383.1*	*1.67%*	*1.43%*	*0.71%*	*0.03%*	*0.02%*	*0.02%*
AL	*01053-7440211*	*Escambia Operating Company LLC*	*325.6*	*5.95%*	*3.53%*	*0.70%*	*0.01%*	*0.00%*	*0.00%*
IN	*18147-8017211*	*INDIANA MICHIGAN POWER DBA AEP ROCKPORT*	*908.4*	*0.33%*	*1.67%*	*0.59%*	*0.00%*	*0.01%*	*0.01%*
PA	*42005-3866111*	*GENON NE MGMT CO/KEYSTONE STA*	*1,251.0*	*0.29%*	*1.29%*	*0.48%*	*0.01%*	*0.00%*	*0.00%*
AL	*01053-985111*	*Escambia Operating Company LLC*	*315.0*	*0.00%*	*1.68%*	*0.02%*	*0.00%*	*0.00%*	*0.00%*

90

Cohutta Wilderness Area

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Sulfate PSAT % Original	Sulfate PSAT % Revised	Nitrate AOI %	Nitrate PSAT % Original	Nitrate PSAT % Revised
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	512.0	1.71%	3.41%	1.79%	0.02%	0.05%	0.05%
GA	13015-2813011	Ga Power Company - Plant Bowen	78.0	19.58%	1.56%	1.56%	1.15%	0.03%	0.03%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	457.2	2.18%	1.05%	1.05%	0.07%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	410.1	4.68%	2.84%	1.00%	0.13%	0.03%	0.03%
		Facilities Who Dropped Off After REVISION							
OH	*39025-8294311*	*Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)*	*454.6*	*1.05%*	*2.06%*	*0.96%*	*0.06%*	*0.03%*	*0.03%*
PA	*42005-3866111*	*GENON NE MGMT CO/KEYSTONE STA*	*801.1*	*0.14%*	*2.06%*	*0.76%*	*0.00%*	*0.01%*	*0.01%*
IN	*18051-7363111*	*Gibson*	*487.1*	*2.31%*	*1.35%*	*0.76%*	*0.10%*	*0.02%*	*0.01%*
IN	*18125-7362411*	*INDIANAPOLIS POWER & LIGHT PETERSBURG*	*477.0*	*2.18%*	*1.19%*	*0.62%*	*0.16%*	*0.03%*	*0.02%*
TN	*47145-4979111*	*TVA KINGSTON FOSSIL PLANT*	*124.0*	*2.17%*	*1.10%*	*0.25%*	*0.13%*	*0.06%*	*0.01%*

91

Mammoth Cave NP

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Sulfate PSAT % Original	Sulfate PSAT % Revised	Nitrate AOI %	Nitrate PSAT % Original	Nitrate PSAT % Revised
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	118.0	16.88%	3.57%	1.26%	2.60%	0.26%	0.25%
IN	18051-7363111	Gibson	198.2	5.21%	2.16%	1.22%	1.20%	0.35%	0.25%
KY	21183-5561611	Big Rivers Electric Corp - Wilson Station	89.9	6.72%	1.07%	1.07%	0.37%	0.06%	0.06%
		Facilities Who Dropped Off After REVISION							
MO	*29143-5363811*	*NEW MADRID POWER PLANT-MARSTON*	*312.7*	*0.66%*	*1.29%*	*0.86%*	*0.04%*	*0.07%*	*0.07%*
IN	*18125-7362411*	*INDIANAPOLIS POWER & LIGHT PETERSBURG*	*182.9*	*3.09%*	*1.50%*	*0.78%*	*0.96%*	*0.40%*	*0.20%*
OH	*39025-8294311*	*Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)*	*256.1*	*1.21%*	*1.43%*	*0.67%*	*0.14%*	*0.11%*	*0.09%*
OH	*39053-8148511*	*General James M. Gavin Power Plant (0627010056)*	*406.5*	*1.45%*	*1.15%*	*0.60%*	*0.04%*	*0.02%*	*0.02%*
AR	*05063-1083411*	*ENTERGY ARKANSAS INC-INDEPENDENCE PLANT*	*498.6*	*0.30%*	*1.15%*	*0.49%*	*0.04%*	*0.05%*	*0.02%*
IN	*18173-8183111*	*ALCOA WARRICK POWER PLT AGC DIV OF AL*	*136.1*	*2.00%*	*1.03%*	*0.30%*	*1.74%*	*0.82%*	*0.22%*
IN	*18129-8166111*	*Sigeco AB Brown South Indiana Gas & Ele*	*162.9*	*2.73%*	*1.16%*	*0.00%*	*0.27%*	*0.06%*	*0.00%*
		Additional sources if use Sulfate + Nitrate ≥ 1%							
KY	*21145-6037011*	*Tennessee Valley Authority (TVA) - Shawnee Fossil Plant*	*233.6*	*1.60%*	*0.86%*	*0.86%*	*0.15%*	*0.14%*	*0.14%*

94

Okefenokee Wilderness Area

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Sulfate PSAT % Original	Sulfate PSAT % Revised	Nitrate AOI %	Nitrate PSAT % Original	Nitrate PSAT % Revised
FL	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	71.5	14.63%	4.32%	2.10%	0.03%	0.01%	0.01%
GA	13015-2813011	Ga Power Company - Plant Bowen	458.1	1.02%	1.74%	1.74%	0.05%	0.04%	0.04%
FL	12123-752411	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	153.5	2.18%	1.64%	1.64%	0.14%	0.11%	0.11%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	909.1	0.46%	2.19%	1.15%	0.01%	0.01%	0.01%
FL	12089-753711	ROCK TENN CP, LLC	64.8	12.82%	1.00%	1.00%	0.88%	0.11%	0.11%
		Facilities Who Dropped Off After REVISION							
PA	*42005-3866111*	*GENON NE MGMT CO/KEYSTONE STA*	*1,129.0*	*0.46%*	*2.09%*	*0.77%*	*0.01%*	*0.01%*	*0.01%*
OH	*39025-8294311*	*Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)*	*921.9*	*0.09%*	*1.34%*	*0.63%*	*0.00%*	*0.01%*	*0.01%*
IN	*18147-8017211*	*INDIANA MICHIGAN POWER DBA AEP ROCKPORT*	*915.7*	*0.55%*	*1.40%*	*0.49%*	*0.01%*	*0.02%*	*0.02%*

92

Linville Gorge Wilderness Area

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Sulfate PSAT % Original	Sulfate PSAT % Revised	Nitrate AOI %	Nitrate PSAT % Original	Nitrate PSAT % Revised
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	81.9	19.21%	2.87%	2.87%	0.68%	0.07%	0.07%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	329.2	5.90%	4.67%	2.45%	0.04%	0.01%	0.01%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	567.5	0.94%	3.49%	1.29%	0.00%	0.00%	0.00%
		Facilities Who Dropped Off After REVISION							
IN	*18147-8017211*	*INDIANA MICHIGAN POWER DBA AEP ROCKPORT*	*503.5*	*1.18%*	*2.22%*	*0.78%*	*0.01%*	*0.07%*	*0.06%*
IN	*18051-7363111*	*Gibson*	*582.3*	*0.67%*	*1.35%*	*0.76%*	*0.01%*	*0.07%*	*0.05%*
MO	*29143-5363811*	*NEW MADRID POWER PLANT-MARSTON*	*688.6*	*0.03%*	*1.11%*	*0.74%*	*0.00%*	*0.00%*	*0.00%*
AR	*05063-1083411*	*ENTERGY ARKANSAS INC-INDEPENDENCE PLANT*	*856.4*	*0.29%*	*1.43%*	*0.61%*	*0.00%*	*0.01%*	*0.00%*
MD	*24001-7763811*	*Luke Paper Company*	*463.8*	*0.23%*	*1.37%*	*0.60%*	*0.00%*	*0.00%*	*0.00%*
IN	*18125-7362411*	*INDIANAPOLIS POWER & LIGHT PETERSBURG*	*550.5*	*0.36%*	*1.12%*	*0.58%*	*0.01%*	*0.07%*	*0.04%*
OH	*39025-8294311*	*Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)*	*380.3*	*2.82%*	*1.00%*	*0.47%*	*0.03%*	*0.02%*	*0.02%*

95

Wolf Island Wilderness

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Sulfate PSAT % Original	Sulfate PSAT % Revised	Nitrate AOI %	Nitrate PSAT % Original	Nitrate PSAT % Revised
FL	12089-753711	ROCK TENN CP, LLC	74.9	8.56%	1.79%	1.79%	0.39%	0.11%	0.11%
GA	13015-2813011	Ga Power Company - Plant Bowen	458.1	1.08%	1.78%	1.78%	0.03%	0.04%	0.04%
GA	13127-3721011	Brunswick Cellulose Inc	27.9	8.84%	1.34%	1.34%	2.94%	0.10%	0.10%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	845.3	1.71%	2.51%	1.32%	0.02%	0.02%	0.02%
GA	13051-3679811	International Paper - Savannah	85.9	7.53%	1.18%	1.18%	0.24%	0.07%	0.07%
		Facilities Who Dropped Off After REVISION							
PA	*42005-3866111*	*GENON NE MGMT CO/KEYSTONE STA*	*1,048.6*	*0.84%*	*2.37%*	*0.88%*	*0.01%*	*0.01%*	*0.01%*
OH	*39025-8294311*	*Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)*	*876.1*	*0.07%*	*1.25%*	*0.58%*	*0.00%*	*0.02%*	*0.01%*
FL	*12047-769711*	*WHITE SPRINGS AGRICULTURAL CHEMICALS,INC*	*173.6*	*1.97%*	*1.05%*	*0.51%*	*0.01%*	*0.01%*	*0.01%*
IN	*18147-8017211*	*INDIANA MICHIGAN POWER DBA AEP ROCKPORT*	*899.0*	*0.37%*	*1.38%*	*0.49%*	*0.00%*	*0.02%*	*0.02%*
		Additional sources if use Sulfate + Nitrate ≥ 1%							
SC	*45015-4120411*	*SANTEE COOPER CROSS GENERATING STATION*	*251.0*	*1.59%*	*0.99%*	*0.99%*	*0.09%*	*0.06%*	*0.06%*
FL	*12031-640211*	*JEA*	*105.1*	*4.43%*	*0.96%*	*0.99%*	*0.09%*	*0.03%*	*0.05%*

93

Shining Rock Wilderness Area

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Sulfate PSAT % Original	Sulfate PSAT % Revised	Nitrate AOI %	Nitrate PSAT % Original	Nitrate PSAT % Revised
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	397.3	1.39%	3.26%	1.71%	0.01%	0.01%	0.01%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	573.4	0.47%	1.16%	1.16%	0.01%	0.02%	0.02%
		Facilities Who Dropped Off After REVISION							
MO	*29143-5363811*	*NEW MADRID POWER PLANT-MARSTON*	*625.2*	*0.36%*	*1.37%*	*0.91%*	*0.00%*	*0.01%*	*0.01%*
IN	*18147-8017211*	*INDIANA MICHIGAN POWER DBA AEP ROCKPORT*	*473.3*	*0.70%*	*2.55%*	*0.90%*	*0.01%*	*0.07%*	*0.07%*
PA	*42005-3866111*	*GENON NE MGMT CO/KEYSTONE STA*	*657.6*	*0.49%*	*2.36%*	*0.87%*	*0.00%*	*0.00%*	*0.00%*
IN	*18051-7363111*	*Gibson*	*554.2*	*0.29%*	*1.55%*	*0.87%*	*0.01%*	*0.07%*	*0.05%*
NC	*37087-7920511*	*Blue Ridge Paper Products - Canton Mill*	*16.9*	*41.29%*	*2.14%*	*0.77%*	*6.65%*	*0.07%*	*0.07%*
OH	*39025-8294311*	*Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)*	*406.7*	*1.37%*	*1.59%*	*0.74%*	*0.03%*	*0.01%*	*0.01%*
AR	*05063-1083411*	*ENTERGY ARKANSAS INC-INDEPENDENCE PLANT*	*783.3*	*0.13%*	*1.74%*	*0.74%*	*0.00%*	*0.01%*	*0.00%*
IN	*18125-7362411*	*INDIANAPOLIS POWER & LIGHT PETERSBURG*	*529.0*	*0.18%*	*1.12%*	*0.58%*	*0.01%*	*0.11%*	*0.05%*
IL	*17127-7808911*	*Joppa Steam*	*582.4*	*0.23%*	*1.07%*	*0.42%*	*0.00%*	*0.01%*	*0.00%*

96

Swanquarter Wilderness Area

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	640.2	3.00%	6.66%	2.46%	0.08%	0.08%	0.06%
NC	37013-8479311	PCS Phosphate Company, Inc. - Aurora	52.5	37.89%	2.16%	2.16%	0.57%	0.05%	0.05%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	651.5	1.77%	2.74%	1.44%	0.06%	0.03%	0.03%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	659.6	0.35%	1.00%	1.33%	0.02%	0.03%	0.04%
MD	24001-7763811	Luke Paper Company	512.5	0.43%	2.88%	1.25%	0.02%	0.05%	0.05%
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	568.6	0.67%	1.19%	1.22%	0.08%	0.10%	0.08%
		Facilities Who Dropped Off After REVISION							
PA	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	620.1	0.55%	1.27%	0.99%	0.05%	0.05%	0.05%
WV	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	625.7	0.84%	1.22%	0.84%	0.07%	0.03%	0.03%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	1,005.3	0.34%	1.69%	0.60%	0.02%	0.03%	0.03%
		Additional sources if use Sulfate + Nitrate ≥ 1%							
PA	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	620.1	0.55%	1.27%	0.99%	0.05%	0.05%	0.05%

97

Joyce Kilmer-Slickrock Wilderness

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	425.1	4.73%	4.69%	2.46%	0.05%	0.01%	0.01%
		Facilities Who Dropped Off After REVISION							
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	711.0	0.27%	2.17%	0.80%	0.00%	0.00%	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	391.2	4.33%	2.27%	0.80%	0.14%	0.16%	0.16%
IN	18051-7363111	Gibson	471.7	2.00%	1.29%	0.73%	0.11%	0.21%	0.15%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	385.1	3.63%	1.53%	0.71%	0.06%	0.01%	0.01%
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	674.4	1.58%	1.36%	0.58%	0.05%	0.02%	0.00%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	453.0	2.16%	1.00%	0.52%	0.14%	0.23%	0.12%
TN	47145-4979111	TVA KINGSTON FOSSIL PLANT	73.7	7.86%	1.24%	0.28%	0.57%	0.10%	0.02%
		Additional sources if use Sulfate + Nitrate ≥ 1%							
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	472.8	0.84%	0.99%	0.99%	0.05%	0.07%	0.07%

100

Cape Romain Wilderness

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
SC	45019-4973611	KAPSTONE CHARLESTON KRAFT LLC	29.3	30.18%	2.86%	2.86%	2.74%	0.25%	0.25%
GA	13015-2813011	Ga Power Company - Plant Bowen	506.2	0.36%	2.71%	2.71%	0.01%	0.10%	0.10%
SC	45015-4834911	ALUMAX OF SOUTH CAROLINA	39.1	17.07%	1.79%	1.79%	0.03%	0.02%	0.02%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	857.1	0.30%	4.74%	1.75%	0.00%	0.01%	0.01%
SC	45015-4120411	SANTEE COOPER CROSS GENERATING STATION	63.8	6.57%	1.73%	1.73%	0.45%	0.21%	0.21%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	701.0	0.84%	3.18%	1.67%	0.00%	0.03%	0.03%
SC	45043-5698611	INTERNATIONAL PAPER GEORGETOWN MILL	57.4	4.31%	1.26%	1.26%	0.35%	0.11%	0.11%
SC	45043-6652811	SANTEE COOPER WINYAH GENERATING STATION	51.4	4.60%	1.02%	1.02%	0.38%	0.13%	0.13%
		Facilities Who Dropped Off After REVISION							
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	776.2	0.11%	1.14%	0.53%	0.00%	0.04%	0.03%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	868.3	0.06%	1.18%	0.42%	0.00%	0.07%	0.06%
		Additional sources if use Sulfate + Nitrate ≥ 1%							
GA	13051-3679811	International Paper - Savannah	166.1	1.76%	0.99%	0.99%	0.04%	0.05%	0.05%

98

James River Face Wilderness

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	270.2	7.66%	5.44%	2.86%	0.14%	0.08%	0.08%
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	207.6	2.76%	2.51%	2.58%	0.36%	0.12%	0.10%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	306.4	1.35%	1.92%	2.55%	0.04%	0.02%	0.04%
WV	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	248.0	3.87%	2.33%	1.59%	0.15%	0.03%	0.04%
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	223.5	3.50%	2.46%	1.36%	0.13%	0.05%	0.08%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	337.1	2.98%	2.88%	1.07%	0.06%	0.03%	0.03%
VA	51580-5798711	Meadwestvaco Packaging Resource Group	46.5	12.64%	1.02%	1.02%	1.14%	0.15%	0.15%
		Facilities Who Dropped Off After REVISION							
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	435.2	1.89%	1.39%	0.65%	0.05%	0.05%	0.04%
IN	18051-7363111	Gibson	729.4	0.59%	1.02%	0.58%	0.02%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	663.5	0.56%	1.33%	0.47%	0.03%	0.01%	0.01%

101

Great Smoky Mountains NP

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	400.5	2.25%	5.10%	2.68%	0.04%	0.02%	0.02%
		Facilities Who Dropped Off After REVISION							
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	688.2	0.11%	2.31%	0.86%	0.00%	0.01%	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	375.5	4.66%	2.42%	0.85%	0.21%	0.19%	0.18%
IN	18051-7363111	Gibson	456.3	1.25%	1.34%	0.75%	0.07%	0.27%	0.19%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	360.0	1.84%	1.50%	0.70%	0.09%	0.02%	0.01%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	435.6	1.48%	1.08%	0.56%	0.12%	0.29%	0.14%
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	675.9	0.19%	1.22%	0.52%	0.02%	0.01%	0.00%
TN	47145-4979111	TVA KINGSTON FOSSIL PLANT	60.0	7.38%	1.23%	0.28%	0.71%	0.08%	0.02%
		Additional sources if use Sulfate + Nitrate ≥ 1%							
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	375.5	4.66%	2.42%	0.85%	0.21%	0.19%	0.18%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	465.3	1.34%	0.94%	0.94%	0.02%	0.06%	0.06%

99

Shenandoah NP

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	249.8	11.83%	8.89%	3.29%	0.10%	0.05%	0.04%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	269.6	1.53%	2.32%	3.08%	0.06%	0.05%	0.08%
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	189.7	4.60%	2.75%	2.83%	0.99%	0.37%	0.31%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	323.4	5.25%	4.88%	2.56%	0.14%	0.10%	0.10%
WV	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	265.0	4.97%	2.20%	1.50%	0.24%	0.18%	0.19%
PA	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	230.4	2.60%	1.56%	1.22%	0.13%	0.04%	0.04%
		Facilities Who Dropped Off After REVISION							
MD	24001-7763811	Luke Paper Company	118.4	6.90%	2.20%	0.96%	0.23%	0.09%	0.09%
PA	42063-3005111	NRG WHOLESALE GEN/SEWARD GEN STA	215.5	1.80%	1.00%	0.76%	0.04%	0.02%	0.01%
WV	54061-6773611	MONONGAHELA POWER CO.- FORT MARTIN POWER	184.4	2.41%	1.06%	0.66%	1.27%	0.47%	0.41%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	505.4	1.31%	1.28%	0.60%	0.11%	0.05%	0.04%
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	295.6	2.09%	1.04%	0.58%	0.09%	0.09%	0.13%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	755.8	0.71%	1.46%	0.52%	0.03%	0.02%	0.02%
		Additional sources if use Sulfate + Nitrate ≥ 1%							
MD	24001-7763811	Luke Paper Company	118.4	6.90%	2.20%	0.96%	0.23%	0.09%	0.09%
WV	54061-6773611	MONONGAHELA POWER CO.- FORT MARTIN POWER	184.4	2.41%	1.06%	0.66%	1.27%	0.47%	0.41%

102

Dolly Sods Wilderness

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	83.6	13.58%	4.94%	5.07%	1.36%	0.26%	0.22%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	233.8	7.62%	6.56%	3.45%	0.10%	0.03%	0.03%
WV	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	163.9	4.64%	4.32%	2.96%	0.16%	0.07%	0.07%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	163.9	1.36%	2.14%	2.84%	0.03%	0.01%	0.02%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	416.9	1.40%	2.25%	1.05%	0.02%	0.04%	0.04%
WV	54051-6902311	MITCHELL PLANT	144.2	1.45%	1.28%	1.01%	0.07%	0.02%	0.03%
		Facilities Who Dropped Off After REVISION							
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	172.8	4.12%	2.43%	0.90%	0.01%	0.00%	0.00%
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	219.8	3.56%	1.45%	0.81%	0.11%	0.01%	0.02%
WV	54061-6773611	MONONGAHELA POWER CO.- FORT MARTIN POWER	79.8	6.53%	1.27%	0.79%	1.07%	0.18%	0.16%
IN	18051-7363111	Gibson	729.5	0.04%	1.24%	0.70%	0.02%	0.04%	0.03%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	676.3	0.44%	1.93%	0.68%	0.01%	0.02%	0.02%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	682.6	0.18%	1.05%	0.54%	0.02%	0.04%	0.02%
OH	39031-8010811	Conesville Power Plant (0616000000)	242.3	0.71%	1.09%	0.00%	0.12%	0.08%	0.00%

103

Otter Creek Wilderness

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	72.8	17.37%	4.49%	4.61%	1.81%	0.26%	0.22%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	214.2	10.46%	7.08%	3.72%	0.18%	0.04%	0.04%
WV	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	148.3	8.19%	4.39%	3.00%	0.30%	0.08%	0.09%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	162.7	1.94%	2.03%	2.70%	0.05%	0.02%	0.03%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	397.5	1.12%	2.40%	1.12%	0.02%	0.06%	0.05%
WV	54051-6902311	MITCHELL PLANT	136.8	1.56%	1.40%	1.10%	0.06%	0.03%	0.04%
		Facilities Who Dropped Off After REVISION							
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	198.0	4.36%	1.67%	0.93%	0.12%	0.02%	0.03%
IN	18051-7363111	Gibson	709.7	0.24%	1.27%	0.72%	0.01%	0.05%	0.03%
WV	54061-6773611	MONONGAHELA POWER CO.- FORT MARTIN POWER	82.7	4.98%	1.14%	0.71%	0.92%	0.20%	0.17%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	655.7	0.64%	2.01%	0.71%	0.01%	0.03%	0.03%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	186.5	3.73%	1.91%	0.71%	0.03%	0.00%	0.00%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	663.0	0.23%	1.07%	0.56%	0.02%	0.04%	0.02%
OH	39031-8010811	Conesville Power Plant (0616000000)	232.8	1.12%	1.07%	0.00%	0.17%	0.08%	0.00%

104

Non-VISTAS Class I Areas

- Only one VISTAS facility has a contribution ≥ 1% at any non-VISTAS Class I Area
- **Tennessee Valley Authority (TVA) - Shawnee Fossil Plant**
  - Hercules-Glades Wilderness Area (1.35% sulfate)
  - Mingo Wilderness Area (1.08% sulfate)

105

VISTAS Facilities ≥ 1%

Facility State	FACILITY_ID_STD	FACILITY_NAME_STD	IMPACTED CLASS I AREAS
FL	12123-752411	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	OKEF
FL	12017-640611	DUKE ENERGY FLORIDA, INC. (DEF)	CHAS
FL	12105-717711	MOSAIC FERTILIZER LLC	EVER
FL	12105-919811	MOSAIC FERTILIZER, LLC	EVER
FL	12089-753711	ROCK TENN CP LLC	OKEF, WOLF
FL	12005-535411	ROCKTENN CP LLC	SAMA
FL	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	EVER
FL	12086-899911	TARMAC AMERICA LLC	EVER
FL	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	OKEF
GA	13127-3721011	Brunswick Cellulose Inc	WOLF
GA	13015-2813011	Ga Power Company - Plant Bowen	CHAS, COHU, OKEF, ROMA, SAMA, WOLF
GA	13051-3679811	International Paper - Savannah	WOLF
KY	21183-5561611	Big Rivers Electric Corp - Wilson Station	MACA
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	COHU, HEGL, MING, SHRO, SIPS
NC	37013-8479311	PCS Phosphate Company, Inc. - Aurora	SWAN
SC	45015-4834911	ALUMAX OF SOUTH CAROLINA	ROMA
SC	45043-5698611	INTERNATIONAL PAPER GEORGETOWN MILL	ROMA
SC	45019-4973611	KAPSTONE CHARLESTON KRAFT LLC	ROMA
SC	45015-4120411	SANTEE COOPER CROSS GENERATING STATION	ROMA
SC	45043-6652811	SANTEE COOPER WINYAH GENERATING STATION	ROMA
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	LIGO
TN	47161-4979311	TVA CUMBERLAND FOSSIL PLANT	SIPS
VA	51580-5798711	Meadwestvaco Packaging Resource Group	JARI
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	DOSO, JARI, OTCR, SHEN, SWAN
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	JARI
WV	54051-6902311	MITCHELL PLANT	DOSO, OTCR
WV	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	DOSO, JARI, OTCR, SHEN

106

Non-VISTAS Facilities ≥ 1%

Facility State	FACILITY_ID_STD	FACILITY_NAME_STD	IMPACTED CLASS I AREAS
IN	18051-7363111	Gibson	MACA, SIPS
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	COHU, MACA, SIPS
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	SIPS
MD	24001-7763811	Luke Paper Company	SWAN
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	DOSO, JARI, OTCR, SHEN, SWAN
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	DOSO, OTCR
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	COHU, DOSO, GRSM, JARI, JKSR, LIGO, OKEF, OTCR, ROMA, SHEN, SHRO, SIPS, SWAN, WOLF
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	JARI, LIGO, ROMA, SHEN, SWAN
PA	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	SHEN

107

Effective Emission Control Technology

- For the purpose of SO_2 control measures, an EGU that has add-on flue gas desulfurization (FGD) and that meets the applicable alternative SO_2 emission limit of the 2012 Mercury Air Toxics Standards (MATS) rule for power plants. The two limits in the rule (0.2 lb/MMBtu for coal-fired EGUs or 0.3 lb/MMBtu for EGUs fired with oil-derived solid fuel) are low enough that it is unlikely that an analysis of control measures for a source already equipped with a scrubber and meeting one of these limits would conclude that even more stringent control of SO_2 is necessary to make reasonable progress.
- For the purposes of SO_2 and NOx control measures, a combustion source (e.g., an EGU or industrial boiler or process heater) that, during the first implementation period, installed a FGD system that operates year-round with an effectiveness of at least 90 percent or by the installation of a selective catalytic reduction system that operates year-round with an overall effectiveness of at least 90 percent (in both cases calculating the effectiveness as the total for the system, including any bypassed flue gas), on a pollutant-specific basis.

108

Additional Considerations

- The final list of four-factor analysis sources will be determined in consultation with the FLMs, EPA, other states, and stakeholders.
- Some states may perform additional four-factor analyses for sources not listed on Slide 106.
- Some states may allow their facilities to take a permit limit that will result in adjusted PSAT impacts below the 1% threshold in lieu of performing a four-factor analysis.
- The large number of coal-fired EGU retirements and fuel switching from coal to natural gas needs to be considered along with the sources selected for the four-factor analysis. States should not be penalized for early action.

109

Contacts for Further Information

- For general, technical, and SIP-related questions, contact the TAWG and CC Chairs:
  - TAWG – Randy Strait (randy.strait@ncdenr.gov)
  - CC – Jim Boylan (james.boylan@dnr.ga.gov)
- For general, contract, and funding questions, contact the Project Manager:
  - John Hornback (hornback@metro4-sesarm.org)

112

Next Steps and Schedule

110

Remaining VISTAS Work Schedule

Task	Schedule
2028 Point Emissions Updates	Completed
2028 Emissions Processing	Late April, 2020
2028 CAMx Modeling	Late June, 2020
2028 Visibility Projections	Mid-July, 2020
2028 Deposition Projections	Mid-July, 2020
Final reports and documentation	Late July, 2020
Website updates and postings	Late July, 2020
End of Contract	September 30, 2020
Regional Haze SIPs Due to EPA	**July 31, 2021**

111