PROPOSED

$PM_{2.5}$ IMPLEMENTATION/MAINTENANCE PLAN

AND REDESIGNATION REQUEST

FOR SACRAMENTO $PM_{2.5}$ NONATTAINMENT AREA

APPENDICES

October 24, 2013

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ACKNOWLEDGEMENTS

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Appendix A: Air Quality Data

Electronic appendix is available in spreadsheet format. Here is the description of each spreadsheet.

Worksheet Name	Worksheet Description
AQS-Raw-Data	Raw daily $PM_{2.5}$ data downloaded from the EPA AQS database. The data was imported into spreadsheet format.
AQS-Raw-DV	Raw $PM_{2.5}$ Design Value data downloaded from the EPA AQS database. The data was imported into spreadsheet format.
Location	Monitoring sites location information
DPM Max Value	Data for Figure 3-3
RSV	Data for Table 3.5a 24-Hour and annual statistics at the Roseville, CA Sunrise Blvd.
DPM	Data for Table 3.5b 24-Hour and annual statistics at the Del Paso Manor monitor
T-St	Data for Table 3.5c 24-Hour and annual statistics at the T-Street monitor
SHD	Data for Table 3.5d 24-Hour and annual statistics at the Sacramento Health Department
WLD	Data for Table 3.5e 24-Hour and annual statistics at the Woodland, CA Gibson Road
T3-6	Data for Table 3-6 Top $PM_{2.5}$ measurements during 2009-2012
F3-3	Data for Figure 3-3 Monthly Average and Peak $PM_{2.5}$ Concentration Values for Del Paso Manor (Design Value Site)
F3-4	Data for Figure 3-4 Annual 98th percentile 24-hour Average Concentration
F3-5	Data for Figure 3-5 Maximum 24-hour Concentrations in the Region

Appendix B: Emissions Inventory

The 2011, 2017, and 2024 emission inventories are presented in various formats and details in this appendix.

Appendix B1 contains the on-road motor vehicle $PM_{2.5}$, NO_X, ROG, and SO_X emissions, vehicle population and activity Burden data generated using EMFAC2011 and transportation activity forecast data from the MTP/SCS2035[1]. It does not include CARB adjustments for recently adopted controls through January 2012. The list of adjustments is presented in Table B5.2.

Appendix B2 (available separately in electronic file format) contains the estimated $PM_{2.5}$, NO_X, ROG, and SO_X stationary, area-wide and off-road forecast summaries by EIC emission categories for the Sacramento Federal Nonattainment Area in CEPAM: NORCAL 2012 $PM_{2.5}$ SIP Baseline Emission Projections, Section a1 – Emission Projections With External Adjustments. It includes ERCs (2.0 tpd $PM_{2.5}$, 3.1 tpd NO_X, 0.6 tpd SO_X, and 4.6 tpd VOC) and adopted controls through mid-2011. It does not include newly identified VOC emission sources: Heritage Dairy (0.1 tpd) and Jepson Prairie Composting (4.1 tpd). It also does not include reductions from PCAPCD Rule 242 - IC Engines, PCAPCD Rule 243 - Polyester Resin/Plastic Product Manufacturing, Carl Moyer and Prop 1B. These additional emissions and reductions are added to the inventory as external adjustments as shown in Tables B5.1 and B5.2.

Appendix B3 (available separately in electronic file format) contains the growth and control data used for emission forecasting stationary and area-wide sources in CARB's SIP planning projections model, CEPAM.

Appendix B4 (available separately in electronic file format) contains the summary of In-Use off-road equipment emissions, horsepower, population, and activity data for the Sacramento Federal Nonattainment Area using data outputs from the 2011 In-Use Off-Road Equipment model. Also available in electronic format are other off-road motor vehicles category specific methods and inventory models from CARB's website,

http://www.arb.ca.gov/msei/categories.htm#offroad_motor_vehicles.

For those off-road emissions categories not updated with new methods and data, such as lawn and garden equipment, data outputs from EMFAC2007 (available in electronic format) are used. These off-road emissions do not include CARB and district adjustments for recently adopted controls through January 2012. The list of adjustments is presented in Appendix B5.

Appendix B5 contains recent emission inventory adjustments by the air districts and CARB. Unlike the emissions inventories presented in Chapter 4, Tables 4.1, 4.2a, and 4.2b, the inventories presented in Appendices B1 and B2 do not include CARB and district adjustments in Tables B5.1 and B5.2. District inventory adjustments for reductions from unaccounted district rules through mid-2011 and for emission source additions are shown in Table B5.1. CARB inventory adjustments for recently adopted controls through January 2012 are presented in Table B5.2. CARB off-road adjustment factors, which are incorporated into CEPAM – Emission Projections with External Adjustments, are available separately in electronic file format.

[1] Metropolitan Transportation Plan/Sustainable Communities Strategy 2035, adopted by SACOG on April 19, 2012.

Appendix B6 contains a summary description and inventory of $PM_{2.5}$, NO_X, and VOC emission reduction credits (ERCs) listed by the individual air districts. Included are: 1) unused ERCs issued for reductions that occurred prior to the 2011 base year, 2) future bankable rice burning ERCs, and 3) Wood Stove/Fireplace Change-Out Incentive Program future ERC. The $PM_{2.5}$, NO_X, and VOC ERC totals were added to the emission inventory forecast years in Chapter 4, Tables 4.1, 4.2a, and 4.2b, respectively.

Appendix B7 contains detailed breakdown of directly emitted $PM_{2.5}$ and $PM_{2.5}$ precursors base-year emissions and forecasts by chemical mass balance (CMB) source category. Emissions inventory projections by source category are used to forecast the contributions of each source category to ambient wintertime $PM_{2.5}$ concentrations in 2011, 2017, and 2024.

Appendix B1: On-Road Motor Vehicle Emissions Inventory

Appendix B1 contains the 2011, 2017, and 2024 on-road motor vehicle summer planning $PM_{2.5}$, $NO_{X,}$ ROG, and SO_X inventories, vehicle population, VMT, and trips for each EMFAC vehicle class category for the Sacramento federal nonattainment area. These updated motor vehicle emissions are based on ARB's EMFAC2011 emission factor model and the latest planning assumptions from SACOG's MTP/SCS 2035. Emissions tables by county are available separately in electronic file format. It does not include CARB adjustments for recently adopted controls through January 2012. The list of adjustments is presented in Table B5.2.

Appendix B1: 2011 On-Road Motor Vehicle Emissions Inventory - Sacramento Federal Nonattainment Area_$PM_{2.5}$ Summary

Version : Emfac2011 (EMFAC 2011 Vehicle Categories)
Run Date : 2012/08/10
Scen Year: 2011
Season : Winter
Area : Sacramento Nonattainment Area [generated by SACOG, approximately El Dorado (MC)+ Placer (SV & MC) + Sacramento + Yolo + Solano (SV)]
Emissions: Tons Per Day

	LDA - GAS	LDA - DSL	LDT1 - GAS	LDT1 - DSL	LDT2 - GAS	LDT2 - DSL	MDV - GAS	MDV - DSL	LHDT1 - GAS	LHDT1 - DSL	LHDT2 - GAS	LHDT2 - DSL	MHDT - GAS	MHDT - DSL	HHDT - GAS	HHDT - DSL	OBUS - GAS	OBUS - DSL	SBUS - GAS	SBUS - DSL	UBUS - GAS	UBUS - DSL	MH - GAS	MH - DSL	MCY - GAS	ALL-TOT
Vehicles	721280	3094	106390	136	255798	121	229719	214	41855	30093	3326	6569	3890	15924	395	7152	1112	640	243	644	299	605	10000	1993	47402	**1488893**
VMT/1000	27735	102	3845	4	10063	4	9303	9	1791	1290	141	286	159	816	30	1006	60	53	10	25	38	78	130	26	394	**57397**
Trips	4533547	17958	647715	719	1612036	658	1450624	1251	623583	378536	49547	82625	77823		7909		50804		971		1194	2420	1000	199	94795	**9635914**
Reactive Organic Gas Emissions																										
Run Exh	2.22	0.01	0.78	0.00	0.86	0.00	1.05	0.00	0.57	0.38	0.05	0.08	0.11	0.40	0.07	0.66	0.02	0.04	0.03	0.02	0.04	0.05	0.06	0.01	1.42	**8.91**
Idle Exh	0	0	0	0	0	0	0	0	0.03	0.00	0.00	0.00	0.01	0.01	0	0.11	0.00	0.00	0.00	0.00	0	0	0	0	0	**0.16**
Start Ex	2.62	0	0.68	0	1.07	0	1.37	0	0.67	0	0.06	0	0.36		0.10		0.07		0.00		0.00	0	0.00	0	0.33	**7.33**
Total Ex	**4.83**	**0.01**	**1.47**	**0.00**	**1.93**	**0.00**	**2.41**	**0.00**	**1.27**	**0.39**	**0.11**	**0.08**	**0.48**	**0.41**	**0.18**	**0.78**	**0.09**	**0.04**	**0.04**	**0.02**	**0.04**	**0.05**	**0.07**	**0.01**	**1.75**	**16.44**
Diurnal	0.12	0	0.02	0	0.04	0	0.03	0	0.00	0	0.00	0	0.00		0.00		0.00		0.00		0.00	0	0.00	0	0.01	**0.22**
Hot Soak	1.07	0	0.29	0	0.36	0	0.27	0	0.09	0	0.01	0	0.03		0.01		0.00		0.00		0.00	0	0.00	0	0.07	**2.20**
Running	3.23	0	1.26	0	1.56	0	1.20	0	0.55	0	0.04	0	0.14		0.03		0.01		0.00		0.00	0	0.00	0	0.33	**8.35**
Resting	0.05	0	0.01	0	0.01	0	0.01	0	0.00	0	0.00	0	0.00		0.00		0.00		0.00		0.00	0	0.00	0	0.00	**0.08**
Total	9.30	0.01	3.07	0.00	3.90	0.00	3.94	0.00	1.88	0.39	0.16	0.08	0.65	0.41	0.22	0.78	0.11	0.04	0.04	0.02	0.05	0.05	0.07	0.01	2.17	**27.37**
Oxides of Nitrogen Emissions																										
Run Exh	6.67	0.10	2.13	0.00	4.20	0.00	5.65	0.01	1.48	7.61	0.10	1.55	0.42	7.27	0.25	12.75	0.12	0.67	0.04	0.31	0.13	1.17	0.23	0.26	0.64	**53.75**
Idle Exh	0	0	0	0	0	0	0	0	0.00	0.09	0.00	0.02	0.00	0.16	0	0.60	0.00	0.04	0.00	0.04	0	0	0	0	0	**0.94**
Start Ex	1.76	0	0.38	0	1.13	0	1.28	0	1.46	0	0.12	0	0.23		0.03		0.11		0.00		0.01	0	0.00	0	0.03	**6.54**
Total Ex	**8.42**	**0.10**	**2.51**	**0.00**	**5.33**	**0.00**	**6.93**	**0.01**	**2.93**	**7.70**	**0.21**	**1.57**	**0.65**	**7.44**	**0.30**	**13.35**	**0.23**	**0.71**	**0.05**	**0.35**	**0.13**	**1.17**	**0.23**	**0.26**	**0.67**	**61.23**
Particulate Matter 2.5																										
Run Exh	0.07	0.01	0.02	0.00	0.03	0.00	0.03	0.00	0.01	0.08	0.00	0.02	0.00	0.24	0.00	0.43	0.00	0.02	0.00	0.01	0.00	0.02	0.00	0.01	0.00	**0.98**
Idle Exh	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0	0.01	0.00	0.00	0.00	0.00	0	0	0	0	0	**0.02**
Start Ex	0.01	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00		0.00		0.00		0.00		0.00	0	0.00	0	0.00	**0.01**
Total Ex	**0.09**	**0.01**	**0.03**	**0.00**	**0.03**	**0.00**	**0.03**	**0.00**	**0.01**	**0.08**	**0.00**	**0.02**	**0.00**	**0.24**	**0.00**	**0.44**	**0.00**	**0.02**	**0.00**	**0.01**	**0.00**	**0.02**	**0.00**	**0.01**	**0.00**	**1.04**
Tirewear	0.06	0.00	0.01	0	0.02	0	0.02	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0	0.00	0	0.00	0.00	0.00	0	0.00	**0.13**
Breakwear	0.48	0.00	0.07	0	0.17	0	0.16	0	0.03	0.05	0.00	0.01	0.00	0.05	0.00	0.03	0.00	0.00	0.00	0.01	0.00	0.03	0.00	0.00	0.01	**1.11**
Total	0.64	0.01	0.10	0.00	0.23	0.00	0.21	0.00	0.04	0.13	0.00	0.03	0.00	0.29	0.00	0.48	0.00	0.03	0.00	0.02	0.00	0.05	0.00	0.01	0.01	**2.29**
Oxides of Sulfur Emissions																										
Run Exh	0.10	0.00	0.02	0.00	0.05	0.00	0.06	0.00	0.02	0.01	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.29**
Idle Exh	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	**0.00**
Start Ex	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00		0.00		0.00		0.00		0.00	0	0.00	0	0.00	**0.00**
Total Ex	**0.11**	**0.00**	**0.02**	**0.00**	**0.05**	**0.00**	**0.06**	**0.00**	**0.02**	**0.01**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.30**

Source: ARB (Jason Crow) e-mail (transmitted on August 22, 2012) providing 2011 on-road emissions based on VMT forecasts in SACOG's MTP/SCS2035 for all areas except Solano(SV). SACOG (Binu Abraham) email (transmitted on September 13, 2012) providing 2011 Solano(SV) data.

Appendix B1: 2017 On-Road Motor Vehicle Emissions Inventory - Sacramento Federal Nonattainment Area_$PM_{2.5}$ Summary

Version : Emfac2011 (EMFAC 2011 Vehicle Categories)
Run Date : 2012/05/09
Scen Year: 2017
Season : Winter
Area : Sacramento Nonattainment Area [generated by SACOG, approximately El Dorado (MC)+ Placer (SV & MC) + Sacramento + Yolo + Solano (SV)]
Emissions: Tons Per Day

	LDA - GAS	LDA - DSL	LDT1 - GAS	LDT1 - DSL	LDT2 - GAS	LDT2 - DSL	MDV - GAS	MDV - DSL	LHDT1 - GAS	LHDT1 - DSL	LHDT2 - GAS	LHDT2 - DSL	MHDT - GAS	MHDT - DSL	HHDT - GAS	HHDT - DSL	OBUS - GAS	OBUS - DSL	SBUS - GAS	SBUS - DSL	UBUS - GAS	UBUS - DSL	MH - GAS	MH - DSL	MCY - GAS	ALL-TOT
Vehicles	756809	3254	111961	143	269076	127	241113	224	43868	31655	3492	6914	4052	19598	367	8997	1162	793	243	696	297	605	10327	2076	49467	**1567315**
VMT/1000	29869	119	4172	5	10761	5	9369	9	1827	1307	145	282	194	1007	50	1294	55	62	10	26	37	78	137	26	426	**61275**
Trips	4783847	19768	683736	801	1694630	772	1497798	1343	653563	398175	52030	86970	81067		7334		53050		973		1187	2420	1033	208	98923	**10119627**
Reactive Organic Gas Emissions																										
Run Exh	0.71	0.00	0.26	0.00	0.33	0.00	0.62	0.00	0.33	0.31	0.02	0.06	0.04	0.20	0.03	0.31	0.01	0.01	0.02	0.01	0.03	0.04	0.02	0.01	1.33	**4.68**
Idle Exh	0	0	0	0	0	0	0	0	0.03	0.00	0.00	0.00	0.01	0.00	0	0.15	0.00	0.00	0.00	0.00	0	0	0	0	0	**0.19**
Start Ex	1.04	0	0.36	0	0.52	0	0.95	0	0.53	0	0.04	0	0.16		0.04		0.05		0.00		0.01	0	0.00	0	0.31	**4.01**
Total Ex	**1.74**	**0.00**	**0.62**	**0.00**	**0.85**	**0.00**	**1.57**	**0.00**	**0.88**	**0.32**	**0.05**	**0.06**	**0.21**	**0.20**	**0.07**	**0.46**	**0.06**	**0.01**	**0.02**	**0.01**	**0.04**	**0.04**	**0.02**	**0.01**	**1.64**	**8.89**
Diurnal	0.07	0	0.03	0	0.04	0	0.04	0	0.00	0	0.00	0	0.00		0.00		0.00		0.00		0.00	0	0.00	0	0.02	**0.19**
Hot Soak	0.62	0	0.20	0	0.28	0	0.34	0	0.08	0	0.01	0	0.01		0.00		0.00		0.00		0.00	0	0.00	0	0.05	**1.59**
Running	1.65	0	0.87	0	1.08	0	1.29	0	0.54	0	0.03	0	0.06		0.01		0.02		0.00		0.00	0	0.00	0	0.20	**5.75**
Resting	0.04	0	0.01	0	0.02	0	0.03	0	0.00	0	0.00	0	0.00		0.00		0.00		0.00		0.00	0	0.00	0	0.01	**0.11**
Total	4.13	0.00	1.74	0.00	2.27	0.00	3.26	0.00	1.50	0.32	0.09	0.06	0.28	0.20	0.08	0.46	0.08	0.01	0.03	0.01	0.04	0.04	0.02	0.01	1.91	**16.54**
Oxides of Nitrogen Emissions																										
Run Exh	3.38	0.06	1.16	0.00	2.08	0.00	3.63	0.00	0.96	5.21	0.06	1.05	0.21	4.10	0.27	7.00	0.07	0.38	0.03	0.30	0.12	0.98	0.13	0.22	0.64	**32.02**
Idle Exh	0	0	0	0	0	0	0	0	0.00	0.09	0.00	0.02	0.00	0.15	0	0.90	0.00	0.03	0.00	0.04	0	0	0	0	0	**1.22**
Start Ex	0.81	0	0.23	0	0.58	0	0.91	0	1.39	0	0.10	0	0.17		0.03		0.10		0.00		0.01	0	0.00	0	0.04	**4.37**
Total Ex	**4.18**	**0.06**	**1.39**	**0.00**	**2.65**	**0.00**	**4.54**	**0.00**	**2.35**	**5.30**	**0.16**	**1.07**	**0.38**	**4.24**	**0.31**	**7.90**	**0.16**	**0.41**	**0.03**	**0.33**	**0.13**	**0.98**	**0.13**	**0.22**	**0.68**	**37.63**
Particulate Matter 2.5																										
Run Exh	0.05	0.00	0.01	0.00	0.02	0.00	0.02	0.00	0.00	0.06	0.00	0.01	0.00	0.09	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	**0.40**
Idle Exh	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	**0.00**
Start Ex	0.01	0	0.00	0	0.00	0	0.01	0	0.00	0	0.00	0	0.00		0.00		0.00		0.00		0.00	0	0.00	0	0.00	**0.03**
Total Ex	**0.06**	**0.00**	**0.02**	**0.00**	**0.02**	**0.00**	**0.03**	**0.00**	**0.01**	**0.06**	**0.00**	**0.01**	**0.00**	**0.09**	**0.00**	**0.10**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.02**	**0.00**	**0.00**	**0.00**	**0.43**
Tirewear	0.07	0.00	0.01	0	0.02	0	0.02	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0	0.00	0	0.00	0.00	0.00	0	0.00	**0.14**
Breakwear	0.52	0.00	0.07	0	0.19	0	0.16	0	0.03	0.05	0.00	0.01	0.00	0.06	0.00	0.03	0.00	0.00	0.00	0.01	0.00	0.03	0.00	0.00	0.01	**1.19**
Total	0.65	0.00	0.10	0.00	0.23	0.00	0.21	0.00	0.04	0.12	0.00	0.03	0.00	0.16	0.00	0.15	0.00	0.01	0.00	0.01	0.00	0.05	0.00	0.01	0.01	**1.78**
Oxides of Sulfur Emissions																										
Run Exh	0.11	0.00	0.02	0.00	0.05	0.00	0.06	0.00	0.02	0.01	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.31**
Idle Exh	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	**0.00**
Start Ex	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00		0.00		0.00		0.00		0.00	0	0.00	0	0.00	**0.01**
Total Ex	**0.11**	**0.00**	**0.02**	**0.00**	**0.06**	**0.00**	**0.06**	**0.00**	**0.02**	**0.01**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.32**

Source: SACOG (Binu Abraham) e-mail (transmitted on May 17, 2012) providing 2014, 2017, 2024 on-road emissions based on VMT forecasts in SACOG's MTP/SCS2035 for all areas except Solano(SV). SACOG (Binu Abraham) email (transmitted on September 13, 2012) providing 2014, 2017, 2024 Solano(SV) data.

Appendix B1: 2024 On-Road Motor Vehicle Emissions Inventory - Sacramento Federal Nonattainment Area_$PM_{2.5}$ Summary

Version : Emfac2011 (EMFAC 2011 Vehicle Categories)
Run Date : 2012/05/09
Scen Year: 2024
Season : Winter
Area : Sacramento Nonattainment Area [generated by SACOG, approximately El Dorado (MC)+ Placer (SV & MC) + Sacramento + Yolo + Solano (SV)]
Emissions: Tons Per Day

	LDA - GAS	LDA - DSL	LDT1 - GAS	LDT1 - DSL	LDT2 - GAS	LDT2 - DSL	MDV - GAS	MDV - DSL	LHDT1 - GAS	LHDT1 - DSL	LHDT2 - GAS	LHDT2 - DSL	MHDT - GAS	MHDT - DSL	HHDT - GAS	HHDT - DSL	OBUS - GAS	OBUS - DSL	SBUS - GAS	SBUS - DSL	UBUS - GAS	UBUS - DSL	MH - GAS	MH - DSL	MCY - GAS	ALL-TOT
Vehicles	820373	3528	121692	156	288220	136	257365	239	46641	33640	3810	7528	4356	21256	359	9997	1265	843	260	699	317	647	11010	2217	54242	**1690795**
VMT/1000	32143	126	4491	6	11409	5	9899	9	1923	1376	157	306	207	1136	46	1485	58	70	11	25	40	83	146	28	468	**65654**
Trips	5189909	21898	740260	922	1813170	838	1580206	1475	694875	423147	56757	94689	87162		7180		57767		1040		1269	2587	1101	222	108473	**10884947**
Reactive Organic Gas Emissions																										
Run Exh	0.37	0.00	0.11	0.00	0.17	0.00	0.31	0.00	0.15	0.23	0.00	0.05	0.01	0.14	0.02	0.33	0.00	0.01	0.01	0.00	0.03	0.04	0.01	0.01	1.37	**3.38**
Idle Exh	0	0	0	0	0	0	0	0	0.03	0.00	0.00	0.00	0.01	0.00	0	0.20	0.00	0.00	0.00	0.00	0	0	0	0	0	**0.25**
Start Ex	0.56	0	0.20	0	0.28	0	0.57	0	0.37	0	0.02	0	0.08		0.01		0.04		0.00		0.01	0	0.00	0	0.32	**2.47**
Total Ex	**0.93**	**0.00**	**0.32**	**0.00**	**0.45**	**0.00**	**0.88**	**0.00**	**0.55**	**0.24**	**0.03**	**0.05**	**0.10**	**0.15**	**0.03**	**0.53**	**0.04**	**0.02**	**0.02**	**0.01**	**0.03**	**0.04**	**0.01**	**0.01**	**1.69**	**6.10**
Diurnal	0.05	0	0.02	0	0.03	0	0.05	0	0.00	0	0.00	0	0.00		0.00		0.00		0.00		0.00	0	0.00	0	0.02	**0.17**
Hot Soak	0.38	0	0.16	0	0.23	0	0.34	0	0.08	0	0.00	0	0.01		0.00		0.00		0.00		0.00	0	0.00	0	0.05	**1.24**
Running	1.27	0	0.67	0	0.89	0	1.25	0	0.52	0	0.03	0	0.04		0.00		0.02		0.00		0.00	0	0.00	0	0.18	**4.87**
Resting	0.03	0	0.01	0	0.02	0	0.03	0	0.00	0	0.00	0	0.00		0.00		0.00		0.00		0.00	0	0.00	0	0.01	**0.10**
Total	2.66	0.00	1.18	0.00	1.62	0.00	2.55	0.00	1.15	0.24	0.06	0.05	0.14	0.15	0.04	0.53	0.06	0.02	0.02	0.01	0.04	0.04	0.01	0.01	1.94	**12.50**
Oxides of Nitrogen Emissions																										
Run Exh	2.54	0.05	0.70	0.00	1.28	0.00	2.24	0.00	0.60	3.28	0.03	0.65	0.09	1.47	0.24	3.41	0.03	0.12	0.02	0.23	0.10	0.93	0.06	0.18	0.69	**18.96**
Idle Exh	0	0	0	0	0	0	0	0	0.00	0.10	0.00	0.02	0.00	0.09	0	1.02	0.00	0.02	0.00	0.03	0	0	0	0	0	**1.28**
Start Ex	0.46	0	0.14	0	0.29	0	0.56	0	1.25	0	0.09	0	0.12		0.03		0.07		0.00		0.01	0	0.00	0	0.04	**3.07**
Total Ex	**3.00**	**0.05**	**0.85**	**0.00**	**1.57**	**0.00**	**2.80**	**0.00**	**1.85**	**3.38**	**0.13**	**0.67**	**0.21**	**1.56**	**0.27**	**4.44**	**0.10**	**0.14**	**0.03**	**0.26**	**0.11**	**0.93**	**0.07**	**0.18**	**0.73**	**23.32**
Particulate Matter 2.5																										
Run Exh	0.06	0.00	0.01	0.00	0.02	0.00	0.02	0.00	0.00	0.05	0.00	0.01	0.00	0.04	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	**0.33**
Idle Exh	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	**0.00**
Start Ex	0.02	0	0.00	0	0.01	0	0.01	0	0.00	0	0.00	0	0.00		0.00		0.00		0.00		0.00	0	0.00	0	0.00	**0.04**
Total Ex	**0.08**	**0.00**	**0.01**	**0.00**	**0.03**	**0.00**	**0.03**	**0.00**	**0.00**	**0.05**	**0.00**	**0.01**	**0.00**	**0.04**	**0.00**	**0.10**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.02**	**0.00**	**0.00**	**0.00**	**0.38**
Tirewear	0.07	0.00	0.01	0	0.02	0	0.02	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0	0.00	0	0.00	0.00	0.00	0	0.00	**0.15**
Breakwear	0.56	0.00	0.08	0	0.20	0	0.17	0.0001	0.03	0.05	0.00	0.01	0.00	0.07	0.00	0.04	0.00	0.00	0.00	0.01	0.00	0.03	0.00	0.00	0.01	**1.27**
Total	0.71	0.00	0.10	0.00	0.25	0.00	0.22	0.00	0.04	0.10	0.00	0.02	0.00	0.11	0.00	0.16	0.00	0.01	0.00	0.01	0.00	0.05	0.00	0.01	0.01	**1.82**
Oxides of Sulfur Emissions																										
Run Exh	0.12	0.00	0.02	0.00	0.06	0.00	0.06	0.00	0.02	0.01	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.33**
Idle Exh	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	**0.00**
Start Ex	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00		0.00		0.00		0.00		0.00	0	0.00	0	0.00	**0.01**
Total Ex	**0.12**	**0.00**	**0.02**	**0.00**	**0.06**	**0.00**	**0.06**	**0.00**	**0.02**	**0.01**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.03**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.34**

Source: SACOG (Binu Abraham) e-mail (transmitted on May 17, 2012) providing 2014, 2017, 2024 on-road emissions based on VMT forecasts in SACOG's MTP/SCS2035 for all areas except Solano(SV). SACOG (Binu Abraham) email (transmitted on September 13, 2012) providing 2014, 2017, 2024 Solano(SV) data.

Appendix B5: Recent Emission Inventory Adjustments

Emission inventory adjustments presented in this appendix include recent changes by the air districts and CARB, and are not reflected in Appendices B1 and B2. These emission changes are due to: 1) recently adopted control measures through January 2012 for mobile sources, and 2) unaccounted adopted control measures through mid-2011 and additional emissions for stationary and area-wide sources. Tables B5.1 and B5.2 contain a summary of the district and CARB emission inventory adjustments, respectively. CARB off-road adjustment factors, which are incorporated into CEPAM – Emission Projections with External Adjustments, are available separately in electronic file format.

Table B5.1. District Emission Inventory Adjustments in Sacramento Nonattainment Area

District Rule/Category/Source	Adoption Year	Implement Year	VOC Emission Changes[1] (TPD)		
			2011	2017	2024[2]
PCAPCD-243 Polyester Resin/Plastic Product Manufacturing	2003	2003	-0.194	-0.222	-0.236
Added Heritage Dairy (Yolo-Solano)			0.105	0.105	0.105
Added Jepson Composting (Yolo-Solano)			4.110	4.110	4.110
Total District Adjustments			**4.021**	**3.992**	**3.979**

District Rule/Category/Source	Adoption Year	Implement Year	NO_X Emission Changes[1] (TPD)		
			2011	2017	2024[2]
PCAPCD-242 IC Engines[3]	2003	2003	-0.033	-0.026	-0.023
Total District Adjustments			**-0.033**	**-0.026**	**-0.023**

1 These changes are included in Chapter 4, Tables 4.1, 4.2a, and 4.2 b. These changes are not included in the detailed inventories contained in Appendix B2.

2 2020 Emission adjustments are assumed for 2024.

3 PCAPCD Rule 242 was adopted on April 10, 2003 and submitted to EPA for approval on December 17, 2010. EPA approved the Rule into the SIP effective on January 3, 2012 (76 FR 67366, 11/01/2011).

Table B5.2. CARB Emission Inventory Adjustments in Sacramento Nonattainment Area

CARB Rule/Category	$PM_{2.5}$ Emission Changes* (TPD)		
	2011	2017	2024
On-Road Emission Inventory			
RFG	0.00	0.00	0.00
Prop 1B	-0.04	0.00	0.00
Moyer	-0.01	0.00	0.00
AB1493	0.00	-0.02	-0.04
Smog Check	0.00	0.00	0.00
ACC	0.00	-0.03	-0.12
Off-Road Emission Inventory			
Carl Moyer	-0.08	-0.02	0.00
Prop 1-B	-0.04	-0.01	-0.01
Areawide Emission Inventory			
Paved Road Dust	-0.15	-0.20	-0.11
Summary	**-0.31**	**-0.27**	**-0.27**

CARB Rule/Category	NOx Emission Changes* (TPD)		
	2011	2017	2024
On-Road Emission Inventory			
RFG	0.00	0.00	0.00
Prop 1B	-0.82	0.00	0.00
Moyer	-0.10	-0.04	0.00
AB1493	0.00	-0.01	-0.01
Smog Check	0.00	-0.35	-0.21
ACC	0.00	-0.15	-0.99
Off-Road Emission Inventory			
Carl Moyer	-1.95	-0.38	0.00
Prop 1-B	-0.84	-0.07	-0.07
Summary	**-3.71**	**-0.99**	**-1.28**

CARB Rule/Category	VOC Emission Changes* (TPD)		
	2011	2017	2024
On-Road Emission Inventory			
RFG	0.00	-1.28	-0.65
Prop 1B	0.00	0.00	0.00
Moyer	0.00	0.00	0.00
AB1493	-0.02	-0.28	-0.62
Smog Check	0.00	-0.42	-0.29
ACC	0.00	-0.07	-0.09
Off-Road Emission Inventory			
Carl Moyer	-0.19	-0.03	-0.01
Summary	**-0.21**	**-2.09**	**-1.65**

*These changes, which include recently adopted control measures up to January 2012, are included in Chapter 4, Table 4.1, Table 4.2a and Table 4.2b. These changes are not included in the detailed inventories contained in Appendix B1 for on-road and Appendices B2 and B4 for off-road.

Appendix B6: Emission Reduction Credits (ERCs)

Unused ERCs Issued for Reductions

Certain pollutant emission reductions due to equipment shutdown or voluntary control may be converted to emission reduction credits (ERCs) and registered with the air districts. These ERCs may then be used as "offsets" to compensate for an increase in emissions from a new or modified major emission source regulated by the air districts. Unused ERCs are considered as potential future emissions supplemental to the forecasted emissions inventory.

The amounts of unused ERCs from stationary sources by air district in Table B6.1. They are included in the emissions forecasts to ensure the potential future use of these credits does not interfere with the continued attainment of the 24-hour $PM_{2.5}$ NAAQS. Since reductions in rice burning in Yolo-Solano air district are banked under Rule 3.21 Rice Straw Emission Reduction Credits, they are included under unused banked ERC. These ERCs are included to maintain the validity of previously banked ERCs and other reductions.

Future Bankable Rice Burning Emission Reduction Credits

California legislation[2] in 1991 (known as the Connelly bill) required rice farmers to phase down rice field burning on an annual basis, beginning in 1992. A burn cap of 125,000 acres in the Sacramento Valley Air Basin was established, and growers with 400 acres or less were granted the option to burn their entire acreage once every four years. Since the rice burning reductions were mandated by state law, they would ordinarily not be "surplus" and eligible for banking. However, the Connelly bill included a special provision declaring that the reductions are qualified for banking if they meet the State and local banking rules.

Reduction in rice burning may be banked in the future under ERC rules[3] under development in Sacramento and Placer air districts. The total amounts of potential bankable rice burning ERCs in the SFNA-$PM_{2.5}$ are added to the total ERCs.

The amounts of future bankable rice burning ERCs for the Sacramento nonattainment area are listed by air district in Table B6.2. They are included in the emissions forecasts to ensure the potential future use of these credits does not interfere the maintenance of the 24-hour $PM_{2.5}$ NAAQS.

Available Wood Stove/Fireplace Change-Out Incentive Program Emission Reduction Credits

The Sacramento County's Wood Stove/Fireplace Change-Out Incentive Program was established in June 2006 to provide financial incentives to remove or replace existing fireplaces and dirty wood stoves. Part of the funding for this incentive program comes from Sacramento County's Solutions for the Environment and Economic Development (SEED) program. One of the SEED program requirements is the revenue generated from ERCs be used to replenish the

[2] Connelly-Areias-Chandler Rice Straw Burning Reduction Act of 1991, section 41865 of California Health and Safety Code.

[3] This rice burning ERC rule must be approved by EPA into the SIP for the rice ERCs to be used for compliance with federal air quality requirements.

ERC bank. The emissions reductions generated using SEED revenue in this incentive program must be banked as ERCs. About half of the emission reductions from this program will be available for the ERC bank. These ERCs from the Wood Stove/Fireplace Change-Out Incentive Program from Sacramento County, presented in Table B6.3, are also added to the total ERCs.

Table B6.1

Summary of Unused Banked Emission Reduction Credits In the Sacramento Nonattainment Area				
	ERC tons/day (winter average day)			
Air District [a]	**$PM_{2.5}$**	**SO_X**	**NO_X**	**VOC**
Sacramento	0.1	0.2	1.6	2.9
Yolo-Solano	1.0	0.2	0.7	0.7
Placer	0.5	0.1	0.5	0.6
Total	1.6	0.6	2.8	4.3

[a] There are no ERCs for El Dorado County AQMD. Rice ERCs from Yolo-Solano which are banked under Rule 3.21 are included here.

Table B6.2

Summary of Future Bankable Rice Burning Emission Reduction Credits In the Sacramento Nonattainment Area				
	ERC tons/day (winter average day)			
Air District [a]	**$PM_{2.5}$**	**SO_X**	**NO_X**	**VOC**
Sacramento	0.10	0.02	0.09	0.08
Placer	0.21	0.04	0.19	0.17
Total	0.31	0.06	0.28	0.25

[a] There are no future bankable rice burning ERCs for El Dorado County AQMD. Rice ERCs for Yolo-Solano are included in Table B6.1 because they are banked under Rule 3.21.

Table B6.3

ERCs From Wood Stove/Fireplace Change-Out Incentive Program				
	ERC tons/day (winter average day)			
Air District	**$PM_{2.5}$**	**SO_X**	**NO_X**	**VOC**
Sacramento	0.09	0.001	0.01	0.10

Appendix B7: $PM_{2.5}$ and $PM_{2.5}$ Precursors Forecasts by CMB Source Category

Detailed breakdown of directly emitted $PM_{2.5}$ and $PM_{2.5}$ precursors base-year emissions and forecasts by chemical mass balance (CMB) source category is presented in Table B7.1. Emissions inventory projections by source category are used to forecast the contributions of each source category to ambient wintertime $PM_{2.5}$ concentrations in 2011, 2017, and 2024. Emissions for stationary, areawide and off-road sources are from CARB CEPAM: NORCAL 2012 $PM_{2.5}$ SIP Baseline Emission Projections, Section a1 - Emission Projections with External Adjustments, downloaded on October 11, 2012. ERCs are included in the emissions inventory. Additional adjustments from Table B5.1 and Table B5.2 are included. On-road emissions include CARB external adjustments and are based on emissions generated by SACOG using EMFAC2011 and SACOG MTP/SCS2035 vehicle activity forecasts. On-road emissions also include a ”safety margin” for transportation conformity budget (1.88 tpd of NO_X and 0.09 tpd of direct $PM_{2.5}$ in 2017 and 2.10 tpd of NO_X and 0.36 tpd of direct $PM_{2.5}$ in 2024).

Table B7.1: Detailed Breakdown of Directly Emitted $PM_{2.5}$ and $PM_{2.5}$ Precursors Base-year Emissions and Forecasts by CMB Source Category

CMB Source Category	EI Source Assignments	Emission Category	Emissions, Tons/Day Sacramento Federal $PM_{2.5}$ Nonattainment Area			Source
			2011	2017	2024	
Ammonium Nitrate	**NO_X**	**Total SFNA**	**99.47**	**80.44**	**61.85**	**$PM_{2.5}$ Plan, Chapter 4, Table 4.2a**
Ammonium Sulfate	**SO_X**	**Total SFNA**	**1.71**	**2.31**	**2.37**	**$PM_{2.5}$ Plan, Chapter 4, Table 4.2a**
Other OC	**VOC**	**Total SFNA**	**106.04**	**96.55**	**94.42**	**$PM_{2.5}$ Plan, Chapter 4, Table 4.2b**
Motor Vehicle	**$PM_{2.5}$ for on- and off-road Mobile sources**	**On-Road + Off-Road $PM_{2.5}$**	**3.41**	**2.81**	**2.75**	**$PM_{2.5}$ Plan, Chapter 4, Table 4.1**
Soil	**$PM_{2.5}$ dust, crustal, soil**	**Total Soil**	**5.26**	**5.74**	**6.00**	**Sum of EICs Below**
	430- 430- 7078- 0000- MINERAL PROCESSES; CEMENT CONCRETE MANUFACTURING AND FABRICATION; SAND/AGGREGATE		0.0001	0.0001	0.0001	Note 1
	430- 995- 7022- 0000- MINERAL PROCESSES; OTHER; CLAY		0.0814	0.1059	0.1214	Note 1
	430- 426- 7102- 0000- MINERAL PROCESSES; CRUSHED STONE EXCAVATION AND PROCESSING (AGGREGATE PROD.); GRANITE		0	0	0	Note 1
	430- 434- 7050- 0000- MINERAL PROCESSES; LIME MANUFACTURING; LIMESTONE		0.001	0.0013	0.0015	Note 1
	430- 436- 7006- 0000- MINERAL PROCESSES; STORAGE PILES; ASPHALTIC CONCRETE		0.0007	0.0009	0.001	Note 1
	430- 995- 7016- 0000- MINERAL PROCESSES; OTHER; CEMENT		0.0106	0.0141	0.0162	Note 1
	430- 995- 7032- 0000- MINERAL PROCESSES; OTHER; FLYASH		0.0041	0.0054	0.0063	Note 1
	430- 995- 7042- 0000- MINERAL PROCESSES; OTHER; GYPSUM		0.0023	0.003	0.0035	Note 1
	430- 995- 7078- 0000- MINERAL PROCESSES; OTHER; SAND/AGGREGATE		0.001	0.0012	0.0014	Note 1
	430- 995- 7020- 0000- MINERAL PROCESSES; OTHER; CERAMICS		0.0108	0.014	0.0161	Note 1

CMB Source Category	EI Source Assignments	Emission Category	Emissions, Tons/Day Sacramento Federal $PM_{2.5}$ Nonattainment Area			Source
			2011	2017	2024	
	430- 995- 7064- 0000- MINERAL PROCESSES; OTHER; NON		0.0003	0.0004	0.0005	Note 1
	430- 995- 7048- 0000- MINERAL PROCESSES; OTHER; LIME		0.0001	0.0001	0.0001	Note 1
	430- 428- 7078- 0000- MINERAL PROCESSES; SURFACE BLASTING; SAND/AGGREGATE		0.0039	0.0052	0.0058	Note 1
	430- 429- 7016- 0000- MINERAL PROCESSES; CEMENT (PORTLAND AND OTHERS) MANUFACTURING; CEMENT		0.0027	0.0035	0.0039	Note 1
	430- 436- 7078- 0000- MINERAL PROCESSES; STORAGE PILES; SAND/AGGREGATE		0.0006	0.0007	0.0008	Note 1
	430- 995- 7000- 0000- MINERAL PROCESSES; OTHER; MINERAL AND METAL PRODUCTS (UNSPECIFIED)		0.0445	0.058	0.0661	Note 1
	430- 428- 7088- 0000- MINERAL PROCESSES; SURFACE BLASTING; STEEL GRIT ABRASIVE		0	0	0	Note 1
	430- 430- 7012- 0000- MINERAL PROCESSES; CEMENT CONCRETE MANUFACTURING AND FABRICATION; BRICKS		0.0008	0.001	0.0012	Note 1
	430- 430- 7016- 0000- MINERAL PROCESSES; CEMENT CONCRETE MANUFACTURING AND FABRICATION; CEMENT		0	0	0	Note 1
	430- 430- 7018- 0000- MINERAL PROCESSES; CEMENT CONCRETE MANUFACTURING AND FABRICATION; CEMENT CONCRETE		0.2059	0.2786	0.3331	Note 1
	430- 328- 1100- 0000- MINERAL PROCESSES; FIXED ROOF TANKS ; GASOLINE (UNSPECIFIED)		0	0	0	Note 1
	430- 995- 7012- 0000- MINERAL PROCESSES; OTHER; BRICKS		0.0051	0.0068	0.0078	Note 1
	430- 422- 7078- 0000- MINERAL PROCESSES; SAND AND GRAVEL EXCAVATION AND PROCESSING; SAND/AGGREGATE		0.065	0.0983	0.1229	Note 1
	430- 424- 7006- 0000- MINERAL PROCESSES; ASPHALTIC CONCRETE PRODUCTION; ASPHALTIC CONCRETE		0.0647	0.0854	0.0975	Note 1
	430- 426- 7078- 0000- MINERAL PROCESSES; CRUSHED STONE EXCAVATION AND PROCESSING (AGGREGATE PROD.); SAND/AGGREGATE		0.0054	0.0072	0.0083	Note 1
	430- 428- 7000- 0000- MINERAL PROCESSES; SURFACE BLASTING; MINERAL AND METAL PRODUCTS (UNSPECIFIED)		0.0094	0.0122	0.014	Note 1
	430- 995- 7018- 0000- MINERAL PROCESSES; OTHER; CEMENT CONCRETE		0	0	0	Note 1
	430- 995- 7075- 0000- MINERAL PROCESSES; OTHER; REFRACTORY		0.0001	0.0002	0.0002	Note 1
	620- 614- 5400- 0000- FARMING OPERATIONS; TILLING DUST; DUST		1.0362	1.0658	1.0493	Note 1
	620- 615- 5400- 0000- FARMING OPERATIONS; HARVEST OPERATIONS ; DUST		0.0156	0.016	0.0158	Note 1

CMB Source Category	EI Source Assignments	Emission Category	Emissions, Tons/Day Sacramento Federal $PM_{2.5}$ Nonattainment Area			Source
			2011	2017	2024	
	620- 618- 0262- 0101- FARMING OPERATIONS; LIVESTOCK HUSBANDRY; AGRICULTURAL WASTE		0.0097	0.01	0.01	Note 1
	630- 622- 5400- 0000- CONSTRUCTION AND DEMOLITION; BUILDING CONSTRUCTION DUST ; DUST		0.457	0.5089	0.5277	Note 1
	630- 624- 5400- 0000- CONSTRUCTION AND DEMOLITION; BUILDING CONSTRUCTION DUST; DUST		0.2171	0.2418	0.2507	Note 1
	630- 626- 5400- 0000- CONSTRUCTION AND DEMOLITION; BUILDING CONSTRUCTION DUST; DUST		0.086	0.0913	0.0919	Note 1
	630- 628- 5400- 0000- CONSTRUCTION AND DEMOLITION; BUILDING CONSTRUCTION DUST ; DUST		0.0758	0.0797	0.0804	Note 1
	630- 634- 5400- 0000- CONSTRUCTION AND DEMOLITION; ROAD CONSTRUCTION DUST; DUST		1.1549	1.2291	1.2358	Note 1
	640- 635- 5400- 0000- PAVED ROAD DUST; PAVED ROAD TRAVEL DUST ; DUST		1.1884	1.2769	1.3927	Note 2
	640- 637- 5400- 0000- PAVED ROAD DUST; PAVED ROAD TRAVEL DUST ; DUST		Included above	Included above	Included above	Note 2
	640- 639- 5400- 0000- PAVED ROAD DUST; PAVED ROAD TRAVEL DUST ; DUST		Included above	Included above	Included above	Note 2
	640- 641- 5400- 0000- PAVED ROAD DUST; PAVED ROAD TRAVEL DUST ; DUST		Included above	Included above	Included above	Note 2
	645- 638- 5400- 0000- UNPAVED ROAD DUST; UNPAVED ROAD TRAVEL DUST; DUST		0.0652	0.0673	0.0673	Note 1
	645- 640- 5400- 0000- UNPAVED ROAD DUST; UNPAVED ROAD TRAVEL DUST; DUST		0.173	0.1887	0.1964	Note 1
	645- 644- 5400- 0000- UNPAVED ROAD DUST; UNPAVED ROAD TRAVEL DUST; DUST		0.0027	0.0028	0.003	Note 1
	645- 646- 5400- 0000- UNPAVED ROAD DUST; UNPAVED ROAD TRAVEL DUST; DUST		0.113	0.1156	0.1134	Note 1
	650- 650- 5400- 0000- FUGITIVE WINDBLOWN DUST; DUST FROM AGRICULTURAL LANDS (NON; DUST		0.1301	0.13	0.1224	Note 1
	650- 651- 5400- 0000- FUGITIVE WINDBLOWN DUST; DUST FROM PASTURE LANDS; DUST		0.002	0.002	0.0018	Note 1
	650- 652- 5400- 0000- FUGITIVE WINDBLOWN DUST; DUST FROM UNPAVED ROADS AND ASSOCIATED AREAS; DUST		0.012	0.0123	0.0123	Note 1

CMB Source Category	EI Source Assignments	Emission Category	Emissions, Tons/Day Sacramento Federal $PM_{2.5}$ Nonattainment Area			Source
			2011	2017	2024	
Wood Burning	**$PM_{2.5}$ residential and open burning**	**Total Wood Burning**	**14.10**	**14.41**	**14.20**	**Sum of EICs Below**
	610- 600- 0230- 0000- RESIDENTIAL FUEL COMBUSTION; WOOD COMBUSTION ; WOOD		10.1458	10.3946	10.2917	Note 1
	610- 602- 0230- 0000- RESIDENTIAL FUEL COMBUSTION; WOOD COMBUSTION ; WOOD		2.8408	2.8213	2.6909	Note 1
	010- 005- 0254- 0000- ELECTRIC UTILITIES; BOILERS; WOOD/BARK WASTE		0.2272	0.288	0.3266	Note 1
	050- 005- 0254- 0000- MANUFACTURING AND INDUSTRIAL; BOILERS; WOOD/BARK WASTE		0.1432	0.1433	0.1433	Note 1
	670- 660- 0262- 0000- MANAGED BURNING AND DISPOSAL; AGRICULTURAL BURNING ; AGRICULTURAL WASTE		0.094	0.0932	0.09	Note 1
	670- 662- 0262- 0000- MANAGED BURNING AND DISPOSAL; AGRICULTURAL BURNING ; AGRICULTURAL WASTE		0.4315	0.4415	0.4345	Note 1
	670- 664- 0200- 0000- MANAGED BURNING AND DISPOSAL; RANGE IMPROVEMENT; SOLID FUEL (UNSPECIFIED)		0.0025	0.0023	0.0021	Note 1
	670- 666- 0200- 0000- MANAGED BURNING AND DISPOSAL; FOREST MANAGEMENT; SOLID FUEL (UNSPECIFIED)		0.0562	0.0562	0.0562	Note 1
	670- 668- 0200- 0000- MANAGED BURNING AND DISPOSAL; WEED ABATEMENT; SOLID FUEL (UNSPECIFIED)		0.023	0.0212	0.0197	Note 1
	670- 670- 0200- 0000- MANAGED BURNING AND DISPOSAL; NON; SOLID FUEL (UNSPECIFIED)		0.1403	0.1457	0.1458	Note 1
	670- 995- 0240- 0000- MANAGED BURNING AND DISPOSAL; OTHER; SOLID WASTE (UNSPECIFIED)		0.0002	0.0002	0.0002	Note 1

CMB Source Category	EI Source Assignments	Emission Category	Emissions, Tons/Day Sacramento Federal $PM_{2.5}$ Nonattainment Area			Source
			2011	2017	2024	
Unaccounted Mass	**Other Emissions**	**Total Unaccounted Mass**	**3.03**	**3.38**	**3.60**	**Sum of EICs Below**
	010- 045- 1412- 0000- ELECTRIC UTILITIES; I.C. TURBINE ENGINES; KERONAPTHA JET FUEL		0	0	0	Note 1
	010- 005- 0110- 0000- ELECTRIC UTILITIES; BOILERS; NATURAL GAS		0	0	0	Note 1
	010- 045- 0110- 0000- ELECTRIC UTILITIES; I.C. TURBINE ENGINES; NATURAL GAS		0.1942	0.1894	0.1769	Note 1
	010- 045- 1200- 0000- ELECTRIC UTILITIES; I.C. TURBINE ENGINES; DIESEL/DISTILLATE OIL (UNSPECIFIED)		0.0003	0.0003	0.0003	Note 1
	010- 040- 0142- 0000- ELECTRIC UTILITIES; I.C. RECIPROCATING ENGINES; LANDFILL GAS		0.0524	0.066	0.075	Note 1
	010- 040- 1200- 0000- ELECTRIC UTILITIES; I.C. RECIPROCATING ENGINES; DIESEL/DISTILLATE OIL (UNSPECIFIED)		0	0	0	Note 1
	020- 995- 0012- 0000- COGENERATION; OTHER; FUEL (UNSPECIFIED)		0	0	0	Note 1
	030- 040- 0110- 0000- OIL AND GAS PRODUCTION (COMBUSTION); I.C. RECIPROCATING ENGINES; NATURAL GAS		0.0052	0.0047	0.004	Note 1
	030- 045- 0110- 0000- OIL AND GAS PRODUCTION (COMBUSTION); I.C. TURBINE ENGINES; NATURAL GAS		0	0	0	Note 1
	030- 040- 0100- 0000- OIL AND GAS PRODUCTION (COMBUSTION); I.C. RECIPROCATING ENGINES; GASEOUS FUEL (UNSPECIFIED)		0	0	0	Note 1
	050- 005- 0110- 0000- MANUFACTURING AND INDUSTRIAL; BOILERS; NATURAL GAS		0.0072	0.0072	0.0069	Note 1
	050- 012- 0110- 0000- MANUFACTURING AND INDUSTRIAL; OVEN HEATERS (FORCE DRYING SURFACE COATINGS); NATURAL GAS		0.0036	0.0036	0.0036	Note 1
	050- 012- 0120- 0000- MANUFACTURING AND INDUSTRIAL; OVEN HEATERS (FORCE DRYING SURFACE COATINGS); LIQUIFIED PETROLEUM GAS (LPG)		0	0	0	Note 1
	050- 040- 0142- 0000- MANUFACTURING AND INDUSTRIAL; I.C. RECIPROCATING ENGINES; LANDFILL GAS		0.0021	0.0022	0.0022	Note 1
	050- 040- 1200- 0000- MANUFACTURING AND INDUSTRIAL; I.C. RECIPROCATING ENGINES; DIESEL/DISTILLATE OIL (UNSPECIFIED)		0.003	0.0031	0.0031	Note 1
	050- 070- 0110- 0000- MANUFACTURING AND INDUSTRIAL; IN; NATURAL GAS		0.0023	0.0024	0.0022	Note 1
	050- 005- 0243- 0000- MANUFACTURING AND INDUSTRIAL; BOILERS; REFUSE DERIVED FUEL (UNSPECIFIED)		0.0001	0.0001	0.0001	Note 1
	050- 040- 1412- 0000- MANUFACTURING AND INDUSTRIAL; I.C. RECIPROCATING ENGINES; KERONAPTHA JET FUEL		0	0	0	Note 1

CMB Source Category	EI Source Assignments	Emission Category	Emissions, Tons/Day Sacramento Federal $PM_{2.5}$ Nonattainment Area			Source
			2011	2017	2024	
	050- 995- 0110- 0000- MANUFACTURING AND INDUSTRIAL; OTHER; NATURAL GAS		0.2052	0.2111	0.1981	Note 1
	050- 995- 0120- 0000- MANUFACTURING AND INDUSTRIAL; OTHER; LIQUIFIED PETROLEUM GAS (LPG)		0.0006	0.0004	0.0004	Note 1
	050- 020- 0110- 0000- MANUFACTURING AND INDUSTRIAL; SPACE HEATING; NATURAL GAS		0.0004	0.0004	0.0004	Note 1
	050- 010- 0120- 0000- MANUFACTURING AND INDUSTRIAL; PROCESS HEATERS; LIQUIFIED PETROLEUM GAS (LPG)		0.0028	0.003	0.003	Note 1
	050- 010- 0110- 0000- MANUFACTURING AND INDUSTRIAL; PROCESS HEATERS; NATURAL GAS		0.0047	0.0046	0.0043	Note 1
	050- 040- 0124- 0000- MANUFACTURING AND INDUSTRIAL; I.C. RECIPROCATING ENGINES; PROPANE		0	0	0	Note 1
	050- 040- 1100- 0000- MANUFACTURING AND INDUSTRIAL; I.C. RECIPROCATING ENGINES; GASOLINE (UNSPECIFIED)		0.0001	0.0001	0.0001	Note 1
	050- 995- 1220- 0000- MANUFACTURING AND INDUSTRIAL; OTHER; DISTILLATE OIL (UNSPECIFIED)		0.0005	0.0005	0.0005	Note 1
	050- 005- 0124- 0000- MANUFACTURING AND INDUSTRIAL; BOILERS; PROPANE		0.0001	0.0001	0.0001	Note 1
	050- 040- 0110- 0000- MANUFACTURING AND INDUSTRIAL; I.C. RECIPROCATING ENGINES; NATURAL GAS		0.0023	0.0024	0.0022	Note 1
	050- 005- 1220- 0000- MANUFACTURING AND INDUSTRIAL; BOILERS; DISTILLATE OIL (UNSPECIFIED)		0	0	0	Note 1
	050- 995- 0200- 0000- MANUFACTURING AND INDUSTRIAL; OTHER; SOLID FUEL (UNSPECIFIED)		0.0053	0.0055	0.0055	Note 1
	050- 995- 1000- 0000- MANUFACTURING AND INDUSTRIAL; OTHER; LIQUID FUEL (UNSPECIFIED)		0	0	0	Note 1
	052- 042- 1200- 0010- FOOD AND AGRICULTURAL PROCESSING; AG. IRRIGATION I.C. ENGINES; DIESEL/DISTILLATE OIL (UNSPECIFIED)		0.0186	0.0047	0.0043	Note 1
	052- 042- 1200- 0011- FOOD AND AGRICULTURAL PROCESSING; AG. IRRIGATION I.C. ENGINES; DIESEL/DISTILLATE OIL (UNSPECIFIED)		0.0158	0.0126	0.007	Note 1
	052- 010- 0120- 0000- FOOD AND AGRICULTURAL PROCESSING; PROCESS HEATERS; LIQUIFIED PETROLEUM GAS (LPG)		0.0007	0.001	0.001	Note 1
	052- 010- 1224- 0000- FOOD AND AGRICULTURAL PROCESSING; PROCESS HEATERS; DISTILLATE OIL #2 (FUEL OIL #2)		0	0	0	Note 1
	052- 070- 0110- 0000- FOOD AND AGRICULTURAL PROCESSING; IN; NATURAL GAS		0.0007	0.0007	0.0006	Note 1
	052- 042- 0110- 0000- FOOD AND AGRICULTURAL PROCESSING; AG. IRRIGATION I.C. ENGINES; NATURAL GAS		0.0005	0.0005	0.0004	Note 1

CMB Source Category	EI Source Assignments	Emission Category	Emissions, Tons/Day Sacramento Federal $PM_{2.5}$ Nonattainment Area			Source
			2011	2017	2024	
	052- 040- 1200- 0000- FOOD AND AGRICULTURAL PROCESSING; I.C. RECIPROCATING ENGINES; DIESEL/DISTILLATE OIL (UNSPECIFIED)		0	0	0	Note 1
	052- 010- 0110- 0000- FOOD AND AGRICULTURAL PROCESSING; PROCESS HEATERS; NATURAL GAS		0.0145	0.0153	0.0142	Note 1
	052- 005- 0110- 0000- FOOD AND AGRICULTURAL PROCESSING; BOILERS; NATURAL GAS		0.0059	0.0061	0.0056	Note 1
	060- 005- 0110- 0000- SERVICE AND COMMERCIAL; BOILERS; NATURAL GAS		0.0182	0.0198	0.0201	Note 1
	060- 005- 0144- 0000- SERVICE AND COMMERCIAL; BOILERS; SEWAGE GAS		0.0004	0.0004	0.0004	Note 1
	060- 005- 1220- 0000- SERVICE AND COMMERCIAL; BOILERS; DISTILLATE OIL (UNSPECIFIED)		0	0	0	Note 1
	060- 045- 1200- 0000- SERVICE AND COMMERCIAL; I.C. TURBINE ENGINES; DIESEL/DISTILLATE OIL (UNSPECIFIED)		0	0	0	Note 1
	060- 005- 0124- 0000- SERVICE AND COMMERCIAL; BOILERS; PROPANE		0.0001	0.0001	0.0001	Note 1
	060- 995- 1220- 0000- SERVICE AND COMMERCIAL; OTHER; DISTILLATE OIL (UNSPECIFIED)		0	0	0	Note 1
	060- 995- 0110- 0005- SERVICE AND COMMERCIAL; OTHER; NATURAL GAS		0.0059	0.0061	0.0061	Note 1
	060- 005- 0142- 0000- SERVICE AND COMMERCIAL; BOILERS; LANDFILL GAS		0.0019	0.002	0.002	Note 1
	060- 010- 0110- 0000- SERVICE AND COMMERCIAL; PROCESS HEATERS; NATURAL GAS		0.0018	0.0019	0.002	Note 1
	060- 012- 0110- 0000- SERVICE AND COMMERCIAL; OVEN HEATERS (FORCE DRYING SURFACE COATINGS); NATURAL GAS		0.0003	0.0003	0.0003	Note 1
	060- 040- 0110- 0000- SERVICE AND COMMERCIAL; I.C. RECIPROCATING ENGINES; NATURAL GAS		0	0	0	Note 1
	060- 040- 1200- 0000- SERVICE AND COMMERCIAL; I.C. RECIPROCATING ENGINES; DIESEL/DISTILLATE OIL (UNSPECIFIED)		0.0016	0.0016	0.001	Note 1
	060- 040- 1412- 0000- SERVICE AND COMMERCIAL; I.C. RECIPROCATING ENGINES; KERONAPTHA JET FUEL		0.0001	0.0001	0.0001	Note 1
	060- 995- 0110- 0000- SERVICE AND COMMERCIAL; OTHER; NATURAL GAS		0.1752	0.1891	0.1925	Note 1
	060- 995- 0120- 0000- SERVICE AND COMMERCIAL; OTHER; LIQUIFIED PETROLEUM GAS (LPG)		0.0002	0.0002	0.0002	Note 1
	060- 030- 0110- 0000- SERVICE AND COMMERCIAL; WATER HEATING; NATURAL GAS		0.0126	0.0135	0.0137	Note 1
	060- 045- 1412- 0000- SERVICE AND COMMERCIAL; I.C. TURBINE ENGINES; KERONAPTHA JET FUEL		0	0	0	Note 1

CMB Source Category	EI Source Assignments	Emission Category	Emissions, Tons/Day Sacramento Federal $PM_{2.5}$ Nonattainment Area			Source
			2011	2017	2024	
	060- 020- 0110- 0000- SERVICE AND COMMERCIAL; SPACE HEATING; NATURAL GAS		0.0459	0.0492	0.0499	Note 1
	060- 010- 0130- 0000- SERVICE AND COMMERCIAL; PROCESS HEATERS; PROCESS GAS		0.0001	0.0001	0.0001	Note 1
	099- 040- 1200- 0000- OTHER (FUEL COMBUSTION); I.C. RECIPROCATING ENGINES; DIESEL/DISTILLATE OIL (UNSPECIFIED)		0.0185	0.0169	0.0139	Note 1
	099- 995- 0000- 0000- OTHER (FUEL COMBUSTION); OTHER; MATERIAL NOT SPECIFIED		0.0008	0.0008	0.0008	Note 1
	110- 132- 0146- 0000- SEWAGE TREATMENT; FLARES; DIGESTER GAS		0.0005	0.0006	0.0006	Note 1
	110- 132- 0130- 0000- SEWAGE TREATMENT; FLARES; PROCESS GAS		0.0012	0.0013	0.0013	Note 1
	110- 110- 0300- 0000- SEWAGE TREATMENT; SEWAGE TREATMENT PLANTS; LIQUID WASTE (UNSPECIFIED)		0.0004	0.0004	0.0004	Note 1
	120- 132- 0136- 0000- LANDFILLS; FLARES; WASTE GAS		0.0171	0.0179	0.0181	Note 1
	120- 122- 0242- 0000- LANDFILLS; CLASS II AND III LANDFILLS; MUNICIPAL SOLID WASTE (MSW)		0	0	0	Note 1
	130- 130- 0240- 0000- INCINERATORS; INCINERATION; SOLID WASTE (UNSPECIFIED)		0	0	0	Note 1
	130- 130- 0110- 0000- INCINERATORS; INCINERATION; NATURAL GAS		0.0004	0.0005	0.0005	Note 1
	130- 130- 0130- 0000- INCINERATORS; INCINERATION; PROCESS GAS		0	0	0	Note 1
	130- 132- 0136- 0000- INCINERATORS; FLARES; WASTE GAS		0.0003	0.0003	0.0003	Note 1
	140- 140- 0010- 0000- SOIL REMEDIATION; AERATION/LANDFARMING; HYDROCARBON COMPOUNDS (UNSPECIFIED)		0	0	0	Note 1
	140- 995- 0240- 0000- SOIL REMEDIATION; OTHER; SOLID WASTE (UNSPECIFIED)		0.0002	0.0003	0.0003	Note 1
	140- 995- 0010- 0000- SOIL REMEDIATION; OTHER; HYDROCARBON COMPOUNDS (UNSPECIFIED)		0	0	0	Note 1
	140- 995- 0300- 0000- SOIL REMEDIATION; OTHER; LIQUID WASTE (UNSPECIFIED)		0	0	0	Note 1
	140- 995- 0110- 0000- SOIL REMEDIATION; OTHER; NATURAL GAS		0.0002	0.0002	0.0002	Note 1
	140- 995- 0120- 0000- SOIL REMEDIATION; OTHER; LIQUIFIED PETROLEUM GAS (LPG)		0	0	0	Note 1
	199- 995- 0000- 0000- OTHER (WASTE DISPOSAL); OTHER; MATERIAL NOT SPECIFIED		0	0	0	Note 1
	199- 995- 0300- 0000- OTHER (WASTE DISPOSAL); OTHER; LIQUID WASTE (UNSPECIFIED)		0	0	0	Note 1

CMB Source Category	EI Source Assignments	Emission Category	Emissions, Tons/Day Sacramento Federal $PM_{2.5}$ Nonattainment Area			Source
			2011	2017	2024	
	199- 995- 0260- 0000- OTHER (WASTE DISPOSAL); OTHER; BIOLOGICAL WASTE (UNSPECIFIED)		0	0	0	Note 1
	199- 170- 0260- 0000- OTHER (WASTE DISPOSAL); COMPOSTING; BIOLOGICAL WASTE (UNSPECIFIED)		0	0	0	Note 1
	199- 190- 0010- 0000- OTHER (WASTE DISPOSAL); VOLATILE ORGANIC WASTE DISPOSAL (EVAPORATION); HYDROCARBON COMPOUNDS (UNSPECIFIED)		0	0	0	Note 1
	199- 170- 0240- 0000- OTHER (WASTE DISPOSAL); COMPOSTING; SOLID WASTE (UNSPECIFIED)		0	0	0	Note 1
	199- 130- 0136- 0000- OTHER (WASTE DISPOSAL); INCINERATION; WASTE GAS		0	0	0	Note 1
	410- 995- 4999- 0000- CHEMICAL; OTHER; CHEMICALS (UNSPECIFIED)		0	0	0	Note 1
	410- 400- 2036- 0000- CHEMICAL; CHEMICAL MANUFACTURING; NITRIC ACID		0	0	0	Note 1
	410- 403- 5018- 0000- CHEMICAL; FIBERGLASS AND FIBERGLASS PRODUCTS MANUFACTURING; FIBERGLASS		0.0072	0.0094	0.0119	Note 1
	410- 404- 5032- 0000- CHEMICAL; PLASTICS AND PLASTIC PRODUCTS MANUFACTURING; POLYETHER RESINS		0.0363	0.0469	0.0592	Note 1
	410- 400- 2006- 0000- CHEMICAL; CHEMICAL MANUFACTURING; AMMONIUM PHOSPHATES		0	0	0	Note 1
	410- 400- 5800- 0000- CHEMICAL; CHEMICAL MANUFACTURING; FERTILIZERS (UNSPECIFIED)		0.0169	0.0207	0.0261	Note 1
	410- 328- 3128- 0000- CHEMICAL; FIXED ROOF TANKS ; ETHANOL (ETHYL ALCOHOL)		0	0	0	Note 1
	410- 400- 5520- 0000- CHEMICAL; CHEMICAL MANUFACTURING; PHARMACEUTICALS		0.0001	0.0001	0.0002	Note 1
	410- 404- 5028- 0000- CHEMICAL; PLASTICS AND PLASTIC PRODUCTS MANUFACTURING; POLYESTERS (UNSPECIFIED)		0.0044	0.0057	0.0072	Note 1
	410- 995- 3160- 0000- CHEMICAL; OTHER; FATTY ALCOHOLS (UNSPECIFIED)		0.0005	0.0006	0.0008	Note 1
	410- 995- 3362- 0000- CHEMICAL; OTHER; UREA		0.0002	0.0003	0.0003	Note 1
	410- 995- 5520- 0000- CHEMICAL; OTHER; PHARMACEUTICALS		0.0034	0.0042	0.0053	Note 1
	410- 400- 2002- 0000- CHEMICAL; CHEMICAL MANUFACTURING; AMMONIA		0.0011	0.0015	0.0018	Note 1
	410- 404- 5060- 0000- CHEMICAL; PLASTICS AND PLASTIC PRODUCTS MANUFACTURING; SYNTHETIC ORGANIC FIBERS		0.0578	0.073	0.092	Note 1
	410- 995- 5020- 0000- CHEMICAL; OTHER; MELAMINE RESINS		0	0	0	Note 1

CMB Source Category	EI Source Assignments	Emission Category	Emissions, Tons/Day Sacramento Federal $PM_{2.5}$ Nonattainment Area			Source
			2011	2017	2024	
	410- 328- 3220- 0000- CHEMICAL; FIXED ROOF TANKS ; METHANOL (METHYL ALCOHOL)		0	0	0	Note 1
	410- 404- 5066- 0000- CHEMICAL; PLASTICS AND PLASTIC PRODUCTS MANUFACTURING; VINYL (UNSPECIFIED)		0.0003	0.0003	0.0004	Note 1
	410- 995- 3346- 0000- CHEMICAL; OTHER; TRICHLOROETHYLENE (TCE)		0	0	0	Note 1
	410- 404- 5000- 0000- CHEMICAL; PLASTICS AND PLASTIC PRODUCTS MANUFACTURING; PLASTICS (UNSPECIFIED)		0.059	0.0736	0.0921	Note 1
	410- 995- 8400- 0000- CHEMICAL; OTHER; INK (UNSPECIFIED)		0.0027	0.0035	0.0043	Note 1
	410- 400- 3362- 0000- CHEMICAL; CHEMICAL MANUFACTURING; UREA		0.0135	0.0174	0.022	Note 1
	410- 340- 5530- 0000- CHEMICAL; WASTEWATER TREATMENT; SOAP/DETERGENTS		0	0	0	Note 1
	410- 400- 3000- 0000- CHEMICAL; CHEMICAL MANUFACTURING; ORGANIC CHEMICALS (UNSPECIFIED)		0	0	0	Note 1
	410- 402- 0248- 0000- CHEMICAL; RUBBER AND RUBBER PRODUCTS MANUFACTURING; RUBBER TIRES		0.0001	0.0001	0.0002	Note 1
	410- 404- 5050- 0000- CHEMICAL; PLASTICS AND PLASTIC PRODUCTS MANUFACTURING; POLYVINYL CHLORIDE (PVC)		0.0059	0.0075	0.0095	Note 1
	420- 418- 6052- 0000- FOOD AND AGRICULTURE; AGRICULTURAL PRODUCTS PROCESSING LOSSES; PEANUTS		0	0	0	Note 1
	420- 420- 6038- 0000- FOOD AND AGRICULTURE; AGRICULTURAL CROP PROCESSING LOSSES; GRAIN (UNSPECIFIED)		0.0063	0.0074	0.0085	Note 1
	420- 420- 6060- 0000- FOOD AND AGRICULTURE; AGRICULTURAL CROP PROCESSING LOSSES; RICE		0.0085	0.0103	0.0116	Note 1
	420- 995- 6000- 0000- FOOD AND AGRICULTURE; OTHER; FOOD AND AGRICULTURAL PRODUCTS (UNSPECIFIED)		0	0	0	Note 1
	420- 414- 6000- 0000- FOOD AND AGRICULTURE; BREWERIES; FOOD AND AGRICULTURAL PRODUCTS (UNSPECIFIED)		0.0246	0.0283	0.0317	Note 1
	420- 408- 6090- 0000- FOOD AND AGRICULTURE; WINE FERMENTATION; WINE		0	0	0	Note 1
	420- 418- 6020- 0000- FOOD AND AGRICULTURE; AGRICULTURAL PRODUCTS PROCESSING LOSSES; COFFEE		0	0	0	Note 1
	420- 418- 6040- 0000- FOOD AND AGRICULTURE; AGRICULTURAL PRODUCTS PROCESSING LOSSES; GRAIN FEED		0	0	0	Note 1
	420- 410- 6090- 0000- FOOD AND AGRICULTURE; WINE AGING; WINE		0	0	0	Note 1
	420- 418- 6000- 0000- FOOD AND AGRICULTURE; AGRICULTURAL PRODUCTS PROCESSING LOSSES; FOOD AND AGRICULTURAL PRODUCTS (UNSPECIFIED)		0.0488	0.0568	0.0638	Note 1

CMB Source Category	EI Source Assignments	Emission Category	Emissions, Tons/Day Sacramento Federal $PM_{2.5}$ Nonattainment Area			Source
			2011	2017	2024	
	420- 418- 6018- 0000- FOOD AND AGRICULTURE; AGRICULTURAL PRODUCTS PROCESSING LOSSES; CEREAL		0.006	0.0071	0.0081	Note 1
	420- 412- 6012- 0000- FOOD AND AGRICULTURE; BAKERIES; BREAD/BAKED GOODS		0	0	0	Note 1
	420- 420- 6040- 0000- FOOD AND AGRICULTURE; AGRICULTURAL CROP PROCESSING LOSSES; GRAIN FEED		0.0003	0.0004	0.0004	Note 1
	420- 420- 6064- 0000- FOOD AND AGRICULTURE; AGRICULTURAL CROP PROCESSING LOSSES; SEEDS		0.0002	0.0002	0.0003	Note 1
	420- 420- 6074- 0000- FOOD AND AGRICULTURE; AGRICULTURAL CROP PROCESSING LOSSES; SUGAR BEETS		0.0008	0.001	0.0011	Note 1
	420- 418- 6080- 0000- FOOD AND AGRICULTURE; AGRICULTURAL PRODUCTS PROCESSING LOSSES; VEGETABLE OIL		0.0003	0.0003	0.0004	Note 1
	420- 420- 6000- 0000- FOOD AND AGRICULTURE; AGRICULTURAL CROP PROCESSING LOSSES; FOOD AND AGRICULTURAL PRODUCTS (UNSPECIFIED)		0.3108	0.3692	0.414	Note 1
	420- 338- 0010- 0000- FOOD AND AGRICULTURE; COOLING TOWERS; HYDROCARBON COMPOUNDS (UNSPECIFIED)		0	0	0	Note 1
	420- 414- 6040- 0000- FOOD AND AGRICULTURE; BREWERIES; GRAIN FEED		0	0	0	Note 1
	420- 418- 6003- 0000- FOOD AND AGRICULTURE; AGRICULTURAL PRODUCTS PROCESSING LOSSES; ALMONDS		0.0305	0.0357	0.0398	Note 1
	610- 606- 0110- 0000- RESIDENTIAL FUEL COMBUSTION; FUEL COMBUSTION ; NATURAL GAS		0.2314	0.2562	0.2727	Note 1
	610- 606- 1220- 0000- RESIDENTIAL FUEL COMBUSTION; FUEL COMBUSTION ; DISTILLATE OIL (UNSPECIFIED)		0.0188	0.0097	0.0097	Note 1
	610- 608- 0110- 0000- RESIDENTIAL FUEL COMBUSTION; FUEL COMBUSTION ; NATURAL GAS		0.1142	0.1263	0.1343	Note 1
	610- 610- 0110- 0000- RESIDENTIAL FUEL COMBUSTION; FUEL COMBUSTION ; NATURAL GAS		0.0092	0.0102	0.0108	Note 1
	610- 995- 0110- 0000- RESIDENTIAL FUEL COMBUSTION; OTHER; NATURAL GAS		0.0269	0.0299	0.0313	Note 1
	610- 995- 0120- 0000- RESIDENTIAL FUEL COMBUSTION; OTHER; LIQUIFIED PETROLEUM GAS (LPG)		0.0131	0.0134	0.0101	Note 1
	660- 656- 0200- 0000- FIRES; STRUCTURAL FIRES; SOLID FUEL (UNSPECIFIED)		0.0289	0.0333	0.0382	Note 1
	660- 658- 0200- 0000- FIRES; AUTOMOBILE FIRES; SOLID FUEL (UNSPECIFIED)		0.0395	0.0442	0.0481	Note 1
	690- 680- 6000- 0000- COOKING; COMMERCIAL CHARBROILING; FOOD AND AGRICULTURAL PRODUCTS (UNSPECIFIED)		0.5345	0.5977	0.6575	Note 1
	690- 682- 6000- 0000- COOKING; DEEP FAT FRYING; FOOD AND AGRICULTURAL PRODUCTS (UNSPECIFIED)		0.0004	0.0004	0.0008	Note 1

CMB Source Category	EI Source Assignments	Emission Category	Emissions, Tons/Day Sacramento Federal $PM_{2.5}$ Nonattainment Area			Source
			2011	2017	2024	
	690- 684- 6000- 0000- COOKING; COOKING (UNSPECIFIED); FOOD AND AGRICULTURAL PRODUCTS (UNSPECIFIED)		0.0495	0.0554	0.0609	Note 1
	450- 456- 0230- 0000- WOOD AND PAPER; SAWMILL/WOODWORKING OPERATIONS; WOOD		0.042	0.0484	0.0493	Note 1
	450- 454- 5620- 0000- WOOD AND PAPER; PLYWOOD/PARTICLE BOARD MANUFACTURING; PLYWOOD/PARTICLEBOARD		0.0328	0.0381	0.0388	Note 1
	450- 450- 5610- 0000- WOOD AND PAPER; PULP AND PAPER MANUFACTURING; PAPER/PULP		0.0433	0.0498	0.0507	Note 1
	450- 995- 0230- 0000- WOOD AND PAPER; OTHER; WOOD		0.292	0.334	0.3392	Note 1
	450- 995- 5610- 0000- WOOD AND PAPER; OTHER; PAPER/PULP		0.0041	0.0048	0.0049	Note 1
	230- 230- 9100- 0000- COATINGS AND RELATED PROCESS SOLVENTS; METAL PARTS AND PRODUCTS COATINGS; OIL BASED (ORGANIC SOLVENT BASED) COATINGS (UNSPECIFIED)		0.0016	0.0019	0.0023	Note 1
	230- 230- 9200- 0000- COATINGS AND RELATED PROCESS SOLVENTS; METAL PARTS AND PRODUCTS COATINGS; WATER BASED COATINGS (UNSPECIFIED)		0.0014	0.0017	0.0019	Note 1
	230- 232- 9000- 0000- COATINGS AND RELATED PROCESS SOLVENTS; WOOD FURNITURE AND FABRICATED PRODUCTS COATINGS; COATINGS (UNSPECIFIED)		0.0026	0.003	0.0031	Note 1
	230- 240- 8302- 0000- COATINGS AND RELATED PROCESS SOLVENTS; THINNING AND CLEANUP SOLVENT USES; THINNING SOLVENTS		0.0001	0.0001	0.0001	Note 1
	230- 230- 9000- 0000- COATINGS AND RELATED PROCESS SOLVENTS; METAL PARTS AND PRODUCTS COATINGS; COATINGS (UNSPECIFIED)		0.0059	0.0067	0.0071	Note 1
	230- 218- 9000- 0000- COATINGS AND RELATED PROCESS SOLVENTS; AUTO REFINISHING; COATINGS (UNSPECIFIED)		0.0001	0.0001	0.0001	Note 1
	230- 218- 9050- 0000- COATINGS AND RELATED PROCESS SOLVENTS; AUTO REFINISHING; TOPCOATS (UNSPECIFIED)		0.0026	0.0029	0.003	Note 1
	230- 995- 9000- 0000- COATINGS AND RELATED PROCESS SOLVENTS; OTHER; COATINGS (UNSPECIFIED)		0.0085	0.0104	0.011	Note 1
	230- 995- 9100- 0000- COATINGS AND RELATED PROCESS SOLVENTS; OTHER; OIL BASED (ORGANIC SOLVENT BASED) COATINGS (UNSPECIFIED)		0.0026	0.0028	0.0029	Note 1
	230- 216- 8350- 0000- COATINGS AND RELATED PROCESS SOLVENTS; PREPARATION SOLVENTS; CLEANUP SOLVENTS		0.0001	0.0001	0.0001	Note 1
	230- 218- 9100- 0000- COATINGS AND RELATED PROCESS SOLVENTS; AUTO REFINISHING; OIL BASED (ORGANIC SOLVENT BASED) COATINGS (UNSPECIFIED)		0.0004	0.0004	0.0004	Note 1
	240- 264- 8400- 0000- PRINTING; LITHOGRAPHIC; INK (UNSPECIFIED)		0.001	0.0012	0.0013	Note 1

CMB Source Category	EI Source Assignments	Emission Category	Emissions, Tons/Day Sacramento Federal $PM_{2.5}$ Nonattainment Area			Source
			2011	2017	2024	
	250- 292- 8200- 0000- ADHESIVES AND SEALANTS; ADHESIVES AND SEALANTS; ADHESIVES AND SEALANTS (UNSPECIFIED)		0.001	0.0013	0.0014	Note 1
	440- 444- 7100- 0000- METAL PROCESSES; METAL PLATING AND COATING OPERATIONS; ZINC		0.0027	0.0031	0.0035	Note 1
	470- 338- 0010- 0000- ELECTRONICS; COOLING TOWERS; HYDROCARBON COMPOUNDS (UNSPECIFIED)		0.002	0.0032	0.0032	Note 1
	499- 338- 0010- 0000- OTHER (INDUSTRIAL PROCESSES); COOLING TOWERS; HYDROCARBON COMPOUNDS (UNSPECIFIED)		0.0049	0.009	0.0125	Note 1
	499- 492- 0012- 0000- OTHER (INDUSTRIAL PROCESSES); ; FUEL (UNSPECIFIED)		0.0082	0.0154	0.0214	Note 1
	499- 995- 0010- 0000- OTHER (INDUSTRIAL PROCESSES); OTHER; HYDROCARBON COMPOUNDS (UNSPECIFIED)		0.0003	0.0005	0.0007	Note 1
	499- 995- 0000- 0000- OTHER (INDUSTRIAL PROCESSES); OTHER; MATERIAL NOT SPECIFIED		0.0006	0.0012	0.0015	Note 1
	540- 590- 0400- 0000- ASPHALT PAVING / ROOFING; ASPHALT ROOFING OPERATIONS; ASPHALT		0.0081	0.0085	0.0085	Note 1

Note 1: Except for on-road, CARB CEPAM: NORCAL 2012 $PM_{2.5}$ SIP Baseline Emission Projections, Section a1 - Emission Projections with External Adjustments, downloaded on October 11, 2012. On-road emissions include CARB external adjustments and are based on emissions generated by SACOG using EMFAC2011 and SACOG MTP/SCS2035 vehicle activity forecasts. On-road emissions above also include a ”safety margin” for transportation conformity budget (1.88 tpd of NO_X and 0.09 tpd of direct $PM_{2.5}$ in 2017 and 2.10 tpd of NO_X and 2.02 tpd of direct $PM_{2.5}$ in 2024). ERCs plus additional adjustments from Table B5.1 and Table B5.2 are included in the table.

Note 2: Revised paved emissions provided by CARB on June 13, 2013, incorporating January 2011 Paved Road Emission Factors, and SACOG MTP SCS 2035 VMTs.

Appendix C: Chemical Mass Balance (CMB): Modeling Parameters, Performance Metrics, and Sensitivity Analyses

As part of the maintenance demonstration analysis, we applied chemical mass balance (CMB) receptor modeling to 2009–2012 wintertime (November–February) $PM_{2.5}$ data. The most recent version of the United States Environmental Protection Agency (EPA) CMB model (EPA CMB v.8.2) was used. This Appendix provides supplementary information about the CMB modeling using the data collected at the Del Paso Manor (DPM) and T Street (T St.) monitoring sites. Specifically, this Appendix describes the modeling details, including the chemical species and sample dates used for the CMB modeling, and the CMB modeling results and model performance metrics, in tabular and graphical formats. Results for several sensitivity analyses are provided, including results for the ambient versus the SANDWICH[1]-adjusted datasets, for T St. with and without levoglucosan, and for Del Paso Manor using two datasets with carbon species from different analytical methods. The development of the wood-burning source profiles are described, as well as the CMB sensitivity tests that were conducted for the three different wood-burning profiles.

Table C-1 summarizes the sample dates that were available for the CMB analyses. There were 44 available dates for the ambient data modeling; of these, a subset of 36 dates was available for the SANDWICH-adjusted data modeling. Twelve dates were considered "high concentration" days, each with a measured total mass greater than 18 $\mu g/m^3$. Meteorological conditions for all days analyzed were conducive for high $PM_{2.5}$ in Sacramento County; therefore, the results from this analysis are representative of the day types of concern for maintenance demonstration. The meteorological conditions included either a strong high pressure system over the Great Basin or an approaching cold front well offshore of California with a weak high pressure system over the Great Basin. Locally, winds were generally light to calm, and the low-level temperature inversions were moderate to strong.

Table C-2 provides a summary of the chemical species used in the CMB modeling runs. The EPA CMB model requires a preselected set of fitting species, used in calculating source contribution estimates, and floating species, used in model validation. Ideally, fitting species are dominant and unique components of different emissions sources. Because of the limited availability of species with data above instrument method detection limits (MDL), only 18 species were included as fitting or floating species for CMB modeling of the Del Paso Manor data; one additional species, levoglucosan, was available for the T St. site. At Del Paso Manor, ten fitting species were selected to represent markers for the predominant emissions source types; at T St., levoglucosan, a unique tracer for wood-burning emissions, was also included as a fitting species. Unless otherwise noted, all results for the T St. site provided in this Appendix included levoglucosan and did not include a pure organic carbon (OC) source profile.

Since the ambient speciation data are limited in terms of unique species/source type combinations, only a handful of source types can be quantified by CMB: ammonium sulfate, ammonium nitrate, mobile sources (combined gas/diesel exhaust), dust, wood burning, and "other OC" (i.e., OC attributed to secondary formation from volatile organic compound (VOC) emissions). The ammonium sulfate, ammonium nitrate, mobile sources, dust, and wood-burning

[1] SANDWICH is the Sulfate, Adjusted Nitrate, Derived Water, Inferred Carbonaceous mass Hybrid material balance approach.

(oak/eucalyptus composite) profiles, as well as the associated uncertainties, were provided by the California Air Resources Board (CARB) via the Sacramento Metropolitan Air Quality Management District (SMAQMD).[2] The "other OC" profile was composed entirely of OC and was given a mass fraction of 1, and an uncertainty of 0.1 in the profile dataset. Two additional wood-burning profiles, discussed below, were developed on the basis of the literature.

Tables C-3 through C-6 provide the CMB modeling results for the Del Paso Manor and T St. monitoring sites. The results in Tables C-3 and C-4 were generated from CMB modeling with the ambient datasets at DPM and T St., respectively, while Tables C-5 and C-6 were generated from the SANDWICH-adjusted datasets at DPM and T St. The results include the measured total mass and CMB-estimated total mass, as well as three performance metrics for the least-squares algorithm (R-square, chi-square, and percent mass), for each sample date. The R-square fitting statistic, determined by a linear regression of the measured and CMB-estimated concentrations for fitting species, ranges from 0.0 to 1.0; values closer to 1.0 indicate that the CMB profiles and source contributions explain the measured concentrations, while R-square values less than 0.8 indicate that source contributions do not explain them well. The chi-square fitting statistic describes the difference between the measured and calculated concentrations for fitting species. Values less than one indicate a good fit, while values between 1 and 2 are considered acceptable. Finally, the percent mass indicates the fraction of mass that was estimated, as the sum of the individual source contribution estimates, for each sample date. Values between 80% and 120% are considered acceptable. Also included in Tables C-2 through C-5 are date-specific source contribution estimates in units of $\mu g/m^3$ for the major source types: ammonium sulfate, ammonium nitrate, motor vehicles, soil/dust, wood burning, and other organic carbon sources. The difference between the measured and CMB-estimated total mass is also provided for each sample date ("Unapportioned").

The CMB results were typically within acceptable ranges for the performance metrics, but the chi-square values were at the high end of the acceptable range. This may be due to the lack of unique tracers for the source types. As shown in Table C-3, average performance statistics for the CMB results using the ambient dataset at Del Paso Manor were 0.9, 5.9, and 78.4 for the R-square, chi-square, and percent mass, respectively. The chi-square improved to 4.1, and the percent mass improved to 79.7 when only the 12 high concentration dates were considered. Further, the sum of species in the ambient dataset typically accounted for only 80% of the measured total mass; therefore, CMB results were equivalent in the total mass apportioned (approximately 80%). As shown in Table C-4, average CMB performance statistics using the ambient dataset at T St. were better: 0.9, 4.0, and 98.4 for the R-square, chi-square, and percent mass, respectively. Levoglucosan is a unique wood-burning tracer and enables better source apportionment between source types, resulting in more total mass apportioned and improved fitting statistics. Certain sample dates had poor (less than 0.8) R-square values; these dates were often characterized by low total mass. The CMB model performance improved for the DPM SANDWICH-adjusted dataset; the R-square, chi-square, and percent mass metrics were 0.9, 4.5, and 94.8, respectively (Table C-5). The CMB model performance for the T St. SANDWICH-adjusted dataset was comparable to the ambient dataset (Table C-6).

Figures C-1 through C-4 provide a time series of CMB-estimated source contributions by source type for each sample date; the percent mass estimated by CMB is also displayed.

[2] Email from Janice Lam and Kasia Turkiewicz, March 17, 2009.

Figures C-1 and C-2 show time series plots for the ambient datasets at DPM and T St. and Figures C-3 and C-4 show time series plots for the SANDWICH-adjusted datasets at DPM and T St. In general, the time series are consistent with the average source contributions provided in the maintenance demonstration report; both sites are predominantly influenced by ammonium nitrate and wood-burning emissions. However, at the Del Paso Manor site there are dates on which contributions from wood burning were low and mass contributions from the OC or unapportioned source types were higher than typical (greater than 10 to 20% of the total mass). On November 3, 2009, for example, the mass apportioned to "Other OC" was 32% and the unapportioned mass was 25% of the total mass. In contrast, at T St. on the same date, CMB apportioned more mass than typical (greater than 10% of the total mass) to the motor vehicles and/or dust source types.

Figures C-5 and C-6 provide a comparison of the CMB results for the T St. site with and without the use of levoglucosan as a model fitting species. Sensitivity tests were conducted to evaluate the results when both levoglucosan data and a pure OC profile were included. The source contribution estimates for the OC source type when the OC profile was included were nearly always negative and less than the standard error, indicating that the OC profile was collinear with other profiles. Therefore, results provided here that include levoglucosan as a fitting species did not also include a pure OC profile. As shown in both the ambient and SANDWICH comparisons, the levoglucosan data enable better attribution of mass between the wood-burning and motor vehicles source types, resulting in less unapportioned mass.

Figure C-7 shows results of a sensitivity test comparing results between two analytical methods used to determine OC and EC at the Del Paso Manor site. Beginning in 2009, the analytical method for carbon species changed, and carbon species with revised analytical methods were available for both Thermal Optical Transmittance (TOT)-based and Thermal Optical Reflectance (TOR)-based carbon parameters. Sensitivity tests were conducted to evaluate the different carbon methods relative to the carbon fractions in the source profiles. On average, the results were very similar (within 5%) for all source types; typically, model performance, including mass apportioned, was better for the TOT-based results.

Additional sensitivity tests were performed to assess the variability in results for different wood-burning source profiles. The results from the wood-burning sensitivity runs are provided in **Figures C-8 and C-9**. Three wood-burning source profiles were compared: (1) a composite oak and eucalyptus profile provided by CARB[3], (2) an oak profile, and (3) a composite oak, pine, and fire profile. The oak and oak/pine/fir profiles were based on reported literature[4]. The range in source contribution estimates for the three wood-burning profiles is displayed for each sample date in Figure C-8. The panels in Figure C-9 show the average source contributions, considering all possible dates in the dataset, for the three different wood-burning profiles.

[3] Email from Janice Lam and Kasia Turkiewicz, March 17, 2009.

[4] Fine, P. M., G. R. Cass, et al. (2004). "Chemical characterization of fine particle emissions from the fireplace combustion of wood types grown in the Midwestern and Western United States." Environmental Engineering Science **21**: 387-409.

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Table C-1. A summary of the 44 dates available for the CMB analyses is provided. Of the 44 dates, 36 dates were available for the SANDWICH-adjusted analyses.

2009	2010	2011	2012
11/3/2009	1/2/2010	1/3/2011	1/10/2012*
11/24/2009*	1/5/2010*	1/9/2011	
11/30/2009*	1/11/2010	1/27/2011*	
12/9/2009	1/20/2010	2/2/2011	
12/15/2009	1/26/2010	2/8/2011	
12/27/2009*	2/1/2010	2/14/2011	
	2/7/2010	2/20/2011	
	2/16/2010	2/26/2011	
	2/22/2010	11/5/2011	
	2/25/2010	11/8/2011*	
	11/4/2010	11/20/2011	
	11/10/2010	11/29/2011*	
	11/16/2010	12/5/2011*	
	11/22/2010	12/11/2011	
	11/28/2010	12/17/2011	
	12/4/2010*	12/20/2011	
	12/7/2010	12/29/2011*	
	12/16/2010*		
	12/22/2010		
	12/28/2010		

The 12 dates marked with an "*" indicate the dates included in the "high concentration" aggregates.

Table C-2. Chemical species included in the CMB model as fitting (marked with an "x") or floating species (unmarked).

Species	Fitting Species	Source
Ammonium	X	Ammonium sulfate, ammonium nitrate
Bromine		Gas/diesel
Calcium	X	Dust
Chlorine		Multiple
Copper		Gas/diesel, dust
Elemental Carbon	X	Wood burning, gas/diesel
Iron	X	Dust
Lead		Multiple
Levoglucosan*	X	Wood burning
Manganese		Multiple
Nickel		Multiple
Nitrate	X	Ammonium nitrate
Organic carbon**	X	Wood burning, gas/diesel
Potassium	X	Wood burning
Silicon	X	Dust
Sodium		Multiple
Sulfate	X	Ammonium sulfate
Titanium		Multiple
Zinc	X	Multiple

* Levoglucosan data were only available for the T St. modeling runs.
** Organic mass estimates were used in the SANDWICH-adjusted datasets instead of organic carbon.

Table C-3. CMB results for the Del Paso Manor ambient dataset.

Negative values for the "Unapportioned" source contribution estimates indicate the predicted total mass was higher than the measured total mass.

Date	Measured Mass	CMB Mass	R-square	Chi square	% Mass	Wood Burning	Ammon. Sulfate	Ammon. Nitrate	OC	Motor Vehicles	Dust	Un-apportioned
11/3/2009	14.50	10.93	0.93	3.76	75.35	1.01	0.34	1.15	4.76	1.63	2.03	3.57
11/24/2009	27.10	23.13	0.94	4.02	85.35	9.98	0.55	6.31	3.13	2.07	1.09	3.97
11/30/2009	27.50	23.74	0.94	3.97	86.34	8.37	0.84	8.48	3.61	1.59	0.85	3.76
12/9/2009	34.70	27.59	0.97	2.12	79.51	12.82	0.62	4.64	6.71	2.34	0.46	7.11
12/15/2009	13.50	13.18	0.95	3.14	97.61	5.01	0.55	5.11	1.20	1.02	0.29	0.32
12/27/2009	26.30	22.85	0.97	2.11	86.88	3.77	1.08	15.46	1.21	1.10	0.22	3.45
1/2/2010	19.30	15.32	0.92	5.78	79.36	4.60	0.93	6.75	2.36	0.49	0.19	3.98
1/5/2010	24.80	20.33	0.94	4.59	81.97	2.12	1.43	12.76	2.60	0.80	0.62	4.47
1/11/2010	16.30	11.90	0.93	4.52	73.02	2.91	0.85	6.08	0.94	0.75	0.38	4.40
1/20/2010	2.40	1.28	0.80	12.83	53.22	0.64	0.10	0.19	0.18	0.11	0.06	1.12
1/26/2010	5.20	3.76	0.80	13.29	72.40	0.73	0.19	1.09	0.97	0.41	0.37	1.44
2/1/2010	15.80	11.74	0.93	3.92	74.31	5.35	0.27	2.91	1.98	0.97	0.26	4.06
2/7/2010	10.50	11.70	0.93	5.39	111.47	3.13	1.30	3.72	2.38	0.59	0.58	-1.20
2/16/2010	11.90	10.22	0.94	4.10	85.85	2.27	0.60	3.32	2.17	0.96	0.90	1.68
2/22/2010	10.80	7.61	0.94	4.51	70.47	3.09	0.58	1.37	1.23	0.58	0.75	3.19
2/25/2010	10.00	8.78	0.91	5.62	87.83	2.83	0.42	2.26	1.94	0.82	0.51	1.22
11/4/2010	12.40	9.31	0.93	3.49	75.07	0.87	0.14	1.31	3.46	1.65	1.88	3.09
11/10/2010	4.30	4.26	0.90	6.56	99.01	1.15	0.31	1.33	0.72	0.41	0.34	0.04
11/16/2010	14.70	13.10	0.92	5.47	89.11	-0.31	0.85	3.54	4.09	1.28	3.66	1.60
11/22/2010	5.70	3.44	0.76	17.80	60.35	2.08	0.27	0.56	0.09	0.27	0.17	2.26
11/28/2010	15.30	12.03	0.94	3.65	78.65	4.42	0.45	3.29	2.85	0.88	0.14	3.27
12/4/2010	30.30	25.13	0.95	2.88	82.94	4.02	0.82	17.39	1.61	0.96	0.32	5.17
12/7/2010	13.40	10.86	0.87	6.20	81.01	4.07	-0.07	1.39	2.37	1.74	1.36	2.54

Date	Measured Mass	CMB Mass	R-square	Chi square	% Mass	Wood Burning	Ammon. Sulfate	Ammon. Nitrate	OC	Motor Vehicles	Dust	Un-apportioned
12/16/2010	18.20	13.51	0.89	5.87	74.21	6.35	0.17	2.44	2.49	1.56	0.50	4.69
12/22/2010	5.90	4.71	0.80	8.55	79.75	1.80	-0.13	0.68	1.20	0.72	0.42	1.19
12/28/2010	11.00	8.31	0.92	5.82	75.55	1.89	0.72	3.30	1.60	0.46	0.35	2.69
1/3/2011	14.50	11.36	0.89	8.45	78.36	4.16	0.40	2.62	2.97	0.63	0.58	3.14
1/9/2011	16.80	13.41	0.97	1.76	79.83	4.34	0.42	5.97	1.89	0.74	0.06	3.39
1/27/2011	24.40	16.96	0.94	4.22	69.51	1.70	0.93	8.82	2.11	1.77	1.63	7.44
2/2/2011	18.80	10.87	0.96	2.51	57.83	3.01	0.57	3.44	1.58	1.35	0.91	7.93
2/8/2011	1.90	0.95	0.94	3.04	49.79	-0.01	0.12	0.11	0.36	0.16	0.22	0.95
2/14/2011	7.40	6.03	0.97	2.31	81.49	1.77	1.14	1.92	0.66	0.21	0.32	1.37
2/20/2011	11.70	8.61	0.91	5.67	73.61	3.93	0.29	1.66	1.89	0.57	0.28	3.09
2/26/2011	6.00	5.65	0.87	5.42	94.12	1.64	0.03	0.79	1.15	1.37	0.66	0.35
11/5/2011	10.10	7.48	0.78	11.59	74.02	4.48	0.08	0.83	1.15	0.70	0.23	2.62
11/8/2011	22.30	15.47	0.88	8.02	69.38	7.57	0.52	2.38	2.78	1.47	0.76	6.83
11/20/2011	4.20	3.04	0.58	28.81	72.26	1.34	0.08	0.44	0.66	0.30	0.22	1.16
11/29/2011	18.30	13.29	0.93	4.57	72.64	2.27	0.73	6.64	1.66	1.09	0.89	5.01
12/5/2011	25.30	21.74	0.96	2.42	85.92	7.50	0.52	9.18	1.80	1.54	1.18	3.56
12/11/2011	33.50	25.29	0.95	3.05	75.48	10.26	0.74	6.38	5.50	1.90	0.51	8.21
12/17/2011	40.70	31.85	0.94	4.70	78.25	10.22	1.25	13.70	4.97	1.16	0.55	8.85
12/20/2011	51.60	40.87	0.94	4.44	79.21	11.92	2.18	22.12	1.74	1.99	0.92	10.73
12/29/2011	52.90	45.31	0.95	3.64	85.65	6.21	1.41	30.34	4.15	1.67	1.53	7.59
1/10/2012	35.80	26.98	0.94	3.23	75.35	11.36	0.55	5.64	3.94	3.95	1.53	8.82

Table C-4. CMB results for the T St. ambient dataset.

The dataset included levoglucosan as a fitting species and did not include a pure organic carbon source profile. CMB was not able to calculate a solution for 2/22/2010 or 12/11/2011; this often indicates collinearity between sources. Negative values for the "Unapportioned" source contribution estimates indicate the predicted total mass was higher than the measured total mass.

Date	Measured Mass	CMB Mass	R- square	Chi- square	% Mass	Wood Burning	Ammon. Sulfate	Ammon. Nitrate	Motor Vehicles	Dust	Un-apportioned
11/3/2009	17.00	14.93	0.86	2.64	87.84	4.96	0.09	1.33	6.26	2.28	2.07
11/24/2009	28.00	24.77	0.89	4.47	88.46	9.95	0.57	8.25	3.90	2.10	3.23
11/30/2009	20.00	23.64	0.93	3.48	118.20	10.37	0.88	10.18	1.17	1.04	-3.64
12/9/2009	26.00	25.56	0.91	5.07	98.31	19.34	0.69	5.08	0.26	0.20	0.44
12/15/2009	14.00	15.75	0.89	4.96	112.50	5.86	0.78	7.66	0.70	0.75	-1.75
12/27/2009	28.00	28.15	0.90	5.05	100.52	9.82	1.07	16.88	0.33	0.06	-0.15
1/2/2010	10.00	12.50	0.94	2.26	124.95	4.69	0.98	6.43	0.31	0.08	-2.50
1/5/2010	22.00	22.86	0.92	3.85	103.90	6.27	1.86	13.43	0.87	0.43	-0.86
1/11/2010	15.00	16.31	0.91	4.14	108.73	6.01	1.35	8.04	0.65	0.27	-1.31
1/20/2010	3.00	1.96	0.83	1.84	65.42	1.28	-0.09	0.31	0.31	0.16	1.04
1/26/2010	4.00	4.18	0.93	1.19	104.44	0.89	0.17	2.09	0.88	0.15	-0.18
2/1/2010	13.00	12.53	0.89	4.89	96.35	5.94	0.51	5.15	0.44	0.49	0.47
2/7/2010	7.00	6.85	0.88	3.78	97.89	4.45	0.23	1.33	0.49	0.35	0.15
2/16/2010	13.00	12.85	0.91	2.99	98.84	3.76	0.71	4.33	2.71	1.35	0.15
2/22/2010											
2/25/2010	6.00	8.00	0.90	2.76	133.38	2.03	0.57	3.58	1.36	0.45	-2.00
11/4/2010	17.00	15.10	0.92	1.70	88.84	5.14	-0.10	2.58	5.81	1.68	1.90
11/10/2010	5.00	5.00	0.89	2.27	99.98	1.77	0.12	1.89	0.92	0.30	0.00
11/16/2010	14.00	13.70	0.95	1.66	97.85	3.77	0.86	5.89	2.30	0.87	0.30
11/22/2010	5.00	4.68	0.86	3.55	93.56	2.27	0.22	1.32	0.51	0.36	0.32
11/28/2010	8.00	7.39	0.91	2.86	92.34	3.31	0.34	3.29	0.35	0.09	0.61
12/4/2010	32.00	30.26	0.91	4.99	94.55	9.49	0.89	19.58	0.12	0.18	1.74
12/7/2010	11.00	13.25	0.88	4.84	120.50	8.07	0.00	2.27	1.34	1.57	-2.25

Date	Measured Mass	CMB Mass	R- square	Chi- square	% Mass	Wood Burning	Ammon. Sulfate	Ammon. Nitrate	Motor Vehicles	Dust	Un-apportioned
12/16/2010	16.00	18.84	0.83	9.19	117.76	11.81	0.36	4.56	1.09	1.01	-2.84
12/22/2010	4.00	2.69	0.84	1.72	67.18	0.56	-0.26	0.99	1.18	0.21	1.31
12/28/2010	13.00	14.42	0.88	6.19	110.91	6.86	0.79	5.58	0.40	0.79	-1.42
1/3/2011	10.00	11.60	0.85	6.82	116.04	6.98	0.26	3.41	0.47	0.49	-1.60
1/9/2011	11.00	12.03	0.82	8.23	109.36	5.65	0.29	5.80	0.18	0.11	-1.03
1/27/2011	23.00	20.02	0.90	5.14	87.05	7.94	1.26	8.47	1.16	1.19	2.98
2/2/2011	9.00	7.47	0.91	3.10	82.98	3.67	0.35	2.19	0.63	0.62	1.53
2/8/2011	1.00	1.18	0.84	1.09	118.20	0.57	0.02	0.10	0.25	0.25	-0.18
2/14/2011	7.00	5.36	0.93	1.66	76.60	1.17	0.89	1.97	0.98	0.36	1.64
2/20/2011	6.00	5.51	0.78	6.95	91.75	3.90	-0.01	1.30	0.21	0.10	0.49
2/26/2011	4.00	3.74	0.89	2.01	93.58	2.48	-0.07	0.67	0.48	0.18	0.26
11/5/2011	10.00	10.25	0.88	4.94	102.54	7.64	-0.05	1.50	0.47	0.70	-0.25
11/8/2011	14.00	14.31	0.91	4.40	102.20	9.10	0.52	3.29	0.71	0.69	-0.31
11/20/2011	3.00	2.65	0.87	2.01	88.26	1.45	-0.23	0.89	0.45	0.09	0.35
11/29/2011	21.00	17.88	0.93	3.11	85.15	6.89	1.05	7.94	1.24	0.76	3.12
12/5/2011	20.00	20.01	0.90	5.47	100.07	10.18	0.39	7.01	0.80	1.64	-0.01
12/11/2011											
12/17/2011	36.00	34.21	0.89	6.68	95.02	13.12	1.71	18.24	0.76	0.39	1.79
12/20/2011	50.00	33.87	0.91	5.39	67.74	13.91	1.52	16.08	1.24	1.11	16.13
12/29/2011	55.00	49.53	0.92	5.01	90.05	16.02	1.45	29.63	0.69	1.74	5.47
1/10/2012	28.00	28.74	0.90	5.69	102.64	16.49	0.82	8.42	1.08	1.92	-0.74

Table C-5. CMB results for the Del Paso Manor SANDWICH-adjusted dataset.

Negative values for the "Unapportioned" source contribution estimates indicate the predicted total mass was higher than the measured total mass.

Date	Measured Mass	CMB Mass	R-square	Chi-square	% Mass	Wood Burning	Ammon. Sulfate	Ammon. Nitrate	OC	Motor Vehicles	Dust	Un-apportioned
11/24/2009	26.40	25.71	0.94	4.40	97.38	9.92	0.69	5.01	6.93	2.07	1.09	0.69
11/30/2009	26.90	26.59	0.95	4.19	98.86	8.35	0.89	7.52	7.38	1.59	0.85	0.31
12/15/2009	13.40	13.43	0.94	4.02	100.25	4.99	0.61	4.10	2.42	1.02	0.29	-0.03
12/27/2009	27.90	26.82	0.97	2.13	96.13	3.77	1.07	16.06	4.59	1.10	0.22	1.08
1/2/2010	19.20	18.43	0.93	5.75	96.00	4.60	0.93	6.59	5.63	0.49	0.19	0.77
1/5/2010	24.30	23.32	0.94	4.70	95.97	2.12	1.42	13.55	4.82	0.80	0.62	0.98
1/11/2010	13.80	13.08	0.94	4.60	94.76	2.91	0.84	6.27	1.93	0.75	0.38	0.72
1/20/2010	2.40	1.76	0.95	2.08	73.31	0.62	0.19	-0.03	0.81	0.11	0.06	0.64
1/26/2010	4.80	4.11	0.89	6.34	85.60	0.73	0.24	0.66	1.70	0.41	0.37	0.69
2/1/2010	15.90	15.40	0.94	3.99	96.83	5.30	0.38	2.00	6.48	0.97	0.27	0.50
2/7/2010	9.00	8.93	0.93	5.30	99.26	3.12	1.42	2.82	0.40	0.59	0.58	0.07
2/16/2010	10.90	11.68	0.84	11.30	107.15	2.24	1.03	0.87	5.70	0.94	0.90	-0.78
2/25/2010	8.80	8.79	0.91	5.81	99.90	2.80	0.58	1.21	2.88	0.81	0.51	0.01
11/4/2010	12.10	12.04	0.91	3.49	99.46	0.85	0.46	0.22	7.00	1.61	1.89	0.06
11/10/2010	3.80	3.92	0.90	5.74	103.19	1.14	0.46	0.45	1.12	0.40	0.34	-0.12
11/22/2010	4.20	3.67	0.91	4.53	87.47	2.02	0.45	-0.03	0.80	0.27	0.18	0.53
11/28/2010	14.80	13.20	0.95	3.10	89.16	4.42	0.46	3.04	4.26	0.88	0.14	1.60
12/4/2010	30.40	29.06	0.96	2.92	95.60	4.02	0.82	17.72	5.22	0.96	0.32	1.34
12/7/2010	10.50	9.97	0.87	4.51	94.91	4.02	0.30	0.15	2.43	1.70	1.36	0.53
12/16/2010	17.70	16.00	0.92	4.22	90.42	6.31	0.27	1.88	5.48	1.56	0.50	1.70
12/22/2010	4.70	4.33	0.87	3.68	92.20	1.78	0.04	0.09	1.29	0.70	0.43	0.37
12/28/2010	10.80	9.66	0.93	5.75	89.48	1.89	0.72	3.20	3.05	0.46	0.35	1.14
1/3/2011	13.00	11.28	0.91	6.96	86.74	4.15	0.42	2.28	3.21	0.63	0.58	1.72
1/9/2011	15.80	14.39	0.97	1.76	91.05	4.33	0.42	5.93	2.90	0.74	0.06	1.41

Date	Measured Mass	CMB Mass	R-square	Chi-square	% Mass	Wood Burning	Ammon. Sulfate	Ammon. Nitrate	OC	Motor Vehicles	Dust	Un-apportioned
1/27/2011	20.40	19.55	0.94	4.46	95.81	1.70	0.92	9.24	4.29	1.77	1.63	0.85
2/2/2011	10.80	11.10	0.90	6.21	102.82	2.98	0.90	1.58	3.41	1.33	0.91	-0.30
2/14/2011	6.20	6.48	0.94	4.37	104.54	1.76	1.59	0.31	2.29	0.21	0.32	-0.28
2/20/2011	9.30	9.07	0.91	5.70	97.55	3.84	0.44	0.78	3.16	0.56	0.28	0.23
2/26/2011	5.60	5.63	0.83	4.68	100.58	1.63	0.23	0.16	1.59	1.35	0.66	-0.03
11/5/2011	9.80	8.83	0.94	2.30	90.12	4.35	0.31	-0.02	3.26	0.70	0.24	0.97
11/8/2011	20.30	19.34	0.93	4.39	95.28	7.44	0.84	0.96	7.88	1.45	0.76	0.96
11/20/2011	3.30	2.77	0.85	5.50	83.93	1.30	0.24	-0.09	0.81	0.29	0.22	0.53
11/29/2011	16.80	14.95	0.93	5.20	88.96	2.28	0.73	6.95	3.01	1.09	0.89	1.85
12/5/2011	24.70	23.95	0.97	2.41	96.96	7.50	0.54	8.56	4.62	1.54	1.18	0.75
12/29/2011	54.30	54.66	0.96	3.58	100.66	6.21	1.41	31.08	12.76	1.67	1.53	-0.36
1/10/2012	35.30	33.14	0.95	2.95	93.89	11.31	0.84	4.26	11.28	3.93	1.53	2.16

Table C-6. CMB results for the T St. SANDWICH-adjusted dataset.

The dataset included levoglucosan as a fitting species and did not include a pure organic carbon source profile. Negative values for the "Unapportioned" source contribution estimates indicate the predicted total mass was higher than the measured total mass.

Date	Measured Mass	CMB Mass	R-square	Chi-square	% Mass	Wood Burning	Ammon. Sulfate	Ammon. Nitrate	Motor Vehicles	Dust	Un-apportioned
11/24/2009	23.00	23.67	0.88	5.00	102.90	10.24	0.95	6.12	4.36	2.01	-0.67
11/30/2009	20.80	22.22	0.92	4.23	106.84	10.41	1.01	8.58	1.19	1.03	-1.42
12/15/2009	12.10	13.77	0.86	6.16	113.83	5.17	0.96	6.15	0.73	0.77	-1.67
12/27/2009	25.50	27.27	0.89	5.71	106.93	8.20	1.07	17.42	0.48	0.10	-1.77
1/2/2010	12.20	12.32	0.94	2.39	100.94	5.41	1.10	5.46	0.27	0.06	-0.12
1/5/2010	22.90	23.40	0.92	3.76	102.18	6.10	1.82	14.20	0.85	0.43	-0.50
1/11/2010	17.00	17.12	0.91	4.05	100.68	6.86	1.33	8.06	0.64	0.23	-0.12
1/20/2010	2.60	1.68	0.79	1.76	64.52	1.10	0.01	0.13	0.28	0.16	0.92
1/26/2010	4.00	3.44	0.82	2.11	86.02	0.99	0.67	0.61	1.04	0.14	0.56
2/1/2010	11.80	12.13	0.86	6.40	102.83	7.34	0.82	3.20	0.37	0.40	-0.33
2/7/2010	5.80	5.85	0.82	4.35	100.90	4.11	0.69	0.19	0.49	0.37	-0.05
2/16/2010	10.90	10.47	0.74	6.18	96.09	3.96	1.88	0.20	3.19	1.25	0.43
2/25/2010	6.70	6.59	0.82	4.51	98.36	2.26	1.16	1.42	1.30	0.45	0.11
11/4/2010	16.20	13.76	0.86	1.93	84.95	5.23	0.73	0.10	6.08	1.62	2.44
11/10/2010	3.90	3.83	0.82	2.55	98.08	1.72	0.77	0.20	0.83	0.31	0.07
11/22/2010	4.80	4.43	0.84	3.00	92.25	2.70	0.72	0.15	0.51	0.35	0.37
11/28/2010	6.50	6.42	0.90	2.87	98.78	2.88	0.53	2.52	0.38	0.10	0.08
12/4/2010	30.60	29.66	0.90	5.19	96.91	8.62	0.90	19.73	0.18	0.23	0.94
12/7/2010	11.10	11.74	0.83	5.46	105.79	7.94	0.73	0.15	1.35	1.56	-0.64
12/16/2010	17.40	19.08	0.83	8.83	109.67	12.14	0.38	4.40	1.17	0.98	-1.68
12/22/2010	2.40	1.90	0.75	1.62	79.08	0.56	0.13	0.16	0.83	0.23	0.50
12/28/2010	13.80	14.17	0.87	6.13	102.71	6.84	0.83	5.30	0.42	0.79	-0.37
1/3/2011	10.10	10.49	0.83	6.99	103.82	6.28	0.42	2.74	0.52	0.52	-0.39
1/9/2011	11.10	11.06	0.82	7.83	99.65	4.68	0.33	5.57	0.24	0.24	0.04

Date	Measured Mass	CMB Mass	R-square	Chi-square	% Mass	Wood Burning	Ammon. Sulfate	Ammon. Nitrate	Motor Vehicles	Dust	Un-apportioned
1/27/2011	21.60	20.86	0.90	5.05	96.56	8.41	1.21	8.85	1.23	1.17	0.74
2/2/2011	6.80	6.71	0.83	4.63	98.60	4.25	1.03	0.21	0.60	0.60	0.09
2/14/2011	5.40	4.66	0.87	1.89	86.33	1.27	1.55	0.18	1.35	0.32	0.74
2/20/2011	4.60	4.70	0.70	6.72	102.20	3.71	0.48	0.16	0.24	0.11	-0.10
2/26/2011	2.90	2.67	0.83	1.97	92.13	1.68	0.21	0.13	0.44	0.20	0.23
11/5/2011	9.40	9.77	0.87	3.90	103.90	7.99	0.51	0.11	0.48	0.68	-0.37
11/8/2011	13.00	13.49	0.88	4.77	103.76	10.04	1.21	0.88	0.71	0.65	-0.49
11/20/2011	2.40	1.90	0.88	0.89	79.21	1.18	0.17	0.11	0.35	0.09	0.50
11/29/2011	17.90	16.94	0.91	3.96	94.62	5.51	1.04	8.43	1.13	0.82	0.96
12/5/2011	17.10	18.32	0.87	6.45	107.12	8.55	0.44	6.77	0.89	1.67	-1.22
12/29/2011	50.50	50.74	0.92	4.91	100.47	16.31	1.43	30.56	0.71	1.73	-0.24
1/10/2012	27.10	29.09	0.92	4.86	107.33	18.25	0.97	6.92	1.11	1.84	-1.99

Figure C-1. Time series of CMB results for the Del Paso Manor ambient dataset. Negative values for the "Unapportioned" source contribution estimates indicate the predicted total mass was higher than the measured total mass.

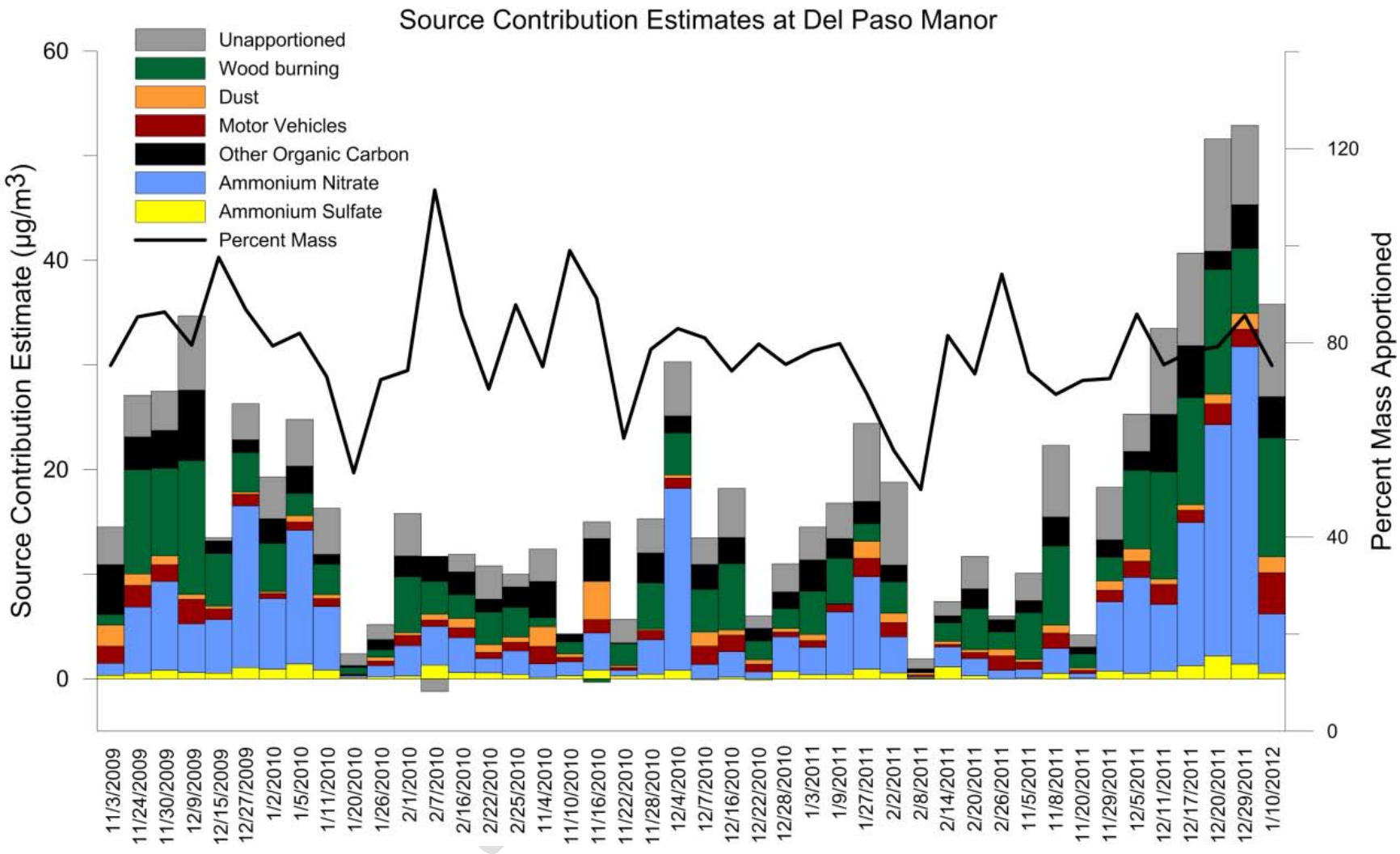


Figure C-2. Time series of CMB results for the T St. ambient dataset. Negative values for the "Unapportioned" source contribution estimates indicate the predicted total mass was higher than the measured total mass.

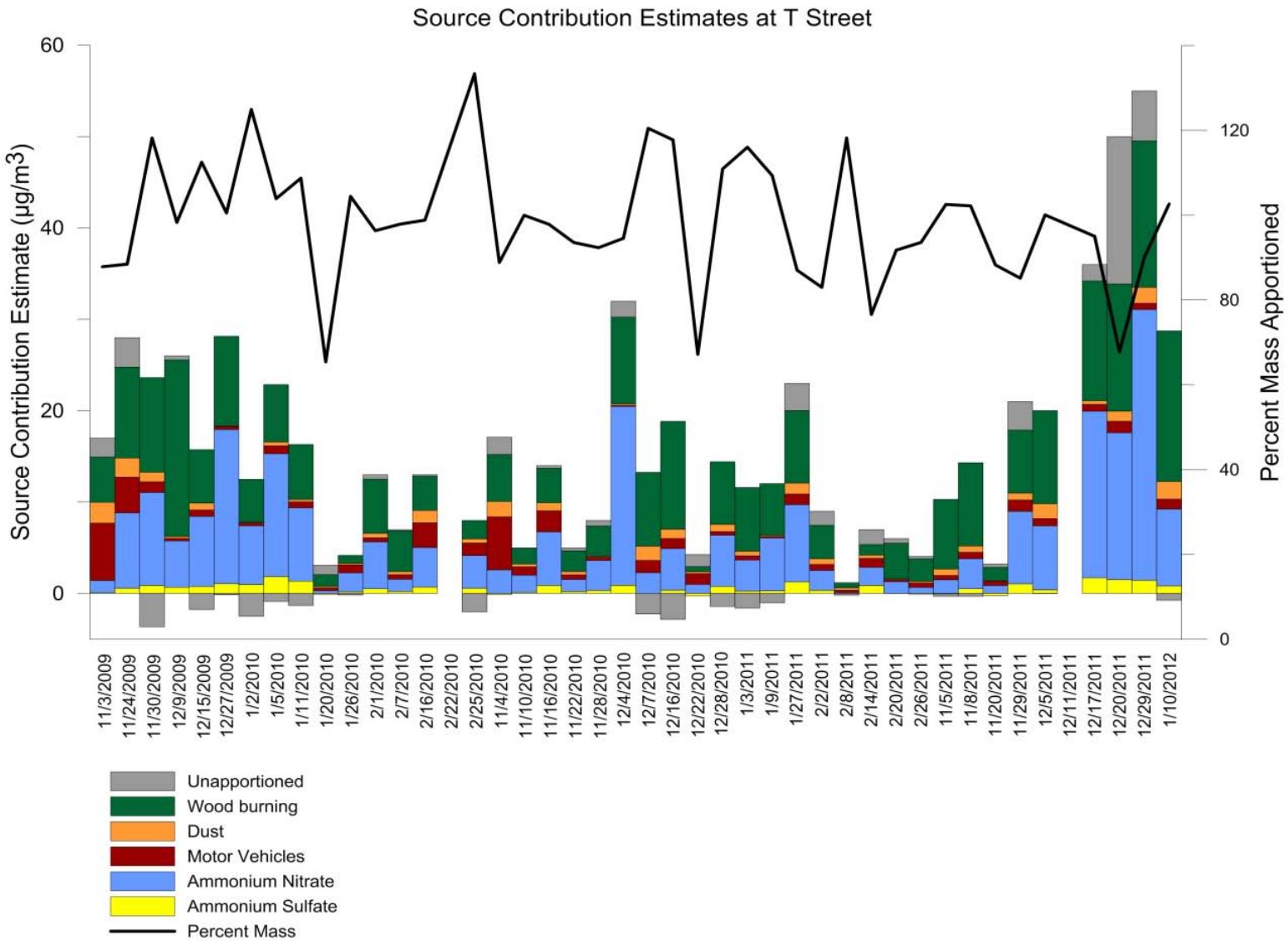


Figure C-3. Time series of CMB results for the Del Paso Manor SANDWICH-adjusted dataset. Negative values for the "Unapportioned" source contribution estimates indicate the predicted total mass was higher than the measured total mass.

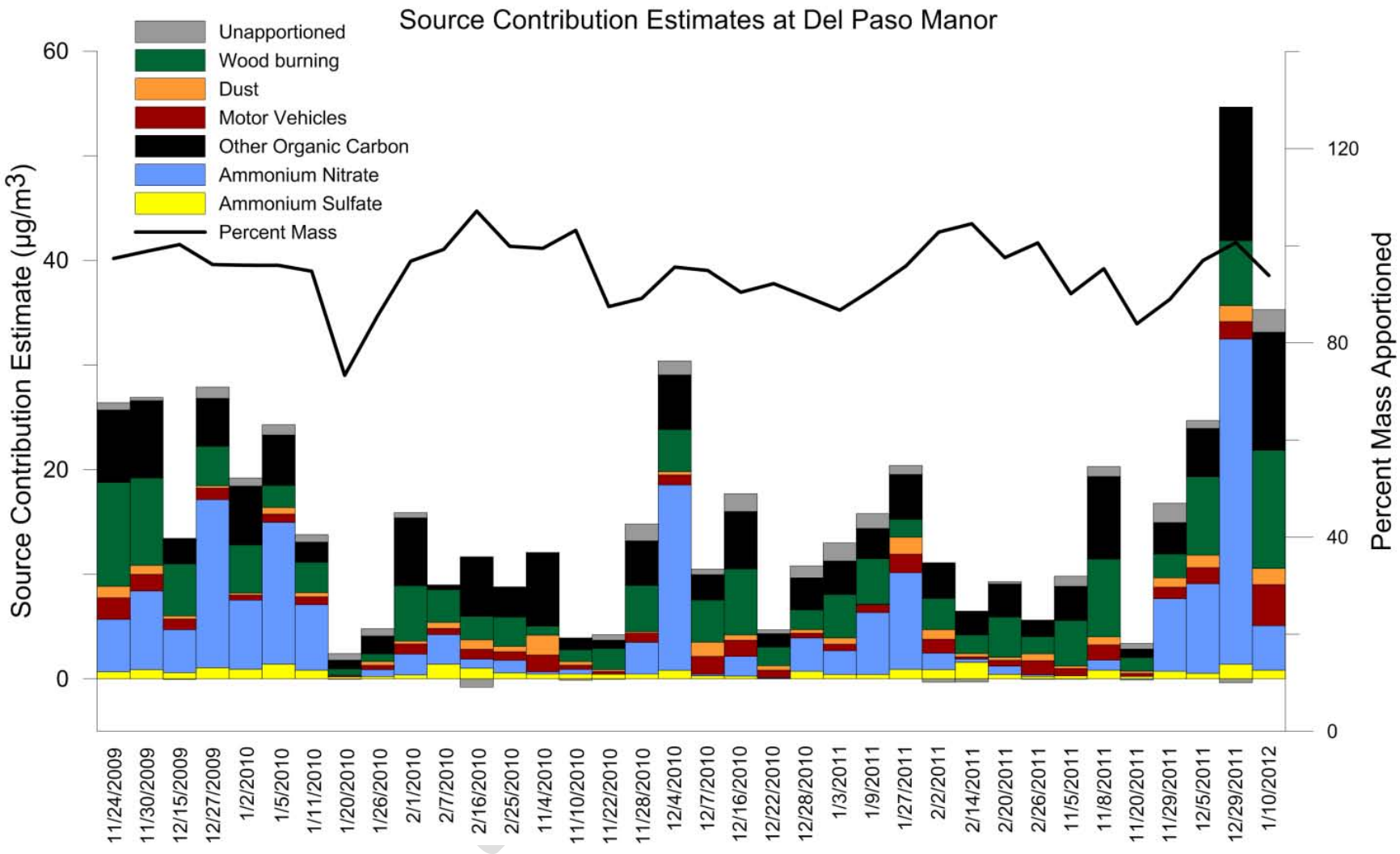


Figure C-4. Time series of CMB results for the T St. SANDWICH-adjusted dataset. Negative values for the "Unapportioned" source contribution estimates indicate the predicted total mass was higher than the measured total mass.

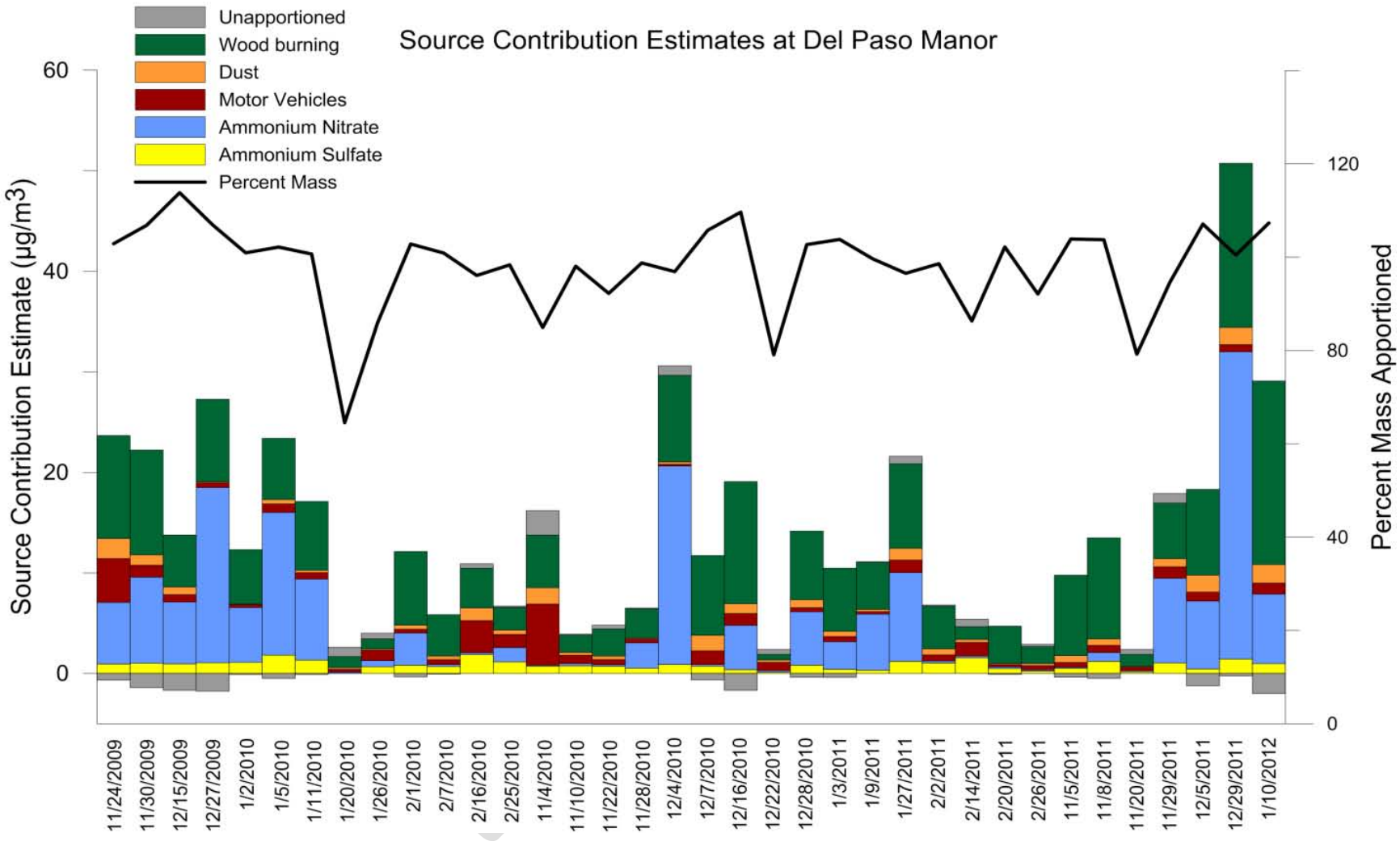


Figure C-5. Comparison of CMB results at T St. for the ambient dataset, with levoglucosan included as a fitting species and omitting the OC profile, for all dates and high concentration dates (a, b), and without including levoglucosan as a fitting species for all dates and high concentration dates (c, d).

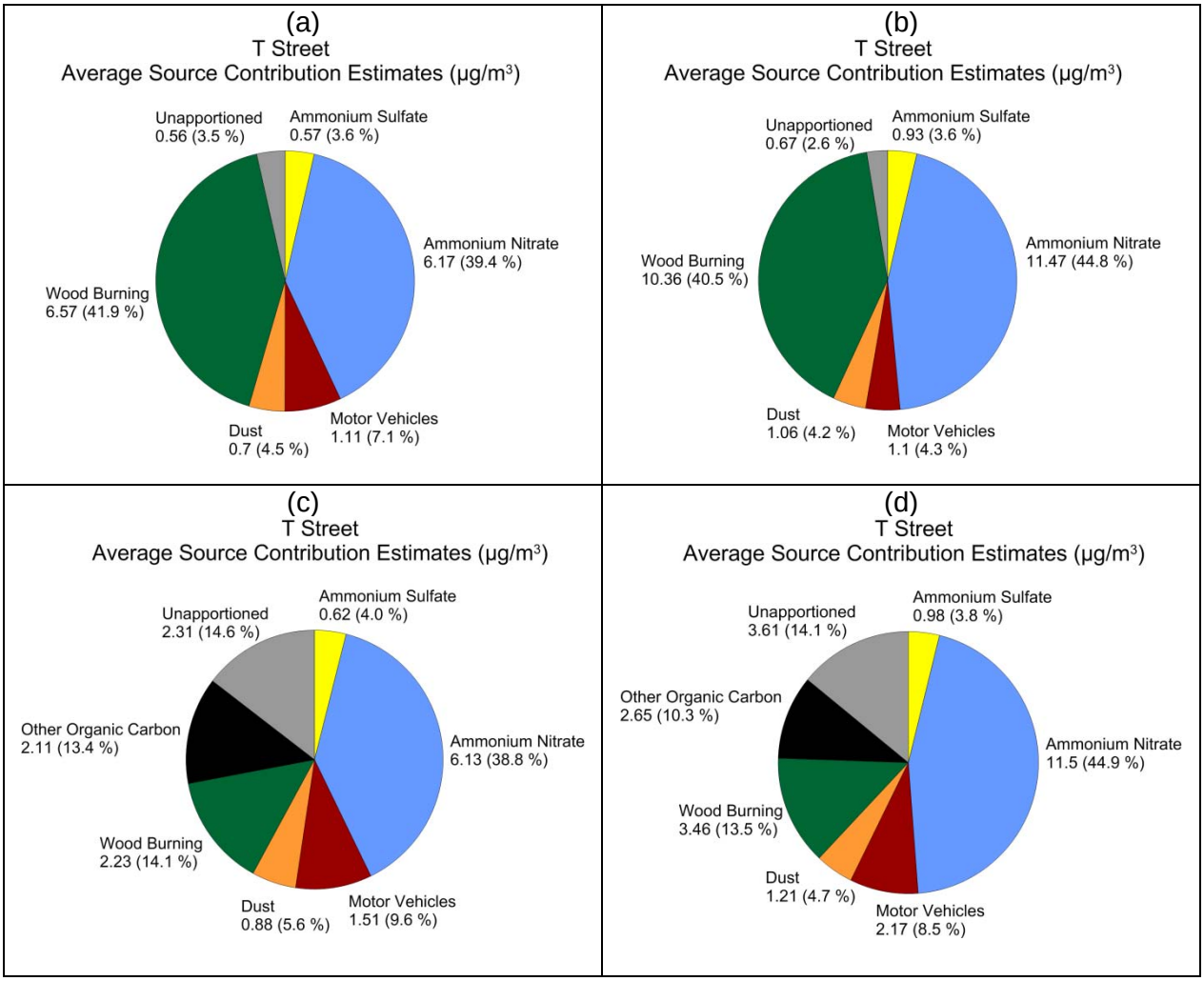


Figure C-6. Comparison of SANDWICH-adjusted CMB results at T St. with levoglucosan included as a fitting species, omitting the OC profile, for all dates and high concentration dates (a, b) and without including levoglucosan as a fitting species, omitting the OC profile, for all dates and high concentration dates (c, d).

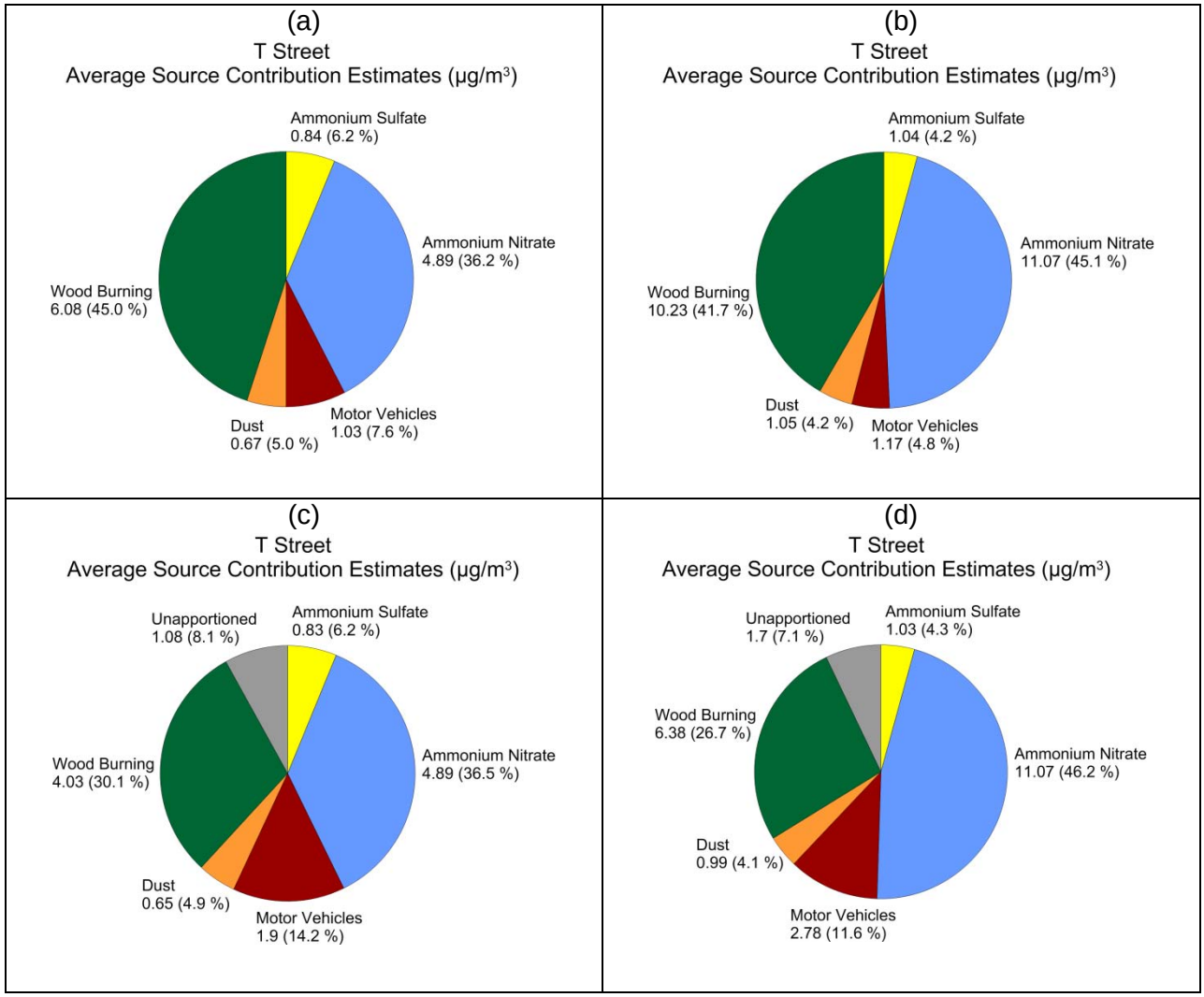


Figure C-7. Comparison of average source contribution estimates at Del Paso Manor for all dates for the ambient dataset with carbon species developed using different analytical methods: Thermal Optical Transmittance (a), and Thermal Optical Reflectance (b).

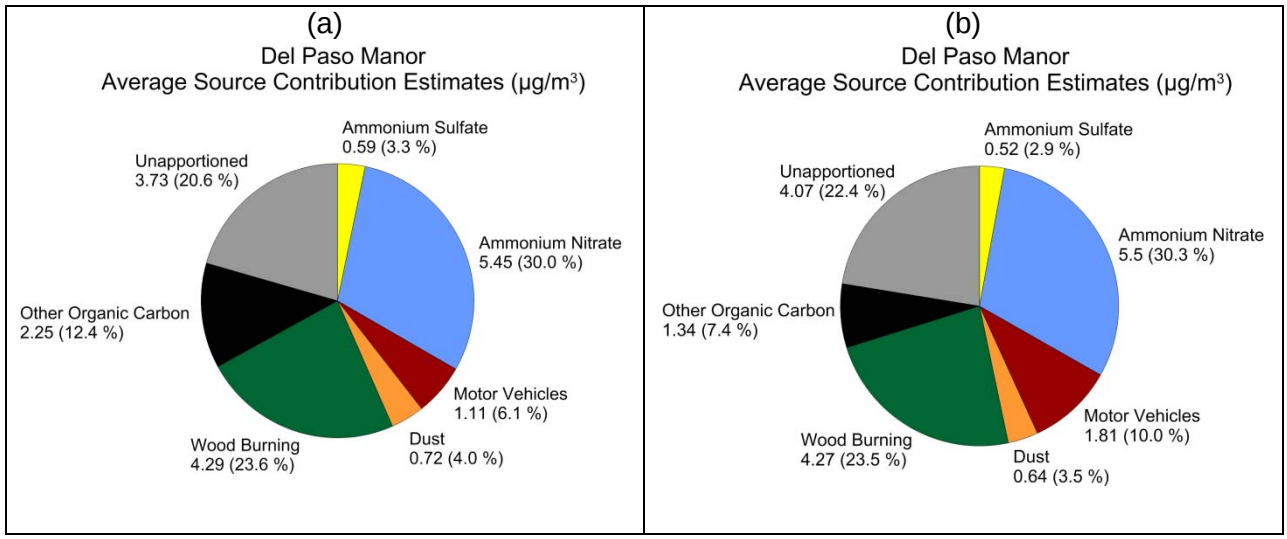


Figure C-8. Time series of wood-burning source contribution estimates at T St. for three different wood-burning source profiles: (1) oak/eucalyptus, (2) oak, and (3) oak/pine/fir.

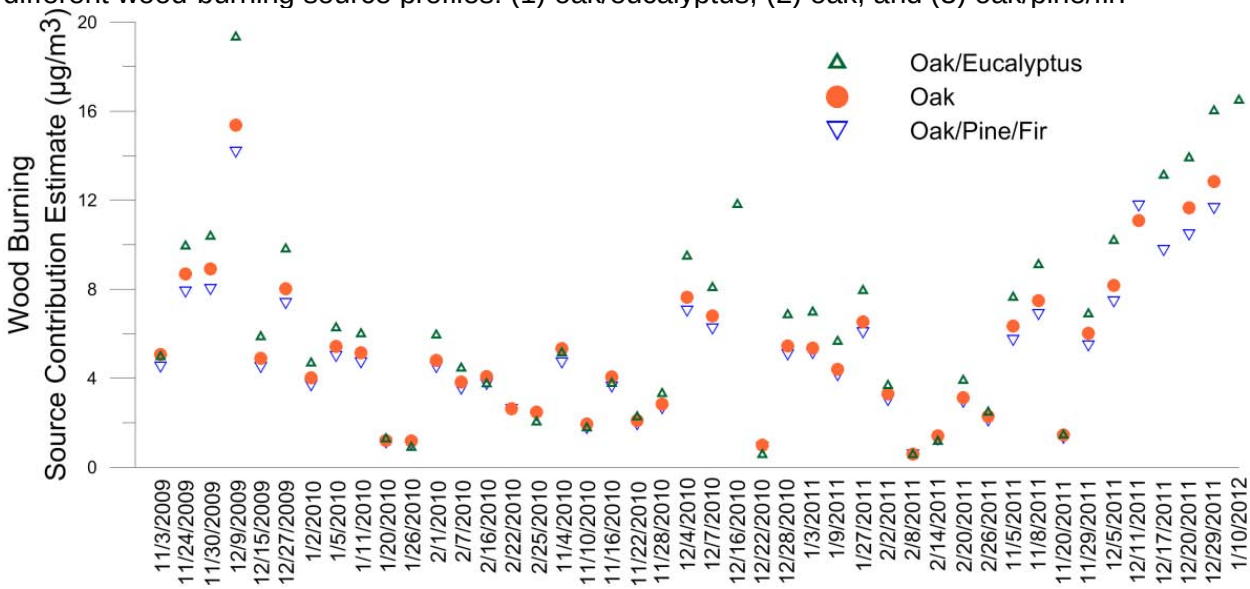
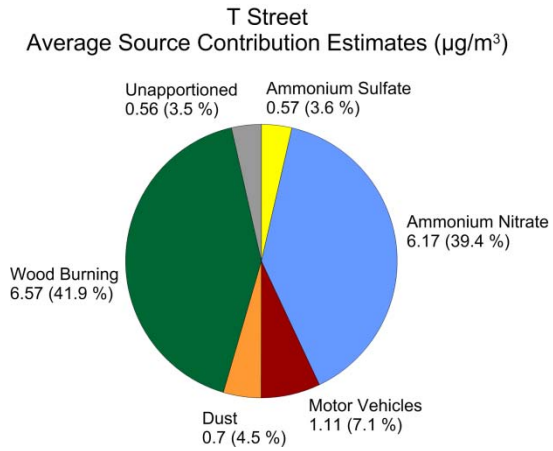
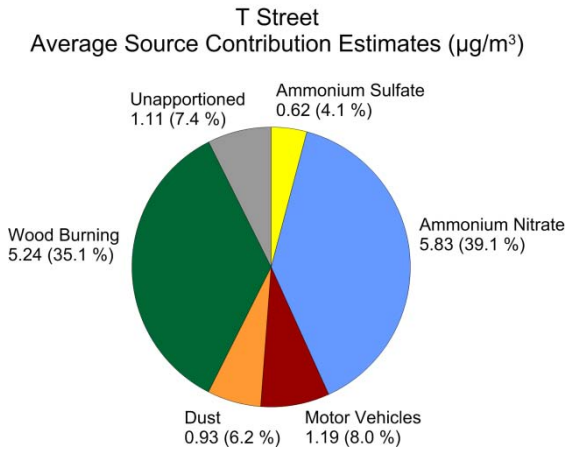


Figure C-9. Comparison of average source contribution estimates at T St., including all samples dates, for the three different wood-burning source profiles: (a) oak/eucalyptus, (b) oak, and (c) oak/pine/fir.

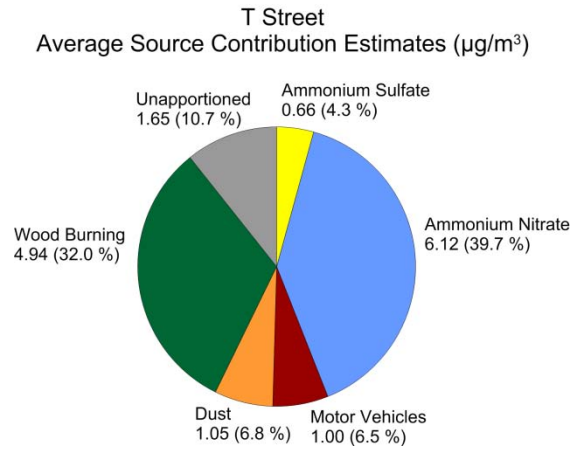
(a)



(b)



(c)



Appendix D:Motor Vehicle Emission Budgets

The motor vehicle emissions budgets (MVEB) for NO_X and $PM_{2.5}$ were calculated for the 2017 interim year and the 2024 maintenance year. On-road motor vehicle emission estimates were developed using the latest available transportation data and California's EMFAC2011 model. The forecasted vehicle miles traveled (VMT) and speed distributions used are based on the Sacramento region's Metropolitan Transportation Plan/Sustainable Communities Strategy 2035 (MTP/SCS 2035) adopted on April 19, 2012 and the Plan Bay Area Preferred Land Use Scenario/Transportation Investment Strategy (May 11, 2012) which was provided by the San Francisco Bay Area Metropolitan Transportation Commission (MTC) to Sacramento Area Council of Governments. The latest adjustments for recent ARB baseline controls were applied to the EMFAC2011 emissions. The transportation budgets incorporate a "safety margin" needed primarily to allow flexibility to adjust or uncertainties in rate of growth and other factors that may affect actual emission estimates. The resulting SIP control forecasted motor vehicle emissions were rounded up to whole numbers to get the MVEB. Tables D-1 and D-2 document the MVEB calculations for 2017, and 2024.

The safety margins as a percentage of the motor vehicle inventory in the plan are 5% in 2017 and 9% in 2024. These percentages are consistent with the safety margin in the Draft 2013 Ozone Plan Revision. Since the Ozone Plan does not cover 2024, the 2018 percentage of the safety margin extended to 2024 for safety margin calculation. In addition, an allowance of 0.20 tpd was added in 2024 to account for growth in $PM_{2.5}$ emissions out to 2035. The $PM_{2.5}$ portion of the motor vehicle emissions included tire and break wear.

Table D-1

Sacramento Federal Nonattainment Area
Transportation Conformity Budgets for 2006 24-hour $PM_{2.5}$ standard
Winter Planning Emissions in Tons per Day

	2017	
	NO_X	$PM_{2.5}$
On-Road Emissions from EMFAC2011	37.62	1.78
Adjustment to Baseline	-0.55	-0.05
Net Inventory	37.07	1.73
Safety Margin	1.88	0.09
Total	38.95	1.82
Conformity Budget	39	2

Table D-2

Sacramento Federal Nonattainment Area
Transportation Conformity Budgets for 2006 24-hour $PM_{2.5}$ standard
Winter Planning Emissions in Tons per Day

	2024	
	NO_X	$PM_{2.5}$
On-Road Emissions from EMFAC2011	23.32	1.82
Adjustment to Baseline	-1.21	-0.16
Net Inventory	22.11	1.66
Safety Margin	2.10	0.36
Total	24.21	2.02
Conformity Budget	25	3

Appendix E: Meteorological Analysis Data

E.1 Electronic files for the meteorological analysis

Electronic appendix is available in spreadsheet format. Here are the descriptions of each workbook and worksheet

Workbook Name: General Statistics Rain.xlsm

Worksheet Name	Worksheet Description
README	Description of each spreadsheet.
#H2	Raw data description file
90883	Raw rain data from National Weather Services
KSAC	KSAC Rain data extracted from Sheet 90883
PV	Pivot Table summarizing the annual rainfall pattern
Fig 5.18	Figure 5.18 of the text

Workbook Name: General Statistics.xlsm

Worksheet Name	**Worksheet Description**
README	Description of each spreadsheet.
Metdata-hr	Hourly meteorological data at the Del Paso Manor Monitor
Metdata-dy	Daily summary of the meteorological data at the Del Paso Manor Monitor
4am-TP	Morning surface temperature summary and chart
4pm-TP	Afternoon surface temperature summary and chart
4am-TG	Morning temperature inversion summary and chart
4pm-TG	Afternoon temperature inversion summary and chart
Ave-HT	Morning average 500mb height summary and chart
Day-DP	Day time dew point temperature summary and chart

Workbook Name: General Statistics Wind.xlsm

Worksheet Name	Worksheet Description
README	Description of each spreadsheet.
Wind	Hourly raw wind speed data for the Del Paso Manor and Sacramento T Street monitors
4pm	4pm data for winter months only
12am	12am data for winter months only
4pm-DPM-TST	Afternoon wind speed summary and chart
12a-DPM-TST	Midnight wind speed summary and chart

Workbook Name: STI AQRules Analysis.xls

Worksheet Name	Worksheet Description
README	Description of each spreadsheet.
All Days	Raw meteorological data for the AQRules Analysis
Generic Pattern	Extraction of the meteorological data satisfied the general pattern scenario criteria
Great Basin High	Extraction of the meteorological data satisfied the Great Basin scenario criteria
PacNW High	Extraction of the meteorological data satisfied the Pacific Northwest High scenario criteria
Pre-cold front	Extraction of the meteorological data satisfied the Pre-cold front scenario criteria
Cutoff low south	Extraction of the meteorological data satisfied the Cutoff Low South scenario criteria
AQRules Graphs	Summary of the AQRules results
CART Graphs	Summary of the STI's CART Analysis Results

Database Name: STI CART Analysis.accdb

This is a Microsoft Access 2010 database. It includes the calculations and results of STI's CART analysis.

E.2 CARB CART Analysis Results (Section 5.1.4)

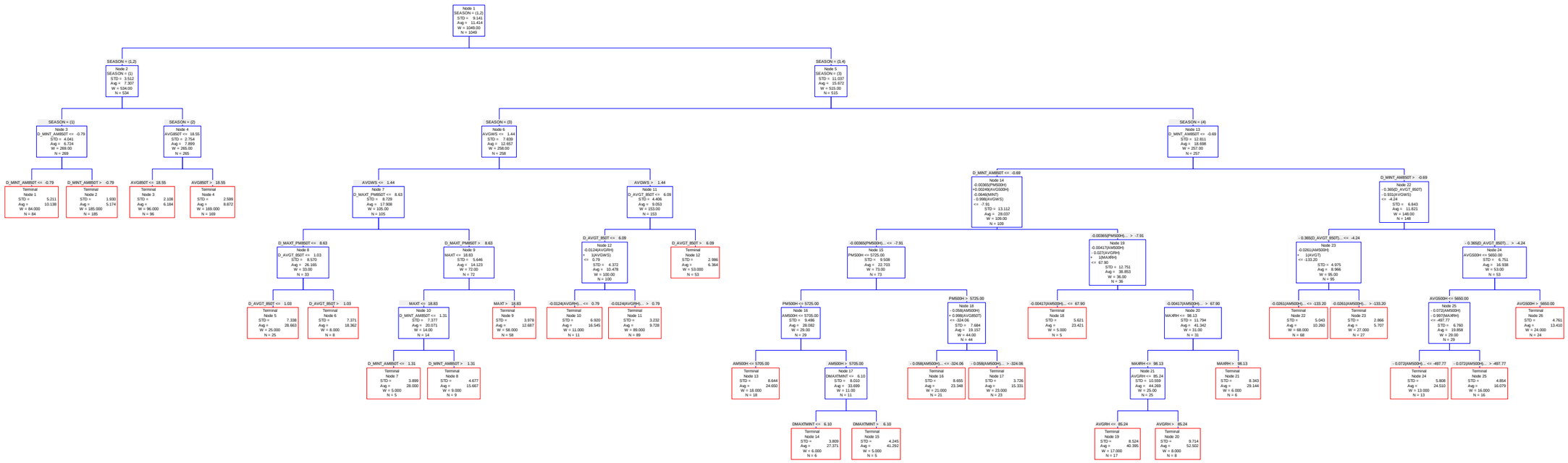


Figure E-1 CART Results (Whole)

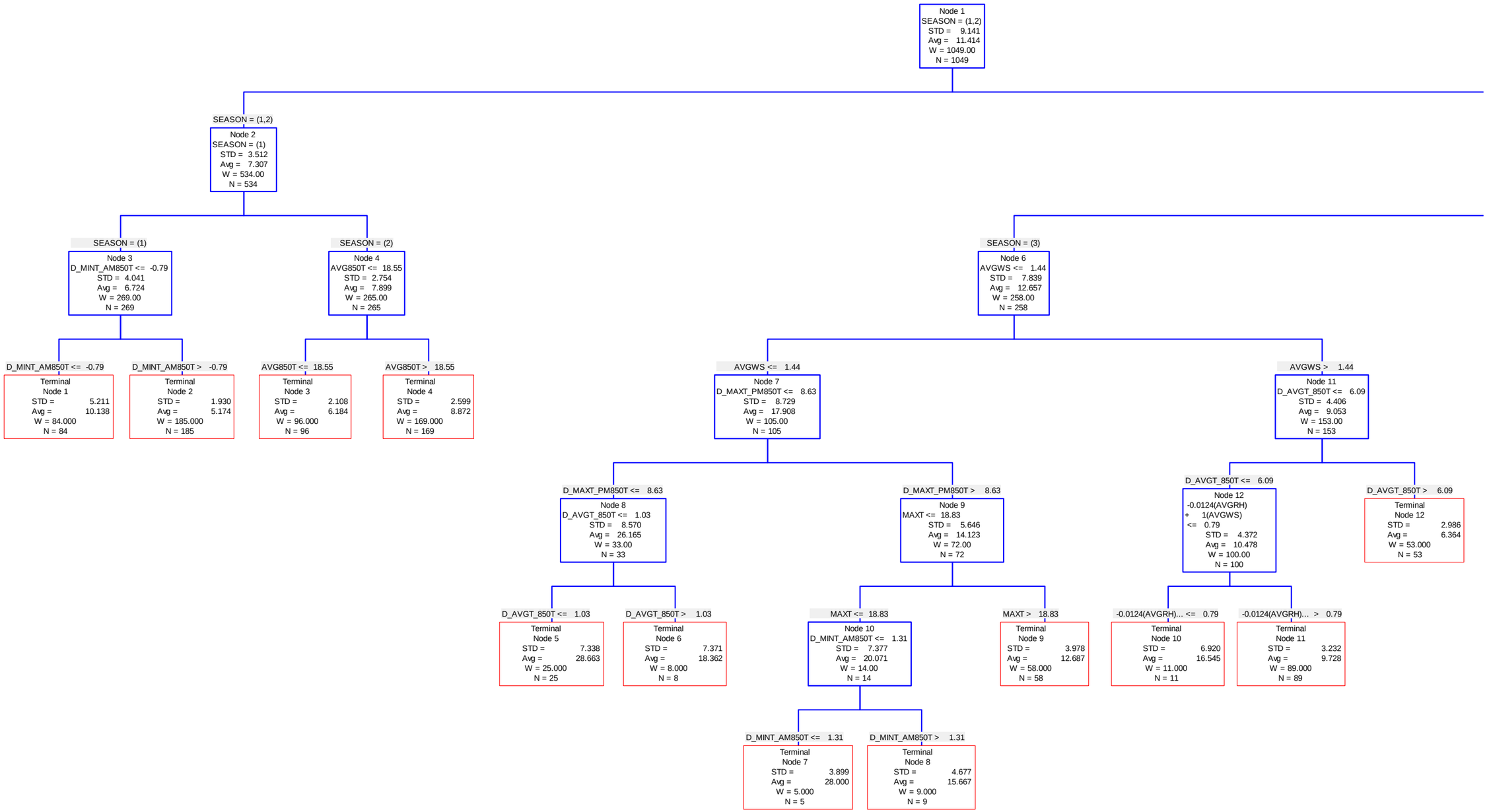


Figure E-2 CART Results (Magnified, Left)

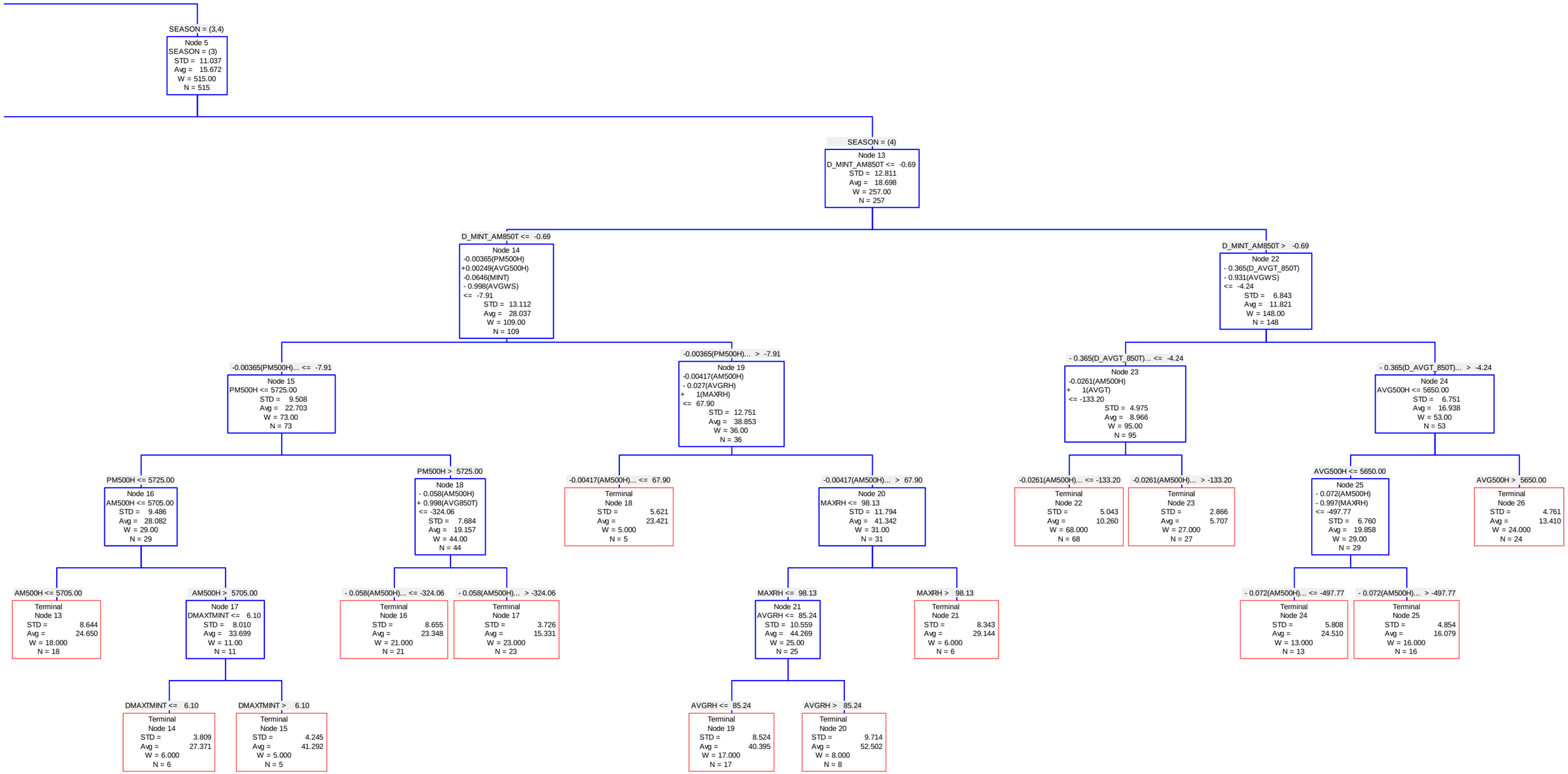


Figure E-3 CART Results (Magnified, Right)