

Appendix S2a: Additional Information for the Supplemental Analysis of 0.055 and 0.060 ppm Alternative Standards for the Ozone Reconsideration

S2a.1 Characterization of Unknown Controls

S2a.1.1 Supplemental Control Information

Supplemental emission controls came from a variety of sources and are an extension of the supplemental emission controls applied in the 0.065 ppm analysis presented in the 2008 Ozone NAAQS RIA. For the alternative standards of 0.055 ppm and 0.060 ppm a majority of the supplemental controls are due to the broader geographic coverage of the analysis areas. Additional NO_x nonEGU and area source control measures were available to be applied, and are reflected below. In addition, the mobile source¹ and EGU measures were retained from the 0.065 ppm supplemental measures analysis. Emission reductions by geographic area are presented in Table Sa.1. Total Costs of the supplemental measures analysis are provided in Table Sa.2.

Table S2a.1: Supplemental Local Control Measure Emission Reductions (annual tons/year) in 2020 Applied for Alternative Standards 0.055 ppm and 0.060 ppm^a

2020 Extrapolated Cost Area	Supplemental local controls emissions reductions [annual tons/year] applied for various standards (ppm)			
	0.055 ppm		0.060 ppm	
	NO _x	VOC ^b	NO _x	VOC ^b
Albuquerque, NM	590		590	
Appleton-Oshkosh, WI	2,800			
Atlanta, GA	16,000	3,500	16,000	3,500
Augusta, GA-SC	4,900*			
Austin, TX				
Baton Rouge, LA	13,000	23	13,000	23
Benton Harbor, MI	18		18	
Benzie Co, MI	2,000*			
Berkeley and Jefferson Counties, WV	1,400*			
Birmingham, AL	17,000		17,000	
Boise, ID	4,200	340	3,200	340
Boston-Lawrence-Worcester, MA	5,200	3,600	5,200	3,600
Buffalo-Niagara Falls, NY	1,100	140	1,100	140
Burlington, VT	370			
Campbell Co, WY	3,800	69	3,800	69
Canyonlands NP	950		570*	
Carlsbad, NM	20,000*		6,800*	
Cedar Co, MO	10		230	

¹ Some of the supplemental mobile source measures included from the 0.065 ppm supplemental measures analysis (2008 Ozone NAAQS RIA) control both NO_x and VOC. The VOC reductions provided in Table Sa.1 reflect mobile source controls only.

2020 Extrapolated Cost Area	Supplemental local controls emissions reductions [annual tons/year] applied for various standards (ppm)			
	0.055 ppm		0.060 ppm	
	NOx	VOC ^b	NOx	VOC ^b
Cedar Rapids, IA	680*			
Charleston, WV	220*			
Charlotte-Gastonia-Rock Hill, NC-SC	15,000	3,300	15,000	3,300
Chattanooga, TN-GA	4,000		1,900*	
Chico, CA	450		450	
Cincinnati-Hamilton, OH-KY-IN	12,000	3,700	12,000	3,700
Clearfield and Indiana Cos, PA	310		80*	
Cleveland, MS	190*			
Cleveland-Akron-Lorain, OH	5,100	390	5,100	390
Clinton, IA	18,000			
Cochise Co, AZ	220		220	
Colorado Springs, CO	540*			
Columbia, SC	2,000		2,000	
Corpus Christi, TX	16,000			
Dallas-Fort Worth, TX	10,000		9,600	
Davenport, IA	110			
Denver-Boulder-Greeley-Ft Collins-Love.,	14,000	4,300	14,000	4,300
Detroit-Ann Arbor, MI	2,100		2,100	
El Paso, TX-NM	3,500	200	3,500	200
Eugene-Springfield, OR	5			
Farmington, NM	19,000	190	19,000	190
Franklin Co, PA	170		100*	
Grand Canyon NP	1,300		1,300	
Grand Rapids, MI				
Great Basin NP				
Great Smoky Mountains NP	8		8	
Green Bay, WI	1,300*			
Gulfport-Biloxi, AL-MS	6,300		6,300	
Hancock, Knox, Lincoln & Waldo Co, ME	1,600		1,600	
Houston-Galveston-Brazoria, TX	21,000		21,000	
Huntington-Ashland, WV-KY	25,000	1,200	25,000	1,200
Huron Co, MI	9,900		7,500*	
Jefferson Co, NY	1,600	710	1,600	710
Johnson City-Kingsport-Bristol, TN	9,500		9,500	
Kansas City, MO-KS	14,000		9,500	
Knoxville, TN	5,700		5,700	
La Crosse, WI				
Lake Charles, LA	6,100		1,200*	
Lansing-East Lansing, MI	120			
Las Vegas, NV	1,000	1,300	1,000	1,300
Little Rock, AR	8,200		3,400*	
Longview, TX	120		120	
Los Angeles South Coast Air Basin, CA ^d	2,200		2,200	
Louisville, KY-IN	2,000		2,000	
Macon, GA	120		120	
Madison and Page Cos (Shenandoah NP), VA	16			

2020 Extrapolated Cost Area	Supplemental local controls emissions reductions [annual tons/year] applied for various standards (ppm)			
	0.055 ppm		0.060 ppm	
	NOx	VOC ^b	NOx	VOC ^b
McAlester, OK	870*			
Medford, OR	470		320*	
Memphis, TN-AR-MS	26,000	1,100	26,000	1,100
Mesa Verde NP	3,800		1,000*	
Minneapolis-St. Paul, MN-WI	1,400			
Mobile, AL	20,000		9,900*	
Monroe, LA	9,300*			
Muskegon, MI				
Nashville, TN	82		82	
Natchez, MS	6,100*			
Nevada Co, CA	98		98	
New Orleans, LA	2,100			
Newton, AR	150			
Norfolk-Virginia Beach-Newport News (HR)	9,100	2,400	9,100	2,400
Northeast Corridor, CT-DE-MD-NJ-NY-PA	9,800	750	9,800	750
Oklahoma City, OK	18,000			
Omaha, NE-IA	12,000		11,000*	
Orlando, FL	1,100			
Owensboro, KY-IN	680		560	
Paducah, KY-IL			120	
Panama City, FL	990		860*	
Parkersburg-Marietta, WV-OH	5,600		560*	
Pascagoula, MS	22,000	410	22,000	410
Pensacola, FL	8,700		8,700	
Phoenix-Mesa, AZ	5,000	3,300	5,000	3,300
Pittsburgh-Beaver Valley, PA	4,800	1,400	4,800	1,400
Portland, OR-WA	4,700		4,700	
Providence (All RI), RI	76			
Raleigh-Durham-Chapel Hill, NC	5,700		5,700	
Rapid City, SD	2,800		700*	
Reno, NV	210		210	
Richmond-Petersburg, VA	4,700	530	4,700	530
Roanoke, VA	2,100			
Rocky Mount, NC				
Sacramento Metro, CA	1,900		1,900	
Salt Lake City-Ogden-Provo, UT	5,000	2,200	5,000	2,200
San Antonio, TX	13,000		13,000	
San Joaquin Valley, CA ^d	980		980	
Schoolcraft Co, MI	4,600*			
Seattle, WA	2,100		2,100	
Somerset, KY	71			
Spokane, WA	1,500			
Springfield, MO	12			
St Louis, MO-IL	20,000	3,400	20,000	3,400
Steubenville-Weirton, OH-WV	75			
Tampa Bay-St. Petersburg, FL	7,900		6,500	

2020 Extrapolated Cost Area	Supplemental local controls emissions reductions [annual tons/year] applied for various standards (ppm)			
	0.055 ppm		0.060 ppm	
	NOx	VOC ^b	NOx	VOC ^b
Toledo, OH	180	50	180	50
Tulsa, OK	28,000		22,000	
Tupelo, MS	1,700*			
Washington, DC-MD-VA	25		25	
Waterloo, IA	20*			
Western Lake Michigan, IL-IN-WI ^c	35,000	820	35,000	820
Wheeling, WV-OH				
Wichita, KS	15,000		11,000*	
Williston, ND	690*			
Wytheville, VA	180			
TOTAL by Pollutant	660,000	39,000	490,000	39,000

^a All estimates are rounded to two significant figures. As such, total will not sum down columns.

^b VOC Reductions are included for mobile source controls that were applied as part of the supplemental measures analysis for 0.065 ppm in the 2008 Ozone NAAQS RIA. There was not sufficient time or resources to extend the mobile source control measures to all areas that are included in the analysis of 0.055 ppm and 0.060 ppm.

^c Western Lake Michigan emission reductions are for a NOx only extrapolated strategy. Less stringent standards included a NOx + VOC strategy for this geographic area.

^d Emission reductions are presented for Los Angeles and San Joaquin Valley for the emission reductions they will need to aid Sacramento to attain in the year 2020.

* Indicates a geographic area that achieved all needed emission reductions with the application of supplemental control measures.

Table S2a.2: Supplemental Local Control Measures Total Annualized Costs in 2020 (M 2006\$) Applied for Alternative Standards 0.055 ppm and 0.060 ppm^a

Extrapolated Cost Area	Supplemental local Total Costs [Millions 2006\$] applied for various standards (ppm)	
	0.055 ppm	0.060 ppm
Albuquerque, NM	\$1.5	\$1.5
Appleton-Oshkosh, WI	\$5.9	
Atlanta, GA	\$50	\$50
Augusta, GA-SC	\$9.9*	
Austin, TX		
Baton Rouge, LA	\$85	\$85
Benton Harbor, MI	\$<0.1	\$<0.1
Benzie Co, MI	\$4.6*	
Berkeley and Jefferson Counties, WV	\$7.5*	
Birmingham, AL	\$54	\$54
Boise, ID	\$9.0	\$7.5
Boston-Lawrence-Worcester, MA	\$15	\$15
Buffalo-Niagara Falls, NY	\$6.0	\$6.0
Burlington, VT	\$2.8	
Campbell Co, WY	\$14	\$14
Canyonlands NP	\$3.7	\$2.1*
Carlsbad, NM	\$60*	\$8.7*
Cedar Co, MO	\$<0.1	\$0.4
Cedar Rapids, IA	\$3.8*	
Charleston, WV	\$1.5*	
Charlotte-Gastonia-Rock Hill, NC-SC	\$58	\$59
Chattanooga, TN-GA	\$13	\$4.5*
Chico, CA	\$2.3	\$2.3
Cincinnati-Hamilton, OH-KY-IN	\$50	\$50
Clearfield and Indiana Cos, PA	\$1.7	\$0.3*
Cleveland, MS	\$<0.1*	
Cleveland-Akron-Lorain, OH	\$28	\$28
Clinton, IA	\$57	
Cochise Co, AZ	\$0.4	\$0.4
Colorado Springs, CO	\$2.0*	
Columbia, SC	\$9.4	\$9.4
Corpus Christi, TX	\$79	
Dallas-Fort Worth, TX	\$24	\$23
Davenport, IA	\$0.3	
Denver-Boulder-Greeley-Ft Collins-Love.,	\$44	\$44
Detroit-Ann Arbor, MI	\$9.9	\$9.9
El Paso, TX-NM	\$14	\$14
Eugene-Springfield, OR	\$<0.1	
Farmington, NM	\$64	\$64
Franklin Co, PA	\$0.5	\$0.3*
Grand Canyon NP	\$2.8	\$2.8
Grand Rapids, MI		

Extrapolated Cost Area	Supplemental local Total Costs [Millions 2006\$] applied for various standards (ppm)	
	0.055 ppm	0.060 ppm
Great Basin NP		
Great Smoky Mountains NP	\$<0.1	\$<0.1
Green Bay, WI	\$1.3*	
Gulfport-Biloxi, AL-MS	\$17	\$17
Hancock, Knox, Lincoln & Waldo Co, ME	\$7.2	\$7.2
Houston-Galveston-Brazoria, TX	\$1.2	\$2.0
Huntington-Ashland, WV-KY	\$100	\$100
Huron Co, MI	\$57	\$45*
Jefferson Co, NY	\$6.5	\$6.5
Johnson City-Kingsport-Bristol, TN	\$22	\$22
Kansas City, MO-KS	\$49	\$15
Knoxville, TN	\$7.2	\$7.2
La Crosse, WI		
Lake Charles, LA	\$20	\$2.3*
Lansing-East Lansing, MI	\$0.8	
Las Vegas, NV	\$8.1	\$8.1
Little Rock, AR	\$19	\$7.3*
Longview, TX	\$0.3	\$0.3
Los Angeles South Coast Air Basin, CA ^b	\$4.3	\$4.3
Louisville, KY-IN	\$9.7	\$9.7
Macon, GA	\$0.3	\$0.3
Madison and Page Cos (Shenandoah NP), VA	\$<0.1	
McAlester, OK	\$3.9*	
Medford, OR	\$1.2	\$0.9*
Memphis, TN-AR-MS	\$84	\$84
Mesa Verde NP	\$8.6	\$0.6*
Minneapolis-St.Paul, MN-WI	\$6.8	
Mobile, AL	\$40	\$15
Monroe, LA	\$35*	
Muskegon, MI		
Nashville, TN	\$0.2	\$0.2
Natchez, MS	\$20	
Nevada Co, CA	\$0.3	\$0.3
New Orleans, LA	\$6.5	
Newton, AR	\$0.2	
Norfolk-Virginia Beach-Newport News (HR)	\$26	\$26
Northeast Corridor, CT-DE-MD-NJ-NY-PA	\$62	\$62
Oklahoma City, OK	\$76	
Omaha, NE-IA	\$28	\$22*
Orlando, FL	\$6.0	
Owensboro, KY-IN	\$2.0	\$1.7
Paducah, KY-IL		\$0.3
Panama City, FL	\$1.0	\$0.7*
Parkersburg-Marietta, WV-OH	\$19	\$0.3*
Pascagoula, MS	\$72	\$72
Pensacola, FL	\$22	\$22
Phoenix-Mesa, AZ	\$15	\$15

Extrapolated Cost Area	Supplemental local Total Costs [Millions 2006\$] applied for various standards (ppm)	
	0.055 ppm	0.060 ppm
	Pittsburgh-Beaver Valley, PA	\$23
Portland, OR-WA	\$13	\$13
Providence (All RI), RI	\$0.1	
Raleigh-Durham-Chapel Hill, NC	\$16	\$16
Rapid City, SD	\$13	\$4.7*
Reno, NV	\$0.6	\$0.6
Richmond-Petersburg, VA	\$11	\$11
Roanoke, VA	\$3.9	
Rocky Mount, NC		
Sacramento Metro, CA	\$5.2	\$5.2
Salt Lake City-Ogden-Provo, UT	\$17	\$17
San Antonio, TX	\$50	\$50
San Joaquin Valley, CA ^b	\$0.4	\$0.4
Schoolcraft Co, MI	\$30*	
Seattle, WA	\$20	\$20
Somerset, KY	\$0.3	
Spokane, WA	\$4.2	
Springfield, MO	\$<0.1	
St Louis, MO-IL	\$87	\$87
Steubenville-Weirton, OH-WV	\$0.1	
Tampa Bay-St. Petersburg, FL	\$19	\$18
Toledo, OH	\$0.8	\$0.8
Tulsa, OK	\$120	\$100
Tupelo, MS	\$5.0*	
Washington, DC-MD-VA	\$<0.1	\$<0.1
Waterloo, IA	\$<0.1*	
Western Lake Michigan, IL-IN-WI	\$130	\$130
Wheeling, WV-OH		
Wichita, KS	\$38	\$9.7*
Williston, ND	\$4.4*	
Wytheville, VA	\$0.6	
TOTALS	\$2,300	\$1,600

^a All estimates are rounded to two significant figures. As such, total will not sum down columns.

^b Costs are presented for Los Angeles and San Joaquin Valley, CA for the emission reductions that will be needed to aid Sacramento to reach attainment in 2020.

* Indicates a geographic area that achieved all needed emission reductions with the application of supplemental control measures.

Sa1.2 Extrapolated Costs – Fixed Cost Approach Sensitivities

Extrapolated costs were calculated for three different values. The central estimate used is \$15,000/ton with sensitivities of \$10,000/ton and \$20,000/ton. The detailed costs by geographic area and alternative standard analyzed are presented in Tables S2a.3 and S2a.4 below.

Table S2a.3: Extrapolated Cost by Geographic Area to Meet the Alternative Standard of 0.055 ppm - Fixed Cost Approach^a

Extrapolated Cost Area	Fixed Cost Approach Extrapolated Costs (M 2006\$)		
	\$10,000/ton	\$15,000/ton	\$20,000/ton
Albuquerque, NM	\$72	\$110	\$140
Appleton-Oshkosh, WI	\$8	\$12	\$16
Atlanta, GA	\$1,200	\$1,900	\$2,500
Austin, TX	\$<1	\$1	\$1
Baton Rouge, LA	\$2,400	\$3,500	\$4,700
Benton Harbor, MI	\$35	\$52	\$70
Birmingham, AL	\$550	\$830	\$1,100
Boise, ID	\$280	\$410	\$550
Boston-Lawrence-Worcester, MA	\$570	\$860	\$1,100
Buffalo-Niagara Falls, NY	\$490	\$740	\$990
Burlington, VT	\$27	\$41	\$54
Campbell Co, WY	\$220	\$330	\$430
Canyonlands NP	\$6	\$8	\$11
Cedar Co, MO	\$14	\$21	\$27
Charlotte-Gastonia-Rock Hill, NC-SC	\$2,000	\$3,000	\$3,900
Chattanooga, TN-GA	\$78	\$120	\$160
Chico, CA	\$26	\$38	\$51
Cincinnati-Hamilton, OH-KY-IN	\$980	\$1,500	\$2,000
Clearfield and Indiana Cos, PA	\$1	\$2	\$2
Cleveland-Akron-Lorain, OH	\$1,800	\$2,700	\$3,700
Clinton, IA	\$56	\$84	\$110
Cochise Co, AZ	\$46	\$69	\$92
Columbia, SC	\$220	\$330	\$440
Corpus Christi, TX	\$150	\$230	\$310
Dallas-Fort Worth, TX	\$2,100	\$3,100	\$4,100
Davenport, IA	\$<1	\$1	\$1
Denver-Boulder-Greeley-Ft Collins-Love.,	\$670	\$1,000	\$1,300
Detroit-Ann Arbor, MI	\$1,700	\$2,600	\$3,500
El Paso, TX-NM	\$160	\$240	\$320
Eugene-Springfield, OR	\$5	\$7	\$9
Farmington, NM	\$670	\$1,000	\$1,300
Franklin Co, PA	\$5	\$7	\$9
Grand Canyon NP	\$200	\$310	\$410
Grand Rapids, MI	\$1	\$1	\$2
Great Basin NP	\$5	\$7	\$9
Great Smoky Mountains NP	\$6	\$8	\$11
Gulfport-Biloxi, AL-MS	\$190	\$280	\$370
Hancock, Knox, Lincoln & Waldo Co, ME	\$150	\$230	\$310
Houston-Galveston-Brazoria, TX	\$1,400	\$2,200	\$2,900
Huntington-Ashland, WV-KY	\$1,500	\$2,200	\$2,900
Huron Co, MI	\$55	\$82	\$110
Jefferson Co, NY	\$240	\$370	\$490
Johnson City-Kingsport-Bristol, TN	\$350	\$530	\$700
Kansas City, MO-KS	\$870	\$1,300	\$1,700

Extrapolated Cost Area	Fixed Cost Approach Extrapolated Costs (M 2006\$)		
	\$10,000/ton	\$15,000/ton	\$20,000/ton
Knoxville, TN	\$160	\$240	\$320
La Crosse, WI	\$3	\$4	\$6
Lake Charles, LA	\$8	\$12	\$16
Lansing-East Lansing, MI	\$17	\$26	\$35
Las Vegas, NV	\$220	\$320	\$430
Little Rock, AR	\$99	\$150	\$200
Longview, TX	\$8	\$12	\$17
Los Angeles South Coast Air Basin, CA ^b	\$2,700	\$4,000	\$5,300
Louisville, KY-IN	\$570	\$850	\$1,100
Macon, GA	\$73	\$110	\$150
Madison and Page Cos (Shenandoah NP), VA	\$3	\$5	\$7
Medford, OR	\$47	\$71	\$94
Memphis, TN-AR-MS	\$1,400	\$2,100	\$2,800
Mesa Verde NP	\$8	\$13	\$17
Minneapolis-St.Paul, MN-WI	\$49	\$73	\$98
Mobile, AL	\$58	\$86	\$120
Muskegon, MI	\$2	\$2	\$3
Nashville, TN	\$19	\$28	\$37
Nevada Co, CA	\$11	\$17	\$22
New Orleans, LA	\$7	\$10	\$14
Newton, AR	\$21	\$32	\$43
Norfolk-Virginia Beach-Newport News (HR)	\$1,200	\$1,800	\$2,400
Northeast Corridor, CT-DE-MD-NJ-NY-PA	\$5,400	\$8,100	\$11,000
Oklahoma City, OK	\$4	\$6	\$7
Omaha, NE-IA	\$500	\$750	\$1,000
Orlando, FL	\$2	\$3	\$3
Owensboro, KY-IN	\$170	\$260	\$350
Paducah, KY-IL	\$6	\$9	\$12
Panama City, FL	\$24	\$36	\$48
Parkersburg-Marietta, WV-OH	\$78	\$120	\$160
Pascagoula, MS	\$370	\$560	\$740
Pensacola, FL	\$150	\$230	\$300
Phoenix-Mesa, AZ	\$460	\$690	\$930
Pittsburgh-Beaver Valley, PA	\$780	\$1,200	\$1,600
Portland, OR-WA	\$330	\$490	\$650
Providence (All RI), RI	\$2	\$4	\$5
Raleigh-Durham-Chapel Hill, NC	\$200	\$300	\$390
Rapid City, SD	\$17	\$25	\$34
Reno, NV	\$95	\$140	\$190
Richmond-Petersburg, VA	\$250	\$370	\$500
Roanoke, VA	\$56	\$85	\$110
Rocky Mount, NC	\$7	\$11	\$14
Sacramento Metro, CA	\$87	\$130	\$170
Salt Lake City-Ogden-Provo, UT	\$380	\$560	\$750
San Antonio, TX	\$260	\$400	\$530
San Joaquin Valley, CA ^b	\$1,800	\$2,600	\$3,500
Seattle, WA	\$950	\$1,400	\$1,900
Somerset, KY	\$4	\$6	\$8

Extrapolated Cost Area	Fixed Cost Approach Extrapolated Costs (M 2006\$)		
	\$10,000/ton	\$15,000/ton	\$20,000/ton
Spokane, WA	\$11	\$17	\$23
Springfield, MO	\$1	\$1	\$2
St Louis, MO-IL	\$2,100	\$3,100	\$4,100
Steubenville-Weirton, OH-WV	\$2	\$3	\$4
Tampa Bay-St. Petersburg, FL	\$1,300	\$1,900	\$2,600
Toledo, OH	\$18	\$27	\$36
Tulsa, OK	\$990	\$1,500	\$2,000
Washington, DC-MD-VA	\$25	\$38	\$50
Western Lake Michigan, IL-IN-WI	\$3,900	\$5,800	\$7,800
Wheeling, WV-OH	\$1	\$2	\$3
Wichita, KS	\$110	\$160	\$220
Wytheville, VA	\$1	\$1	\$1
TOTALS	\$49,000	\$73,000	\$98,000

^a All estimates are rounded to two significant figures. As such, total will not sum down columns.

^b Costs are presented for Los Angeles and San Joaquin Valley, CA for the emission reductions that will be needed to aid Sacramento to reach attainment in 2020.

Table S2a.4: Extrapolated Cost by Geographic Area to Meet the Alternative Standard of 0.060 ppm - Fixed Cost Approach^a

Extrapolated Cost Area	Fixed Cost Approach Extrapolated Costs (M 2006\$)		
	\$10,000/ton	\$15,000/ton	\$20,000/ton
Albuquerque, NM	\$25	\$38	\$50
Atlanta, GA	\$640	\$960	\$1,300
Baton Rouge, LA	\$2,400	\$3,500	\$4,700
Benton Harbor, MI	\$2	\$3	\$4
Birmingham, AL	\$5	\$8	\$10
Boise, ID	\$140	\$200	\$270
Boston-Lawrence-Worcester, MA	\$350	\$520	\$700
Buffalo-Niagara Falls, NY	\$340	\$510	\$680
Campbell Co, WY	\$100	\$160	\$210
Cedar Co, MO	\$19	\$29	\$39
Charlotte-Gastonia-Rock Hill, NC-SC	\$1,300	\$2,000	\$2,600
Chico, CA	\$15	\$22	\$29
Cincinnati-Hamilton, OH-KY-IN	\$470	\$700	\$930
Cleveland-Akron-Lorain, OH	\$1,500	\$2,300	\$3,000
Cochise Co, AZ	\$19	\$29	\$38
Columbia, SC	\$67	\$100	\$130
Dallas-Fort Worth, TX	\$1,100	\$1,700	\$2,300
Denver-Boulder-Greeley-Ft Collins-Love.,	\$290	\$440	\$580
Detroit-Ann Arbor, MI	\$1,700	\$2,600	\$3,500
El Paso, TX-NM	\$81	\$120	\$160
Farmington, NM	\$340	\$510	\$680
Grand Canyon NP	\$5	\$8	\$10
Great Smoky Mountains NP	\$2	\$3	\$4
Gulfport-Biloxi, AL-MS	\$51	\$77	\$100
Hancock, Knox, Lincoln & Waldo Co, ME	\$50	\$76	\$100
Houston-Galveston-Brazoria, TX	\$1,900	\$2,900	\$3,900

Extrapolated Cost Area	Fixed Cost Approach Extrapolated Costs (M 2006\$)		
	\$10,000/ton	\$15,000/ton	\$20,000/ton
Huntington-Ashland, WV-KY	\$770	\$1,200	\$1,500
Jefferson Co, NY	\$150	\$230	\$310
Johnson City-Kingsport-Bristol, TN	\$120	\$180	\$240
Kansas City, MO-KS	\$270	\$410	\$540
Knoxville, TN	\$35	\$53	\$71
Las Vegas, NV	\$130	\$200	\$270
Longview, TX	\$2	\$4	\$5
Los Angeles South Coast Air Basin, CA ^b	\$2,200	\$3,400	\$4,500
Louisville, KY-IN	\$270	\$400	\$540
Macon, GA	\$41	\$62	\$83
Memphis, TN-AR-MS	\$720	\$1,100	\$1,400
Nashville, TN	\$1	\$2	\$3
Nevada Co, CA	\$9	\$13	\$17
Norfolk-Virginia Beach-Newport News (HR)	\$700	\$1,000	\$1,400
Northeast Corridor, CT-DE-MD-NJ-NY-PA	\$4,200	\$6,300	\$8,300
Owensboro, KY-IN	\$49	\$73	\$97
Paducah, KY-IL	\$5	\$8	\$10
Pascagoula, MS	\$110	\$170	\$220
Pensacola, FL	\$15	\$23	\$31
Phoenix-Mesa, AZ	\$230	\$340	\$450
Pittsburgh-Beaver Valley, PA	\$450	\$670	\$890
Portland, OR-WA	\$59	\$88	\$120
Raleigh-Durham-Chapel Hill, NC	\$5	\$8	\$11
Reno, NV	\$11	\$16	\$21
Richmond-Petersburg, VA	\$110	\$160	\$210
Rocky Mount, NC	\$0	\$0	\$0
Sacramento Metro, CA	\$70	\$110	\$140
Salt Lake City-Ogden-Provo, UT	\$190	\$280	\$380
San Antonio, TX	\$59	\$89	\$120
San Joaquin Valley, CA ^b	\$1,500	\$2,200	\$3,000
Seattle, WA	\$460	\$690	\$920
St Louis, MO-IL	\$1,000	\$1,500	\$2,000
Tampa Bay-St. Petersburg, FL	\$450	\$680	\$900
Toledo, OH	\$9	\$13	\$17
Tulsa, OK	\$320	\$490	\$650
Washington, DC-MD-VA	\$10	\$15	\$20
Western Lake Michigan, IL-IN-WI	\$3,900	\$5,800	\$7,800
TOTALS	\$32,000	\$47,000	\$63,000

^a All estimates are rounded to two significant figures. As such, total will not sum down columns.

^b Costs are presented for Los Angeles and San Joaquin Valley, CA for the emission reductions that will be needed to aid Sacramento to reach attainment in 2020.

Sa1.3 Extrapolated Costs – Hybrid Approach Sensitivities

Three estimates were generated for the extrapolated costs using the hybrid approach. The mid range value is presented in the results of the supplemental analysis. The three values were based upon generating different values for the multiplier M (for more information on M

and the hybrid approach equations see the 2008 Ozone NAAQS RIAⁱ Appendix 5a). The low value of M was 0.12, the mid value was 0.24, and the high value was 0.47. The detailed results of these sensitivity analyses are presented by geographic area in Tables S2a.5 and S2a.6.

Table S2a.5: Extrapolated Cost by Geographic Area to Meet the 0.055 ppm Alternative Standard - Hybrid Approach^a

Extrapolated Cost Area	Ratio of Unknown to Known Emission Reductions	Low		Mid		High	
		Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)	Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)	Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)
Albuquerque, NM	2.54	\$19,000	\$140	\$24,000	\$170	\$33,000	\$240
Appleton-Oshkosh, WI	0.08	\$15,000	\$12	\$15,000	\$12	\$16,000	\$12
Atlanta, GA	2.17	\$19,000	\$2,300	\$23,000	\$2,800	\$30,000	\$3,800
Austin, TX	3.06	\$20,000	\$1	\$26,000	\$1	\$37,000	\$2
Baton Rouge, LA	1.22	\$17,000	\$4,000	\$19,000	\$4,500	\$24,000	\$5,600
Benton Harbor, MI	1.19	\$17,000	\$60	\$19,000	\$67	\$23,000	\$82
Boise, ID	4.97	\$24,000	\$660	\$33,000	\$900	\$50,000	\$1,400
Boston-Lawrence-Worcester, MA	2.47	\$19,000	\$1,100	\$24,000	\$1,400	\$32,000	\$1,900
Buffalo-Niagara Falls, NY	4.15	\$22,000	\$1,100	\$30,000	\$1,500	\$44,000	\$2,200
Burlington, VT	2.63	\$20,000	\$53	\$24,000	\$66	\$34,000	\$91
Campbell Co, WY	3.82	\$22,000	\$470	\$29,000	\$620	\$42,000	\$910
Canyonlands NP	0.45	\$16,000	\$9	\$17,000	\$9	\$18,000	\$10
Cedar Co, MO	2.65	\$20,000	\$27	\$24,000	\$33	\$34,000	\$46
Charlotte-Gastonia-Rock Hill, NC-SC	4.61	\$23,000	\$4,600	\$31,000	\$6,200	\$48,000	\$9,400
Chattanooga, TN-GA	1.33	\$17,000	\$140	\$20,000	\$150	\$24,000	\$190
Chico, CA	1.02	\$17,000	\$43	\$19,000	\$48	\$22,000	\$57
Cincinnati-Hamilton, OH-KY-IN	1.84	\$18,000	\$1,800	\$22,000	\$2,100	\$28,000	\$2,700
Clearfield and Indiana Cos, PA	0.23	\$15,000	\$2	\$16,000	\$2	\$17,000	\$2
Cleveland-Akron-Lorain, OH	2.59	\$20,000	\$3,600	\$24,000	\$4,400	\$33,000	\$6,100
Clinton, IA	0.26	\$15,000	\$87	\$16,000	\$90	\$17,000	\$95
Cochise Co, AZ	3.93	\$22,000	\$100	\$29,000	\$130	\$43,000	\$200
Columbia, SC	11.77	\$36,000	\$800	\$57,000	\$1,300	\$98,000	\$2,200
Corpus Christi, TX	0.63	\$16,000	\$250	\$17,000	\$270	\$19,000	\$300
Dallas-Fort Worth, TX	2.53	\$19,000	\$4,000	\$24,000	\$4,900	\$33,000	\$6,800
Davenport, IA	0.16	\$15,000	\$1	\$16,000	\$1	\$16,000	\$1
Denver-Boulder-Greeley-Ft Collins-Love.,	1.38	\$17,000	\$1,200	\$20,000	\$1,300	\$25,000	\$1,600
Detroit-Ann Arbor, MI	2.54	\$19,000	\$3,400	\$24,000	\$4,200	\$33,000	\$5,700
El Paso, TX-NM	1.88	\$18,000	\$300	\$22,000	\$350	\$28,000	\$460
Eugene-Springfield, OR	0.91	\$17,000	\$8	\$18,000	\$8	\$21,000	\$10
Farmington, NM	3.28	\$21,000	\$1,400	\$27,000	\$1,800	\$38,000	\$2,600

Extrapolated Cost Area	Ratio of Unknown to Known Emission Reductions	Low		Mid		High	
		Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)	Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)	Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)
Franklin Co, PA	1.30	\$17,000	\$8	\$20,000	\$9	\$24,000	\$11
Grand Canyon NP	2.50	\$19,000	\$400	\$24,000	\$490	\$33,000	\$670
Grand Rapids, MI	0.80	\$16,000	\$2	\$18,000	\$2	\$21,000	\$2
Great Basin NP	2.26	\$19,000	\$9	\$23,000	\$11	\$31,000	\$15
Great Smoky Mountains NP	3.52	\$21,000	\$12	\$27,000	\$15	\$40,000	\$22
Gulfport-Biloxi, AL-MS	1.97	\$18,000	\$340	\$22,000	\$410	\$29,000	\$540
Hancock, Knox, Lincoln & Waldo Co, ME	1.19	\$17,000	\$260	\$19,000	\$290	\$23,000	\$360
Houston-Galveston-Brazoria, TX	1.05	\$17,000	\$2,400	\$19,000	\$2,700	\$22,000	\$3,200
Huntington-Ashland, WV-KY	2.93	\$20,000	\$3,000	\$25,000	\$3,700	\$36,000	\$5,200
Huron Co, MI	0.47	\$16,000	\$87	\$17,000	\$91	\$18,000	\$100
Jefferson Co, NY	3.97	\$22,000	\$540	\$29,000	\$710	\$43,000	\$1,100
Johnson City-Kingsport-Bristol, TN	2.71	\$20,000	\$700	\$25,000	\$870	\$34,000	\$1,200
Kansas City, MO-KS	3.66	\$21,000	\$1,900	\$28,000	\$2,400	\$41,000	\$3,600
Knoxville, TN	1.79	\$18,000	\$290	\$21,000	\$350	\$28,000	\$450
La Crosse, WI	0.09	\$15,000	\$4	\$15,000	\$4	\$16,000	\$5
Lake Charles, LA	0.11	\$15,000	\$12	\$15,000	\$12	\$16,000	\$13
Lansing-East Lansing, MI	0.75	\$16,000	\$28	\$18,000	\$31	\$20,000	\$35
Las Vegas, NV	2.06	\$19,000	\$400	\$22,000	\$480	\$30,000	\$640
Little Rock, AR	0.84	\$16,000	\$160	\$18,000	\$180	\$21,000	\$210
Longview, TX	1.50	\$18,000	\$15	\$20,000	\$17	\$26,000	\$21
Los Angeles South Coast Air Basin, CA ^b	2.74	\$20,000	\$5,300	\$25,000	\$6,600	\$34,000	\$9,100
Louisville, KY-IN	4.93	\$24,000	\$1,300	\$32,000	\$1,800	\$50,000	\$2,800
Macon, GA	6.19	\$26,000	\$190	\$37,000	\$270	\$59,000	\$430
Medford, OR	1.36	\$17,000	\$82	\$20,000	\$93	\$25,000	\$120
Memphis, TN-AR-MS	5.28	\$24,000	\$3,400	\$34,000	\$4,700	\$52,000	\$7,200
Mesa Verde NP	0.18	\$15,000	\$13	\$16,000	\$13	\$16,000	\$14
Minneapolis-St.Paul, MN-WI	0.53	\$16,000	\$78	\$17,000	\$83	\$19,000	\$92
Mobile, AL	0.27	\$15,000	\$89	\$16,000	\$92	\$17,000	\$97
Muskegon, MI	0.42	\$16,000	\$3	\$16,000	\$3	\$18,000	\$3
Nashville, TN	2.96	\$20,000	\$38	\$25,000	\$47	\$36,000	\$67
Nevada Co, CA	2.27	\$19,000	\$21	\$23,000	\$26	\$31,000	\$35

Extrapolated Cost Area	Ratio of Unknown to Known Emission Reductions	Low		Mid		High	
		Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)	Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)	Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)
New Orleans, LA	0.29	\$16,000	\$11	\$16,000	\$11	\$17,000	\$12
Newton, AR	4.03	\$22,000	\$47	\$29,000	\$63	\$44,000	\$93
Norfolk-Virginia Beach-Newport News (HR)	3.73	\$22,000	\$2,600	\$28,000	\$3,400	\$41,000	\$5,000
Northeast Corridor, CT-DE-MD-NJ-NY-PA	3.42	\$21,000	\$11,000	\$27,000	\$15,000	\$39,000	\$21,000
Oklahoma City, OK	0.02	\$15,000	\$6	\$15,000	\$6	\$15,000	\$6
Omaha, NE-IA	2.48	\$19,000	\$970	\$24,000	\$1,200	\$33,000	\$1,600
Orlando, FL	0.04	\$15,000	\$3	\$15,000	\$3	\$15,000	\$3
Owensboro, KY-IN	5.81	\$25,000	\$440	\$36,000	\$620	\$56,000	\$970
Paducah, KY-IL	1.42	\$18,000	\$10	\$20,000	\$12	\$25,000	\$15
Panama City, FL	1.32	\$17,000	\$42	\$20,000	\$47	\$24,000	\$58
Parkersburg-Marietta, WV-OH	1.36	\$17,000	\$140	\$20,000	\$150	\$25,000	\$190
Pascagoula, MS	2.27	\$19,000	\$710	\$23,000	\$860	\$31,000	\$1,200
Pensacola, FL	1.77	\$18,000	\$270	\$21,000	\$320	\$28,000	\$410
Phoenix-Mesa, AZ	2.46	\$19,000	\$900	\$24,000	\$1,100	\$32,000	\$1,500
Pittsburgh-Beaver Valley, PA	2.08	\$19,000	\$1,400	\$22,000	\$1,700	\$30,000	\$2,300
Portland, OR-WA	2.04	\$19,000	\$610	\$22,000	\$730	\$29,000	\$960
Providence (All RI), RI	0.10	\$15,000	\$4	\$15,000	\$4	\$16,000	\$4
Raleigh-Durham-Chapel Hill, NC	3.95	\$22,000	\$430	\$29,000	\$570	\$43,000	\$850
Rapid City, SD	0.50	\$16,000	\$27	\$17,000	\$28	\$19,000	\$31
Reno, NV	5.45	\$25,000	\$230	\$34,000	\$330	\$54,000	\$510
Richmond-Petersburg, VA	2.81	\$20,000	\$500	\$25,000	\$620	\$35,000	\$870
Rocky Mount, NC	1.56	\$18,000	\$13	\$21,000	\$15	\$26,000	\$19
Sacramento Metro, CA	1.95	\$18,000	\$160	\$22,000	\$190	\$29,000	\$250
Salt Lake City-Ogden-Provo, UT	0.87	\$17,000	\$620	\$18,000	\$680	\$21,000	\$800
San Antonio, TX	1.35	\$17,000	\$460	\$20,000	\$520	\$25,000	\$650
San Joaquin Valley, CA ^b	3.19	\$21,000	\$3,600	\$26,000	\$4,600	\$38,000	\$6,600
Seattle, WA	2.46	\$19,000	\$1,800	\$24,000	\$2,300	\$32,000	\$3,100
Somerset, KY	1.11	\$17,000	\$7	\$19,000	\$7	\$23,000	\$9
Spokane, WA	0.32	\$16,000	\$18	\$16,000	\$18	\$17,000	\$19
Springfield, MO	0.41	\$16,000	\$1	\$16,000	\$1	\$18,000	\$1
St Louis, MO-IL	2.62	\$20,000	\$4,000	\$24,000	\$5,000	\$34,000	\$6,900

Extrapolated Cost Area	Ratio of Unknown to Known Emission Reductions	Low		Mid		High	
		Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)	Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)	Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)
Steubenville-Weirton, OH-WV	1.54	\$18,000	\$3	\$20,000	\$4	\$26,000	\$5
Tampa Bay-St. Petersburg, FL	7.38	\$28,000	\$3,600	\$41,000	\$5,300	\$67,000	\$8,700
Toledo, OH	0.87	\$17,000	\$29	\$18,000	\$32	\$21,000	\$38
Tulsa, OK	2.80	\$20,000	\$2,000	\$25,000	\$2,500	\$35,000	\$3,500
Washington, DC-MD-VA	2.68	\$20,000	\$50	\$24,000	\$62	\$34,000	\$86
Waterloo, IA	0.22	\$15,000	\$0	\$16,000	\$0	\$17,000	\$0
Western Lake Michigan, IL-IN-WI	2.27	\$19,000	\$7,400	\$23,000	\$9,000	\$31,000	\$12,000
Wheeling, WV-OH	2.30	\$19,000	\$3	\$23,000	\$3	\$31,000	\$4
Wichita, KS	0.66	\$16,000	\$180	\$17,000	\$190	\$20,000	\$220
Wytheville, VA	0.13	\$15,000	\$1	\$15,000	\$1	\$16,000	\$1
TOTALS			\$97,000		\$120,000		\$170,000

^a All estimates are rounded to two significant figures. As such, total will not sum down columns.

^b Costs are presented for Los Angeles and San Joaquin Valley, CA for the emission reductions that will be needed to aid Sacramento to reach attainment in 2020.

Table S2a.6: Extrapolated Cost by Geographic Area to Meet the 0.060 ppm Alternative Standard - Hybrid Approach^a

Extrapolated Cost Area	Ratio of Unknown to Known Emission Reductions	Low		Mid		High	
		Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)	Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)	Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)
Albuquerque, NM	0.89	\$17,000	\$42	\$18,000	\$46	\$21,000	\$54
Atlanta, GA	1.12	\$17,000	\$1,100	\$19,000	\$1,200	\$23,000	\$1,500
Baton Rouge, LA	1.22	\$17,000	\$4,000	\$19,000	\$4,500	\$24,000	\$5,600
Benton Harbor, MI	0.06	\$15,000	\$3	\$15,000	\$3	\$15,000	\$3
Boise, ID	3.13	\$21,000	\$280	\$26,000	\$350	\$37,000	\$500
Boston-Lawrence-Worcester, MA	1.50	\$18,000	\$610	\$20,000	\$710	\$26,000	\$890
Buffalo-Niagara Falls, NY	2.87	\$20,000	\$680	\$25,000	\$850	\$35,000	\$1,200

Extrapolated Cost Area	Ratio of Unknown to Known Emission Reductions	Low		Mid		High	
		Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)	Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)	Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)
Campbell Co, WY	1.84	\$18,000	\$190	\$22,000	\$230	\$28,000	\$290
Cedar Co, MO	0.81	\$16,000	\$32	\$18,000	\$35	\$21,000	\$40
Charlotte-Gastonia-Rock Hill, NC-SC	3.07	\$20,000	\$2,700	\$26,000	\$3,400	\$37,000	\$4,800
Chico, CA	0.59	\$16,000	\$24	\$17,000	\$25	\$19,000	\$28
Cincinnati-Hamilton, OH-KY-IN	0.88	\$17,000	\$770	\$18,000	\$840	\$21,000	\$990
Cleveland-Akron-Lorain, OH	29.84	\$68,000	\$10,000	\$120,000	\$18,000	\$230,000	\$34,000
Cochise Co, AZ	1.63	\$18,000	\$34	\$21,000	\$40	\$27,000	\$51
Columbia, SC	3.55	\$21,000	\$140	\$28,000	\$180	\$40,000	\$270
Dallas-Fort Worth, TX	1.78	\$18,000	\$2,100	\$21,000	\$2,400	\$28,000	\$3,100
Denver-Boulder-Greeley-Ft Collins-Love.,	0.60	\$16,000	\$470	\$17,000	\$500	\$19,000	\$560
Detroit-Ann Arbor, MI	2.54	\$19,000	\$3,400	\$24,000	\$4,200	\$33,000	\$5,700
El Paso, TX-NM	0.94	\$17,000	\$130	\$18,000	\$150	\$22,000	\$170
Farmington, NM	1.65	\$18,000	\$610	\$21,000	\$700	\$27,000	\$900
Grand Canyon NP	0.06	\$15,000	\$8	\$15,000	\$8	\$15,000	\$8
Great Smoky Mountains NP	1.12	\$17,000	\$3	\$19,000	\$3	\$23,000	\$4
Gulfport-Biloxi, AL-MS	0.54	\$16,000	\$82	\$17,000	\$87	\$19,000	\$97
Hancock, Knox, Lincoln & Waldo Co, ME	0.39	\$16,000	\$79	\$16,000	\$83	\$18,000	\$90
Houston-Galveston-Brazoria, TX	1.26	\$17,000	\$3,300	\$19,000	\$3,800	\$24,000	\$4,600
Huntington-Ashland, WV-KY	1.55	\$18,000	\$1,400	\$20,000	\$1,600	\$26,000	\$2,000
Jefferson Co, NY	2.50	\$19,000	\$300	\$24,000	\$370	\$33,000	\$500
Johnson City-Kingsport-Bristol, TN	0.91	\$17,000	\$200	\$18,000	\$220	\$21,000	\$250
Kansas City, MO-KS	1.45	\$18,000	\$480	\$20,000	\$550	\$25,000	\$690
Knoxville, TN	0.39	\$16,000	\$55	\$16,000	\$58	\$18,000	\$63
Las Vegas, NV	1.29	\$17,000	\$230	\$20,000	\$260	\$24,000	\$320
Longview, TX	0.44	\$16,000	\$4	\$17,000	\$4	\$18,000	\$4
Los Angeles South Coast Air Basin, CA ^b	2.30	\$19,000	\$4,300	\$23,000	\$5,200	\$31,000	\$7,000
Louisville, KY-IN	2.34	\$19,000	\$520	\$23,000	\$630	\$32,000	\$850
Macon, GA	3.48	\$21,000	\$87	\$27,000	\$110	\$40,000	\$160
Memphis, TN-AR-MS	2.75	\$20,000	\$1,400	\$25,000	\$1,800	\$34,000	\$2,500
Nashville, TN	0.20	\$15,000	\$2	\$16,000	\$2	\$16,000	\$2
Nevada Co, CA	1.74	\$18,000	\$16	\$21,000	\$18	\$27,000	\$23

Extrapolated Cost Area	Ratio of Unknown to Known Emission Reductions	Low		Mid		High	
		Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)	Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)	Average Cost/Ton (2006\$)	Hybrid Extrapolated Costs (M 2006\$)
Norfolk-Virginia Beach-Newport News (HR)	2.16	\$19,000	\$1,300	\$23,000	\$1,600	\$30,000	\$2,100
Northeast Corridor, CT-DE-MD-NJ-NY-PA	2.64	\$20,000	\$8,200	\$24,000	\$10,000	\$34,000	\$14,000
Owensboro, KY-IN	4.12	\$22,000	\$110	\$30,000	\$140	\$44,000	\$210
Paducah, KY-IL	0.22	\$15,000	\$8	\$16,000	\$8	\$17,000	\$8
Pascagoula, MS	0.68	\$16,000	\$180	\$17,000	\$190	\$20,000	\$220
Pensacola, FL	0.18	\$15,000	\$24	\$16,000	\$24	\$16,000	\$25
Phoenix-Mesa, AZ	1.21	\$17,000	\$390	\$19,000	\$440	\$24,000	\$530
Pittsburgh-Beaver Valley, PA	1.20	\$17,000	\$760	\$19,000	\$860	\$23,000	\$1,000
Portland, OR-WA	0.37	\$16,000	\$92	\$16,000	\$96	\$18,000	\$100
Raleigh-Durham-Chapel Hill, NC	0.11	\$15,000	\$8	\$15,000	\$8	\$16,000	\$8
Reno, NV	0.61	\$16,000	\$17	\$17,000	\$18	\$19,000	\$21
Richmond-Petersburg, VA	1.19	\$17,000	\$180	\$19,000	\$200	\$23,000	\$250
Rocky Mount, NC	0.04	\$15,000	\$0	\$15,000	\$0	\$15,000	\$0
Sacramento Metro, CA	1.57	\$18,000	\$120	\$21,000	\$140	\$26,000	\$180
Salt Lake City-Ogden-Provo, UT	0.43	\$16,000	\$300	\$17,000	\$310	\$18,000	\$340
San Antonio, TX	0.30	\$16,000	\$92	\$16,000	\$95	\$17,000	\$100
San Joaquin Valley, CA ^b	2.68	\$20,000	\$2,900	\$24,000	\$3,600	\$34,000	\$5,000
Seattle, WA	1.18	\$17,000	\$790	\$19,000	\$880	\$23,000	\$1,100
St Louis, MO-IL	1.32	\$17,000	\$1,700	\$20,000	\$2,000	\$24,000	\$2,400
Tampa Bay-St. Petersburg, FL	5.37	\$24,000	\$1,100	\$34,000	\$1,500	\$53,000	\$2,400
Toledo, OH	0.12	\$15,000	\$13	\$15,000	\$13	\$16,000	\$13
Tulsa, OK	1.45	\$18,000	\$570	\$20,000	\$650	\$25,000	\$820
Washington, DC-MD-VA	1.09	\$17,000	\$17	\$19,000	\$19	\$23,000	\$23
Western Lake Michigan, IL-IN-WI	2.27	\$19,000	\$7,400	\$23,000	\$9,000	\$31,000	\$12,000
TOTALS			\$66,000		\$85,000		\$120,000

^a All estimates are rounded to two significant figures. As such, total will not sum down columns.

^b Costs are presented for Los Angeles and San Joaquin Valley, CA for the emission reductions that will be needed to aid Sacramento to reach attainment in 2020.

ⁱ Available on the Internet at <<http://www.epa.gov/ttn/ecas/regdata/RIAs/5a-ozoneriachapter5appendixa.pdf>>.