Appendix 3A

Massachusetts 1-Hour Ozone Standard Control Measures

Control measures included in the 1-hour standard SIPs for EMA and WMA are listed below. MassDEP will continue to implement these measures but has not taken credit for Reasonable Further Progress or attainment demonstration purposes for any of the listed measures, with the exception of the NOx Budget Program and LEV program as discussed in *Section 3, Control Measures.*

Name of Control Measure	**Type of Measure**	**Approval Status**
On-board Refueling Vapor Recovery	Federal rule	Promulgated at 40 CFR 86
Federal Motor Vehicle Control program (Tier 0)	Federal rule	Promulgated at 40 CFR 86 (pre-1990)
CA Low Emission Vehicle (CA LEV)	State initiative	SIP approved (67 FR 78179; 12/23/02)
Heavy Duty Diesel Engines (On-road)	Federal rule	Promulgated at 40 CFR 86
Federal Non-road Heavy Duty diesel engines	Federal rule	Promulgated at 40 CFR 89
Federal Non-road Gasoline Engines	Federal rule	Promulgated at 40 CFR 90
Federal Marine Engines	Federal rule	Promulgated at 40 CFR 91
Rail Road Locomotive	Federal rule	Promulgated at 40 CFR 92
AIM Surface Coatings	State initiative	SIP approved (60 FR 65242; 12/19/95)
NSR*	State rule	SIP Submitted May 3, 1979
Automotive Refinishing	State initiative	SIP approved (61 FR 5696; 2/14/96)

Enhanced Inspection & Maintenance **	CAA SIP requirement	SIP approved (65 FR 69254; 11/16/00)
NOx RACT*	CAA SIP requirement	SIP approved (64 FR 48095; 9/2/99)
VOC RACT pursuant to sections 182(a)(2)(A) and 182(b)(2)(B) of CAA	CAA SIP requirement	SIP approved (58 FR 34908; 6/30/93 and 64 FR 48297; 9/3/99)
VOC RACT pursuant to section 182(b)(2)(A) and (C) of CAA	CAA SIP requirement	Partial SIP Approved (64 FR 48297; 9/3/99). SIP approved (67 FR 62179; 10/4/02
Stage II Vapor Recovery	CAA SIP requirement	SIP Approved (65 FR 78974; 12/18/2000)
Reformulated Gasoline	State opt-in	SIP Approved (67 FR 55121; 8/28/02)
Clean Fuel Fleets	CAA SIP requirement	SIP approved (60 FR 6027; 2/1/95); Massachusetts used CAL LEV reductions to meet the Clean Fuel Fleet requirement.
Transit System Improvements (EMA only)	State initiative	SIP approved (59 FR 50495; 10/4/94) Amendments submitted to EPA in December 2006.
High Occupancy Vehicle Lanes (EMA only)	State initiative	SIP approved (59 FR 50495; 10/4/94) Amendments adopted in 1996.
Certification of Tunnel Ventilation Systems (EMA only)	State initiative	SIP approved (57 FR 46310; 10/8/92) Reg. amended 2006; SIP Submitted to EPA 7/06
Parking Freeze Regulations (EMA only): City of Boston, City of Cambridge, Logan	State initiative	City of Boston, City of Cambridge - FIP (40 FR 25162; 6/12/75) Logan Airport/East Boston – SIP approved (58 FR 14153; 3/16/93

Airport, East Boston, South Boston		and 66 FR 14318; 3/12/01) South Boston; SIP Approved (61 FR 53628; 10/15/96)
NOx SIP Call	EPA requirement	SIP approved (65 FR 81743; 12/27/00). Reg. amended 2004
On-board diagnostics	CAA SIP requirement	Regulation effective 1/17/03. SIP revision submitted to EPA March 22, 2004.
CA LEV II	State initiative	State regulations adopted in 1999. SIP submitted 1/22/03
LEV - ZEV Mandate and Revision	State initiative	State regulations adopted 12/19/03 through emergency rulemaking; finalized 7/2/04.
LEV - Not-to-Exceed Standards for Heavy-and-Medium Duty Diesel Engines	State initiative	State regulations adopted December 2001.

***NSR and RACT**

MassDEP regulation, 310 CMR 7.00 Appendix A: Emissions Offsets and Nonattainment Review, contains the Massachusetts New Source Review (NSR) program for stationary sources of NOx and VOCs. ~~MassDEP intends to maintain t~~The major source applicability thresholds of potential-to-emit (PTE) 50 tons per year of volatile organic compounds and PTE 50 tons per year of NOx that applied to serious 1-hour ozone nonattainment areas, also apply under the 8-hour ozone standard.[1] ~~instead of the PTE 100 tons per year NOx threshold, which it could adopt as a moderate 8-hour nonattainment area.~~ NSR offset ratio requirements will remain at 1.2 to 1 (rather than the 1.15 to 1 ratio required for moderate areas). ~~MassDEP will also maintain its existing~~ The major source thresholds for RACT will not change. (RACT regulations are discussed in detail in Section 6.)

[1] EPA's *Final Rule to Implement the 8-Hour Ozone National Ambient Air Quality Standard - Phase I* , 69 FR 23952, April 30, 2004, allowed areas to adopt the major source thresholds that applied to their 8-hour standard classification, even though the thresholds might be less stringent than those that applied to the area under the applicable 1-hour ozone standard classifications. In December 2006, the U.S. Court of Appeals for the D.C. Circuit vacated EPA's Phase 1 rule, holding that parts of the rule violated provisions of the CAA. The count concluded that the provision allowing an area to adopt less-stringent major source thresholds constituted illegal "backsliding." Even prior to this court decision, MassDEP decided to retain its 1-hour NOx RACT threshold of PTE 50 tons, rather than adopt the less-stringent PTE 100 ton threshold that EPA's rule would have allowed had it not been vacated.

** **Enhanced Inspection and Maintenance and On-Board Diagnostics Program**

The Massachusetts Enhanced Emissions and Safety Test (I&M program) requires most model year 1984 – 1995 vehicles to be tested on a dynamometer, and model year 1996 and newer vehicles to be tested with on-board diagnostic (OBD) equipment. The 2008 RFP emissions estimate are based on the existing program. The contract for the current program expires on September 30, 2008 and MassDEP intends to adopt program revisions that will take effect October 1, 2008. MassDEP will amend its current regulation to make program revisions and submit the amended regulation to EPA as a separate SIP amendment. The SIP amendment will demonstrate that the revised program effectively replaces the emission reductions required by the existing program, and that that revised program will meet the requirements of EPA's I&M rule. .

APPENDIX 3B MA 2002 TO 2009 VOC & NOx PROJECTIONS BY CATEGORIES - Tons per Year (TPY) and Summer Day (TPSD) Eastern & Western MA

ks/inv2002-sip-rfp/RFP-2009-ema-wma-projections/ jan.29//2008

SOURCE CATEGORY	SCC	ACTUAL VOC 2002 TPY STATE	ACTUAL VOC 2002 TPSD STATE	ACTUAL VOC 2002 TPSD E.MA	ACTUAL VOC 2002 TPSD W.MA	2009 CTL	VOC 2002-09 GR.FAC STATE	PRE-CTL VOC 2009 TPSD STATE	POST-CTL VOC 2009 TPSD STATE	POST-CTL VOC 2009 TPSD E.MA	POST-CTL VOC 2009 TPSD W.MA	ACTUAL NOx 2002 TPY STATE	ACTUAL NOx 2002 TPSD STATE	ACTUAL NOx 2002 TPSD E.MA	ACTUAL NOx 2002 TPSD W.MA	NOx 2002-09 GR.FAC STATE	PROJECTED NOx 2009 TPSD STATE	PROJECTED NOx 2009 TPSD E.MA	PROJECTED NOx 2009 TPSD W.MA	GROWTH FACTOR SOURCE
POINT SOURCES																				
1. NOx Budget Sources		533.0	1.50	1.35	0.15		0.912	1.37	1.37	1.23	0.14	32940.0	82.77	74.49	8.28	n/a	56.01	50.41	5.60	MVU/CAIR Budget 2009
2. Other Point		5114.0	14.50	13.05	1.45		1.050	15.23	15.23	13.70	1.52	12650.0	46.83	42.15	4.68	1.050	49.17	44.25	4.92	MANE-VU CAIR Growth Factor
TOTAL POINT SOURCES		**5647.0**	**16.00**	**14.40**	1.60				**16.59**	**14.93**	**1.66**	**45590.0**	**129.60**	**116.64**	**12.96**		**105.18**	**94.66**	**10.52**	
OTC 2006 Model Rule-BOTW Point Source Glass/Fiberglass Furnaces (NOx only) effective 1/1/2009																	-1.50	-1.35	-0.15	
NET TOTAL POINT SOURCES		**5647.0**	**16.00**	**14.40**	**1.60**				**16.59**	**14.93**	**1.66**	**45590.0**	**129.60**	**116.64**	**12.96**		**103.68**	**93.31**	**10.37**	
AREA SOURCES																				
Waste Treatment																				
1. POTW's	2630020000	511.4	1.40	0.97	0.43		1.075	1.51	1.51	1.04	0.46									MA DET-employment
2. HW TSDF	2640000000	84.1	0.23	0.08	0.15		1.075	0.25	0.25	0.09	0.16									MA DET-employment
3. MSW Landfills	2620030000	1497.2	4.10	2.99	1.12		1.018	4.17	4.17	3.04	1.14									Population -US Census
Total Waste Management		**2092.7**	**5.73**	**4.04**	**1.70**				**5.93**	**4.17**	**1.76**									
Gasoline Distribution																				
1. Tank Truck Unl. (Stage 1)	2501060051	2081.4	6.72	5.65	1.08		1.023	6.87	6.87	5.78	1.10									MassHighway VMT
2. Vehicle Refuel. (Stage 11)		In On-Road Mobile category																		MassHighway VMT
3. Underground Tank Breath.	2501060201	1425.6	3.91	3.28	0.62		1.023	4.00	4.00	3.36	0.63									MassHighway VMT
4. Transit Losses	2505030120	213.3	0.69	0.58	0.11		1.023	0.71	0.71	0.59	0.11									MassHighway VMT
5. Aircraft Refuel.	2275900101	275.8	0.76	0.73	0.03		1.021	0.78	0.78	0.75	0.03									MassHighway VMT
6. Petro Vessel Unload.	2505020000	459.0	1.25	1.25	0.00		1.023	1.28	1.28	1.28	0.00									MassHighway VMT
7. Portable Fuel Contain Resident	2501011000	5534.3	15.16	13.03	2.13	0.089	1.028	15.58	14.20	12.20	1.99	2009 CE & benefits derived from MACTEC/OTC TSD 2/28/07 Tables 3.8 & 3-9 and Appendix D (see note 1)								Population -US Census
8. Portable Fuel Contain Commerc	2501012000	1054.2	2.89	2.48	0.41	0.089	1.028	2.97	2.71	2.32	0.38	2009 CE & benefits derived from MACTEC/OTC TSD 2/28/07 Tables 3.8 & 3-9 and Appendix D (see note 1)								Population -US Census
Total Gasoline Distribution		**11043.6**	**31.38**	**27.00**	**4.38**				**30.54**	**26.28**	**4.26**									
Stationary Source Solvent Evap.																				
1. Dry Cleaning	2420000000	9.0	0.03	0.03	0.00		1.043	0.03	0.03	0.03	0.00									MA DET-employment
2. Solvent Clean -Degr Cold Cln	2415300000	6456.5	24.83	21.50	3.33	0.34	0.952	23.64	15.60	13.51	2.09	2009 Reductions derived from Pechan/OTC TSD Model Rules March 31 2001 Table IV-6(see note 2)								MA DET-employment
2. Solvent Clean -Degr Vapor	2415100000	2021.1	7.77	6.73	1.04		0.952	7.40	7.40	6.41	0.99									
3. Consumer Products -Solvents	2465000000	22690.1	62.16	54.26	7.91	0.16	1.030	64.02	53.84	47.00	6.85	2009 CE & benefits derived from MACTEC/OTC TSD 2/28/07 Table 3.7 and Appendix D (see note 1)								Population -US Census
4. Graphic Arts:	2425000000	3683.1	14.17	12.28	1.89		1.015	14.38	14.38	12.46	1.92									MA DET-employment
5. Industrial Adhesives -Point	402007XX	347.4	0.95	0.81	0.14	0.22	1.425	1.35	1.06	0.90	0.16	2009 CE & benefits derived from MACTEC/OTC TSD 2/28/07 Table 3.5 and Appendix D (see note 1)								
6. Indus/comm Adhesives-Area	2440020000	3526.9	9.66	8.21	1.45	0.64	1.380	13.33	4.80	4.08	0.72	2009 CE & benefits derived from MACTEC/OTC TSD 2/28/07 Table 3.5 and Appendix D (see note 1)								
Total Solvent Evaporation		**38734.1**	**119.57**	**103.82**	**15.76**				**97.11**	**84.39**	**12.73**									
Non-Indus. Surface Coating:																				
1. Auto. Refinish	2401005000	2380.5	9.16	7.84	1.31		1.023	9.37	9.37	8.02	1.34									MA DET-employment
2. AIM Architect. Coating	2401001000	11827.2	42.12	36.77	5.36	0.31	1.023	43.09	29.73	25.95	3.78	2009 Reductions derived from Pechan/OTC TSD Model Rules March 31 2001 Table IV-6(see note 2)								MA DET & population
3. AIM Traffic Marking	2401008000	1285.6	4.58	4.00	0.58	0.31	1.020	4.67	3.22	2.82	0.41	2009 Reductions derived from Pechan/OTC TSD Model Rules March 31 2001 Table IV-6(see note 2)								MassHighway VMT
3.AIM High Perf. Maintenance	2401100000	2056.9	7.33	6.39	0.93	0.31	0.940	6.89	4.75	4.14	0.60	2009 Reductions derived from Pechan/OTC TSD Model Rules March 31 2001 Table IV-6(see note 2)								MA DET-metals& plasti
4. AIM Oth. Speclty Purp Coat	2401200000	2056.9	7.33	6.39	0.93	0.31	0.950	6.96	4.80	4.19	0.61	2009 Reductions derived from Pechan/OTC TSD Model Rules March 31 2001 Table IV-6(see note 2)								MA DET-metals& plasti
Total Auto Ref & AIM Coating		**19607.1**	**70.52**	**61.39**	**9.11**				**51.88**	**45.12**	**6.74**									
Industrial Coating:																				
1. Furniture & Fixtures	2401020000	2560.4	9.85	8.42	1.43		1.000	9.85	9.85	8.42	1.43									MA DET-employment
2. Metal Containers	2401040000	201.6	0.78	0.61	0.16		0.957	0.75	0.75	0.58	0.15									MA DET-employment
3. Motor Vehicles New	2401070000	121.1	0.47	0.41	0.05		1.070	0.50	0.50	0.44	0.05									MA DET-employment
4. Machinery & Equip.	2401055000	3687.4	14.18	12.22	1.96		0.960	13.61	13.61	11.73	1.88									MA DET painting,coating
5. Appliances	2401060000	863.9	3.32	2.85	0.47		0.878	2.91	2.91	2.50	0.41									MA DET-employment
6. Other Transportation Equip.	2401990000	439.1	1.69	1.42	0.26		1.070	1.81	1.81	1.52	0.28									MA DET-employment
7. Metal Sheet, Strip,Coil	2401045000	956.3	3.68	3.30	0.37		0.946	3.48	3.48	3.12	0.35									MA DET metal & plastic
8. Factory Finished Wood	2401015000	2736.6	10.53	9.13	1.39		1.000	10.53	10.53	9.13	1.39									MA DET-employment
9. Electric Insulation	2401065000	820.7	3.16	2.73	0.43		0.884	2.79	2.79	2.41	0.38									MA DET-employment
10. Other Prod. Coating	2401090000	1928.3	7.42	6.47	0.94		0.950	7.05	7.05	6.15	0.89									MA DET assembl,fabric
11. Marine Coatings	2401080000	242.1	0.93	0.81	0.12		1.070	1.00	1.00	0.87	0.13									MA DET-riggers,mechan
Total Industrial Coating		**14557.5**	**56.01**	**48.37**	**7.58**				**54.28**	**46.87**	**7.35**									
Miscelleneous Solvents:																				
1. Cutback Asphalt	2461022000	328.5	3.64	3.18	0.46	1.00	1.018	3.71	0.00	0.00	0.00	2009 CE & benefits derived from MACTEC/OTC TSD 2/28/07 Table 3.6 and Appendix D (see note 1)								MA DET-employment
2. Emulsified Asphalt	2461021000	434.4	4.79	4.18	0.61	0.90	1.018	4.88	0.49	0.43	0.06	2009 CE & benefits derived from MACTEC/OTC TSD 2/28/07 Table 3.6 and Appendix D (see note 1)								MA DET-employment
3. Pesticide Use	2461800000	910.7	4.26	2.97	1.29		1.029	4.38	4.38	3.06	1.33									MA DET-employment
4. Bakeries	2302050000	648.3	1.78	1.61	0.16		1.073	1.91	1.91	1.73	0.17									MA DET-employment
5. Breweries/Wineries	2302070001	86.8	0.24	0.21	0.03		1.018	0.24	0.24	0.21	0.03									Population -US Census
6. Petroleum Spills	2830000000	327.3	0.90	0.73	0.17		1.023	0.92	0.92	0.75	0.17									MassHighway VMT
7. Asphalt Roofing	2461023000	536.7	2.41	1.95	0.46		1.115	2.69	2.69	2.17	0.51	10.4	0.05	0.04	0.01	1.015	0.06	0.04	0.01	MA DET-employment
8. Leaking USTs	2660000000	6.1	0.02	0.01	0.00		1.018	0.02	0.02	0.01	0.00									Population -US Census
Total Miscellaneous Solvents		**3278.8**	**18.04**	**14.84**	**3.18**				**10.65**	**8.36**	**2.28**	**10.40**	**0.05**	**0.04**	**0.01**		**0.06**	**0.04**	**0.01**	
Small Statonary Fuel Combustion																				
1. Residential Coal	2104002000	10.0	0.00	0.00	0.00		1.071	0.00	0.00	0.00	0.00	3.0	0.00	0.00	0.00	1.071	0.00	0.00	0.00	MANE-VU & EIA
2. Residential D.Oil	2104004000	330.4	0.32	0.28	0.04		1.064	0.34	0.34	0.30	0.04	8340.9	8.16	7.12	1.04	1.074	8.68	7.58	1.11	MANE-VU & EIA
3. Residential N.Gas	2104006000	300.5	0.29	0.25	0.04		1.126	0.33	0.33	0.28	0.05	5136.1	5.02	4.38	0.64	1.118	5.65	4.93	0.72	MANE-VU & EIA
4. Residential Wood-burning	2104008000	66217.0	15.14	13.01	2.13		1.042	15.78	15.78	13.56	2.22	1332.0	0.17	0.15	0.02	1.064	0.18	0.16	0.02	MANE-VU & EIA
5. Residential Kerosene	2104011000	2.0	0.00	0.00	0.00		1.765	0.00	0.00	0.00	0.00	51.6	0.05	0.04	0.01	1.739	0.09	0.07	0.02	MANE-VU & EIA
6. Residential LPG	2104007000	18.5	0.02	0.02	0.00		1.031	0.02	0.02	0.02	0.00	863.6	0.85	0.74	0.11	1.019	0.88	0.76	0.11	MANE-VU & EIA
Total Residential Fuel		**66878.4**	**15.77**	**13.56**	**2.21**				**16.46**	**14.16**	**2.31**	**15727.2**	**14.25**	**12.43**	**1.82**		**15.48**	**13.50**	**1.98**	

APPENDIX 3B MA 2002 TO 2009 VOC & NOx PROJECTIONS BY CATEGORIES - Tons per Year (TPY) and Summer Day (TPSD) Eastern & Western MA

ks/inv2002-sip-rfp/RFP-2009-ema-wma-projections/ jan.29//2008

SOURCE CATEGORY	SCC	ACTUAL VOC 2002 TPY STATE	ACTUAL VOC 2002 TPSD STATE	ACTUAL VOC 2002 TPSD E.MA	ACTUAL VOC 2002 TPSD W.MA	2009 CTL	VOC 2002-09 GR.FAC STATE	PRE-CTL VOC 2009 TPSD STATE	POST-CTL VOC 2009 TPSD STATE	POST-CTL VOC 2009 TPSD E.MA	POST-CTL VOC 2009 TPSD W.MA	ACTUAL NOx 2002 TPY STATE	ACTUAL NOx 2002 TPSD STATE	ACTUAL NOx 2002 TPSD E.MA	ACTUAL NOx 2002 TPSD W.MA	NOx 2002-09 GR.FAC STATE	PROJECTED NOx 2009 TPSD STATE	PROJECTED NOx 2009 TPSD E.MA	PROJECTED NOx 2009 TPSD W.MA	GROWTH FACTOR SOURCE
1. Commercial/Instit Coal	2103001000	0.0	0.00	0.00	0.00		1.045	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	1.045	0.00	0.00	0.00	MANE-VU & EIA
2. Commercial/Instit D.Oil	2103004000	26.6	0.03	0.02	0.01		1.228	0.04	0.04	0.02	0.01	1566.6	1.81	1.57	0.24	1.225	2.22	1.93	0.29	MANE-VU & EIA
3. Commercial/Instit R.Oil	2103005000	0.7	0.00	0.00	0.00		1.615	0.00	0.00	0.00	0.00	34.5	0.04	0.03	0.01	1.676	0.06	0.05	0.02	MANE-VU & EIA
4. Commercial/Instit N.Gas	2103006000	168.2	0.19	0.16	0.03		1.126	0.21	0.21	0.18	0.03	3059.0	3.53	3.06	0.47	1.103	3.97	3.45	0.53	MANE-VU & EIA
5. Commercial/Instit Kerosene	2103011000	0.5	0.00	0.00	0.00		1.332	0.00	0.00	0.00	0.00	32.0	0.04	0.03	0.01	1.332	0.05	0.04	0.01	MANE-VU & EIA
6. Commercial/Instit LPG	2103007000	3.3	0.00	0.00	0.00		1.082	0.00	0.00	0.00	0.00	152.3	0.18	0.16	0.02	1.082	0.19	0.17	0.02	MANE-VU & EIA
7. Commercial/Instit Wood & Prod	2103081000	15.3	0.02	0.02	0.00		1.000	0.02	0.02	0.02	0.00	198.0	0.23	0.20	0.03	1.000	0.23	0.20	0.03	MANE-VU & EIA
Total Commercial/Instit Fuel		**214.6**	**0.24**	**0.20**	**0.04**				**0.27**	**0.22**	**0.05**	**5042.4**	**5.83**	**5.05**	**0.78**		**6.74**	**5.84**	**0.91**	
1. Small Industrial Coal	2102001000	0.1	0.00	0.00	0.00		0.951	0.00	0.00	0.00	0.00	11.8	0.02	0.02	0.00	0.951	0.02	0.02	0.00	MANE-VU & EIA
2. Small Industrial D.Oil	2102004000	22.0	0.03	0.02	0.01		1.020	0.03	0.03	0.02	0.01	388.7	0.54	0.47	0.07	1.018	0.55	0.48	0.07	MANE-VU & EIA
3. Small Industrial R.Oil	2102005000	0.0	0.00	0.00	0.00		0.950	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.956	0.00	0.00	0.00	MANE-VU & EIA
4. Small Industrial N.Gas	2102006000	443.3	0.61	0.53	0.08		1.189	0.73	0.73	0.63	0.10	8060.6	11.16	9.66	1.50	1.163	13.27	11.49	1.78	MANE-VU & EIA
5. Small Industrial Kerosene	2102011000	0.1	0.00	0.00	0.00		1.000	0.00	0.00	0.00	0.00	2.9	0.00	0.00	0.00	1.000	0.00	0.00	0.00	MANE-VU & EIA
6. Small Industrial LPG	2102001000	6.1	0.01	0.01	0.00		1.019	0.01	0.01	0.01	0.00	283.5	0.39	0.33	0.06	1.014	0.40	0.34	0.06	MANE-VU & EIA
7. Small Industrial Wood-Products	2102008000	362.1	0.50	0.43	0.07		1.173	0.59	0.59	0.50	0.08	4686.0	6.49	5.58	0.91	1.149	7.61	6.55	1.07	MANE-VU & EIA
Total Small Industrial Fuel		**833.7**	**1.15**	**0.99**	**0.16**				**1.35**	**1.17**	**0.19**	**13433.5**	**18.60**	**16.06**	**2.54**		**21.85**	**18.87**	**2.98**	
1. Open Burning -M.Solid Waste	2610030000	0.8	0.00	0.00	0.00		1.024	0.00	0.00	0.00	0.00	1.2	0.00	0.00	0.00	1.020	0.00	0.00	0.00	MANE-VU
2. Open Burning -Brush Waste	2610000400	174.3	0.13	0.10	0.03		1.024	0.13	0.13	0.10	0.03	45.9	0.03	0.02	0.01	1.020	0.03	0.02	0.01	MANE-VU
3. Open Burning -Leaf Burning	2610000100	17.3	0.00	0.00	0.00		1.024	0.00	0.00	0.00	0.00	3.8	0.00	0.00	0.00	1.020	0.00	0.00	0.00	MANE-VU
4. Open Burning -Yard Waste	2610040400	142.3	0.11	0.09	0.02		1.024	0.11	0.11	0.09	0.02	37.5	0.03	0.02	0.01	1.020	0.03	0.02	0.01	MANE-VU
Total Open Burning		**334.7**	**0.24**	**0.19**	**0.05**				**0.25**	**0.19**	**0.05**	**88.4**	**0.06**	**0.04**	**0.02**		**0.06**	**0.04**	**0.02**	
1. Wildfires: Forest/Brush	2810001000	345.3	1.69	1.36	0.33		1.000	1.69	1.69	1.36	0.33	57.2	0.28	0.23	0.05	1.000	0.28	0.23	0.05	
2. Structural Fires	2810030000	75.9	0.18	0.15	0.02		1.000	0.18	0.18	0.15	0.02	9.7	0.02	0.02	0.00	1.000	0.02	0.02	0.00	
3. Vehicle Fires	2610000000	17.3	0.05	0.04	0.01		1.000	0.05	0.05	0.04	0.01	2.2	0.01	0.01	0.00	1.000	0.01	0.01	0.00	
4. Food Preparation Backyard Grills	2810025000	374.8	3.26	2.78	0.48		1.018	3.32	3.32	2.83	0.49	0.0	0.00	0.00	0.00	1.015	0.00	0.00	0.00	Population -US Census
5. Food Prep - Commercial Charbroi	2302002000	642.7	1.76	1.53	0.23		1.045	1.84	1.84	1.60	0.24	0.0	0.00	0.00	0.00	1.039	0.00	0.00	0.00	MA DET-employment
6. Food Prep - Comm. Deep Fat Fryi	2302003000	722.1	1.98	1.72	0.26		1.045	2.07	2.07	1.80	0.27	0.0	0.00	0.00	0.00	1.039	0.00	0.00	0.00	MA DET-employment
Total Other Fires and Cooking		**2178.1**	**8.92**	**7.58**	**1.33**				**9.15**	**7.78**	**1.36**	**69.1**	**0.31**	**0.26**	**0.05**		**0.31**	**0.26**	**0.05**	
TOTAL COMBUSTION		**70439.5**	**26.32**	**22.52**	**3.79**				**27.48**	**23.52**	**3.95**	**34360.6**	**39.05**	**33.84**	**5.21**		**44.44**	**38.50**	**5.94**	
TOTAL AREA SOURCE		**159753.3**	**327.57**	**281.98**	**45.50**				**277.88**	**238.71**	**39.08**	**34371.0**	**39.10**	**33.88**	**5.22**		**44.50**	**38.54**	**5.95**	
ON-ROAD MOBILE*		**57185.5**	**151.89**	**127.41**	**24.47**				**74.23**	**63.50**	**10.73**	**143367.6**	**453.05**	**381.35**	**71.70**		**202.69**	**174.96**	**27.73**	
OFF-ROAD MOBILE																				
OFF-HIGHWAY																				
Aircraft -Logan	2275050000	206.5	0.57	0.57	0.00		1.190	0.68	0.68	0.68	0.00	1294.7	3.55	3.55	0.00	1.176	4.22	4.22	0.00	MASSPORT
Aircraft -Others	2275050000	792.5	2.17	1.73	0.44		1.150	2.50	2.50	1.99	0.51	1821.1	4.99	1.65	3.34	1.139	5.74	1.90	3.84	MANEVU - CAIR
1. Total Aircraft		999.0	2.74	2.30	0.44				3.17	2.67	0.51	3115.8	8.54	5.19	3.34		9.96	6.12	3.84	
2. Railroads	2285002000	309.8	0.85	0.59	0.26		0.950	0.81	0.81	0.56	0.25	7154.0	19.60	13.65	5.95	0.955	18.62	12.97	5.65	MANEVU - CAIR
3. Commercial Marine Vessels	2280020010	432.6	1.19	1.19	0.00		1.020	1.21	1.21	1.21	0.00	2589.9	7.10	7.10	0.00	1.016	7.24	7.24	0.00	MANEVU - CAIR
Total Off-Highway		**1741.4**	**4.78**	**4.08**	**0.70**				**5.20**	**4.44**	**0.75**	**12859.7**	**35.24**	**25.94**	**9.29**		**35.83**	**26.33**	**9.49**	
NONROAD MODEL EQUIPMENT																				
1. Agricultural Equipment			0.25						0.18				1.76				1.53			NONROAD Model proj 2008
2. Airport Eq			0.06						0.05				0.57				0.5			NONROAD Model proj 2008
3. Commercial Eq			15.40						12.28				9.13				8.37			NONROAD Model proj 2008
4. Construction & Mining			7.83						5.16				42.39				35.5			NONROAD Model proj 2008
5. Industrial Equipment			8.71						4.76				35.32				22.27			NONROAD Model proj 2008
6. Lawn & Garden -Commercial			53.66						30.62				9.97				8.46			NONROAD Model proj 2008
7. Lawn & Garden -Residential			34.71						29.32				2.52				2.25			NONROAD Model proj 2008
8. Logging Eq			0.26						0.16				0.42				0.28			NONROAD Model proj 2008
9. Pleasure Craft			84.68						65.69				6.47				8.44			NONROAD Model proj 2008
10.Railroad Eq			0.01						0.01				0.02				0.02			NONROAD Model proj 2008
11.Recreational Eq			13.47						18.62				0.78				0.82			NONROAD Model proj 2008
SUBTOTAL NON-ROAD MODEL EQ		**54835.8**	**219.04**	**192.11**	**26.97**				**166.85**	**144.83**	**22.01**	**30046.7**	**109.35**	**96.15**	**13.13**		**88.44**	**78.19**	**10.24**	
Portable fuel containers NonRoad					PFC NonRoad CE 0.058:				-0.50	-0.43	-0.07	2009 CE & benefits derived from MACTEC/OTC TSD 2/28/07 Table 3.9 and Appendix D (see note 2)								
									166.35	**144.40**	**21.94**									
TOTAL OFF-ROAD MOBILE		**56577.2**	**223.82**	**196.19**	**27.67**				**171.55**	**148.84**	**22.69**	**42906.4**	**144.59**	**122.09**	**22.42**		**124.27**	**104.52**	**19.73**	
ANTHROPOGENIC	**TOTAL**	**279163.0**	**719.28**	**619.98**	**99.24**				**540.25**	**465.99**	**74.17**	**266235.0**	**766.34**	**653.96**	**112.30**		**475.13**	**411.34**	**63.78**	

Totals may not add up correctly due to rounding

1. DEP used MACTEC/OTC "Identification & Evaluation of Candidate Control Measures" TSD 2/28/2007 Tables 1-2, 3-5 to 3-9 and Appendix D tables for control efficiencies and reduction benefits for PFCs, Consumer Products, Adhesives & Sealants, and Asphalt Paving.

2. Reductions for Solvent Cleaning and AIM were derived from Pechan/OTC "Control Measure Development Support Analysis of Ozone Transport Commission Model Rules", (OTC MR) March 31 200, Section D-2 and Table IV-6.

OTC MR has CE 66% for Solvent Cleaning, but MA already has 32% in place before 2002, so the 34% remainder is the net 2009 benefit. For the 4 AIM sub-categries, a benefit of 19 tons divided by the 2009 uncontrolled emissions of 61.6 tons gives a 31% control efficiency.

* 2009 On-Road Mobile projections from 2008 Mobile Source Emission Budgets prepared MA Office of Transportation Planning 10/17/2007

n/a - not applicable

DOE - US Department of Energy

APPENDIX 3B MA 2002 TO 2009 VOC & NOx PROJECTIONS BY CATEGORIES - Tons per Year (TPY) and Summer Day (TPSD) Eastern & Western MA

ks/inv2002-sip-rfp/RFP-2009-ema-wma-projections/ jan.29//2008

			ACTUAL	ACTUAL	ACTUAL	ACTUAL			PRE-CTL	POST-CTL	POST-CTL	POST-CTL	ACTUAL	ACTUAL	ACTUAL	ACTUAL		PROJECTED	PROJECTED	PROJECTED	
			VOC	VOC	VOC	VOC		VOC	VOC	VOC	VOC	VOC	NOx	NOx	NOx	NOx	NOx	NOx	NOx	NOx	
			2002	2002	2002	2002		2002-09	2009	2009	2009	2009	2002	2002	2002	2002	2002-09	2009	2009	2009	GROWTH FACTOR
SOURCE CATEGORY		SCC	TPY	TPSD	TPSD	TPSD	2009	GR.FAC	TPSD	TPSD	TPSD	TPSD	TPY	TPSD	TPSD	TPSD	GR.FAC	TPSD	TPSD	TPSD	SOURCE
			STATE	STATE	E.MA	W.MA	CTL	STATE	STATE	STATE	E.MA	W.MA	STATE	STATE	E.MA	W.MA	STATE	STATE	E.MA	W.MA	