Modeling Alternative NLEV Implementation and Adoption of California Standards in MOBILE6
February 2, 2005

This document supplements and revises the guidance given in Section 7.4.1 of the document entitled: "Technical Guidance on the Use of MOBILE6 for Emission Inventory Preparation" located on EPA/OTAQ's website (http://www.epa.gov/otaq/models/mobile6/m6techgd.pdf), and supercedes draft supplemental guidance on this subject dated December 21, 2001. This revision updates the treatment of the 2003 model year under the LEV II program, and the modeling of evaporative emissions for Partial Zero Emission Vehicles (PZEVs) based on consultation with California's Air Resources Board (ARB).

The default case in MOBILE6 for post-Tier 1 emission control programs assumes that the National Low Emission Vehicle (NLEV) program applicable to the non-Northeastern states is implemented in model year 2001, and that the Federal Tier 2 program begins implementation in model year 2004. Users who wish to use MOBILE6 with alternate control program scenarios will need to invoke additional input features as described in this guidance.

An earlier phase-in of these NLEVs would be modeled using an alternate input file in conjunction with the "94+ LDG IMP" command, detailed in the MOBILE6 User's Guide (Section 2.8.11.4). An alternate data file (NLEVNE.D), developed by EPA and provided with the final model release, reflects the appropriate phase-in of NLEV standards in the 1999 and 2000 models years. Northeastern states subject to the earlier phase-in provisions on NLEV should use the NLEVNE.D file instead of the MOBILE6 default for accurate representation of the NLEV program in their area.

Under Section 177 of the Clean Air Act, states have the option to adopt California emission control programs instead of the federal program if the California programs would help achieve the air quality goals of that state. The focus of this option has been the evaluation of programs which are alternatives to the Federal Tier 1 and Tier 2 programs. California's emission control program for light-duty vehicles consists of the LEV I and LEV II programs, which are considered separable for states outside of California and in MOBILE6's modeling approach.

California's LEV I program affects light-duty vehicles beginning with the 1994 model year and continuing until the start of the LEV II program. Some northeastern states adopted California's LEV I program as an alternative to the Federal Tier 1 and NLEV programs. Because the specific implementation schedules of the LEV I program vary from state to state, users wishing to model the LEV I program in a specific non-California state will need to develop a custom input file to be used in conjunction with the "94+ LDG IMP" command. This custom file should be based on the default file P94IMP.D provided with the final model release, modified as appropriate to reflect the appropriate phase-in schedule of vehicles under the LEV I program (i.e. TLEV, LEV, ULEV and ZEV) for that state. The modified phase-in schedule should only affect model years 1994 through 2003; beginning in model year 2004, the model assumes implementation of the Tier 2 program.

Beginning in 2004, the MOBILE6 default case is the federal Tier 2 program under the phase-in presented in the MOBILE6 report M6.EXH.004, "Accounting for the Tier 2 and Heavy-Duty 2005/2007 requirements in MOBILE6". States have the option of adopting California's LEV II program in place of the Federal Tier 2 program. The ARB's phase-in of the LEV II program (as of July 17, 2001) is given by vehicle type in the three tables in the appendix of this guidance. For all pollutants, analysis of the LEV II option in MOBILE6 will be performed using alternative input files (listed in parentheses) in conjunction with these four commands:

- **T2 EXH PHASE-IN**, which provides phase-in percentages by exhaust certification bin, vehicle class and pollutant (corresponding input file **LEVIIPH.D**) (for model years 2004 through 2015),

- **T2 CERT**, which defines the 50,000 mile standard levels by exhaust certification bin, vehicle class and pollutant (corresponding input file **LEVIIST.D**)), and

- **T2 EVAP PHASE-IN**, which provides phase-in percentages for evaporative standards (similar to the phase-in of the exhaust standards) by vehicle class for model years beginning with 2004 (corresponding input file **LEVIIEVP.D**).

- **94+ LDG IMP** (corresponding input file **LEVII94.D**) has two uses:

  - for model years 1994 through 2003 is used to establish the fraction of certification standard classes, from Tier 0 through ZEV. The provided file reflects the NLEV program for states not affected by the early NLEV phase-in provisions for Northeastern states.

  - for model years 2004 through 2025 is used **ONLY** to establish the fraction of zero-emitting exhaust vehicles (ZEVs). The remainder of vehicles (for each of those model years) are categorized simply as "Tier 2" and allocated according to the bin phase-in fractions provided with the preceding "**T2 EXH PHASE-IN**" and "**T2 EVAP PHASE-IN**" commands.

  Users who would like to model the LEV I or northeastern NLEV and LEV II programs in conjunction can create a single input file (**94+ LDG IMP**) for this command (for both exhaust and evaporative emissions) which reflects the phase-in for the appropriate programs from 1994 onward.

These four commands and the corresponding input files are described in the User's Guide to MOBILE6 (Sections 2.8.11.3 and 2.8.11.4).

The four input files listed above were developed for MOBILE6 directly from LEV II phase-in assumptions developed for EMFAC2001 by the California ARB. Thus, these files reflect the California LEV II program as projected to be implemented in California. The analysis of LEV II-based programs which differ from California's implementation will require modification to the above files. It is important to note that MOBILE6 only checks to make sure that phase-in

percentages for a given vehicle class and model year add to 1. MOBILE6 does not check to ensure the phase-in schedule or standards entered in the model are in compliance with the provisions of either the Tier 2 rule or LEV II rule; it is, therefore, up to the user to ensure that alternate Tier 2 or LEV II phase-in schedules and standards are accurate and meet the requirements of these rules. Users should contact EPA to ensure the correct modifications are made to the default input files.

Two aspects of the LEV II rule cannot be modeled directly in MOBILE6, requiring approximations to be applied. The first applies to PZEVs in model year 2003. California's current requirement is that 0.4 percent of LDV/LDT1s be certified as ZEVs and 9.3 percent of LDV/LDT1s be certified as PZEVs in 2003. The 2003 ZEV requirement is in the ZEV column of the LEVII94.D input file. However, MOBILE6 does not provide the flexibility to model PZEVs in 2003, hence EPA is accounting for PZEVs as ULEVs in model year 2003 only.

The second aspect of the LEV II rule requiring approximation is the treatment of PZEV evaporative emissions in all model years. MOBILE6 does not provide the flexibility to model PZEVs as a separate evaporative category; the two candidate categories to account for PZEV evaporative emissions are the standard LEV II standards, or ZEV levels (i.e. zero emissions). Recent consultation with the ARB indicates that the EMFAC model does assign emissions and deterioration to PZEVs. EPA, therefore, believes that it is more appropriate to treat PZEVs no different than standard LEV II vehicles in terms of evaporative emissions, rather than ZEVs. This approximation is reflected by using the LEVII94.D file for both exhaust and evaporative emission phase-in.

APPENDIX

Table A-1

ARB's LEV II Phase-In (as of July 17, 2001) of Passenger Cars (PC) and Light-Duty Truck 1's (LDT1)

Mdl Yr	LEV I	ULEV I	LEV II	ULEV II	Tier2-4	Tier2-3	PZEV	ATPZEV	ZEV
2003	70.3%	20.0%	0.0%	0.0%	0.0%	0.0%	8.4%	0.9%	0.4%
2004	61.0%	0.0%	20.1%	0.0%	0.0%	0.0%	16.6%	1.9%	0.4%
2005	12.0%	9.0%	51.3%	0.0%	0.0%	0.0%	25.1%	2.2%	0.4%
2006	0.0%	0.0%	40.5%	23.0%	0.0%	0.0%	33.0%	3.0%	0.5%
2007	0.0%	0.0%	25.0%	15.0%	19.1%	0.0%	36.9%	3.4%	0.6%
2008	0.0%	0.0%	15.0%	25.0%	14.6%	0.0%	41.0%	3.8%	0.6%
2009	0.0%	0.0%	4.0%	6.0%	10.0%	29.0%	44.9%	5.2%	0.9%
2010	0.0%	0.0%	4.0%	6.0%	10.0%	24.4%	49.0%	5.6%	1.0%
2011	0.0%	0.0%	4.0%	6.0%	10.0%	19.8%	53.1%	6.1%	1.0%
2012	0.0%	0.0%	4.0%	6.0%	10.0%	14.2%	56.6%	7.8%	1.4%
2013	0.0%	0.0%	4.0%	6.0%	10.0%	14.2%	56.6%	7.8%	1.4%
2014	0.0%	0.0%	4.0%	6.0%	10.0%	14.2%	56.6%	7.8%	1.4%
2015	0.0%	0.0%	4.0%	6.0%	10.0%	11.1%	56.7%	10.3%	1.9%
2016	0.0%	0.0%	4.0%	6.0%	10.0%	11.1%	56.7%	10.3%	1.9%
2017	0.0%	0.0%	4.0%	6.0%	10.0%	11.1%	56.7%	10.3%	1.9%
2018	0.0%	0.0%	4.0%	6.0%	10.0%	8.0%	56.7%	12.9%	2.4%
2019	0.0%	0.0%	4.0%	6.0%	10.0%	8.0%	56.7%	12.9%	2.4%
2020	0.0%	0.0%	4.0%	6.0%	10.0%	8.0%	56.7%	12.9%	2.4%

Table A-2

ARB's LEV II Phase-In (as of July 17, 2001) of
Light-Duty Truck 2's (LDT2)

Mdl Yr	LEV I	ULEV I	Tier2-9	LEV II	ULEV II	Tier2-4
2003	85.0%	15.0%	0.0%	0.0%	0.0%	0.0%
2004	0.0%	0.0%	75.0%	25.0%	0.0%	0.0%
2005	0.0%	0.0%	50.0%	50.0%	0.0%	0.0%
2006	0.0%	0.0%	25.0%	75.0%	0.0%	0.0%
2007	0.0%	0.0%	0.0%	50.0%	50.0%	0.0%
2008	0.0%	0.0%	0.0%	40.0%	60.0%	0.0%
2009	0.0%	0.0%	0.0%	40.0%	40.0%	20.0%
2010	0.0%	0.0%	0.0%	35.0%	45.0%	20.0%
2011	0.0%	0.0%	0.0%	35.0%	45.0%	20.0%
2012	0.0%	0.0%	0.0%	35.0%	45.0%	20.0%
2013	0.0%	0.0%	0.0%	35.0%	45.0%	20.0%
2014	0.0%	0.0%	0.0%	35.0%	45.0%	20.0%
2015	0.0%	0.0%	0.0%	35.0%	45.0%	20.0%
2016	0.0%	0.0%	0.0%	35.0%	45.0%	20.0%
2017	0.0%	0.0%	0.0%	35.0%	45.0%	20.0%
2018	0.0%	0.0%	0.0%	35.0%	45.0%	20.0%
2019	0.0%	0.0%	0.0%	35.0%	45.0%	20.0%
2020	0.0%	0.0%	0.0%	35.0%	45.0%	20.0%

Table A-3

ARB's LEV II Phase-In (as of July 17, 2001) of
Medium-Duty Trucks

Mdl Yr	LEV I	ULEV I	Tier2-10	Tier2-8	LEV II
2003	60.00%	40.00%	0.00%	0.00%	--
2004	0.00%	0	81.50%	18.50%	--
2005	0.00%	0	63.00%	37.00%	--
2006	0.00%	0	39.00%	61.00%	--
2007	--	--	0.00%	0.00%	100%
2008	--	--	0.00%	0.00%	100%
2009	--	--	0.00%	0.00%	100%
2010	--	--	0.00%	0.00%	100%
2011	--	--	0.00%	0.00%	100%
2012	--	--	0.00%	0.00%	100%
2013	--	--	0.00%	0.00%	100%
2014	--	--	0.00%	0.00%	100%
2015	--	--	0.00%	0.00%	100%
2016	--	--	0.00%	0.00%	100%
2017	--	--	0.00%	0.00%	100%
2018	--	--	0.00%	0.00%	100%
2019	--	--	0.00%	0.00%	100%
2020	--	--	0.00%	0.00%	100%