

TABLE IV.F-3—NATIONAL ENGINEERING COMPLIANCE COSTS AND SOCIAL COSTS ESTIMATES FOR THE PROPOSED RULE: 2004–2030

[\$10⁶]^a

Year	Engineering compliance costs	Total social costs ^b
2004	0.00	0.00
2005	0.00	0.00
2006	0.00	0.00
2007	39.61	39.61
2008	130.41	130.40
2009	132.25	132.25
2010	262.02	262.01
2011	641.12	641.07
2012	1,010.37	1,010.27
2013	1,202.52	1,202.40
2014	1,329.14	1,329.01
2015	1,260.74	1,260.62
2016	1,298.40	1,298.27
2017	1,318.75	1,318.62
2018	1,325.02	1,324.89
2019	1,339.30	1,339.16
2020	1,366.79	1,366.66
2021	1,351.08	1,350.94
2022	1,349.58	1,349.44
2023	1,365.53	1,365.38
2024	1,371.60	1,371.45
2025	1,395.98	1,395.83
2026	1,419.79	1,419.64
2027	1,442.91	1,442.76
2028	1,465.41	1,465.26
2029	1,487.68	1,487.53
2030	1,509.77	1,509.61
NPV at 3%	16,524.29	16,522.66
NPV at 7%	9,894.02	9,893.06

Notes:

^a Figures are in 2001 dollars.

^b Figures in this column do not include the human health and environmental benefits of the proposal.

VI. Alternative Program Options

Our proposed emission control program consists of a two-step program to reduce the sulfur content of nonroad diesel fuel in conjunction with the proposed Tier 4 engine standards. As we developed this proposal, we evaluated a number of alternative options with regard to the scope, level, and timing of the standards. This section presents a summary of our analysis of several alternative control scenarios. A complete discussion of all the alternatives, their feasibility, and their inventory, benefits, and cost impacts can be found in Chapter 12 of the draft Regulatory Impact Analysis for this proposal.

While we are interested in comments on all of the alternatives presented, we

are especially interested in comments on two alternative scenarios which EPA believes merit further consideration in developing the final rule: a program in which sulfur levels are required to be reduced to 15 ppm in essentially a single step, and a variation on the proposed two-step fuel control program, in which the second step of sulfur control to 15 ppm in 2010 would apply to locomotive and marine diesel fuel in addition to nonroad diesel fuel. This section describes these two options in greater detail; additional information can be found in Chapter 12 of the draft Regulatory Impact Analysis for this proposal.

A. Summary of Alternatives

We developed emissions, benefits, and cost analyses for a number of alternatives. The alternatives we considered can be categorized according to the structure of their fuel requirements: whether the 15 ppm fuel sulfur limit is reached in two-steps, like the proposed program, or one-step.

One-step alternatives are those in which the fuel sulfur standard is applied in a single step: there are no fuel-based phase-ins. We evaluated three one-step alternatives. Option 1 is described in detail in Section VI.B, below. We considered two other one-step alternatives which differ from Option 1 in the timing of the fuel option (2006 or 2008) and the engines standards (level of the standards and when they are introduced). As described in Table IV-1, Option 1b differs from Option 1 regarding the timing of the fuel standards, while Option 1a differs from Option 1 in terms of the engine standards. Both Option 1a and 1b would also extend the 15 ppm fuel sulfur limit to locomotive and marine diesel fuel as well.

Two-step alternatives are those in which the fuel sulfur standard is set first at 500 ppm and then is reduced to 15 ppm. The two-step alternatives vary from the proposal in terms of both the timing and levels of the engine standards and the timing of the fuel standards. Option 2a is the same as the proposed program except the 500 ppm fuel standard is introduced a year earlier, in 2006. Option 2b is the same as the proposed program except the 15 ppm fuel standard is introduced a year earlier in 2009 and the trap-based PM standards begin earlier for all engines.

Option 2c is the same as the proposed program except the 15 ppm fuel standard is introduced a year earlier in 2009 and the trap-based PM standards begin earlier for engines 175–750 hp. Option 2d is the same as the proposed program except the NO_x standard is reduced to 0.30 g/bhp-hr for engines 25–75 hp, and this standard is phased in. Finally, Option 2e is the same as the proposed program except there are no new Tier 4 NO_x limits.

Options 3 and 4 are identical to the proposed program, except Option 3 would exempt mining equipment over 750 hp from the Tier 4 standards, and Option 4 would include applying the 15 ppm sulfur limit to both locomotive and marine diesel fuel. Option 4 is discussed in detail in Section IV.C, below.

Option 5a and 5b are identical to the proposal except for the treatment of engines less than 75 hp. Option 5a is identical to the proposal except that no new program requirements would be set in Tier 4 for engines under 75 hp. Instead Tier 2 standards and testing requirements for engines under 50 hp, and Tier 3 standards and testing requirements for 50–75 hp engines, would continue indefinitely. The Option 5b program is identical to the proposal except that for engines under 75 hp only the 2008 engine standards would be set. There would be no additional PM filter-based standard in 2013 for 25–75 hp engines, and no additional NO_x+NMHC standard in 2013 for 25–50 hp engines.

Table VI-1 contains a summary of a number of these alternatives and the expected emission reductions, costs, and monetized benefits associated with them in comparison to the proposal. These alternatives cover a broad range of possible approaches and serve to provide insight into the many other program design alternatives not expressly evaluated further. The analysis was done using a 3% discount rate. If we were to use another rate, the values would change but not to such a degree as to change our conclusions regarding the various options. A complete discussion of all the alternatives, their feasibility, and their inventory, benefits, and cost impacts can be found in Chapter 12 of the draft Regulatory Impact Analysis for this proposal.