Internal Review Comments on
Draft Emission Reduction Plan for Ports and International Goods Movement

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December 2005

General Comments: Overall, the report is clearly written and readable by the educated public. However, there is a tension between writing too much for the lay reader and not enough for technical reader. We understand that this document is meant more for the lay audience but perhaps a few additional details may be helpful. It is a good report with much information and provides a vision of potential future controls and their utility. However, more could be added about alternative fuels and other health effects related to gaseous constituents of diesel engine exhaust.

1. In the summary description of the health impacts they specify that they are interested in calculating only the impacts of internal transportation systems (trucks, rail) in so far as they reflect movement of goods in intercontinental trade. However, in the body of the report, it is several time pointed out that the same transportation systems that handle the imports and exports also handle movement of goods within California and the United States as a whole. So, any regulatory actions which improve the health impacts of goods movement related to intercontinental trade will also improve the health impacts of goods movement related to internal trade. Although it is clearly of interest to identify that fraction of internal goods movement which is related to the intercontinental trade via the ports when considering projections of trade volumes, attribution of costs and so on, it seems illogical not to also present "up front" the entire benefit to be obtained from regulations or other measures which mitigate the health impacts of any goods movement regardless of the source of the cargo.

2. Consideration of alternative strategies for mitigation of health impacts of internal transportation concentrates almost exclusively on regulations, market interventions and voluntary agreements aimed at reducing the impact of pollution from diesel-powered equipment. The considerable efforts by various interested parties, including CARB itself as well as SCAQMD and other air districts to develop alternative fuel vehicles are almost entirely ignored. While these efforts to mitigate diesel impacts are clearly appropriate and necessary, there should also be a place for application of zero-emissions and PZEV technologies such as electric power, and CNG- or even hydrogen-fueled vehicles. While these are likely to be longer-term options they have far greater potential to minimize health impacts, especially in local near-source situations where the health impacts are currently most severe. The analysis of port operations correctly identifies replacement of auxiliary diesel engine power by grid-derived electric power as a powerful tool to minimize health-damaging emissions from ships while in port, and on-port mechanical operations. It is implicit in this that grid-derived power is already at least partly derived from renewable and relatively non-polluting sources, and the attractiveness of this substitution is greatly increased if it is coupled with other State-wide efforts to increase

the proportion of grid power from renewable and non-polluting sources which do not contribute to net CO2 emissions. This opportunity (or caveat, if grid power continues to rely on fossil fuels) should be made explicit in the report. The report fails to even mention electric traction as an option for mitigating rail impacts. This technology is ubiquitous in its application worldwide, and is even employed widely for passsenger rail systems in California, so the only barrier to its application is the cost of conversion, not feasiblity. In particular, its use for local switching equipment in rail yards and for tractor units on high-intensity metropolitan corridors (where its introduction would be easiest from a cost and regulatory point of view) has the potential to enormously reduce pollution impacts in precisely those areas where the impact of rail operations is currently most severe. As noted in the report, the overall scale of rail operations is presently not large except in some of these localized near-source areas, but is likely to become worse (including exceeding the per-ton-mile emission rate of projected "clean" trucks) unless cleaner rail operations are introduced. The calculation of truck and rail impacts in the report apparently fails to consider the substantial benefits of reducing traffic congestion in metropolitan areas (and thus secondarily reducing pollutants emitted from all mobile sources) if major "truck route" goods movement can be diverted to rail, although it is mentioned that several port authorities and air districts are examining this option. Use of electric traction for long-distance rail operations is a longer-term objective which obviously will require US involvement, but it does have the potential to significantly reduce pollution impacts statewide (and nationally), to reduce CO2 emissions (especially if improved rail operations were to take travel market share from airlines and other fuel-intensive modes), and to reduce dependence of imported fossil fuels.

2. Calculation of the health impacts of diesel emissions assumes that all such impacts are caused by the particulate component of the emissions (apart from the separate consideration of NOx/ozone). While the diesel PM emissions are used as an accessible dose metric of total emissions, particularly when calculating cancer risk, they are by no means the only component of diesel exhaust with health impacts, especially when considering near-source exposures. Gaseous components of the exhaust (especially naphthalenes, butadiene and aldehydes) may contribute substantially to both cancer and non-cancer health impacts. They are also important contributors to ambient air toxics concentrations both of the emitted materials and their atmospheric transformation products. This latter issue does not appear to have been considered in the report, but is evidently an area of substantial impact and one about which at least some quantitative information is available (e.g., the data on ambient air concentrations of butadiene, formaldehyde, acrolein etc. in the South Coast air basin). The detailed consideration of NOx emissions in the report appears to mainly address ambient levels and the interaction of NOx and photochemically generated ozone, rather than also considering direct effect of such emissions near the sources. The report's disclaimer that health effects other than cancer and cardiovascular disease are not well-quantified as regards dose-response is not altogether unjustified, but much more could have been done by taking advantage of ARB's and OEHHA's extensive efforts to quantify health risks from ambient air toxics and Hot Spots emissions.

4. Estimation of mortality impacts from cardiovascular disease in the report depends on a

draft evaluation mainly by US EPA of national data in an update to the Pope et al. study. The methodology and underlying data used are presented in a cursory and inadequate manner, and little consideration of the complexities of interpretation is presented. It seems inappropriate to rely on this non-peer reviewed estimate, (the peer reviewers quoted at the back of the document make it clear that they haven't been able to do much more than agree that the Pope et al. 2003 study is a reasonable basis for an estimate) in preference to the much more careful and extensive presentation in the recent CARB/OEHHA health effects analysis for the PM AAQS, which has been thoroughly peer reviewed and presents California-specific estimates. (This may be an important point: the report argues somewhere in the section that California PM is similar to other PM in the US, hence the national estimates are applicable, whereas in fact I understood that ambient PM in California was in fact considerably different from that found in other parts of the US, especially the East Coast cities.) The comments at the end of the report imply that something will be changed and the final will reflect use of the California AAQS analysis, but that isn't apparent in the current draft.

5. Some discussion appears in the report and peer review comments about "double counting" of mortality between overall mortality estimates based on PM and other cause-specific estimates (specifically cancer, since other mortality endpoints are not considered in any detail). It seems to me that something reasonable could have been done if the cause-specific analyses available in the AAQS report are used. (Bart O. could comment on this). The diesel-related mortality estimates are likely to be underestimates since they do not account for any effects besides particle-related mortality (based on the percentage of the total ambient PM assumed to be contributed by diesel) and cancer (quantified by diesel PM emissions). As noted previously, although some other effects are not as easily quantified (and some rely on a "safe level" determination rather than an absolute risk calculation), more could have been done. We do note the table relating other health effects that were not quantified and hope the quantified health effects could be expanded upon in the future. A clear statement that health impacts are likely underestimated due to the inability at this time to consider the other potential health effects from diesel engine exhaust constituents and secondary transformation products would be a good addition.

Specific comments:

1.Page ES-2, first sentence under Public Health Assessment. Suggest rewording the sentence to read “As part of the emission reduction plan, ARB staff estimated the public health impacts <u>for some of the quantifiable adverse health effects</u> of the goods movement system in California. That clearly indicates that more health effects are possible but not yet readily quantifiable without substantial additional review and analysis.

2. page ES-5, 2nd paragraph, fourth sentence. Should be “implementing” rather than “implementation”.

3. page ES-11, second paragraph, the statewide diesel risk reduction plan was not adopted in 1991. Diesel exhaust was identified as a toxic air contaminant in 1998 and the risk

reduction plan was adopted following this identification. Also, missing the word "in" before some in the last line of the first paragraph.

4.page 1-1, first paragraph line 7. Data "are" (not "is")

5. page 1-3, first line should read "…detailed in OEHHA and ARB's review of the state ozone standard."

6. page 1-5 (and elsewhere) The statement that 70% of the potential cancer risk from toxic air contaminants in California is due to diesel particulate is misleading and actually a misstatement of what was in MATES II, the origin of this figure. MATES II evaluated cancer risks for a subset of TACs, not all carcinogenic TACs. In addition, there are many more compounds in the air that are carcinogens tht do not have quantitative risk estimates. It would be more appropriate to say that About 70 percent of the potential cancer risk from a subset of common toxic air contaminants in California…" On page III-3 there is a similar sentence that needs to be reworded.

7. page 1-7 and elsewhere. There should be some discussion of the costs of lung cancer from diesel exhaust. The costs of treating cancer is very high, and although there are fewer people expected to develop lung cancer than cardiopulmonary disease, it should be mentioned.

8. page II-2, second paragraph, third sentence, not sure you can apply the Sioutas and co data to ALL components of vehicle exhaust. You can't apply it to all traffic-related pollutants, e.g., NO2 which forms from NO emitted by vehicles and is actually higher in concentration further from the freeway than right next to it.

9. page IV-6 – Should have some qunantitation of the reduction of cancer in the health benefits section – it is not mentioned that I could find, but is an important endpoint.

9. Page V-1. second paragraph, 3rd sentence. Suggest rewording to "The health impacts are concentrated on nearby communities and the need for mitigation is urgent." The impacts have quite a huge footprint, and so it seems illogical to say "Highly concentrated" in nerarby neighborhoods.