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Memorandum

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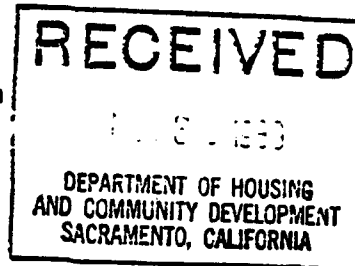
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To : D-29
Maureen Higgins, Director
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Community Development
P.O. Box 952051
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Date November 21, 1989 DEC 04 1989

Subject: Comments on HH&T
Plastic Pipe
Environmental
Impact Report

From : Office of Environmental Health
Hazard Assessment
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Sacramento, CA 95814
324-7572



At your request, staff of the Office of Environmental Health Hazard Assessment has reviewed the Draft Environmental Impact Report (DEIR) on the expanded use of plastic plumbing pipe, recently released by the Department of Housing and Community Development (HCD). Because we were involved (in cooperation with the California Public Health Foundation) in producing much of the information used for assessing worker health and safety impacts, we focused our review on the worker health and safety sections of the DEIR.

We have two fundamental concerns about the DEIR. First, it understates the magnitude of toxic chemical exposures found to occur during plastic pipe installation, and underrates the potential health impact of those exposures. Second, the DEIR alludes to a series of measures that could minimize these impacts, yet it provides no substantive recommendations about how HCD could assure that these measures would be implemented.

We believe that the exposures known to occur during installation of plastic plumbing pipe are significant enough that HCD must provide some mechanism for assuring, more directly, that the recommended control measures are adopted throughout the industry. The following are recommendations for strengthening the DEIR in these areas. We believe that methods for effectively implementing the hazard control measures must be incorporated into the DEIR, or the inadequacy of existing toxicity data may hinder acceptance of the final Environmental Impact Report.

1. State fully the extent of chemical exposures during installation of plastic plumbing pipe.

The DEIR Summary correctly states that "installation using current procedures may cause short-term exposure limits to be exceeded one or more times on a substantial fraction of work days." However, the body of the DEIR fails to cite much of the strongest data from our worker exposure study. For example, the DEIR discusses the somewhat abstract concept of short-term exceedance probabilities, but nowhere mentions that worker exposures to tetrahydrofuran (THF) reached 529 ppm, more than twice the federal Permissible Exposure Limit. The DEIR does not clearly state that

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workers installing plastic pipe for extended periods in highly-enclosed spaces are almost certain to experience repeated exposures above the legal exposure limit.

Similarly, the DEIR correctly states the highest measured exposures to THF and methyl ethyl ketone (MEK), 77% and 22.5% of their respective legal exposure limits. However, the DEIR does not point out that the highest measured exposure to all pipe cement solvents exceeded the exposure limit, based on an accepted index of combined exposure. Nor does it cite our estimate that workers installing chlorinated polyvinylchloride (CPVC) potable water pipe will be overexposed to these chemicals on approximately one of every ten work days.

Perhaps most importantly, the DEIR gives only brief mention to the importance of skin contact with plastic pipe cements and primers as a route of entry of toxic chemicals into the body. Specifically, the DEIR does not cite our data showing that some plumbers with heavy skin contact with cements and primers had concentrations of THF in their urine far in excess of the amount that would be expected from their airborne exposures alone. The estimated equivalent airborne THF exposures for these plumbers were up to 740 ppm, nearly four times the full-shift exposure limit. While the exact values are subject to some interpretation, these data give important evidence that some plumbers may absorb very substantial amounts of THF through their skin, and that the extent of skin contact must be given careful consideration when assessing overall exposure.

2. State more clearly the inadequacy of available toxicity information, especially for THF, and the limits thus placed on assessing the health impact of documented exposures.

The DEIR, in its summary of Cumulative and Long-Term Implications, acknowledges that the toxicologic data are not complete, yet asserts that "repeated exposure would probably not accumulate to serious, long-term health risks." In the case of THF, the chemical present at highest concentrations during CPVC water pipe installation, a statement that the toxicologic data are "not complete" seriously misrepresents the level of inadequacy. To our knowledge, no studies of the chronic toxicity of THF have been reported. Even the effects of short-term exposures at various exposure levels are relatively unknown in humans. Therefore, the ability of THF to cause such adverse health effects as cancer, nervous system damage, or reproductive toxicity must be considered unknown. The DEIR's conclusion that repeated exposure would "probably not accumulate to serious, long-term health risks" is entirely inappropriate. This unfounded assertion should be removed from the DEIR, especially from the sections on Cumulative and Long-Term Implications and on Significant Irreversible Changes.

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Since the publication of our report on worker health hazards during plastic pipe installation, new information has been published about possible liver damage in workers exposed to THF (Garnier et al., Tetrahydrofuran Poisoning After Occupational Exposure. British Journal of Industrial Medicine 43: 677-78, 1989). This underscores the imprudence of assuming that long-term health risks would not be significant, in the absence of any chronic toxicity data. Forming public policy on such an assumption would be similarly imprudent.

Additionally, the consequence of repeated irritation of eyes, nose, and throat should not be lightly dismissed. A growing body of evidence suggests that repeated irritation may contribute to chronic illness (see, for example, Barnhart, S., Occupational Bronchitis: A Marker for Irritant Exposure. Seminars in Respiratory Medicine 7: 249-256, 1986 or Woutersen, R.A., et al., Nasal Tumors in Rats after Severe Injury to the Nasal Mucosa and Prolonged Exposure to 10 ppm Formaldehyde. Journal of Applied Toxicology 9: 39-46, 1986).

In a similar vein of underestimating the possible health impacts of documented risk factors, the DEIR states, in the Conclusion of the Worker Health and Safety section, that "increased use of plastic pipe may also lead to a decrease of unknown magnitude in the risk of accidental injury." This conclusion was apparently not based on any supporting evidence, and ignores two risk factors cited in our study that could well lead to an increase in serious accidents (namely, less-trained workers and a faster work pace).

Finally, the Worker Health and Safety section also concludes that "No major outbreaks of solvent-related illness are known among plumbers in California." While this may be a true statement, it is meaningless since no effort has been made to identify any such outbreaks or to compile cases of solvent-related illness among plumbers. It should be removed.

3. The recommended measures for limiting exposures should be made much more concrete, and specific implementation proposals should be assessed to determine whether real improvements in working conditions and work practices would be made.

The DEIR Summary concludes, in the worker health section, that "the occasionally excessive short-term exposures as well as total biological uptake could be reduced by instituting reasonable control measures that are not now widely used." However, unless HCD devises specific, effective implementation proposals, the hazard control recommendations included in the DEIR should not be expected to have much real impact on working conditions or exposure levels. In the absence of specific, effective implementation strategies, HCD must give much more serious consideration to the worker exposures, and possible health risks, likely to occur with increased use of plastic pipe.

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Since the DEIR contains few concrete implementation proposals, we offer some possibilities below. Of course, numerous other strategies could also be devised. In any case, HCD should assess the ability of these strategies to assure safe and healthful working conditions.

On the subject of worker education and training, the DEIR states that "HCD could encourage primer and cement manufacturers and plastic pipe and supplies distributors to provide additional technical information to employers." Unfortunately, unavailability of technical information is not the weak link that prevents employers from mounting effective health and safety training programs. Rather, such programs are generally not offered because plumbing contractors have no background (and often no skill) in health and safety training, and because good training resources for plumbers are not generally available. Additionally, Cal/OSHA has previously devoted few of its limited resources to enforcement of training requirements in the current construction safety regulations, and lacks resources to enforce the training provisions aggressively in the near future.

To effectively implement a recommendation for better training, HCD could encourage or require plastic pipe manufacturers and distributors to commit substantial resources in an effort to create effective training programs for safe use of plastic pipe. These programs could be offered directly by the manufacturers and suppliers, or could be sponsored by these groups but provided by unions, contractors' associations, and private consultants.

Similarly, the DEIR properly points to plastic pipe installation in enclosed spaces as a particular problem area, and suggests that Cal/OSHA enforce existing regulations that require forced ventilation to reduce exposures to acceptable levels. However, Cal/OSHA enforcement resources are limited, so unless a specific agreement can be reached to focus enforcement efforts on these regulations, Cal/OSHA activity should not be relied upon to prevent installation of plastic pipe in enclosed areas or to assure that proper ventilation will be provided. We recommend that HCD consider a role for local building inspectors, who already make frequent inspections at every construction site. While these inspectors should not be expected to evaluate exposure levels, they could easily determine whether plastic pipe was being installed in enclosed areas and whether forced ventilation was provided. Perhaps HCD could devise a mechanism for granting some enforcement authority to local building inspectors, or at least a mechanism for assuring that appropriate referrals to Cal/OSHA were made.

The DEIR recommends adding worker health and safety questions to licensing examinations given by the Contractors State Licensing Board. Many contractors could be expected to answer these questions correctly, although they may not have effective health and safety programs for their workers. Therefore, this recommendation should be made more substantial. For example, individual plumbing contractors could be required to provide

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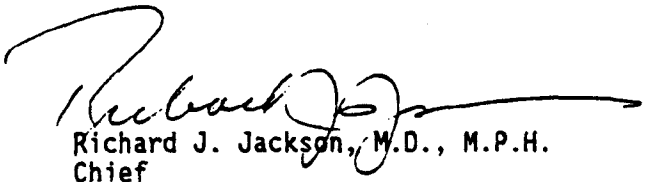
Maureen Higgins, Director
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documentation that they had instituted a comprehensive worker health and safety program whenever they applied for a building permit that called for installation of plastic pipe. At your request, we would be willing to specify the elements that could be required as part of a comprehensive health and safety training program.

The DEIR suggests that HCD recommend to the National Sanitation Foundation (NSF) that they prohibit use of dimethylformamide in plastic pipe cements and primers, and that they require an addition of indelible dyes (to discourage skin contact to the few primers and cements that currently do not contain dyes). Such a recommendation may influence NSF, but certainly do not constitute a guarantee that these measures will be carried out. HCD should explore other measures that more directly assure these simple yet effective measures.

We recognize that the suggestions above imply a role for HCD in the area of worker health and safety that goes beyond its previous activities. Essentially, this expanded responsibility began with HCD's inclusion of worker health and safety in the environmental impact review process. However, we believe that the measures recommended above are feasible, and that in the absence of other effective means of protecting worker health they are also appropriate.

We would be happy to discuss these recommendations in greater detail, and look forward to continuing our productive working relationship with your Department.



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