The Vinyl Institute

f VI
Massachusetts
Air Toxic Proposal

R&S 029377

February 21, 1986

TO: VI Manufacturing Practices Committee

Roy suggested that I forward the attached material provided by Nat Blackman. As Nat notes, the material describes an Air Toxics Program that Massachusetts is considering. (Vinyl chloride is listed).

Meredith N. Scheck, Manager
Government & Regulatory Affairs

MNS/pmb
enclosure
cc: P. de la Cruz

A Division of
THE SOCIETY OF THE PLASTICS INDUSTRY, INC.
WAYNE INTERCHANGE PLAZA II 155 Route 46 West, WAYNE, N.J. 07470
(201) 890-9299

BORDEN CHEMICAL
DIVISION OF BORDEN INC

FEB 18 1986

February 10, 1986

Vinyl Institute
Wayne Interchange Plaza II
155 Route 46 West
Wayne, N. J. 07140

Attention: Dr. Roy Gottesman

Dear Roy:

Enclosed is some material describing an Air Toxics program that Massachusetts is considering, which was sent to me by Associated Industries of Massachusetts. Since vinyl chloride is one of the contaminants listed, I thought it advisable that you be alerted to this and take any appropriate action.

Sincerely,

N. M. Blackman
Environmental Affairs Manager

NMB/lmm

cc: L. Fishbein

R&S 029378

ASSOCIATED
INDUSTRIES
OF MASSACHUSETTS

462 BOYLSTON STREET
BOSTON, MA 02116
(617) 262-1180

February 5, 1986

TO: AIM Air Quality Committee

FR: G. Montgomery Lovejoy III

RE: AIR TOXICS REGULATIONS
AIR REGULATORY REFORM DRAFT POLICY
ACID RAIN LEGISLATION

AIR TOXICS, A CALL FOR INPUT TO DEQE

The Department is preparing to move the Chemical Health Effects Methodology (CHEM) and the system to derive Ambient Air Levels to public hearing. These represent the "formula" the Department will utilize in generating the numbers that your facility will be held to if you emit any compound the Department suspects will affect public health!

CHEM and AAL have been reviewed by two external review groups comprised of toxicologists from around the country. The Department is accepting comments on their responses to the external review until February 21st. AIM has a number of significant concerns with the "formula" and with the Department's responses. All Air Committee members who have received the responses should get comments into me by February 14th, and to the Department by the 21st. This is a critical point in the process and industry must respond!

The Department is conducting a 6-month internal review of implementation issues. AIM is urging that the implementation plan be developed with industry input and prior to going to public hearing with CHEM and AAL.

The implementation issues phase is where manufacturers can have a significant effect upon the upcoming regulatory program. The goal is to make the requirements equitable and cost-effective while protecting public health. With your companies' technical input this objective is achievable.

Request information, prepare your comments, and plan to attend the next meeting of the DEQE Air Toxics Advisory Committee:

(more)

DATE: Thursday, March 13, 1986

TIME: 10:00 A.M. - 12:00 NOON

PLACE: DEQE
10th Floor Conference Room
One Winter Street
(corner of Washington and Winter Streets)
Boston, Massachusetts

AIM MOUNTS EFFORT TO MODERNIZE AIR REGULATIONS
WANTS WORKABLE REGULATIONS FOR HIGH AND ADVANCED TECHNOLOGY INDUSTRY

The AIM Air Quality Committee, with strong representation from the high technology and advanced technology sectors, is aggressively pursuing improvements to the Division of Air Quality Control's regulations.

The Air Pollution Control Regulations 310 CMR 6.00, 7.00, and 8.00, originally developed in the early 1970's, were crafted to address the characteristics of the so-called "basic industries" in Massachusetts. The 1980's has introduced a new industrial production profile which turns over processes rapidly necessitating expedited permit reviews to allow companies to innovate and compete.

A task force of the Air Committee comprised of Myron Baker, Northrop Corporation; Stephen Greene, Digital Equipment Corporation; Richard Mannion, Foxboro Company; and Verne Shortell, Wang Laboratories, Inc. have drafted proposals and met with the DAQC urging that a policy be adopted.

Responding to this initiative and the need to allocate resources to those air programs providing the greatest public health benefit, the Division issued a draft policy in late January. The policy will benefit companies in all industrial categories.

The Policy on Plan Review of Small Sources proposes to alter the existing plans approval process by listing categories of processes which they will approve simply by receiving process registration information from the source. The categories include certain:

1. fossil fuel utilization facilities,
2. research and development facilities,
3. equipment relocations,
4. vapor degreasers.

I encourage members to comment on the draft proposal. Copies are available through my office.

ACID RAIN BILL PASSED, Regulations Under Consideration

Senate 1187, "An Act to Limit Acid Deposition in the Commonwealth" became Chapter 590 of the Acts of 1985.

ASSOCIATED
INDUSTRIES
OF MASSACHUSETTS

462 BOYLSTON STREET
BOSTON, MA 02116
(617) 262-1180

R&S 029381

January 31, 1986

Mr. Bruce K. Maillet, Director
Division of Air Quality Control
DEQE
One Winter Street
Boston, MA 02108

Dear Bruce:

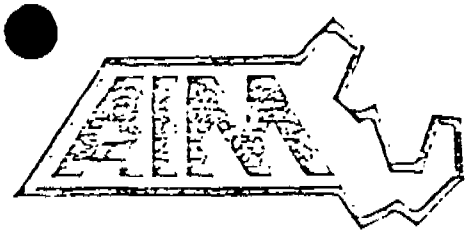
Members of the business community, including myself, are concerned about a number of issues that arose at the January 21 Air Toxics Advisory Committee meeting.

First and foremost, the continuing lack of serious consideration in incorporating manufacturers' comments into CHEM and AAL is quite disturbing. To date, industry comments have been critized and cast aside. The Department continues to highlight the predominately favorable comments, leading all to believe CHEM and AAL are the model in air toxics methodologies.

The role of the so-called "advisory committee" is another concern. The Committee had to convince the Department to allow it to comment on the responses to the second external review process. Additionally, there was no idea or mention on behalf of the Division as to the role of the Committee in the implementation program development phase.

I would like to bring your attention to the minutes of the May 17, 1984 Advisory Committee meeting item 5 - (enclosed). The minutes suggest that the Advisory Committee will comment on AAL's and implementation issues as the program matures. The need for ongoing, credibl and independent review of AAL's is great and would benefit the public, business and the Department.

The timing of the public hearings on CHEM and AAL is crucial. An implementation plan for the air toxics program must be developed by the Division, for review and input by the Advisory Committee prior to holding public hearings on CHEM and AAL. The significance and potentia impact upon the regulated community are too great for the Department to be given the ability to generate ambient air levels for any compound without holding the Department to guidelines on how to implement the numbers.



. . . for a more competitive Massachusetts

– OVER –

The manufacturing community has pointed out to your office a number of significant implementation issues to be addressed. We are anxious to work closely with you in providing technical expertise and comment on this critical program component.

AIM will submit comments on the Departmental responses to the second external review by February 22nd. Your consideration of the points raised in this letter would be appreciated.

Sincerely,

G. Montgomery Lovejoy III, Director
Energy and Environment Program

EML/ga
cc: -AIM Air Quality Committee ✓
-James Neely, Principal Planner, DAQC
-Carol Rowan, Acting Director
Office of Research and Standards

MASSACHUSETTS AIR TOXICS PROGRAM

Presented by
Paul A. Walker
Senior Environmental Engineer
Hollingsworth & Vose Company
January 15, 1986

Environmental Issues 1986
Associated Industries of Massachusetts

Massachusetts Air Toxics Program

Introduction: Today, I should like to present the Massachusetts Air Toxics Program; provide some background on reasons behind the development of this program; describe the method to derive acceptable ambient levels; discuss the implementation of the program; briefly compare the Massachusetts program to other states and the federal program; and finally, point out some of the shortcomings of the method to derive AALs and the Massachusetts air toxics program as a whole.

Background: Industry first got wind of a Massachusetts air toxics policy in October, 1982. At that time, EPA had established final standards for only four air contaminants - asbestos, beryllium, mercury, and vinyl chloride - under Section 112 of the Clean Air Act, National Emission Standards for Hazardous Air Pollutants (NESHAPS). Because of the lack of a comprehensive federal program, several states, including New York, had set up their own air toxics programs. Given these circumstances, the Department of Environmental Quality Engineering (DEQE) felt compelled to develop their own air toxics policy, too.

The fundamental question which, I believe, should have been answered before developing the Massachusetts policy was, "Are there any adverse health effects caused by emissions of air contaminants in the Commonwealth that establish the need for such a program?

Rather than answer this fundamental question, however, the Department cited three areas where they felt they need an air toxics program. The first area is responding to sudden and accidental incidents in which high concentrations of toxic air contaminants are released into the atmosphere; e.g., a train derailment. A second area is handling odor complaints. And the third area cited by the Department as a justification for an air toxics policy is reviewing applications for approval of new or modified sources which would emit toxics.

The Department then proceeded to develop their air toxics policy. One of the first steps the Department took in the development of their policy - and here I should like to commend DEQE for taking such a step - was to set up an advisory committee consisting of representatives from industry, public interest groups, academia, and, of course, regulatory agencies. The Advisory Committee, which was subsequently divided into three subcommittees, met many times since the first meeting in December, 1982, and attempted to set guidelines for acceptable ambient levels for pollutants of concern in the Commonwealth.

Presentation: In my hand is the product of the many meetings between the Department and the Advisory Committee - a yellow document

entitled, "The Chemical Health Effects Assessment Methodology And The Method To Derive Acceptable Ambient Levels", and dated June, 1985.

At this point, let me ask, "How many of you have seen this document?"

This 400+ page document, as its title suggests, contains two methodologies. The first methodology is called the chemical health effects assessment methodology (CHEM). It uses scientific data to assess the health effects associated with exposure to 100 or so compounds.

The second methodology involves a formula to calculate an acceptable ambient level for any toxic air contaminant - a level which the Department considers to be safe and will be protective of public health with a margin of safety. Let me concentrate on the second methodology - the formula to calculate an acceptable ambient level (AAL).

Basically, the calculation entails dividing an occupational level by a series of safety factors to obtain an acceptable ambient level. The first step in the formula is the selection of the "most appropriate occupational level" (MAOL). The possible choices for the MAOL are: OSHA's standard, NIOSH's guideline, or ACGIH's recommendation. As examples, I have selected a dozen compounds. See Table 1.

As may be seen from Table 1, for some compounds, the difference among the threshold limit values (TLVs), as the standards/guidelines/recommendations are known, is only a factor of two or three. For other compounds (not listed in Table 1), OSHA's standard/NIOSH's guideline/ACGIH's recommendation vary by factors as large as 100. Thus, the selection of the MAOL for a compound is a critical step.

For the majority of the 100 or so compounds listed in the yellow document, the occupational level selected by the Department is the lowest of the standard/guideline/recommendation of OSHA/NIOSH/ACGIH. Is the lowest TLV the most appropriate occupational level for the Department to select in most cases?

Having selected the most appropriate occupational level, the next step in the Department's calculation for deriving the AAL is to use a factor to adjust time from an 8 hour workday to a 24 hour exposure and from a 5 day workweek to a 7 day exposure. So, the MAOL, which for most of the compounds is an 8-hour time weighted average, is divided by 4.2 ($\frac{168\text{-hour week}}{40\text{-hour workweek}}$) since ambient exposures to toxic air contaminants, unlike workplace exposures, may be continuous. But is the AAL a 24-hour average as the Department intends to view it, or is the AAL a weekly figure?

After adjusting for time, the Department's calculation extrapolates from an adult to a child, since children are

Table 1. OSHA's Standard/NIOSH's Guideline/ACGIH's Recommendation vs. MAOL Chosen By Department For Selected Compounds.

Compound	OSHA's Standard (ppm)	NIOSH's Guideline (ppm)	ACGIH's Recommendation (ppm)	MAOL (ppm)
Ammonia	50	50(C)	25	25
Asbestos	2 fibers/cm^3	0.1 fibers/cm^3	0.02-2 fibers/cm^{3a}	0.1 fibers/cm^3
Benzene	10	10(C)	10	10
Carbon tetrachloride	10	2(C)	5	5
Ethyl acrylate	25	-	5	5
Formaldehyde	3	1(C)	1	1
Methyl chloroform (1,1,1-Trichloroethane)	350	350(C)	350	350
Phenol	5	5	5	5
Styrene	100	-	50	50
Tetrachloroethylene	100	50	50	50
Toluene	200	100	100	100
Vinyl chloride	1	1(C)	5	1

(C) ceiling value
[a] Recommendation depends on fiber type

particularly susceptible to the effects of air pollution, by dividing by 1.75. This factor accounts for the higher ventilation rate per unit of body weight in a child as compared to an adult.

Then, for every one of the compounds listed in the document, the Department applies a safety factor of 10 to account for a non-worker sensitive population. The Department's rationale for doing so is to assure protection for high risk groups (e.g., hypersensitive people). But does a non-worker sensitive population exist for each and every compound, or, for some compounds, is the highest risk group actually the worker? If that is the case, should a safety factor be applied to account for a non-worker population?

Thus, in the Department's method to derive an acceptable ambient level, the minimal factor applied to an occupational level for all compounds is 73.5 (4.2 x 1.75 x 10). So, for example, if the threshold limit value for a compound were 1 part per million in the workplace, then the ambient level deemed acceptable by the Department could be no higher than approximately one one-hundreth of one part per million. And for many compounds, the AAL could be much lower, because in those cases where all health effects (such as carcinogencity, mutagencity, and developmental/reproductive toxicity) have not been accounted for, or where there is inadequacy of toxicity data, additional safety factors may be applied in the formula. These toxic effects safety factors, as they are called, may range as high as 100. Consequently, the overall factor applied in the Department's formula to derive an acceptable ambient level for a compound may range from 73.5 to 7350. Here, let me turn again to the dozen compounds I have selected as examples to illustrate this point. See Table 2.

Now that the Department has derived acceptable ambient levels for 100 or so compounds, initially (but the very same methodology is meant to be used to derive an AAL for any compound), how will these numbers be implemented? As I mentioned earlier, the Department intends to employ the AALs as ambient standards to be averaged over a 24-hour period.

The very magnitude of the AALs, however, raises several important issues concerning the implementation of the Massachusetts air toxics program. For instance, what are typical backgrounds for these compounds? Are the backgrounds higher or lower than the AALs? Might natural background be above the acceptable ambient level derived by the Department's method for some compounds? If so, would it make any sense to set an acceptable ambient concentration for those compounds below background?

Another implementation question raised by the very low AALs is the availability of analytical techniques. Are analytical techniques available for detecting such low concentrations? If not, would it make any sense to establish an acceptable

Table 2. Overall Factors Applied in Department's Formula For Selected Compounds.

Compound	MAOL (ppm)	AAL (ppm)	Overall factor
Ammonia	25	0.034	735
Asbestos	0.1 fibers/cm^3	0.001 fibers/cm^3	73.5
Benzene	10	0.0136	735
Carbon tetrachloride	5	0.0068	735
Ethyl acrylate	5	0.00068	7350
Formaldehyde	1	0.0014	735
Methyl chloroform (1,1,1-Trichloroethane)	350	0.0952	3675
Phenol	5	0.0068	735
Styrene	50	0.068	735
Tetrachloroethylene	50	0.0136	3675
Toluene	100	0.136	735
Vinyl chloride	1	0.0014 (1410)	735

concentration at a level that is below the limit of detectability?

In the early phases of their program, the Department will not have to address these issues; for the Department has assumed that background is zero and the sole contributor of the pollutant of concern is the source. The Department has advised that the program will apply not only to manufacturing facilities but also to dry cleaning establishments, gas stations, etc. In addition, they have decided to rely on modeling, as opposed to monitoring, to determine whether or not a source is in compliance with the AAL. Furthermore, the location at which compliance will be determined is the property line of the source. Now, what would you do if the Department claimed that, based on their modeling, the emissions from your facility resulted in a contravention of ambient air standards? Might you wish to monitor background as well as downwind concentrations to ascertain whether or not background was indeed zero and if your source were the sole contributor of the pollutant?

Those are some of the questions regarding the implementation of the Massachusetts air toxics program which will have to be answered at some time in the future. But in the time remaining today let's turn back to the AALs, themselves. Are the derived levels reasonable? Are they too high? Are they too low?

One way of answering such a question for a particular compound is to subject the compound to a "perspective test". Once such test which I use to help me understand the degree of toxicity of a given compound is to compare its standard to that of a compound which is generally recognized as more toxic. Take for example, ethyl acrylate and compare its AAL to those of benzene and vinyl chloride, both of which are known human carcinogens. Referring to Table 2 again, the AAL derived by the Department's method for ethyl acrylate is 0.00068 ppm; while the AALs for benzene and vinyl chloride are 0.0136 and 0.0014, respectively. Does this mean that ethyl acrylate is 2-20 times more toxic than benzene and vinyl chloride? Or, is something wrong with the method to derive the acceptable ambient levels?

How does Massachusetts's air toxics program compare with those of other states and the federal program? As mentioned earlier, New York has set up their own air toxics program. Their AALs are the contaminant concentrations considered to be acceptable averages at a receptor on an annual basis. They are guidelines; not standards. For most compounds, the AALs are calculated by dividing threshold limit values by a factor of either 50 or 300, depending on the degree of toxicity of the air contaminant. A comparison of New York's AALs with the corresponding AALs in Massachusetts for the dozen compounds which I am using as examples, appears in Table 3.

Bear in mind that New York's AALs are annual averages; while those in Massachusetts are 24-hour averages. If extrapolated to 24-hour averages, New York's AALs would be much higher than the

Table 3. New York's AALs vs. Massachusetts For Selected Compounds.

Compound	AAL (ug/M^3) MA[a]	NY[b]
Ammonia	24.5	360
Asbestos	0.001 fibers/cm^3	---
Benzene	41	100
Carbon tetrachloride	40.8	100
Ethyl acrylate	2.7	---
Formaldehyde	2	5
Methyl chloroform (1,1,1 Trichloroethane)	517	38,000
Phenol	25.9	10
Styrene	292.5	716
Tetrachloroethylene	91	1,116
Toluene	510	7,500
Vinyl chloride	2.7	0.4

[a] 24-hour average
[b] Annual average

annual averages listed in Table 3.

On the federal level, in June, 1985, EPA announced their two-part strategy for dealing with toxic air contaminants. For sudden, accidental releases, EPA intends to draw up an acute hazards list of substances most likely to cause serious harm in the event of a large release.

For routine emissions, EPA is in the process of completing their consideration of some 40 chemicals for regulation under Section 112 of the Clean Air Act. Since May, 1985, they have announced their intentions to add the following chemicals to their list of hazardous air pollutants:

Chromium - either total or hexavalent
Carbon tetrachloride
Chloroform
Ethylene oxide
1,3 Butadiene
1,2 Dichloroethane
Cadmium
Trichloroethylene
Tetrachloroethylene (PERC)

And EPA has announced their intention not to regulate the routine emissions of the following chemicals under Section 112:

Toluene
Chlorofluorocarbon - 113
Methyl chloroform (1,1,1 Trichloroethane)
Acrylonitrile
Epichlorohydrin
Manganese
Chlorinated benzenes
Vinylidene chloride
Chloroprene
Hexachlorocyclopentadiene

EPA's reason for not regulating the above compounds generally is that the health risk from ambient exposure to the compounds is not sufficient to warrant regulation. EPA's announcement not to regulate a compound, however, has no effect on the regulation of that compound as a volatile organic compound (VOC) in order to attain the national ambient air quality standard for ozone. Nor does their announcement preclude any state or local air pollution control agency from regulating emission sources of the compound. Hence, EPA's announcements are not likely to have much effect on such states as Massachusetts that have set up their own air toxics programs.

Conclusion: In conclusion, I should like to point out some of the shortcomings of the Department's method to derive acceptable ambient levels and their proposed air toxics program. I believe the Department has not considered the total effect of multiple safety factors in their formula to derive the AALs. There is

double-counting in the method to derive AALs; for example, the application of a safety factor to account for a non-worker sensitive population where the sensitive population is the worker; the application of the same toxic effects safety factors where the occupational level already includes a margin of safety. For many compounds, the result of the application of these multiple safety factors is an AAL that is far too low.

With regard to the air toxics program as a whole, I believe that an implementation plan needs to be drawn up to answer some of the questions raised earlier. In an AIM meeting with Commissioner Sylva and Assistant Commissioner Hagg in October, 1985, the Commissioner agreed to draft such a plan before going to public hearing on the methodology to derive AALs.

Finally, I believe that more action needs to be taken by such groups as EPA and NESCAUM (Northeast States for Coordinated Air Use Management) to assure that acceptable ambient levels and air toxics programs are consistent from state to state. After all, if the acceptable ambient level for a compound is considered safe, and the AAL is <u>the</u> concentration that will protect public health, then why should that AAL be so different from the corresponding AAL in another state?