Attachment 11

Health Effects Review

The Texas Clean Air Act provides this agency with a broad definition of air pollution and strong powers to remedy and to prevent conditions of air pollution. The Act defines "air pollution" as "the presence in the atmosphere of one or more air contaminants or combinations thereof, in such concentration and of such duration as are or may tend to be injurious to or adversely affect human health or welfare, animal life, vegetation or property, or as to interfere with the normal use and enjoyment of animal life, vegetation or property." This definition has been part of the Act since it was enacted in 1965. The definition covers adverse effects of any possible air contaminants, not just the ones for which there are national standards.

The authority to remedy conditions of air pollution came with the original passage of the Act in 1965. In 1971 the Act was amended to add the authority for preconstruction review of new and modified facilities. This review ensures that those facilities will not cause or contribute to conditions of air pollution. Where national standards that are set to protect public health apply, review of existing and proposed sources is relatively straightforward. There are such health-based, national standards for six of the most common air contaminants but not for the thousands of other air contaminants with which this agency must deal. The six for which there are national standards are called "criteria pollutants" because EPA bases the standards for them on massive "criteria documents" that contain the technical information on the contaminants and their effects. The six are particulate matter, sulfur dioxide, carbon monoxide, ozone, nitrogen dioxide, and lead. The thousands of other

air contaminants are often referred to as "non-criteria" air contaminants. National emission standards for hazardous air pollutants (NESHAPS) have been issued for certain sources of five non-criteria air contaminants: asbestos, beryllium, mercury, vinyl chloride, and benzene. NESHAPS have been proposed for three other substances or groups of substances, but no standards have been set. The three are radionuclides, coke oven emissions, and arsenic.

This agency has been dealing with non-criteria air contaminants for many years. Before there were national standards for any air contaminants, the Texas Air Control Board had adopted a wide range of regulations and standards including specific ones for hydrogen sulfide, fluoride compounds, and sulfuric acid mist. We still find these standards useful for preventing air pollution; there are still no national standards for them. The early Texas Air Control Board standards and regulations were developed after extensive work, including gathering information and holding public hearings at which technical experts testified about the effects of the contaminants.

As the permits program got underway in 1972 and 1973, individual decisions had to be made about the air quality impact of hundreds of sources. To determine whether each proposed source was consistent with the intent of the Texas Clean Air Act, the permit engineers had to consider the predicted impact of chemical emissions that were not covered by specific standards. The permits staff used engineering and modeling techniques to predict emissions and ambient concentrations, but for toxicity evaluations they had to rely increasingly on health effects expertise. Out of this need grew the function of what can perhaps best be described as health effects review. That function has evolved and become more sophisticated over the years. The rest of this

presentation will describe how health effects reviews are now carried out by the staff and how they serve various agency activities.

Health effects reviews at the Texas Air Control Board involve examination of predicted or measured ambient concentrations of various non-criteria air contaminants. Predicted data result from modeling of projected emissions in the permit review process; measured data come from ambient monitoring associated with special studies conducted in response to citizen complaints or staff concerns.

In the case of permit review, a two stage review procedure has recently been designed which will allow the principal effort to be focused on permits that might involve a significant impact. The effects evaluation staff, in consultation with the Permits Division, has developed a "screening list" of types of facilities or emissions that will not require a case-by-case review. These types of facilities or emissions are ones that have been evaluated by effects evaluation staff on numerous occasions and have been found not to be detrimental to public health or welfare as long as National Ambient Air Quality Standards and Texas Air Control Board regulations are met. Permit engineers will consult this screening list to determine whether an application for a regular permit or a special permit should or should not be submitted to the effects evaluation staff for detailed review.

In the first stage of detailed case-by-case review the predicted emissions from a permit application for a proposed new or modified source are modeled to predict public exposure. Then the ambient concentration values are reviewed by effects specialists to evaluate public health risk. This review includes evaluation of all available and pertinent toxicological information, including standards set

for exposure in occupational situations (such as the TLV), the documented effects levels on which the occupational standards are based, and epidemiological and toxicological information from the literature and from consultation with other federal, state, or private health related agencies. Upon completion of this review and analysis, the effects evaluation staff forwards to the Permits Division a statement regarding any public health risk that is expected to result from predicted exposures.

In the case of health effects analyses associated with special studies of sources, contaminants, or areas, the effects evaluation staff participates in the development of a study design. This design includes specification of compounds of potential concern, appropriate averaging time for specific contaminants, the adequacy of analytical detection limits, and other factors that must be defined to allow a thorough toxicological review of collected data. After data are available from such a study, effects specialists evaluate monitored levels of air contaminants in a manner similar to that described above for permits review. Examples of special studies in which these health effects review procedures have been or are being used are the Deer Park Study and the Gulf Coast Community Exposure Study.

TACB effects specialists have reviewed both predicted and actual ambient levels of hundreds of chemical substances for possible adverse health effects. Most of these reviews are for permits and special monitoring projects, but some are also carried out in connection with interagency work. For example, reviews of air emissions from toxic waste sites have been carried out in connection with monitoring requested by the Texas Department of Water Resources. Health effects reviews associated with accidental episodes are most often sought when monitoring is used to check the

possibility of continuing contamination. Accidental episodes involving common industrial substances are normally handled by emergency management agencies using predetermined procedures. The TACB Emergency Action Center often assists in the management.

To facilitate literature reviews associated with evaluation of specific chemical air contaminants, the effects evaluation staff maintains files of documents, articles, and other literature related to substances that have been or are expected to be the subject of agency review. Principal sources of information include 1) the "Registry of Toxic Effects of Chemical Substances," published by the National Institute for Occupational Safety and Health, 2) "Documentation of the Threshold Limit Values for Substances in Workroom Air" published by the American Conference of Governmental Industrial Hygienists, 3) "Chemical Regulation Reporter" published by the Bureau of National Affairs, Inc., 4) "IARC Monographs on the Evaluation of Carcinogenic Risks of Chemicals to Man" published by the World Health Organization, and 5) the reports from the National Cancer Institute Bioassay Program. Many other journals and texts are used, as well as communication with scientists in various government agencies, industry research institutes, and academia. The staff is in the process of upgrading these files using an automated system for storage and retrieval of effects information.

The TACB Medical Resources Advisory Panel is also available for consultation on matters relating to health effects of non-criteria air contaminants. This Panel was established in 1977 to assist the agency in evaluation of public exposure to potentially toxic air contaminants. The Panel consists of individuals with expertise in epidemiology, occupational medicine, chemical carcinogenesis, genetics,

environmental toxicology, respiratory physiology, allergic diseases, and development of standards and regulations for human exposure to toxic or potentially toxic substances.

On February 12, 1982, the Texas Air Control Board adopted a Resolution that mandated continued emphasis on "the need to prevent excessive public exposure to contaminants which may adversely affect health." The Resolution also instructed the staff to increase priority of efforts to identify, investigate, monitor, and control "air contaminants not regulated under the Federal Clean Air Act."

In response to this direction from the Board and the mandates of the Texas Clean Air Act, and because the amount and quality of information on chemical contaminants is increasing, the staff is redoubling its efforts to collect and use the best information available and to provide reliable and understandable health effects evaluations to the operational parts of the agency.

Texas Air Control Board
Research Division
Revised January 18, 1985