

TOXIC AIR EMISSIONS IN TEXAS

I. Toxic Air Emissions from Industries, Small Sources, and Motor Vehicles in Texas

For purposes of this document, the term "toxic air pollutant" will be synonymous with the definition for "hazardous air pollutant" found in Title III of the Environmental Protection Agency's (EPA) Clean Air Act (CAA) proposal. The proposed CAA lists 191 substances or groups of substances considered to be toxic. To be considered toxic, there must be "sufficient evidence to establish that the pollutant is known to cause or can reasonably be anticipated to cause in humans any of the following:

- (i) cancer or developmental effects, or
- (ii) serious or irreversible --
 - (I) reproductive dysfunctions, or
 - (II) neurological disorders, or
 - (III) heritable gene mutations, or
 - (IV) other chronic health effects, or
 - (V) adverse acute human health effects."

The EPA would be able to add to or delete from the list should sufficient evidence warrant such action.

Many naturally occurring or man-made chemicals are toxic in sufficient concentration. Products used in everyday life are sources of toxic air pollutants. Examples would be gasoline, plastics, automobiles, synthetic fibers, paint, and insecticides.

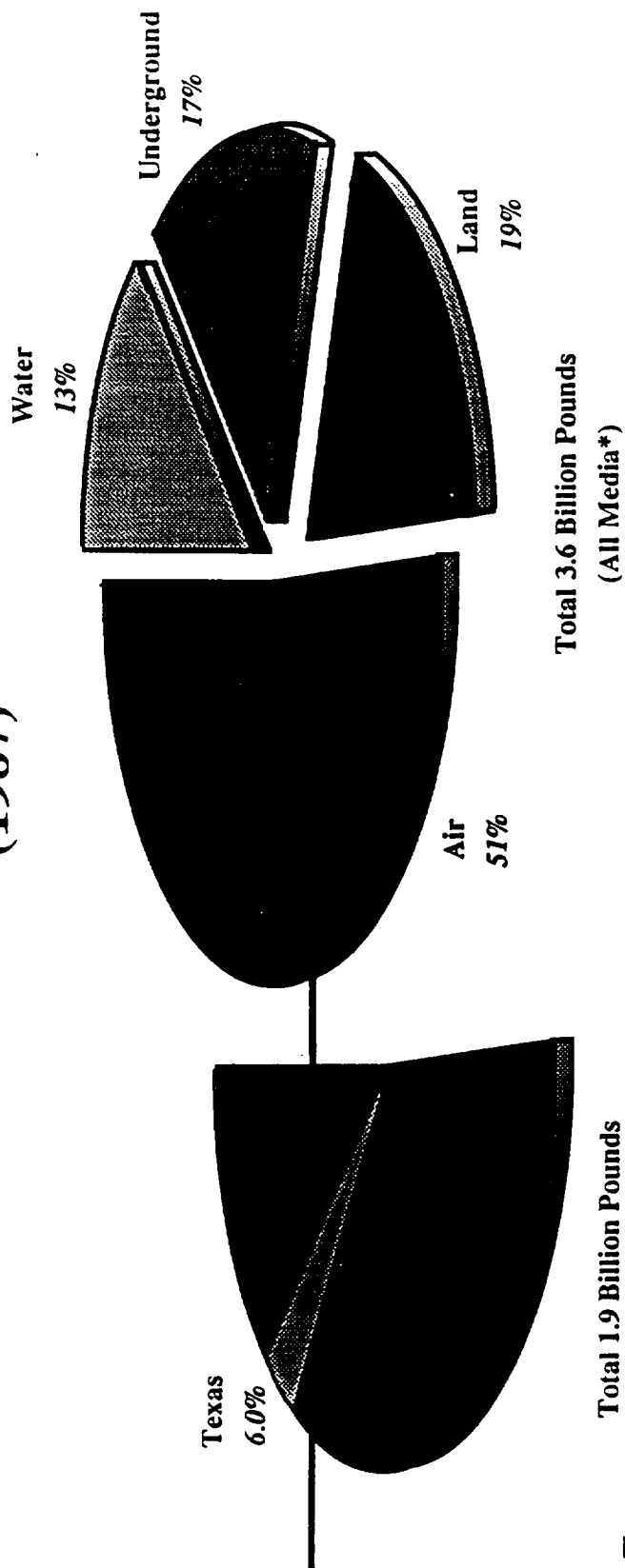
In April of 1989, EPA released information on toxic emissions from industrial sources using its Toxic Release Inventory System (TRIS) containing data collected for calendar year 1987 emissions. The list of chemicals used by EPA for this inventory was longer than the proposed CAA list and contained substances that are not considered very toxic. The information presented in this report comes from this TRIS inventory, but has been limited to the 191 chemicals in the CAA list. The TRIS information looked at releases to all media, including air, water, land, and underground. Discharges of toxic chemicals to the air accounted for 51% of the national total of 3.6 billion pounds released (Figure 1). Texas accounted for 111 million pounds or 6.0 percent of the national total of air toxics emitted by industrial sources. Figure 2 shows that this is one of the largest total emission inventories of air toxics in the country. Totals are of similar magnitude for the largest emitting states. Rankings vary by which list of toxics one uses. It should be noted that the chemical industry accounted for 36 percent of the nationwide emissions of air toxics (a share four times larger than any other industry), and Texas contains almost two-thirds of the nation's petrochemical manufacturing capacity.

Emissions of toxics from motor vehicles in Texas are similar in magnitude to those from industrial sources. These emissions are estimated to be 143 million pounds annually. However, the largest source of emissions of toxic air pollutants in Texas is from small (area) sources (Figure 3). Area sources include small sources that are related to population in an area. Examples include gasoline stations, dry cleaners, and products used around the

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Figure 1.

Annual Releases of Air Toxics From Industrial Sources in the Nation (1987)



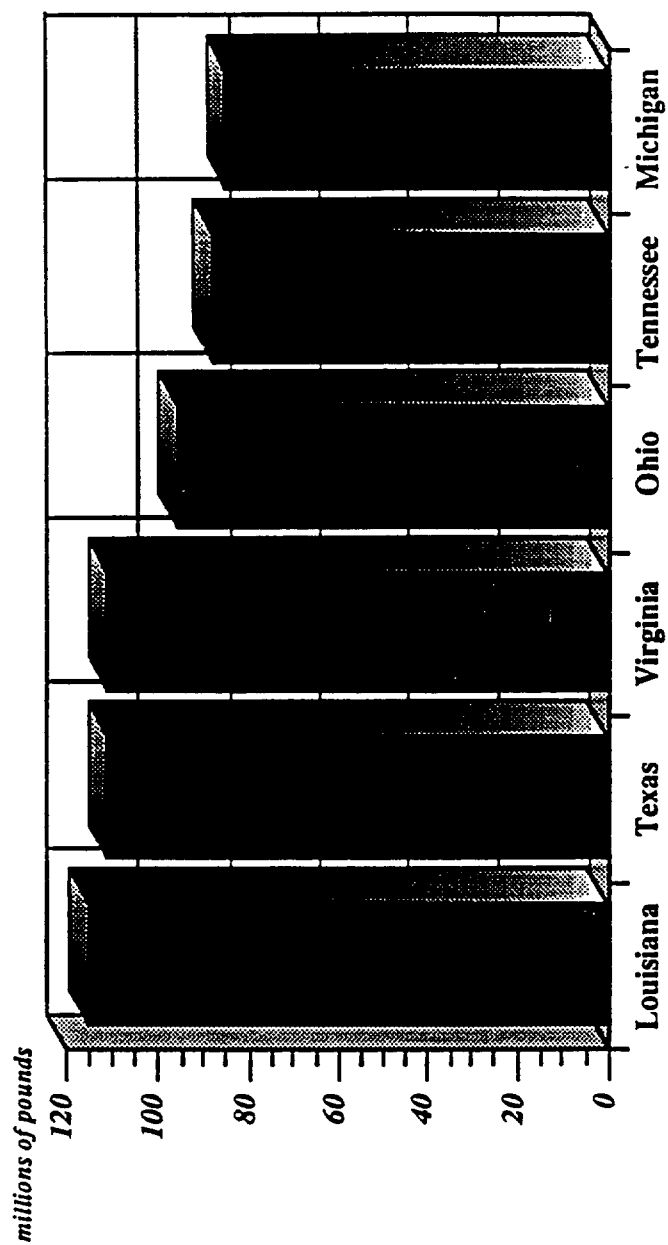
**Does not include materials listed as being reused or treated rather than released to the environment.*

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Figure 2.

The 6 States With the Largest Total Air Emissions From Industrial Sources (1987)

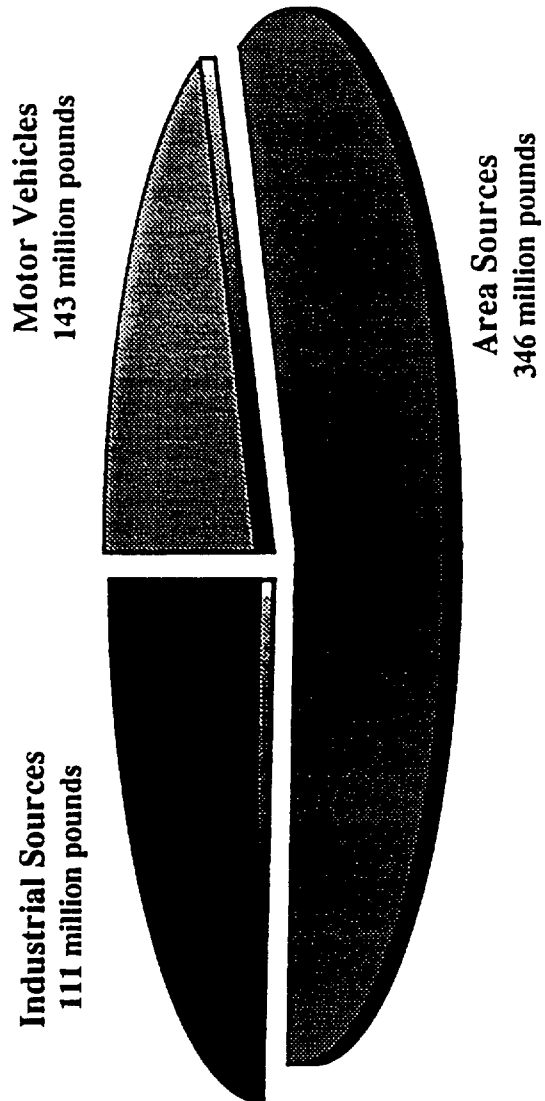


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Figure 3.

Sources of Air Toxic Emissions in Texas (1987)

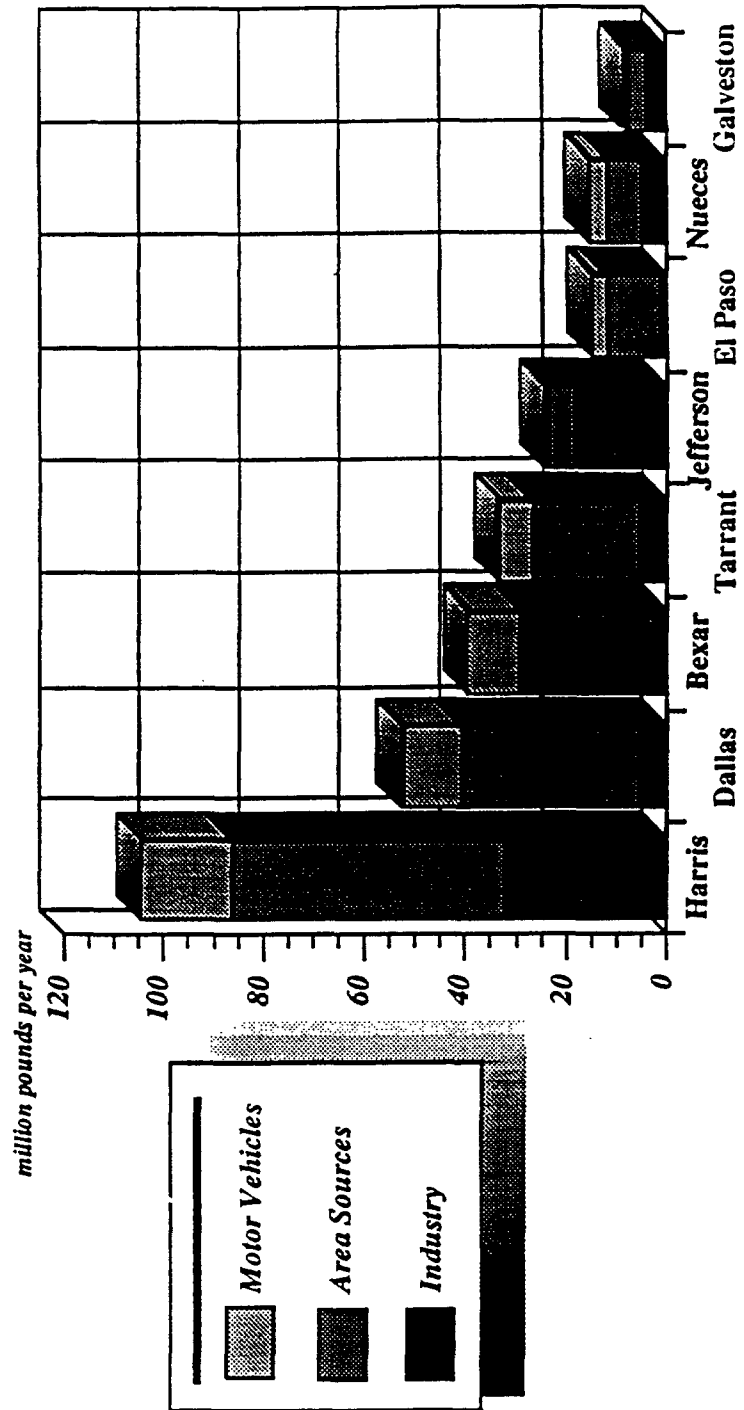


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Figure 4.

Sources of Toxic Air Emissions in Eight Counties in Texas (1987)



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home. Statewide emissions of air toxics from area sources are estimated to be 346 million pounds per year. This is larger than the combined emissions from industrial sources and motor vehicles.

The distribution of toxic emissions in Texas is not uniform throughout the state. Area source and motor vehicle emissions are higher in the more heavily populated areas. Industrial emissions are similarly concentrated in the manufacturing centers of the state. Figure 4 displays the makeup of air toxic emissions in Bexar, Dallas, El Paso, Galveston, Harris, Jefferson, Nueces, and Tarrant counties.

II. Impacts of Toxic Air Emissions on Public Health

The emissions data collected in air toxic inventories alone cannot be used to determine public health impacts. Emission rate does not equate directly to exposure. Other factors which determine the actual exposure include the pathway of exposure (e.g. inhalation and ingestion), concentration of the contaminant, length of exposure, and proximity to the source. The toxicity of the chemical is also very important in determining whether there are potential adverse health impacts from emissions. Therefore, to accurately evaluate public health impacts, it is essential to have the latest scientific data on chemicals of concern and actual monitoring data to evaluate real exposure levels.

Although the Texas Air Control Board (TACB) has conducted ambient monitoring for toxic substances, limited funding has significantly restricted the number of sites and chemicals that have been studied. The community exposure monitoring that has been done showed levels of the chemicals studied to be within the range of levels found in other U.S. cities with no significant exceedances of TACB health guidelines. The TACB has also conducted a limited number of source-specific monitoring studies. In some cases, "hot spots" were detected. These are localized areas in the vicinity of specific plant sites where ambient levels of various toxic compounds appeared to be higher than the agency considered acceptable. Where levels of concern have been found, control actions have been taken. More needs to be known about toxic substances and the ambient concentrations to which the public is exposed. This will only be accomplished by advances in scientific knowledge and increased funding for ambient monitoring and engineering analyses.

III. The TACB Air Toxics Monitoring Program

A. Current Monitoring Activities

TACB monitoring for air toxics began in the early 1970's and has evolved as technology and priorities have changed. Long before passage of community right-to-know legislation, the public expressed concern about exposure to toxic air pollutants. Air toxics monitoring, therefore, has become one of the highest priorities of the TACB air monitoring effort, although available resources have not kept pace with demand. The air toxics monitoring program consists of three distinct parts: ambient community monitoring, source-oriented monitoring, and emergency response.

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1. Ambient Community Monitoring

Since 1973 and continuing until recently, all samples from the TACB ambient particulate matter network have been analyzed for concentrations of 31 elements including potentially toxic metals. The particulate network is currently composed of 39 monitors. These samplers are located in communities throughout the state. The agency will be purchasing an updated analytical instrument to continue this activity and facilitate other specialized particulate matter monitoring studies.

Between 1980 and 1986, the agency operated a pesticide monitoring network to determine public exposure near areas of heavy aerial spraying. Many of these monitors were located in the Rio Grande Valley, while some were located in the Panhandle and in southeast Texas. No pesticides were detected at levels which would pose a health risk to the community.

TACB conducted the Gulf Coast Community Exposure Study beginning in 1985 to measure ambient levels of ten toxic air contaminants in four heavily-industrialized coastal counties. The levels of these air pollutants were consistent with those found in other urban industrialized areas of the United States, with no indications of public health risk from the contaminants studied.

The agency participates in the EPA Urban Air Toxics Program in Dallas and Houston, collecting samples for analysis for formaldehyde, various organic compounds, and trace heavy metals. The Dallas site will be moved to Fort Neches, which has been the target of several source-oriented monitoring projects. The EPA Toxic Air Monitoring System (TAMS) site in Houston was operated by the TACB from 1985-1988 to evaluate air toxics methodologies and quality assurance procedures.

TACB has the capability to deploy small monitoring devices to collect periodic samples for selected toxic organic compounds in response to complaints or other indications that air toxics may be affecting communities near industrial facilities. Two such systems are presently in operation in Texas City and Odessa.

2. Source-Oriented Monitoring

In 1982, the agency began designing and developing a mobile laboratory trailer. Completed in 1985, the mobile laboratory is used in source-oriented monitoring projects to evaluate the impact of toxic emissions from particular industries on nearby communities. Instrumented mobile sampling vans, used since 1974, supplement the mobile laboratory and provide wider area sampling coverage. The agency has completed 17 such investigations since 1985 at sites identified as potential "hot spots" for air toxics by TACB Regional Offices. At six of the last seven industrial complexes surveyed, air contaminant levels for certain compounds either exceeded TACB health effects screening levels or suggested the desirability of additional monitoring to identify any long-term problems. Based on the results of one study, enforcement action resulted in a significant reduction of chloroprene emissions from a chemical facility in Houston. Long-term monitoring for specific air toxics is being conducted in Texas City and Odessa as a result of two other mobile laboratory investigations.

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In addition, TACB has performed air toxics monitoring projects at two petrochemical facilities in Houston and a chemical plant near Bishop as part of grants funded by EPA under its High Risk Point Source Program. This program evaluates the need for pollutant-specific control strategy development at sites selected by the EPA.

TACB conducts soil sampling in areas where toxic pollutant deposition is suspected. A recent project to sample soil and dust in Bryan resulted in enforcement action against a pesticide blending facility for emissions of arsenic. The agency is identifying and sampling other sources in the state where soils may be indicative of problem emissions.

Regional offices also routinely collect various types of soil, material, and air samples to be analyzed in the central laboratory in Austin. The laboratory maintains a complement of instrumentation to accomplish a wide variety of both inorganic and organic analyses.

3. Emergency Response

The TACB Air Toxics Response Program is designed to provide a state-of-the-art on-site air monitoring capability during emergencies involving actual or potential releases of air toxics occurring during significant industrial accidents. Staff members are available on 24-hour call to support a core response team. The response trailer contains advanced sampling and analytical equipment, safety and communications gear, and a personnel decontamination facility. The most recent deployment was to the October 1989 Phillips Chemical explosion in Pasadena.

B. Options for Expanding Air Toxics Activities

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The TACB staff considers that expanding monitoring capabilities would be essential as a part of an expanded air toxics program. If the Committee desires, the TACB staff is prepared to offer a conceptual outline for a comprehensive air toxics program that would include significant additional monitoring activities.

IV. Efforts by the TACB and Local Governments to Control Toxic Air Emissions

The TACB operates under legislation set forth in the Texas Clean Air Act (TCAA). Although the TCAA does not outline a specific air toxics program, it does provide general legal authority to the TACB to protect the air resources of the state. In doing so, the TCAA prohibits emissions of air contaminants in concentrations which may be injurious to health or property. The major elements of the TACB air toxics program are a permit program for new and modified sources and a variety of efforts applicable to existing sources.

The TACB permit program was initiated in 1972 to address the control of criteria and noncriteria pollutants proposed to be emitted by new or modified facilities. Criteria pollutants are those for which a National Ambient Air Quality Standard (NAAQS) has been established. This includes particulate matter, sulfur dioxide, carbon monoxide, nitrogen oxide, lead, and ozone. The formation of ozone is predominantly controlled by regulation of volatile organic compounds. Noncriteria pollutants are all other air contaminants and include those considered to be hazardous or toxic. The most important part of a permit review is the engineering review of both routine and accidental

emissions. The TACB requires that permit applicants apply the best available control technology (BACT) within economic reasonableness and technical practicability to control proposed emissions to the atmosphere. After the engineer completes the review, any remaining emissions are evaluated through computer modeling to determine expected ambient concentrations. Predicted concentrations then undergo a health effects review to ensure that public health is protected. In addition, the application is reviewed to determine if substances are used in the process which could lead to catastrophic results should an accidental release occur. The company's proposal is reviewed in an effort to ensure that reasonable efforts have been made to minimize the risk of such releases.

There is no similar program for existing (non-permitted or "grandfathered") facilities that ensures that all sources emitting toxic compounds are reviewed to ensure that public health is protected. Limited resources are focused primarily on the identification and review of individual sources that may pose a public health risk. Sources may be identified as being of concern through agency site investigations, through complaints, through work performed by EPA or another agency indicating a possible problem, through the TACB's monitoring efforts, or through review of emissions information.

Annual site investigations by the TACB regional offices and local program offices are performed at the major industrial sources in their jurisdictions. During these investigations, the inspector reviews the operations of the facility for compliance with the rules and regulations of the Board, including those specifically addressing toxic substances. In the case of local programs, there can be local ordinances that are enforced as well. The EPA has promulgated, and the TACB enforces, National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations to cover the following pollutants associated with certain industrial processes: mercury, vinyl chloride, beryllium, benzene, asbestos, and arsenic. TACB Regulations II and III address the following pollutants: hydrogen sulfide, sulfuric acid mist, beryllium, lead, and fluorides. As mentioned above, some local governments are involved in enforcing regulations related to air toxics. The Select Committee may wish to seek testimony from local programs as to their activities in this area.

Companies that experience process upsets or accidental releases that will result in the emission of contaminants to the atmosphere are required to report such incidents to the appropriate TACB regional office promptly. Any of these reports which indicate a significant potential public health threat are investigated. As a result of the 1986 Community Right-to-Know Act (Title III of the Superfund Amendments and Reauthorization Act of 1986 [SARA]), local planning groups have been formed to (1) assist the public in knowing what chemicals of concern are manufactured or present at industrial operations in their communities, and (2) conduct planning to minimize the potential for accidental releases and to improve emergency response to major releases. The effectiveness of these local planning groups has not been evaluated by the TACB. The Committee may elect to seek testimony from representatives of these organizations.

In addition to enforcing current regulations, the TACB conducts case-by-case reviews at industrial sites. These reviews can be initiated as the result of any of several circumstances, including citizen complaints, EPA referrals, monitoring data indicating a possible public health problem, and selection as a site for comprehensive review under the TACB air toxics pilot program funded by the Legislature

beginning in fiscal 1990. These reviews can include the following elements as appropriate: the collection of emissions information sufficient to perform computer modeling of the impact of emissions, thorough on-site investigation, ambient air monitoring, a health effects evaluation of the modeling or monitoring data, and a control technology review. In cases where the level of emissions represents a public health concern, additional control by the company is sought. Additional controls have been achieved and have been made enforceable through board order, permit amendment, or regulation development.

V. Efforts by Texas Industries to Reduce Toxic Air Emissions

Many companies, both individually and collectively through trade associations, have been active in the control of toxic air pollutants. An example of such programs is the Community Awareness & Emergency Response (CAER) program developed by the Chemical Manufacturers Association, which has been endorsed by numerous companies. This program is an effort to help the public maintain an awareness of the use and production of toxic chemicals in their areas. It is also designed to facilitate the preparation of a planned response to chemical emergencies. The visibility afforded to toxic emissions as a result of the reporting required by Section 313 of SARA has also served as a catalyst to promote voluntary emission reduction efforts on the part of individual companies. The Committee may wish to seek testimony from industrial or trade association representatives regarding efforts underway by Texas industries.

VI. Changes in Federal Air Pollution Control Law Being Considered by Congress, and Modifications in Texas Law that may be Required to Implement these Changes

In July 1989, the President submitted to Congress a bill that would amend the Clean Air Act (CAA) of 1977. Title III of this bill proposes to amend Section 112 of the CAA to require the use of best control technologies to minimize the emissions of toxic air contaminants. The 191 substances that are to be considered hazardous are specifically listed. The proposal differs from existing legislation in that it requires EPA to implement industry-specific control measures on a specified schedule and to issue operating permits under Title IV of the proposed CAA amendments to insure compliance with the provisions of the CAA. This permit process will include existing sources and will be fully controlled by EPA through delegation of the program. The states would have very little ability to tailor the process to meet specific needs or constraints. The fee structure associated with the proposal might collect fees as large as \$400,000 from individual sources and could collect as much as \$48 million from affected sources in Texas.

The first phase of the proposal would require EPA to publish within a year of adoption a list of major industry source categories subject to regulation. Major sources are defined in this proposal as any source with at least 10 tons per year (T/Y) of any listed pollutant, or at least 25 T/Y of listed pollutants in aggregate. A plant that emits 100 T/Y of a criteria pollutant (one for which there is an air quality standard) would also be a major source. Area sources or small sources may also be subject to regulation if by the nature and extent of their emissions the EPA determines that control should be required.

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The second phase of the proposal would require EPA to develop emission standards for the industry categories on the following schedule:

- 10 categories in the first 2 years,
- 25 percent of the categories within 4 years,
- 50 percent of the categories within 7 years,
- and all remaining categories within 10 years.

The standards would be based on the level of emission control achieved in practice by the best controlled similar sources. The bill refers to this level of control as the maximum achievable control technology (MACT). Compliance dates for application of these requirements to existing sources within a category could be set by EPA but would not be allowed to be later than six years after promulgation.

The final phase of the proposal would require the EPA to evaluate any residual risk that remains after the standards for an industry category have been in place. This review must be completed within seven years after promulgation. If EPA determines that an unreasonable risk remains from a category after MACT is in place, standards must be promulgated within two years that would adequately protect against such risk.

The Texas Clean Air Act (TCAA) gives broad enforcement authority to the Texas Air Control Board (TACB). However, a few changes would have to be made in Texas law in order to implement the proposed legislation. The renewal period for operating permits would need to be decreased from 15 years to 5 years. In addition, the current TCAA does not contemplate the permitting of existing sources. Finally, the current TCAA establishes a maximum fee that can be charged by the TACB. This maximum is set at \$50,000 and would need to be lifted in order to accommodate the larger fees associated with the proposed federal program.

In addition to the requirements of Titles III and IV, one provision of Title VII would establish an air pollutant release investigation board with the EPA. This board would investigate major life-threatening releases of air toxics. The exact makeup, duties, and powers of the board would be established in any final legislation.

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Toxic Releases to All Media
From Industrial Sources (1987)

(data collected in EPA TRIS Inventory
but limited to 191 chemicals in
EPA's proposed Clean Air Act)

<u>Media</u>	<u>Million Pounds Released</u>	<u>Percent of Total</u>
Air	1,860	51
Land	677	19
Underground	610	17
Water	<u>489</u>	<u>13</u>
	3,636	100

The Six States With the Largest Total Air Emissions
From Industrial Sources

Louisiana	115,263,000
Texas	110,993,000
Virginia	110,515,000
Ohio	95,926,000
Tennessee	87,648,000
Michigan	85,409,000

Releases of Toxic Air Emissions
in Texas by Source Type
(Est. 1987)

<u>Type</u>	<u>Million Pounds Released</u>	<u>Percent of Total</u>
Area Sources	346	58
Mobile Sources	143	24
Industrial Sources	<u>111</u>	<u>18</u>
	600	100

Sources of Toxic Air Emissions
in Eight Counties in Texas
(estimate in million pounds
released in 1987)

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<u>County</u>	<u>Area</u>	<u>Industry</u>	<u>Mobile</u>
Bexar	26.9	2.0	10.4
Dallas	35.3	5.1	12.2
El Paso	10.8	0.5	3.6
Galveston	4.0	3.9	1.0
Harris	54.4	31.5	18.9
Jefferson	5.6	17.8	1.1
Nueces	6.9	4.6	3.7
Tarrant	21.0	5.1	7.3

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