Texas Environmental Health Institute

Progress Report & Future Directions

Prepared September 2007

By

The Texas Department of State Health Services

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BACKGROUND

In 2001, in response to citizen concerns about the potential impact of environmental pollutants on their health, the Texas Legislature passed legislation establishing the Texas Environmental Health Institute (TEHI or Institute) as a joint venture between the Texas Department of Health, predecessor agency to the Texas Department of State Health Services (DSHS), and the Texas Natural Resources Conservation Commission, predecessor agency to the Texas Commission on Environmental Quality (TCEQ), the State environmental agency. Section 19.01, Title 5, Subtitle G, Chapter 427, of the Texas Health and Safety Code, directs the TCEQ to enter into an agreement with the DSHS, to jointly establish the Texas Environmental Health Institute ***to examine ways to identify, treat, manage, prevent, and reduce health problems associated with environmental contamination.***

Establishment of the Institute

On December 6, 2001, an Interagency Memorandum Of Agreement (MOA) was entered into by and between the Texas Natural Resources Conservation Commission (predecessor of the TCEQ) and the Texas Department of Health (predecessor of the DSHS), pursuant to the authority granted and in compliance with the provisions of the Interagency Cooperation Act, TEXAS GOVERNMENT CODE Chapter 771. The purpose of the Agreement was to establish the Institute and to describe the tasks to be performed and the duties and responsibilities of each of the agencies in enabling the Institute to accomplish its purposes. As part of the Agreement, the agencies agreed to establish a Board to make recommendations to the agencies concerning methods of accomplishing the purposes of the Institute. The Board was to consist of one representative from each agency as well as a representative from a Texas School of Law; a Texas School of Public Health; a Texas medical school; a Texas school of higher education; a community representative living in or near an area affected by a Superfund site; a representative of environmental advocates; and a representative of industry. The Board was established to set the initial direction for the Institute. The members of the Board discontinued participation after the initial purposes of the Board were satisfied and as the work became more focused on the agencies' completion of the assigned pilot project involving specific medical testing and evaluation.

The Institute was not established with any staff; rather it was established as a virtual entity with its functions to be carried out by the Environmental Epidemiology Division (currently the Environmental & Injury Epidemiology and Toxicology Branch) within DSHS.

Specific Purposes of the Institute

The originating legislation served as a guide in determining the specific purposes of the Institute. The purposes are to:

1. Develop a statewide plan to identify health conditions, related or potentially related to environmental contamination, of residents of this state who live or have lived within the immediately surrounding area of a federal superfund site or a state superfund site;

2. Develop a plan to promote and protect the health and safety of residents in immediately surrounding areas by preventing or reducing their health risks from exposure to chemical and biological contaminants, radioactive materials, and other hazards in the environment and the workplace;

3. Develop a plan for informing and educating citizens in immediately surrounding areas about the identified health risks and ways to prevent or reduce exposure;

4. Identify private and federal funding opportunities for Institute operations; and

5. Conduct, coordinate, or pursue funding for research concerning short-term and long-term impacts of exposure to environmental contamination.

In addition, Sec. 427.006 (a-d) directed the Institute to conduct a pilot project at the RSR West Dallas site and the Cadillac Heights site for a period of two years and to submit to the 78th Legislature the results of the pilot project and the plan for the future organization of the Institute.

Institute Objectives

The specific purposes of the Institute were operationalized into the seven interdependent objectives listed below. These objectives build upon each other to provide an overall framework to have a positive impact on environmental health.

Objective 1	Implement an efficient statewide plan to accomplish the purposes of the Institute;
Objective 2	Identify health conditions, related or potentially related to environmental contamination, of residents of this state who live or have lived within the immediately surrounding area[1] of a federal superfund site or a state superfund site;
Objective 3	Promote and protect the health and safety of residents in immediately surrounding areas[1] by preventing or reducing their health risks from exposure to chemical and biological contaminants, radioactive materials, and other hazards in the environment and workplace;
Objective 4	Inform and educate citizens in immediately surrounding areas[1] about the identified health risks and ways to prevent or reduce exposure;
Objective 5	Identify private and federal funding opportunities for Institute operations;
Objective 6	Conduct, coordinate, or pursue funding for research concerning short-term and long-term impacts of exposure to environmental contamination;
Objective 7	Conduct a pilot project at the RSR West Dallas site and the Cadillac Heights Neighborhood;

[1] Defined as areas where the Commission (TCEQ) has determined that people may have potentially been significantly exposed to one or more pollutants from an identified site

VISION AND MISSION STATEMENTS

Institute Vision Statement

To have healthy informed communities
This vision statement describes what the Institute strives to achieve. Individuals often have to make choices about their lifestyles that can affect their health. They frequently need to rely on public authorities to provide them with reliable information so that they may make informed decisions. Often they also rely on government to protect them from threats which are beyond their control.

Institute Mission Statement

To examine ways to identify, treat, manage, prevent, and reduce health problems associated with environmental contamination
This mission statement identifies the overall purpose of the Institute and describes the Legislative mandate that it must fulfill.

Purpose of this Report

This report enumerates the progress made towards achieving the Institute objectives and recommends future directions for the Institute

PROGRESS

Objective 1

Recommend and implement an efficient statewide plan to accomplish the purposes of the Institute;

Significance

Environmental health is a segment of public health concerned with assessing, understanding, and controlling the impacts of the environment on people. Often assessing potential environmental health problems requires the involvement of people from many disciplines: physicians, epidemiologists, engineers, scientists, etc. A statewide coordinated approach to examining potential environmental health problems is essential to ensure efficient non-duplicative government operations.

Tasks

1a	Identify existing legislation and programs relating to accomplishing the purposes of the Institute
1b	Based on existing legislation and programs recommend a plan to accomplish the purposes of the Institute

Accomplishments

1a: Identify existing legislation and programs related to accomplishing the purposes of the Institute

Existing Legislation: In 1989, the Texas Legislature passed the "*Health Risk Assessment Act*". This act, written into law as Texas Health and Safety Code Chapter 503, provides for a plan to guide intergovernmental cooperation concerning the regulation of toxic substances and harmful physical agents and addresses the prevention and control of adverse health effects resulting from exposure to those agents. It stipulates that in its capacity to protect the public health, the department (DSHS) shall coordinate health risk assessments conducted under this chapter. This chapter also established the "Toxic Substances Coordinating Committee" (TSCC) to coordinate communication among member agencies concerning each agency's efforts to regulate toxic substances and harmful physical agents.

In 1989, the Texas Legislature passed the "*Registry and Cleanup of Certain Hazardous Waste Facilities Act*". This act, written into law as Texas Health and Safety Code Chapter 361,

Subchapter F, Section 361.181, required the Commission (TCEQ) to annually publish an updated state registry identifying, to the extent feasible, each facility that may constitute an imminent and substantial endangerment to public health and safety or the environment due to a release or threatened release of hazardous substances into the environment. The registry shall identify the relative priority for action at each listed facility. The relative priority for action at facilities listed on the registry shall be periodically reviewed and revised by the Commission as necessary to accurately reflect the need for action at the facilities. Pursuant to the Act, the Commission must update the registry (state Superfund registry) annually to add new facilities in accordance with the Act, '361.184(a) and '361.188(a)(1) (30 TAC '335.343) or to delete facilities in accordance with the Act, '361.189 (Act, '361.183(a) and 30 TAC '335.344).

In 1993, the Texas Legislature passed the "*Epidemiologic or Toxicologic Investigations Act*". This act, written into law as Texas Health and Safety Code Subchapter C, Section 161.0211, stipulates that under its duty to protect public health, the department shall conduct epidemiologic or toxicologic investigations of human illnesses or conditions and of environmental exposures that are harmful or believed to be harmful to public health. This act stipulates that DSHS shall use generally accepted methods of epidemiology or toxicology in the conduct of an investigation, and that a person shall provide medical, demographic, epidemiologic, toxicologic, or environmental information to the department, without risk of being liable for damages or other relief for providing medical or other confidential information to the department during these investigations. CONFIDENTIALITY: Under Section 161.0213, information relating to an epidemiologic or toxicologic investigation of human illness or conditions and environmental exposures that are harmful or believed to be harmful to public health are not public information under the open records law and are subject to the same confidentiality requirements as described by Section 81.046, Confidentiality of Communicable Diseases.

Existing Programs: In 1985, in response to concerns raised about ethylene dibromide in grain products, Texas Department of Health, the predecessor of DSHS, established the Environmental Epidemiology Division. The Division was directed to assess the public health impact of environmental exposures and to make recommendations related to the abatement of the exposures to protect public health. During the implementation of HB 2292 when DSHS was created, additional programs were added to the Division and it was reorganized into the *Environmental & Injury Epidemiology and Toxicology (EIET) Branch.* The EIET Branch includes the Health Assessment and Toxicology (HAT) Program – the principal state public health program involved with health issues around hazardous waste sites. HAT identifies communities where people may be exposed to hazardous substances in the environment, assesses how hazardous a site is, and recommends actions to protect people's health.

EIET is not an enforcement or regulatory branch; rather it works with and makes recommendations to: citizens, professional associations, private industry, and to local, state, and federal agencies such as the Texas Commission on Environmental Quality (TCEQ), the Agency for Toxic Substances and Disease Registry (ATSDR), the U.S. Environmental Protection Agency (EPA), the Centers for Disease Control and Prevention (CDC), the Health Resources Services Administration (HRSA), and the National Institute for Occupational Safety and Health (NIOSH). EIET stakeholders include citizens, workers, environmental groups, hospitals, EMS providers, researchers, and local, state, and federal agencies. The shared interest among these groups is to make Texas a safer place to live.

In 1999, the TCEQ adopted the Texas Risk Reduction Program (TRRP) rule (30 TAC 350), a corrective action process directed toward the protection of human health. TRRP incorporates risk assessment techniques and contains requirements regarding such issues as the identification of existing and potential future exposure pathways based on land use (residential or commercial/industrial) and affected media (e.g., surface soil, groundwater), the evaluation of individual-chemical and cumulative risk/hazard, and delineation of contamination at superfund and other sites where a chemical release has occurred. TCEQ and the EIET Branch of DSHS often work together to evaluate the potential for adverse health effects associated with environmental contamination at superfund and other sites

1b: Based on existing legislation and programs recommend a plan to accomplish the purposes of the Institute.

Incorporate the Institute within the EIET Branch of DSHS: DSHS has the principal responsibility for the protection of the health of Texas residents and provides medical, epidemiological, and laboratory support to state agencies in all areas of environmental public health. It was recommended that the EIET Branch adopt the functions of the Institute. This branch is ideally suited to carry out the functions of the Institute. The mission of the EIET Branch – to use the principles of epidemiology, toxicology, and surveillance to identify populations at risk in order to develop evidence-based actions to protect and promote the health of the people of Texas – is consistent with the purposes of the Institute and fits well with its overall mission, "to identify, treat, manage, prevent, and reduce health problems associated with environmental contamination". The Branch includes epidemiologists, toxicologists, environmental specialists, health educators, and community involvement personnel. Throughout the remainder of this document, references to the functions and accomplishments of EIET will be synonymous with those of the Institute.

Objective 2

Identify health conditions, related or potentially related to environmental contamination, of residents of this state who live or have lived within the immediately surrounding area of a federal superfund site or a state superfund site;

Significance

Generally, while much is known about the effects that short-term exposure to high levels of certain chemical contaminants may have on human health, little is known about the health effects that may result from long-term, low-level exposures; the types of exposures that may be associated with living in areas proximal to federal or state superfund sites. Identifying areas of potential exposure and identifying health conditions potentially related to environmental exposures may help fill basic information gaps.

Tasks

2a	Identify Federal and State Superfund sites in Texas
2b	Identify Priority Health Conditions related to or potentially related to environmental exposures
2c	Encourage research to identify areas of potential environmental exposures

Accomplishments

2a: Identify Federal and State Superfund sites in Texas

A list of Federal and State Superfund sites as of September 2007 is included in Appendix A.

2b: Identify Priority Health Conditions potentially related to environmental contamination

As part of an integrated strategy to evaluate the relationship between illness and exposure to hazardous substances, the agencies identified priority health conditions for further consideration and research. The following eight priority health conditions were selected based on:

- the frequency of epidemiologic or toxicologic associations with the hazardous substances found at NPL sites;
- the severity of the adverse health condition;
- the extent of physician, public health practitioner, and community concerns; and

- the ability to lessen the impact of a particular illness through medical care or prevention activities.

The identified conditions include:

1. birth defects and reproductive disorders,
2. cancer,
3. immune function disorders,
4. kidney dysfunction,
5. liver dysfunction,
6. lung and respiratory diseases
7. neurotoxic disorders, and
8. hematological effects

2c: Encourage research to identify areas of potential environmental exposures

TEHI provided Texas State University and Texas A&M University Health Science Center with funds to develop the GIS-based Toxics Release Inventory (TRI) Map Layers and GeoDatabases and create a comprehensive geographic information system for 2002 through 2005 TRI reporting facilities. Developing these GIS components will expand the coverage of the environmental databases and update health outcome data on birth defects and congenital malformations to enable further research on relating adverse health outcomes and environmental exposures. In addition, Texas State University and Texas A&M University Health Science Center extended the GIS-Based Superfund Site Map Layers and GeoDatabases. These updated databases were linked to the respective geocoded addresses of industrial facilities and boundaries of more recently added superfund sites.

TEHI provided The Institute of Environmental and Human Health at Texas Tech University with funds to develop an integrated system to monitor environmental hazards that may have an impact on human health. The integrated system of technologies and resources resulting from this effort, particularly the GIS -based mapping overlays and precise near-real time databases of environmental health hazards that exist throughout the State of Texas, will significantly improve the abilities of municipal services, communities, industry, and individual citizens to prepare for and respond to hazardous incidents or disasters. These highly accurate and easily up-datable digital overlays and databases will be readily accessible to local and state emergency first responders and hazardous materials teams, and may be utilized by environmental scientists to enhance their understanding of where biological and chemical hazards occur and how they may affect people.

Objective 3

Promote and protect the health and safety of residents in immediately surrounding areas by preventing or reducing their health risks from exposure to chemical and biological contaminants, radioactive materials, and other hazards in the environment and workplace;

Significance

Texas's citizens who are concerned about the potential impact that the environment may have on their health often times expect governmental agencies and policy makers to act on these concerns. The ability to evaluate the pathways of exposure and review and analyze toxicological data is critical to preventing or reducing health risks from exposure to chemical contaminants and necessary to address citizen concerns.

Tasks

3a	Develop the ability to respond to public health concerns that arise as a result of perceived, potential, or actual human exposure to a hazardous substance by developing methods to analyze, interpret, and evaluate data about environmental hazards, pathways of exposure, toxicological data, and human health effects potentially related to environmental hazards
3b	Evaluate the health risks to individuals living in immediately surrounding areas

Accomplishments

3a: Develop the ability to respond to public health concerns

EIET has established a Cooperative Agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), a federal agency within the Department of Health and Human Services to develop the capacity to collect, integrate, analyze, and interpret data about environmental hazards, exposure to environmental hazards, and health effects potentially related to environmental hazards.

In partnership with ATSDR, EIET has developed standardized methodology to evaluate and respond to public health concerns as they relate to human exposure to hazardous substances around Superfund sites or other areas of concern. In the event that EPA lists or proposes for listing new sites onto the NPL, or in the event that EIET receives requests for health assessments or consultations, EIET will initiate or complete public health assessments (PHAs) or health consultations (HCs) in accordance with this established methodology.

For each PHA or HC, DSHS will visit the site, meet with the community to determine community health concerns, acquire and review available environmental and historical data, analyze possible pathways of exposure, acquire and analyze available and appropriate health outcome data, and assess the potential public health threat. Established methodology includes obtaining the following information:

- Background information
    - Site operations and history
    - Regulatory history and activities
- Land use and natural resources information
- Demographic information
- Community health concerns information
- Environmental contamination information
- Exposure pathway information
- Health outcome data
- Substance-specific information

EIET uses this information to evaluate the public health significance of the site by:

- Assessing the quality and representativeness of all available environmental data,
- Identifying possible exposure pathways and media,
- Identifying possible exposure points and routes,
- Identifying potentially exposed populations,
- Determining appropriate exposure point concentrations, and
- Identifying the need for additional exposure information

Assessments evaluate the site both for potential noncancer and cancer endpoints and include a quantitative, site-specific, estimate of the cancer risk and a weight of evidence evaluation of the chemicals' ability to cause cancer in humans. Where appropriate, EIET also considers multiple pathways of exposure, multiple chemical exposures, and special populations such as children, pica children, the elderly, and the infirm. Exposure pathways are presented to clearly describe the extent to which people may have come in contact with site contaminants. Each evaluation contains; a description of all completed and potential exposure pathways and whether the pathways occurred in the past, are presently occurring, or may occur in the future; a brief description of any pathways that have been eliminated; and the location and estimated size of any potentially exposed populations.

EIET also has developed the capacity to conduct biological testing, physiological testing, and exposure investigations, the purpose of which is to provide exposure information for the completion of an investigation. As funds permit, biological testing for chemical exposure may be performed if present or past human exposure is suspected and if testing will enable the health assessor to confirm that exposures have occurred. EIET may test for biological markers of exposure if:

- Potentially exposed persons can be identified and located for testing, and
- Sensitive laboratory tests are available to detect the presence of the hazardous substance, its metabolite, or other biological marker.

Standard medical testing of physiological function may be conducted if:

- Exposed persons can be identified and located for testing and
- Sensitive physiological tests are available to detect biological effects associated with the exposure.

Final reports of these investigations may address the following major areas of concern:

- Identification of potentially hazardous substances
- Concentrations of concern by chemical and environmental media
- Environmental and human exposure pathways
- A judgment as to whether the pathways constitute a public health concern
- Justification for concerns
- The overall public health implications of the site
- Community health concerns
- Available and appropriate health outcome data
- Recommendations related to mitigating the potential human exposure and the need for follow-up actions, including the need for "optional" activities such as health studies

3b: Evaluate the health risks to individuals living in immediately surrounding areas

Since 2001, EIET has responded to numerous public health concerns relating to actual or potential exposure to a hazardous substance. As of September 2007, EIET has completed 11 public health assessments (2 more in progress), 46 health consultations (2 more in progress), 4 petitioned health assessments/consultations (2 more in progress), 3 exposure investigations, and 15 technical assists. A list of the public health assessments, health consultations, exposure investigations, technical assists, and petitioned health assessments/consultations completed by the EIET Branch is available in Appendix B. Each public health assessment or health consultation completed by the Branch includes recommendations to reduce or eliminate exposure and a public health action plan outlining actions conducted or planned to reduce exposure.

Objective 4

Inform and educate citizens in immediately surrounding areas about the identified health risks and ways to prevent or reduce exposure;

Significance

The growth of the Internet has resulted in a flood of health-related information being available to people at every desktop. Thus, it is easy for the public to obtain information that often is confusing, contradictory, and unreliable. Public health agencies have a crucial role in providing the public with accurate, understandable, and scientifically valid information. Public health agencies also are in a unique position to provide information on the relationships between disease and exposure to toxic substances. Understanding the health risks associated with exposure often is the first step towards reducing the risk.

Tasks

4a	Develop a community action plan with associated education outreach activities to develop and deliver information to citizens
4b	Provide communities with easy access to educational materials pertaining to each site
4c	Implement the community outreach plan

Accomplishments

4a: Develop a community action plan with associated outreach activities to develop and deliver information to citizens

Community involvement and health education are part of an integrated, site-specific process that includes the site health assessor, toxicologists, environmental agency staff, and the community. Over the past several years EIET has developed an approach to community action plans that promotes public participation in the health assessment/consultation process. Each community action (CA) plan depends on a number of site-specific factors. These include:

1. The presence of completed past or present exposure pathways,
2. The severity of exposures that may have occurred or are occurring,
3. The potential health effects related to such exposures,
4. The level of involvement from other agencies or organizations,
5. The level of concern among residents near the site or other interested parties, and
6. The cultural, historical, or social factors

During the development of each site-specific community action plan sites generally are classified either as low concern or high concern.

Low Concern Sites: Some sites have no past or present completed exposure pathways, few people living nearby, and low concern among the few who are nearby. At such sites the community action plan usually includes the following steps:

1. Contact the people who have been involved in the remedial process at EPA and the State Environmental agency (TCEQ); this is usually the project manager and the community involvement person at those agencies. With sites of low community concern, the project manager and community involvement person have typically not received and are not aware of any community health concerns related to the site. Contact local officials, people from the local health department nearest the site, and people from the DSHS Regional Office to gather any health concerns they may have received that could be related to the site. In some cases DSHS staff can use past newspaper articles about a site to identify key issues; newspaper articles often provide names of local people who may serve as helpful contacts.

2. During a site visit, the EIET community involvement liaison and the EIET health assessor look for potential exposure pathways to people who live or work nearby. They also may talk with residents who live near the site.

3. After the site visit, a number of research tools (e.g., field notes, cross phone directories, U.S. Census data, mapquest.com, anywho.com) are used to identify all homes and businesses near the site.

4. A letter is sent to each home or business near the site to explain the health assessment process and to request any site-related health concerns that they have. A pre-addressed response form is included with the letter.

5. Any health concerns received are researched, and then responded to by letter and/or a phone call from the appropriate staff member.

6. Copies of the completed health assessment or health consultation are sent to staff from other agencies involved at the site and other interested parties. A summary of the health assessment is sent to community members that have expressed interest in the site. The local news media for the area may be provided with the summary. Links to the DSHS website www.dshs.state.tx.us/epitox are provided for those who prefer to review the full report on-line. The full report also is sent to those wishing to receive it.

High Concern Sites: Some NPL sites and most of the petition sites that we deal with require a higher level of CI/HE response for one or more of the six reasons listed above. A higher level of response is needed at such sites in order to address community health concerns and/or to prevent exposures in certain target populations. At these sites, the following CA process is employed:

Conduct Needs Assessment: Research the history of the site and surrounding community to help determine community needs. This involves identifying agency staff involved with the site, including EPA, TCEQ, the local government, the DSHS Regional office, the local health

department, elected officials, and other involved organizations such as Regional Councils of Government (COGs), universities, school districts, or non-profit organizations. Identify community leaders, activists, and grassroots organizations involved at the site. Talk with all these key people involved at the site to determine any health concerns or exposure issues related to the site. Develop a site contact list with names, phone numbers and contact information for agency and community people involved with the site.

a. Find out what educational and community involvement activities have been implemented at the site in the past by other agencies.
b. Develop a demographic, community, and geographic profile for the site. Use U.S. Census data and other sources to determine:
    i. The languages spoken in the area
    ii. The basic socio-economic level of residents
    iii. The racial, ethnic, cultural, religious, and age-related dimensions of the community
    iv. The major industries in the area
    v. The past history of government, industry, and residents at the site.
c. Identify newspapers, radio stations, television stations, community newsletters, and other media used in the community and the usage patterns in the community, i.e., the preferred media sources for different segments of the community. Create a contact list of persons at media outlets in the community.
d. Identify meeting spaces preferred by different segments of the community; these typically are near the site of concern and may include private homes, community centers, schools, colleges, churches, and hospitals. Identify preferred meeting times in different sectors of the community, which may be affected by sports activities, religious activities, shift work schedules, and age factors.
e. Determine the health care providers, clinics, hospitals, local health department staff, and other community health resources in the area. Talk with health providers in the area to determine the level of awareness of issues related to the site, the level of environmental health training among these providers, and any potential issues where health professional education could be provided.

4b: Provide communities with easy access to educational materials pertaining to each site

Site-specific and/or chemical-specific educational materials are distributed at community meetings or mailed to homes and businesses near the site. The EIET Branch has also created an "EpiTox" web site which provides access to all publications, investigations, and educational materials developed by the Branch. In addition to providing links to other environmental health resources, the web page also includes an e-mail link through which individuals can request information or answers to specific environmental health related concerns. The "EpiTox" web site is accessed approximately 16,000 times per month. The link to the "EpiTox" web page is provided below:

http://www.dshs.state.tx.us/epitox/default.shtm

4c: Implement the community outreach plan

Through the cooperative agreement with ATSDR the EIET Branch has established positions for a Community Involvement Liaison (CIL) and a Health Educator (HE). The individuals in these positions serve as the bridge between the health assessment staff and the people interested in a

particular site. The CIL initiates activities to engage citizen participation. These activities are designed to provide site-specific information to concerned citizens and to solicit their input concerning site activities. The CIL organizes public meetings and assures that appropriate staff attends the meetings to provide information and recommendations related to the health impact of the site.

The HE coordinates preventative public health education activities for each site as necessary by working with the assessment team to assure the proper planning, implementation, and evaluation of all preventative public health education activities conducted at each site.

A list of Health Education activities conducted between 2001 and September 2007 is available in Appendix C.

Objective 5

Identify private and federal funding opportunities for Institute operations;

Significance

The mission of the Institute cannot be achieved without adequate funding.

Task

Seek and apply for funding to support activities consonant with the mission of the Institute

Accomplishments

EIET has actively sought federal funds to perform work consistent with the purposes of the Institute. Since September 29, 2002, EIET has received $1,367,252 in federal funds through a Cooperative Agreement with the Agency for Toxic Substances and Disease Registry (ATSDR) to identify pathways of exposure to contaminants from hazardous waste sites and releases and identify, implement, and coordinate public health interventions to reduce exposures to hazardous substances at levels of health concern.

Objective 6

Conduct, coordinate, or pursue funding for research concerning short-term and long-term impacts of exposure to environmental contamination;

Significance

The paucity of knowledge pertaining to the effects that short-term and long-term exposure to chemical contaminants may have on human health inhibits our ability to more fully evaluate the public health significance of these exposures. Properly designed research studies may add to our knowledge base; thereby improving our ability to promote activities to prevent or reduce exposures.

Task

6a	Pursue research funds to conduct epidemiologic and toxicologic investigations around hazardous waste sites
6b	Develop the capacity to conduct research on the short-term and long-term impacts of environmental exposures
6c	Encourage research concerning human health impacts of exposure to environmental contamination

Accomplishments

6a: Pursue research funds to conduct epidemiologic and toxicologic investigations around hazardous waste sites

Determining the Prevalence of Multiple Sclerosis in Communities:
In response to a citizen's concern regarding the perception of "too much" multiple sclerosis (MS) in a community, EIET initiated an investigation. The resultant health consultation that was prepared concluded that the reported number of MS cases in the neighborhood appeared to be high. The report also identified a source of historic heavy metal contamination in the neighborhood and noted that previous studies in the scientific literature had investigated the role of metals exposure in the development of the disease. The final report recommended that a research study be conducted among persons who lived in the neighborhood to determine if there was a true excess of MS. The Branch applied for and received funds from the federal ATSDR/CDC to examine the prevalence of MS in the group of children who lived in two communities and attended the two public elementary schools in the area of interest.

In response to concerns of too much Amyotrophic Lateral Sclerosis (ALS) among former air force base workers, EIET applied for and received funds to develop incidence rates (based on year of diagnosis) and prevalence estimates for ALS.

Funding Period	Total Funds Awarded
9/30/02 to 9/29/03	$ 90,728
9/30/03 to 9/29/04	$ 90,728
9/30/04 to 9/29/05	$ 90,728
9/30/05 to 9/29/06	$ 90,728
TOTAL	**$362,912**

6b: Develop the capacity to conduct research on the short-term and long-term impacts of environmental exposures

EIET has established a capacity to conduct epidemiological studies of non-communicable disease. This includes surveillance and investigations of populations exposed and potentially exposed to toxic substances and harmful physical agents. The Branch has previously completed two site-specific surveillance projects funded by ATSDR, one at the Koppers Company, Inc. NPL Site in Texarkana and the other at the United Creosoting Company NPL Site in Conroe. Additionally, DSHS staff assisted ATSDR with the Crystal Chemical Arsenic Exposure Study Final Report.

6c: Encourage research concerning human health impacts of exposure to environmental contamination

In 2005, the Agency for Toxic Substances and Disease Registry released a report that between 1953 and 1992, the former W.R. Grace & Co./Texas Vermiculite site, located at 2651 Manila Road in Dallas, processed vermiculite mined in Libby, MT. The major findings for the site were consistent with many of those found at 21 other sites that received materials from Libby, mainly:

- Former workers are most at risk for asbestos exposure
- Those that lived with former workers while Libby vermiculite was being processed at the plant between 1953 and 1992 also could have been exposed to asbestos by workers carrying home asbestos fibers on their hair and clothing
- Former workers and household members who lived with them should take specific steps to protect their health and improve quality of life:
    - Learn more about asbestos exposure,
    - See a doctor with experience in asbestos-related lung disease,
    - Quit smoking,
    - Get regular flu and pneumonia shots.

TEHI provided Parkland Health and Hospital System (Parkland) in Dallas, Texas with funds to conduct a screening program for asbestos-related lung diseases among former workers and family members, and residents who lived near the former W.R. Grace & Co./Texas Vermiculite site. Parkland organized and conducted a community education program concerning the methods and findings from the surveillance activities.

For this project, 378 chest x-rays were reviewed. Of these, 19 were identified as possible asbestosis, and were asked to come back to Parkland for a follow-up Pulmonary Function Test (PFT). Sixteen of those 19 have done so. Interpretation of the PFT, and integration with the medical history and x-ray findings is still underway at UT Health Center at Tyler.

Another 19 were identified as possibly having pulmonary nodules, and were advised to consult their own doctors for rule out lung cancer as soon as possible. Two of those 19 had been given a lung cancer diagnosis prior to joining the project. Follow-up mail surveys will be sent to the remaining 17 patients to determine how many received a confirmed diagnosis of lung cancer.

Of the remaining 340 patients, 124 were notified of some x-ray finding which should be followed up, but which was unrelated to asbestos exposure. These included granulomas, abnormalities of the spine, left ventricular hypertrophy, tracheal/mediastinal displacement of unknown cause, possible emphysema and possible subsegmental atelactasis. Two-hundred sixteen were found to have no medically significant abnormalities on x-ray.

Objective 7

Conduct a pilot project at the RSR West Dallas site and the Cadillac Heights Neighborhood;

Significance

Citizens of West Dallas expressed concerns regarding the potential effects of environmental pollution on their health - Lead smelters in operation at several sites in Dallas from 1936 to 1990 exposed residents of some Dallas neighborhoods to high levels of environmental lead. City of Dallas Health Department pediatric lead testing which began in the 1970s found children with high blood lead in neighborhoods near the RSR smelter in the West Dallas area and in the Cadillac Heights neighborhood of South Dallas near two other lead smelters (Dixie Metals, National Lead/Exide). The EPA and the TCEQ did extensive testing and cleanup around the RSR site in the 1990's. Questions still remain among people who lived in West Dallas and Cadillac Heights about lead from smelters and their health.

Task

Complete the pilot project in West Dallas and provide a report of the studies findings to the 78th Legislature

Accomplishments

Funding for the pilot project was obtained through a Supplemental Environmental Project Agreement between DSHS and TCEQ. The department contracted with Parkland Health and Hospital System (Parkland), in Dallas Texas, to conduct the pilot project. Parkland conducted a two-phase project designed to assess the health of people in the neighborhoods of interest. Phase 1 consisted of taking a medical history with a focus on potential lead exposure. Phase 2 consisted of a focused physical examination and laboratory testing designed to detect lead poisoning and other important health problems. A total of 4,215 individuals participated in Phase 1 and 2,797 individuals participated in Phase 2. A report for the project was prepared and submitted on November 28, 2005. The pilot project was completed and the results were submitted to the 78th Legislature. Additional funds were provided in 2006 to carry out follow-up activities related to the pilot project. Below is a brief summary of the results and conclusions of the Parkland Lead Pilot Project, as presented by a contracting consultant.

Results: Among adults (ages 20 to 80+ years), blood lead levels were lower than age-matched comparison for Texas Blacks from NHANES III. Among children (ages from under one year to 19 years), blood lead levels from the 2002 survey were lower than age-group matched comparison for Texas Black children from the NHANES III survey. Importantly, age-group specific child blood lead levels in the 2002 Parkland survey were one-tenth the blood lead levels observed in age-group matched 1980-1989 children from the area in a prior investigation.

Liver function panels:

- Mainly affected by increasing age and abnormally high Body Mass Index (BMI);
- Abnormal Alkaline Phosphatase being the only liver test significantly associated with blood lead level.

Hematology (blood) panels:

- Affected significantly by advancing age, high BMI, and tobacco smoking;
- Abnormal WBC being significantly associated with blood lead level.

Kidney function tests:

- Not directly associated with blood lead level;
- Abnormal creatinine was significantly associated with blood lead level.

Blood lipid panels:

- Significantly associated with increasing age and abnormally high BMI;
- Abnormally high LDL was associated with blood lead level.

Diabetes related tests:

- Associated with advancing age and abnormally high BMI.

Self-Reported (not verified) Cancers:

- **Brain cancer** was associated with having had a parent who worked in the smelter;
- **Lung cancer** was associated with tobacco smoking.

Self-reported (not-verified) Birth Defects:

- **Brain plus Spine defects** were significantly associated with whether the mother's parent worked in the smelter;
- **Brain defects** were significantly associated with whether the mother worked in the smelter;
- **Alimentary tract defects** were significantly associated with the mother having worked in a smelter;
- **Genitourinary defects** were significantly associated with the mother not currently living in the target area.

Conclusions: Lead pollution in the West Dallas and Cadillac Heights communities was a health problem previously recognized (e.g., 1980's and before). Blood lead levels of all age groups 19 years and younger (the populations segment well-known to be a barometer of community health conditions) decreased by ten-fold comparing 2002 data with 1980-1989 data. Clean-up and abatement efforts subsequent to designation as an EPA Superfund site in the mid-1990's have markedly reduced the lead pollution health threat to children and adults in the target neighborhoods. Liver function was weakly affected by blood lead level, but highly affected by heightened liver activity of a specific enzyme (GGTP) frequently associated with alcohol abuse, cocaine abuse, or exposure to other toxicants. Additionally, abnormal kidney function among older adults who lived in these neighborhoods was associated with a lingering affect of previous lead exposure. These results are tentative and it is recommended that medical records for the cancer and birth defect clusters be reviewed. Funds were provided to review Parkland medical charts on approximately 80 – 100 Lead Project participants that reported a diagnosis of neurological birth defects on their medical history.

FUTURE DIRECTIONS

To Identify Health Conditions, Related or Potentially Related to Environmental Contamination We Plan to:

Encourage the Geocoding of Environmental and Disease Data: Encouraging the development and use of geographic information systems (GIS) to integrate data about environmental hazards and exposures with data about diseases that are possibly linked to environment contamination will help identify health conditions, related or potentially related to environmental contamination, a key goal of the Institute. In January 2001, the Pew Environmental Health Commission, launched in 1999 by the Pew Charitable Trust, issued a report titled "America's Environmental Health Gap: Why the Country Needs a Nationwide Health Tracking Network". The gap that this report refers to is the basic lack of information between exposure to low levels of environmental pollutants and adverse health conditions. Currently, no system exists in Texas at the State level to track many of the exposures and health effects that may be related to environmental hazards. While Texas does maintain various environmental, exposure, and disease tracking systems it lacks the ability to link these systems together. Because existing systems are not linked, it is difficult to study and monitor relationships among hazards, exposures, and health effects.

The goal of establishing this capacity within the state will be to protect communities by providing information to federal, state, and local agencies to: 1) monitor and distribute information about environmental hazards and disease trends, 2) identify whether minorities, children, women of childbearing age, or other potentially vulnerable groups are disproportionately impacted by environmental contamination, 3) advance research on possible linkages between environmental hazards and disease, and 4) develop, implement, and evaluate regulatory and public health actions to prevent or control environment-related diseases.

Encourage Research on the Priority Health Conditions: Additional research is needed to assess the potential relationships between adverse health conditions and exposure to hazardous substances. In general, an expansion of research in environmental epidemiology to determine the distribution and severity of exposures, risks, and health effects associated with hazardous waste sites is recommended. This research should include: 1) an evaluation of the incidence and prevalence of the priority health conditions in populations living near hazardous waste sites, 2) hypothesis-generating activities to identify potential relationships between exposure and disease, and 3) the identification of risk factors which could be targeted by prevention strategies.

Encourage the Development and Use of Biological Markers of Exposure: The measurement of chemicals in people is the best metric for determining exposure. Encouraging the development and use of biomonitoring methods will improve our capacity to identify and evaluate exposure to hazardous substances in potentially affected populations. The overall purpose of this biomonitoring will be to provide unique exposure information to scientists and health officials to help prevent disease that results from exposure to environmental contaminants. Biomonitoring data may be used to determine: 1) which chemicals get into Texan's bodies, 2) the prevalence of people with certain chemicals in their bodies, 3) whether certain areas of the state or certain groups of people are associated with higher exposure to certain chemicals, 4) the effectiveness of public health efforts to reduce exposure, 5) whether exposure levels are higher among minorities, children, women of childbearing age, or other potentially vulnerable groups, 6) trends over time

of levels of contaminants in the population, and 7) priorities for research on human health effects.

To Protect and Promote the Health and Safety of Residents in Immediately Surrounding Areas by Preventing or Reducing Risks We Plan to:

Continue to Assess Potential Risks to the Citizens Living Near Superfund and Other Hazardous Waste Sites: The relationship with the Agency for Toxic Substance and Disease Registry (ATSDR) to conduct site-specific activities around hazardous waste sites has enabled Texas to build the capacity to assess risks and address citizen concerns pertaining to living near hazardous waste sites. EIET will continue to foster this relationship as a source of funds to identify risks, recommend actions to reduce those risks, and to educate the public with regard to those risks. EIET will complete a minimum of ten (10) assessments for communities near Superfund or other hazardous waste sites, each year. For sites where there is a completed exposure pathway and data gaps exist that affect the ability to interpret the risks to people, EIET may, as funds are available, initiate Exposure Investigations to provide the information necessary to assess the risks. Exposure investigations may consist of additional environmental sampling, biomarker testing, and/or physiologic testing. The following activities will be associated with this assessment process: 1) providing regulatory agencies with an evaluation of the public health implications of hazardous waste sites; 2) providing regulatory agencies with recommendations for actions to reduce or prevent exposures; 3) educating residents where exposures may have occurred; 4) providing physicians with site-specific contaminant health effects information; 5) involving community members, concerned parties, and health professionals in the health assessment process; and 6) working with TCEQ to ensure that, where appropriate, actions are taken to reduce risks and protect human health.

Improve Public Access to Information about Potential Environmental Health Risks: Encourage the development of an internet site where the public can have easy access to highly accurate and easily up-datable information on the location and inventory of potential hazards. This access will provide a portal for informing and educating citizens about potential health risks and provide information on specific ways to reduce exposure.

To Provide for Public Input We Plan to:

Utilize the Toxic Substances Coordinating Committee (TSCC) open meetings as a means of notifying other state agencies and the public of Institute functions: The EIET Branch also is responsible for administering the functions of the Toxic Substances Coordinating Committee (TSCC), a committee established by Texas Health and Safety Code Chapter 503 to coordinate communication among member agencies concerning each agency's efforts to regulate toxic substances and harmful physical agents. The EIET Branch Manager is the Chair of the TSCC and the meetings, which take place once per quarter, are subject to the open meetings act with meeting times and agenda posted in advance in the Texas Register. We plan to utilize the TSCC open meetings as means for notifying the public of Institute functions. Both DSHS and TCEQ are members of the TSCC and work closely with other member agencies to identify populations at risk and address citizens' concerns with respect to exposure to hazardous substances. Additional information of the TSCC can be found at: http://www.tscc.state.tx.us/.

Planned Projects:

The following two projects will begin October 2007:

TEHI will provide Texas State University with funds to add additional GIS functions to the GIS-EpiLink and link environmental and birth data in the Dallas area from 1996 through 2003. This linkage of both environmental and birth data in the Dallas area will then be used for future epidemiology projects.

TEHI will provide Texas A&M University Health Science Center with funds to conduct an epidemiological sub-analysis utilizing the Reported Air Emissions from the Toxic Release Inventory in Texas, 1996 through 2001 and the Texas State and Federal Superfund (Hazardous Waste Site) Database 2004 links to determine the relation between residential proximity to state and federal superfund sites and industries reporting air emissions of chemicals and selected birth defects, low birth weight, and preterm birth. In addition, they will explore whether race/ethnicity and other measures of socioeconomic status are associated with maternal residential proximity to waste sites and industrial facilities for Dallas, Denton, and Tarrant counties.

Appendices

Appendix A
Federal and State Superfund Sites

Federal Superfund Sites

The following sites were identified as of September 2007 either as listed or proposed for listing on the Federal National Priorities List (NPL) of Superfund sites in Texas:

Site Name	CERCLIS#	County	Listing	Listing
Rockwool Industries, Inc	TXD066379645	Bell	03/06/98	09/29/98
Bandera Road Groundwater Plume	TXN000606565	Bexar	09/27/06	03/07/07
R&H Oil/Tropicana	TXD057577579	Bexar	06/14/01	N/A
Koppers Co.	TXD980623904	Bowie	10/15/84	06/10/86
Lone Star Army Ammunition Plant	TX7213821831	Bowie	10/15/84	07/22/87
Texarkana Wood Preserving Co.	TXD008056152	Bowie	04/10/85	06/10/86
Gulfco Marine Maintenance	TXD055144539	Brazoria	09/05/02	04/30/03
ALCOA (Point Comfort)/Lavaca Bay	TXD008123168	Calhoun	06/23/93	02/23/94
Pantex Plant (USDOE)	TX4890110527	Carson	07/29/91	05/31/94
RSR Corp.	TXD079348397	Dallas	05/10/93	09/29/95
East 67th Street Groundwater Plume	TXN000606614	Ector	09/27/06	03/07/07
Odessa Chromium #1	TXD980867279	Ector	10/15/84	06/10/86
Sprague Road Ground Water Plume	TX0001407444	Ector	04/01/97	09/25/97
Malone Service Company, Inc.	TXD980864789	Galveston	08/24/00	06/14/01
Motco, Inc.	TXD980629851	Galveston	12/30/82	09/08/83
Tex-Tin Corp	TXD062113329	Galveston	06/17/96	09/18/98
Garland Creosoting Company	TXD007330053	Gregg	07/22/99	10/22/99
Crystal Chemical Co.	TXD990707010	Harris	12/30/82	09/08/83
French Ltd.	TXD980514814	Harris	12/30/82	09/08/83
Geneva Industries/Fuhrmann Energy	TXD980748453	Harris	09/08/83	09/21/84
Highlands Acid Pit	TXD980514996	Harris	12/30/82	09/08/83
Jones Road GW Plume	TXN000605460	Harris	04/30/03	09/29/03
Many Diversified Interests, Inc.	TXD008083404	Harris	09/29/98	01/19/99
North Cavalcade Street	TXD980873343	Harris	10/15/84	06/10/86
Patrick Bayou	TX0000605329	Harris	06/14/01	09/05/02
Sikes Disposal Pits	TXD980513956	Harris	12/30/82	09/08/83
Sol Lynn/Industrial Transformers	TXD980873327	Harris	10/15/84	03/31/89
South Cavalcade Street	TXD980810386	Harris	10/15/84	06/10/86
Longhorn Army Ammunition Plant	TX6213820529	Harrison	07/14/89	08/30/90
State Road 114 Ground Water Plume	TXSFN0605177	Hockley	07/22/99	10/22/99
Hart Creosoting Company	TXD050299577	Jasper	04/23/99	07/22/99
Jasper Creosoting Company, Inc.	TXD008096240	Jasper	03/06/98	07/28/98
Palmer Barge Line	TXD068104561	Jefferson	05/11/00	07/27/00
Star Lake Canal	TX0001414341	Jefferson	07/22/99	07/27/00
State Marine of Port Arthur	TXD099801102	Jefferson	03/06/98	07/28/98
Petro-Chemical Systems (Turtle Bayou)	TXD980873350	Liberty	10/15/84	06/10/86
Conroe Creosoting Company	TXD008091951	Montgomery	04/30/03	09/29/03
United Creosoting Co.	TXD980745574	Montgomery	09/08/83	09/21/84
Brine Service Company	TX0000605264	Nueces	09/13/01	09/05/02
City of Perryton Well #2	TX0001399435	Ochiltree	09/29/98	01/19/99
Bailey Waste Disposal	TXD980864649	Orange	10/15/84	06/10/86
Falcon Refinery	TXD086278058	San Patricio	09/05/02	N/A
Air Force Plant #4 General Dynamics	TX7572024605	Tarrant	07/22/87	08/30/90
Sandy Beach Road Ground Water Plume	TXN000605649	Tarrant	04/27/05	09/14/05
Sheridan Disposal Services	TXD062132147	Waller	06/10/86	03/31/89

State Superfund Sites

In accordance with the Act, §361.188, the state Superfund registry (published September 29, 2006) identifying those facilities that are listed and have been determined to pose an imminent and substantial endangerment in descending order of hazard ranking system (HRS) scores are as follows.

1. Col-Tex Refinery. Located on both sides of Business Interstate 20 (U.S. 80) in Colorado City, Mitchell County: tank farm and refinery.
2. J. C. Pennco Waste Oil Service. Located at 4927 Higdon Road, San Antonio, Bexar County: waste oil and used drum recycling.
3. Precision Machine and Supply. Located at 500 West Olive Street, Odessa, Ector County: chrome plating and machine shop.
4. Sonics International, Inc. Located north of Farm Road 101, approximately two miles west of Ranger, Eastland County: industrial waste injection wells.
5. Maintech International. Located at 8300 Old Ferry Road, Port Arthur, Jefferson County: chemical cleaning and equipment hydroblasting.
6. Federated Metals. Located at 9200 Market Street, Houston, Harris County: magnesium dross/sludge disposal, inactive landfill.
7. Niagara Chemical. Located west of the intersection of Commerce Street and Adams Avenue, Harlingen, Cameron County: pesticide formulation.
8. International Creosoting. Located at 1110 Pine Street, Beaumont, Jefferson County: wood treatment.
9. McBay Oil & Gas. Located approximately three miles northwest of Grapeland on Farm Road 1272, Houston County: oil refinery and oil reclamation plant.
10. Materials Recovery Enterprises. Located about four miles southwest of Ovalo, near U.S. 83 and Farm Road 604, Taylor County: Class I industrial waste management.
11. Toups. Located on the west side of Texas 326, 2.1 miles north of its intersection with Texas 105, in Sour Lake, Hardin County: fencepost treating facility and municipal waste.
12. Harris Sand Pits. Located at 23340 South Texas 16, approximately 10.5 miles south of San Antonio at Von Ormy, Bexar County: commercial sand and clay pit.
13. JCS Company. Located north of Phalba on County Road 2415, approximately 1.5 miles west of the intersection of County Road 2403 and Texas 198, Van Zandt County: lead-acid battery recycling.
14. Jerrell B. Thompson Battery. Located north of Phalba on County Road 2410, approximately one mile north of the intersection of County Road 2410 and Texas 198, Van Zandt County: lead-acid battery recycling.
15. Hayes-Sammons Warehouse. Located at Miller Avenue and East Eighth Street, Mission, Hidalgo County: commercial grade pesticide storage.
16. Jensen Drive Scrap. Located at 3603 Jensen Drive, Houston, Harris County: scrap salvage.
17. State Highway 123 PCE Plume. Located near the intersection of State Highway 123 and Interstate Highway 35 (IH-35) in San Marcos, Hays County: contaminated groundwater plume.
18. Baldwin Waste Oil Company. Located on County Road 44 approximately 0.1 mile west of its intersection with Farm Road 1889, Robstown, Nueces County: waste oil processing.

19. Hall Street. Located north of the intersection of 20th Street East and California Street, north of the Dickinson city limits, Galveston County: waste disposal and landfill/open field dumping.
20. Unnamed Plating. Located at 6816 - 6824 Industrial Avenue, El Paso, El Paso County: metals processing and recovery.
21. Tricon America, Inc. Located at 101 East Hampton Road, Crowley, Tarrant County: aluminum and zinc smelting and casting.

Pursuant to the Act, §361.181, those facilities that may pose an imminent and substantial endangerment, and which have been proposed to the state Superfund registry, are set out in descending order of hazard ranking system (HRS) scores as follows.

1. Kingsland. Located in the vicinity of the 2100 and 2400 blocks of Farm to Market Road 1431, in the community of Kingsland, Llano County: two groundwater plumes.
2. First Quality Cylinders. Located at 931 West Laurel Street, San Antonio, Bexar County: aircraft cylinder rebuilder.
3. Rogers Delinted Cottonseed - Colorado City. Located near the intersection of Interstate Highway 20 and State Highway 208 in Colorado City, Mitchell County: former cottonseed delinting, processing.
4. ArChem Thames/Chelsea. Located at 13013 Conklin Lane, Houston, Harris County: chemical manufacturing and recycling.
5. Hicks Field Sewer Corp. Located approximately 2.5 miles northwest of Saginaw, southwest of Big Fossil Creek and approximately 1.8 miles west of the intersection of U.S. Highway 81-287 and Farm to Market Road 156, Tarrant County: former sewage treatment facility.
6. Industrial Road/Industrial Metals. Located at 3000 Agnes Street, Corpus Christi, Nueces County: lead acid battery recycling and copper coil salvage.
7. Tenaha Wood Treating. Located at 275 County Road 4382, about a mile and a half south of the city limits and near the intersection of U.S. Highway 96 and County Road 4382, Tenaha, Shelby County: wood treatment.
8. Poly-Cycle Industries, Inc., Tecula. Located northeast of Tecula on the southeast corner of the intersection of Farm to Market Road 2064 and County Road 4216, Cherokee County: lead acid battery recycling.
9. Sherman Foundry. Located at 532 E. King Street in south central Sherman, Grayson County: cast iron foundry.
10. James Barr Facility. Located in the 3300 block of Industrial Road, Pearland, Brazoria County: vacuum truck waste storage facility.
11. Pioneer Oil and Refining Company. Located at 20280 South Payne Road, outside of Somerset, Bexar County: oil refinery.
12. Voda Petroleum Inc. Located at 211 Duncan Street, Clarksville City, Gregg County: waste oil recycling facility.
13. Force Road Oil and Vacuum Truck Company. Located at 1722 County Road 573 (Alloy Road), approximately 1,300 feet east of the Brazoria-Fort Bend County Line, Brazoria County: oily wastewater disposal and oil recovery facility.
14. Marshall Wood Preserving. Located at 2700 West Houston Street, Marshall, Harrison County: wood treatment.
15. Avinger Development Company (ADCO). Located on the south side of Texas 155, approximately one quarter mile east of the intersection with Texas 49, Avinger, Cass County: wood treatment.

16. Harvey Industries, Inc. Located at the southeast corner of Farm Road 2495 and Texas 31 (One Curtis Mathes Drive), Athens, Henderson County: television cabinets and circuit board manufacturing.
17. Hu-Mar Chemicals. Located north of McGothlin Road, between the old Southern Pacific Railroad tracks and 12th Street, Palacios, Matagorda County: pesticide and herbicide formulation.
18. American Zinc. Located approximately 3.5 miles north of Dumas on U.S. 287 and five miles east on Farm Road 119, Moore County: zinc smelter.
19. El Paso Plating Works. Located at 2422 Wyoming Avenue, El Paso, El Paso County: metal plating.
20. Ballard Pits. Located at the end of Ballard Lane, west of its intersection with County Road 73 approximately 5.8 miles north of Robstown, Nueces County: storage and disposal of hazardous substances.
21. Cass County Wood Treating. Located at 304 Hall Street within the southeastern city limits of Linden, Cass County: wood treatment.
22. Spector Salvage Yard. Located at Jackson Avenue and Tenth Street, Orange, Orange County: military surplus and chemical salvage yard.
23. San Angelo Electric Service Company (SESCO). Located at 926 Pulliam Street in a residential area of northeastern San Angelo, Tom Green County: electric transformer recycling.
24. Tucker Oil Refinery/Clinton Manges Oil & Refining Company. Located on the east side of U.S. Highway 79 in the rural community of Tucker, Anderson County: oil refinery.
25. Dorchester Refining Company. Located in the 1700 block of West First Street on the west border of the city of Mount Pleasant, Titus County: oil refinery.
26. Bailey Metal Processors, Inc.. Located one mile northwest of Brady on Highway 87, McCulloch County: scrap metal dealer, primarily conducting copper and lead reclamation.
27. City View Road Groundwater Plume. Located northwest of the intersection of Interstate Highway 20 and State Highway 158, Midland County: groundwater contamination plume.
28. Mineral Wool Insulation Mfg. Co..Located on Shaw Road at the northwest corner of the city limits of Rogers, Bell County: mineral wool manufacturing.
29. Aluminum Finishing Company. Located at 6006 Ardmore Street, Houston, Harris County: metal plating.
30. Poly-Cycle Industries, Jacksonville. Located at 2505 South Jackson Street, Jacksonville, Cherokee County: lead acid battery chips recycler and lead recovery.

Appendix B
Activities Completed by the EIET Branch

Public Health Assessments	
Site Name	**Completion Date**
Garland Creosoting	2/22/2001
Malone Service Co.	1/30/2002
Palmer Barge Line	5/6/2002
Patrick Bayou	3/20/2003
Brine Services Co.	3/26/2003
R&H Oil Company	12/16/2003
Falcon Refinery	4/8/2004
Gulfco Marine Maintenance	4/19/2004
Conroe Creosoting Co.	11/23/2004
Jones Road Groundwater Plume	5/13/2005
Sandy Beach Road Groundwater Plume	1/17/2007
East 67th Street Groundwater Plume	in progress
Bandera Road Groundwater Plume	in progress

Health Consultations	
Site Name	**Completion Date**
Galveston Bay East	1/12/2001
Galveston Bay Clear Lake	2/27/2001
Galveston Bay West	2/27/2001
Galveston Bay Upper	2/27/2001
Kingsbury Metal Finishing	4/25/2001
Arroyo Colorado Fish sampling	5/3/2001
El Paso County Metal Survey Historical Soil	7/20/2001
El Paso County Metal Survey Confirmation	8/17/2001
El Paso County Metal Survey UTEP	8/24/2001
El Paso County Metal Survey Arroyo Park	9/21/2001
Winters Seed Co.	10/4/2001
El Paso County Metal Survey El Paso Schools	10/12/2001
Arroyo Colorado sediment	10/19/2001
Rio Grande at Laredo	12/20/2001
Houston Ship Channel and Tabbs Bay	12/28/2001
State Marine of Port Arthur	1/23/2002
Clear Creek Fish	3/8/2002
Lake Raven	3/8/2002
Trichloroethylene Groundwater Plume	6/24/2002
El Paso County Metal Survey	7/11/2002
Greens Bayou	7/15/2002
El Paso County Metal Survey Tom Lea Park	9/6/2002
Former Laredo AFB Shotgun Range, Residential	9/6/2002
Former Laredo AFB Industrial WWTP	11/12/2002
Conroe Creosoting Co. Water Wells	2/19/2003
Barton Springs Pool	4/18/2003
El Paso County Metal Survey Arsenic Soil Bioavailability	7/10/2003
Conroe Creosoting Co. Sediments	8/25/2003
Ballard Sand Pits (Brine Services CalAllen Pits)	12/1/2003
Booker Landfill	2/23/2004
El Paso County Metal Survey Childhood Blood Lead	4/21/2004
Pelican Bay Groundwater Plume	6/28/2005

Palestine Foundry (Residential yards)	7/21/2005
Ridgeway Lagoon	10/2/2005
Georgetown Perchlorate	10/19/2005
Palestine Foundry (Daycare)	11/17/2005
Consumption of Deer Tissue Collected at Caddo Lake National Wildlife Refuge	1/24/2006
Helena Chemical Company	2/1/2006
Cox Road Dump Site	3/14/2006
Palestine Bioavailability Study, Arsenic and Vanadium Soil Action Levels	5/24/06
Cox Road Dump Site, Barium Health Concern	8/8/2006
First Quality Cylinders, Community Health Concern	9/26/2006
Tenaha Wood Treating	9/30/2006
Tronox LLC, Texarkana Facility	9/30/2006
Former Delroc Oil Refinery/Woodwind Lakes Sudivision	2/23/2007
Panola County Road 329	8/7/2007
Gulfco Marine Maintenance - Fish and Crab Sampling	in progress
Leander ISD - proposed elementary school #19	in progress

Petitioned Public Health Assessments/Consultations	
Site Name	**Completion Date**
Corpus Christi Landfills	1/25/2001
Hi-Yield Ridgeway Lagoon Site	10/2/2001
W.J. Smith Wood Preserving Co.	3/17/2005
El Paso – Juarez H2S	12/28/2005
Midlothian (TXI) Petition Air Data Evaluation of VOCs and Metals	in progress
Midlothian (TXI) Petition Air Data Evaluation NAAQS	in progress

Exposure Investigations	
Site Name	**Completion Date**
Hebbronville Exposure Investigation	11/6/2003
Caddo Lake	3/21/2005
Hebbronville Dietary Arsenic Exposure Investigation	9/7/2005

Technical Assists	
Site Name	**Completion Date**
Delroc Preliminary Data Analysis	11/22/2006
Palestine Foundry Thallium	12/4/2006
BigTex	12/12/2006
Reliable Machine and Supply Company	1/30/2007
East 67th Street Nitrates	3/6/2007
Panola County Road 329	5/4/2007
Helotes Debris Pile Fire	6/7/2007
Dioxins in San Jacinto River	6/14/2007
Mercury in Drinking Water	6/25/2007
Gulfco Marine Maintenance - Fish and Crab Sampling	6/26/2007
Leander ISD - proposed elementary school #19	7/13/2007
Broken Mercury Thermometer	9/10/2007
Sherwin Alumina	9/11/2007
Port Arthur	9/11/2007
Echo Lake Fish Risk Assessment Review	9/11/2007

Appendix C
Health Education Activities Completed by the EIET Branch

Health Education Activities

- ALCOA/Rockdale facility (2005) – Concerns about cancer and other illnesses were received from residents living near local industries. DSHS staff presented information on our role in environmental investigations, provided information about health effects and exposure, and answered questions from concerned citizens regarding health environmental impacts.

- Austin - Barton Springs Pool (2002-2003) – A series of articles in the local daily newspaper raised concerns regarding environmental contaminants in the Barton Springs pool located in downtown Austin. The Barton Springs pool is a popular swimming area that is used year round. In response to the concerns raised, DSHS staff reviewed surface water, sediment, and soil samples collected from the pool and surrounding areas; DSHS summarized their findings in a health consultation. DSHS staff participated in public meetings, city council meetings, and open forums to discuss findings and to address health concerns of the public and city officials.

- Austin Travis County (2003) – DSHS staff participated in the Austin Travis County Sheriff's Office Health Fair. Staff distributed exposure education materials to 300 people.

- Bandera Road Groundwater Plume National Priorities List site (2006-2007) – Tetrachloroethylene was found in groundwater wells by the Texas Commission on Environmental Quality (TCEQ). As an emergency response, the TCEQ installed filtration systems on affected water wells. The site was put on the National Priorities List. DSHS staff attended community meetings and educated residents about the Public Health Assessment process and exposure pathways and provided chemical-specific and site-specific fact sheets. Staff answered questions about health concerns.

- Caddo Lake Mercury in Fish (2003-2005) – DSHS issued a consumption advisory for largemouth bass and freshwater drum from Caddo Lake in 1995 due to elevated levels of mercury in the fish. In 2003, DSHS began receiving anecdotal reports from a community group that people, possibly including subsistence fishers, continued to eat these species of fish from Caddo Lake. In response to these concerns DSHS staff conducted an exposure investigation of subsistence fishers identified as consuming fish from Caddo Lake. The purpose of this investigation, which was conducted from May 11, 2004 through May 15, 2004, was to assess whether people who ate fish from Caddo Lake were potentially being exposed to harmful amounts of methylmercury (MeHg). Blood mercury levels were measured in 71 voluntary participants. At the time the blood was collected, each participant was asked about the types of fish they ate, how often they ate fish, and where the fish they ate were caught. The fish catch locations supplied by the participants were used to determine possible lake area sites for obtaining additional fish tissue samples. DSHS hosted a community meeting and an availability session in order to explain the findings of the investigation and address any community health concerns. DSHS staff prepared the "Public Health Statement for Mercury, Caddo Lake" fact sheet, which was distributed to citizens during the investigation and the community meetings. DSHS staff attended additional community meetings hosted by the Caddo Lake Institute and was available for answering community questions in regards to health impacts.

- Conroe Creosoting National Priorities List site (2003-2004) – DSHS reviewed environmental data to assess the potential public health impact of contamination

associated with the Conroe Creosoting Company site. DSHS prepared two health consultations and one public health assessment to address the community's concerns that area groundwater wells might be affected and that soil on or surrounding the site was contaminated and could pose a potential health risk. DSHS staff attended multiple public meetings and availability sessions, visited with area churches and community members, and explained DSHS and EPA (Environmental Protection Agency) activities associated with the site. DSHS staff accompanied EPA while collecting access agreements from citizens whose yards were sampled and collected and addressed health concerns during this process. DSHS staff prepared fact sheets for the chemicals present on site, which were distributed to citizens during the public meetings and while assisting EPA in gathering access agreements.

- East 67th Street Groundwater Plume National Priorities List site (2006) – Tetrachloroethylene was found in groundwater wells by the TCEQ. As an emergency response, the TCEQ installed filtration systems on affected water wells. The site was put on the National Priorities List. DSHS staff attended community meetings and educated residents about the Public Health Assessment process and exposure pathways and provided a chemical-specific fact sheet. Staff answered questions about health concerns.

- El Paso Metals Survey (2001-2006) – DSHS partnered with the EPA and the Agency for Toxic Substances and Disease Registry (ATSDR) to evaluate elevated metals in soil in residential yards of northern and central El Paso. DSHS education and community involvement staff prepared site-specific fact sheets in English and Spanish. Hands-on education regarding reducing exposure to metals also was conducted. Staff attended more than 20 meetings with city officials, local health officials, resident associations, and community members and educated attendees about the health risk associated with exposure to elevated arsenic and lead in this area. At the request of EPA, DSHS and ATSDR staff conducted an exposure investigation of children living in homes EPA had identified as having elevated levels of lead in the soil. The purpose of this investigation, which was conducted from November 11, 2004 through November 13, 2004, was to assess whether children living in these homes were ingesting potentially harmful amounts of lead. Blood lead levels were measured and each participant's parents were asked about their child's potential for exposure through behavior.

- El Paso/Juarez North Treatment Plant (2004-2005) – Residents of the El Paso Lower Valley Neighborhood have complained to various agencies and government officials about very strong odors of sewage and human waste that have occurred in their neighborhood since at least 2001. The El Paso Lower Valley Neighborhood (where most of the odor complaints have originated) is located within a few hundred yards of the United States - Mexico border. The neighborhood is less than one mile east of the Juárez North Wastewater Treatment Plant, located in Juárez, Mexico. In response to citizens' concerns DSHS conducted an investigation and prepared a health consultation. As a part of the investigation, DSHS staff and TCEQ staff visited the treatment plant in September 2004 and evaluated the effectiveness of the Mexico system. DSHS team members contacted some residents by phone in September 2004 for an initial survey of when (time of day) odors usually were noticed, where (locations in the neighborhood) odors usually were noticed, and descriptions of the odors. DSHS team members met with residents in November 2004 and March 2005 and requested that citizens gather information about the odors for a two-week period. Citizens were each given an "odor diary" to record this

information. DSHS staff used the odor diaries to compare reported bad odors with the TCEQ air monitoring data collected in that area.

- Hebbronville Arsenic in Drinking Water (2003-2005) – In January 2003, a resident of Hebbronville contacted the DSHS to report concerns of high arsenic in the drinking water being supplied to residents by the Jim Hogg Water Control and Improvement District (WCID) #2. Residents expressed concern over possible health effects from exposure to the arsenic in the water. In response to community concerns DSHS conducted an exposure investigation. The purpose of this investigation, which was conducted from August 4, 2003 through August 8, 2003, was to assess current individual exposure to arsenic of people living in Hebbronville that received utility bills from the WCID #2. Total urinary inorganic arsenic levels were measured in 140 individuals (14 children and 126 adults). As a result of the exposure investigation, DSHS found that two-thirds (⅔) of the people tested had urinary inorganic arsenic levels greater than the reference concentration for non-occupationally exposed individuals (10 µg/L). While the results could be attributable to individual variations in tap water consumption, DSHS conducted a follow-up investigation to explore other potential sources of exposure to inorganic arsenic. Since beans and rice are staples of the South Texas Hispanic diet and both absorb water during cooking, we undertook an investigation to assess whether beans and rice prepared with local tap water provided a significant additional source of arsenic exposure. DSHS staff hosted a public meeting to explain the findings of the investigation and provided letters to each participant to explain their test results and what type of follow-up, if any, should be taken.

- Jones Road National Priorities List site (2003-2005) – Tetrachloroethylene was found in groundwater wells by the TCEQ. As an emergency response, the TCEQ installed filtration systems on affected water wells. The site was put on the National Priorities List. DSHS staff attended community meetings and educated residents about the Public Health Assessment process and exposure pathways and provided a site-specific fact sheet. Staff answered questions about health concerns.

- Many Diversified Industries (MDI) National Priorities List site (2003) – Residential yards and part of an elementary school yard in the Fifth Ward Community of Houston, Harris County contained elevated levels of lead in soil. DSHS staff, the City of Houston Health and Human Services Department (HHSD), and the EPA identified boundaries for a specific childhood blood lead testing activity. DSHS staff assisted the HHSD in creating a presentation about child blood lead poisoning prevention. DSHS staff gave a presentation to 30 residents explaining the DSHS role in partnership with the HHSD and EPA and educated attendees about exposure using the "No Exposure = No Risk" message.

- Midlothian Petition site (2005-2006) – In partnership with the ATSDR, the DSHS is preparing a series of health consultations in response to a petition to evaluate the possible health implications of exposures to environmental contaminants in the air in Midlothian, Ellis County. DSHS staff met with the petitioner and selected community representatives, city representatives, and industry representatives and educated them about the health consultation process and clarified expectations from the health consultation. DSHS staff toured one of the cement plants to learn processes and the potential for emissions of environmental contaminants. During December 12, 2005 through December 14, 2005,

DSHS staff visited with neighbors living near the four industrial plants in the area to collect health concerns possibly related to contaminants from the plants.

- Palestine Arsenic concern (2005) – The DSHS was asked by the EPA to determine the public health significance of arsenic, lead, and vanadium found in soil samples collected from residential yards and playgrounds in Palestine; this led to an investigation and health consultation. Based on elevated sampling results, DSHS staff provided education to physicians and residents with elevated contaminants in soil. Educational material about taking an exposure history and chemical specific health was mailed to 50 area physicians. Community fact sheets ("Arsenic and Lead Prevention Fact Sheet" and "Eating Vegetables From Your Garden") were prepared in English and Spanish. DSHS staff accompanied the EPA when residents were given their individual soil sampling results and answered health questions and provided these educational fact sheets.

- Pelican Bay/Sandy Beach Road Groundwater Plume (2005-2006) – This site was placed on the National Priorities List due to contaminated public and private water supply wells. DSHS staff visited with residents to determine general knowledge of the groundwater plume and the scheduled public meeting. Residents were given a site-specific fact sheet that provided education that with properly installed, operated, and maintained filtration systems, there is no exposure to the contamination in the groundwater. DSHS staff partnered with EPA and ATSDR Region 6 staff to provide education about contamination in the area, the Superfund Process, the Public Health Assessment process, and fact sheets about site-specific information for residents to take home. Exposure to contaminated drinking water has been mitigated by providing filtration systems on private water wells, shutting down contaminated public water supply wells, and providing connections to uncontaminated public water supply systems.

- Perchlorate Fact Sheets (2002) – DSHS health educator and principal investigator prepared a "Perchlorate Fact Sheet" both for the lay person and for physicians. These fact sheets are posted on the DSHS web site. The fact sheets were distributed by TCEQ public drinking water staff in a series of meetings that they hosted to address concerns about perchlorate testing conducted on public drinking water supplies, primarily in west Texas.

- Port Lavaca (2007) – Fishing is banned in parts of Lavaca Bay near the Alcoa Plant. DSHS staff visited with local bait shops, RV parks, citizens, and visitor's center employees, from Port O'Connor up the coast to Port Lavaca, to distribute updated brochures about fishing in Lavaca Bay. The bait shops were especially receptive to the updated brochures and agreed to distribute them to customers.

- Tronox LLC, Texarkana Facility (2006) – Residents were concerned that area creeks were contaminated with creosoting products such as polycyclic aromatic hydrocarbons (PAHs) and that they were being exposed to harmful levels of these substances when using the creeks for recreational purposes. DSHS staff evaluated sediment data collected from the creeks in 2004 and 2005 and prepared a health consultation addressing the citizen's concerns. A fact sheet summarizing the health consultation and ways to reduce exposure was mailed to over 130 concerned residents in the area, as well as to the local library and public health department.