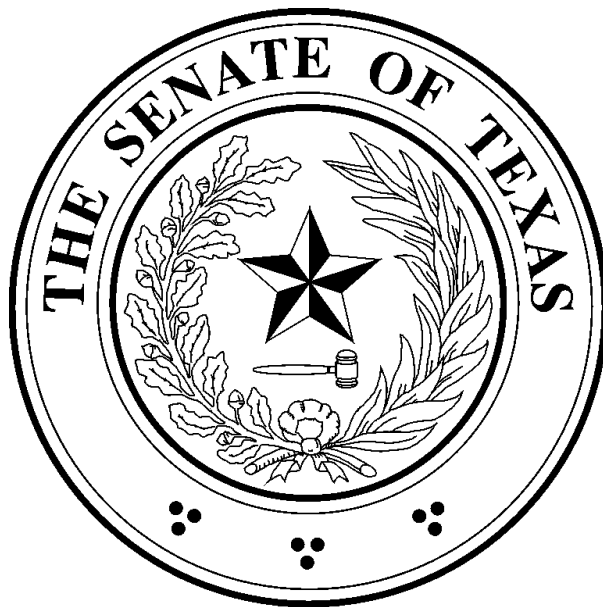


# **Texas Borderlands 2009**

## ***The Environmental and Economic Consequences of Border Industrialization***



**Texas Senator Eliot Shapleigh  
District 29  
El Paso, Texas  
May 2008**

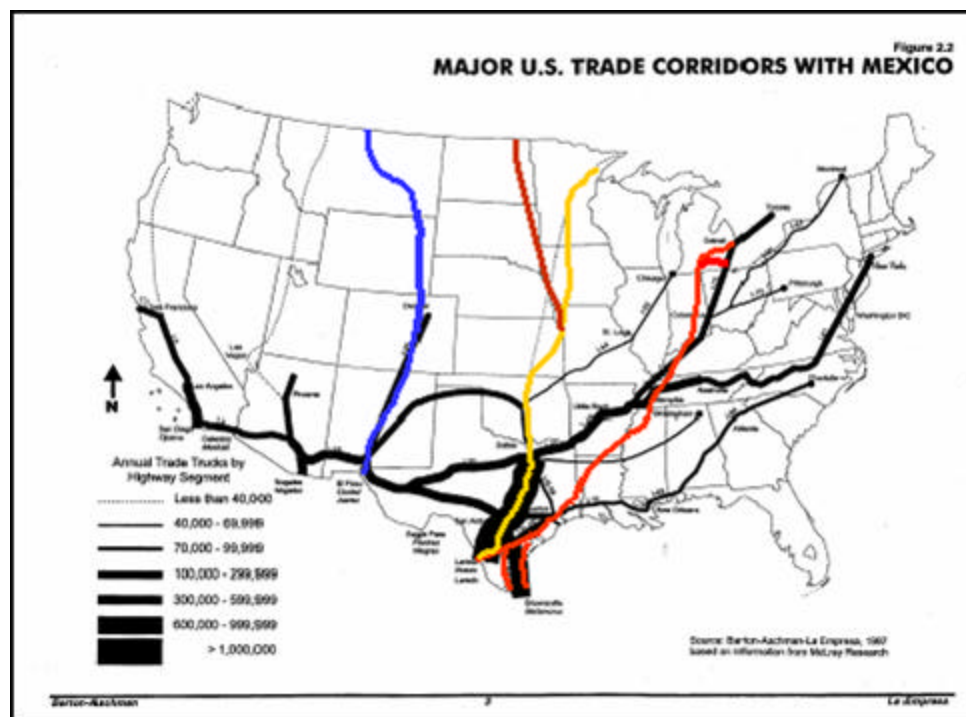
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## Introduction

The North American Free Trade Agreement (NAFTA) was implemented in January 1994, removing many barriers to trade between the U.S., Mexico, and Canada. As a result of NAFTA, trade and investment have increased dramatically in the Texas Borderlands. As a part of the NAFTA environmental agreements, institutions such as the Border Environment Cooperation Commission (BECC), and the North American Development Bank (NADB) were established, and Environmental Protection Agency (EPA) Border offices were put in place. In addition, the EPA and its Mexican counterpart have developed a series of plans designed to improve environmental conditions along the U.S.–Mexico Border.

The question remains, however, what strain on the Border's environmental infrastructure has been brought about by the industrialization of the region? While experts' answers differ, it is clear that the burden on environmental infrastructure and institutions has been enormous. Many critics argue that the mechanisms set up to deal with the consequences of industrial and population growth have proven to be woefully inadequate. And although the effects are felt most acutely on the Border, the chart *Major U.S. Trade Corridors with Mexico* shows that NAFTA has had an impact throughout the United States.



This chapter examines the history of trade liberalization in the Border region, binational institutions developed to address the resulting environmental stress, and finally, an overview of environmental and economic conditions along the Border in the post-NAFTA era.

## ***History of Border Industrialization***

In the early 1990s, some cities lacked wastewater treatment facilities, and millions of gallons of untreated sewage fouled waterways and beaches along the Border. In Ciudad Juarez, 55 million gallons of raw sewage per day were released into the Rio Grande. A sizeable population of Border residents suffered from health problems, such as asthma and high blood lead levels. Emissions from vehicles, industrial sources, burning trash, residential heating, and dust from unpaved roads contributed to poor air quality. The chart *The U.S.-Mexican Border Environment* provides a brief overview of programs and legislation designed to assist those living in the Border region.

### ***The U.S.-Mexico Border Environment***

<b>1889-1965</b>	
1889	International Boundary Commission (IBC) created
1944	International Boundary and Water Commission (IBWC) created
1964	Maquiladora program initiated in Mexico
<b>1965-1990</b>	
1982	SEDUE (Mexican environmental agency) established
1983	Agreement on Cooperation for the Protection and Improvement of the Environment in the Border Area (La Paz Agreement) signed
1986	Mexico joins the General Agreement on Tariffs and Trade (GATT)
1988	Mexico General Law for Ecological Equilibrium and Environmental Protection enacted
1990	U.S.-Mexican Border environmental working groups established
<b>1990-1992</b>	
1990	Presidents Bush and Salinas agree to pursue a North American Free Trade Agreement
1992	First U.S.-Mexico Border environmental plan (Integrated Border Environmental Plan for U.S.-Mexico Border Area) initiated Secreteria de Desarrollo Social (SEDESOL) created Good Neighbor Environmental Board created
1992-1993	Negotiations of NAFTA and environmental side agreements begin

<b>1992 Early NAFTA Era</b>	
1993	Negotiations of environment and labor side agreements begin The Commission on Environmental Cooperation (CEC), the Border Environment Cooperation Commission (BECC), and the North American Development Bank (NADB) established
1994	Mexico joins the Organization for Economic Cooperation and Development (OECD) President Zedillo administration begins, Secretaría de Medio Ambiente, Recursos Naturales y Pesca (SEMARNAT) created (Mexico's environmental agency)
1995	Staff and operating procedures established for CEC, BECC, and NADB
1996	Second Border environmental plan initiated: U.S.-Mexico Border XXI Program
1996	Mexico's General Ecology law revised
1998	<i>OCED Performance Review of Mexico</i> published
2000	<i>U.S.-Mexico Border XXI Progress Report</i> published U.S. Mexico Border Health Commission created
<b>Post-2000</b>	
2001	Third Border environmental plan, <i>Border 2012</i> , initiated
2004	President Bush signs H.R. 254, allowing for expansion of the NADB/BECC jurisdiction to include communities in Mexico up to 300 km from the Border.

Source: Southwest Center for Environmental Research and Policy

Against this backdrop, the United States, Mexico, and Canada negotiated a free trade agreement, which some advocates saw as an opportunity to enhance economic growth and generate new resources to address infrastructure and environmental problems on the Border. These problems, long recognized at the local level, gained national visibility as the trade debate intensified.

While certain mechanisms for improving Border environmental conditions have been put in place as a result of trade negotiations, the resources and scope of these mechanisms fall woefully short of what is needed. Expanded trade, population growth, and increased industrialization continue to tax the already stressed Border environment, and efforts, leadership, and resources to address these consequences are inadequate.

### ***The Maquiladora Program—A Precursor for Border Industrial Growth***

Increased stress on the Border environment began soon after the Mexican maquiladora program began in 1964. Maquiladoras are product assembly factories, the majority of which are located in the Mexican Border region. The program has grown dramatically since its inception.

The expansion of the maquiladora sector, however, occurred without corresponding development of basic infrastructure, such as water and wastewater treatment plants, municipal and hazardous waste management facilities, or roads. The maquiladoras are also a magnet for domestic migration. The population growth resulting from industrialization with its associated urban sprawl, congestion, waste, air pollution, and increased depletion of natural resources was a major source of environmental stress.<sup>1</sup>

The overall result of Border industrial expansion was serious pollution, as well as increased demand for land, energy, water and environmental services. These environmental consequences, however, were slow to draw the attention of the U.S. and Mexican governments. Within Mexico, there was a perception that its northern Border, with its low unemployment and relatively high wages, did not merit particular attention. Moreover, since virtually all tax revenue from the maquiladora sector is federal, the decisions on how to use the resources are not made in the Border region. Compounding the problem is the fact that, since materials are imported to the maquiladoras, the factories do not have local suppliers. There are comparatively few entrepreneurial opportunities to create locally generated profits that could be cycled back into these communities.

### ***The 1983 La Paz Agreement***

The 1983 agreement between the United States and Mexico for the protection and improvement of the environment in the Border area (known as the La Paz Agreement) established the first binational framework for cooperation on environmental issues. The U.S. EPA and Mexico's environmental counterpart, SEMARNAT, acted as the national coordinators of efforts to address Border environmental problems. Under the La Paz Agreement, a Joint Advisory Committee (JAC) made up of 20 members, 10 from each country, was created to make recommendations on improving air quality in the Paso del Norte air shed. Other formal workgroups comprised of federally appointed governmental and academic experts make additional policy recommendations concerning water, air, contingency planning, emergency response, hazardous waste, enforcement cooperation, and pollution prevention. However, because the La Paz Agreement lacks any formal venue into national policies, some critics continue to see it as more symbolic than practical.

### ***Programs Negotiated with NAFTA***

#### ***Integrated Border Environment Plan (IBEP) 1992-1994***

The IBEP was the first binational federal initiative created under the assumption that increased trade liberalization would create additional stress for the Border environment. The plan was initiated in 1992 amid NAFTA negotiations. It proposed strengthening enforcement of environmental laws, increasing cooperative planning, expanding wastewater treatment facilities, and developing a computer tracking system on transboundary movement of hazardous wastes. Because the IBEP lacked an implementation plan, it was widely criticized as nothing more than a

plan to plan. There was also concern that the plan's policies were dictated by the federal capitals, rather than by residents of the Border region.

### *Good Neighbor Environment Board (GNEB)*

The Good Neighbor Environmental Board was created in 1992 to advise the President and Congress on environmental issues and infrastructure needs in the U.S. Border states. Board membership includes representatives from certain U.S. government agencies; Arizona, California, New Mexico, and Texas' state governments; and private organizations, including community development, academic, health, environmental, and other non-governmental entities. The board has made numerous recommendations, and while EPA workgroups and other Border institutions have implemented some of these recommendations, it does not have high visibility among federal officials.

### *The North American Free Trade Agreement (NAFTA)*

NAFTA negotiators reached an initial agreement in August 1992. The task of selling NAFTA to the U.S. Congress fell to then President-elect Bill Clinton, who would take office in January 1993. As a candidate, Clinton had announced conditional support for NAFTA, dependent on the establishment of satisfactory side agreements on environment and labor. A statement that Clinton made in October 1992 at North Carolina State University became the basis of the U.S.' negotiating position for the environmental side agreements:

*Before we implement the agreement, we must establish an environmental protection commission with substantial powers and resources to prevent and clean up water pollution. The commission should also encourage the enforcement of the country's own environmental laws through education, training and commitment of resources and provide a forum to hear complaints. Such a commission would have the power to provide remedies, including money damages and the legal power to stop pollution.<sup>2</sup>*

NAFTA was the first major trade agreement between developed and developing countries and between partners with significant economic inequalities. NAFTA's primary goal was to promote trade and cross-Border investment by reducing tariffs and other barriers. The NAFTA Agreement included provisions concerning:

- tariff liberalization;
- rules of origin for content in manufactured goods;
- foreign investment;
- financial services;
- intellectual property;
- government procurement;
- trilateral side agreements on labor and the environment; and
- bilateral agreements on the Border environment.

However, NAFTA did *not* include:

- A labor agreement. Although some 63 professional occupations were able to move freely within the NAFTA region, there were no provisions for unskilled labor.
- An agreement to develop the human and physical capital of the poorer regions of the NAFTA areas to achieve convergence and full integration.
- A program for Border regional development to directly benefit Border residents.<sup>3</sup>

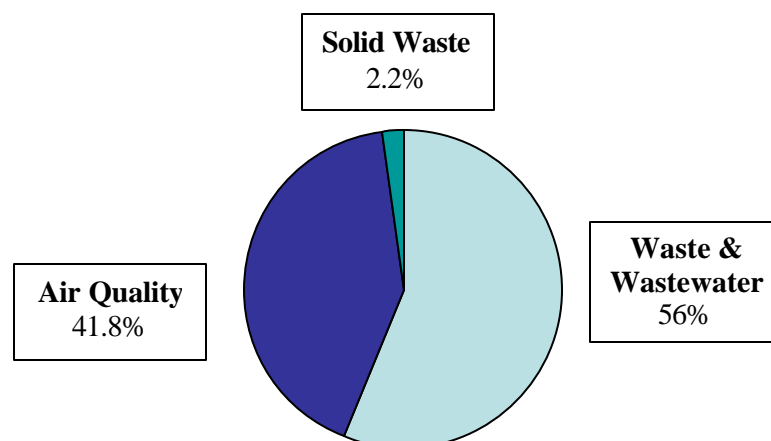
Many environmental and consumer groups feared that NAFTA would result in a reduction of U.S. environmental standards, or that companies would relocate to Mexico to reduce labor costs and avoid U.S. environmental regulations. Critics viewed Mexico as a pollution haven and argued that by promoting investments in Mexico with its limited enforcement of environmental and labor standards, NAFTA would exert a downward pull on environmental, labor and health standards throughout the region.

### *The Environmental Side Agreements*

The Commission on Environmental Cooperation (CEC), which was created under the NAFTA side agreements, obligates countries to enforce their laws and regulations. Provisions of this agreement allow for citizen complaints when this obligation is not met. This side agreement also establishes a council of environmental ministers and an independent secretariat to assist in implementing the overall agreement, to manage dispute settlements, and to assess the environmental effects of NAFTA.

The Border Environment Cooperation Commission (BECC) was established to prepare and certify environmental infrastructure projects, and the North American Development Bank (NADB) was established to leverage private-sector capital for financing construction of BECC-certified projects. The institutional design of the BECC and the NADB was a departure from earlier approaches to binational infrastructure development, which previously had been largely administered through the International Boundary Water Commission (IBWC). Since NADB has not had the full faith and credit of United States-backed loans, a common criticism is that the cost of money from that bank is higher than the market. This has severely restricted the flow of infrastructure money to Border communities with great need. The NADB was capitalized with \$225 million from each country and given the ability to draw on additional callable capital.<sup>4</sup> The chart *NADB Loans by Sector* shows where the greatest environmental resources are invested as of December 2006.

***NADB Loans by Sector***





The NADB was augmented in 1997 by the creation of the Border Environmental Infrastructure Fund (BEIF), which provides grants for water and wastewater projects. The NADB has also established an Institutional Development Program (IDP), which is primarily for utility capacity building.

The BECC, with headquarters in Ciudad Juarez, Chihuahua, was designated to assist local communities and other sponsors in developing and implementing environmental infrastructure projects and to certify projects for NADB financing. The BECC was augmented by grant funds from EPA for its Project Development Assistance Program (PDAP). To be certified by the board of directors, project sponsors must comply with general standards in several areas, including: (1) the environment and human health, (2) technical feasibility, (3) financial feasibility, (4) community participation, and (5) sustainable development. The chart *BECC Certification Criteria* further describes the criteria and requirements for BECC certification.

### ***BECC Certification Criteria***

<b>Criteria</b>	<b>Brief Description of Requirements</b>
Human Health & Environment	<ul style="list-style-type: none"> <li>• human health and environmental need</li> <li>• environmental assessment</li> <li>• compliance with applicable environmental and cultural resource laws</li> </ul>
Technical	<ul style="list-style-type: none"> <li>• appropriate technology</li> <li>• operation and maintenance</li> <li>• compliance with applicable design regulations and standards</li> </ul>
Financial & Project Management	<ul style="list-style-type: none"> <li>• financial feasibility</li> <li>• fee/rate models</li> <li>• sound project management</li> </ul>
Community Participation	<ul style="list-style-type: none"> <li>• comprehensive community participation plan, including steering committee and public meetings to guarantee local community support</li> </ul>
Sustainable Development	<ul style="list-style-type: none"> <li>• compliance with principles of sustainable development</li> <li>• institutional and human capacity building</li> <li>• natural resource conservation</li> <li>• community development</li> </ul>

*Source: Southwest Center for Environmental Research and Policy*

The federal governments of the U.S. and Mexico, recognizing that most communities in the Border area were not able to finance projects on their own, also committed to providing assistance for construction. As the BECC and NADB evolved, the U.S. government, through the EPA, made the decision to administer much of the U.S. portion of these appropriations through the BECC via its Project Development Assistance Program and the NADB.

Working alongside the BECC and NADB to ensure coordination is the Texas Commission on Environmental Quality (TCEQ). The TCEQ has a Division of Border Affairs to

ensure that the BECC's certification process of Texas Border environmental infrastructure projects and the TCEQ's regulatory review of the projects are compatible.

### ***Post-NAFTA Environmental Programs***

#### ***Border XXI***

The Border XXI Program was an effort to get the U.S. and Mexico to work cooperatively toward sustainable development through protection of human health and the environment as well as the proper management of natural resources in both countries. It is the follow-up program to the IBEP.

The principal goal of Border XXI was to promote sustainable development in the Border region by seeking a balance among social and economic factors, and environmental protection in Border communities and natural areas. The central strategy of Border XXI consisted of three components: public involvement; decentralization of environmental management through state and local capacity building; and improved communication and cooperation among federal, state, tribal, and local government agencies. Border XXI defined five-year objectives for the Border environment, as well as mechanisms for fulfilling those objectives.

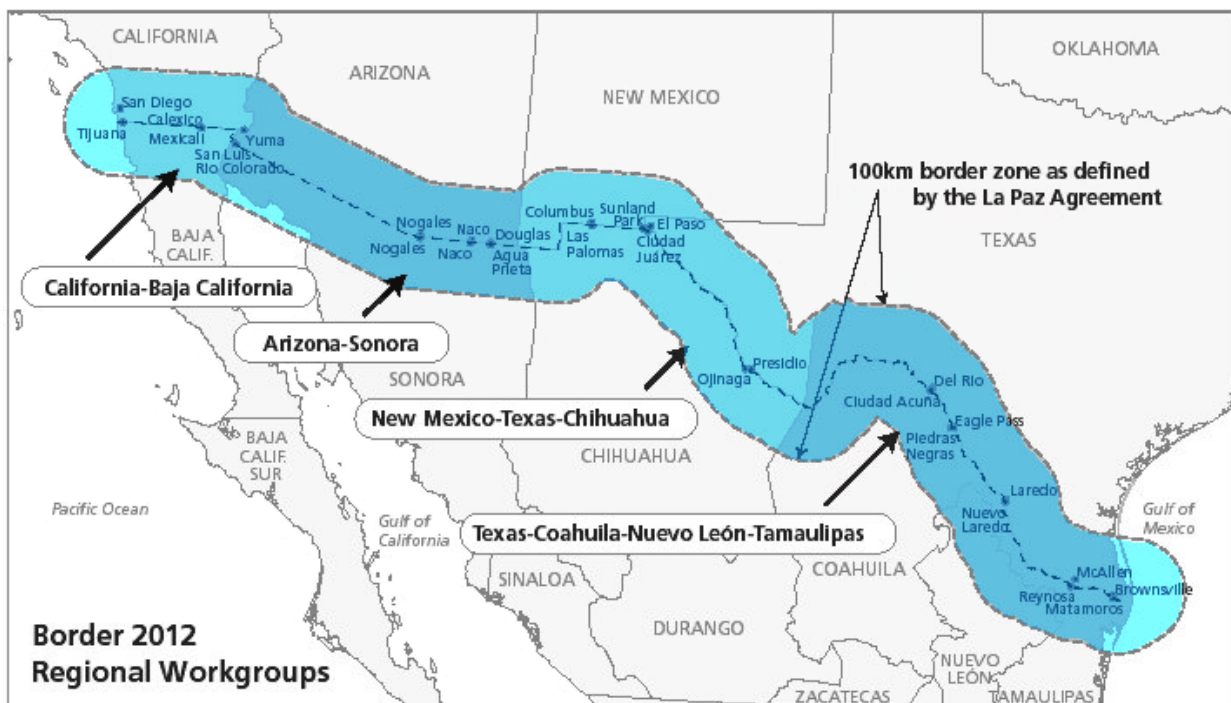
Nine binational Border XXI workgroups implemented the program by integrating the efforts of participating entities and defining specific projects to meet Border XXI objectives. Each workgroup operated under the guidance of a U.S. and Mexican co-chairperson. The workgroups ensured effective coordination of bilateral efforts by bringing together federal agencies from both countries with interests in a given issue.

#### ***Border 2012***

Border 2012, the next iteration of the Border XXI program, was initiated in 2002. As a U.S.-Mexico binational partnership involving federal, state, local and U.S. tribal governments, the program's mission is to protect public health and the environment in the U.S.-Mexico Border region. The guiding principles behind Border 2012 are to:

- achieve concrete, measurable results;
- foster transparency and public participation;
- adopt a bottom-up approach for setting priorities and in decision-making;
- measure program progress;
- reduce the highest public health risks;
- recognize the sovereignty of U.S. tribes;
- recognize historical debt of indigenous peoples in Mexico;
- address disproportionate environmental impacts;
- improve stakeholder participation; and
- strengthen capacity.<sup>5</sup>

The program's specific goals are to reduce water contamination, air pollution, and land contamination; improve environmental health; reduce exposure to chemicals as a result of accidental chemical releases and/or acts of terrorism; and improve environmental performance through compliance, enforcement, pollution prevention, and promotion of environmental stewardship. As shown in the picture below, Border 2012 operates as a regionally-based program working to achieve a specific set of environmental and human health objectives. A three-tiered level of organization consisting of regional workgroups, local task forces and Border-wide policy forums carries out the programmatic work.



Stakeholders bring their perspectives to bear in the evaluation of projects proposed to address the environmental priorities within each region. The stakeholders represent local, state, tribal and federal governments, as well as communities, businesses, environmental organizations, academia and other interested entities. U.S. and Mexican federal agencies participate in regional workgroups. The regional workgroups are supported by local task forces.

Under the program, U.S. and Mexican federal agencies address issues that may be more effectively approached from a Border-wide perspective in a series of policy forums. This effort is led by the EPA, SEMARNAT (Mexico's version of the EPA), the 10 Border states, 26 U.S. Border tribes, and other federal and state agencies. The Border 2012 program funds task forces, workgroups and policy forums on such topics as the integration of sustainable development principles into Border programs.

On the U.S. side, at the policy forums, citizens expressed a range of concerns including water quality and quantity, wastewater, power plants, unpaved roads, wood burning, exposure to pesticides and toxic metals, used-tire piles, and hazardous-materials transportation through populated areas. They called for solutions to air basin and watershed problems. Citizens

generally supported the proposal for regional task forces but expressed concern about sufficient funding. Tribal participation, industry involvement, participation of natural resource agencies, and environmental education were also named as priorities. After revising the Border plan to reflect stakeholder input, the draft plan was finalized in 2003, and has been partially implemented.

In addition to the Border XXI and Border 2012 Programs, there is the Southwest Center for Environmental Research and Policy (SCERP). With the assistance of an advisory council composed of experts from multiple disciplines, SCERP conducts research on the environment and develops Border policies to promote a higher quality of life for Border residents. In order to improve the environment and keep ecological systems intact, SCERP uses input from binational, state, tribal, and local policy-makers. SCERP is currently conducting numerous environmental studies dealing with such Border issues as agricultural burning, sewage treatment and levels of enteric disease, and thermoplastic waste in manufacturing in the El Paso-Ciudad Juárez Area.

## ***Climate Change***

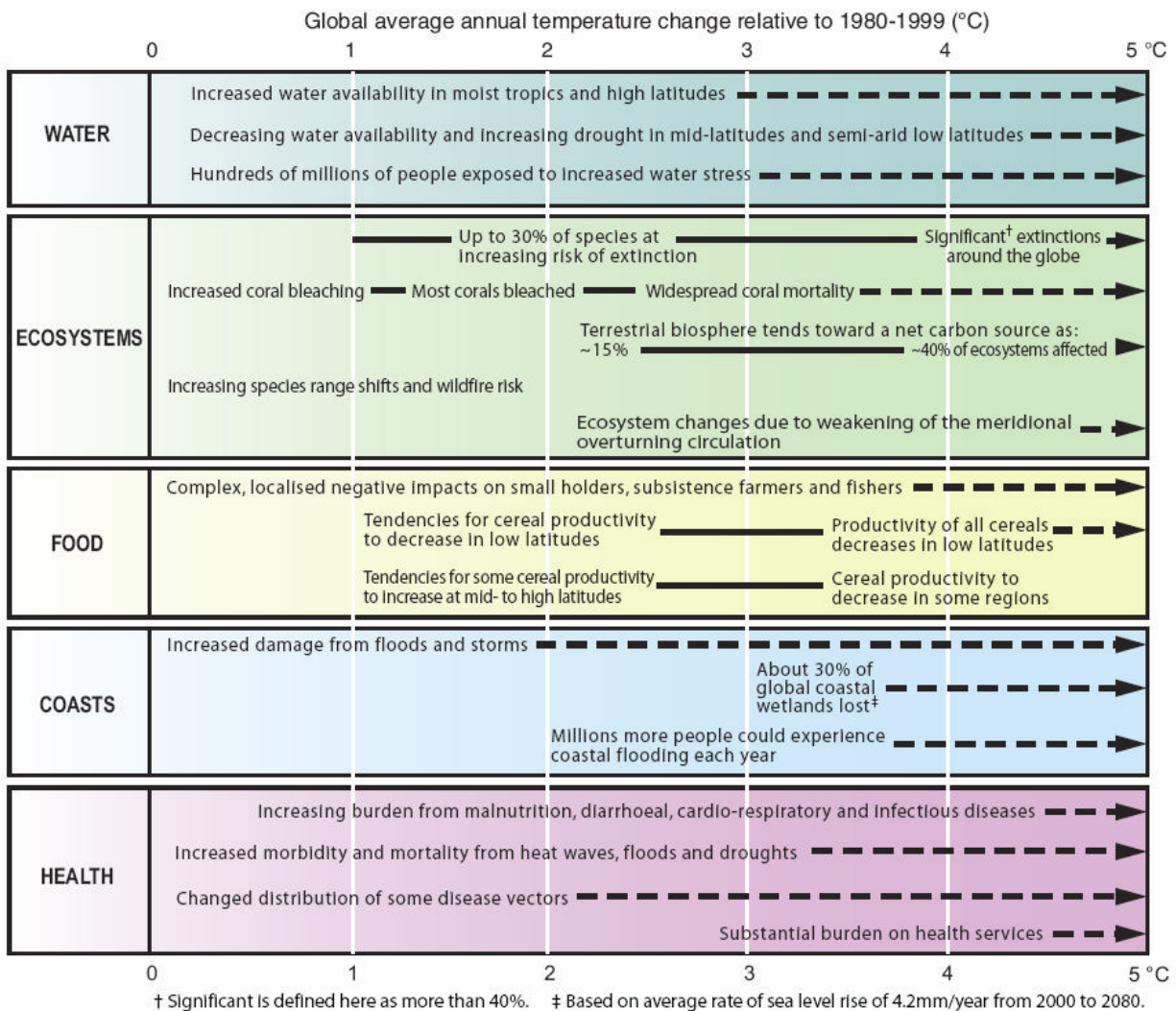
Regardless of whether the scope of the discussion is global, national or regional, climate change is an integral component of any assessment of the environment. Global warming refers to the overall increase in the temperature of the Earth's atmosphere related to additional heat being trapped by greenhouse gases, much of which is tied to human activities (*e.g.*, fossil fuel combustion and deforestation). "Climate change" can be used interchangeably with "global warming" because the changes in temperature affect the weather patterns that people and ecosystems have become accustomed to over time.

The United Nations' Intergovernmental Panel on Climate Change (IPCC) recently released an assessment of climate change. The February 2007 report—the fourth report published by the IPCC—indicates that global warming is occurring at a rate quicker than previously anticipated, and we may pass the threshold for devastating climate change as soon as a decade from now. This threshold is commonly defined as an increase of two degrees centigrade above pre-industrial temperatures. Beyond this two-degree increase, scientists predict that millions, especially the poor, will be negatively affected by increases in temperature and sea level, water shortages from changes in rainfall, and subsequent changes in agricultural viability. Other related effects include increased incidence of various diseases and species extinction. The IPCC's report states:

*If warming is not kept below two degrees centigrade, which will require the strongest mitigation efforts, and currently looks very unlikely to be achieved, the substantial global impacts will occur, such as species extinctions, and millions of people at risk from drought, hunger, flooding.*

The IPCC report predicts water shortages will affect nearly two billion people and place almost one-third of animal and plant species at risk. The first chart below highlights these and various other effects resulting from climate change. The second chart summarizes regional impacts of climate change in North America.

***Examples of impacts associated with global average temperature change***  
*(Impacts will vary by extent of adaptation, rate of temperature change and socio-economic pathway)<sup>6</sup>*



***Projected Regional Impacts for North America<sup>7</sup>***

Warming in western mountains is projected to cause decreased snowpack, more winter flooding and reduced summer flows, exacerbating competition for over-allocated water resources.
In the early decades of the century, moderate climate change is projected to increase aggregate yields of rain-fed agriculture by 5 to 20%, but with important variability among regions. Major challenges are projected for crops that are near the warm end of their suitable range or which depend on highly utilised water resources.
Cities that currently experience heat waves are expected to be further challenged by an increased number, intensity and duration of heat waves during the course of the century, with potential for adverse health impacts.
Coastal communities and habitats will be increasingly stressed by climate change impacts interacting with development and pollution.

In sum, for North America, scientists predict the temperature rise will increase crop yields, but increase economic damage from extreme weather events (*e.g.*, flash floods, hurricanes) and increase competitiveness for water resources in areas already experiencing water shortages. In addition, U.S. Centers for Disease Control and Prevention (CDC) officials have testified to Congress that we can expect a broad range of health-related issues resulting from increased temperature and sea level, including: increases in water-borne and vector-borne diseases (*e.g.*, cholera and malaria) as well as the emergence of new diseases; increases in air pollution related to drought conditions; and increases in mortality rates from heat stress, heart failure, and injuries related to extreme weather events.<sup>8</sup>

Over the last 100 years, average global temperatures have risen by one degree Celsius as a result of human activities. Remarkably, scientists expect an additional half-degree rise in temperature by the end of the next decade.<sup>9</sup> According to the IPCC report, 1996 to 2006 were the warmest years in recorded history. In fact, the first six months of 2006 were the warmest period on record for the United States, and five states, including Texas, experienced record warmth. Many of our cities are already facing potential water shortages in meeting the needs of our growing cities, as well as meeting the needs of the agriculture and manufacturing sectors. Texas can expect the state's winters, on average, to warm between two and five degrees Fahrenheit, and summers between four and 11 degrees Fahrenheit by mid-century. As the temperature rises, the evaporation of water increases, including key water sources such as aquifers, reservoirs and rivers.

### *Colorado River*

In addition to rises in sea level and the rate of water evaporation, global warming will also negatively affect mountain snowpack. The snowmelt from the Rocky Mountains—the major source for the 1,450 mile-long Colorado River—provides the water supply for Colorado, Utah, Wyoming, New Mexico, Arizona, Nevada and California.<sup>10</sup> The Colorado River serves 30 million people as well as the agricultural, industrial and municipal needs of this region. Many experts are concerned that the future of the Western and Southwestern regions of the country will be in jeopardy as population growth continues at a rapid pace and lengthy droughts deplete existing water resources.<sup>11</sup>

According to a recent study published by U.S. Geological Survey scientists Gregory J. McCabe and David M. Wolock,<sup>12</sup> “[t]he Colorado River may shrink in this century to its lowest level in at least 500 years because of global warming, threatening water supplies to California and six other states.”<sup>13</sup> Using a water-balance model and multi-century tree-ring reconstruction of stream flow for the basin, the scientists examined the potential effects of global warming on water-year stream flow in the Colorado River basin. They found that if the atmospheric temperature increases by 0.86 degree Celsius and precipitation rates do not increase accordingly, then the water levels of the Colorado River basin will be lower than at any time from 1490 to 1998. However, as mentioned earlier, the IPCC report predicts that temperatures will rise by two degrees Celsius during this century.

## *Sierra Mountains*

The Sierra Mountains constitute another snowpack that will be greatly affected by global warming. In 2006, using the emission scenarios established by the IPCC, the Union of Concerned Scientists carried out a climate modeling project examining the effects of global warming on the Sierra Mountains snowpack. The scientists found that California would lose 30% of the snowpack under the low emission scenario and 90% under the high emission scenario. These results were quite shocking, and given that the Sierras are the primary water source for much of California, the study ultimately resulted in statewide caps on emissions.<sup>14</sup>

## *Further Implications for the Texas Border Region*

Despite these international and national reports, Texas' 2007 State Water Plan did not address the potential effects of climate change because "the effect on the state's water resources over the next 50 years is probably small enough that it is unnecessary to plan for it specifically." In direct contrast to the state agency's position, recent studies focused on Texas indicate climate change will have significant impact on Texas' water supply. For example, a 2001 study by Bruce McCarl, a Texas A&M agricultural economist, found that a temperature rise of 3.2 degrees Fahrenheit and a decrease in rainfall of 4.10 inches a year (also known as "HAD 2030," a widely used Hadley Centre climate change model) would reduce recharge of the Edwards Aquifer by 20% to 24% per year.<sup>15</sup> Given that the IPCC report predicted a potential increase of three degrees in Texas by 2020, this reduction in the capacity of the Edwards Aquifer is likely to occur within a few decades.

The Hueco Bolson (aquifer) is a primary water source for the Border region encompassing El Paso and Ciudad Juarez. In April 2008, Ruben Chavez Guillen, the Groundwater Director for Mexico's National Water Commission, reported that the Hueco Bolson is being used at a rate significantly greater than the aquifer is being recharged.<sup>16</sup> Approximately 254 million cubic meters are taken out while only 170 million cubic meters are added per year. This historical, excessive pumping has caused a reduction in the aquifer of approximately 15 to 105 feet over the last decade and a half. Moreover, surface run-off pollutants have diminished the quality of the water available from the aquifer. The governments of El Paso and Ciudad Juarez have implemented very different strategies to address the reduction of available fresh water from the Hueco Bolson.

In addition to the Hueco Bolson, El Paso is dependent on surface water from the Rio Grande. However, the water supply from the Rio Grande is limited to certain parts of the year and by drought. Recognizing the need for additional fresh water sources and because of the large amount of brackish water available in the Hueco Bolson, El Paso Water Utilities began studying the possibility of desalinating the brackish water in the bolsons in the early 1990s. Brackish water contains more salt than is allowed in drinking water, but significantly less than ocean water.

In 2007, to ensure sufficient water supply for at least the next half-century, El Paso Water Utilities and Fort Bliss (U.S. Army) opened the world's largest inland desalination plant. This desalination plant produces 27.5 million gallons of potable water from brackish water on a daily

basis—a 25% increase of El Paso Water Utilities’ fresh water production.<sup>17</sup> Because the desalination process incorporates the most comprehensive water treatment technology currently available, other potential pollutants are also removed. The facilities augment existing supplies to make sure El Paso and Ft. Bliss have sufficient water for growth and development for 50 years and beyond.

In contrast, the government of the Mexican state of Chihuahua has decided to address future water shortages in the Ciudad Juarez area in a different manner. The Chihuahua government awarded a contract to Carso Infrastructure and Construction Company (CISCA), which is part of Mexico billionaire Carlos Slim’s Grupo Carso, to supply residents of Ciudad Juarez with potable water.<sup>18</sup> CISCA will invest \$100 million dollars to construct the Conejos-Medanos Aqueduct, which will transport water from the Conejos-Medanos Aquifer (also known as the Mesilla Aquifer in the U.S.) to the Ciudad Juarez area. In return for the investment, the Chihuahuan government gave CISCA a 10-year concession to sell water to Ciudad Juarez’s municipal government. Many groups and individuals have expressed concerns that privatization of the water supply will result in poor service and high rates as seen in other Mexican cities that have pursued this strategy. Furthermore, because the Conejos-Medanos Aqueduct involves the drilling of 23 new deep wells on the Mexican side of the Border, the project will have significant consequences for nearby Las Cruces, New Mexico and other U.S. Border communities that depend on the aquifer.

### ***Impacts of Industrialization on the Texas Border Environment***

About 13 million residents live in the Border region. With a population growth rate twice that of either nation alone, the population is expected to increase to 19.5 million by 2030. The U.S. General Accounting Office reported in 1999 that \$3.3 billion would be needed to meet existing infrastructure requirements on both sides of the Border for potable water, wastewater treatment, and solid waste disposal. About 77 percent of this amount would be needed for wastewater treatment.<sup>19</sup>

#### ***Water***

Population and industrial growth along the Border stimulated by NAFTA has created large demands for clean and safe drinking water. In the United States, the lack of access to safe drinking water is associated primarily with colonias—small, peri-urban communities that are located mainly along the Border. A 1998 Texas A&M University document reported that 50 percent of the estimated 350,000 colonias residents lacked access to safe drinking water. In addition, due to population growth, major Border sister cities such as El Paso/Ciudad Juarez may face serious drinking water shortages unless additional water sources of potable water are found.<sup>20</sup>

One of the greatest threats to water quality in the Rio Grande also stems from the increase in Border population, which is straining community water and wastewater treatment plants. Without adequate service, raw or poorly treated wastewater is more likely to enter the river, increasing bacteria levels and contributing to an increase in levels of waterborne diseases such as



hepatitis A and shigellosis. For example, the rate of incidence statewide in Texas was less than half of that in the 14 counties directly on the U.S.-Mexico Border.<sup>21</sup>

On the U.S. side, the majority of municipalities have EPA approved, publicly-owned wastewater treatment plants. U.S. colonias, which are usually outside of established water districts, generally do not have access to sewer and wastewater disposal systems. On the Mexican side of the Border, Mexico's National Water Commission estimated that in 1997, while 69 percent of the population lived in residences connected to sewage collection systems, only 34 percent of the collected wastewater was treated. In a few communities, raw or insufficiently treated wastewater eventually flowed into surface and drinking water sources shared by both countries.<sup>22</sup>

The International Boundary and Water Commission released in 2004 the final report in a series of studies of pollutants in the Rio Grande. The report on the *Rio Grande Toxic Substances Study* can be accessed on the IBWC's web page.<sup>23</sup>

### *Local Initiatives*

Another issue of import in the Border region is flooding resulting from increased extreme weather events. In 2006, El Paso and Ciudad Juarez experienced torrential rainstorms and subsequent flooding, which resulted in significant hardships, costs and damage to many areas on both sides of the Border. The flooding, which was caused by runoff overwhelming existing storm water drains, created numerous health and safety issues for the residents of El Paso. In response, legislation was passed to assist the city with creating storm water districts, which will manage and control storm water drainage.

After experiencing two years worth of rain in a matter of days, the resulting damage to homes, businesses, infrastructure and other property in the El Paso area was estimated in the tens of millions of dollars, and the region was declared a Federal Disaster Area. Unfortunately, homes, businesses and other property were located in arroyos or floodplains fed by arroyos. Those that were allowed to build in arroyos saw the most devastation during the rainfall as rushing water destroyed property and created significant health hazards. In response, legislation was passed during the 80th Legislative Session to ensure that counties adopt regulations for flood plain management that are not less stringent than those set forth by the National Flood Insurance Program. Counties must also provide for the imposition of penalties on landowners that violate such measures.

### *Air Pollution*

Air quality also continues to be a major problem, as many residents in Border cities are exposed to health-threatening levels of air pollution from a variety of sources. According to the EPA, 14 Border cities in 1999 exceeded or were expected to exceed at least one of the ambient air quality standards set by their respective federal governments. Rapid urbanization and industrialization are responsible for most of the air pollution problems in the Border region. The citizens of El Paso/Ciudad Juarez have long been exposed to high levels of air pollution.

According to the Joint Advisory Committee on Air Quality (JAC), the sources of this pollution are emissions from the increasing vehicular traffic in the area, dust from unpaved roads and the surrounding desert, open burning, fireplaces and wood-burning stoves, and industrial activity.<sup>24</sup>

The Ninth Report of the Good Neighbor Environmental Board identifies the increasing vehicular traffic at Border crossings as a particular area of concern:<sup>25</sup>

Along the U.S.–Mexico border, vehicle traffic has been steadily increasing over the past 15 years due to population growth, a booming economy, and rapidly expanding bilateral trade that is carried primarily by trucks. Mobile sources are major contributors of urban air pollution, and cause the formation of carbon monoxide, ozone, nitrous and sulfur dioxide, hydrocarbons and particulate matter. The increased traffic, passenger-vehicle fleet characteristics, and an aging drayage fleet (short-range commercial trucks used to deliver freight across the border) have concerned public and health officials. A health study conducted in November 2003 by the Commission for Environmental Cooperation of North America in the El Paso, Texas — Ciudad Juárez, Chihuahua urban region observed a significant association between ozone ambient levels and respiratory-related emergency visits by children.

Efforts are underway to reduce harmful diesel truck emissions. For example, the U.S. and Mexican governments are working to reduce sulfur levels in gasoline and diesel fuel beginning in 2006. U.S. EPA regulations require new heavy-duty diesel engines to be equipped with advanced pollution controls starting in 2007. While these actions will reduce emissions from Border truck traffic, there may continue to be localized “hot-spots” of pollution due to the sheer magnitude of traffic at Border crossings and the slow turnover of diesel engines.

The EPA identifies six criteria pollutants: ozone, nitrogen dioxide, sulfur dioxide, particulate matter, carbon monoxide, and lead. If a geographical area is not in compliance with one of the criteria pollutants, the EPA may designate it as a “non-attainment area.” In addition to the criteria pollutants, the EPA maintains a list of pollutants also potentially harmful to public health and the environment, called hazardous air pollutants (HAPs). The HAPs are also referred to as air toxics. Big Bend National Park and Guadalupe National Park in West Texas have problems with regional haze, and citizens in the Laredo area have expressed concern about carbon monoxide, even though the area is in compliance.

Historically, El Paso and Ciudad Juárez perpetually suffered from non-attainment for federal air quality standards. However, over the last decade air quality in the El Paso and Juárez region has systemically progressed, a success which is a direct result of the collaboration of several entities on both sides of the Border who share a common objective—clean air. Although

the Border cities' recent turnaround is commendable, air quality in El Paso and Ciudad Juárez still requires improvement and constant monitoring.

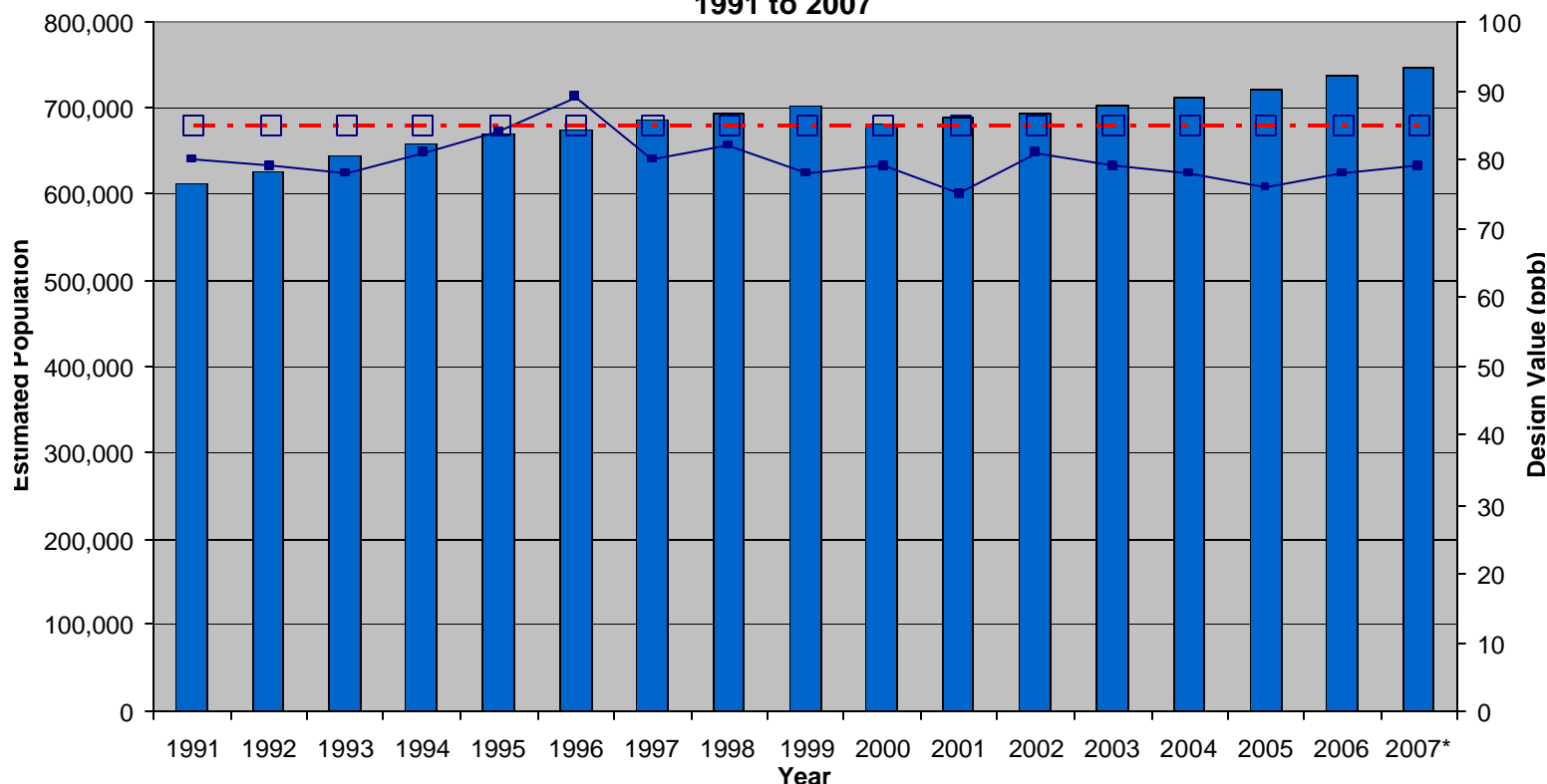
Currently, three out of the six EPA identified criteria pollutants—ozone, particulate matter (PM) and carbon monoxide (CO)—comprise the main focus of air quality groups in the Border cities. Although El Paso was in compliance with the 8-hour National Ambient Air Quality Standard for ground-level ozone of 80 parts per billion (ppb), the EPA recently announced a new 8-hour ozone limit of 75 ppb, effective May 27, 2008.<sup>26</sup> The EPA will propose a separate rule in June 2008 to address monitoring requirements necessary to implement the new standard; the final rule will be issued by March 2009. To comply with the new standard, all states must submit recommendations to the EPA by March 2009 for areas designated "attainment," "non-attainment," or unclassifiable. The EPA will issue final classifications by March 2010. If the EPA does not have the requisite information to make these decisions, then the EPA must issue designations by March 2011. All states must submit State Implementation Plans (SIPs) delineating how they will reduce pollution to meet the standards by the date that the EPA will set in a separate rule. That date can be no later than three years after the EPA's final designations. Thus, if the EPA issues final designations in 2010, then SIPs would be due in 2013. The dates by which states must meet the 8-hour standard will vary based on the severity of the problem specific to each state.

The EPA decided to lower the ozone limit subsequent to a consensus reached by numerous scientists and medical groups that agreed that the current limit, which was set in 1997, is no longer safe for the public health. These groups include the American Academy of Pediatrics, the American Medical Society, the American Thoracic Society, the American Lung Association, and all 23 members of the EPA's scientific advisory panel.<sup>27</sup> The EPA's scientific advisory panel unanimously recommended lowering the standard to 60–70 ppb to ensure the protection of millions of citizens who would otherwise be vulnerable to aggravated asthma, bronchitis, heart attacks, respiratory problems and premature deaths.<sup>28</sup> Although the EPA chose to only lower the standard to 75 ppb, the agency reports that this reduction in ozone will prevent as many as 900 to 1000 premature deaths and 5600 hospital or emergency room visits annually. The EPA estimates that reducing the ozone standard will cost \$8.5 billion, but save between \$2 and \$19 billion in health care costs.<sup>29</sup>

In striking contrast, the Texas Commission on Environmental Quality (TCEQ), has actively fought the lowering of the ozone standard, stating it would not improve public health, and the modifications necessary to adhere to the lower ozone standard would be detrimental to the state's economy. Even though federal law prohibits the EPA from considering economic costs when setting and/or evaluating the 8-hour ozone standard, the TCEQ has vigorously argued that these costs should be included in the decision-making process. In addition, the state's Governor and Attorney General are considering joining a lawsuit against the EPA.

While the debate continues, one thing is almost certain, El Paso will once again fall into non-attainment for this particular pollutant, as demonstrated below.<sup>30</sup> From 2004 to 2006, El Paso County had a three-year average of 78 ppb. With an 8-hour ozone standard of 75 ppb, El Paso County along with about 344 other counties will fail to meet the standard.<sup>31</sup>

**El Paso -- Estimated Population and 8-Hour Ozone Design Values,  
1991 to 2007**



Source: Ozone -- EPA and Mother database. 2007 data is current as of November 19, 2007 and is subject to change.

1991-2006 Population -- <http://www.census.gov/popest/archives/1990s/MA-99-03b.txt> and <http://www.census.gov/popest/counties/CO-EST2006-01.html>, July 3, 2007

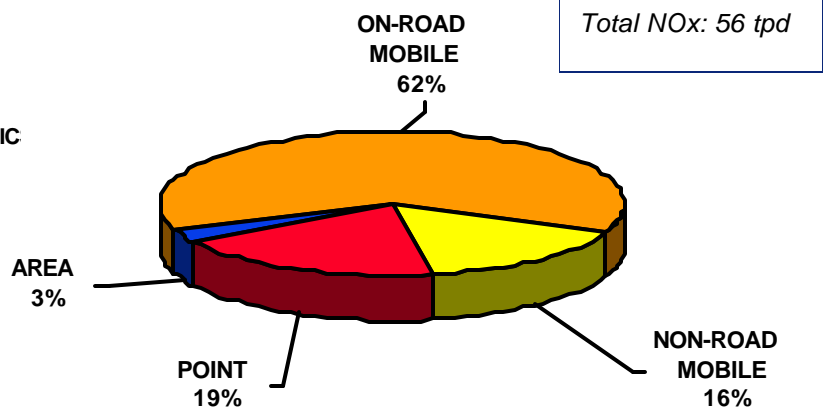
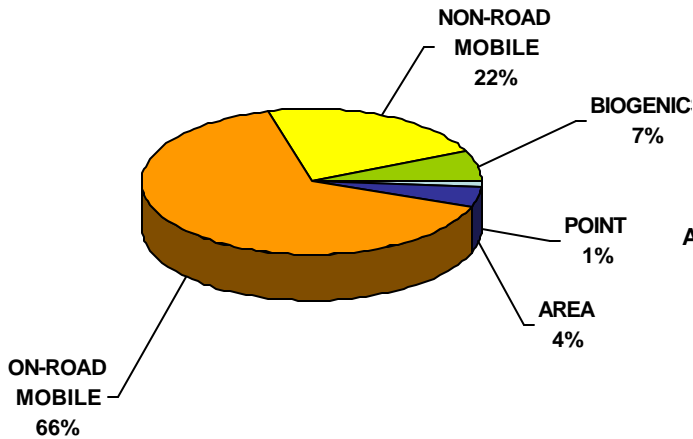
2007 Population -- <http://www.window.state.tx.us/ecodata/popdata/popfiles.html>

Even though Juarez's ozone emissions have decreased over the last several years, the city still designates ozone as one of the two air pollutants of major concern to the city due to its effects on the health of its citizens, the magnitude of concentrations of the pollutant in the air, and the frequent exceedances of federal air quality standards.<sup>32</sup> For more information on the health and environmental effects caused by ozone, please refer to the EPA's website <http://www.epa.gov/air/oaqps/gooduphigh/bad.html#7>.

In contrast to prior years, El Paso and Juárez are both currently in compliance with the 8-hour CO Design Values and demonstrate a downward trend in CO levels over the last seven years. Yet, with the expansion of Fort Bliss brought about by Base Realignment and Closure (BRAC), which is expected to bring 65,000 additional troops and dependents to the city by 2011,<sup>33</sup> and the influx of students and professors expected to reside in El Paso due to the expansion of the Texas Tech Medical School to a four-year institution, preventive measures to control contaminants such as CO and nitrogen oxide (NOx) should remain intact or be enhanced to solidify El Paso's compliance for CO, NOx and other contaminants in the near future. As the figures below show, the main source of CO and NOx emissions are produced by on-road mobile sources, which are expected to increase due to the expected influx of people.

**2005 EL PASO  
CO EMISSIONS INVENTORY  
(WITH BIOGENICS)**

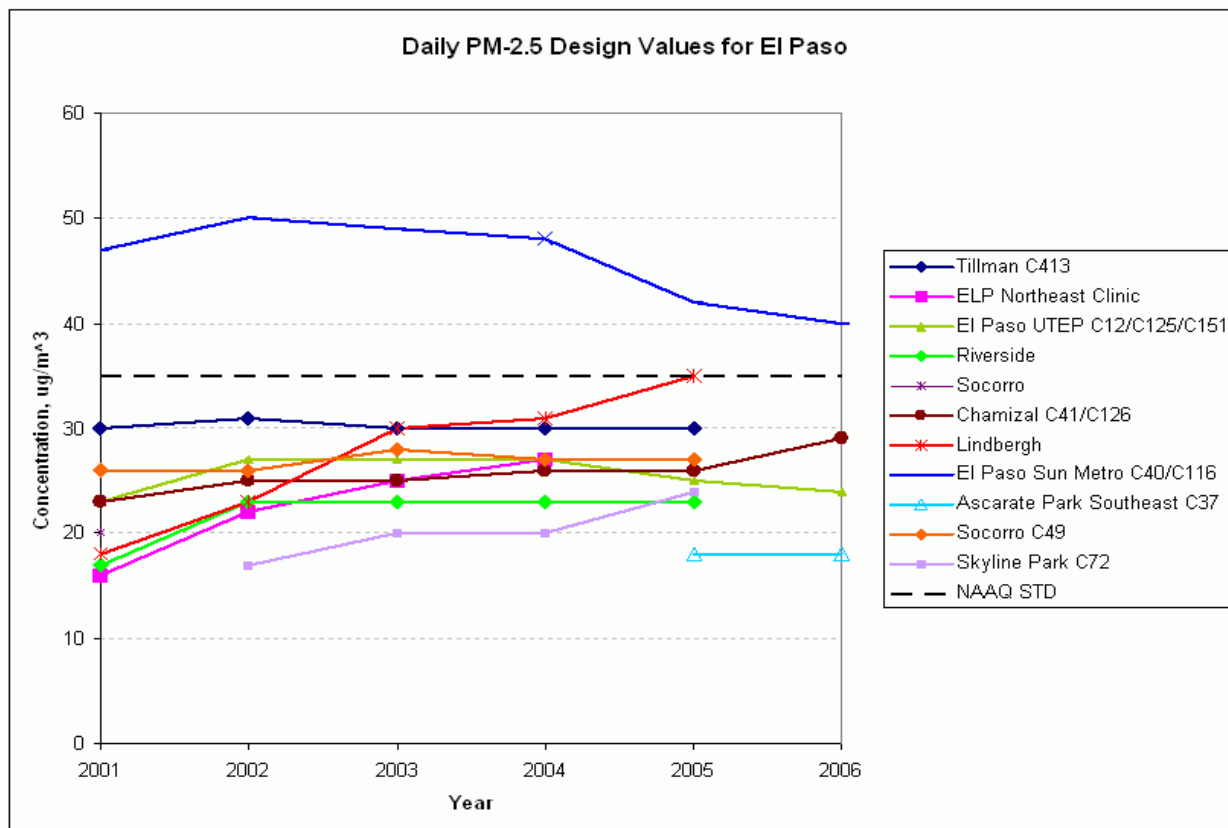
**NO<sub>x</sub> EMISSIONS INVENTORY**



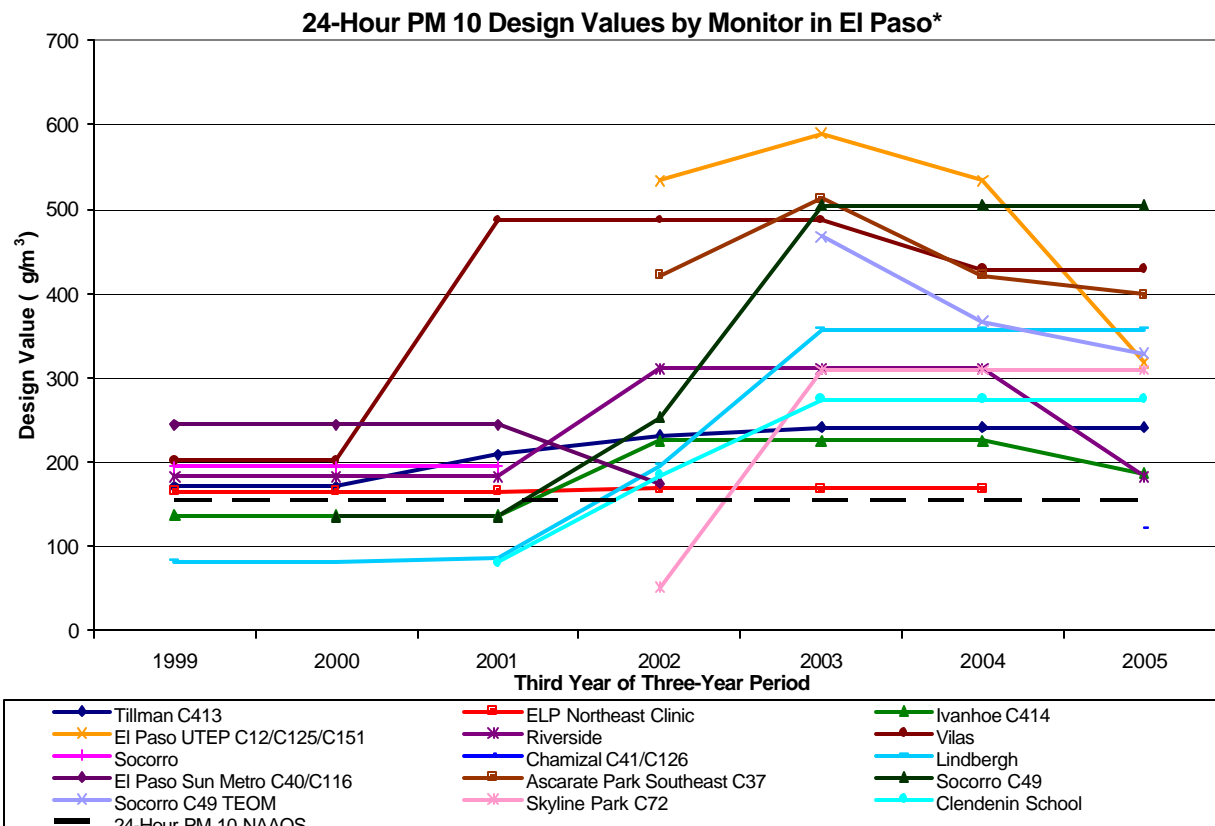
\*Source: TCEQ Office of Chief Engineer

According to the EPA, particle pollution, also known as particulate matter (PM), is a complex mixture of extremely small particles and liquid droplets in the air. When breathed in, these particles can reach the deepest regions of the lungs. If exposed to PM, a variety of significant health problems might ensue, ranging from aggravated asthma to premature death in people with heart and lung disease.<sup>34</sup> In addition to health related problems, the EPA has declared PM as the major cause for reduced visibility in most parts of the United States.

PM is the primary concern for both El Paso and Juárez air quality entities, specifically PM<sub>2.5</sub>, which are fine particles 2.5 micrometers in diameter or smaller, and PM<sub>10</sub>, which are coarse particles smaller than 10 micrometers in diameter but larger than 2.5. As shown in the figure below, daily PM<sub>2.5</sub> levels in El Paso are generally on an upward trend. A prime example is the Lindbergh monitoring station, which was shut down in 2006 due to the fact that it was on the threshold of exceeding the designated limit.



In terms of  $PM_{10}$ , El Paso is still in non-attainment. Various monitoring stations are in exceedance of the 24-hour  $PM_{10}$  Design Values, as the graph below demonstrates. Meanwhile, on the other side of the Border, monitoring sites in Juárez through the 2000-2004 period observed fluctuating exceedances of  $PM_{10}$  design values ranging from 11 to 15, consequently resulting in Juárez's non-attainment for  $PM_{10}$ .<sup>35</sup> One of the drivers behind the high level emissions of PM in Juárez is outdoor burning by rudimentary brick kilns. In an effort to reduce the PM emissions in Juárez by obsolete outdoor brick kilns, the El Paso Electric Company spawned a program using a design by a New Mexico State University professor for a revised structure that reduces pollutants by 80 percent.<sup>36</sup> Although all of the kilns are not presently in use, El Paso Electric has built 28 new kilns in Juárez.<sup>37</sup>



Due to the magnitude of the problem and the potential health implications caused by PM exposure, the City of El Paso has implemented the following preventive and action measures:

- street paving;
- street sweeping generally and as soon as possible after winter frost events;
- parking lot paving;
- industrial roadway paving; and
- burn/no-burn programs during the winter.<sup>38</sup>

While ozone, CO and PM remain the predominant focal points for air quality entities in El Paso and Juárez, other serious contaminants are present in the air. For example, monitoring site CAMS 36 (located at 8470 Plant Rd., El Paso, Texas 79915) is included in TCEQ's Air Pollutant Watch List area. This site has continuously reported hydrogen sulfide (H<sub>2</sub>S) concentrations above the state regulatory standard (80 ppbv) as well as the odor threshold (5 ppbv) since 2004.<sup>39</sup> According to the Texas Department of State Health Services (DSHS), exposure to the measured levels of H<sub>2</sub>S at site CAMS 36 could potentially cause negative health effects (*e.g.*, eye irritation, decreased lung function, headache) in sensitive individuals.<sup>40</sup> The possibility of the measured levels of H<sub>2</sub>S at CAMS 36 adversely affecting the health of sensitive individuals is amplified due to the site's proximity, 1.5 miles east, to J.P. Shawver Park, where a



substantial amount of people engage in various sporting and leisurely activities that are available for all ages throughout the entire week.

Both El Paso and Juárez have made tremendous strides in their endeavor to reach compliance of National Ambient Air Quality Standards (NAAQS), but with PM<sub>2.5</sub> & PM<sub>10</sub> still pressing issues and an influx of people expected to move to El Paso in the near future, members of the JAC recommend the following in order to continue the air quality progress of the Border cities:

- The construction of a fly-over at the US-54 South/Loop 375 interchange. Such a fly-over would mitigate congestion on I-10 East by redirecting eastbound I-10 traffic onto US-54 South and onto Loop 375 East. This would provide an alternate eastbound traffic artery while substantially reducing CO, hydrocarbon, and nitrogen oxides concentrations in the area while also reducing the traffic congestion east of the I-10/US-54 interchange.
- Expanding the number of monitoring stations in El Paso and Juarez; there are currently ten sites in El Paso and three in Juarez. Monitoring sites in the Northeast, Northwest, and Central El Paso would enable the JAC and other air quality entities to develop a more comprehensive analysis of the air quality in El Paso.
- Develop more binational collaboration and funding for Mexican air quality entities to allow air quality monitoring in Juárez and assess air quality impacts caused by the rapid growth of Ciudad Juárez.

### *Big Bend and Carbon I and II*



Two large coal burning plants, Carbon I and II, are located near Allende, Coahuila, the main coal-producing area of Mexico. The U.S. National Park Service (NPS) has expressed concern about the pollution from these power plants, especially the substantial reduction in visibility they cause. The Carbon II power plant is located approximately 20 miles south of the U.S.-Mexico Border from Eagle Pass. The pollution it produces is more than any other modeled by the NPS. Air quality models show emissions from Carbon I and II are affecting air quality in Big Bend National Park. Summertime visibility in the park can be affected as often as one in five days and for a duration of up to one week. The operation of Carbon I and II is estimated to add between 200,000 and 250,000 tons of sulfur dioxide per year to the atmosphere, an amount equivalent to the seventh largest source in the United States. Despite the fact that the plants comply with Mexico's environmental laws, neither power plant is equipped with scrubber devices or other technology to reduce emissions.<sup>41</sup>



Two major field studies have been done to establish the causes of the haze at Big Bend National Park. The Big Bend Regional Aerosol and Visibility Observational (BRAVO) Study, funded by the U.S. Environmental Protection Agency and the National Park Service, took place during July to October 1999. The primary goals of BRAVO were “to understand the long-range, trans-boundary transport of visibility-reducing particles from regional sources in the U.S. and Mexico and to quantify the contributions of specific U.S. and Mexican source regions and source types responsible for poor visibility at Big Bend NP.”<sup>42</sup>

While the BRAVO report<sup>43</sup> concluded that the Carbon power plants had a bigger impact on the pollution levels at Big Bend than any other individual source, it also showed that power plants in Texas and other parts of the U.S. also had important contributions.<sup>44</sup> To date, the TCEQ has taken no action to address the pollution coming from Texas sources that harm air quality at Big Bend National Park.

## ***Land Contamination***

Waste returned to the U.S. from maquiladoras under terms of the La Paz Agreement still concerns Border residents. While the amount returned is small in comparison to waste generated in the U.S., most waste either passing through or for disposal in Texas returns primarily through three ports of entry in El Paso, Laredo, and Brownsville. Of 216 facilities in Texas that treat commercial hazardous waste or provide on-site industrial treatment, only eight are in the Border Region.

Border residents are also concerned about the transportation of hazardous materials. Concerns are heightened because residents often do not know the types and amounts of hazardous materials being transported through or temporarily stored within their communities while awaiting transfer to Mexico.<sup>45</sup>

Many communities in the Border Region also still lack the infrastructure to collect and properly dispose of solid waste. Solid waste disposal problems in Texas are mainly restricted to colonias, where solid waste collection is often inconsistent and inadequate. Compared to the rest of the state, municipal solid waste (MSW) issues stand out as a Border concern. In those areas, access to and affordability of proper MSW collection and disposal systems are limited, frequently resulting in improper waste disposal.

Municipalities and counties with populations over 30,000 must assure that solid waste collection services are provided to all persons under the jurisdiction of the county or municipality. Chapter 364 (County Solid Waste) of the Health and Safety Code permits a county to offer and require the use of solid waste disposal services within its territory and to charge a reasonable fee for the service. This helps to maintain the health and safety of the community and avoids the illegal dumping and burning of residential trash. Under Section 364.034(e) (Solid Waste Disposal Services: Fees) of the Health and Safety Code, individuals who have entered into a pre-existing solid waste collection agreement with a third party are exempt from receiving county-mandated solid waste services. This provision has hampered the efforts of counties to

ensure that all residents receive and utilize solid waste disposal services because residents may sign up for a service and then discontinue it shortly thereafter.

Legislation passed during the 80<sup>th</sup> Legislative Session allows for an exemption for a person receiving services at the level that is the same as or higher than the level of services that would otherwise be required by the county/municipality. After service is terminated under that contract, the person has 15 days to notify the county/municipality of termination. This does not pertain to a private entity that contracts to provide temporary solid waste disposal service to a construction project.

Illegal dumping also continues to be a major issue in the Border Region. A 1997 assessment found illegal dumping to be the most frequently reported Border-wide MSW concern.



Used-tire disposal is a rampant problem, with almost four million scrap tires generated in Texas annually. This issue is more acute in the Border region than in the rest of the state.<sup>46</sup> Ciudad Juarez has the largest tire pile in the Border region with approximately 4 to 5 million tires.

Tire piles cause increased vector-borne disease (e.g., mosquito-borne disease) and the increased possibility of fire, which in turn, pollutes the air. Tire pile cleanup and tire reuse efforts through the Border 2012 initiative—almost half a million dollars invested in eight projects—have removed 2.2 million tires. Some of these tires were used to generate tire-derived fuel while others were utilized in reuse demonstration projects. Despite significant progress, these piles remain. According to the latest assessment of Border 2012, approximately 60,000 tires are removed every month but 30,000 tires are added in Ciudad Juarez.

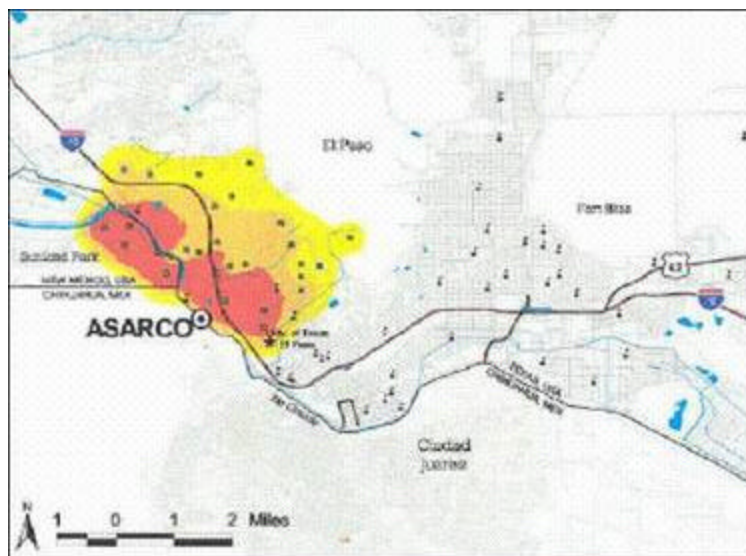
## ASARCO

Perhaps the most well noted battle over illegal dumping and excessive waste on the Border Region deals with ASARCO. Founded in 1899, ASARCO grew to be known as a copper giant, who had plants across the county including one in El Paso, TX. ASARCO has been the target of federal, state and local complaints involving at least 94 sites in 21 states.<sup>47</sup> In 2005, ASARCO filed for bankruptcy—one of the nation's largest environmental bankruptcies. As of October 2007, ASARCO had pending nearly \$11 billion in environmental claims. ASARCO has left communities in 75 communities in 16 states with environmental liabilities, which are the subject of the pending Chapter 11 bankruptcy in filed in Corpus Christi, Texas. One of the cities most affected is El Paso.

With respect to ASARCO's operation in El Paso, here are the facts:

- In the early 1970s, children living near the smelter were found to have very high blood-lead levels, resulting in the relocation of the families and the razing of their homes.
- ASARCO has contaminated at least 1,097 El Paso homes and businesses with lead and arsenic.
- Between 1992 and 1997, ASARCO illegally burned hazardous waste in their El Paso smelter. ASARCO and its Corpus Christi subsidiary, Encycle, had a permit to extract metals from hazardous waste, but instead simply sent it to El Paso to be burned in an attempt to save money. As a result, more than 5,000 tons of waste was illegally burned in my city, including more than 300 tons of chemical warfare agents from the Rocky Mountain Arsenal outside Denver, Colorado. ASARCO thus was fined \$20 million by the EPA in 1999.
- The Texas Commission on Environmental Quality (TCEQ) recently continued ASARCO's march toward the reopening of the company's century-old copper smelter. Standing unified in opposition to the reopening of the smelter are Governor Bill Richardson, Congressman Silvestre Reyes, and the mayors of El Paso, Juarez, and Sunland Park, amongst others. The reopening of ASARCO will define the region, and particularly El Paso, for the next generation.

Serious concerns about on- and off-site lead contamination exist in El Paso, and residents worry that both the EPA and the negligent TCEQ will leave El Paso landowners and taxpayers with significant liabilities because their interests were not adequately protected in the bankruptcy. Based on the length of ASARCO's operations in Omaha and Tacoma, the footprint of contamination in El Paso is believed to be far larger than the EPA has reported. For example, in Tacoma, the state is dealing with 1,000 square miles of contamination. In Omaha, over 32,000 properties were tested. Compare this to the 3-kilometer testing radius and fewer than 3,700 properties tested in El Paso. Herein below is the EPA map, which shows the lead contamination in El Paso.



For years, an El Paso-based fertilizer company, Ionate, sold a fertilizer that was used on the lawns all across our community. This fertilizer was laden with lead, arsenic, and other hazardous heavy metals. The now out-of-business company used slag from the Oglebay Norton slag-crushing company in west El Paso as part of the fertilizer. Oglebay Norton obtained the slag, a byproduct of the smelting process, from ASARCO. The fact is the EPA never established the eastern boundary of lead contamination in El Paso. The full extent of lead in El Paso yards remains unknown, but it is significantly more than what ASARCO reports in the Corpus Christi bankruptcy court.

## ***Cactus Rustling***

The current trend in home landscaping has focused on Xeriscape, a concept that conserves water and protects the environment. Select trees, shrubs, and groundcovers are selected based on their adaptability to a region's soil and climate. The desert Southwest has used its native desert plants as a new means of conserving water under the Xeriscape landscape model. Stringent Arizona laws regulating desert plant trade have made the West Texas desert a prime target for the illegal harvesting of cacti and other succulents. So called "cactus rustlers" take desert plants from private and/or public land with out permission. The plants are then sold for profit in Texas and other states, especially Arizona and California. Some private landowners also harvest desert plants on their own land. The Chihuahuan Desert is one of the most biologically rich deserts in the world, home to almost a quarter of the 1,500 cactus species known to science, including many species found nowhere else. The removal of these plants in such large numbers is seriously damaging the delicate desert ecosystem. Removing too many of these crucial cacti and desert plants deprives desert dwellers, such as mountain lions, hummingbirds, woodpeckers, and bats, of food and shelter and disrupts the ecological balance of the area.

The United States ranks among the world's largest cactus producers; markets with the highest concentration of growers and harvesters are located in the Southwest. Between 1998 and June 2001, almost 100,000 succulents worth an estimated \$3 million were shipped from Texas to Arizona. These included both cacti harvested from the wild in Texas and illegal imports from Mexico. Mexican authorities seized almost 800 cactus specimens from travelers entering or passing through the U.S. from Mexico in 1998. The cacti trade is massive, and it is likely that it will continue to grow due to the existing high demand for landscaping plants. It is expected that this demand for desert plants will soon surpass the desert's natural supply. Recognizing what a valuable asset our desert is for our standard of living, Senator Shapleigh filed S.B. 689 during the 80<sup>th</sup> Legislative Session. This bill directed the Texas Department of Agriculture to administer and adopt rules necessary to enforce a system of inspections to ensure that each desert plant sold in or leaving Texas has been legally harvested. While this measure passed the Senate, it was not given a hearing in the House Agriculture and Livestock Committee.

## ***Transportation***

As U.S. and Mexican trade has increased due to NAFTA, the growth has led to more commercial vehicle traffic at U.S.-Mexico ports-of-entry. U.S.-Mexico trade is mostly moved across land via commercial vehicle. In Texas, 23 international crossings serve as ports-of-entry for trade with Mexico and handle approximately 80 percent of U.S.-Mexico overland trade. This percentage is not expected to change any time in the foreseeable future. Rather, the number of commercial vehicle crossings will grow exponentially over the next 10 to 15 years, creating choke points for trade and negative consequences for the environment.<sup>48</sup>

Enhanced trade has increased the number of northbound commercial vehicle crossings from 2.7 million in 1994 to more than 4.3 million in 2001. In Texas, the Federal Motor Carrier Safety Administration reported that the state had 3.1 million Border crossings in 2000. This is three times more than California, which has the second busiest Border. In fact, Texas was home to the top two busiest crossings – Laredo, with 1.3 million and El Paso, with 725,000 crossings. In this same year, Border bridges at Texas ports-of-entry recorded over 6.7 million commercial vehicle movements, more than half of which had U.S. origins or destinations outside of the state.<sup>49</sup>

In June 2004, the U.S. Supreme Court opened the way for Mexican trucks to travel throughout the U.S., granting the free access intended by NAFTA in 1995. Critics expressed concern, not only because of projected dramatic increases in congestion at ports-of-entry, but also because Mexican carriers do not have to meet U.S. standards for safety, driver certification, pollution controls and hazardous material transport.<sup>50</sup>

In Alpine, Texas, many residents fear that the increased traffic will destroy a growing tourist economy centered almost exclusively on nearby Big Bend National Park. The highway going through town that averaged 50 trucks per day in 2002 is projected to carry as many as 500 trucks per day in the next five years.<sup>51</sup>

Another cause for concern is increased rail traffic carrying hazardous materials. Texas hazardous materials incidents have risen dramatically since 1996, from 1,004 to 1,450 in 2000.<sup>52</sup> The breakdown of these accidents can be seen in the table *Total Rail Accidents/Incidents, 2000*. These accidents appear to correspond with the steady increase in incoming rail container crossings of the U.S.-Mexico Border, which went from 127,570 in 1996 to 239,421 in 2000, in Texas alone.<sup>53</sup>

### ***Total Rail Accidents/Incidents, 2005***

<b>Accidents/Incidents</b>	<b>Fatalities</b>	<b>Injuries</b>
1241	72	662

Source: Bureau of Transportation Statistics, *State Transportation Profile*<sup>54</sup>

## *Homeland Security*

Homeland security concerns have also significantly increased congestion along Texas trade corridors. With no reliable means to filter illicit cross-Border activity from the legitimate exchange of goods and people, the response has been to restrict the binational transportation arteries.

The complex nature of the U.S.-Mexico Border presents undeniable risks from a homeland-security perspective. With heightened awareness of the need to protect water supplies, there is concern about important watercourses and reservoirs associated with the Rio Grande. Infrastructure such as pipelines, rail lines, dams, and canal systems may easily be viewed as targets. In addition, the heavily industrialized nature of some Border communities raises concerns about the dangers posed by the transport and storage of hazardous materials.

The merits and effectiveness of specific homeland security measures are subject to debate. But there is no question that some of those measures have had unintended adverse consequences for the environment along the U.S.-Mexico Border. And although the effects are felt across the entire nation, they are acutely felt by U.S.-Mexico Border communities. Prolonged waits at the Border have compounded existing air-quality problems by increasing emissions from idling vehicles, resulting in a negative impact to residents' health.

### *Border Fence*

On September 29, 2006, the Senate approved the Secure Fence Act (H.R. 6061), which authorized the building of 700 miles of fence along the U.S.-Mexico border. Many land and business owners, law enforcement officials, and environmentalists oppose the new law. A *Washington Post* article published in October of 2006 highlighted the new law's most significant flaws:

- Such a barrier would have a negative ecological impact on the region's wildlife. The fence will disrupt the habitats of numerous plant and animal species including pronghorn sheep, jaguar, and pygmy owls.
- The cost of maintaining the fence would be extremely expensive, especially in areas where summer flash floods are likely to repeatedly uproot sections of the fence.
- In order to build the fence, new roads would have to be built in some regions of the border, thus creating new routes to illegally enter the United States.
- The passage of H.R. 6061 ignores the availability of cheaper and more effective technology to guard the border.

Thus far, Homeland Security Secretary Michael Chertoff has waived over 30 federal laws, including several environmental laws, to advance the Bush administration's plan to build approximately 700 miles of fencing before the next President takes office.

## *Effects on the Mexican Border Environment*<sup>55</sup>

As noted earlier, U.S. and Mexican government officials argued that increased trade and investment under NAFTA would generate the resources needed to clean up the environment. They also argued that NAFTA would remove incentives for concentrating industrial development along the U.S.-Mexico Border, dispersing environmental damage already occurring there. It is clear, however, that NAFTA-related activity has increased air and water pollution and generated tons of hazardous waste in Mexico. Instead of industrial development being more dispersed throughout the country, it intensified along the Border, inflicting still more environmental degradation in already heavily polluted areas. During the NAFTA era, the number of maquiladora factories nationwide more than doubled from 1700 plants in 1990 to 3600 in 2001, with 2700 plants located along the Border. According to Mexican government figures, the cost of NAFTA-related environmental damage was an estimated \$47 billion in 1999 alone. Meanwhile, the institutions that were set up to facilitate and fund environmental cleanup and protection programs have proven themselves to be wholly inadequate.

Since NAFTA, spending on the environment in Mexico has fallen 45 percent in real terms and plant-level environmental inspections declined at a similar rate. Under Mexican law, hazardous waste created by U.S. companies in the maquila zones must be shipped back to the U.S. for treatment. However, Mexico's Institute of Natural Ecology (INEGI) calculated in 1997 that only 12 percent of eight million tons of hazardous wastes generated in the maquila zones received adequate treatment and as little as 20 percent is actually returned to the country of origin. The only tool to monitor waste flows was the U.S. Government's "Haztracks" database, but it was cancelled in 2003.

While Mexico's general population increased 40 percent between 1980 and 2000, the Border population has more than doubled. Mexico's overcrowded Border cities have struggled to meet their basic sewage and waste disposal needs. The lack of adequate sewer systems means that water sources are contaminated with garbage and human wastes. The rates of diseases related to unsafe water, such as hepatitis A and shigellosis, and those related to failed public health infrastructure, such as tuberculosis, have skyrocketed, with hepatitis A infection rates along the Border more than double the Mexican national rate. Contamination from toxic waste and industrial chemicals has been linked to a concentration of clusters of high cancer rates, birth defects and lupus along the Border.

The new water projects and sewage treatment facilities that NAFTA promised in 1993 have been hamstrung by the cumbersome rules of the institutions designed to fund them. The NADB has an estimated lending capacity of almost \$3 billion, but by the end of 2001 had only loaned \$15 million, in large part because the impoverished communities involved could not raise the required equity financing and user fees. Meanwhile, between 1991 and 2001, there was a 218 percent increase in truck traffic carrying goods northward from Mexican assembly plants, which has contributed to smog problems along the Border.

An INEGI study estimates the financial costs of environmental degradation at 10 percent of Gross Domestic Product (GDP) from 1988 to 1999, an average of \$36 billion U.S. dollars of



damage each year. The impact overwhelms the value of economic growth, which has been 2.5 percent annually, or \$14 billion U.S. dollars per year. The environmental side institutions created by NAFTA set some important precedents, but were not equipped to address these problems and are buried by environmental needs totaling \$36 billion U.S. dollars.

Environmental degradation is occurring because the proper mechanisms were not put in place to help Mexico manage its economic growth in an environmentally sustainable manner. In preparation for NAFTA, Mexico doubled spending on environmental protection and started a much-needed industrial environmental inspection program. However, shortly after NAFTA was signed and fiscal woes set in, attention to the environment plummeted. According to INEGI, real spending on environmental protection declined by the equivalent of \$200 million U.S. dollars since 1994.

## ***Conclusion***

Over a decade after the signing of NAFTA, Border communities are increasingly alarmed by the broken promises of NAFTA. Even though proponents of free trade agreements prefer to address only economic issues, it is impossible to separate economic issues from social, political, legal, demographic, and environmental issues. Perhaps the greatest failure of NAFTA is that it was not a more comprehensive agreement with emphasis on social and environmental infrastructure investment and on economic and political reform. While such a comprehensive approach was probably not possible given the political realities of the time, the NAFTA approach may make economic convergence and sustainable development unattainable for the foreseeable future.

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