COMPARING U.S. AND MEXICO ENVIRONMENTAL REGULATIONS

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ACRONYMS AND DEFINITIONS

AP	Associated Press
BMP	Best Management Practices
CAFE	Corporate Average Fuel Economy (law)
CBI	Caribbean Basin Initiative - Economic Recovery Act
CCA	Control Criteria Aqua
CCAT	Control Criteria Atmospheric
CE	Criteria for Ecology
CFR	Code of Federal Regulations
CRS	Congressional Research Services
DOT	Department of Transportation
EEE	Ecological Equilibrium and Environmental (Protection Law)
ELN	Environmental Laws and Norms
EMI	Environmental Management for Industries
EPA	Environmental Protection Agency
ERM	Environmental Resources Management
GATT	General Agreement on Trade Tariffs
HCS	Hazardous Communications Standards
HMTA	Hazardous Materials Transportation Act
IMF	International Monetary Fund
LAFTA	Latin American Free Trade Agreement
MSDS	Material Safety Data Sheets
NAFTA	North American Free Trade Agreement
NOM	Normas Oficales Mexicanas
NTB	Nontariff Trade Barriers
NTE	National Technical Ecological (norms)
OSHA	Occupational Safety and Health Standards
OTCA	Omnibus Trade and Competitiveness Act
RO/RO	Roll on/roll off shipping containers
S/A/I	Section/Article/Item
SCE	Southern California Edison
SEDESOL	Secretariat of Social Development (May/1992)
SEDUE	Secretario de Desarrollo Urbano Y Ecologia

SNA	System of National Accounts
SOW	Statement of Work
STP	Speciality Technical Publications
USAID	U.S. Agency for International Development
USDOC	U.S. Department of Commerce
WB	World Bank
WTO	World Trade Organization
WWTP	Wastewater Treatment Plant
Z list	OSHA list of hazardous chemicals (29CFR1910, Subpart Z, Worker Right -to-know)

CHAPTER ONE

PROBLEM DEFINITION

A. Research Objectives

The objectives of this thesis are to research and compare the Environmental laws of the U.S. and Mexico to determine how to develop a method for the transferring of environmental requirements between the two national standards. This documentation will be completed through research and documentation of:

1. peripheral issues affecting the enforcement of Mexico's laws,
2. the writing structure of the environmental laws,
3. a cross-reference between the Mexican and U.S. laws,
4. Mexico's social constraints,
5. obligations of international treaties, and
6. comparison with U.S. environmental laws.

This thesis will present a thorough, well conceived documentation that can be used by professional environmental personnel in transition between the two countries and their requirements. To the best of this authors knowledge, this is the first time anyone has made a comprehensive effort to cross-reference the U.S. and Mexican environmental laws.

To initiate a new law in both the U.S. and Mexico it must first be published in the respective country's Federal Register of legislative

documents. Publishing an ecological law will initiate a standard, but understanding the enforcement criteria and comparing it to another country's program is more difficult. The objective of this thesis is to develop and document a cross reference index to help environmental personnel readily find comparative laws per subject listing.

B. Deliverable Products

This thesis will develop three deliverable products:

1) The first is a cross-reference of the environmental laws of the two countries as provided in Appendix A. The cross-reference between the U.S. and the Mexican environmental laws is sorted alphabetically by subject titles in the first column of the matrix. This will assist companies from one country that are considering moving to the other, to quickly determine what environmental laws and standards they must comply with at their new destination by subject titles.

2) The second deliverable is the reader's training provided in chapter four to search out specific environmental laws based on the subject titles of interest as identified in the cross-referenced laws.

3) The third deliverable is a summarized comparison of U.S. and Mexican environmental standards and regulations for Air, Water, Chemical list and Manufacturing constraints that is provided in chapter five. The comparisons are not all inclusive but are intended as a teaching technique to follow in developing a detailed comparison for any specific industry or process which the readers might desire to develop.

C. Mexico's National Phobia

A major constraint for developing a comparison and a company specific Environmental Program for a company moving to Mexico is Mexico's national apprehension of Yankee intervention in Mexico's internal affairs. A fear of having the U.S. cram their laws and technology down Mexico's throat because the U.S. perceives it is good for Uncle Sam therefor it must be good for Mexico. Any environmental program developed by a reader must be completely within the context of Mexican regulations, with their designated organizations and authorities, to avoid any appearance of a U.S. company trying to push U.S. environmental laws into Mexico's internal affairs.

This task is easier than the reader might first imagine as Mexico has published and is publishing environmental laws through their Federal Register and Environmental Enforcement Agencies which are accessible through a translating services on CD ROM disks. The environmental regulations and company programs will be affected by several peripheral issues of which the reader must be aware.

D. Peripheral Issues that will Aid in the Implementation of An Environmental Enforcement Program

There are six considerations that will aid in the development and documentation of an environmental program for a company going into Mexico. These are:

1. CBI, NAFTA, GATT, LAFTA

The Caribbean Basin's Economic Recovery Act (CBI), North American Free Trade Agreement (NAFTA), and the General Agreements on Trade Tariffs (GATT) illustrate the evolving awareness of environmental problems and their inclusion in regional and world trade agreements. The CBI enacted in 1983 predates NAFTA which was enacted in December 1994. CBI provided major funding, duty free co-production of goods, and

tax-free entry of products grown and manufactured in 23 CBI countries into the U.S. The CBI however, did not mention any environmental controls (U.S. DOC, *Caribbean Basin Initiative*).

NAFTA, signed in December 1983, required numerous environmental controls. A governmental agency in Mexico known as "SEDESOL" (Secretariat of Social Development), is designated to administer the environmental program.

NAFTA will eventually expand throughout Latin America, as "LAFTA," the Latin American Free Trade Agreement. Mexico's environmental agency will probably be duplicated or studied by every country in Central and South America. The Mexican laws can be accepted and used as South America's national standards without the appearance of Yankee colonialism, especially if they can be economically implemented in acceptable cost tradeoffs as green technology. "Green technology" is improved production technology that increases productivity of quality merchandise while decreasing the amount of pollution per unit of production.

The GATT Agreement is a compilation of several agreements and their documentation that total an estimated 22,000 pages. The generalized agreement covers several conferences held over several years. GATT is not available "in total" for public review and there is some question as to exactly

what is included. The congressional offices of Oklahoma congressmen have different responses to request for GATT information but no all encompassing documents are available. .

There are serious negotiations already underway to expand NAFTA into the Four Amigos Pact by extending it to Chili. In anticipation of the NAFTA expansion, the U.S. Department of Commerce (USDOC) has implemented an environmental marketing effort toward Chili and Argentina (USDOC, *Chile and Argentina Environmental Technologies Export Market Plan*). The expansion of the trade block will continue from there until the full Latin American Free Trade Agreement (LAFTA) will be developed for all of the American Countries. Before the NAFTA pack is further expanded, an evaluation of Mexico's environmental regulations compared to those of the U.S. is needed to verify that a serious effort is being made for Mexico to protect their ecology. Chapter five of this thesis was developed to provide an overall ecological comparison as well as to provide individual companies an indication of how the two countries' laws compare.

If Mexico, with all of NAFTA's Funding assistance, does not implement a successful environmental protection system, then there is almost no chance that Chili or any other Latin American country can even start such a program.

2. International Organizations

The World Bank (WB), International Monetary Fund (IMF) and the U.S. Agency for International Development (USAID) are already de facto world (ecological) enforcement organizations. They control independent nations' ecological policies by lending or not lending them the capital funds for needed projects. The decisions of the investment organization depend on a nation's overall industrial and debt structure, their public health programs, and human rights activities. The loan applications may be tailored to consider their environmental ecological controls. Unfortunately unless a nation's ecological controls are structurally in place, they may be set aside for other considerations such as the promoting of "clear-cutting" of Brazil's national forest to produce a quick cash infusion to reduce a short term debt crisis.

Many of the world's nations have set up a "System of National Accounts" (SNA). SNA optionally may or may not have ecological renewable or non-renewable resources listed as a national asset to offset indebtedness. Also SNA may or may not account for national pollution and environmental quality. Accounting for the natural degradation of a nation's environment and/or liabilities for pollution remediation would more

accurately reflect a nation's net worth. However, unless all borrowing nations use a similar format to include the liabilities, an individual nation's environmental liability would reduce its national assets balance, limiting its borrowing capabilities and subsequently causing the interest rates to be raised on its debts.

The WB, IMF, and USAID all have heavy influence on smaller world economies and are in turn influenced by the United States, which is the major provider of funds. (Guruswamy, L.D., et al, *Incorporating Natural Resources in National Income Accounts*, p. 1140)

3. Technology Transfers Affecting Environmental Controls

A major source of Mexico's industrial technology is the U.S. trading and industrial companies who are expanding into Mexico and developing facilities there. Those companies are presently operating under strict U.S. environmental laws at home. They can transfer their environmental avoidance/remediation technology into Mexico with their plants if they are required to by Mexico's regulations and environmental enforcement agencies.

An example of environmental disaster, due to a failure to plan, is the two sulfur emission spewing electrical utility plants, Carbon One and Two, south of Eagle Pass and San Antonio, Texas. The plants were designed by

Southern California Edison (SCE) of Rosemead, California, a major utility company. Air emission controls were not designed or built into the structure of the plants as the air emissions controls were not required, by Mexico's ecological laws at the time of bid award. (Pasztor, A., WSJ, Sept 8, 1993). Allegedly, the particulate emissions laws governing the two power plants are ten times weaker than the U.S. environmental standards and the sulfur dioxide limit was eight times higher. The needed scrubbers would have cost an estimated $300M to install in 1993. Mexico officials say they cannot afford to pay. Due to the environmental controversy, the World Bank (WB) has pulled out of the financing arrangements.

The two utility plants were built close to high sulfur coal obtained from strip mining pits which were a major generator of new jobs. The plants were built in an isolated area to 1) create jobs and 2) send power south to Mexico City. No power is marketed into the U.S. The isolated Mexican area just happens to be near the international border with the U.S. and Big Bend National Park.

4. Lack of Mexican Quality and Productivity

Interestingly enough, the fact that Mexican Industries were not ready to compete with U.S./Canadian mass production of quality goods when NAFTA

took effect has helped Mexico's environmental program. While sales of Mexican production are starting to increase, the production of goods is being done with less workers and with less pollution. Mexican companies are automating as fast as possible to take advantage of available NAFTA money and to increase both quality and production of industrial goods and services with less production waste.

Mexico's government statistics report that, when NAFTA took effect the number of Mexican workers producing goods like TVs and tractors declined 7 percent, while production rose 9 percent. The increased productivity was due to purchases and installation of automated equipment. The Mexican garment industry has laid off 10 % of their garment workers since January 1994 and the least affected sector, food and beverages has laid off 0.3% (AP Bureau, Chalco, Mexico December 12, 1994).

The cited factor for the layoffs was that manufacturers, who had been crippled for years by economic crisis and protected from competition by import curbs, suddenly had the chance to retool plants and become more efficient by replacing man with machines, purchased tariff free, from the U.S. and Canada. The new machines didn't need additional expenses for job training, quality improvement, and/or environmental training.

NAFTA induced financing for new equipment was made available to help Mexico companies compete with the imports of companies like Wal-Mart, Sam's Club, Price Club, and other warehouse stores which flooded the Mexican market with better quality goods at lower prices.

Mexico's expectation that NAFTA would create increased employment and that U.S. jobs would pour south hasn't happened except in the construction industry which has the lowest paying jobs available.

Typical of the Mexican small business experiences under NAFTA is the production of tortillas. Tortillas are a flat round pancake piece of non-leavened bread made mainly from finely ground corn meal. Tortillas are used in making Taco shells, are wrapped around meat for burritos, and/or eaten by themselves as "pan" or bread. The Tortillas are a mainstay of Mexican meals and their production was a major small or cottage business in Mexico before a government conservation program was launched to consolidate the hundreds of small shops into a few mass production efficient centers.

Several years ago, before NAFTA, this author visited a tortilla shop in Progressio Mexico which was a salesroom in front of 30-50 small shops, each of which had an individual busy cooking tortillas over a small fire in a grease skillet. The tortillas were then gathered and carried to the front shop for street vending. In December, 1994 following full implementation of

NAFTA and government programs to support it, this author again visited the same shop.

The shop location and front sales counter was all that remained the same. Now the front shop is a manufacturing plant where all the dough is prepared by one individual in a large commercial steel, electrical driven, mixing bowl from 50 pound burlap sacks mixed with one gallon (3.785 liters) cans of liquid ingredients. The balls of dough are then carried to three parallel, mass production units where they are placed in a hopper and squirted out the bottom. The dough is automatically rolled and cut to size with the excess peeled up, reballed and returned to the hopper by three teenage girls. The round tortillas move in a steady stream by conveyer through a gas fired, U shaped oven back to the beginning and are dumped in a stack in front of the girls who count and stack them on a distinctly colored yellow waxpaper which is then wrapped around the stack.

For the environmental, mass production, and marketing functions, the new operation is excellent. The three gas fired ovens replaced 30-50 open fires, skillet greases were eliminated, high volume bulk material handling replaced small units, and people carrying the florescent yellow packages on the street are a walking advertisement for the shop. While the operation is very efficient with the four production people replacing the 30-50 previous

cooks in the back shops, the loss of income for the affected families may be part of a larger problem.

5. Social Expectations

Social expectations in Mexico are for better quality goods at lower prices, but nobody mentioned any job cut-backs or lay-offs due to automation. While the argument can be made that environmental compliance is not sociologically dependent, environmental personnel must be acutely aware that when an individual's social expectations and hopes, are raised for jobs and/or improved living standards, then dashed, the deprived segment will react, often violently. Recent and current Mexican examples are:

a) The riots of December, 1993 which occurred along the U.S. and Mexican Border. Mexico first raised their working class expectations for more and better, lower priced goods by advertising for and passing NAFTA. Mexico then lowered the 32% tax rate exemption on goods that Mexican citizens can bring home from the U.S. from $300 down to $50. (Rangel, E., Valley Morning Star December 27, 1994, p. A 2).

b) The rebellion in Mexico's southern state of Chiapas was started on December 19, 1993, the date NAFTA took effect, in an attempt by the poverty stricken population to:

- protest NAFTA, and
- gain an improved standard of living (Hayward, S., Valley Star).

It was also to:

- gain a voice for democracy, and
- justice through land distribution. (Eaton, T. Dallas Morning News, December 29, 1994 pp. 1 & 10A).

Another aspect to the Chiapas rebellion is that San Cristobal de las Casas potentially blocks Mexico's "southern trade," highway system. Highway #190 with its infrastructure system is the most direct trucking route to and from Guatemala, which funnels trade vehicles from El Salvador, Honduras, and southern Belize through southern Mexico. San Cristobal can be circumvented both east and west by traffic routes but not economically. To go west, trucks must cross the Continental Divide of the "Sierra Madre Occidental" (West) and to go east, the trucks must go through North Belize into the Yucatan Peninsula. The transportation cost of alternative routes will be prohibitive.

Any U.S. company planning on moving into the southern region must provide ecological protection while actively facilitating and publishing an economic development policy.

6. Existing problems that have received wide publicity

Mexico has all of the normal problems, but politically several environmentally sensitive problems exist to accelerate remediation programs (Speciality Technical Publishers, Environmental Management for Mexican Industry, pp. 1.1-1.7).

Some of the environmental problems are:

- El Paso/Juarez and San Diego/Tijuana exceed the carbon monoxide and ozone standards.
- Inhalable particulate matter norms (PM10) are exceeded in at least parts of seven of the eight twin cities on the U.S./Mexican border.
- Nogales Mexico has an open, burning toxic waste dump that is contaminating both the air and ground water on both sides of the border. (Price, R., *Many Blame Toxic Waste from Mexico*, USA Today).
- Industrial companies must start using sewage treated grey water for their source water as all fresh, potable water is being reserved as drinking water supply for the populace.
- The air pollution in Mexico City has reach the pollution point where companies such as a PMEX oil refinery with its associated jobs was moved out of the Federal District's Mexico City Valley.
- The El Paso-Juarez valley's air pollution is so bad that an international air control district has been established and funded to initiate remediation actions on both sides of the border (Pasztor, A., *U.S., Mexico Officials Plan to Create Air-Pollution Zone for Border Residents*).

- The Carbon One and Two coal fired electrical power plants south of Eagle Pass Texas, are creating a political embarrassing incident and the money ($350-400M) will be found to correct the problem (sulfuric coal dust) and protect the U.S. air from the Big Bend National Park to San Antonio to Corpus Christe, Texas and all points south to the border.

E. Peripheral Problems Impeding The Implementation Of Environmental Programs

There are ten peripheral considerations that may impede a company's program to implement an aggressive ecological protection program in Mexico. These considerations are:

1. Trade Deficits

Expanding NAFTA trade has resulted in an expansion of Mexico's trade deficit with U.S. contributing to the devaluation of the peso. In the first nine months of trade following NAFTA enactment, Mexican exports to the U.S. grew 22 percent to $35.7B. However, U.S. exports grew 9 percent to $37.5B for an increased Mexico deficit of $1.8B. (AP Bureau, Chalco, Mexico, p. 14)

Much of the capital equipment in the trade expansion helped to improve the environmentally related, industrial production capacity.

However, the devaluated peso makes future improvements at least 50% more expensive depending on where the peso finally stabilizes. Mexico's industrial upgrading through NAFTA became a victim of its own success.

2. Transportation

One problem related to the environmental upgrading is the inability to minimize system cost such as transportation. An estimated 90% of all NAFTA goods produced through the Canadian, U.S., Mexico hemispherical geographical area will move north-south, along three well defined trucking routes and east-west on two more routes. Once the industrial goods have left Mexico all of the expenses and pollution from the transportation will be a U.S. expense and will be lumped and hidden in existing state cost categories and government programs. The affected states are going to try for some type of pollution cost recovery.

A. Highway Systems

The inspections and their integrity related to transportation are especially important because the highway systems are a natural conduit for drug movement from South America into the U.S. population

centers. Examining the routes:

1) The three north-south routes are:

   a) From Vancouver, British Columbia to San Diego, Ca., to Mexicali, Mexico by the U.S. 5 highway system.

   b) From Winnipeg, Manitoba south to San Antonio on U.S. 29 & 35 then dispersing into the Rio Grande Valley and on to Monterrey and Mexico City.

   c) From Toronto, Ontario to Oklahoma City on U.S. 90/70 and/or 44 then south on U.S. 35 into San Antonio.

2.) The two east-west Routes are:

   a) U.S. 10 across the southwestern states will be a heavy east-west trucking route for Mexican goods due to a lack of lateral highways in Mexico near the border and for movement of goods to and from the southeastern U.S.

   b) U.S. 44/70 which runs from the southwestern U.S. to the northeastern U.S.. This highway system will carry Mexico originated goods into the New England states and distribution centers along the route.

B. Drug Smuggling

One apparent solution for decreasing the 100% unloading and loading inspections and transportation cost in border crossings would be to inspect and seal the semi-trailers at the point of production and unseal them at their destination. This would allow more roll on/roll off

(RO/RO) shipments on rail and container ship movements. However, while this author was in Brownsville, Texas in December 1994, a sealed truck was selected at random and opened for verification of the system. The truck contained $2.4 M of drugs behind a false side wall.

C. Structural Capacity of the Highway System

The U.S. highway systems are constructed for and limited to 90,000 pound load limits while the Mexico highway system has a 130,000 pound limit. This is going to be a states' problem as NAFTA is an international treaty which prohibits non-tariff barriers such as restricting interstate commerce movement of Mexico's trucks with their 130,000 pound loads (Mitchell, K. Access, pp. 6-9).

D. Cargo and Inspection Facilities

In attempting to solve the transportation and drug inspection problems several transportation improvements are being made:

1) Transloading and inspection docks are being constructed along the border where trucks from Mexico cross the international trade bridges to the weather protected docks from the south side. The goods are unloaded, inspected and reloaded into U.S. and Canadian trucks backed up on the north side of the docks.

2) Additional facilities are also being provided where sealed trailers are uncoupled from Mexican tractors, opened & inspected, resealed, and picked up by different tractors from the U.S. and Canada.

3) In the Brownsville area, 12 miles west of Brownsville and six miles south of San Benito Texas, a completely separate cargo transfer / inspection facility has been constructed. It is complete with a separate highway, free international six lane bridge, and handling facilities to expedite movement of goods. It bypasses the metropolitan Brownsville-Matamoros Area and connects the U.S. 77 and Mexico 2 highway systems. A second facility will also be built between two large industrial parks east of Brownsville-Matamoros, adjacent to Brownsville's International Airport.

4) In the Laredo-Nuevo crossing south of San Antonio, there are allegations that due to the inadequate transportation infrastructure of access roads, bridges, and inspection facilities, it takes up to 24 hours for trucks to move goods across the border.

3. Unemployment

Unemployment is a very real danger for Mexico even though the official statistics list only 6.9% as unemployed, because:

A. Population Age

Twenty-five percent of their population is less than 16 years old. They are without jobs and hopes of getting one when they move into the labor market are slim. Approximately one million workers per year are becoming of age and moving into the labor market. (A.P. Chalco, Mexican Workers NAFTA's Losers).

B. Undocumented Workers

There are an estimated three million undocumented workers toiling illegally in the U.S. who are being shipped home by the legislative efforts of a new U.S. congress, and

C. Underemployment

Millions more in Mexico are currently underemployed and barely surviving (Hayward, S., Vallley Star).

It will be imperative that company environmental programs not be linked with forced unemployment in the minds of the labor force.

4. Creditability of Mexico's Environmental Inspection Program:

Another problem is a general U.S. distrust of Mexico's effort to inspect and determine causes of pollution. In central Mexico at the Silva Dam in the state of Guanajuato, there is a seven square mile, manmade lake. In January an estimated 20,000 migratory birds died (A.P. Mexico City, *Probe Sought of Bird Kills in Mexico*). By February 19, 1995 the continuing bird deaths was estimated at 40,000 birds of 22 species. When the 1995 spring migration back to Canada, begins, the birds will again pass through the Silva area and an additional killing may occur with a die-off scattered up the Central Flyway of the U.S..

Originally the Mexican authorities claimed to have found no cause for the birds' deaths despite the facts that:

a) Autopsies indicate heavy metal poisoning from chemical plants may be involved.

b) The city of Leon with 800,000 population dumps its waste water (including industrial waste) into the lake's sources.

c) Scores of local hide tanneries in the Leon region dump their waste effluents directly into streams 12 miles upstream from the lake.

The magnitude of the problem has expanded as:

a) Livestock are starting to die.

b) Toxins may be creeping into the aquifers.

c) Children who play near the water have developed skin ailments.

d) The reservoir is turning into a "Mexican Environmental Nightmare." (McMahon, C., Silva Mexico).

Mexico's National Water Commission has now blamed the deaths on an agricultural pesticide called "Endosulfan."

The original death of the 20,000 migratory birds in December caused only a minor stir in certain circles of the U.S., primarily the Audubon Society. However, the Silva Reservoir has now taken on a life of its own. Mexico's failure to take quick, aggressive action to explain the death of migrating waterfowl from the U.S. and Canada has elevated the Silva Reservoir case to the NAFTA Environmental Cooperation Agency based in

Montreal and will be the agency's first case if formerly presented for their review. (Powell, S., Tulsa World, Sports p.4 & Tulsa World January 17, 1995)

5. Internal U.S. opposition to U.S. Environmental Laws

A physical resistance to the implementation of environmental regulations in the U.S. has been growing for some time. It has been alleged (Margolis, J., Chicago Tribune, December 8, 1994) that in California, Oregon, Nevada, and New Mexico, private threats and harassing telephone calls to homes of federal inspectors have been made by people opposed to federal environmental law enforcement of environmental regulations against low or no pay corporate activities on public owned lands. These protected activities include acid based gold mining, cattle grazing on government ranges, and private hunting parties on public lands that cannot be reached by the public without crossing private property. Allegedly some of the harassment has been coordinated by local government officials as part of a resistance to federal government takeover of local jobs or for prosecuting local citizens.

Five states (Delaware, Louisiana, New Jersey, Pennsylvania, and Virginia) have refused to enforce the EPA federally mandated Central Tail

Pipe Air Emission Inspection System to help the EPA's dirty air cities to reach their mandated cleanup levels. The compliance refusals are based on claims that "better roadside measuring technology is available." (Everly-Douze, Susan, Tulsa World, January 9, 1995, p.1).

With the republican sweep to power in the U. S., the considerable rhetoric that the implementing regulations for the U.S. ecological laws are going to be reviewed and modified, has not been lost on Mexico. The impact of the headlines but not the details of the internal U.S. opposition to environmental compliance regulations are spilling over into Mexico.

However, there is a difference between the resistance in the two countries. In the U.S. the protest and reviews are intended to review alternative technologies available and to slow down the burgeoning expansion of industrial regulatory controls in order to better balance the interest of businesses with the environmental requirements (Tulsa World, Santa Fe, N.M., *Environmental Rule Cost Blasted*). In Mexico the protest is a denial of any problem that might require any implementing controls that could limit jobs, such as shutting down the companies contaminating the water that allegedly killed 40,000 birds, but who also contribute jobs and pay the taxes which pay public officials' salaries.

In a discussion between this author and Mr. Ricardo Garza Blanc, the

Director General of San Luis Potosi, (Mexico) Municipal Facilities, in the summer of 1994, he stated that "Mexico's (SEDESOL) major interest are in the enforcement of Clean Air and Drinking Water Acts and seem to be in response to outside pressure." At some point the enforcement will take on a life of their own, as Mexico is "out of" clean air and water. The smog in Mexico City is worse than San Francisco (California) and Tokyo (Japan) while the supply of ground water is nearly exhausted. Director Blanc stated that industries in San Luis Potosi are almost to the point of being allocated "gray water" from the city sewage treatment systems as the only industrial intake water available. The purpose of our meeting was to discuss how Oklahoma and/or Tulsa companies could help in building an industrial park which could 1) assist in electrical cogeneration and 2) provide the processing of sewage water such that it could be used as input to industrial plants. The Mexican industries are going to treat intake water, if necessary, before it can be used then treat it again before it can be disposed of offsite.

6. International Borders

International borders were a matter (accident) of historical development and did not anticipate international environmental pollution. In order to cover international environmental pollution a new category of

documented ecological information has been created within the law books entitled "International Environmental Law and World Order." An initial scanning of listed information indicates that numerous treaties, negotiations, United Nations declarations, and international arbitrations have already established several presidencies which may or may not have the authority of laws but which are international in nature and could be integrated into a world order, law structure.

People, and politicians in particular, have several fears related to international borders and activities. These include:

a) the worry that another country or world organization will have, or appear to have gained control over their sovereignty. This freedom extends to the "rights" for a nation's industries to dump their pollution into/onto your neighbors' environment such as:

   1) the Ohio River Valley's power plants' sulfur emissions that carry into Canada as acid rain,
   2) the steel and asbestos plants that dump their emissions into the U.S. side of the Great Lakes,
   3) Mexico's Carbon One and Two, coal fired electrical plants that belch sulfur emissions into south Texas,
   4) Mexico's oil platforms that blow out and pollute south Texas beaches,
   5) Arizona and California agricultural pollution of surface water flowing into Mexico, and/or
   6) the absorption and polluting of the Colorado River irrigation water before it gets to Mexico,

b) the well founded worry that the U.S. ecological improvements that have been made for environmental protection will be compromised. One of the first cases of the World Trade

Organization's (WTO) Environmental Review Board was a review of a U.S. embargo on tuna from Mexico. The embargo was based on a review of the long-net fishing technique because the tuna nets kill dolphins. The tuna embargo was overturned by an international arbitration decision because it was considered a trade barrier, rather than an ecological measure, (Guruswamy, L.D. et al, p. 1135)

c.) that someone is going to dump processed waste or waste storage facilities into their state such as the processed city sludge that New York city keeps trying to contract out for land placement in Oklahoma, south Texas and Mexico.

7. Environmental Applications vs. Optimization Problems

One major problem that company environmental personnel are going to face is an inability to define cost tradeoffs between U.S. and Mexican Environmental Standards. However, regulatory compliance is not really an economical issue at all. It is a question of whether one wants to operate or not. If one is moving from one country to the other, the question of optimizing ones operation is mute, the real question is "Do you or do you not want to open and operate a facility in the intended country?"

8. Peso Devaluation

Additional upgrading of the Mexican industrial base is going to be slowed because of the devaluation of the peso to half of its previous value.

Replacement parts now cost twice as much to buy when the equipment fails and much of the NAFTA funds have already been spent. The Mexican government's administrative operations have been cut back which means that previously slow approval for financing initiatives will be even slower or non existent. If an environmental planner has a direct U.S. finance source then the peso devaluation won't matter. Anything else is in real trouble.

One tortilla business manager in Mexico claims that several of his tortilla machines are shutdown because he cannot buy spare parts. President Zedillo's plan to stabilize the peso and hold down inflation has interest rates at 100% and higher and he has not finalized a plan to help small and medium sized businesses. Inflation is forecast at 42% in 1995 for Mexico and 50% of Mexico's businesses are projected to fail this year. If Mexico's economy does not stabilize it may well become a powder keg of 90 million rioting people. (A.P. Bureau, Mexico City, Barker, T., *Mexican Debtors Protest*)

9. Revolutions and assassinations

The assassinations of Mexico's political leaders and the revolt of the pheasants in the most economic and environmental sensitive areas of Mexico must also be considered before a company imposes a restrictive

environmental controls program.

Mexico's environmental program will definitely take second place to the massive program to stabilize the Mexico peso. In order to receive the $58B international bailout scheduled for the peso, Mexican leaders have agreed to a 10% limit on raises against the current wage and salary freezes. The 10% wage increase is small compared to the 40% inflation and the 50% tax rate. The declining spendable income is further reduced by the 100% interest rates and half priced peso. The financial frustrations to the populace can very well lead to physical violence against banks, government officials and foreign companies.

10. Risk Assessment

In order to implement an aggressive ecological program the originator (and reader) must first understand what the microbiological data means and how it is applied in the overall ecological system to calculate risk exposure to potential receptors.

One element of the environmental protection programs that is difficult to understand is the risk assessment for pollutant agents that are not acute or immediately lethal. The fact that the toxicological impact of a toxic chemical or its gas does not immediately produce a fatality does not make it safe. The

chronic long-term effects may merely delay the death. The longer the related deaths are delayed, the harder it is to establish a direct linkage between cause and effect.

Two examples are:

a) 1,1,2 trichlorethylene (C_2HCl_3) whose usage has been approved for years in the U.S. for everything from dentistry to anaesthesia to hand soap. The government approved method of disposal was to pour out the residue to evaporate. Open dumping in isolated locations was an approved disposal method which polluted both the air and groundwater.

b) there is an unlined, open toxic dump in Nogales, Mexico that has been burning for years, polluting both the air and groundwater on both sides of the border. It was a common dumping location for the Maquiladoras in the area who also provided the majority of the jobs and political financing on both sides of the border . (Price, R., *Nogales: Something is very Wrong).*

11. Generic Risk Exposure

Each type of exposure has a specific formula. Chapter six of the EPA/540/1-89/002 provides a menu of various equations to quantify how much exposure is accumulated per scenario. Many of the equation elements have standard default values which are provided in case the evaluators don't have more precise numbers. The major consideration factor for the equations are the balancing units of the equations. The following equation which is

used for dermal contact with chemicals in water is provided as an example:

(EPA/540/1-89/002, Eq. 6-13, p. 6-37)

$$\text{Intake or absorption (mg/kg-day)} = \frac{(CC \times SA \times PC \times ET \times EF \times ED \times UCF)}{(BW \times AT)}$$

CC	=	chemical concentration (ug/l-different per chemical and exposure site ; determined by field test),
SA	=	surface area (of skin exposure in cm^2),
PC	=	permeability constant (different per chemical and per environmental conditions),
ET	=	exposure time in life-time (standard 70 years),
EF	=	exposure frequency (365 days/years),
ED	=	exposure duration (standard 70 years),
UCF	=	unit conversion factors to balance out equation units
BW	=	body weight (assume 70 KG),
AT	=	average (exposure) time period (years - 70 years), and
IR	=	ingestion rate (2 Liters/day) if an ingestion equation is used.

U.S. emission and affluent standards are health guided and are generally intended to be set to one chance of a fatality occurring if an event or exposure happens one million times. This is shown as $1x10^{-6}$ when expressed in mathematical equations.

F. Summary Of Problems

The first three problems that arises from a potential move of production facilities across an international border are:

1. "What are the new environmental standards with which one must comply?"

2. "What happens if one's specific question is not answered in the literature?"
3. "How do the environmental regulations of the two countries compare?"

G. Solutions To The Problems

Specific answers to the questions are developed in the thesis:

1. The standards related to specific topics are provided in the cross-reference developed in Appendix A which is also the first deliverable product of the thesis. By cross-referencing subjects and topics to known standards that the environmental personnel are already familiar with, it will make the requirements easier to understand and identify with.
2. In many cases, environmental personnel will have a detailed question that is not listed in the cross-reference. Chapter four of the thesis provides an examination of the detailed structure of the regulations and its documentation is the second deliverable of the thesis. Appendix B contains a table of contents for five environmental regulations for the reader to extend his search for answers.

3. The last question and third deliverable product is an overall comparison of the two countries regulations and is provided in chapter five. Remember that just complying with the regulations is not enough, one must also consider and plan for the other constraints provided in this thesis.

CHAPTER TWO

SOURCES OF RESEARCH INFORMATION

The purpose for this section of the thesis is to identify those U.S. and Mexican laws and regulations that will be researched to compare the ecological standards of the U.S. vs. Mexico.

In general, both sets of regulations are ecologically categorized by: air (emissions), water (effluents), and "solid and hazardous waste," plus two general categories of "industrial controls," and "health and safety." The laws are grouped somewhat differently but the categories carry across the groupings. The thesis research will consider each of the ecological categories. The intent at this point is to define the U.S. and Mexican regulations which will be used for the thesis and to provide an understanding of how they can be used.

The following references are used:

A. Occupational Safety and Hazardous Act (OSHA)

The U.S. OSHA Law was enacted in 1970 with subsequent regulations to protect workers in the workplace. Before the federal law was enacted state agencies were responsible for worker safety. OSHA compliance was

established within the Labor Department. Cost tradeoffs were not considered as the purpose of the act was to protect workers' safety through the elimination of toxic substances in the work place and the elimination of chronic health effects. (Carson, T. & Cox, D., Hazardous Materials Management, p. 60.) OSHA toxic standards and air contaminants are considered a matter of public health and basically, are non-negotiable.

B. Hazardous Materials Transportation Act (HMTA)

The initial U.S. HMTA of 1975 was passed to ensure safe transportation of substances that "may pose a threat to health, safety, property, or the environment when transported by air, water, rail or highway." (Carson & Cox, Hazardous Materials Management, p. 71). Enforcement was assigned to the Department of Transportation (DOT). In addition to helping define hazardous and toxic materials, the HMTA required contingency planning for incidents that may arise due to storage and/or movement of the materials. The regulations have been standardized internationally through the United Nations, including surface, water, and air shipments, and are not dependent on trade treaties for enactment. Almost all materials have a United Nations (UN) Number assigned to them which is used to document the Material Safety Data Sheets (MSDS) which are part of

transportation manifest accompanying all shipments of hazardous materials worldwide.

C. Environmental Protection Agency (EPA)

The regulations administered by the U.S. EPA are based on a series of federal laws starting in the 1970s which focus on cleaning up the existing conventional chemical hazards and preventing future environmental damage through controlling the by-product releases of chemical substances. However, the reader should remember that blind obedience to federal regulations are not protection from later accusations or court actions.

D. Chemical Hazards

The chemical hazards are classified in two groups: physical and health:

1. Physical Hazards

   The physical hazards are provided in 40 CFR 261 and are classified as:

   A. Ignitability with various considerations such as: combustibility, flash point, explosive limits, and the concentrations at which a mixture will maintain a continuous flame given an adequate supply of oxygen.

B. Corrosivity which is the ability to wear away materials by chemical action depending on temperature and environmental conditions.

C. Reactivity which is the ability to violently react considering temperatures, chemical composition, and environmental conditions.

2. Health Hazards

The physical hazards are immediate and obvious to the beholders. Less obvious but equally dangerous are the health hazards which are measured as either "acute or chronic."

A. Acute effects are the results of a single, rather high exposure with rapid onset of symptoms ranging from headache to dizziness to death depending on the agent of exposure, exposure dose, duration of exposure, type of exposure etc. Levels are measured as lethal concentrations such as LC_{50} of a material which on the basis of laboratory tests is expected to kill 50 percent of a group of test animals when administered as a single exposure within 1-4 hours. A median lethal dosage (LD_{50}) term is also used to describe an acute exposure, which means the

lethal dosage that is required to produce death in 50% of lab animals exposed within the first 30 days.

B. Chronic effects are long term, physical symptoms generally cumulative over years of exposure. The risk of death are measured in terms such as one-in-a-million ($1x10^{-6}$) but no time limit is imposed, just the act(s) of exposure.

The ecological evidence to prove the chronic effects of long term exposure is open to differing interpretations of what constitutes damages and there are several areas of uncertainty in this area of work. SEDESOL has not chosen to get involved in detailed calculations of long term chronic worker ailments. At this time the Risk Assessment documentation required by Mexican regulations is more qualitative than quantitative and the prevention of pollution is receiving more attention than cleaning up past "super fund sites.". The question of " what levels of by-product releases are acceptable to prevent environmental damages" are directly answered by the regulations but the readers must know that the regulatory standards do change. Accordingly, the reader must be aware of why the regulations related to chemical agents of exposure exist.

E. Toxicological Elements Of Risk Assessments

For Chemical Hazards

1. Source

There must be a method of release of the substance from its concentrated source into the environment; generally by leakage, spills, leaching, volatilization or infiltrations. The regulations governing control of chemical hazards cover:

a. contaminants as defined by toxic/hazardous chemical lists,
b. concentrations of the chemicals released to the environment,
c. time of open exposures before the chemicals are recovered, and
d. locations and accountability to workers and the public.

2. Pathways

The substance must be transported by a media which will be; air, surface water, and/or groundwater. The pathway must identify:

a. type of media-air, dust, water etc available to transport the chemicals,
b. rate of Migration - speed and media moving the chemical,
c. time of movement, atmospheric and environmental conditions, and
d. substance decay rate - potency decay time during exposure period.

3. Transport Mechanism

There must be a transport mechanism with which the chemical moves. These may be:

a. volatilization; gas/liquid boil-off from or to chemical transport,
b. wind erosion; movement of powdered chemicals or exhaust stack emissions,
c. leaching; absorption of contaminant by transport media moving through a concentration of the chemical,
d. storm water runoff; collection of pollutants by rainfall,
e. surface waters; contaminants suspended in surface waters, and
f. underground waters; contaminants suspended in underground.

4. Receptor Locations

The receptor location is environmentally relative to where the substance started. The further away from the exposure point, the less likely the effect on the receptor.

5. Receptors

The sensitivity of the receptors to the chemicals depend on several factors: These include:

a. age and/or maturity of receptors; young children vs. older people,
b. types or receptors; mammals vs. water vs. plants,
c. physical condition of receptors; healthy vs. stressed or ill,
d. time length of exposure; briefly vs. several years in the workplace,
e. environmental conditions; hot, still and muggy vs. dry and windy.

6. Exposure Routes

The routes of how the substance enters the body of the receptor once it arrives. Exposure routes include:

a. inhalation; breathing into the lungs,
b. dermal contact; contact through the touching of the skin,
c. absorption; penetrating through the skin, and
d. ingestion; swallowing into the stomach

7. Dosage of Exposure

The dosage of exposure is based on exposure activities, and the age, health, physical conditions, physical and mental stress etc of the individual receptors. Dosages are determined by field measurements.

8. Identification of Uncertainties

While the accuracy of the equations used in calculating risk assessments are very accurate, the quantities going into the equation are not. The accuracy of the numbers used will vary from the location from which the numbers are selected. Uncertaintity factors that must be considered include:

a. environmental sampling and analysis,
b. evaluation of exposure pathways,
c. fate and transport modeling,
d. toxicology values and quality of studies, and
e. completeness of the overall data base.

F. Elements Of A Health Risk Related To Chemical Hazards

To perform a risk assessment four steps must be taken. 1) Data must be collected and evaluated to 2) determine that a chemical of risk has been released and exist in a 3) pathway in sufficient strength and quantities to 4) expose existing or potential receptors. A toxicity assessment must be made to determine the degree and type of danger involved. Toxicity assessments include:

1. Data Collection & Evaluation

Data collection and evaluation are the sampling and quantitative analysis

of the potential site pollutants. The evaluation involves several factors

including:

a. site assessments,
b. selection of analytical methods,
c. selection of quantitative methods,
d. developing site to background comparisons, and
e. identify chemicals of concern and their concentrations.

2. Exposure Assessment

Exposure assessment is the development of realistic exposure scenarios

for the site involved. These scenarios involve:

a. site characterization,
b. establishment of pathways,
c. identify potential receptor populations,
d. testing and estimating exposure concentrations, and
e. estimating receptor's chemical intake.

3. Toxicity Assessment

Toxicity assessment is the analysis to determine the qualitatively calculated potential for adverse human health effects from the exposure to the detected and tested chemicals. The factors which must be considered are:

a. gather data for chemicals of concern,
b. identify exposure periods, and
c. determine toxicity values for:
    1) noncarcinogenic
    2) carcinogenic risk

4. Risk Characterization

Risk characterization is the final step of pulling all of the site information together and making some conclusions. Both the U.S. and Mexican regulations provide some information but only the U.S. regulations explaining how the findings are to be calculated and used.

a. quantify all above data and balance the equations,
b. combine exposure pathways,
c. assess & present uncertainty factors and weightings, and
d. consider site-specific studies.

G. Mexico's Civil Law System vs. U.S. Common Law, Regulatory Systems

Mexico's legal system is a "civil law" system as opposed to the "common law" system used in the U.S.

Under the "Civil Law" System, facilities which are not in compliance with Environmental Standards can be shut down until the plant management signs a consent decree and post bonds to finance needed improvements. There is no extended paper process while company lawyers delay the enforcement agency. As a practice, only that portion of the facility that is in violation is closed. The enforcers are acutely aware of production, jobs, and production of product. (Environmental Management for Mexican Industry, 2.0 Legal Framework)

In contrast, the common laws of the U.S. allow an appeals system whereby the companies can delay the actual correction of the problem while seeking to reduce the penalties.

H. Mexico's Environmental Laws And Norms

The ELNs are the Mexico's defined environmental standards. Plants are either in or out of compliance with no negotiations.

The initial Mexican Environmental Standards (Norms) were known as "National Technical Ecological Norms" (NTEs) and were published by the "Secretariat of Urban Development and Ecology" (SEDUE) which was created in 1972 by Mexico's first modern environmental law. Some of the original NTEs are still in existence.

The original Mexican Environmental Law of 1972 was updated on January 28, 1988 with the "Ecological Equilibrium and Environmental (EEE) Protection Act," now known as the General Ecology Law. The NTEs were redesignated as the "Normas Oficiales Mexicanas" (NOMs). On May 25, 1992 SEDUE was reorganized to form the "Secretariat of Social Development" (SEDESOL) to administer and enforce environmental laws, regulations, and standards (STP Environmental Management for Mexican Industry, p.1). In 1988, there were approximately 70 NTEs which were expanded to 80 NOMs by the Fall of 1994. The total is expected to reach 200 NOMs in early 1995. Individual NOMs, are being released as research is completed by SEDESOL on Mexico's need for each one.

There are five regulatory programs defined as follows:

- The administrative and organization of the Environmental Regulations,
- National Air Pollution,
- Air Pollution in Mexico City,
- Environmental Impact Assessments, and

- Hazardous Waste.

As of February 15, 1995, the five programs have 98 NTEs and NOMs broken down generically as follows:

1. Environmental air emissions

The following air emission titles are the norms which Mexico has published to establish the guidelines for air quality:

Atmospheric Pollution	Microindustrial Exclusions
Cement Emissions	Natural Gas
CO Measure and Calibration	NOX Measure and Calibration
Coal Combustion	Operating Licenses
Diesel Combustion	Ozone
Diesel Engines, New	Particulate Concentration
Dodecylbenzesulfonic	Smoke Opacity
Evaluation Criteria	Solid Particulates
Fuel Oil Combustion	Sulfur Emissions
Liquid Fuel-Sulfur	TSP Measure & Calibration

2. Solid and Hazardous waste

The following solid and hazardous waste titles are the norms which Mexico has published to establish the guidelines for waste disposal:

Ancillary Facilities	Incompatibility
Containment Units	PCB Waste
Environmental Protection	Pesticides, Fertilizers
Generation of Reports	Simplification Programs
Hazardous Waste	Toxicity Characteristics
Hazardous Waste Containment	Toxicity Extraction Test

3. Water effluents

The following water titles are the norms which Mexico has published to establish the guidelines for water treatment:

Asbestos
Pulp & Paper
Flour Manufacturing
Beer & Malt Industry
Textiles
Iron & Steel
Carbonated Beverages
Discharge
Meat Packing & Slaughtering
Dairy Operations
Water Regulations
Wood Impregnation
Flat Glass & Fiberglass
Basic Petrochemistry
Rubber Tires, Tubes
Glass, Blown & Press
Cane Sugar
Thermo-electric
Leather Tanning & Finishing
Copper
Water Quality
Plastic & Synthetic Polymers
Fertilizer except Phosphoric

4. Health and safety

The following health and safety titles are the norms which Mexico has published to establish the guidelines for worker safety:

Chemical contamination in work environment,
Classification risk levels,
Fire prevention,
First aid units,
Flammable and combustible substances,
Job accidents,
Medical examinations,
Noise,
Personal protective equipment,
Safety and hygiene,

Storage, transportation and handling of corrosive, irritant and toxic substances, and
List of toxic substances.

5. General Norms and controls of industry

The following titles for general environmental norms are those which Mexico has published to establish the guidelines for industrial administration:

General administration,
Ecological imbalance prevention,
Environmental impact statements,
Extremely hazardous activities,
Fiscal incentives,
Highly hazardous activities, and
Steam generation plants.

6. SEDESOL

The environmental regulations are administered by SEDESOL which was created on May 25, 1992 to replace SEDUE. SEDESOL is similar to the EPA and consist of two divisions which are:

1) The National Institute of Ecology which has:
   a. Environmental Planning,
   b. Environmental Standards,
   c. Development of Natural Resources, and
   d. Research and Development.

2) The Procurolria or Enforcement Division, which has

responsibility for:

a. Social Participation,
b. Operations,
c. Verifications,
d. Administrative
e. Environmental Audit and Planning,
f. Programming and Technical Support, and
g. Legal.

I. Environmental Management for (Mexican) Industry

Mexico's standards are issued as both regulations and industrial Laws. The EMIs are a collection of applicable standards, forms and requirements by specialized industrial segments to help each segment to better identify their specialized requirements and identify both regulatory requirements and Best Management Practices (BMP). The table of contents for the EMI manual is provided on page 118 of this thesis.

The EMIs also illustrate a major difference between U.S. and Mexican Government organizations and their approaches to environmental regulations. Mexico's SEDESOL is responsible for developing both environmental standards and the country's natural resources. This duality has a moderating influence on propagating overly restrictive environmental standards. Specifically SEDESOL is responsible for the following agencies:

- Environmental Planning,

- Environmental Standards,
- Development of Natural Resources, and
- Research and Development.

Having the adjacent Research and Development agency in SEDESOL gives the environmental agency an advantage in that they can determine the latest environmental technology and/or best management practices without having to spend years and scarce resources developing the data.

J. Similarities between Mexican and U.S. Environmental Regulations

There are very close similarities between Mexican and U.S. environmental laws and regulations, primarily because SEDESOL is having the individual U.S. Environmental regulations reviewed and tailored before they are issued as Mexico's standards. These similarities include:

1) both employ health-based ambient air quality standards,

2) both employ use-based water quality criteria,

3) both employ emission limitations or technology-based controls on air pollution releases,

4) their hazardous waste definitions and management requirements are similar,

5) both employ permitting and new source reviews, and

6) both have spill and incident reporting requirements."

K. Major Differences between Mexico and U.S. Environmental Efforts

1. Mexico attempts governmental planning of ecological zoning, to place an industry in an area that can both support it and not be damaged by it. For example, the Carbon One & Two utility plants placed in northeastern Mexico. For Mexico it was a good location.
2. The U.S., has a Superfund Program which Mexico has not initiated.

L. Environmental Philosophies

1. U.S. Philosophies

Prior to the November 1994 elections, the U.S. environmental remediation philosophy was to enforce cleanup and remediation in all areas simultaneously. All past super funds and toxic dumps were to be cleaned up while all existing plants and processes were to install the latest preventive technology at the same time. If a company had both past and present pollution then they must remediate both simultaneously. The prognosis since November 1994 has changed somewhat, but the present regulations are in place and it will take at least a year for congress to review, revise, and dilute the legislation, if they do. In the interim, based on in-place regulations, the

U.S. environmental philosophies are a mixture of cleaning up the past, installing the latest and best technology, and avoiding any additional pollution input by utilizing water and air emission permits

2. Mexico Philosophy

Mexico's environmental philosophy is to concentrate on improving the production technology to ensure current and future processes do not increase the existing pollution backlog. By integrating the latest technology into the current industrial base, Mexico obtains all of the latest environmental prevention technology without the sudden cost of replacing the older production base. Mexico industry will eventually replace its old industrial base in order to stay competitive while financing it through NAFTA and other financed programs. The Mexican philosophy is to control their environmental pollution by 1) prevention of future contamination while 2) cleaning up the past contaminants as they accumulate the industrial wealth and marketing opportunities to do so.

Mexico has an environmental cleanup advantage of not having the billions of dollars of cost potentials in currently polluted intercity sites and/or other super fund dump sites. Their industrial base has an advantage of "control by pollution prevention," as they build and expand their industrial processes with the latest technology (McGuinn, Y.C. 1992). They do have existing problems as exemplified by the burning toxic waste dump in Nogales (Price, R., *Many Blame Waste From Mexico*), the polluted air in the valley around Mexico City, and the polluted Silva Reservoir, all of which will eventually have to be remediated.

Without it being obvious or documented, Mexico appears to have the luxury of waiting for some other country to develop and prove the remediation technology they need before spending any research/ investment funds. Mexico has less than 1/6 of the industrial base that the U.S. has for environmental remediation, but has complete access to U.S. technology, communications, environmental research, and computer technology that the U.S. and other countries have developed. Mexico's position of environmental remediation and avoidance is somewhat analogous to the installation of the new communications base in Mexico. The U.S. has the sunk the cost of thousands of miles of copper cables and telephone poles into its telecommunications Industry. Mexico is going directly to satellite connected

information and data processing, by-passing several levels of communications development paid for by other countries.

SEDESOL seems to have leap-frogged to the leading edge of environmental technology by contracting with major U.S. international companies to review existing, available, environmental regulations and world wide technology and to propose those which are applicable to Mexico.

Under NAFTA, Mexico has gained access to large quantities of monies for upgrading their industrial base in exchange for opening up their borders to imported goods. This allows Mexico to fund their environmental technology revolution during the upgrading of their industries. How well they are taking advantage of this is illustrated by examining the latest air regulations issued and/or up-dated in December, 1994 and published in January 1995. A partial listing of these include:

> NOM-CCAT-010-ECOL/1993. Establishes the characteristics of equipment and the measurement procedure for inspection of levels of pollutant emissions from in-use motor vehicles fueled by gasoline, liquefied petroleum gas, natural gas, or other alternative fuel.
>
> NOM-CCAT-003-ECOL/1993. Establishes the maximum allowable emission levels of pollutant gases from the exhaust of gasoline fueled in-use motor vehicles.
>
> NTE-CCAT-001/88. Updates the procedure for determining the concentration of carbon monoxide in the air.

NOM-CCAT-004-ECOL/1993 Establishes the maximum allowable emission levels of unburned hydrocarbons, carbon monoxide, and nitrogen oxides from the exhaust of new in-plant motor vehicles as well as evaporative hydrocarbons from fuel systems fueled by gasoline, liquefied petroleum gas (LPG), natural gas and other alternative fuels, with a gross vehicle weight of 400 to 3,867 kilograms.

NOM-CCAT-0087-ECOL/1993 Establishing the maximum allowable levels of smoke opacity for exhaust from diesel-powered in-circulation motor vehicles.

NOM-CCAT-012-ECOL/1993. Establishes the maximum allowable emission levels of hydrocarbons, carbon monoxide and smoke from the exhaust of gasoline or gas-oil mixture fueled in-use motorcycles

NOM-CCAT-013-ECOL/1993. Establishes equipment characteristics and measurement procedures for the inspection of emission levels of pollutant gases from gasoline or gas-oil mixture fueled in-use motorcycles.

NOM-CCAT-014-ECOL/1993. Establishes the maximum permissible emission levels for pollutant gases from the exhaust of in-use motor vehicles using liquefied petroleum gas, natural gas or other alternative fuels.

NOM-CCAM-005-ECOL/1993. Establishes measurement methods for the determination of the concentration of sulfur dioxide in ambient air and the calibration procedures for measurement apparatus.

A review of the bibliographies, when available, for the Mexican environmental regulations reveals references to various parts of 40 CFR; the California Code of Regulations, Title 16, various chapters; and a statement that the Norms do not concur with any international standard.

The last water regulation available was NOM-CCA-033-ECOL/1993. It was published in the Official Journal of the Federation on October 18,

1993; in the Federal District of Mexico City, on October 14, 1993; was translated outside Mexico in July 1994; and published as ELN C35 in July 1994. The regulation established the bacteriological conditions for the use of urban or municipal wastewaters as a mixture of irrigation water to use with raw vegetables and fruit. No distinctions is made between stalk, leaf, or root crops. The crops are, or can be, imported directly across the border into south Texas and then distribute to all points north in wholesale food distribution systems. Reviewing the act's bibliography reveals seven of the ten references are U.S. water, wastewater, and emission effluent guidelines and standards.

M. Risk Communications, Proven technology is not always acceptable

The fact that a treatment is scientifically acceptable is not always legally sufficient as people who deal with genetically enhanced milk production and improved genetic tomatoes have discovered. It is possible that a technology can be adequate to meet regulatory requirements and not be acceptable to the public population, consumers or even the court system..

How environmentally sensitive information is communicated to the public is called "Risk Communications" and will play a major part in how Mexico's corporate environmental personnel can report their findings and

procedures. For example: The facts are that non-industrial sludge from New York City is safe to use for fertilizing grain land in Oklahoma and pasture lands in Texas. The studies are partially based on ecological studies conducted in England (Jones, K.C. et al, *Organic Contaminants in Agricultural soil with a known History of Sewage Sludge Amendments* ...). That approval information, isn't acceptable to the people in Oklahoma or south Texas, as land disposal contractors and the city of New York are finding out the hard way through the court system.

The shipment of raw vegetables such as potatoes and carrots, and some fruits such as strawberries, into the U.S. are wide open under NAFTA and GATT but may be politically questionable. The vegetable farms in Mexico can legally use treated and tested city sewage to augment their scarce irrigation water as a safe means for sewage disposal. The U.S. Department of Agriculture (USDA) is also testing the use of polluted, waste water in growing vegetables.

The USDA is taking water that is high in nitrogen and phosphorus (similar to sewage processed "grey" water) from fish growing tanks to hydroponically grow strawberries and lettuce. The practice is considered so safe that the growing test is not about the safeness of the food supply. The project is seeking an acceptable method to purge the wastewater before

releasing it back into public stream as acceptable recycled water. (AP Bureau, Washington, *USDA Researchers using Waste Water on Plants*, 2/16/95). Water and food plant absorption of sewage products is an old form of water recycling and has been used by Japan for centuries. This author has personally visited Japanese vegetable growing farms and they have routinely disposed of their untreated human waste for centuries into water streams used for flood irrigation of both root and leafy foodstuffs.

N. NAFTA and GATT's World Trade Organization

The WTO, as approved by congress in the GATT treaty, is the administrative structure that will help regulate the NAFTA agreement. The WTO has existed since the late 1940's but has never been accepted or ratified until 1994 by the U.S. The initial GATT Environmental Appeals Board is scheduled to have an initial 120 members, with equal votes. The nations will range in size from the tiny Caribbean island nation of St. Kitts up to the U.S. A fully expanded NAFTA will eventually expand into the GATT format. The NAFTA board will be blended into the WTO enforcement structures. Under GATT there are no weighted voting rights or veto authorities. Under the WTO tribunals the rules of decisions are vastly different to what the U.S. population is accustomed. Allegedly the WTO tribunal would have the

authority to:

1) operate in closed door secrecy,
2) ban the press,
3) prohibit citizen groups from either participating or even attending,
4) not disclose the contending governments' briefs and other evidence,
5) not provide public transcripts,
6) have no independent appeal, and
7) limit standing or recognition to national governments only.
(Ralph Nader)

The Uruguay round of GATT negotiations provided solutions to many of the seven listed problems and the Freedom of Information Act (FOIA), gives the public full access to the public transcripts and all of the other information that the U.S. Trade Representatives have.

As of December 31, 1994, 80 GATT members have ratified the treaty including the U.S. (USDOC, Oklahoma International Trade Bulletin, March 1995 p. 4)

A reading of a Congressional Research Service's (CRS) report CRS-94-627A on the WTO states that the agreement does make "acceptance of all trade agreements" a condition of WTO membership. Initially decision making is by consensus, but if that fails, then a majority vote, one country-one vote will decide the issue. The legislative attorney writing the report did not feel that WTO adopted panel and appellate reports would have a direct effect on U.S. laws. In addition to the improvements negotiated into GATT

by the Uruguay Round, Congress has a safeguard against GATT with a clause inserted in Title I, of the Omnibus Trade and Competitiveness Act (OTCA) of 1988, 19USC2901 et seq that no trade agreements entered into by the U.S. can be amended with force against the U.S. without an implementing bill being enacted into law. (Grimmett, J.J., PCRS-2, footnote 3). In addition the current administration has agreed to support a WTO Dispute Settlement Review Commission. Not-with-standing, the WTO is going to have an impact on independent nation's environmental laws.

One U.S. law regulating the vehicle fuel economy and luxury taxes has already been reviewed by the WTO. The WTO panel agreed that the U.S. Corporate Average Fuel Economy Law (CAFE), called the "gas guzzlers" act, "was in conflict with the GATT intent." However, the panel decided that a country's conservation measures can excuse a country's laws that are otherwise inconsistent with the GATT. Of $558M in "gas guzzler" fines, European producers had to pay $494M (88.5%) of the fines. (Dunnne, N. & Williams, p. 4)

The gas guzzler controversy comes under a segment of GATT called a Nontariff Trade Barriers (NTB) which is eventually going to be used by other trade partners to challenge a number of U.S. ecological protection laws and regulations. The floating, long net tuna embargo against Mexico was

overturned under this NTB clause. However, the NTB is a two edged sword.

The U.S. is using the NTB provisions to attack Europe's ban on imports of U.S. products treated with hormones. This is an attempt to force the acceptance of U.S. beef and pork exports baned since 1989. (AP Bureau, world Staff, *U.S. to Attack EU Meat Ban*, 4-8-95)

CHAPTER THREE.

CROSS REFERENCE INDEX

The best method of documenting the interfaces of the two countries Regulatory sources and Environmental Laws was to create a cross reference index as provided in Appendix A. The first step in creating the index was by researching the regulations and creating an alphabetical table of contents. This was accomplished by reading the Mexican regulations and developing a Table of Contents with reference columns that identify the references which apply to each item in the table.

A. Definitions of Column Headings

Referencing Appendix A, page 94, there are six columns on each page, alphabetically labeled and titled:

A. "Titles of Laws & Regulations,"
B. "Ref;" reference source of the subject title,
C. "C/T/C;" categories, titles, and chapters of the referenced source,
D. "S/A/I;" section/article/item of the "C/T/C" from column C,
E. "Specific Mexican Laws" is the reference standard for the subject title,
F "American Law" is the reference in column "F" for the subject.

Where environmental laws are not available then the reference columns are left blank until the law(s) are expanded to cover the item, additional research provides a reference, or an acceptable legal precedence can be identified. In many cases, the published standards are similar in both countries.

To the best of this researcher's knowledge there is no other environmental cross-reference available, either published or unpublished.

B. Acronyms and Definitions

In order to have a more compact thesis document and a quick reference to the applicable acronyms, an Acronyms and Definitions section was provided immediately following the Table of Contents.

C. Column "B" Heading Definitions

There are three sources cited in column "B" of the cross-reference indexfor the regulations reviewed. These are:

1. ELN (Mexico's) Environmental Laws and Norms,
2. EMI Environmental Management for (Mexican) Industry (including Maquiladoras), and
3. EEE Ecological Equilibrium and Environmental Law.

For a detailed description of reference information, their table of

contents, and other sources, the reader is referred to appendix B.

D. Column "C" Heading Definitions

Column C is column's B's references broken down into more details as provided in appendix B.

E. Column "D" Heading Definitions

Column D's "S/A/I" listings are a detailed third level reference for the itemized subject in column "A."

F. Column "E" Heading Definitions (Mexican Labor Law References)

The specific Mexican laws are the reference citations, almost all of which contain acronyms in the published titles. These acronyms are reviewed here then provided in the Acronyms and Definitions following the Table of Contents:

1. NTE; National Technological Ecological (NTEs, being replaced by NOMS),

2. CCA; Criteria, Control of Aqua (water),

3. NOM; "Norm, Ofical Mexico" (official standards), replacing NTEs,

4. CE; Criteria, Ecological.

G. Column "F" Heading Definitions (American Law References)

The specific U.S. laws also include their acronyms which are provided in the list of acronyms. The Code of Federal Regulations (CFR) are grouped into their intended purposes which are:

1. 29CFR, Occupational Safety and Health Agency (OSHA)
2. 40CFR, Environmental Protection Agency (EPA)

CHAPTER FOUR

HOW TO USE THE THESIS RESEARCH MATERIALS

The easiest way to use the "cross reference index" is to locate the topic of interest in the alphabetical listing in column A, then look up and read the provided references. The second and best method is to review the referenced materials in sections four and five of this thesis with their detailed table of contents in appendix B. This allows you to know where to look for the categories of data in case the reader's specific topic of interest is not listed in the description column ("A") of the cross-reference. The Mexican regulations do not have an alphabetical index so unless a topic is listed in the cross-reference, the reader must know where to look for detailed information about the topic of interest.

A. Available Sources

In review, the basic Mexican Index References are:

1. EEE, *Ecological Equilibrium and Environmental Protection Law* enacted by the Mexican Government which can be ordered through the Mexican Consultant. It is contained in its entirety in various sources.

2. ELN, *Environmental Laws & Norms* which is a registered and copyrighted publication published by Specialty Technical Publishers (STP), Inc. as provided in the "Cited References" of the thesis. The information is also available from Environmental Resources Management.

3. EMI - *Environmental Management for Mexican Industry Including Maquiladoras* is another copyrighted publication published by Specialty Technical Publishers, Inc. as provided in the "Cited References" of the thesis.

B. Structures Of The References

Each of the background text references are broken down into similar formats with somewhat different titles for the structures as they are produced by different organizations. Appendix B provides a table of contents and detailed instructions on how to use the information.

C. Examples of How To Use The Cross Reference

Having scanned the widely varied subjects in the referenced regulations listed in Appendix B, the reader should now have a greater appreciation of the Cross Reference's ability to correlate the information into a more usable format.

1. Disclaimer

A cross reference disclaimer is required at this point. No guarantees of any kind are implied or intended as to the total inclusion of all cross references covering the large body of related regulations. The regulations are constantly being changed and upgraded. Even as this thesis was in its final draft, the author has received two new update of Mexican Regulations which contains several updates and four single spaced pages of reference number changes with the explanation that "Mexico recently passed a Norm changing the numbers for several of the norms covered in Mexican Laws and Norms."

2. Air Quality

For the first example, the question is posed: "Where does one find comparable regulations for comparing the evaluation criterions for air quality?" Going to appendix A, page 93, the reader would find "Air Quality" in column A, lines 13-15: Monitoring stations (13), Evaluation Criteria(14), and Surveillance and Control Regions (15). The "Evaluation Criterions" are found in the Mexican references in ELN (column B), Categories B1 (column C), Articles A1 through A5 (column D) and in 40 CFR 1210.1710 (column F) in the American regulations.

The next three examples are for bodies of regulations prominent in the U.S., but not an identified regulation per se in Mexico. These examples require some detailed knowledge of the subjects and reflective thought as they are not listed directly in the cross reference. The three examples are:

- biological health risk assessments based on epidemiological studies,
- sewage Sludge Disposal, and
- hazardous Communications.

3. Biological Health Risk Assessments,

Referencing the cross reference index, there are no listings for "biological health risk" or "epidemiological studies." By going to appendix B, page 118, the reader can reference the table of contents for Mexico's Environmental Laws and Norms (ELN) manual. The reader will find Section E of the manual is dedicated to Health and Safety with 20 related articles E1-E20. Specific subcategories of the ELN are:

A - General explanations of environmental laws,
B - Air,
C - Water,
D - Solid and hazardous waste,
E - Health and safety, and
F - Controls of industry.

A detailed title review of the ELNs reveals that Mexico does not yet

have an Official Norm dedicated to "Biological Health Risk Assessments." Referencing the EMIs in appendix B, page 118, will also disclose no Biological Risk Assessment titles. This is understandable as the quantitative technique of "Biological Risk Assessments" were developed by the EPA, to calculate "chronic" health risk to potential receptors as part of the Superfund Program, which Mexico has not initiated.

Reviewing the cross reference in Appendix A, there are no biological entries, but there are three entries under "Risk Assessment" found on page lines 443, 444 and 445 of page 109 and 110:

> 1) "Risk Assessment, Preliminary," line 443, to be found in EMI, Section 4.1.0., annex 4b, which will be an outline, according to Column "E."
>
> 2) "Risk Levels Assessment," line 444, is in ELM Category E1, whose authority is the Social Security Act of Mexico.
>
> 3) "Risk Management-Report quantities," line 445, in EMI, Section 11.0.0. which is a list and checklist.

Researching the first entry from line 443, the reader will find a "guidance for developing a Preliminary Risk Assessment," a well designed, 13 page, qualitative, ecological, social-economical questionnaire. The document is designed to "Identify potential Social, Physical, and/or Health Risk the project will create to the construction workers, site environment and ecology within 10 Km of the site."

Researching the second reference from line 444, "E1" in ELN E1, (Mexico's Environmental Laws and Norms), the reader will discover that all Mexican industries are classified in five levels of risk and their "Occupational Accident and Disease Insurance" rates are imposed by Mexico's Social Security Act and assessed accordingly. The five levels are:

1) "Ordinary Risks of Life," which is the production of food, drinks, clothing, schools, drugs, paper products etc.

2) "Low Risk," which are supermarkets, container assemblies, transportation assembly, footwear, clothing, public broadcasting etc.

3) "Medium Risk," which is chemical & fertilizer production, aircraft assembly, carpentry workshops, clearing work, housing etc.

4) "High Risk," which involves oils, cement plants, explosive liquids, distillation of coal, metallic mineral plants, fishing industry etc.

5) "Maximum Risk," which involves asbestos-cement, diving, quarries, production of explosives, pits, pyrotechnics, well drilling etc.

Some categories, such as explosive liquids and/or fluids, appear in different risk levels. The concentrations required by the risk assessment questionnaire from EMI 4.0, annex 4b identified on line 443 of the cross reference identified above, provide the required information to be used in the final classification. The questionnaire requires the information for each substance involved in the processes proposed for construction to include the substance's:

1) toxicity,
2) genetic damage,
3) explosiveness,
4) flammability,
5) reactivity, and
6) corrosiveness.

Researching the third entry EMI 11.0.0 from line 445, the reader finds the Section entitled "Risk Management (chemical emergency preparedness)." The SEDESOL risk management regulations are established for the handling of those substances classified as high risk. The high risk definitions are expanded in EMI 11.0.0 to include more physical risk areas and are defined to be:

1) substances that could form explosive clouds,

2) chemicals that are present in quantities that could result in the presence of concentration limits greater than those allowed, in a 100 meter strip around the industrial site,

3) a high risk because of their:

a) radioactivity,
b) biological properties,
c) flammable,
d) explosiveness,
e) toxicity,
f) reactivity, or
g) corrosiveness.

Considering that there are no detail analysis in Mexican regulations for the chronic effects that hazardous chemicals have on contaminant receptors,

the reader would be led to ask about Mexico's limits on acute hazardous chemicals and how they compare to the U.S. regulations. Going to line 11 of the Cross Reference's page 93, the reader will find a listing for "Air Contaminants, Emissions for Mexican Industries," with a Mexican reference of ELN E9 and a U.S. reference of 29 CFR 1910.1000. A quick check by the reader of Table 5.7 in the next chapter will reveal that the allowable eight hour contaminant levels between the two countries are exactly identical.

4. Sewage Sludge Disposal

The reader's next question could relate to disposal of city sewage sludge. One disposal method is by land farming. Land farming, while not popular in the U.S., is an approved method, under controlled conditions, of sewage disposal which allows the nutrients to be returned to the soil as fertilizer. Turning to the alphabetical listing of the Cross Reference on page 104, the reader will find land farming (line 297) and land disposal (lines 294-295) with a reference to EMI 8.2.4. However, if the reader, reads EMI 8.2.4 he will discover that the regulations state "The land disposal of non-hazardous waste is not recommended."

Knowing that both water and fertilizer are in short supply in Mexico, the reader would look under Sewage Sludge and Irrigation on line 464 of

the reader would look under Sewage Sludge and Irrigation on line 464 of page 110, which references to ELN's C34 & C35. Both allow irrigation with liquid city sludge. C34 sets the organic toxic pollutants and heavy metal limits while C35 sets the bacteriological conditions where the restrictions are related to time between irrigation and harvesting. In attempting to develop comparative tables for the U.S. land disposal standards from 40 CFR 261.24 vs Mexico's irrigation standards from C-34, it is noted that they are not directly comparable. The different regulations are written for different purposes. The lesson to be learned here is that a direct comparisons of the laws between the two countries are not always possible.

5. Hazardous Communications, example

The Hazardous Communication Standard (HCS) is based on employees "right to know" the hazard's of the chemicals they are exposed to when working, (29 CFR 1910.1200, appendix E). The U.S. standard has several requirements which when integrated, becomes the Hazardous Communication System (HCS also). These requirements are:

a) a readily accessible listing of all hazardous substances in the workplace,

b) container labels, safety placards, chemical identifications , and labeling of all piping,

c) material Safety Data Sheets on all hazardous chemicals,

d) information as to who is responsible,

e) training and records, and

f) contingency Plans.

Checking the "Cross Reference," there is not a "Hazardous Communications" listed but by looking up each of the six listed HCS elements independently the reader will find a line reference for three of the six entries as provided below:

a) Workplace, contaminants, concentration limits, line 588, page 114,

b) Labels & Symbols, Transport Containers & Vehicles, line 292, page 104,

c) Material Safety Data Sheet (MSDS), none listed but several different MSDS Spanish language forms are found in the Forms Section of EMI.

d) Responsibility, looking under "Risk Management - Report Quantities," line 445 of page 110, provides a reference in EMI 11.0.0.. The SEDESOL Risk Management Regulation is tailored for High Risk Substances but is an excellent summary for developing a hazardous communication program..

e) Training and Records, none are listed in the cross reference nor are records listed. Under "Medical Examinations." there is one regulation, E10, listed on line 318 of page 105. However, a reading of the referenced E10 discloses no training requirements at that location.

Browsing through the cross reference index will disclose that under the Hazardous Waste Section, line 262 of page 102

there is a Hazardous Waste Training and Records regulation, EMI 7.2.6.

f) Contingency Plans are not listed in the Cross Reference, but referring back to "Risk Management for High Risk Facilities" on line 445 of page 110 discussed above, there is a requirement for contingency plans, training, practice and incident simulations for current incident management procedures (EMI 11.0.0)

CHAPTER FIVE

DEVELOPMENT OF RESEARCH MATERIALS TO COMPARE U.S. AND MEXICAN ENVIRONMENTAL LAWS

This chapter is designed to give an overview of comparative laws and regulations related to Mexican standards. The reader must understand that individual regulations are changing almost weekly and individual project research must be conducted at the time of project implementation to include the new publications.

A reader's assumption might be that each set of regulations has a matrix table of numbers defining the overall standards. This is not the case as many of the regulations are tailored to specific topics within the categories such as Mexico's discussion of motorized bicycles within noise levels.

A. Water Comparisons

Mexico's water norms are listed in chapter 2, section H, subsection 3, on page 47 and compared to the U.S. water standards in Table 5.1 on page 78. The standards vary widely reflecting specialization of the regulations as to the water's usage.

Table 5.1 COMPARISONS OF WATER QUALITY

Water Pollutants (ug/l)	U.S. STANDARD 40 CFR 131.36 Drinking[1]	U.S. STANDARD 40 CFR 131.36 Fresh[2]	Mexican Drinking Aqua[3]	Mexican Fresh Aqua[4]
Arsenic	0.018	360.0	500.0	200.0
Benzene	1.2	0.0	10.0	depends[5]
Cadmium	0.0	3.9	10.0	50.0
Chloroform	5.7	0.0	30.0	300.0
Copper	0.0	18.0	1.0	depends
Cyanide	0.0	22.0	200.0	1,000.0
Lead	0.0	82.0	50.0	1,000.0
Mercury	0.14	2.4	1.0	10.0
Nickel	610.0	1,400.0	10.0	4,000.0
Selenium	0.0	20.0	10.0	0.8
Silver	0.0	4.1	50.0	depends
Zinc	0.0	120.0	5,000.0	11.0

Footnotes:

1. Levels for $<1x10^{-6}$ Carcinogenic Risk, 40 CFR 131.36
2. Criterion max for Fresh Water, 40 CFR 131.36
3. Criteria for Mexico's Drinking Water CE-CCA-001/89, EMI T6-1
4. Criteria for Mexico's Fresh Water NTE-CCA-031/91, EMI T6-1
5. Depends - Calculations of other water constituents such as hardness

B. Solid And Hazardous Waste

All solid waste is not hazardous and in fact non-industrial sewage which is solid but not hazardous is one of the hardest to dispose of because

of the great bulk produced in the U.S. A small percentage of non-industrial sewage is land farmed but the U.S. has a disposal problem and in the future the current land farming disposal rate and outlets must be doubled or tripled to dispose of the increasing quantities of this solid waste. "Land farming" is the incorporating of sewage sludge on or into the land to condition the soil or fertilize crops or vegetation grown in the soil. Under Mexico's EMI 8.2.4 Waste Treatment and Disposal, the rule is "On-site land disposal of non-hazardous waste is not recommended unless there are extenuating circumstances." "Land Farming" by title is not covered by Mexican regulations. However Mexico does blend liquid sewage waste into their irrigation water and thus avoids the cost of drying and transportation facilities plus simplifying the disposal process. Liquid wastes are not land filled. (ELN C35, NOM-CCA-033-ECOL/1993)

Solids and Hazardous waste consist of three categories: Inorganic (Table 5.2), organic (Table 5.3),and volatile organic (Table 5.4). The inorganics are the metals.

Table 5.2 COMPARISON OF INORGANIC CONSTITUENT LIMITS

FOR TOXICITY LEVELS

INORGANIC CONSTITUENT (mg/l)	U.S. STANDARD 40 CFR 261.24	MEXICO'S STANDARDS (NOM-CRP-001) (ELN D3.38T5)
Arsenic	5.0	5.0
Barium	100.0	100.0
Cadmium	1.0	1.0
Hexavalent Chrome	5.0	5.0
Nickel	5.0	5.0
Mercury	0.2	0.2
Silver	5.0	5.0
Lead	5.0	5.0
Selenium	1.0	1.0

The second and third solid waste tables (5.3 and 5.4) are the comparison of the Organic Constituents between the U.S. and Mexico. The difference between the elements in the tables are the volatile nature of the organic constituents.

Table 5.3 COMPARISON OF ORGANIC POLLUTANT STANDARDS

ORGANIC CONSTITUENT (mg/l)	U.S. STANDARD 40 CFR 261.24	MEXICO'S STANDARDS (NOM-CRP-001) (ELN D3.38T6)
Acrylonitrile	5.0	5.0
Chlordane	0.03	0.03
O-cresol	200.0	200.0
M-cresol	200.0	200.0
P-cresol	200.0	200.0
2,4-Dichlorophenoxyacetic Acid	10.0	10.0
Endrin	0.02	0.02
Hexachloroethane	3.0	3.0
Lindane	0.4	0.4
2,4,5-Trichlorophenol	400.0	400.0

The third table, 5.4, contains the comparison of Mexico vs. U.S. volatile constituent. Their volatility is part of the control problem as they dissipate into the atmosphere and surrounding environment before they can be controlled.

Table 5.4 COMPARISON OF VOLATILE ORGANIC POLLUTANT STANDARDS

VOLATILE ORGANIC (mg/l)	U.S. STANDARD 40 CFR 261.24	MEXICO'S STANDARDS (NOM-CRP-001) (ELN D3.38T7)
Benzene	5.0	5.0
Chloroform	6.0	6.0
Carbon Tetrachloride	0.5	0.5

C. LAND APPLICATION FOR SEWAGE SLUDGE

Land application for non-industrialized sludge can be either a dry material placement or an element of irrigation.

Table 5.5 U.S. LAND APPLICATION FOR SEWAGE SLUDGE VS MEXICO'S IRRIGATION STANDARDS (not directly comparable)

POLLUTANT	U.S. STANDARD 40 CFR 503.13(b)T4 (kg/hectare annual)	MEXICO IRRIGATION C34-CCA-032 (mg/l)
Arsenic	2.0	0.1
Cadmium	1.9	0.01
Chromium	150.0	None
Copper	75.0	0.2
Lead	15.0	5.0
Mercury	0.85	none
Molybdenum	n/a	none
Nickel	21.0	0.2
Selenium	5.0	0.02
Zinc	140.0	2.0

Table 5.6 RATES OF POLLUTANT MAXIMUM CEILING

CONCENTRATIONS FOR LAND APPLICATION
(These values are shown as a general comparison)

POLLUTANTS	U.S. STANDARD 40 CFR 503.13(b)T1 (Milligrams/Kilograms)	MEXICO IRRIGATION C34-CCA-032 (mg/l)
Arsenic	75.0	0.1
Cadmium	85.0	0.01
Chromium	3,000.0	none
Copper	4,300.0	0.2
Lead	840.0	5.0
Mercury	57.0	none
Molybdenum	75.0	none
Nickel	420.0	0.2
Selenium	100.0	0.02
Zinc	7,500.0	2.0

D. Lead Pipes, Solder, and Flux

U.S. Standard 40 CFR 141.43 requires total prohibition; the Mexican standards are not published yet.

E. Air Controls

Air controls are set for maximum permissible concentration levels of contaminants in workplace environments for an 8 hour shifts.

Table 5.7 AIR CONTAMINANT LIMITS FOR AN 8 HOUR SHIFT

CONTAM-INANT	U.S. STANDARD 29 CFR 1910.1000 (Table Z-1)	U.S. STANDARD 29 CFR 1910.1000 (Table Z-1)	MEXICO STANDARDS (ELN E-9, Table 1)	MEXICO STANDARDS (ELN E-9, Table 1)
	PPM	MG/M^3	PPM	MG/M^3
Ethyl Acetate	400	1,400	400	1,400
Isopropyl Acetate	250	950	250	950
Methyl Acetate	200	610	200	610

F. Health and Safety

The Health and Safety Regulations of ELN, Section E, genetically listed in chapter two, section four, in general match the OSHA regulations contained in 29 CFR 1900 and subsequent sections. There are a large number of very good checklists under specific headings which will assist in defining good health and safety practices.

The health regulations include individual guidance for defining of dangers for various industries, filling out accident reports, medical requirements, instructions for building conditions, personal protection equipment etc. At present 20 Health and Safety regulations have been issued but more are continuously being published as new industries are reviewed and requirements established.

G. General Norms and Controls of Industry

As generically listed in chapter two, section five on page 50, there are four general administrative regulations and nine control regulations. The general regulations include the government guidance on how to establish government controls, agencies and committees. The control regulations include fiscal incentives, two general regulations on "Ecological Equilibrium," and several instructions on how to prepare various forms, preventive reports and treaty agreements which relate to Mexico's environmental program. .

CHAPTER SIX

SUMMARY AND CONCLUSION

In summary, the environmental cross reference index between Mexican and U.S. Laws is in appendix A, starting on page 93. The instructions on how to use it are in chapter four, starting on page 67. This thesis provides both an exploration of the regulations of both countries and a cross reference between them. To complete this thesis the Mexican environmental regulations were obtained and read in detail, then crossed referenced to the U.S. regulations.

The comprehensive depth of the regulations varies between the two countries, with the U.S. being more detailed to force remediation of past contaminations and prevention of future health damages. Mexico is targeted to "preventive regulations," which are based on U.S. research precedents.

Mexican regulations have some shortcomings but also some strong points. The most obvious short comings are a lack of regulations for health risk assessments, records for worker's training, and land farming of non-industrial sewage sludge. However, Mexico has an excellent regulation format. They are grouping their laws into industrial summaries, whereby the EMIs provide the basic environmental requirements in a collected format to

make it easier on industries to comply with those regulations.

As discussed in Chapter two, section I, page 49, Environmental Management for Mexican Industry, the same Mexican agency (SEDESOL) that has responsibility for environmental regulations, has the responsibility for development of natural resources, and the research and development for environmental protection. The dual responsibility of environmental protection and natural resources development maintains a conservative cost conscience approach on expansion of environmental regulations. Having the latest research on environmental remediation, helps implement the latest technology without wasting research time and monies.

The health standards, as exemplified by the comparison tables in chapter five, have not suffered as Mexico has largely adopted the U.S. standards which were developed after extensive ecotoxicity studies of the ecological communities of concern. Chapter five provides several comparison tables which show that the environmental standards are almost identical. In some cases the standards do vary as the needs and philosophies of the country are different.

This thesis has accomplished its objectives of comparing U.S. and Mexican environmental regulations and providing their cross-reference.

BIBLIOGRAPHY

Access, *I-35 promoted as major NAFTA corridor*, published by Oklahoma Department of Transportation, V 26, #12, December 1994, P-6.

AP Bureau, Chalco Mexico, *Mexican Workers NAFTA'S losers*, published in Tulsa World News, December 12, 1994, News p 14.

AP Bureau, Mexico City, *Mexican Debtors Protest*, Tulsa World News, March 21, 1995, pg B-2.

AP Bureau, Mexico City, *Probe Sought of Bird Kills in Mexico*, published in Tulsa World News, January 5, 1995, Classified P 7.

AP Bureau, Washington, USDA Researchers using Waste Water on Plants, Tulsa World, 2-16-95.

AP Bureau, World Staff, *U.S. to Attack EU Meat Ban*, Tulsa World, April 8, 1995, p B-1.

Barker, T., *Refining Mexico*, Tulsa World, March 21, 1995, pg B-2.

Carson, T. & Cox, D., Hazardous Materials Management, published by Institute of Hazardous Materials Management, Rockville, MD., 1992)

City Hall, Published in Brownsville, November 23, 1994.

Congressional Research Service, of the Library of Congress:

GATT: General Agreement on Tariffs and Trade, IB 481G, Nov., 1994
GATT and Other Trade Agreements: Congressional Action by Statute or by Treaty? IB94-890 S updated Nov 17, 1994,
Trade and environment: GATT and NAFTA, IB94-165 ENR, updated Apr 4, 1994,
Trade Negotiations: The Uruguay Round IB86147, updated Oct 7,1994,
Uruguay Round, Industry Issues IB94030 updated Oct 7, 1994,
World Trade Organization: Institutional Issues and Dispute Settlement IB94-627A updated Aug 3, 1994,

Eaton, T., *Mexican president gets off to rocky start with Chiapas, currency troubles*, Mexico City Bureau of the Dallas Morning News, December 29, 1994, p 1 & 10A.

Environmental Professional Development - Certification Program, Okla. State University, Engineering Extension Department, 1994-95 Program.

EPA, Vendor Information System for Innovative Treatment Technologies (VISITT), EPA 542-R-94-003 #3, Version 3.0, July 1994. call 1-800-245-4505.

Eroles, Maricarmen, ***Sierra Blanca area continues to be magnet for nation's waste dumps***, Texas Environmental News, January 10, 1995, p 23.

Everly-Douze, S., *New EPA Flexibility Aids Dirty-Air Fight*, Tulsa World, January 9, 1995, News P 1-3.

Hayward, S., Associated Press-Mexico City, *NAFTA's first year proves sobering to Mexico*, Valley Star, p A1&A12.

Institute of Hazardous Materials Management, Handbook on Hazardous Materials Management, 5th Edition, 1992.

Handy, J., Free Trade Bridge is most modern crossing on border, $16 million facility has capacity to expand, News Publishing Co. Inc., Winter Texan Visitor Guide, November 1993, p-3.

Johnson, W.I. & Madden, M.P., Installation Restoration and Hazardous Waste Control Technologies, published by U.S. Army Corps of Engineers Toxic and Hazardous Materials Agency and The National Institute for Petroleum and Energy Research, 1992.

Jones, K.C. et al, *Organic Contaminants in an Agricultural Soil with a Known History of Sewage Sludge Amendments: Polynuclear Aromatic Hydrocarbons*, Institute of Environmental an Biological Sciences, Lancaster University, England,

Mader, R., ***Brownsville/Matamoros touted as site for first eco-industrial park in United States,*** Texas Environmental News, January 1995, p 23.

Margolis, J., *Lawlessness Alive Out West, - Employees Enforcing Environmental Laws Face Threats,* Chicago Tribune, published in Tulsa World, December 8, 1994.

McMahon, C., Lake in Mexico Death Trap for 40,000 water birds, Chicago Tribune, published in Tulsa World, 2-19-95 CP-30.

McCracken, P., ***Chile first Latin American country slated to join NAFTA partnership***, Texas Environmental News, January 1995, p 25.
Mexico City Bureau of Dallas Morning News,

McGuinn, Y.C. and Theodore, L., Pollution Prevention, Published by Van Nostand Reinbhold, N.Y., Y.Y., 1992.

Monasterio, F.O. & Stuckey, M.C., ***Environmental Management for Mexican Industry (including Maquiladoras)***, published by Specialty Technical Publishers, Inc., North Vancouver, B.C., Canada, 1995.

Monasterio, F.O. & Stuckey, M.C., ***Mexico: Environmental Laws and Norms***,

published by Specialty Technical Publishers, Inc., North Vancouver, B.C., Canada, 1995.

News Publishing Co. Inc., Maquiladoras aid border businesses, twin-plants play important role in Rio Grande Valley economy, Winter Texan Visitor Guide, November 1994.

National Institute for Petroleum and Energy Research (NIPR) & U.S. Army Corps of Engineers (USACOE), Installation Restoration and Hazardous Waste Control Technologies, CETHA-TS-CR-92053, 1992 Edition, November 1992.
Obmascik, M., A New Era for Emissions Tests Begins: Cleaner Air has Price Tag, The Denver Post, January 2, 1995, p 1 & 7A.

Oklahoma Department of Commerce & U.S. Department of Commerce, *Oklahoma International Trade Bulletin*, Recognizing and Heeding Cultural Differences Can Be Key to International Business Success, December 1944, p 2-4.

Oklahoma Directory of Manufacturers and Processors, Oklahoma Department of Commerce, 1992-93.

Rangel, E., Dallas Morning Star Bureau, McAllen, ***NAFTA helps some, hurts others on border***, Valley Morning Star, December 27, 1994, pA2.

Paztor, A., Power Plants in Mexico Cast Pall over NAFTA, Wall Street Journal, September 8, 1993, P-B1.

Paztor, A., U.S., Mexican Officals plan to Create Air-Pollution Zone for Border Residents, Wall Street Journal, Sept 10, 1993, p-A4.

Powell, S., *A Mystery at Lake DeGray*, published in Tulsa World News, January 10, 1995, Sports P 7.

Rangel, E., NAFTA helps some, hurts others on border, Valley Morning Star, Harlingen, Texas, Dec. 27, 1994, P-A2.

Rangel, E., *NAFTA'S FALSE HOPES, Smaller border towns in Mexico, U.S. looking for payoff*, Dallas Morning News, December 28, 1994, P-C1.

Rio Grande Valley Business, published in McAllen Texas, December 19/26 1994,

Speciality Technical Publishers, Environmental Management for Mexican Industry - Including Maquiladoras, Published by STP, North Vancouver, B.C.,Caanada, 1995.

Specialty Technical Publishers, Inc., Mexico: Environmental Laws and Norms, Published by STP, North Vancouver, B.C.,Caanada, 1995.

Tulsa World, *Environmentl Rule Cost Blasted*, Santa Fe, N.M. published Dec. 7, 1993, P-B2.

Tulsa World, *U.S, to Attack EU Meat Ban*, April 8, 1955 pg B-1.

USACOE, Installation Restoration and Hazardous Waste Control Technologies, CETHA-TS-CR-92053, prepared by The National Institute for Petroleum and Energy Research (NIPR), 1992 Edition.

USDOC-Bretl, K., Environmental Technologies Exports - A guide to U.S. Government Resources," unpublished for Office of Environmental Technologies Exports (ETE), 1995.

USDOC-Bretl, K., Export Assistance Programs - Environmental-Specific Export Programs, unpublished for Office of Environmental Technologies Exports, 1995.

USDOC-*Chile and Argentina: Environmentqal Technologies Export Market Plan*, Trade Promotion Coordinating Committee/Environmental Trade Working Group, October 1994.

USDOC-Fletcher, W. and Sobin, R., *The International Market for Environmental Goods and Services*, Congressional office of Tecdhnology Assessment, 1994.

USDOC - Strauss, T., The Environmental Technologies Export Handbook, unpublished - by the International Trade Administration, 1995.

USDOC, Caribbean Basin Initiative, January 18, 1995.

USDOC-EEE, Bretl, K., Environmental Technologies Exports - A Guide to U.S. Government Resources, published by Environmental Technologies Exports (ETE), 1995.

USDOC-EEE, Bretl, K., Export Assistance Programs - Environmental-Specific Export Programs, 1995.

USDOC, International Trade Administration, National Trade Data Bank-Mexico,

BMR9403	Pollution Control Equipment,
IMI930330	Nuevo Leon Environ Services Market Prfl,
IMI930927	Environmental Protection News,
IMI931220	Environmental Contacts,
IMI9401254	Environmental Clean-Up Projects,
ISA9312	Solid/Hazardous Waste Management Equip./Svcs.

ISA9402 Air Pollution Control Equipmnet
ISA9405 Water Pollution Control Equipment

USDOC, Oklahoma International Trade Bulletin, March 1995, pg 4

USDOC, Strauss, T., *The Environmental Technologies Export Handbook*, 1995,

USEPA, *Remediation Technologies Screening Matrix - Reference Guide*, Office of Solid Waste and Emergency Response Technology Innovation Office, Washington, DC 20460, July 1993.

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5	Agricultural Irrigation, Municipal & Urban Contamin	EMI	6.1.2	Annex 6A	NTE-CCA-032-91	40CFR403
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8	Agriculture Irrigation, Conditions for treated H2O	EMI	6.1.2	Annex 6A	NTE-CCA-032-91	40CFR403
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12	Air Emissions Programs	EMI	5.0			40CFR50-99
13	Air Quality Monitoring Stations					40CFR58
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15	Air Quality, Survillance & Control Regions	ELN	B 1	A1-5		40CFR81.11
16	Air Stripping-Air Quality Standards					40CFR50
17	Airborne Particulate Matter Determination	EMI	5.1.2	Annex 5A	NTE-CCAT-002-88	40CFR50.6
18	Alternative fuels emission levels	ELN	B29		NOM-CCAT-014-ECOL/93	40CFR86-92,Ca,T16C33
19	Aluminum Forming, HAZ WASTE, Stds & Reports	ELN	D3	Table 2.3	NOM-CRP-001-ECOL/93	40CFR60.190/467
20	Ambient Air Quality Standards					40CFR50
21	Ancillary Facilities of Haz Waste Contaminant Units	ELN	D10		NOM-CRP-005-ECOL/93	
22	Animal Slaughtering & Meat Packing	ELN	C23		NOM-CCA-022-ECOL/93	40CFR432
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25	Aquatic Life Coastal Water Quality Requirements	ELN	C13	Table 1	CE-CCA-001-89	40CFR220-233
26	Aquatic Guidelines for Toxic Substances					40CFR797.1050-1970
27	Aquatic life Fresh Water Quality Requirements	ELN	C13	Table 1	CE-CCA-001-89	40CFR125.10
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30	Asbestos Construction Mfg Industry Discharge	ELN	C4		NOM-CCA-008-ECOL/93	40CFR427
31	Asbestos Textiles, Friction Matls & Sealants Indust	ELN	C37		NOM-CCA-020-ECOL/93	40CFR427
32	Asbestos-limits & Procedures	EMI	6.1.2	Annex 6A	NTE-CCA-008-88	40CFR763.120+
33	Asphalt Facilities Emissions/Effluent					40CFR60.90-93/
34	Atmospheric Control, Prevention,Control & Reporti	ELN	B 9	A1-51+	General Law-many	42USC1857et seq
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44	Bulk Gasoline Terminals Emissions/Effluent					40CFR60.500/
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46	Cane Sugar Industry,Wastewater discharge	ELN	C14		NOM-CCA-002-ECOL/93	
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53	Cement & Concrete Burning Ovens' Particles	EMI	5.1.2	Annex 5A	NTE-CCAT-002-88	40CFR60.50
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57	Characteristics of Hazardous Waste-Industry Listin	ELN	D3	Tables	NOM-CRP-001-ECOL/93	40CFR261
58	Chemical Fate Texting Guidelines					40CFR796
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65	CO Measurement Method & calibrate Equip	EMI	5.1.2	Annex 5A	NTE-CCAT-001-91	
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68	Coffee Benefits-limits & Procedures	EMI	6.1.2	Annex 6A	NTE-CCA-027-90	
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77	Control,Safety Mea,Penalties-Public Denunciation	EEE	T6C7	A189-194	General Ecology Law	
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259	Haz Waste, Toxicity Constituents	EMI	7.1.5	Annex 7B	NTE-CRP-002-89	
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423	Preserved Food Packing Industry, Wastewater	ELN	C25		NOM-CCA-023-ECOL/93	40CFR407
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425	Pressed and Blown Glass, Contaminants	ELN	C 5	A1-8	NTE-CCA-011-88	
426	Preventive Report, Formation-Ecological Damage	ELN	F 4	Outline	Gen Law F2, A7 & 8	
427	Protected Natural Areas	EEE	T2	A44-87	General Ecology Law	
428	Public Hearings, Effluent Stand's for Toxic Pollutants					40CFR104
429	Publicly Owned Treatment Works					40CFR122
430	Pulb & Paper- Effluent limits & Procedures	EMI	6.1.2	Annex 6A		40CFR430
431	Pulp and Paper, Wastewater to waterbodies	ELN	C8-3		NOM-CCA-015-ECOL/93	40CFR430
432	Pulp, Recycled Fiber Industry, Wastewater	ELN	C28-3		NOM-CCA-025-ECOL/93	40 FR430
433	Radiation Protection Programs					40CFR190-192
434	Radionuclides					49CFR173.435
435	RCRA-Resource Conversation & Recovery Act 1976					42USC9601-9675
436	Recreation Water Contact Quality Requirements	ELN	C13	Table 1	CE-CCA-001-89	
437	Refine Petro & Petrochemical-limits & Procedure	EMI	6.1.2	Annex 6A	NTE-CCA-003-88	
438	Refine Petro & Petrochemical-limits & Procedure	EMI	6.1.2	Annex 6A	NTE-CCA-003-88	40CFR419
439	Registration, Pesticides, Fertilizers & Toxic Substs	ELN	D 5	Lists	Inter Dept Commis,'87-88	
440	Resources Conservation and Recovery Programs					40CFR256.30
441	Restaurants & Hotels-limits & Procedures	EMI	6.1.2	Annex 6A	NOM-CCA-026-ECOL/93	
442	Restaurants & Hotels-limits & Procedures	ELN	C31		NOM-CCA-026-ECOL/93	
443	Risk Assessment, Preliminary	EMI	4.1.0	Annex4B	Outline	
444	Risk Levels Assessment	ELN	E1		Social Security Act	

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1	TITLES OF LAWS & REGULATIONS	REF	C/T/C	S/A/I	Specific Mexico Laws	American Law
2						
445	Risk Management-Report quantaties	EMI	11.0.0		List & Checklist	29CFR1910.1200
446	Rubber Processing Effluent Standards	ELN	C3		NOM-CCA-012-ECOL/93	EPA440/1-74/013&030
447	Rubber Processing Emmision Standards				NOM-CCA-012-ECOL/93 ??	40CFR60.540/428
448	Rubber Production, Haz Waste Stds & Rpts	ELN	D3	Table 6.1	NOM-CRP-001-ECOL/93	40CFR60.540/428
449	Safe Drinking Water Act					42USC300et seq
450	Safety & Hygiene Conditions in Workplaces	ELN	E9		Inst#1,Labor & Social Sec	29CFR1910.1200
451	Safety & Hygiene for Noise	ELN	E11	Levels	Inst#11,Labor & Social S	
452	Safety & Hygiene for stacking & Unstack materials	ELN	E16		NOM-006-STPS/93	
453	Safety & Hygiene, Nonionizing Electromagnetic Ra	ELN	E18		NOM-013-STPS/93	
454	Safety & Hygiene, Prod,Storage, & Handle explos	ELN	E17		NOM-008-STPS/93	
455	Safety & Hygiene, Showers, Locker Rooms & Lock	ELN	E19		NOM-018-STPS/93	
456	Safety & Hygiene, Static Electricity	ELN	E20		NOM-022-STPS/93	
457	Safety &Hygiene at Work	ELN	E 2	A1-271	Organic,labor,Sanitary laws	
458	Sampling of Receiving Water Bodies	ELN	C9	Article 8	NOM-AA-14/80	
459	Sawmill Products-limits & Procedures	EMI	6.1.2	Annex 6A	NTE-CCA-019-88	
460	Sawmill Products/Pulp & Paper Boards	EMI	6.1.2	Annex 6A	NTE-CCA-019-88	40CFR429-431
461	Secretariat of Social development, Adminstrat Unit	ELN	A 2	A1	SEDESOL	
462	SEDESOL Responsibilities & Administation	EMI	3.1.0		List & Graphs	
463	Service Stations-Testing of Vapor Recovery-	EMI	5.1.2	Annex 5A	NOM-PA-CCAT-023-93	
464	Sewage Sludge and Irrigation	ELN	C34/C35		NOM-CCA-033-ECOL/1993	40CFR501-503/261.24
465	Sewage Sludge Disposal					40CFR125
466	Sewage Treatment Plants-Emissions					40CFR60.150
467	Sheet Glass, Contaminants	ELN	C 6	A1-8	NTE-CCA-010-88	40CFR426
468	Sheet Glass-limits & Procedures	EMI	6.1.2	Annex 6A	NTE-CCA-010-88	40CFR426
469	Simplification Program for import/export Haz Matls	ELN	D13		Haz Matl Imports/Exports	
470	Site Select/prep-conventional steam generate pla	ELN	F 9	A1-3	CE-OESE-002-88	

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1	TITLES OF LAWS & REGULATIONS	REF	C/T/C	S/A/I	Specific Mexico Laws	American Law
2						
471	Soap & Detergent, Wastewater Discharge	ELN	C33		NOM-CCA-3-ECOL/93	40CFR417
472	Soap & detergent-limits & Procedures	EMI	6.1.2	Annex 6A	NTE-CCA-030-91	40CFR417
473	Soda Beverage-limits & Procedures	EMI	6.1.2	Annex 6A	NTE-CCA-016-88	
474	Soda Beverage-limits & Procedures	EMI	6.1.2	Annex 6A	NTE-CCA-016-88	
475	Solid Waste Disposal Program	EMI	8.0		Checklist	40CFr256.20
476	Solid Waste Facility Planning and Implementation					40CFr256.40
477	Solid Waste, Storage & Collection					40CFR243
478	Solids in Waters, Gravimetric	ELN	C9	Article 8	NOM-AA-34/81	
479	Source Separation Guidelines for Solid Waste Recovery					40CFR246
480	Sources-Solid Particulate Matter	EMI	5.1.2	Annex 5A	NTE-CCAT-009-88	
481	SOX Measurement & Equipmnet Calib	EMI	5.1.2	Annex 5A	NTE-CCAT-005-91	40CFR50.4
482	SOX Measurement & Equipmnet Calib	EMI	5.1.2	Annex 5A	NTE-CCAT-005-91	40CFR50.4
483	Spill or Incident Manifest Form	EMI	FORM	FORMS	In Spanish	
484	Stationary Source,Forms, Instructions in Fed Jurisc	ELN	B17		General Law-many referen	
485	Stationary Sources, New					40CFR60
486	Stationary Sources-Diesel Combustion Process	EMI	5.1.2	Annex 5A	NTE-CCAT-005-88	40CFR60
487	Stationary Sources-Fuel Oil-Atmosphere Emission	EMI	5.1.2	Annex 5A	NTE-CCAT-077-88	40CFR60
488	Stationary Sources-Natural Gas Combustion	EMI	5.1.2	Annex 5A	NTE-CCAT-008-88	40CFR60
489	Steam Generators, Fossil Fueled					40CFR60.30
490	Steel Making Plants-Effluent/Emissions					40CFR420/60.140
491	Sugar Cane Industry Effluent into waterbodies	ELN	C14		NOM-CCA-002-ECOL/93	
492	Sugar Cane Industry-limits & Procedures	EMI	6.1.2	Annex 6A	NTE-CCA-002-88	40CFR409
493	Sulfides, Colorimetry Methylene Blue & Iodometric	ELN	C10	Article 8	NOM-AA-84/82	
494	Sulfur Acid Mist	ELN	B3-4		NOM-CCAT-001-ECOL/93	40CFR50.4-60
495	Sulfur Dioxide	ELN	B3-4		NOM-CCAT-001-ECOL/93	40CFR50.4-60
496	Sulfur Dioxide (SO(2)) daily avg 0.13 PPM	ELN	B1-1			40CFR50.4-60

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1	TITLES OF LAWS & REGULATIONS	REF	C/T/C	S/A/I	Specific Mexico Laws	American Law
2						
497	Sulfur Dioxide, establish mea methods,ambient air	ELN	B30		NOM-CCAM-005-ECOL/93	40CFR50 App A 7/90
498	Sulfur Limits in Gas-Oil fuels for Stationary Sources	ELN	B16		NOM-CCAT-015-ECOL/93	
499	Sulfur Trioxide	ELN	B3-4		NOM-CCAT-001-ECOL/93	40CFR50.4-60
500	Sulfur, Atmospheric Emissions	EMI	5.1.2	Annex 5A	NTE-CCAT-012-88	40CFR50.4
501	Sulfur, Liquid Fuel <2% by Weight ?? UPGRADED?	ELN	B16	A1-4	NTE-CCAT-018-91?NOM-CCAT-015-ECOL/93	
502	Sulfuric Acid Plants-Emissions/Effluent	EMI	5.1.2	Annex 5A	NTE-CCAT-001-88	40CFR60.30/
503	Sulfuric Acid Plants-Emissions/Effluent	ELN	B3-3		NOM-CCAT-001-ECOL/93	40CFR60.30/
504	Suspended particulates Measure&Equip Calib	EMI	5.1.2	Annex 5A	NTE-CCAT-002-91	40CFR50, App B 7/90
505	Suspended particulates Measure&Equip Calib	ELN	B20		NOM-CCAM-002-ECOL/93	40CFR50, App B 7/90
506	Suspended particulates,275 micrograms per cubic	ELN	B1.1			
507	Suspended Particulates,Determining Concentratio	ELN	B11	A1-8	NTE-CCAM-0002/88`	
508	Synthetic Rubber, Tires, Tubes, Contaminants	ELN	C 3	A1-8	NTE-CCA-012-88	
509	Synthetic Rubber,tires,&tubes-limits & Procedures	EMI	6.1.2	Annex 6A	NTE-CCA-012-88	
510	Synthetic Rubber,tires,&tubes-limits & Procedures	EMI	6.1.2	Annex 6A	NTE-CCA-012-88	40CFR414
511	Tannery & Leather Finishing-limits & Procedures	EMI	6.1.2	Annex 6A	NTE-CCA-021-88	40CFR425
512	Terrestrial Toxic Substance Guidelines					40CFR799.2050-2850
513	Texas Water Commission Waste Classification	EMI	App-A			
514	Textile asbestos,friction & Sealers Limits & Proced	EMI	6.1.2	Annex 6A	NTE-CCA-020-88	
515	Textile Industry, Effluents into waterbodies	ELN	C12	A1-8	NOM-CCA-014-ECOL/93	40CFR410
516	Textile-limits & Procedures	EMI	6.1.2	Annex 6A	NTE-CCA-014-88	40CFR410
517	Thermal Energy, Environmental Protection	EEE	T4C7	A155-156	General Ecology Law	
518	Thermo Electric Centers-limits & Procedures	EMI	6.1.2	Annex 6A	NTE-CCA-001-88	
519	Thermoelectric Centers,Conventional, Contaminan	ELN	C11	A1-8	NTE-CCA-001-88	
520	Thermoelectric Centers-/Elect Pwr Generator	EMI	6.1.2	Annex 6A	NTE-CCA-001-88	40CFR423
521	Timber Products Effluent Standards					40CFR429
522	Total Dissolved Solids, Testing, Gravimetric Meth	ELN	C9	Article 8	NOM-AA-20/80	

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1	TITLES OF LAWS & REGULATIONS	REF	C/T/C	S/A/I	Specific Mexico Laws	American Law
2						
523	Toxic Chemical Inventory Forms					40CFR370.40
524	Toxic Chemical, Specific Listings					40CFR372.65
525	Toxic Pollutnat Effluent Standards & Prohibitions					40CFR129
526	Toxic Substance Lists- 2 list enclosed	ELN	E12	S3-A278	General Health Law-2parts	40CFR302.4
527	Toxic Substances Aquatic Guidelines					40CFR797.1050-1970
528	Toxic Substances Guidelines for Terrestrial Env.					40CFR799.2050-2850
529	Toxic Substances Transformation Processes					40CFR796.3100-3800
530	Toxicity Testing					40CFR798
531	Toxicity-by Industries - to the Environment	ELN	D 3		NOM-CRP-001-ECOL-93	40CFR700-799
532	Transformation Processes, Toxic Substances					40CFR796.3100-3800
533	Transport-Compat Groups for C-I Explosive Waste	EMI	12.1.0	Anex12A	NTTMP-SCT-001-92	
534	Transport-Customary Require for Hazardous Matls	EMI	12.1.0	Anex12A	NTTMP-SCT-002-92	
535	Transport-Fab Specs for Containers & Packaging	EMI	12.1.0	Anex12A	NTTMP-SCT-004-92	
536	Transport-Labels & Symbols, Containers & Vehicle	EMI	12.1.0	Anex12A	NOM-EE-59	
537	Transport-Transportation Emergency Form	EMI	12.1.0	Anex12A	NTTMP-SCT-008-92	
538	Transport-Transportation Emergency Form	EMI	12.1.0	Anex12A	NTTMP-SCT-018-92	
539	TSCA-Toxic Substance Control Act					40CFR720
540	Underground Injection Control Program					40CFR144-1466
541	Vechicles-Diesel Fuel-Smoke Opacity	EMI	5.1.2	Annex 5A	NTE-CCAT-011-90	
542	Vehicles- Hydrocarbons, CO,NO using gasoline	EMI	5.1.2	Annex 5A	NTE-CCAT-003-88	
543	Vehicles-Gasoline Emissions-Measure Characteri	EMI	5.1.2	Annex 5A	NTE-CCAT-013-89	
544	Vehicles-Gasoline Emissions-wt>3000 KG	EMI	5.1.2	Annex 5A	NTE-CCAT-014-91	
545	Vehicles-Liquified Petroleum Gas-Weight >?	EMI	5.1.2	Annex 5A	NTE-CCAT-017-90	
546	Virgin Pulp Industry, Wastewater Discharge	ELN	C27		NOM-CCA-024-ECOL/93	
547	Visual, Environmental Protection	EEE	T4C7	A155-156	General Ecology Law	
548	Volatile Organic Liquid Storage Vessels-Emissions					40CFR60

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1	TITLES OF LAWS & REGULATIONS	REF	C/T/C	S/A/I	Specific Mexico Laws	American Law
2						
549	Waste Classification, Texas Water Commission	EMI	App-A			
550	Wastewaer, Asbestos Textiles, Friction Matls & Se	ELN	C37		NOM-CCA-020-ECOL/93	40CFR427
551	Wastewater Fee Deferment Form	EMI	FORM	FORMS	In Spanish	
552	Wastewater Permit Form	EMI	FORM	FORMS	In Spanish	
553	Wastewater Sampling	ELN	C9	Article 8	NOM-AA-3/80	
554	Wastewater Sedimentable Solids, Imhoff Cone Me	ELN	C9	Article 8	NOM-AA-4/77	
555	Wastewater usage by irrigation	ELN	C34		NOM-CCA-032-ECOL/93	
556	Wastewater, Asbestos Construction Mfg	ELN	C4		NOM-CCA-008-ECOL/93	40CFR427
557	Wastewater, Biochemical Oxy Demand,Incubation	ELN	C9	Article 8	NOM-AA-28/81	
558	Wastewater, Coffee Processing Industry	ELN	C30		NOM-CCA-027-ECOL/93	
559	Wastewater, Fish & Seafood Processing-oil & mee	ELN	C29-3	Table	NOM-CCA-028-ECOL/93	
560	Wastewater, Grease & Oil, Soxhlet Extraction	ELN	C9	Article 8	NOM-AA-5/80	
561	Wastewater, Hospitals	ELN	C32-3		NOM-CCA-029-ECOL/93	
562	Wastewater, Metal Finishing to Waterbodies	ELN	C24-3	Tables	NOM-CCA-017/93	
563	Wastewater, Municipal & Sewerage Drainage Limi	ELN	C36		NOM-CCA-031-ECOL/93	
564	Wastewater, Nitrogen, Kjeldahl Method	ELN	C9	Article 8	NOM-AA-26/80	
565	Wastewater, Ph-Potentiometric	ELN	C9	Article 8	NOM-AA-8/80	
566	Wastewater, Phosphorous,Colorimetric Molybden	ELN	C9	Article 8	NOM-AA-29/81	
567	Wastewater, Preserved Food Packing Industry	ELN	C25	Table	NOM-CCA-023-ECOL/93	
568	Wastewater, Pulp & Paper Discharge	ELN	C28-3	Table	NOM-CCA-025-ECOL/93	
569	Wastewater, Recycled Pulp Fiber Industry	ELN	C28-3	Table	NOM-CCA-025-ECOL/93	
570	Wastewater, Regulatory Requirements for Mexico	EMI	6.0		forms, reports & standards	
571	Wastewater, Soaps and Detergents Industry	ELN	C33		NOM-CCA-030-ECOL/93	
572	Wastewater, Temperature Visual,Thermometer	ELN	C9	Article 8	NOM-AA-7/80	
573	Wastewater, vegtables/fruit irrigation, municipal us	ELN	C35		NOM-CCA-033-ECOL/93	
574	Wastewater, Virgin Pulp Industry	ELN	C27-3		NOM-CCA-024-ECOL/93	

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1	TITLES OF LAWS & REGULATIONS	REF	C/T/C	S/A/I	Specific Mexico Laws	American Law
2						
575	Wastewater,Animal slaughter&Meat Packing	ELN	C23		NOM-CA-022-ECOL/93	40CFR432
576	Wastewater,Total Dissolved Solids,Gravimetric M	ELN	C9	Article 8	NOM-AA-20/80	
577	Water Pollution, Prevention and Control(3-29-73)	ELN	C1	A1-70	Envir' Pollution, A1-3,5,9	
578	Water Containment Level Goals					40CFR141.50
579	Water Ecological Criteria, Guidelines, & Standards	EMI	6.1.2	Annex 6A	CE-CCA-001-89	40CFR401
580	Water Quality, Ecological Criteria/Standards	ELN	C13	A1-2	CE-CCA-001/89	40CFR131
581	Water Treatment	EMI	6.1.2	Annex 6A	NTE-CCA-031-91	40CFR403
582	Water, Primary Drinking Standards					40CFR141.70
583	Water, Restaurants & Hotels-limits & Procedures	EMI	6.1.2	Annex 6A	NTE-CCA-026-91	
584	Waters Law, National	ELN	C26			
585	Wood Product impregnation,Effluents to Waterbod	ELN	C20	Tables	NOM-CCA-019-ECOL/93	40CFR429.70
586	Worker Protection and/or Emergency Planning					40CFR311
587	Workplace, Fire Prevention & Protection	ELN	E14			
588	Workplace,Contaminants Concentration Levels	ELN	E 9	Lists	Inst#10,Labor & Social S	29CFR1910.1000
589	Workplace,Safety & Hygien,Corrosive, Irritant,Toxi	ELN	E 7		Inst#9,Labor & Social Sec	
590	Workplace,Safety Conditions for flammable and c	ELN	E 8		NOM-005-STPS/93	
591	Zinc in Water, Colorimetric Dithtzone I,II,&Atomic Ab	ELN	C9	Article 8	NOM-AA-78/82	40CFR60.170/421.8+
592	Zinc Production, Haz Waste Stds & Reports	ELN	D3	Tabl2.10	NOM-CRP-001-ECOL/93	40CFR60.170/421.8+

APPENDIX B

STRUCTURES OF REFERENCED PUBLICATIONS

Each of the background and text references are broken down into a similar formats with somewhat different titles for the structures as they are produced by different organizations. A study of the published texts show the following:

1. EEE, Ecological Equilibrium and Environmental

Mexico's EEE (Ecological Equilibrium and Environmental Protection Law is printed in total as B2 in the ELN reference book. The EEE was Published in the Official Journal of Federation Jan 28, 1988 - It consist of 194 sequential articles divided by six titles, The six titles are further subdivided by 25 chapters within the Titles. The six titles are also divided into 194 articles within the titles. The structure is broken out as follows:

Title I.	General and Administrative Provisions (Articles 1-43)
Title II.	Protected Natural Areas (Articles 44-87)
Title III.	Rational Use of Natural Elements (Articles 88-109)
Title IV.	Environmental Protection (Articles 110 - 156)
Title V.	Public Participation (Articles 157-159)
Title VI.	Measures for Control and Safety and Sanctions (Articles 160-194)

As a specific detailed example "Title one of the "EEE" General Provisions has five chapters in (Articles 1-43) (reference ELN B2, pg B2-1): These five chapters are:

1. Preliminary Provisions (Articles 1-3)
2. Cooperation among the Federal Government, the states, and the local governments (Articles 4-7)
3. Attributions of SEDUE and Coordination among the Agencies and Bodies of Federal Public Administration (Articles 8-14)
4. Ecological Policy (Articles 15-16)
5. Instruments of Ecological Policy (Articles 17-43).

Chapter five. has nine sections (Articles 17-43):

1. Ecological Planning (Articles 17-18),
2. Ecological Regulation Articles (Articles 19-20),
3. Ecological Criteria in Development Promotion (Articles 21-22),
4. Ecological Regulations of Human Settlements (Articles 23-27),
5. Environmental Impact Evaluation (Articles 28-35),
6. Technical Ecological Standards (Articles 36-37),
7. Measures for Protection of Natural Areas (Article 38),
8. Ecological Education ;and Research (Articles 39-41),
9. Information and Oversight (Articles 44-87)

Each article is broken down by items. For example Section 2 of Chapter 5 was entitled "Ecological Regulation Articles," and has Articles 19 & 20.

Article 20 has three divisions:

1. natural resources,
2. secondary productive activities & services, and
3. human settlements.

The articles's divisions are divided into items. Article 20's division two "location of secondary productive activities and services" is divided into four items. These items are:

a. public works influence location of productivity activities.
b. financing of economic activities induce proper location.
c. tax incentives
d. construction or operation of commercial or service establishments.

Basically all of the Mexican environmental regulations follow a similar format and once the reader becomes accustomed to the system, the system is very logical. The CFR also follows a similar format but the CFRs have an index so the readers generally do not have to understand the organizational structure of the text. The structural outlines of the remaining Mexican references are:

2. ELN, ENVIRONMENTAL LAWS & NORMS

The subcategories of ELN (Environmental Laws and Norms) are:

A. General explanations of environmental laws (Articles A1-A4)
B. Air (Articles B1-B30),
C. Water (Articles C1-C37),
D. Solid & Hazardous Waste (Articles D1-D14),
E. Health & Safety (Articles E1-E20),
F. Controls of Industry (Articles F1-F9).

3. EMI, Environmental Management For Industries including Maquiladoras

Under the EMI reference the major subheadings are:

1. Introduction (Articles 1.0-1.4),
2. Legal Framework (Articles 2.0),
3. Administrative (Articles 3.0-3.3),
4. Preconstruction & Start-Up (Article 4.0 + annexes & forms),
5. Air (Articles 5.0-5.3 + checklists, annexes & lists of standards),
6. Wastewater (Articles 6.0-6.3 + tables, list & standards),
7. Hazardous Waste (Articles 7.0-7.3 + tables, list & standards),
8. Solid Waste (Articles 8.0-8.3 + checklists),
9. Special Materials (Articles 9.0-9.8 + checklists),
10. Noise (Articles 10.0-10.4 + checklist & standards),
11. Risk Management - Chemical Emergency Preparedness (Articles 11.0-11.3 + list & standards),
12. Transportation (Articles 12.0-12.6 + checklist, standards & forms), and
13. Facility Remediation (Articles 13.0-13.6).

EMI Appendixes

A Texas Water Commission Waste Classifications plus a set of Decision Flowcharts,
B. California Hazardous Waste Identification and Lists, and
C Forms - 15 sets, everything from import manifest to water permits.

4. NAFTA, NORTH AMERICAN FREE TRADE AGREEMENT

The North American Free Trade Agreement Consist of 51 articles divided into seven parts plus 45 annexes. The Parts are:

Part One -	Objective (Articles 1),
Part Two -	Obligations (Articles 2-7),
Part Three -	Commission for Environmental Cooperation Articles 8-19),
Part Four -	Cooperation and provision of Information (Articles 20-21),
Part Five -	Consultation and Resolution of Disputes (Articles 22-36),
Part Six -	General Provisions (Articles 37-45),
Part Seven -	Final Provisions (Articles 46-51), and the
Annexes -	Integral part of agreement defining specific points (Articles 1-45).

5 .CFR, CODE FEDERAL REGULATIONS

A. Title 29 CFR 1910, Table of Contents for Occupational Safety and Health Standards:

Subpart A	General,
Subpart B	Adoption and Extension of Established Federal Standards,
Subpart C	General Safety and Health Provisions,
Subpart D	Walking-Working Surfaces,
Subpart E	Means of Egress,
Subpart F	Powered Platforms, Man lifts, and Vehicle-Mounted Work Platforms,
Subpart G	Occupational Health ;and Environmental Control,
Subpart H	Hazardous Materials,
Subpart I	Personal Protective Equipment,
Subpart J	General Environmental Controls,
Subpart K	Medical and First Aid,
Subpart L	Fire Protection,
Subpart M	Compressed Gas and Compressed Air Equipment,
Subpart N	Materials Handling and Storage,
Subpart O	Machinery and Machine Guarding,
Subpart P	Hand and Portable Powered Tools and Other Hand-Held Equipment,
Subpart Q	Welding, Cutting and Brazing,
Subpart R	Special Industries,
Subpart S	Electrical,
Subpart T	Commercial Diving Operations, and
Subpart U-Y	Reserved.

B. Title 40 CFR, EPA (Environmental Protection Agency)

The table of contents for the Environmental Protection Agency are:

1-49 Administration & Definitions,
50-99 Air Programs,
50A Air Emission Standards,
100-149 Water Programs,
150-189 Pesticide Programs,
190-192 Radiation Protection,
201-211 Noise,
220-233 Ocean Dumping,
240-299 Solid & Toxic Waste,
300-399 Emergency Plan & Right to Know,
400-471 Water Effluent Standards,
501-503 Sewage Sludge, and
700-799 Toxic Substances.

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Biographical:

Personal Data: Born in Blair, Oklahoma, on November 18, 1937, the son of J. T. and Estine Bevers.

Education: Graduated from Blair High School, Blair, Oklahoma, in May 1956; received Bachelor of Science degree in Industrial Engineering from Oklahoma State University, Stillwater Oklahoma in May 1961; received Master of Business Administration from Indiana University, in January 1969; received Associate degree of Horticulture from Tulsa Junior College, Tulsa, Oklahoma in May 1981. Completed the requirements for the Master of Science degree with a major in Environmental Science at Oklahoma State University in July 1995.

Experience: Thirty years of designing, administering and working with: Project Control Systems for Construction, Environmental Requirements, Regulations of the Federal Government, and major industrial requirements. Includes definition and documentation of project/program requirements, design of supporting job cost accounts for data bases, documenting of projects' work breakdown structures, estimating of workscopes

then scheduling of the work activities, computer input and analysis of project schedules, traveling for field tracking/evaluations and reporting, and corporate briefings of technical projects.

Military: Retired as a Lieutenant Colonel, USAF (reservist). Air Force specialty was Administration of technical contracts and assisting small businesses. Duty stations and tours included: Texas, Illinois, Okinawa, Vietnam, Thailand, Guam, Georgia, and Wisconsin.

Military Training: Completed numerous military schools including: Aircraft Maintenance (repair and maintenance of all electro-hydraulic systems and power plants), Squadron Officers School, Government Procurement Regulations, Command and Staff School, Air War College, and the Industrial College of the Armed Forces.

Construction Experiences: As a technical project administrator, prepared construction scheduling and estimating for: pipeline planning of a gas company, nuclear power plant for a utility company, retrofit for a petrochemical plant in Louisiana, pipeline construction in Bogota Columbia, and development of small businesses for various investors.

Computer Knowledge: Microsoft: Windows 3.1, Excel 4.0, Project 3.0, Word Perfect 6.1A, Word Star, Project/2, Lotus 123, PMS-II, MMS-II, and RMS-II

Education for Teaching: University level effectiveness teaching certificate to identify/Retain At-Risk and Culturally Diverse Students, October 1994 at Oklahoma State University in Stillwater, Oklahoma.