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Howard G. Applegate*

A Discussion of U.S.–Mexico Experience in Managing Transboundary Air Resources: Problems, Prospects, and Recommendations for the Future

El Paso and Ciudad Juarez (EPJAZ) are both undergoing rapid urbanization. In twenty years, the population of Cd. Juarez has increased 300 percent; El Paso is the third most rapidly growing city in the United States. All of EPJAZ is plagued by the chronic problems of unemployment and under-employment. Newer industries are relatively clean in terms of air pollution. They are attracted to EPJAZ because of the Mexican *maquiladora* program or the availability of cheap labor. Most of the industrial sources of pollution are older industries. The completion of a new natural gas pipeline into Cd. Juarez and the resolve to introduce heavy industry to offset the female-employing *maquiladoras* may change the picture in the future.

TYPES AND LEVELS OF POLLUTANTS IN EPJAZ

EPJAZ consists of three states, two nations, and one airshed. A packet of air, together with accompanying pollutants, may cross any of the several borders. Indeed, the rugged terrain many times sets up flow patterns so that pollutants may criss-cross the borders several times. This makes it very difficult to pinpoint sources of pollution. Frequent inversions (over 90 percent during colder months) ensure that whatever is put into the air stays around for a period of time.

The EPA has declared El Paso a non-attainment area for total suspended particulates (TSP). Very little TSP is generated by industry. The 200 miles of unpaved alleys and streets in El Paso plus the many hundreds of miles of unpaved streets in Cd. Juarez account for most of the TSPs on a yearly basis. During the colder months, burning, both for heating and cooking, in the poorer sections of EPJAZ accounts for a great deal of TSP. Poorer families on both sides of the border literally burn anything for heat; old tires are a particular favorite since they burn (smolder) all night.

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El Paso has also been declared a non-attainment area in ozone and carbon monoxide. Carbon monoxide is directly linked to vehicles via oxides of nitrogen and hydrocarbons. There are approximately 500,000 vehicles in EPJAZ. Three recent studies revealed:

1. 83 percent of vehicular carbon monoxide is emitted in El Paso, 9 percent in Cd. Juarez, and 8 percent in Fort Bliss and the international bridges.
2. The Texas State Implementation Plan to bring El Paso into compliance with federal standards for carbon monoxide will not work;
3. The Texas State Implementation Plan to bring El Paso into compliance with federal standards for ozone will not work.¹

The Texas State Implementation Plan Will Not Work Since It Ignores Cd. Juarez

The EPA has also found El Paso to be out of compliance for sulfur dioxide. The chief source of this compound is a smelter. The Texas Air Control Board has granted the smelter a variance for the past ten years. Recently, the Board has recommended the variance be made permanent, i.e., the smelter be excused from complying with the emission standard. The smelter has requested permission to burn coal, instead of natural gas or petroleum products. They claim the burning of coal will not seriously affect the atmosphere, so no pollution controls are needed. The request is under consideration by the Board. There is strong evidence the burning of coal will bring about significant deterioration of the atmosphere unless controls are installed on the boilers.

El Paso is the only city in Texas to be out of compliance with the federal lead standard. A smelter is believed to be the chief emitter. The smelter claims to have spent over 90 million dollars to clean up their effluent, but levels of lead have not changed significantly since 1972.

FEDERAL POLICY FRAMEWORK IN THE UNITED STATES
AND MEXICO

Bath points out,² quite correctly, that the federal policy frameworks of neither country are adequate to deal with the border environment. The border is far removed from power centers; neither country officially admits that aerial pollutants either enter or leave their respective jurisdictions;

1. Applegate, *Allocation of Vehicular Emissions of Carbon Monoxide in El Paso, Texas and Ciudad Juarez, Chihuahua*, 15 ENVTL. SCI. AND TECH. 963-66 (1981); J. Crocker, *A Study of Ozone in the El Paso-Cd. Juarez Area* (Master's Thesis, The University of Texas at El Paso, 1981); M. Aguirre, *A Study of Carbon Monoxide in the El Paso-Cd. Juarez Area* (M.S. Thesis, The University of Texas at El Paso, 1982).

2. Bath, *U.S.-Mexico Experience in Managing Transboundary Air Resources: Problems, Prospects, and Recommendations for the Future*, in this volume.

and, in the case of the United States, overlapping responsibilities hamper enforcement. Bath sums up the situation nicely by saying, "both countries have proven to be failures in preventing or alleviating air pollution along the border."³

THE INTERNATIONAL/BINATIONAL CONTEXT

Both Applegate and Bath have reviewed previous binational efforts to cope with border pollution.⁴ Federal efforts are best summed up by citing Dr. Manuel Lopez Portillo (SMA) and Mr. Douglas M. Costle (EPA), who on November 20, 1980, stated there was "little to show in terms of meaningful accomplishments" in improving the border environment.

It is my opinion that local efforts have been more successful than their federal counterparts because of the unofficial nature of the local efforts. These efforts challenge no power base, require nothing in writing from either capitol, and in fact, insofar as either federal government is concerned, do not exist. These local environmental efforts are part of the "informal policy making" of the borderlands.⁵

Bath is guardedly optimistic of the future in solving environmental problems of the border. He points out the issue is on the agenda in discussions at the federal level and border governors have addressed the issue at their meetings. I do not share his optimism, at least for the near future. While we await the ponderous movement of political wheels to churn out binational agreements, I propose a more pragmatic approach for the near future. Instead of appealing to altruistic motives, let us appeal to pesos and dollars. Let us not say clean air is good for children, but rather, let us say clean air is good for our wallets.

ECONOMICS AND BORDER AIR POLLUTION

I first proposed that economics be the framework for helping solve air pollution along the border in 1981,⁶ and will sketch only the bare bones of my thesis here. I propose that the United States accept the legal concept of air held by Mexico, and that Mexico accept the bubble concept of an airshed now being implemented in the United States.

The atmosphere in Mexico belongs to the state—*res publica*. In the United States, the atmosphere is held in common—*res communes*. The

3. *Id.*

4. Applegate, *International Air Pollution in El Paso and Ciudad Juarez*, 3 THE ENV. PROFESSIONAL 1-12 (1981); Bath, *Alternative Cooperative Arrangements for Managing Transboundary Air Resources Along the Border*, 18 NAT. RES. J. 197-98 (1978).

5. Sloan & West, *The Role of Informal Policy-making in U.S.-Mexico Border Cities*, 58 SOC. SCI. Q. 270-82 (1977); West, *Informal Policy Making Along the Arizona-Mexico International Border*, 27 ARIZ. RESEARCH 1-8 (1978).

6. Applegate, *supra* note 4.

Mexican state has claimed outright ownership of the atmosphere which is owned by everyone. The Mexican state, since it owns the air, can obviously set a value for the use of its property. The United States government, on the contrary, since it does not own the air, can not set a value on its use. One can not legally set a value, either actual or potential, on something one does not own. The first step in the economic framework, therefore, will be for the federal government of the United States to establish an entitlement to the atmosphere.

Once this is done, then both governments are dealing with a public property resource (PPR) very similar to other PPRs owned by them: national grazing lands, national forests, public buildings, etc. Both of the governments and their respective industries have had a long history of economic interactions with PPRs.

If the United States accepts the Mexican concept of ownership of air, what does Mexico accept from the United States? They accept the concept of an airshed as an aerodynamic entity based on laws of science. Man can divide politically an airshed, but the laws of aerodynamics prevail. Under the bubble concept, the airshed is visualized as being under a gigantic dome having but one smoke stack. The effluent from that single stack, no matter where or how the effluent reaches the stack, must meet agreed upon standards.

Let us consider an example. Suppose a hydrogen fluoride (HF) plant is started in Cd. Juarez. Let us further suppose that no anti-pollution devices are installed. A large percentage of the *maquiladoras* in Cd. Juarez are electronic assembly plants. HF is a powerful corrosive and the fumes will seriously corrode all metals. This could lead to a high rejection rate of the electronic assemblies as they are being installed in component units in the United States. Furthermore, if the fumes cross into El Paso, they could corrode the metal products of a smelter and a copper refinery.

Obviously, under the present conditions, the HF plant has no economic incentive to install controls. The electronic assembly plants have an economic incentive to install filters in their buildings, until the cost of the filters equals the costs of damaged assemblies. The cost of either the damaged assemblies or the filters will be paid by the consumers. Neither the smelter nor refining plant can do much to alleviate the damages, since their products are stored in the open.

Since the air is now a PPR, it has a value be it clean or dirty; with all the airshed treated as one (a huge bubble of air), any one industry has access to both governments. Obviously, a cost-effective study needs to be done on methods to reduce MF levels in the bubble to a level acceptable to all. The emitters and receptors are bound together under a bubble of air and not separated by a boundary. Thus, they have an incentive to find, by mutual effort, the cost-effective solution. We have internalized

costs previously externalized, provided economic incentives that replace altruistic impulses, and replaced unilateral decision making with a system of viable give and take.

The emitters may find it cost effective to clean less than totally and pay to install, in the receptors, equipment to filter their incoming air. Similarly, the receptors may find it cost effective to filter their own air less and spend money helping the emitters reduce their emissions.

Both governments, since they own the air, will be encouraged to have input into the negotiations. Industries, both north and south of the border, have dealt with their governments for the use of PPRs in the past. The legal and economic bases for such dealings have been well established. This will facilitate the establishment of a free market price for the use of the atmosphere. Individuation of the air, pollution-permit exchange, and market values will be established by the free-enterprise system.

Some type of binational administrative structure will have to be established to deal with the bubble-industries. Now the ideas of Bath come into play. What I have proposed is simply a small way in which the greater proposal of Bath can be achieved.

DEBATE SOBRE LA EXPERIENCIA ESTADOS UNIDOS-MÉXICO EN LA ADMINISTRACIÓN DE LOS RECURSOS ATMOSFÉRICOS FRONTERIZOS

El Paso y Ciudad Juárez han pasado por una rápida urbanización. El área está constituida por tres estados, dos naciones y una capa de aire. Frecuentes inversiones atmosféricas durante el invierno determinan que la contaminación permanece en el ambiente.

El Paso es una área que no cumple con la regla de PST (total de partículas suspendidas). En El Paso existen 200 millas de calles y callejones que no están pavimentados, y hay cientos de millas en Ciudad Juárez que pesan para el PST sobre una base anual. Durante el invierno, la quema de llantas usadas como calefacción por familias pobres en ambos lados de la frontera constituye una gran parte del PST. También El Paso es una zona que no cumple con la norma de ozono ni con la de monóxido de carbono. El plan de mejoramiento del estado de Texas no se llevará a cabo, porque El Paso no cumple con las normas federales y porque el plan ignora totalmente a Ciudad Juárez.

El Paso tampoco cumple con la norma de dióxido de azufre. Es la única ciudad del estado de Texas que está en falta con las principales normas federales. Una fundidora es la principal causante de estos dos males. Ni en Estados Unidos ni en México existe una política federal adecuada para tratar con la contaminación ambiental fronteriza.

La Economía y la Contaminación Ambiental en la Frontera

La atmósfera en México pertenece al estado (*res publica*). En los Estados Unidos, pertenece a todos (*res communis*). El estado mexicano obviamente puede imponer un valor a su propiedad, la atmósfera, mientras que el gobierno estadounidense no puede, porque la atmósfera no le pertenece legalmente. Por consiguiente el gobierno estadounidense debe establecer un dominio sobre la atmósfera. Ambos gobiernos están tratando con un recurso de propiedad pública (RPP), similares a otros recursos que les pertenecen como los parques nacionales, los edificios públicos, etc.

Si los Estados Unidos aceptan el concepto mexicano de la propiedad estatal del aire, ¿aceptará México el concepto estadounidense de la capa de aire? Una capa de aire es una entidad aerodinámica basada en las leyes de la ciencia. Bajo este concepto de burbuja (esférico), la capa de aire se visualiza como si estuviéramos debajo de un domo gigante, que tiene una sola chimenea para el humo, cuyo efluente, sin importar de dónde o cómo alcanza la chimenea, debe de estar de acuerdo con normas.

Por ejemplo: el humo de una planta de fluoruro de hidrógeno ubicada en Ciudad Juárez, corroerá seriamente todos los metales en las plantas de ensamble electrónico. Esto podría llevar a un alto porcentaje de rechazo de esos componentes cuando se instalen en los Estados Unidos. Si el aire es un bien público, tiene valor esté limpio o sucio; emisores y receptores se encuentran vinculados y no separados por una frontera. Los emisores podrían encontrar más económico limpiar menos de la totalidad y pagar la instalación, en los receptores, de equipo de filtración del aire captado. O, los receptores podrían encontrar más económico filtrar el aire captado menos, y gastar en ayudar a los emisores reducir sus emisiones.

Ambos gobiernos, dado que son dueños de su aire, serán alentados a entrar en negociaciones. Las industrias, tanto en México como en los Estados Unidos, han negociado en el pasado sobre el uso de los bienes públicos; las bases legales y económicas están bien establecidas. Ello facilitará la implantación de un precio de mercado libre para el uso de la atmósfera. La individualización del aire, el intercambio de permisos para contaminación y los valores de mercado serán establecidos mediante el sistema de libre empresa. Alguna estructura administrativa tendrá que establecerse para tratar con las industrias en la burbuja.