

# Dispelling a Myth of Industrial Wastewater Pollution in Tijuana

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Since the 1930s, raw sewage flowing into the United States from Mexico has posed a serious threat to public health and the environment in the South Bay communities of San Diego. Due to the efforts of the states of California and Baja California, dry weather sewage flows no longer occur on a regular basis at the international border, and the most serious public health problem has therefore abated.

Serious issues remain, however. One unresolved concern is continued acute and chronic toxicity violations of the U.S. EPA National Pollutant Discharge Elimination System (NPDES) permit for the International Wastewater Treatment Plant, which treats 25 million gallons per day of Tijuana's wastewaters. The plant is located immediately across the border from Tijuana in San Ysidro, California. For years, many thought the source of these violations was heavy metals in wastewaters from industrial sources in Tijuana. Baja California officials

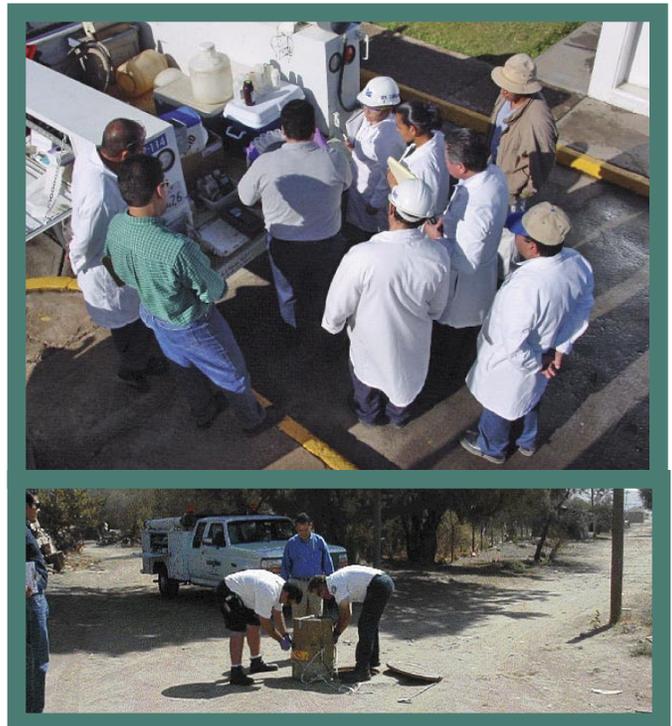
became concerned that industrial toxins would jeopardize plans to reclaim wastewater to supplement local water supplies. In fact, the prevailing consensus was that Tijuana's growing maquiladora industry was poisoning California's waterways. However, recent binational monitoring efforts between California and Baja California have dispelled this myth.

## *A Bilateral Effort Begins*

In March 2001, California and Mexico signed a historic three-year Agreement of Cooperation and launched the first comprehensive industrial wastewater monitoring and pretreatment program in Baja California. The agreement committed the states of California and Baja California

to jointly develop and implement a regional program for monitoring and pretreatment of industrial wastewaters in the cities of Tijuana, Tecate, and Mexicali. The program was later expanded to include monitoring in Ensenada. The goal was to sample and analyze wastewater throughout the collection systems of each of the four border cities and obtain data to support wastewater operations and an industrial wastewater discharge control program. In addition, a training curriculum for wastewater operators and industrial wastewater inspectors was developed and classroom and hands-on training were provided.

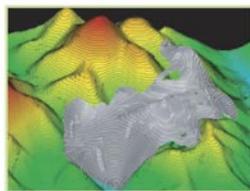
Agencies cooperating in this effort include the Baja California Dirección General de Ecología (DGE), Comisión Estatal de Agua (CEA), and Comisiones Estatales de Servicios Públicos of Tijuana, Tecate, Ensenada, and Mexicali. To date, the California State Water Resources Control Board and the San Diego and Colorado River Basin Regional Water Quality Control boards have contributed technical services to Baja California totaling close to \$1.1 million in the form of sampling, laboratory analysis, and training, and have purchased, donated, and assisted in



*Training Baja California personnel on sample collection and protocol in Mexicali (top). Sampling a sewage collector in Tecate (bottom).*



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the transfer of equipment totaling nearly \$400,000. The city of San Diego and San Diego State University acted as contractors to the state of California to implement the program by providing consulting services in the areas of sampling, analysis, wastewater operations, and industrial wastewater inspector training, in addition to equipment donations. Partner agencies worked with California State University–Sacramento to translate and adapt its nationally recognized industrial wastewater worker training manuals and videos for use in Baja California and potentially throughout Mexico.

### Sampling and Training

Binational technical and policy committees comprised of representatives of all partner agencies developed and implemented sampling plans and training programs, exchanged and made data and program information public on both sides of the border, and established priorities and the future direction of the program. Sampling activities involved setting up and programming automatic samplers and collecting the samples for analysis the next day. So that all days of the week would be represented, a sampling event was started every eight days. In Tijuana, where monitoring efforts began prior to the official launch of the program in February 1999 and ended in December 2002, approximately 160 sampling events were conducted at 59 floating and fixed sites, many located in Tijuana's industrial parks. In Tecate, approximately 80 sampling events were conducted at 69 sites from February 2002 through November 2004, and in Mexicali and Ensenada, a total of 22 to 25 sampling events were conducted at 17 to 23 sites in each city from January to July 2003.

The city of San Diego initially performed all these activities while training Baja California personnel. Gradually the Baja California crew took over the sampling and delivered samples to San Diego for analysis. In general, analyses were for metals, volatile organic compounds, semi-volatile organic compounds, organophosphorous pesticides, organochlorine pesticides and PCB,

MAXIMUM PERMISSIBLE LIMITS			
PARAMETERS (Milligrams per liter, unless specified)	Monthly average	Daily average	Instantaneous
Greases and oils	50	75	100
Sedimentary solids (milliliters per liter)	5	7.5	10
Total arsenic	0.5	0.75	1
Total cadmium	0.5	0.75	1
Total cyanide	1	1.5	2
Total copper	10	15	20
Chromium hexavalent	0.5	0.75	1
Total mercury	0.01	0.015	0.02
Total nickel	4	6	8
Total lead	1	1.5	2
Total zinc	6	9	12

*Mexican Official Standards for Discharge of Waters into Urban or Sewer Systems.*

ammonia-nitrogen, total suspended solids, and other general parameters.

To date, Mexican authorities have used donated equipment and technical assistance provided by California to assist in Baja California's regulatory efforts. These efforts have resulted in fines or temporary closures of a half dozen industrial operations until wastewater could be pretreated to meet Mexican Official Standards for Discharge of Waters into Urban or Sewer Systems (Norma Oficial Mexicana, 1996, see table).

### Results: Industry Not Implicated

Results of the sampling efforts in Tijuana's industrial parks showed that metal concentrations in the sewer collection system met Mexican discharge standards with the exceptions of a few sites that were addressed through Baja California's regulatory process. In addition, the overall strength of Tijuana's wastewater, evaluated according to the concentrations of key components, such as biological oxygen demand, chemical oxygen demand, total suspended solids, ammonia, and nitrogen, was found to be comparable to or higher than typical domestic wastewater in California. Reports of data collected in Tijuana may be viewed at [www.waterboards.ca.gov/border/publications.html](http://www.waterboards.ca.gov/border/publications.html); a comprehensive summary and analysis of data collected in Tijuana will be published soon.

Based on these results and toxicity identification evaluations performed on the influent and effluent of the International Treatment Plant, a direct relationship between Tijuana's industries and violations at the International Treatment Plant was not identified. Nonetheless, debate continues over what can be done to resolve the toxicity violations. Work is underway to determine if the sources are domestic or commercial and whether modifications to operations procedures or processes at the International Treatment Plant will reduce effluent toxicity. Final resolution of the effluent toxicity

problem may require completion of the long-delayed secondary treatment processes at the International Treatment Plant.

Due to limited funds for the industrial wastewater monitoring program, only baseline data were collected in Tecate, Ensenada, and Mexicali. Additional data must be obtained before conclusive statements can be made regarding the overall quality of wastewater in these three cities. Due to budget cuts in California, funds to continue the monitoring efforts in Baja California have been exhausted. Nonetheless, with use of donated and newly purchased analytical and sampling equipment, Baja California has committed to continue monitoring the wastewater in all four cities, even if the scope must be limited.

Overall, the program has been a major success, demonstrating that border states and communities can work effectively together to address mutual concerns. In the process, data generated from the program have helped dispel public misconceptions that could hinder cross-border relationships and cooperation.

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**Reference.....**  
*Norma Oficial Mexicana (Mexican Official Standards for Discharge of Waters into Urban or Sewer Systems), NOM-002-ECOL-1996. www.mexicanlaws.com/NOM-002-ECOL-1996.htm*