

International Boundary and Water Commission United States and Mexico



2008 ANNUAL REPORT



FRONT COVER: Confluence of the Rio Grande and Conchos River during the 2008 flood.

**INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO**



“The jurisdiction of the Commission shall extend to the limitrophe parts of the Rio Grande (Rio Bravo) and the Colorado River, to the land boundary between the two countries, and to works located upon their common boundary, each Section of the Commission retaining jurisdiction over that part of the works located within the limits of its own country.”

Article 2, 1944 Water Treaty

International Boundary and Water Commission United States and Mexico



M E S S A G E F R O M T H E C O M M I S S I O N

The International Boundary and Water Commission, United States and Mexico (IBWC), experienced unprecedented tragedy in 2008 with the deaths of U.S. Commissioner Carlos Marin and Mexican Commissioner Arturo Herrera. The two Commissioners were on their way to view flood conditions on the Rio Grande and Conchos River when the small chartered plane in which they were passengers crashed in mountainous terrain near Presidio, Texas-Ojinaga, Chihuahua on September 15. Both men had dedicated their careers to the Commission and their untimely passing represents an irreplaceable loss of knowledge and experience, not only to the Commission but to the border community as a whole.

Commissioner Marin had been appointed to his position in December 2006 after 27 years of service to the Commission. Prior to his appointment as Commissioner, he served as Deputy Commissioner and Principal Engineer of the Operations Department, among other engineering positions. During his career, he played a lead role in Commission projects related to flood control, sanitation, boundary demarcation, and mapping. He took particular pride in his work as Project Manager for construction of the Nuevo Laredo International Wastewater Treatment Plant during the 1990s.

Arturo Herrera had served as Mexican Commissioner since 1989. A Commission employee since 1982, he also held posts as Principal Engineer, Secretary, and head of the Tijuana, Baja California office. As Commissioner, he signed 35 Minutes related to a broad range of subjects including sanitation, boundary demarcation, water quality, and water supply. Under his leadership, the problem of Mexico's deficit in water deliveries to the United States, a matter that had become an irritant in the bilateral relationship, was resolved in accordance with the terms of the 1944 Water Treaty. He will always be remembered for his expertise and dedication.

Commissioners Marin and Herrera were long-time IBWC colleagues and friends. They devoted their lives to a common goal of furthering cooperation between the United States and Mexico on transboundary issues. It is a measure of both Commissioners' dedication and service that they were working together to develop a binational solution to Rio Grande flood conditions when their lives were tragically cut short.

Immediately following the tragedy, Principal Engineer Al Riera served as Acting U.S. Commissioner while Secretary Jesús Luévano was designated person in charge of the Mexican Section.

In November, President George W. Bush appointed C.W. "Bill" Ruth to the post of U.S. Commissioner. Commissioner Ruth had previously worked for the U.S. Section for 25 years before retiring in 1998 as Principal Engineer of the Special Projects Department. Since 2002, he had served as United States Representative of the Rio Grande Compact Commission, which is responsible for the accounting and distribution of waters of the Rio Grande among the States of Colorado, New Mexico, and Texas from the river's headwaters in Colorado to Fort Quitman, Texas.

The Mexican government in October named long-time Principal Engineer Luis Antonio Rascon to

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the post of Interim Commissioner. In addition to his 18 years of experience as Principal Engineer, he held the position of head of the Mexican Section's Office of Engineering, which addresses projects related to international bridges, border sanitation, and groundwater.

Earlier in the year, the Commission mourned the passing of two previous U.S. Commissioners — Joseph P. Friedkin, who was Commissioner from 1962 to 1986, and Carlos Ramirez, who served from 2001 to 2003. Commissioner Friedkin is considered one of the most influential leaders in Commission history due to his 48 years with the agency — first as an engineer and later as Commissioner — and his key role in implementing with his Mexican counterparts some of the Commission's major projects of the 20th century, including Amistad and Falcon Dams, the Chamizal Project, resolution of the salinity problem on the Colorado River, implementation of the 1970 Boundary Treaty, and improvements to the Lower Rio Grande Flood Control Project. Commissioner Friedkin was the only U.S. Commissioner to earn the rank of Ambassador due to his leadership as the architect of the Chamizal Treaty. Although Commissioner Ramirez's service to the Commission was cut short by illness, during his tenure he signed two Minutes related to irrigation conservation projects in the Conchos River basin and Mexico's deficit in delivery of Rio Grande water to the United States.

Even while dealing with tragedy, Commission employees faithfully executed their responsibilities in applying the boundary and water treaties between the two countries. These responsibilities included boundary demarcation, operation and maintenance of international storage dams, water accounting, maintenance of flood control projects, and operation of international sanitation projects.

The year was noteworthy due to flooding that occurred during September and October. The flood originated in the Conchos River basin in Mexico with a series of powerful storms that battered the region beginning in August. By September, the Conchos floodwaters had worked their way downstream to the Rio Grande, causing serious flooding at Presidio, Texas-Ojinaga, Chihuahua following levee failures on both sides. The floodwaters then moved downstream some 365 miles (587 km) into Amistad Reservoir at Del Rio, Texas-Ciudad Acuña, Coahuila, forcing the Commission to make flood releases from Amistad Dam.

The Commission also concluded a water delivery cycle in accordance with the 1944 Water Treaty. Under the treaty, Mexico delivers Rio Grande water to the United States from six Mexican tributaries in cycles of five years. However, the cycle that began in 2007 ended in 2008 when the U.S. could no longer store the water because the U.S. conservation capacity at both Amistad and Falcon Reservoirs was filled. The treaty provides that a cycle ends when the U.S. conservation capacity at both reservoirs is filled.

The Commission concluded two Minutes in 2008. Minute 313, "Maintenance in the Rectified Channel of the Rio Grande," establishes each country's responsibilities for Rio Grande maintenance from El Paso, Texas-Ciudad Juarez, Chihuahua to Fort Quitman, Texas. Minute 314, "Extension of the Temporary Emergency Delivery of Colorado River Water for Use in Tijuana, Baja California," continues an arrangement whereby Tijuana may take delivery of a portion of its Colorado River allotment via the U.S. conveyance system.



D E D I C A T I O N

The International Boundary and Water Commission dedicates this report in honor of the memory of former Commissioners Carlos Marin of the United States and Arturo Herrera of Mexico. In their impeccable service as heads of this agency, they honored the duties that were conferred upon them by their respective Governments to the benefit of residents on both sides of the border. The memory of Commissioners Marin and Herrera will be forever present with those of us who are a part of this Commission as an example of cooperation between the United States and Mexico.



Commissioners Arturo Herrera (*left*) and Carlos Marin

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I. INTERNATIONAL BOUNDARY

Boundary Demarcation

The IBWC is responsible for demarcating the border between the United States and Mexico. This includes installing and maintaining boundary monuments and markers on the land boundary between the two countries and placing appropriate plaques and elements demarcating the boundary on international bridges and at the land ports of entry.

As part of a pilot program for enhanced boundary demarcation originally proposed by the Principal Engineers in 2006, the Mexican Section installed additional boundary markers to the west of El Paso, Texas-Ciudad Juarez, Chihuahua. Installation of 14 posts measuring 30 feet (9 meters [m]) in height and with flashing lights was completed in July while 450 5-foot (1.5 m) tall posts were installed in the fall.

In accordance with Minute 244, “Maintenance of the International Land Boundary Monuments,” the Mexican Section performed maintenance on monuments 1 through 79 from El Paso, Texas-Ciudad Juarez, Chihuahua to near Douglas, Arizona-Agua Prieta, Sonora. Likewise, as required by Minute 302, “Enhanced Demarcation and Monumentation of the International Boundary at International Boundary River Bridges and Land Boundary Ports of Entry,” the U.S. Section completed boundary demarcation maintenance at the Free Trade Bridge at Los Indios, Texas-Lucio Blanco, Tamaulipas; the Pharr, Texas-Reynosa, Tamaulipas International Bridge; at three international bridges at Brownsville, Texas-Matamoros, Tamaulipas; and at the ports of entry at Andrade, California-Algodones, Baja California and Nogales, Arizona-Nogales, Sonora II (Mariposa). The Mexican Section replaced the pavement markers and traffic buttons that demarcate the boundary at the four international bridges at El Paso, Texas-Ciudad Juarez, Chihuahua and at the three ports of entry along the New Mexico-Chihuahua border and performed boundary demarcation maintenance at the international bridges in Del Rio, Texas-Ciudad Acuña, Coahuila; Eagle Pass, Texas-Piedras Negras, Coahuila; and at Amistad Dam.



New boundary markers were installed as part of a pilot project near El Paso, Texas-Ciudad Juarez, Chihuahua.

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The two Sections also developed plans to test a new means for demarcating the boundary at the international bridges and ports of entry. The current traffic buttons that demarcate the boundary are not durable and require significant maintenance. The two Sections proposed testing a recessed traffic button embedded into the pavement at some land ports and at the planned new bridge at Tornillo, Texas-Guadalupe, Chihuahua.

Boundary demarcation buoys at Amistad Reservoir were inspected regularly during the year and lanterns were replaced on buoys at the upper end of the reservoir. Demarcation monuments at Falcon Reservoir were inspected but no maintenance was performed because water levels remained too low for most of the year to access the platform at the top of the monuments.

The two Sections exchanged initial reports regarding the Global Positioning System (GPS) survey of boundary monuments. As part of the multi-year effort, the United States Section coordinated the GPS survey of 39 monuments along the Arizona-Sonora border while the Mexican Section coordinated the survey of monuments on the rest of the land boundary.

In accordance with Commission understandings reached in 2007, the U.S. Section prepared a draft report in 2008 documenting various boundary encroachments affecting both countries, including both public and private fencing and buildings that encroached in the territory of the other nation. The U.S. Section submitted the draft report to the Mexican Section for review in February so that the document could be finalized and submitted to both Governments.

The Commission also undertook the demarcation of the international boundary underground in the covered part of the Nogales Wash tunnel through central Nogales, Arizona-Nogales, Sonora after it was discovered that a portion of a U.S. Border Patrol wall erected in the tunnel encroached on Mexican territory. The Commission coordinated with authorities in both countries for the removal of the wall.

To the west of Columbus, New Mexico-Palomas, Chihuahua, the U.S. Section relocated privately-owned ranch fence after it was determined that New Mexico ranchers had inadvertently erected their fence in Mexico years before. Additionally, at the request of the Mexican Section, the U.S. Section coordinated with officials in the United States for the removal of a segment of fence along the Arizona-Sonora border near the Santa Cruz River that was inadvertently erected in Mexican territory by the National Guard in 2006.



The Commission demarcates the boundary on the bridges at night to minimize traffic disruption.

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Boundary Mapping

In accordance with the 1970 Boundary Treaty, the Commission is responsible for preparing maps of the U.S.-Mexico border. The IBWC, in cooperation with the U.S. Geological Survey and Mexico's National Institute of Statistics and Geography, completed a pre-final set of Rio Grande boundary photomaps. The photomaps are expected to be produced and formally approved by both Governments in 2009. The two Sections initiated discussions regarding production of a set of boundary maps for the Colorado River boundary and made arrangements to acquire updated aerial images of this part of the border.

II. RIO GRANDE

Water Deliveries under the 1944 Water Treaty

The 1944 Water Treaty between the United States and Mexico governs the distribution of the waters of the Rio Grande between the two countries from Fort Quitman, Texas to the Gulf of Mexico. Under this treaty Mexico delivers a minimum annual average of 350,000 acre-feet (431.72 million cubic meters [mcm]) of water to the United States from six Mexican tributaries in cycles of five years. The five-year cycle that began in October 2007 concluded on October 8, 2008 with a total delivery of 798,453 acre-feet (984.88 mcm). The five-year cycle ended early due to application of a little-used treaty provision that provides, "Whenever the conservation capacities assigned to the United States in at least two of the major international reservoirs, including the highest major reservoir, are filled with waters belonging to the United States, a cycle of five years shall be considered as terminated and all debits fully paid, whereupon a new five-year cycle shall commence." The U.S. conservation capacity at Amistad was filled in September and Falcon filled on October 8.



The 1944 Water Treaty provides for the distribution of the waters of the Rio Grande between the United States and Mexico, including in this reach near Presidio, Texas-Ojinaga, Chihuahua.

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The two Sections initiated discussions to resolve a difference in treaty interpretation regarding water accounting when the U.S. conservation capacity is filled at both reservoirs. According to the U.S. Section interpretation, a long-term water delivery cycle would not commence until reservoir storage drops and the U.S. is able to store water delivered by Mexico. In the Mexican Section's view, a new long-term cycle began on October 9.

Convention of 1906

The Convention of 1906 provides for the equitable distribution of the waters of the Rio Grande for irrigation purposes in the El Paso, Texas-Ciudad Juarez, Chihuahua region. In accordance with the Convention, the United States delivers to Mexico a total of 60,000 acre-feet (74 mcm) of water annually, except in the event of extraordinary drought or serious accident to the irrigation system



Three of American Dam's gates were replaced during 2008.

in the United States. Reservoir conditions were favorable in 2008 and Mexico was allotted a full supply of 60,000 acre-feet (74 mcm). The water is stored at Elephant Butte and Caballo Dams in New Mexico, which are operated by the U.S. Bureau of Reclamation to release water to downstream users in both countries. To complete the deliveries, the Commission operates the American and International Diversion Dams at El Paso-Ciudad Juarez to divert water into each country's irrigation canal system. The Commission worked to resolve a problem of unauthorized withdrawal of U.S. water by Mexican users and to compensate the United States for this unauthorized use.

To coordinate water deliveries among different users to maximize the efficiency of deliveries, the Commission held monthly meetings in coordination with the U.S. Bureau of Reclamation, Mexico's National Water Commission, Elephant Butte Irrigation District, and El Paso County Water Improvement District No. 1 to exchange information regarding changing runoff and storage conditions.

At American Dam, which diverts the U.S. share of water into the American Canal at El Paso, the U.S. contractor completed a project to replace 3 of the dam's 13 gates and to install cathodic protection.

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The five-year joint Safety of Dams inspection of International Dam was conducted in February. Based on the observations, review of records, operational criteria, and engineering judgment, the inspectors classified International Dam as Normal (Safe), or Dam Safety Action Class V in the U.S. Army Corps of Engineers risk-based action classification system. The inspection team did not find any major evidence of conditions that could affect the structural safety or operational capability of the dam.

Flood Control - Upper Rio Grande

In February, the Commission signed Minute 313, “Maintenance in the Rectified Channel of the Rio Grande.” The agreement makes recommendations for works, such as sediment removal and levee repairs, in critical locations where the Rio Grande channel has problems conveying normal and flood flows as a result of sediment, vegetation growth, and levees in poor condition. The agreement covers a 91-mile (146.4 km) reach of the river from El Paso, Texas-Ciudad Juarez, Chihuahua



The Commission removed sediment at El Paso-Ciudad Juarez in accordance with Minute 313.

downstream to Fort Quitman, Texas. In accordance with the agreement, each country is responsible for removing sediment from specific river reaches totaling 45.5 miles (73.2 km) each. Each country will continue to be responsible for maintaining the floodways and levees on its side of the international boundary. By establishing a clear understanding of the responsibilities to be undertaken by each Section, Minute 313 will facilitate scheduling and funding of maintenance work on an ongoing basis. Failure to perform this work presents a risk of municipal flooding and could result in a change in the river’s course, altering the international boundary.

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Minute 313 further identified priority sites affected by flood flows during storms in August 2006. In accordance with Minute 313, sediment was removed from the Rio Grande channel and floodway between the International Diversion Dam and the beginning of the Chamizal Project channel. The work, which was funded by the U.S. Section and performed by a Mexican Section contractor, removed 271,000 cubic yards (207,000 cubic meters) of sediment from a 1.86-mile (3 km) reach. Mexico initiated the removal of sediment in two additional reaches: 1) between American Dam and International Dam and 2) between the old Riverside Dam site near the Ysleta-Zaragoza International Bridge to just downstream from the Alamo Grade Control structure. The Mexican Section also rehabilitated some levee segments and cleared vegetation from the channel. The U.S. Section had raised its priority levee segments in this area in 2007. In 2008, the U.S. Section conducted additional bank stabilization work near International Dam and initiated efforts to obtain environmental permits to perform silt removal in the river at the Guayuco and Diablo Arroyos.

The U.S. Section also initiated construction of levee rehabilitation in the Mesilla Valley in New Mexico north of the international boundary.

Flood Control – Presidio, Texas-Ojinaga, Chihuahua

A major Rio Grande flood swept through Presidio, Texas-Ojinaga, Chihuahua in September and October, shutting down the international bridge for weeks and causing flood damage on both sides of the border. The flood originated on Mexico's Conchos River, which flows into the Rio Grande just upstream from Presidio-Ojinaga. By early September, flows from the Conchos had caused the Rio Grande to rise to dangerous levels. Rio Grande flow peaked on September 19 at 53,678 cubic feet per second (cfs) (1520 cubic meters per second [cms]), the greatest flow in 30 years and in excess of the 42,000 cfs (1189 cms) design flood.



Rio Grande levees near the Presidio-Ojinaga International Bridge were put to the test in both countries.

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A segment of the U.S. Rio Grande flood control levee in a rural area downstream of Presidio was overtopped and failed, sending floodwaters onto adjacent farmland and a golf course. Upstream, USIBWC crews worked to shore up the levees protecting the urban part of Presidio, working 24 hours per day to combat seepage and sand boils that put the levees at risk of failure. They also coordinated to have state and local emergency management officials drop large sandbags in a low spot along an existing railroad embankment to prevent floodwaters from the downstream levee break from backing up into town. In Mexico, the failure of levees on the Conchos River and Rio Grande caused major flooding in Ojinaga and forced the closure of the international bridge after the Mexican access road and port facilities were flooded.

USIBWC crews were in active flood fight operations from early September until mid-October, conducting regular levee patrols, using heavy equipment and sandbags to repair levee seepage and sand boils, and pumping floodwaters. The two Sections also coordinated closely regarding flows and dam releases on the Conchos River. Following the flood, both Sections began work on emergency levee repairs and to plan for long-term improvements to the flood control project. As part of the long-term plan, the Commission proposed increasing the capacity of the project to a 100-year design flood rather than the current 25-year capacity.

Flood Control – Lower Rio Grande

In the Lower Rio Grande Flood Control Project, the Commission went on 24-hour operations in preparation for flood conditions after Hurricane Dolly, a category two storm, made landfall just north of Brownsville, Texas-Matamoros, Tamaulipas on July 23. The hurricane dumped up to 18 inches (46 cm) of rain in some areas, causing widespread local flooding in both countries. However, flows in the Rio Grande, although above normal, remained below flood stage and it was not necessary to operate the IBWC diversion dams to divert flow into the interior floodway system. The U.S. Section provided assistance to local communities by installing and operating pumps in flooded neighborhoods and responding to calls for assistance with malfunctioning drainage structures.



Hurricane Dolly caused local flooding.

In May, prior to flood season, the Commission conducted the annual flood control workshops at Falcon and Amistad International Dams and for the Lower Rio Grande Flood Control Project. The purpose of these workshops is to ensure Commission personnel are fully trained and prepared for flood operations at the international dams using the Commission's flood control

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operations criteria. During this event, personnel from Mexico's National Water Commission actively participated.

Work began on improvements to the Lower Rio Grande Flood Control levees in the United States. U.S. Section personnel raised the height of 22 miles (35.4 km) of deficient levee segments in the area of Brownsville, Texas. To address structural and height deficiencies with the Rio Grande flood control levees farther upstream, the Hidalgo County Drainage District #1 funded construction of a levee-wall near Mission and Hidalgo, Texas in coordination with the U.S. Department of Homeland Security and the U.S. Section.

Amistad Dam Operation and Maintenance

Located near Del Rio, Texas-Ciudad Acuña, Coahuila, Amistad Dam is operated jointly by the two Sections of the IBWC. The dam provides water storage, flood control, and hydroelectric power for both countries in accordance with the 1944 Water Treaty. In September, the Commission initiated flood operations at Amistad Dam after a rapid rise in the reservoir. The rise occurred after floodwaters from the Conchos River hundreds of miles upstream in Mexico entered the Rio Grande at Presidio, Texas-Ojinaga, Chihuahua and then moved downstream, filling the conservation capacity of Amistad Reservoir.



The Commission made flood releases from Amistad Dam in September and October.

At the beginning of September, Amistad Lake was at 1102 feet (335.8 m) elevation with storage at 73% of normal conservation capacity. One month later, the lake had risen 17 feet (5 m) and was just over conservation capacity, its highest level in 15 years. Commission personnel made flood releases from the dam at the rate of 17,657 cubic feet per second (500 cms) for nearly one month before tapering back the third week in October. Historically, releases at this rate have occurred every three to five years but have been less frequent in recent years due to drought.

At the end of flood season, the Commission decided to establish a new, higher conservation capacity at Amistad on a temporary basis in order to store additional water. The temporary conservation pool was set at 1120 feet (341.385 m), 3 feet (1 m) higher than normal. This will allow for the storage of nearly 200,000 acre-feet (243.5 mcm) in additional water. The Commission has engaged in this practice in the



past as a way to ensure the availability of additional water for users in the United States and Mexico during the non-hurricane season. Both countries agreed to restore the normal conservation capacity on May 1, 2009 in order to assure the evacuation of any excess water prior to the start of hurricane season on June 1.

The Commission also worked to implement recommendations from the Safety of Dams inspection carried out in 2007 by a binational group of technical advisors. The 2007 report indicated the dam is generally well maintained and able to operate under normal and flood conditions. However, the experts gave Amistad Dam a rating of Dam Safety Action Class II – Urgent (Potentially Unsafe). The rating is based largely on engineering judgment of the joint technical advisors regarding the potential impact of seepage from naturally-occurring sinkholes and the high risk in terms of the combination of potential loss of life and economic damages. As recommended, the Commission convened a panel of experts in 2008 to conduct additional study. The experts conducted site visits to the dam, evaluated historical data, visited seepage areas, and conducted a potential failure modes analysis. They were scheduled to deliver their draft report to the Commission in early 2009.

Falcon Dam Operation and Maintenance

Falcon Dam, located on the Rio Grande at Falcon Heights, Texas-Nueva Ciudad Guerrero, Tamaulipas, was constructed in accordance with the 1944 Water Treaty to store water for downstream users. Additionally, it plays an important role for flood control and hydroelectric power



Falcon Dam experienced normal conditions for most of the year.

generation for both countries. In the fall, flood releases out of Amistad Dam, located 300 miles (481 km) upstream, combined with other inflows quickly filled Falcon Reservoir, which went from 42% of capacity at the beginning of September to full conservation capacity by early November, an increase of 23 feet (7 meters).

The situation at Falcon was complicated by additional flood flows coming into the reservoir from the Salado River, a Mexican tributary. Downstream from the dam, the San Juan River in Mexico was also in flood. As this tributary flowed into the Rio Grande, it caused high flow in the Lower Rio Grande

Valley to the Gulf of Mexico. With Falcon on the rise, the Commission analyzed the best way to manage the reservoir, fearing that flood releases out of the dam would exacerbate the high flows already experienced downstream and could cause flood conditions in the Valley.

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Commission personnel from the United States and Mexico reviewed past practices during similar conditions and decided to establish a conservation pool at Falcon of 304 feet (92.66 m), nearly 3 feet (1 m) higher than normal. By establishing this new conservation capacity on a temporary basis, the Commission's operating criteria allowed it to store additional water in Falcon. Not only did this decision reduce the risk of flooding downstream but it will ensure the availability of 245,000 acre-feet (302.5 mcm) in additional water for users in the United States and Mexico in 2009. As at Amistad, the additional waters will be evacuated from Falcon prior to the 2009 hurricane season.

Anzalduas Dam Operation and Maintenance

Anzalduas Dam, located near McAllen, Texas-Reynosa, Tamaulipas, is a Commission diversion dam used to divert water from the Rio Grande into Mexico's irrigation canal and to divert floodwaters into the U.S. interior floodway.

Construction of a new maintenance shop building on the U.S. side of the dam was completed early in the year. The project included installation of new fencing and pavement in the yard. The Commission also completed annual maintenance on Gates #2 and #5. The work included sand blasting and painting a truss beam and replacing rusted ladders, handrails, and platforms on the gates' marine landing.



The Commission performed routine maintenance on the gates of Anzalduas Dam.

Retamal Dam Operation and Maintenance

Retamal Dam, located 38 miles (61 km) downstream from Anzalduas Dam near Donna, Texas-Rio Bravo, Tamaulipas, was built specifically for flood control purposes. The dam is able to divert flood flows into Mexico's interior floodway and to limit flood flows downstream at Brownsville, Texas-Matamoros, Tamaulipas.

In August, heavy rain from a summer storm fell in Starr County, Texas causing a rapid rise in the Rio Grande and elevated flows downstream to the Gulf of Mexico. The Mexican Section requested that preparations be undertaken so that water could be diverted at Retamal Dam into Mexico's interior floodway in order to limit downstream flows in the river to 8475 cfs (240 cms). However, flow peaked at 6674 cfs (189 cms) and no diversions were necessary. Although the storms caused above-normal flow, the Rio Grande did not experience flood conditions.

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The two Sections continued to discuss plans to remove an island at Retamal as recommended by Safety of Dams inspections and consistent with the Commission's obligation to remove obstructions in the river under the 1970 Boundary Treaty. The two Sections proposed a two-phase approach whereby vegetation on the island would be removed in the first phase followed by complete removal of the island in a subsequent phase.



The Commission operates and maintains Retamal Diversion Dam.

Power Generation at Amistad and Falcon Dams

Both countries operate hydroelectric power plants at Amistad and Falcon Dams. In accordance with international agreements, the power plants generate electricity equally for both countries, regardless of the national ownership of water being released.

In May, the two Sections met to review studies and proposals for low-flow power generation at the dams, which would require installation of new turbines. During the Rio Grande drought of the 1990s and early 2000s, water releases from both dams were so low that water could not be run through the turbines and generators. Based on this review, the two Sections decided to continue to study the feasibility of installing low-flow units on the Mexican Power Plant at Amistad and the U.S. Power Plant at Falcon, both of which would generate electricity for both countries. This proposal appears to be the most cost-effective of the alternatives analyzed, minimizes the disruption in power generation that could occur during installation, and is most compatible with existing facilities. Because the Mexican Power Plant at Amistad Dam currently has a penstock available, the new turbine could be installed relatively easily with minimal disruption of power generation. However, if the turbine were installed at the U.S. Power Plant at Amistad, power generation would be completely

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shut down for 12 to 18 months, and construction of a coffer dam and building expansion would be required. Likewise, at Falcon Dam, conditions at the U.S. Power Plant are much more favorable to installation of the low-flow unit as compared to the Mexican Power Plant. The two Sections are consulting with their respective stakeholders — the Western Area Power Administration and the South Texas Electric Cooperative in the United States and the Federal Electricity Commission and National Water Commission in Mexico — regarding their interest in the proposal.



The Commission is considering installing a low-flow generating unit at the Falcon Dam Power Plant.

Due to the success of a pilot project initiated in 2006 to share power generation between the two countries during hours of peak demand (afternoon and evening), the Commission formalized the arrangement by means of a Joint Report of the Principal Engineers, which was signed December 15, 2008. Under the Joint Report, the switch from morning to afternoon generation occurs on a weekly basis (Wednesday at midnight) at both Amistad and Falcon Dams. The Joint Report would allow for future modification of this schedule as events warrant, including any upgrades to the Power Plants. Additionally, changes during emergency conditions would continue to be permitted.

Proposed Laredo, Texas - Nuevo Laredo, Tamaulipas Weir

In August, the Commission hosted a meeting at U.S. Section Headquarters in El Paso, Texas to discuss the proposed Laredo, Texas-Nuevo Laredo, Tamaulipas Weir on the Rio Grande. The weir would store water for use by both cities, generate hydroelectric power, and provide a lake for recreational opportunities. The meeting was attended by personnel from both Sections of the IBWC, officials from the Cities of Laredo and Nuevo Laredo, and representatives of Mexico's National Water Commission. The parties agreed to form a Binational Technical Committee (BTC) to develop a Scope of Work for a feasibility study and to discuss other aspects of the proposed weir. The BTC met regularly for the remainder of the year to work on the Scope of Work and to address other issues, such as water rights and the role of the participating agencies in the development of the weir. The U.S. Section received appropriations in the amount of \$250,000 to pay for the initial feasibility study.



Proposed Brownsville, Texas - Matamoros, Tamaulipas Weir

The Commission scheduled several meetings during the year to discuss the proposed Brownsville-Matamoros Weir and Reservoir with officials from both countries. The Brownsville Public Utilities Board has proposed to construct the weir approximately 7 miles (11 km) downstream from the Gateway International Bridge between the two border cities. The project would provide a reservoir with a capacity of approximately 6,000 acre-feet (7.4 mcm) to store excess flows on the Lower Rio Grande to increase the water supply capacity of both Brownsville and Matamoros. Mexican officials have continued to express concern about the potential impacts of the weir on Matamoros, fearing that the weir could cause a rise in the water table, damaging buildings and other infrastructure in the city. The Commission facilitated the exchange of technical information and studies about potential impacts in Matamoros and sought to develop a work plan acceptable to both countries to conduct additional geotechnical analysis of potential impacts to Matamoros in the form of a Risk Assessment Study. The Mexican Section advised that, should the project be approved, Mexico would be prepared to cover a proportional share of operation and maintenance costs of the weir but that the United States would be expected to cover all other costs, including costs to mitigate potential effects in Matamoros.

Water Conservation Projects in the Mexican Irrigation Districts

Minute 309, a 2003 Commission agreement, provides for Commission review of an annual report of volumes of water conserved through irrigation district modernization projects in the Conchos River basin in Mexico and conveyance of conserved waters to the Rio Grande beginning in January of each year. The U.S. Section requested from the Mexican Section a copy of the report describing conservation projects and volumes of water conserved in the Conchos irrigation districts during 2007 so that these waters could be transferred to the Rio Grande in 2008 in accordance with Minute 309. The Mexican Section proposed that a new format for the annual report be developed taking into account that construction of conservation projects has ended. The Mexican Section also stated its view that Minute 309 only requires a transfer of water to the Rio Grande if the water is needed to allow Mexico to comply with its water delivery obligation under the 1944 Water Treaty. The two Sections continued discussions during the year to resolve these differing interpretations of Minute 309 and initiated work on a new Minute on this subject that would address a new formula for the volumes of water conserved, the timeframes for transfer of conserved waters to the Rio Grande, and reporting requirements.

El Morillo Drain Operation and Maintenance

El Morillo Drain is a binational water quality project of the IBWC designed for salinity control purposes. Extending for 75 miles (121 km) through Tamaulipas, the drain diverts saline irrigation return flows to the Gulf of Mexico, preventing degradation of Rio Grande water quality. El Morillo Drain

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El Morillo Drain pumping plant.

experienced various operational difficulties, including pumps that were not functioning, accumulation of silt and trash in the Drain, and challenges related to flood management in Mexico. During the summer, saline water overflowed into the Rio Grande for an extended period of time; however, the salinity level did not pose a concern to Texas irrigators or the Texas Commission on Environmental Quality. When Morillo Drain water flows into the Rio Grande instead of being diverted to the canal, it is usually within acceptable salinity levels.

Late in the year, a new U.S. partner undertook responsibility for a portion of El Morillo Drain operation and maintenance. Under longstanding arrangements, the United States covers 50% of the operation and maintenance costs of El Morillo Drain while Mexico covers the other half. The U.S. contribution is shared equally by the federal government and local water users. Since 1966, the U.S. Section had partnered with the Lower Rio Grande Water Committee, which was responsible for the local share of costs. However, that responsibility was transferred to the Rio Grande Regional Water Authority, a group established by the State of Texas in 2003.

Invasive Species

During 2008, each Section of the Commission contributed \$25,000 toward control of aquatic weeds in the Lower Rio Grande. A plan developed by experts at Texas Parks and Wildlife proposed application of an herbicide to control water hyacinth, a floating plant, in the reach between Donna, Texas-Rio Bravo, Tamaulipas and Brownsville, Texas-Matamoros, Tamaulipas. The Mexican Section proposed that biological or mechanical control methods be considered. High flows in the river during the latter part of the year cleared out much of the hyacinth and treatment was not needed. The two Sections prepared to assess the extent of aquatic weeds in the Lower Rio Grande in early 2009 to determine the appropriate course of action.

The IBWC also provided international coordination for a U.S. government plan to eradicate carrizo cane (*arundo donax*) on the U.S. bank of the Rio Grande in the area of Laredo, Texas. Carrizo cane, a non-native plant that can reach 30 feet (10 meters) in height, grows in dense monoculture stands along the Rio Grande. The plan included three control strategies – cutting the stem of the plant and then treating it with herbicide, aerial spraying of herbicide, and physical removal of shoots and roots by hand or mechanical means. The Mexican Section requested that any activities carried out by the U.S. be closely coordinated with Mexican officials, that caution be used in applying herbicides, and that laboratory results of tests performed on the water in the application areas be provided to the Mexican Section. A pilot study of the treatment methods will be carried out in 2009.



III. COLORADO RIVER

Water Deliveries, Morelos Dam Operation and Maintenance

In accordance with the stipulations of the 1944 Water Treaty, the United States fulfilled its obligation to deliver 1.5 million acre-feet (1,868.657 mcm) of Colorado River water to Mexico during the year; due to rainfall and operational challenges in the United States, actual deliveries totaled 1.591 million acre-feet (1,962.947 mcm). To track this activity, monthly operational meetings were held with the participation of the U.S. Bureau of Reclamation, Mexico's National Water Commission, and the two Sections of the IBWC.

Preparations proceeded for a project to remove sediment at Morelos Dam. Located on the Colorado River near Yuma, Arizona-Los Algodones, Baja California, Morelos Dam diverts Mexico's share of Colorado River water. The project consists of removing sediment upstream and downstream from the spillway. The sediment, which has accumulated over a number of years, has impacted the ability to operate the dam safely and has reduced the dam's capacity to pass flood flows. The U.S. Section obtained all necessary permits for the project and arrangements were made for a Mexican Section contractor to conduct the work and dispose of the sediment in Mexico. Construction is scheduled to begin in early 2009. The Commission also plans to mitigate for the environmental impacts of the project by restoring habitat.

Wellton-Mohawk Drain Operation and Maintenance



The Wellton-Mohawk Drain after sediment was removed.

The Wellton-Mohawk Drain bypasses saline irrigation return flows from the United States to improve the quality of Colorado River water delivered to Mexico. In accordance with Minute 284, the United States pays for maintenance for a portion of the drain in Mexico. In June, a break in the drain was detected, which caused water to flow across the desert. Due to a sediment plug downstream in the area maintained by Mexico, the water had backed up and saturated the canal, causing it to break. The U.S. Bureau of Reclamation funded repair work, which included repair of the canal and removal of sediment. Both Sections worked together on the development of a contract to accomplish the repairs.

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Routine maintenance of the Wellton-Mohawk Drain was also performed during the year, covering such work as restoration of the concrete panels, maintenance of crossing and control structures, clearing of berms, and cleaning of the sediment basin. In accordance with international agreements, the work was funded by the United States and performed by a Mexican contractor. The United States also loaned dredging equipment to Mexico in order to undertake the emergency removal of sediment that had affected drain function.

Salinity

In accordance with Minute 242, the salinity of Colorado River water delivered to Mexico must be similar to that of water delivered to U.S. users at Imperial Dam as indicated by a salinity differential established in that agreement. Specifically, the waters delivered to Mexico upstream of Morelos Dam shall have an annual average salinity of no more than 115 parts per million (ppm) $\pm$ 30 U.S. count (121 ppm $\pm$ 30 Mexican count) over the annual average salinity of waters arriving at Imperial Dam.

The two Sections monitor the salinity of the waters that arrive at Morelos Dam; this data is then exchanged and a monthly report is signed documenting the monthly salinity differential between Imperial Dam and Morelos Dam. Since 2003, there have been variations in the salinity values calculated by Mexico and the United States, which has led to considerable differences in the salinity values and the differentials between the two dams. A study was initiated in 2006 of the different testing methods used by laboratories in each country. The final report is scheduled to be completed in 2009. The Commission hopes to implement recommendations from the binational technical group related to testing methods and reporting requirements that should be followed by each country.

For 2008, the salinity differential between Imperial Dam and Morelos Dam was 140 ppm according to the U.S. standards and 157 ppm according to Mexican standards.

The U.S. Bureau of Reclamation began to work on an environmental study to analyze the proposed operation of the Yuma Desalting Plant on a pilot basis at one-third capacity for 365 operating days beginning in 2009. The plant was built to help the U.S. meet salinity requirements for Colorado River water delivered to Mexico by desalting and salvaging drainage water that otherwise



The Colorado River at the Northerly International Boundary, Yuma Desalting Plant at top right.

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would be too saline to deliver to Mexico. In November 2008, the Commission initiated consultations on the proposed pilot run and discussions focused on developing a plan to monitor the environmental impact in Mexico of plant operations. Should the plant be put into operation, flow in the Wellton-Mohawk Drain that discharges to the Santa Clara Slough in Mexico would be reduced. So that the slough's habitat would not be affected, the Mexican Section expressed interest in identifying potential alternative water sources to make up for the reduced flow. The proposed pilot run follows a test run conducted in 2007 during which the plant was operated at 10% capacity for three months after years of being idle.

United States-Mexico Joint Cooperative Actions

In accordance with the August 13, 2007 Joint Statement of the United States and Mexico related to the Colorado River, a Binational Core Group was created to address joint cooperative actions for the use of Colorado River waters in both countries. The group was convened March 11 in Phoenix, Arizona by the International Boundary and Water Commission.

The objective of the joint cooperative process is to establish, under the auspices of the Commission, an international group of representatives of federal, state, and expert non-government organization stakeholders from the United States and Mexico to explore, identify, and ultimately implement water conservation, shortage management, augmentation and environmental initiatives with binational benefits in the areas of environmental, agricultural and urban water use. The Binational Core Group established four work groups to pursue cooperative actions in four broad areas: 1) conservation, 2) new water sources, 3) environmental issues, and 4) system operations. The Binational Core Group and Work Groups held several meetings during the year to advance joint cooperative actions. The Core Group directed the New Water Sources Work Group to convene a Binational Technical Committee to study a proposed binational seawater desalination plant at Rosarito, Baja California.

Environmental Preservation of the Delta

Given the interest of both countries in preserving the ecology of the Colorado River Delta, the IBWC in 2001 signed Minute 306, "Conceptual Framework for United States-Mexico Studies for Future Recommendations Concerning the Riparian and Estuarine Ecology of the Limitrophe Section of the Colorado River and its Associated Delta," which established a framework for developing cooperative projects focused on water use for environmental purposes. The U.S. and Mexican governments convened a binational workshop in 2008 to develop the work plan for a hydrologic model for the Colorado River Delta. The conceptual work plan outlined the phases for the basic modeling and information gathering required to model the Colorado River from the Northernly International Boundary to the Colorado River Delta at the Gulf of California.

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Water Supply for the City of Tijuana, Baja California

In November, the Commission signed Minute 314, “Extension of the Temporary Emergency Delivery of Colorado River Water for Use in Tijuana, Baja California.” The Minute provides for delivery of a portion of Mexico’s Colorado River allotment to Tijuana at Mexico’s cost via the U.S. conveyance system when there are capacity problems or outages on the Mexican side. The Minute allows for annual extensions of deliveries for up to five years. A previous agreement for emergency deliveries, Minute 310, expired in 2008.

During 2008, 5,085.6 acre-feet (6.27 mcm) of water was delivered through the Otay emergency connection under the terms of Minutes 310 and 314.

Lower Colorado River Boundary and Capacity Preservation Project

The Lower Colorado River Boundary and Capacity Preservation Project is an effort to study and implement a channel configuration that preserves the Colorado River international boundary line,



IBWC is studying options to preserve the Colorado River boundary line, especially in the reach downstream from Morelos Dam where the river experiences low flow.

ensures sufficient capacity to convey floodwaters through the river’s international reach, and considers environmental impacts. An updated flood flow study is needed in order to determine the required conveyance capacity in the limitrophe (boundary segment). In support of this effort, the U.S. Bureau of Reclamation performed a cross-sectional survey and submitted the survey data to the U.S. Section in July. The cross-sections are being incorporated into a USIBWC model that includes the Colorado River from the confluence with the Gila River downstream through the limitrophe (boundary segment). Different flow profiles will be routed through the study reach to

determine the carrying capacity of the existing channel. The results will then be discussed with Mexico so that the two Sections can establish a new design flood flow for the limitrophe reach based on the results of the study. To achieve this goal, binational workshops will be arranged with both Sections of the Commission and their respective technical advisors to reach a consensus on the design flood flow.



Invasive Species

The Aquatic Nuisance Species Task Force met quarterly to discuss the invasive species problem in the Lower Colorado River basin. Based in the United States, this interagency group includes participation by the Mexican Section of the Commission and other affected Mexican entities as technical advisors.



Giant salvinia in the Colorado River.

The U.S. Bureau of Reclamation in October hosted a Quagga Mussel Workshop with Mexican participation to educate users of the Lower Colorado River about how to spot the mussel, the problems it may cause, and to receive feedback and recommendations from users that are experiencing problems. Discovered in the Colorado River Basin in 2007, the quagga mussel is a non-native species that can colonize rapidly, coating the surfaces of water infrastructure and causing significant impacts to water storage and delivery systems, hydroelectric power plants, recreational use, and aquatic ecosystems. In the United States, control measures are being researched and implemented including using a freshwater bacterium that may harm the digestive system of the mussel, and coating the surfaces of water infrastructure with material that may dissuade colonization. Downstream, Mexico has not reported any mussels in its canals.

Efforts also continued to address another invasive species, giant salvinia (*Salvinia molesta*), an aquatic fern from Brazil that multiplies rapidly into thick mats on the water surface that can clog water intakes and impede boating, fishing, and swimming. The weed can also reduce oxygen content and degrade water quality for aquatic species. In 2008, the U.S. Department of Agriculture released 3500 salvinia weevils, which feed on the plant, in the Lower Colorado River region. From April until October, pesticides were applied in the Palo Verde Irrigation District's outfall drain in the United States, which flows into the Colorado River. Although giant salvinia has been found in the Colorado River at the Northerly International Boundary and at Morelos Dam, it is not a serious problem affecting water deliveries in Mexico.

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I V . S A N I T A T I O N

San Diego, California - Tijuana, Baja California

In November, the U.S. Section awarded a contract for construction of the upgrade of the South Bay International Wastewater Treatment Plant (SBIWTP) in San Diego, California. The contract in the amount of \$88 million was awarded to PCL Construction of Tempe, Arizona. The SBIWTP currently provides advanced primary treatment of 25 million gallons per day (mgd) (1100 liters per second [lps]) of wastewater emanating from Tijuana, Mexico. The contract covers construction of a 25 mgd (1100 lps) secondary treatment process at the existing plant. Construction is scheduled to be completed in approximately two years.

Throughout the year, the SBIWTP continued to operate, providing advanced primary treatment for Mexican sewage. The two Sections exchanged information regarding the volumes of wastewater treated at the plant in order to determine Mexico's share of operations and maintenance costs and to ensure payment of required amounts in accordance with Minute 296.



South Bay International Wastewater Treatment Plant.

Calexico, California - Mexicali, Baja California

The Mexicali II sanitation project, a wastewater collection and treatment project developed with funding from both the United States and Mexico, was brought online in 2007. In early 2008, the Mexicali utility (CESPM) began bypassing raw sewage from the new wastewater treatment plant into the New River, which flows into the United States at Calexico. The U.S. Environmental Protection Agency, which funded some costs associated with the Mexicali II project, and the California Regional Water Quality Control Board expressed strong objections to the discharge to the New River. Agreements for U.S. funding for the project require that there be no bypass of untreated sewage into the New River. The IBWC convened two meetings in March to address the problem; discharge stopped by mid-March.

Throughout the year, the IBWC regularly monitored New River water quality at the international boundary; the data indicate that dissolved oxygen levels were low for much of the year, which negatively affects aquatic life in the river, and levels of fecal coliform bacteria were often high, an indicator of the presence of sewage.

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Nogales, Arizona - Nogales, Sonora

Located in Rio Rico, Arizona, the Nogales International Wastewater Treatment Plant (NIWTP) was constructed in 1972 within the framework of IBWC Minute 227 to treat wastewater from the sister cities of Nogales, Arizona and Nogales, Sonora. Minute 276, signed in 1988, provided for the expansion of the NIWTP and allotted to Mexico 9.9 million gallons per day (mgd) (434 liters per second) in treatment capacity at the plant.



Construction of the NIWTP upgrade.

Significant advances were made in construction of the upgrade of the NIWTP; construction was nearly completed by year's end and commissioning of the new treatment systems was scheduled to begin in February 2009. A major overhaul of the plant was necessary to meet updated water quality standards in the United States.

For the year ending September 30, 2008, the volume of Mexican sewage treated at the plant was an average of 10.3 mgd or a total of 14,277,474.4 cubic meters for the year, which is in excess of Mexico's allotted flow capacity of 9.9 mgd, equivalent to 13,678,773 cubic meters per year. Arrangements were made for Mexico to pay its proportional share of operation and maintenance costs (O & M) in accordance with IBWC Minutes. Under those agreements, for its allotted capacity at the plant Mexico pays a proportional share of O & M based on the Mexican economy; for flows in excess of its allotted capacity, Mexico pays full costs.

In addition, throughout the year the IBWC coordinated delivery to the Nogales, Sonora utility of chlorine tablets to disinfect the surface water in the Nogales Wash. Similarly, field visits were conducted along the Nogales Wash for the purpose of inspecting the water quality conditions of the wash and its tributaries, the existence of uncontrolled wastewater discharges, and the sanitation conditions in adjacent areas.

Pretreatment meetings were held on a quarterly basis attended by Commission personnel and representatives of the local utilities in Mexico and the United States. Pretreatment refers to the effort to control the discharge of contaminants into the sewer system – contaminants that can disrupt the treatment process at the NIWTP. Quarterly monitoring of NIWTP effluent indicated that the plant exceeded the U.S. permit limits for ammonia nitrogen, total suspended solids, and various metals. Monitoring of influent and flows at the international boundary detected cadmium, copper, iron, lead, manganese, and zinc in excess of permitted limits. The data analysis indicated that flows originating in Mexico and the United States may be contributing to elevated concentrations of metals in the NIWTP influent.

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Naco, Arizona - Naco, Sonora

The IBWC conducted a joint inspection of the lagoon wastewater treatment system in Naco, Sonora in September after receiving reports of fugitive sewage flows entering the United States from Mexico to the west of the Naco Port of Entry. Commission personnel observed that effluent from the east treatment lagoons was not being reused, thereby forcing the utility to pump wastewater to the west treatment lagoons, which appeared to have overflowed. They also observed that design problems with storm drains near the port of entry may contribute to transboundary flows. The two Sections made plans to initiate a joint evaluation of the Naco, Sonora sanitation system and to prepare a report of conclusions and recommendations. They also coordinated with the Naco, Sonora utility regarding future plans to dispose of effluent from the existing wastewater treatment lagoons.

Presidio, Texas - Ojinaga, Chihuahua

The wastewater treatment plant at Ojinaga was severely damaged by the Rio Grande flood in September; the plant had only begun operating in late 2006. As sewage from the plant washed into the Rio Grande two miles (3 km) downstream from the international bridge, officials from Texas stepped up their monitoring of bacteria in the river. The high volume of water in the river helped to dilute the bacteria from the plant. Mexico has begun repairs to the plant and expects it to resume operations in 2009.

Laredo, Texas - Nuevo Laredo, Tamaulipas

Constructed in the 1990s within the framework of the Commission, the Nuevo Laredo International Wastewater Treatment Plant (NLIWTP) is a binational project to address concerns about Rio Grande water quality in the area of Laredo, Texas-Nuevo Laredo, Tamaulipas. During the year, it treated an average volume of 22.5 million gallons per day (986 liters per second) of sewage from Nuevo Laredo. Of total operation and maintenance costs for the year of \$2,668,330.90 USD, the U.S. share was agreed to be \$150,000 USD.

Personnel from both Sections conducted joint inspection visits of the plant, observing cracks to the oxidation ditches, which appear to be worsening over time. The cracks are the result of differential settlement due to subsurface water flows emanating from the drying beds adjacent to the oxidation ditches. The municipal utility developed recommendations to fix the problem at an estimated cost of \$1.27 million USD and requested the assistance of the Commission. The two Sections discussed the appropriate means to address the problem and fund any necessary repairs, as well as future U.S. contributions toward overall operation and maintenance of the plant.



V. OTHER PROJECTS

Water Quality Monitoring

During 2008, the Commission continued with routine observation and exchange of data on water quality in the international and transboundary rivers, as well as the effluent from the wastewater treatment plants that discharge into those bodies of water in San Diego, California-Tijuana, Baja California; Calexico, California-Mexicali, Baja California; Nogales, Arizona-Nogales, Sonora; Douglas, Arizona-Agua Prieta, Sonora; El Paso, Texas-Ciudad Juarez, Chihuahua; and Laredo, Texas-Nuevo Laredo, Tamaulipas. The information was distributed to interested authorities in each country.

The U.S. Section's Texas Clean Rivers Program for the Rio Grande conducted more than 300 routine samplings of Rio Grande water quality and prepared quarterly and annual water quality reports.



The Commission collects and exchanges water quality information.

Geographic Information System (GIS) and Binational Water Quality Database

The Commission has been working on developing a boundary-wide Geographic Information System (GIS) to produce and display information using seamless datasets related to natural resources, projects, watersheds, rivers, boundary demarcation, and other topics. U.S. participating agencies include the U.S. Geological Survey (USGS) and Environmental Protection Agency (EPA) while Mexican participants include Mexico's National Water Commission (Conagua) and the National Institute of Statistics and Geography (INEGI), among other state and local entities from both countries that are working to promote data sharing, form partnerships, and develop a network to display and distribute information. The Commission met with these groups to create a binational database for water quality through a partnership with the USGS and Conagua to host data from monitoring agencies in both the U.S. and Mexico and store it in one database operated and maintained by the Commission. The Commission and its partners have also developed a web interface to disseminate information via the internet and are working with binational work groups to update watershed boundaries and stream networks along the border.

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Shared Groundwaters

The IBWC continued discussions about U.S.-Mexico cooperation for the Transboundary Aquifer Study spearheaded and funded by the U.S. Geological Survey in cooperation with water resources research institutes in the U.S. border states of Arizona, New Mexico, and Texas. Meetings were held in April and December to discuss the proposed framework for Mexican participation and the role of IBWC. The goal of the study is to characterize priority aquifers that span the U.S.-Mexico border.

Water Gaging and Weather Observation Network

To fulfill its treaty obligations to account for the national ownership of waters of the boundary rivers, the Commission operates and maintains more than 60 gaging stations on the Colorado River, Rio Grande, and their tributaries. Each Section operates and maintains the gaging stations on tributaries in its country. Most stations use satellite telemetry to provide near real-time flow data. The Commission collects hydrometric and weather data, which is processed and used in binational water accounting computations, dam operations, and real-time flood operations. The data is compiled and published in the annual Water Bulletins – the Rio Grande Water Bulletin and the Western Boundary Water Bulletin. During the year, the Commission published the 2005 bulletins.

The Rio Grande flood destroyed the instruments of the El Mulato gaging station downstream from Presidio, Texas-Ojinaga, Chihuahua; the Commission plans to move the station to a new site. A new flood gaging station at the Cordova International-Bridge of the Americas at El Paso, Texas-Ciudad Juarez, Chihuahua was fabricated and installed. Work was initiated to purchase a replacement for the 11-mile gage on the Colorado River, which was vandalized in September. Routine maintenance and inspections of the other gaging stations were carried out.

Staff takes a manual measurement of Rio Grande flow.





International Bridges and Land Ports of Entry

During 2008, the Commission undertook the following activities related to the international bridges and land ports of entry:

- Approved construction plans for the proposed international bridge at Donna, Texas-Rio Bravo, Tamaulipas.
- Approved construction of riprap revetment at the base of Piers 3 and 4 of the B & M Bridge in Brownsville, Texas-Matamoros, Tamaulipas by the Brownsville & Matamoros Bridge Company.



Commissioners Arturo Herrera (left) and Carlos Marin sign the plans for the Donna-Rio Bravo International Bridge.

Projects on the International Boundary and Rio Grande Floodplain

In 2008, the Commission reviewed and approved the following projects crossing the international boundary or located within the Rio Grande floodplain:

- Installation of a 12-inch diameter natural gas pipeline across the international boundary 1.6 miles (2603 m) downstream from the Morelos International Dam on the Colorado River by North Baja Pipeline, L.L.C. and Gasoducto Bajanorte Natural Industrial, S. de R.L. de C.V.
- Construction of a 10.75-inch diameter liquid hydrocarbon (gasoline and diesel) pipeline across the international border at San Elizario, Texas-Zaragoza, Chihuahua by P.M.I. Services North America and PMI Norteamerica, S.A. de C.V.
- Construction of a 12-inch diameter natural gas pipeline across the boundary 21.2 miles (34 km) upstream from the Solidarity Bridge (Laredo III-Colombia) near Laredo, Texas-Colombia, Nuevo Leon by Encinar Gathering, Ltd. and Lewis Energy Mexico, S. de R.L. de C.V.
- Phase II of the U.S. Border Patrol Infrastructure Improvement Project in Laredo, Texas consisting of construction of a road and associated drainage structures near the international railroad bridge.

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- Installation of a 24-inch wastewater pipeline and associated outfall structure on the bank of the Rio Grande by the City of La Joya, Texas.
- Construction of a building pad by Ferris & Flinn, L.L.C. on behalf of Alan Johnson on the floodplain of the Rio Grande immediately upstream from the Free Trade Bridge at Los Indios, Texas-Lucio Blanco, Tamaulipas.
- The Access Road Project proposed by Mexico and the Levee Relocation Project proposed by the United States associated with construction of the new international bridge at Donna, Texas-Rio Bravo, Tamaulipas.

Flood Control at Nogales, Arizona - Nogales, Sonora

The U.S. Section repaired a segment of the Nogales Wash channel in the United States that was damaged during a storm in August 2007. The Nogales Wash is a concrete-lined channel that flows north from Nogales, Sonora to Nogales, Arizona. The storm damaged a 150-foot long (46 meter) segment, washing out the floor of the channel and leaving a void behind a portion of the channel wall in a section located 1.5 miles (2.4 km) north of the U.S.-Mexico border. The \$500,000 repair was carried out in May and June. Repairs were considered critical in order to protect the International Outfall Interceptor (IOI). Located in the damaged section of the wash, the IOI conveys wastewater from the international boundary to the Nogales International Wastewater Treatment Plant. Had the pipe ruptured, it could have released untreated wastewater into the wash, creating a potential public health threat.

The repairs from the 2007 storm were completed just prior to the 2008 monsoon. Unfortunately, the summer rainy season brought additional problems for the Nogales Wash and caused widespread flooding in both countries. A July 6 storm dislodged a concrete floor panel from the Nogales Wash just north of the area damaged the previous year. The U.S. Section assisted the City of Nogales, Arizona with repair, part of an effort to protect the IOI and to prevent the panel from getting swept downstream and causing additional damage.



Repairs were made to the Nogales Wash before the rainy season.

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Just days later, on July 12, another summer downpour led to major flooding in downtown Nogales, Arizona and Nogales, Sonora, causing a part of the Nogales Wash tunnel in Mexico to collapse and inundating businesses on both sides of the border. Subsequent studies by Commission engineers determined that a U.S. Border Patrol wall and a large Mexican sewage pipe in the tunnel created obstructions to stormwater flowing through the wash, contributing to the flooding. The storm also dislodged two panels in the open channel portion of the wash in the United States; the City of Nogales, Arizona repaired the damage.



Flood in Nogales, Sonora that caused the collapse of part of the Nogales Wash tunnel.

One month later, on the afternoon of August 12, a flash flood swept through the Nogales Wash and caused flooding in downtown Nogales, Arizona-Nogales, Sonora similar to the July flood. An inspection by IBWC showed no significant additional damage to the Nogales Wash.

To address the recurring flood problems, the two Sections began work on a comprehensive plan to address stormwater control in the area.

Columbus, New Mexico - Palomas, Chihuahua Stormwater

The two Sections met three times in the fall with stakeholders from both countries to discuss solutions to an ongoing stormwater problem at the border at Columbus, New Mexico-Palomas, Chihuahua. Most recently, a storm on July 11 caused significant flooding in Palomas and forced the temporary closure of the port of entry. The New Mexico Department of Transportation is working on a Master Drainage Plan for Columbus that should improve the handling of stormwater flow affecting both communities. The United States Government is also planning drainage improvements for the port of entry, subject to appropriations. The U.S. Border Patrol reported that it had advanced on drainage projects in the region associated with the installation of border fencing and roads. Officials in the United States committed to expand drainage ponds, clear debris and sediment from drainage culverts near the port of entry, and construct an open channel to

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convey flows from west of the port of entry to the east. Mexico indicated that it planned to erect jersey barriers around the port of entry at Palomas to keep flood flows out of the community; this plan will be submitted to the Commission for review to ensure that it will not exacerbate flooding in adjacent areas. IBWC agreed to look at other interim solutions that could be implemented until the long-term projects are funded and built.

Tijuana River Flood Control Project

The IBWC continued to operate the binational Tijuana River Flood Control Project, which includes a concrete-lined river channel, levees, and a related flood warning system. The Tijuana River flows north from Tijuana, Baja California into San Diego County, California. In accordance with an agreement with the U.S. Section, U.S. Customs and Border Protection performed maintenance of the U.S. portion of the project, including silt removal from the concrete-lined channel and vegetation clearing upstream from the Dairy Mart Road Bridge.



The Commission's Tijuana River Flood Control Project, looking into Mexico.

Significant rainfall in the Tijuana River basin in November and December 2008 culminated in a flow of 22,000 cubic feet per second (622 cms) on December 17, 2008. Although the Commission's Flood Control Project ably handled the flood flows, downstream moderate flooding occurred along Monument Road in San Diego County where several farms and equestrian facilities were under six to eight feet (2.5 m)

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of water, causing substantial crop losses and drowning several horses. In Tijuana, the flooding caused one death. The high flow also resulted in heavy deposition of trash, tires, and silt in the valley. At the request of stakeholders in the United States, the Commission began discussions about possible means to address the trash problem in the Tijuana River Valley.

The binational flood warning system for the Tijuana River, established in 2003, continued to function, providing real-time precipitation and flow data to emergency managers in both countries. In the United States, maintenance of the Automated Local Evaluation in Real Time (ALERT) flood warning system was performed by the County of San Diego while the International Boundary and Water Commission and Mexican agency partners maintained the Mexican side. The two Sections also continued discussions regarding installation of a satellite telemetry system for water elevation and precipitation data at Carrizo Dam, a flood control and water storage dam located in Mexico.

U.S. Border Security Fence

The U.S. Section coordinated with U.S. Customs and Border Protection (CBP) throughout the year for issues related to the Secure Border Initiative (SBI) to secure America's border and reduce illegal border crossings. SBI activities include construction of security fencing in the United States near the international boundary.

As part of this coordination, CBP provided fence plans and hydraulic models for consideration by the Commission to ensure that border fencing would not interfere with the Commission's boundary maintenance responsibilities, would not cause obstruction of stormwater flows, and, as required by the 1970 Boundary Treaty, would not obstruct or deflect the normal or flood flows of the Colorado River and Rio Grande. The U.S. Section placed survey stakes along the international boundary at various locations to ensure that fence construction crews were aware of the location of the international boundary.



Construction of the border fence along the international land boundary.

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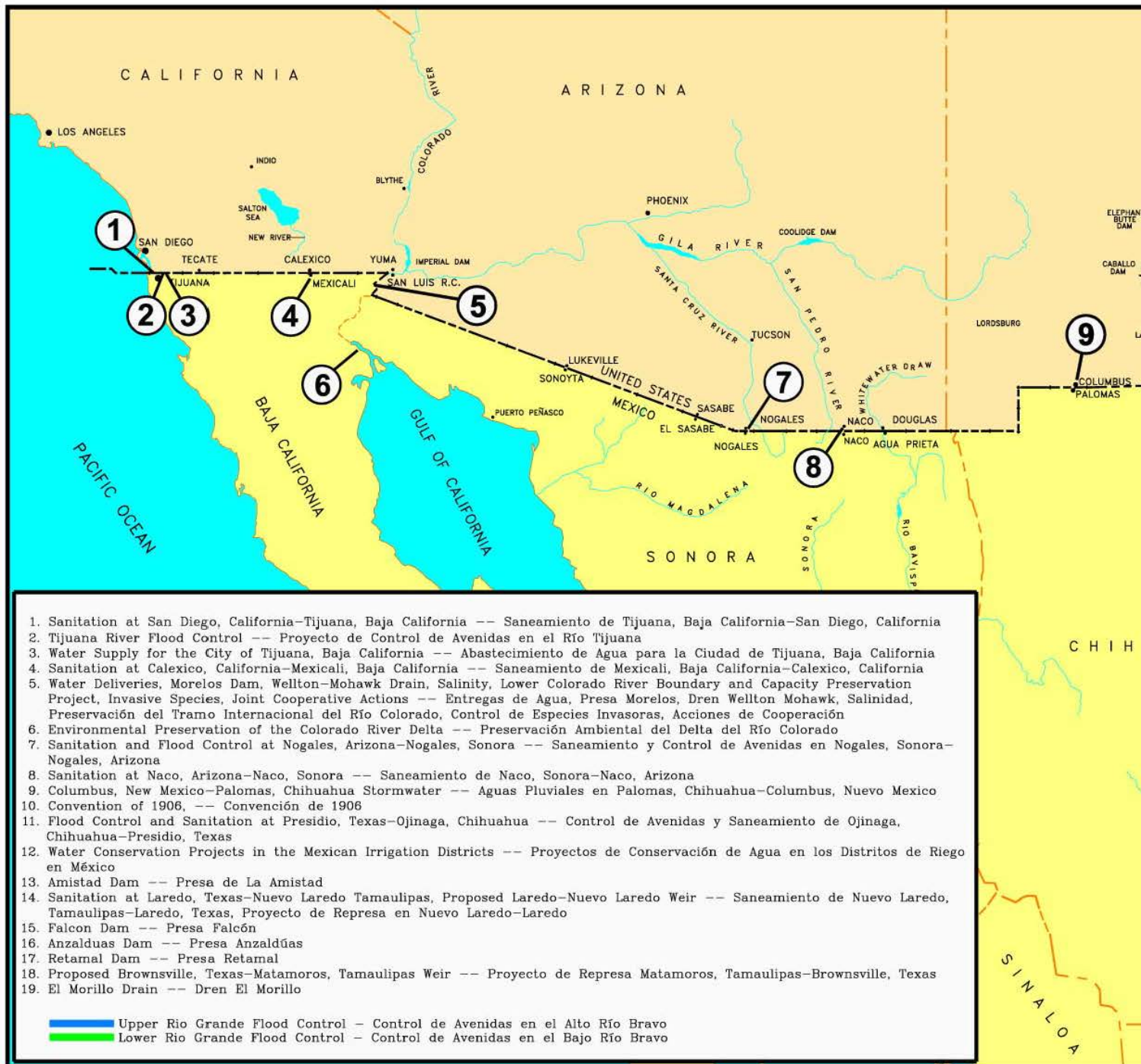


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Projects of the International Boundary and Water Commission Included in the 2008 Annual Report



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