

INTERNATIONAL BOUNDARY AND WATER COMMISSION

UNITED STATES AND MEXICO



AERIAL VIEW OF ANZALDUAS DIVERSION DAM IN THE LOWER RIO GRANDE

2005
ANNUAL REPORT

*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

MESSAGE FROM THE COMMISSIONERS

During 2005, the International Boundary and Water Commission, United States and Mexico (IBWC) carried out various activities related to boundary demarcation, maintenance of the channels of the international rivers, control and use of the international waters, and monitoring of the quantity and quality of these waters. These activities were undertaken in conformance with the terms of the boundary and water treaties agreed to by the Governments of the United States and Mexico. Application of these treaties is the responsibility of the IBWC.

During the year, U.S. President George W. Bush designated longtime Commission employee Carlos Marin as Acting Commissioner following the resignation of Arturo Q. Duran. The Mexican Section continued to operate under the leadership of longtime Commissioner Arturo Herrera Solis.

The major Commission accomplishment for the year was the resolution of Mexico's deficit in Rio Grande water deliveries to the United States. The breakthrough arrangement, based on the hard work and technical expertise of the Commission, was announced in March by U.S. Secretary of State Condoleezza Rice and her Mexican counterpart, Foreign Secretary Ernesto Derbez. The commitments announced in March were fulfilled and the Commission declared on September 30 that the deficit had been eliminated.

These and other activities are described in this report, which has been prepared in conformance with and in fulfillment of Article 24, paragraph (g), of the 1944 Water Treaty.



Carlos Marin
Acting United States Commissioner



J. Arturo Herrera Solis
Mexican Commissioner

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I.- BOUNDARY DEMARCATION

Maintenance of Boundary Demarcation Features

The Commission 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.

Consequently, during 2005, the Commission inspected and/or performed maintenance on the boundary markers installed at 16 international bridges and five land ports of entry.

The U.S. Section undertook rehabilitation of several boundary monuments to the west of Nogales, AZ-Nogales, Son. Likewise, inspection visits were made to the international monuments in the border zone to the west of the Colorado River and maintenance was performed as necessary.



Demarcation of the international boundary at the the Eagle Pass, TX-Piedras Negras, Coah. International Bridge.



Monument No. 85A on the international boundary.

Resolution of the Rio Grande Water Deficit

The IBWC in 2005 marked the resolution of Mexico's long-standing deficit in Rio Grande water deliveries to the United States under the 1944 Water Treaty. The treaty provides for the distribution of the waters of the Rio Grande between the two countries from Fort Quitman, Texas to the Gulf of Mexico. In accordance with that treaty, Mexico delivers water to the United States from six of its Rio Grande tributaries in cycles of five years; water from these tributaries is allotted two-thirds to Mexico and one-third to the United States.

Starting with the five-year cycle that ended in 1997, Mexico had experienced a deficit in water deliveries to the United States. Although some progress had been made in prior years to address the deficit, the issue was not resolved until 2005.

At the beginning of the year, binational negotiations were held in Washington, DC and El Paso, TX, with the goal of reducing or eliminating the deficit. As a result, the IBWC Commissioners formulated and presented to their respective governments recommendations on this subject, agreeing that the volume of the deficit on October 1, 2004 was 716,670 acre-feet (af) or 884 million cubic meters (mcm) and identifying water sources for covering this volume. These understandings were endorsed by

both governments through the exchange of diplomatic notes on March 10, 2005.

At the end of September, Mexico completed the water allotments to the United States in keeping with the aforementioned understandings. Accordingly, the Commission declared that the deficit had been eliminated in its entirety and the 1992-1997 and 1997-2002 cycles closed. The two IBWC Commissioners formally acknowledged the above through the exchange of letters.

Convention of 1906

In accordance with the Convention of 1906, the United States delivered Rio Grande water to Mexico at Ciudad Juarez, Chihuahua — water that was released from Elephant Butte and Caballo Dams in New Mexico. During 2005, Mexico received a full treaty allotment of 60,000 acre-feet (74 mcm), diverting its water through the Acequia Madre Canal for irrigation in the Juarez Valley.

The Commission, in coordination with the U.S. Bureau of Reclamation, which operates the two dams, Mexico's National Water Commission, Elephant Butte Irrigation District, and El Paso County Water Improvement District No. 1, held monthly meetings to exchange information regarding changing runoff and storage conditions in order to maximize the efficiency of deliveries by coordinating among users.

The Commission coordinated the schedule for water deliveries to Mexico in 2005, operated the diversion dams in El Paso, TX-Ciudad Juarez, Chih. (American and International Dams), and measured and monitored the volumes delivered.

In February, IBWC officials joined dignitaries from other water agencies from Southern New Mexico and the area of El Paso, TX-Ciudad Juarez, Chih. to mark the centennial of the U.S. Bureau of Reclamation's Rio Grande Project. The Rio Grande Project was originally authorized to settle conflicting interests over the limited supply of water within the Rio Grande Basin of southern Colorado, New Mexico, and far west Texas. As part of the project, Elephant Butte and Caballo Dams were constructed to supply water to the region's users, including Mexico. The project also includes flood control and hydroelectric power components.

The IBWC coordinates closely with Reclamation to ensure that release of waters from Rio Grande Project dams fulfills the requirements of the Convention of 1906.

Flood Control - Upper Rio Grande

In August, the Rio Grande at El Paso, TX-Ciudad Juarez, Chih. experienced extremely high flow due to locally heavy rainfall. The



Commission meeting to develop the Rio Grande flood control exercise.

river flowed out of the low-flow channel and onto the floodplain near International Dam. The staff monitored the situation closely and opened the gates of International Dam in order to lower the water level. Rains also caused flooding of farmland along the Rio Grande downstream of Ft. Quitman, TX. Silt from arroyos that flow into the river is an ongoing problem that contributes to reduced conveyance capacity and flooding.

Flood Control - Lower Rio Grande

In the Lower Rio Grande, Hurricane Emily made landfall on July 20 at a point 80 miles (129 km) south of Brownsville, TX-Matamoros, Tamps., damaging villages in Mexico and generating high flows in the Rio Grande.

The IBWC operates the Lower Rio Grande Flood Control Project, which includes a system of

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levees and floodways covering 180 river miles (290 km) from Peñitas, TX-Diaz Ordaz, Tamps. to the Gulf of Mexico. Emergency personnel worked around the clock at Anzalduas and Retamal Dams, the Commission's two diversion dams in the project, for several days immediately following the hurricane.

To limit downstream flows in the Rio Grande at Brownsville, TX-Matamoros, Tamps., Mexico diverted Emily-related flow at Retamal Dam into its interior floodway.

As a result of the storm, Rio Grande flow at Roma, TX-Ciudad Miguel Aleman, Tamps. peaked at more than 25,000 cubic feet per second (cfs) (700 cubic meters per second [cms]) and flow at Rio Grande City, TX-Camargo, Tamps. exceeded 20,000 cfs (560 cms). Still, flow remained within the river's conveyance capacity. The two Sections coordinated with agencies in both countries to disseminate information and monitor flows, including inflows from Rio Grande tributaries.

As it does every year prior to hurricane season, the Commission in June conducted its flood control exercise at Anzalduas and Retamal Dams as well as at the Commission's two international reservoirs farther upstream — Falcon and Amistad Dams — with the participation of the U.S. National Weather Service and Mexico's National Water Commission. Additionally, the IBWC coordinated with authorities in

both countries to exchange information and strengthen preventive measures to address flood emergencies in the Rio Grande.

Operation and Maintenance of Amistad Dam

Amistad Dam, located on the Rio Grande near Del Rio, Texas-Ciudad Acuña, Coahuila, is operated jointly by the two Sections of the IBWC. The dam provides water storage, flood control, and hydroelectric power for both countries. At the end of 2005, joint storage was 2.77 million acre-feet (3418 mcm) or 88% of capacity, similar to end-of-year storage in 2004.



Maintenance of a gate at Amistad International Dam at Del Rio-Cd. Acuña.

The Commission jointly operated Amistad Dam, releasing water to users in both countries for water supply to border cities, irrigation, and generation of

electricity, among other uses. The Commission also carried out required preventive maintenance and repair of the equipment, components, facilities, instruments, and structure of the dam itself.

The United States Section concluded the field work for the Amistad Dam silt survey; this information will be reviewed by the Mexican Section in order to update calculations for the dam's storage capacity.

Operation and Maintenance of Falcon Dam

The IBWC's other large storage reservoir on the Rio Grande is Falcon Dam, located upstream from Roma, TX – Ciudad Miguel Aleman, Tamps. Like Amistad Dam, Falcon provides water storage, flood control, and hydroelectric power generation for both countries. At the end of 2005, joint storage was 1.62 million acre-feet (2001 mcm) or 61% of capacity.

During 2005, the normal program of monitoring and maintenance of the structural and mechanical elements of the dam continued. Additionally, the IBWC conducted operational activities to release volumes of water as requested by each country.

In accordance with IBWC agreements, the Mexican Section

undertook the silt survey for Falcon Dam. The Commission will use the information gathered in this survey to calculate the new storage capacity of the reservoir.

Power Generation at Amistad and Falcon Dams

Both countries operate hydroelectric power plants at Amistad and Falcon Dams, which generate electricity equally for both countries.

Discussions regarding the sharing of power generation between the two countries during hours of peak demand resumed during the calendar year. The electric cooperatives in the United States had asked the IBWC to review the practice whereby Mexico generated power during the evening hours while the United States generated electricity during the morning hours. Discussions indicated that evening generation was much more valuable to U.S. power companies as compared to power generated between the hours of midnight and noon.

Internal discussions of the IBWC led to a subsequent meeting in November with participation of the State of Texas, the U.S. power cooperatives, Mexico's National Water Commission, and the Federal Electricity Commission of Mexico. As a result of the favorable discussions, the parties agreed to



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develop draft rules to be implemented on a trial basis during calendar year 2006 to alternate power generation during hours of peak demand between the two countries.

Maintenance of Anzalduas and Retamal Dams

Both Sections of the IBWC carried out preventive maintenance on the Anzalduas and Retamal International Diversion Dams on the Rio Grande. Anzalduas Dam, located near McAllen, TX-Reynosa, Tamps., allows for the diversion of the U.S. share of Rio Grande floodwaters to the interior floodway and the diversion of irrigation water into Mexico's canal system. Retamal Dam, located 38 miles (61 km)

downstream from Anzalduas, was built for flood control purposes. It enables Mexico to divert to its interior floodway its share of Rio Grande floodwaters and limits flood flows into the area of Brownsville, TX-Matamoros, Tamps.

At Anzalduas Dam, the stoplogs were sandblasted and painted, and maintenance of gates #1 and #6 of the dam was completed, thereby complying with international agreements which call for maintenance to be performed on two of the six gates each year.

At Retamal Dam, brush and weeds were cleared from the areas adjacent to the dam and the access road, and the handrails, arms, and counterweights on the center floodgate were cleaned and painted.



Gate #1 at Anzalduas Dam was sandblasted as part of preventive maintenance.

Water Conservation Projects in the Mexican Irrigation Districts

The Commission reviewed the 2003-2004 Report of Mexico's National Water Commission on the progress of the modernization and improved technology projects in the irrigation districts in the Conchos River Basin, within the context of Minute 309, and concluded that the agreements of the Minute had been fully met. Minute 309, a 2003 Commission agreement, provides for IBWC review of volumes of water conserved through the modernization projects and conveyance of conserved waters to the Rio Grande.

During the period between January and March 2005, the waters saved from these projects were transferred to the Rio Grande, with a total of 39,822 acre-feet (49.12 mcm) reaching the Rio Grande. From this volume of water, each country was allotted its corresponding proportion in accordance with the 1944 Water Treaty and Minute 309.

In December 2005, the Commission conducted a joint field visit to the Conchos River irrigation districts to observe the progress on works and investments corresponding to the 2004-2005 agricultural season.

Environmental Preservation of the Rio Grande

During 2005, the IBWC supported several environmental agencies and groups in the United States and Mexico in the development of pilot projects for controlling salt cedar (tamarisk) along the Rio Grande in the area of Big Bend, TX-Maderas del Carmen, Coah., making it possible for crews working on the control projects to carry out their activities on both sides of the international boundary. Control of this species is a high priority given the elevated amounts of water it consumes.

The Commission also lent support to the coordination of the Dia del Rio activities in Laredo, TX-Nuevo Laredo, Tamps.

Presidio, TX— Ojinaga, Chih.

In 2005, U.S. Section personnel started removal of the concrete weir located in the Rio Grande channel at the Below gaging station site, 1000 feet (305 meters) east from Alamito Creek and downstream from Presidio, TX-Ojinaga, Chih. The weir had been partially removed in the early 1990s. The weir had created an obstruction to flows, thus allowing sediment to be deposited upstream and downstream of the weir, a problem that worsened with each high flow. A sandbar had been created where vegetation, consisting mainly of salt cedar, had established itself. The sandbar had



become a hazard, affecting the gaging station and operation of the cableway across the river used for water measurement purposes. This gaging station measures Rio Grande flows directly downstream from Presidio-Ojinaga, which account for inputs from the Conchos River and Alamito Creek.

Control of Invasive Aquatic Plants

Inspection visits were made to the Rio Grande channel, where a notable increase was observed in invasive species such as hydrilla (*Hydrilla verticillata*) and water hyacinth, (*Eichhornia crassipes*) in the reach of the Rio Grande between Falcon Dam and Rio Grande City, TX-Ciudad Camargo, Tamps. covering approximately 37.3 river miles (60 km). Studies were performed and courses of action developed to control these invasive species. In addition, binational meetings were held on the topic.

Operation and Maintenance of El Morillo Drain

El Morillo Drain, located in the State of Tamaulipas, Mexico, is a binational project that conveys saline irrigation return flows to the Gulf of Mexico, thereby reducing the salinity of the Rio Grande. Consistent with the agreements in Minutes 223 and 303 of the International Boundary and Water Commission, maintenance works were carried out during the year, including the removal of sediment,

replacement of concrete panels in the drain, and cleaning of the siphons. Emergency works to clean up the drain at critical points were also performed. In addition, binational meetings were held with the participation of the two IBWC Sections and Mexico's National Water Commission to follow up on the electrical repairs at the pumping station.

The Commission also initiated discussions to develop a project for renovation of El Morillo Drain in order to reduce the amount of maintenance required to keep the drain in good operating order. During the year, the United States Environmental Protection Agency transferred to the U.S. Section appropriated funds in the amount of \$625,000 for design and construction. The project will likely include encasing the drain with reinforced concrete in critical areas to reduce the accumulation of sediment and other debris. Construction is expected to begin in early 2007.



Morillo Drain Pumping Plant

**Brownsville, TX-
Matamoros, Tamps.
Weir**

The IBWC convened stakeholders from both countries to discuss the proposed Brownsville-Matamoros Weir project, which entails construction of a weir (a kind of dam) across the Rio Grande to enhance the municipal water supply for both cities. During the meetings, concerns expressed by Mexico regarding the potential effects of weir operation on groundwater table elevations were addressed. Consultants for the Brownsville Public Utilities Board (PUB) made a presentation based on a study they performed of groundwater table elevations in Matamoros resulting from the operation of the weir project. The study concluded that buildings in Matamoros would not be affected by the increase in groundwater table elevation. However, Mexico’s National Water Commission made a presentation indicating that certain low areas in Matamoros would be negatively impacted. Mexico concluded that the site proposed by the PUB would not be acceptable unless certain mitigation measures were adopted. Other sites were considered but no decision was reached.

**Water Gaging and
Weather Observation
Network**

The Commission operated and maintained more than 60

gaging stations on the Rio Grande, Colorado River, and tributaries. Each Section is responsible for the operation and maintenance of gaging stations on the tributaries in its respective country. Most stations use satellite telemetry to provide near real-time water level data, including six stations installed on Mexican tributaries in 2005. 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.

**Binational
Rio Grande Summit**

Some 200 stakeholders from throughout the Rio Grande Basin gathered in McAllen, TX-Reynosa, Tamps. on November 17-18, 2005 for the Binational Rio Grande Summit sponsored by the IBWC. The objective of the Summit was to convene experts and water users from the basin to develop recommendations for consideration by the Governments of the United States and Mexico related to sustainable management of the basin. Participants included representatives from local, state, and federal government, academics, environmental organizations, municipal water utilities, farmers, and irrigation districts from both countries.



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IBWC Commissioners Arturo Herrera (l) and Carlos Marin at the Binational Rio Grande Summit.

The Binational Rio Grande Summit recommendations, which resulted from two days of presentations and discussion, focused on four broad conference themes:

- Legal and Institutional Aspects
- Binational Basin Management
- Environment and Water Quality
- Finance.

The recommendations included such things as conducting binational information sharing, supporting and funding water infrastructure projects, and developing incentives to promote water conservation.



Closing session of the Binational Rio Grande Summit at Mc Allen, TX– Reynosa, Tamps.

Water Deliveries, Operation and Maintenance of Morelos Dam

In accordance with the stipulations of the 1944 Water Treaty, the United States delivered to Mexico a full allotment of Colorado River water for 2005. To effect these deliveries, the Mexican Section of the Commission operated the Morelos Diversion Dam near Yuma, Arizona - Los Algodones, Baja California, assuring diversion of Mexico's share of water to Colorado River Irrigation District 014. Additionally, the Mexican Section continued its program of sampling for suspended sediments that arrive at Morelos Dam. In accordance with the maintenance program, the Mexican Section also carried out improvements such as the installation of cathodic protection on the gates of the dam and replacement of the emergency generator.

Operation and Maintenance of the Wellton-Mohawk Drain

The Wellton-Mohawk Drain bypasses saline irrigation return flows from the United States to improve the quality of Colorado River water delivered to Mexico. Maintenance performed under Minute 284 was limited in 2005 due to budget constraints. It included clearing and vegetation removal for a length of 21 miles

(34 km) from the international boundary and replacement of concrete panels on the side slopes.

Salinity

During 2005, cooperative measures continued to improve the quality of Colorado River water delivered to Mexico at the Northerly International Boundary and Southerly International Boundary. In accordance with Minute 242, the salinity of waters delivered to Mexico must be similar to that delivered to U.S. users at Imperial Dam; to achieve this, the Minute establishes a salinity differential, essentially a cap on the difference between the salinity of waters available to each country.

To resolve discrepancies between U.S. and Mexican laboratory results for salinity levels in water samples, meetings were held throughout 2005 to review sampling techniques, testing methodology, and the results of tests performed by both countries. The purpose of these efforts was to standardize the results from the salinity analyses performed by the two countries.

From October 2004 to January 2005, the system installed at the Southerly International Boundary (SIB) underwent testing and calibration to improve the quality of the water delivered to Mexico at this site. Due to personnel and equipment issues, this system will not be fully operational until late 2007.



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This system includes a diversion channel to divert Yuma Valley agricultural drainage waters into the Wellton-Mohawk Bypass Drain and a variable speed pump installed at the Main Drain Pumping Plant to reduce the large fluctuations of flow in water delivered to Mexico during the four months of the year specified by Mexico (October, November, December, and January), thereby decreasing the salinity spikes. An improvement in the salinity of the water delivered at the SIB has been observed during the critical months mentioned.

For 2005, the salinity differential between Imperial Dam and Morelos Dam was 118 parts per million (ppm) according to the Mexican standards and 95 ppm according to United States standards, meeting the levels stipulated in Minute 242.

Lining of the All-American Canal

The All-American Canal, located near the international boundary in the United States, conveys Colorado River water for agricultural irrigation in the Imperial and Coachella Valleys of California. Given the increasing demand for water in the region, water managers plan to line a reach of the canal to prevent water loss through seepage so that this conserved water can be used in urban areas along the California coast. The preferred alternative for the lining is to construct a 23-mile (37-km) canal parallel to the existing one.

The Mexican Section of the IBWC has expressed its disagreement with the plans that the United States intends to carry out for this project because of potential negative impacts in Mexico. The Commission arranged meetings with technical advisers from both countries in February, April, June, and July 2005, in which Mexican officials presented information about potential effects in Mexico should the All-American Canal be lined. Information was also exchanged on possible cooperative options to address the potential impacts of the project in Mexican territory. At year's end, discussion of these options was ongoing.

Environmental Preservation of the Delta

In 2005, under the framework of IBWC 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," the Commission compiled a Colorado River Delta database that was posted on the websites of the two IBWC Sections.

Additionally, nongovernmental organizations (NGOs) that are members of the Advisory Group established by the Commission pursuant to Minute 306 prepared a report, "Conservation Priorities in the Colorado



River Delta," which they shared with the Commission so that the conservation and environmental protection projects for the Colorado River Delta could be considered by authorities in both countries. The Commission scheduled Advisory Group meetings for the early part of 2006 to review the NGO document.

Water Supply for the City of Tijuana, B.C.

Within the framework of IBWC Minute 310, "Emergency Delivery of Colorado River Water for use in Tijuana, Baja California," it was agreed to provide Tijuana with water through the Southern California Aqueduct System for five years starting in 2003; this water is allotted to Mexico in Article 10(a) of the 1944 Water Treaty. In 2005, 163 acre-feet (201,470 cubic meters) of water was delivered. Under the terms of Minute 310, Mexico compensates affected entities in the United States for all costs associated with these deliveries.



Personnel operating the Emergency Connection to supply water to Tijuana, B.C.

Silt

During 2005, weekly sediment sampling was conducted at the Northerly International Boundary in the Colorado River immediately upstream from Morelos Dam. The U.S Bureau of Reclamation continued desilting works in the area of Imperial Dam, 18 miles (29 km) upstream of Yuma, Arizona, removing approximately 1.0 million cubic yards (.756 million cubic meters) of silt. This activity is scheduled to be completed in June 2006.

Because no flooding occurred in 2005 on the Gila and Bill Williams Rivers (U.S. tributaries to the Colorado River), sediment conditions were normal at the Northerly International Boundary. The settling basin constructed in 2001 in the Colorado River immediately upstream of Morelos Dam has worked according to design, preventing large volumes of silt from entering Mexico's canal system in the Mexicali Valley.

Lower Colorado River Boundary and Capacity Preservation Project

The objective of the Lower Colorado River Boundary and Capacity Preservation Project is to study and implement a channel configuration that ensures sufficient capacity to convey floodwaters through the international reach of the Colorado River, preserves the international boundary line, and considers environmental aspects.



III .- COLORADO RIVER

During 2005, the United States Section initiated a process in coordination with the U.S. Bureau of Reclamation and its consultant, Brown & Caldwell, to review the conveyance capacity required in this reach to safely pass floodwaters and to undertake the Flood Frequency Study at Morelos Dam. Once this work is complete, the Commission will be able to consider construction of works to meet the project's goals.

Aquatic Weeds

During 2005, both Sections actively participated in joint meetings to study the control of giant salvinia (*Salvinia molesta*) in the Lower Colorado River, exchanging information on the methods and actions currently being applied, and those proposed for future control of this species.

Giant salvinia is a floating fern that can clog water intakes for irrigation, impede recreational activities, such as boating and fishing, and degrade water quality for aquatic species.

Monitoring continued of the aquatic weeds that pass through the Colorado River. Together with the United States Department of Agriculture and Mexico's Colorado River Irrigation District 014, the Commission considered the need to reinforce existing control programs for other weeds, such as hydrilla, with the goal of applying them to control giant salvinia.



Aquatic weeds upstream from Morelos Dam.

IV.- SANITATION AND WATER QUALITY

Sanitation at San Diego, CA–Tijuana, B.C.

During 2005, the IBWC continued to undertake activities to address sanitation issues at San Diego, CA-Tijuana, B.C. The IBWC currently operates the South Bay International Wastewater Treatment Plant (SBIWTP) in San Diego; this plant provides advanced primary treatment of wastewater generated in Tijuana.

In accordance with Minute 311, the Commission held internal discussions and international dialogue regarding the proposed construction in Mexico of a secondary treatment plant to provide a higher level of treatment for SBIWTP effluent and to treat additional raw sewage from Tijuana.

The U.S. Section completed various requirements under federal law in the United States, including finishing environmental studies for the project and entering into negotiations with a company to provide required private participation in the project.

Mexico's federal government and the State of Baja California in December 2005 completed the ninth of ten annual payments to the United States government through the IBWC to cover Mexico's share of costs associated with the construction of the SBIWTP. Mexico also makes quarterly payments for its share of operation and maintenance costs.

To address sewage in the Tijuana River, which flows north into the United States near the SBIWTP, the two Sections coordinated efforts for the timely attention to occurrences of trans-boundary runoff and discharge from the Tijuana River and its tributaries. Corresponding maintenance was assured of Pump Station CILA and the Tijuana River pilot channel. This minimized the threat to public health and the environment by controlling dry-weather discharges into the United States.



SBIWTP in San Diego, CA

IV.- SANITATION AND WATER QUALITY

Sanitation at Calexico, CA - Mexicali, B.C.

Substantial progress was made during the year on the Mexicali II sanitation project, a wastewater collection and treatment project being constructed by CESP, the public services utility of Mexicali, B.C. As part of this project, the Las Arenitas wastewater treatment plant is expected to begin operations in late 2006.

Construction of Mexicali II marks the culmination of many years of work by entities in both countries, including significant early leadership by the IBWC. The lack of adequate sanitation infrastructure in Mexicali has contributed to contamination of the New River, which flows north into the United States at Calexico, CA.

In 2005, the monthly sanitation inspection visits of the New River continued. Coordinated by IBWC, the visits include the participation of various agencies from the United States and Mexico. These field visits are conducted for the purpose of observing the water quality conditions of the river and its tributaries, the existence of uncontrolled wastewater discharges, and the sanitation conditions in these water bodies and adjacent areas.

Sanitation at Nogales, AZ - Nogales, Son.

The Nogales International Wastewater Treatment Plant (NIWTP), located in Rio Rico, AZ, was constructed in 1972 within the framework of IBWC Minute 227 to treat wastewater from the Cities of Nogales, AZ and Nogales, Son. A subsequent agreement, Minute 276, provided for the expansion of the NIWTP and allotted to Mexico a treatment capacity at the plant of 9.9 million gallons per day (434 liters per second).

During the year ending in September 2005, the NIWTP treated 5327.1 million gallons (20,165,543.6 cubic meters), with 63% of the flow from Mexico and 37% from the United States. Mexico paid the costs associated with treatment of Mexican sewage, including treatment for volumes in excess of the capacity assigned to Mexico in Minute 276. In October, a binational meeting was held to address the different aspects of managing flows in excess of Mexico's allotment at the NIWTP.

During the year, work continued on installation of the Supervisory Control and Data Acquisition System (SCADA) at the NIWTP to reduce electrical consumption at the plant and provide plant operators with more control and better information about the plant's performance. Additionally, a contract was issued to remove sludge from the NIWTP lagoons.



IV.- SANITATION AND WATER QUALITY

Four Binational Work Group meetings were held in 2005 on the subject of pretreatment for the Nogales Sister Cities. 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. The goal of the meetings was to study possible cooperative actions for handling this issue.

In addition, throughout the year the IBWC coordinated delivery to the Nogales, Sonora utility of calcium hypochlorite to disinfect the surface water in the Nogales Wash.

In August a sewer pipe in Nogales, Sonora ruptured, sending millions of gallons of raw sewage into Nogales Wash. Officials on both sides of the border chlorinated the flows for disinfection and the USIBWC put into operation the pumping plant in the wash, which diverted some of the flow for treatment at the NIWTP.

That same month, a sulfuric acid spill affected the Santa Cruz River, prompting activation of the Nogales Sister City Emergency Response and Preparedness Plan. The spill occurred in Mexico after a train with tanker cars of sulfuric acid derailed near the river. The IBWC offered support to local emergency managers who took steps to protect the public and drinking water.

In December, the North American Development Bank approved a \$59 million grant to

the City of Nogales, Arizona to overhaul the NIWTP. The main purpose of the upgrade is to bring the plant into compliance with water quality laws applicable in the United States.

Additionally, a consultant submitted a report in March on the International Outfall Interceptor (IOI), the 9-mile (14-km) long pipe that conveys sewage from the international boundary to the NIWTP. The report recommended pipeline rehabilitation to repair structural damage and eliminate infiltration. Implementation of the IOI rehabilitation is contingent upon the availability of funding.

Sanitation at Naco, AZ - Naco, Son.

In 2005 the IBWC conducted quarterly joint inspections of the lagoon wastewater treatment system in Naco, Son. with the objective of observing the current conditions of the east side lagoons and the pumping plant that conveys wastewater to the west side lagoons. In accordance with IBWC recommendations, the local utility took measures to protect the lagoons against erosion that was being caused by wave action.

The local utility also replaced the pumps at the sewage lift station that had been rehabilitated by the U.S. Section in 2000. The new pumps should be easier to maintain, improving performance of the wastewater collection system.



IV.- SANITATION AND WATER QUALITY

Sanitation at El Paso, TX – Ciudad Juarez, Chih.

In response to concerns expressed by residents on both sides of the border about odors emanating from the Ciudad Juarez North Wastewater Treatment Plant, the IBWC facilitated binational meetings to follow up on odor control activities. Binational visits were also carried out to sites where effluent from the two Ciudad Juarez Wastewater Treatment Plants is discharged into the Rio Grande.

Follow-up was also performed regarding the proposed Anapra Wastewater Treatment Project in Ciudad Juarez. Binational meetings and visits to the proposed plant construction site were conducted.

Sanitation at Nuevo Laredo, Tamps.

The Nuevo Laredo International Wastewater Treatment Plant (NLIWTP) is a binational project constructed in the 1990s within the framework of the IBWC to address Rio Grande water quality concerns in the area of Laredo, TX-Nuevo Laredo, Tamps. In accordance with the agreements in Minute 297, the IBWC reached consensus on the United States share of the operations and maintenance (O&M) costs for the sanitation system in Nuevo Laredo. The total O&M costs presented for 2005 were \$2,537,353.28 U.S.

dollars, out of which the United States contributed \$400,000.00. Moreover, personnel from both Sections continued to conduct weekly joint inspections of the NLIWTP and prepare associated reports.

Water Quality Monitoring

As part of the Joint Memorandum, "Recommendation of an Initial International Program for Observation of the Quality of International Waters of the United States and Mexico," dated July 5, 1977, the IBWC has been collecting water quality information to assess and address water quality along the border where the United States and Mexico share transboundary water resources.

In the international reach of the Rio Grande basin, the IBWC routinely compiles and exchanges water quality information along the major urban areas such as El Paso, TX-Ciudad Juarez, Chih.; Del Rio, TX-Ciudad Acuña, Coah.; Eagle Pass, TX - Piedras Negras, Coah.; Roma, TX - Ciudad Miguel Aleman, Tamps.; Hidalgo, TX - Reynosa, Tamps.; and Brownsville, TX-Matamoros, Tamps. The data indicate that fecal coliform bacteria are a water quality concern downstream of some urban areas along the international reach of the Rio Grande.



IV.- SANITATION AND WATER QUALITY

Along the New River, which flows from Mexicali, Baja California north through Calexico, California before emptying into the Salton Sea, water quality is monitored for several parameters in accordance with Minute 264. During 2005, the level of dissolved oxygen was not in compliance with the Minute 264 standard. These low levels of dissolved oxygen may lead to fish kills and create anoxic conditions leading to loss of aquatic communities and nuisance conditions such as increased odor from organic decomposition. Impacts to water quality and habitat affect this reach and concerns have been raised by the local communities regarding the levels of bacteria that could potentially be a health concern to people who come into contact with the waters of the New River.

The IBWC also collects and exchanges water quality data on infrastructure projects along the border that affect water quality. Data is reviewed to determine compliance with the established permit limits for each particular wastewater treatment plant. For

the sister cities of Nogales, AZ - Nogales, Son., monthly data on the quality of the influent and effluent from the Nogales International Wastewater Treatment Plant (NIWTP) in Arizona was compiled, exchanged, and distributed to the pertinent authorities. At the NIWTP, effluent that exceeds the U.S. permit limits for Ammonia-nitrogen and turbidity is an ongoing concern. The U.S. Section has been working with its partners to improve the level of treatment to meet U.S. permit requirements for surface water and comply with the State of Arizona groundwater protection permit limits.

In addition, information is compiled daily on the quality of water flowing through the Nogales Wash, an urban stream that flows from Nogales, Son. into the United States. Significant improvement in the levels of fecal coliform in the Nogales Wash were realized during 2005 due to chlorination of flows in the Wash carried out by the State of Sonora water utility (COAPAES).



**Water quality sampling
on Lower Rio Grande
tributaries.**

IV.- SANITATION AND WATER QUALITY

In the San Diego, CA-Tijuana, B.C. region, monthly water quality data on the Pacific Ocean at Imperial Beach, CA and the Tijuana, B.C. beaches was compiled, exchanged, and distributed to the pertinent authorities. The program includes monitoring related to the South Bay Ocean Outfall -- the pipeline that discharges effluent from the Commission's South Bay International Wastewater Treatment Plant (SBIWTP) in San Diego at a point 3.5 miles (5.6 km) offshore in the Pacific Ocean. The IBWC South Bay Ocean Monitoring Program includes over 35 stations along the shore and offshore to monitor water quality and aquatic communities. At the international boundary in the Pacific Ocean, high bacterial concentrations have led to beach closures in the San Diego region.

Data on the influent and effluent from the SBIWTP and the San Antonio de los Buenos Wastewater Treatment Plant in Tijuana were also compiled and exchanged for each month in 2005.

In the El Paso, TX-Ciudad Juarez, Chih. area, monthly data is provided to the United States on the quality of the influent and effluent from the Ciudad Juarez North and South Wastewater Treatment Plants that drain into Mexico's irrigation canal system. Sampling points within the canal include monitoring stations above and below the treatment plants at Km 135 Discharge Drain, El Guayuco, and Fort Quitman. The canal empties into the Rio Grande below Fort Quitman, Texas. Likewise, data from El Paso's wastewater treatment plants (WWTP) (Roberto Bustamante WWTP, Haskell R. Street WWTP, Northwest WWTP, and the Fred Hervey Water Reclamation Plant) are provided to Mexico for review.

In Nuevo Laredo, Tamps., IBWC Minute 279 establishes water quality standards for the Nuevo Laredo International Wastewater Treatment Plant (NLIWTP). The NLIWTP meets the standards for effluent quality on a regular basis; it discharges into the Rio Grande below the two sister cities of Laredo, TX-Nuevo Laredo, Tamps.



Effluent from the Nuevo Laredo International Wastewater Treatment Plant is monitored.

Desalinization Study for the San Diego, CA- Tijuana, B.C. Region

In the framework of IBWC Minute 301, support was provided to local authorities for international coordination of the "Feasibility Study for the Development of Joint Seawater Desalinization Opportunities for the San Diego-Tijuana Region," which was completed in March 2005 and distributed to the participating authorities in the United States and Mexico. The study considered financing options and legal and institutional aspects. The San Diego County Water Authority (SDCWA) contracted with P.B. Water to develop the study.

Transboundary Aquifers

In the area of ground-water, the IBWC exchanged and distributed data from wells in the Yuma Valley and San Luis Rio Colorado. Information was presented on the aquifer in the area of the Imperial Valley-Mexicali Valley that would be impacted by the lining of the All-American Canal. Quarterly drilling was done in water table sample wells in the area of Amistad Dam.



*Water table sample wells at
Amistad Reservoir*

V.- OTHER PROJECTS

International Bridges

In 2005, the Commission approved the conceptual plan to replace the Tornillo, TX-Guadalupe, Chih. International Bridge, known as the Fabens Bridge, construction of which is proposed 1900 feet (594 m) upstream from the current bridge over the Rio Grande. Similarly, support was given in the form of data and field activities for development of preliminary projects for the following proposed international bridges: Laredo, TX-Nuevo Laredo, Tamps. No. V; the second Del Rio, TX-Ciudad Acuña, Coah. International Bridge; and the Westrail International Railroad Bridge in Brownsville, TX-Matamoros, Tamps.

Tecate Port of Entry

During 2005, the port of entry at Tecate, CA-Tecate, B.C. was renovated. Due to construction of the new port's northbound entry gates, an auxiliary boundary marker was removed. In its place, brass caps were installed on either side of the new northbound gate.

Projects on the Rio Grande Floodplain

In 2005, the Commission reviewed and approved the following projects within the floodplain of the Rio Grande:

- Improvements to the plaza on Water Street in Laredo, TX.
- Santa Ursula Connector Project to connect Santa Ursula Road to Water Street on the Rio Grande floodplain in Laredo, TX.
- Construction of an overpass above the Rio Grande levee in Reynosa, Tamps. for the road known as the Libramiento Oriente.
- Remodeling and expansion of the Reynosa, Tamps. Customs Office as part of the Aduana Modelo project.
- Phase III construction and renovation of Las Tortugas Park in Ciudad Juarez, Chih.
- Construction of a roadway in Eagle Pass, TX, part of which is located in the Rio Grande floodplain.
- Construction of the Nuevo Laredo, Tamps. Municipal Storm Drainage Collectors, including construction of the following stormwater collection drains that discharge into the Rio Grande: 15 de Septiembre (North and South), Campeche, Independencia, Riva Palacio, and Canal Concordia.

Tijuana River Flood Control Project

The telemetry system installed by the IBWC in the Tijuana River basin and at the Abelardo L. Rodriguez Dam was active and operational throughout



the year, demonstrating its effectiveness during the rainy season. This system enables the water elevation and rainfall at Rodriguez Dam to be measured in near real time, providing timely and reliable data. Rodriguez Dam is a small Mexican reservoir in the Tijuana River that plays a key role in the flood control system for Tijuana and downstream interests in San Diego. It is part of the binational Tijuana River Flood Control Project, which includes a concrete-lined river channel and levees. The IBWC looked at the possibility of installing a new remote station at Matanuco Arroyo, downstream from the Abelardo L. Rodriguez Dam, in order to accurately measure releases and leakage from the dam but the project has not yet been implemented.

Nogales Flood Control Project

The IBWC maintained formal communication with relevant authorities regarding the proposed installation of the Nogales Flood Warning System (NFWS). The NFWS would consist of rain and stream flow gages located at key areas in the Nogales Wash basin in Nogales, AZ-Nogales, Son. Funding for purchase and installation of all gaging and communication equipment would be from the United States Army Corps of Engineers (USACE), the agency responsible for most federal flood control projects in the United States. The USACE would also fund normal operational costs for this system in

Mexico. The IBWC would coordinate international efforts for the installation of the system in Mexico and for financial transactions from the USACE to Mexico for the operational costs of the system in Mexico. Funding is not expected for a number of years.

To advance this effort, the Nogales Wash Flood Control Study, developed under the framework of the Commission, was revised and distributed to interested authorities. The purpose of the study was:

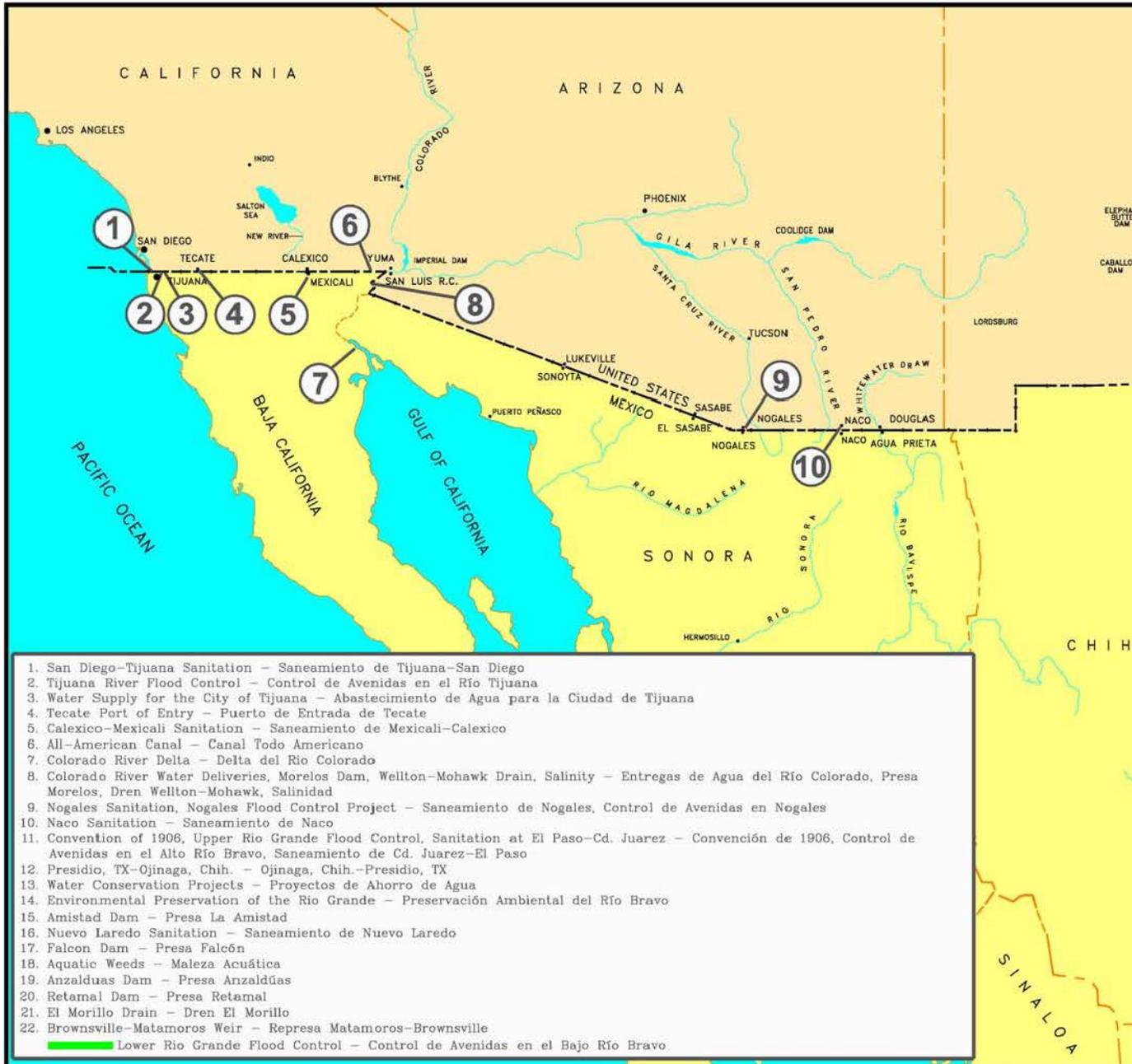
- 1) to identify the nature of the current flood problem in Nogales, Sonora;
- 2) to develop measures that might potentially reduce the threat of flooding; and
- 3) to analyze and compare alternatives to reduce potential flood damage.



Maintenance of the Nogales Wash in Sonora.

2005 PROJECT MAP

Projects of the International Boundary and Water Commission Included in the 2005 Annual Report



Mapa de Proyectos de la Comisión Internacional de Límites y Aguas Incluidos en el Informe Anual 2005

