ENCON INTERNATIONAL, INC.

Engineering, Environmental & Technical Services

FINAL
ENVIRONMENTAL ASSESSMENT FOR
"Replacement of the Old American Canal"
Located in El Paso, Texas

Prepared for:
United States Section, International Boundary
and Water Commission
Contract No. IBM 99-27

Prepared by:
ENCON International, Inc.
7307 Remcon Circle, Suite 101
El Paso, Texas 79912

December 6, 2001
ENCON Project #127-00

NOTICE OF AVAILABILITY

UNITED STATES SECTION
INTERNATIONAL BOUNDARY AND WATER COMMISSION
Replacement of the Old American Canal, Located in El Paso, Texas; Notice of Final Finding of No Significant Impact

AGENCY: United States Section, International Boundary and Water Commission, United States and Mexico

ACTION: Notice of Availability of a Final Finding of No Significant Impact and a Final Environmental Assessment

SUMMARY: Based on the Draft Environmental Assessment (EA) and the public comments received, the United States Section, International Boundary and Water Commission (USIBWC), finds that the proposed action of replacement of the existing American Canal is not a major federal action that would have a significant adverse effect on the quality of the human environment. An Environmental Impact Statement will not be prepared for the project. The Final Finding of No Significant Impact (FONSI) and Final EA have been forwarded to the United States Environmental Protection Agency and various Federal, State and local agencies and interested parties for information only. No comments are requested. The final FONSI and EA are also available on the USIBWC Home Page at *http://www.ibwc.state.gov* under "What's New," and at the reference desk at The University of Texas at El Paso Library and the El Paso Main Library. A limited number of copies of these documents are available upon request from Mr. Fox at USIBWC, 4171 North Mesa Street #C-310, El Paso, TX 79902; Telephone: (915) 832-4736; E-mail: stevefox@ibwc.state.gov.

The proposed replacement and enlargement of the 1.98-mile-long American Canal involves demolishing the deteriorating concrete open channel segments of the canal and replacing them with reinforced concrete-lined canal segments. The USIBWC is authorized under the Rio Grande American Canal Extension Act of 1990 ("RGACE" or the Act of 1990), Public Law 101-438, dated October 15, 1990, to construct, operate, and maintain an extension of the existing American Canal in El Paso, Texas; which would provide for a more equitable distribution of waters between the United States and Mexico, reduce water losses, and minimize many hazards to public safety.

Water for both irrigation and domestic use in El Paso County is diverted into the American Canal at the American Dam located on the Rio Grande approximately 3 miles upstream from downtown El Paso. The American Dam and American Canal were constructed from 1937 to 1938, within United States territory to divert United States waters away from the Rio Grande, and to allow into the international reach of the Rio Grande only those waters assigned to the Republic of Mexico under the Convention of 1906. This ensured that United States waters diverted at the American Dam would be completely retained within the United States.

In the Act of 1990, the United States Congress also authorized the negotiation of international agreements for the RGACE to convey Mexican waters authorized under the 1906 Convention. In view of the conveyance water losses and the safety issues inherent in Mexico's existing canal system, the RGACE was designed to accommodate Mexico's annual 60,000 acre-foot allotment of water at 335 cubic feet per second (cfs), should Mexico request its allotment delivered at this location.

Alternatives Considered:
Five alternatives were considered during the preparation of the environmental assessment, including the Open Channel Alternative (the Proposed Action Alternative) and the No Action Alternative. All four action alternatives include 1) increasing the canal capacity to 1535 cfs, 2) demolition of existing canal structures and open channel concrete lining, 3) reconstructing and enlarging the 400-foot open channel segment immediately downstream from the headgates and the 100-foot open channel segment upstream from the gaging station, 4) not repairing or replacing the two closed conduit segments under West Paisano Drive, 5) installing fences to minimize entrance into the canal, 6) installing safety equipment to reduce canal drownings, 7) removing the Smelter Bridge and the abutments of Harts Mill Bridge, and 8) providing mitigation for the loss of the Smelter Bridge by preparing Historic American Engineering Record (HAER) Level III documentation of the structure (including existing and original construction drawings, captioned photographs, and written data). The alternatives are summarized below:

Alternative 1 - Closed Conduit Alternative: All existing open channel segments (Upper, Middle, and Lower) between the American Dam and International Dam would be replaced with closed conduits, with the two excepted open reaches in the Upper Open Channel segment. This Alternative would be the most expensive to construct and would lose the historic predominantly open visual character of the canal.

Alternative 2 - Closed Conduit/Open Channel Alternative A: The Middle Open Channel segment would be replaced with a closed conduit. The Upper and Lower Open Channel segments would be reconstructed and enlarged. This alternative would accomplish all the stated objectives, but would lose some of the historic predominantly open visual character of the canal. Choosing this alternative would likely both reduce the number of drownings in the canal, but increase the number of pedestrian traffic fatalities on nearby highways. If final engineering design studies determine the necessity of a closed conduit for the middle canal segment, this alternative would become the preferred alternative.

Alternative 3 - Closed Conduit/Open Channel Alternative B: The Middle and Lower Open Channel segments would be replaced with closed conduits. The Upper Open Channel segment would be reconstructed and enlarged. This alternative would accomplish all the objectives, but at a cost second highest among the action alternatives. It would also likely triple the number of pedestrian traffic deaths on nearby highways.

Alternative 4 - Open Channel Alternative (the Proposed Action Alternative): The Upper, Middle, and Lower Open Channel segments would be reconstructed and enlarged. This Alternative would accomplish all the necessary objectives at the lowest construction cost. It would result in the lowest number of pedestrian traffic fatalities on nearby highways. Though the original canal lining would be replaced, this Alternative would preserve the historic predominantly open visual character of the canal. (It should be noted that if final engineering design studies for the replacement of the old

American Canal determine the necessity of a closed conduit for the middle canal segment, the proposed action alternative would become Alternative 2.)

Alternative 5 - No Action Alternative: The three open channel segments would be left untouched, with no replacements, enlargements, or repairs of any canal segments. While this alternative preserves intact the historic Smelter Bridge, it does not accomplish any of the stated objectives. The annual number of drownings in the Canal would not be reduced. Without reconstruction or major repair of the canal, a serious canal failure is likely within the next five years, especially during the peak irrigation period with the highest canal flow. Such a canal failure would likely close the American Canal for at least one month during costly emergency repairs. If the canal flow was disrupted for just one month due to repairs, the El Paso Water Utilities production of potable water would be reduced by 80 to 120 million gallons per day, and over a thousand El Paso County farmers could lose their crops, likely resulting in up to 500 bankruptcies. The No Action Alternative is not considered to be a viable alternative.

The preliminary engineering design studies for the replacement of the old American Canal indicate that a closed design may become the preferred alternative for the middle canal segment. Limited right-of-way constraints and existing infrastructure restrictions will dictate the proper design and construction methods to minimize the adverse effects to the public and adjacent landowners along the project. The reported project conditions will remain the same, but the aesthetics of the predominantly open canal will change. The USIBWC will consult with the Texas State Historic Preservation Officer should the preliminary canal design study recommend that the subject portion of the open canal be replaced with pre-cast box culvert.

The Draft FONSI and Draft EA were distributed November 21, 2000. The Notice of Draft FONSI for the Draft EA was published in the Federal Register on November 29, 2000. The Legal Notice of the Draft FONSI and Draft EA was published in the El Paso Times on December 2, 2000. The Public Comment period extended from November 21, 2000 through January 2, 2001. Public comments received were compiled into the Final EA, dated October 31, 2001. The Final EA finds that the proposed action does not constitute a major federal action that would cause a significant local, regional, or national adverse impact on the environment, because the Proposed Action Alternative would:

1. Improve structural stability of the American Canal, providing a reliable conveyance structure to transport flows of allocated water from the Rio Grande to El Paso County farms and to existing and planned El Paso Water Utilities water treatment facilities. The Rio Grande will be unchanged from existing conditions under USIBWC jurisdiction;

2. Minimize seepage loss through the cracks in the canal lining;

3. Provide the full design capacity (1535 cfs) influent into the RGACE;

4. Improve safety and reduce the risk of accidental drownings in the American Canal by installing fences and safety equipment;

5. Preserve the historic predominantly open channel character of the Canal; and

6. Preserve historical and photographic documentation of the historic Smelter Bridge per HAER Level III Standard.

Based on the Final Environmental Assessment and the implementation of the proposed historical mitigation, it has been determined that the proposed action will not have a significant adverse effect on the environment, and an Environmental Impact Statement is not warranted.

Mario Lewis
General Counsel

Date

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 IBWC Background Information

For centuries the Rio Grande River has been used as a source of irrigation water for agriculture in the El Paso – Juarez area. Even before the Spanish settlement of the area in the later half of the 17th Century, irrigation canals had already been constructed to convey water from the Rio Grande to cultivated fields. By the early 1900s, nearly 9,000 acres of the Rio Grande Valley in the El Paso-Juarez area were being irrigated with water from the river, as detailed in the Historical/Cultural Section of this Assessment, included as Appendix K ("Controlling Water on the Border: The American Canal System, International Boundary and Water Commission, El Paso, Texas" submitted November 1999 by Human Systems Research, Inc., and a Supplemental Report submitted April 2000 by Parsons Engineering Science). Currently in El Paso County, Rio Grande water is used to irrigate approximately 69,000 acres of farmlands and to produce nearly half of El Paso's potable water.

In 1889 the governments of the United States and Mexico established the International Boundary Commission (IBC), which a 1944 Treaty later renamed the International Boundary and Water Commission or IBWC. One of the early actions of the IBC was to discuss delivery of Rio Grande water to Mexico. During the Mexican-American Convention of 1906, the two countries agreed to deliver 60,000 acre-feet of water annually to Mexico at the headgates of the Acequia Madre facility on the southern shore of the Rio Grande in Cd. Juarez, Chihuahua, opposite El Paso, Texas. Presently, the IBWC fulfills the following international boundary and water responsibilities:

- Land boundary demarcation,
- River boundary maintenance,
- International flood control,
- Appropriation of the boundary river waters,
- Operation of international dams and reservoirs, and
- Solutions to boundary water quality issues.

The International Boundary and Water Commission is actually a single international commission, with an American Commissioner heading the US Section of the IBWC (USIBWC), and a Mexican Commissioner heading the Mexican Section of the IBWC (MXIBWC). Each Section is responsible for the IBWC functions or structures within each separate country.

1.2 Location and Description of the American Canal

The area under study in this document for the American Canal reconstruction alternatives comprises a narrow strip of land bordering the 1.98-mile long American Canal. The American Canal extends from the head gates at the American Dam to the upstream end of the Rio Grande

American Canal Extension (RGACE) adjoining the downstream International Dam. Replacement of the Old American Canal is also referred to as Reconstruction of the American Canal. The Canal is located east of the Rio Grande, on the American side of the international boundary between the United States and Mexico. Generally, the Canal parallels West Paisano Drive (US Highway 85) and the Burlington Northern Santa Fe Railroad tracks, which also occupy the same very narrow strip of land.

The Canal is located on the USGS map titled "Smeltertown, TX-NM Map #31106-G5-TF-024", portions of which are included as Figures 1, 2, and 3 in Appendix C. The study area forms a northwest-southeast trending polygon approximately 225 meters (738 feet) wide by 3,200 meters (10,497 feet) long, situated in UTMG Zone 13 with corner points at approximate locations as follows:

NW Corner	E 355350	N 3517400
NE Corner	E 355600	N 3517400
SW Corner	E356920	N 3514800
SE Corner	E357200	N 3514800

The American Canal is a concrete-lined canal consisting of three open channel segments generally paralleling West Paisano Drive, and two closed conduit segments under West Paisano Drive. Although the RGACE continues over 15 miles from the International Dam downstream to the Riverside Dam, the entire American Canal evaluated in this Assessment is only approximately two miles long.

It should be noted that some structures or roadways have been renamed since they were used in old maps of the American Canal area. For instance, the International Dam is labeled "Mexican Dam" in many of the older maps. West Paisano Drive is referred to by its former name, Doniphan Drive. The 1961 USIBWC map is contained in the Historical / Cultural Section of this document. This map was also used as the map source for "Figure 4: Map of the Utilities Located in the American Canal Area", (Appendix C).

1.3 Clarification Of "A" and "B" Terminology Used To Identify Canal Segments In Maps

Both the original 1938 Bureau of Reclamation map and also the 1961 USIBWC map of the Canal area (developed from the 1938 BOR map), use the "A" and "B" designations to describe the cross-sectional shape of the Open Channel Segment, rather than the location of the segment. As the location, rather than the shape of the canal segment is important for this Environmental Assessment, the "A" and "B" designations have not been used in the maps or for the descriptions of open channel segments

Parsons Reports contained in Appendix K]. For example, in this document the segments previously labeled "Lower Open Channel "A" or "B" will both be called simply, "Lower Open Channel."

MAP REFERENCES OF AMERICAN CANAL SEGMENTS

Designation in this Document	**Designation on 1938 & 1961 Maps**
Upper Open Channel	Upper Open Channel A
Closed Channel A, or Conduit A	Conduit A
Middle Open Channel	Middle Open Channel B
Closed Channel B, or Conduit B	Conduit B
Lower Open Channel	Lower Open Channel B and Lower Open Channel A

1.4 Condition Of American Canal Segments

The five segments of the American Canal appear to be in various stages of deterioration. The open channel segments appear to have suffered much more deterioration than the closed conduits, perhaps because the open channel segments are constructed of only three-inch thick concrete, and are more exposed to weathering (e.g., sun and wind) than are the closed conduits.

Because of the continuing deterioration of the concrete lining of the open channel segments of the American Canal, the flow capacity is now greatly diminished. The USIBWC is concerned that at some time in the near future the Canal will be unable to safely convey its design capacity of 1200 cfs due to loss of foundation material through cracks in the concrete lining from turbulence caused by normal canal flows. Subjecting the existing lining to the anticipated higher design flow of 1535 cfs desired for the American Canal, would accelerate this foundation deterioration, and hasten the failure of the concrete canal lining.

1.5 Historical and Legislative Background

For a full history and legislative background of the American Canal, refer to Appendix K of this Assessment to review the November 1999 Human Systems Research, Inc. report titled, "Controlling Water on the Border: The American Canal System, US Section of International Boundary and Water Commission, El Paso, Texas and the April 2000 Supplemental Report by Parsons Engineering Science, Inc." The 1993 "Final Environmental Assessment, Rio Grande American Canal Extension, El Paso, Texas," published by the USIBWC can also be used as a relevant background reference.

The construction of the American Dam and American Canal were authorized by the Act of August 29, 1935 (Ch. 305, 49 Stat. 961). Then by the Act of June 4, 1936 (Ch. 500, 49 Stat. 1463), the USIBWC was authorized to "construct, operate, and maintain the Rio Grande Canalization Project from downstream of the Percha Diversion Dam in New Mexico to the American Canal at El Paso, Texas."

Both the RGACE described in Section 1.6 and the present reconstruction alternatives for the American Canal were authorized by the "Rio Grande American Canal Extension Act of 1990," (refer to Appendix C of this document).

During the planning of the RGACE, the Mexican Section of the IBWC expressed interest in later receiving its annual 60,000-acre foot water allotment from the end of the RGACE near Riverside Dam rather than at the head gates of the Acequia Madre at the International Dam. For that reason, the USIBWC increased the design capacity of the RGACE by 60,000 acre-feet per year at a maximum delivery rate of 335 cubic feet per second (cfs). The final design capacity of the RGACE was 1535 cfs (1200 cfs + 335 cfs).

1.6 Other Recent American Canal Replacement Actions

As detailed within the Historical/Cultural Section at Appendix K, some of the original Canal structures (i.e., bridges) have been removed, but most were never replaced. During the last five years, however, a portion of the earthen Franklin Canal (which delivered water through the City of El Paso to farms in El Paso's Lower Valley) was replaced with the concrete RGACE structure. According to personnel from the El Paso County Water Improvement District #1 (EPCWID #1), the RGACE saves many thousands of acre-feet of water per year due to reduced seepage losses.

1.7 Organization Of This Document

The U.S. Council of Environmental Quality (CEQ) which is responsible for interpreting the National Environmental Policy Act (NEPA) requirements, has asked that under normal circumstances, Environmental Assessments be confined to 15 pages of text which should be easily understood by persons without a science, engineering or other technical background. In order to comply with CEQ guidelines, this document incorporates the single most important indicator effect to represent the many effects to a given environmental issue (e.g., Air Quality). Those selected indicator effects for each issue are listed in charts for ease of comparing alternatives.

Only summary information from each section (i.e., Transportation Corridor) of the Assessment is included in this text. More complete assessment documentation for each section is included in its specific appendix, followed by any supporting documentation.

2.0 PURPOSE OF AND NEED FOR ACTION

2.1 Rationale For Change

Capacity

- The American Canal was originally designed to convey 1200 cfs of irrigation water, but its capacity has diminished due to structural deterioration.
- The RGACE was constructed from 1997 – 1998 to convey 1535 cfs of water, but actually receives much less from the deteriorating American Canal.
- The El Paso Water Utilities – Public Service Board (EPWU-PSB) presently produces 80 MGD (124 cfs) of potable water from the Canal, but plans to increase production to 120 MGD (186 cfs) during the next five years.
- Within approximately five years, the EPWU-PSB plans year-round potable water production from the Canal.
- Mexico is considering producing potable water from its Rio Grande allotment and receiving its water allotment via a siphon beneath the Rio Grande at the end of the RGACE near Riverside Dam, rather than at the head gates of the Acequia Madre near the International Dam. However, Mexico has not finalized this change in point of delivery at this time.
- Much water is currently lost by seepage through existing cracks in the American Canal.

Stability

- The existing American Canal is over 70 years old, and has suffered many cracks over the years.
- The concrete lining of the Canal is only three inches thick. At least four-inch thick reinforced concrete is preferred for open channels.
- Merely patching the Canal would not utilize newer concrete industry improvements for canal design and construction.

Safety

- When the Canal was originally constructed, there was little thought of persons drowning in the Canal. Many safety structures can now be installed to assist in saving the lives of the persons who fall into the Canal.
- When the Canal was constructed in the 1930's for delivery of irrigation water, the designers were probably not concerned about infiltration of potentially contaminated groundwater into the Canal through the under drain system or through future cracks in the canal lining. However, the current use of the Canal as El Paso's principle potable water source raises this concern of protecting the water quality within the Canal structure.

2.2 Previous Related Environmental Assessments

Prior to construction activities of the 15.4-mile long RGACE, an Environmental Assessment was published by the USIBWC in December, 1993, titled, "Final Environmental Assessment, Rio Grande American Canal Extension." Following the recommendations of that document, the USIBWC constructed a concrete-lined canal that begins at the downstream end of the approximately 2-mile long American Canal, and ends at Riverside Dam near the Zaragoza International Bridge.

This previous assessment of the RGACE described in detail, the need for added safety features, for reducing water losses, and for conveying water to Mexico near Riverside Dam.

2.3 Explanation Of Need For Decision

Reconstruction of the American Canal is needed to increase canal security, to physically stabilize the structure, and to increase flow capacity to obtain the full benefits of the RGACE. The American Canal segments are shown in Figure Nos. 1-3 located in Appendix C. At several locations, the reinforced concrete panels of the Canal have deteriorated and are in structural distress. Reconstruction of the Canal is necessary to increase its conveyance capacity to equal that of the RGACE; to improve the structural integrity of the existing, deteriorated concrete lining; and to allow for the continued operation of the Canal over the life of the new RGACE. Further, structural stability may be increased by installation of: 1) a thicker concrete lining; 2) improved panel joints which contain smooth dowels to permit longitudinal thermal expansion and contraction while limiting transverse movement; and 3) flexible joint filler material between the concrete panels, and/or reinforced concrete lining. Installation of high fences, warning signs, safety ladders, and safety cables set at intervals along the Canal will minimize accidental physical access and reduce the chance for human injury. One important physical constraint in the area is the limitation of space between the Rio Grande and the very steep slope rising to Interstate 10, especially in the Middle Open Channel Segment, which has very limited right-of-way for any construction alternative.

2.4 Scoping of Major Issues and Their Indicators

The NEPA process of grouping environmental concerns into areas of investigation is often called the scoping of major issues. In this assessment, the phrases "environmental resources" and "environmental issues" are used interchangeably. The environmental issues have been grouped or scoped into the following areas of investigation:

- Air Quality,
- Habitats, Wetlands, Endangered Species, Fish and Wildlife,
- Real Estate, Utilities, Easements, and Rights-of-Way,
- Transportation Corridor,
- Environmental Justice,

- Historical/Cultural,
- Water and Soil,
- Hazardous Waste, and
- Miscellaneous.

3.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

Most construction activities will take place during the non-irrigation or dry season from mid October through mid February except those activities not affecting water conveyance in the Canal, i.e., contractor staging and mobilization, fence installation, etc. (Refer to Location Maps in Appendix C.) The construction performance period is anticipated to extend through two non-irrigation periods beginning in the fall of 2003 and concluding in the spring of 2005.

3.1 Alternative 1 – Closed Conduit Alternative

Replace all existing open channel segments (Upper, Middle, and Lower) between the American Dam and International Dam with closed conduits, with the exception of a 400-foot length of open channel immediately below the headgates and a 100-foot length of open channel immediately above the gauging station in the Upper Open Channel segment. The two excepted sections of open channel would be reconstructed and enlarged. Because the existing segments of the closed conduit under Paisano Drive are in good repair and appear adequate to carry the projected flows, those culverts would be left in place.

3.2 Alternative 2 – Closed Conduit/Open Channel Alternative A

Replace the Middle Open Channel segment with a closed conduit. Reconstruct and enlarge the Upper and Lower Open Channel segments. No repairs or replacement of the closed conduit segments would be performed.

3.3 Alternative 3 - Closed Conduit/Open Channel Alternative B

Replace the Middle and Lower Open Channel segments with a closed conduit. Reconstruct and enlarge the Upper Open Channel segment. No repairs or replacement of the closed conduit segments would be performed.

3.4 Alternative 4 – Open Channel Alternative (the Proposed Action)

Replace the Upper, Middle, and Lower Open Channel segments with enlarged open channel segments. No repairs or replacement of the closed conduit segments would be performed.

3.5 Alternative 5 – No Action Alternative

Leave the three open channel segments untouched, with no replacements, enlargements, or repairs of any canal segments.

3.6 Alternatives Considered But Eliminated

3.6.1 Repairing The Existing Concrete Lining

This Alternative would have been similar to the No Action Alternative, but would have patched the original 3-inch thick concrete lining as needed, without increasing the capacity of the Canal. As the existing Canal is in poor condition and inadequately sized, this Alternative was not studied in depth.

3.6.2 Repairing the Existing Concrete Lining and Raising the Ramparts Above the Concrete Lining of the Canal

This Alternative would have patched the original 3-inch thick concrete lining, and increased the capacity of the Canal to approximately 1535 cfs by building ramparts vertically above the existing lip of the Canal. This Alternative would probably cause more stress to the existing concrete lining, creating a greater potential safety concern. Therefore, this Alternative was not studied in depth.

3.6.3 Replacing All Five Canal Segments with a Continuous Open Channel Located Between West Paisano Drive and the Rio Grande

In the area of the Middle Open Channel of the Canal where the Rio Grande nearly abuts West Paisano Drive, the Rio Grande flood plain (much of it owned by ASARCO) is too narrow for construction of a new canal. For this same reason, the same Canal segment was not built on the west side of Paisano Drive in 1938; therefore, this Alternative was not further studied.

3.7 Proposed Mitigation Measures for All Four Action Alternatives

All four action alternatives require the removal of the 1938 Smelter Bridge at the entrance to ASARCO. The loss of the bridge will be mitigated by preparation of Level III Historic American Engineering Record (HAER) documentation including drawings, photographs, and written data. The proposed mitigation is fully detailed in the Parsons Report contained in Appendix K of this document

4.0 DESCRIPTION OF KEY ISSUES OR RESOURCES OF THE AFFECTED ENVIRONMENT

The issues summarized below are thoroughly discussed and evaluated in the Appendix corresponding to that particular issue. For each environmental issue, the most important indicator was chosen to evaluate the issue in a matrix of representative effects from the five different reconstruction alternatives.

DESCRIPTION OF ENVIRONMENTAL ISSUES AFFECTED BY REPLACEMENT ALTERNATIVES

Resource (Issue) ↓	Most Important Effects for Each Environmental Resource						
	1	2	3	4	5	6	Effect Chosen as Indicator
Air Quality	Will construction add excessive CO to air?	Will construction add excessive ozone to air?	Will construction add excessive particulates to air?	High risk of delays during Canal reconstruction due to air quality?			Will construction add excessive particulates to air?
Habitat , Wetlands, Endangered Species, Fish & Wildlife	# Acres of wetlands remaining	# Endangered species displaced during construction	# Endangered species habitats in Canal area	# Permanent fish population in Canal area	# Cliff Swallow nesting sites in Canal area	Population of Cliff Swallows in Canal area	Population of Cliff Swallows in Canal area
Real Estate, Utilities, Easements, Rights-of-way	Length of underground utility mains and lines relocated for construction	% Change in values of commercial properties	Length of overhead electric lines relocated during construction	Length of TxDoT right-of- way used for staging during construction	$ loss to El Paso agribusiness from 30-day canal failure	# local farm bankruptcies resulting from 30-day canal failure & repair	# local farm bankruptcies resulting from 30-day canal failure & repair
Transportation Corridor	# Automobiles per day on W. Paisano during construction	# Automobiles per day on Yandell Drive overpass during canal construction	# Buses per day on Paisano during construction	# W. Paisano northbound lanes closed during construction	# Annual pedestrian traffic deaths on W. Paisano & I-10	# Annual pedestrian traffic injuries on W. Paisano & I-10	# Annual pedestrian deaths on W. Paisano & I-10
Environmental Justice	# local residents to be relocated by construction	# Drownings in American Canal annually	% Increase in illegal crossings through Canal	# Annual crimes reported to police in Canal area	Annual cost for additional Border Patrol Agents	# Local residents permanently employed through Canal reconstruction	# Drownings in American Canal annually
Historical, Cultural	# Original 1938 bridges remaining	# Original 1938 bridge abutments remaining	# Original 1938 closed conduits remaining	Length of closed conduit remaining	Length of open channel remaining	Length of original 1938 open channel lining remaining	Length of open channel remaining
Water and Soil	Maximum water delivery capacity (cfs)	Stormwater capture capacity (cfs)	Lost EPWU–PSB daily drinking water production during construction (MGD)	EPCWID #1 - $ costs during Canal reconstruction	Availability of ASARCO oil/water separator during reconstruction	Direct financial loss to farmers during reconstruction	Lost EPWU–PSB daily drinking water production during construction
Hazardous Wastes	Residents at risk from potential airborne heavy metals?	Residents at risk from potential airborne hydrocarbons?	Construction workers at risk from potential airborne heavy metals?	Workers at risk from potential airborne hydrocarbons?	Disposal of heavy metal-soil or water as hazardous waste?	Disposal of hydrocarbon-soil or water as hazardous waste?	Disposal of hydrocarbon-soil or water as hazardous waste?
Miscellaneous	Contractor construction costs						Contractor construction costs

Note: Some environmental issues have fewer than six effects, resulting in some blanks in the chart above.

4.1 Air Quality

A conformity determination has been made under 40 CFR, Part 51.858 using analytical methods. The Federal action is in conformity with the specific requirements and the purposes of the Texas State Implementation Plan pursuant to the USIBWC's affirmative obligation under Section 176 (c) of the Clean Air Act in accordance with the requirements of 40 CFR, Ch. 1, Part 51, Subpart W. The Federal action is in compliance with the Clean Air Act.

As detailed in Appendix F, El Paso is located in an EPA designated "non-attainment area." The non-attainment designation indicates that at least once per year, the area exceeded the Maximum Air Concentration (MAC) for ozone, carbon monoxide, or particulates. However, because of significantly improved air quality tin the area since 1992 the "non-attainment" status may be redesignated as a "maintenance" area by the time of construction. In the El Paso area during the proposed Canal reconstruction period from October through February, carbon monoxide and particulates are more serious concerns than ozone, especially when air inversion layers trap airborne contaminants near the land surface during the hours from sunset through mid-morning. Either airborne particulate or carbon monoxide concentrations could have been selected as the indicator issue, but particulates are more visible to the public. Therefore, Air Particulate Concentration was chosen as the indicator for this issue.

4.2 Habitats, Wetlands, Endangered Species, Fish And Wildlife

Before onsite reconstruction activities begin, the preparation of a Construction Stormwater Pollution Prevention Plan (S3P) will be required by the TNRCC and the City of El Paso. The S3P will include a section of "Best Management Practices" such as hay bales, silt fences, or other similar erosion prevention techniques as also requested by Texas Parks and Wildlife Department. The Canal area contains no wetlands, populations of endangered species, habitats, or permanent fish populations. Because of the extent of concrete lining, the Canal area does not have the number of animal or plant populations of other nearby areas like those on the earthen banks of the nearby Rio Grande. As planned, all the reconstruction alternatives would avoid disturbance of migratory bird nesting sites during the early March through late July breeding season, and therefore, comply with the provisions of the Migratory Bird Treaty of 1918. Because Cliff Swallows nest in the Canal area and feed mainly on water insects that live in the same area, the population of Cliff Swallows was chosen as the indicator issue.

4.3 Real Estate, Utilities, Easements And Rights-Of-Way

During any of the construction alternatives, utility lines and mains do not generally appear to require relocation. Nor does it appear that rights-of-way or easements need to be purchased or permanently changed. Local real estate values in the Canal area do not appear to be affected by the choice of any alternative. However, the farms that are irrigated from the American Canal are more greatly affected by the Canal than properties in the Canal area. The estimated Number of Farm Bankruptcies due to a canal failure was chosen as the indicator of this issue.

4.4 Transportation

None of the alternatives will permanently affect any transportation resources, except pedestrian traffic deaths on West Paisano Drive (US 85) and Interstate 10, which are expected to rise proportionately to the number of persons crossing the border illegally via the Canal area. The only temporary construction effect to transportation in the Canal area is the necessary temporary closure of one lane of northbound traffic on West Paisano Drive. Therefore, the Number of Pedestrian Traffic Fatalities was chosen as the most important indicator of effects to transportation.

4.5 Environmental Justice

None of the alternatives would temporarily or permanently displace local poor persons or change the number of available jobs in the Canal area. The alternatives would affect the number of persons crossing into the US (potentially smuggling drugs and weapons) while passing through the river and Canal. These illegal crossings would require different numbers of US Border Patrol Agents and El Paso Police Officers to protect the area. But even though the cost to the Border Patrol could be very considerable, the worth of a human life saved from drowning is even higher. Especially since safety is one of the principal reasons for construction listed in the "Purpose and Needs" statement of this Document. Therefore, the number of Canal Drownings was chosen as the indicator to Environmental Justice.

4.6 Historical / Cultural

It is difficult to quantify the effects to cultural and/or historical resources in this Assessment. None of the five alternatives will disrupt the flow of water in the Rio Grande in the area of the Zaragoza Bridge where the Ysleta del Sur Pueblo (Tribe) uses the River and its waters for certain tribal religious ceremonies at locations held sacred by the Tribe. None of the Tribe's sacred locations would be accessed as part of any of the five reconstruction alternatives. Therefore, none of the five alternatives should disrupt the religious practices of the Tribe.

All historically or culturally important sites dating before 1937 are considered to have been either destroyed by the annual flooding of the shifting alluvium in the Rio Grande floodplain prior to construction of Elephant Butte Dam, or highly disturbed by construction activities of the American Canal in the 1930s. If archaeological sites or historical structures that may qualify for designations as State Archaeological

Landmarks, or that may be eligible for listing on the National Register of Historic Places in accordance with 36 CFR Part 800 are discovered after work begins, the contractor will immediately cease operations in that particular area and notify the client, the Texas State Historic Preservation Officer (SHPO), the Ysleta del Sur Pueblo Tribe (Tribe), other appropriate agencies, and the USIBWC. The contractor will take reasonable steps to protect and preserve the discoveries until they have been inspected by the client, SHPO, Tribe, other appropriate agencies, and the USIBWC, and will assist obtaining any necessary approvals or permits to enable the work to continue. The contractor will not resume work in the area of the discovery until authorized to do so by the client, SHPO, Tribe, other appropriate agencies, and the USIBWC. If human remains are discovered, the Tribe will be notified immediately and consulted with in a timely and meaningful manner to provide information and address rights under the Native American Graves Protection and Repatriation Act. (See appendix B.4 regarding the Tribe's enthnographic spiritual connection to the Rio Grande).

As the American Canal is one of only two remaining American systems constructed to implement international water treaties, the remaining historical structures (i.e., the Smelter Bridge at the entrance to ASARCO) may have more importance to historians than to the public. The loss of the historic Smelter Bridge, which is required by the four Action Alternatives, will be mitigated by preparation of Level III Historic American Engineering Record (HAER) documentation including drawings, photographs, and written data. The proposed mitigation is fully detailed in the Parsons Report contained in Appendix K of this document. To best portray the original open visual character of the Canal, the length of open channel segments was chosen as the indicator effect for the Historical / Cultural Resource.

4.7 Water And Soil

As the primary source of local groundwater (the Hueco Bolson) is being rapidly depleted, the EPWU-PSB will soon rely on the American Canal as its primary sustainable source of drinking water. Currently, water from the Canal is used by El Paso County farmers to irrigate crops with annual production of over $300 million which essentially pays the salaries of nearly 50,000 local people in agriculture-related jobs. During peak irrigation and water production seasons, an emergency canal shutdown with related-repairs caused by possible contaminated groundwater entering the undersized and deteriorating canal would drastically disrupt the lives of all El Pasoans. Therefore, the lost daily EPWU–PSB Drinking Water Production was chosen as the indicator to this resource.

4.8 Hazardous Waste Disposal

Historic manufacturing facilities and railroad tracks were used in the area long before chemical or petroleum releases were regulated by the government. In the 1960s, the former community of Smeltertown adjoining the Upper Open Channel segment was condemned and closed because of high concentrations of lead in both the blood of Smeltertown residents and in the local soil. More important than the lead concentrations in soil are the presence of other heavy metals in groundwater and soil. Arsenic, cadmium and selenium have been detected in the soil of the Canal area, likely originating from nearby past industrial usage. It is unlikely that area residents or employees will be affected by heavy metals during reconstruction, however, construction workers will need personal protection equipment (i.e., respirators, etc.) if airborne heavy metal exposures occur.

There have been several known hydrocarbon releases in the vicinity of the American Canal. Although there have been discussions of possible spills or releases before the existence of TNRCC, no other hazardous waste releases are known with certainty. Based on a review of available data of soil and groundwater analyses, there is a possibility of encountering diesel or gasoline plumes in all three open channel sections of the Canal. Therefore, Disposal of Hydrocarbon-Contaminated Groundwater and Soil was chosen as the indicator for the issue of Hazardous Waste Disposal.

4.9 Miscellaneous Issues: Costs, Maintenance, Etc.

Based on similar recent construction, the USIBWC estimates contractor construction cost to be approximately $1 million per mile ($190 per foot) for open channel construction, and approximately $3 million per mile ($570 per foot) for closed conduits. No direct cost estimates were available either for extensive repairs to the Canal or for annual maintenance for each alternative. Therefore, Contractor Construction Cost was chosen as the indicator. However, the construction cost estimates do not include any costs for expected slope shoring in the Middle Section to maintain the required slope for the BNSF Railroad. Cost estimates for shoring will be determined later during the design phase.

5.0 SUMMARY OF CONSEQUENCES OR EFFECTS TO ENVIRONMENTAL RESOURCES

None of the alternatives would encounter or disturb wetlands, endangered species, or threatened wildlife habitats. None of the alternatives would cause any permanent detrimental effect to local wildlife populations. Generally, the beneficial lowering of drowning deaths in the Canal is roughly offset by increases in pedestrian traffic fatalities on nearby highways. The first four alternatives appear to safeguard a steady flow of El Paso County's only renewable source of domestic and irrigation water; Alternative 5 (the No Action Alternative) does not.

The CEQ regulations require including direct and indirect effects and their significance, and cumulative effects. A comparison of consequences of each alternative is matrixed in the following table. Summary descriptions of expected consequences caused by each alternative follow the matrix.

MATRIX CHART SHOWING EXPECTED CONSEQUENCES OF EACH ALTERNATIVE TO INDICATOR EFFECTS OF ENVIRONMENTAL RESOURCES

	Expected Consequences to Resources of Each Alternative Action				
Alternative → Resource (Issue) ↓	**ALT 1**	**ALT 2**	**ALT 3**	**ALT 4**	**ALT 5**
Air Quality	Canal reconstruction will not add excessive PM-10 particulates to air.	Canal reconstruction will not add excessive PM-10 particulates to air.	Canal reconstruction will not add excessive PM-10 particulates to air.	Canal reconstruction will not add excessive PM-10 particulates to air.	Canal reconstruction will not add excessive PM-10 particulates to air.
Habitat, Wetlands, Endangered Species, Fish and Wildlife	Population of 25 Cliff Swallows in Canal area	Population of 25 Cliff Swallows in Canal area	Population of 25 Cliff Swallows in Canal area	Population of 25 Cliff Swallows in Canal area	Population of 25 Cliff Swallows in Canal area
Real Estate, Utilities, Easements, Rights–of-Way	0 Local Farm Bankruptcies resulting from canal repair shutdown	0 Local Farm Bankruptcies resulting from canal repair shutdown	0 Local Farm Bankruptcies resulting from canal repair shutdown	0 Local Farm Bankruptcies resulting from canal repair shutdown	500 Local Farm Bankruptcies resulting from canal repair shutdown
Transportation Corridor	4.5 Annual Pedestrian Highway Traffic Deaths	3 Annual Pedestrian Highway Traffic Deaths	4.5 Annual Pedestrian Highway Traffic Deaths	1.5 Annual Pedestrian Highway Traffic Deaths	1.5 Annual Pedestrian Highway Traffic Deaths
Environmental Justice	0 Drownings in American Canal annually	3* Drownings in American Canal annually	1* Drowning in American Canal annually	5* Drownings in American Canal annually	5 Drownings in American Canal annually
Historical, Cultural	675 feet of Open Channel	4959 feet of Open Channel	2239 feet of Open Channel	7979 feet of Open Channel	7804 feet of Open Channel
Water and Soil	0 MGD lost daily EPWU – PSB Drinking Water Production	0 MGD lost daily EPWU – PSB Drinking Water Production	0 MGD lost daily EPWU – PSB Drinking Water Production	0 MGD lost daily EPWU – PSB Drinking Water Production	80 – 120 MGD lost daily EPWU – PSB Drinking Water Production
Hazardous Wastes	Disposal of hydrocarbon-contaminated soil or water as hazardous waste is likely	Disposal of hydrocarbon-contaminated soil or water as hazardous waste is likely	Disposal of hydrocarbon-contaminated soil or water as hazardous waste is likely	Disposal of hydrocarbon-contaminated soil or water as hazardous waste is likely	Disposal of hydrocarbon-contaminated soil or water as hazardous waste is likely (at future time)
Miscellaneous	Approximately $4.6 million Contractor Construction Cost	Approximately $2.8 million Contractor Construction Cost	Approximately $3.7 million Contractor Construction Cost	Approximately $1.6 million Contractor Construction Cost	Approximately $0 million Contractor Construction Cost (Does not include future Contractor Emergency Repair Costs)

*Note: Construction of additional fences and new safety equipment would probably significantly reduce the number of drownings from these estimates.

5.1 Discussion Of Effects Of Alternative 1 (The Closed Conduit Alternative)

Replacing the three open channel segments with closed conduits appears to best safeguard the water supply, but at the highest reconstruction cost of any of the alternatives. Alternative 1 requires as much soil work and dewatering as Alternative 2, 3, and 4, with the same risk of hazardous waste disposal as in Alternative 2, 3, and 4. With exclusive use of closed conduits, this Alternative loses the open channel character of the 1938 Canal. While this Alternative is expected to reduce the number of annual drownings in the Canal, it would actually prevent any possibility of assisted rescue if someone falls into the Canal in either of the short open sections. This Alternative would likely triple the number of pedestrian injuries and fatalities on the two nearby highways, and would greatly increase the local reported crime rate. The US Border Patrol, El Paso Police Department, BNSF and UP Railroads, and ASARCO especially do not want this Alternative chosen.

5.2 Discussion Of Effects Of Alternative 2 (The Closed Conduit/Open Channel Alternative A)

The Closed Conduit/Open Channel Alternative A appears to adequately safeguard the water supply, but at approximately half the construction cost of the Closed Conduit Alternative. This Alternative reduces the annual number of Canal drownings, but increases the number of pedestrian traffic fatalities on nearby highways. This Alternative does preserve the original open character of the Canal in the segment closest to the planned city park, but not in the segment most visible to the public along West Paisano.

5.3 Discussion Of Effects Of Alternative 3 (Closed Conduit/Open Channel Alternative B)

Closed Conduit/Open Channel Alternative B appears to safeguard the water supply almost as well as the first two alternatives, at a lower construction cost than Alternative 1, but higher than Alternative 2. This Alternative does preserve the original open character of the Canal in the segment closest to the planned park, but not in the segment most visible to the public along West Paisano.

5.4 Discussion Of Effects Of Alternative 4 - "The Proposed Action" (Open Channel Alternative)

This Alternative is preferred by USIBWC, BOR, EPCWID #1, Border Patrol, El Paso Police Department, BNSF and UP Railroads, ASARCO, and Parsons Engineering Science (the Cultural Historical Consultant for this Assessment). This Alternative would adequately ensure the supply of water to farmers and water treatment plants at approximately one third the cost of the Closed Conduit Alternative. This Alternative maintains the lowest number of pedestrian deaths and injuries. The high number of drownings appears the same as the No Action Alternative, but that number will probably be greatly reduced with the addition of safety equipment and new fences. This Alternative best preserves the original open channel character of the original Canal.

5.5 Discussion Of Effects Of Alternative 5 (The No Action Alternative)

When looking at only short-term rather than long-term direct and indirect effects, Alternative 5 appears more appealing than it should. As with any new construction project, a no-action alternative is typically the least expensive and least disruptive in the short run. This Alternative best preserves historical structures in the short term. However, it does not provide long-term preservation and the necessary capacity to provide El Paso with a reliable source of irrigation water and drinking water. The likelihood of hazardous waste disposal during construction for the No Action Alternative appears to be nearly zero until one realizes that canal failure events with related emergency repairs would result in even more costly, expedited disposal of the same contaminated groundwater and soil.

In the event of a major emergency canal repair during the peak of the irrigation season, the short-term effects to area farmers and domestic water users would be staggering, and the long-term cumulative effects could be even worse.

Cumulative Impacts (per CEQ Regulations)

During the peak water season, a loss of 120 MGD of drinking water production, a $300 million loss to local agribusiness, and up to 500 forced bankruptcies of local farmers renders the short-term cost savings for No Action as actually the most expensive of the alternatives. In addition, choosing Alternative 5 (the No Action Alternative) appears to result in a higher combined number of annual deaths from drownings and highway pedestrian fatalities than any other alternative. The historical significance of preserving the entire original American Canal does not outweigh the additional loss of human lives, and the potential huge losses of potable water production and losses to agribusiness.

In addition, the No-Action Alternative greatly increases the risk and embarrassment of an emergency environmental cleanup from potentially contaminated groundwater entering the Canal from failed channel walls. This scenario would be a public relations disaster, especially in the near future as the city of El Paso plans to use American Canal water year round as a drinking water source.

APPENDIX A

- **List of Preparers**

LIST OF PREPARERS

Name	Contributions	Degree(s)	Years Experience
John Knopp, F.E.	Primary Author	B.S. Civil Engineering M.A. Liturgiology M.S. Environmental Engineering	20
James E. Bubb, P.E.	Report Quality Control	B.S. Mechanical Engineering M.S. Propulsion Systems Ph.D. Fluid Mechanics	30+
Alex Woelper, P.E.	Environmental Engineering	B.S. Civil Engineering M.A. Instruction	20
Thomas Kretzschmar	Water and Soil	M.S. Geology Ph.D. Geochemistry	10
Ravi Kommajosyula	Geology Review	B.S. Geology/Chemistry M.S. Geology M.S. Geochemistry	4
Jacob Worley	Habitats, Wetlands, Endangered Species, Fish & Wildlife	B.S. Zoology, Botany	3
Kelly Worley	Habitats, Wetlands, Endangered Species, Fish & Wildlife	B.S. Zoology, Botany	3
Bobbi Sorrell	Report Administration	A.S. Business Administration	13
Natalie Misquez	Report Administration	A.S. Microcomputer Applications	5

APPENDIX B

(Listings)

B.1 - List of Agencies, Organizations, and Persons Consulted During Draft EA for Comments

B.2 - Organizations Consulted During EA

B.3 - Public Comments Received

B.4 - Other Correspondence

B.5 - List of Agencies Organizations, and Persons Mailed During Final EA

B.1 - LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS CONSULTED

B.1 - List of Agencies, Organizations, and Persons Consulted

POC	Title	Organization	Address	City	State	Zip
Mr. Lairy Johnson	Environmental Manager	ASARCO	P.O. Box 1111	El Paso	TX	79999
Mr. Harry Lara	Field Engineer	Burlington Northern Santa Fe Railway	1624 1st Street NW	Albuquerque	NM	87102
Mr. Cordell Roy	Superintendent	Chamizal National Memorial	800 South San Marcial	El Paso	TX	79905
Mr. Armando Jimarez	City Architect	City of El Paso	2 Civic Center Plaza, 4th Flr.	El Paso	TX	79999
Ms. Pat Adauto	Director of City Planning	City of El Paso	2 Civic Center Plaza	El Paso	TX	79999
Mr. Edward Drusina	Director of Public Works	City of El Paso	2 Civic Center Plaza	El Paso	TX	79999
The Honorable Carlos Ramirez	Mayor of El Paso	City of El Paso	2 Civic Center Plaza	El Paso	TX	79999
The Honorable Rose Rodriguez	West Central Representative	City of El Paso	2 Civic Center Plaza	El Paso	TX	79999
The Honorable Jan Summerall	West Side Representative	City of El Paso	2 Civic Center Plaza	El Paso	TX	79999
Dr. Jorge C. Magaña, M.D.	Director	City-County Health Unit	222 S. Campbell	El Paso	TX	79901
The Honorable Daniel Haggerty	County Commissioner, 4th Precinct	County of El Paso	500 E. San Antonio	El Paso	TX	79901
The Honorable Dolores Briones	County Judge	County of El Paso	500 E. San Antonio	El Paso	TX	79901
Mr. Mark Brotherton	Chairman	El Paso County Historical Society	9305 Turrentine	El Paso	TX	79925
Mr. Edd Fifer	General Manager	El Paso County Water Improvement Dist. #1	294 Candelaria	El Paso	TX	79907
Mr. Pete Parraz	President	El Paso Hispanic Chamber of Commerce	2829 Montana, Suite 2-F	El Paso	TX	79903
Ms. Barbara Valle	Head Librarian	El Paso Public Library	501 North Oregon Street	El Paso	TX	79901
Ms. Jane Fowler	Sanctuary Chair	El Paso Trans-Pecos Audubon Society	601 W. Yandell, F25	El Paso	TX	79902
Ms. Anai Padilla	Water Conservation Manager	El Paso Water Utilities, PSB	1154 Hawkins	El Paso	TX	79925
Mr. Gregg Cooke	Regional Administrator, 6RA	U.S. EPA, Region VI	1445 Ross Ave., Ste 1200	Dallas	TX	75202
Mr. Hector Pena	Technical Professional	EPA-Enforcement Division	1445 Ross Ave., Ste 1200	Dallas	TX	75202
Mr. Michael Janskey	Technical Professional	EPA-Enforcement Division	1445 Ross Ave., Ste.1200	Dallas	TX	75202
Mr. Joe Rubio	Lead Organizer	EPISO	7134 Alameda Ave.	El Paso	TX	79915
Ms. Denise Francis	State Single Point of Contact	Govenor's Budget Planning Office	P.O. Box 12428, Capitol Station	Austin	TX	78711
Mr. Wes Jurey	President	Greater El Paso Chamber of Commerce	10 Civic Center Plaza	El Paso	TX	79901
Mr. Robert Perez	Texas Director	LULAC, District No. 4	8700 Edgemere	El Paso	TX	79902
Ms. Catriona Glazebrook	Executive Director	National Audubon Society	2525 Wallingwood, Ste 1505	Austin	TX	78746
Mr. Hector F. Diaz	Acting Executive Director	Rio Grande Council of Gov'ts	1100 N. Stanton, Ste. 610	El Paso	TX	79902
Ms. Marybele Chavez	District Engineer	Texas Department of Hwys & Public Trans.	212 N. Clark, P.O. Box 10278	El Paso	TX	79905

POC	Title	Organization	Address	City	State	Zip
Mr. Oscar Mestas	District Manager	Texas Forest Service, El Paso Office	2 Civic Center Plaza	El Paso	TX	79999
Mr. F. Lawerence Oaks	Deputy State Historical Preservation	Texas Historical Commission	P.O. Box 12276	Austin	TX	78711
The Honorable Manny Najera	Representative - District #75	Texas House of Representatives	1716 Mike Hill	El Paso	TX	79936
The Honorable Norma Chavez	Representative - District #76	Texas House of Representatives	6070 Gateway East #508	El Paso	TX	79905
The Honorable Paul Moreno	Representative - District #77	Texas House of Representatives	2314 Montana Ave.	El Paso	TX	79903
The Honorable Pat Haggerty	Representative - District #78	Texas House of Representatives	4849 N. Mesa St. #206	El Paso	TX	79912
The Honorable Joe Pickett	Representative - District #79	Texas House of Representatives	1790 Lee Travino #307	El Paso	TX	79936
Mr. Archie Clouse	Regional Director	TNRCC	401 E. Franklin Ave., Ste 560	El Paso	TX	79901
Mr. Andrew Sansom	Executive Director	Texas Parks & Wildlife Dept.	4200 Smith School Road	Austin	TX	78744
Mr. David Riskind	Technical Professional	Texas Parks & Wildlife Dept.	4200 Smith School Road	Austin	TX	78744
The Honorable Jane Nelson	Texas State Senator, District #9	Texas Senate	P.O. Box 12068	Austin	TX	78711
The Honorable Eliot Shapliegh	Texas Senator - District #29	Texas Senate	800 Wyoming, Suite A	El Paso	TX	79902
Dr. Patricia Phillips	Head Librarian	UTEP Library	UTEP Library	El Paso	TX	79968
Mr. Vince Muñoz	Tribal Governor	Tigua Tribal Council	P.O. Box 17579	El Paso	TX	79917
LTC Raymond G. Midkiff	District Engineer	U.S. Army Corps of Engineers	4101 Jefferson Plaza NE	Albuquerque	NM	87109
Mr. Dan Malanchuk	Biologist, El Paso Office	U.S. Army Corps of Engineers-Albuquerque Dist.	P.O. Box 6096	Fort Bliss	TX	79906
Mr. Bert Cortez	Projects Manager	U.S. Bureau of Reclamation, Rio Grande Project	700 E. San Antonio St., Rm. B318	El Paso	TX	79901
Mr. Gurdit Dhillo	Acting District Director	U.S. Customs Service	P.O. Box 9516	El Paso	TX	79985
Mr. Bernie Olivas	Inspector	U.S. Department of Agriculture	3600 East Paisano, Rm. 154A	El Paso	TX	79905
Ms. Jennifer Fowler-Propst	Field Supervisor, Ecological Svc	U.S. Fish & Wildlife Service	3530 Pan American Highway, NE	Albuquerque	NM	87107
Ms. Nancy Kaufman	Regional Director	U.S. Fish & Wildlife Service, Region 2	P.O. Box 1306	Albuquerque	NM	87103
Mr. David C. Frederick	Supervisor, Office of Ecological Svc	U.S. Fish & Wildlife Service	10711 Barnet Road, Suite 200	Austin	TX	78758
Mr. Robert K. Johnson	Administrator	U.S. General Services Administration	700 E. San Antonio, Rm. C-415	El Paso	TX	79901
Mr. Ernesto Martinez	Assistant Chief	U.S. Immigration & Naturalization	8901 Montana Ave.	El Paso	TX	79925
The Honorable Silvestre Reyes	Congressman - District #16	United States House of Representatives	310 N. Mesa St., #400	El Paso	TX	79901
The Honorable Kay Hutchinson	Senator	United States Senate	284 Russell Senate Office Bldg.	Washington	D.C.	20510
Ms. Beth Parker	Project Manager	Daniel B. Stephens & Associates, Inc.	6020 Academy Rd NE, Suite 100	Albuquerque	NM	87109
The Honorable Phil Gramm	Senator	United States Senate	284 Russell Senate Office Bldg.	Washington	D.C.	20510
Ms. Bess Metcalf	Member	Rio Grande/Rio Bravo Basin Coalition	109 North Oregon, Suite 617	El Paso	TX	79901
Ms. Elizabeth Walsh	Member	Sierra Club, El Paso Regional Group	829 Cloudburst Drive	El Paso	TX	79912

B.2 - ORGANIZATIONS CONSULTED DURING EA

B.2 - ORGANIZATIONS CONSULTED DURING EA

AGENCY NAME	DEPT.	PHONE #	POC	POSITION
ABRAMS CONSTRUCTION	CONSTRUCTION	915-593-7393	BRAD EVERETT	PROJECT MANAGER
ALLIANCE ENV., INC.	DRILLING	915-855-8717	DAVID B. HOGAN	MANAGER
ASARCO	ENVIRONMENT	915-541-1819	LAIRY JOHNSON	ENVIRONMENTAL MANAGER
BNSF RAILROAD	NM DIVISION	505-767-6847	HENRY LARA	FIELD ENGINEER
BNSF RAILROAD	EL PASO DIVISION	915-534-2366	HENRY MONDRAGON	ROADMASTER
BNSF RAILROAD	EL PASO DIVISION	915-534-2308	MITCH ESPINOZA	TRAINMASTER
BNSF RAILROAD	RESOURCE PROTECTION	915-534-2309	MARIO REYES	CAPT. RAILROAD POLICE
BNSF RAILROAD	EL PASO DIVISION	915-534-2364	JOHN CAMPOS	TECHNICAL
BOGGS REAL ESTATE APPRAISAL	APPRAISAL	915-584-3670	JAMES BOGGS	CERTIFIED PROPERTY APPRAISER
CITY OF EL PASO	PARKS DEPT.	915-541-4745	NAT CAMPOS	PLANNING DIRECTOR
CITY OF EL PASO	CITY PLANNING DEPT.	915-541-4718	ROSEMARY STALEY	CHIEF PLANNER
CITY OF EL PASO	CITY ENGR. TRANSP.	915-541-4060	LUISA GARCIA	TRANSPORTATION ENGR.
CLEAN AIR PARTNERSHIP	N/A	915-543-9933	VERONICA CARBAJAL	SPOKESPERSON
EL PASO COUNTY WATER IMPROVEMENT DISTRICT #1	IRRIGATION	915-859-4186	ED FIFER	GENERAL MANAGER
EL PASO ELECTRIC	LINE LOCATION	915-543-5924	TERRY ALLEN	UNDERGROUND INSPECTOR
EL PASO NATURAL GAS	LINE LOCATION	800-344-8377	STAFF	UNDERGROUND INSPECTOR
EL PASO POLICE	TRAFFIC ENFORCEMENT	915-564-7000	LT. ROY DAVIS	SUPERVISOR
EL PASO POLICE	WESTSIDE COMMAND	915-564-7000	LT. TIM DAVIDSON	LIEUTENANT
EL PASO POLICE	WESTSIDE COMMAND	915-564-7000	RUDY BONILLA	OFFICER
EL PASO POLICE	UNION PACIFIC RLRD.	915-534-3614	CAPT. JAMES EDGAR	OFFICER
EL PASO POLICE	PUBLIC INFO. OFFICER	915-564-7000	TERESA CHAVIRRA	PUBLIC OFFICER
EL PASO WATER UTILITIES	WATER SYSTEMS DIV.	915-594-5773	DR. DOUG RITTMAN	MANAGER WATER SYSTEMS
EL PASO WATER UTILITIES	CENTRAL STREET PLANT	915-594-5402	ROBER RILEY	TECHNICAL
EL PASO WATER UTILITIES	GEOLOGY	915-594-5516	ROGER SPERKA	GEOLOGIST
EL PASO WATER UTILITIES	WESTSIDE	915-594-5785	ALFONSO ORTIZ	LINE LOCATOR
EL PASO CENTRAL APPRAISAL DISTRICT	COMMERCIAL INDUSTRY PROPERTY	915-780-2000	VINCE KEMENDO	ASSISTANT MANAGER OF APPRAISAL DIST.
EL PASO CITY-COUNTY HEALTH & ENVIRONMENTAL	AIR MONITORING	915-771-5800	JESUS REYNOSA	ENGINEER

B.2 - ORGANIZATIONS CONSULTED DURING EA

AGENCY NAME	DEPT.	PHONE #	POC	POSITION
EL PASO CITY-COUNTY HEALTH & ENVIRONMENTAL	AIR MONITORING	915-771-5800	HENRY DEL RIO	TECHNICAL
EL PASO FIRE DEPT.	HAZARDOUS WASTE	915-771-1000	CHIEF TARANGO	CHIEF
HYDROMETRICS, INC.	ENVIRONMENTAL	915-532-3489	HAROLD KUTZ	CONSTRUCTION ENGINEER
MCI	LINE LOCATION	800-950-5555	STAFF	FIELD TECHNICIAN
QWEST COMMUNICATIONS	LINE LOCATION	800-283-4237	DAVE LUNBECK	FIELD TECHNICIAN
SOUTHWESTERN BELL	LINE LOCATION	800-828-5127	STAFF	LINE LOCATORS
SOUTHERN UNION GAS	LINE LOCATION	915-680-8242	STAFF	FIELD TECHNICIAN
SPRINT COMMUNICATIONS	LINE LOCATION	915-203-3895	RICK DERAGISH	FIELD TECHNICIAN
SUN METRO	SCHEDULES	915-534-5824	PETE DUNAVENT	ASSISTANT
TEXAS DEPT. OF TRANSP.	ADVANCE TRANSP. PLANNING	915-774-4200	JUDY RAMSEY	ADMINISTRATOR
TEXAS DEPT. OF TRANSP.	MAINTENANCE	915-774-4319	ROBERT TEJADA	DIRECTOR
TEXAS DEPT. OF TRANSP.	TRAFFIC CONTROL	915-774-4267	GILBERT JORDAN	ASSISTANT
TEXAS ONE CALL	UTILITIES	800-245-4545	BECKY	DISPATCH
EL PASO CITY WATER IMPROVEMENT DISTRICT #1	WATER	915-859-9111	WENDY MCELROY	WATER TECH
TNRCC	EL PASO, AIR QUALITY	915-834-4949	ARCHIE KLAUS	REGIONAL DIRECTOR
TNRCC	EL PASO, AIR QUALITY	915-834-4949	JOE SAENZ	AIR MONITOR TECHNICIAN
TNRCC	AUSTIN, AIR QUALITY	512-239-1620	LARRY BUTTS	AIR MONITOR TECHNICIAN
TNRCC	EL PASO, AIR QUALITY	915-834-4949	MARIO BALDERRAMA	AIR MONITOR TECHNICIAN
TNRCC	EL PASO, SOILS	915-834-4949	TERRY MCMILLAN	MANAGER
US ARMY CORPS OF ENGINEERS	REGIONAL PLANNING	213-452-3871	JOY JAISWAL	ENVIRONMENTAL MANAGER
US BORDER PATROL	EL PASO SECTOR	915-782-4300	EDWARD F. GERBER	AGENT
US BORDER PATROL	EL PASO SECTOR	915-782-4379	ERNESTO MARTINEZ	ASSISTANT CHIEF
US BORDER PATROL	EL PASO SECTOR	915-782-4300	JAMES GONZALEZ	AGENT
US BORDER PATROL	EL PASO SECTOR	915-782-4300	FERNANDO MELENDEZ	AGENT
US BUREAU OF RECLAMATION	EL PASO SECTOR	915-534-6321	WAYNE E. TREERS	WATER OPERATIONS TEAM LEADER
USGS	NEW MEXICO	505-830-7901	LINDA S. WEISS, P.E.	NM DISTRICT CHIEF
USGS	NEW MEXICO	505-830-7902	ROGER FERREIRA	ASSISTANT CHIEF

B.3 - PUBLIC COMMENTS RECEIVED

All public comments received in response to the preparation of this Environmental Assessment are provided on the following pages.

DIAMOND RASH GORDON & JACKSON, P.C.
ATTORNEYS AT LAW
300 EAST MAIN STREET
SEVENTH FLOOR
EL PASO, TEXAS 79901-1379

TOM DIAMOND
NORMAN J. GORDON*
RONALD L. JACKSON
JOHN R. BATOON
ROBERT J. TRUHILL
RUSSELL D. LEACHMAN**
JOSETTE FLORES

ALAN V. RASH
OF COUNSEL

*BOARD CERTIFIED - CIVIL TRIAL LAW
TEXAS BOARD OF LEGAL SPECIALIZATION
**BOARD CERTIFIED - CRIMINAL LAW
TEXAS BOARD OF LEGAL SPECIALIZATION

TELEPHONE
(915) 533-2277

FAX (915) 545-4623

December 1, 2000

International Boundary and
Water Commission United States and Mexico
The Commons, Bldg. C, Suite 310
4171 N. Mesa Street
El Paso, Texas 79902

Attn: Ms. Sylvia A. Waggoner
Division Engineer

Re: Reconstruction of the American Canal Project - El Paso, Texas

Dear Ms. Waggoner:

This will acknowledge receipt of your letter dated November 21, 2000 in which you transmitted the draft Finding of No Significant Impact and draft Environmental Assessment for the above-referenced project.

Enclosed herewith, please find a copy of the Consultation Policy which has been formally adopted by the Ysleta Del Sur Pueblo.

Please contact me so that we can discuss this matter and arrange a consultation schedule.

Sincerely,

Robert J. Truhill

RJT/mrc
Enclosure
cc: Dr. Adolph Greenberg, Ph.D.
Mr. Steve Fox, USIBWC

CONSULTATION POLICY

Ysleta Del Sur Pueblo

Preface: This document formalizes the existing procedures for consultation (government to government, or otherwise) between the Pueblo of Ysleta del Sur and the United States federal government including any and all agencies/offices/departments/bureaus therein. This policy statement reflects completely the procedures followed and adhered to by this federally recognized Indian tribe during previous consultations and therefore the procedures to be followed and adhered to in future consultations.

Consultation: Consultation is the formal, bilateral process of negotiation, cooperation and policy-level decision-making between two sovereign entities: the Tigua Tribe of Ysleta del Sur Pueblo and the United States Government or its designate. Consultation, therefore, is a process that leads ultimately to a decision. Consultation is not just a process or a mean to an end. As such, it should not be viewed by others and is not viewed by the Pueblo of Ysleta del Sur as a mere formality during the stages of any project. Consultation is not notifying our Tribal Council that an action will occur, requesting written comments on the action or alternative actions, and then proceeding with the action or one of the a priori alternatives. Such authoritarian, top-down procedures do not constitute consultation because a decision is not affected bilaterally between two sovereign entities.

Consultation Objectives:

1) Assures that the Tribal Council and its designates understand fully the technical and legal issues, implications, and probable impacts involved in and resulting from an action or alternatives so that an informed policy-level decision can be made.

2) Improved policy-level decision-making of both the Tribal Council and the federal government.

3) Bilateral decision-making between and among sovereigns leading to co-managerial structure.

4) Protection of Ysleta del Sur Pueblo's cultural and natural resources, cultural tradition, economy and lifestyle.

5) Compliance with and respect for Tribal laws and Tribal integrity.

6) Full compliance with federal Indian law, federal statutes, and federal policy.

7) Develop and achieve mutual decisions through working relationships.

8) Improve the integrity and efficacy of decisions over time.

9) Recognition that the Tribe is both a stakeholder and regulator in projects that have potential or real impacts on tribal resources, culture, and lifestyle.

Consultation Procedures:

The consultation venue works or proceeds in much the same way that federal agencies typically operate. This means a series of technical meetings followed by a series of policy meetings. The technical meetings provide opportunities for consultation by and with the appropriate technical staff of both entities. The policy meetings provide opportunities for the resolution of those issues left unresolved at the technical level and for the resolution of those issues that are clearly policy grounded. The outcome of this procedure is the development of a common understanding of the technical and legal issues affecting or are affected by a decision. It is this common understanding in a democratized context that provides the basis for decision-making. The Tigua Tribal Council will address more cooperatively those issues with which they had been thoroughly consulted with prior to a decision.

Consultation requires that federal agencies and the Tribal Council fully understand their roles in the context of the federally-mandated government-to-government relationship and the responsibilities which devolve upon the federal government under the Trust doctrine. In this environment, both the Tribal Council and the federal agency will benefit from the perspectives each brings to the table. This means personal communication, which is one of the foundations for meaningful consultation. To make this process work, the following series of activities should guide consultation:

1. Federal agency contacts the Governor of the Pueblo of Ysleta del Sur to inform him of an impending project or to conduct an activity which may or may not impact a tribal resource or tribal concern.

2. The Governor, after meeting with the Tribal Council and/or it designates, responds back to the federal agency that this issue is or is not important. If it is important, the Governor will communicate to the federal agency that the Tribe will initiate consultation.

3. Consultation is initiated through technical staff meetings which will inform the respective staffs in a comprehensive way so that each can brief and/or make recommendations to their

respective policy level entities in an informed way.

4. After the technical staff has briefed the Tribal Council, the Council will define the consultation protocol it wishes to follow, which will typically entail additional technical and policy level meetings, research activities, and a final policy level meeting to make a decision. These are then transmitted in written form to the federal agency. The outcome here should be a memorandum of agreement to establish a working relationship between entities.

5. The consultation protocol is followed.

6. A decision couched in bilateral cooperation between the federal agency and the Tribal Council is formulated. This decision will be fully compliant with federal and tribal laws and policies. The decision will protect the resources to which the Tigua Tribe of Ysleta del Sur Pueblo has specific aboriginal and Spanish land grant reserved rights. The decision will protect the cultural tradition and the religious practices of the Tribe.

This consultation policy will insure that Tribal Council and the federal government have not only communicated but have developed mutual understanding and trust. Within this context, policy level decision-making can and must work.

U.S. INT'L BOUNDARY WATER COMM.

4171 N. MESA, BLDG C, RM 224

EL PASO, TEXAS 79902

AD# 4333 SEQ# 562121
LINES 69 COST $——

PUBLISHERS AFFIDAVIT

STATE OF TEXAS
COUNTY OF EL PASO

Before me, a Notary in and for El Paso County, State of Texas, on this day personally, appeared TERRIE CARTER who states upon oath that she is the ASSISTANT CLASSIFIED MANAGER of the EL PASO TIMES, a daily newspaper published in the City and County El Paso, State of Texas, which is a newspaper of general circulation and which has been continously and regularly published for the period of not less than one year in the said County of El Paso, and that he was such upon the EL PASO TIMES.

That the LEGAL copy was published in the EL PASO TIMES **for the dates of such publication being as follows,**

1 DAY(s) to wit 12/02, 2000.

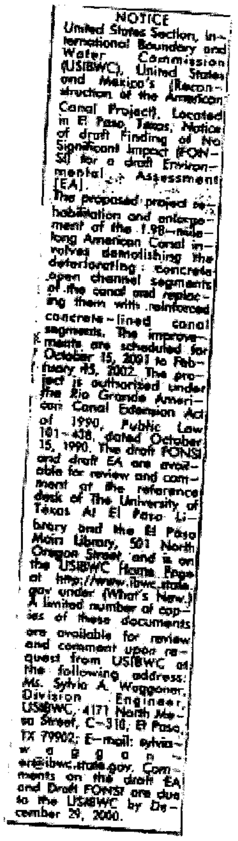
Signed Terrie A. Carter

Subscribed and sworn to before me,

this the 4TH day of DECEMBER, 2000

Belia Duenes

OFFICIAL SEAL
BELIA DUENES
NOTARY PUBLIC
In and for the State of Texas
My commission expires 03-19-2004



NOTICE

United States Section, International Boundary and Water Commission (USIBWC), United States and Mexico's (Reconstruction of the American Canal Project), Located in El Paso, Texas, Notice of draft Finding of No Significant Impact (FONSI) for a draft Environmental Assessment (EA).

The proposed project rehabilitation and enlargement of the 1.98-mile-long American Canal involves demolishing the deteriorating concrete open channel segments of the canal and replacing them with reinforced concrete-lined canal segments. The improvements are scheduled for October 15, 2001 to February 15, 2002. The project is authorized under the Rio Grande American Canal Extension Act of 1990, Public Law 101-438, dated October 15, 1990. The draft FONSI and draft EA are available for review and comment at the reference desk of The University of Texas At El Paso Library and the El Paso Main Library, 501 North Oregon Street and is on the USIBWC Home Page at http://www.ibwc.state.gov under (What's New.) A limited number of copies of these documents are available for review and comment upon request from USIBWC at the following address: Ms. Sylvia A. Waggoner, Division Engineer, USIBWC, 4171 North Mesa Street, C-310, El Paso, TX 79902; E-mail: sylviawaggoner@ibwc.state.gov. Comments on the draft EA and Draft FONSI are due to the USIBWC by December 29, 2000.

From: "Ray Mathews" <Ray.Mathews@twdb.state.tx.us>
To: <stevefox@ibwc.state.gov>
Date: 12/11/00 9:51AM
Subject: American Canal Project file

Mr. Fox, I am the TRACS Coordinator for the Texas Water Development Board, and I have tried to open the EA/FONSI for Reconstruction & Enlargement of the American Canal at your web site without success. Could you email me the file for this report, so that I can review it for my agency. Thank you, Ray

Raymond C. Mathews, Jr.
Natural Resource Specialist V
Lead Environmentalist for Senate Bill 1
Texas Water Development Board
Hydrologic & Environmental Monitoring Division
Environmental Section
1700 North Congress Avenue
Austin, TX 78711-3231
(512) 936-0822 (office)
(512) 936-0889 (fax)
email: Ray.Mathews@twdb.state.tx.us

CC: <mrositas@governor.state.tx.us>

DOLORES BRIONES
COUNTY JUDGE
(915) 546-2098
FAX (915) 543-3888

County of El Paso
OFFICE OF THE COUNTY JUDGE

COUNTY COURTHOUSE
500 E. SAN ANTONIO ST., SUITE 301
EL PASO, TEXAS 79901-2427
E - MAIL
briones@co.el-paso.tx.us

December 18, 2000

Sylvia A. Waggoner
Division Engineer
Environment Management Division
International Boundary and Water Commission
The Commons, Building C, Suite 310
4171 N. Mesa Street
El Paso, Texas 79902

Re: Reconstruction and Enlargement of the American Canal, El Paso, Texas

Dear Ms. Waggoner,

Alternative 4 of the above proposed project, for which the environmental assessment finds no significant impact, is a reasonable alternative. The County of El Paso does not oppose the proposed "Open Channel Alternative" provided proper measures are taken to protect the citizens of El Paso from harm and loss of property. It should be noted, however, that the development of a River Park along the U.S. bank of the Rio Grande is in progress and measures need to be considered to prevent obstruction of the proposed pedestrian, bicycle, and equestrian trails along this park.

The County of El Paso is coordinating the development of the River Park with Mr. Jim Stefanov, Chief Technical Planning, IBWC. Mr. Jesse Acosta, the County's Planning Coordinator and Mr. John Torres, Project leader for the River Park, will continue to be in contact with IBWC. If you need additional information please call Mr. Acosta or Mr. Torres at (915) 834-8242.

Sincerely yours,

Dolores Briones, County Judge
County of El Paso, Texas

Equal Opportunity Employer

TEXAS
HISTORICAL
COMMISSION
The State Agency for Historic Preservation

GEORGE W. BUSH, GOVERNOR
JOHN L. NAU, III, CHAIRMAN
F. LAWERENCE OAKS, EXECUTIVE DIRECTOR

December 21, 2000

Sylvia A. Waggoner, Division Engineer
C/o Steve Fox
Environmental Management Division
International Boundary and Water Commission
The Commons, Building C, Suite 310
4171 N. Mesa Street
El Paso, Texas 79902

Re: Project review under Section 106 of the National Historic Preservation Act of 1966
Draft FONSI and EA – Reconstruction and Enlargement of the American Canal Project,
El Paso, El Paso County
IBWC

Dear Mr. Fox,

Thank you for your correspondence describing the above referenced project. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

The staff led by lead reviewer Lyman Labry of the Division of Architecture has reviewed the draft FONSI and EA for the American Canal Project in consultation with staff in our Archeology Division. We have no concerns regarding the proposed alternative No. 4 (the Open Channel Alternative) and hereby issue a determination of NO ADVERSE EFFECT.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review or if we can be of further assistance, please contact Lyman Labry at 512/305-9109.

Sincerely,

Lyman Labry

Lyman Labry, Project Reviewer for Trans-Pecos Region
for
F. Lawerence Oaks, State Historic Preservation Officer

cc: FLO/LML
Myles Miller, Archeology Division

CARLOS M. RAMIREZ
MAYOR
MONICA D. CUNNINGHAM
CHIEF ADMINISTRATIVE OFFICER
ESTRELLA ESCOBAR
EXECUTIVE ASSISTANT TO THE MAYOR
MARK THREADGILL
EXECUTIVE ASSISTANT TO THE MAYOR

CITY COUNCIL
JAN SUMRALL
DISTRICT NO. 1
ROSE RODRIGUEZ
DISTRICT NO. 2
LARRY M. MEDINA
DISTRICT NO. 3
JOHN COOK
DISTRICT NO. 4
PRESI ORTEGA, JR.
DISTRICT NO. 5
PAUL JOSEPH ESCOBAR
DISTRICT NO. 6
LUIS G. SARIÑANA
DISTRICT NO.7
ELVIA G. HERNANDEZ
DISTRICT NO. 8

December 26, 2000

Mr Steve Fox
USIBWC
4171 North Mesa Street, C-310
El Paso, Texas 79902

RE: Draft Fonsi and Draft EA
Reconstruction and Enlargement of American Canal
El Paso, Texas

Dear Mr. Fox:

Thank you for the opportunity to submit the Department's comments on the referenced project. While we offer general consensus with the assessment made, the following concerns should be considered in the final analysis:

1. In previous meetings with the Rio Grande Task Force regarding the Rio Grande Riverpark project, it was agreed that sufficient levee accessibility should be maintained to allow a hike/bike trail to pass through the area. It had been commented that the IBWC would need to include a few closed conduit sections to provide space for the trail. The City and County are in the process of preparing additional grant applications to extend a trail from Anapra to the Downtown area. Construction on the funded portion of the trail between Country Club Road and Vinton will begin next year.

2. It is our understanding that the bridge to be removed is not the privately owned brick company bridge. At a future date, this bridge will require an in-depth review. Currently, this bridge provides the only direct access to Madero Park on the western bank of the Rio Grande River in New Mexico. Rehabilitation of Madero Park is underway and is proposed to be a historical node along the Riverpark trail. This bridge or another connection to both banks of the river will need to be retained.

   The bridge to be removed is of historical merit. In addition to the drawings to be made, we would suggest that a marker with a drawing be placed as near to the site as possible. This location could become a stop on the Riverpark

"Honor our Past...
...Imagine our Future

Two Civic Center Plaza • El Paso, Texas 79901-1196 • (915) 541-4000 • FAX (915) 541-4501

trail, and would be in keeping with the heritage corridor theme and be eligible for the historical marker program underway with participation from the El Paso Community Foundation. The marker should maintain the established style of the other markers underway as part of the program.

3. As the design and construction plans are developed, coordination with the Rio Grande Taskforce should be ongoing. Jim Stefanov of the IBWC local office serves as Vice-Chair and can provide the necessary coordination between the two organizations.

Should you have any questions on these comments, please contact Rosemary Staley, Chief Urban Planner/Long Range Division, at (915) 541-4718. I look forward to our continued coordination on this project.

Sincerely,

**DEPARTMENT OF PLANNING,
RESEARCH & DEVELOPMENT**

Patricia D. Adauto

Patricia D. Adauto
Interim Director

c: *Monica D. Cunningham, Chief Administrative Officer*
Estrella Escobar, Executive Asst. to the Mayor

Texas Review and Comment System

Review Notification

Applicant/Origination Agency: International Boundary& Water Commission-US &Mexico
Contact Name: Mr. Steve Fox
Contact Phone: 915/832-4100
Email: stevefox@ibwc.state.gov

Project Name: Draft EA/FONSI: Reconstruction & Enlargement of American Canal, El Paso

Funding Agency: IBWC **SAI/EIS#:** TX-R-20001128-0001-50
Date Received: 11/28/2000 **Date Comments Due BPO:** 12/28/2000

Review Participants

Agencies

Texas Attorney General's Office
Ms. Karen W. Kornell
Chief, Natural Resources Div.
300 W. 15th Street, 10th Floor
Austin, Texas

Texas Historical Commission
Dr. James Bruseth
TRACS Coordinator
1511 Colorado Street
Austin, Texas

Texas Parks & Wildlife Department
Mr. Robert W. Spain
Chief, Habitat Assessment Branch
4200 Smith School Road
Austin, Texas

State Soil and Water Conservation Board
Mr. Robert G. Buckley
Executive Director
P.O. Box 658
Temple, Texas

Texas Department of Health
Ms. Peggy L. Belcher
TRACS Coordinator
1100 W. 49th Street
Austin, Texas

Bureau of Economic Geology
Scott Tinker, Ph.D.
Director
University Station, Box X
Austin, Texas

Texas Natural Resource Conservation Commission
Ms. Mary Lively
Office of Policy & Regulatory Dev. MC205
P. O. Box 13087
Austin, Texas

Cogs

Rio Grande Council of Governments
Mr. Glen Hinton
Criminal Justice Coord/TRACS
1100 N. Stanton Street, Suite 610
El Paso, TX 79902

Texas Water Development Board
Mr. Ray Mathews Jr.
TRACS Coordinator
1700 North Congress Avenue
Austin, Texas

General Land Office
Ms. Lanell Aston
Executive Assistant, Office of the Deputy Comm.
Stephen F. Austin Building, Rm. 720
Austin, Texas

Texas Department of Transportation
Mr. Ken Bohuslav
TRACS Coordinator
11th & Brazos
Austin, Texas

Special Notes/Comments:

Summary of application provided by SPOC. Reviewers should contact applicant directly, or go to: http://www.ibwc.state.gov, to receive a full copy for review.

☒ **No Comment** ______________________________

Review Agency **Signature**

Return Comments to: Denise S. Francis

Denise S. Francis, State Single Point of Contact
Governor's Office of Budget & Planning
P.O. Box 12428
Austin, TX 78711
(512) 305-9415

DIAMOND RASH GORDON & JACKSON, P.C.
Attorneys at Law
300 E. Main Street
Seventh Floor
El Paso, Texas 79901-1379

Tel : 915-533-2277
Fax: 915-545-4623

Tom Diamond
Norman J. Gordon*
Ronald L. Jackson
John R. Batoon
Robert J. Truhill
Russell D. Leachman**
Josette Flores

Alan V. Rash
Of Counsel

*Board Certified - Civil Trial Law
Texas Board of Legal Specialization
**Board Certified - Criminal Law
Texas Board of Legal Specialization

December 28, 2000

VIA E-MAIL stevefox@ibwc.state.gov

International Boundary
and Water Commission
The Commons, Building C, Suite 310
4171 N. Mesa Street
El Paso, Texas 79902

Attention: Steve Fox

Re: **Comments of the Ysleta Del Sur Pueblo on the Draft Fonsi and Draft EA**
Reconstruction & Enlargement of American Canal
El Paso, Texas

Dear Mr. Fox:

This firm represents the Ysleta Del Sur Pueblo, and these comments on the Draft EA on the reconstruction and enlargement of the American Canal dated October 19, 2000 are written on its behalf.

The Pueblo specifically notes the statements and conclusions set forth under Section 4.6 of the Draft EA where in it is stated that "Any historical or culturally important sites dating before 1937 are considered to have been destroyed either by annual flooding of the Rio Grande floodplain prior to construction of Elephant Butte Dam, or by construction activities of the American Canal". The Pueblo contends that the proposed reconstruction and enlargement project is the latest in a continuing pattern of federal projects involving the Rio Grande River which have changed the historic conditions of the River and have adversely affected the Pueblo's ability to perform religious ceremonies associated with the River.

The Pueblo has previously filed suit against the International Boundary and Water Commission in this respect. A copy of the Original Complaint is enclosed herewith. The EA should be revised to reflect the Pueblo's contention.

UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
EL PASO DIVISION

YSLETA DEL SUR PUEBLO **and RICK QUESADA**	§	
Plaintiffs,	§	
vs.	§	**CIVIL ACTION NO. CA-00-EP-0205**
UNITED STATES INTERNATIONAL BOUNDARY AND WATER COMMISSION and DOUGLAS ECHLIN,	§	
Defendants.	§	

ORIGINAL COMPLAINT FOR INJUNCTIVE RELIEF

TO THE HONORABLE JUDGE OF SAID COURT:

COMES NOW, the Ysleta del Sur Pueblo (hereinafter "Tribe" or "Pueblo"), a federally recognized Indian Tribe and Rick Quesada, an individual member of said Tribe (collectively referred to as "Plaintiffs"), and request that this Court issue an injunction prohibiting the Defendants, Douglas Echlin and the United States International Boundary and Water Commission (hereinafter "USIBWC), from continuing to violate the mandates of the National Environmental Policy Act (hereinafter "NEPA") 42 U.S.C. § 4321 et seq., and the American Indian Religious Freedom Act, 42 U.S.C. §1996 (hereinafter "AIRFA").

ISSUES PRESENTED

1. This case examines whether the USIBWC in conducting an environmental impact statement for the El Paso-Las Cruces Regional Sustainable Water Project (hereinafter the "Project") must address the restoration of in stream flows in the Rio Grande River as a project alternative where

the cessation of in stream flows has created environmental degradation and impaired the constitutional rights of an American Indian Tribe and its people. Further, this case examines whether the USIBWC has followed the statutory mandate under NEPA to consult with the Pueblo regarding the proposed actions.

JURISDICTION

2. This action arises under the National Environmental Policy Act of 1969 as amended in 42 U.S.C. § 4321 et seq., and the American Indian Religious Freedom Act at 42 U.S.C. §1996. This Court has jurisdiction of this action under 28 U.S.C. §1331 and 28 U.S.C. §1361, and may issue a declaratory judgment and further relief under 28 U.S.C. §§2201 and 2202.

PARTIES

3. Plaintiff, Ysleta del Sur Pueblo is a federally recognized Indian Tribe. See 25 U.S.C. §1300g et seq. Its tribal lands are located within El Paso County, Texas..

4. Plaintiff Rick Quesada is an individual who resides in El Paso County, Texas and is an enrolled member of the Ysleta del Sur Pueblo. Mr. Quesada is the War Captain, a spiritual leader of the Pueblo.

5. Defendant Douglas Echlin is an Environmental Protection Specialist of the Environmental Management Division of the USIBWC. Mr. Echlin is the acting director for comments pertaining to the environmental impact study being conducted by the USIBWC for the proposed El Paso-Las Cruces Regional Sustainable Water Project. Mr. Echlin may be served with service of process by serving him at 4171 North Mesa Street, Suite C-310, El Paso, Texas 79902.

6. The USIBWC is a federal agency acting through its United States Commissioner, John M. Bernal (see 22 U.S.C.§277 et seq.), and has received federal funding in connection with the El

Paso-Las Cruces Regional Sustainable Water Project. The USIBWC may be served by serving its United States Commissioner, John M. Bernal at 4171 N. Mesa Street, Suite C-310, El Paso, Texas 79902.

HISTORICAL BACKGROUND

7. The Ysleta del Sur Pueblo is an aboriginal American Indian tribe. It arrived in El Paso in 1680 in the aftermath of a Pueblo revolt and settled in its present location in El Paso County in 1682. It established an extensive aboriginal territory under Spanish law and also received the Ysleta Grant from Governor Cachupin in 1751 in recognition of its rights under Spanish law to a Pueblo League. The Spanish Grant was recognized by the Mexican government and the State of Texas and is that part of El Paso County lying in the El Paso Valley Flood Plain between the Ascarate Grant and the Socorro Grant. The Pueblo developed an extensive irrigation system, parts of which are still in use today, and cultivated the Grant area with a variety of crops. The Pueblo's irrigation rights and right to use of the river predate the Elephant Butte Project and the formation of the United States of America. The Grant title under Spanish law was a communal title and not subject to alienation. The Pueblo's legal rights were protected by the Spanish authorities and this protection continued under Mexican jurisdiction. With the advent of the American period in 1848 attempts were made to subvert the Indian title into private non-Indian titles. This culminated with the incorporation of Ysleta in 1871 which was formed for the purpose of subverting Indian titles in contravention of the Indian Non-Intercourse Act, 25 U.S.C. § 177, and the Treaty of Guadalupe Hidalgo, 9 Stat. 922.

8. As a result of the incorporation of Ysleta in 1871, the Pueblo lost physical possession of its lands and its members became laborers on lands that were unlawfully possessed by others. The United States of America has never terminated the Pueblo's aboriginal title or its recognized title in

the Ysleta Grant. In common with the other pueblo tribes of the southwest, this Pueblo has extensive religious association with the Rio Grande River and in spite of its loss of physical possession of its holdings, members of the Pueblo continue to visit the river and make use of its water in connection with religious ceremonies. The USIBWC has proposed alternative uses of the river in the El Paso - Las Cruces Regional Sustainable Water Project which will permanently deplete the flows in the river at the sacred locations that the Indians rely upon to cleanse and renew the tribe on an annual basis. See affidavit of Rick Quesada in the Appendix accompanying the Motion for Preliminary Injunction. The tribe's property interests and religious use of the river and its waters arise under the First and Fifth Amendments to the U. S. Constitution.

9. The USIBWC proposed alternatives will create a permanent condition where continued diversion of water from the river will result in a stagnant non-flowing series of pools, if that, below the Zaragoza bridge in a polluted state. These conditions are unsuitable for the religious practices vital to the tribe's heritage and tradition. In the past, the Tribe has been able to obtain river flows for its religious purposes. The United States has never terminated the Pueblo's rights to the use of the river. Under the proposed alternatives, no consideration has been given to the Pueblo, and no alternatives have been considered which provide for in-stream flows. These alternatives present a constitutional denial of the Tribe's religious use of the river and create a health hazard and an environmental nuisance.

10. The USIBWC has failed and refused to consult with the tribe as required by the National Environmental Policy Act in preparing an Environmental Impact Statement (EIS) that

impacts the Pueblo's rights by failing to address in-stream flows. Further there is no authority for the

USIBWC to expend public funds on a project which has not been authorized by Congress.

FACTUAL BASIS

11. On or about April 7, 2000, the USIBWC, acting as lead agency for the El Paso- Las Cruces Regional Sustainable Water Project, issued a draft environmental impact statement (hereinafter "DEIS") relating to the proposed regional water plan. The proposed project involves major federal action which requires the preparation of the DEIS. The goal of the project is to develop a high quality sustainable drinking water supply for the El Paso-Las Cruces region through the year 2030. The USIBWC is acting as the lead agency in preparation of the DEIS, and is the designated federal agency for NEPA compliance. Substantial federal funds have been used in preparation of the DEIS. The USIBWC is acting in concert with other cooperating federal agencies including the U.S. Bureau of Land Management, the U.S. Bureau of Reclamation, the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Bureau of Land Management, the Natural Resources Conservation Service and the U.S. Department of the Army.

12. The Rio Grande is a sacred place for the Ysleta del Sur Pueblo and its people. The Pueblo has been conducting religious ceremonies and collecting materials for religious purposes at its sacred sites on the Rio Grande since 1682. The spiritual activity area of the Pueblo encompasses a reach of the Rio Grande extending upstream from the Zaragosa crossing approximately five-eighths of a mile and continuing downstream ending at the eastern boundary of the Ysleta Grant. These religious practices require a sufficient water quantity to allow submersion, and a sufficient in stream flow to carry various religious materials downstream. In the absence of the required flows, the

Pueblo will not be able to perform its religious activities.

13. Plaintiffs have a constitutional interest in their freedom to exercise their religious practices at the river as they have done since the inception of the United States.

14. The United States has a trust responsibility to the Pueblo to protect the rights of the Pueblo. The Pueblo has a grant and an aboriginal claim to the lands which are specifically and adversely affected by the proposed actions. The Pueblo irrigated and used lands affected by the proposed action since the late 1600's. Many of the irrigation ditches or "acequias" which are still in use were originally built by the Pueblo.

15. The United States has a trust responsibility to protect and maintain rights reserved by or granted to American Indians through treaties and federal statutes. The Pueblo's rights are protected by the Treaty of Guadalupe Hidalgo.

16. Despite it legal obligations, USIBWC refused and continues to refuse to consider restoration of in-stream flows and to consult with the Pueblo.

17. As a result of the foregoing failure of consultation, the DEIS is based upon incorrect and insufficient data, especially concerning in-stream flows. For example, the DEIS provides that "no Indian trust asset issues were identified at the project's public scope meetings which were held in September 1998", and that "[t]he project would not significantly change the historic condition of the Rio Grande downstream of the Riverside Dam in El Paso and south of Zaragosa crossing, or the ability of the Ysleta Del Sur Pueblo to perform religious ceremonies associated with the river at this location". The Rio Grande historically has had in-stream flows which were used by the Pueblo for more than 300 years. The DEIS gives no consideration to any alternatives that would provide for in-stream flows, but rather treats recent diversions of flows as historical. The proposals will adversely

affect the Plaintiffs' historical use of the river.

18. Further delay in bringing this action has been rendered impractical by the response of Defendants to Plaintiff's demand for consultation. USIBWC has indicated in correspondence that it has no intention of consulting with the Pueblo. See affidavit of Robert J. Truhill in the appendix accompanying the Motion for Preliminary Injunction. If forced to wait for the EIS to be issued, Plaintiffs injuries will only be magnified. The NEPA statute contemplates consultation. All attempts at consultation or to even establish a protocol for consultation have been futile. Due to the lack of consultation, the scope of alternatives considered are unduly limited and does not include restoration of in-stream flows. A post hoc review is not meaningful consultation and not in conformity with the NEPA mandate.

PRAYER

WHEREFORE, PREMISES CONSIDERED, Plaintiffs respectfully request that the USIBWC and Douglas Echlin be cited to appear, and that after notice and hearing, that the Plaintiffs recover the following:

1. A preliminary injunction prohibiting the issuance of an EIS in connection with the El Paso-Las Cruces Regional Sustainable Water Project or any other action in furtherance of the project until such time as there has been full consultation with the Pueblo and consideration of the issues identified herein;

2. A permanent injunction prohibiting the issuance of an EIS in connection with the El Paso-Las Cruces Regional Sustainable Water Project or any other action in furtherance of the project in the absence of full consultation with the Pueblo and consideration of the issues identified herein;

3. In the alternative, the Court issue an order compelling Defendants to engage in

meaningful consultation with the Pueblo and to consider the issues identified herein;

4. Costs;

5. Such other relief either at law or in equity to which Plaintiffs may show themselves justly entitled.

Respectfully submitted,

DIAMOND, RASH, GORDON & JACKSON, P.C.

BY: ______________________________
TOM DIAMOND
State Bar No. 05804000
RUSSELL D. LEACHMAN
State Bar No 12069710
ROBERT J. TRUHILL
State Bar No. 20254500
300 E. Main St., 7th Floor
El Paso, Texas 79901
(915) 533-2277
(915) 545-4623 fax
ATTORNEYS FOR PLAINTIFFS

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the forgoing Original Complaint for Injunctive Relief and Summons was sent via certified mail in accordance with Rule 4(i), Federal Rules of Civil Procedure to the following persons on the 11th day of July, 2000: James Blagg, United States Attorney for the Western District of Texas, Attn: Civil Process Clerk, 601 NW Loop 410, Suite 600, San Antonio, Texas 78216, and Janet Reno, Attorney General of the United States, Department of Justice Building, 950 Pennsylvania Ave. NW, Room 5111, Washington, D.C. 20530; I also hereby certify that a true and correct copy of the forgoing Original Complaint for Injunctive Relief and Summons was personally served and sent via certified mail in accordance with Rule 4(i), Federal Rules of Civil Procedure to the following persons on the 11th day of July, 2000 Doug Echlin, Environmental Protection Specialist, Environmental Management Division, United States International Boundary and Water Commission, 4171 N. Mesa Street, Suite C-310, El Paso, Texas 79902, and John M. Bernal, United States Commissioner, United States International Boundary and Water Commission, 4171 N. Mesa Street, Suite C-310, El Paso, Texas 79902.

/S/
RUSSELL D. LEACHMAN
Attorney for Plaintiffs

Antonio D. Flores

From: Antonio D. Flores
Sent: Friday, December 29, 2000 1:53 PM
To: 'stevefox@ibwc.state.gov'
Cc: Edward Drusina
Subject: Draf: FONSI and Draft EA Reconstruction and Enlargement of American Canal

Steve,

The City of El Paso Department of Public Works offers the following comments on subject:

1. The canal adjacent to West Paisano Drive should be covered in its entirety due to the recent large number of automobile fatalities in this area.

2. IBWC should further study this portion of the canal alignment to address the safety concerns of Mexico and U.S. residents.

3. Laredo and Nuovo Laredo border area has a wide and beautiful river separating both cities. Why can't El Paso have something similar and still address economic and environmental considerations?

Sincererly,

Antonio D. Flores, P.E.
City of El Paso
Department of Public Works
Ph./Fax (915)541 4475/4405

From: "Lara, Harry L" <Harry.Lara@bnsf.com>
To: "'stevefox@ibwc.state.gov'" <stevefox@ibwc.state.gov>
Date: 1/2/01 3:14PM
Subject: RECONSTRUCTION & ENLARGEMENT OF THE AMERICAN CANAL AT EL PASO, TX.

Steve,
This is as per Sylvia A. Waggoner's letter dated November 21, 2000 with attached draft copy of the Environmental Assessment for the Reconstruction of the American Canal Project at El Paso, Tx. Following are issues that need to be considered when designing this project.

The area the BNSF Railroad would be concerned with can be referred to as between Railroad M.P. 1153 and M.P. 1154 on the southside of the ASARCO PLant. If and when a plan is agreed upon we would be concerned with the proposed reconstruction and/or enlargement project and its close proximity to our main track. No matter which alternative is taken the project will intersect the live load influence area due the location of the existing canal. The plans for the proposed project will have to be designed to resist railroad live loads. This should also include the design of any temporary shoring and retaining walls.

Anyone working on BNSF Property will have to take a BNSF Safety Orientation Course via the internet, will have to wear the required personal protective equipment, will abide by all BNSF rules and requirements, and will require track protection by a qualified BNSF employee.

If you have any questions please call me at (505)767-6847. Thanks

Sincerely,
Harry L. Lara

CC: "Goff, James R" <James.Goff@bnsf.com>, "Hulstrom, Scott A" <Scott.Hulstrom@bnsf.com>, "Sloggett, Craig L" <Craig.Sloggett@bnsf.com>, "Atkins, Brian A" <Brian.Atkins@BNSF.com>

United States Department of the Interior

FISH AND WILDLIFE SERVICE
10711 Burnet Road, Suite 200
Austin, Texas 78758
(512) 490-0057

Consultation #2-15-99-I-806

Sylvia A. Waggoner
International Boundary and Water Commission
The Commons, Building C, Suite 310
4171 North Mesa Street
El Paso, Texas 79902

Dear Ms. Waggoner:

This is a response to your November 21, 2000 letter requesting that the U.S. Fish and Wildlife Service (Service) provide comments on your Draft Finding of No Significant Impact (FONSI) and Draft Environmental Assessment (EA): Reconstruction and Enlargement of American Canal, El Paso, Texas. We received certain segments of the Draft EA with your letter and downloaded the entire 393 page Draft EA from your website.

As indicated in your Draft EA in Appendix G2, we initially commented on this project in a brief letter to John Knopp of Encon International dated September 20, 1999. In that letter we concurred with your FONSI to federally listed or proposed threatened and endangered species and other resources for which we have the responsibility of protecting. Appendix G1 of your EA, entitled "Habitats, Wetlands, Endangered Species, Fish and Wildlife Report", provided information on the population of cliff swallows that utilize airspace above the American Canal and the Rio Grande for foraging and structures associated with the canal for nest sites. We understand that some of the structures upon which the swallows currently build their nests would be disturbed or destroyed during your proposed canal reconstruction and enlargement. We understand that structures will be available as nest sites for the swallows when the proposed project is completed.

In order to avoid harm to nesting cliff swallows (and barn swallows if they also nest on your structures) and avoid a violation of The Migratory Bird Treaty Act of 1918 (MBTA), we recommend that any destruction or disturbance to swallow nesting sites take place outside the breeding season, which generally extends from early March to late July in Texas. The MBTA prohibits persons to "pursue, hunt, take, capture, kill, [or to] attempt to take, capture, or kill . . . any migratory bird included in the terms of this Convention . . .for the protection of migratory birds . . ." This Act provides protection for the swallows nesting on your canal structures, as they winter in southern South America and migrate to North America to nest every spring. It would be illegal to destroy those nests containing eggs or young birds, as those young birds would certainly be killed in the process. Also, attempting to move nests containing eggs or young would also be illegal under the Act, as parent birds would almost certainly abandon any nests that had been moved, and their eggs or young would quickly perish. Prohibiting birds from returning to active nests resulting in death or injury to eggs or young in the nest would also constitute a violation of the MBTA.

If destruction or disturbance of swallow nesting sites must take place during the breeding season, then we recommend that you take measures before the breeding season to discourage swallow use of those canal structures that must be disturbed or destroyed. For example, swallows could be discouraged from nesting on certain structures by removing old nests *before the breeding season*. Loosely hung cloth could be attached to structures to cover potential nest attachment sites, or a substance, such as petroleum jelly or grease could be applied to potential nest sites to persuade the swallows to select different nest sites.

If, by some accident, swallows build new nests or reoccupy old nests that were inadvertently not removed from the previous season on structures that must be disturbed or destroyed during the breeding season, then please contact us for further guidance on how to proceed with your project.

Again, we thank you for your concern for threatened and endangered species, migratory birds, and other natural resources, and we appreciate the opportunity to provide comments on your Draft EA. We wish you luck with your canal reconstruction and enlargement project. If we can be of further assistance or if you have questions about these comments, please contact Ray Brown of our staff at (512) 490-0057, extension 243.

Sincerely,

William Seawell
for
David C. Fredrick
Supervisor

OFFICE OF THE GOVERNOR

RICK PERRY
GOVERNOR

Wednesday, January 10, 2001

Mr. Steve Fox
International Boundary&Water Commission-US &Mexico
4171 N. Mesa Street, C-310
El Paso, TX 79902

RE: TX-R-20001128-0001-50

Draft EA/FONSI: Reconstruction & Enlargement of American Canal, El Paso

Dear Mr. Fox:

Your application for assistance referenced above has been reviewed. No substantive comments were received.

We appreciate the opportunity afforded to review your proposal. Please let me know if we can be of further assistance.

Sincerely,

Denise S. Francis /mhr

Denise S. Francis, State Single Point of Contact
DSF/mhr

cc: International Boundary and Water Commission

Post Office Box 12428 Austin, Texas 78711 (512) 463-2000 (Voice)/(512) 475-3165 (TDD)

TEXAS
PARKS &
WILDLIFE

January 12, 2001

Sylvia A. Waggoner
Environmental Management Division
International Boundary and Water Commission
The Commons, Building C, Suite 310
4171 N. Mesa Street
El Paso, TX 79902

RE: Reconstruction and Enlargement of American Canal, El Paso County

Dear Ms. Waggoner:

Thank you for coordinating with this agency in your planning activities regarding the reconstruction and enlargement of the American Canal in El Paso. Texas Parks and Wildlife Department (TPWD) staff have reviewed the Draft Environmental Assessment (DEA) and offer the following comments regarding this project.

The project entails demolishing approximately two miles of deteriorating concrete open channel segments of the canal and replacing them with reinforced concrete-lined canal segments. Activities associated with the project include increasing the canal capacity to 1535 cubic feet per second, demolition of existing canal structures and open channel concrete lining, reconstructing and enlarging the 400-foot open channel segment immediately downstream from the headgates and the 100-foot open channel segment upstream from the gaging station, installing fences along the canal, installing safety equipment to reduce canal drownings, and removing the Smelter Bridge and the abutments of Hart's Mill Bridge.

Soil erosion and siltation into nearby aquatic and wetland habitats should be minimized using hay bales, silt fence, or similar soil erosion prevention techniques. Hay bales should be certified weed-free or comprised of locally grown hay or straw in order to prevent the introduction of exotic and invasive plant species. In order to enhance the stabilization of exposed soils, newly graded areas should be seeded or sodded with native grasses. Removal of large trees and native vegetation should be avoided.

Because activities entail improvements to existing structures, adverse impacts to fish and wildlife resources should be minimal.

I appreciate the opportunity to review and comment on this project.

Sincerely,

Danny Allen
Wildlife Habitat Assessment Program
Wildlife Division

cc: Melissa Parker (Resource Protection)

DLA:pmo.8279

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512-389-4800
www.tpwd.state.tx.us

To manage and conserve the natural and cultural resources of Texas for the use and enjoyment of present and future generations.

B.4 - OTHER CORRESPONDENCE

DIAMOND RASH GORDON & JACKSON, P.C.
Attorneys at Law
300 E. Main Street
Seventh Floor
El Paso, Texas 79901-1379

Tel.: 915-533-2277
Fax: 915-545-4623

Tom Diamond
Norman J. Gordon*
Ronald L. Jackson
John R. Batoon
Robert J. Truhill
Josette Flores

Alan V. Rash
Of Counsel

*Board Certified - Civil Trial Law
Texas Board of Legal Specialization

October 19, 2001

HAND-DELIVERY

International Boundary
and Water Commission
The Commons, Building C, Suite 310
4171 N. Mesa Street
El Paso, Texas 79902

Attention: Mr. Steve Fox

Re: **Comments of the Ysleta Del Sur Pueblo on the Draft Fonsi and Draft EA Reconstruction & Enlargement of American Canal - El Paso, Texas**

Dear Mr. Fox:

This will acknowledge receipt of your e-mail dated October 19, 2001 in which you transmitted 2 proposed paragraphs which would be inserted into the EA/FONSI for the above-referenced project.

The proposed language makes reference to archaeological sites or historical structures and ignores the Tribe's ethnographically documented spiritual connection to the river. Enclosed herewith, please find a copy of the "Ysleta Del Sur Pueblo and The Rio Grande, An Ethnographic Assessment of Ysleta Del Sur Pueblo's Relationship with the Rio Grande" by Adolph M. Greenberg, Ph.D., the Pueblo's ethnographer. Dr. Greenberg's study is transmitted to the IBWC under the condition that it is for the agency's internal review and is not authorized for publication or dissemination to the public and is strictly confidential.

The Pueblo requests that this letter, **without Dr. Greenberg's study**, be appended to the EA.

C:\MRC Documents\TIGUA\GENERAL\IBWC.fox.418

Upon receipt of this correspondence please contact this office so that we can discuss the Pueblo's request.

Sincerely,

Robert J. Truhill

RJT/mrc
Enclosure

cc: Governor Albert Alvidrez
Lt. Governor Filbert Candelaria
Rick Quezada, War Captain
Dr. Adolph Greenberg, Ph.D.

C:\MRC Documents\TIGUA\GENERAL\IBWC.fox.o18

B.5 – LIST OF AGENCIES ORGANIZATIONS, AND PERSONS MAILED DURING FINAL EA

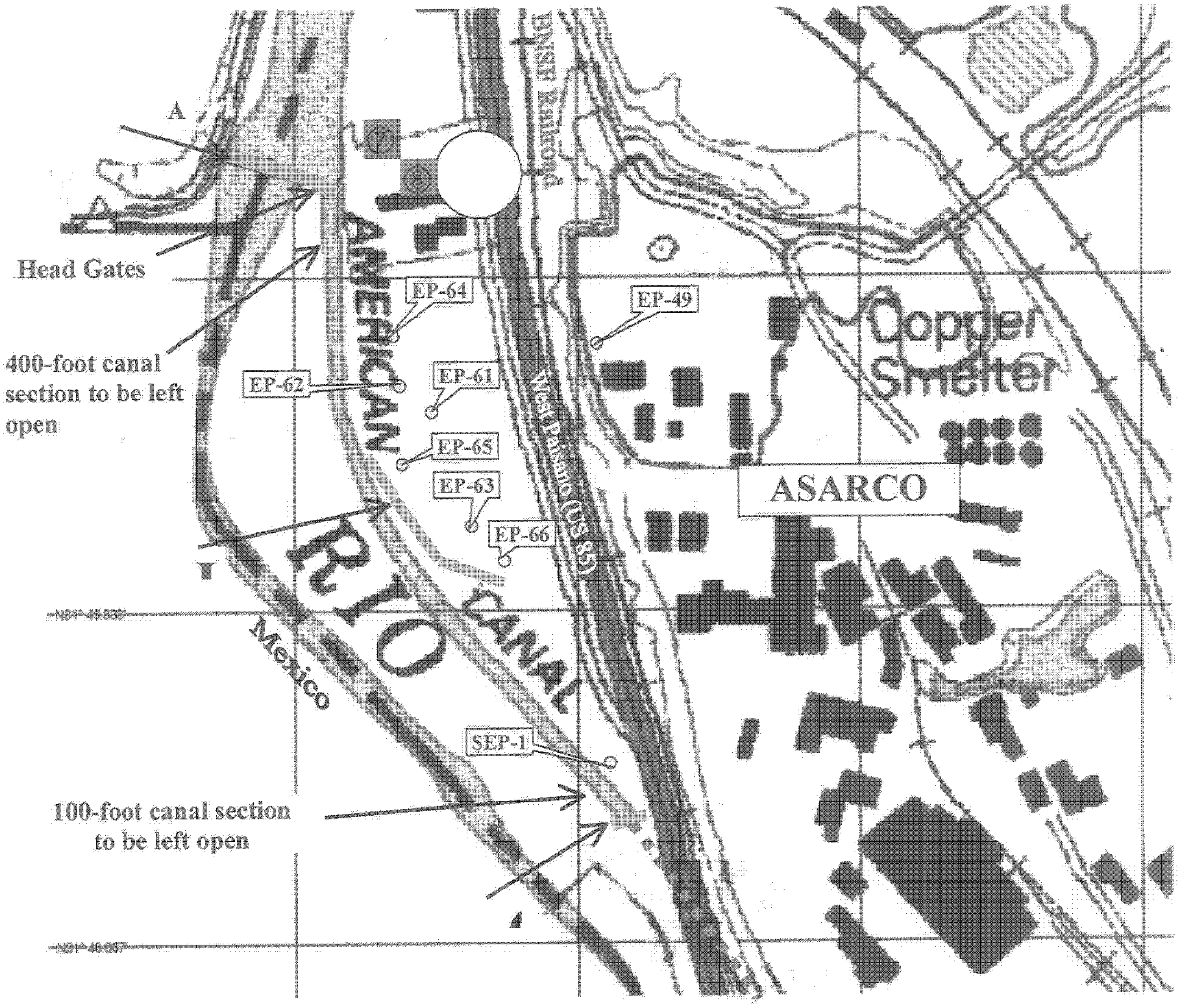
Mr.	Johnson	Mr. Lairy Johnson	Environmental Manager	ASARCO	P.O. Box 1111	El Paso	TX	79999
Mr.	Lara	Mr. Harry Lara	Field Engineer	Burlington Northern Santa Fe Railway	1624 1st Street NW	Albuquerque	NM	87102
Mr.	Roy	Mr. Cordell Roy	Superintendent	Chamizal National Memorial	800 South San Marcial	El Paso	TX	79905
Mr.	Jimarez	Mr. Armando Jimarez	City Architect	City of El Paso	2 Civic Center Plaza, 4th Floor	El Paso	TX	79999
Ms.	Adauto	Ms. Pat Adauto	Director of City Planning Department	City of El Paso	2 Civic Center Plaza	El Paso	TX	79999
Mr.	Drusina	Mr. Edward Drusina	Director of Public Works Department	City of El Paso	2 Civic Center Plaza	El Paso	TX	79999
Mayor	Caballero	The Honorable Raymond Caballero	Mayor of El Paso	City of El Paso	2 Civic Center Plaza	El Paso	TX	79999
Representative	Rodriguez	The Honorable Rose Rodriguez	West Central Representative	City of El Paso	2 Civic Center Plaza	El Paso	TX	79999
Representative	Summerall	The Honorable Jan Summerall	West Side Representative	City of El Paso	2 Civic Center Plaza	El Paso	TX	79999
Dr.	Magaña	Dr. Jorge C. Magaña, M.D.	Director	City-County Health Unit	222 S. Campbell	El Paso	TX	79901
Commissioner	Haggerty	The Honorable Daniel Haggerty	County Commissioner, 4th Precinct	County of El Paso	500 E. San Antonio	El Paso	TX	79901
Judge	Briones	The Honorable Dolores Briones	County Judge	County of El Paso	500 E. San Antonio	El Paso	TX	79901
Mr.	Brotherton	Mr. Mark Brotherton		El Paso Historical Society	5305 Turrentine	El Paso	TX	79925
Mr.	Fifer	Mr. Edd Fifer	General Manager	El Paso County Water Improvement District #1	294 Candelaria	El Paso	TX	79907
Mr.	Parraz	Mr. Pete Parraz	President	El Paso Hispanic Chamber of Commerce	2829 Montana, Suite 2-F	El Paso	TX	79903
Ms.	Valle	Ms. Barbara Valle	Head Librarian	El Paso Public Library	501 North Oregon Street	El Paso	TX	79901
Ms.	Fowler	Ms. Jane Fowler	Sanctuary Chair	El Paso Trans-Pecos Audubon Society	601 W. Yandell, F25	El Paso	TX	79902
Ms.	Padilla	Ms. Anai Padilla	Water Conservation Manager	El Paso Water Utilities, PSB	1154 Hawkins	El Paso	TX	79925
Mr.	Cooke	Mr. Gregg Cooke	Regional Administrator, 6RA	U.S. Environmental Protection Agency, Region VI	1445 Ross Ave., Suite 1200	Dallas	TX	75202
Mr.	Pena	Mr. Hector Pena	Technical Professional	EPA-Enforcement Division	1445 Ross Ave., Ste. 1200	Dallas	TX	75202
Mr.	Janskey	Mr. Michael Janskey	Technical Professional	EPA-Enforcement Division	1445 Ross Ave., Ste. 1200	Dallas	TX	75202
Mr.	Rubio	Mr. Joe Rubio	Lead Organizer	EPISO	7134 Alameda Ave	El Paso	TX	79915
Ms	Francis	Ms. Denise Francis	State Single Point of Contact	Govenor's Budget Planning Office	P.O. Box 12428, Capitol Station	Austin	TX	78711
Mr.	Jurey	Mr. Wes Jurey	President	Greater El Paso Chamber of Commerce	10 Civic Center Plaza	El Paso	TX	79901
Mr.	Perez	Mr. Robert Perez	Texas Director	LULAC, District No. 4	4110 Alameda Ave	El Paso	TX	79905
Ms	Glazebrook	Ms. Catriona Glazebrook	Executive Director	National Audubon Society	2525 Wallingwood, Suite 1505	Austin	TX	78746
Mr.	Diaz	Mr. Hector F. Diaz	Acting Executive Director	Rio Grande Council of Governments	1100 N. Stanton, Ste. 610	El Paso	TX	79902
Ms.	Chavez	Ms. Marybele Chavez	District Engineer	Texas Department of Highways & Public Trans.	212 N. Clark, P.O. Box 10278	El Paso	TX	79905
Mr.	Mestas	Mr. Oscar Mestas	District Manager	Texas Forest Service, El Paso Office	401 E. Franklin Ave, Ste. 540	El Paso	TX	79901
Mr.	Oaks	Mr. F. Lawrence Oaks	Deputy State Historical Preservation	Texas Historical Commission	P.O. Box 12276	Austin	TX	78711
Representative	Najera	The Honorable Manny Najera	Representative - District #75	Texas House of Representatives	1716 Mike Hill	El Paso	TX	79936
Representative	Chavez	The Honorable Norma Chavez	Representative - District #76	Texas House of Representatives	6070 Gateway East #508	El Paso	TX	79905
Representative	Moreno	The Honorable Paul C. Moreno	Representative - District #77	Texas House of Representatives	2314 Montana Ave	El Paso	TX	79903
Representative	Haggerty	The Honorable Pat Haggerty	Representative - District #78	Texas House of Representatives	4849 N. Mesa St. #205	El Paso	TX	79912
Representative	Pickett	The Honorable Joe Pickett	Representative - District #79	Texas House of Representatives	1790 Lee Travino #307	El Paso	TX	79936
Mr.	Clouse	Mr. Archie Clouse	Regional Director	Texas Natural Resource Conservation Commission	401 E. Franklin Ave., Suite 560	El Paso	TX	79901
Mr.	Sansom	Mr. Andrew Sansom	Executive Director	Texas Parks & Wildlife Dept.	4200 Smith School Road	Austin	TX	78744
Mr.	Riskind	Mr. David Riskind	Technical Professional	Texas Parks & Wildlife Dept.	4200 Smith School Road	Austin	TX	78744
Senator	Nelson	The Honorable Jane Nelson	Texas State Senator, District #9	Texas Senate	P.O. Box 12068	Austin	TX	78711
Senator	Shapleigh	The Honorable Eliot Shapleigh	Texas Senator - District #29	Texas Senate	800 Wyoming, Suite A	El Paso	TX	79902
Dr.	Philips	Dr. Patricia Philips	Head Librarian	The University of Texas at El Paso, Library	UTEP Library	El Paso	TX	79968
Governor	Muñoz	Mr. Vince Muñoz	Tribal Governor	Tigua Tribal Council	P.O. Box 17579	El Paso	TX	79917
LTC	Midkiff	LTC Raymond G. Midkiff	District Engineer	U.S. Army Corps of Engineers	4101 Jefferson Plaza NE	Albuquerque	NM	87109
Mr.	Malanchuk	Mr. Dan Malanchuk	Biologist, El Paso Office	U.S. Army Corps of Engineers - Albuquerque District	P.O. Box 6096	Fort Bliss	TX	79906
Mr.	Cortez	Mr. Bert Cortez	Projects Manager	U.S. Bureau of Reclamation, Rio Grande Project	700 E. San Antonio St., Rm. 8318	El Paso	TX	79901
Mr.	Dhilon	Mr. Gurdit Dhilon	Acting District Director	U.S. Customs Service	9400 Viscount, Suite 104	El Paso	TX	79925
Mr.	Olivas	Mr. Bernie Olivas	Inspector	U.S. Department of Agriculture	3600 East Paisano, Rm. 154A	El Paso	TX	79905
Ms	Parker	Ms. Beth Parker	Project Manager	Daniel B. Stephens & Associates, Inc.	6020 Academy Rd NE	Albuquerque	NM	87109
Ms	Fowler-Propst	Ms. Jennifer Fowler-Propst	Field Supervisor, Ecological Svc	U.S. Fish & Wildlife Service	500 Gold Ave SW Rm 8100	Albuquerque	NM	87102
Ms.	Kaufman	Ms. Nancy Kaufman	Regional Director	U.S. Fish & Wildlife Service	Region 2, P.O. Box 1306	Albuquerque	NM	87103
Mr.	Frederick	Mr. David C. Frederick	Supervisor, Office of Ecological Svc	U.S. Fish & Wildlife Service	10711 Burnet Road, Suite 200	Austin	TX	78758
Mr.	Johnson	Mr. Robert K. Johnson	Administrator	U.S. General Services Administration - El Paso Office	700 E. San Antonio, Rm. C-415	El Paso	TX	79901
Mr.	Martinez	Mr. Ernesto Martinez	Assistant Chief	U.S. Immigration & Naturalization Service	8901 Montana Ave.	El Paso	TX	79925
Congressman	Reyes	The Honorable Silvestre Reyes	Congressman - District #16	United States House of Representatives	310 N. Mesa St., #400	El Paso	TX	79901
Senator	Hutchinson	The Honorable Kay Hutchinson	Senator	United States Senate	284 Russell Senate Office Bldg.	Washington	D.C.	20510
Senator	Gramm	The Honorable Phil Gramm	Senator	United States Senate	284 Russell Senate Office Bldg.	Washington	D.C.	20510
Ms	Metcalf	Ms. Bess Metcalf		Rio Grande/Rio Bravo Basin Coalition	109 North Oregon, Suite 617	El Paso	TX	79901
Ms	Walsh	Ms. Elizabeth Walsh		Sierra Club, El Paso Regional Group	829 Cloudburst Drive	El Paso	TX	79912
Mr.	Harris	Mr. Steve Harris	Executive Director	Rio Grande Restoration	P.O. Box 1612	El Prado	NM	87529
	Smith	Ms. Judy Smith	Monograph Acquisitions Svcs	MONO.ACQ.SVCS	Colorado State Libraries	Ft. Collins	CO	80523

APPENDIX C

(Introduction Section 1.0)

C.1 - FIGURE 1: UPPER OPEN CHANNEL

Figure 1: Upper Open Channel Segment of the American Canal, El Paso, Texas



3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Datum: WGS84
250 feet Source Data: 1994 USGS Smeltertown, TX-NM 31106-G5-TF-024

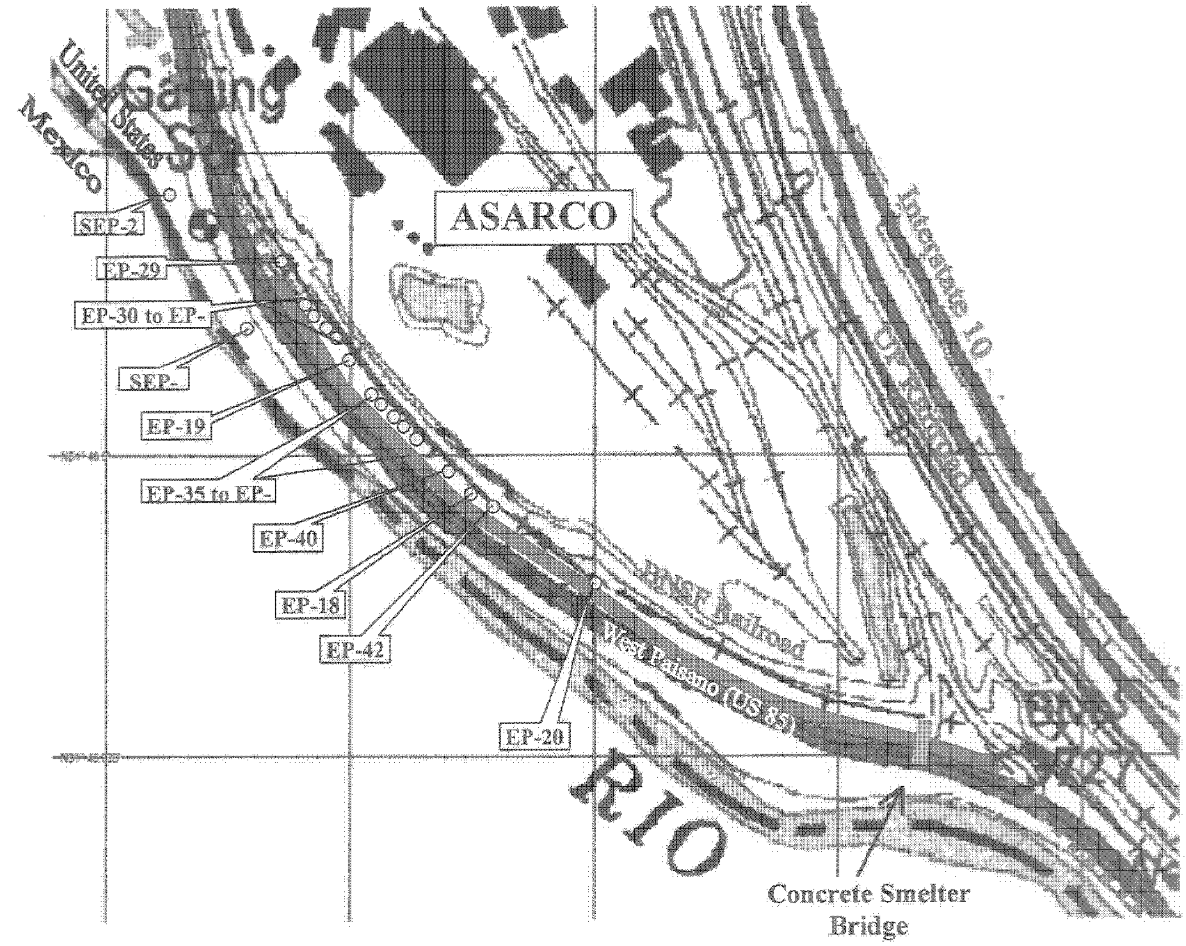
▬	**Open Channel**
▪▪▪▪▪▪▪	**Conduit**
▨	**Building**
○	**Monitor or Surface Well**

N

③	USIBWC Field Office
⑦	Closed UST at American Dam

C.2 - FIGURE 2: MIDDLE OPEN CHANNEL

Figure 2: Middle Open Channel Segment of The American Canal, El Paso, Texas



3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Datum: WGS84
Source Data: 1994 USGS Smeltertown, TX-NM 31106-G5-TF-024

250 feet
Scale 1:6,400

Open Channel

Conduit

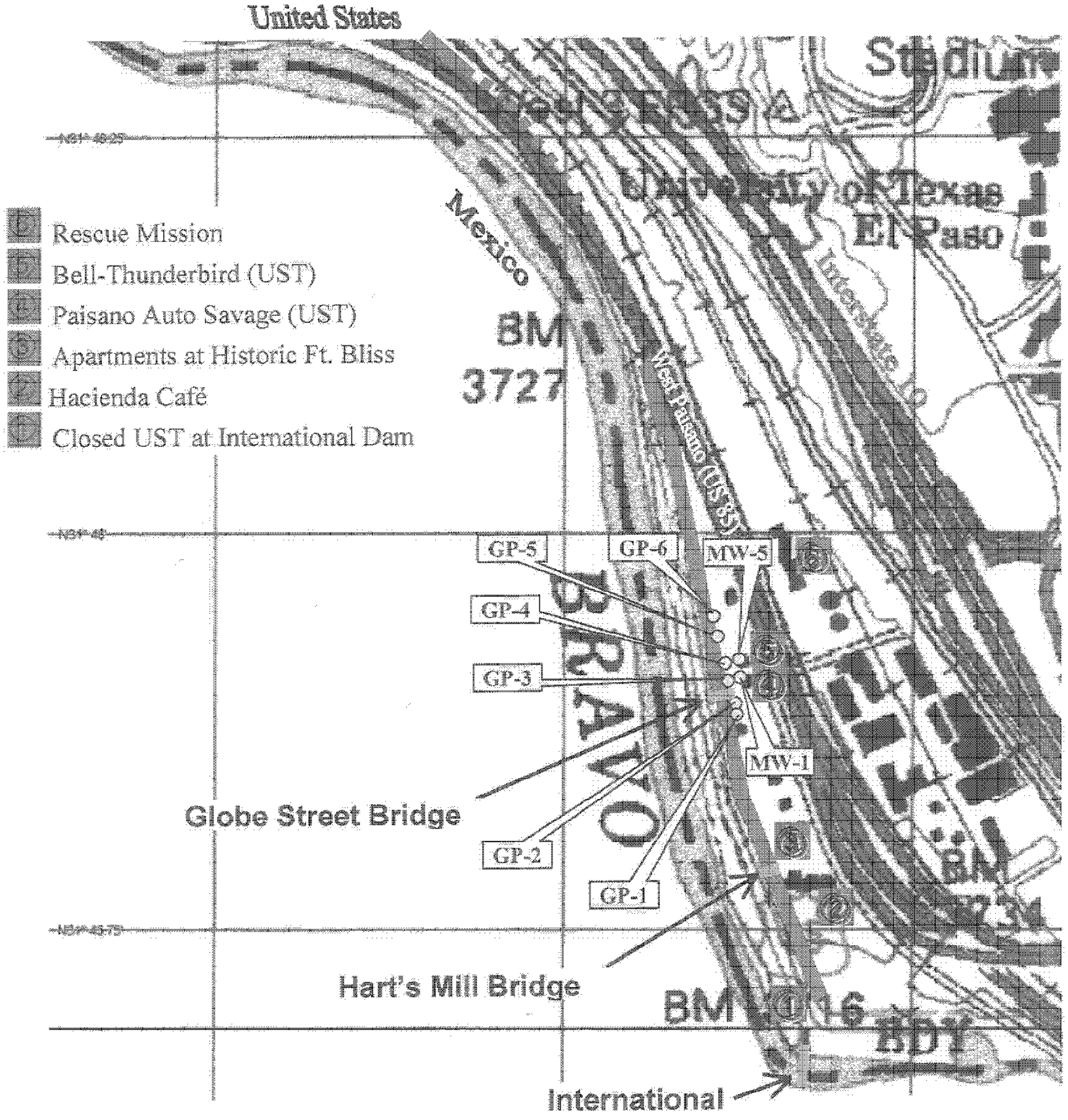
Building

○ **Monitor or Surface Well**

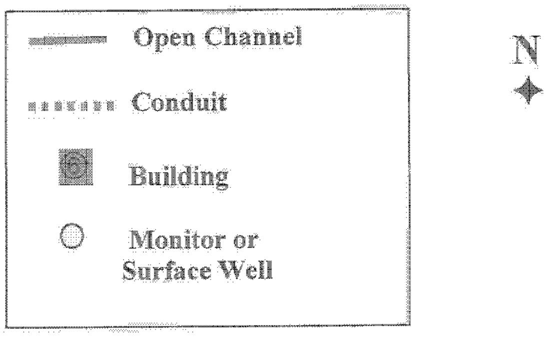
N

C.3 - FIGURE 3: LOWER OPEN CHANNEL

Figure 3: Lower Open Channel Segment of The American Canal, El Paso, Texas

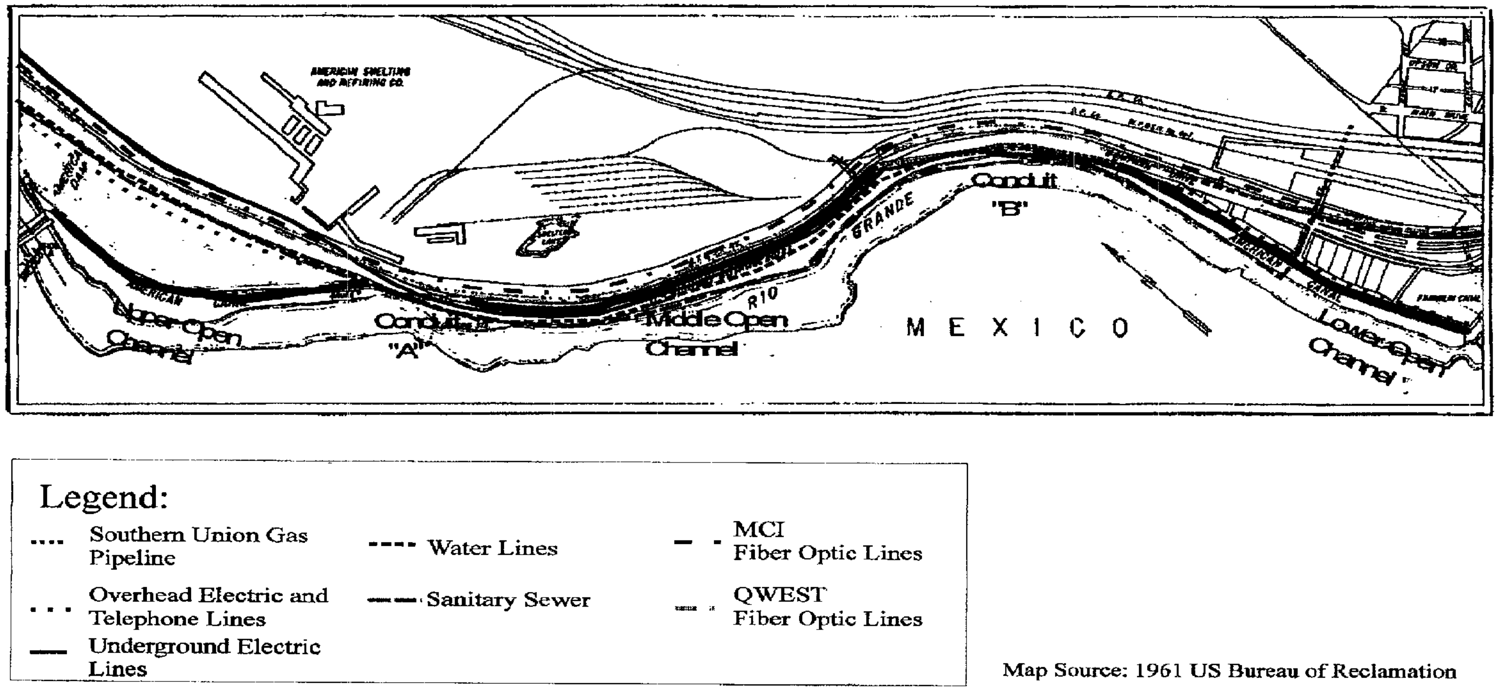


3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Datum: WGS84
250 feet Source Data: 1994 USGS Smeltertown TX-NM 31106-G5-TF-024



C.4 - FIGURE 4: MAP OF UTILITIES

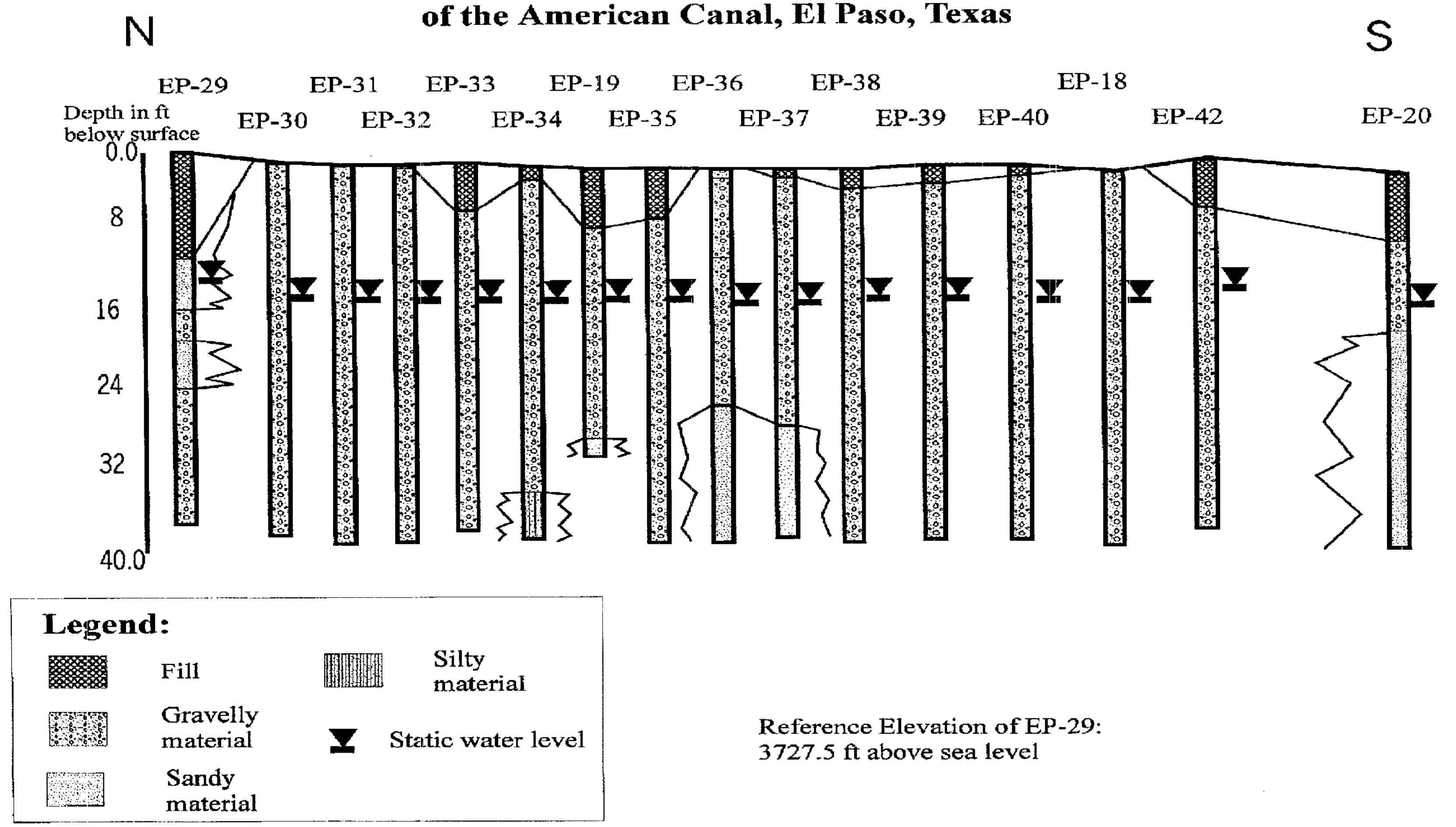
Figure 4: Map of Utilities Located Within American Canal Area, October 1999



Map Source: 1961 US Bureau of Reclamation

C.5 - FIGURE 5: SOIL CROSS SECTION

Figure 5: Simplified North-South Soil Cross Section of Selected ASARCO Soil Borings Converted to Monitoring Wells in the Middle Open Channel Segment of the American Canal, El Paso, Texas



Reference Elevation of EP-29:
3727.5 ft above sea level

C.6 - RIO GRANDE AMERICAN CANAL EXTENSION ACT OF 1990 DOCUMENT

Appendix A.

Rio Grande American Canal Extension Act of 1990 (Enrolled Bill (Sent to President))
--H.R.4758--
H.R.4758

One Hundred First Congress of the United States of America
AT THE SECOND SESSION

Begun and held at the City of Washington on Tuesday, the twenty-third day of January, one thousand nine hundred and ninety

An Act

To provide for the construction, operation, and maintenance of an extension of the American Canal at El Paso, Texas.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the 'Rio Grande American Canal Extension Act of 1990'.

SEC. 2. FINDINGS.

The Congress finds the following:

(1) The Riverside Dam on the international reach of the Rio Grande River at El Paso, Texas, provides the water used to irrigate nearly 32,000 acres of farmland in the United States.

(2) In June 1987, the Riverside Dam failed, and the temporary replacement structure now in place on the river cannot be relied upon to guarantee the continued provision of these waters to the United States.

(3) Building a permanent structure in an international reach of the Rio Grande would require the conditional approval of the Government of Mexico through an action of the International Boundary and Water Commission, United States and Mexico, and Mexico could use such structure to divert waters to its own land.

(4) The United States constructed the American Dam completely in United States territory to ensure that waters from the American Canal would be completely retained within the United States up to a point below Mexico's diversion at the International Dam.

(5) Potentially disruptive international issues might arise from the commingling of the waters of the United States and the waters of Mexico in this reach of the Rio Grande, while such issues would not arise if a canal extension were constructed and operated wholly on the American side of the river.

(6) The construction and operation of an extension of the American Canal which would lie wholly in the United States would provide for a more equitable distribution of waters between the United States and Mexico, reduce water losses, and eliminate many hazards to public safety.

SEC. 3. CONSTRUCTION OF CANAL EXTENSION, OPERATION, MAINTENANCE, AND USE.

(a) CONSTRUCTION OF EXTENSION- Subject to subsection (e), the Secretary shall construct an extension of the American Canal, together with pumping plants, wasteways, measuring devices, and other facilities needed to connect such extension with existing irrigation systems. Such extension shall lie wholly in the United States and shall be approximately 13 miles in length, beginning at the downstream end of the current American Canal in El Paso, Texas, and extending to Riverside Heading.

(b) OPERATION OF CANAL-

(1) IN GENERAL- Except as provided in paragraph (2), the Secretary shall operate the extension of the American Canal provided for in subsection (a).

(2) DELIVERY OF WATERS- The Secretary shall enter into an agreement with El Paso County Water Improvement District Number 1 pursuant to which the Water Improvement District would be responsible for the operation of the American Canal with respect to the delivery of all waters, with the exception of those waters belonging to Mexico which, consistent with paragraph (3), the Secretary shall be responsible for delivering.

(3) UNITED STATES OBLIGATIONS UNDER 1906 AND 1933 CONVENTIONS- In authorizing the agreement described in paragraph (2), this Act--

(A) does not in any way affect the jurisdiction, powers, or prerogatives of the International Boundary and Water Commission, United States and Mexico, and

(B) does not in any way impede the ability of the United States Government to fulfill its obligations under the 1906 and 1933 Conventions.

(c) USE OF CANAL AS CONVEYANCE CHANNEL-

(1) USE BY MEXICO- The Secretary may enter into an agreement with Mexico which permits Mexico to usethe American Canal as a conveyance channel. Any such agreement shall require Mexico to make payments to the United States for Mexico's use of the American Canal.

(2) USE BY NON-FEDERAL ENTITIES- Upon obtaining the express approval of the Secretary, El Paso County Water Improvement District Number 1 may enter into agreements with other non-Federal entities pursuant to which such entities may use the American Canal as a conveyance channel.

(d) MAINTENANCE OF EXTENSION- The Secretary shall maintain the extension of the American Canal provided for in subsection (a).

(e) LOCAL CONTRIBUTIONS TO COSTS- The extension of the American Canal provided for in subsection (a) may not be constructed unless the Secretary and El Paso County Water Improvement District Number 1 have entered into the following agreements:

(1) CONSTRUCTION COSTS- An agreement pursuant to which El Paso County Water Improvement District Number 1 will pay $5,000,000 as its share of the construction costs for the construction of the extension of the American Canal provided for in subsection (a).

(2) MAINTENANCE COSTS- An agreement pursuant to which El Paso County Water Improvement District Number 1 will contribute a cumulative amount of $50,000 each year to the United States Commissioner as its share of the costs for maintenance of the extention of the American Canal provided for in subsection (a). After the 7-year anniversary of the completion of the construction of that extension (and after the end of each 7-year interval since the last such renegotiation), the Secretary and the El Paso County Water Improvement District Number 1 may renegotiate the amount of the contribution of El Paso County Water Improvement District Number 1 pursuant to the agreement required by this paragraph in order to reflect any increase in Bureau of Labor Statistics Consumer Price Index-Urban Wage Earners and Clerical Workers (CPI-W)-1982-84-100 Index. In the event the funds contributed by the El Paso County Water Improvement District Number 1 pursuant to this paragraph are not utilized during any given year, the funds shall be carried over to the succeeding years in a contingency fund for necessary preventative and routine maintenance work to be performed by the United States Section, International Boundary and Water Commission.

(f) REPEAL OF PREVIOUS CONSTRUCTION AUTHORIZATION- Title IV of the Act entitled `An Act to authorize various Federal reclamation projects and programs, and for other purposes', approved September 28, 1976 (Public Law 94-423; 90 Stat. 1327), is repealed.

SEC. 4. STUDY OF SUBSIDENCE DAMAGE.

The Secretary--

(1) shall conduct a study to determine the likelihood and extent of any damage to property adjacent to the American Canal which would be caused by subsidence related to the Canal extension provided for in section 3(a), and

(2) shall submit a report to the Congress detailing his findings not later than 1 year after the date of the enactment of this Act.

SEC. 5. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated--

(1) $42,000,000 to construct the extension of the American Canal provided for in section 3(a); and

(2) such sums as may be necessary to operate and maintain that extension and to conduct the study required by section 4.

SEC. 6. DEFINITIONS.

As used in this Act--

(1) the term `American Canal' means the Rio Grande American Canal constructed pursuant to the Act of August 29, 1935 (49 Stat. 961);

(2) the term 'United States Commissioner' means the United States Commissioner, International Boundary and Water Commission, United States and Mexico; and

(3) the term 'Secretary' means the Secretary of State, acting through the United States Commissioner.

Speaker of the House of Representatives.

Vice President of the United States and President of the Senate.

APPENDIX D

(Purpose and Needs Section 2.0)

- **USIBWC Purpose and Need Statement for the Environmental Assessment**

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

SEP 3 - 1999

John Knopp, Project Manager
ENCON International, Inc.
7307 Remcon, Suite 101
El Paso, TX 79912

Dear Mr. Knopp:

Development of a purpose and need statement for the Environmental Assessment (EA) for the rehabilitation of the existing American Canal Project, El Paso, Texas (Canal) was discussed during a telephone conversation between you and Mr. Douglas Echlin of the United States Section, International Boundary and Water Commission (USIBWC) on August 17, 1999. The following statement is provided for the EA which is being prepared by ENCON International, Inc.

> "The proposed Canal rehabilitation is authorized under the Rio Grande American Canal Extension Act of 1990. The existing Canal discharges into the Rio Grande American Canal Extension Project (RGACE). Rehabilitation is needed to increase Canal security, stabilize the Canal and increase the Canal capacity to obtain the full benefits of the RGACE. The Canal has limited right-of-way within the reach located along the east side of Highway 85. The Canal vicinity map is shown in Figure 1 and features of it are shown on Figure 2. At several locations, the reinforced concrete panels of the Canal have deteriorated and are in distress. Rehabilitation of the Canal is necessary to increase its conveyance capacity to equal that of the RGACE canal, improve the structural integrity of the existing, deteriorated concrete lining, and to increase its structural stability to allow for the continued operation of the Canal over the expected life of the newer RGACE canal. Further, structural stability may be increased by installation of: 1) a thicker concrete lining; 2) improved panel joints which contain smooth dowels to permit longitudinal expansion and contraction while limiting transverse movement, and flexible joint filler material between the concrete panels; and/or 3) replacement of the existing Canal lining with precast concrete box culverts and/or reinforced concrete lining. Installation of high fences, posted signs, safety ladders, and safety cables set at intervals along the Canal will minimize physical access to the canal and reduce the chance for human injury."

The Commons, Building C, Suite 310 • 4171 N. Mesa Street • El Paso, Texas 79902
(915) 832-4100 • (FAX) (915) 832-4190

If you have questions, please call me at (915) 832-4740, or have your staff call Steve Fox at 832-4736.

Sincerely,

Sylvia A. Waggoner

Sylvia A. Waggoner
Division Engineer
Environmental Management Division

Attachments:
Figure 1. Canal Vicinity Map
Figure 2. Strip Map of American Canal Showing Open Channels and Conduits

Cc: Human Systems Research, Inc.,

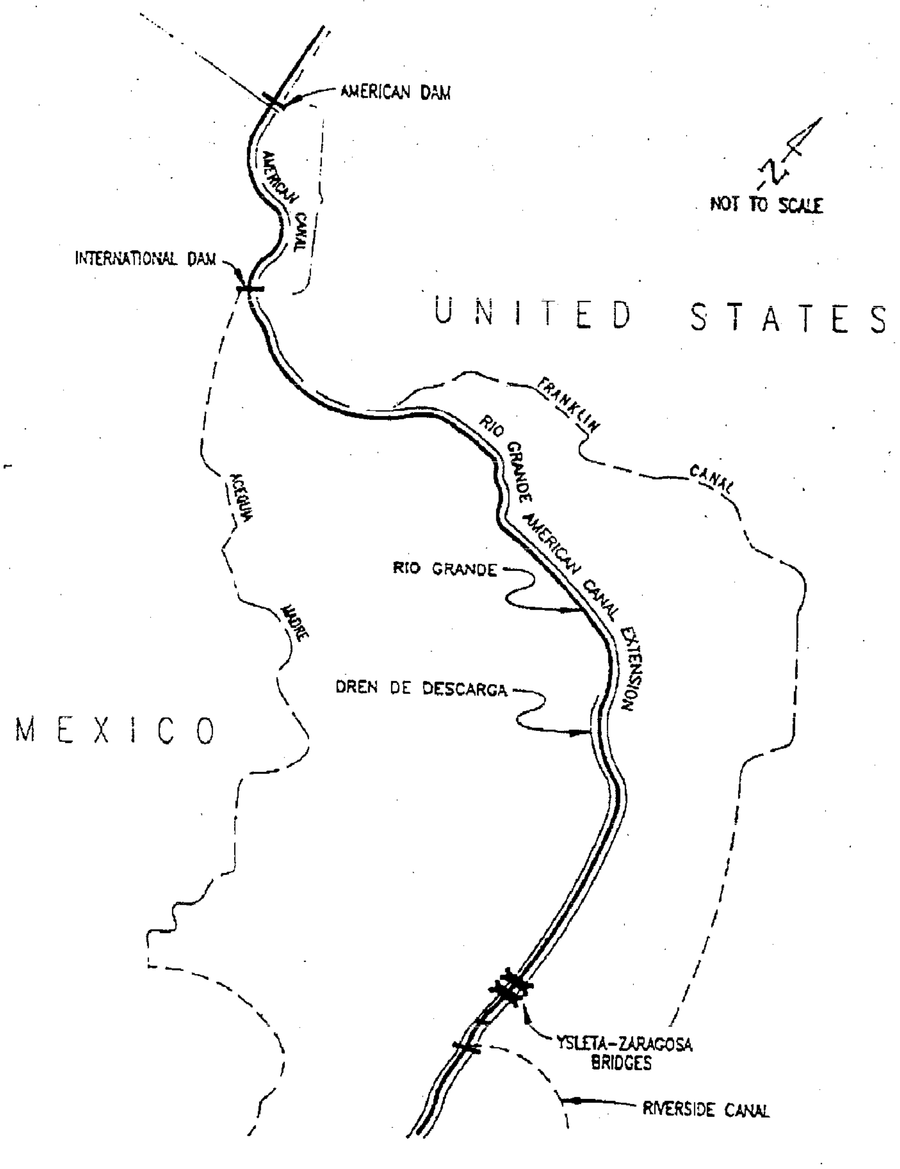


Figure 1. Canal Vicinity Map

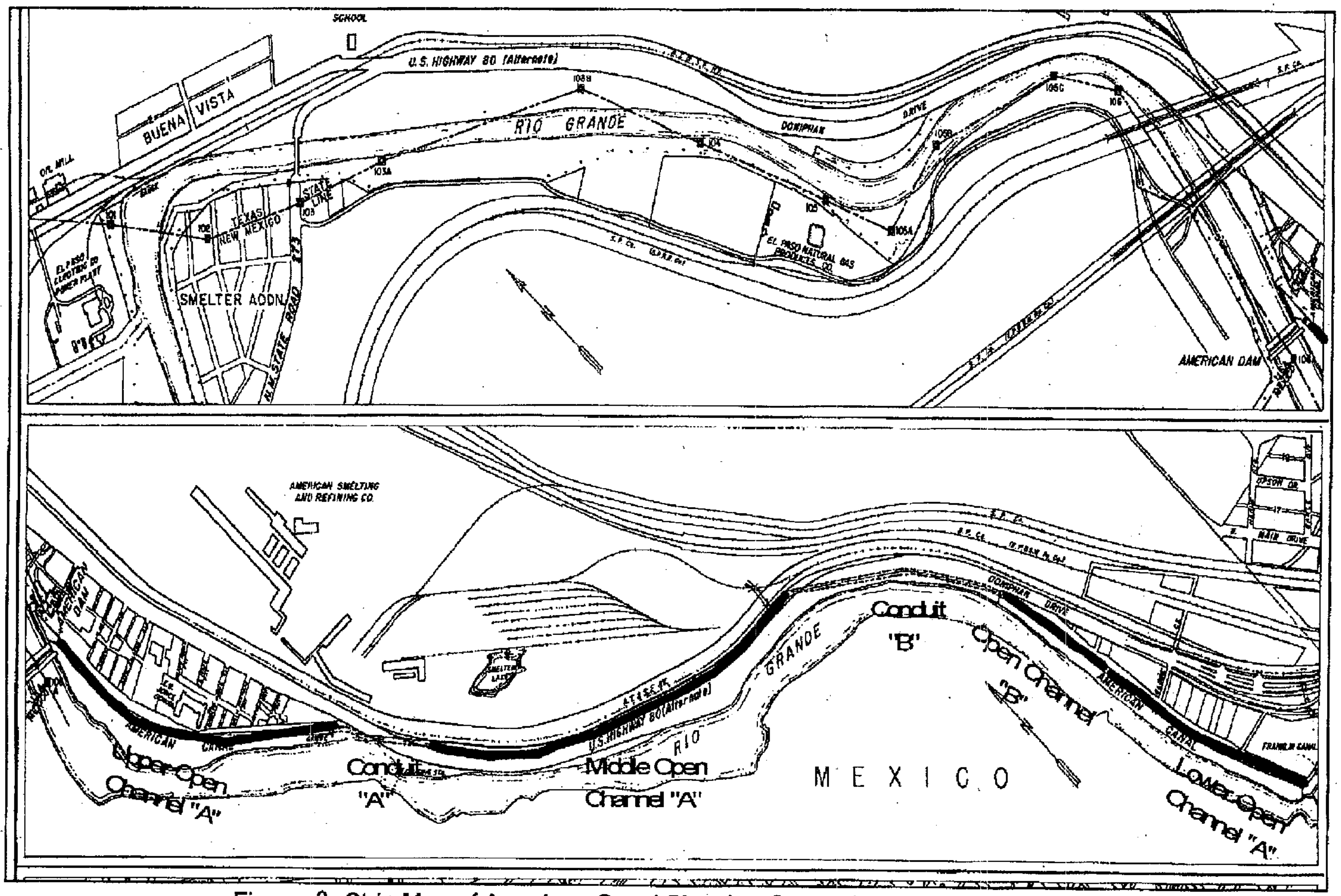


Figure 2. Strip Map of American Canal Showing Open Channels and Conduits
(From U.S. Bureau of Reclamation, Irrigable Area and Property Maps, Sheet 1, 1961).

APPENDIX E

(Alternative Section 3.0)

E.1 - REPRESENTATIVE CROSS-SECTIONS OF EXISTING OPEN CHANNEL PORTIONS OF THE AMERICAN CANAL

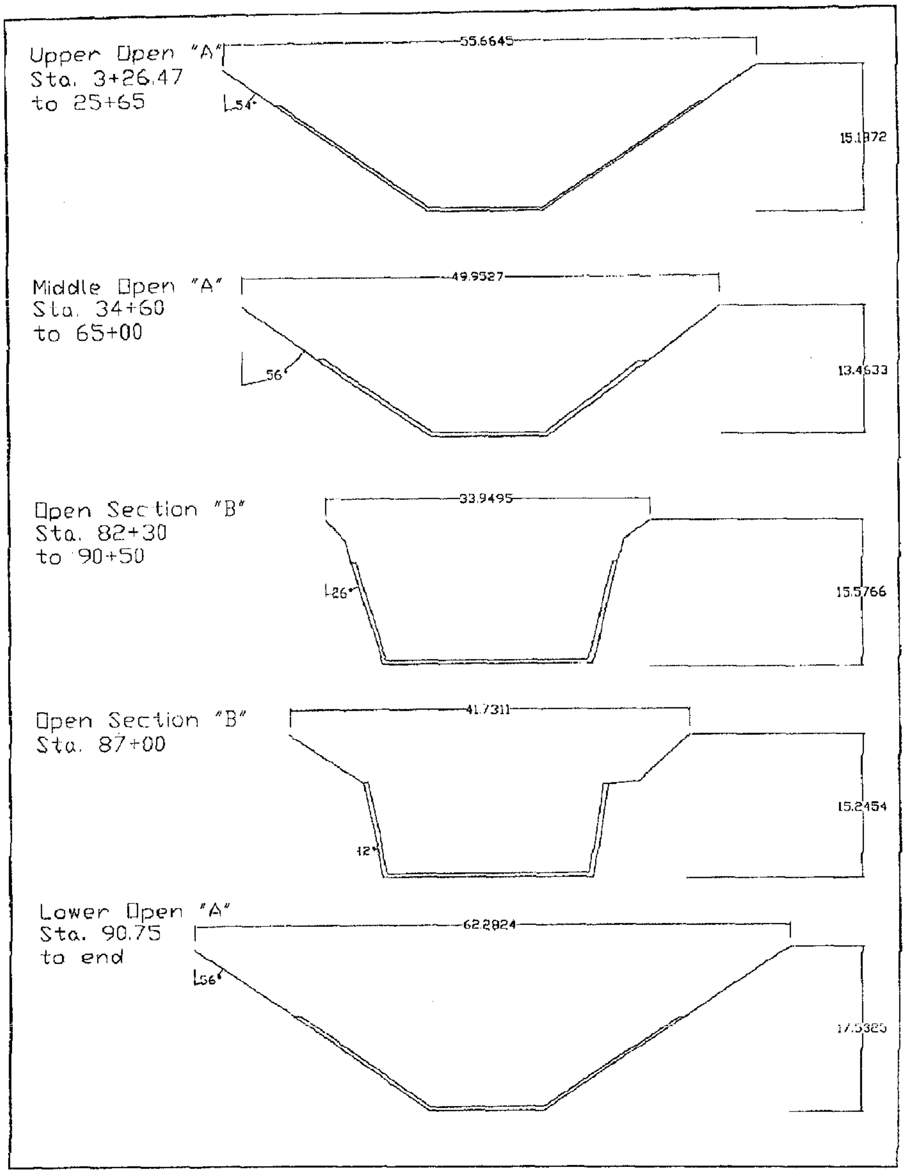


Figure 5. Representative Cross-sections of Open Channel Portions of the American Canal (Redrawn from original engineering drawings on file at IBWC).

E.2 - REPRESENTATIVE CROSS-SECTIONS OF EXISTING CLOSED CONDUIT PORTIONS OF THE AMERICAN CANAL

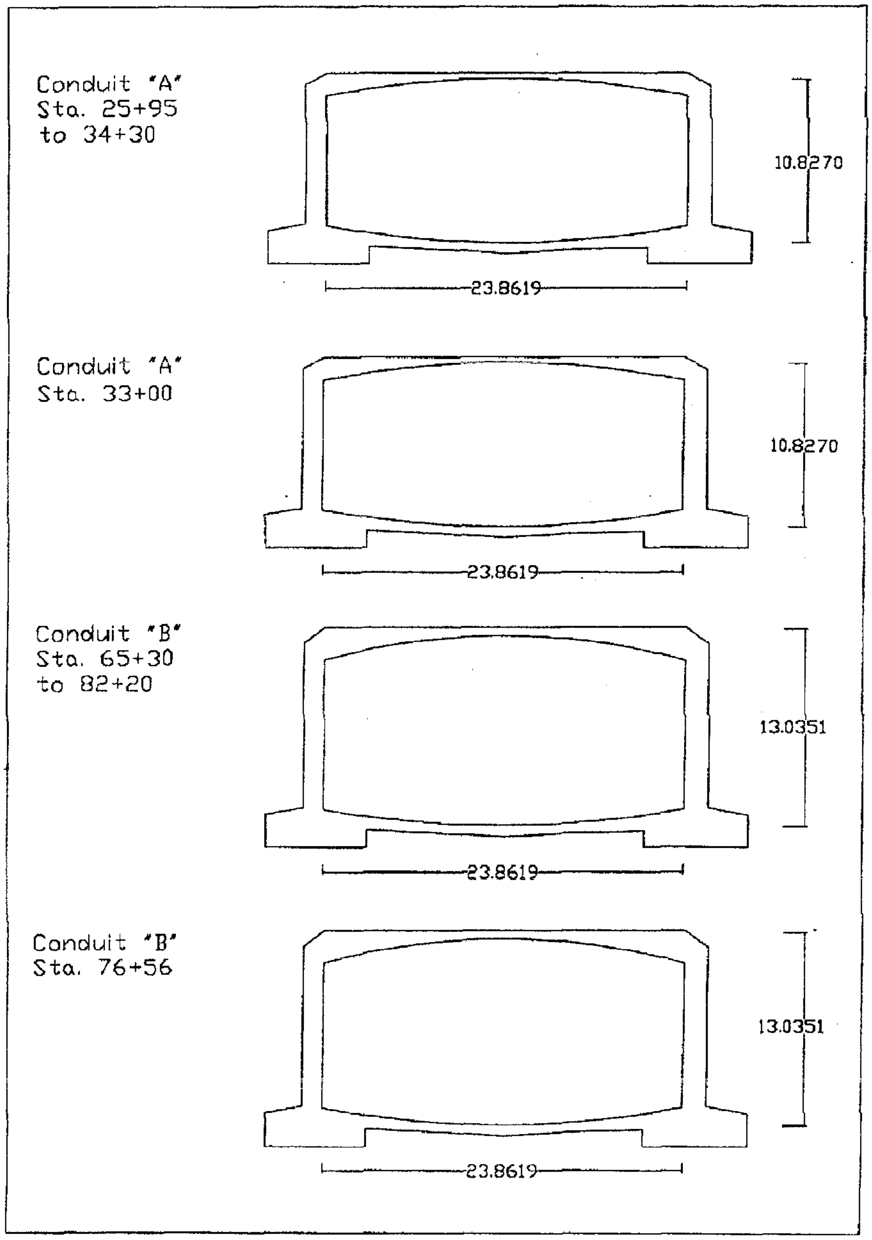
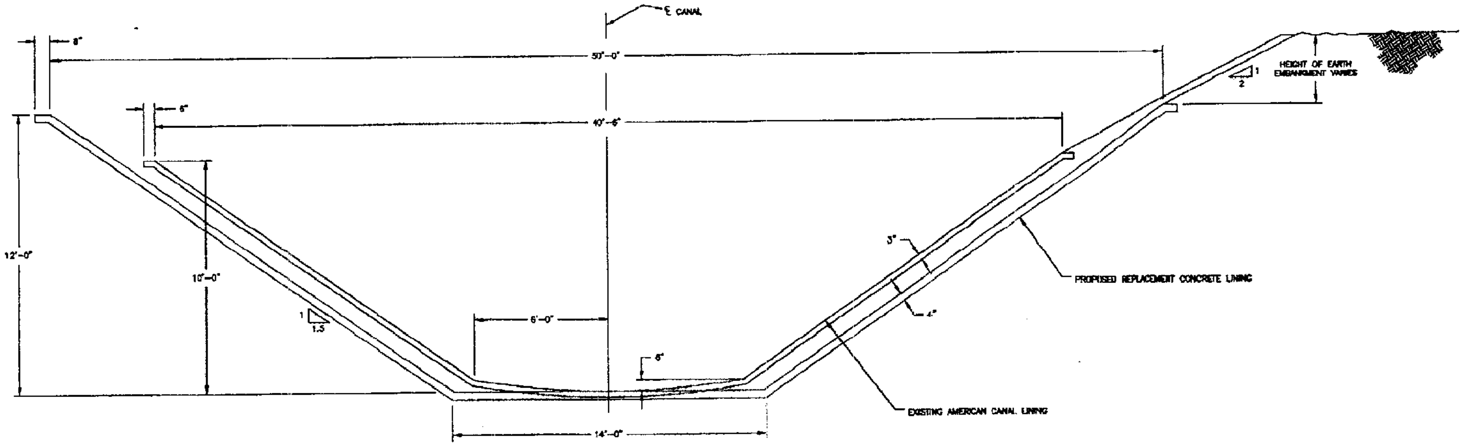
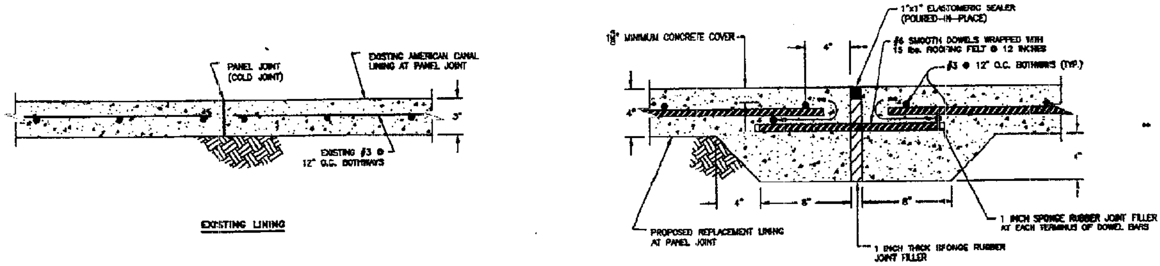


Figure 6. Representative Cross-sections of Closed Conduit Portions of the American Canal (Redrawn from original engineering drawings on file at IBWC).

E.3 - REPRESENTATIVE CROSS-SECTION OF PROPOSED 1535 cfm OPEN CHANNEL SECTION



CROSS SECTION VIEW
(INVERT OF EXISTING AND PROPOSED LINING TO BE IDENTICAL)



EXISTING LINING

PROPOSED REPLACEMENT LINING

** EXTRA #3 REINFORCING BARS PLACED TO STABILIZE #6 SMOOTH DOWELS DURING CONCRETE PLACEMENT.

CROSS SECTION OF TYPICAL PANEL JOINT
CROSS SECTION LOCATED ALONG CANAL CENTERLINE

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

RIO GRANDE AMERICAN CANAL EXTENSION PROJECT

REACH F
TYPICAL DETAILS OF
OPEN CANAL ALTERNATIVE

1 OF 1 | EL PASO, TEXAS | FEBRUARY 2000 | 25171

APPENDIX F

(Air Quality)

F.1 – AIR QUALITY TEXT

AIR QUALITY

1.0 Federal, State, and Local Standards

Local air quality is monitored by federal, state, city-county, and Mexican entities, but is not subject to Mexican legislation. The State of Texas has adopted the NAAQS or National Ambient Air Quality Standards (40 CFR Part 50), including subsequent changes to the Standards.

Under the Clean Air Act, in 1976, the EPA established an Air Quality Index called the "Pollutant Standards Index" for use by local and state communities. The Index provides information on pollutant concentrations for nitrogen dioxide, sulfur dioxide, carbon monoxide, ground-level ozone, and particulate matter. The Air Quality Index is "normalized" for each pollutant, so that an index of 500 indicates significant harmful levels from that pollutant.

The presently used EPA Air Quality Index was revised in 1997. The new Index replaced the previous 1-hour ozone standard with a new 8-hour standard, and supplemented the particulate matter standard with 24-hour and annual standards for fine particulate matter.

REVISED AIR QUALITY INDEX

Index Values	Descriptor	Color
0-50	Good	Green
51-100	Moderate	Yellow
101-150	Unhealthy for Sensitive Groups	Orange
151-200	Unhealthy	Red
201-300	Very Unhealthy	Purple
301-500	Hazardous	Maroon

2.0 El Paso – Juarez – Las Cruces Air Quality Control Region

El Paso is located in an area designated as a "non-attainment area" by the EPA. The standards found in the 1997 EPA Air Quality Index set maximum air quality contaminant concentrations for ozone, carbon monoxide, and particulates. The non-attainment designation indicates that at least once per year, the area exceeded the maximum air concentration of ozone, carbon monoxide, or particulates.

It should be noted that because of significantly improved air quality in El Paso since 1992, TNRCC has requested that EPA drop El Paso's restrictive non-attainment designation, and redesignate El Paso as a less-restrictive air quality "maintenance" area. If this change occurs before beginning of canal construction activities, the recommended Best Management Practices or BMPs would still be recommended, but air quality-related construction delays would be very unlikely.

EPA NON-ATTAINMENT AREA DESIGNATION PARAMETERS

Parameter	Maximum Allowable Concentration (MAC)	Frequency
Carbon Monoxide (CO)	9.5 ppm	Once per year
Ozone (O_3)	0.125 ppm (125 ppb) per one hour <u>or</u> 0.085 ppm (85 ppb) average per 8 hours	Once per year
Particulates (PM-10)	0.155 mg/m^3 (155 μg/m^3)	Once per year

3.0 Local Air Quality Monitoring

Throughout the El Paso region, fifteen air monitors gather data continuously. The El Paso City-County Health & Environmental District (EPCCHED) maintains three sites, TNRCC operates five sites, New Mexico Environment Department (NMED) operates four sites, and the Juarez Directorate of Ecology & Emergency Response supplies four sites monitored by EPCCHED. The various agencies monitor carbon monoxide, sulfur dioxide, particulates, wind speed, wind direction, and temperature.

WEBSITES TO OBTAIN EL PASO VICINITY AIR MONITORING DATA

Agency	Number of Area Monitoring Sites	Website Address
TNRCC	5	http://www.tnrcc.state.tx.us/air/monops
EPCCHED	3	http://airq.ci.el-paso.tx.us
Cd. Juarez Directorate of Ecology & Emergency Response	3	Maintained by EPCCHED, but data not available online
NMED	4	Forwarded to UTEP–CERM, but data not available online

4.0 Discussion of Principal Local Air Pollutants

<u>Carbon Monoxide</u>

From sunset through mid-morning during typical winter months when air inversion layers trap airborne contaminants near the land surface, carbon monoxide is a more serious concern than ozone in El Paso. No data is available for the expected low levels of construction-generated air pollution during the proposed canal reconstruction activities. No air pollution-related delays were caused during the nearby construction of the American Canal Extension (RGACE) in 1997 and 1998. No air pollution-related delays are expected during the proposed reconstruction. Most of the construction activities would occur during the daylight hours when carbon monoxide levels are typically lowest during the proposed construction months.

The following air data was taken from an EPCCEHD air monitoring site located in downtown El Paso, approximately two miles southeast of the study area and a half mile from the Rio Grande. Data from the entire year is offered as a comparison of peak winter carbon monoxide measurements and lower summer carbon monoxide measurements.

1998 WIND AND CARBON MONOXIDE MEASUREMENTS NEAR AMERICAN CANAL

Month	Average Daily Wind Speed (mph)	Maximum Hourly Wind Speed (mph)	Avg. Wind Direction (Degrees from North)	Avg. CO (ppm)	Hourly CO Maximum (ppm)
January	3.2	7.7	NW 304.2	1.45	16.79
February	4.5	20.9	NW 310.2	0.83	6.71
March	4.9	17.5	WNW 295.0	0.74	6.05
April	4.8	12.6	W 279.3	0.76	6.41
May	4.1	14.2	NW 304.6	0.85	9.09
June	4.3	11.5	WNW 286.7	0.65	4.56
July	4.8	15.8	WSW 256.7	0.34	3.04
August	4.4	18.1	NW 292.2	0.48	3.68
September	3.9	12.5	WSW 257.2	0.66	7.09
October	4.2	12.2	S 176.8	0.97	10.63
November	2.9	12.5	WSW 242.7	1.36	13.25
December	3.9	14.6	SW 221.0	1.31	16.73

Measured EPCCEHD at Tillman Health Center in Downtown El Paso, approximately 2 miles SE of study area. Hourly measurements were taken through the entire month and averaged.

Ozone

In the El Paso area, ozone is typically only a potential air quality problem in the warmest months of the year, May through October, especially from 10:00 a.m. to 3:00 p.m. If the airborne concentrations of ozone are expected to reach unhealthy levels, TNRCC notifies the National Weather Service and the Paso del Norte Clean Cities Coalition which declares an Ozone Action Day. The Clean Cities Coalition then notifies the media, schools, and businesses of the alert. A declared Ozone Action Day alert advises persons with respiratory problems to stay indoors during the peak ozone hours, and advises individuals and businesses to curtail driving, lawn-mowing, use of solvents, and other ozone-producing activities until after 6:00 p.m.

As no air monitoring data is available from the exact study area, the following air data was taken from the TNRCC air-monitoring site at UTEP, located less than a half mile from the study area. The months of October through February correspond to the non-irrigation months during which the proposed canal reconstruction would take place.

OZONE MEASUREMENTS FROM AIR SAMPLED NEAR AMERICAN CANAL DURING WINTER MONTHS, 1998 - 1999

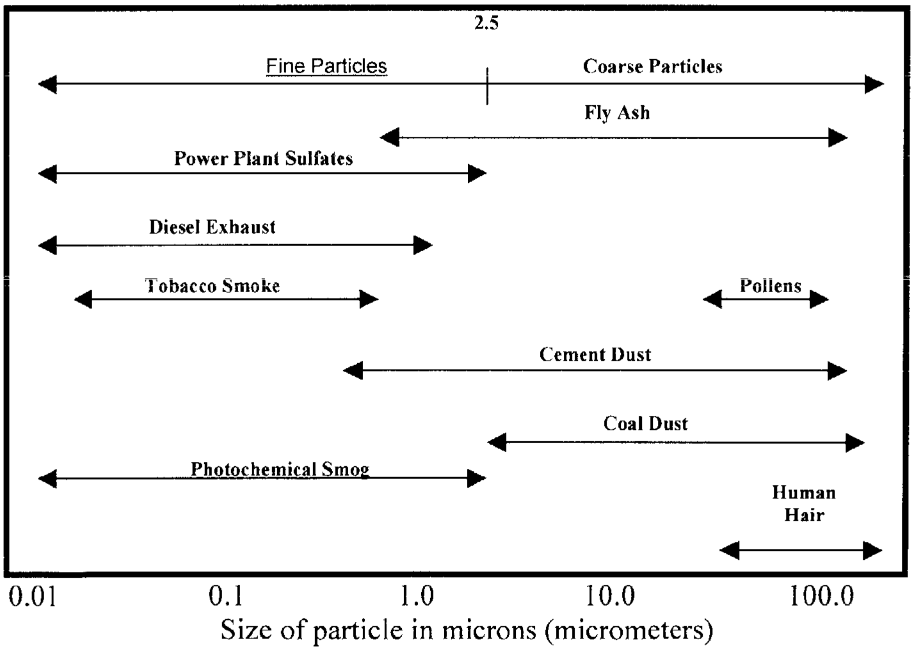
Month	Average Ozone in parts per billion (ppb)	Hourly Ozone Maximum (ppb)	Does Maximum exceed EPA 125 ppb MAC Std.?
October	18.53	86.12	No
November	11.87	54.25	No
December	10.85	34.34	No
January	10.30	32.65	No
February	11.30	41.73	No

Measured by TNRCC at UTEP, approximately ½ mile east of study area.
Hourly measurements were taken through the entire month and then averaged.

Particulates

Airborne particulate matter is often described as a haze. Airborne particulates include both solid particles and liquid droplets, ranging in size from 0.01 to 100 microns (micrometers). Those particles smaller than 2.5 microns are designated as "fine particles," and include diesel exhaust emitted directly from its source, and gases such as SO, SO_2, NOx, and VOCs which can interact with other compounds in the air to form particulate matter commonly found in photochemical smog. Many types of fine particles can grow in size with added humidity, and therefore, can produce increased smog during the slightly more humid summer months in the El Paso area.

SIZE OF TYPICAL AIR PARTICULATES



Particles larger than 2.5 micrometers or “coarse particles” are generally derived from unpaved roads, materials handling, crushing and grinding operations like rock quarries, combustion, or (in El Paso) from strong, dry westerly winds.

Breathing particulates can cause lost work days, school absences, and serious health problems such as asthma.

As no air monitoring data is available from the exact study area, the following air particulate data was taken from the TNRCC air-monitoring site at UTEP, located less than a half mile from the study area. The months of October through February correspond to the non-irrigation months during which canal reconstruction would take place. The TNRCC web site does not yet include readings for the new EPA air particulate PM-2.5 category, but does include the larger size PM-10 particulates.

MEASUREMENTS OF AIRBORNE PARTICULATES (PM-10) SAMPLED NEAR AMERICAN CANAL DURING WINTER MONTHS, 1998 - 1999

Month	Avg. P-10 in micrograms per cubic meter (μg/m^3)	Hourly P-10 Maximum (μg/m^3)	Does Maximum exceed EPA 155 μg/m^3 MAC ?
October	30.78	275.20	Yes
November	46.97	966.00	Yes
December	30.21	176.20	Yes
January	39.39	636.94	Yes
February	45.07	368.16	Yes

Measured by TNRCC at UTEP, approximately ½ mile east of study area.

Hourly measurements were taken through the entire month and then averaged.

5.0 Summary Information

El Paso’s air pollution is not caused by persons exclusively on the American side of the border. Individuals and businesses on both sides of the American - Mexican border contribute to the pollution. Automobiles are considered to be the chief source of ozone, carbon monoxide, and particulates in the El Paso area. Unpaved roads, open burning and both large and small manufacturing operations are also sources of air pollution in the area.

SUMMARY OF 1999 PRINCIPAL AIR QUALITY PARAMETERS IN EL PASO, TEXAS

Parameter→ **Comparison↓**	**Carbon Monoxide (CO)**	**Ozone (O_3)**	**Particulates (PM-10)**
Principal sources of contaminant	Automobiles, fire places, open burning	Automobiles	Smokestacks, unpaved roads, automobiles, pollens, open burning, and dust storms
Local measures to reduce pollutant levels	Fireplace and no-burn days are announced, and only oxygenated gasoline is sold October – April.	Ozone Actions Days May – Oct., but compliance with restrictions is strictly voluntary.	No warnings are made for airborne particulates. Grading & other dirt work requires spraying water. New El Paso buses run on natural gas rather than diesel.
Problem season in El Paso area	Cool weather October - March	Warm weather May - October	All year
Months with possible elevated levels during reconstruction	October - February	October	October – February

6.0 Air Quality Effects of Five *Canal Replacement* Alternatives

No long-term, indirect, or cumulative effects to Air Quality are expected from any alternative. Possible short-term effects during construction are described in the following discussion.

In the El Paso area, carbon monoxide and particulates are more serious concerns than ozone, especially during the hours from sunset through mid-morning during winter months when air inversion layers trap airborne contaminants near the land surface. No data is available for the expected low levels of construction-generated air pollution during the proposed canal reconstruction activities. No air pollution-related delays were caused during the construction of the RGACE in 1997 and 1998. No air pollution-related delays are expected during the proposed reconstruction. Most of the construction activities would occur during the daylight hours when carbon monoxide levels are typically lowest during the proposed construction months. Ambient air quality issues should not affect the reconstruction activities.

Under CFR, Part 51.858 and the Texas State Implementation Plan, air emissions for Federal projects in El Paso, a non-attainment area, must fall below the *De Minimus* values of 50 tons per year for each of the two precursors of Ozone, namely Oxides of Nitrogen (NO_x) and Volatile Organic Hydrocarbons VOCs; and also below 100 tons per year each for Carbon Monoxide (CO) and Particulates (PM-10). Using a typical construction estimate of 80 pounds of fugitive dust per acre would add approximately 35 tons of PM-10 in the year 2001 and 22 tons in 2002. Using the methodology approved by EPA's "Nonroad Engine and Vehicle Emission Study Report," and EPA's "AP 42," an Air Emissions Estimate was performed for this project. The 1991 emission estimates have not yet been updated by EPA. The estimates for project air emissions contained in the following table are much lower than the *De Minimus* quantities. Therefore, pursuant to the USIBWC's affirmative obligation under Section 176 (c) of the Clean Air Act, in accordance with the requirements of 40 CFR, Ch. 1, Part 51, Subpart W, the project has been determined to be in compliance with the Clean Air Act. Spreadsheets of the Air Emission Estimates are located in Section F.5.

ESTIMATES OF AIR EMISSIONS DURING AMERICAN CANAL RECONSTRUCTION
OCT. 15 – FEB. 15

Parameter → **Year ↓**	**CO**	**PM - 10**	**NO_x**	**VOCs**
De Minimus* *per Year	100 Tons / Year	100 Tons / Year	50 Tons / Year	50 Tons / Year
2001	3.6 Tons / Year	36.2 Tons / Year	8.6 Tons / Year	0.9 Tons / Year
2002	2.3 Tons / Year	22.8 Tons / Year	5.7 Tons / Year	0.6 Tons / Year

Air quality will not be affected more than any typical construction project due to any of the five proposed canal reconstruction alternatives, especially if the below-listed mitigation activities are followed. Monitoring the air and soil for hydrocarbons during soil excavation activities can prevent possible worker exposure caused by harmful levels of airborne substances.

Either airborne particulate or carbon monoxide concentrations would serve as an indicator, but particulates are more visible to the public as smog, therefore air particulates was chosen as the indicator of this resource in the following table.

SUMMARY OF SHORT-TERM AIR QUALITY EFFECTS
FROM FIVE *CANAL REPLACEMENT* ALTERNATIVES

Alternative → **Effect ↓**	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**
Will canal reconstruction activities add great amounts of carbon monoxide to the air?	No	No	No	No	No
Will canal reconstruction activities add great amounts of ozone to the air?	No	No	No	No	No
Will canal reconstruction activities add great amounts of PM-10 particulates to the air?	No	No	No	No	No
High risk of delays during reconstruction due to ambient air quality?	No	No	No	No	No
Risk of worker exposure to airborne hydrocarbons during reconstruction activities	Low	Low	Low	Low	Low*
Risk of worker exposure to airborne heavy metals during reconstruction	Low	Low	Low	Low	Low*

* During possible emergency reconstruction

7.0 Suggested Best Management Plan Measures to Mitigate Air Quality Concerns

1. To reduce CO and Particulates:
    - Do construction work during daytime hours.
    - Spray disturbed soil with water.
    - When breaking old concrete lining, spray with water to minimize dust.
    - No open fires after sunset on days designated as "No Burn" days.

2. To reduce Ozone (during warm days during canal rebuilding, especially in October), follow general voluntary guidelines of the Ozone Action Days.

3. Monitor air and soil for hydrocarbon concentrations during excavation activities to prevent possible worker exposures.

F.2 – AIR MONITORING SITES IN THE EL PASO – JUAREZ - LAS CRUCES AREA

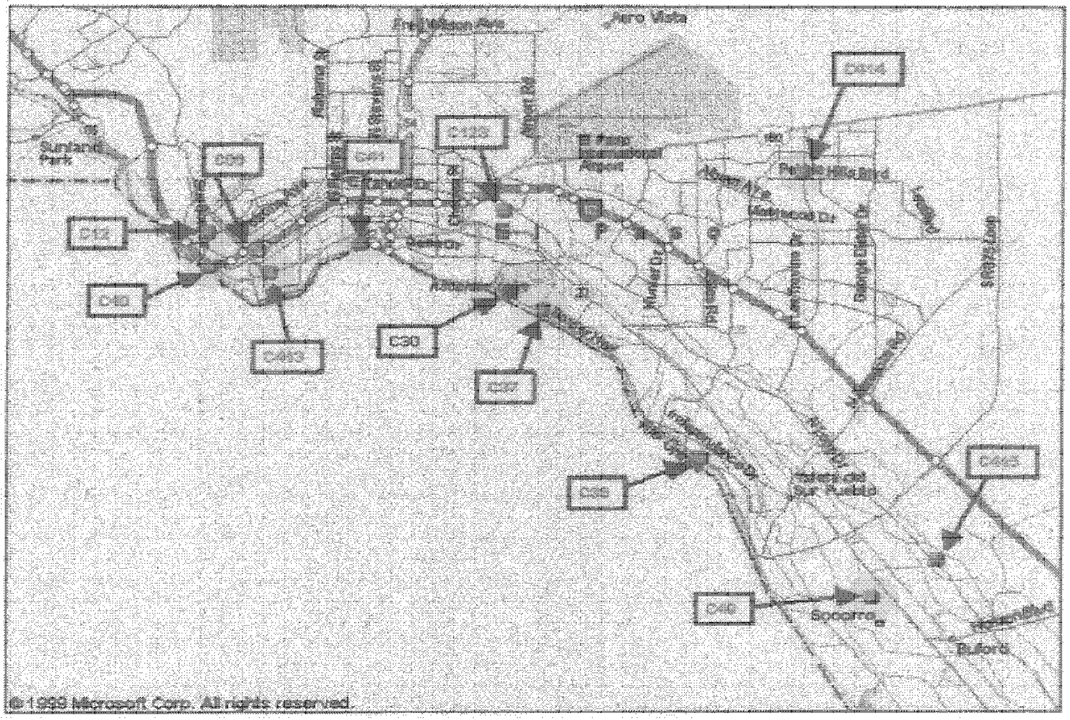
(Source: TNRCC)

Texas Natural Resource Conservation Commission

Rules | Calendar | Publications | Forms | About TNRCC | Help

Select a Monitoring Site in Region 6 (El Paso)

Select a monitoring site from the map(s) below to retrieve a monthly summary of the hourly data collected at a specific continuous air monitoring station.



© 1999 Microsoft Corp. All rights reserved.

- Red station numbers and symbols indicate currently active sites.
- Black station numbers and symbols indicate de-activated sites. Historical data is available for these sites.
- Yellow highlighted sites indicate there is Air Quality data available at the site.
- Stations numbered 1 through 300 are operated and maintained by the TNRCC.
- Stations numbered 400 through 499 are operated and maintained by one or more local Government entities (city or county).
- Stations numbered 600 through 699 are operated and maintained by one or more private monitoring networks.

Return to Map of Texas

PLEASE NOTE: This data has not been verified by the TNRCC and may change. This is the most current data, but it is not official until it has been certified by our technical staff. Data is collected from TNRCC air monitoring sites and may include data collected by other outside agencies. This data is updated hourly. All times shown are in Local Standard Time.

5/26/00 11:45:03 AM

F.3 – UTEP AIR QUALITY

Air Quality Data from UTEP for Ozone and Particulates
(November 1999 - March 2000)

(Source: TNRCC)

Daily Air Quality Statistics at UTEP (TNRCC Site C-12) November 1999

Day	Carbon Monoxide (ppm)			Ozone (ppb)			P-10 Particulates ($\mu g/m^3$)		
	Maximum	Average	Standard Deviation	Maximum	Average	Standard Deviation	Maximum	Average	Standard Deviation
1	4.2	0.7	0.93	32.96	13.66	13.62	140.00	43.10	27.21
2	1.4	0.4	0.30	28.77	17.85	10.42	183.69	70.31	49.34
3	2.5	1.0	0.69	24.07	7.96	9.39	157.76	56.96	41.90
4	3.8	1.3	1.08	38.65	7.85	13.49	147.94	64.54	38.77
5	4.5	1.9	1.22	27.48	6.08	9.91	263.80	109.50	78.18
6	4.4	1.2	1.02	27.78	7.70	10.48	147.54	45.26	37.98
7	1.0	0.5	0.22	28.24	11.18	10.30	67.48	26.44	17.02
8	3.1	1.0	0.81	31.69	9.76	10.19	246.34	75.86	66.71
9	1.4	0.8	0.37	32.30	9.27	12.08	102.89	53.07	26.53
10	2.4	1.1	0.64	30.39	6.78	11.38	225.11	76.67	56.80
11	2.6	1.0	0.59	30.12	8.00	11.29	150.61	49.58	41.51
12	2.2	0.8	0.47	22.80	8.30	8.44	65.55	28.32	16.35
13	3.7	1.4	0.94	49.76	10.42	15.37	291.00	92.94	96.32
14	2.7	0.8	0.53	31.58	9.09	11.53	157.49	52.02	41.68
15	2.3	1.1	0.49	35.55	8.81	13.09	191.40	73.76	48.92
16	4.3	1.4	0.98	37.62	8.65	14.42	228.57	94.67	60.36
17	2.5	1.2	0.63	27.07	7.90	10.48	189.01	80.76	46.90
18	0.6	0.4	0.08	31.64	16.84	7.81	155.36	53.14	44.01
19	2.5	0.8	0.61	36.05	12.68	12.58	101.95	58.76	28.18
20	2.5	1.0	0.62	30.75	9.41	11.93	139.60	62.39	38.19
21	1.1	0.5	0.18	36.22	20.54	10.63	157.93	37.89	37.13
22	0.7	0.5	0.07	42.07	24.75	12.89	75.37	36.34	22.68
23	2.3	0.8	0.46	39.50	13.65	13.12	161.87	55.34	45.90
24	2.0	0.8	0.46	35.80	20.78	14.22	62.33	36.53	17.64
25	1.2	0.6	0.24	40.85	19.05	15.26	65.42	29.90	13.69
26	3.7	0.8	0.68	36.45	15.76	12.54	117.67	40.65	34.71
27	6.0	1.4	1.27	36.25	9.95	13.95	243.10	71.99	60.06
28	3.6	1.5	0.89	24.41	4.26	6.76	243.53	104.59	70.95
29	2.0	0.9	0.40	41.51	17.25	15.88	64.04	33.57	15.08
30	4.6	1.7	1.30	42.80	16.04	16.20	328.41	85.79	108.01
Monthly	6.0 ppm	0.99 ppm	0.82 ppm	49.76 ppb	12.00 ppb	13.25 ppb	328.41$\mu g/m^3$	60.02 $\mu g/m^3$	54.67 $\mu g/m^3$

*Complete hourly statistics can be found on the TNRCC website at http://www.tnrcc.state.tx.us/cgi-bin/monops

Daily Air Quality Statistics at UTEP (TNRCC Site C-12) December 1999

Day	Carbon Monoxide (ppm)			Ozone (ppb)			P-10 Particulates ($\mu g/m^3$)		
	Maximum	Average	Standard Deviation	Maximum	Average	Standard Deviation	Maximum	Average	Standard Deviation
1	2.9	1.0	0.75	45.19	11.07	15.38	209.24	73.30	64.70
2	0.7	0.1	0.17	40.16	22.38	10.98	128.36	59.19	35.17
3	0.3	0.0	0.08	42.06	27.30	10.34	341.32	90.11	106.18
4	0.8	0.1	0.25	36.02	17.19	13.18	46.96	21.70	11.51
5	1.1	0.3	0.29	38.96	12.86	11.52	33.07	17.34	5.77
6	1.6	0.4	0.42	30.60	8.68	10.29	141.96	43.56	39.96
7	2.7	0.7	0.88	37.54	12.07	13.12	129.53	43.15	41.16
8	2.4	0.6	0.79	44.33	18.46	15.90	242.52	88.41	60.95
9	2.0	0.5	0.51	37.20	12.83	12.78	78.44	38.92	18.23
10	2.7	0.9	0.83	22.03	5.75	7.50	125.59	36.91	33.27
11	2.6	0.6	0.74	30.71	12.90	13.35	66.79	38.88	17.45
12	2.8	0.5	0.73	38.75	12.79	14.12	178.56	58.09	62.42
13	1.1	0.2	0.35	38.31	12.23	13.49	110.34	46.72	29.60
14	0.1	0.0	0.02	39.73	26.17	9.22	77.02	26.13	16.43
15	2.0	0.4	0.53	38.42	13.48	14.05	390.21	89.74	109.37
16	1.3	0.3	0.42	27.73	6.22	9.66	85.54	37.96	23.17
17	2.7	0.4	0.76	25.71	8.87	9.84	217.51	51.25	64.48
18	1.5	0.4	0.34	46.92	10.97	13.61	96.38	41.62	25.80
19	0.9	0.1	0.19	36.32	20.30	10.85	66.19	23.61	16.91
20	2.2	0.4	0.50	35.01	11.05	13.28	217.61	53.99	46.75
21	1.0	0.4	0.28	28.66	15.43	8.56	80.67	30.49	21.08
22	0.5	0.1	0.14	33.64	24.08	10.85	19.58	12.55	3.12
23	0.8	0.3	0.23	33.39	15.24	10.17	44.56	21.37	11.51
24	1.1	0.2	0.28	32.39	21.09	8.61	26.78	14.83	5.88
25	0.6	0.2	0.14	28.04	17.01	8.06	21.83	11.57	3.40
26	1.5	0.3	0.46	24.42	15.00	9.54	50.94	16.12	11.86
27	1.6	0.6	0.47	24.53	5.53	9.18	93.60	35.71	24.19
28	1.9	1.0	0.54	14.73	2.42	4.74	99.16	40.71	27.46
29	1.2	0.5	0.26	30.98	10.13	10.82	40.97	19.02	8.70
30	unavailable	unavailable	unavailable	23.57	7.26	7.17	99.16	33.08	28.08
31	unavailable	unavailable	unavailable	46.79	8.18	13.48	230.63	61.97	67.22
Monthly	2.9 ppm	0.39 ppm	0.56 ppm	46.92 ppb	13.67 ppb	12.89 ppb	390.21$\mu g/m^3$	41.23 $\mu g/m^3$	48.51 $\mu g/m^3$

*Complete hourly statistics can be found on the TNRCC website at http://www.tnrcc.state.tx.us/cgi-bin/monops

Daily Air Quality Statistics at UTEP (TNRCC Site C-12) January 2000

Day	Carbon Monoxide (ppm)			Ozone (ppb)			P-10 Particulates (μg/m^3)		
	Maximum	Average	Standard Deviation	Maximum	Average	Standard Deviation	Maximum	Average	Standard Deviation
1	unavailable	unavailable	unavailable	36.68	23.29	9.24	173.48	173.47	0.01
2	unavailable	unavailable	unavailable	40.58	29.40	10.30	unavailable	unavailable	unavailable
3	unavailable	unavailable	unavailable	40.51	27.86	12.35	173.44	39.63	45.55
4	unavailable	unavailable	unavailable	38.65	12.01	12.76	185.65	55.34	59.11
5	unavailable	unavailable	unavailable	39.49	14.09	13.55	95.31	48.13	25.59
6	0.0	0.0	--	39.56	21.22	15.23	99.22	28.73	25.89
7	1.0	0.1	0.25	38.12	19.96	12.97	131.26	42.98	40.67
8	0.2	0.0	0.04	42.74	19.59	13.66	44.98	23.20	10.35
9	0.0	0.0	0.01	46.14	35.41	7.17	39.67	16.90	7.49
10	0.8	0.1	0.17	44.00	28.88	10.24	53.11	24.94	12.46
11	1.1	0.2	0.28	40.37	21.27	10.81	65.60	23.81	14.54
12	1.0	0.2	0.30	39.76	19.90	11.84	94.46	31.23	24.46
13	3.1	0.4	0.67	29.08	14.19	9.05	86.78	27.75	23.46
14	0.5	0.2	0.14	31.77	21.60	6.75	33.10	18.67	7.12
15	1.7	0.7	0.56	41.98	12.58	14.33	178.72	57.24	49.52
16	3.9	1.2	1.10	44.56	13.63	14.36	199.83	82.63	58.53
17	3.8	0.5	0.86	42.78	12.26	14.04	198.14	95.17	53.22
18	2.2	0.4	0.62	40.94	9.59	10.01	262.81	86.37	79.20
19	7.1	1.2	1.81	43.45	13.87	15.88	309.61	83.75	98.49
20	3.8	1.5	1.10	36.39	12.70	12.40	251.54	77.52	61.38
21	3.8	0.7	0.82	38.59	19.86	13.90	115.72	42.72	37.53
22	0.5	0.2	0.07	35.53	25.60	7.48	40.81	18.29	9.79
23	4.3	0.7	0.98	43.71	18.48	15.42	273.55	51.97	72.25
24	3.0	1.1	0.86	67.07	13.00	18.15	103.09	46.33	28.34
25	3.2	0.7	0.72	63.81	14.39	19.05	128.96	54.20	40.89
26	2.5	0.4	0.56	39.42	18.59	11.65	250.42	70.44	56.37
27	0.4	0.2	0.10	45.07	29.80	11.53	101.43	36.98	23.98
28	1.7	0.4	0.38	42.52	23.92	10.60	62.97	26.68	17.94
29	0.9	0.5	0.24	44.68	22.25	15.25	44.20	18.43	10.20
30	1.0	0.5	0.25	58.03	21.00	17.22	82.50	33.43	21.17
31	0.4	0.2	0.07	41.12	28.69	9.47	77.33	25.34	17.60
Monthly	7.1 ppm	0.48 ppm	0.76 ppm	67.07 ppb	19.99 ppb	14.32 ppb	309.61μg/m^3	46.95 μg/m^3	51.06 μg/m^3

*Complete hourly statistics can be found on the TNRCC website at http://www.tnrcc.state.tx.us/cgi-bin/monops

Daily Air Quality Statistics at UTEP (TNRCC Site C-12) February 2000

Day	Carbon Monoxide (ppm)			Ozone (ppb)			P-10 Particulates ($\mu g/m^3$)		
	Maximum	Average	Standard Deviation	Maximum	Average	Standard Deviation	Maximum	Average	Standard Deviation
1	0.8	0.3	0.16	37.57	25.64	7.93	33.83	16.95	6.96
2	2.4	0.6	0.46	45.23	16.70	15.08	108.78	33.26	27.24
3	2.9	0.6	0.64	48.88	19.35	18.12	150.60	39.71	37.11
4	1.3	0.6	0.40	35.71	19.88	13.08	112.70	33.47	24.69
5	2.9	0.9	0.86	49.21	23.22	16.50	224.73	64.04	75.04
6	2.6	1.1	0.67	50.33	15.71	19.12	146.67	76.10	38.59
7	2.7	0.9	0.69	53.49	15.40	19.13	160.87	45.31	49.52
8	6.7	2.0	1.57	41.53	11.31	14.59	337.51	116.05	106.25
9	3.0	0.6	0.59	38.32	14.05	11.87	172.55	58.87	46.00
10	0.8	0.3	0.19	41.92	19.48	13.69	92.18	39.73	23.70
11	0.9	0.3	0.20	47.78	27.19	13.90	109.64	35.03	30.87
12	1.6	0.4	0.37	47.04	28.55	14.91	239.05	67.26	60.78
13	0.4	0.2	0.05	46.97	35.10	9.72	103.18	33.10	27.41
14	0.6	0.3	0.13	32.66	20.84	8.93	64.30	27.17	18.87
15	0.5	0.2	0.09	38.43	22.52	10.45	67.97	23.00	17.03
16	2.6	0.7	0.61	67.79	18.88	18.31	138.15	49.41	33.16
17	0.8	0.3	0.14	40.77	27.80	10.85	461.08	126.86	153.81
18	3.8	0.7	0.93	47.00	24.87	15.23	181.53	46.26	51.42
19	2.4	1.0	0.60	52.78	18.42	19.84	112.55	49.79	26.07
20	3.1	0.8	0.76	51.87	24.90	17.77	203.55	55.53	59.89
21	1.7	0.7	0.47	42.09	16.76	14.00	60.76	35.31	15.24
22	0.3	0.2	0.05	42.98	30.93	8.42	148.11	33.97	32.98
23	4.7	0.7	1.07	49.88	25.24	17.73	205.71	45.97	51.06
24	3.9	1.1	1.01	39.94	20.05	16.78	718.82	165.90	183.29
25	0.3	0.2	0.03	48.87	39.35	6.71	76.32	29.19	21.61
26	4.2	0.6	1.03	52.76	32.93	16.01	167.59	39.10	44.36
27	4.3	1.0	0.92	unavailable	unavailable	unavailable	301.38	76.76	75.32
28	2.1	0.6	0.59	unavailable	unavailable	unavailable	655.13	144.31	192.98
29	2.3	0.6	0.64	unavailable	unavailable	unavailable	104.91	36.32	33.39
Monthly	6.7 ppm	0.63 ppm	0.76	67.79 ppb	22.91 ppb	16.09	718.82 $\mu g/m^3$	56.76 $\mu g/m^3$	80.22 $\mu g/m^3$

*Complete hourly statistics can be found on the TNRCC website at http://www.tnrcc.state.tx.us/cgi-bin/monops

Daily Air Quality Statistics at UTEP (TNRCC Site C-12) March 2000

Day	Carbon Monoxide (ppm)			Ozone (ppb)			P-10 Particulates (μg/m³)		
	Maximum	Average	Standard Deviation	Maximum	Average	Standard Deviation	Maximum	Average	Standard Deviation
1	2.5	0.8	0.61	unavailable	unavailable	unavailable	84.10	47.33	20.32
2	1.3	0.4	0.38	51.90	28.43	22.70	107.69	36.64	30.06
3	1.8	0.7	0.44	50.28	21.39	17.70	100.90	36.44	24.72
4	0.8	0.4	0.13	59.53	38.16	12.71	37.59	20.67	8.40
5	0.7	0.3	0.16	51.36	34.83	12.82	93.20	44.84	23.22
6	2.8	0.7	0.56	50.22	23.64	16.58	127.13	45.45	31.31
7	0.3	0.2	0.05	46.69	39.01	6.19	244.39	63.57	74.28
8	1.3	0.4	0.32	49.43	24.47	15.14	126.95	34.73	34.06
9	1.0	0.3	0.18	47.61	20.67	13.97	69.97	29.42	17.49
10	0.4	0.2	0.08	52.97	33.60	12.66	53.66	20.05	11.20
11	4.7	0.9	1.19	59.17	33.31	19.76	303.66	53.28	85.92
12	3.6	1.0	0.72	85.42	26.98	27.75	177.86	60.47	46.56
13	2.2	0.8	0.54	54.23	19.35	19.36	150.92	69.01	47.75
14	1.3	0.5	0.37	59.87	25.24	21.42	130.72	45.48	38.84
15	1.3	0.5	0.32	59.38	32.70	21.08	90.14	36.56	19.29
16	0.4	0.2	0.07	55.51	40.41	7.92	186.63	60.14	54.22
17	0.8	0.4	0.19	51.42	33.79	12.51	49.54	23.02	12.09
18	0.6	0.2	0.10	57.63	45.65	12.16	514.27	131.63	154.04
19	2.8	0.9	0.73	60.52	32.01	20.07	141.40	35.91	40.53
20	2.0	1.1	0.31	50.49	35.43	11.69	198.55	77.26	54.55
21	1.1	1.0	0.04	52.26	42.80	7.91	33.93	15.93	6.55
22	1.1	0.5	0.37	47.00	30.04	11.16	49.31	21.10	10.59
23	0.8	0.3	0.17	61.81	35.85	18.69	76.78	30.23	18.23
24	2.1	0.7	0.49	61.95	22.58	25.02	144.93	60.37	42.75
25	1.5	0.6	0.36	72.40	19.20	22.96	132.91	61.91	38.37
26	0.9	0.2	0.15	59.20	34.56	16.04	35.27	17.84	7.26
27	1.1	0.3	0.24	61.12	31.37	19.04	73.84	28.21	20.27
28	0.6	0.4	0.13	39.20	28.59	8.48	105.38	43.05	25.61
29	1.0	0.4	0.18	48.14	31.37	13.16	79.51	23.66	16.48
30	0.7	0.3	0.13	47.65	31.21	14.25	86.66	39.55	21.75
31	1.1	0.3	0.20	51.55	34.48	13.65	110.85	45.21	30.27
Monthly	4.7 ppm	0.51 ppm	0.48 ppm	85.42 ppb	31.18 ppb	17.91 ppb	514.27μg/m³	43.85μg/m³	50.27 μg/m³

*Complete hourly statistics can be found on the TNRCC website at http://www.tnrcc.state.tx.us/cgi-bin/monops

F.4 – DOWNTOWN EL PASO AIR QUALITY

Air Quality Data from Tillman Health Center for Wind Speed (WS) and Wind Direction (WD) (October 1998 - February 1999)

(Source: El Paso City-County Health & Environmental District)

Daily Wind Data
Tillman Health Center (2 miles SE of Study Site)
(Source: EPCCHED-Air Quality Program)

Day	October-98		November-98		December-98		January-99		February-99	
	Avg. Wind Speed (mph)	Avg. Wind Dir.	Avg. Wind Speed (mph)	Avg. Wind Dir.	Avg. Wind Speed (mph)	Avg. Wind Dir.	Avg. Wind Speed (mph)	Avg. Wind Dir.	Avg. Wind Speed (mph)	Avg. Wind Dir.
1	3.7	198.1	2.5	270.7	2.9	156.8	4.7	N/A	N/A	N/A
2	3.1	282.2	2.6	240.1	3.8	216.0	2.7	N/A	N/A	N/A
3	4.9	285.6	1.9	254.6	4.3	301.7	4.4	N/A	N/A	N/A
4	6.8	286.1	3.8	148.5	2.6	279.1	2.8	N/A	N/A	N/A
5	4.6	309.1	5.7	131.4	2.8	266.9	3.0	N/A	N/A	N/A
6	2.5	204.8	4.1	222.7	3.9	282.5	2.4	N/A	N/A	N/A
7	3.2	144.1	2.9	282.6	4.5	309.7	2.2	N/A	N/A	N/A
8	2.3	156.2	3.1	253.9	4.3	102.4	3.6	N/A	N/A	N/A
9	1.6	161.1	6.4	288.7	3.9	135.2	3.5	N/A	N/A	N/A
10	2.4	249.2	3.3	279.5	10.8	77.9	2.3	N/A	N/A	N/A
11	2.2	259.3	2.6	159.6	3.2	285.8	1.9	N/A	N/A	N/A
12	4.6	137.9	3.4	143.1	3.0	288.9	4.1	N/A	N/A	N/A
13	2.6	144.7	3.0	275.0	1.6	204.9	3.3	N/A	N/A	N/A
14	2.3	191.9	2.4	276.5	2.9	147.4	N/A	N/A	N/A	N/A
15	6.3	279.5	1.9	244.5	6.0	108.8	N/A	N/A	N/A	N/A
16	4.6	281.8	1.8	246.5	4.9	120.8	N/A	N/A	N/A	N/A
17	4.0	286.1	1.8	233.0	7.7	97.6	N/A	N/A	N/A	N/A
18	9.4	97.6	2.7	284.3	5.7	301.6	N/A	N/A	N/A	N/A
19	9.0	110.0	2.6	284.9	2.3	228.1	N/A	N/A	N/A	N/A
20	8.7	94.5	5.0	123.8	3.1	260.2	N/A	N/A	N/A	N/A
21	7.4	124.2	2.3	268.7	3.9	281.3	N/A	N/A	N/A	N/A
22	6.2	105.5	1.9	246.3	8.0	125.7	N/A	N/A	N/A	N/A
23	3.8	94.7	2.0	169.1	3.4	153.2	N/A	N/A	N/A	N/A
24	2.6	137.3	2.2	238.7	3.9	150.9	N/A	N/A	N/A	N/A
25	3.2	152.0	2.1	236.4	2.7	282.5	N/A	N/A	N/A	N/A
26	4.5	305.7	1.5	199.5	2.5	281.4	N/A	N/A	N/A	N/A
27	4.3	119.0	1.5	233.0	2.4	285.0	N/A	N/A	N/A	N/A
28	2.3	267.6	1.8	232.3	2.9	N/A	N/A	N/A	N/A	N/A
29	1.5	189.1	4.9	299.1	2.4	N/A	N/A	N/A	N/A	N/A
30	2.7	223.8	3.5	192.7	1.7	N/A	N/A	N/A	N/A	N/A
31	3.7	283.8	N/A	N/A	2.4	N/A	N/A	N/A	N/A	N/A

Note: Wind direction in degrees measured clockwise from north.
Complete statistics can be found at the EPCCHED website at: http://airq.ci.el-paso.tx.us

N/A = Not Available

F.5 – ESTIMATES OF EMISSIONS DURING AMERICAN CANAL RECONSTRUCTION

Estimated 2001 Air Emissions During American Canal Reconstruction (Oct. 15 - Dec. 31)

Construction Equipment Used	N	HRS	HP	LF	EF				T			
					CO	PM	NOx	VOC	CO	PM	NOx	VOC
Dump Truck	4	80	658	0.50	2.80	1.44	9.60	0.84	0.3	0.2	1.1	0.1
Water Truck	1	440	658	0.50	2.80	1.44	9.60	0.84	0.4	0.2	1.5	0.1
Compactor-Roller	2	320	99	0.50	3.10	0.78	9.30	0.20	0.1	0.0	0.3	0.0
Grader	1	320	147	0.50	3.80	1.00	9.60	1.54	0.1	0.0	0.2	0.0
Excavator	1	160	143	0.50	5.20	1.44	10.73	0.70	0.1	0.0	0.1	0.0
Dozer	1	240	356	0.50	3.00	1.26	9.60	0.84	0.1	0.1	0.5	0.0
Crane	2	240	194	0.50	4.20	1.44	10.30	1.26	0.2	0.1	0.5	0.1
Backhoe/Loader	1	440	175	0.50	4.30	1.29	10.30	1.40	0.2	0.1	0.4	0.1
Concrete Truck	3	240	658	0.50	2.80	1.44	9.60	0.84	0.7	0.4	2.5	0.2
Generators	6	440	99	0.50	9.20	1.44	9.20	1.41	1.3	0.2	1.3	0.2
Total Emissions for Construction Equipment									**3.6**	**1.2**	**8.6**	**0.9**
Fugitive Dust	-	-	-	-	-	-	-	-	-	**35.0**	-	-
Total Emissions									**3.6**	**36.2**	**8.6**	**0.9**

$T = N * HRS * HP * LF * EF\ )\ 910{,}000$ **grams/ton**

N = # Units
HRS = # Hours used per Calendar Year
HP = Average Rated Horsepower
LF = Load Factor
EF-CO = Average CO Emissions in grams per horsepower-hour
EF-PM = Average PM Emissions in grams per horsepower-hour
EF-NOx = Average NOx Emissions in grams per horsepower-hour
EF-VOC = Average VOC Emissions in grams per horsepower-hour
T-CO = Estimated Mass of CO Emissions in tons per year
T -PM = Estimated Mass of PM Emissions in tons per year
T -NOx = Estimated Mass of NOx Emissions in tons per year
T -VOC = Estimated Mass of VOC Emissions in tons per year

Estimated 2002 Air Emissions During American Canal Reconstruction (Jan. 1 - Feb. 15)

Construction Equipment Used	N	HRS	HP	LF	EF				T			
					CO	PM	NOx	VOC	CO	PM	NOx	VOC
Dump Truck	3	80	658	0.50	2.80	1.44	9.60	0.84	0.2	0.1	0.8	0.1
Water Truck	1	280	658	0.50	2.80	1.44	9.60	0.84	0.3	0.1	1.0	0.1
Compactor-Roller	1	280	99	0.50	3.10	0.78	9.30	0.20	0.0	0.0	0.1	0.0
Grader	1	50	147	0.50	3.80	1.00	9.60	1.54	0.0	0.0	0.0	0.0
Excavator	0	0	143	0.50	5.20	1.44	10.73	0.70	0.0	0.0	0.0	0.0
Dozer	1	200	356	0.50	3.00	1.26	9.60	0.84	0.1	0.0	0.4	0.0
Crane	2	200	194	0.50	4.20	1.44	10.30	1.26	0.2	0.1	0.4	0.1
Backhoe/Loader	0	0	175	0.50	4.30	1.29	10.30	1.40	0.0	0.0	0.0	0.0
Concrete Truck	3	200	658	0.50	2.80	1.44	9.60	0.84	0.6	0.3	2.1	0.2
Generators	6	280	99	0.50	9.20	1.44	9.20	1.41	0.8	0.1	0.8	0.1
Total Emissions for Construction Equipment									**2.3**	**0.8**	**5.7**	**0.6**
Fugitive Dust	-	-	-	-	-	-	-	-	-	**22.0**	-	-
Total Emissions									**2.3**	**22.8**	**5.7**	**0.6**

T = N * HRS * HP * LF * EF) 910,000 grams/ton

N = # Units
HRS = # Hours used per Calendar Year
HP = Average Rated Horsepower
LF = Load Factor
EF-CO = Average CO Emissions in grams per horsepower-hour
EF-PM = Average PM Emissions in grams per horsepower-hour
EF-NOx = Average NOx Emissions in grams per horsepower-hour
EF-VOC = Average VOC Emissions in grams per horsepower-hour
T-CO = Estimated Mass of CO Emissions in tons per year
T -PM = Estimated Mass of PM Emissions in tons per year
T -NOx = Estimated Mass of NOx Emissions in tons per year
T -VOC = Estimated Mass of VOC Emissions in tons per year

F.6 – AIR QUALITY RECORDS OF CONVERSATIONS

RECORD OF CONVERSATION - ENCON File # 122-9
Air

Name: Brad Everett

Date/Time: 9/8/99 3:00 p.m.

Agency: Abrams Construction

Phone No: 915-593-7393

No Air Emissions data was requested, collected, or kept by Abrams Construction during previous American Canal extension construction.

However, no one from City-County Health Dept., or TNRCC ever asked them to delay due to air emissions or a pollution layer created during winter temperature inversion layers. He said air quality was never a problem.

Recommended Action or Response

Name and Date: John Knopp 9/8/99

RECORD OF CONVERSATION - ENCON File # 122-9
Air

Name: Veronica Carbajal
Date/Time: 10/9/99 11:15 a.m.
Agency: Clean Air Partnership
Phone No: 915-543-9933

Ref: Ozone

At this time, compliance with Ozone Action Days is still voluntary. Typically, ozone levels in El Paso only exceed maximums in the period from May through October.

Ref: Carbon Monoxide
Although El Paso does exceed CO standards, much progress has been made by selling oxygenated gasoline from October through April.

No "CO Action Days" exist.

Recommended Action or Response

Name and Date: John Knopp 10/9/99

RECORD OF CONVERSATION - ENCON File # 122-9
Air

Name: Archie Clouse, Regional VI Dir.
Date/Time: 10/8/99
Agency: TNRCC/Air Quality
Phone No: 915-783-6683

1) Ozone Action Days are voluntary and should not affect canal construction

2) No specific construction regulations exist for non-attainment areas to protect air quality

Addendum June 2, 2000 11:00 a.m.

Concerning Clean Air Conformity:
In non-"attainment" areas like El Paso, the state may institute a State Implementation Plan (SIP) to measure conformity. In Texas, the conformity rule is used only on environmental assessments dealing with transportation structures like highways or with factories.

TNRCC considers that the formulas for estimating the quantity of air pollutants are not applicable for this canal reconstruction--even during the construction phase.

Name and Date: John Knopp 6/2/00

RECORD OF CONVERSATION - ENCON File # 122-9
Air

Name: Chuck Jacobs

Agency: USIBWC/Construction

Date/Time: 9/27/00 10 a.m.

Phone No: 915-832-4780

RE: Assumptions for Reconstruction to be used to estimate air emisions

1. 8-hour work shifts, 5-day work weeks
2. Oct 15, 2001 - Feb 15, 2002, Estimated Project Timeline
3. Two weeks to break and remove concrete using 1 excavator and 1 backhoe/loader
4. Two weeks to haul concrete debris for recycle using loader and 4 dump trucks
5. Subgrade preparation, Nov 1 - Feb 1 using 2 compactors, 2 dozers, 1 grader
6. Construction Nov 15 - Feb 15 using 3 concrete trucks, 1 roller, 1 mechanical form, 2 cranes, 1 dozer, 1 roller, 1 dump truck
7. Six days to reconstruct roads using 3 dump trucks, 1 grader, 1 roller
8. One water truck used throughout project

Recommended Action or Response

Name and Date: John Knopp 9/27/00

RECORD OF CONVERSATION - ENCON File # 122-9
Air

Name: Mike Jansky
NEPA Reviewer, (CAA #309)

Agency: EPA

Date/Time: 9/15/00 9:30 am

Phone No: 214-665-7451

RE: Air Quality Comformity

Under his authority under the Clean Air Act #309, he would not expect more than a statement that emissions for the construction project would be far under the deminimus.

Recommended Action or Response

Call John Behnam, EPA Region 6 Conformity Director

Name and Date: John Knopp 9/15/00

RECORD OF CONVERSATION - ENCON File # 122-9
Air

Name: John Behnam
Air Conformity Dept.

Agency: EPA Region VI

Date/Time: 9/18/00

Phone No: 214-665-7247

RE: Air Quality

If the E. A. shows air conformity for construction, no modeling is required

No technical analysis of long term effects or mitigations would be required.

Consult AP-42 and TNRCC for SIP rules.

Recommended Action or Response

Name and Date: John Knopp 9/18/00

RECORD OF CONVERSATION - ENCON File # 122-9
Air

Name: Greg Janssen

Agency: EPA, Air Quality Office

Date/Time: 10/17/00 2:00 pm

Phone No: 734-214-4285

To estimate emissions from specific pieces of construction equipment in accordance with AP-42, use methodology and values from November 1991, "Nonroad Engine and Vehicle Emission Study Report," (Publication # EPA-21A-2001 or EPA 460/3-91-002). Go to www.epa.gov/otaq/nonroadt.htm

Recommended Action or Response

Name and Date: John Knopp 10/17/00

RECORD OF CONVERSATION - ENCON File # 122-9
Air

Name: Archie Clouse, Director

Agency: TNRCC Region VI

Date/Time: 2/21/01

Phone No: 834-4949

RE: Air Quality Non-Attainment Status

By using oxygenated gasoline in the winter, Ozone Alert days, dust control, and other emission control measures, the local air quality has been improving since 1992. Actually, the maximum contaminant levels of ozone, carbon monoxide, and particulates have not been exceeded in El Paso for three years. Therefore, TNRCC Region VI has requested that EPA drop El Paso's non-attainment status, and redesignate El Paso as an Air Quality "Maintenance Area." An air quality maintenance area has comparatively less stringent air emissions and air monitoring requirements.

Though that change in air quality status is expected, the local area retains its non-attainment status until that time.

Recommended Action or Response

Name and Date: John Knopp 02/21/01

APPENDIX G
(Habitats, Wetlands, Endangered Species, Fish and Wildlife Section)

G.1 - "HABITATS, WETLANDS, ENDANGERED SPECIES, FISH AND WILDLIFE REPORT"

Introduction

This document is the final report on "Habitat, Wetlands, Fish and Wildlife" wherein floral and faunal resources were investigated. These results are presented in coordination with the United States Fish and Wildlife Service.

Objectives

The objectives of this investigation are to:

- delineate habitats within the American Canal Project area,
- determine if any of the habitats within the American Canal Project area are wetlands,
- determine if any habitats are critical habitats,
- determine if any potential federal and state listed, proposed, or candidate threatened or endangered species occur within the project area,
- census birds, mammals, fish, reptiles and amphibians within the project area,
- determine an indicator species within the habitats, and
- determine effects of alternatives on the indicator species within the project area.

Methods

Study Area

The American Canal Project (ACP) area is a narrow 1.98-mile (3.19-km) corridor along the American Canal from the American Dam to the International Dam (Fig. 1). The International Dam (referred to as the "Mexican Dam" on the 1935 International Boundary and Water Commission map).

- The Upper Section is between the American Dam and the conduit where the conduit is enclosed to go under West Paisano Drive. There is an access road on either side of the open channel in the Upper Section, which is used by the United States Section, International Boundary and Water Commission (USIBWC). The Upper Section is bounded by a chain link fence.

- The Middle Section lies east of West Paisano Drive. The open channel in the Middle Section is bounded on both sides by a chain link fence without an access road.

- The Lower Section extends from West Paisano Drive to the International Dam. The Lower Section is bounded by the Rio Grande on one side and a chain link fence on the other. An access road lies on both sides of the open channel in the Lower Section and is used by the US Border Patrol.

Data was collected between 16 June 1999, and 30 June 1999.

Habitat delineation

A 100 meter line transect was surveyed for vegetation in the Upper and Lower Sections. Vegetation was identified at every even meter along the transect. Where more than one species of vegetation occurred, those species were noted. Canopy species type was also collected wherever it occurred along the transect. Habitats are delineated based upon the vegetation types occurring within the study areas. In the Middle Section, a line transect was not feasible because the area between the Canal and the chain link fence ranged from fifteen centimeters to three meters wide. An observational survey for vegetation was performed.

Herpetofauna

A 100 meter line transect was walked for reptiles and amphibians on three consecutive days in the Upper and Lower Sections. Any reptiles or amphibians spotted during the survey were identified and recorded. All reptiles and amphibians seen inside the project area at any time were noted regardless of its presence on the transect. In the Middle Section, a line transect was not feasible because the area between the Canal and the chain link fence ranged from fifteen centimeters to three meters wide. An observational survey for reptiles and amphibians was performed.

Birds

An inventory of birds was established using an area search method (Ralph, et al. 1993). In each section a circular one hectare plot was sampled. Monitoring began at dawn, and lasted 20 minutes. The number and species of birds observed and heard were recorded. All birds observed outside the designated plots, but within the project area, and all birds observed in areas adjacent to the project area were noted.

Mammals

Small terrestrial mammals were sampled using Sherman traps in the Upper and Lower Sections. Twenty Sherman traps were set out 5 meters apart along a 100 meter line transect. Traps were opened at dusk and checked the following morning. Captured mammals were identified and released. Observational techniques were used for diurnal, burrowing, and mammals too large to be captured in Sherman traps. To compensate for their range, all mammals observed outside the transects, but within the project area, and all mammals observed in areas adjacent to the project area were noted. In the Middle Section, a line transect was not feasible because the area between the Canal and the chain link fence ranged from fifteen centimeters to three meters wide. An observational survey for mammals was performed

Results

Upper Section of the American Canal

The vegetation survey in the Upper Section yielded *Cressa truxillensis*, *Cynodon dactylon*, and *Solanum eleagnifolium* as the predominant species. *Prosopis glandulosa* and *Ailanthus altisima* are the most common trees. *Happlopappus gracilis, Spaeralcea, Salsola kali,* and *Caesalpinia gilliesii* were also seen (Table 1). The most common birds observed were Rock Dove, Cliff Swallow and Barn Swallow. Cliff Swallow nests were observed at the flow measurement bridge, and the entrance to the enclosed conduit at the southern end of this section. Common Nighthawk, Mourning Dove, Redwing Blackbird, Western Kingbird, Killdeer, Great Tailed Grackle, European Starling, House Finch, and Mallard were also observed in the project area. Snowy Egret and Great Egret were observed on the Rio Grande river directly adjacent to the project area (Table 2). Three species of reptiles, *Cnemidopherus inornatus*, *Cnemidopherus uniparens*, and *Urosaurus ornatus*, were observed (Table 3). *Cynomys ludovicianus, Citellus spilosoma*, and *Sylvilagus autoboni* were the only mammals observed (Table 4).

Middle Section of the American Canal

The Middle Section has minimal terrestrial habitat. The habitat consists of areas where cracks have formed in the concrete canal and vegetation has grown through. The area between the Canal and the project area boundary ranges from fifteen centimeters to three meters in width on both sides of the Canal. Areas at the northern and southern end have more terrestrial habitat which is dominated by *Cynodon dactylon. Prosopis glandulosa* was the predominant tree observed. *Hoffmanseggia densiflora, Malva neglecta, Mentzelia pumila, Larrya tridentata*, and *Yucca elata* were also observed (Table 1). Rock Dove and Mourning Dove are the predominant birds observed. Other birds observed were Cliff Swallow, Killdeer, Great Tailed Grackle, Western Kingbird, and Redwing Blackbird (Table 2). Potential Cliff Swallow nesting sites were observed at the entrances to the closed conduits at the northern and southern ends of the Middle Section. Two species of reptiles, *Urosaurus ornatus and Uta stansburiana*, were observed. (Table 3). *Sylvilagus autoboni* and *Lepus californicus* were the only mammals observed (Table 4).

Lower Section of the American Canal

Cressa truxillensis, Suaeda suffrutescens, Atriplex canescens, and *Cynodon dactylon* are the most abundant plant species observed in the Lower Section. *Tamarix pentandra, Prosopis glandulosa*, and *Ulmus pumila* was the most common trees observed. Other plant species observed were *Calliandra humilis, Conyza canadensis, Arundo donax, Caecalpinia gilliesii*, and *Yucca elata* (Table 1). Rock Dove, Redwing Blackbird, Mourning Dove, Cliff Swallow and House Sparrow were the most common birds observed. Great Tailed Grackle, Northern Mockingbird, Western Kingbird, and Barn Swallow were also observed in the Lower Section. Mallard and Snowy Egret were observed on the Rio Grande River directly adjacent to the project area (Table 2). Potential Cliff Swallow nesting sites were observed at the entrances to the closed conduits at the northern and southern ends of the Lower Section. *Bufo speciosus* and *Cnemidopherus uniparens* were the only reptile and amphibian species observed (Table 3). *Mus musculus* was the only mammal observed in the Lower Section (Table 4).

Wetlands

A Wetland is defined as an area that is saturated by surface or ground water with vegetation adapted for life under those soil conditions. No wetland was observed in the project area. The Army Corps of Engineers has stated that this project is not regulated under the provisions of Section 404 of the Clean Water Act concerning wetlands (see Letter from US Department of the Army, Albuquerque District, Corps of Engineers contained within this Appendix).

Assessment and Discussion

The only habitat in all three sections is a ruderal habitat. A ruderal habitat is defined as a habitat where disturbance is sustained but where there is no intentional substitution of vegetation. Roadsides are an example of ruderal habitats (Goudie, 1994). Species typical to ruderal habitats and observed in all sections include *Cressa truxillensis, Cynodon dactylon, and Solanum eleagnifolium. C. truxillensis* is the most abundant species observed in each area, and is known to be a ruderal and an invasive plant of disturbed areas. *S. eleagnifolium* is quite common and is also considered an invasive weed (Kearney and Peebles, 1969). The access roads to either side of the Canal in the Upper Section and the Lower Section are frequently used by USIBWC and the US Border Patrol employees. These access roads in the Upper and Lower Section are void of all but the most hearty vegetative pioneers. Faunae in the project area include animals which are common in ruderal habitats. *Cnemidopherus uniparens* populations have been observed expanding into areas that have been overgrazed (Degenhardt, et al, 1996).

Table 1
Vegetative Species Observed in the Three Sections of the American Canal Between the American Dam and the International Dam, El Paso, Texas.
June 18, 1999 to June 30, 1999

Species	Common Name	Upper Section	Middle Section	Lower Section
Ailanthus altisima	Tree of Heaven	4	0	0
Arundo donax	Giant Reed	0	0	3
Atriplex canescens	Fourwing Saltbush	0	0	3
Caesalpinia gilliesii	Bird of Paradise Tree	4	0	5
Calliandra humilis	Fairy Duster	0	0	1
Conyza canadensis	Horseweed	0	0	7
Cressa truxillensis	Alkali Weed	27	26	13
Cynodon dactylon	Bermuda Grass	5	23	5
Haplopappus gracilis	Haplopappus	1	0	0
Hoffmanseggia densiflora	Hog Potato	0	7	0
Larrya tridentata	Creosote	0	1	0
Malva neglecta	Common Mallow	0	2	0
Mentzelia pumila	Stick Leaf	0	2	0
Prosopis glandulosa	Mesquite	2	11	3
Salsola kali	Russian Thistle	3	4	0
Solanum eleagnifolium	Evening Nightshade	3	4	2
Sphaeralcea sp.	Globemallow	2	0	0
Suaeda suffrutescens	Desert Seepweed	0	0	22
Tamarix pentandra	Salt Cedar	0	0	1
Ulmus pumila	Siberian Elm	1	0	2
Yucca elata	Soaptree Yucca	0	1	2

Table 2
Bird Species Observed in the Three Sections of the American Canal Between the American Dam and the International Dam, El Paso, Texas.
June 18, 1999 to June 30, 1999

Species	Common Name	Upper Section	Middle Section	Lower Section
Agelaius phoeniceus	Redwing Blackbird	0	3	10
Anas platyrhynchos	Mallard	1	0	2
Carpodacus mexicanus	House Finch	3	0	0
Casmerodius albus	Great Egret	1	0	0
Charadrius vociferus	Killdeer	5	2	0
Chordeiles minor	Common Nighthawk	13	0	0
Columba livia	Rock Dove	56	34	36
Egretta thula	Snowy Egret	4	0	1
Hirundo pyrrhonata	Cliff Swallow	6	2	17
Hirundo rustica	Barn Swallow	18	0	1
Mimus polyglottos	Northern Mockingbird	0	0	1
Passer domesticus	House Sparrow	0	0	17
Quiscalus mexicanus	Great Tailed Grackle	8	4	7
Sternus vulgaris	European Starling	4	0	0
Tyrannus verticalis	Western Kingbird	3	1	1
Zenaida macroura	Mourning Dove	6	7	12

Table 3
Amphibian and Reptile Species Observed in the Three Sections of the American Canal Between the American Dam and the International Dam, El Paso, Texas
June 18, 1999 to June 30, 1999

Species	Common Name	Upper Section	Middle Section	Lower Section
Bufo speciosus	Texas Toad	0	0	1
Cnemidopherus uniparens	Little Striped Whiptail	2	0	1
Cnemidopherus inornatus	Desert Grassland Whiptail	1	0	0
Urosaurus ornatus	Tree Lizard	1	3	0
Uta stansburiana	Side Blotched Lizard	0	2	0

Table 4
Mammal Species Observed in the Three Sections of the American Canal Between the American Dam and the International Dam, El Paso, Texas.
June 18, 1999 to June 30, 1999

Species	Common Name	Upper Section	Middle Section	Lower Section
Citellus spilosoma	Spotted Ground Squirrel	2	0	0
Cynomys ludovicianus	Blacktail Prairie Dog	1	0	0
Lepus californicus	Blacktail Jackrabbit	0	1	0
Mus musculus	House Mouse	0	0	2
Sylvilagus autoboni	Desert Cottontail	3	1	0

The aquatic habitat in the Canal is temporary. The Canal flows with water during the irrigation season, and fish that have historically been observed in the main canal of the Rio Grande have been observed in the American Canal. Fish species in the Canal can be accounted for by migration from the Rio Grande during the high flow rates of the irrigation season. The habitat is not continually viable because the Canal is concrete, and therefore does not support aquatic vegetation important for aquatic communities. Species observed have historically included Bullhead Catfish, Large Mouth Bass, Sunfish, Gizzard Shad, Common Carp, River Carpsucker, Mosquito Fish, and other minnows and shiners (US Fish and Wildlife Service, 1993). Frequent emptying of the water in the Canal excludes the possibility of permanent fish populations.

No potential federal and state listed proposed, or candidate threatened or endangered species were found within the project area (Table 5).

Table 5
Endangered Species Listed as Occurring in El Paso County Texas
List Compiled by Texas Parks and Wildlife 1999

Species	Common Name	Status
Coryphantha sneedii sneedii	Sneed Pincushion Cactus	Endangered
Empidonax trailii extimus	Southwestern Willow Flycatcher	Endangered
Falco femoralis septentrionalis	Northern Aplomado Falcon	Endangered
Falco peregrinus anatum	American Peregrine Falcon	Endangered
Sterna antillarum	Interior Least Tern	Endangered
Strix occidentalis lucida	Mexican Spotted Owl	Endangered

Conclusions

To determine the effects of the proposed alternatives provided by the USIBWC on the wildlife community within the project area, a representative species was selected from the community as an indicator species to be examined in light of the proposed alternatives provided by the USIBWC.

The Cliff Swallow represents a species whose activities utilize much of the resources within and surrounding the project area. Many nests have been observed at the entrances to the closed conduits and at the flow measurement bridge near the American Dam. There were six potential Cliff Swallow nesting sites observed along the entire length of the project area. Cliff Swallows feed on flying insects that are attracted to the water of the river and the Canal and the surrounding vegetation. The Cliff Swallow was selected as the indicator species for the wildlife, habitat, and wetlands portion of this environmental assessment (see Table 6).

1. Closed Conduit Alternative. Closed conduits would probably reduce the number of feeding sites for Cliff Swallows on the Canal; however the proximity of the Rio Grande river immediately adjacent to the Upper and Lower Sections would probably continue to provide feeding sites. Nesting sites at the flow measurement bridge would probably not be effected. Nesting sites observed at the entrances to the conduits would probably become inaccessible; however the new entrance to the enclosed conduit would provide potential nesting sites. The Closed Conduit Alternative would probably cause no change to Cliff Swallow populations. The Closed Conduit Alternative would probably reduce the number of Cliff Swallow nesting sites by four (Table 6.).

2. Closed/Open Channel Alternative A. Replacing the Middle Section with a closed conduit would probably reduce feeding area on the Canal; however the proximity of the Rio Grande river to the project area would probably continue to provide feeding sites. The entrances to the closed conduits that provide nesting sites will be gone thereby reducing nesting sites. This reduction in the nesting sites would probably not affect the number of Cliff Swallow nesting sites because the flow measurement bridge in the Upper Section would remain available for nesting, and the entrance to the closed conduits in the Lower Section would continue to provide nesting sites. The Closed/Open Channel Alternative A would probably cause no change to Cliff Swallow populations. The Closed/Open Channel Alternative A would probably reduce the number of Cliff Swallow nesting sites by two (Table 6.).

3. Closed/Open Channel Alternative B. Closing in the Upper and Lower Sections would probably reduce feeding area and nesting sites for the Cliff Swallow on the Canal; however the proximity of the Rio Grande river to the project area would probably continue to provide feeding sites. The reduction in the nesting sites would probably not significantly impact the Cliff Swallow because the flow measurement bridge in the Upper Section would remain available for nesting, and the entrances to the closed conduits in the Middle Section would continue to provide nesting sites. The Closed/Open Channel Alternative B would probably not reduce Cliff Swallow populations, but would probably reduce Cliff Swallow nesting sites by two (Table 6.).

4. Open Channel Alternative. Rebuilding all existing open sections of the Canal would probably not reduce the feeding areas and nesting sites for the Cliff Swallow. Rebuilding the open sections of the Canal would probably cause no significant impact on Cliff Swallow populations. Rebuilding the open sections of the Canal would cause no significant impact on Cliff Swallow nesting sites.

5. No-Action Alternative. The No-Action Alternative would not change existing conditions in the project area, and therefore not effect Cliff Swallow populations and Cliff Swallow nesting sites.

Table 6
Effects to Habitat and Wetlands, Fish and Wildlife
From Five American Canal Reconstruction Alternatives

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Number of Endangered Species displaced	0	0	0	0	0
Number of Cliff Swallow Nesting Sites	2	4	4	6	6
Population of Cliff Swallows	25	25	25	25	25
Acres of local Wetlands affected	0	0	0	0	0
Permanent Fish population in Canal	0	0	0	0	0
Number of Endangered Species Habitats in Canal Area	0	0	0	0	0

Literature Cited

Degenhardt, William G., Charles W. Painter, Andrew H. Price. 1996. Amphibians and Reptiles of New Mexico. University of New Mexico Press, Albuquerque, NM

Goudie, Andrew. 1994. The Human Impact on the Natural Environment. Fourth Edition. The MIT Press, Cambridge, Mass.

Kearney and Peebles, 1969. Arizona Flora. University of California Press, Berkeley and Las Angeles, CA.

Ralph, C. John, G. R. Geipel, P. Pyle, T. E. Martin, D. F. DeSante. 1993. Handbook of Field Methods for Monitoring Landbirds. U.S. Forest Service Technical Report: PSW-GTR-144.

Short, Robert M. 1993. Fish and Wildlife Coordination Act Report, American Canal Extension Project. United States Fish and Wildlife Service. Unpublished.

G.2 - LETTER FROM US DEPARTMENT OF INTERIOR, FISH AND WILDLIFE SERVICES

United States Department of the Interior

FISH AND WILDLIFE SERVICES
Austin Ecological Services Office
Hartland Bank Building
10711 Burnet Road, Suite 200
Austin, Texas 78758
(512)490-0057

SEP 20 1999

2-15-99-I-0806

John Knopp
Encon International
7307 Remcon, Suite 101
El Paso, Texas 79912

Dear Mr. Knopp,

We have reviewed the "American Canal Environmental Assessment, Habitat, Wetlands, Fish and Wildlife, Final Report" dated September 2, 1999, prepared by Mr. Jacob Worley and received in our office on September 7, 1999. The Assessment concerns a proposed project by the International Boundary and Water Commission for improving 3.186 km of the American Canal in El Paso from the American Dam to the International Dam.

We concur with the findings in the Assessment that no significant effects to fish and wildlife resources are anticipated and the project will have no affect to species listed as threatened or endangered. For any potential concerns regarding wetlands, we recommend you contact the U.S. Army Corps of Engineers, Albuquerque District, Regulatory Branch.

Thank you for coordinating this project with us. For further correspondence regarding this project, please reference the Consultation Number on this letter. Any questions may be addressed to Nathan Allan at 512-490-0057.

Sincerely,

William Seawell
for

David C. Frederick
Supervisor

cc: Jacob C. Worley, 7305 S. Main, Mesilla Park, NM 88047

G.3 – RECORDS OF CONVERSATION

RECORD OF CONVERSATION - ENCON File # 122-9
Habitats, Wetlands, Endangered Species, Fish and Wildlife

Name: Ray Brown
Agency: US Fish & Wildlife Service (Austin)
Date/Time: 3/7/01 2:30 p.m.
Phone No: 512-490-0057

RE: Migratory Bird Treaty of 1918

Because reconstruction of the American Canal is limited to the non-irrigation season (October - February), no birds will be directly impacted. Therefore, the US Fish and Wildlife Service does not require a permit or request mitigation measures for project compliance with the Migratory Bird Treaty of 1918.

Recommended Action or Response

Name and Date: John Knopp 3/7/01

RECORD OF CONVERSATION - ENCON File # 122-9
Habitats, Wetlands, Endangered Species, Fish and Wildlife

Name: Kamile McKeever

Agency: US Fish and Wildlife Service (Albuquerque)

Date/Time: 3/7/01 3:00 p.m.

Phone No: 505-248-7887

Fax No: 505-248-7885

RE: Empty Nest Policy

Because the proposed construction project would not destroy any eggs or nestlings, the Interim Empty Nest Policy of the US Fish and Wildlife Service, Region 2, does not require either a permit or written notification of the beginning date of construction.

Recommended Action or Response

Name and Date: John Knopp 3/7/01

APPENDIX H

(Real Estate, Utilities, Easements, and Rights-of-Way)

H.1 - REAL ESTATE, UTILITIES, EASEMENTS, AND RIGHTS-OF-WAY TEXT

REAL ESTATE, UTILITIES, EASEMENTS, AND RIGHTS-OF-WAY

1.0 Introduction

This section is best understood while referring to the map provided at Figure 4, Appendix C. The narrow study corridor constitutes the route of the closed conduit segments and both levees of the three open channel segments of the American Canal. The eastern levee of the Lower Open Channel segment is adjacent to the western property line of many commercial businesses, and the western levee is adjacent to the flood plain of the Rio Grande. The eastern side of the Middle Open Channel segment adjoins BNSF Railroad tracks adjacent to ASARCO, and the western side of this channel portion adjoins the curb of West Paisano Drive. The eastern levee of the Upper Open Channel segment is adjacent to the rear of the USIBWC Field Offices and unimproved ASARCO flood plain land (formerly the site of Smeltertown), while the western levee is adjacent to the Rio Grande.

Within the corridor are rights-of-way for BNSF Railroad, West Paisano Drive, and the USIBWC American Canal. Easements for various utilities and telecommunications companies also lie within the rights-of-way.

Real estate values considered included not only adjoining properties, but also farms to which water is delivered through the American Canal. The local properties would be directly affected; while farms would be indirectly affected.

2.0 Utilities

Several public and private utility companies utilize the study corridor. They include El Paso Water Utilities-Public Service Board, El Paso Electric Company, El Paso Natural Gas, Southern Union Gas, various telecommunications companies, and the US Border Patrol. No utility lines cross into Mexico through the study area. The locations of the various utility easements are detailed below, and the routes are marked on the area map of utilities located at Figure 4, Appendix C. Because utility lines are sometimes moved or extended, the utility locations noted in this Assessment should be checked again before canal reconstruction begins.

UTILITIES LOCATED WITHIN AMERICAN CANAL RECONSTRUCTION AREA, JUNE 2000

Name of Company	Utility	Locations in Project Area as Reported October, 1999	Utility Locations Affected by Reconstruction Activities
El Paso Water Utilities – Public Service Board	36-inch potable water main	One continuous main within project area: • From Downtown: northbound Paisano Drive Right-of-Way (ROW), crosses Paisano over south end of Conduit B, then within southbound Paisano ROW	None
El Paso Water Utilities – Public Service Board	24-inch sewer main increasing to 30-inch	One continuous main within project area: • From south: crosses Lower Open Channel near Hart Lane, then north within western Lower Open Channel Levee (35'-50' from concrete canal lining), crosses south end of Conduit A, then north within northbound Paisano ROW	• Sewer Main Crossing Lower Open Channel near Hart Lane • Sewer Main Crossing south end of American Canal Conduit A
Southern Union Gas	Gas distribution lines	Two lines within project area: • From south: crosses Paisano near Globe Mills, then within paved road in front of businesses adjoining Lower Open Channel segment • From north: along northbound Paisano ROW in Upper Open Channel segment	None
El Paso Natural Gas	Gas lines	None (From south along BNSF RR tracks, then north through ASARCO)	None
El Paso Electric	• Buried cables • Overhead lines	• West of Paisano along Closed Conduits and Middle Open Channel segments (Routing for buried cables to planned new lighting along Lower Open Channel is not yet determined) • East of Lower Open Channel Levee, behind businesses west of Paisano	• None • None unless large equipment requires extra clearance
Southwestern Bell	• Buried lines • Overhead lines	• None • East of Lower Open Channel Levee, behind businesses west of Paisano	• None • None unless large equipment requires extra clearance
MCI	Fiber optic lines	East of tracks, in BNSF RR ROW	None
QWEST	Fiber optic lines	West of tracks, in BNSF RR ROW	None, if RR right-of-way not disturbed
Sprint Communications	Fiber optic lines	None	None
US Border Patrol	Spotlights shining on Rio Grande and American Canal	Mounted on power poles east of Lower Open Channel levee, behind businesses west of Paisano. These will probably be relocated by Border Patrol before Oct. 2000	None, if moved by Border Patrol before Oct. 2000 construction

3.0 Rights-of-Way and Easements

Rights-of-way would be needed from both TxDOT and the BNSF Railroad for staging of reconstruction activities (equipment, vehicles, supplies, etc.) for the Middle Open Channel segment of the American Canal. Entering the BNSF Railroad right-of-way requires requesting a permit from the railroad at least six weeks before entrance is required. A Railroad flagman, physical barriers, and other right-of-way requirements must also be provided. Additional BNSF Railroad slope requirements for any reconstruction involving Railroad rights-of-way can be obtained from the BNSF field division engineer in Albuquerque. A Union Pacific Railroad ROW would not be needed for this reconstruction project.

Along the Middle Open Channel, the western lip of the concrete canal adjoins the curb of West Paisano Drive. At that point, Paisano has no shoulder, and no additional right-of-way. Therefore, using the TxDoT right-of-way for staging would involve closing the northbound lane of West Paisano over the entire length of the Middle Open Channel, approximately 3000 feet. Personnel from the TxDoT Maintenance Department require at least a week's notification for lane closure, but request as much notice as possible.

Fiber optic lines which are laid in easements of the BNSF Railroad right-of-way will probably not be affected by construction staging activities which might take place in the Railroad right-of-way. The present USIBWC right-of-way appears to be sufficient for reconstruction in the Upper and Lower Open Channel segments, and may be sufficient for reconstruction in the Middle Open Channel segment. After the engineering specifications for the project are developed, it will be possible to determine if additional right-of-way access is needed for actual construction.

The US Border Patrol uses existing power poles along the Lower Open Channel to support its lighting equipment, and uses buried electric cable to provide power to this lighting equipment. At present, the Border Patrol is planning to install new lighting on its own poles, reportedly, closer to the river. Although this lighting equipment is not a separate utility, it has been included with utilities in this section.

4.0 Real Estate Values

The only real estate values to be considered in the study area are those of the commercial and apartment properties on West Paisano Drive adjoining the Lower Open Channel Segment. However, indirectly, real estate values of the farms irrigated from the American Canal system would also be affected in the event of a canal failure.

Resale Values in the Study Area

Because none of the canal reconstruction alternatives involves closing the roads in front of any businesses, no loss of revenue is expected during construction. Similarly, because none of the canal reconstruction alternatives would require acquiring any of the adjoining land, and the canal would not limit or improve access to these businesses, the resale values of the nearby properties are not expected to change. However, one of the local business owners feared an increase in the number of local burglaries and a resulting increase in the insurance premium if the canal was rebuilt entirely as a closed conduit.

Taxable Appraised Values in the Study Area

The Central Appraisal District, which has the authority to appraise commercial buildings for all local and state taxing entities, does not expect any of the alternatives to alter the taxable appraisals of the study area properties.

Indirect and Cumulative Effects to Irrigated Farms and El Paso Agribusinesses

El Paso County houses approximately 1700 businesses either directly or indirectly involved in agriculture-related business. Over 69,000 acres of farmland are irrigated with surface water distributed by the El Paso County Water Improvement District #1 which obtains its water from the American Canal. In the local desert climate with an average annual rainfall of seven inches, all agricultural crops are irrigated; none is dryland-farmed. Annual El Paso County agricultural production is currently estimated to be valued at approximately $302 million. However, the financial worth to El Paso County agricultural-related production, manufacturing, processing, wholesale and retail trade is valued at approximately $7.1 billion. Agribusiness is a very important sector of the El Paso economy. Any disaster or loss to the local farmers is multiplied by its effect on farm workers, chemical companies, wholesalers, transporters, retailers, banks, cotton gins, and many other businesses. El Paso agribusiness relies on dependable delivery of quality irrigation water.

Except for the No-Action Alternative, any of the four other alternatives chosen for reconstruction would help to protect the values of farms which use the American Canal for obtaining irrigation water. As discussed in the Assessment, if the old concrete canal lining suffers major damage during the peak summer irrigation season, and requires only one month of closure for repair, the loss in crop value could reach $20 million for farms whose irrigation water is transported via the American Canal. A $20 million loss would result in an estimated 500 local farm bankruptcies. The cumulative agribusiness "ripple effect" could result in up to $300 million in local losses.

As fully detailed in the Water and Soil Section at Appendix L, any of the alternatives, except the No-Action Alternative, also protect the permanent delivery of water to the El Paso Water Utilities' water treatment plants. By the year 2005, all potable water for El Paso will likely be treated water from the Rio Grande.

5.0 Summary of Effects

The effects of the five alternatives are conveniently summarized in the chart on the following page. Major utility mains and lines would be relatively unaffected, except for the points at which water and sanitary sewer mains cross over the closed conduit sections. At those areas, the water or sewer mains might need to be supported or disconnected and reconnected as the section of new closed conduit is connected to the old section. However, as the engineering specifications are not yet developed, it is not possible to state with certainty whether or not the water or sewage mains would need to be relocated.

Railroad and highway rights-of-way would be used for staging construction activities (i.e., personnel, equipment, vehicles, supplies, etc.) along the Middle Open Channel. The present USIBWC right-of-way appears to be sufficient for reconstruction in the Upper and Lower Open Channel segments, and may be sufficient for reconstruction in the Middle Open Channel segment. When the engineering specifications for the project are developed, it will be possible to determine if additional right-of-way access would be needed.

More important than the utilities or the right-of-way issues, are the real estate concerns. While local real estate values are expected to be relatively unaffected directly by any of the alternatives, real estate values of farms served by the American Canal could be greatly affected if a major canal failure develops during the peak summer irrigation months. As discussed in the Water Section of this report, a major failure of the patched and crumbling original three-inch-thick concrete canal lining could result in a repair period of up to 30 days, with a resulting disastrous loss of water and income to farms, related agribusinesses, and to the El Paso Water Utilities – Public Service Board.

The indicator issue chosen in the table on page 6 is the real estate-related number of local farm bankruptcies in the event of a canal failure and repair within the next five years.

SUMMARY OF EFFECTS ON REAL ESTATE, UTILITIES, RIGHTS-OF-WAY, & EASEMENTS FROM FIVE CANAL RECONSTRUCTION ALTERNATIVES

Alternative→ Effect ↓	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Length of water mains to be relocated (in feet)	0	0	0	0	0
Length of waste water mains to be relocated (in feet)	0	0	0	0	0
Length of gas lines to be relocated (in feet)	0	0	0	0	0
Length of buried electric cable to be relocated (in feet)	0	0	0	0	0
Length of overhead electric lines which might need to be relocated (in feet)	600	0	600	600	0
Length of fiber optic lines to be relocated (in feet)	0	0	0	0	0
TxDoT ROW used for staging during construction (in feet, approx.)	3000	3000	3000	3000	0
BNSF Railroad right-of-way used for staging during reconstruction (in feet, approx.)	3000	3000	3000	3000	0
Change in taxable appraised values of commercial properties adjoining Lower Open Channel (in %)	0	0	0	0	0
Change in Resale Value of Commercial Properties adjoining Lower Open Channel (in %)	0	0	0	0	0
Loss in El Paso County agricultural production from 30-day canal failure repair	$0	$0	$0	$0	$20 million
Loss to agribusinesses from emergency 30-day canal failure repair period	$0	$0	$0	$0	$300 million
Local farm bankruptcies resulting from 30-day canal failure repair period	0	0	0	0	500

6.0 Mitigations

The American Canal is used as a source of drinking water for the City of El Paso. Therefore, at any location where a sanitary sewer crosses over a closed or open channel segment of the canal, the canal should be protected from possible cross-contamination or infiltration of sanitary sewage, per standard engineering practices and local ordinances.

H.2 - RECORDS OF CONVERSATION

RECORD OF CONVERSATION - ENCON File # 122-9
Real Estate

Name: Mr. James Boggs

Date/Time: 8/31/99

Agency: Boggs Real Estate Appraisal

Phone No.: 915-854-3670

Mr. Boggs stated that the proposed alternatives of the American Canal would have no noticeable effect on the privately-owned commercial or residential property in the project area. The only change in property values would be to the subject property itself because potentially, the owner would be able to build over a box culvert but not over an open canal. However, as the owner of the canal (USIBWC) cannot sell the land, and has no plans to build any structures over or adjacent to the Canal, there would be no actual change in the property value.

Recommended Action or Response

Name and Date: John Knopp 8/31/99

RECORD OF CONVERSATION - ENCON File # 122-9
Real Estate

Name: Vince Kemendo, Asst. Manager
Agency: EP Central Appraisal Dist.
Date/Time: 10/4/99 3:30 p.m.
Phone No.: 915-780-2000

"Presently, we would not anticipate any change in property values along the project site for any of the proposed alternatives."

Recommended Action or Response

Name and Date: John Knopp 10/4/99

RECORD OF CONVERSATION - ENCON File # 122-9
Utilities

Name: Becky

Agency: Texas Call One

Date/Time: 10/8/99

Phone No.: 800-245-4545

Planned a "Survey Type" Investigation for 9:00 a.m., Wednesday, Oct. 13th.

Confirmation # 281-61-90

Will locate utilities along canal.

Recommended Action or Response

Name and Date: John Knopp 10/8/99

RECORD OF CONVERSATION - ENCON File # 122-9
Utilities

Name: Rick Deragish

Agency: Sprint Communications

Date/Time: 10/13/99

Phone No.: 915-203-3895

No fiber optic lines in study corridor

Recommended Action or Response

Call Collin Sword, District Engineer at (800) 254-3798.

Name and Date: John Knopp 10/13/99

H.3 - DOCUMENTS

LOCATION REQUEST INFORMATION

- YOUR TELEPHONE NUMBER
- YOUR NAME
- COMPANY
- COMPANY ADDRESS
- CITY OR CLOSEST TOWN
- COUNTY
- STREET ADDRESS
- NEAREST STREET INTERSECTION
- TYPE OF WORK
- *LENGTH OF JOB*
- BLASTING (YES OR NO)
- TYPE OF WORK

HB 2295, The Texas Underground Facility Damage Prevention Act requires that Excavators in Texas notify a one call notification center 48 hours prior to digging.

An easy TOLL FREE call providing the information above can prevent costly damages, prevent accidents, protect the environment and meet the requirements of the Law.

Be Safe. . .

Not Sorry !

Call Before . . . .

Digging

Blasting

Drilling

Grading

Pipe Pushing

Boring

Earth Moving

Texas One Call System

1-800-245-4545

Texas Law – HB 2295
Requires Excavators to contact a notification center at least 48 hours before digging.

For Information call

Gary Craig

At the

Texas One Call Office

(281) 970-0505

CALL
BEFORE YOU DIG

FOR FREE LOCATION OF UNDERGROUND FACILITIES IN YOUR AREA

Texas One Call System

1-800-245-4545

WHAT IS TEXAS ONE CALL ?

Texas One Call is a computerized notification center, which establishes a communications link between those who dig underground (excavators) and those who operate underground facilities (operators).

Texas One Call center is funded by members who are operators engaged in:

1. Communications
2. Gas Distribution
3. Gas Transmission and Gathering
4. Electric Power
5. Products/Pipelines
6. Water and Wastewater

(Water & Wastewater are "Class B" facilities per HB2295 and are NOT required to register with a one call notification center)

Texas One Call will determine from the excavator the location of the work.

Texas One Call will notify all its members with underground facilities in the area where the excavation will take place as well as all registered notification centers in Texas.

All operator members of all registered notification centers will mark their facilities in the area of the excavation. **ONLY ONE CALL IS NECESSARY.**

All messages to and from Texas One Call are recorded for the protection of both the excavator and the operators.

WHO BENEFITS ?

Everyone...operators, excavators and the general public benefit from the elimination of dig-ins, damages and outages. It reduces the chance of injury or worse, damage to public and private property and loss or interruption of services vital to public safety.

HOW MUCH DOES IT COST ?

Texas One Call Service is FREE to excavators. The notification center is funded by members of Texas One Call . Cost of membership is offset by the reduction in cost of repairs due to dig-ins.

HOW TO USE TEXAS ONE CALL SYSTEM

1. Excavator dials the Texas One Call System toll free number 1-800-245-4545.

2. An operator at the center records the required information listed on the back of this brochure, tells the caller names of companies and notification centers that will be notified, and gives the caller a Location Request Number.

3. The Location Request message is transmitted by computer link to the owners of the underground facilities and to all other registered notification centers in Texas.

4. The underground facility owner or operator marks the Location of facilities at the excavation site.

APWA STANDARD

COLOR CODE FOR TEMPORARY MARKING OF UNDERGROUND FACILITIES

RED - Electric Power Lines, Cables, Conduit and Lighting Cables

YELLOW - Gas, Oil, Steam, Petroleum or Gaseous Material.

ORANGE - Communication, Alarm or signal Lines, Cables or Conduit.

BLUE - Water, Irrigation and Slurry Lines.

GREEN - Sewers and Drain Lines

PINK - Temporary survey Markings

WHITE - Proposed Excavation

THE TEXAS ONE CALL *TOLL-FREE* PHONE NUMBER PROVIDES THE MEANS TO CONTACT ALL REGISTERED UNDERGROUND

APPENDIX I

(Transportation Section)

I.1 - TRANSPORTATION TEXT

TRANSPORTATION CORRIDOR

1.0 Introduction

The study area lies within a narrow transportation corridor leading northwest from downtown El Paso. This transportation corridor comprises one federal highway, railroad tracks from two different railroads, and one local bus route. The study area does not include any international bridges, navigable waterways, designated bicycle paths, or major pedestrian walkways.

2.0 Highways

The American Canal crosses twice under West Paisano Drive (US 85), and generally parallels Paisano Drive for the entire two-mile study area. Paisano is a divided four-lane roadway which connects downtown El Paso and west El Paso. Although the El Paso-Juarez area is a major center of interstate trucking, Paisano is not a major truck route. Most interstate commercial trucks use Interstate 10, located less than a quarter mile east of the study corridor. According to the 1998 Traffic Map produced by the Texas Department of Transportation (TxDoT), Division of Transportation Planning, West Paisano Drive carried approximately 19,000 vehicles per day in 1998. Paisano appears to be heavily traveled only during the morning and evening rush hours. In comparison, the adjacent segment of Interstate 10 carried approximately 117,000 vehicles per day in 1998.

The Yandell Overpass, the main traffic artery connecting West Paisano Drive with Sunset Heights and UTEP, carried approximately 4480 vehicles per day according to the 1998 TxDoT Traffic Map. The overpass would be unaffected by any of the five alternatives of canal reconstruction.

Many of the persons who enter the United States illegally on foot do so by crossing the Rio Grande immediately west of the study corridor, then cross Paisano Drive and Interstate 10. As these individuals are often running fast to avoid apprehension by the US Border Patrol, they often dart out into the dangerous, fast-moving traffic. The Engineering Department of the City of El Paso cited two pedestrian traffic fatalities and one incapacitating pedestrian injury in that area of Interstate 10 during 1998, and one fatality and one incapacitating pedestrian injury during 1997, but reported no recorded incidences on cars driving into the Canal in the study area.

In the two-mile study section of West Paisano Drive, the City of El Paso Engineering Department did not record any pedestrian fatalities during 1997 and 1998, but did report two pedestrian injuries each year. According to the US Border Patrol, most persons who cross the Rio Grande in the study area do so at the closed conduit segments of the American Canal. If enclosing the entire canal length in closed conduits results in tripling the number of daily illegal crossings, as predicted by the US Border Patrol, the number of pedestrian injuries and deaths will likely rise accordingly.

During reconstruction of the Middle Open Channel, the Engineering Department of the IBWC expects the need for northbound lane closure along the entire length of the Middle Section due to the narrow USIBWC right-of-way. The guardrail would be removed to facilitate the use of the lane for construction-related trucks, supplies, equipment, and for safety purposes. During any construction, concrete traffic barriers would be installed to prevent drivers from accidentally driving into the Canal. Reconstruction of the Upper or Lower Open Channel Segments would require only short duration lane closure at the point where those segments intersect West Paisano Drive. According to TxDoT Maintenance Department personnel, even if one lane of West Paisano Drive were closed in each direction at the same time, the highway could still carry the normal volume of traffic, with minor delays expected only during the rush hour period, especially in the evening.

The truck entrance to ASARCO will be unaffected by construction and will remain open; however, the automobile entrance would be closed during reconstruction of the Middle section.

The study corridor lies within an area of future TxDoT construction which would complete the construction of Loop 375 from downtown El Paso to the northwest. However, this highway construction is still many years away according to TxDoT Planning personnel. At present, TxDoT has not chosen the exact route, dimension, or elevation of the roadway. While Loop 375 may or may not pass through the study corridor, there is no way to evaluate the potential effects of canal reconstruction on any future Loop 375 construction at present.

3.0 Railroads

Two railroads are located in the traffic corridor, the Burlington Northern Santa Fe (BNSF) Railroad and the Union Pacific (UP) Railroad. Burlington Northern uses these tracks principally for local traffic, usually five trains per day Monday through Friday, with fewer trains on Saturday and none on Sunday. Because of the proximity of the BNSF tracks to the international boundary, BNSF Railroad reports a high rate of thefts and vandalism to its trains in this area, especially while the trains are sitting on side tracks waiting for another train to pass.

The BNSF track is located uphill from and adjacent to the Middle Open Channel Segment of the American Canal. Use of portions of the BNSF right-of-way would be essential during canal reconstruction activities. However, to prevent damage or delays to the Railroad, the BNSF requires anyone using the right-of-way to have a BNSF flagman, railroad insurance, and a BNSF permit.

Approximately twenty groundwater pumps are located in the BNSF right-of-way from a remediation system for a previous ASARCO diesel release. ASARCO has verbally offered the use of these pumps for the dewatering operations during the canal reconstruction. Together, these ASARCO water pumps can pump approximately 30 gpm (gallons per minute). Two fiber optic cables are located in the BNSF right-of-way, which adjoins the USIBWC Middle Open Channel right-of-way.

Locally, the Union Pacific Railroad carries much more traffic than the BNSF Railroad. However, in the study corridor, the BNSF tracks adjoin the Middle Open Channel segment of the American Canal, while the Union Pacific tracks are located at least one hundred yards up to about a half mile east of the American Canal. Therefore, no direct effects to the Union Pacific Railroad operations appear likely, while direct effects to the BNSF Railroad operations would be expected.

4.0 Bus Routes

The West Paisano Drive corridor is serviced by only one bus route. The Westside Express (Sun Metro Bus #18) neither picks up nor drops off passengers in the study corridor. The bus route uses the corridor Monday through Friday from approximately 6:30 to 8:30 a.m. and from 4:30 to 6:30 p.m. In case of construction or traffic delays, the Sun Metro Westside Express travels on Interstate 10, and maintains the same schedule. The route carries approximately 2600 riders per month or 130 riders per day.

5.0 Bicycle Paths

At present, there are no designated bicycle paths through the study area. However, the City of El Paso Parks and Recreation Department hopes to construct bike paths though the corridor in the future. While no actual plans have been drawn up for the corridor study area, the City has applied for a TxDoT grant to help develop a park with bike paths and walkways just south of the study area. The US Border Patrol does not allow bicycle traffic on the American Canal levees.

6.0 Pedestrian Traffic

Typically, very few pedestrians are observed walking on the concrete sidewalks along West Paisano Drive in the study corridor. Most pedestrian traffic would typically be from downtown to the Rescue Mission at 1949 West Paisano, located on the east side of Paisano near the southern end of the study corridor. The US Border Patrol and the El Paso Police Department discourage pedestrians (even utility company and other workers) from walking along the fenced levees of the American Canal, especially alone or at night. Typically no pedestrians are observed walking along the Canal. However, the City of El Paso Parks and Recreation Department would include walkways and bike paths near portions of the Canal, if the Department ever constructs a riverside park as occasionally discussed by City Parks Department personnel. Actual plans for such a park do not yet exist.

7.0 International Bridges

No international pedestrian or vehicular bridges exist in the study corridor. The closest international bridges are located approximately 1½ miles south in downtown El Paso.

8.0 Navigable Waterways

Neither the American Canal nor the El Paso reach of the Rio Grande are considered to be navigable waterways. There are no other navigable waterways in the study area.

9.0 Summary of Transportation Effects

Most of the effects on the local transportation corridor caused by the canal reconstruction are considered to be short-term or temporary (such as lane closure), and would occur only during construction activities. The few remaining effects are considered to be long-term or permanent. As the construction will not increase or decrease the number of area businesses or residences, the canal reconstruction project is not expected to change the permanent traffic volume on Paisano Drive (U.S. 85). The annual number of Interstate 10 pedestrian traffic fatalities was chosen as the indicator issue in the following table.

SUMMARY OF EFFECTS TO THE TRANSPORTATION RESOURCE FROM FIVE CANAL REPLACEMENT ALTERNATIVES

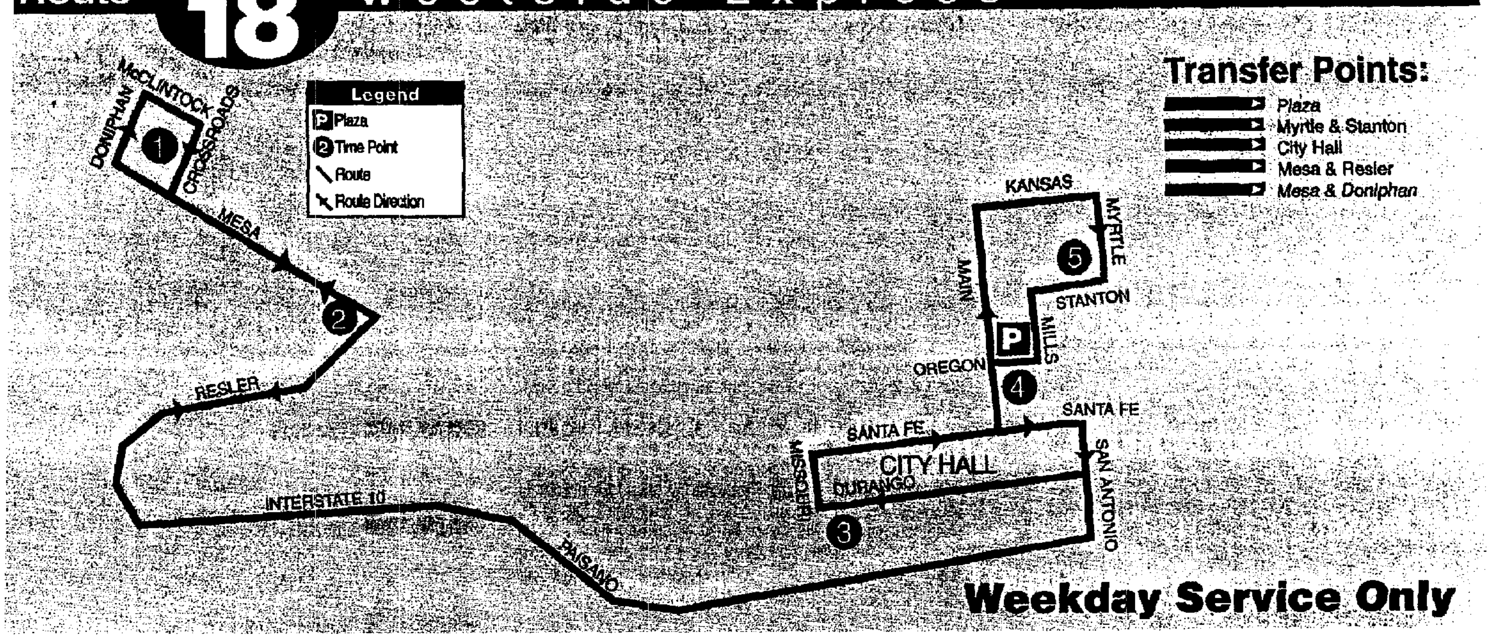
Alternative→ Effect ↓	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Paisano Drive capacity during Canal construction activities (# cars / day)	19,000	19,000	19,000	19,000	19,000
Yandell Drive overpass capacity during Canal construction activities	4,480	4,480	4,480	4,480	4,480
Southbound Paisano Drive (U.S. 85) lane closure during construction (# lanes)	0	0	0	0	0
Northbound Paisano Drive (U.S. 85) lane closure during construction (# lanes)	1	1	1	1	0
Bus traffic during construction (buses / day)	10	10	10	10	10
Pedestrian traffic during construction (# / hour)	0-1	0-1	0-1	0-1	0-1
BNSF Railroad capacity during construction (# trains / day)	5	5	5	5	5
Miles of bike paths open to public in study area after construction	0	0	0	0	0
Cars going off Paisano Drive (U.S. 85) into American Canal after construction	0	0	0	0	0
Estimated annual pedestrian traffic deaths on Interstate 10 after construction	4.5	3.0	4.5	1.5	1.5
Annual pedestrian traffic injuries on Interstate 10 and Paisano after construction	7.5	5.0	7.5	2.5	2.5
Long term additional traffic on Paisano Drive (U.S. 85) after construction	0	0	0	0	0

10.0 Mitigations

The U.S. Border Patrol, El Paso Police Department, BNSF Railroad, UP Railroad, and ASARCO have requested the construction of tall fences topped with barbed or razor wire on both sides of any canal reconstruction alternative. Adding additional fences, lighting, surveillance equipment, and Border Patrol personnel would help to reduce the number of persons crossing the river, the number of traffic fatalities and injuries, and the number of drownings. However, only the installation of additional fences will likely be in the budget of USIBWC mitigation actions. The other suggested mitigations involve actions by the US Border Patrol.

I.2 - SUN METRO BUS ROUTE

Route 18 Westside Express



Weekday Service Only

Boarding Point at Plaza Transit Center:
Main and Oregon

Morning

1 Doniphan & Mesa	2 Mesa & Resler	3 City Hall	4 Plaza Transit Ctr	5 Myrtle & Stanton	2 Mesa & Resler	1 Doniphan & Mesa
6:18	6:25	6:44	6:47	6:52	7:11	7:18
6:48	6:55	7:14	7:17	7:22	7:41	7:48
7:18	7:25	7:44	7:47	7:52	8:11	8:18
7:48	7:55	8:14	8:17	8:22	---	---
8:18	8:25	8:44	8:47	8:52	---	---

Plain Type=AM / Bold Type= PM

Evening

3 City Hall	4 Plaza Transit Ctr	5 Myrtle & Stanton	2 Mesa & Resler	1 Doniphan & Mesa	2 Mesa & Resler	3 City Hall
4:15	**4:18**	**4:23**	**4:42**	**4:49**	**4:56**	**5:15**
4:45	**4:48**	**4:53**	**5:12**	**5:19**	**5:26**	**5:45**
5:15	**5:18**	**5:23**	**5:42**	**5:49**	**5:56**	**6:15**
5:45	**5:48**	**5:53**	**6:12**	**6:19**	**6:26**	**6:45**
6:15	**6:18**	**6:23**	**6:42**	**6:49**	**6:56**	**7:15**

Plain Type=AM / Bold Type= PM

I.3 - CITY OF EL PASO TRAFFIC FATALITY AND INJURY INFORMATION (1997 - 1998)

Pedestrian Accidents on Highways Between International Dam and American Dam (Source: El Paso Police Department)

Year	Highway	Cross Street or Milepost	Date	Time	Cause	Results
1997	I-10 West	MP 18	08-27-97	0538	Pedestrian Not Crossing at Intersection	Fatal
1997	I-10 West	MP 18	11-20-97	1450	Pedestrian Not Crossing at Intersection	Incapacitating Injury
1997	West Paisano (U.S. 85)	Ruhlen Ct.	10-26-97	1600	Pedestrian Not Crossing at Intersection	Incapacitating Injury
1998	West Paisano (U.S. 85)	Ruhlen Ct.	05-25-98	2008	Pedestrian Not Crossing at Intersection	Incapacitating Injury
1998	I-10 East	MP 18	11-13-98	1907	Pedestrian Not Crossing at Intersection	Fatal
1998	I-10 East	MP 18	11-13-98	1907	Pedestrian Not Crossing at Intersection	Fatal

I.4 - RECORDS OF CONVERSATION

RECORD OF CONVERSATION - ENCON File # 122-9
Transportation

Name: Pete Dunavent

Agency: Sun Metro

Date/Time: 9/1/99

Phone No: 915-534-5829

Only Bus #18 runs through West Paisano. There are 5 express buses in the morning and 5 in the afternoon.

The route carries 2,600 passengers per month.

Recommended Action or Response

Name and Date: John Knopp 9/1/99

RECORD OF CONVERSATION - ENCON File # 122-9
Transportation

Name: Judy Ramsey, Trans. Planning Admin.
Date/Time: 9/99
Agency: Texas Dept. of Transportation
Phone No: 915-774-4322

Texas Dept. of Transportation plans to extend Loop 375 from downtown through study area in about 10 years.

No specs or right-of-way requirements exist yet.

Recommended Action or Response

Name and Date: John Knopp 9/99

RECORD OF CONVERSATION - ENCON File # 122-9
Transportation

Name: Lt. Roy Davis, Supervisor
Agency: El Paso Police, Traffic Enforcement
Date/Time: 10/6/99
Phone No: 915-564-7000

Border Patrol Operation "Hold the Line" began in 1993 and dropped the traffic fatalities dramatically, 40%.

Recommended Action or Response

Call Luisa Garcia at City Engineering in Traffic & Transportation Dept. for statistics of fatalities and injuries.

Name and Date: John Knopp 10/6/99

RECORD OF CONVERSATION - ENCON File # 122-9
Transportation

Name: Mitch Espinoza, Trainmaster

Date/Time: 10/12/99 10:15 a.m.

Agency: Burlington Northern Santa Fe Rlrd.

Phone No: 915-534-2308

There are 3 freight trains per day (6:00 a.m., 9:00 a.m., and 10:30 p.m.) on the tracks by the Canal - 6 days per week.

There is also a roundtrip local industry train five days a week. The train services ASARCO, the cement company, and other local industries. During their 3:30 p.m. to 3:30 a.m. shifts, cars may remain sitting on the tracks for a time, but generally not till after 5:00 p.m.

Recommended Action or Response

Call Mario Reyes (Burlington Northern Santa Fe Police) about railroad crime.

Name and Date: John Knopp 10/12/99

RECORD OF CONVERSATION - ENCON File # 122-9
Transportation

Name: Henry Lara, Field Engineer **Date/Time:** 10/25/99 10:00 a.m.

Agency: BNSF Railroad, NM Division **Phone No:** 505-767-6847

Before planned construction design, engineers should contact him.

Addendum June 5, 2000 2:00 p.m.

Meeting with Harry Lara, John Knopp, Andy Sieger, and Steve Fox at Canal at entrance to ASARCO

Currently the BNSF Railroad requires constructing a 2:1 slope to insure slope stability. However, for this project the BNSF can accept a steeper 1.5:1 slope during and after canal construction. BNSF Railroad requests that canal plans be submitted to the railroad for review. Mr. Lara anticipates no disruption in service during canal reconstruction.

Name and Date: John Knopp 10/25/99

RECORD OF CONVERSATION - ENCON File # 122-9
Transportation

Name: Henry Mondragon, Roadmaster
Date/Time: 10/25/99
Agency: Burlington Northern Santa Fe Rlrd.
Phone No: 915-534-2366

The right-of-way fluctuates by the Middle Channel location. However, to work within 25 feet of the centerline requires a flagman at $500.00 per day plus overtime, railroad liability insurance, and paperwork. Applications for working on Railroad Rights-of-way land require approximately 6 weeks to process.

Recommended Action or Response

1) Call Harry Lara, New Mexico Division Field Engineer concerning slope and sheet pile requirements (505) 767-6847.
2) Call Ben Calyborne from Catellus Management in Irving, Texas for requirements concerning Right-of-way. USIBWC should give copies to contractors for reconstruction meeting.

Name and Date: John Knopp 10/25/99

RECORD OF CONVERSATION - ENCON File # 122-9
Transportation

Name: Mario Reyes, Capt. Railroad Police

Agency: BNSF Railroad, Resource Protection Div.

Date/Time: 10/26/99 1:00 p.m.

Phone No: 915-534-2309

Because trains coming into the yards are easy targets for criminals, the trains are frequently vandalized or burglarized.

Before 1993 when the Border Patrol began "Operation Hold the Line," the railroad averaged 27 burglaries per day near the project area, (roughly 810 per month). That number was reduced to approximately 1 per month, a 99.9% reduction.

High fences with barbed wire would reduce crime if open canals are replaced with closed conduits.

People who open closed containers or cars to keep warm also suffer.

More fences and gates would help reduce crime.

Recommended Action or Response

Send explanation and chart.

Name and Date: John Knopp 10/26/99

RECORD OF CONVERSATION - ENCON File # 122-9
Transportation

Name: Robert Tejada, Dir. of Maintenance

Agency: Texas Dept. of Transportation

Date/Time: 10/26/99

Phone No: 915-774-4319

For construction, submit traffic Control Plan (signage, barriers, etc.) to him.

Texas Dept. of Transportation needs at least a week to process lane closure requests, but more time is better.

West Paisano will be able to handle the normal traffic even with lane closure during construction.

Recommended Action or Response

Name and Date: John Knopp 10/26/99

APPENDIX J

(Environmental Justice)

J.1 – ENVIRONMENTAL JUSTICE TEXT

ENVIRONMENTAL JUSTICE

1.0 Rationale and Description

When environmental justice was added in 1994 to the scope of National Environmental Policy Act-related environmental assessments, the expected assessment areas were never explicitly detailed. Rather, a spirit was shaped to include justice concerns to the community, and especially the direct and indirect consequences to the health and well being of the poor.

2.0 Introduction

The study area is a very sparsely populated area approximately one mile north of downtown El Paso, the poorest (per capita) major city in the United States. The area lies in an Empowerment Zone designated by the Federal government to promote redevelopment in poor areas.

Lower Open Channel Area: There are two apartment buildings or tenements that cater to low-income people. One of the apartment buildings originally served as the site of Fort Bliss in the late 1800s before the Army Post was moved to its present location northeast of downtown El Paso. The apartment buildings house a somewhat transient population estimated to be fewer than 50 persons. The windows of the apartments are covered with iron security bars. The back yards of the apartment buildings, which adjoin the Lower Open Channel of the American Canal, have wire fences topped with barbed wire, which have been cut in many places. At the present time, no grocery stores, convenience stores, laundries, gas stations, or other services related to local residents are located in the study corridor. No local buses serve the residents of the study corridor. The area near the apartment buildings has very few trees or other amenities of any type. Adjoining the apartments is a small, little-used City Park with an onsite wastewater lift station which is used to pump sanitary sewage westward across the Canal and uphill to the Northwest Wastewater Treatment Facility located north of Executive Center Drive.

Some small manufacturing or service businesses are located adjacent to the apartments. The largest and best known of the businesses is the historic Hacienda Café located east of the south end of the Lower Open Channel. Typically, the local residents are not employed in the adjoining businesses. Because of the high rate of local burglaries by persons who cross the Rio Grande to burglarize El Paso residences or businesses, the adjacent businesses are typically surrounded by high chain link fences topped with barbed and/or razor wire.

Across Paisano Drive from the row of businesses is the Rescue Mission of El Paso, which houses up to 125 homeless persons a night during the peak winter months. The yard of the Rescue Mission is also enclosed with high security fences to prevent burglaries.

Middle Open Channel Area: The fenced open channel is located east of Paisano Drive, and the Rio Grande lies to the west of Paisano. Adjacent to the Canal are the Burlington Northern Santa Fe Railroad tracks. The ASARCO (American Smelting and Refining Corporation) smelter facility occupies the land east of the railroad tracks. Though the ASARCO property rises steeply above the railroad tracks and a guard is posted at the gate to reduce unauthorized access to the property, ASARCO personnel report a relatively high rate of burglaries and thefts of company vehicles and equipment.

Upper Open Channel Area: Adjoining this canal segment is a USIBWC field office, which contains the only structures remaining from the historic community known as "Smeltertown." This former residential community was condemned and razed in the 1960s because of high levels of lead found both in the blood levels of the residents and in the soil of the neighborhood. There are no residences or other businesses in the area of the Upper Open Channel.

3.0 Crime / Border Patrol / EP Police Department

The United States Border Patrol is charged by the Department of the Interior with the task of protecting the American border from drug runners, weapons smugglers, and undocumented aliens trying to enter the country illegally. Border Patrol Agents have the authority to detain persons entering illegally. Border Patrol officers in the study area have occasionally been the targets of gunmen from across the border, and Border Patrol vehicles are frequently attacked with rocks and guns by Mexican criminal gang members who have crossed into the United States. A few years ago in the study area, Mexican criminals routinely blocked West Paisano at night and then robbed the unsuspecting drivers of their money and sometimes their cars. In 1993, after national news coverage of the problem, the Border Patrol obtained money to begin "Operation Hold the Line." This operation increased the number of agents, installed lighting, surveillance cameras, motion detectors, and tall fences along the American Canal or the Rio Grande in the study area.

To reduce the number of crimes along the border and to minimize the personal danger to its agents, the US Border Patrol has begun an improvement of the security in the area between downtown and the International Dam. New 1000-watt lights will be installed approximately 150 feet apart on tall poles near the river. Motion sensors and additional surveillance cameras will also be mounted on the poles.

The Westside Command of the El Paso Police Department is assigned the task of protecting persons and property in the study area. Police officers described and named several criminal gangs operating in areas in Mexico immediately across the Rio Grande from the study area. They described witnessing robberies, assaults, and rapes committed in Mexico by gang members who prey on the Mexican poor, especially individuals waiting to cross the Rio Grande into the United States.

For the three-year period from 1996 through 1998, the El Paso Police Department recorded one Robbery, four Aggravated Robberies, eight Burglaries of Habitations and Businesses, twelve Burglaries of Vehicles, three Aggravated Assaults, and five Thefts in the study area. Police personnel reported that the crime rate was much worse before the Border Patrol's "Operation Hold the Line" began in 1993. The Police Department reported that the Operation has reduced traffic fatalities by 40%, and has greatly reduced the number of burglaries and other types of crime in a large portion of the City of El Paso. El Paso Police Department personnel feared that replacing the open channels with closed conduits would probably result in a higher crime rate. Police personnel expressed concern that as they could not assign special officers exclusively to the canal area, officers might be delayed in arriving at crime scenes. The Police Department noted that they cannot detain anyone until a crime is committed, and the Border Patrol would have to increase security if the open channel segments were replaced with closed conduits.

4.0 Drownings in and Rescues from Canal

Minimizing the number of drownings is included as a part of the training and is a responsibility of the US Border Patrol Agents. They seek to accomplish this goal by 1) improving canal safety equipment, 2) publicizing the dangers of drowning in the swift canal waters, and 3) improving the percentage of successful live rescues from the canal. To warn of the dangers, the Border Patrol provides public service announcements to be used on Juarez radio stations and large posters to be placed in public buildings in Juarez. (A reduced example of one of the posters follows within this Appendix).

The Border Patrol keeps records of rescues and drownings for the entire American Canal and Rio Grande American Canal Extension (RGACE). They estimated that approximately one third of the canal rescues and half the canal drownings actually occur in the two-mile long original American Canal. As can be seen in the following table, when Border Patrol Agents began receiving improved rescue training and rescue equipment, the number of live rescues increased and the number of drownings decreased.

ANNUAL NUMBER OF HUMAN DROWINGS AND LIVE RESCUES FROM THE AMERICAN CANAL REPORTED BY US BORDER PATROL AGENTS

Activity	Fiscal Year				
	1995	1996	1997	1998	1999
Estimated Number of Drownings in 2-mile long American Canal	Not Available	Not Available	Not Available	10	5
Estimated Number of Live Human Rescues in 2-mile long American Canal	15	30	25	30	15

5.0 Businesses in the Study Area

The private police departments of both the Burlington Northern Santa Fe Railroad and the Union Pacific Railroad reported a high rate of burglary and vandalism of their trains in the study area, especially in the areas closest to the Lower Open Channel and Conduit B. Personnel from both railroads stated that they expected the rate of crime to rise if the open channels are reconstructed as closed conduits, but they could not estimate the percentage increase. Police personnel from both railroads described a very dramatic reduction in crime against their trains when the Border Patrol began its "Operation Hold the Line" in 1993.

Owners of businesses adjoining the Lower Open Channel of the American Canal stated that persons routinely cut through their fences or barbed wire after crossing the river and the canal. Reportedly, those persons run through their properties on their way into El Paso; but occasionally, they burglarize the area businesses. Business owners did not recall seeing drowning victims in the canal, but they had heard of drownings in the canal over the past years. Local business owners seemed to be more concerned about the possibility of higher crime if the Lower Open Channel segment were enclosed as a closed conduit (alternatives 1 and 3). The business owners also feared a corresponding increase in their insurance rates.

6.0 Proposed Rio Grande Riverpark

In conjunction with the National Park Service, the Texas Department of Transportation, the City of Sunland Park, and other agencies and local groups, the City of El Paso has structured a four-phase plan to develop a park on the eastern bank of the Rio Grande from downtown El Paso north to Borderland Road, a distance of approximately 15 miles.

The City Department of Planning, Research, and Development plans to gradually develop the park with historic markers, trees, walking trails, bike paths, and picnic tables. The first phase would extend from downtown El Paso to the International Dam. The second phase of the park would encompass the entire 2-mile Canal area. The objective of El Paso Planning Department personnel is to begin Phase II park construction within approximately three to five years. While plans have not been finalized, tentative plans include a fourteen-foot wide bicycle path near the river. City Planning personnel stated that the bike path could be built near fenced open channel segments or even above closed conduit segments. In the study area, the bike path is expected to cross the canal only once, at or near the head gates of the American Canal. In all five reconstruction alternatives, that 400-foot canal section would be left open, and therefore, construction of a bicycle and a footbridge would be required over the open channel.

7.0 Summary of Environmental Justice Effects from the Five Canal Reconstruction Alternatives

None of the four construction alternatives is expected to seriously disrupt the lives of the local residents or business owners during construction. Similarly, none of the alternatives is expected to change the number of permanent jobs in the study area.

The US Border Patrol expects fewer drownings with more sections of closed conduits, but also expects the higher number of illegal border crossings to result in higher numbers of pedestrian traffic fatalities and pedestrian injuries, (Refer to Transportation Section in Appendix I of this report). Similarly, the El Paso Police Department and the US Border Patrol would both expect an increase in crime in the study area as well as in other sections of west El Paso due to any additional channel enclosures. Both agencies anticipate the need for additional Border Patrol agents and equipment where existing open channel segments become closed conduits.

SUMMARY OF EFFECTS TO ENVIRONMENTAL JUSTICE RESOURCE FROM THE FIVE CANAL REPLACEMENT ALTERNATIVES

Alternative→ Effect ↓	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Number of local residents to be relocated by reconstruction	0	0	0	0	0
Number of local residents to be permanently employed by new businesses created through canal reconstruction	0	0	0	0	0
Annual number of crimes reported to El Paso police in American Canal area	24	16	24	8	8
Number of annual drownings in American Canal	0	3*	1*	5*	5
Change in number of annual illegal crossings to US via American Canal area	300%	100%	200%	0%	0%
Number of Border Patrol Agents needed to protect American Canal area	16	12	14	8	8
Number of additional pole-mounted 1000-watt lights needed by Border Patrol	48	19	33	0	0
Additional annual costs to Border Patrol	$1,564,000	$1,150,000	$1,377,000	$630,000	$630,000
Initial facility improvement costs to Border Patrol	$1,600,000	$900,000	$1,300,000	$300,000	$300,000
Approximate length of proposed River Park adjoining Canal (in miles)	2	2	2	2	2

* Construction of additional fences as a mitigation would probably lower the number of drownings from these estimates.

The Annual Number of Drownings in the American Canal was chosen as the indicator issue for the Environmental Justice Resource.

8.0 Mitigations

The El Paso Police Department, US Border Patrol, BNSF Railroad, UP Railroad, and ASARCO have all requested the construction and regular maintenance of eight-foot-high fences topped with barbed wire throughout the entire length of the Canal, especially for any closed conduit sections. This mitigation would reduce the crime rate, the number of drownings, and the number of traffic deaths on I-10.

J.2 – AMERICAN CANAL CRIME STATISTICS FROM 1996-1999

(Source: El Paso Police Department)

EL PASO POLICE DEPARTMENT
EL PASO, TEXAS

INTER - OFFICE MEMORANDUM

TO: Lt. Davidson

FROM: Westside Impact Team

RE: NEPA Environmental Assessment for 2-mile long segment of the American Canal beside Paisano Drive.

DATE: Sept 06, 1999

The following is a breakdown of criminal activity reported from the 1700 to 2800 block of W. Paisano over a three year period (Jan 01, 1996 thru Sept 01, 1999).

Aggravated Robberies: (Four)
#1. 2200 W. Paisano, #96-169020
#2. 2400 W. Paisano, #96-227335
#3. 2300 W. Paisano, #99-182359
#4. 2000 W. Paisano, #99-183324

Robberies: (One)
#1. 2300 W. Paisano, #97-003100

Burglary of Habitation & Business: (Eight)
#1. 2000 W. Paisano, #96-296076
#2. 2000 W. Paisano, #96-305040
#3. 1720 W. Paisano, #97-169039
#4. 1720 W. Paisano, #97-185278
#5. 2000 W. Paisano, #97-228164
#6. 1720 W. Paisano, #97-303211
#7. 2616 W. Paisano, #98-175077
#8. 2000 W. Paisano, #99-139349

Burglary of Vehicles: (Twelve, five of which were Border Patrol units)
#1. 2300 W. Paisano, #96-126326
#2. 2301 W. Paisano, #97-167329
#3. 2700 W. Paisano, #97-192053
#4. 2800 W. Paisano, #97-192048
#5. 2800 W. Paisano, #98-227350 (BP)
#6. 2000 W. Paisano, #98-212044 (BP)
#7. 2000 W. Paisano, #98-234321
#8. 2301 W. Paisano, #98-242099 (BP)
#9. 2301 W. Paisano, #98-250116 (BP)
#10 2300 W. Paisano, #98-336173
#11 2000 W. Paisano, #99158202
#12 2301 W. Paisano, #99232029 (BP)

Aggravated Assaults: (Three, one which was on a Police Officer)
#1. 2300 W. Paisano, #96-004036
#2. 2300 W. Paisano, #96-094314
#3. 2200 W. Paisano, #96-213048

Theft Cases: (Five)
#1. 2301 W. Paisano, #96-029201
#2. 2301 W. Paisano, #96-046132
#3. 2000 W. Paisano, #96-089240
#4. 2616 W. Paisano, #98-141146
#5. 2301 W. Paisano, 99-188173

Numerous Cases of Vandalism

J.3 – AMERICAN CANAL WARNING POSTER DISTRIBUTED IN MEXICO

(Source: US Border Patrol)

MEXICANO, NO ARRIESGUES TU VIDA AL CRUZAR A ESTADOS UNIDOS; CONOCE TUS DERECHOS Y OBLIGACIONES

[illegible] NO TE EXPONGAS A PELIGROS. NO CRUCES POR RIOS, CANALES DE RIEGO, [illegible] DESERTICAS O CARRETERAS RAPIDAS. NO DUERMAS EN VIAS DE FERROCARRIL. [illegible] DEJES ENGAÑAR CON INFORMACION INCORRECTA SOBRE EL CRUCE.

[illegible] ALGUNA AUTORIDAD EN ESTADOS UNIDOS, TIENES [illegible] A SER [illegible] CON RESPETO AUNQUE NO CUENTES CON [illegible] EN TU LEGAL ESTANCIA EN ESTE PAIS. EN TAL [illegible] SEGUIR ESTAS **RECOMENDACIONES**:

○ [illegible] CUALQUIER CONFRONTACION CON LA AUTORIDAD. NO ASUMAS [illegible] AGRESIVAS; NO TE RESISTAS NI INTENTES ESCAPAR; SOLO EXIGE QUE SE RESPETEN TUS DERECHOS

○ [illegible] CONDUZCAS CON MENTIRAS, SIEMPRE PROPORCIONA TU NOMBRE [illegible] Y TU DOMICILIO CORRECTO. ESTO SERA DE GRAN UTILIDAD [illegible] CASO DE QUE ALGUN FAMILIAR QUIERA LOCALIZARTE

○ [illegible] CONSIDERAS NECESARIO, TIENES DERECHO A CONTAR CON LA [illegible] DE UN ABOGADO O DE UN REPRESENTANTE DEL CONSULADO MEXICANO PARA QUE RECIBAS ORIENTACION

○ [illegible] EDAD Y VIENES ACOMPAÑADO POR UN FAMILIAR ADULTO, [illegible] AUTORIDAD MIGRATORIA PARA QUE NO LOS SEPAREN

○ [illegible] UTILICES [illegible] FALSOS O QUE NO TE PERTENEZCAN, PUES PODRIAS [illegible] PROCESA[illegible]MENTE Y TERMINAR EN LA CARCEL; TAMPOCO PORTES ARMAS DE [illegible] NAVAJAS U OTROS INSTRUMENTOS PELIGROSOS

[illegible] UN BOLETO DE AVION Y/O AUTOBUS QUE NO USASTE POR HABER [illegible] SOLICITA QUE TE COMUNIQUEN CON UN REPRESENTANTE DEL [illegible] DE MEXICO PARA AYUDARTE A RECLAMAR EL REEMBOLSO DE LO [illegible] PAGASTE. SI RADICAS EN CIUDAD JUAREZ, TE RECOMENDAMOS QUE PARA [illegible] TRAMITE TE DIRIJAS A LA DELEGACION DE LA SECRETARIA DE RELACIONES EXTERIORES, UBICADA EN MELQUIADES ALANIS 6588,
TELEFONOS 17 59 64 Y 17 59 63

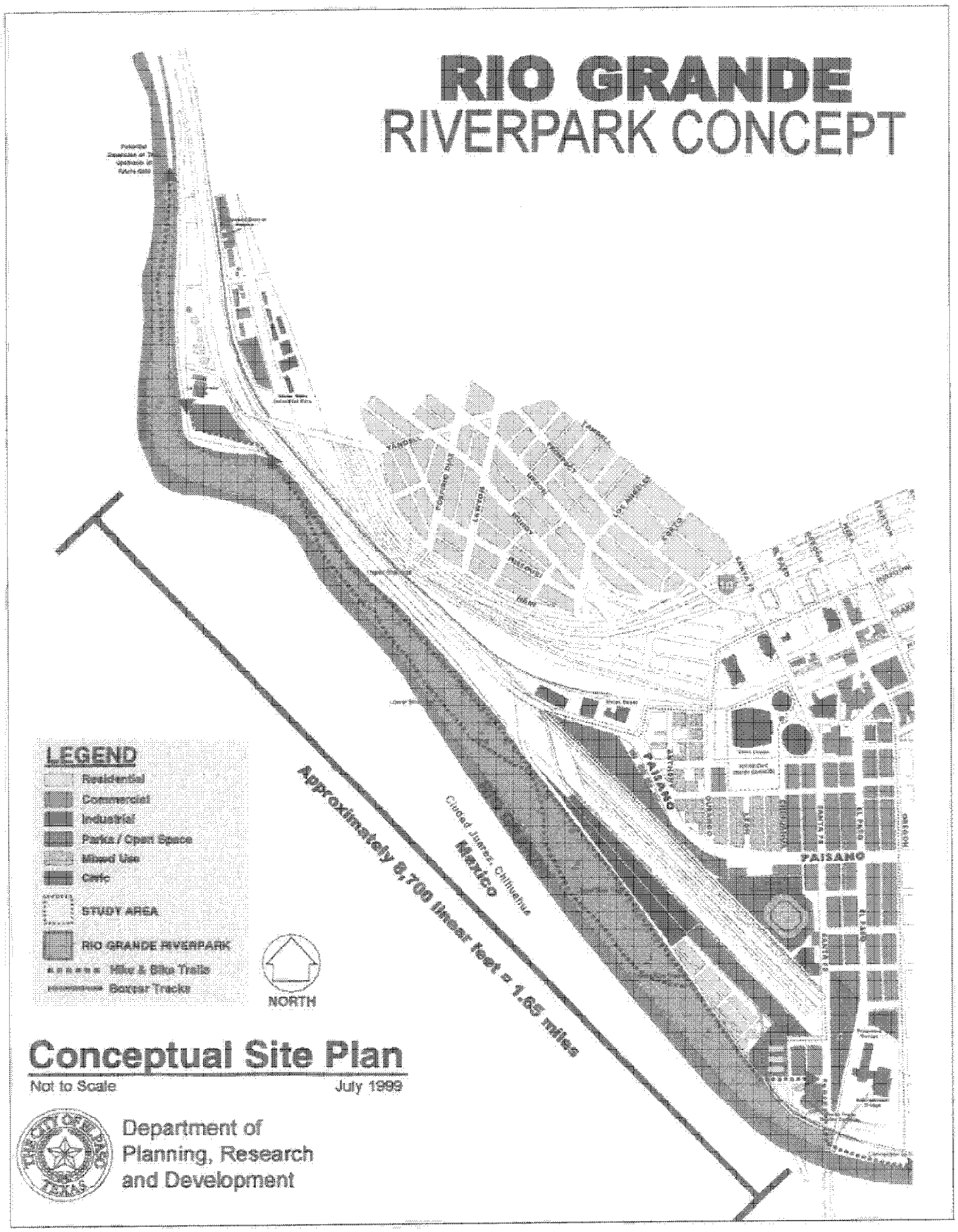
[illegible] GENERAL
[illegible] MEXICO
DEPARTAMENTO DE PROTECCION
(915) [illegible]

910 EAST SAN ANTONIO
EL PASO, TEXAS 79901

J.4 – RIO GRANDE RIVER PARK CONCEPT DOCUMENTS

(Source: City of El Paso)

RIO GRANDE
RIVERPARK CONCEPT



Conceptual Site Plan

Not to Scale July 1999

Department of
Planning, Research
and Development

RIO GRANDE
RIVERPARK CONCEPT

Potential hike trail with bridge over drainage area.

Open space near trail and river bank.

View of park from northwest.

THE CITY OF EL PASO TEXAS

Department of
Planning, Research
and Development

RIO GRANDE
RIVERPARK CONCEPT

Trail Design Concepts.

THE CITY OF EL PASO TEXAS

Department of
Planning, Research
and Development

United States Department of the Interior
NATIONAL PARK SERVICE
INTERMOUNTAIN REGION
Intermountain Support Office - Santa Fe
P.O. Box 728
Santa Fe, New Mexico 87504-0728

1849-1999

In reply refer to:

D18(IMSF-RTCA)

Mr. Nat Campos
Planning Director
Two Civic Center Plaza
El Paso, Texas 79901-1196

Dear Mr. Campos:

It is a pleasure to inform you that the Rio Grande Riverpark project has been selected for support by the National Park Services' Rivers, Trails and Conservation Assistance Program (RTCA) for Fiscal Year 2000. Paul Cusumano and I will represent RTCA in this effort and I will be your primary contact for assistance and information. The RTCA program works with communities across the United States to develop community plans which address: quality of life issues relating to trails and greenways, recreation, river corridor enhancements, fisheries and habitat improvements, cultural resource enhancement, and environmental education.

The Rio Grande Riverpark application for assistance rated very strong in our regional project selection process. We were very impressed with the partners already supporting the Riverpark idea and the City's willingness to take on a very complex and challenging project. The Rio Grande should become an attractive community resource for El Paso.

We are currently developing a work plan for our involvement in the project. We hope all of the partners in the Rio Grande Task Force could sign a partnership agreement indicating their willingness for a collaborative approach to Rio Grande planning and improvements.

We look forward to working with your staff and other partners in this ambitious project. If you have any questions about RTCA assistance, please call me at (505) 988-6092.

Sincerely,

Attila Bality
Outdoor Recreation Planner,
Rivers, Trails and Conservation Assistance Program

J.5 – RECORDS OF CONVERSATION

RECORD OF CONVERSATION - ENCON File # 122-9
Environmental Justice

Name: Lt. Tim Davidson and Officer Rudy Bonilla

Date/Time: 9/24/99 2:00 pm

Agency: El Paso Police Department-Westside Command

Phone No: 915-585-6000

Subject: Effects of 5 USIBWC American Canal Alternatives on Crime in El Paso

The subject area is considered to be an area of high numbers of crimes against persons and property. Most crimes in this area are committed by persons who cross the Rio Grande from Mexico, commit the crime, and return very quickly to Mexico. Many Kern Place home burglaries are committed by persons crossing the river near Apache Creek and the Hacienda Café, and then crossing under Interstate 10 through storm drains. Occasionally the criminals block traffic on Paisano Drive, and assault or rob drivers. Recently, one criminal on a hill threw large rocks at a Police car parked near the entrance to ASARCO, damaging the car and injuring one officer. train cars are often burglarized as the train sits waiting on side tracks near Paisano Drive.

Statistics provided by the Police Department counted only the number of crimes actually reported to police, and said to have been committed along Paisano Drive. The actual numbers are known by the Police Department to be much higher, including assaults or crimes against Police Officers, Border Patrol Agents, undocumented aliens, and others. Reported crimes from January 1, 1996 to September 1, 1999 included

Aggravated Robberies	04
Robbery	01
Burglaries of Habitation or Business	08
Burglaries of Vehicle	12
Aggravated Assaults	03
Thefts	05
TOTAL	33
(Yearly Average)	08

The Police have observed that fences are not good crime deterrents. Criminals quickly cut the fences with wire cutters and go through. The Rio Grande is often too shallow to deter criminals. Deeper than the river, the American Canal has been the best deterrent to crime. The Police are handicapped to control the crime problem because they cannot arrest anyone until after they have committed a crime, not just for coming across the river. Only the Border Patrol can do that. They suggest that as any canal segments are enclosed, fewer deterrents will remain, crime levels will rise, and more Border Patrol agents will be needed to patrol the area.

RECORD OF CONVERSATION Continued

Name: Lt. Tim Davidson and Officer Rudy Bonilla
Date/Time: 9/24/99, 2:00 pm
Agency: El Paso Police Department-Westside Command
Phone No.: 915-585-6000

Predicted Effects of American Canal Reconstruction Alternatives on the Number of Crimes Committed on the US Side of the Border Near the American Canal in El Paso, Texas

Alternative θ **Effect o**	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Estimated Number of Crimes Reported in the Area of the American Canal	24	16	24	08	08
Estimated % Change in Annual Number of Crimes Reported in El Paso	200% Increase	100% Increase	200% Increase	0% Increase	0% Increase

Addendum June 1, 2000

The El Paso Police Department Westside Command prefers Alternative 4, which would maintain the swift-flowing Canal as a crime deterrent. The Police Department recommends fences be reconstructed on both sides of the Canal.

Name and Date: John Knopp 6/1/00

RECORD OF CONVERSATION - ENCON File # 122-9
Environmental Justice

Name: Ernesto Martinez, James Gonzales, Edward Gerber, Fernando Melendez

Date/Time: 10/5/99 9:00 a.m.

Agency: U.S. Border Patrol

Phone No.: 915-834-8350

Subject: Effects of 5 USIBWC American Canal Alternatives on U.S. Border Patrol Activities

The Border Patrol Agency is responsible for preventing the flow of drugs and undocumented persons from crossing the international border. The subject area is considered by the Agency to be an area of high numbers of illegal border crossings, drug smuggling, and violent crimes. To reduce those problems, the Border Patrol has added more personnel, installed lights, cameras, and "sensor" fences. Border Patrol agents stated that fences along the canal or the river can reduce the number of persons crossing the border, but cannot stop the traffic entirely. Before the fence was installed, Border Patrol agents sometimes saw vehicles driving across the shallow riverbed near the middle open canal segment in non-irrigation months. Especially where enclosed by fences, the American Canal has been the best deterrent to drug trafficking and illegal crossings. The agents stated that the numbers of illegal crossings had increased significantly in the area south of the International Dam after the American Canal Extension was enclosed in a closed culvert, similar to what is planned in this project area. The increased number of illegal crossings and drug smuggling operations has necessitated an ongoing improvement of fences and lighting from the international bridges downtown upriver to the International Dam. The fences are 8-foot high fences topped with barbed wire. Lighting towers spaced approximately 150 feet apart house 1000-watt lights. The Agency suggest that as any canal segments are enclosed and fewer deterrents remain, incidences of illegal crossings and crimes committed will rise, and more Border Patrol agents, fences, and lights will be needed to protect the area. The Agency also predicted that an increase in the number of illegal crossings would result in a proportional increase in the number of traffic-related deaths and injuries on both Paisano Drive and Interstate 10, paralleling the 2-mile long canal.

The Agency considers the upper segment of the canal near the headgates to be the area of the highest number of illegal crossings and drug smuggling, the northern end of the middle open canal segment near the pump house to be second highest, and the southern end of the middle open canal segment across from the entrance to ASARCO to be third. The Agency reports many persons crossing the Canal via a small utility footbridge near the Hacienda Café.

The number of reported drownings in the American Canal was approximately ten during fiscal year 1998 and five in fiscal year 1999 The Border Patrol attributes this reduction from 1998 to 1999 to the agency's purchase and use of improved life-saving equipment, and to the Border Safety Initiative which publicizes in Mexico the dangers of crossing the canal.

Human Drownings in and Rescues from the American Canal & American Canal Extension

	Fiscal Year				
Parameter and Location	**1995**	**1996**	**1997**	**1998**	**1999**
Estimated Number of Drownings in 2-mile long American Canal	Not available	Not Available	Not Available	10	5
Reported Number of Live Human Rescues from American Canal & its Extension (from American Dam to Riverside Dam)	45	90	75	90	44
Estimated Number of Live Human Rescues in 2-mile long American Canal, American Dam to International Dam, (One third of the total number rescued from the canal & extension).	15	30	25	30	15

Note: While the number of live rescues and drowning victims recovered from the Canal and canal extension are known, the exact numbers of rescues and drownings which actually occurred in the 2-mile section of the Canal were not recorded, and are uncertain.

Record of Conversation (continued)
Environmental Justice

Predicted Effects of Various American Canal Reconstruction Alternatives On the U.S. Side of the Border Near the American Canal in El Paso, Texas

Alternative → **Effect ↓**	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Approximate Length of Open Canals (feet)	400 feet	4925 feet	2345 feet	8005 feet	8005 feet
Approximate Length of Box Culverts (feet)	10,129 feet	5604 feet	8184 feet	2524 feet	2524 feet
Estimated % Change in Number of Annual Illegal Crossings in 2-mile canal area	300% Increase	100% Increase	200% Increase	0% Increase	0% increase
# of Border Patrol Agents needed to protect Upper Segment of Canal	4	2	2	2	2
Annual Cost of Salaries & Equipment to protect Upper Segment of American Canal	$300,000	$150,000	$150,000	$150,000	$150,000
Annual Cost of Salaries & Equipment to protect Upper Segment of American Canal	$300,000	$150,000	$150,000	$150,000	$150,000
# of Border Patrol Agents needed to protect Middle & Lower Segments	12	10	12	6	6
Annual Cost of Salaries & Equipment to protect Middle & Lower Segments	$1,080,000	$900,000	$1,080,000	$450,000	$450,000
Annual Cost of Salaries & Equipment to protect entire 1.98-mile canal	$1,380,000	1,050,000	$1,230,000	$600,000	$600,000
Estimated Number of additional pole-mounted 1000-watt Lamps Needed	48	19	33	0	0
Estimated Cost to Install Lighting, Fencing and Surveillance Cameras	$1,600,000	$900,000	$1,300,000	$300,000	$300,000
Estimated Annual Cost of Electricity and Maintenance of Lighting, Cameras, & Fences	$184,000	$100,000	$147,000	$30,000	$30,000
Estimated Additional Annual Cost	$1,564,000	$1,150,000	$1,377,000	$630,000	$630,000

The Border Patrol suggests enclosing all segments of the canal (open or closed) with two rows of razor-wire-topped 8-foot high chain link fences, spaced approximately six feet apart, as a mitigation for all four alternatives to reduce the number of illegal crossings.

Addendum June 1, 2000

The Border Patrol prefers Alternative 4 which would maintain the deterrence of an open canal, while saving between $520,000 and $934,000 per year in expenses if Alternatives 1, 2, or 3 were chosen.

Name and Date: John Knopp 6/1/00

RECORD OF CONVERSATION - ENCON File # 122-9
Environmental Justice

Name: Rosemary Staley, Chief Planner
Date/Time: Nov. 5, 1999
Agency: City of El Paso, City Planning
Phone No.: 915-541-4718

She spoke of the phases of the park, including the American Canal area being included in Phase 2. City will put up "Quality of Life" issues for bond issue in 2000, and then they'll have a timetable. Park will extend from downtown to NM line, then overlap Sunland Park's new River Park, and then extend to Borderland Road.

They may connect it over the old American Dam or over the old bridge to a New Mexico Chihuahua Park where "Monument 1" is located. They need a 14-foot wide bike path that is handicap accessible. A bridge or culvert would be needed over the head gates of the American Canal.

Recommended Action or Response

Name and Date: John Knopp 11/5/99

APPENDIX K

(Historical / Cultural)

K.1 - ERRATA

ERRATA

The purpose of this errata page is to correct the text and captions related to bridges that were misidentified in the historical and archaeological investigation conducted by Human Systems Research, Inc. (HSR) in 1999.

The photographs listed below were incorrectly labeled and the correct captions are as follows:

- Plate 30: Photograph depicts 12 March 1938 view of Hart's Mill Road Bridge; and
- Plate 66: Photograph depicts 1999 view of the remnants of the Hart's Mill Road Bridge.

The descriptions of the Globe Street and Hart's Mill Road Bridges on pages 62, 66, and 67 of the HSR report contain incorrect information. The description and dimensions provided correctly describe only the Hart's Mill Road Bridge. A revised description of the two bridges can be summarized as follows:

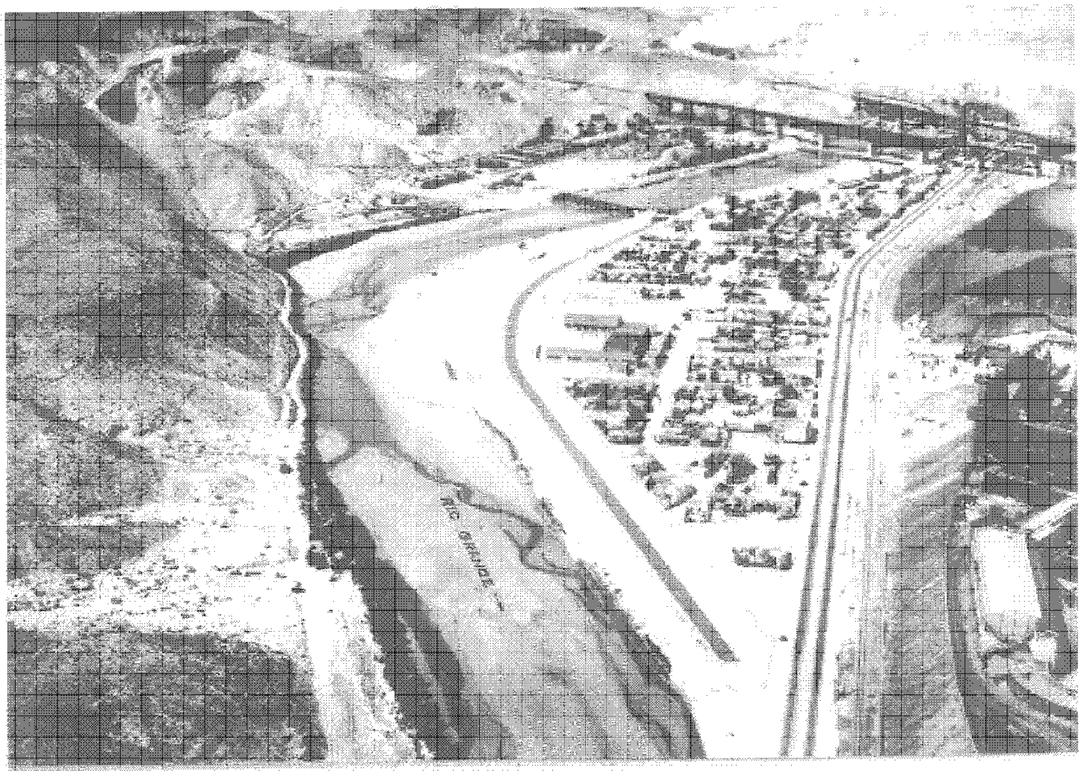
> An examination of USIBWC construction drawings, maps, and photographs reveals that while the Globe Street Bridge was constructed as a footbridge across the canal, the structure at Hart's Mill Road was a timber vehicular bridge. Although remnants of the Globe Street Bridge no longer exist, the original Hart's Mill Road Bridge has been replaced with a sewer line and only the abutments remain. Photograph #ADC-385 in the USIBWC archives depicts the construction of the Globe Street footbridge in an April 1938 view. Furthermore, a construction drawing dated May 28, 1938, and entitled "Earthwork & Gravel Surfacing at American Dam and Canal – General Plan" (#2693-49) corroborates the location and method of construction of both the Globe Street and Hart's Mill Road Bridges. No construction drawings have been found for the Globe Street pedestrian bridge, perhaps indicating the structure's simplicity of design.

Furthermore, the HSR study claimed that a third bridge, which led to the American Smelting and Refining Company (ASARCO) plant, was likewise of wood-frame construction, has been replaced by a new structure, and that no original remnants exist. However, the Smelter Road Bridge still stands and is addressed in detail in the August 2000 *Supplemental Report, Controlling Water on the Border: The American Canal System, United States Section, International Boundary and Water Commission, El Paso, Texas.* The correct station for the Smelter Road Bridge is 63.00.

K.2 - HUMAN SYSTEMS RESEARCH, INC. (HSR) REPORT

CONTROLLING WATER ON THE BORDER:

THE AMERICAN CANAL SYSTEM, INTERNATIONAL BOUNDARY AND WATER COMMISSION, EL PASO, TEXAS



By

Neal W. Ackerly, Ph.D.

Prepared for
United States Section
International Boundary and Water Commission
United States and Mexico
El Paso, Texas
Contract #IBM 96-23

Submitted by
Human Systems Research, Inc.
Tularosa, New Mexico

November 1999
HSR Report No. 9904

Table of Contents

List of Tables

List of Figures

List of Plates

ABSTRACT

This study focuses on the historical and archaeological background of the American Canal in El Paso, TX. Construction of the canal began in 1937 and was completed in 1938. The American Canal is operated and maintained by the United States Section of the International Boundary and Water Commission (USIBWC) which has proposed to reconstruct the American Canal using one of four (4) alternate courses of action as follows:

> Alternative 1 (Box Canal Alternative). This alternative calls for all but 400 ft of open channel portions of the American Canal between the American Dam and the International Dam to be replaced with boxed conduits
>
> Alternative 2 (Partial Box Canal Alternative A). This alternative calls for replacing 2941 ft of open channels with closed conduits, leaving the remainder of the canal in its original configuration
>
> Alternative 3 (Partial Box Canal Alternative B). This alternative calls for replacing 5521 ft of open channels with boxed conduits, leaving the remainder of the canal in its original configuration.
>
> Alternative 4 (No-action Alternative). This alternative would leave the American Canal in its original configuration.

This report presents detailed archival research, combined with repeat photography and on-site inspections of the existing canal system. This research shows that the American Canal system has retained a high degree of integrity relative to its original 1938 configuration. More precisely, the American Canal exhibits a number of historically-significant engineering and construction characteristics typical of Depression-era Federal irrigation projects.

Second, the American Canal represents the earliest attempt by the United States to enforce the terms and conditions of the 1906 Treaty with Mexico regarding water allocations between the two countries. As such, it symbolizes efforts to resolve water allocations from the Rio Grande between the United States and Mexico *in the Rio Grande basin* in a way that ultimately allowed the expansion of irrigated agriculture in the El Paso Valley.

Based on the findings presented here, the American Canal is potentially eligible for inclusion on the National Register of Historic Places. Specifically, its construction style is typical of Depression-era construction methods *and* the canal is pivotal in international relations between the United States and Mexico. Accordingly, the American Canal is significant under Criterion "A" and Criterion "C" of Section 106 of the National Historic Preservation Act (1966). It is recommended that Alternative 3 be implemented by the USIBWC.

INTRODUCTION

Irrigation in the El Paso Valley of west Texas may have antedated the 1540 arrival of Coronado and been an independent invention of Native Americans (Hutson 1898:18, 66; Taylor 1902:15). Irrigation almost certainly appeared shortly thereafter, since Espejo commented in 1582 that "Some of the [Piro] fields are under irrigation, possessing very good diverting ditches, while others are dependent on the weather [rainfall]" (Bolton 1930:178).

Later authors, notably White (1950:4–7), believed that irrigation was a Spanish innovation first introduced to the region sometime between 1659 and 1661. Similarly, Hackett found that "Farther Garcia was there [Juarez] attending to the establishment of a farm, and obliging even the heathen to construct a ditch for it, with great labor, from the Rio del Norte" (1932:193–213).

Regardless of the precise timing, the arrival of irrigation technology began to radically transform the El Paso Valley, particularly after the Pueblo Revolt of 1680 (Ackerly 1994, White 1950). The sudden influx of refugees from the north, both Spanish and Indian, demanded a substantial increase in the scale of agricultural production to support this new population. By 1726, even after the Reconquest in 1692, the El Paso Valley contained several irrigation canals (White 1950:18). Irrigation systems continued to expand throughout the 1700s and 1800s so that, by 1908, upwards of 9,000 acres were actively cultivated.

Further expansion of irrigation systems in the region continued throughout the twentieth century, largely under the aegis of the Bureau of Reclamation (BOR). The goals of the BOR were to (1) stabilize water supplies, (2) institute flood control measures, and (3) increase agricultural production in the valley. However, the project considered here, the American Canal, was built not so much to address any of these three goals, but rather to resolve potential treaty disputes between the United States and Mexico. The general purpose of the American Dam-American Canal project is best summarized in a BOR Project History (1938:66–67; see also Timm 1941:189):

> The American Canal built by the International Boundary Commission serving the Franklin Canal was completed and placed in operation on June 2, 1938. This canal was built for the purpose of insuring a division of water in accordance with the Treaty of 1906, which gave Juarez Valley, Mexico, 60,000 acre-feet per year in recognition of prior use and rights to Rio Grande water. The canal is concrete lined, 9,800 feet long and required a new diversion dam, which is a multiple radial gate type placed in concrete pier structure. This afforded a means of closer regulation of irrigation water, insured the delivery of required water to the American side and water was delivered to Mexico in accordance with the treaty provisions. As a result there was a considerable reduction in the amount of water received by the Juarez Valley, and requests were made to readjust the flow.

As this quote makes abundantly clear, the purpose of the American Dam and Canal project was to resolve disputes over water allocations between the United States and Mexico. Only then could sufficient water supplies be assured for American farmers to expand the scale and scope of agriculture in the valley.

This study was prompted by a proposal from the United States Section, International Boundary and Water Commission (USIBWC) to reconstruct the American Canal. For purposes of this report, the title International Boundary and Water Commission (IBWC) is used in a manner to mean either the IBWC or the United States Section of the International Boundary and Water Commission (USIBWC). The United States and Mexico when referencing the international organization use the acronym IBWC. When referring to one section or the other of this international commission, the Acronyms USIBWC for the United States and MxIBWC for Mexico, are used (Source: IBWC).

Specifically, the IBWC has proposed replacing one or more of the concrete-lined, open-channel segments of the American Canal with concrete box conduits extending from the beginning of the American Canal at the American Dam downstream approximately 1.98 mi to the intake of the Franklin Canal at the International Dam. Mr. Steve Fox, Environmental Protection Specialist with the IBWC, is the liaison between Human Systems Research and ENCON International, the IBWC contractor preparing the Environmental Assessment. Mr. John Knopp is the ENCON project manager.

This report provides (1) an overview of the project area, (2) a review of United States-Mexico treaty controversies that prompted construction of the American Dam-American Canal complex, (3) a narrative chronology augmented with vintage photographs that summarizes major milestones in the construction of the American Canal, and (4) inventories of the American Dam, American Canal, and associated water-control and measurement structures associated with the American Canal system.

This report relies on a variety of records including BOR project histories, internal IBWC reports and as-built engineering drawings, and on-site inspection of existing irrigation facilities. In addition, a concerted effort was made to obtain repeat photographs comparing the configuration of the irrigation system in 1938 with its current (1999) configuration. Using this approach, it is possible to better evaluate the extent (or lack thereof) of changes in the system since its completion in 1938. Considered together, the information presented in this report provides (1) a detailed historic context for the American Canal and (2) an evaluation of potential effects arising from the four IBWC reconstruction alternatives.

The proposed alternate IBWC undertakings discussed later in this report would be limited to the existing right-of-way; no new right-of-way will be required for any alternative. This right-of-way traverses an area that was extensively disturbed during the original 1937–1938 construction of the American Canal. On this basis, there would be minimal integrity of any remnant prehistoric or historic remains that might once have existed in this right-of-way. For this reason, this report focuses on the American Canal as the primary cultural resource of importance.

A DESCRIPTION OF THE PROJECT AREA

The project area is situated on the United States side of the International Boundary between the United States and Mexico. It extends from the upstream American Dam approximately two mi downstream to the International Dam and encompasses all of the American Canal (Plate 1).

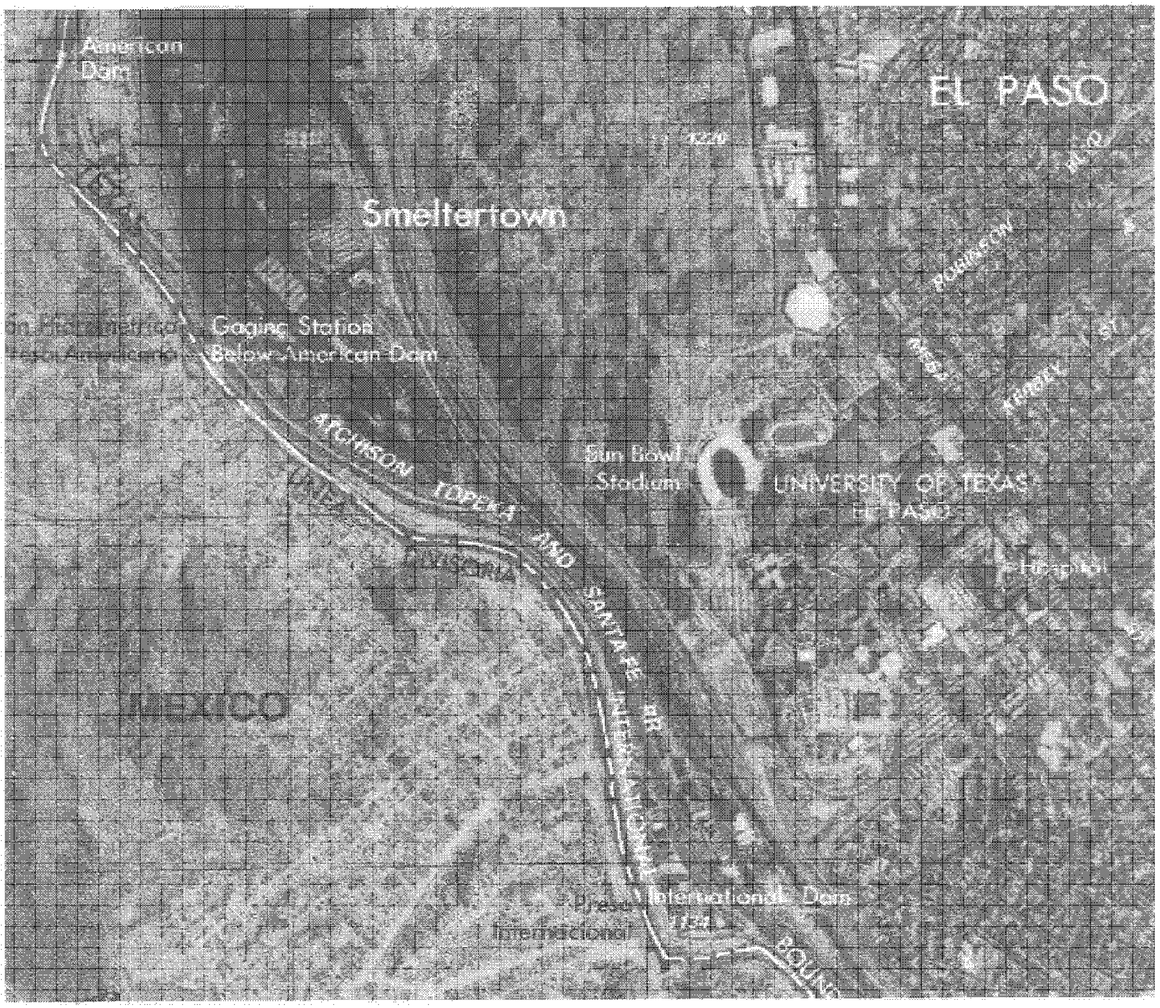


Plate 1. Aerial Photograph of the Project Area
(From Department of the Treasury, United States
Customs Service, Smeltertown, 1:25,000, 1982).

The project area consists of a northwest-southeast trending polygon situated in UTMG Zone 13 with corner points at approximately:

NW Corner— E 355350, N 3517400
NE Corner—E 355600, N 3517400
SW Corner—E 356920, N 3514800
SE Corner—E 357200, N 3514800

This polygon measures 225 m in width and is approximately 3,200 m in length (720,000 m^2). Although portions of this polygon extend into Mexico, all work was restricted to the United States side of the border.

Some 1961 strip maps depicting location of the American Dam, the American Canal, and the International Dam are shown in Figure 1. The American Canal is situated entirely within USIBWC right-of-way. The canal extends southeastward from the American Dam (Station 00), south of the American Smelting and Refining Company (ASARCO) plant, along the left bank of the Rio Grande. At the canal's downstream gauging station, approximately 2,700 ft from the dam (Station 2,700), it enters a culvert running underneath U.S. 80 and continues below the surface for about 870 ft (Station 3570). The canal resumes an above-ground, open-channel for another 3,000 ft, then enters a second conduit at about Station 6,570. This second conduit extends below the surface for 1,600 ft (Station 8,720). It then remerges as an open channel that continues another 2,700 ft to the beginning of the Franklin Canal (Station 10,970). Within the project area, the right-of-way for the American Canal proper encompasses an area of 3,200 m in length by approximately 31 m in width (99,200 m^2).

In addition to the canal itself, the American Canal contains a number of other features. The features listed below are ordered from upstream to downstream:

1. Station 00—a weir-sluiceway complex at the intake of the American Canal
2. Station 30—a concrete bridge with canal headgates over the canal into the American Dam complex
3. Station 9,300—a 16-ft-wide concrete bridge over the canal into ASARCO

Additional details regarding these structures are presented in the archaeological inventory below.

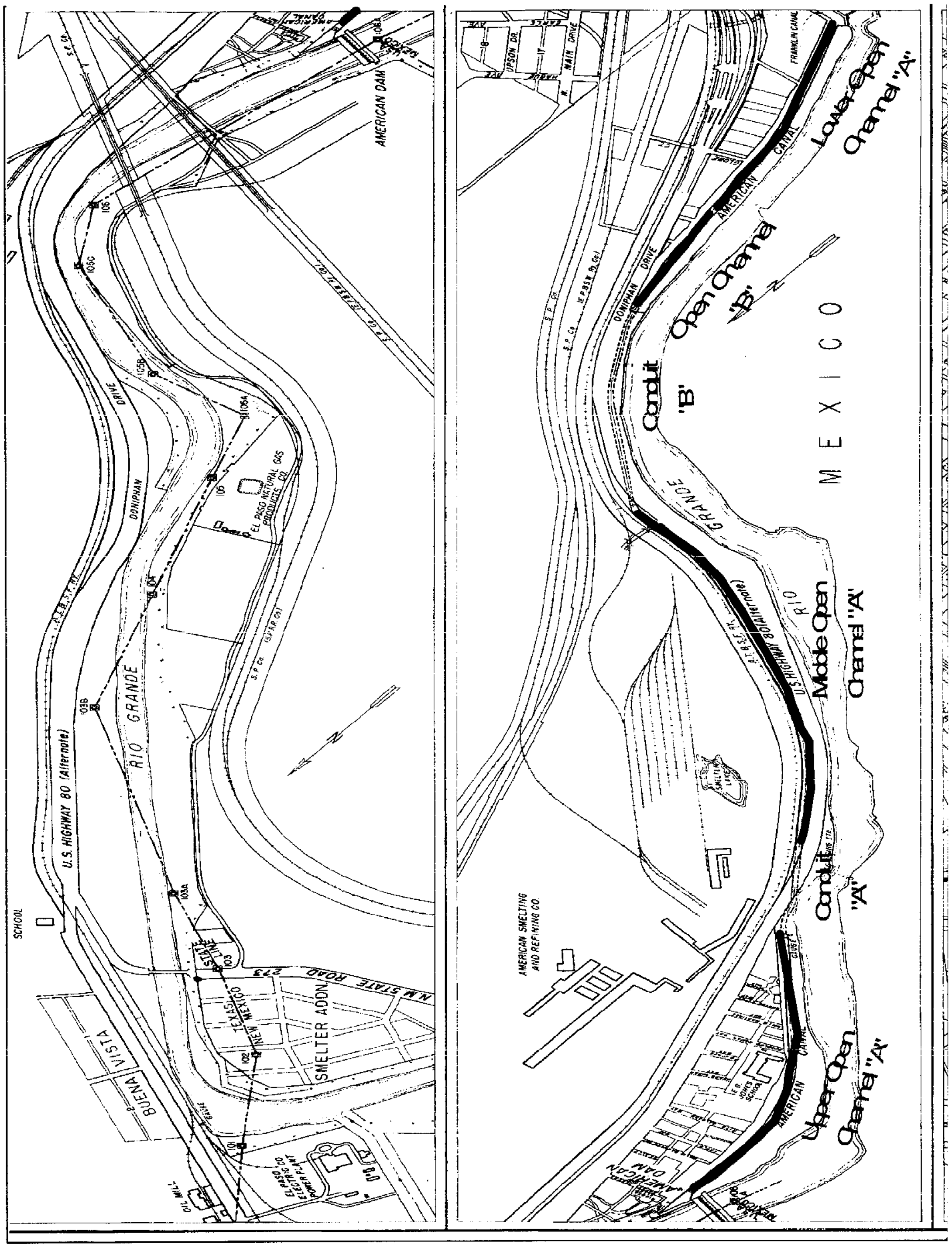


Figure 1. Strip Map of American Canal Showing Open Channels and Conduits (From U.S. Bureau of Reclamation, Irrigable Area and Property Maps, Sheet 1, 1961).

UNITED STATES-MEXICO TREATY CONTROVERSIES: A PROLOGUE TO CONSTRUCTION OF THE AMERICAN CANAL

Given that water for irrigation purposes was critical to both the United States and Mexico, early treaties and conventions, astonishingly, did not explicitly consider the allocation of water between the two countries. In the United States, the progressive expansion of irrigation systems upstream of Paso del Norte, especially those in the San Luis Valley of southern Colorado, led to water shortages in many downstream portions of the Rio Grande Basin, including the Paso del Norte region (Mills 1896 in Follett 1898:12). Documentary sources suggest persistent seasonal water shortages as early as 1879 and lack of water continued to play a crucial role in inhibiting agricultural production throughout the Rio Grande Basin.

Under the terms of Article V of the 1848 Treaty of Guadalupe-Hidalgo and Article VII of the 1852 treaty between the United States and Mexico, the boundary between the two countries was established as the middle of the deepest channel of the Rio Grande. This agreement implied, but did not specify, that Mexico was free to divert irrigation water into canals in Ciudad Juarez opposite El Paso, Texas, from its half of the river. However, faced with ever-changing river channel locations, the United States and Mexico agreed, in 1884, that the dividing line would conform to the original 1852 channel of the Rio Grande and reaffirmed that no works affecting the river flow would be constructed. Yet, even at this later time, no agreement existed concerning how much water could be diverted by either country.

Between 1855 and 1885, progressive channel migration, estimated at more than 0.6 mi, resulted in the southward migration of the main stem of the Rio Grande into Mexican territory. This channel shift resulted in loss of lands and destruction of ditches, as well as threats to the Mexican diversion dam and remaining Acequia Madre. By 1885, it was found that:

> ...not only had Mexico lost a very considerable part of cultivated and irrigable lands and some dwelling houses, but also one of the irrigating canals, known as the Chamizal Ditch, loss of which constituted a greater damage because it ruined and converted into arid lands a considerable amount of ground formerly used for viticulture and the cultivation of choice fruits; that these damages were caused in the beginning by the natural effect of the water, which in this part of the channel attacks the right bank as it makes a big curve, to the detriment of the concave part, which is on the right-hand [Mexican] side, and partly caused by small wing-dams constructed for defense on the left [American] side, which helped powerfully to increase the destruction that already without them had been considerable (Ernst 1889:57–58).

In an effort to stabilize the channel, Mexican authorities constructed, in 1886, a series of wing-dams downstream of their dam to halt further movement of the river into Mexican territory. The reaction of United States authorities was almost immediate: the actions of the Mexican government were construed as a violation of Article VII of the 1852 treaty and Article III of the 1884 convention because the structures altered the channel of the Rio Grande and potentially impeded the navigability of the river (Ernst 1889:50). Although the Mexican government suspended further construction of wing structures, this incident clarified the linkage between channel stability—a factor very explicitly considered in all prior treaties and conventions—and the operation of acequia systems in the El Paso Valley. Despite this incident, the United States and Mexico did not undertake any agreements regarding water diversions into canals.

A second event underscored the problem of water allocations between the United States and Mexico. In 1890, local El Paso developers argued that canal systems and community ditch associations were not efficiently delivering water to farms in the valley. Their proposed remedy involved the construction of a single canal that was large enough to provide water to all farmers throughout the valley.

This proposal culminated in the formation of the El Paso Irrigation Company and its ill-fated offspring, the Franklin Canal. In its original prospectus for the Franklin Canal, the company proposed to construct a large canal through the middle of the floodplain for some 30 mi downstream of the American Dam. The company would then contract for water deliveries to individual farmers or community ditch associations. Within two years, the El Paso Irrigation Company fell on difficulties and was reorganized as the Franklin Irrigation Company. Between 1892 and 1912, the Franklin Canal was leased to the El Paso Valley Water Users Association.

Designed to divert approximately 300 cubic feet per second (cfs), the Franklin Canal was intended to convey water for some 30 mi down the El Paso Valley. A 1909 report indicates that infilling by sediments had reduced the capacity to only about 175 cfs (BOR, RG 115, National Archives and Records Administration (NARA), General Correspondence File, 1902–1942,115-54-A-81, Box 1111, Folder 249, np). At the time the BOR acquired the canal in 1912, the Franklin Canal extended for only 5 mi through the valley and its capacity was only about 85 cfs (BOR, RG 115, NARA, Project Reports, Box 722, pp 1–4).

The reason the Franklin Canal was of little concern to Mexican water users can be traced to the location of the dam that supplied water to the canal. The Mexican Dam appears to have been rebuilt in 1848 and then again between 1886 and 1889 using stronger materials (Plate 2). At the same time, the American Dam was constructed 1800 ft *below* the Mexican Dam. Although efforts were made to place the American Dam upstream of the Mexican Dam, opposition from American landowners prevented its construction at that location. Consequently, farmers on the Acequia Madre in Juarez were able to divert water before it reached the American Dam and the Franklin Canal did not pose any substantial threat to Mexican farmers (BOR, NARA, RG 115, Project Reports, Fiock letter, 22 July 1935). Sometime between 1904 and 1909, the intake or throat of the Franklin Canal was relocated to a point some 150 to 200 ft above the Mexican Dam (BOR, NARA, RG 115, Project Reports, pg. 14; Fiock, BOR, FRC, 22 July 1935). The apparent lack of response of the Mexican government to this relocation suggests this intake was constructed after the 1906 agreement in which the United States agreed to supply Mexico with water (see Appendix AA for a copy of this treaty).

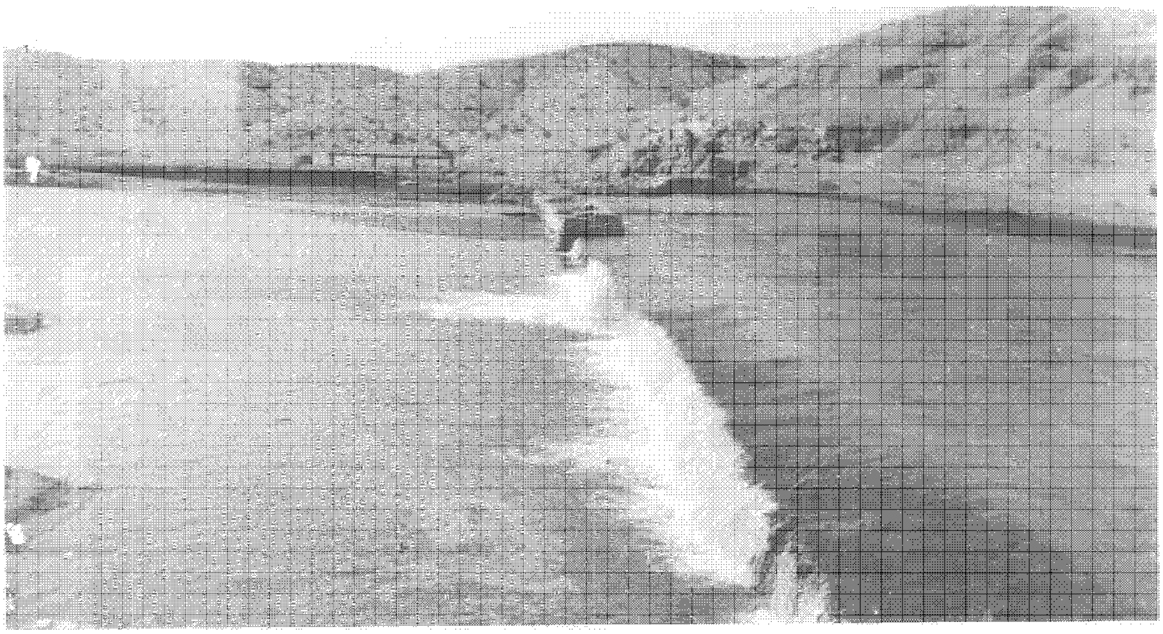


Plate 2. Mexican Dam and Head of Juarez's Acequia Madre
(August 1934 - NARA, BOR, RG 115-87-0028, Resch report).

The explicit consideration of water allocations between the United States and Mexico was an inadvertent outgrowth of the first effort to construct a dam on the Rio Grande. A local New Mexican businessman, Nathan Boyd, formed the Rio Grande Dam and Irrigation Company in 1895 with the express intent of appropriating all of the water of the Rio Grande and building a water storage facility near Engle, N.M. Shortly thereafter, Boyd arranged for a group of English financial backers to take over control of the company while preserving much of its original intent. According to the original prospectus, the Rio Grande Irrigation and Land Company, Ltd. was

> . . . formed to acquire, by lease and assignment, the franchise rights, water rights, right of appropriating the waters of the Rio Grande (United States of America), contracts, properties, and undertaking of the Rio Grande Dam and Irrigation Company, and for the purposes of irrigating, colonizing, and improving the lands in the famous Rio Grande Valley, between Engle, N. Mex. and Fort Quitman, Tex[as] (Mills in Follett 1898:12).

Dam sites were proposed at Elephant Butte, Rincon, and Fort Selden, New Mexico (Mills 1896 in Follett 1898:12).

The Mexican government responded that this project violated the 1852 and 1884 agreements, since a dam would adversely affect the navigability of the Rio Grande. Although this scheme foreshadowed the eventual construction of the Elephant Butte Dam, subsequent litigation (*United States of America vs. Rio Grande Irrigation and Land Company, Ltd.*) prevented the company from continuing its plans. Nevertheless, the proposed dam crystallized the problems associated with water allocations between the United States and Mexico.

In 1896, W. W. Follett was assigned the task of determining water usage throughout the Rio Grande Basin. His report (Follett 1898) showed the surface water of the Rio Grande to be oversubscribed and that remedial measures would have to be taken to avoid the collapse of irrigation agriculture throughout the downstream portions of the basin. Follett (1898:41) further recommended that the United States:

> ...restrain any such reservoirs hereafter constructed from the use of any waters to which the citizens of the El Paso Valley, either in Mexico or in the United States, have right by prior appropriation, and provide some legal and practicable remedy and redress, in case such waters should be used, to the citizens of both countries. And that thereafter the two Governments provide by joint representatives or mixed commission who are to reside at their respective ends of the dam, for a permanent distribution of the flow, as follows: one half or so much as one-half as may be required to the Mexican side of the river for such use as the Mexican Government may see proper to apply it.

This report is the first reference to the dilemma of allocating water between the two countries. More important, Follett recommended that Mexico receive 50 percent of the Rio Grande's flow.

Given the decision to construct the Elephant Butte Dam, the United States and Mexican governments negotiated an agreement in 1906 to allocate water between the two countries (see Appendix AA). According to Article I, the United States agreed to provide 60,000 acre-feet of water annually at the headgate of the Acequia Madre in Juarez (Lawson 1926:2). What is surprising is that the amount allocated to Mexico represented slightly less than 10 percent of the long-term average annual discharge of the Rio Grande at El Paso, Texas. Even more surprising are other terms of this agreement. Under the terms of Article IV, the United States stipulated these water deliveries would not to be ". . . construed as a recognition by the United States of any claim on the part of Mexico to the said waters." In other words, the United States did not recognize that Mexico had any legal claim to any water from the Rio Grande. Even today, water deliveries to Mexico continue on the basis of this 1906 agreement.

Despite the agreement between the United States and Mexico regarding water allocation between the countries, illegal diversions of water by Mexican farmers began as early as 1919 and continued at various points below the American-Mexican Diversion Dam for a number of years (BOR, RG 115, NARA, General Correspondence files, 1902–1942, Box 1109, 115-54-A-81, Folder 249, pg. 3–4; Lawson 1926:3). In 1923, for example, Debler estimated illegal diversions to amount to almost 30,000 a.f. *above* the 60,000 a.f. agreed upon in 1906 (BOR RG 115, NARA, Project Reports, 1910–1955, Box 717, Folder: Water Supply Requirements, pg. 6; Lawson 1926:5). Three years later, Lawson (1926:3) found no less than seven illegal dams diverting water downstream of the International Dam. In a 1935 report, Fiock noted:

> ...in 1932 a large increase in the diversions by the Mexican canals was made and has continued; also since the Mexican canal diversion records have not been made accessible (although it is certain that such records are kept) there is nothing else to believe other than the Mexican records show a much greater volume being diverted than is allowed in the treaty of 1906, and for that reason the Mexican officials do not wish to release them.

The apparent locations of these illegal diversion dams began with the San Augustine Acequia (Plate 3) some 17 mi below the International Dam (BOR, RG 115, NARA, General Correspondence files, 1902–194, Fiock 1935:np; BOR, RG 115, NARA, General Correspondence files, 1902–1942, Box 1109, 115-54-A-81, Folder 249, pg. 4). Still other illegal diversion dams were found further downstream (Lawson 1926:4). These included, ordered by downstream distance, the Guadalupe Acequia (32 mi), San Ignacio Acequia (32 mi—Plate 4), Porvenir Acequias (44 and 45 mi—Plate 5 below), Miramar Acequia (48 mi), Cuervo Acequia (Plate 6), and San Lorenzo Acequia (Plate 7).

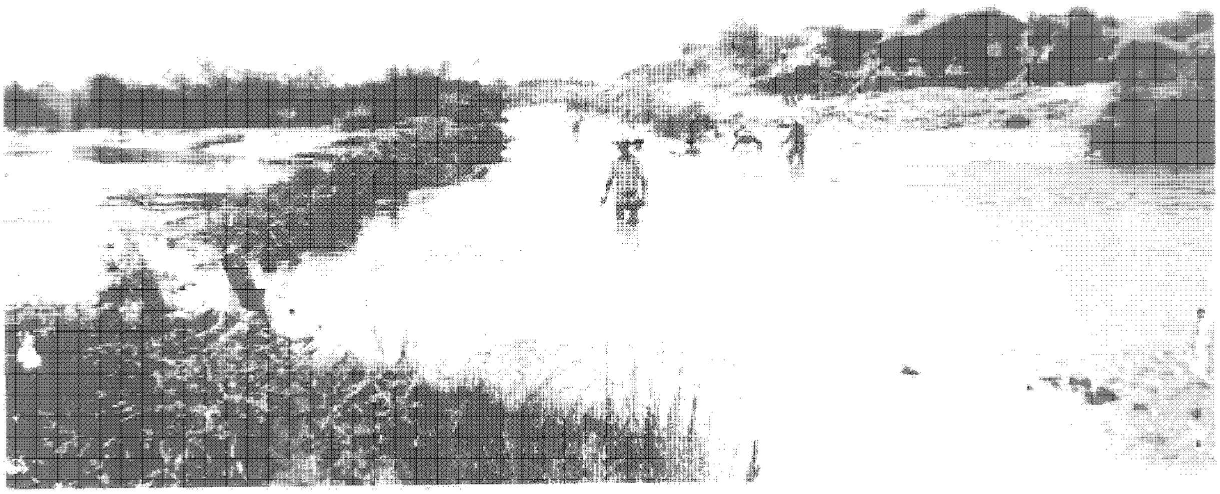


Plate 3. Brush-and-Rock Diversion Dam of the San Augustine Acequia (August 1934 - NARA, BOR, RG 115-87-0028, Resch Report).

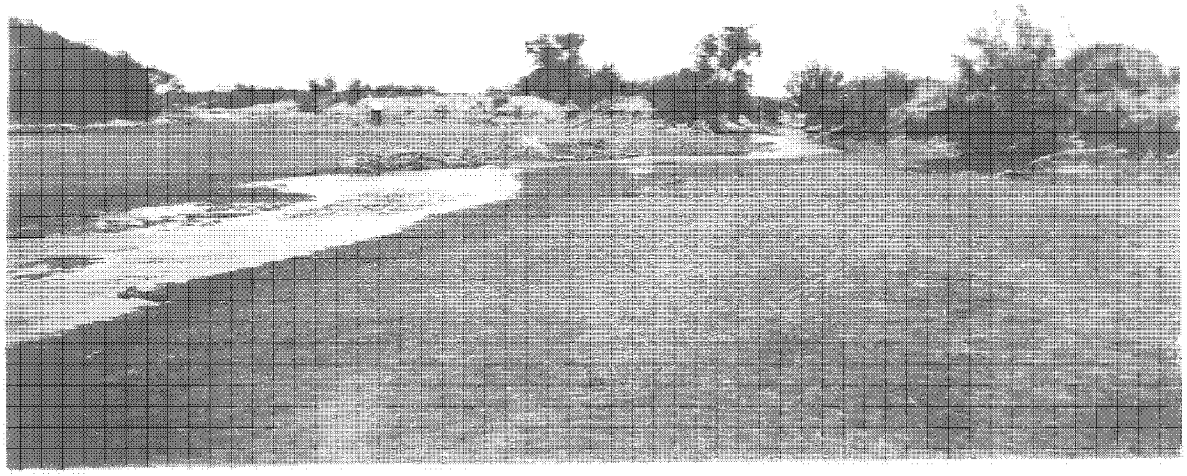


Plate 4. San Ignacio Earthen Dam Looking Upstream - Note Reduced Flow of the Rio Grande(August 1934- NARA, BOR, RG 115-87-0028, Resch Report

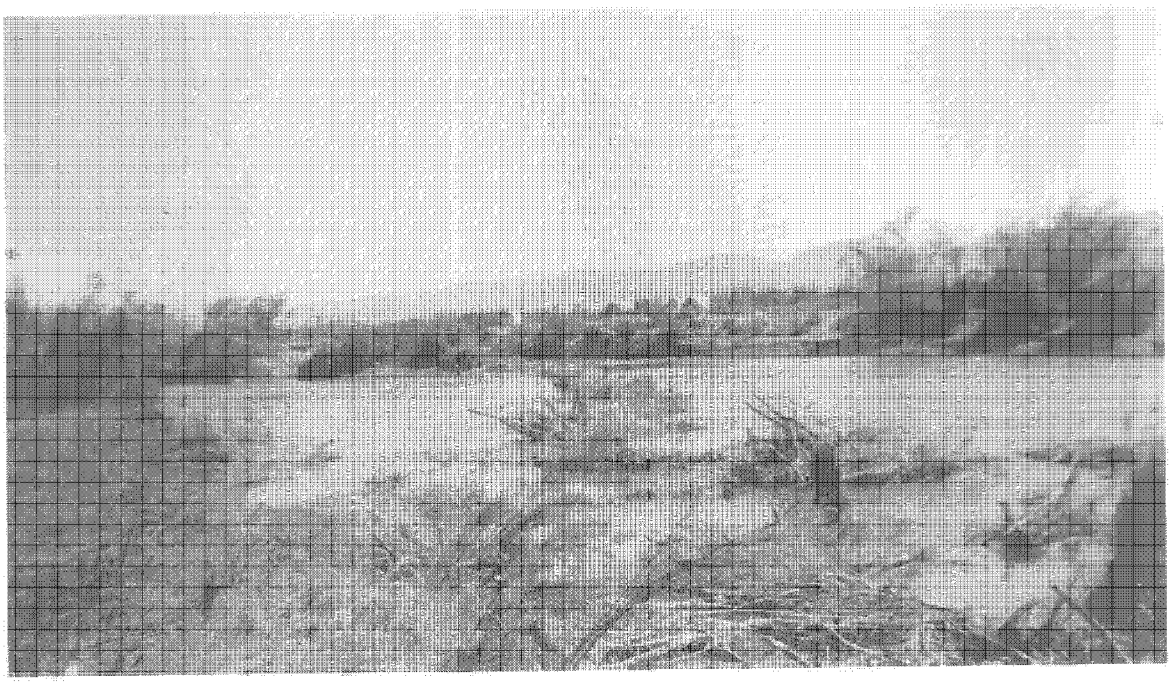


Plate 5. El Porvenoir Brush Dam Looking Downstream (July 1934 - NARA, COR, RG 115-87-0028, Resch Report).

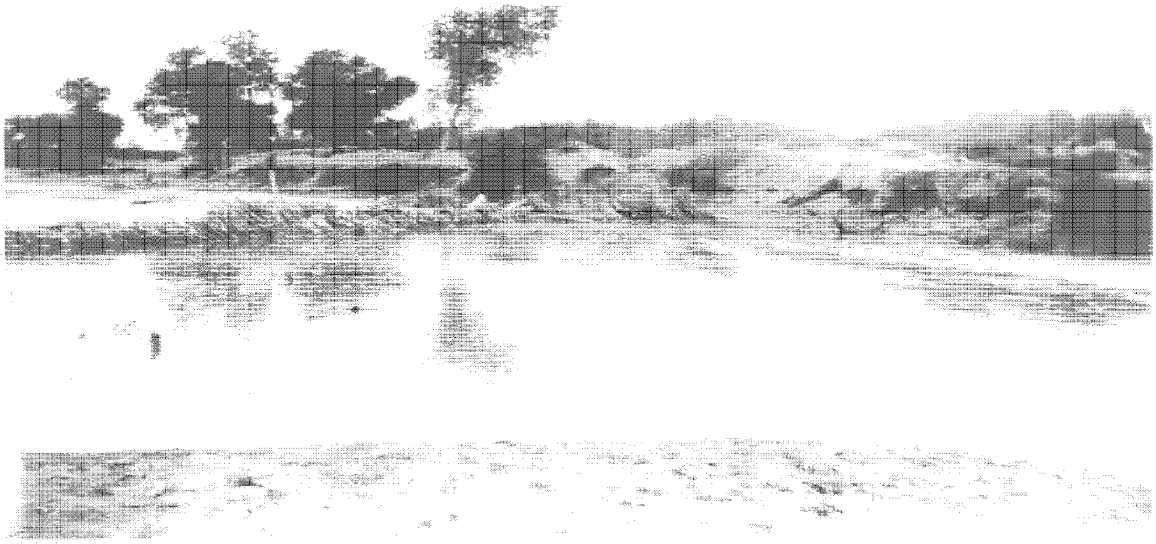


Plate 6. Brush-and Rock Dam of the Cuervo Acequia
(July 1934 - NARA, BOR, RG 115-87-0028, Resch Report).

Plate 7. Dam (left) and Intake (right) of the San Lorenzo Acequia
(July 1934 - NARA, BOR, RG 115-87-0028, Resch Report).

The presence of so many illegal diversions caused Resch (1934:7–9, 26–27) to comment at length about the nature of difficulties between the United States and Mexico:

> The conservation and economic distribution of water in the El Paso Valley has become increasingly difficult, in fact impossible, during the past two years due to the lack of information regarding the volume of water that was being diverted by the [Mexican] Acequia Madre, and to the absence of some means of measuring out the 60,000 acre-feet as provided in the distribution schedule contained in Article II of the [1906] treaty . . . An attempt was made to secure from the Mexican Irrigation Service an estimate of their diversion prior to the time it was to be made, but the effort was far from being successful and it was abandoned after several telephone calls failed to secure the necessary information . . . However it was soon evident [fall of 1933] that the Acequia Madre was not being operated according to treaty; in fact, due to the excess diversion by the Acequia Madre above treaty stipulations more water was being diverted into the head of the Mexican Canal than could be diverted by the Franklin Canal. While all of the water being taken into the head was not used, due to the system under which the canal is operated, at the same time it was not available for diversion by the Franklin Canal in which it was badly needed. The Mexican system of operation has been uncontrolled intake at the head of the canal, no gates of any type being used and net control being secured by one waste return to the river about 400 feet below the International Dam and a second waste return to river about one mile below the International Dam. With 250 second feet and less available in the river during the fall months it can readily be seen how the Acequia Madre uncontrolled intake seriously interfered with the operation of the Franklin Canal by "running" most of the water around the International Dam through the Acequia Madre head, then to the river through one of the wasteways . . . [This] indicates conclusively that the Acequia Madre at Juarez and a number of additional canals diverting from the river between Juarez and Fort Quitman were diverting and using during the period covered by the records of 1910–1928 more than 60,000 acre-feet a year.

Resch presented a number of recommendations in his report. His two most relevant conclusions were (Resch 1934:26–27; see also Lawson 1926:7, 10):

> Conclusion #3. Economic and efficient control and conservation of water below El Paso is impossible due to the uncontrolled diversions of the Acequia Madre at Juarez, Mexico, opposite El Paso, Texas, and the several other unauthorized diversions to the Mexican side of the river below that point.

> Conclusion #5. The only permanent solution is the construction of a diversion dam above the point where the Rio Grande becomes the International Boundary and an All American Canal built from the diversion dam along the American side of the river to the present Franklin Canal which would ultimately be enlarged to carry the entire irrigation requirement for the El Paso Valley.

Both recommendations were adopted by the International Boundary and Water Commission (IBWC) as a justification for constructing the American Dam and the American Canal. What is ironic, of course, is that despite completion of these two structures, illegal diversions of water into Mexican acequias continued well into the 1940s (Timm 1941:189–190). Indeed, one commentator observed that illegal diversions in 1945 probably equaled or exceeded the 60,000 acre-feet to which Mexico was legally entitled under the 1906 treaty (IBWC 1945:15). Consequently, full implementation of the American Dam and Canal did not, in and of itself, solve the problem of illegal water diversions.

American and Riverside Dams

Two measures immediately were proposed to reduce illegal Mexican diversions. First, the IBWC proposed, in 1926, to build a dam *above* the Mexican diversion dam at a point along the Rio Grande before the river became the International Boundary between Mexico and the United States (BOR, RG 115, NARA, General Correspondence files, 1902–1942, Box 1109,115-54-A-81, Folder 249, pg. 7). This dam would capture the entire flow of the Rio Grande into the Franklin Canal and then divert the Mexican allotment of 60,000 a.f. into the Acequia Madre on the Juarez side of the river (Fiock 1935:np).

What was more important, as BOR officials noted (1935:19), was that this dam would allow the United States to completely control water distributions in the El Paso region:

> It is proposed to construct a diversion dam across the river [Rio Grande] near El Paso, above the point where the International Boundary Line between the United States and Mexico leaves the Rio Grande and runs west to California. The location is to be such that it will lie entirely in United States territory. The proposed dam will consist essentially of thirteen steel gates located between concrete piers and so arranged that the ordinary controlled flow of the river can be diverted into a new canal (to connect with the present Franklin Canal) while high flows can be passed through the structure with a minimum of interference and consequent backing-up of the water. The new canal is designed to carry a flow of water sufficient for all of the Rio Grande Federal Irrigation Project lands below El Paso (estimated at 1200 second feet), so that eventually all of such lands can be supplied from the new diversion dam through the new canal and an enlarged Franklin Canal.

The BOR also commented at length on the general design and constraints faced in constructing the American Dam (BOR 1935:25–27):

> [The dam] is a structure of the floating type, resting on the fine sands and silts of

> the river bed, which extend to considerable depths . . . The proposed structure consists of twelve steel radial gates, each 30 feet wide by 7'6" high, set between reinforced concrete piers 24" thick and 18" above the floor. In addition, a special gate is provided through which diversions to Mexico can be measured. The floor or apron is a reinforced concrete slab extending upstream for a distance of forty feet above the gates, and downstream for a distance of 30 feet below them. This floor varies in thickness as shown on the plans, being 9 inches above the piers, 24 inches under the piers, and 18 inches below the piers. A line of 20-foot sheet steel piling extends across the river under both the upper and lower ends of the concrete apron, and a line of weep holes for structure drainage is located immediately above the downstream row of sheet pile . . . A small "sill" at the lower end of the downstream apron will tend to prevent erosion below by deflecting water currents upward and creating a "backroll" with upstream velocities immediately below the sill. Below the structure proper it is planned to pave the river bottom with a bed of bonded riprap three feet in depth and twenty-five feet in length, across the entire width of the dam. Should erosion occur, this riprap will prevent any excessive scouring below the dam structure.

As later accounts by Hill (1964:9–10) indicate, the American Dam was, indeed, built largely to the original 1935 specifications (Figures 2 and 3):

> AMERICAN DIVERSION DAM on the Rio Grande 2 miles northwest of El Paso and immediately above the point where the river becomes the International Boundary line, is for the diversion of irrigation water to the El Paso Valley for use on the American side. This dam consists of a 286-foot long concrete weir with 13 radial gates with a structural height of 18 feet and a hydraulic height of 5 feet. It was constructed in 1938 and is operated by the American Section of the International Boundary and Water Commission to regulate delivery of water to Mexico in accordance with Treaty [of 1906] provisions.

The construction of the American Dam was completed in July of 1938 (BOR, RG 115, NARA, Project Histories, Box 1087, 115-66A693, pg. 20–23).

The second component of this plan, while not directly relevant to this specific inquiry, was construction of the Riverside Dam and Canal complex to capture water not diverted into the Franklin Canal and the Acequia Madre (BOR, RG 115, NARA, General Correspondence files, 1902–1942, Box 1109, 115-54-A81, Folder 249, pg. 8). This

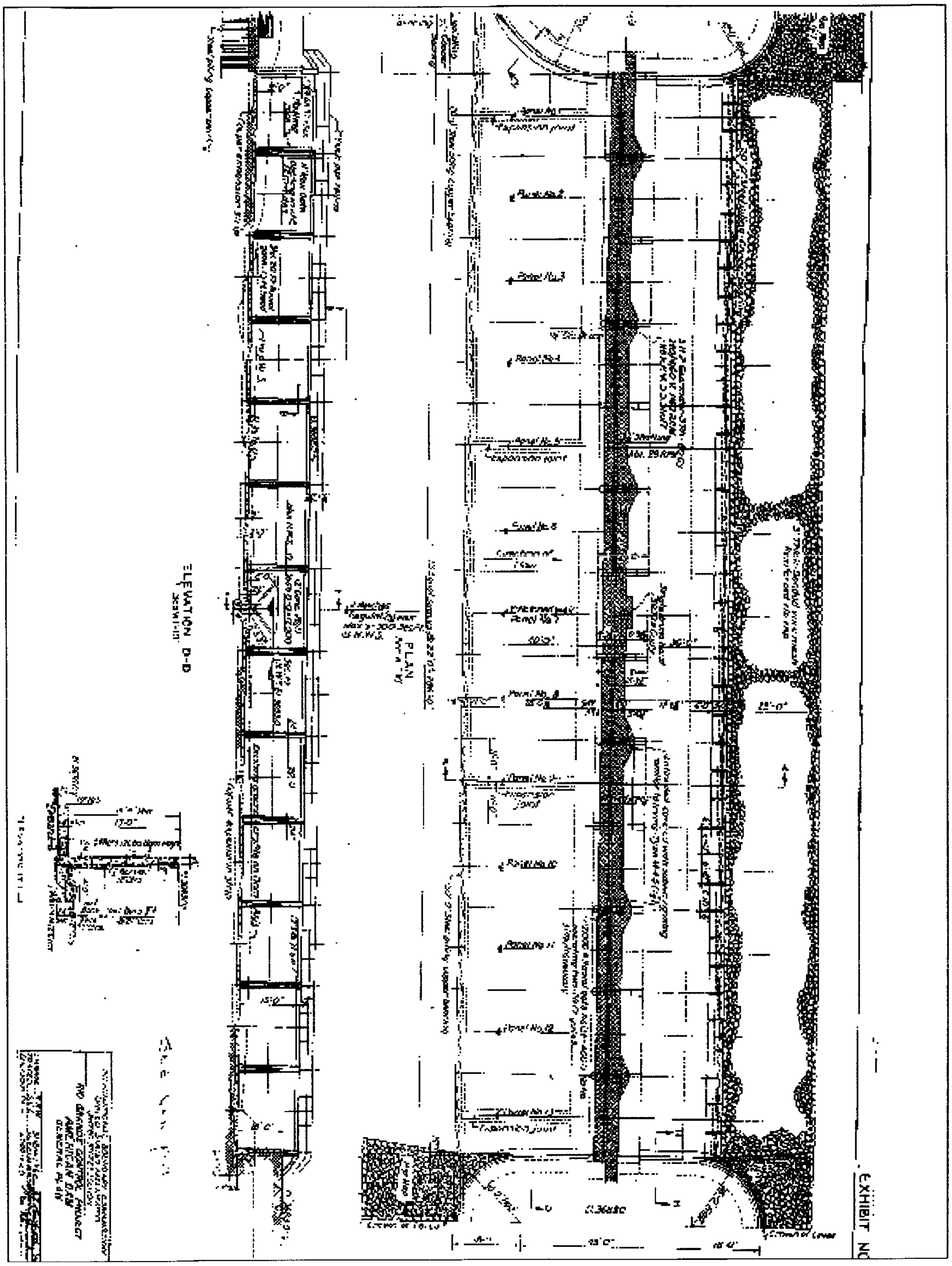


Figure 2. Plan and Profile Engineering Drawing of the American Dam (1935).

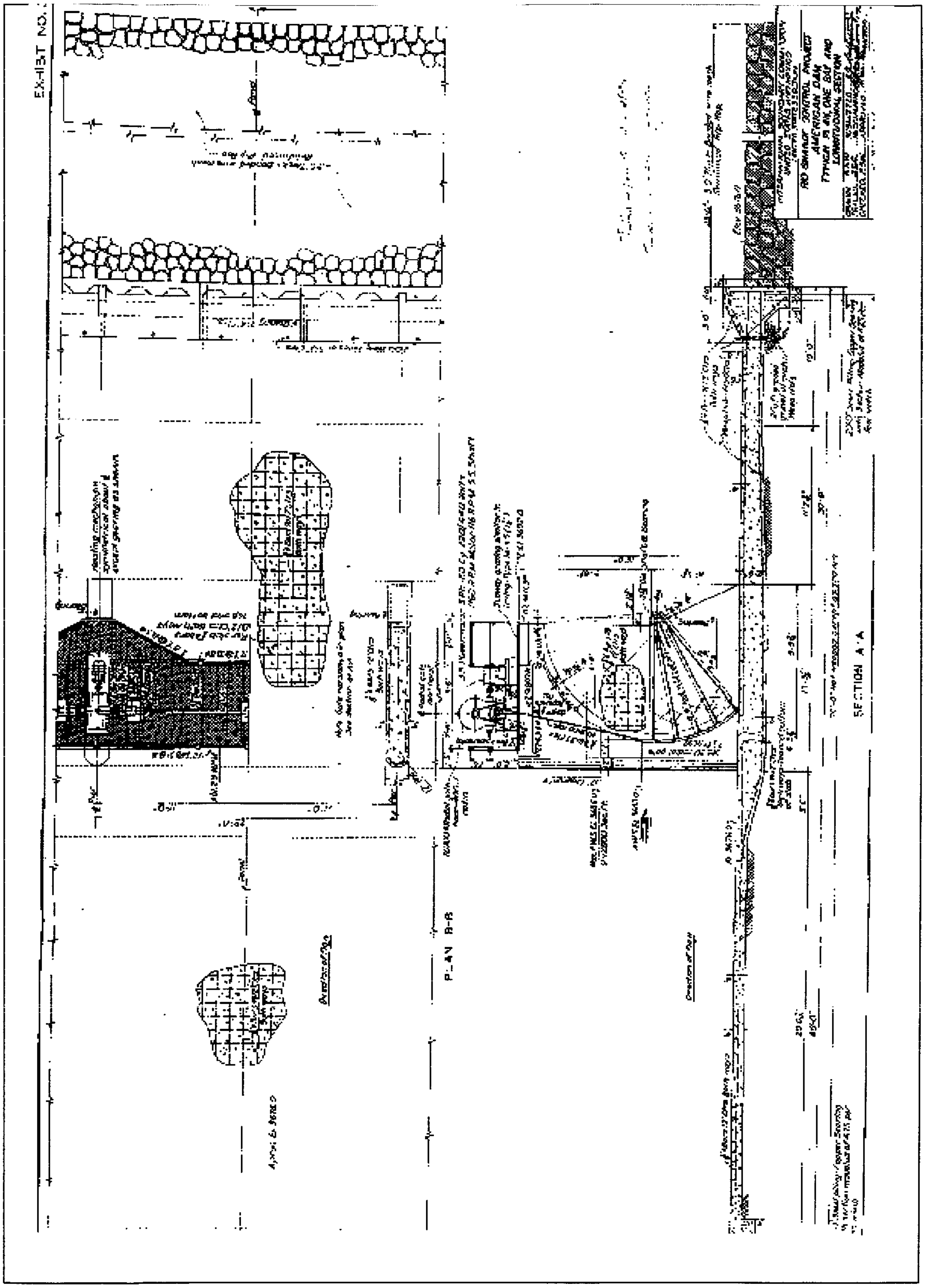


Figure 3. Engineering Drawing of Radial Gates at the American Dam (1935).

facility would not only capture excess water, but would provide a more stable diversion point for irrigable lands in the San Elizario, Tornillo, and Island Districts (BOR, RG 115, NARA, General Correspondence files, 1902–1942, Box 1109,115-54-A-81, Folder 249, pg. 9). Construction of this complex was begun in 1927 and completed by 1940. The Riverside Dam is 20 mi downstream from the former location of the headgates of the Franklin Canal.

AMERICAN DAM AND CANAL: AS-BUILT CHARACTERISTICS

The American Dam provided water through the newly-constructed American Canal in the following fashion (BOR 1938:27–28):

> The manner of operation of the American Dam and Canal is that the water allocated to Mexico is passed through the dam into the old river channel, while the remaining total flow of the river is carried through the American Canal to the Franklin Canal settling basin. The net diversion for the Franklin is made several miles below the settling basin after sluicing operations have returned to the river all of the water not desired for the Franklin Canal net diversion. This water returned to the river, of course, is for later diversion by the Riverside Canal located a few miles below Ysleta, Texas. Incidentally, the old International Diversion Dam, which formerly served both the Franklin Canal and the Acequia Madre [of Juarez] is now used only by the Acequia Madre, since under the new setup the diversion for the Franklin Canal is now made at the American Dam.

As noted above, the American Dam was useless without completing the American Canal. Yet, compared to the dam, construction of the canal was far more problematic due, in large part, to difficulties in acquiring easements and the high sediment content of Rio Grande waters (Resch 1934:27–28; Figure 4 and Plate 8):

> The American Canal, while only two miles long, will involve a number of difficult and costly features. These are due largely to the limitations of the location, and to the railroads, paved highway, and other works already constructed in the narrow canyon which the canal also must traverse . . . Right of way will be a costly item. The physical limitations of the location are such that the upper end of the canal must be located through a thickly settled district of "shacks" and small houses in what is locally known as "Smelter Town," and a number of such properties must be purchased and torn down. Its lower end is within the El Paso city limits and through a well developed section known as "Old Fort Bliss Place" and the "Wuerthman Subdivision" . . . The headworks of the American Canal consist of a long skimming weir over which river waters are diverted into a settling basin 1200 feet long. At the lower end of the settling basin water is diverted into the canal proper over a second skimming weir.

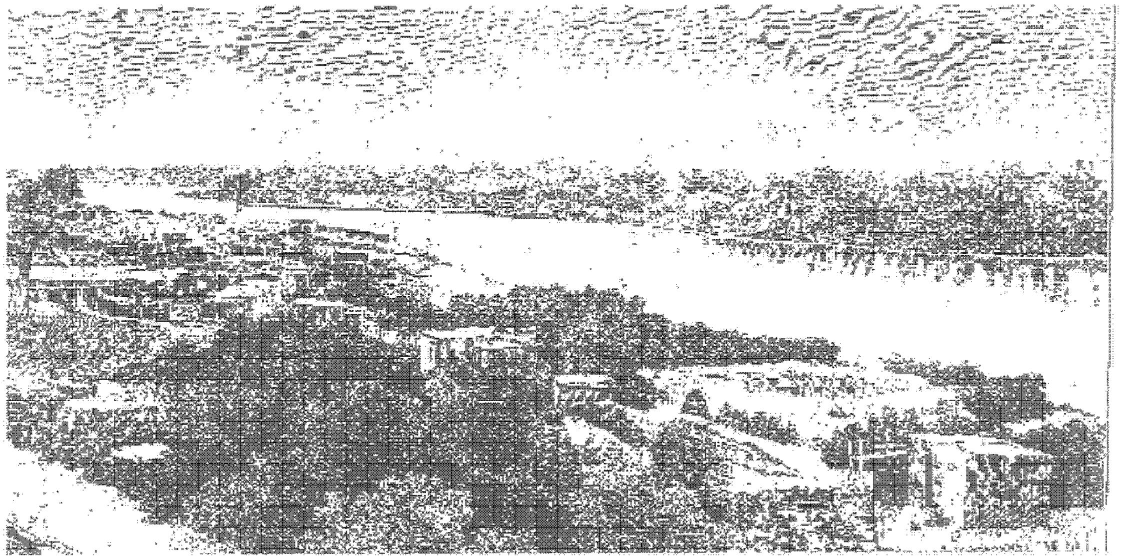


Figure 4. Structures Along the Left Bank of the Rio Grande Near the Future Site of the American Dam (1888—From Ernst 1889:63).

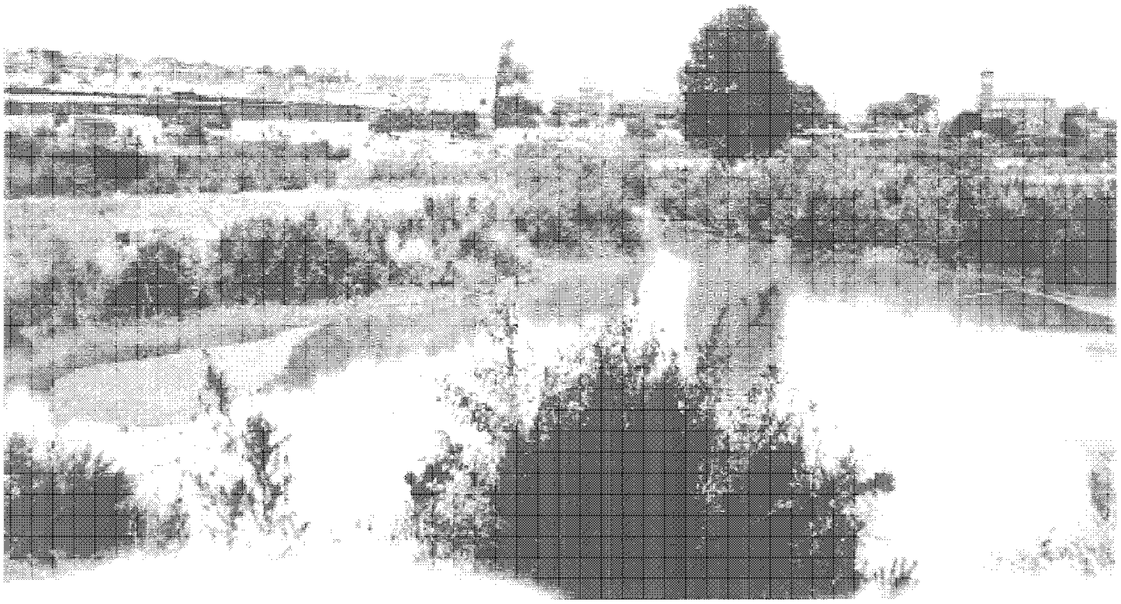


Plate 8. Dwellings Near the Future American Canal Right-of-Way (ca. 1918).

> The purpose of the skimming weirs is to prevent, insofar as possible, the entrance of heavier sands and silts into the canal by diverting in each case, only the "top layer" of water . . . Adjacent to the second skimming weir are radial sluice gates. When these gates are closed they act as a check, or dam, in the settling basin, and low velocities with consequent deposition of silt and sand in the settling basin result. When open, however, the grade is such that the flow of water in the settling basin is greatly accelerated, and the resulting high velocities will be sufficient to scour out the sand and silt deposits with the settling basin and carry them on into the river.

American Dam

The American Dam is a diversion dam of the floating type. It is located 3.5 mi from the business center of El Paso and between 140-200 ft above the boundary between the United States and Mexico (IBWC 1955:44, IBWC 1981:1). It is 284 ft wide between abutments and 70 ft long from the edge of the upstream apron to the downstream side of the dentated-type sill (IBWC 1955:44, IBWC 1981:1). The dam is controlled by thirteen 7.56 x 20 ft radial gates with the gate sill on the floor of the structure, which was placed approximately two ft below the existing river bed. The dam and canal were designed with a 1200 cfs capacity and the dam's gates open automatically when Rio Grande flows exceed this amount (IBWC 1981:1).

American Canal

A general summary statement regarding the American Canal appeared in a BOR Project History (1938:29–30):

> Below the intake structure leading from the settling basin to the canal, the canal section consists of a concrete-lined trapezoidal channel to Station 15+18.5, a distance of 1164.0 feet. At Station 15+18.5 a fifty foot transition leads to a closed monolithic concrete section located under the paved highway (U.S. 80) and which continues to Station 38+50. Through this stretch of 2281.50 feet, there is barely sufficient room between the river and the Atchison, Topeka and Santa Fe Railway for the paved highway and the railway is located at the foot of a high slag dump . . . From Station 38+50 to Station 60+31.25, a distance of 2181.25 feet, the canyon widens out sufficiently to permit of the location [sic] of an open concrete-lined conduit between the highway and the railway. At Station 60+31.25, the canal again enters a closed monolithic section which continues to Station 70+50 or for 1518.75 feet. Near Station 62, the railroad and the highway are so close together that is was necessary to locate the canal between the pavement and the river. As the distance between these features in the particular locality is less than 100 feet, the closed section became necessary. From Station 75+50 to Station 98+50, or for the last 2300 feet of the canal location, the river and the highway diverge sufficiently to make it possible to adopt a concrete-lined trapezoidal [open] canal section.

More detailed descriptions of the canal derive from other sources. At the head of the American Canal, upstream of the headgates, is a skimming weir. The weir is oriented at a 90-degree angle to the long axis of the American Dam. It extends upstream from the left abutment of the dam along an axis parallel to the general course of the river (IBWC 1955:44). The weir is situated at a 70-degree angle to the American Canal headgate structure and measures 250 ft long by 2 ft high. A 210 x 2.5 ft timber platform is placed on top of it for access by foot for cleaning/maintenance.

The American Canal's headgate structure is constructed of concrete and steel. Its overall dimensions are 9 x 44 ft. The structure contains two radial sluice gates, each 20 ft wide x 11 ft high. The radial gates are raised and lowered by two 3-h.p., Type D-254 Gearmotors (3 Ph 60 Cy. 220/440 V. 1160 rpm motors) and two 12,000-lb. radial gate hoists geared at a 400:1 ratio. The floor of the equipment platform is covered with subway grating.

There are a number of attributes common to all of the American Canal's open sections. Concrete lining in open sections contain vertical construction joints across the bottom and side slopes on 10-ft centers. The lining also includes 2-in.-diameter weep holes draining into 1 x 1 ft gravel drains located along 5-foot centers. There are five weep holes per cross-section, two on each side and one on the bottom (Plate 9).

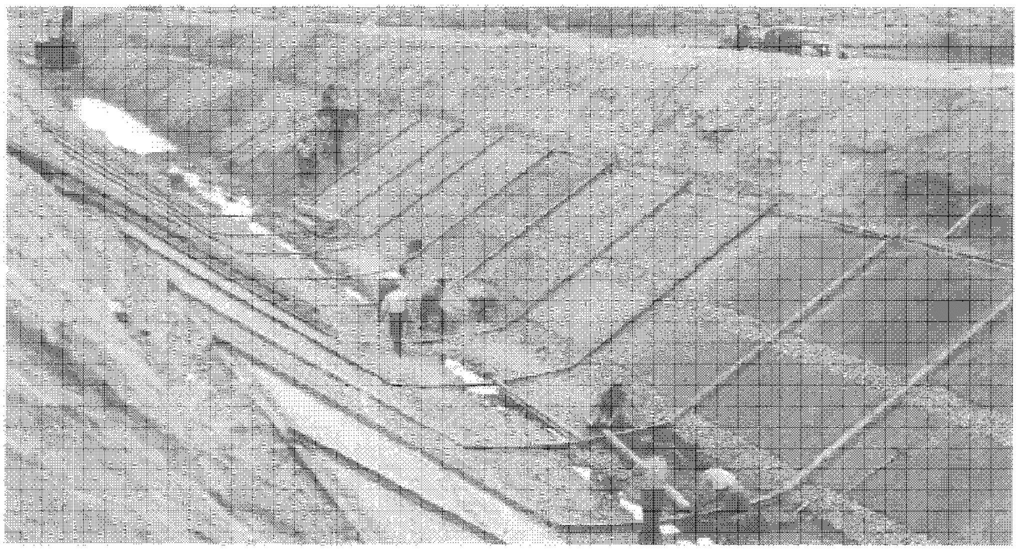


Plate 9. Open Section "A" Showing Configuration of Construction Joints and Gravel Drains Common in All Open Sections, 31 December 1937.

As-built engineering drawings (IBWC files, El Paso) provide nine representative cross-sections showing the configuration of the American Canal. Open section "A" refers to portions of the canal that traverse alluvial sediments, while open section "B" refers to portions of the canal passing through bedrock. Open section "A" consists of three discontinuous segments as follows: upper open "A," middle open "A," and lower open "A." Upper open "A" extends 2,239 ft below the intake structure before entering Conduit "A." Middle open "A" begins 3,224 ft below the intake structure before entering Conduit "B." Lower open "A" begins 8,374 ft below the intake structure and continues to the junction of the Franklin Canal. Cross-sections from Stations 14+00, 45+00, and 102+45 exhibit a general trapezoidal shape (Figure 5 and 7). In each of these segments, the canal measures 55.75 ft wide at the top, 12 ft wide at the bottom, and 10 ft in depth. Side slopes are 1.5:1. The concrete lining is 0.25 ft thick and reinforced with 3/8-in. deformed steel bars on 1 ft centers. The three lengths of open section "A" comprise about 70 percent of the canal's total length.

Open section "B" begins approximately 7,894 ft from the headgate and extends 480 ft. Two representative cross-sections are located at Stations 84+15 and 87+00 (Figures 6 and 7). Open section "B" is 58 ft wide at the top and 21 ft wide at the bottom. The overall depth is 10 ft with a side slope of .25:1. The concrete lining ranges from 0.83 ft thick across the bottom to as little as 0.5 ft in thickness along the sides.

Situated at two intervals in the American Canal are closed conduits through which irrigation water is conveyed. The first, Conduit "A," begins 2,239 ft downstream from the headgate and extends 985 ft northeastward beneath U.S. 80. The second, Conduit "B," begins 6,165 ft downstream from the headgate and extends 1,729 ft southeastward beneath U.S. 80. As-built engineering drawings provide detailed data regarding the dimensions and construction materials of both conduits. Both are rigid-frame concrete structures measuring 1.83 ft thick on the sides and top. The conduits are 28.5 ft wide. Conduit "A" is 11 ft high, while Conduit "B" is 13 ft high. The footings for both conduits measure 6.5 ft x 1.75 ft. Similar to the open sections, 2-in. weep holes on 5-ft centers are located on the bottom and sides of both conduits. As well, both conduits have been heavily reinforced to support an earth cover, overlying highway pavement and associated traffic. Conduit "A" has only a 2-ft earth cover, while conduit "B" is more heavily reinforced, having upwards of a 4-ft earth cover.

Associated with the original canal were a number of ancillary structures, notably bridges. Two bridges, one located at Globe Street and the other at Hart's Mill Road, were built in 1938. Both bridges measured 41.5 ft long by 18 ft wide and were situated 15.4167 ft above the base of the canal. These bridges were constructed of 0.33 x 1.33 x 22 ft stringers with 0.25 x 0.67 x 18 ft plank flooring. Bridge supports included two abutments measuring 7.3 x 19 ft and a 12 x 12 x 15.5 ft concrete and steel pile.

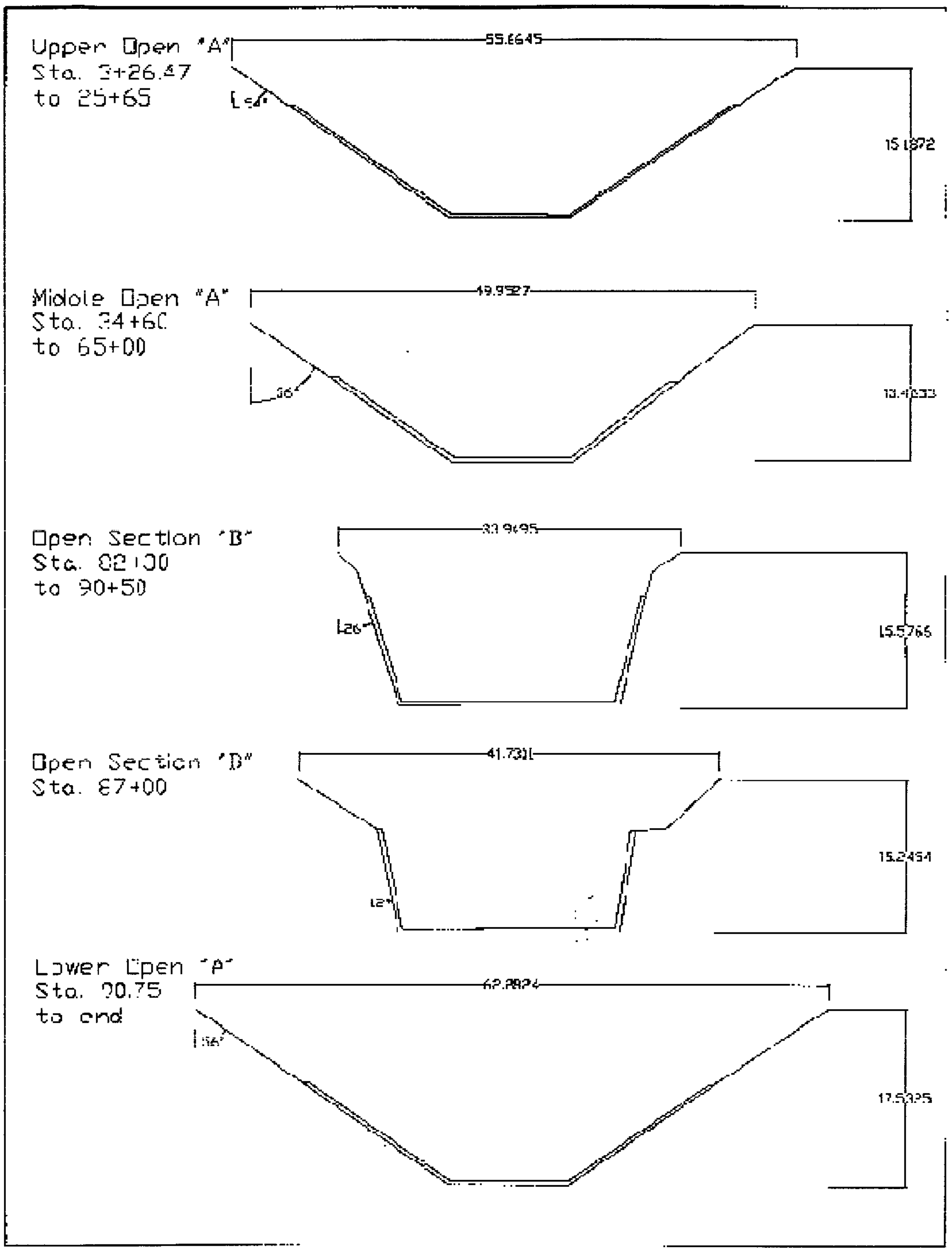


Figure 5. Representative Cross-sections of Open Channel Portions of the American Canal (Redrawn from original engineering drawings on file at IBWC).

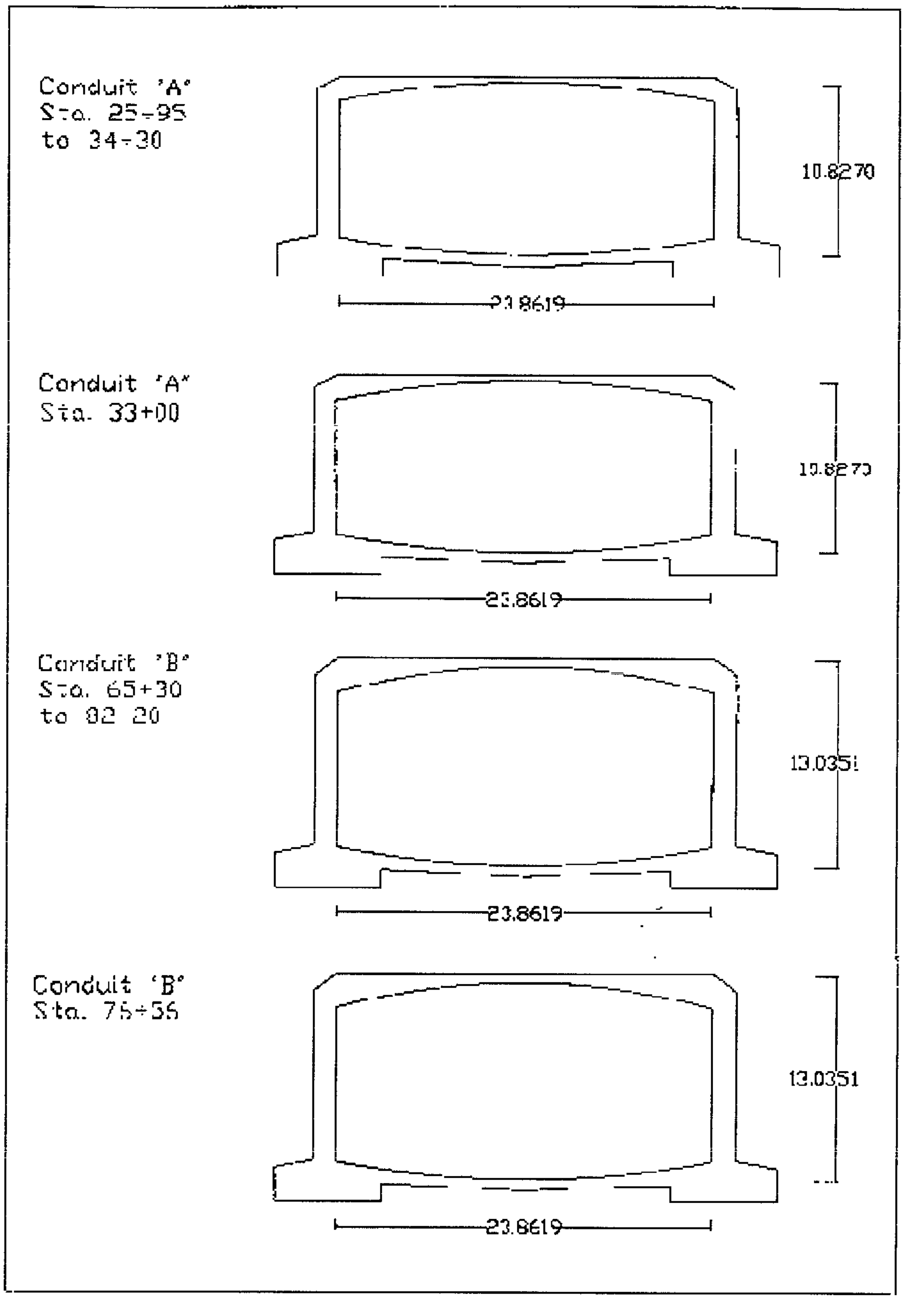


Figure 6. Representative Cross-sections of Closed Conduit Portions of the American Canal (Redrawn from original engineering drawings on file at IBWC).

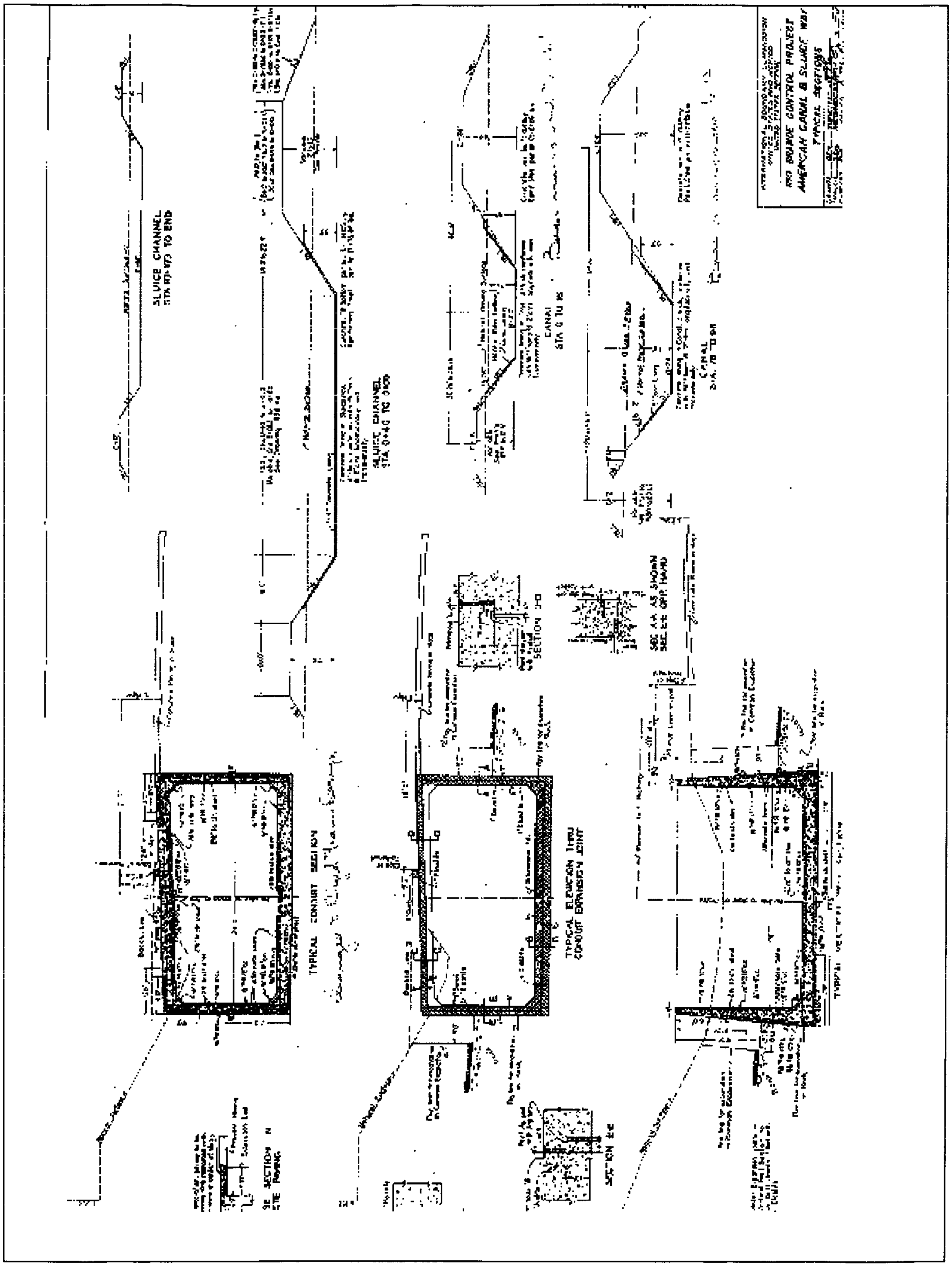


Figure 7. Cross-sectional Drawings of Sluiceway, Culverts, and Canal Channels (1935).

Overall operating characteristics of the American Canal from its inception in 1938 are summarized using data from the IBWC. Between 1938 and 1996, total annual diversions into the American Canal averaged 285,336 acre–feet (SD = 120,327). At the same time, there were considerable annual fluctuations in total diversions consistent with alternating macro-regional wet-and-dry climatic cycles (Figure 8). For example, the deleterious impact of the 1950s drought interval on water diversions into the American Canal is readily apparent in Figure 8.

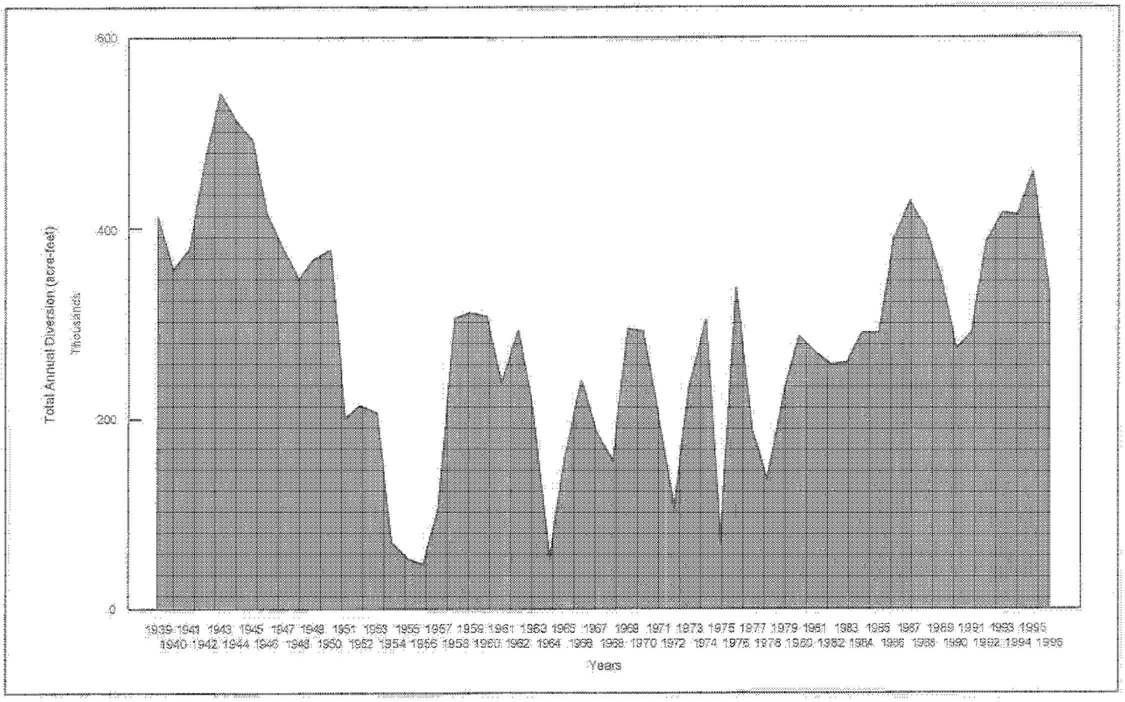


Figure 8. Annual Acre-foot Diversions in
the American Canal: 1938-1996 (IBWC Records)

Similarly, there are pronounced seasonal differences in water diversions corresponding to local agricultural practices and demand for irrigation water (Figure 9). Water is generally diverted, beginning in February, to soak fields prior to planting. The irrigation season begins in earnest in April, with peak periods of water diversions continuing through May, June, and July. Beginning in August, as crops begin to be harvested, water diversions gradually decline. By October, there is almost no water being diverted. During the period October to January, the canal minimal water—mostly from seepage through the headgates—and activities focus primarily on routine canal maintenance.

Not surprisingly, the flow of water through the American Canal mirrors total seasonal acre-foot diversions (Figure 10). Flows increase in March, decline through April and May, and peak in July when crops are most in need of irrigation water. Interestingly, water diversions have never exceeded the original design capacity of 1,200 cfs.

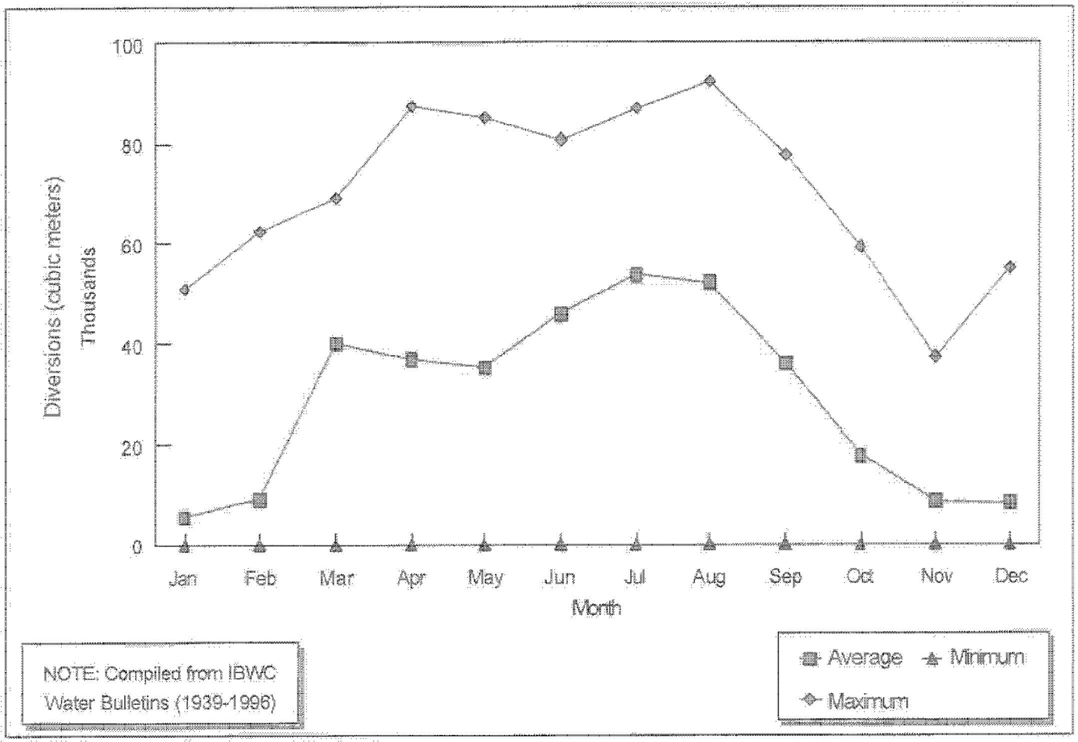


Figure 9. Seasonal Volume of Water
Diversions of American Canal: 1956-1996.

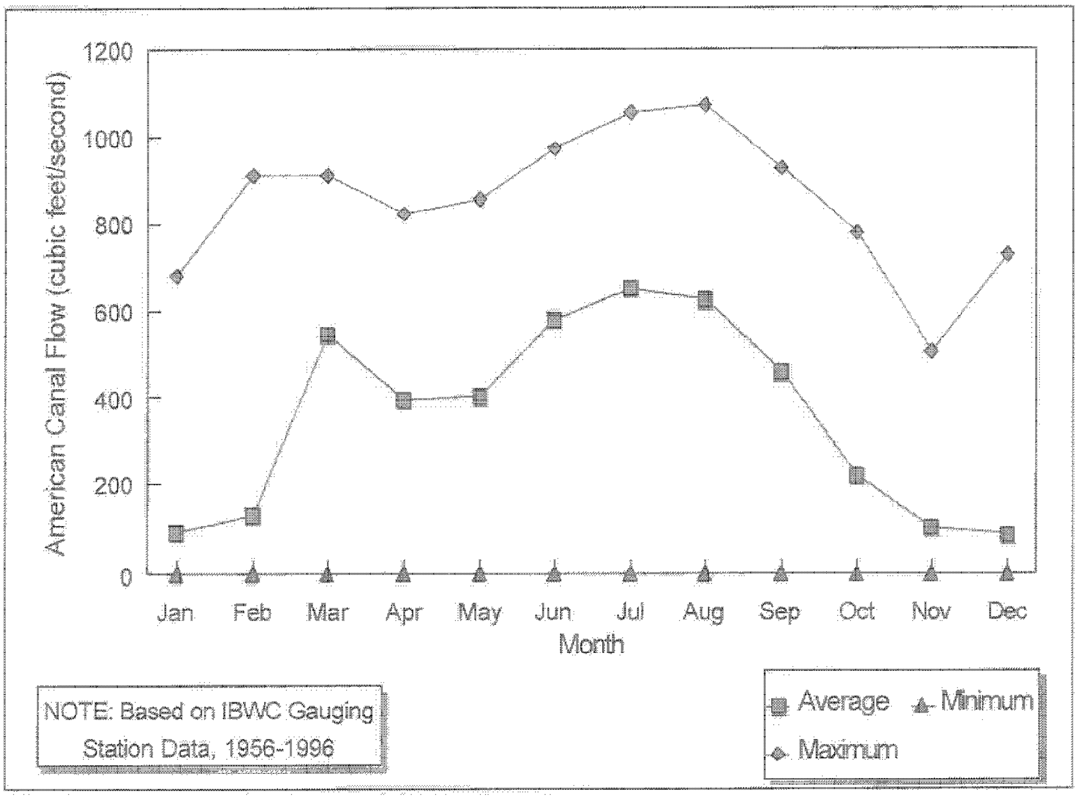


Figure 10. Seasonal Flow Rate of the
American Canal: 1956-1996.

There is independent confirmation that the design attributes described above were largely implemented during final construction. Specifically, a summary by the Water and Power Resources Service (1981:1057) indicates that, as described above, the American Canal is 2.1 mi long, concrete lined, with side slopes at a 1.5:1 ratio, a bottom width of 12 ft, a water depth of 8.75 ft, and a capacity of 1,200 cfs. These measurements conform almost exactly to those recommended in the 1935 engineering feasibility and design study.

A CONSTRUCTION CHRONOLOGY AND PHOTODOCUMENTARY SUMMARY OF THE AMERICAN DAM AND CANAL SYSTEM

Records from a retrospective summary of the American Dam and Canal construction history provide a detailed chronology of events surrounding this project (IBWC 1938:Exhibit E). A selected narrative summary, extracted verbatim from this chronology, has been combined with a parallel sequence of vintage photographs, also from IBWC files, to provide a comprehensive overview of the American Canal project. Major milestones and related photographs for some of these milestones are presented below.

April 3, 1935	Letter of Department authorized American Commissioner to begin investigation and study of canalization.
April, 1935	Surveys begun.
August 3, 1935	Preliminary Report submitted to Department.
August 29, 1935	Authorization $1,000,000, Public Act #392, 74th Congress, approved.
Nov 25, 1935	Engineering Board Report.
Dec 5, 1935	Budget estimate $1,000,000 transmitted to Department.
Dec 14, 1935	Final Report.
Dec 16, 1935	Final Report submitted to Department.
June 4, 1936	Authorization of canalization project and of appropriation $1,000,000, Public Act #648, 74th Congress, approved.
July 28, 1936	Right-of-way acquisition initiated.
August 25, 1936	Field party began final location of canal and right-of-way.

August 27, 1936	Chief Engineer of Western Lines, A.T. & S.F. R.R. Co., visited El Paso for conference on relocation of Santa Fe tracks.
August 30, 1936	Chief Designing Engineer Savage, Bureau of Reclamation, visited project for conference on project design.
October 14, 1936	Invitation for bids issued for the principal construction contract.
October 26, 1936	Construction of Garage and Field Office begun by Government force.
Nov 14, 1936	Bids opened for the principal construction contract.
Dec 16, 1936	Contract # IBM-975 awarded to Austin Bridge Co. and Austin Road Co., estimated amount $348,908.60, for the construction of the American Dam and Canal. Contractor given notice to begin the work.
January 4, 1937	Field Office completed and occupied.
January 6, 1937	Contractors started clearing rights-of-way.
January 16, 1937	Contract IBM-994 awarded to Austin Bridge Co. and Austin Road Co., estimated amount $4,085, for Smelter Arroyo Improvements.
January 25, 1937	River diversion began.

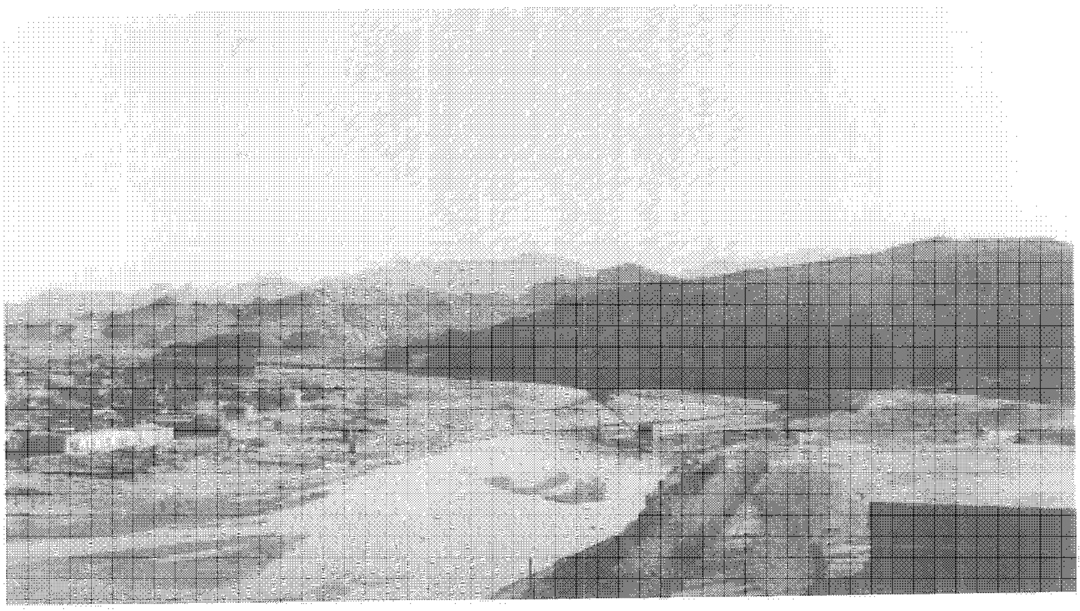


Plate 10. Beginning River Diversions, 27 January 1937.

February 12, 1937	Canal Excavation started.
February 15, 1937	Cofferdam for Units 2 and 3 completed; excavation for dam started; dewatering cofferdam started.
February 27, 1937	Started driving steel sheet piling.

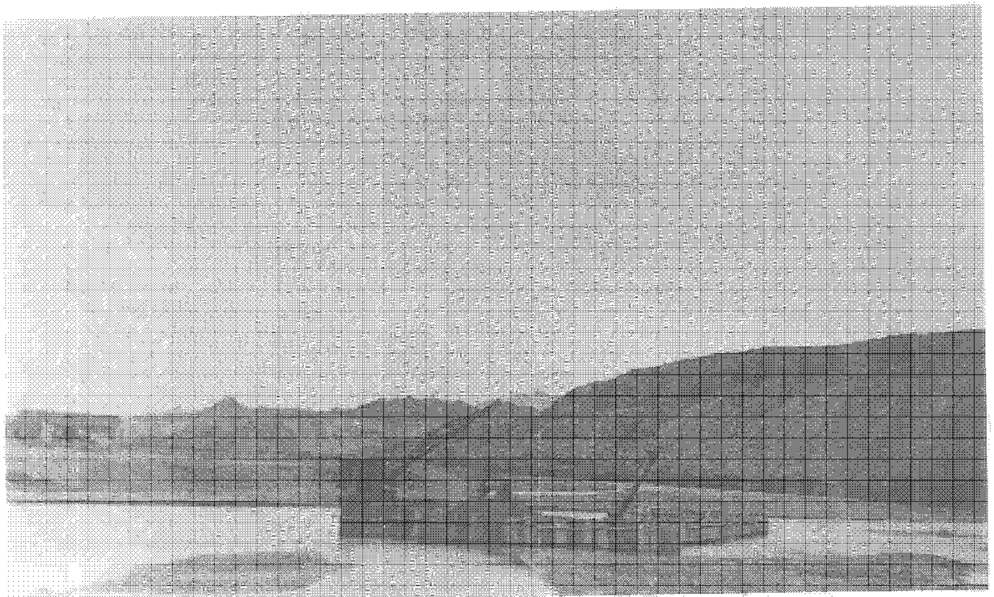


Plate 11. Cofferdam for the American Dam, 8 February 1937.

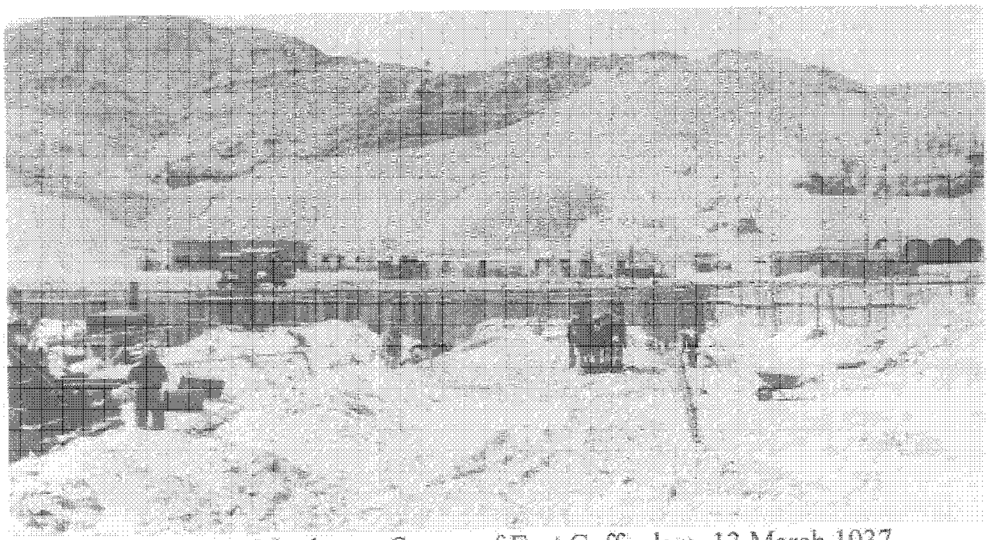


Plate 12. Northwest Corner of East Cofferdam, 13 March 1937.

March 18, 1937	First concrete poured—Jones School retaining Wall.
March 22, 1937	First concrete poured in American Dam.

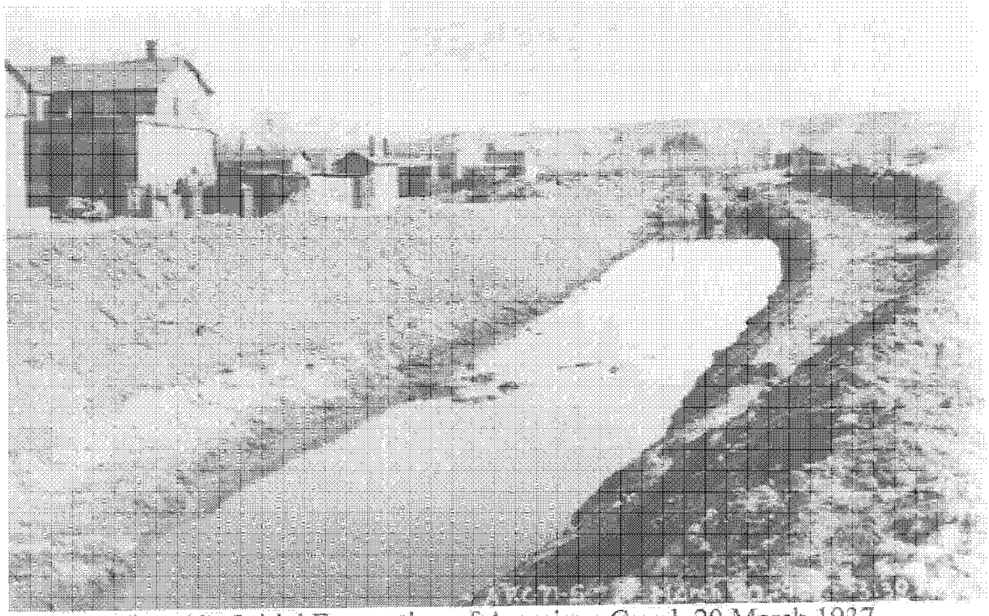


Plate 13. Initial Excavation of American Canal, 20 March 1937.

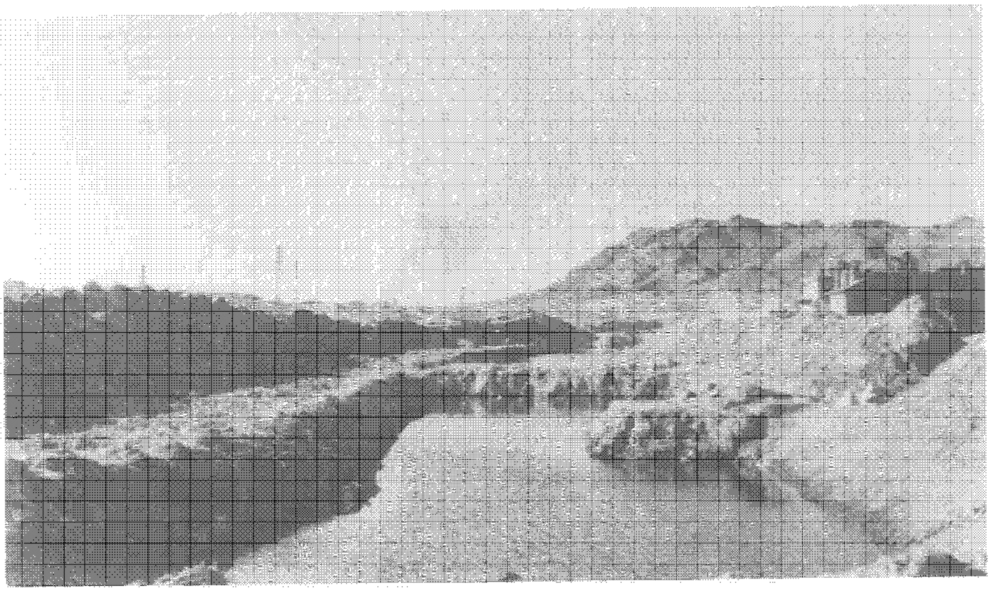


Plate 14. Early Phase of American Canal Construction;
View from Hart's Road, 31 March 1937.

March 29, 1937 Contractors began work on Smelter Arroyo Improvement.

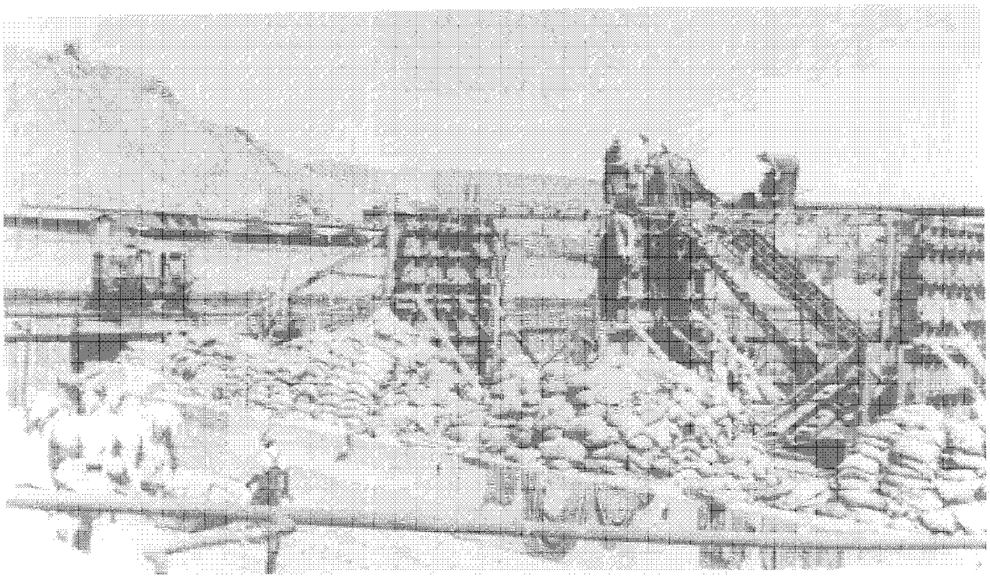


Plate 15. Piers 7-9 of the American Dam
Prior to Pouring Concrete, 12 April 1937.

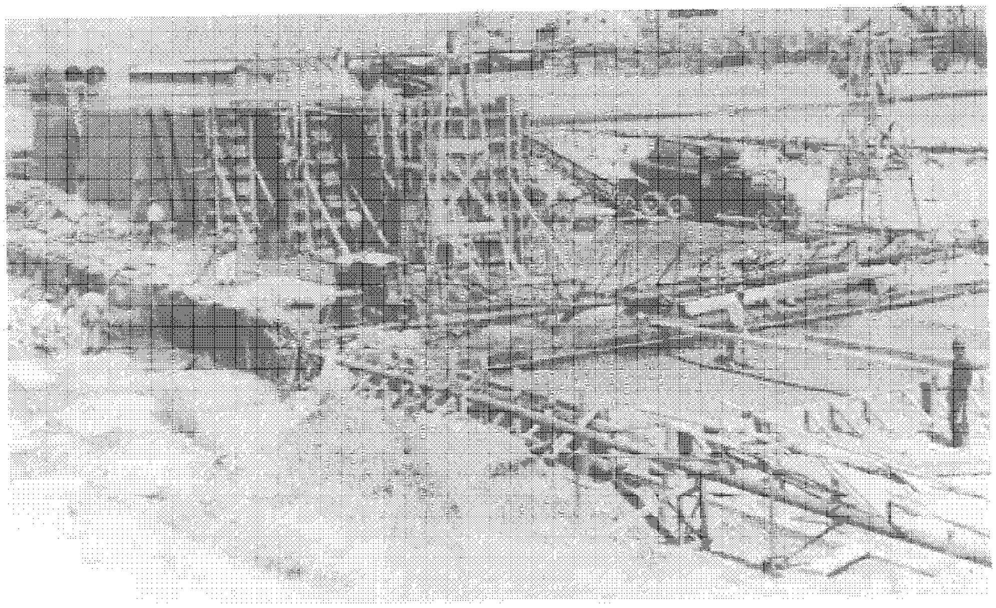


Plate 16. Pouring Concrete in Pier 5, American Dam, 19 April 1937.

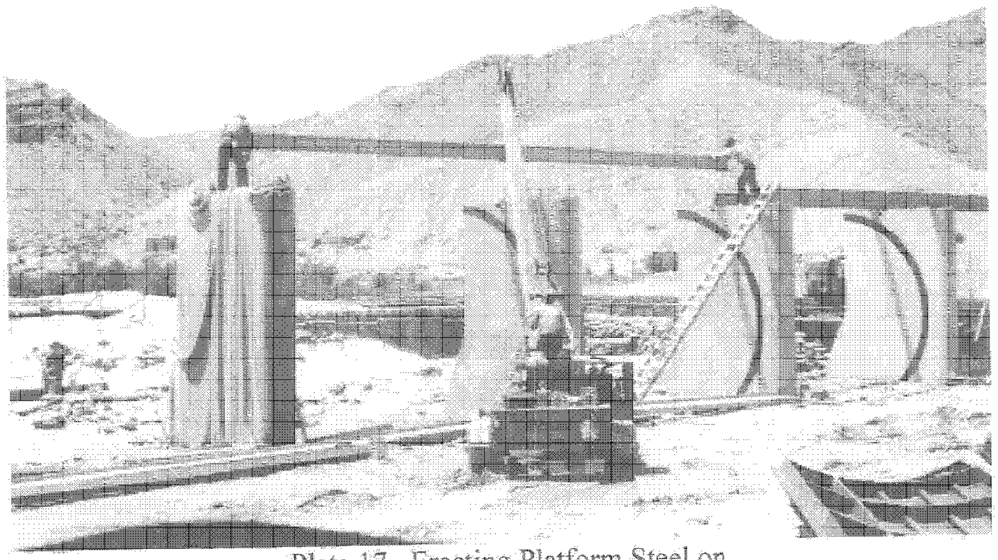


Plate 17. Erecting Platform Steel on
Piers 6-9, American Dam, 28 April 1937.

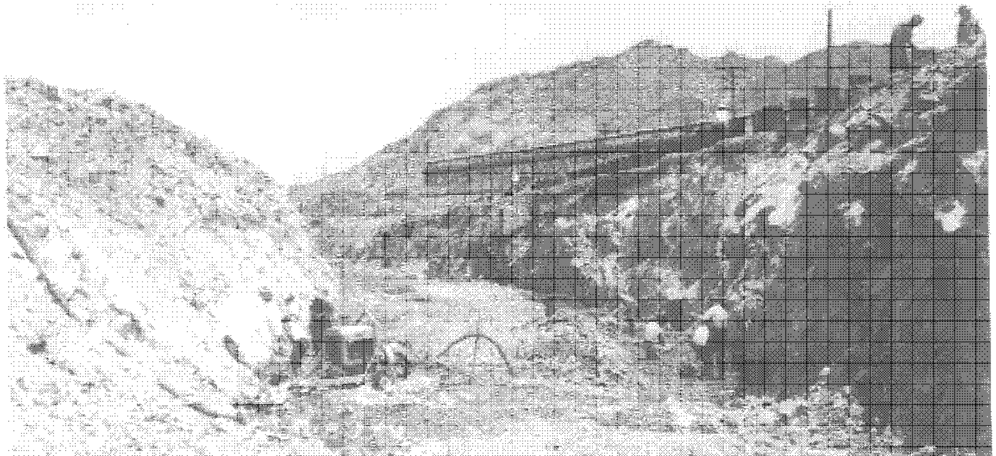


Plate 18. Hand-grading in the American Canal, May 1937.

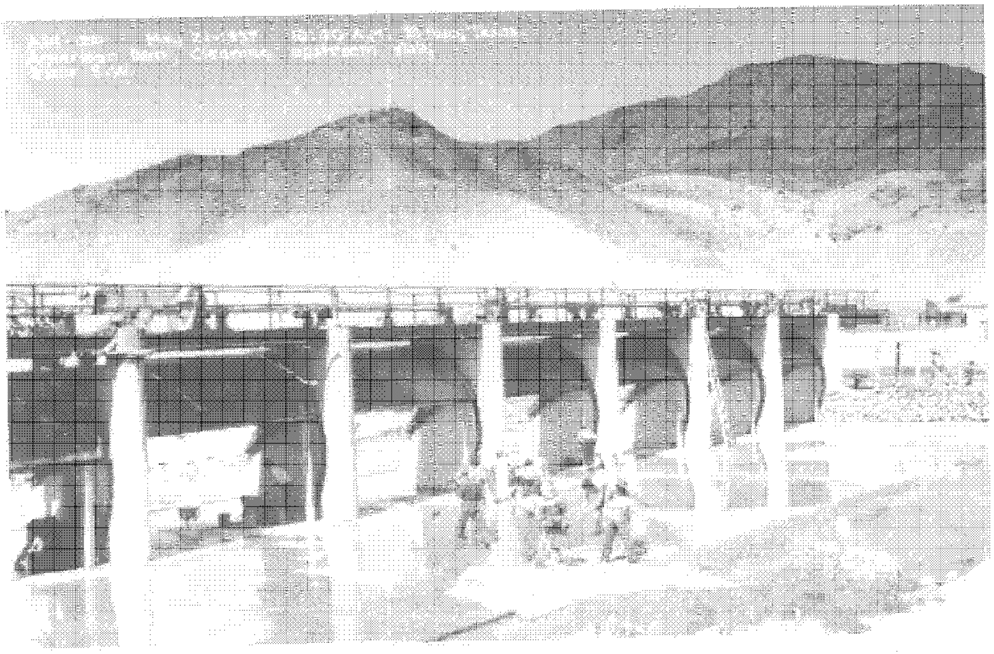


Plate 19. Cleaning Upstream Slab of the American Dam, 21 May 1937.

May 21, 1937	Units 1, 2, and 3 of American Dam completed, including gates # 1–8
May 22, 1937	River turned through completed section of dam.
May 29, 1937	4,000 cubic feet per second flowed through the dam.

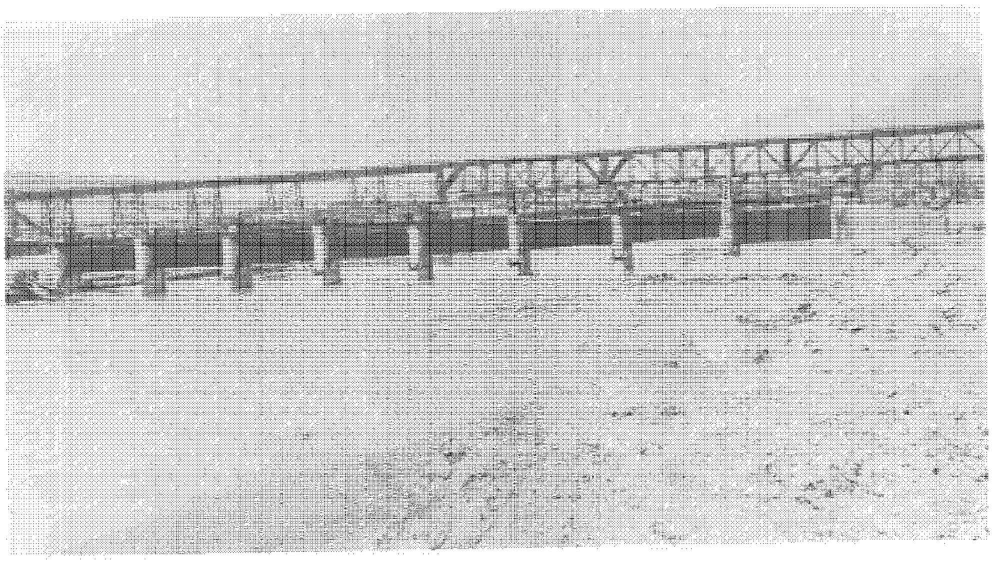


Plate 20. Water Flowing Through American Dam, 31 May 1937.

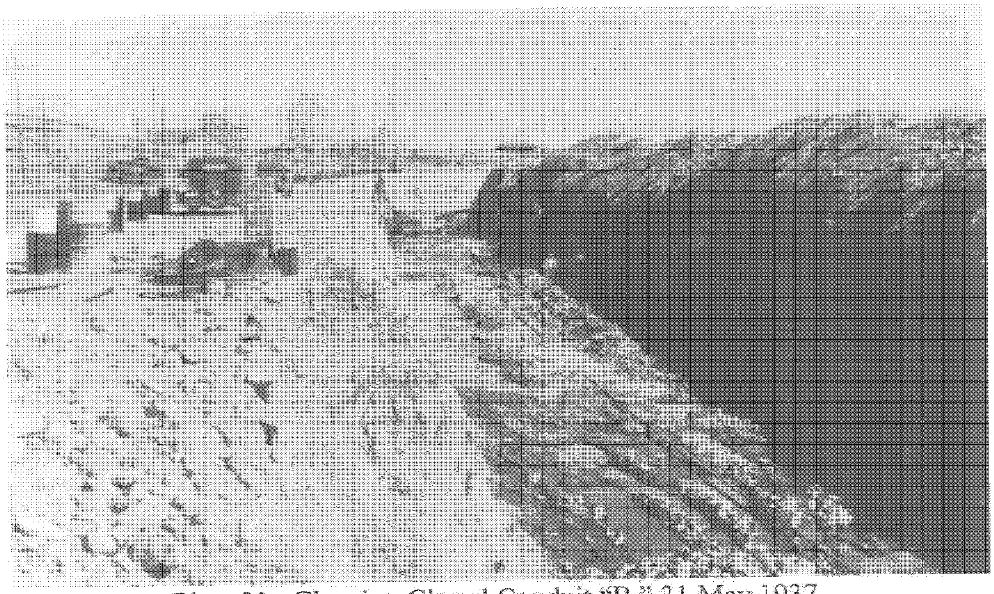


Plate 21. Cleaning Closed Conduit "B," 31 May 1937.

June 11, 1937	First concrete poured for canal, at station 81+25, closed conduit "A."
June 22, 1937	West side cofferdam unwatered, excavation begun.

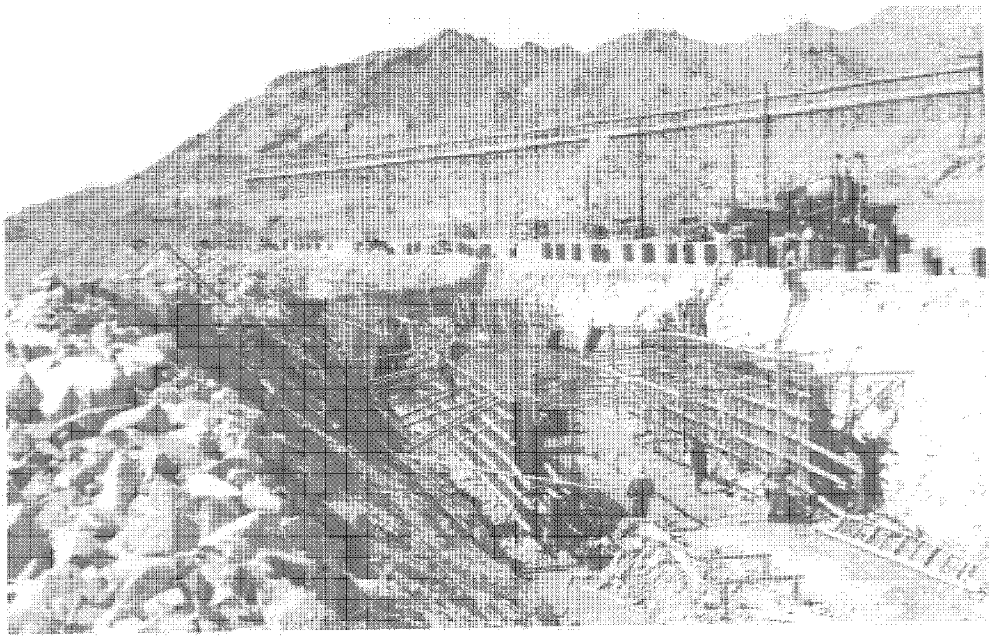


Plate 22. Pouring First Concrete, Closed Conduit "B," 22 June 1937.

June 26, 1937	Contract # IBM-1096 awarded to Austin Bridge Co. and Austin Road Co., estimated amount $26,185.00, for the construction of Protective Work above American Dam.
June 28, 1937	4,700 c.f.s. flood passed American Dam. No damage to cofferdam.
June 30, 1937	Construction costs to date total $394,681.15. Average of 63 men employed during year. Approximately 26% of dam and canal completed.
July 1, 1937	Relocation of A.T. & S.F. Track and Western Union lines begun.
July 9, 1937	Smelter Arroyo Improvements, Contract IBM-994, completed.

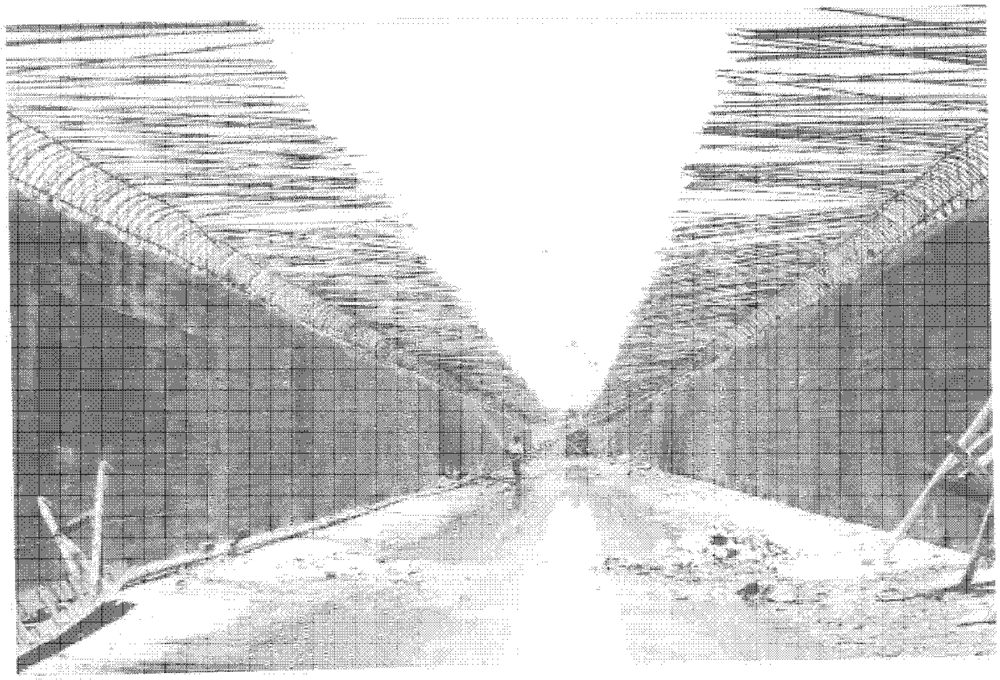


Plate 23. Closed Conduit "B" Concrete Walls Completed, 29 July 1937.

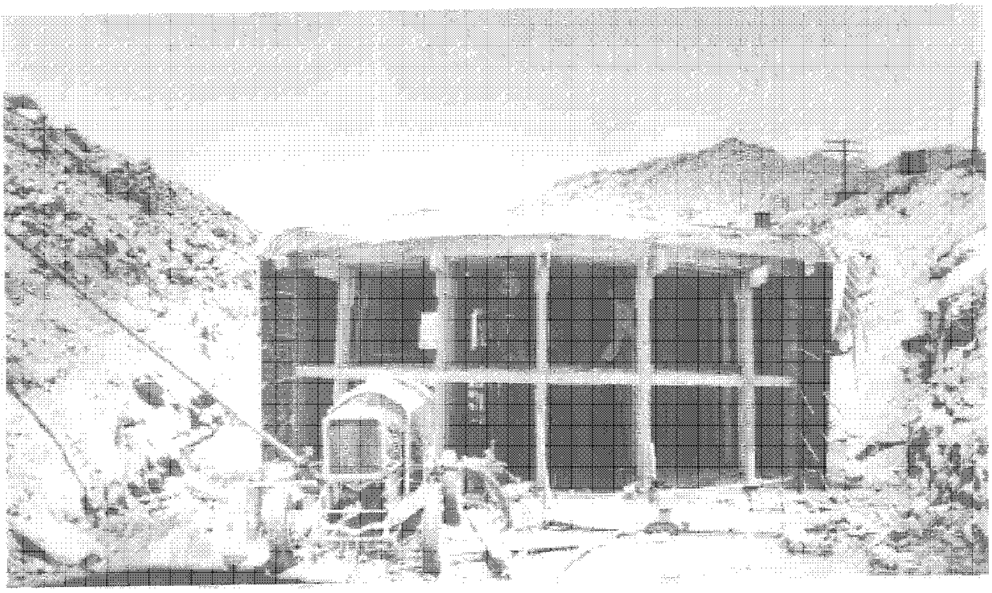


Plate 24. Forms for Roof of Closed Conduit "B" in Place, 29 July 1937.

August 31, 1937	Erection of radial gates in dam proper completed.
Sept. 20, 1937	Work on Closed Conduit "A" begun.
October 18, 1937	Relocation of track, A.T. & S.F. R.R. completed.

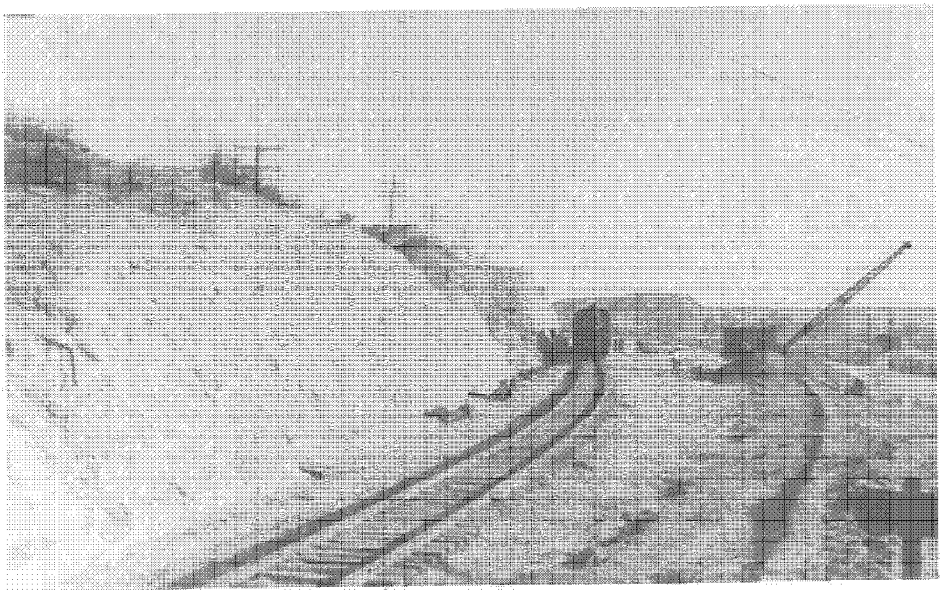


Plate 25. Relocation of AT&SF Railway Tracks, 19 October 1937.

October 23, 1937 Protective Work above American Dam started.

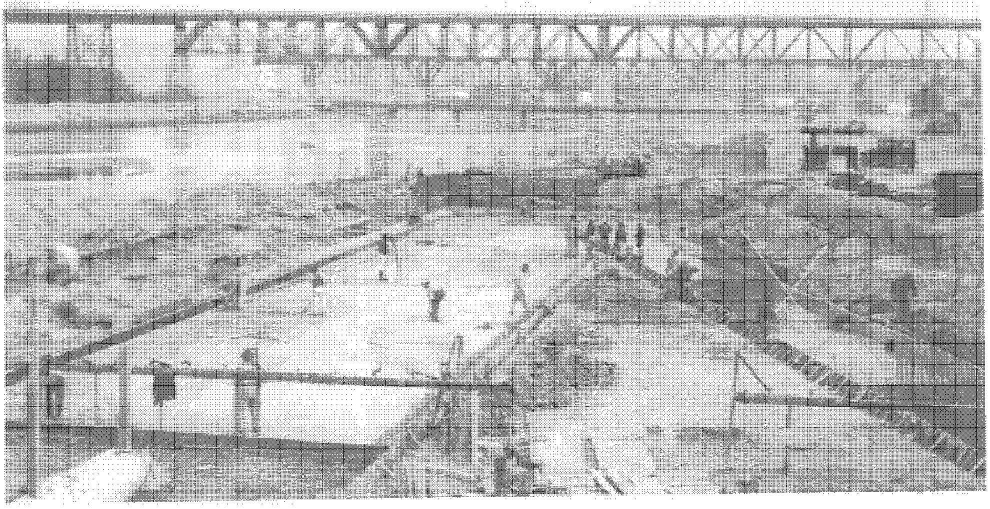


Plate 26. Pouring Concrete for the American Canal Headworks, 10 November 1937.

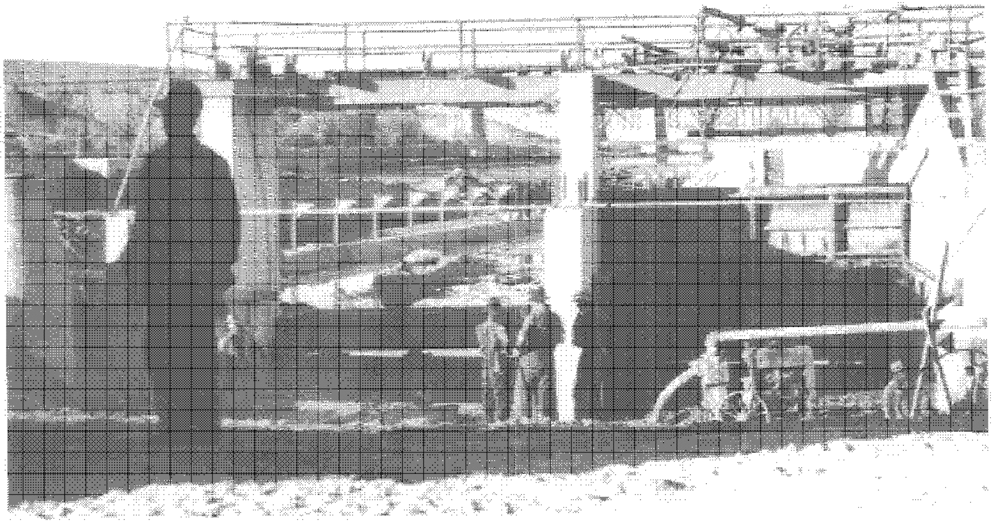


Plate 27. Erecting American Canal Headgates, 27 November 1937.

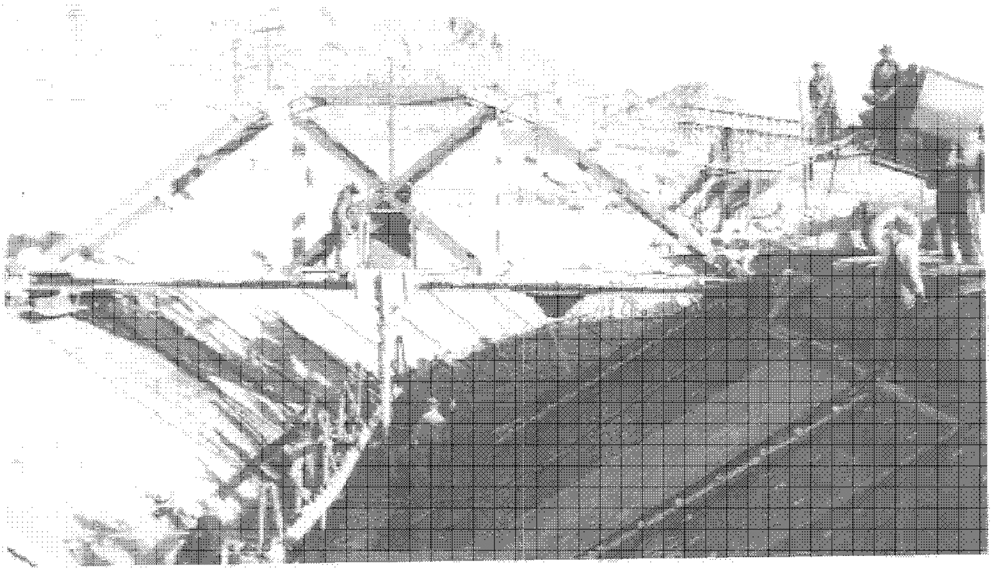


Plate 28. Pouring First Concrete in Open Section "A," 17 December 1937.

Dec 19, 1937 Third cofferdam at American Dam removed completing river diversion.

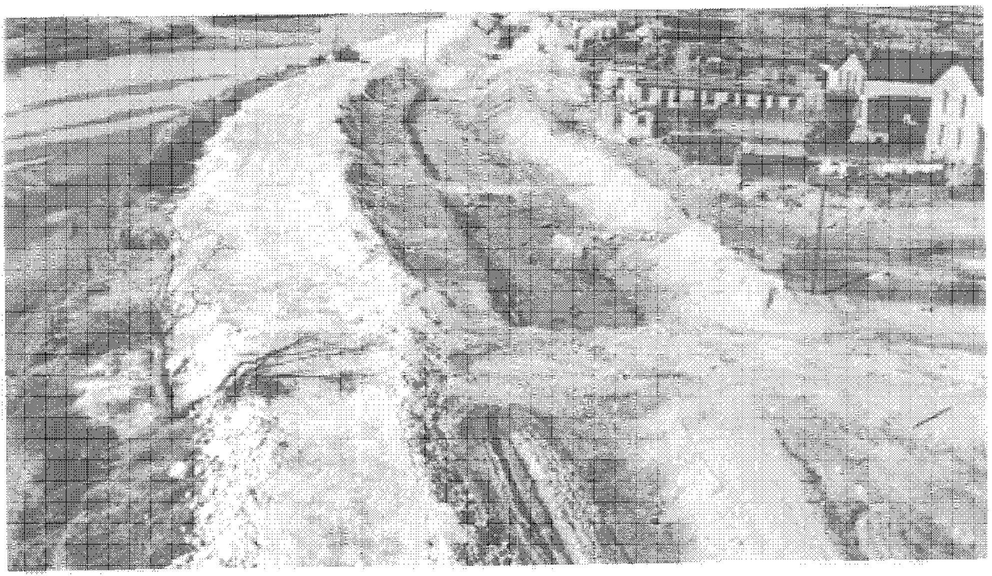


Plate 29. Open Section "A" Under Construction, 24 December 1937.

Dec 28, 1937 Closed Conduit "B" completed.

Dec 31, 1937 Approximately 73% of dam and canal completed.

January 15, 1938	Connection of new American Canal to Franklin Canal Heading completed.
February 20, 1938	Lower section of canal lining completed.

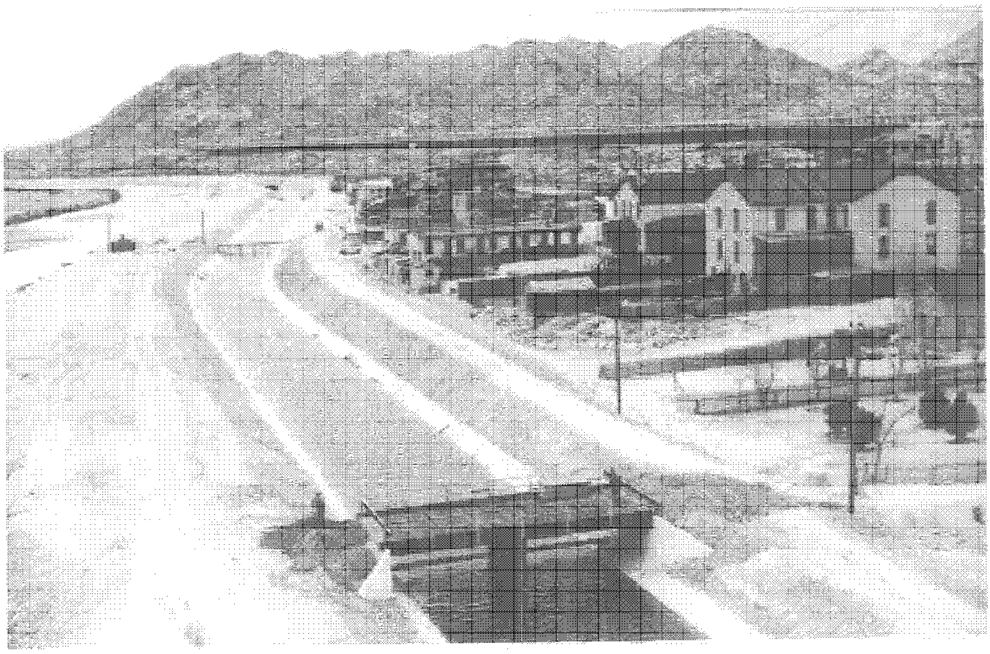


Plate 30. Lower Open Section "A" with Globe Street Bridge in Foreground, 12 March 1938.

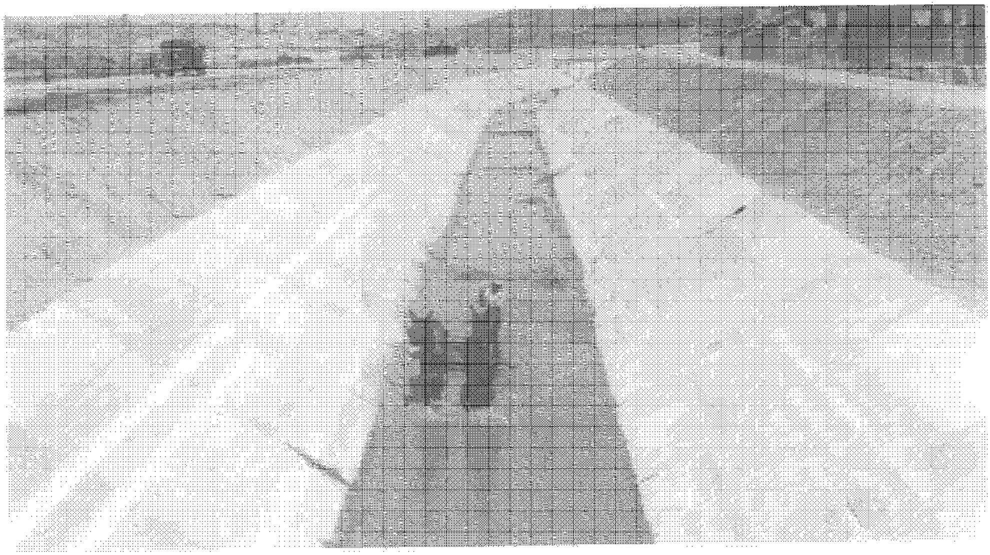


Plate 31. Final Cleaning of Upper Open Section "A," 31 March 1938.

April 12, 1938 Closed Conduit "A" completed.

April 19, 1938 Canal intake transition and upper section of canal lining completed.

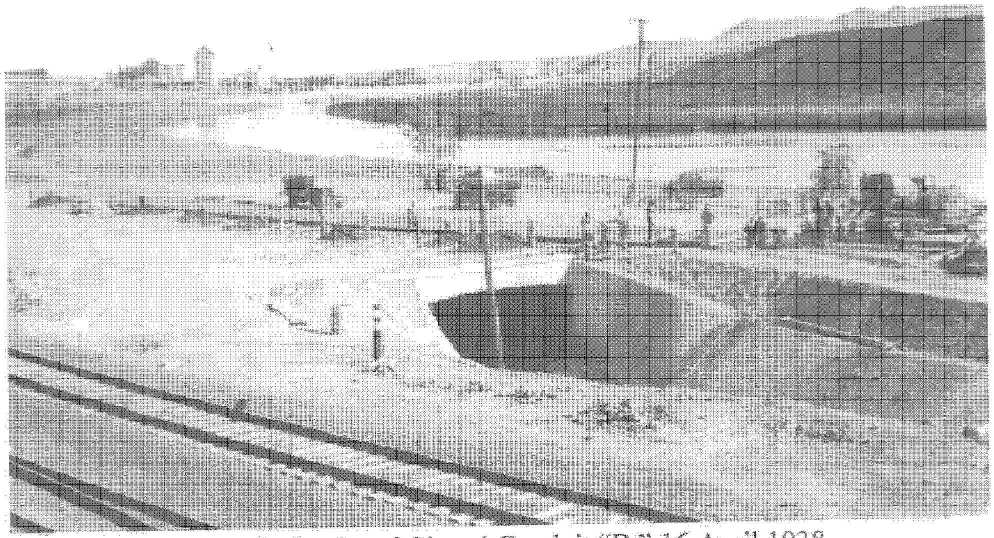


Plate 32. Intake of Closed Conduit "B," 16 April 1938.

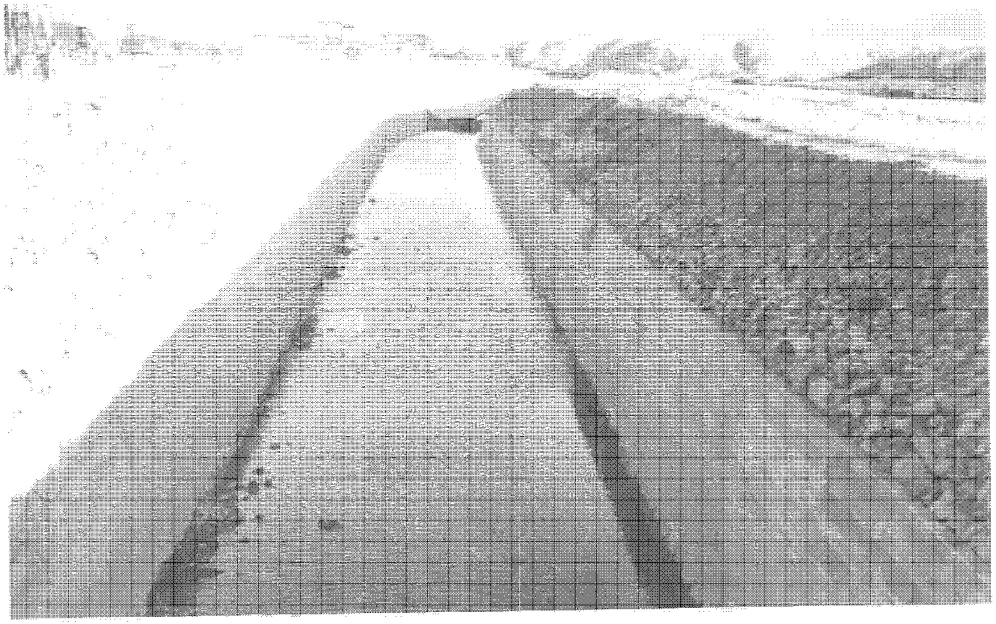


Plate 33. Open Section "B" Looking Downstream, 1 May 1938.

May 24, 1938 Canal lining completed.

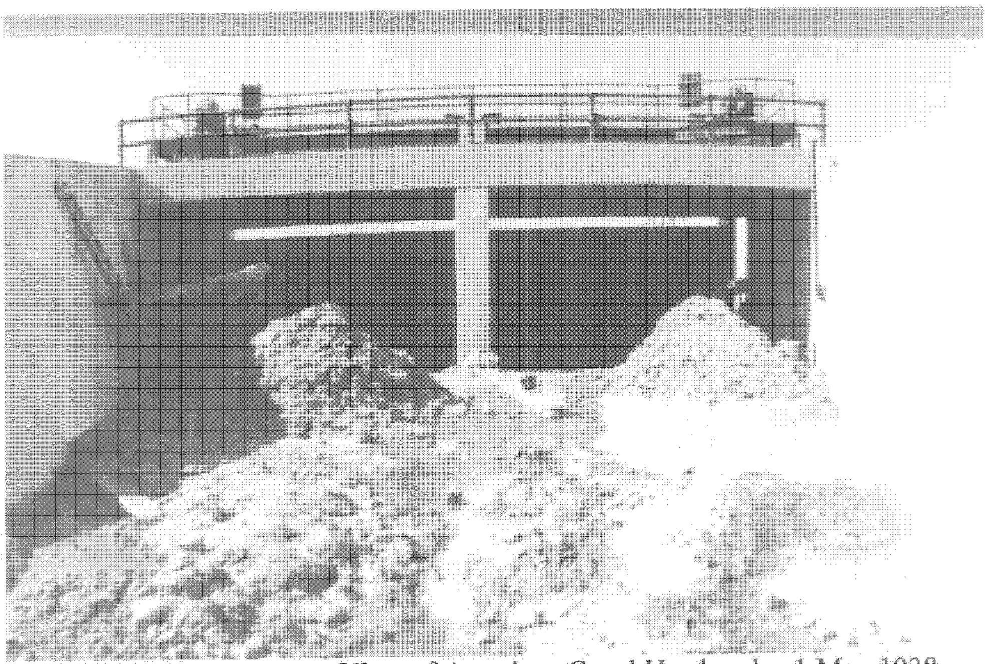


Plate 34. Downstream View of American Canal Headworks, 1 May 1938.

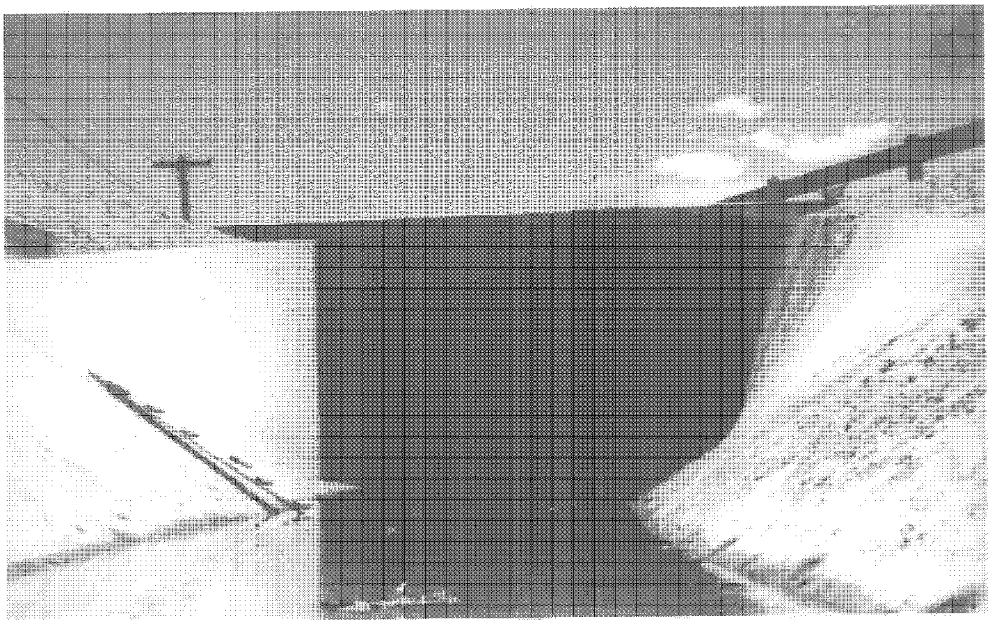


Plate 35. Intake of Closed Conduit "B," 25 May 1938.

May 27, 1938	Contract # IBM-975 for construction of American Dam and Canal completed.
June 2, 1938	American Dam and Canal put into service.

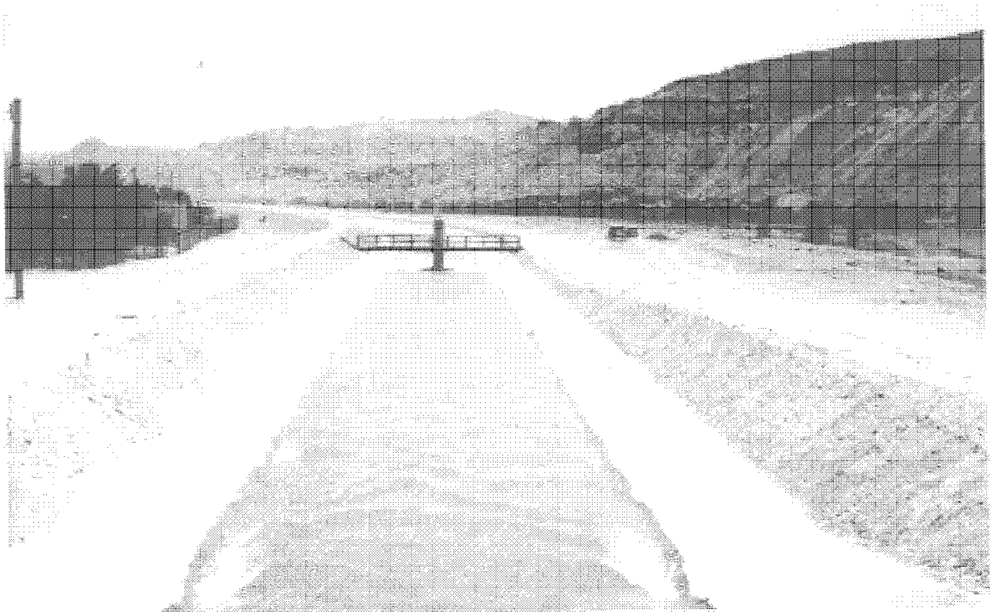
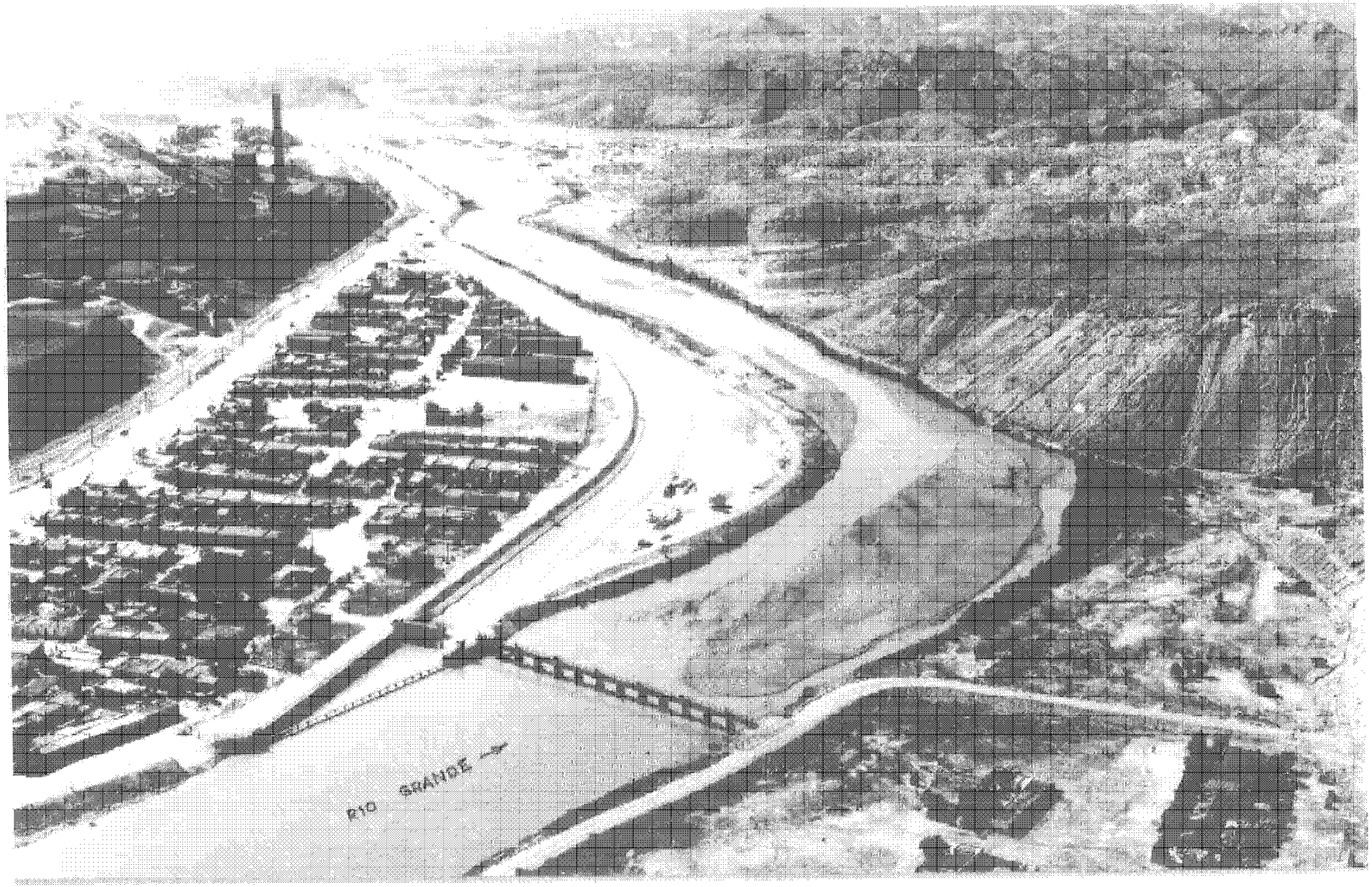


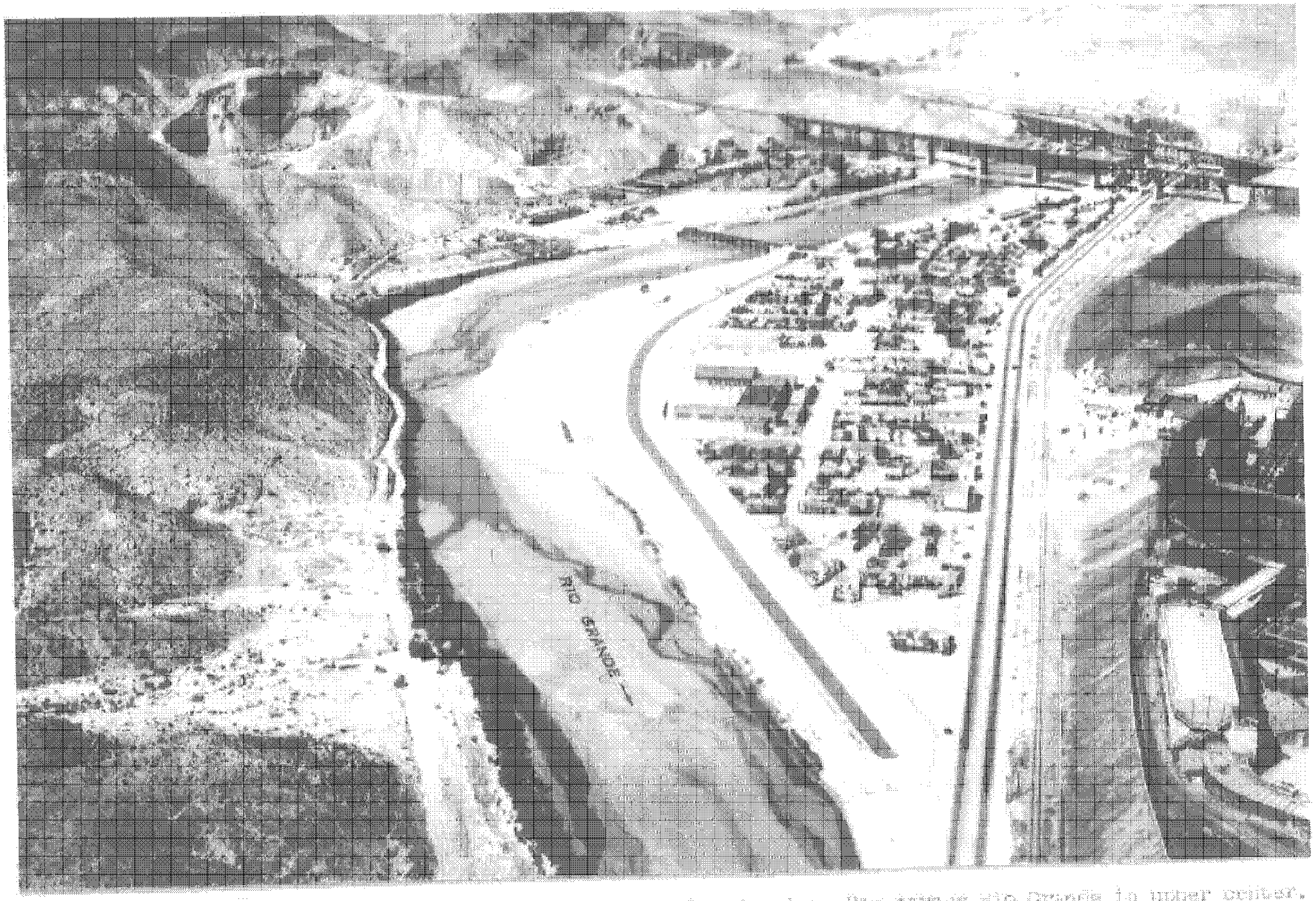
Plate 36. Upper Open Section "A" From Headgate, 3 June 1938.

June 18, 1938	Contract # IBM-1318 awarded to Austin Bridge Co. and Austin Road Co., estimated amount $10,252.50 for earthwork and levee surfacing.
June 22, 1938	Protective work above American Dam, Contract # IBM-1096, completed.
June 30, 1938	Construction costs to date $850,937.52. Average of 150 men employed during the six-month period. Dam, canal, and protective work above dam completed.
August 10, 1938	Austin Bridge Co. and Austin Road Co. completed fourth and last contract (# IBM-1318) for construction of dam and canal.
August 31, 1938	Total cost to date $864,614.20; total man-hours 439,263. Average of 101 employees during entire construction. Total earthwork 333,219 cubic yards; total concrete placed 18,365 cubic yards.



American Dam and Canal in operation. View southeast showing dam and part of canal. Irrigation water for El Paso Valley flowing through canal; water for delivery to Mexico being discharged into river channel through gate at left end of dam. El Paso Smelter in upper left. Aerial photograph, August 18, 1939.

Plate 37. American Dam and Intake of the American Canal After Completion, 18 August 1939.



View north showing upper open section of American Canal. American Dam across Rio Grande in upper center. Railroad bridges in upper right. U.S. Highway 80-A and El Paso smelter at right. October 18, 1938.

Plate 38. Upper Open Section "A" Looking Upstream; Note Entry into Closed Conduit "A", 18 October 1938.

INVENTORY OF THE AMERICAN DAM

The American Dam is *not* part of the proposed USIBWC undertaking. However, the American Canal, the focus of this proposed undertaking, cannot fully be evaluated without considering the dam that supplies water to it.

As noted above, the dam has not been modified since its completion in 1938. It is 284 ft wide between abutments and 70 ft long from the edge of the upstream apron to the downstream side of the dentated-type sill. Water diversions are controlled by thirteen 7.56 x 20-ft radial gates, whose base is approximately 2 ft below the grade of the river bed.

In the remainder of this section, all photographs dated 1938 were obtained from IBWC files in El Paso. These vintage photographs are used to compare and contrast changes in the configuration of the American Dam between 1938 and 1999. Plate 39 shows the American Dam and intake of the American Canal viewed upstream of the dam. Plate 40 is a vintage 1938 photograph of the dam-canal complex viewed from even further upstream, while Plate 41 is a repeat photograph taken during this project. A comparison of these two photographs confirms that the American Dam has not changed from its 1938 configuration.

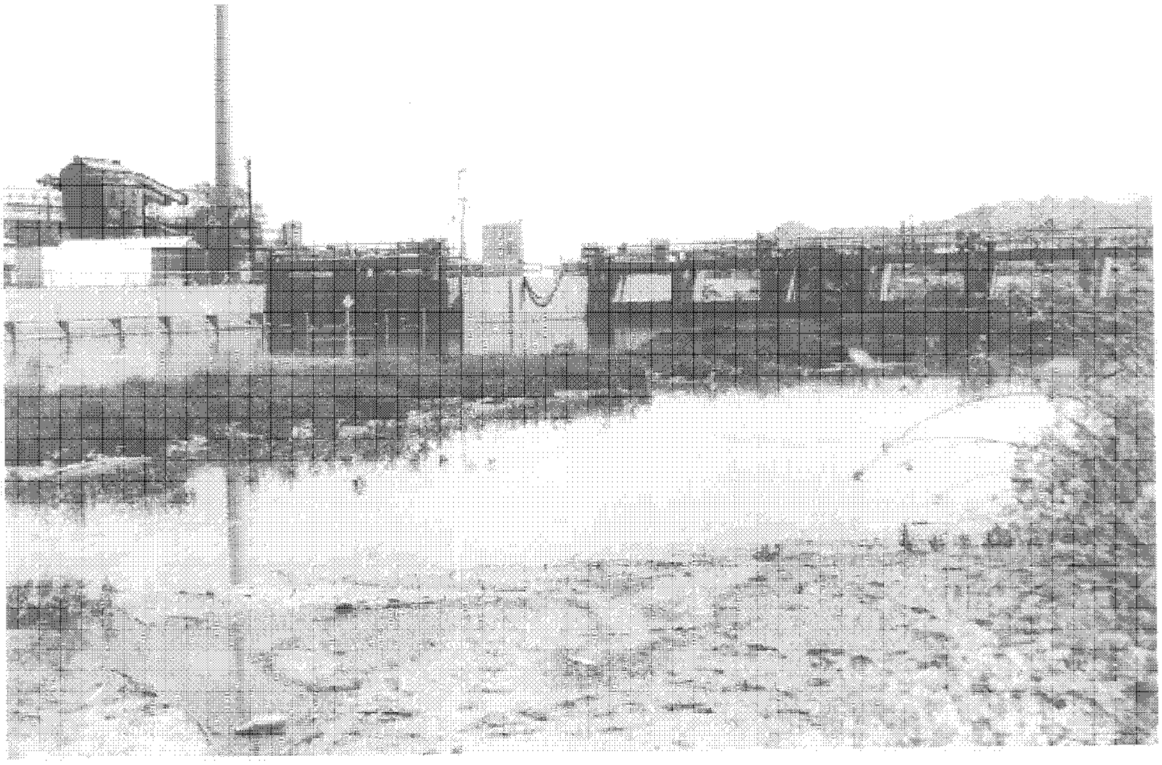


Plate 39. American Dam (right) and American Canal Weir and Intake (left), 1999.

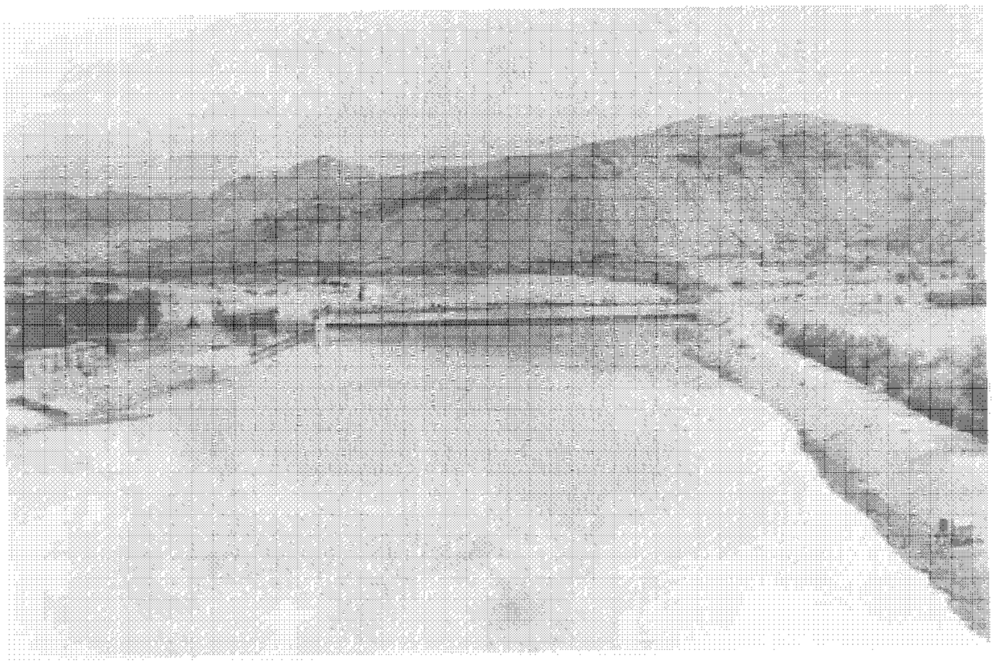


Plate 40. American Dam (center) and Canal (left), 1 July 1938.

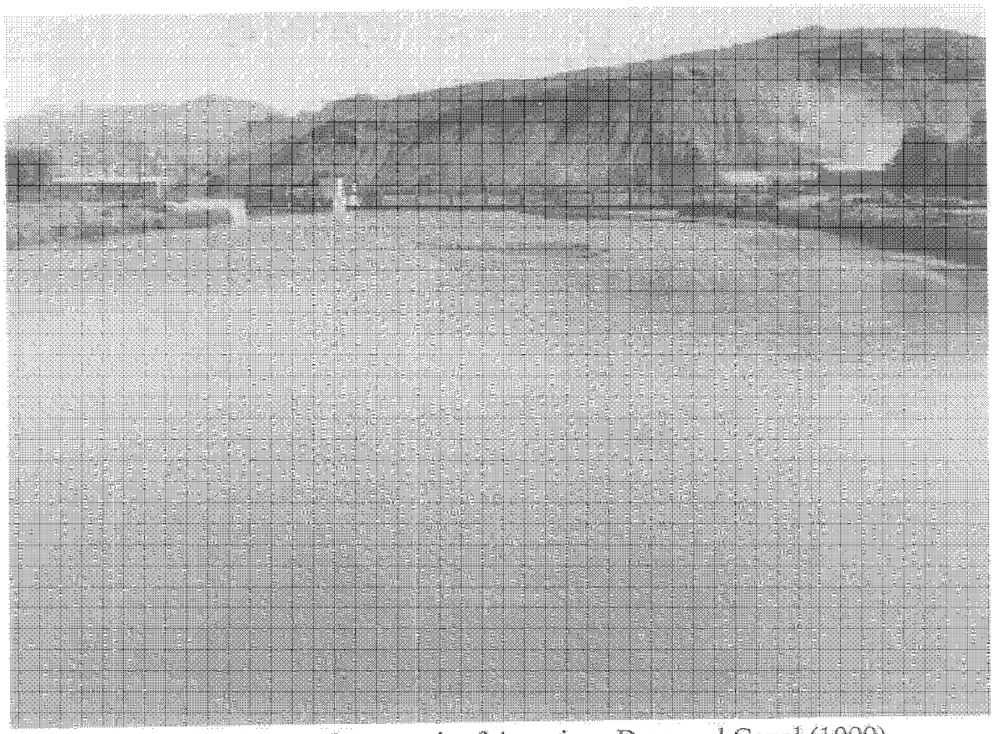


Plate 41. Repeat photograph of American Dam and Canal (1999).

INVENTORY OF THE AMERICAN CANAL

A comparison of photographs taken in 1938 and 1999 show that the intake and weir of the American Canal retains virtually all of its original, as-built characteristics (Plates 42 and 43). Indeed, there appears to have been no change to its configuration since 1938.

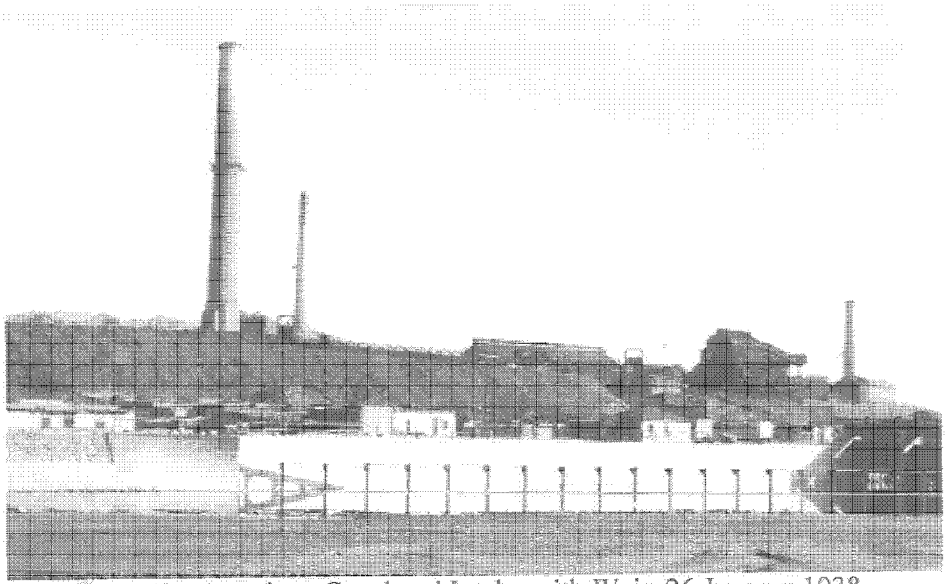


Plate 42. American Canal and Intake with Weir, 26 January 1938.

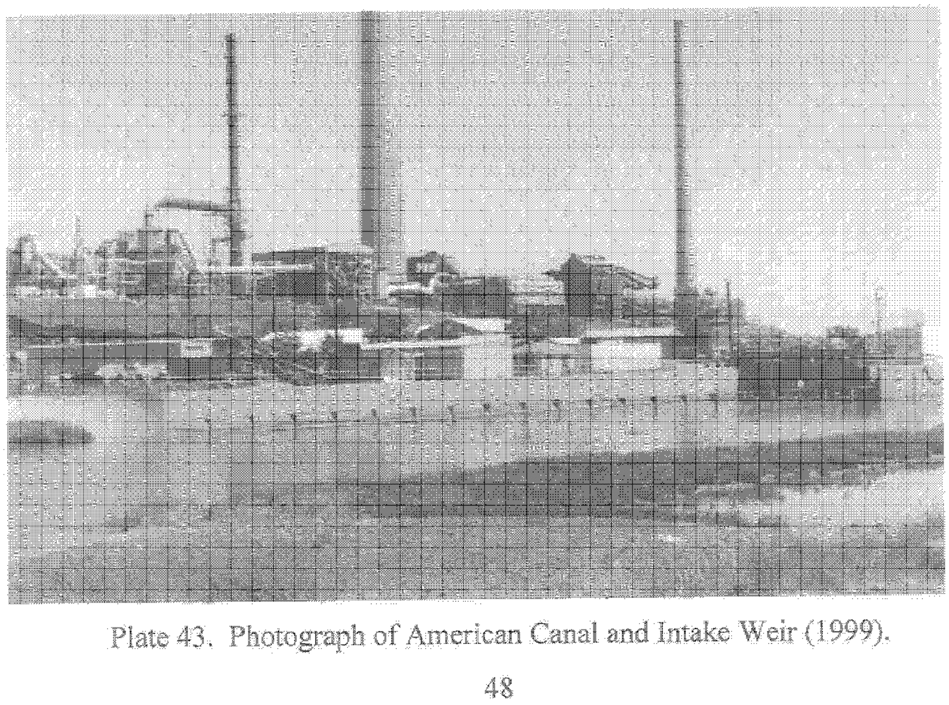


Plate 43. Photograph of American Canal and Intake Weir (1999).

Skimming Weir

The original skimming weir, measuring 250 ft in length and 2 ft in height, is situated above the headgates of the canal (see Figure BB-3 in Appendix BB). Remeasurement during this inventory, as well as comparative repeat photography, confirmed that the contemporary weir conforms to the original design specifications (Plates 44 to 47). The hoist motors for each headgate are both 3 h.p. Gearmotor 1160-rpm designs (see Figure BB-4 in Appendix BB). These, too, also conform to original, as-built specifications (Plates 48 and 49). The dual 12 X 20 ft radial gates are of original construction (Plate 50, see Figure BB-2 in Appendix BB).

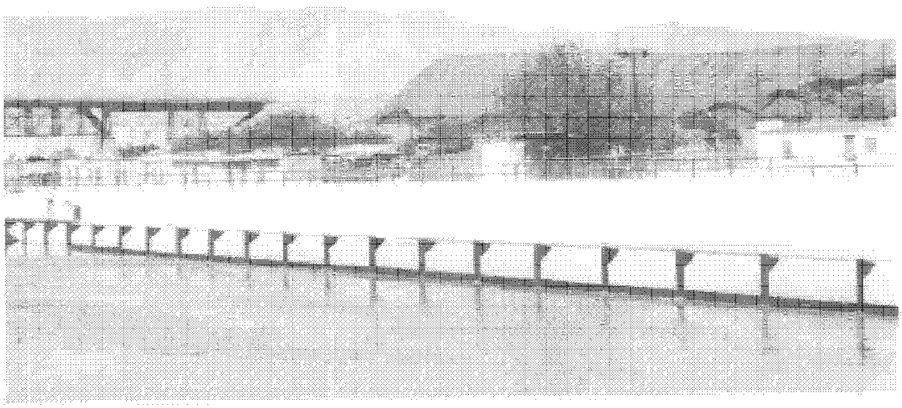


Plate 44. American Canal Weir Looking North, 14 May 1938

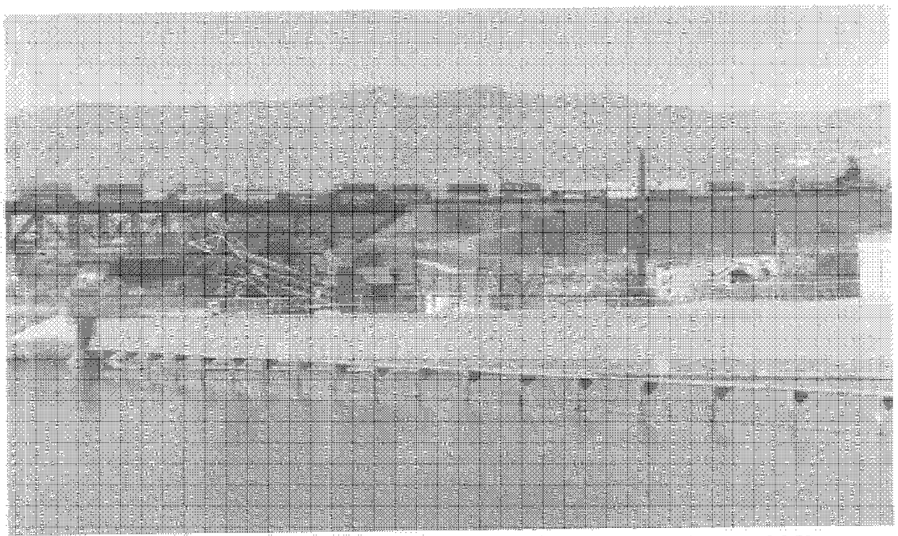


Plate 45. Repeat Photograph of American Canal Weir (1999).

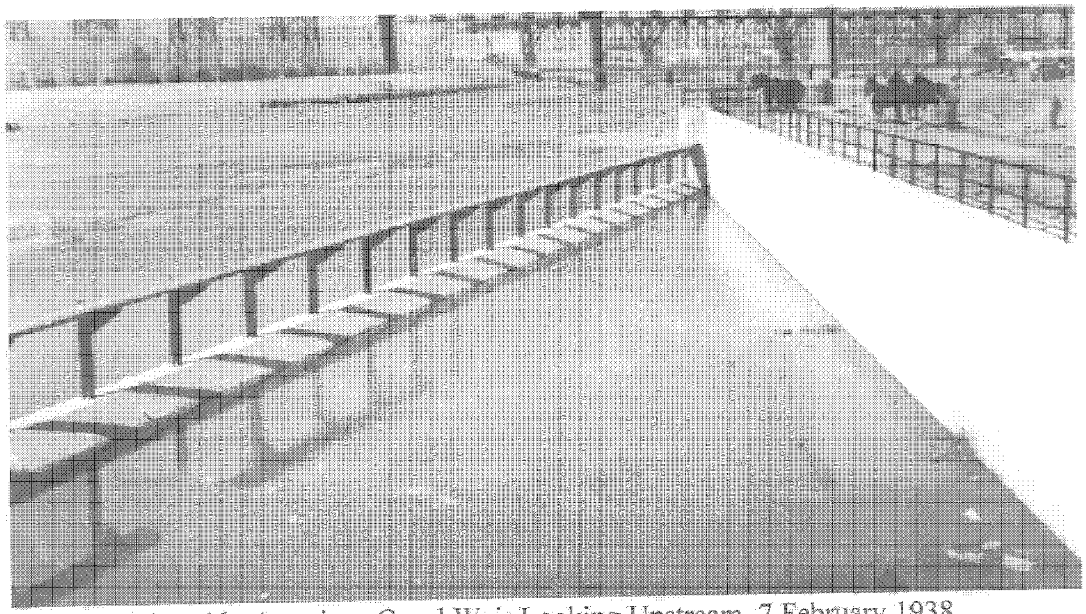


Plate 46. American Canal Weir Looking Upstream, 7 February 1938.

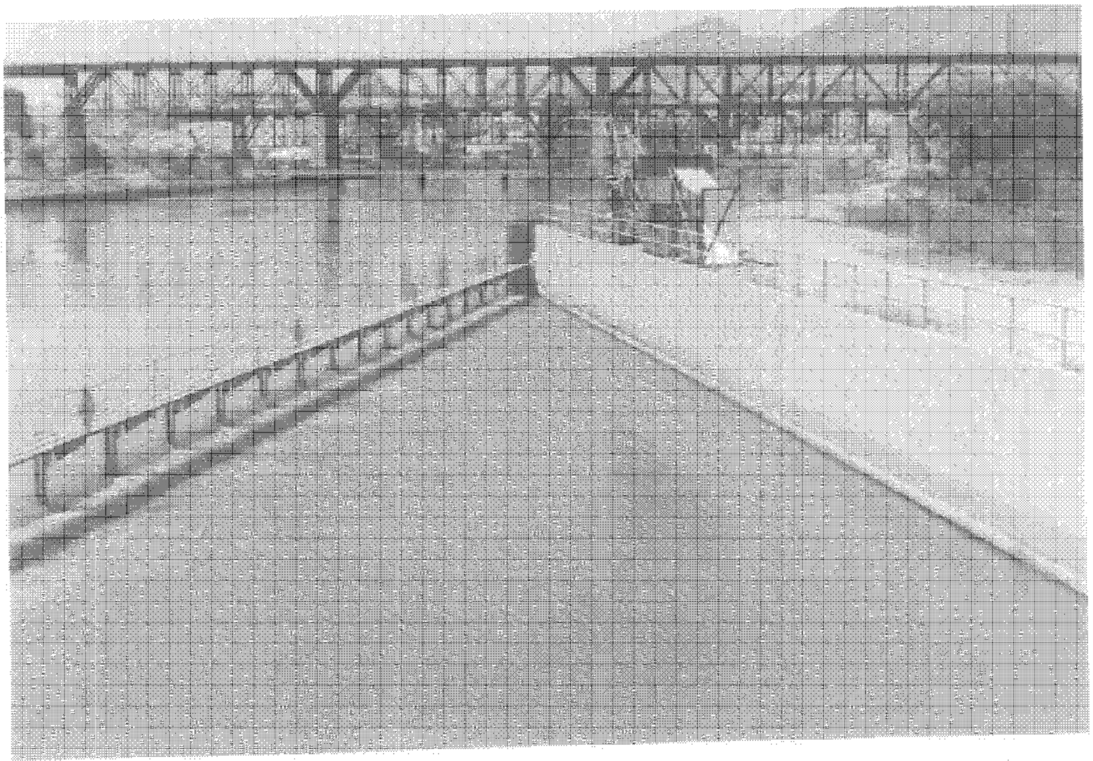


Plate 47. Repeat photograph of American Canal Weir Looking Upstream (1999).

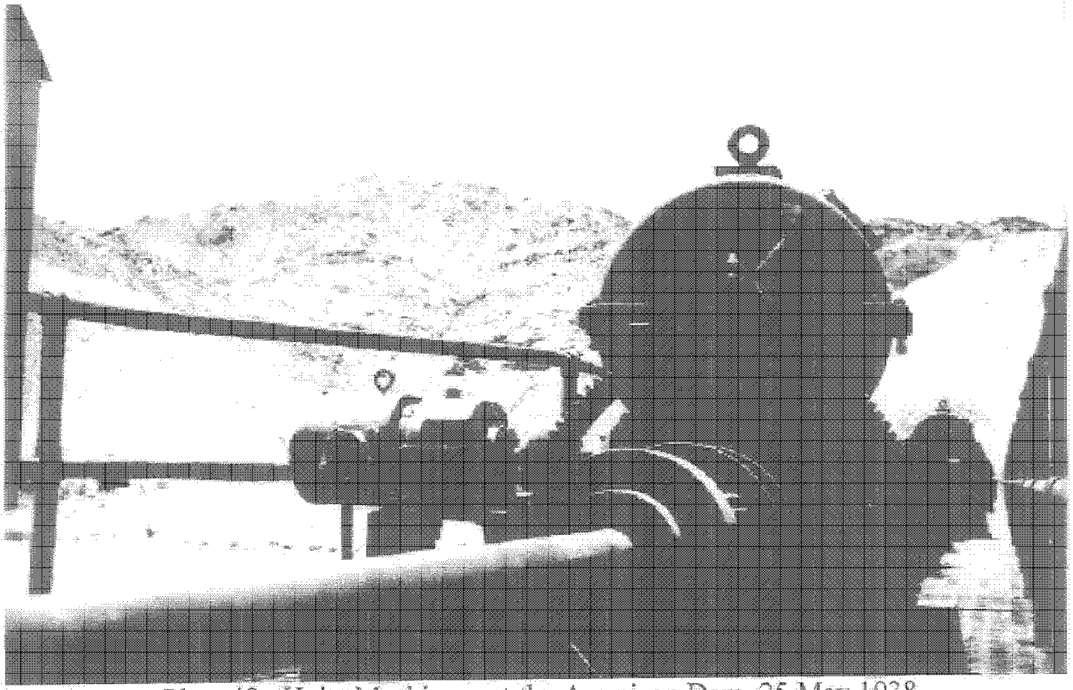


Plate 48. Hoist Machinery at the American Dam, 25 May 1938

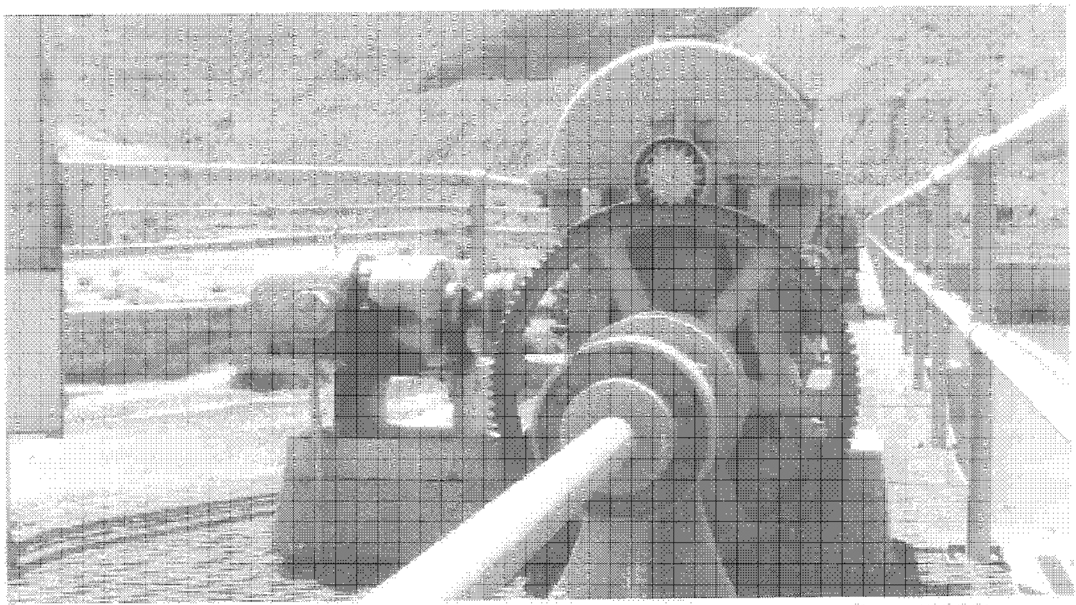


Plate 49. Repeat photograph of Hoist Machinery at the American Dam (1999).

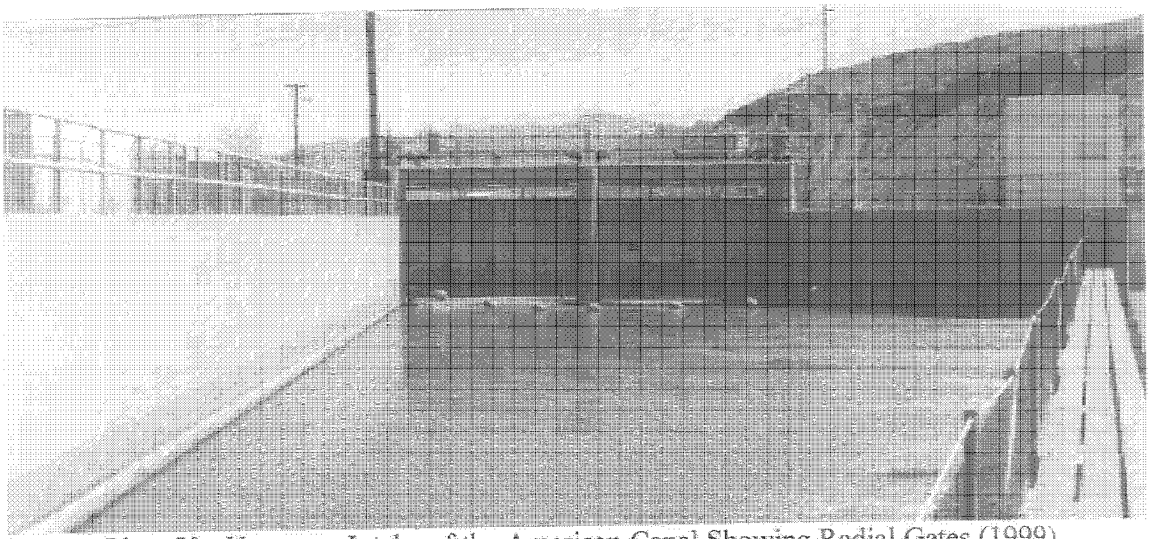


Plate 50. Upstream Intake of the American Canal Showing Radial Gates (1999).

American Canal

Examination of the contemporary American Canal also revealed a high degree of integrity with respect to original canal configurations. There is independent confirmation that the design attributes described above were largely implemented during final construction. Indeed, the contemporary canal corresponds almost precisely to an earlier summary by the Water and Power Resources Service (1981:1057) indicating that the canal is 2.1 mi long, concrete-lined, with side slopes at a 1.5:1 ratio, a bottom width of 12 ft, a water depth of 8.75 ft, and a capacity of 1,200 cfs. Further, the original headgate structure remains unchanged from that built in 1938 (Plates 51 and 52).

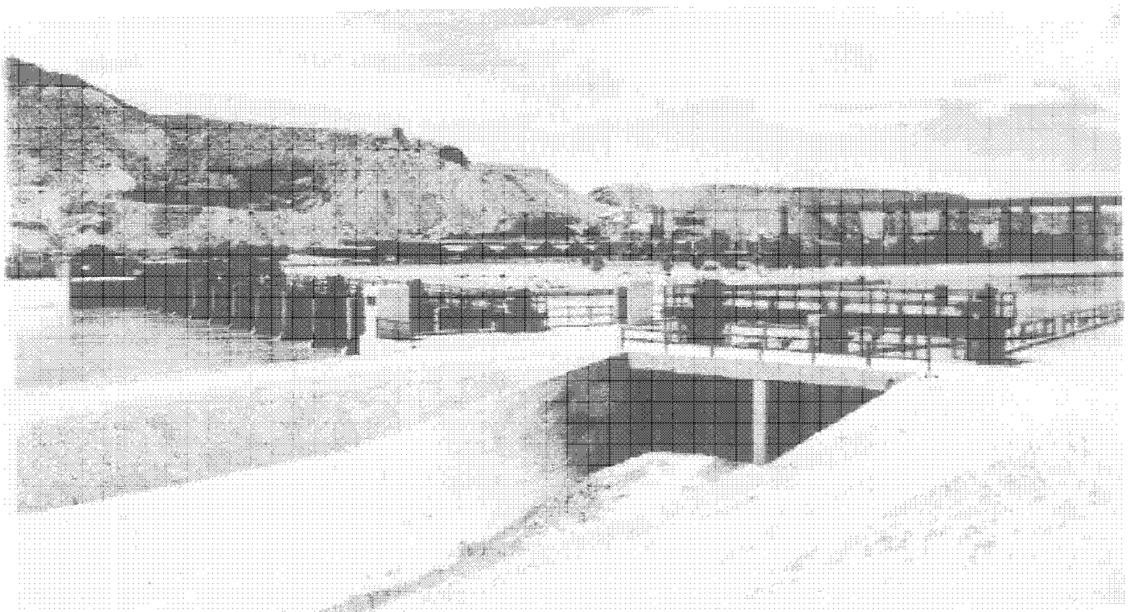


Plate 51. American Dam and Canal Intake, 28 May 1938.

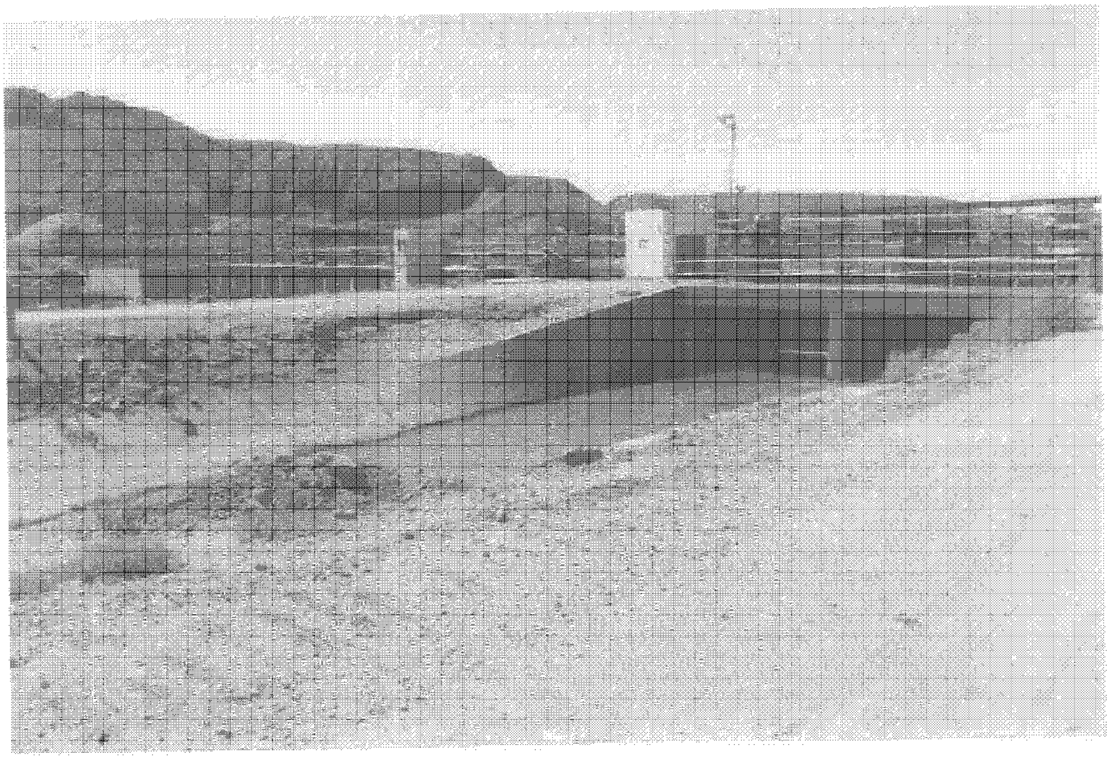


Plate 52. Repeat Photograph of the
American Dam and Canal Intake (1999).

Open Channels

The dimensions of the American Canal have remained largely unchanged since 1938. For example, Plates 53 and 54 present an original, as-built view of the American Canal downstream of the headgate and a repeat photograph taken in 1999.

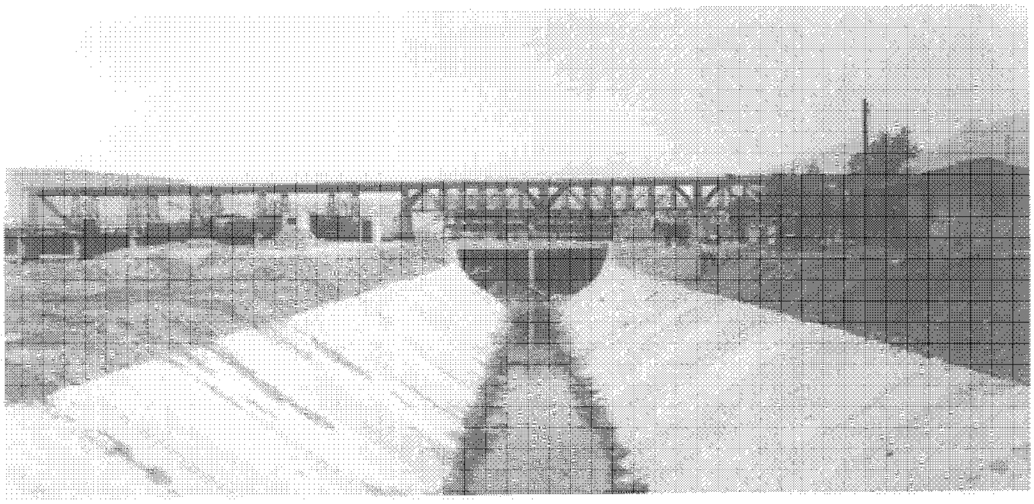


Plate 53. American Canal Downstream of Headgate, 30 April 1938.

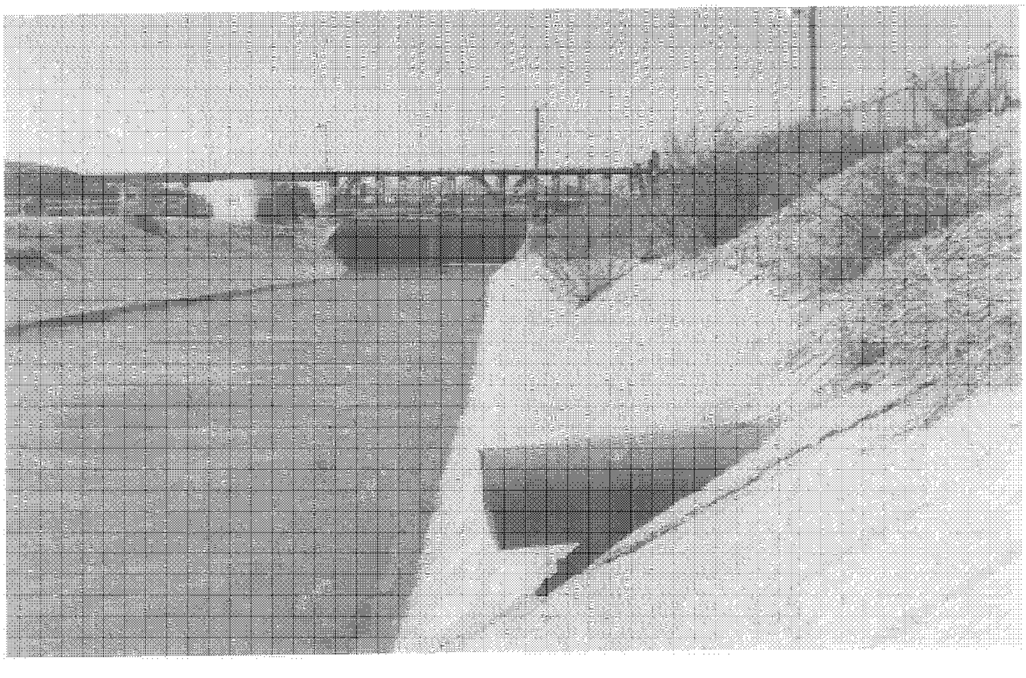


Plate 54. Repeat Photograph of American
Canal Downstream of Headgate (1999).

Original, as-built dimensions of the American Canal are available from a series of cross-sections extending down the length of the canal (Table 1). Measurements during this inventory confirm that cross-sectional characteristics have remained unchanged since 1938, although several concrete "panels" have been replaced over time as required to maintain the canal in operational readiness. Original, as-built cross-sections of the American Canal are available from a number of sources. Open channel "A" cross-sections proved remarkably stable, as did the cross-sections of Open channel "B" portions of the canal (see Figure BB-5 and BB-6 in Appendix BB). For this study, canal widths were measured from the top of the concrete lining rather than the plane of the adjoining berms since successive remodeling probably has altered this plane. All 1938 measurements have been modified accordingly to match this measurement approach.

Table I
Comparative Measurements of Selected Portions
of the American Canal: 1938 and 1999

		1938		1999	
Station (ft)	Segment	Top Cross-Sectional Width (ft)	Depth (ft)	Top Cross-Sectional Width (ft)	Depth (ft)
0.00	Headgate	42.0	No data	42.0	11.2
344	Upper Open "A"	43.6	10.9	40.7	No data
1742	Upper Open "A"	43.6	10.9	40.7	11.3
2239	Conduit "A"	26.9	12.09	No data	No data
3224	Middle "A"	32.9	8.2	No data	No data
6165	Conduit "B"	26.9	13.4	25.9	12.1
7894	Open "B"	26.8	10.4	24.1	11.5
8374	Lower Open "A"	40.7	9.8	No possible comparison*	No possible comparison*
10474	American-Franklin Confluence	No data	No data	No possible comparison*	No possible comparison*

* Rebuilt in 1997

In contrast, the confluence of the American Canal with the Franklin Canal has undergone significant modifications as a result of reconstruction in 1997 (Plates 55 and 56). Plate 55 shows a view looking upstream at the skimming weir and the settling basin. Plate 56 shows a view looking downstream from the downstream end of the reconstructed settling basin. As a consequence, there is little correspondence between the original configuration of the American-Franklin confluence in 1938 and that observed today.

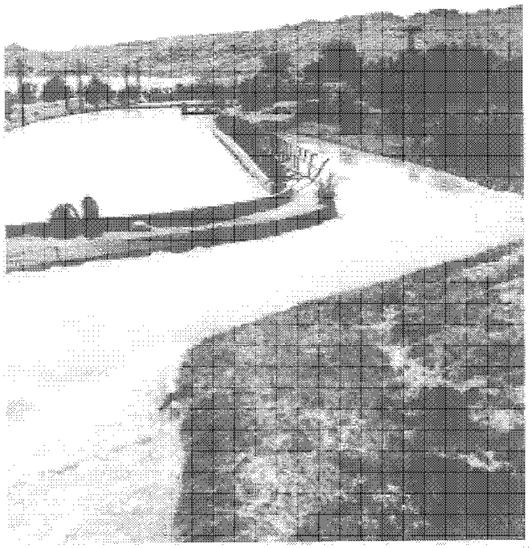


Plate 55. Confluence of the American and Franklin Canals, 17 May 1939.

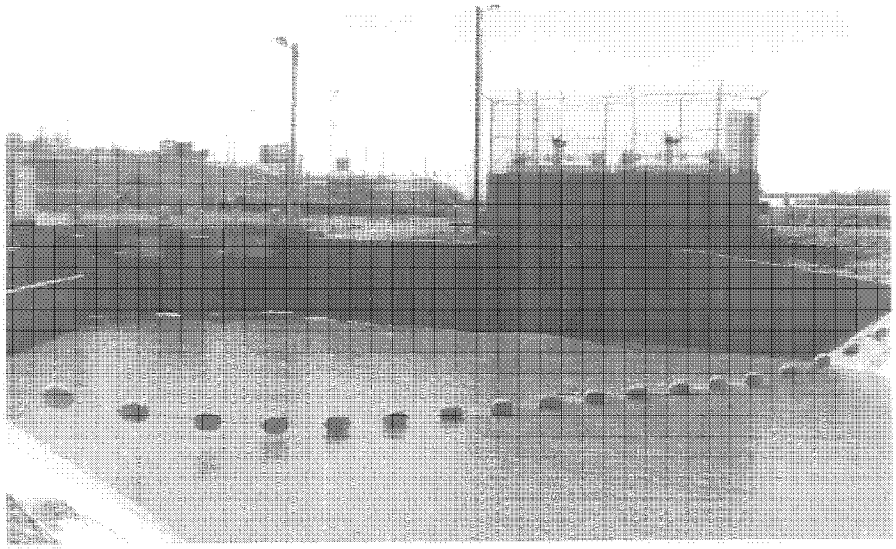


Plate 56. Headgates of the Franklin (left) and Wastegates (right) of the American Canals (1999).

Conduits

The two subterranean conduits, "A" and "B," also show no discernable changes compared with their 1938, as-built characteristics (see Figure BB-7 in Appendix BB). Dimensions measured during this inventory, as well as comparative repeat photography, conform precisely to the 1938 nominal specifications (Plates 57 and 58).

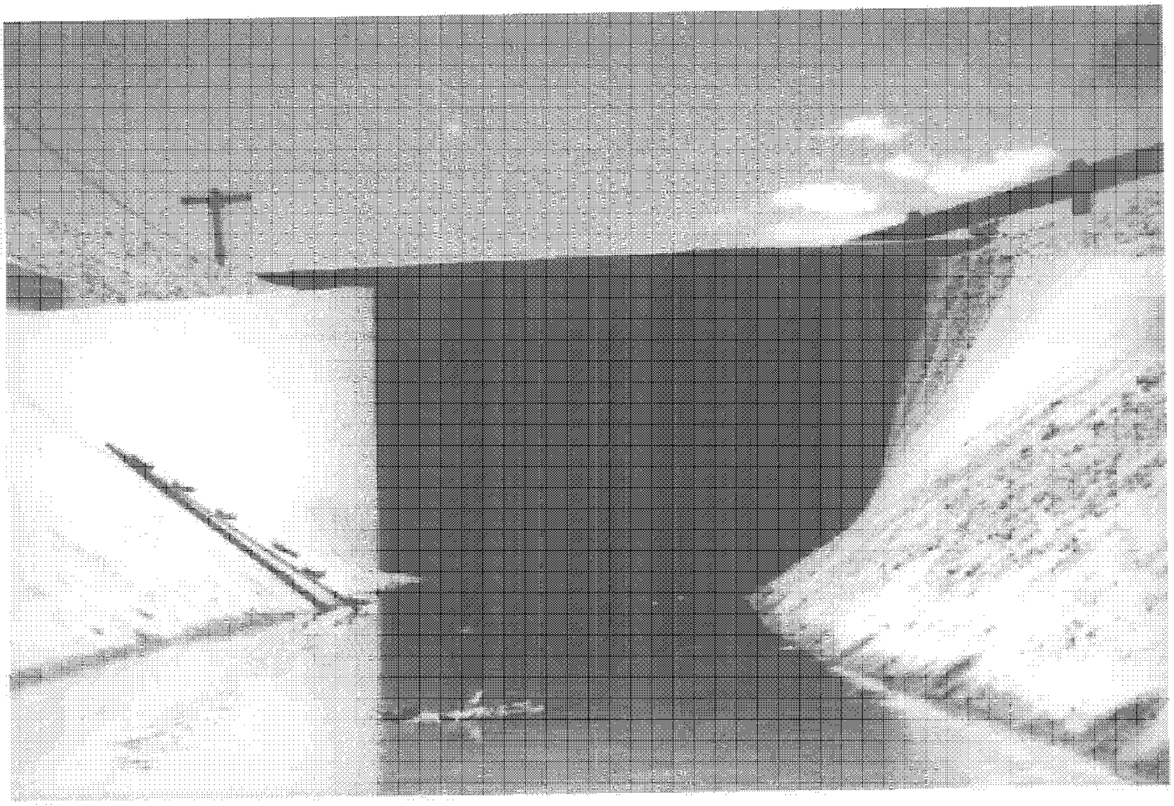


Plate 57. Upstream Intake of Closed Conduit "B," 25 May 1938.

The interior of conduits "A" and "B" could not be evaluated during this inventory. Safety considerations prevented entering the conduits, since water was flowing through the conduits at an estimated rate of 1050 cfs. The general configuration of conduit interiors can, however, be gleaned from vintage photographs (Plates 23 and 24) showing the conduits to be of a rounded rectangular cross-section. There is no low-flow channel (see also Figure BB-7 in Appendix BB) and water simply retreats toward the low point (i.e., center) of the conduit during periods of reduced flow. Plate 59 shows the interior of Conduit "B" immediately following completion in 1938. There is no evidence to indicate that either conduit "A" or conduit "B" has been modified in any way since 1938.

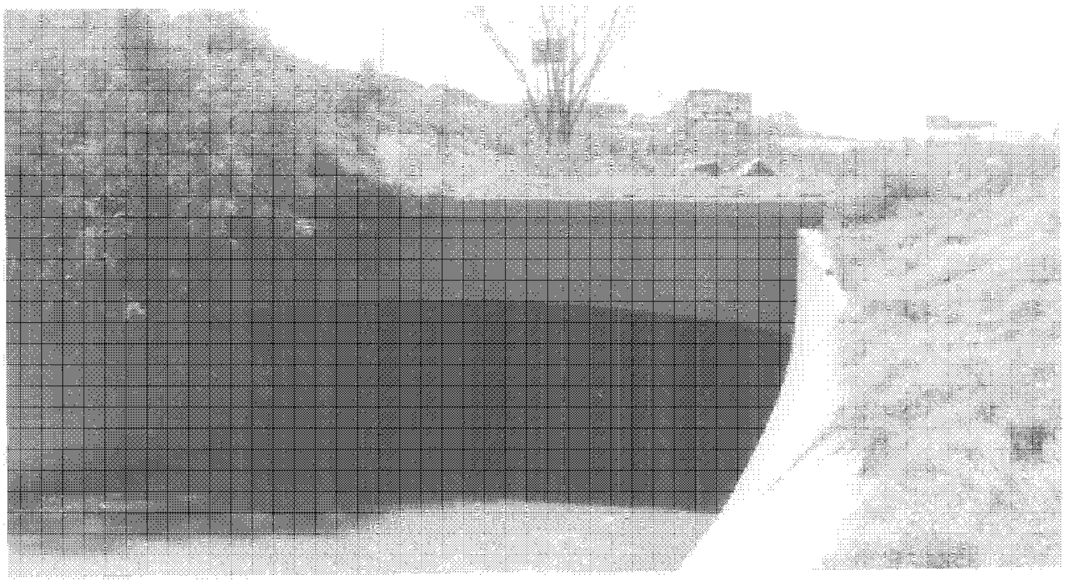


Plate 58. Repeat Photograph of Intake of Closed Conduit "B" (1999).

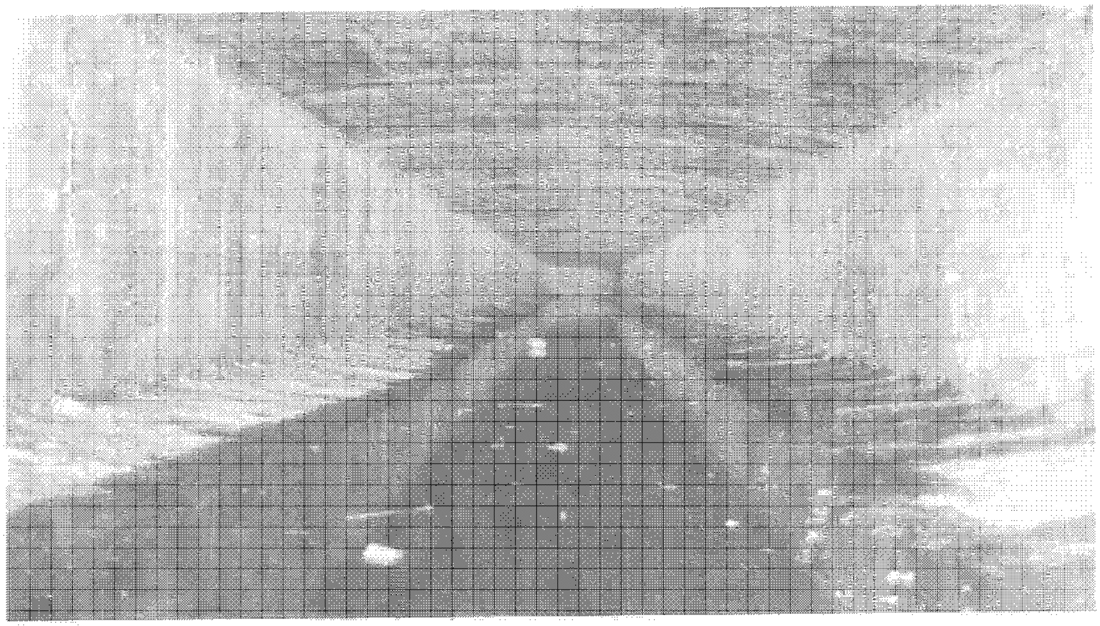


Plate 59. Interior of As-built Closed Conduit "B," 29 April 1938.

STRUCTURES IN THE AMERICAN CANAL

Structures refer to a variety of water-control (e.g., checks, siphons), water measurement (e.g., gauges) and bridging devices often associated with canals. At the time the American Canal was constructed in 1938, there were a number of gauges, bridges, and other structures in the canal.

Most of the original structures appear to have long since been removed entirely or replaced with newer structures. Most appear to have been removed prior to 1972. Indeed, according to a 1972 structure inventory (Table 2), the American Canal contained the following devices, ordered from head to tail (IBWC 1972:Exhibit F(1)).

Table 2
American Canal Structures (1972)

Station	Structure	Owner	File No.
4+30	2" Water line (abandoned)	El Paso Brick Co.	LSF/G2
4+30	8" Water line	ASARCO	LSF/G-245
4+30	Sewer line	IBWC	No file
2+93	36" X 46' Iron Pipe	IBWC	L2.I27
10+81	36" Concrete Pipe	Public Service Board	LSF/G-891
12+51.62	42" Concrete Storm Drain	City of El Paso	LSF/G-888

Accordingly, all that remains of most of the original 1938 structures are vintage drawings and photographs.

Gauges

There is one gauge in the American Canal, one located about 100 m downstream from the headgate. (Plates 60 and 61). Original specifications for these devices could not be located. Regardless, the 1938 gauges have been replaced by three newer gauging devices. One is located about 110 m downstream from the headgate, another at the intake of Conduit "A," and the last approximately 150 m above the headgate of the Franklin Canal (Plates 62 to 64).

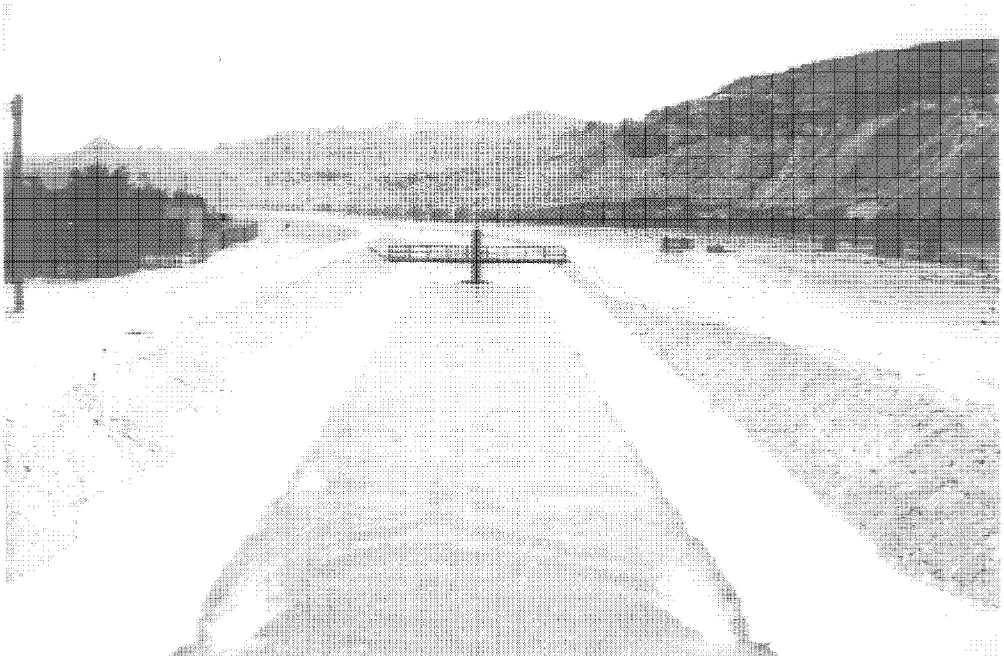


Plate 60. Gauging Station 100 m Downstream of American Canal Headgates, 3 June 1938.

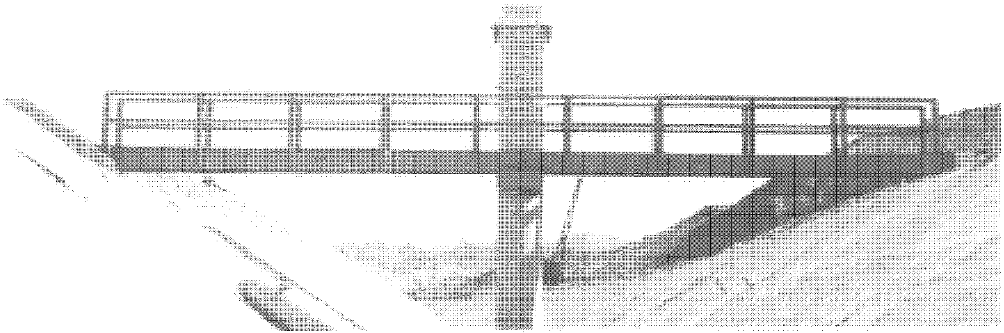


Plate 61. Detail of Gauging Station 100 m Downstream of American Canal Headgates, 1 May 1938.

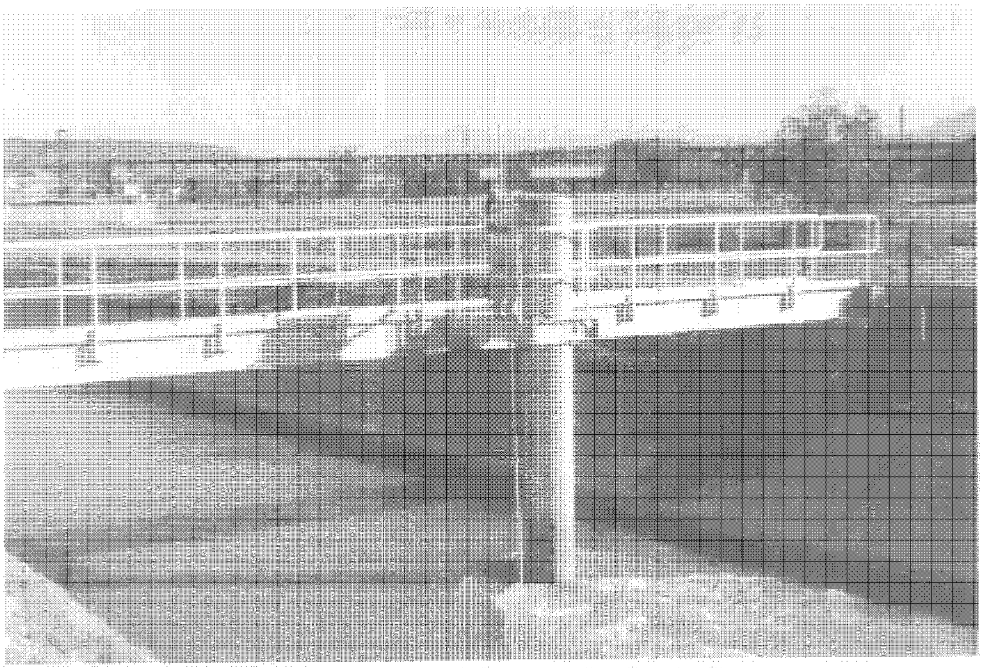


Plate 62. Bridge and Gauging Station in Open Channel "A" at 1742 ft from Headgates (1999).

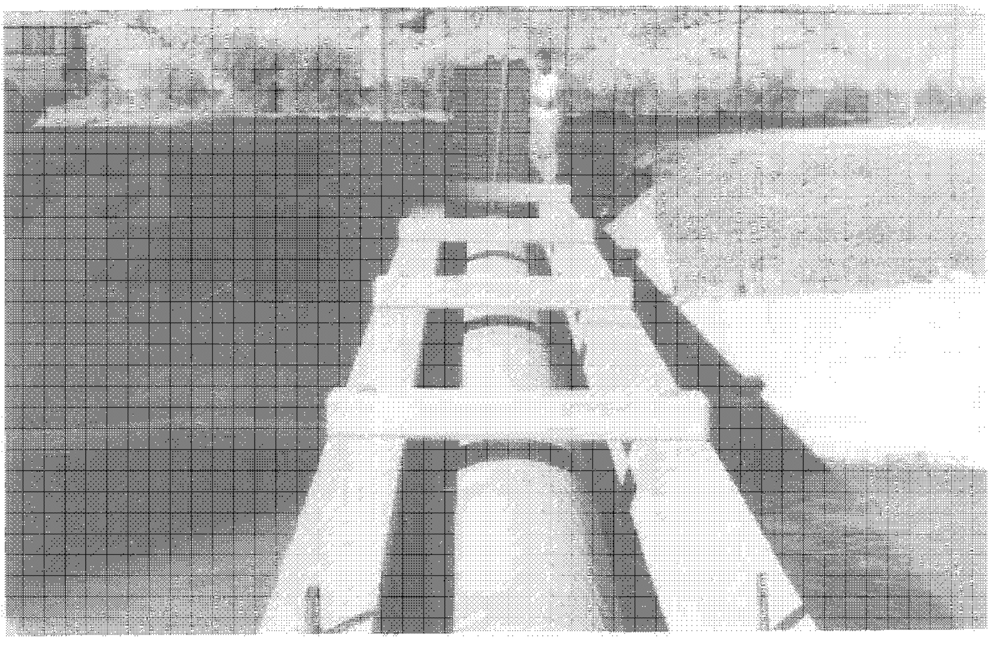


Plate 63. Gauging Station and Utility Crossing Above Closed Conduit "A" Looking North (1999).

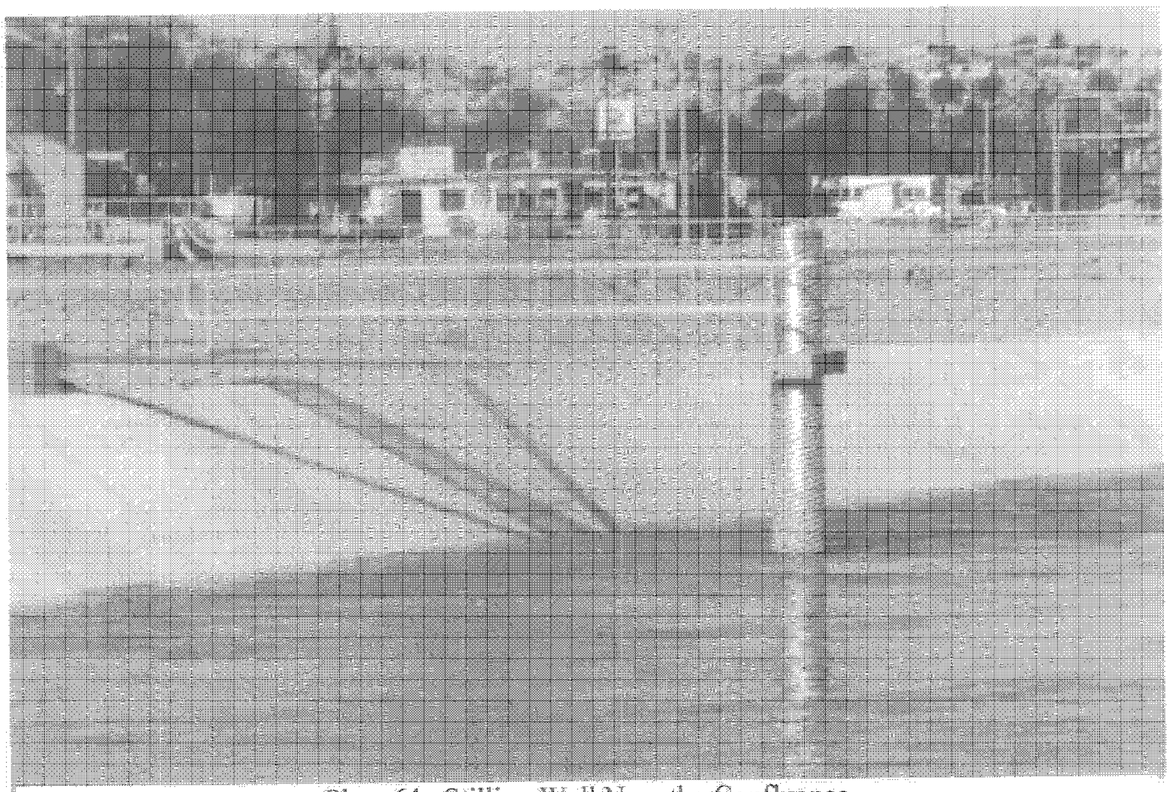


Plate 64. Stilling Well Near the Confluence
of the American and Franklin Canals (1999).

Bridges

Three bridges crossed the American Canal when it was completed in 1938. One was located at the U.S. 80 entrance into the ASARCO plant; the remaining two crossed the American Canal at the foot of Globe Street and at Hart's Mill (Plates 65 and 67).

Nominal specifications for all bridges indicate they were 41.5 ft long X 18 ft wide (see Figure BB-8 and BB-9 in Appendix BB). All were constructed of 0.33 x 1.33 x 21 ft stringers with a decking built of 0.25 x 0.67 X 18 ft wooden planks. A 15.5 ft tall wooden piling with cross-bracing located in the center of the structure provided additional support. Concrete abutments at both ends anchored the bridges firmly into the canal berms.

The bridge over the canal into the ASARCO plant has been replaced by a new structure and all evidence of the original bridge has been removed. Further downstream, below the outlet of Conduit "B," the right (south) bank of the Rio Grande is not fenced. To prevent illegal immigrants from crossing into the United States, the Globe Street and Hart's Mill bridges were removed sometime between 1938 and 1971. The only part of the original Globe Street Bridge that remains today are the abutments (Plates 65 and 66).

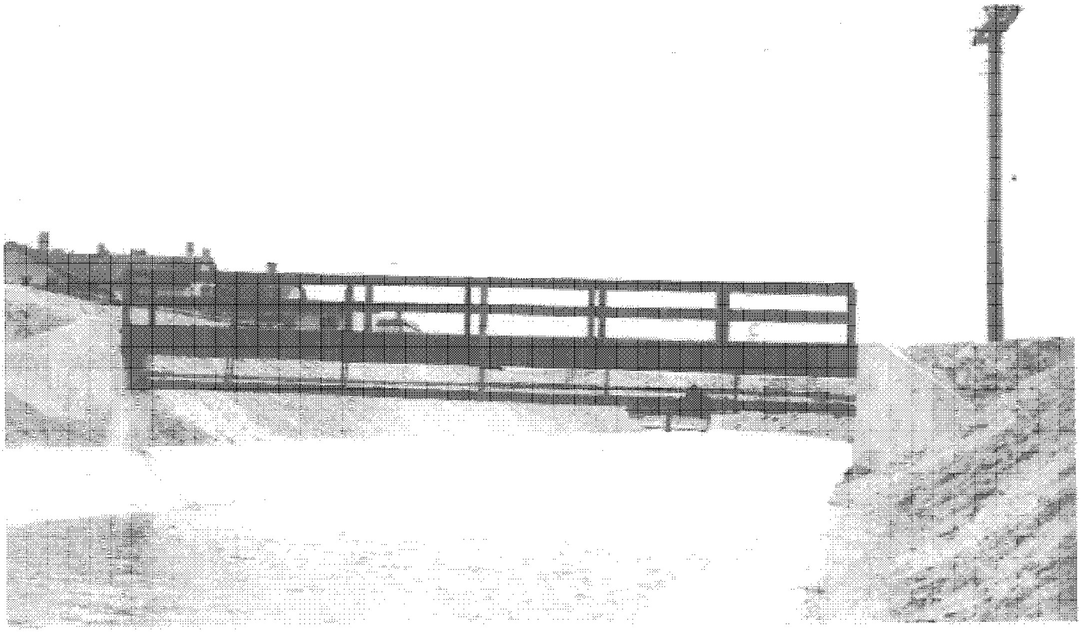


Plate 65. Globe Street Bridge, 15 May 1938.

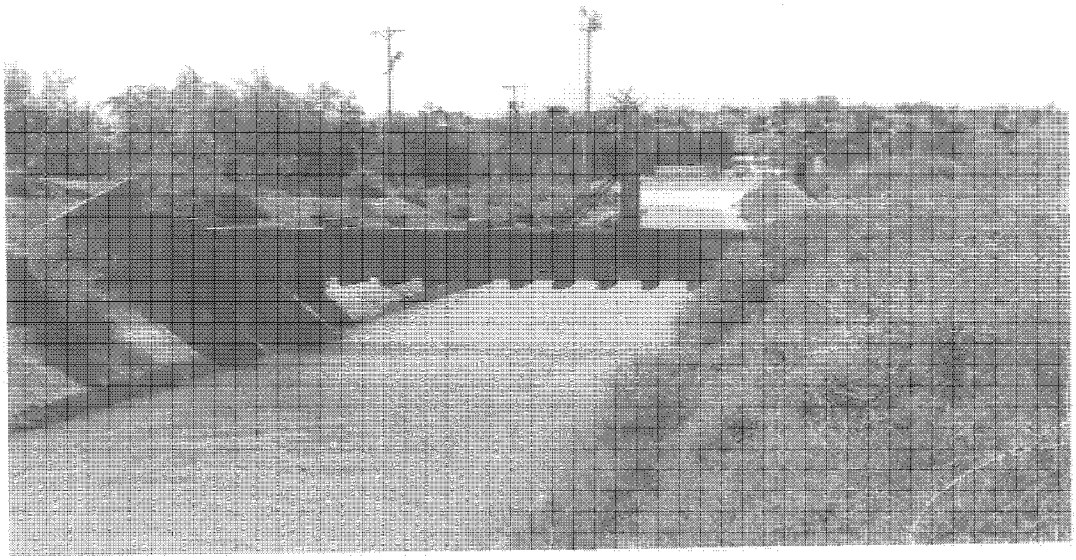


Plate 66. Repeat Photograph of the Remnant
of the Globe Street Bridge (1999).

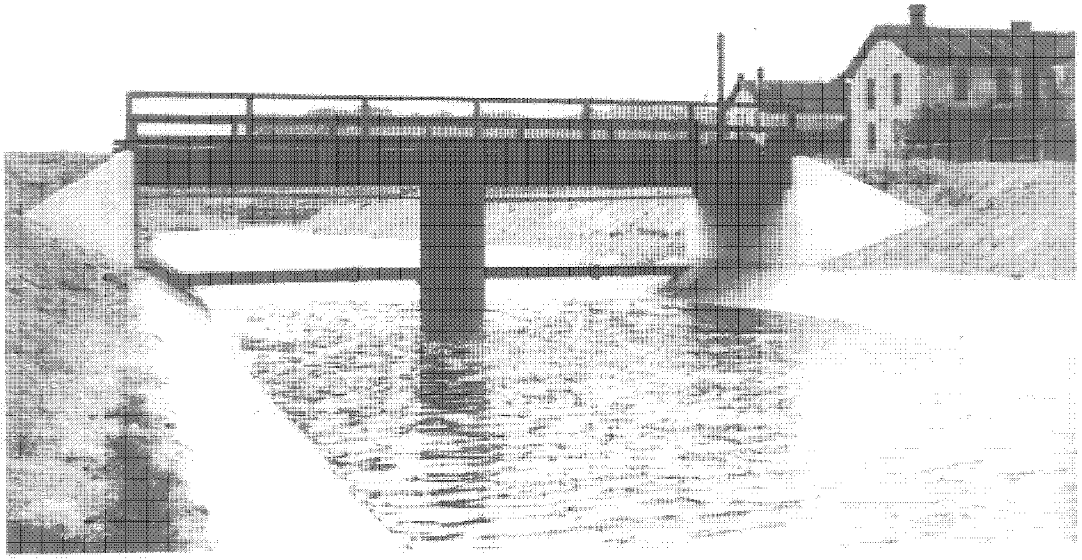


Plate 67. Hart's Road Bridge, 15 May 1938.

SUMMARY AND RECOMMENDATIONS

Detailed archival research, combined with repeat photography and an on-site inventory, indicates that the American Canal system has retained a high degree of integrity relative to its original 1938 configuration. Of all the features examined here, only water control devices and bridges exhibit any changes; most have been removed entirely or replaced with newer structures. Accordingly, the American Canal exhibits a number of historically-significant engineering and construction characteristics typical of Depression-era Federal irrigation projects.

More importantly, the American Canal represents the earliest attempt by the United States to enforce the terms and conditions of the 1906 Treaty with Mexico. Specifically, it was constructed with a design capacity of 1,200 cfs to insure that only the 60,000 acre-feet of water owed to Mexico annually was, in fact, delivered to Mexico under the 1906 Treaty. As such, it symbolizes efforts to resolve water allocations between the United States and Mexico *in the Rio Grande basin* in a way that ultimately allowed the expansion of irrigated agriculture in the El Paso Valley.

The only other example of irrigation works built to allocate water between the United States and Mexico is the Boulder Canyon Project—authorized by an Act of Congress on 21 December 1928 (45 Stat. 1057)—on the Colorado River. According to the 3 February 1944 treaty between the United States and Mexico, 1,500,000 acre-feet of water initially stored in Hoover Dam is delivered to Morelos Dam in Mexico through a series of subsidiary dams, including the Davis, Parker, Imperial, and Laguna Dams, along the Colorado River (WPRS 1981:83, 299, 307, 341). Of these, the Imperial Dam and All-American Canal are directly responsible for diverting water to Mexico according to 1944 treaty commitments (WPRS 1981:69, 338). Completed in 1940, the Imperial Dam and All-American Canal are quantitatively and qualitatively quite different from the American Dam-American Canal complex, having capacities in excess of 15,000 cfs (e.g., WPRS 1981:71–72, 299).

Accordingly, the American Dam and American Canal complex is but one of two examples of irrigation works that divide water between the United States and Mexico according to specific treaty obligations. Based on the findings presented here, the American Canal is potentially eligible for inclusion on the National Register of Historic Places (NPS 1991). Specifically, its construction style is typical of Depression-era construction methods *and* the canal is pivotal in international relations between the United States and Mexico. Accordingly, the American Canal is significant under Criterion "A" and Criterion "C," respectively, of Section 106 of the National Historic Preservation Act (1966).

The IBWC has proposed to reconstruct the American Canal in an effort to improve its structural stability and increase its conveyance capacity to 1,500 cfs discharge. Measures proposed to improve structural stability include (1) replacing existing open-channel concrete lining with thicker concrete lining, (2) improving concrete panel joints to increase longitudinal expansion and contraction consistent with varying thermal regimes present in the canal, and (3) replacing existing open-channel portions of the canal with precast concrete box culverts. These measures, when fully implemented, would increase the canal's capacity to 1,500 cfs and would insure the permanence of the canal. In addition, the IBWC proposes to install high fences, posted signs, safety escape ladders, and safety cables at various intervals along the American Canal in an effort to reduce unauthorized access to the canal and minimize the potential for injuries.

Four alternatives have been proposed to improve the stability and capacity of the American Canal. These including the following:

1. Alternative 1 (Box Canal Alternative). This alternative calls for all open-channel portions of the American Canal between the American Dam and the International Dam to be replaced with boxed conduits, *with the exception of a 400 ft open channel immediately downstream of the American Canal headgates.* This 400 ft open channel section would be replaced by a newer, thicker concrete lining and would allow for the proper operation and maintenance of the flow measurement gauge.

2. Alternative 2 (Partial Box Canal Alternative A). This alternative calls for the open channel portion of the American Canal between Conduit "A" and Conduit "B," identified elsewhere in this report as the Middle Open Channel "A," to be replaced with a box conduit. Upper Open Channel "A," Open Channel "B," and Lower Open Channel "A" would *not* be replaced with box conduits, but *would be* reconstructed and slightly enlarged. Although the remaining open-channels would be replaced by thicker concrete lining, these segments would remain as open channels, thereby conforming to the original configuration of the American Canal.

3. Alternative 3 (Partial Box Canal Alternative B). This alternative calls for open channel portions of the American Canal previously identified as Middle Open Channel "A," Open Channel "B," and Lower Open Channel "A" to be replaced with a box conduit. Upper Open Channel "A" would *not* be replaced with a box conduit, but would remain as an open channel. The concrete lining of this segment would, however, be replaced by a new, thicker concrete lining.

4. Alternative 4 (No-action Alternative). This alternative would leave the American Canal in its current configuration. The concrete lining of open- channel portions would remain as they are and existing box conduits would not be affected.

About 74 percent of the length of the American Canal now consists of open channels, while the remaining 26 percent consists of closed conduits (2.9 open:1 closed). Though largely hidden from public view, there are remnants of two original bridges still present in the lower segment (i.e., Lower Open "A") of the canal. As well, there are two complete original conduits (i.e., Conduit "A" and Conduit "B") that will not be affected by any of the proposed alternatives.

Based on the existing characteristics of the American Canal, Table 3 summarizes the effect of each of the four alternatives on its existing character. The lower the ratio of open to closed canal channel, the less visible the American Canal becomes and the greater the cumulative effect of any one alternative on the overall integrity of this system.

Table 3
Effects of Proposed Alternatives on the American Canal

Effects	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Original 1938 Bridges Removed (no.)	2	2	2	0
Original 1938 Bridges Remaining (no.)	0	0	0	2
Original 1938 Box Culverts Remaining (no.)	2	2	2	2
Original 1938 Open-channel Segments Replace by Box Conduits (ft)	7,360	2,941	5,521	0
Original 1938 Open-channel Lining Replaced with New Concrete Lining (ft)	400	4,819	2,239	0
Original 1938 Open-channel Lining Remaining (ft)	0	0	0	7,760

Based on these data, the potential effects of each alternative can be summarized as follows:

1. Alternative 1 would replace all but 400 ft of the open channel portions of the American Canal with closed conduits. The relative proportions of open to closed portions of the canal would shift dramatically to 1 ft of open channel for every 26 ft of closed channel. This alternative would reduce the need for physical safety barriers (e.g., fences, ladders, and cables) would probably lead to the greatest reduction in human injuries along the canal alignment.
At the same time, this alternative *would erase almost all visible evidence* of the as-built characteristics of the American Canal. This alternative also would remove all evidence of the two remnant bridges spanning the canal. Considered jointly, this alternative would virtually erase any visible evidence of this feature in a way that is incompatible with its demonstrated historic significance.

2. Alternative 2 would replace only the middle, open-channel section—2,941 ft—of the American Canal with a new box conduit. The relative proportions of open to closed portions of the canal would be reduced to 1.1 ft of open channel for every 1.0 ft of closed channel. Both bridge remnants would be removed. However, existing original conduits would not be affected in any way. Remaining open-channel portions of the American Canal would be slightly enlarged and replaced with new, thicker concrete lining. This alternative would require the greatest investment in physical safety barriers (e.g., fences, ladders, and cables) and the potential for human injuries would be only slightly reduced. This alternative would preserve large portions of the visible (i.e., open-channel) segments of the original canal, but may not be as cost-effective as Alternative 1 in meeting the goal of increasing the capacity of the canal and reducing human injuries.

3. Alternative 3 would replace an aggregate of 5,521 ft of original open-channel canal with closed conduits, thereby reducing open channels:closed channels to a ratio of 0.27:1. This alternative would remove all evidence of the two remnant bridges spanning the canal. This alternative would require a moderate investment in physical safety barriers and probably achieve a moderate reduction in human injuries along the canal alignment. At the same time, this alternative would leave largely intact the upper 2,239 ft open-channel segment of the American Canal immediately below the headgate. For reasons discussed below, this alternative most closely achieves a balance between the need for preserving portions of this canal and the need of the IBWC to increase the canal's capacity and reduce the potential for human injuries along the canal alignment.

4. Alternative 4 would not result in any changes to the existing configuration of the American Canal and the relative proportions of open to closed channels (2.9:1) would remain unchanged. As well, existing original conduits and remnant bridges would not be affected by this alternative. Installation of physical safety barriers would not occur and the potential for human injuries along the American Canal alignment would remain unchanged from current conditions. While this alternative would preserve the American Canal in its current 1938 as-built configuration, it would fail to (1) improve structural stability, (2) increase the canal's capacity, and (3) reduce the potential for human injuries.

A summary matrix ranking the four reconstruction alternatives in terms of specific factors is presented in Table 4. Each factor is ranked from 1 (worst) to 4 (best). An overall rank for each alternative is presented by multiplying alternative-specific ranks for visibility, stability, capacity, and injuries. It may be seen that Alternative 1 has the highest overall rank, but would result in a reconstructed system that is the least visible of any alternative and the least similar to the original 1938 system.

Table 4
Matrix for Evaluating Reconstruction
Alternatives for the American Canal.
(Ranked where 4=best, 1=worst)

Factor	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Visibility	1	3	2	4
Structural Stability	4	2	3	1
Increased Capacity	4	2	3	1
Human Injuries	4	2	3	1
Overall Alternative Rank—(Multiply rank score in each alternative)	64	24	54	4

To reiterate, the American Canal is one of only two water diversion devices in the nation that regulates the distribution of water between the United States and Mexico. Further, the American Canal is typical of Depression-era construction methods and design specifications employed in irrigation construction. In an effort to achieve a balance between the historic significance of this resource and the needs of the IBWC, *it is recommended that the IBWC pursue Alternative 3* for the following reasons:

1. This alternative preserves the original headgate and upper 2,239 ft open channel of the American Canal in a segment where the canal parallels U.S. 85 and is visible to passing motorists and pedestrians. When accompanied by appropriate IBWC signage, this would enhance public appreciation for the pivotal role played by this irrigation feature in the development of the El Paso Valley, as well as in relations between the United States and Mexico.

2. At the same time, this alternative results in a 71 percent reduction in the amount of open channel present in the American Canal, thereby largely meeting the IBWC's goal of increasing the structural stability and discharge capacity of the American Canal. At the same time, this reduction in the amount of open-channel segments greatly reduces the potential for human injuries. Assuming a uniform distribution of injuries per length of open channel canal, this alternative should result in a 71 percent decline in injuries along the American Canal.

3. Existing remnants of bridges over the American Canal are situated along a segment of the canal largely hidden from public view. Further, the superstructures of these bridges have already been removed, thereby reducing the overall integrity of these structures to a significant degree. The removal of these structures would not affect the overall integrity of the American Canal.

4. The overall rank-order score of Alternative 3 is relatively comparable to that of Alternative 1—the highest ranked alternative—without sacrificing the visibility that so directly affects the integrity of the American Canal.

In sum, it is recommended to the Texas Historical Commission (THC) and the United States Section of the International Boundary and Water Commission (USIBWC) that the American Canal is eligible for inclusion on the National Register of Historic Places under Criteria "A" and "C" of Section 106 of the National Historic Preservation Act (1966). Further, it is recommended to THC and IBWC that reconstruction Alternative 3 (Partial Box Canal Alternative B) be implemented to preserve the most important segment of the American Canal while simultaneously meeting the needs of the USIBWC.

REFERENCES CITED

Ackerly, Neal W.

1994 *Historic and Modern Irrigation Systems in El Paso, Texas.* Bureau of Reclamation, Albuquerque District, Contract No. 1245-3-CP-40-14010, Delivery Order No. 3, Albuquerque, NM.

Bolton, Herbert E.

1930 *Spanish Explorations in the Southwest, 1542–1706.* Scribner Books, NY.

Debler, E. B.

1924 Water Supply Requirements: Rio Grande. National Archives and Records Administration (NARA), BOR, RG 115, Engineering and Research Center Project Reports, 1910–1955; Box 717; Folder: Water Supply Requirements, Rio Grande; Federal Records Center, Denver.

Ernst, O. H.

1889 Message from the President of the United States Transmitting a Report Relative to the Construction of Certain Dams in the Rio Grande. 50th Congress, 2nd Session, *Executive Document No. 44*, U.S. Government Printing Office, Washington, D.C.

Fiock, L. R.

1952 Letter of 18 February to Regional Director re: Longevity of Radial Gates on the Rio Grande Project. NARA, BOR, RG 115, Federal Records Center, Denver.

1938 Letter of 11 March to Consulting Engineer re: Operation of American Dam. NARA, BOR, RG 115, Federal Records Center, Denver.

1935 Letter of 22 July to Commissioner re: Construction of Mexican Dam at El Paso; Including an Overview of the History of Irrigation in El Paso. NARA, BOR, RG 115, Federal Records Center, Denver.

Follett, W. W.

1898 Equitable Distribution of the Waters of the Rio Grande. 55th Congress, 2nd Session, *Senate Document No. 229*, U.S. Government Printing Office, Washington, D.C.

Hackett, Charles W.

1932 *Historical Documents Relating to New Mexico, Nueva Vizcaya, and Approaches Thereto, to 1773.* Carnegie Institution, Washington, D.C.

Hill, Leon

1964 Part II, Actual Operations: Integrated Operation of Reservoirs for Irrigation, Flood Control, and Other Purposes. Regional Office, Region 5, Amarillo (correspondence).

Hutson, William F.

1898 Irrigation Systems in Texas. U.S. Geological Survey, *Water Supply and Irrigation Papers,* No. 13, U.S. Government Printing Office, Washington, D.C.

International Boundary and Water Commission (IBWC)

1981 Technical Summaries of Projects Along the International Boundary Between the United States and Mexico. Manuscript on file, IBWC, El Paso, TX.

1972 Standard Operation and Maintenance Manual, El Paso Rio Grande Projects. Manuscript on file, IBWC, El Paso, TX.

1955 History and Development of the International Boundary and Water Commission, United States and Mexico. Manuscript on file, IBWC, El Paso, TX.

1945 Report of the Commissioner for the Fiscal Year Ending June 30, 1945. Manuscript on file, IBWC, El Paso, TX.

1938 Report on Construction of the American Dam and Canal of the Rio Grande Canalization Project, November 30, 1938. Manuscript on file, IBWC, El Paso, TX.

1930 Report of the American Section of the International Water Commission, United States and Mexico. 71st Congress, 2nd Session, *House Document No. 359,* U.S. Government Printing Office, Washington, D.C.

Lawson, L. M.

1926 Board Report on Proposed Work for the Protection and Control of the Water Supply—Rio Grande Project. NARA, BOR, RG 115, Office of the Chief Engineer, Denver, General Correspondence Files, 1902–1942, Rio Grande, Box 1109, 115-54-A-81, Folder 249, Rio Grande, May-December 1926, Federal Records Center, Denver.

National Archives and Records Administration (NARA)

1935 Report on the Franklin Canal. BOR, RG 115, General Correspondence File, 1902–1942, 115-54-A-81, Box 1109, Folder 249, Federal Records Center, Denver

1935 Final Report–Control and Canalization of the Rio Grande, Caballo Dam, New Mexico, to El Paso, Texas. NARA, BOR, RG 115, Engineering and Research Center, Project Histories, Box 1087, 115-66A-693, Old Box 214, Federal Records Center, Denver

1912 Report on the Franklin Canal. BOR, RG 115, Project Reports, Box 722, Federal Records Center, Denver.

1909 Report on the Franklin Canal. BOR, RG 115, General Correspondence File, 1902–1942, 115-54-A-81, Box 1111, Folder 249, Federal Records Center, Denver.

Resch, W. F.

1934 Report on Mexican Canal Diversion—Rio Grande Project. U. S. Department of the Interior, Bureau of Reclamation, 29 March 1934. NARA, BOR, RG 115, Federal Records Center, Denver.

Taylor, Thomas U.

1902 Irrigation Systems of Texas. U.S. Geological Survey, *Water Supply and Irrigation Papers*, No. 71, U.S. Government Printing Office, Washington, D.C.

Timm, Charles A.

1941 *The International Boundary Commission, United States and Mexico*. University of Texas, Bureau of Research in the Social Sciences, No. 4134, Austin.

United States Department of the Interior, Bureau of Reclamation (BOR)

1938 Rio Grande Project: Annual Project History. Copies on file at the El Paso District Office of the BOR; Also available on microfilm at Zimmerman Library, University of New Mexico and at NARA, BOR, RG 115, Engineering and Research Center Project Histories, Box 143, 8NN-115-90-011, Federal Records Center, Denver.

1935 The American Canal and Dam Project, Appendix No. 1: Report of Board of Consulting Engineers, November 25, 1935. NARA, BOR, RG 115, Engineering and Research Center, Project Histories, Box 1087, 115-66-A-693, Old Box 214, Federal Records Center, Denver.

1938 Project History. Microfiche on file, Zimmerman Library, University of New Mexico, Albuquerque.

United States Department of the Interior, National Park Service (NPS)
1991 *National Register Bulletin 16A.* U.S. Government Printing Office, Washington, D.C.

Water and Power Resources Service
1981 *Project Data.* U.S. Government Printing Office, Denver.

White, Alice M.
1950 History of the Development of Irrigation in the El Paso Valley. Unpublished M.A. thesis, Department of History, University of Texas, El Paso.

White, J. B.
1938 Report on the Construction of the American Dam and Canal of the Rio Grande Canalization Project, November 30, 1938. Manuscript on file, IBWC, El Paso, TX.

APPENDIX AA

ENGLISH VERSION OF A TREATY BETWEEN THE UNITED STATES OF AMERICA AND UNITED STATES OF MEXICO

(1906)

FROM
"REPORT OF THE AMERICAN SECTION OF THE INTERNATIONAL WATER COMMISSION, UNITED STATES AND MEXICO
71ST CONGRESS, 2ND SESSION, HOUSE DOCUMENT No. 359
(1930)

1906 United States-Mexico Treaty Apportioning Water Between the Two Countries

Whereas a Convention between the United States of America and the United States of Mexico, providing for the equitable distribution of the waters of the Rio Grande for irrigation purposes, and to remove all causes of controversy between them with respect thereto, was concluded and signed by their respective Plenipotentiaries at Washington on the twenty-first day of May, one thousand nine hundred and six, the original of which Convention, being in the English and Spanish languages, is word for word as follows:

The United States of American and the United States of Mexico being desirous to provide for the equitable distribution of the waters of the Rio Grande for irrigation purposes, and to remove all causes of controversy between them with respect thereto, and being moved by considerations of international comity, have resolved to conclude a Convention for these purposes and have named as their Plenipotentiaries:

The President of the United States of American, Elihu Root, Secretary of State of the United States; and

The president of the United States of Mexico, His Excellency Señor Don Joaquín D. Casasús, Ambassador Extraordinary and Plenipotentiary of the United States of Mexico at Washington, who, after having exhibited their respective full powers, which were found to be in good and due form, have agreed upon the following articles:

Article I

After the completion of the proposed storage dam near Engle, New Mexico, and the distributing system auxiliary thereto, and as soon as water shall be available in said system for the purpose, the United States shall deliver to Mexico a total of 60,000 acre-feet of water annually, in the bed of the Rio Grande at the point where the headworks of the Acequia Madre, known as the Old Mexican Canal, now exist above the city of Juarez, Mexico.

Article II

The delivery of the said amount of water shall be assured by the United States and shall be distributed through the year in the same proportions as the water supply proposed to be furnished from the said irrigation system to lands in the United States in the vicinity of El Paso, Texas, according to the following schedule, as nearly as may be possible:

	Acre feet per Month	Corresponding cubic feet of water
January	0	0
February	1090	47480400
March	5460	237837600
April	12000	522720000
May	12000	522720000
June	12000	522720000
July	8180	356320800
August	4370	190357200
September	3270	142441200
October	1090	47480400
November	540	23522400
December	0	0
Total for the Year	60,000	2613600000

In case, however, of extraordinary drought or serious accident to the irrigation system in the United States, the amount delivered to the Mexican Canal shall be diminished in the same proportion as the water delivered to lands under said irrigation system in the United States.

Article III

The said delivery shall be made without cost to Mexico, and the United States agrees to pay the whole cost of storing the said quantity of water to be delivered to Mexico, of conveying the same to the international line, of measuring the said water, and of delivering it to the head of the Mexican Canal. It is understood that the United States assumes no obligation beyond the delivering of the water in the bed of the river above the head of the Mexican Canal.

Article IV

The delivery of water as herein provided is not to be construed as a recognition by the United States of any claim on the part of Mexico to the said waters; and it is agreed that in consideration of such delivery of water, Mexico waives any and all claims to the waters of the Rio Grande for any purpose whatever between the head of the present Mexican Canal and Fort Quitman, Texas, and also declares fully settled and disposed of, and hereby waives, all claims heretofore asserted, against the United States on account of any damages alleged to have been sustained by the owners of land in Mexico, by reason of the diversion by citizens of the United States of waters of the Rio Grande.

Article V

The United States, in entering into this treaty, does not thereby concede, expressly or by implication, any legal basis for any claims heretofore asserted or which may be hereafter asserted by reason of any losses incurred by the owners of land in Mexico due or alleged to be due to the diversion of the waters of the Rio Grande within the United States; nor does the United States in any way concede the establishment of any general principle or precedent by the concluding of this treaty. The understanding of both parties is that this treaty extends only to the portion of the Rio Grande which forms the international boundary, from the head of the Mexican Canal down to Fort Quitman, Texas, and in no other case.

Article VI

The present Convention shall be ratified by both contracting parties in accordance with their constitutional procedure, and the ratifications shall be exchanged at Washington as soon as possible.

In witness whereof, the respective Plenipotentiaries have signed the Convention in both the English and Spanish languages and have thereunto affixed their seals. Done in duplicate at the City of Washington, this 21st day of May, one thousand nine hundred and six.

Elihu Root [seal]
Joaquín D. Casasús [seal]

APPENDIX BB

SELECTED ENGINEERING DRAWINGS OF THE AMERICAN DAM, AMERICAN CANAL, AND ASSOCIATED STRUCTURES.

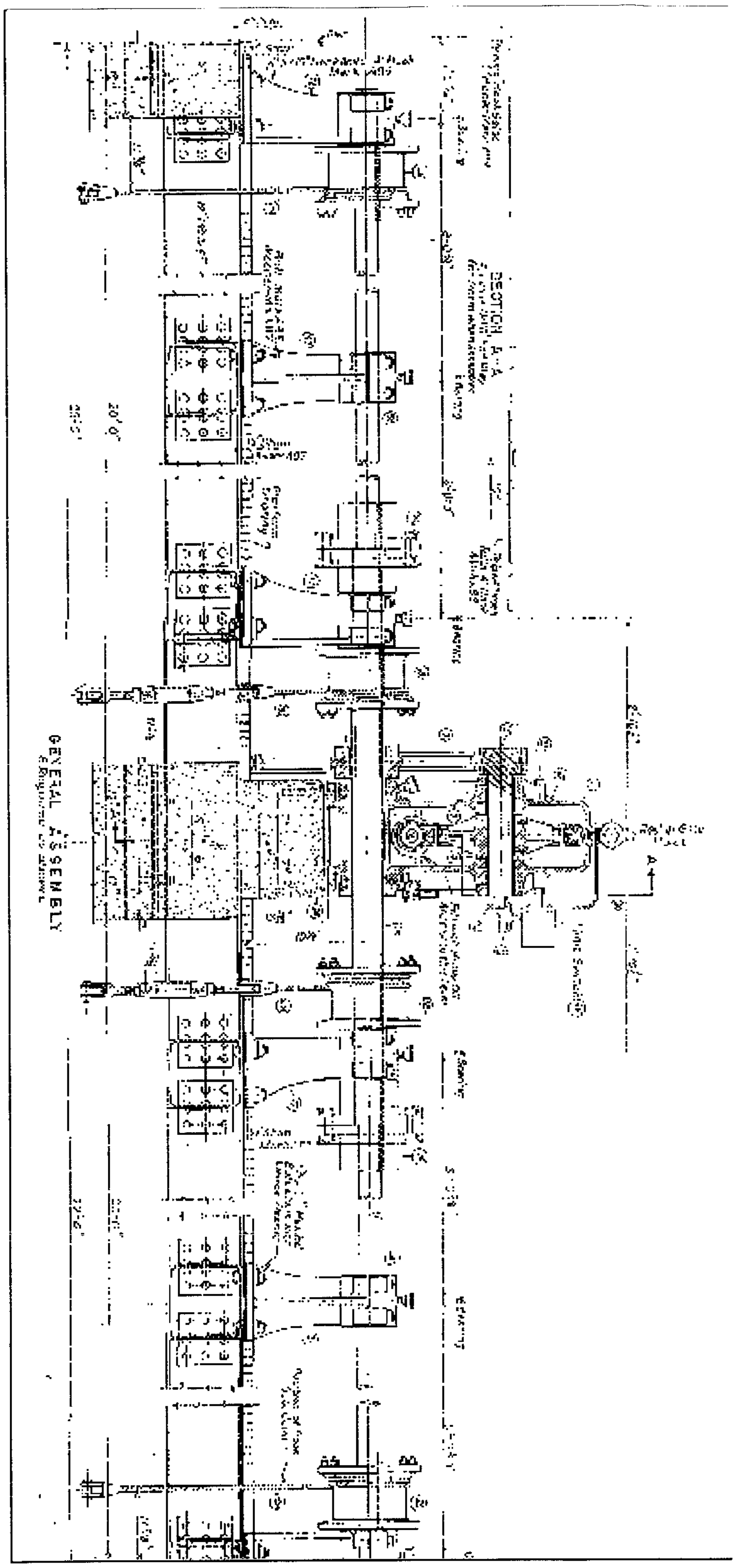


Figure BB–1. Schematic of Hoist Devices on the American Dam.

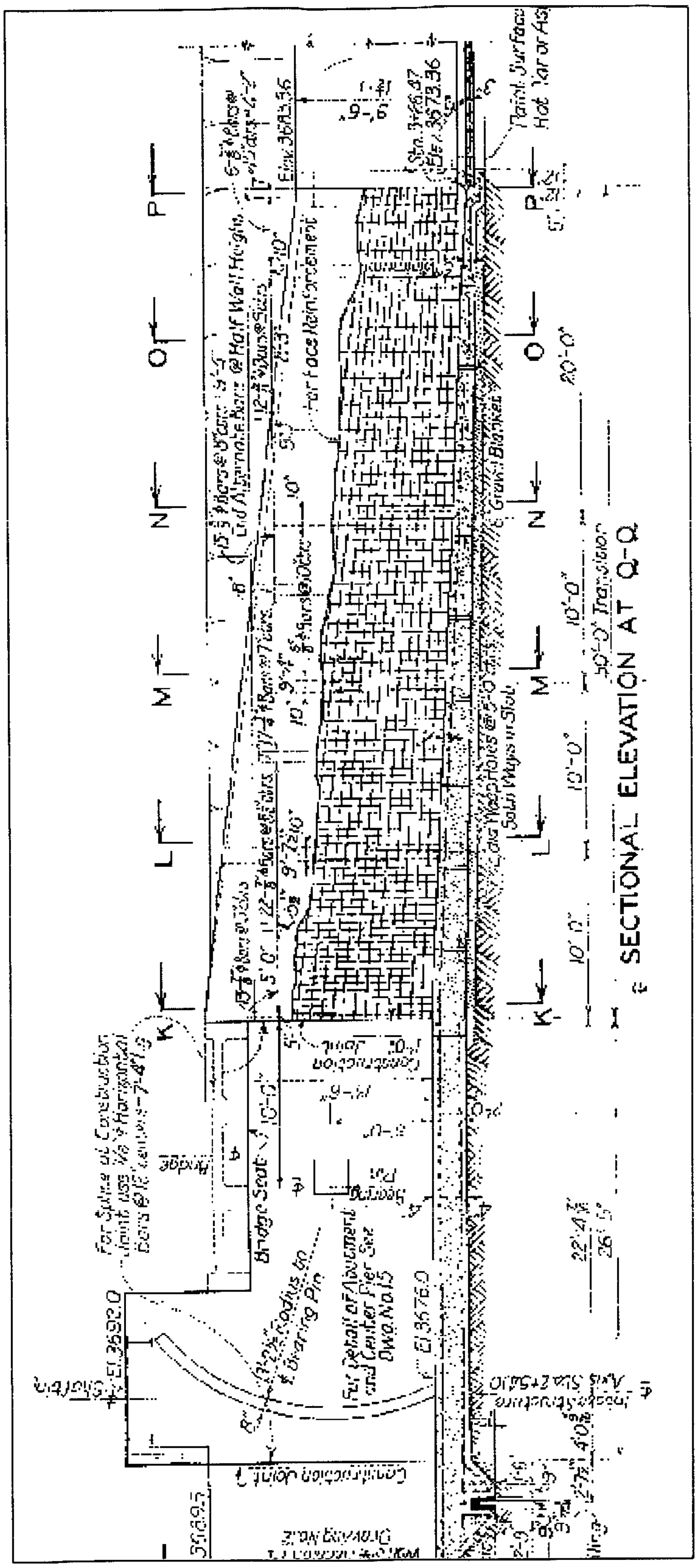


Figure BB–2. Longitudinal Cross-section of the Intake for the American Canal.

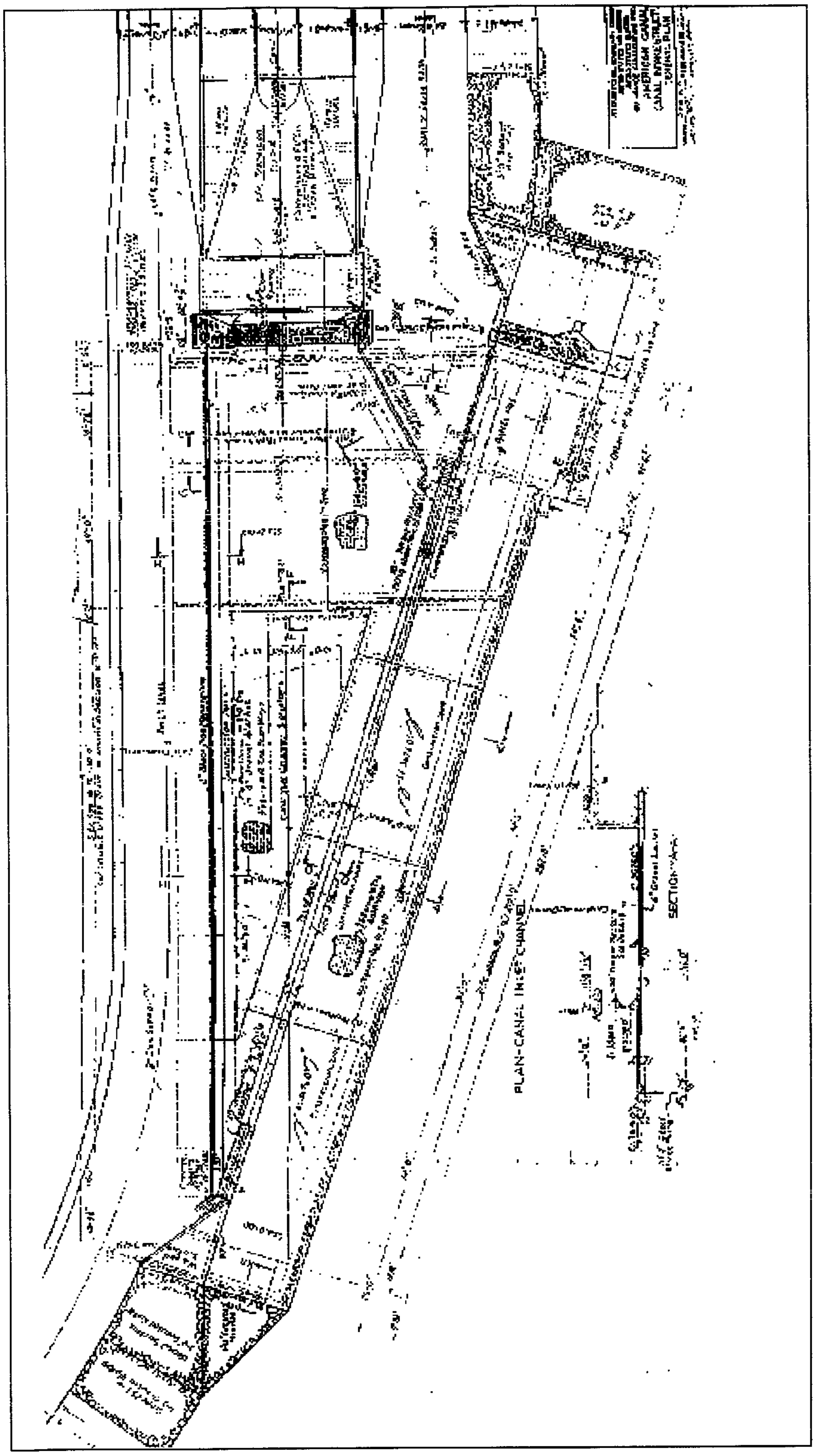


Figure BB-3. Plan View Schematic of American Canal Weir-Intake-Headgate Structure.

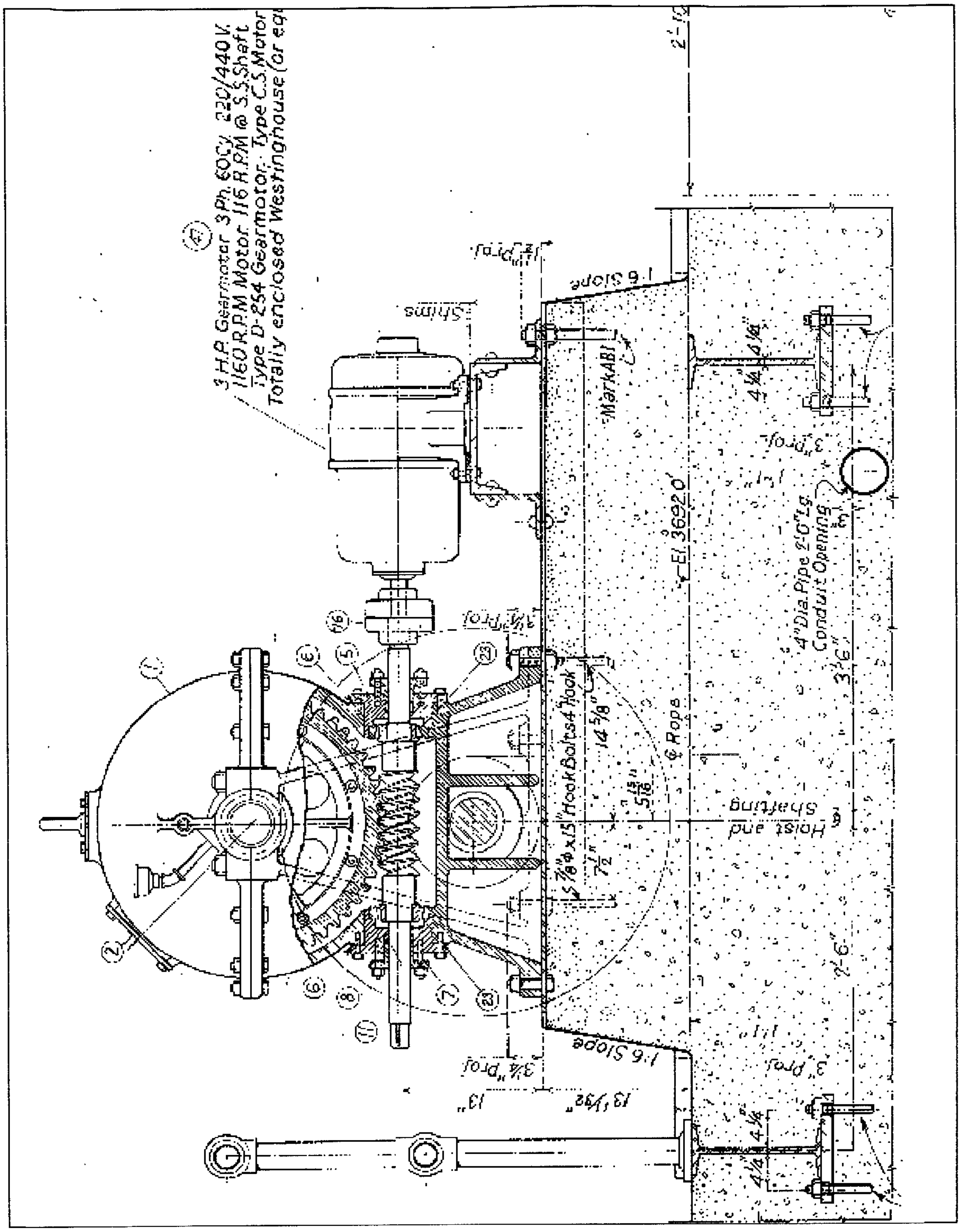


Figure BB-4. Schematic of Hoist Motors Used on the American Dam and American Canal Intake.

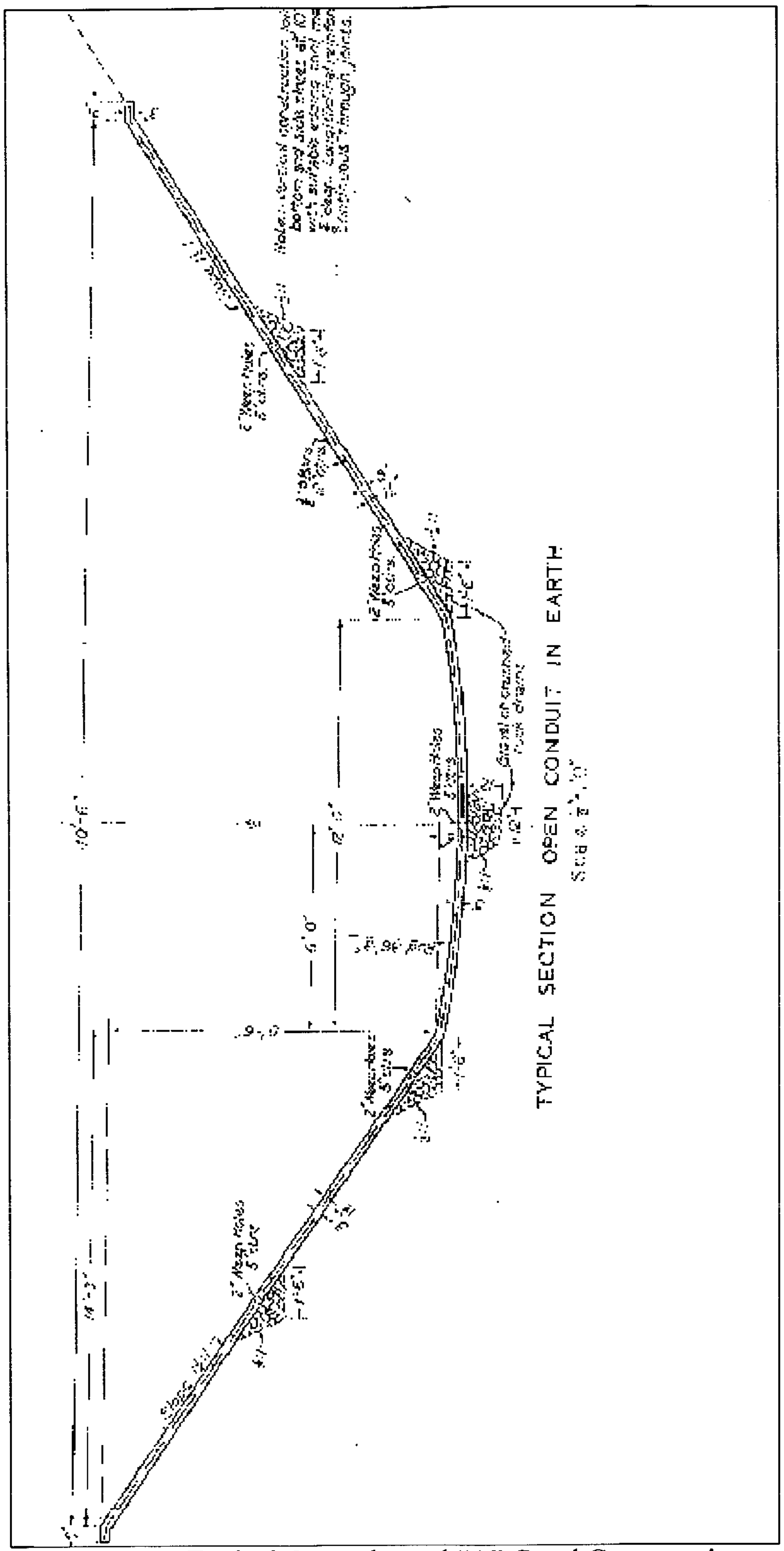


Figure BB–5. Typical Open-channel "A" Canal Cross-section.

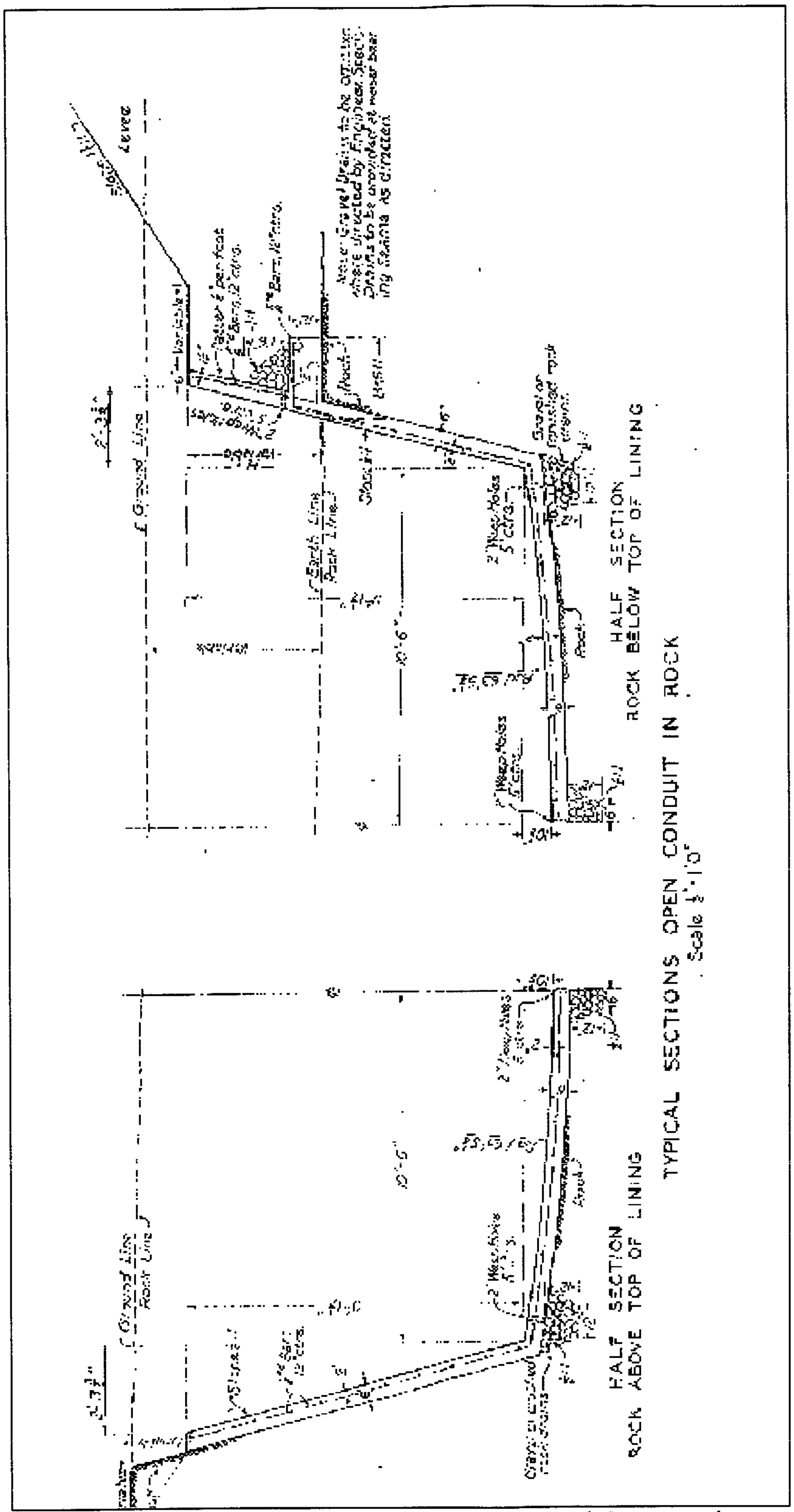
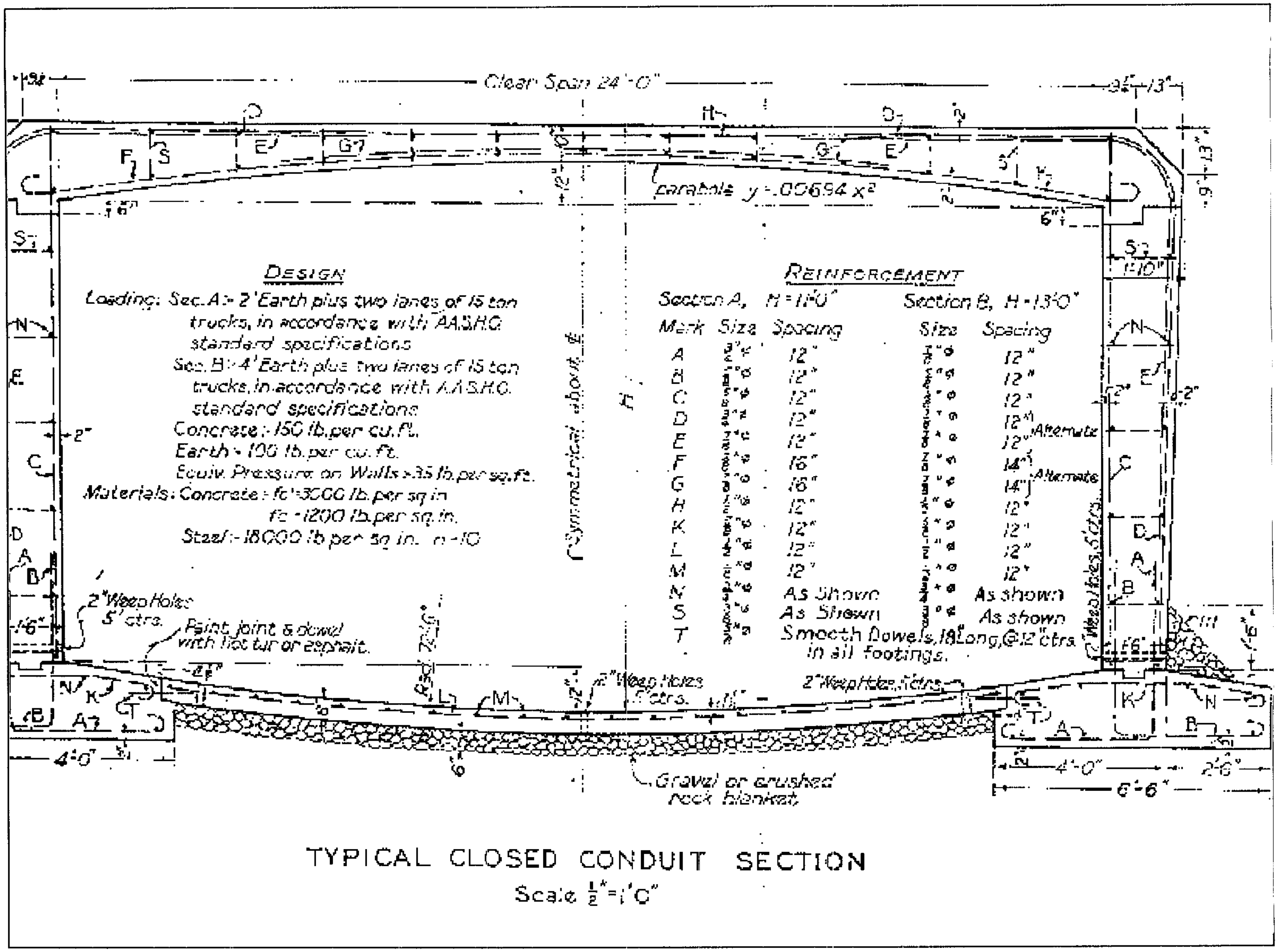


Figure BB–6. Typical Open-channel "B" Canal Cross-section.



TYPICAL CLOSED CONDUIT SECTION

Scale $\frac{1}{2}$"=1'0"

DESIGN

Loading: Sec. A:- 2' Earth plus two lanes of 15 ton trucks, in accordance with A.A.S.H.O. standard specifications

Sec. B:- 4' Earth plus two lanes of 15 ton trucks, in accordance with A.A.S.H.O. standard specifications

Concrete :- 150 lb. per cu. ft.

Earth - 100 lb. per cu. ft.

Equiv. Pressure on Walls - 35 lb. per sq. ft.

Materials: Concrete :- fc'=3000 lb. per sq in

fc - 1200 lb. per sq. in.

Steel :- 18000 lb per sq in. n - 10

REINFORCEMENT

	Section A, H=11'0"		Section B, H-13'0"	
Mark	Size	Spacing	Size	Spacing
A	[illegible]	12"	[illegible]	12"
B	[illegible]	12"	[illegible]	12"
C	[illegible]	12"	[illegible]	12"
D	[illegible]	12"	[illegible]	12" Alternate
E	[illegible]	12"	[illegible]	12" Alternate
F	[illegible]	16"	[illegible]	14" Alternate
G	[illegible]	16"	[illegible]	14" Alternate
H	[illegible]	12"	[illegible]	12"
K	[illegible]	12"	[illegible]	12"
L	[illegible]	12"	[illegible]	12"
M	[illegible]	12"	[illegible]	12"
N	[illegible]	As Shown	[illegible]	As shown
S	[illegible]	As Shown	[illegible]	As shown
T	[illegible]	Smooth Dowels, 18" Long, @ 12" ctrs in all footings.		

Figure BB-7. Conduit Cross-sections for Conduit "A" and Conduit "B".

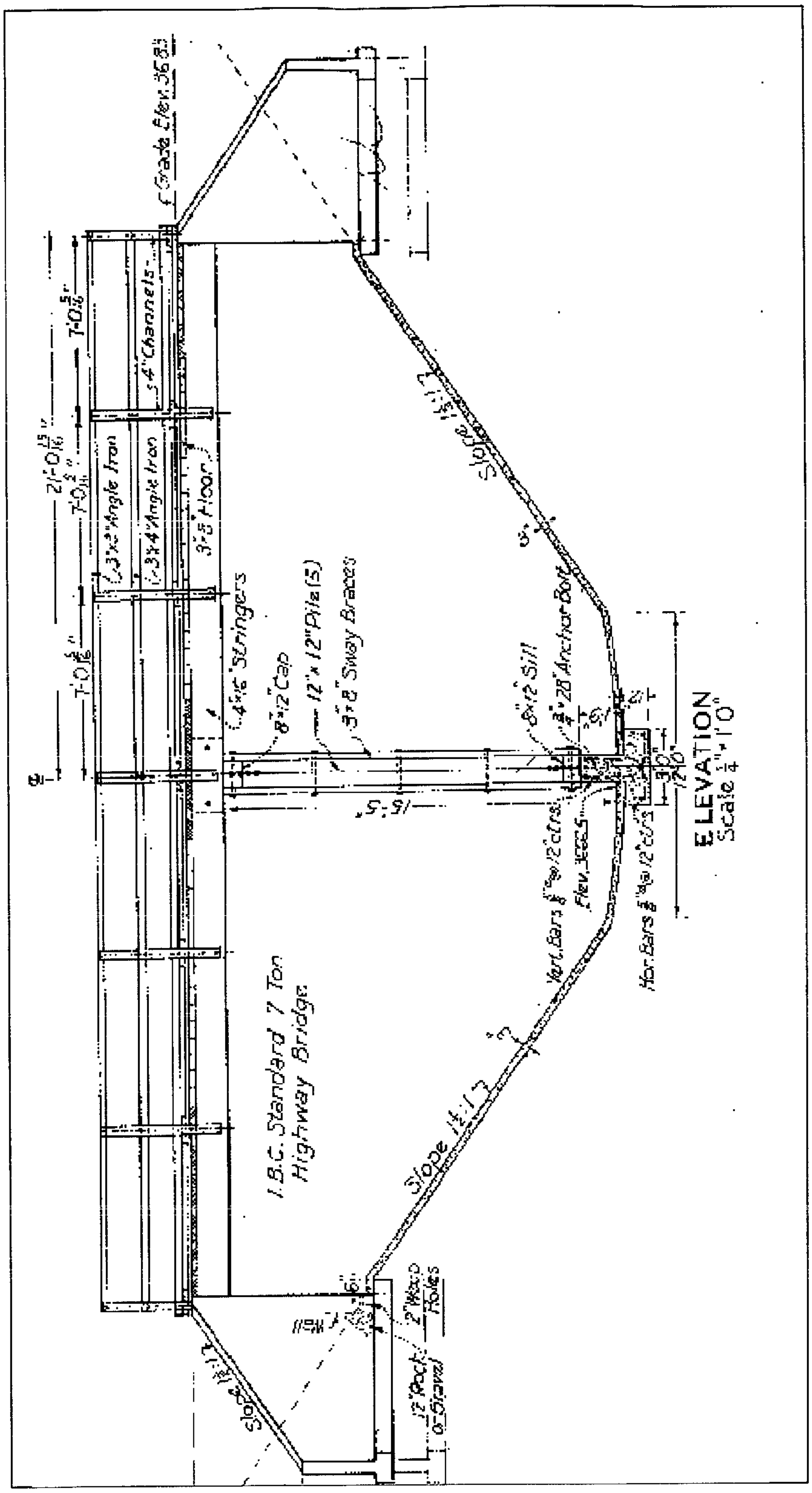


Figure BB-8. Cross-section of Standard 7-ton IBWC Bridge.

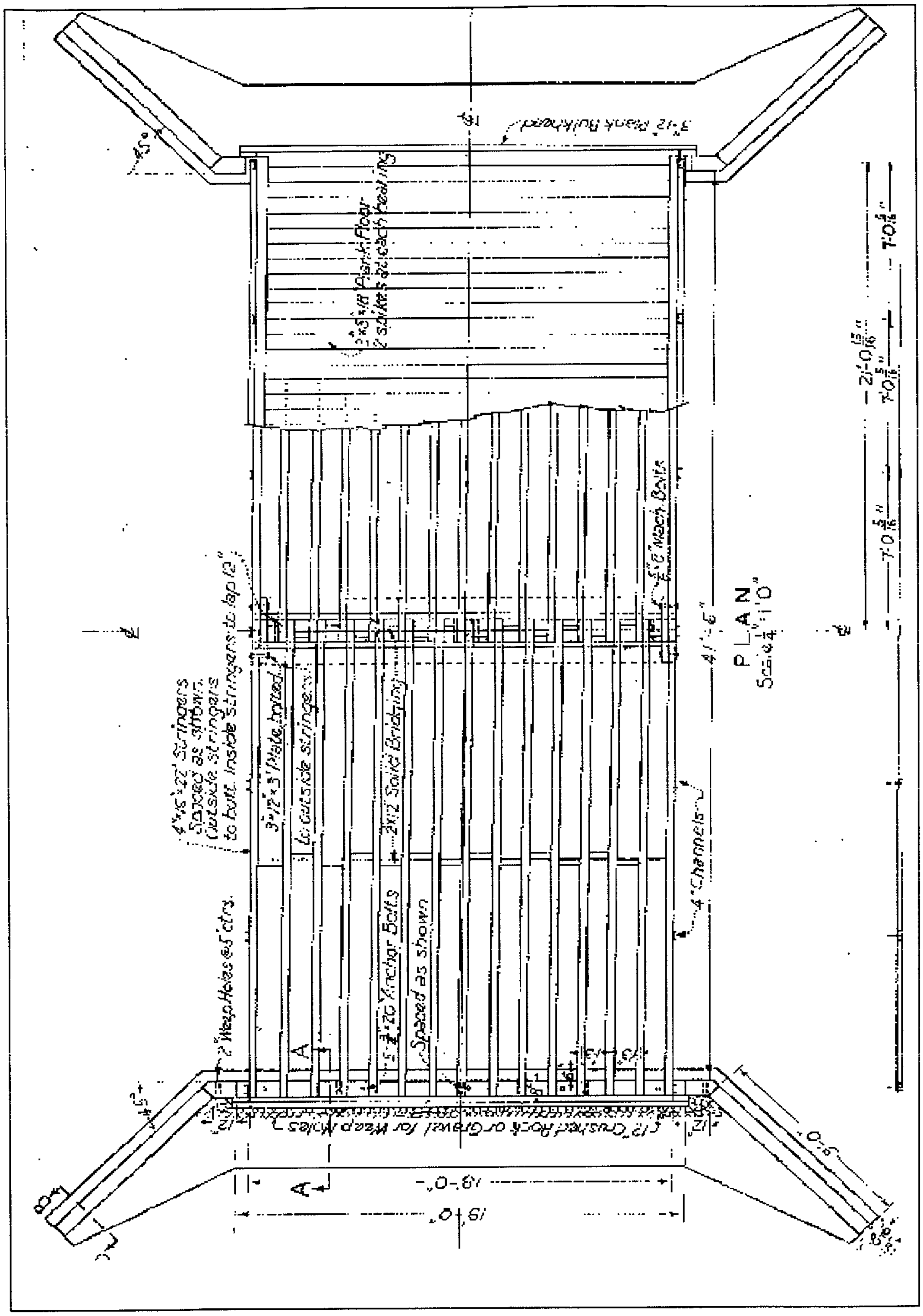
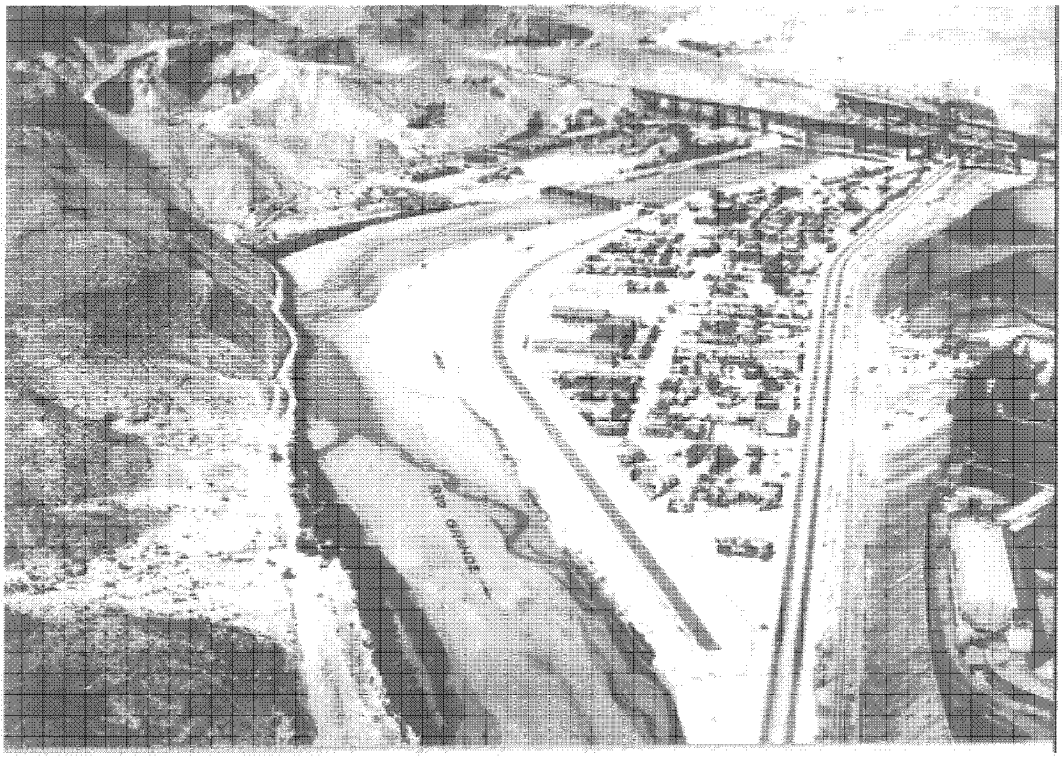


Figure BB-9. Plan View of Standard 7-ton IBWC Bridge.

K.3 - PARSONS ENGINEERING SCIENCE (PARSONS) REPORT

SUPPLEMENTAL REPORT

CONTROLLING WATER ON THE BORDER: THE AMERICAN CANAL SYSTEM, UNITED STATES SECTION, INTERNATIONAL BOUNDARY AND WATER COMMISSION, EL PASO, TEXAS



Prepared for
United States Section
International Boundary and Water
Commission
United States and Mexico
El Paso, Texas
Contract # IBM 99-30

Prepared by
Parsons Engineering Science, Inc.
Austin, Texas

August 2000

Table of Contents

List of Tables

List of Figures

List of Plates

ERRATA

The purpose of this errata page is to correct the text and captions related to bridges that were misidentified in the historical and archaeological investigation conducted by Human Systems Research, Inc. (HSR) in 1999.

The photographs listed below were incorrectly labeled and the correct captions are as follows:

- Plate 30: Photograph depicts 12 March 1938 view of Hart's Mill Road Bridge; and
- Plate 66: Photograph depicts 1999 view of the remnants of the Hart's Mill Road Bridge.

The descriptions of the Globe Street and Hart's Mill Road Bridges on pages 62, 66, and 67 of the HSR report contain incorrect information. The description and dimensions provided correctly describe only the Hart's Mill Road Bridge. A revised description of the two bridges can be summarized as follows:

> An examination of USIBWC construction drawings, maps, and photographs reveals that while the Globe Street Bridge was constructed as a footbridge across the canal, the structure at Hart's Mill Road was a timber vehicular bridge. Although remnants of the Globe Street Bridge no longer exist, the original Hart's Mill Road Bridge has been replaced with a sewer line and only the abutments remain. Photograph #ADC-385 in the USIBWC archives depicts the construction of the Globe Street footbridge in an April 1938 view. Furthermore, a construction drawing dated May 28, 1938, and entitled "Earthwork & Gravel Surfacing at American Dam and Canal – General Plan" (#2693-49) corroborates the location and method of construction of both the Globe Street and Hart's Mill Road Bridges. No construction drawings have been found for the Globe Street pedestrian bridge, perhaps indicating the structure's simplicity of design.

Furthermore, the HSR study claimed that a third bridge, which led to the American Smelting and Refining Company (ASARCO) plant, was likewise of wood-frame construction, has been replaced by a new structure, and that no original remnants exist. However, the Smelter Road Bridge still stands and is addressed in detail in the August 2000 *Supplemental Report, Controlling Water on the Border: The American Canal System, United States Section, International Boundary and Water Commission, El Paso, Texas.* The correct station for the Smelter Road Bridge is 63.00.

INTRODUCTION

The United States Section of the International Boundary and Water Commission (USIBWC), the agency which operates and maintains the American Canal in El Paso, Texas, has proposed to reconstruct the canal in order to improve its structural stability and increase its overall capacity from 1,200 to 1,535 cubic feet per second. This supplemental report serves as an addendum to the historical investigation and archaeological inventory of the American Canal conducted in 1999 by Human Systems Research, Inc. (HSR). The previous analysis assessed the potential impacts of four alternatives for the proposed reconstruction of the canal, including a No Action Alternative in which the canal would be maintained in its current configuration. The three action alternatives proposed the replacement of varying amounts of the open channel segments (ranging from a total of 2,941 feet to 7,360 feet) with closed conduits. Additionally, HSR conducted extensive archival research on the construction of the American Canal, as well as repeat photography and on-site inspections of the existing canal system. Figure 1 depicts the location and layout of the American Canal, which is situated on the American side of the international boundary between the United States and Mexico. Figures 2 and 3 provide detailed views of portions of the canal.

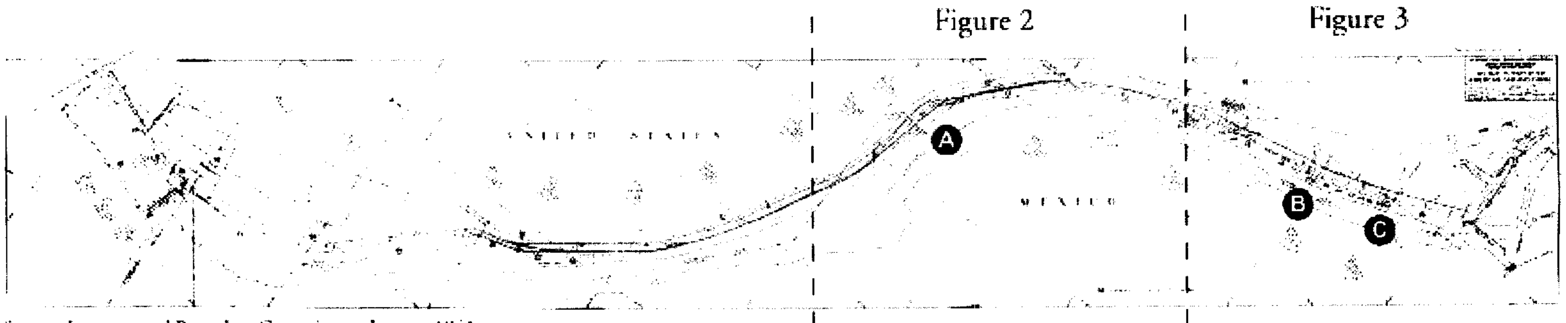
Thus, the purpose of this subsequent study is two-fold: (1) to address a new alternative that was proposed following the submission of the previous analysis; and (2) to refine the statement of historical significance for the American Canal. Evaluation of the additional alternative, as well as fieldwork and photographic research of the only bridge associated with the canal that remains intact, was conducted in March 2000.

In general terms, the American Canal possesses significance for its political and agricultural contributions to the El Paso Valley. Completed on June 2, 1938, construction of the American Canal represents the earliest attempt by the United States to ensure the distribution of waters to the United States and Mexico under the terms of the 1906 Treaty with Mexico. Although the HSR report stated that the American Canal exhibits historically significant engineering and construction characteristics typical of Depression-era Federal irrigation projects, this claim was not established. Upon consideration of both the previous investigation and this more recent evaluation, this supplemental report emphasizes the retention of the design and configuration of the canal as opposed to the supposed significance of its method of construction and use of materials. It should be noted that by the time of the construction of the American Canal, the use of reinforced concrete was common and hardly more representative of Depression-era construction than of any other period during the 20th century.

DESCRIPTION OF OPEN CHANNEL ALTERNATIVE

Implementation of the newly proposed alternative would retain the headgate structure and two closed conduit sections, yet require the removal and reconstruction of all concrete lining in the open channel portions, which constitute approximately 74% of the total

Figure 1: Location of the American Canal



Source: International Boundary Commission, January 1941

A	Smelter Bridge
B	Globe Street Bridge
C	Approximate Location of Hart's Mill Road Bridge

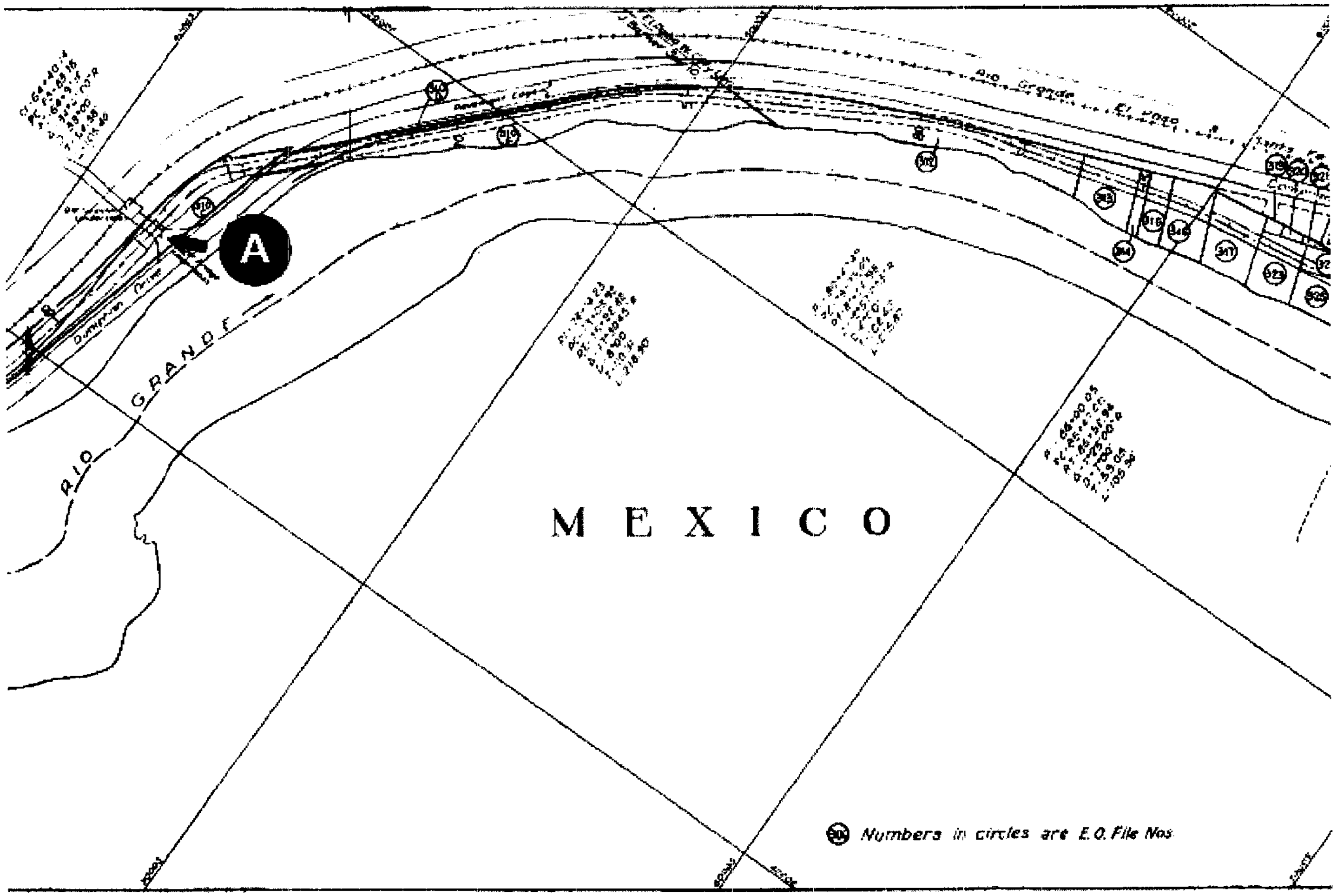
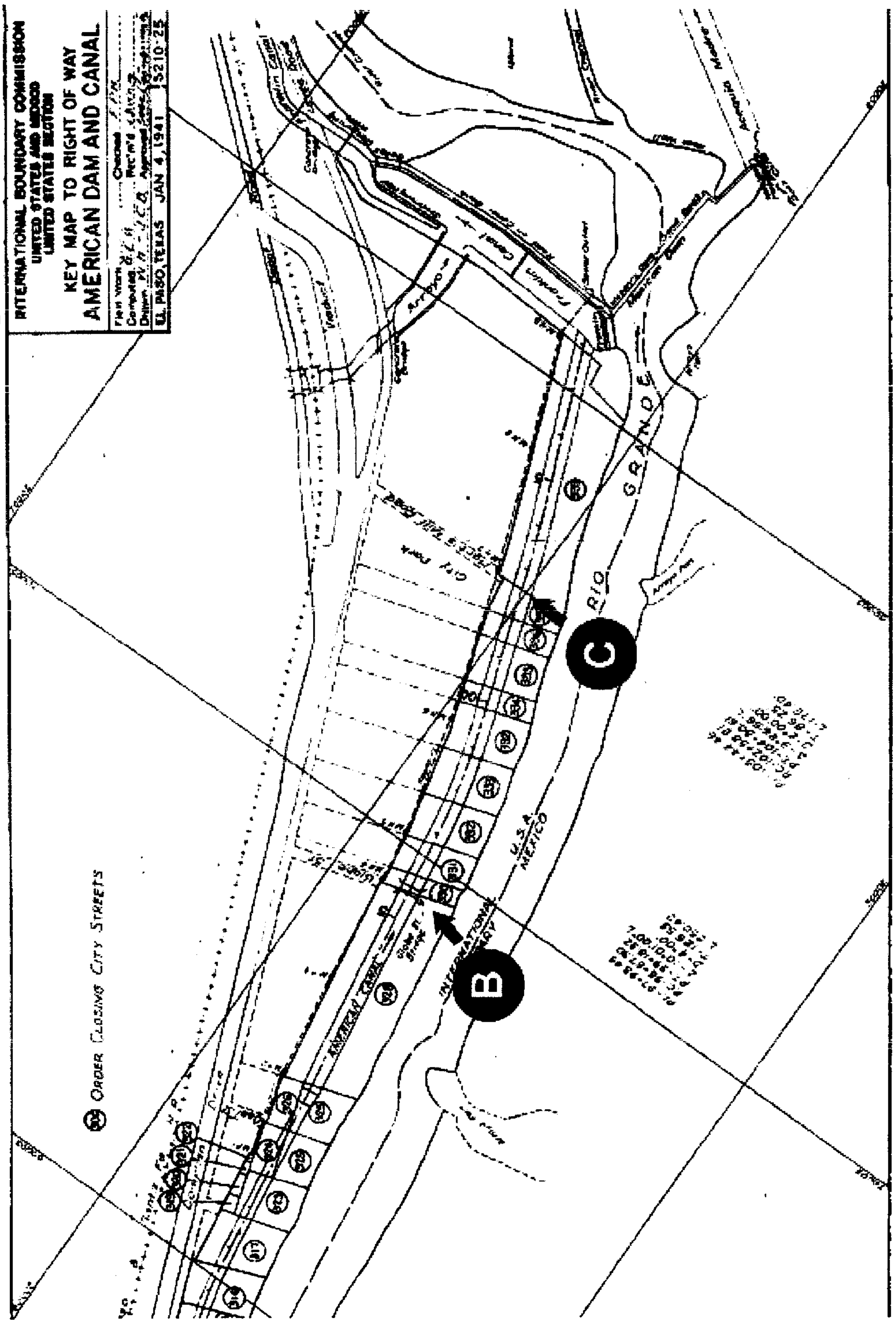


Figure 2: Location of Smelter Bridge

Figure 3: Location of Globe Street and Hart's Mill Road Bridges

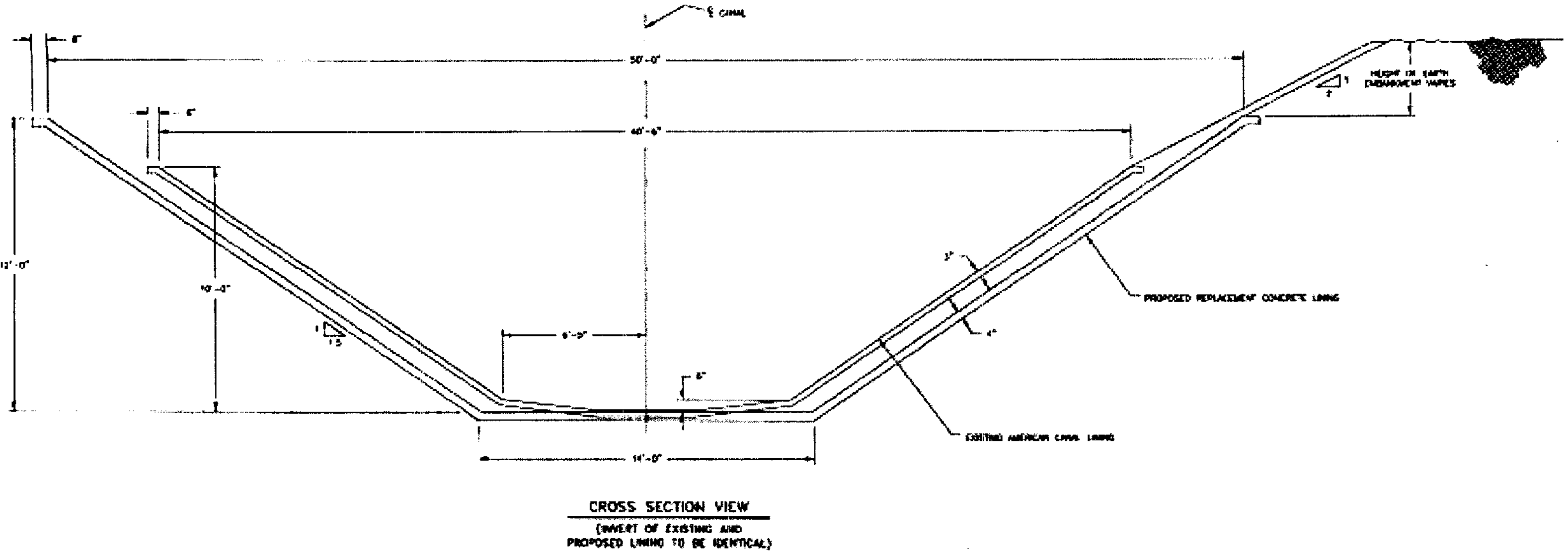
Showing location of ROW Plats



length of the canal. Prior to installation of the new concrete lining, the open channel dimensions would be slightly enlarged to convey higher design flow. Anticipated characteristics of the new open channel portions are illustrated in Figure 4, which shows the cross section of the new lining superimposed over top of a sketch of the old (existing) lining. Improved panel joints in the new lining are also proposed. The fourth alternative would retain the original aesthetic character of the canal's design by preserving its open channel segments and eliminating the construction of new closed conduits as recommended in the other three action alternatives.

Implementation of any of the four action alternatives would involve retaining the two original closed conduits since they appear to be in excellent structural condition and have sufficient capacity to handle the new design flow. However, any of the four action alternatives would require the removal of the original concrete panels that line the open channel segments in order to accommodate the increased flow. Most of these panels are currently in an extremely deteriorated state, as evidenced by cracking, spalling, and shifting. Depending on the alternative selected, this lining would be replaced with either a new lning of concrete that measures two feet wider and two feet higher than the existing panels (as depicted in Figure 4), or new precast concrete closed conduits with a double barrel opening. Additionally, in order to accommodate the proposed widening of the canal, the original transition areas flanking the closed conduits also would be removed so as to allow the extant closed conduits to properly tie into the new canal (Seiger 2000). The variations between the five different alternatives are illustrated in Table 1 in the Determinations of Effect and Recommendations section of this report.

Figure 4 Open Channel Alternative – Typical Cross Section



REFINEMENT OF HISTORICAL SIGNIFICANCE

Construction of the American Dam and Canal was intended to ensure the distributions of waters to the United States and Mexico under the terms of the 1906 Treaty with Mexico. This treaty provides a guaranteed amount of delivery to Mexico. The Juarez Acequia Madre complex provides delivery of approximately 60,000 acre-feet of water. The El Paso Valley receives about 376,862 acre-feet of water. The American Canal complex is significant in that it prevented disruptions in United States – Mexican relations by separating United States from Mexican waters. As such, and in accordance with the findings of HSR, the American Canal is significant under National Register Criterion A for several reasons: its importance in international relations between the United States and Mexico; its role in water distribution to ensure compliance with the Treaty of 1906; and its contributions to the development of irrigated agriculture in the El Paso Valley. Furthermore, the American Canal possesses significance under Criterion C for its overall design, specifically its open character and configuration, and continues to exhibit such aspects of its historic integrity as location, setting, materials, workmanship, and feeling.

Although the HSR investigation addressed three bridges originally associated with the American Canal, the report included historic documentation of only two of these structures – the Globe Street and Hart's Mill Road Bridges. An examination of USIBWC construction drawings, maps, and photographs reveals that while the Globe Street bridge was constructed as a footbridge across the canal, the structure at Hart's Mill Road was a timber vehicular bridge. Although remnants of the Globe Street Bridge no longer exist, the original Hart's Mill Road Bridge has been replaced by a sewer line and only the abutments remain. Furthermore, the HSR study claimed that a third bridge, which led to the American Smelting and Refining Company (ASARCO) plant, has been replaced by a new structure and no original remnants exist. The report also mistakenly stated that all three bridges were of wood construction with concrete abutments.

However, this supplemental report specifically addresses the existence of this third bridge, known as the Smelter Bridge. With a total width of 34 feet, the bridge is of poured concrete construction, leads east from Paisano Drive, extends over the canal, and provides access to the ASARCO plant. The bridge features a poured concrete approach road, deck, and abutments. Each side of the bridge is composed of low guardrails consisting of four poured concrete piers connected by two rails square in plan. The guard rails, curbs, and span have a rough-faced aggregate surface. Barbed wire fencing flanks each side of the bridge. A modern poured concrete barrier abuts the eastern span at its northern corner.

The USIBWC Headquarters in El Paso possesses extensive archives pertaining to the construction of the American Canal. This collection includes historic photographs, maps, and construction drawings for the canal and its associated features and bridges. A review of historic photographs within the archives reveals that construction of the Smelter Bridge was completed by December 1937. By March 1938, the portion of the canal on each side of the bridge, as well as neighboring Conduit A, also was completed.

Plates 1 through 5 illustrate the construction of the Smelter Bridge, and include a portion of the original construction drawing (Plate 1), a view of the land prior to construction (Plate 2), the pouring of the concrete deck (Plate 3), and its appearance upon completion (Plates 4 and 5). Additionally, two contemporary views of the bridge are included in order to illustrate that the Smelter Bridge remains largely intact and relatively unchanged (Plates 6 and 7). However, it should be noted that the images offered in this supplemental report represent only a sampling of the documentation that exists for both the Smelter Bridge and the American Canal and were selected as representative views.

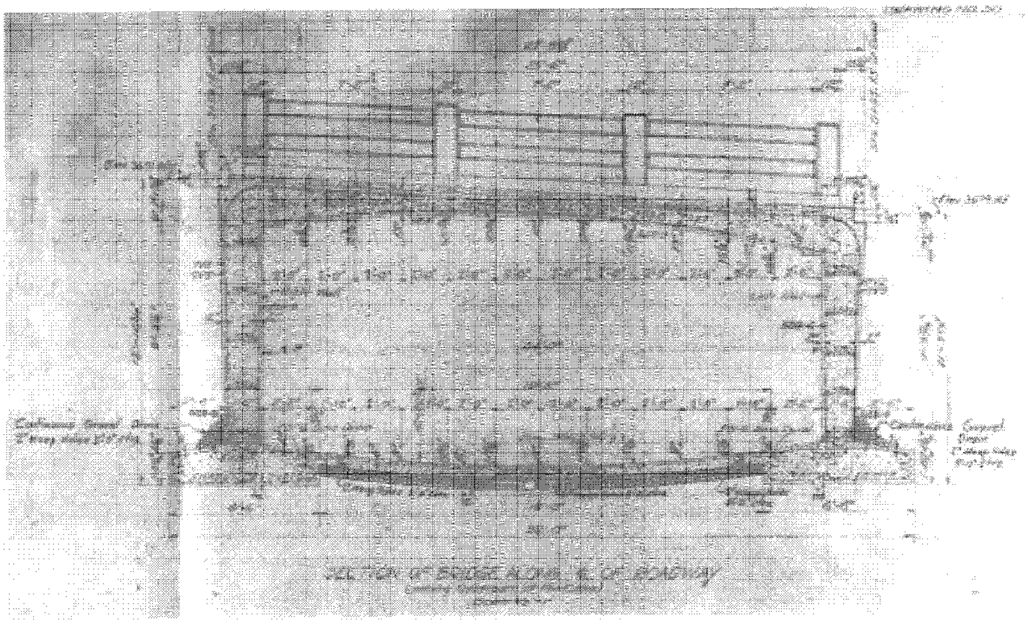


Plate 1: Section of Smelter Bridge, February 10, 1937.
Source: Construction drawing for Smelter Bridge and Transitions. Courtesy of USIBWC.

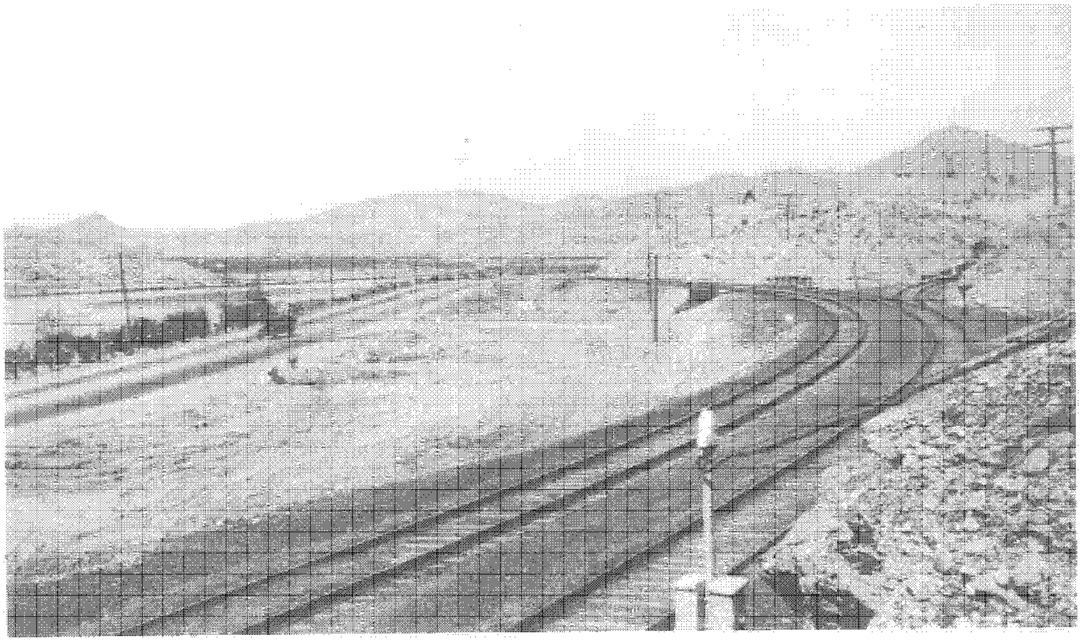


Plate 2: View prior to construction of the Smelter Bridge or American Canal, looking west, March 31, 1937.
Source: USIBWC Archives, Photograph No. ADC-703.

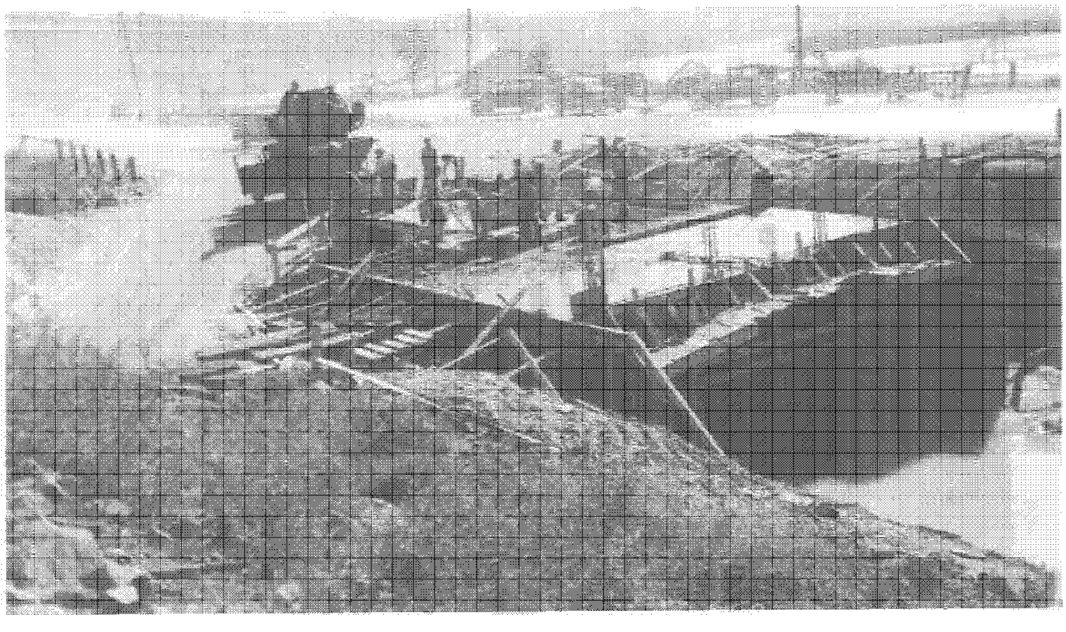


Plate 3: Pouring the concrete deck for Smelter Bridge, looking southeast, October 29, 1937.
Source: USIBWC Archives, Photograph No. ADC-240.

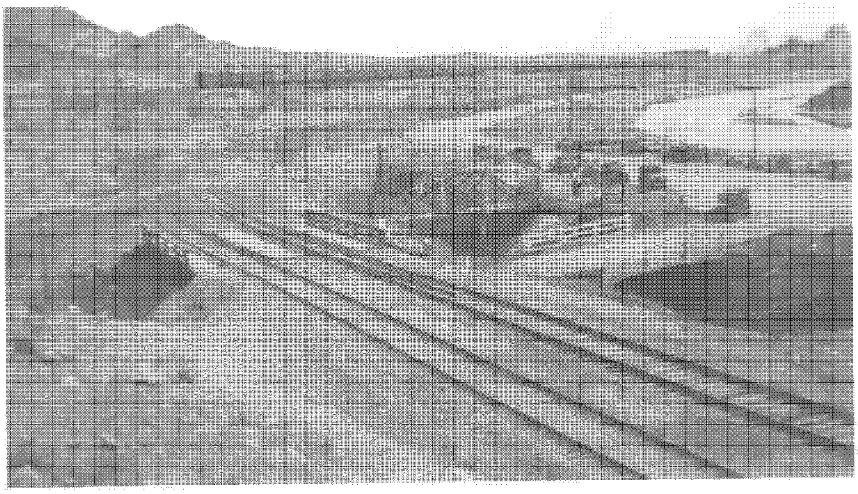


Plate 4: View of the completed Smelter Bridge and the construction of the American Canal, looking south, December 31, 1937.
Source: USIBWC Archives, Photograph No. 302.

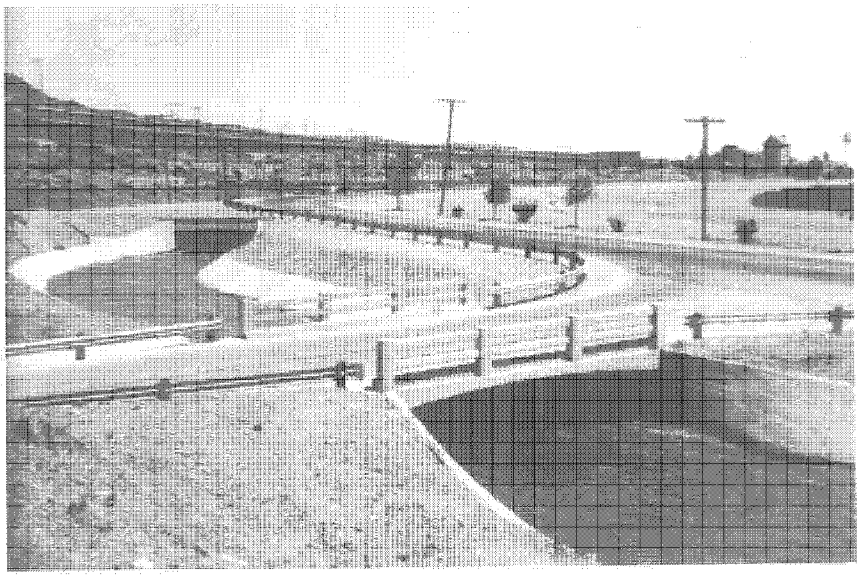


Plate 5: View of the Smelter Bridge and American Canal, looking south, June 11, 1938.
Source: USIBWC Archives, Photograph No. 1586.

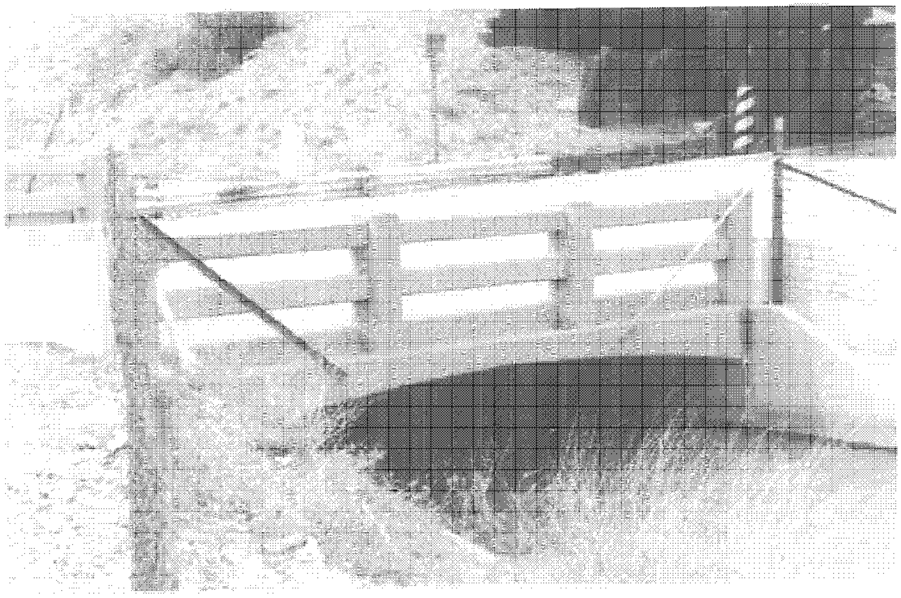


Plate 6: View of Smelter Bridge from the eastern side of Paisano Drive, looking northeast, March 20, 2000.

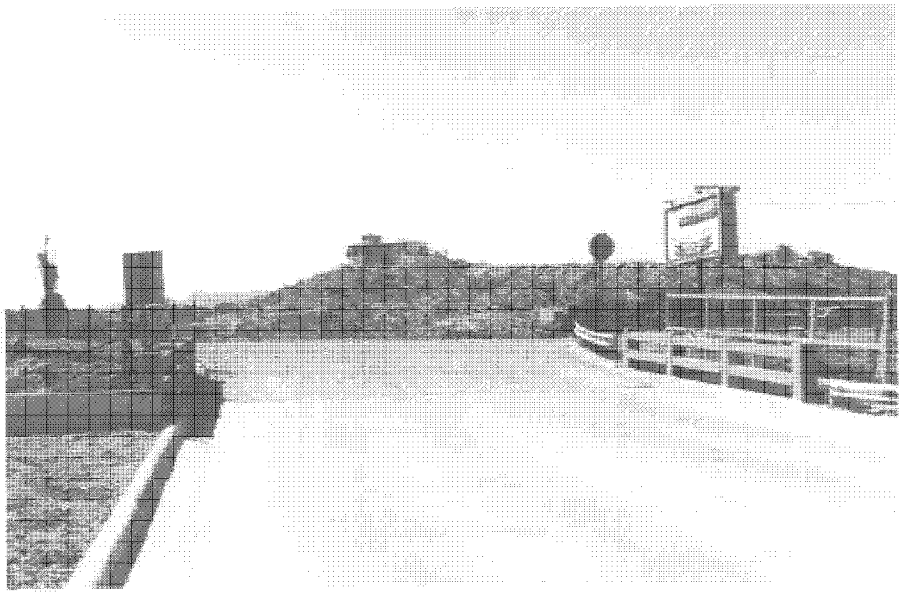


Plate 7: View of Smelter Bridge toward Paisano Drive, looking west, March 21, 2000.

DETERMINATIONS OF EFFECT AND RECOMMENDATIONS

Implementation of any of the four action alternatives, including the newly proposed Open Channel Alternative, would have an adverse effect on the American Canal for purposes of Section 106 of the National Historic Preservation Act due to the removal of original materials (e.g., concrete lining) and demolition of associated structures (e.g., extant Smelter Bridge and abutments of Hart's Mill Road Bridge). With the exception of the two original closed conduits, most of the remaining material composing the canal is in a deteriorated state and of insufficient size to handle the proposed increased capacity. Thus, the replacement of these materials would be necessary in order to eliminate the need for continual repairs and monitoring of the condition of materials. Additionally, although original to the construction of the American Canal, the Smelter Bridge is too narrow to accommodate large trucks that traverse the bridge to enter and exit the ASARCO plant. In fact, vehicular damage is evident on the pier at the northwestern corner of the northern side of the bridge.

Despite the loss of these original materials and structural components, implementation of the Open Channel Alternative would retain the visual character of the canal's original design by maintaining its open channel configuration. In contrast, the other three action alternatives propose disrupting the character of the original design of the canal with the construction of some segments of closed conduits. Although enclosing the uncovered portions of the canal presents a safety advantage, the construction of closed conduits is typically more costly than simply relining the canal with slightly enlarged replacement concrete panels. As such, Alternative 4 would be the most cost effective option and have the least impact on the original character and design of the American Canal, with the exception of the No Action Alternative.

SUMMARY OF EFFECTS

Table 1 on the following page highlights the characteristics of each of the alternatives, and their respective effects. The American Canal System is significant primarily for its association with American history, and much less so for its engineering and construction characteristics. With the exception of the removal of the Smelter Bridge, the proposed open channel alternative will largely preserve the overall visual characteristics and original design and feeling of the canal. For this reason, the length of open channel remaining in each alternative was chosen as the indicator issue.

Table 1

Comparison of Proposed Alternatives

Effects	**Alternative 1 (Closed Conduit)**	**Alternative 2 (Partial Closed Conduit Alternative A)**	**Alternative 3 (Partial Closed Conduit Alternative B)**	**Alternative 4 (Open Channel)**	**Alternative 5 (No Action)**
Number of original 1938 bridges removed	1	1	1	1	0
Number of original 1938 bridges remaining	0	0	0	0	1
Number of original 1938 bridge abutments removed	2	2	2	2	0
Number of original 1938 bridge abutments remaining	0	0	0	0	2
Number of original 1938 closed conduits remaining	2	2	2	2	2
Length of closed conduit (in feet)	9,774	5,490	8,210	2,470	2,470
Length of open channel (in feet)	675	4,959	2,239	7,979	7,804
Length of original 1938 open channel lining remaining (in feet)	0	0	0	0	7,804

Sources:

Ackerly, 1999.
Seiger, 2000.

PROPOSED MITIGATION MEASURES

For purposes of Section 106 of the National Historic Preservation Act, the American Canal System is significant primarily for its history, and much less so for its engineering and construction characteristics. The proposed open channel alternative will have the least effect of the possible alternatives other than the no-action alternative, since it will largely preserve the overall visual characteristics and original design and feeling of the canal, with the exception of the removal of the Smelter Bridge. Nevertheless, removing the Smelter Bridge will have an adverse effect on the canal.

In order to mitigate the adverse effect of the loss of this bridge, the USIBWC will prepare documentation of the resource according to Level III Historic American Engineering Record (HAER) standards. Preparation of the HAER documentation will draw on the extensive existing documentation and archival records pertaining to the construction of the American Canal. The Headquarters of the USIBWC in El Paso maintains a substantial collection of historic documentary materials, including photographs, maps, and construction drawings. In addition, an uncataloged collection of materials is located in the vaults at the USIBWC American Dam field office. Furthermore, Record Group 76 housed at the National Archives Southwest Region branch in Fort Worth contains assorted monthly reports related to construction, technical, and budgetary progress for various Rio Grande canalization projects, including the American Canal (Hacker 2000). Some of these reports include photographs, maps, and blueprints relevant to these canalization projects.

The HAER documentation of the Smelter Bridge would consist of the following three components:

- Drawings: Creating a sketch plan of the Smelter Bridge, as well as compiling a set of existing drawings of the resource, including the original construction drawings on file at the USIBWC, in order to illustrate the dimensions and historic value of the bridge;
- Photographs: Producing photographs with large-format negatives of exterior and interior views of the Smelter Bridge in either a 4 x 5", 5 x 7", or 8 x 10" format. All photographs will be perspective-corrected, contain full captions, and convey both the appearance and significance of the resource; and
- Written data: Completing a one-page HAER Data Form, which includes such information as location, builder, present owner, present use, and other descriptive information about the resource. Additionally, the cultural resources documentation of the American Canal System provided in the initial study prepared by Human Systems Research, as well as in this Supplemental Report, will contribute to the textual record of the Smelter Bridge.

REFERENCES CONSULTED

Ackerly, Neal W.
1999 *Controlling Water on the Border: The American Canal System, International Boundary and Water Commission, El Paso, Texas*. Prepared by Human Systems Research, Inc., for the United States Section, International Boundary and Water Commission.

Hacker, Meg
2000 Director of Archival Operations for National Archives Southwest Region, Fort Worth, Texas. Personal communication with Cynthia Liccese of Parsons Engineering Science, Inc., 19 April 2000.

Seiger, Andrew
2000 Project Engineer, USIBWC. Personal communication via electronic mail with Cynthia Liccese of Parsons Engineering Science, Inc., 28 March 2000.

United States Section, International Boundary and Water Commission (USIBWC)
1936 *American Dam and Canal Construction Progress Photographs*. Albums commence with Volume 1 (October 2, 1936 to May 3, 1937) and conclude with Volume 9 (June 2, 1938 to October 1939). On file at the USIBWC Headquarters, El Paso, TX.

1937 Construction drawings for the "Smelter Bridge and Transitions" (Sheets 2240-49, 2241-49, 2242-49, 2244-49, and 2245-49) dated February 10, 1937. Original drawings on file at the USIBWC Headquarters, El Paso, TX.

LIST OF PREPARERS

USIBWC Project Manager:	Steve Fox, M.S.
Parsons ES Program Manager:	R.C. Wooten, Ph.D.
Architectural Historian:	Cynthia Liccese, B.A.
Graphics:	Karen Rasmussen, Ph.D.
Quality Assurance:	Brian D. Crane, Ph.D.

APPENDIX L

(Water and Soil)

L.1 - WATER AND SOIL TEXT

WATER AND SOIL

1.0 WATER

For over 100 years, people in the El Paso-Juarez area have been mining groundwater from the Hueco Bolson. As many wells in the aquifer have already gone dry, people realize that the renewable Rio Grande will have to become an increasingly important water source for the area. In El Paso, the American Canal serves as the "faucet" to that source of water. A discussion of this source of water follows.

1.1 Background of the American Canal

After the construction of Elephant Butte Dam and reservoir, the 60,000 acre-feet of water allotted to Mexico was delivered at the head gates of the International Dam near downtown Ciudad Juarez. However, individual farmers in Mexico occasionally continued to build small diversion dams across the Rio Grande downstream from El Paso, and illegally diverted part of the American water allotment into Mexican fields. To prevent the diversion of American water, the US Government, through the US Bureau of Reclamation, built the American Canal to divert all of El Paso County's water allotment from the Rio Grande at a point before it passed to Mexican soil. The Canal was originally constructed (1937-1938) for farms located in the southern part of El Paso County, below downtown El Paso on the American side of the international boundary. No other uses for river water were planned at that time when the entire El Paso – Ciudad Juarez Valley was still very rural, with a population not much over 100,000.

Now, more than 60 years later, the population of the valley has risen to estimates approaching three million people. As the cities have expanded, much of the farmland has been converted to urban neighborhoods, with the water rights commonly being leased by the cities. Now, the water of the American Canal is used not only for irrigation of crops but also for providing drinking water for El Paso. In 1999, two water treatment plants operated by the El Paso Water Utilities – Public Service Board (EPWU - PSB) produced approximately 80 MGD (million gallons per day) of potable water from the American Canal. Two planned expansions of the Jonathon Rogers Water Treatment Facility will increase the drinking water use of American Canal water to approximately 160 MGD. Though a third facility is planned in Northwest El Paso's Upper Valley, no expansion of the aging downtown Umbenhauer-Robertson (or "Canal Street") Plant is planned at this time.

At present, the City of Juarez uses rapidly diminishing supplies of groundwater for 100% of its drinking water. However, through the Border Environmental Cooperation Commission, Cd. Juarez is reportedly requesting a grant from the North American Free Trade Bank to build a water treatment facility to purify river water into potable water. Though no official request has been made by Cd. Juarez to take this water from the American Canal, it is likely to happen if the treatment facility is actually built. Similarly, the Mexican Government is reported to be considering requesting its entire 60,000 acre-foot annual water allotment to be delivered from the end of the American Canal near the Riverside Dam, rather than at the International Dam; though Mexico has not made that decision at this time. Withdrawing the water downstream would prevent a huge annual water loss through the crumbling Acequia Madre, and would prevent the drowning of many persons in the Acequia Madre as it flows through Juarez.

1.2 Control of the American Canal

Though the USIBWC presently owns and maintains the American Canal, the Bureau of Reclamation regulates both the flow in the American Canal and the storage of Elephant Butte Reservoir and other Rio Grande dams. Its area customers are the Elephant Butte Irrigation District (EBID), the El Paso County Water Improvement District #1 (EPCWID #1), and the Mexican government. El Paso County farmers and EPWU – PSB request water from EPCWID #1 which then requests a Bureau of Reclamation water release from Elephant Butte. From Elephant Butte, the water reportedly takes approximately three days to reach the American Canal.

1.3 Capacity of the American Canal

Because of the probable future Mexican request to take its annual water allotment at the rate of 335 cfs (cubic feet per second) from the American Canal, the design capacity of the recently-completed, approximately 15.4-mile Rio Grande American Canal Extension (RGACE) was increased from 1200 cfs to 1535 cfs. The original segments of the Canal were designed to carry only 1200 cfs, but can probably no longer carry that volume of water. A recent USIBWC engineering inspection and test found only the two closed conduit segments under West Paisano Drive to be in good enough condition to carry the expected peak flow of 1535 cfs.

Even in this arid area of about seven inches of annual precipitation, flash floods can occur. For example, according to EPCWID #1 personnel, some years ago, the generally dry College Arroyo which drains the area near UTEP was measured at nearly 1500 cfs. That arroyo flows under Interstate-10, and empties into the RGACE immediately south of the study area, and below the International Dam, where the stormwater becomes part of the irrigation allotment downstream.

So in addition to its current use as a source of both agricultural and potable water, the Canal also serves as a flood control structure. In June of 1999, a four-inch rainfall in Northern Do★a Ana County, New Mexico, produced a Rio Grande flow of over 7000 cfs which threatened to destroy the aging and weakened International Dam. To reduce the force on the dam, the El Paso County Water Improvement District #1 and the Bureau of Reclamation decided to divert approximately 1450 cfs through the American Canal and return it to the river below the International Dam through the wasteway. Luckily, neither the Dam nor the Canal sustained any serious damage in that operation.

Because of canal deterioration and damage, the original 1200 cfs design capacity of the American Canal is thought to be somewhat diminished. Personnel from the USIBWC and the EPCWID #1 have expressed concern that in its present deteriorated condition, some segments of the American Canal (especially the Lower Open Channel) can safely carry much less water in a sustained flow.

The capacity is also somewhat diminished by losses due to evaporation and to water seeping through the cracks in the canal lining. The evaporation rate in the El Paso area can exceed six feet per year, though the swift canal current probably reduces the evaporation rate from the Canal. The evaporation losses from the canal are estimated to be 25 to 40 acre feet per year. No estimate was available for losses through the cracks in the canal lining.

DEMANDS AND CAPACITY OF FIVE AMERICAN CANAL *REPLACEMENT* ALTERNATIVES

Alternatives→ Effects↓	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Maximum water delivery capacity (cfs)	1535	1535	1535	1535	1200**
Current expected average daily water demand (cfs)	750*	750*	750*	750*	750*
Current maximum expected daily water demand (cfs)	1200*	1200*	1200*	1200*	1200*
Storm water capture capacity for peak irrigation day [max capacity - max demand] in cfs	335*	335*	335*	335*	0*
Storm water capture capacity for avg. irrigation day [max cap – avg. demand] in cfs	785*	785*	785*	785*	450*, **
Possible future Mexican water demand from American Canal (cfs)	335	335	335	335	335
Water demand for average irrigation day including Mexican demand (cfs)	1085	1085	1085	1085	1085
Storm water capture capacity on average irrigation day (with Mexican demand) in cfs	450	450	450	450	115

*Does not include possible future 335 cfs delivery to Mexico near Riverside Dam

**It is unknown if this maximum water delivery can be sustained without risking damage to the Canal or "locking up" of the Canal. The sustained water delivery capacity actually may be much lower.

At peak flows of 1200 – 1535 cfs, the great force of the swiftly-flowing water could more easily damage the already deteriorated three-inch-thick concrete. Additionally, stormwater flow from summer monsoon rains is most likely to occur during the peak irrigation and domestic water use months of July and August. A heavy stormwater flow added to a peak irrigation flow would put the damaged segments of the Canal at greater risk. Personnel from the EPCWID #1 suggest that such a flow in the next five years could cause tremendous damage to the existing concrete canal lining. They fear that the time needed to empty the canal, dewater the surrounding area, obtain all necessary permits, and repair or replace a section of the Canal could easily take up to 30 days. The effects of an unplanned 30-day canal repair project during peak irrigation in July could cause up to a $20 million loss in crops in El Paso County, a $300 million loss to El Paso agribusinesses, 500 local farmers going bankrupt, a $1 million loss to EPCWID #1, over $5 million in losses to EPWU-PSB, extreme water restrictions, business disruptions to El Paso water users, and potential legal liability to many agencies.

1.4 Sources of Water in the American Canal

Generally all of the water in the American Canal flows from the Rio Grande through the head gates which open at the American Dam. Except for occasional stormwater runoff from West Paisano Drive and a few other areas, all the water in the Canal comes from the river. During the irrigation season, most of the water in the El Paso region of the Rio Grande has been released from Elephant Butte Reservoir. During the non-irrigation season, very little water is released from Elephant Butte, and much of the flow is "secondary water" such as stormwater, return water from agricultural fields through drainage ditches, or discharge into the river from the Las Cruces Wastewater Treatment Facility. According to EPCWID #1 personnel, 41% of its available annual water is secondary water.

1.5 Hydrogeology

The American Canal, located on the banks of the Rio Grande, forms a small passage between the Franklin Mountains and the Juarez Mountains. The ground water in this area is fed by the recharged alluvial fans located at the Franklin Mountains. The principal aquifers in El Paso County are the Mesilla Bolson which underlies the Rio Grande Valley in Northwestern El Paso County, and the Hueco Bolson which is located generally east of the Franklin Mountains in South and East El Paso. In places, the principal aquifers can be up to 1000 feet thick. The aquifer below the river in the area of the Canal is quite shallow, but plays an important role in connecting the river, the Mesilla Bolson, and the Hueco Bolson. The shallow aquifer is recharged by infiltration from the Rio Grande and from irrigated fields during the irrigation season. Reportedly, up to half the water used locally for agricultural flood irrigation percolates down into the groundwater. The shallow aquifer under the Canal is not used as a source of potable water.

1.6 Depth to Local Groundwater

The local groundwater table fluctuates seasonally from a high near the end of the irrigation season in September to a low after the beginning of the irrigation season in March. In the study area, more groundwater information is available for the Upper Open Channel Area than for the Middle or Lower Open Channel Areas (see Figures 1-3 in Appendix C). A summary of measurements of 1997–1999 groundwater elevations in the Upper Open Channel Area from ASARCO-owned monitor wells is found below. (A more complete set of data is contained in the supporting documents of this Appendix.) The measurements indicate a fluctuation of the local shallow water table of up to 2.8 feet.

1997–1999 GROUNDWATER ELEVATIONS MEASUREMENTS AT ASARCO MONITOR WELLS IN THE UPPER OPEN CHANNEL AREA

Monitor Well ID #	Groundwater Elevation Minimum (Ft.)	Groundwater Elevation Maximum (Ft.)	Fluctuation in Groundwater Elevation (Ft.)
EP-61	3711.14	3713.51	2.37
EP-62	3711.00	3713.34	2.34
EP-63	3710.10	3712.94	2.84
EP-64	3711.73	3713.82	2.09
EP-65	3710.66	3713.07	2.41
EP-66	3711.03	3712.89	1.86

Each season, the lowest ASARCO monitor well groundwater levels were measured during winter. However, the groundwater elevations in February 1999 were approximately two feet higher than in February 1997 and February 1998. Therefore, before any dewatering activities are begun for reconstruction of the Canal, updated groundwater elevations should be determined for more current data. Personnel from ASARCO and Hydrometrics have stated that the bottom of the Upper Open Channel lining is always above the groundwater level.

The Middle and Lower Open Channel portions of the study area do not have extensive sets of groundwater table data. The available data indicates similar seasonal fluctuations of the water table. Because USIBWC personnel report seeing water draining through cracks into the American Canal every autumn after irrigation season ends, it can be assumed that the bottom of the concrete canal lining lies below the water table in open channel segments. That implies the need for dewatering during canal reconstruction.

Available local groundwater elevation data also suggests a groundwater flow generally following the local topography above (typically below arroyos). Overall, groundwater flows from alluvial fans under ASARCO across Paisano towards the Rio Grande. On the Rio Grande flood plain, water generally flows parallel to the river.

1.7 Water Quality

An important chemical parameter commonly analyzed in laboratories to determine water quality is Total Dissolved Solids (TDS). But because the lab testing takes at least 24 hours to obtain results, a field monitoring equivalent, specific conductivity (EC), provides "real time" data. Therefore, EC measurements are very commonly taken and used to monitor water quality. Other common measurements to monitor surface water quality include sodium, chlorides, sulfates, some metals, Biochemical Oxygen Demand (BOD), and coliform bacteria.

1.7.1 Groundwater Quality

As previously mentioned, the local drinking water has historically been pumped from the deep aquifers which typically have better water quality than the Rio Grande. The deeper local aquifers typically have lower concentrations of TDS, sodium, sulfates, chlorides, and other parameters than the surface river source. The shallow local aquifers beneath the American Canal typically have such high concentrations of salts and minerals that they are not used as sources of either drinking water or irrigation water.

1.7.2 Surface Water Quality

Data of chemical analyses for Rio Grande water samples from Elephant Butte Dam to the Tornillo Drain (in southern El Paso County, downstream from the American Canal) were available from both the EPCWID #1 and the EPWU–PSB from as early as 1936. However, the two sets of data were typically collected on different dates. Water is not commonly sampled by USIBWC from head gates of the American Canal. However, river water from under the Courchesne Bridge closely approximates the water quality flowing into the Canal.

1998-1999 RIO GRANDE WATER QUALITY PARAMETERS MEASURED NEAR AMERICAN DAM AT COURSHESNE BRIDGE

Month Sampled	Temperature °C	Field measured EC (μmho/cm^2)	Lab-measured TDS (ppm)
April-99	17.5	1094	676
March-99	15.2	932	615
February-99	7.2	1015	542
January-99	9.7	2100	1291
December-98	15.0	1975	1254
November-98	NA	2070	1123
October-98	18.1	1307	735
September-98	28.7	711	735

Winter EC measurements always showed higher values than summer measurements. The difference in EC measurements is mainly due to the presence of higher Cl, SO_4 and Na concentrations during the winter when a higher percentage of the river flow is from secondary sources (i.e., return flow from fields and effluent from waste water treatment plants at Las Cruces, Anthony, Hatch, etc.) rather than from the water stored at Caballo and Elephant Butte Reservoirs.

A comparison of chemical analyses of American Canal water influent and effluent samples is found in the following chart, which shows the values to be very similar for the various parameters. The slight differences might be attributed to the delay of one day or to other factors. The comparison shows that influent and effluent quality of canal water are nearly identical during irrigation season.

CHEMICAL ANALYSES OF INFLUENT AND EFFLUENT OF AMERICAN CANAL, SAMPLED AUGUST 18 AND 19, 1997

Sampling Location	EC (µmho/cm^2)	TDS (mg/l)	Ca (mg/l)	Na (mg/l)	Cl (mg/l)	HCO_3 (mg/l)	SO_4 (mg/l)
Courchesne Bridge (near Canal head gates)	957	585	58	97	76	191	170
Canal Street Water Plant (near end of Canal)	938	583	69	116	90	183	188

1.8 Environmental Concerns in the Canal Area

Many possible sources of contamination have historically existed along the route of the American Canal. At present, the only large industries operating in the area are brick manufacturing plants across the river, often noted by plumes of dust and smoke. Even the large ASARCO smelter that operated in that location for over 100 years has been temporarily shut down for approximately two years. For decades, a nearby plant produced Portland Cement. Smaller facilities have included a gardening center, a metal plating operation, a bus depot and other facilities. Since the 1880s, railroads have transported chemicals and other hazardous materials on tracks adjacent to the Canal. Until recent years, no records were kept for spills or leaks from trains. For many years after the U.S. ban on the sale of leaded gasoline, some drivers on Paisano Drive (U.S. 85) filled their cars and trucks in Mexico with leaded gasoline, which emitted leaded exhaust. USIBWC's diesel generators were fueled from onsite diesel storage tanks. Further, with prevailing winds generally from the west, other potential contaminants could easily have blown into the area from other sources. In summary, the many sources of potential hydrocarbon and/or heavy metals contamination warrant concern in the Canal area.

The two water-related concerns are the possible infiltration of contaminated groundwater through the existing cracks and joints in the concrete canal lining, and the discharge of potentially poor quality water during reconstruction dewatering activities, per Clean Water Act Section 401. During the non-irrigation season, when groundwater typically leaks into the nearly empty American Canal, USIBWC and TNRCC personnel have sometimes smelled or seen what appeared to be diesel or gasoline leaking into the Canal through the cracks in the canal lining. Some leaks led TNRCC to investigate unknown sources and to identify leaking underground petroleum storage tanks (LUSTs). Indeed, several LUSTs have been identified in the study area. Data from boring logs and monitor wells from UST-related projects are included in Appendix L.

TNRCC-DOCUMENTED HYDROCARBON RELEASES (LEAKING USTs) IN THE STUDY AREA

Location	TNRCC LUST No.	TNRCC Facility No.	Current TNRCC status
ASARCO UST Facilities (2 diesel locations)	• 94594 • 95897	• 0021993 • 0021993	• 1999, Open; Closure Requested • 1999, Open
Paisano Auto Salvage	• 97518	• 0028230	• 1997, Open
USIBWC American Dam UST Facility	• 108049	• 9971	• 1998, Closed
Bell Thunderbird	• 96823	• 47661	• 1999, Open
USIBWC- International Dam UST Facility	• 107801	• Not assigned	• 1997, Closed

1.8.1 Upper Open Channel Groundwater Chemistry

The Upper Open Channel is the northern part of the study area along the island-like Rio Grande flood plain between Paisano Drive and the Rio Grande, from the American Dam to Conduit A. This area includes ASARCO monitoring wells EP-61 to EP-66, and a surface water sample station (SEP-1) at the southern rim of the area. In the southwestern area of this flood plain, an approximately 15 foot high vertical interceptor curtain was installed three to five feet below the groundwater surface. The curtain consists of a 60-mil thick impermeable fabric and a bentonite clay liner.

A dual-phase vacuum extraction system has been installed in the flood plain by ASARCO, and has been operating in this area to remove the liquid and gas phases of a diesel plume. The vacuum extraction remediation system consists of 70 interconnected extraction wells in ten rows, spaced about 50 feet apart. Water samples were obtained from ASARCO monitor wells EP-57 to EP-66 in the area.

Groundwater samples from ASARCO wells EP-61, 62, 63, 64, and 66 showed elevated specific conductivity (EC) measurements as high as an 8420 μmho/cm^2 at EP-64. That suggests a TDS concentration over 5000 mg/l, which would be too high for normal discharge into the river during the irrigation season.

Heavy Metals

In the Upper Open Channel area, several water samples collected from ASARCO monitoring wells contained elevated heavy metal concentrations. As dissolved metals do not migrate in plumes as do hydrocarbons, valid "plume maps" of concentrations of metals cannot be drawn. Area maps that were prepared by ASARCO for each dissolved metal show the average of that metal over four sampling events from August 1997 to May 1998.

As: Arsenic was detected in all the ASARCO water samples along the American Canal. The highest value (11 mg/l) found in EP-66 exceeds the present EPA limit for drinking water of 0.05 mg/l by over 200 times and exceeds the recently-announced future 0.005 mg/l limit by 2000 times. As previously stated, this groundwater is not used as a source of potable water, and is therefore, not subject to the EPA drinking water maximum allowable concentration (MAC). During construction and dewatering activities, migration of some contaminated water towards dewatering pumps is possible due to the lowering of the local water table and a probable increase of the flow gradient towards the monitor wells close to the Canal.

Se: Selenium was also detected in all water samples analyzed from the monitor wells in this study area. Most of the water samples exceeded the EPA drinking water MAC of 0.01 mg/l. The highest Selenium value of 0.62 mg/l was found in the water sample from monitor well EP-64.

Cd: Cadmium levels in most of the ASARCO water samples were below the laboratory detection limit. The highest value was observed at ASARCO SEP-1 with 0.01 mg/l (MAC = 0.005 mg/l). Similar to the arsenic distribution, high Cd concentrations were found in ASARCO EP-49 (43.0 mg/l). Furthermore, a migration of contaminated water from this well towards the Canal would be possible during dewatering operations. However, as detailed in Section 1.8.2, cadmium does not appear to be migrating and does not appear to present a serious threat.

Pb: Lead concentrations in all the monitor wells were either below or near the detection limit (SEP-1). Even the wells which had high detectable heavy metal concentrations, contained low detectable lead concentrations. This reflects the tendency of Pb to be easily absorbed to soil surfaces. Further, lead is not very soluble. The present drinking water MAC for lead is 0.05 mg/l.

Hydrocarbons

The available data from the 1997 diesel spill in this area shows a diesel plume extending from the higher elevations at the ASARCO plant down to the Rio Grande flood plain. Initial data from ASARCO monitor well EP-65 (approximately 200 feet from the Canal) showed a diesel free product thickness of 2.5 feet. The available data for February 2000 shows the diesel plume decreased in ASARCO EP-65 to a thickness of only 0.02 feet. Hydrometrics Inc. (ASARCO environmental consultant) personnel expect the plume to be greatly diminished by the start of the projected canal reconstruction in October 2001.

It should be mentioned that, as a result of the remediation system, the cleanup of those portions of the local groundwater aquifer with the highest permeability was successful. However, the less permeable areas may not have been as well remediated by this system.

At the former UST location near the American Dam, seven monitor wells were maintained over a period of three years from 1994 to 1997. In 1994, the highest hydrocarbon concentrations in groundwater samples were detected at MW-6 (approximately 17 ppm BTEX and 7 ppm TPH) and at MW-1 (6.7 ppm BTEX and 43 ppm TPH). High TPH concentrations were also detected at MW-3 (900 ppm). The concentrations of BTEX and TPH found in wells MW-1, MW-3, and MW-6 decreased as a result of the remediation system in operation at the subject facility. The final closure report for this site was submitted in July 1998 (see table titled "Hydrocarbon Releases at TNRCC-Registered Facilities in the Study Area", page 8), and the facility was given TNRCC "closure". This closure status suggests that no further environmental assessment or corrective actions are warranted.

1.8.2 Middle Open Channel Groundwater Chemistry

In contrast to the Upper Open Channel area, the Middle Open Channel area is comprised of only a narrow strip of land between Paisano Drive and the Burlington Northern Santa Fe Railroad tracks. Directly adjacent to the railroad tracks, the land slopes downward from the railroad right-of-way towards the Canal. Monitor Wells EP18-20 and EP 29-40 are located in this portion of BNSF right-of-way.

Groundwater sampled from the monitor well EP-20 showed a very high specific conductivity of 10,090 μmho/cm^2 suggesting a TDS concentration over 6000 mg/l. This saline water would require authorization prior to discharge during dewatering activities. Soil and groundwater pH values are typically near 8 in this area.

Heavy Metals

As: As in the Upper Open Channel area, elevated concentrations of arsenic were detected in the water samples from all monitor wells located in the Middle Open Channel area ("Diesel Plume #1"). The highest concentration in this portion of the Canal was detected at ASARCO Monitor Well EP-20. Similar concentrations of arsenic were also detected at monitor wells EP-43, EP-12, and EP-70 located approximately 250 feet up-gradient from the Canal. Despite their distance from the Canal, the up-gradient locations of these wells suggests a potential migration of the arsenic contamination towards the Canal area during construction dewatering when local groundwater could be drawn towards the canal area.

Se: Selenium was also detected in all monitor wells close to the Canal. The highest selenium concentration near the Canal was 3.7 mg/l which was observed at monitor well EP-35. Monitor well EP-12, located approximately 250 feet upstream from the monitor well EP-35, also showed a selenium concentration of 3.7 mg/l. It should be noted that selenium is commonly found in other distant areas near the Rio Grande.

Cd: The 0.042 mg/l cadmium concentration present in monitor well EP-20 was the only value above the detection limit. A surface water analysis of ASARCO Pond 1 (located approximately 300 feet uphill from the Canal) showed 12.67 mg/l, an extremely high concentration of cadmium. The distance is probably enough that cadmium does not appear to present a serious threat in this area.

Pb: At the elevated local soil pH values of approximately 8, lead typically does not readily dissolve in water, and does not migrate past the top few inches of soil. Not suprisingly, in this area, groundwater concentrations of lead (Pb) were found to be below the laboratory detection limit, and should not present any serious contamination potential for the water pumped during the construction dewatering.

Hydrocarbons

A pump-and-treat system to remediate a diesel plume from a former release at ASARCO consists of pumps, an oil/water separator, and an aerator. For this remediation site, data available from different years indicated a successful cleanup of this diesel plume. The August 1999 data did not indicate any remaining detectable concentrations of BTEX or TPH in any of the subject remediation monitor wells; therefore, TNRCC Site Closure Status has been requested. Pump-and-treat operations are typically most effective in remediating hydrocarbon contamination in areas of high permeability.

1.8.3 Lower Open Channel Groundwater Chemistry

The Lower Open Channel portion is the southernmost segment located between Paisano Drive and the Rio Grande near the International Dam. The land slopes gently from Paisano Drive towards the Rio Grande (see Appendix C). A few commercial buildings and some apartments are located adjacent to the Lower Open Channel area.

Heavy Metals

Project limitations precluded obtaining groundwater samples for metals analyses at this study area. Except for rust and metal debris located on the Paisano Auto Salvage property, heavy metal contamination from current local businesses is not expected to be a concern. However, past on-site practices regarding stored metals are not known.

Hydrocarbons

In the Lower Open Channel portion of the study site, several past hydrocarbon releases have occurred. Analyses were available from releases at Bell Thunderbird, Paisano Auto Salvage, and at the International Dam.

The releases at the adjoining Paisano Auto Salvage and Bell Thunderbird were reported in 1992 and 1991, respectively. TNRCC closure status has apparently not been granted at either location, though monitors wells have not been sampled in several years, reportedly due to bankruptcies of the business owners. Groundwater samples from Paisano Auto Salvage monitor wells (MW1 to MW4) were analyzed in 1992 for BTEX and TPH. The highest BTEX concentration of 1148 ppm and TPH concentration of 104 ppm were detected at MW-2 and MW-3, respectively. For this study, it was not possible to sample the groundwater from the existing monitor wells in 1999 as several feet of scrap metal covered the subject facility.

Available 1997 field measurements for Bell Thunderbird Monitor Wells indicated a gasoline plume thickness of 0.82 feet at MW-1. While laboratory analyses data were not available from 1997, it can be assumed that with a plume nearly one foot thick, the BTEX concentration would be near the saturation concentration of over 1700 ppm. In the July 16, 1999 ENCON sampling event, laboratory analyses of groundwater from Bell Thunderbird Monitor Wells (MW-1, MW-5) indicated a significant decrease to 1.082 ppm. (see Summary below.) It should be noted that for liquids, a measurement of 1 mg/l is approximately equivalent to 1 ppm. It can be assumed that due to natural biodegradation, the hydrocarbon concentrations previously detected at this site have diminished significantly since the earlier sampling events.

1.8.4 Summaries of Hydrocarbon and Metal Concentrations in Groundwater in Three Open Channel Areas

SUMMARY OF RECENT HEAVY METAL MAXIMUM CONCENTRATIONS IN GROUNDWATER FROM MONITOR WELLS IN THREE OPEN CHANNEL AREAS

Contaminants	Upper Open Channel	Middle Open Channel	Lower Open Channel
As	11.0 mg/l	1.05 mg/l	Not available
Se	0.38 mg/l	3.7 mg/l	Not available
Pb	Below detection limit	Below detection limit	Not available
Cd	Below detection limit	0.042 mg/l	Not available

SUMMARY OF RECENT MAXIMUM HYDROCARBON MEASUREMENTS IN MONITOR WELLS IN THREE OPEN CHANNEL AREAS

Contaminants	Upper Open Channel	Middle Open Channel	Lower Open Channel
TPH	Below detection limit	Below detection limit	14 mg/l (Thunderbird)
BTEX	Below detection limit	Below detection limit	1.082 mg/l (Bell Thunderbird)
Diesel plume vertical thickness (in feet)	0.18 feet	Sheen Only	(Not applicable)
Gasoline plume vertical thickness (in feet)	(Not applicable)	(Not applicable)	None observed

2.0 SOILS AND SOIL CHEMISTRY

During the preparation of this document, a 1992 US Geological Survey report prepared for the USIBWC titled "Results of Simulations by a Preliminary Numerical Model of Land Subsidence in the El Paso, Texas Area" was reviewed. However, the purpose of the USGS report was modeling land subsidence that might occur upon replacing the existing earthen canal with a concrete canal in a different area of El Paso County. Differences in soil characteristics and final objectives, i.e., replacing existing concrete canal segments with new segments, restricted the usefulness of the numerical model.

2.1 Soil Types

The soil types in the study area were summarized from ASARCO cross-sections as four general groups. Permeabilities stated are typical for soils of this type and were not obtained for these specific area soils, which can vary widely from published norms.

Gravelly material: (gravelly silt, and silty, to sandy gravel)
This soil predominantly consists of coarse-grained material with lesser proportions of fine-grained material. This soil type, which is common around the arroyo fillings, has a very high permeability (typically 10^1 to 10^{-1} ft/min or 10^{-2} to 10^{-3} m/s).

Sandy material: (fine-grained to coarse-grained sand, silty sand, and clayey sand)
This soil is dominated by sand and has only minor portions of other materials. The permeability of this material is generally high (typically $10^{-1}$to 10^{-4} ft/min or 10^{-3} to 10^{-6} m/s).

Silty material: (sandy silt, clayey silt, and organic silt)
This soil is relatively dense due to the presence of fine-grained material. Therefore, the permeability of this soil material is generally low (typically 10^{-4} to 10^{-6} ft/min or 10^{-5} to 10^{-8} m/s).

Clayey material: (gravelly clay, sandy clay, and silty clay)
This soil is very dense due to the presence of a high amount of clay minerals, which also contributes to its very low permeability (typically 10^{-6} ft/min or less than 10^{-8}m/s). This type of clayey material generally forms a barrier to water percolation in an aquifer depending on the clay thickness and continuity.

2.2 Soil Chemistry

2.2.1 Upper Open Channel Soil Chemistry

It should be mentioned that this flood plain contains the site of the former Smeltertown which had to be relocated due to lead contamination in the soil. This contamination was caused by long-term air emissions from the ASARCO plant. The 1994 soil sample results from the USIBWC American Dam UST Facility site, which is located directly north of the former Smeltertown, showed very high lead concentrations (3200 mg/l) at the bottom of an excavation site. The source of the lead detected at the American Dam UST Facility is therefore likely related to the air emission concentrations. Other soil samples from 1994 analyzed for hydrocarbons showed BTEX concentrations in the soil of approximately 190 mg/kg. Soil samples taken in 1994 from MW-1A showed a fairly high soil contamination of hydrocarbons around the surface of the water table (6.2 mg/kg benzene, 136.8 mg/kg BTEX and 12,000 ppm TPH). Soil samples taken in 1998 indicated maximum benzene concentrations of up to 130 mg/kg (MW-2) at a distance of approximately 220 feet from the American Canal. Despite the TNRCC closure status of this USIBWC UST site, (probably granted as a result of the steadily decreasing hydrocarbon concentration in the water samples from the monitoring wells [see section 1.6.1]), the soil still might present elevated hydrocarbon concentrations in some locations. Fortunately, the locations with (1998) elevated hydrocarbon concentrations in the soil are some distance from the Canal and therefore, may not be of concern during reconstruction activities. It is possible that water-borne hydrocarbons which migrated towards the American Canal are now trapped in the soils adjacent to the concrete walls of the Canal.

Heavy Metals

Soil data were not available for the area of the ASARCO-owned portion of the Rio Grande flood plain near the facility. Only water samples were analyzed for heavy metals. The water samples from this area contained significant concentrations of arsenic and selenium. This may suggest that the vicinity soil also has elevated concentrations of arsenic and selenium. It may be that the groundwater carrying elevated concentrations of heavy metals is being stopped in its flow path towards the river by the concrete walls of the American Canal. Arsenic and selenium concentrations from the groundwater are likely to continue to become trapped in the fine sand and clay particles within the subsurface soil. The true extent of heavy metal contamination in the soil is not fully known.

Hydrocarbons

At the site of the ASARCO Diesel Plume #2, no soil samples were collected and analyzed for hydrocarbons, but it is likely that diesel may remain adhered to the soils within the area of the plume. It appears that the diesel plume at this site has not reached the soil immediately adjacent to the American Canal. But without additional soil samples from borings near the levee of the Canal, hydrocarbon migration to groundwater and soil near the Canal cannot be ruled out.

Soil to be excavated along the Upper Open Channel of American Canal might or might not contain elevated concentrations of both heavy metals and hydrocarbons.

2.2.2 Middle Open Channel Soil Chemistry

The discussion related to heavy metals and hydrocarbons in the Upper Open Channel is also valid for the Middle Open Channel area. However, TNRCC Closure status has been requested for ASARCO's Diesel Plume #1 because hydrocarbon concentrations have been reduced to non-detection levels.

2.2.3 Lower Open Channel Soil Chemistry

Soil analyses were available from Bell Thunderbird, but not from Paisano Auto Salvage or the International Dam UST. Using a geoprobe, ENCON International obtained soil samples on July 16, 1999, from the narrow eastern levee of the American Canal (see results in Appendix L.14). The soil samples were analyzed for both hydrocarbons and heavy metals. The heavy metals laboratory results indicated that only lead showed slightly elevated values, which should not present a contamination hazard due to its relatively immobile chemical behavior in soil.

3.0 CONTAMINATION POTENTIAL AND CONCLUSIONS

The contamination potentials for the three Open Channel areas concerning groundwater and soils are assessed separately. The evaluation of the available data for groundwater and soil is summarized in the tables that follow.

Upper Open Channel: This segment of the construction site is located close to several potential contaminants in groundwater and soil. The highest arsenic concentrations and other hydrocarbon contaminants in the segment were detected close to the Canal reconstruction site.

Middle Open Channel: This segment of the site has a high selenium contamination potential in ground water and soil. The highest selenium concentrations for the whole project area were found close to the Middle Open Channel portion of this Canal. Additionally, it is possible that hydrocarbons are still of local concern for both soil and groundwater, despite the documented satisfactory cleanup results.

Lower Open Channel: In this segment of the study area, the concern includes possible hydrocarbon contaminants in both groundwater and soil. There is no conclusive proof that the hydrocarbon contaminants have completely degraded or migrated offsite. Heavy metals are not likely in either soil or water in this area.

GROUNDWATER CONTAMINATION POTENTIAL IN OPEN CHANNEL AREAS

Contaminant	Risk		
	Upper Open Channel	**Middle Open Channel**	**Lower Open Channel**
Heavy metals			
As	Medium	Low	Unknown
Se	Low	High	Unknown
Cd	Low	Medium	Unknown
Pb	Low	Unlikely	Low
Hydrocarbons			
Diesel	High	Low	Low
Gasoline	Unlikely	Unlikely	Medium

SOIL CONTAMINATION POTENTIAL IN OPEN CHANNEL AREAS

Contaminant	Risk		
	Upper Open Channel	**Middle Open Channel**	**Lower Open Channel**
Heavy metals			
As	Low	Low	Low
Se	Unlikely	Low	Low
Cd	Unlikely	Low	Low
Pb	Unlikely	Low	Low
Hydrocarbons			
Diesel	Medium	Medium	Medium
Gasoline	Unlikely	Unlikely	Low

In Summary, there is a possibility of localized hydrocarbon or heavy metal contamination of groundwater or soil in all three Open Channel areas. These contaminants could be encountered during construction activities and could also contaminate water in the existing Canal through infiltration through cracks.

4.0 WATER AND SOIL EFFECTS OF FIVE ALTERNATIVES

The planned reconstruction activities would be completed within the October through February season when water is not used for water treatment or for irrigation. None of the construction alternatives is likely to have any serious long-term effects on the water quality of the Rio Grande. During planned reconstruction activities, water pumped and soil excavated can be sampled and tested regularly. The previously described 15-20 gpm pump-and-treat operation at ASARCO is available to treat any hydrocarbon-contaminated water encountered in the areas of the two ASARCO diesel plumes. ASARCO's lined pond will be available to store and evaporate any water with high concentrations of heavy metals in areas of previous ASARCO-related metal concentrations. Discharge of high-TDS water can be authorized during nonirrigation season only. Water with high TDS is not usable for either irrigation or potable water.

EFFECTS TO CANAL WATER QUALITY FROM FIVE AMERICAN CANAL REPLACEMENT ALTERNATIVES

Alternatives→ **Effects↓**	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 5**
Is there a long-term risk of heavy metal contamination of canal water via adjacent groundwater or soil?	No	No	No	No	Yes
Is there a long-term risk of hydrocarbon contamination of canal water via adjacent groundwater or soil?	No	No	No	No	Yes
During planned reconstruction during non-irrigation season or emergency rebuilding (likely during irrigation season), will high-TDS groundwater need treatment before discharge into the river?	No	No	No	No	Yes
During planned reconstruction or emergency rebuilding, will ASARCO facilities be available for treating or storing contaminated groundwater from Upper and Middle Open Channel segments?	Yes	Yes	Yes	Yes	No

During peak irrigation and water production seasons, an emergency canal shutdown and repair caused by possible contaminated groundwater entering the undersized and deteriorating canal would drastically disrupt the lives of all El Pasoans. Therefore, the lost daily EPWU–PSB Drinking Water Production was chosen as the indicator to this resource.

During planned dewatering activities, EPCWID #1 can request BOR to release stored water to minimize the possibility of exceeding CWA Section 401 requirements for discharging high TDS waters into live streams. During unplanned emergency dewatering activities, water from Caballo Dam, which takes three days to flow to the American Canal head gates, might not arrive in time to assist with CWA Section 401 compliance.

During planned dewatering activities, the TDS concentration can be estimated in the field during construction by measuring specific conductivity (EC). Extremely high TDS - water can be pumped to ASARCO's massive lined oxidation pond eliminating the need for CWA compliance certification.

EFFECTS TO WATER AND SOIL RESOURCES OF FIVE AMERICAN CANAL RECONSTRUCTION ALTERNATIVES

Alternatives→ Effects↓	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Maximum water delivery capacity (cfs)	1535	1535	1535	1535	1200*
Storm water capture capacity for peak irrigation day without Mexican allotment (cfs)	335	335	335	335	0
Expected # of major canal failures during peak irrigation season (requiring 1 month closure for emergency repairs) within the next 5 years	0	0	0	0	1
Direct financial loss to EPCWID#1 farmers during 1-month disruption of service & canal repair	$0	$0	$0	$0	$20 Million
"Ripple effect" loss to El Paso economy during 1-month disruption of service & canal repair	$0	$0	$0	$0	$300 Million
Estimated number of bankruptcies among farmers due to farm losses from 1-month disruption of service & canal repair	0	0	0	0	500
Loss of daily drinking water production by 2 EPWU-PSB Board plants during 1-month disruption of service & canal repair	0	0	0	0	80 -120 MGD
Lost Revenue to EPWU-PSB during 1-month disruption of service & canal repair	0	0	0	0	$3.6 - $5.4 Million
Additional EPCWID#1 costs during disruption of service & canal repair, not including possible lawsuits	$0	$0	$0	$0	$1 Million
Additional tax levied on EPCWID#1 customers to pay for canal failure & repair (per acre)	0	0	0	0	$15
Is there a long-term risk of heavy metal or hydrocarbon contamination of canal water via adjacent groundwater or soil?	No	No	No	No	Yes
During planned reconstruction or emergency rebuilding, will high-TDS groundwater need treatment before discharge into the river?	No	No	No	No	Possibly
During planned reconstruction or emergency rebuilding, will ASARCO facilities be available for treating or storing contaminated groundwater for Upper and Middle Open Channel segments?	Yes	Yes	Yes	Yes	No

** It is unknown if this maximum water delivery can be sustained without risking damage to the Canal or "locking up" of the Canal. The sustained water delivery capacity actually may be much lower.

5.0 MITIGATIONS

- Beginning canal reconstruction at the upper portion of each channel segment would minimize the inflow of any contaminated groundwater in that section.
- During soil excavation activities, soil and air should be monitored regularly for volatile hydrocarbons and heavy metals.
- During dewatering activities, groundwater should be field-tested regularly for specific conductivity to check for relative TDS values in water to be discharged.
- During dewatering activities, if groundwater samples have a hydrocarbon odor or sheen, they should be diverted to an oil-water separator and pretreated prior to discharge into the river or possibly into the ASARCO stormwater pond.
- To further protect the Canal from infiltration, an impermeable liner and/or clay fill should be placed prior to the construction of new canal segments.
- The Stormwater Pollution Prevention Plan will include "Best Management Practices" such as hay bales, silt fences, or other similar erosion prevention techniques, as requested by the Texas Parks and Wildlife Department.

6.0 RECOMMENDATIONS

Even in the arid El Paso climate, any reconstruction alternatives could include working during times of rainfall. Therefore, a construction Stormwater Pollution Prevention Plan (SWP3) must be prepared and submitted to the City of El Paso. A Texas Pollutant Discharge Elimination Permit (TPDES) must be requested from EPA prior to submitting the SWP3. As the area has no wetlands, a dredging permit from the US Army Corps of Engineers (per CWA 404) is not expected to be required. See letter from Corps of Engineers at Appendix G.

7.0 SOURCES OF INFORMATION FOUND IN THIS SECTION

Data and maps used for this study were made available by TNRCC and by the following companies and institutions:

ASARCO, 2699 West Paisano Drive, (east of Paisano)

- Chemical analyses of groundwater samples for the years 1997 to 1999, for hydrocarbons (groundwater) and for heavy metals,
- Groundwater elevations between February 1997 and February 1999,
- One geological cross-section, and boring logs of several monitor wells in Upper Open Channel and Middle Open Channel.

Bell Thunderbird, 2000 West Paisano Drive, (west of Paisano)

- Chemical analyses of groundwater samples for hydrocarbons (1997-1999) and for heavy metals (calculated average for the quarterly samples taken between August 1997 and May 1998),
- Groundwater elevations for August 1992 and January 1997,
- Boring log for monitor well MW-1.

Paisano Auto Salvage, 1908 West Paisano Drive (west of Paisano)

- Chemical analyses of 1992 groundwater sample for hydrocarbons,
- Ground water elevations for 1992.

USIBWC, American Dam UST Facility, 2616 Paisano Drive (west of Paisano)

- Chemical analyses for 1994 to 1998,(groundwater, and soil samples for hydrocarbons) and soil samples for hydrocarbons for heavy metals,
- Boring log for monitor well MW-1A.

USIBWC, International Dam UST Facility (West of Paisano)

Groundwater elevations (year unknown).

El Paso County Water Improvement District #1 (EPCWID #1)

Chemical analyses of Rio Grande water samples from Elephant Butte Reservoir to Tornillo Drain for September 1998 to April 1999.

El Paso Water Utilities-Public Service Board (EPWU-PSB)

Chemical analyses of Rio Grande water samples at the Courchesne Bridge (1936-1997) and at the Canal Street Water Plant (1986-1999).

ENCON International, Inc.

- Chemical analyses of groundwater samples from Bell Thunderbird.
- Chemical Analyses of soil samples from geoprobe samples for heavy metals.
- Geoprobe soil logs GP-1 to GP-6.
- Bell Thunderbird monitor wells MW-1, MW-6 (1999).

L.2 – RIO GRANDE WATER QUALITY

Summary Water Quality Data from Caballo Dam to American Dam

(Source: EPCWID #1)

SUMMARY OF WATER QUALITY DATA
FROM CABALLO DAM TO AMERICAN DAM
(Source: El Paso County Water Improvement District #1)

Sample Location	Date	Field Tests		Laboratory Analytical Results									
		Temp	EC	TDS	pH	Na	Ca	Mg	SAR	Cl	SO_4	NO_3	PO_4
		°C	µohm/cm^2	mg/L		mg/L	mg/L	mg/L	ratio	mg/L	mg/L	mg/L	mg/L
Caballo Cable (Downstream from Caballo Dam where water is stored)	Oct-98	18.0	623	410	8.30	65.6	46.4	10.1	2.20	47.5	111	1.24	<MDL
	Nov-98	unavailable	unavailable	460	8.08	70.3	49.9	11.8	2.32	58.8	111	2.10	<MDL
	Dec-98	14.4	889	504	7.95	104	51.6	10.5	3.44	61.2	108	2.46	<MDL
	Jan-99	4.9	1220	709	7.92	166	53.6	16.8	5.05	61.2	108	2.46	<MDL
	Feb-99	7.4	850	482	8.24	80.4	17.3	<MDL	unavailable	107	121	3.29	<MDL
	Mar-99	11.6	815	506	8.29	89.5	28.6	12.9	3.48	90.9	120	1.56	<MDL
American Dam (Head gates of American Canal)	Oct-98	27.9	2070	767	8.23	139	75.1	16.9	3.75	124	227	1.45	<MDL
	Nov-98	unavailable	unavailable	1173	8.17	216	98.9	21.4	5.12	175	331	12.1	<MDL
	Dec-98	16.9	1970	1244	8.29	293	108	23.7	6.63	194	342	11.7	1.30
	Jan-99	12.5	2090	1263	8.11	293	95.6	23.4	6.94	250	399	14.4	1.13
	Feb-99	9.4	1170	641	7.97	131	26.4	<MDL	unavailable	145	216	7.84	1.49
	Mar-99	15.6	1093	749	814	134	35.4	15.2	4.73	138	195	4.70	0.985

<MDL = Below Lab Detection Limit

L.3 – CANAL FLOW AND INFLUENT WATER QUALITY

- **Selected Rio Grande Water Quality Data Collected from Courchesne Bridge (1936-1997)**

  (Source: EPWU - PSB)

- **Diversion from the Rio Grande into American Canal at El Paso, Texas**

  (Source: USIBWC)

SELECTED RIO GRANDE WATER QUALITY DATA COLLECTED FROM COURCHESNE BRIDGE (1936 - 1996)
(Source: EPWU- PSB)

Date	SiO_2 mg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	HCO_3 mg/l	CO_3 mg/l	SO_4 mg/l	Cl mg/l	F mg/l	NO_3 mg/l	PO_4 mg/l	Rept TDS mg/l	Hard mg/l	Sp. Cond.	pH	Calc TDS mg/l
Jan-36	***	130	31	303	***	301	Tr	418	307	***	Tr	***	1412	453	2140	8.3	1490
Feb-36	***	132	26	243	***	270	Tr	382	243	***	4.3	***	1236	437	1840	8.1	1300
Mar-36	***	100	20	163	***	218	0	297	145	***	3.1	***	978	333	1360	7.7	946
Apr-36	***	99	21	154	***	206	0	312	125	***	3.1	***	853	333	1300	7.6	920
May-36	***	97	20	142	***	203	Tr	289	126	***	4.3	***	853	323	1270	8.0	881
Jun-36	***	94	21	139	***	202	0	281	108	***	4.3	***	758	322	1230	7.9	849
Jul-36	***	93	18	139	***	208	0	270	115	***	3.1	***	816	307	1200	7.6	846
Aug-36	***	89	19	132	***	199	0	260	112	***	4.3	***	677	300	1100	7.9	815
Sep-36	***	96	20	154	***	223	Tr	246	152	***	1.2	***	816	322	1280	8.1	892
Oct-36	***	125	24	246	***	274	0	368	242	***	1.9	***	1118	412	1830	7.6	1281
Nov-36	***	126	29	268	***	289	Tr	400	275	***	1.2	***	1317	435	2000	7.9	1388
Dec-36	***	127	32	254	***	287	0	396	256	***	3.1	***	1265	447	1870	7.8	1355
Jan-56	***	154	38	788	***	329	0	958	706	***	<0.6	***	2891	539	4250	8.1	2973
Feb-56	***	166	47	877	***	323	0	1067	806	***	0.6	***	3178	607	4700	8.2	3287
Mar-56	***	130	27	191	***	195	0	446	169	***	1.2	***	1133	437	1630	8.0	1159
Apr-56	***	114	26	168	***	199	0	403	126	***	<0.6	***	993	390	1430	8.1	1036
May-56	***	124	28	307	***	214	0	528	263	***	0.6	***	1405	426	2090	8.0	1465
Jun-56	***	106	24	173	***	192	0	375	143	***	0.6	***	964	364	1430	8.0	1014
Jul-56	***	92	23	168	***	187	0	339	137	***	0.6	***	927	325	1350	8.1	947
Aug-56	***	99	21	204	***	201	0	357	172	***	0.6	***	1008	334	1530	7.9	1055
Sep-56	***	94	23	205	***	195	0	368	176	***	<0.6	***	1015	331	1530	7.8	1061
Oct-56	***	165	37	861	***	262	0	1104	770	***	0.6	***	3199	563	4580	8.0	3200
Nov-56	***	168	38	858	***	274	0	1102	769	***	<0.6	***	3163	574	4610	8.2	3209
Dec-56	***	168	40	787	***	302	Tr	999	726	***	<0.6	***	2986	585	4400	8.5	3022

***Not Tested

SELECTED RIO GRANDE WATER QUALITY DATA COLLECTED FROM COURCHESNE BRIDGE (1936 - 1996)

(Source: EPWU- PSB)

Date	SiO_2 mg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	HCO_3 mg/l	CO_3 mg/l	SO_4 mg/l	Cl mg/l	F mg/l	NO_3 mg/l	PO_4 mg/l	Rept TDS mg/l	Hard mg/l	Sp. Cond.	pH	Calc TDS mg/l
Jan-76	***	100	22	200	***	252	0	340	180	***	1.9	***	1037	340	1650	8.0	1096
Feb-76	***	100	21	180	***	262	0	320	150	***	0.6	***	986	336	1450	7.9	1034
Mar-76	***	82	16	120	***	212	0	210	100	***	1.2	***	684	271	1040	7.5	741
Apr-76	***	80	15	110	***	200	0	220	84	***	***	***	662	261	1010	7.7	709
May-76	***	76	15	100	***	204	0	200	74	***	0.6	***	588	251	961	7.7	670
Jun-76	***	81	16	120	***	218	0	230	85	***	0.6	***	662	268	1040	7.8	751
Jul-76	***	86	17	130	***	224	0	240	96	***	0.6	***	728	285	1110	8.0	794
Aug-76	***	83	16	120	***	224	0	220	89	***	1.2	***	691	273	1060	8.0	753
Sep-76	***	96	20	170	***	250	0	300	130	***	1.9	***	919	322	1370	8.1	968
Oct-76	***	120	31	290	***	290	0	490	240	***	1.2	***	1353	427	2060	8.2	1462
Nov-76	***	120	32	300	***	270	0	500	270	***	1.2	***	1471	431	2160	8.1	1493
Dec-76	***	130	32	340	***	300	0	530	270	***	1.2	***	1530	456	2260	8.0	1603
Jan-96	15	73	18	160	8.3	228	0	260	150	0.6	3.9	0.52	828	260	1310	8.3	902
Feb-96	12	66	17	130	7.1	197	9.0	200	120	0.7	2.1	0.46	698	230	1110	8.2	749
Mar-96	11	56	13	95	5.8	196	0	160	79	0.7	1.4	0.09	557	190	878	8.3	607
Apr-96	11	65	15	110	5.2	220	0	190	95	0.7	1.0	0.06	624	220	1020	8.2	702
May-96	12	62	14	120	6.8	198	7.0	200	95	0.6	***	***	***	210	1060	8.4	703
Jun-96	12	49	11	86	6.3	155	0	150	66	0.6	1.6	0.09	498	170	801	7.9	526
Jul-96	17	60	14	110	7.1	195	4.0	190	89	0.7	0.8	0.64	627	210	1000	8.3	671
Aug-96	16	57	13	100	7.4	181	0	180	85	0.6	2.0	1.53	588	200	963	8.0	626
Sep-96	18	72	17	150	7.5	217	4.0	240	120	0.7	1.4	0.58	766	250	1220	8.4	830
Oct-96	24	110	27	270	9.4	189	***	440	260	0.7	3.7	0.18	1330	390	2000	8.6	1310
Nov-96	24	140	32	400	12	321	0	540	400	0.8	4.9	0.43	1740	480	2660	8.3	1851
Dec-96	22	140	31	410	11	299	8.0	570	430	0.7	3.9	0.43	1870	480	2810	8.5	1904

***Not Tested

Diversions from the Rio Grande into American Canal at El Paso, Texas
(Source: USIBWC)

Mean Daily Discharge in Cubic Feet per Second 1995

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	118.7	249.4	261.0	706.4	854.7	649.9	1084.3	946.6	928.9	755.8	385.0	3.2
2	114.8	252.9	222.2	653.4	914.8	1063.1	1140.8	953.6	907.7	794.7	337.3	3.2
3	103.1	246.2	406.2	586.3	897.1	1155.0	1109.0	1102.0	950.1	755.8	306.6	3.2
4	121.9	229.2	445.0	547.5	851.2	1151.4	1155.0	1218.5	1133.8	724.1	290.0	2.8
5	133.9	225.0	476.8	579.2	812.4	1094.9	1119.6	1027.8	1140.8	657.0	285.4	2.8
6	151.9	215.8	522.7	540.4	798.2	1006.6	1006.6	1130.2	1109.0	628.7	301.3	2.8
7	155.1	198.9	533.3	466.2	865.3	883.0	1070.2	1162.0	996.0	614.6	286.1	2.5
8	142.0	217.6	543.9	501.5	808.8	907.7	1087.9	1109.0	900.7	653.4	275.8	2.5
9	161.4	272.0	632.2	533.3	734.7	1006.6	1098.5	1041.9	890.1	657.0	255.0	2.5
10	156.5	367.3	586.3	434.4	706.4	1031.3	1091.4	943.0	826.5	642.8	241.9	2.5
11	143.8	250.4	561.6	406.2	727.6	1045.5	1013.7	914.8	1102.0	596.9	237.4	2.5
12	139.2	226.0	702.9	392.1	755.8	1059.6	1027.8	886.5	1147.9	621.6	227.8	2.5
13	132.1	226.8	826.5	416.8	706.4	964.2	978.4	1158.5	1112.6	646.4	220.0	2.5
14	129.3	192.8	844.1	547.5	653.4	879.5	999.6	1218.5	1063.1	649.9	219.0	2.5
15	128.6	232.4	784.1	547.5	688.7	865.3	1073.7	1169.1	1063.1	681.7	206.6	2.5
16	131.4	395.6	883.0	600.4	762.9	918.3	1080.8	1176.2	1126.7	720.5	197.4	2.5
17	120.4	356.7	897.1	671.1	727.6	974.8	1094.9	1155.0	1109.0	702.9	195.7	2.5
18	116.9	254.0	904.2	667.5	911.3	999.6	1073.7	1183.2	978.4	731.1	193.6	2.5
19	113.4	225.0	875.9	625.2	1063.1	1013.7	1017.2	1190.3	974.8	734.7	192.1	2.5
20	118.0	251.5	883.0	586.3	1094.9	1013.7	1010.2	1147.9	911.3	766.4	195.0	2.5
21	285.0	328.5	943.0	717.0	1119.6	950.1	1066.7	1119.6	851.2	893.6	186.1	2.5
22	317.2	278.0	996.0	695.8	1080.8	830.0	1070.2	1070.2	791.2	921.9	185.8	2.5
23	329.5	251.1	1006.6	717.0	1024.3	914.8	1063.1	978.4	805.3	879.5	186.5	2.5
24	334.5	226.0	981.9	695.8	904.2	1017.2	1073.7	967.8	812.4	794.7	140.9	2.5
25	340.8	241.6	967.8	681.7	858.3	1020.7	1087.9	932.4	791.2	773.5	120.1	2.5
26	363.8	219.7	900.7	642.8	883.0	1010.2	1041.9	946.6	713.5	770.0	182.3	2.5
27	406.2	262.4	865.3	589.8	893.6	928.9	1003.1	1024.3	664.0	766.4	182.3	2.5
28	367.3	254.7	858.3	515.7	883.0	865.3	1003.1	1155.0	625.2	755.8	173.1	2.5
29	356.7	N/A	890.1	614.6	939.5	943.0	981.9	1105.5	646.4	561.6	57.9	2.5
30	300.6	N/A	770.0	664.0	851.2	953.6	989.0	1066.7	801.8	487.4	3.2	2.5
31	266.7	N/A	695.8	N/A	720.5	N/A	996.0	978.4	N/A	413.2	N/A	2.5

N/A = Not Available

Note: Original USIBWC Metric Data converted at 1 cms = 35.32 cfs

L.4 – APPROXIMATION OF CANAL EFFLUENT WATER QUALITY

Robertson & Umbenhauer "Canal Street Water Treatment Plant

Selected Influent Water Quality Data (Oct-Mar, 1991-1999)

(Source: EPWU - PSB)

APPROXIMATION OF CANAL EFFLUENT WATER QUALITY

Robertson & Umbeuhauer ("Canal Street") Water Treatment Plant Influent Data
(Selected Dates October - May, 1991 - 1999)
(Source: EPWU- PSB)

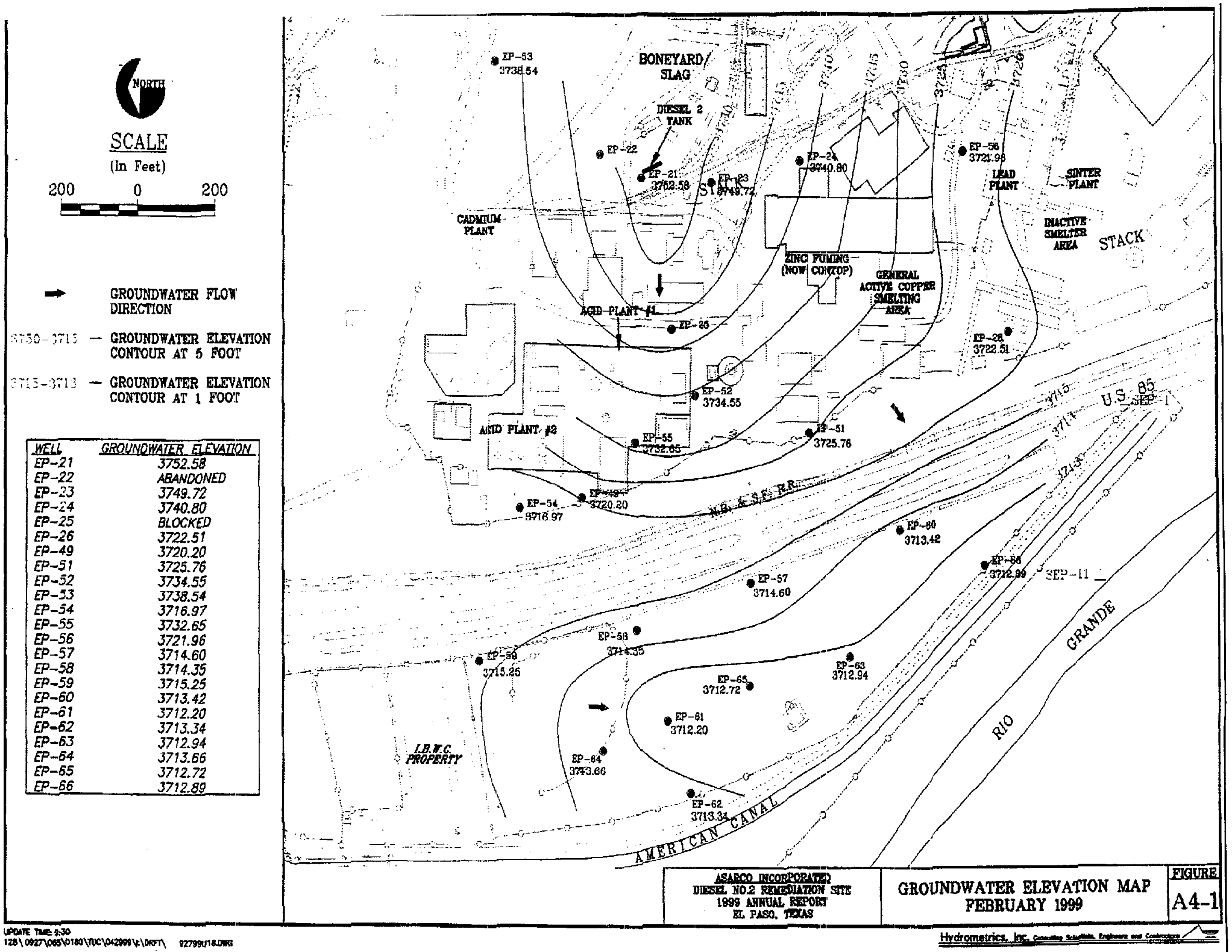
Date	SiO_2 mg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	HCO_3 mg/l	CO_3 mg/l	SO_4 mg/l	Cl mg/l	F mg/l	NO_3 mg/l	PO_4 mg/l	Rept TDS mg/l	Hard mg/l	Sp. Cond.	pH
Mar-91	***	79	10	156	***	223	4.9	231	102	***	***	***	***	238	***	8.42
Nov-91	28	124	28	273	11	281	19	420	228	0.9	4.2	0.1	1247	428	1950	8.38
Mar-92	11	68	13	132	7.0	178	12	218	95	0.8	1.5	<0.09	635	224	1093	8.43
Oct-92	15	104	21	191	8.2	255	16	298	150	1.3	3.0	0.1	917	344	1440	8.71
Feb-93	15	90	17	180	7.9	229	2.4	246	180	0.7	2.9	0.1	840	296	1290	8.40
Mar-93	13	65	13	119	6.1	181	4.8	179	100	0.6	1.3	0.1	578	216	930	8.44
Oct-93	17	89	19	181	8.3	239	7.2	288	140	0.7	3.4	0.1	854	300	1340	8.50
Nov-93	28	118	24	254	11	276	6.0	404	215	0.7	3.7	0.1	1171	392	1720	8.50
Dec-93	25	121	27	269	10	290	7.2	411	230	1.1	4.2	0.1	1224	414	1770	8.50
Feb-94	10	71	14	130	7.3	181	3.6	197	115	0.7	1.9	<0.09	629	236	1020	8.43
Mar-94	6.0	63	12	118	6.0	176	1.2	166	100	0.6	1.5	0.2	554	204	875	8.30
Oct-94	15	71	12	123	8.1	173	2.4	197	110	0.6	3.1	<0.09	613	230	1110	8.37
Nov-94	20	122	22	232	9.9	290	2.4	374	200	0.7	4.0	0.1	1109	394	1720	8.42
Dec-94	27	126	25	286	11	295	3.6	444	238	0.8	4.7	0.1	1284	418	1915	8.37
Jan-95	18	127	24	315	10	290	4.8	504	250	0.9	5.7	0.1	1384	416	2080	8.33
Mar-95	8.0	65	11	100	5.5	176	2.4	145	85	0.6	1.0	<0.09	501	206	852	8.41
Sep-95	15	81	16	157	6.6	210	7.2	238	125	0.6	1.9	<0.09	736	268	1150	8.43
Nov-95	21	120	25	268	6.7	300	2.4	397	230	0.7	5.2	0.1	1203	404	1860	8.42
Jan-96	14	80	18	162	5.6	210	4.8	238	145	0.7	4.4	0.1	762	276	1170	8.36
Feb-96	12	72	16	138	5.9	200	3.6	196	120	0.7	4.1	0.1	655	246	1040	8.39
Mar-96	12	65	12	109	6.0	188	3.6	155	93	0.6	1.6	<0.09	539	214	860	8.32
Feb-97	17	79	17	162	8.2	202	7.2	206	165	0.8	3.4	0.1	748	268	1270	8.43
Mar-97	15	65	12	107	6.3	183	2.4	141	103	0.7	1.6	0.1	529	212	914	8.33
Mar-98	12	71	11	126	7.0	200	3.6	177	99	0.68	7.2	0.08	601	222	980	8.48
Oct-98	12	71	16	140	7.1	212	3.6	230	110	0.66	4.5	0.09	690	240	1100	8.44
Mar-99	11	63	13	109	7.2	190	2.4	170	87	0.7	43	0.18	550	210	910	8.40

***Not Tested

L.5 – GROUNDWATER ELEVATION MAPS

American Canal Area 1997-1999

(Source: ASARCO)



➡ GROUNDWATER FLOW DIRECTION

3750-3715 — GROUNDWATER ELEVATION CONTOUR AT 5 FOOT

3715-3713 — GROUNDWATER ELEVATION CONTOUR AT 1 FOOT

WELL	GROUNDWATER ELEVATION
EP-21	3752.58
EP-22	ABANDONED
EP-23	3749.72
EP-24	3740.80
EP-25	BLOCKED
EP-26	3722.51
EP-49	3720.20
EP-51	3725.76
EP-52	3734.55
EP-53	3738.54
EP-54	3716.97
EP-55	3732.65
EP-56	3721.96
EP-57	3714.60
EP-58	3714.35
EP-59	3715.25
EP-60	3713.42
EP-61	3712.20
EP-62	3713.34
EP-63	3712.94
EP-64	3713.66
EP-65	3712.72
EP-66	3712.89

ASARCO INCORPORATED
DIESEL NO.2 REMEDIATION SITE
1999 ANNUAL REPORT
EL PASO, TEXAS

GROUNDWATER ELEVATION MAP
FEBRUARY 1999

FIGURE
A4-1

UPDATE TIME: 9:30
128\0927\065\0180\TUC\042999\E\DRFT\ 92799U18.DWG

Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors

NORTH

SCALE
(In Feet)
200 0 200
(Approximate Only)

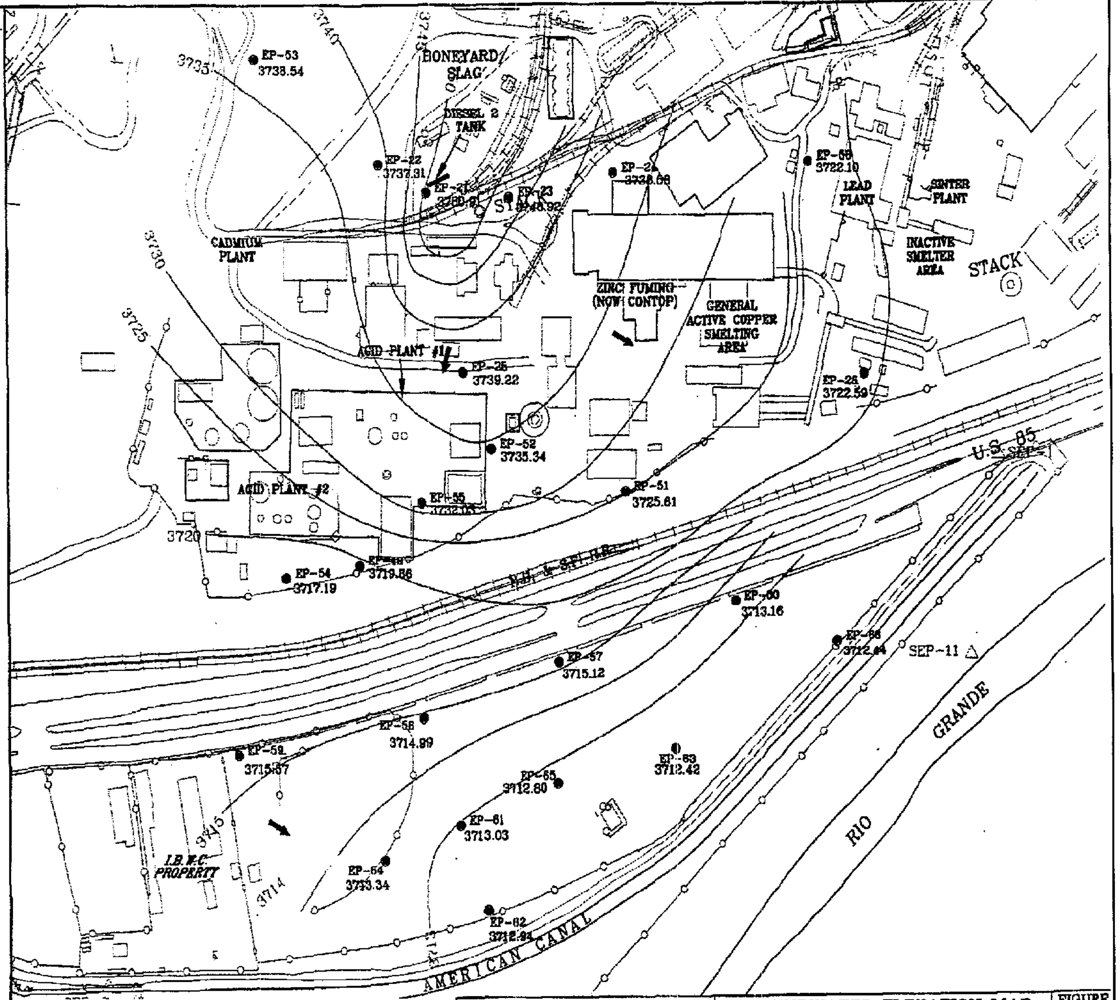
CONTOUR INTERVALS

GROUNDWATER FLOW DIRECTION

3750-3715 GROUNDWATER ELEVATION CONTOUR AT 5 FOOT

3715-3713 GROUNDWATER ELEVATION CONTOUR AT 1 FOOT

WELL	GROUNDWATER ELEVATION
EP-21	3750.91
EP-22	3737.31
EP-23	3748.92
EP-24	3738.58
EP-25	3739.22
EP-26	3722.59
EP-49	3719.86
EP-51	3725.61
EP-52	3735.34
EP-53	3738.54
EP-54	3717.19
EP-55	3732.03
EP-56	3722.10
EP-57	3715.12
EP-58	3714.99
EP-59	3715.57
EP-60	3713.16
EP-61	3713.03
EP-62	3712.94
EP-63	3712.42
EP-64	3713.34
EP-65	3712.80
EP-66	3712.44



ASARCO INCORPORATED
EL PASO PLANT DIESEL NO.2
REMEDIATION SITE
EL PASO, TEXAS

GROUNDWATER ELEVATION MAP
DIESEL NO.2
NOVEMBER 1998

FIGURE

Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors

UPDATE TIME: 9:30
128\0927\086\0180\TUC\010699\c\DRFT\ 92799U02.DWG

NORTH

SCALE
(In Feet)
200 0 200
(Approximate Only)

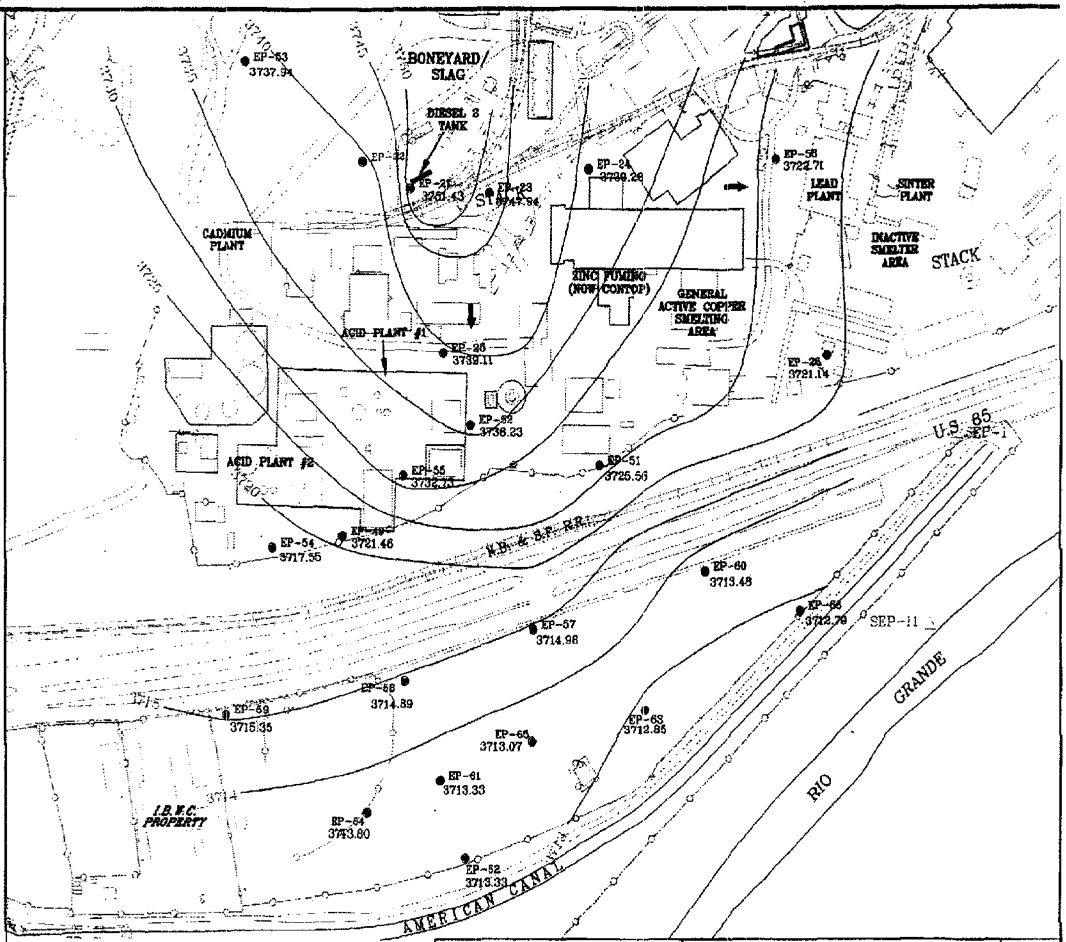
CONTOUR INTERVALS

GROUNDWATER FLOW DIRECTION

3750-3715 GROUNDWATER ELEVATION CONTOUR AT 5 FOOT

3715-3713 GROUNDWATER ELEVATION CONTOUR AT 1 FOOT

WELL	GROUNDWATER ELEVATION
EP-21	3751.43
EP-22	
EP-23	3747.94
EP-24	3739.28
EP-25	3739.11
EP-26	3721.14
EP-49	3721.46
EP-51	3725.56
EP-52	3736.23
EP-53	3737.94
EP-54	3717.55
EP-55	3732.73
EP-56	3722.71
EP-57	3714.98
EP-58	3714.89
EP-59	3715.35
EP-60	3713.48
EP-61	3713.33
EP-62	3713.33
EP-63	3712.85
EP-64	3713.80
EP-65	3713.07
EP-66	3712.79



ASARCO INCORPORATED
EL PASO PLANT DIESEL NO.2
REMEDIATION SITE
EL PASO, TEXAS

GROUNDWATER ELEVATION MAP
DIESEL NO.2
AUGUST 1998

FIGURE

Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors

UPDATE TIME 9:30
128\0715\085\0160\TUC\1211239E\DRFT\ 71598UAO.DWG

NORTH

SCALE
(in Feet)
200 0 200
(Approximate Only)

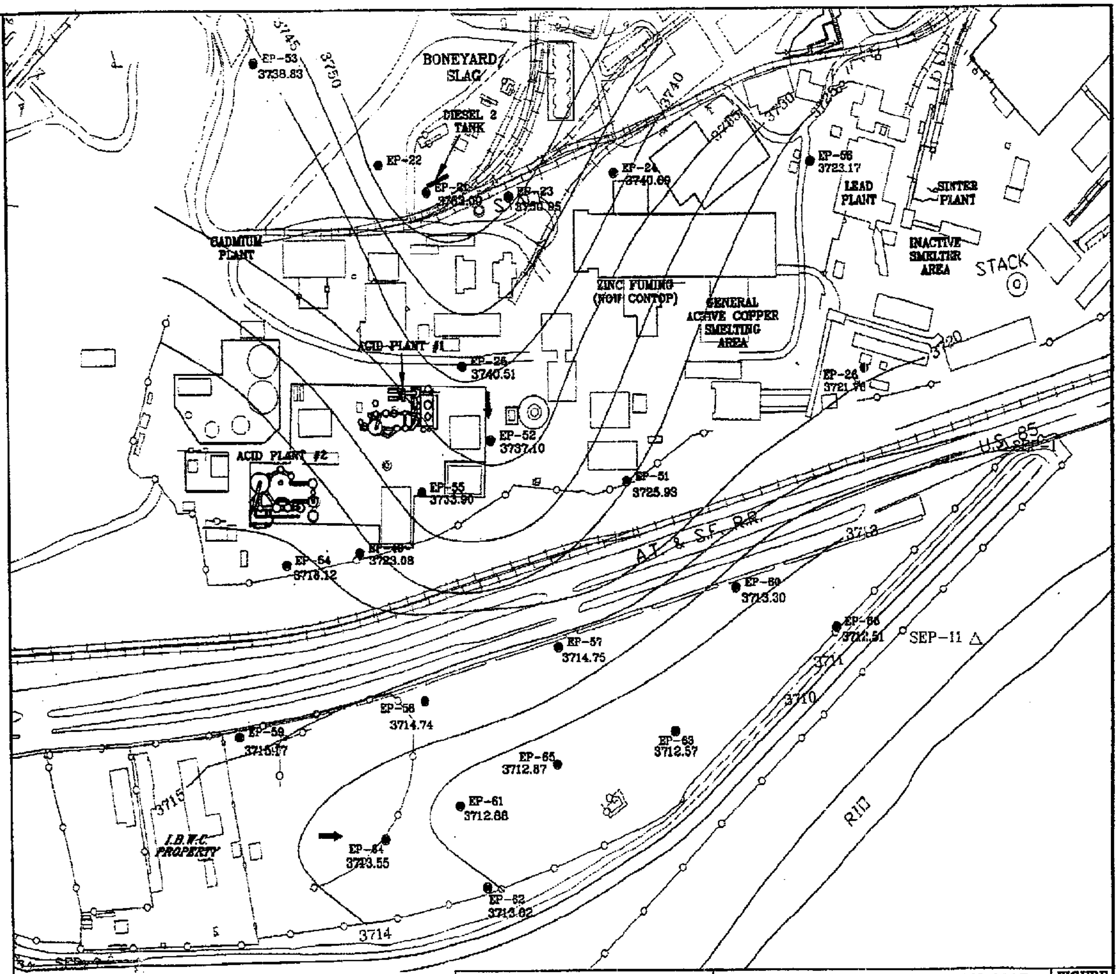
CONTOUR INTERVALS

→ GROUNDWATER FLOW DIRECTION

3750-3715 — GROUNDWATER ELEVATION CONTOUR AT 5 FOOT

3715-3713 — GROUNDWATER ELEVATION CONTOUR AT 1 FOOT

WELL	GROUNDWATER ELEVATION
EP-21	3735.00
EP-22	
EP-23	3750.95
EP-24	3740.69
EP-25	3740.51
EP-26	3721.78
EP-49	3723.08
EP-51	3725.93
EP-52	3737.10
EP-53	3738.83
EP-54	3718.12
EP-55	3733.90
EP-56	3723.17
EP-57	3714.75
EP-58	3714.74
EP-59	3715.17
EP-60	3713.30
EP-61	3712.88
EP-62	3713.02
EP-63	3712.57
EP-64	3713.55
EP-65	3712.87
EP-66	3712.51



ASARCO INCORPORATED
EL PASO PLANT DIESEL NO.2
REMEDIATION SITE
EL PASO, TEXAS

GROUNDWATER ELEVATION MAP
DIESEL NO.2
MAY 1998

FIGURE

Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors

PLOT TIME: 9:30
23\0715\065\0180\TUC\081088\E\DRFT\ 7159BU12.DWG

NORTH

SCALE
(In Feet)
200 0 200
(Approximate Only)

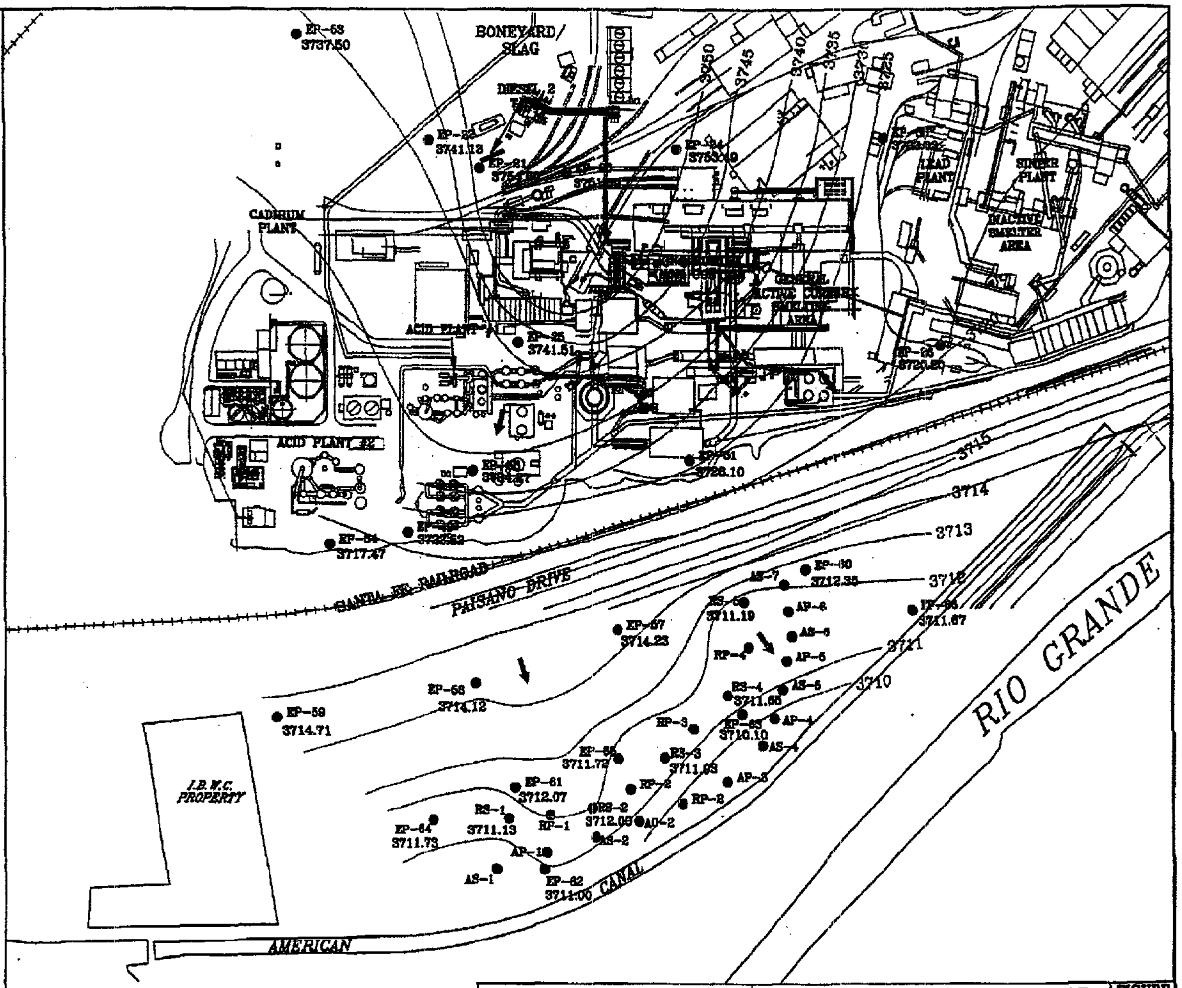
CONTOUR INTERVALS

→ GROUNDWATER FLOW DIRECTION

3750-3715 — GROUNDWATER ELEVATION CONTOUR AT 5 FOOT

3715-3710 — GROUNDWATER ELEVATION CONTOUR AT 1 FOOT

WELL	*GROUNDWATER ELEVATION*
EP-21	3754.60
EP-22	3741.13
EP-23	3751.59
EP-24	3753.49
EP-25	3741.51
EP-26	3720.20
EP-49	3722.52
EP-51	3726.10
EP-52	
EP-53	3739.50
EP-54	3717.47
EP-55	3734.27
EP-56	3723.03
EP-57	3714.23
EP-58	3714.12
EP-59	3714.71
EP-60	3712.35
EP-61	3712.07
EP-62	3711.00
EP-63	3710.10
EP-64	3711.73
EP-65	3711.72
EP-66	3711.67
RS-1	3711.13
RS-2	3712.00
RS-3	3711.93
RS-4	3711.65
RS-5	3711.19



ASARCO INCORPORATED
EL PASO PLANT DIESEL NO.2
REMEDIATION SITE
EL PASO, TEXAS

GROUNDWATER ELEVATION MAP
DIESEL NO.2
FEBRUARY 1998

FIGURE

UPDATE TIME 9:30

NORTH

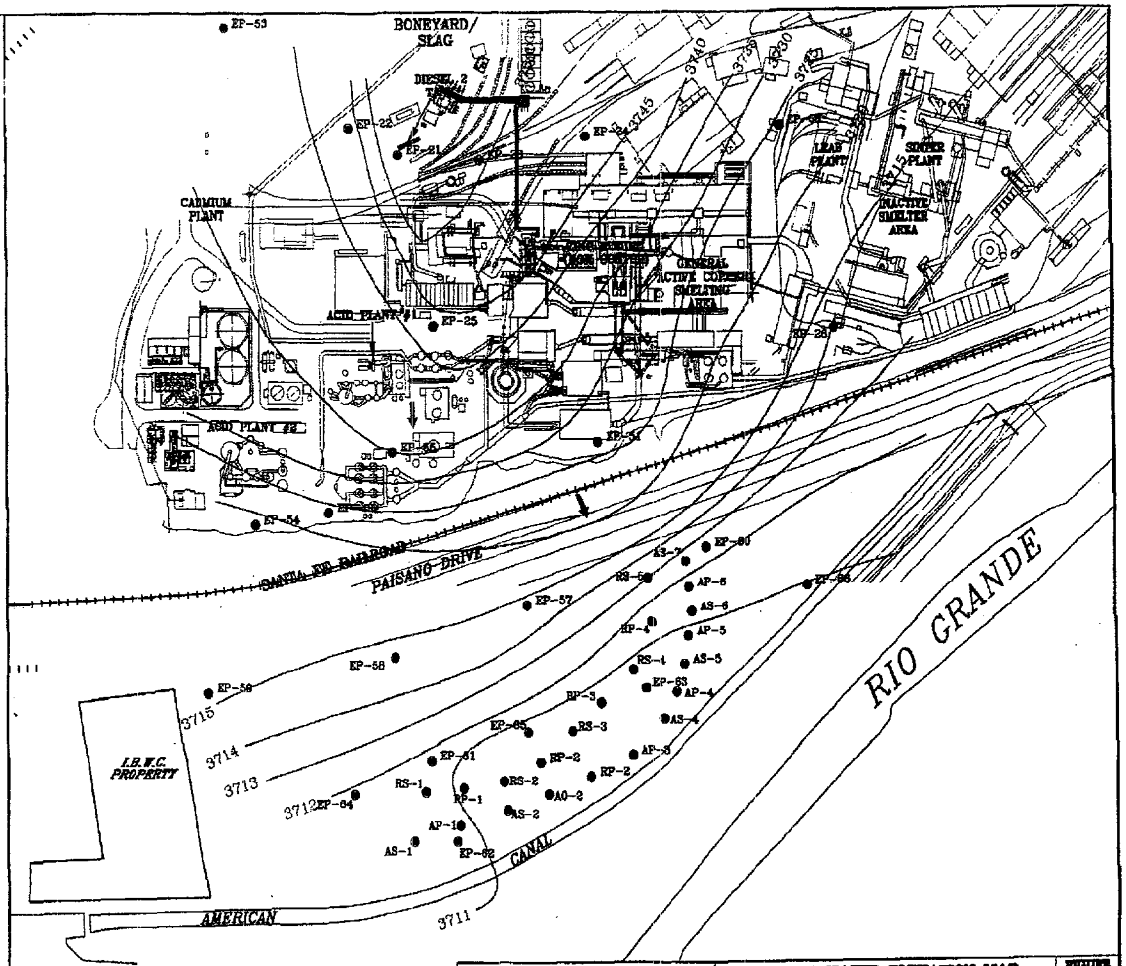
SCALE
(In Feet)
200 0 200
(Approximate Only)

➡ GROUNDWATER FLOW DIRECTION

3750-3715 — GROUNDWATER ELEVATION CONTOUR AT 5 FOOT

37:5-3711 — GROUNDWATER ELEVATION CONTOUR AT 1 FOOT

WELL	GROUNDWATER ELEVATION
EP-21	3735.35
EP-22	3740.47
EP-23	3750.22
EP-24	3748.40
EP-25	3741.48
EP-26	3713.94
EP-49	3723.16
EP-51.	3725.86
EP-52	
EP-53	3739.16
EP-54	3718.32
EP-55	3734.04
EP-56	3723.58
EP-57	3714.51
EP-58	3714.53
EP-59	3715.17
EP-60	3712.50
EP-61	3711.14
EP-62	3711.09
EP-63	3710.22
EP-64	3711.95
EP-65	3710.66
EP-66	3711.03



ASARCO INCORPORATED
EL PASO PLANT
DIESEL NO.2 1997 ANNUAL REPORT
EL PASO, TEXAS

GROUND WATER ELEVATION MAP
DIESEL NO. 2
NOVEMBER 1997

FIGURE
A4-4

Hydrometrics, Inc. Consulting Scientists, Engineers, and Contractors

JPDATE TIME: 2:30
128\0715\055\0180\TUC\042095\A\DRFT\' 7158BU37.DWG

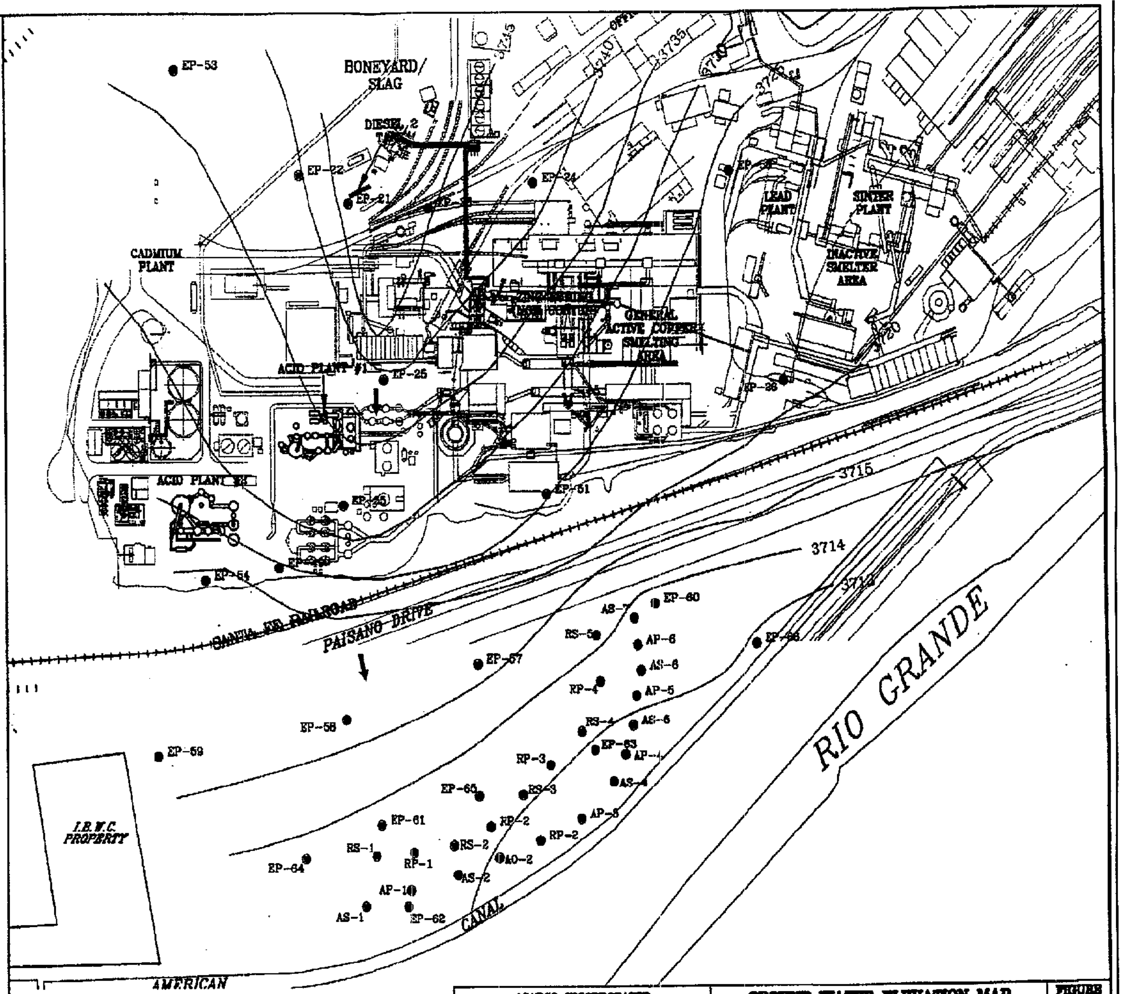
NORTH

SCALE
(In Feet)
200 0 200
(Approximate Only)

CONTOUR INTERVALS
3711-3715=1'
3715-3745=5'

→	GROUNDWATER FLOW DIRECTION
3713-3715 —	GROUNDWATER ELEVATION CONTOUR AT 1 FOOT
3715-3745 —	GROUNDWATER ELEVATION CONTOUR AT 5 FEET

WELL	GROUNDWATER ELEVATION
EP-21	3747.88
EP-22	3738.96
EP-23	3745.65
EP-24	3742.78
EP-25	3739.56
EP-26	3721.84
EP-49	3723.93
EP-51	3725.84
EP-52	BLOCKED
EP-53	3738.04
EP-54	3718.79
EP-55	3733.88
EP-56	3722.86
EP-57	3715.15
EP-58	3715.18
EP-59	3715.47
EP-60	3713.52
EP-61	3713.51
EP-62	3713.32
EP-63	3712.90
EP-64	3713.82
EP-65	3713.24
EP-66	3712.86



ASARCO INCORPORATED
EL PASO PLANT
DIESEL NO.2 1997 ANNUAL REPORT
EL PASO, TEXAS

GROUND WATER ELEVATION MAP
DIESEL NO. 2
AUGUST 1997

FIGURE
A4-3

Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors

JPDATE TIME: 2:30
128\0715\085\0180\TUC\042098\\DRFT\ 71598U36.DWG

NORTH

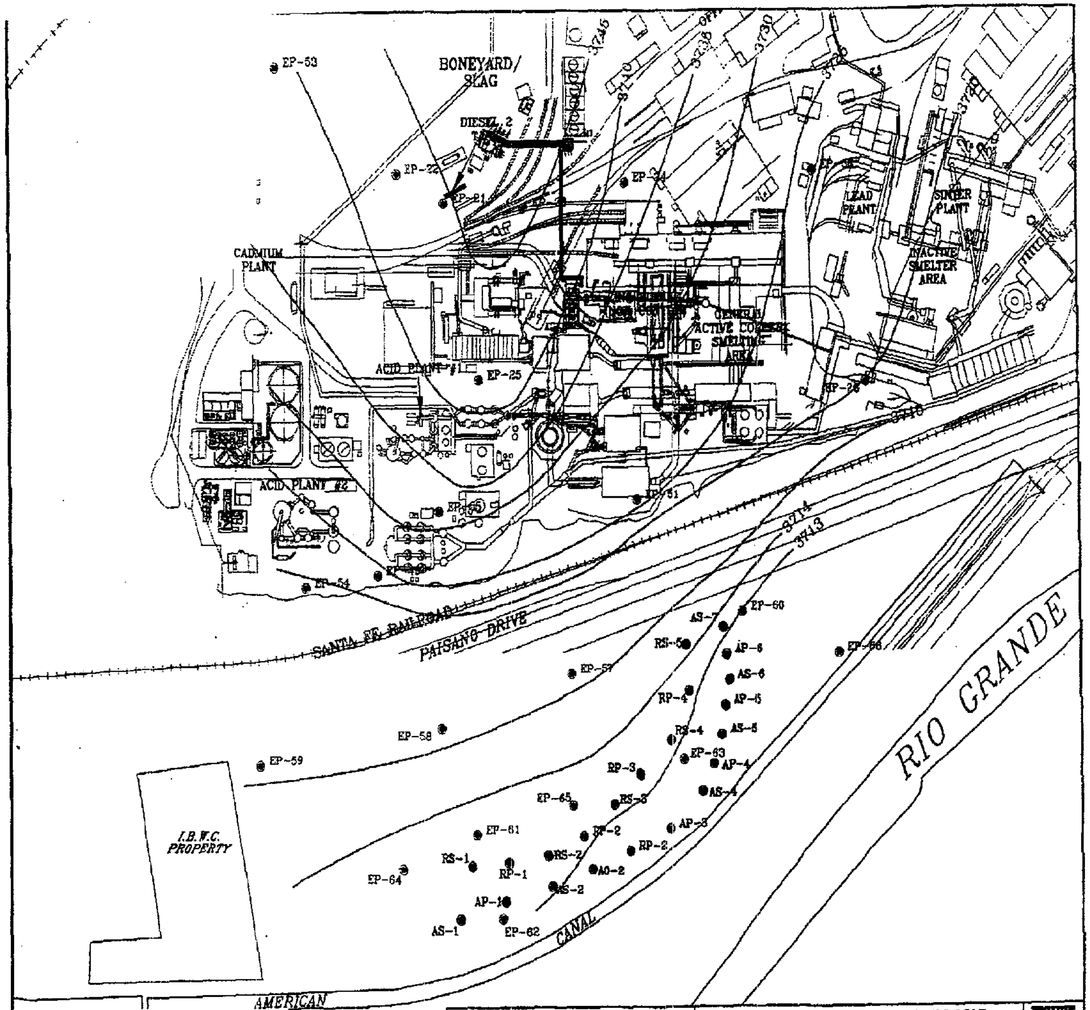
SCALE
(In Feet)
200 0 200
(Approximate Only)

CONTOUR INTERVAL = 1'

➡ GROUND WATER FLOW DIRECTION

3714 —— GROUND WATER ELEVATION CONTOUR

WELL	GROUNDWATER ELEVATION
EP-53	3738.34
EP-22	3743.65
EP-21	3743.53
EP-23	3745.42
EP-24	3739.27
EP-56	3722.71
EP-26	3720.06
EP-51	3726.11
EP-55	3734.32
EP-49	3723.51
EP-54	3718.77
EP-59	3715.27
EP-58	3715.14
EP-57	3715.10
EP-60	3713.02
EP-66	3712.60
EP-64	3713.74
EP-61	3713.43
EP-65	3713.15
EP-63	3712.64
EP-62	3713.29



ASARCO INCORPORATED
EL PASO PLANT
DIESEL NO.2 1997 ANNUAL REPORT
EL PASO, TEXAS

GROUND WATER ELEVATION MAP
DIESEL NO. 2
MAY 1997

FIGURE
A4-2

Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors

JPDATE TIME: 2:30
128\0715\085\0160\TUC\042098\F:\GRFT\ 71596035.DWG

L.6 – USIBWC AMERICAN DAM UST FACILITY DOCUMENTS

(Source: TNRCC)

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL # of pages ► 6

To Mr. John Knopp
From USIBWC Mike Mim
Dept./Agency Encon
Phone # 832-4738
Fax # 581-2044
Fax # 832-4167

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Barry R. McBee, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
John M. Baker, *Commissioner*
Jeffrey A. Saitas, *Executive Director*

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

July 29, 1998

Mr. Yusuf E. Farran, P.E.
Division Engineer, EMD
International Boundary and Water Commission
4171 N. Mesa St. Bldg C-Suite 310
El Paso, TX 79902

Re: Leaking Petroleum Storage Tank (LPST) Case Closure of Subsurface Release of Petroleum Hydrocarbons at the American Dam, 2616 Paisano, El Paso (El Paso County), Texas. (LPST ID No.108049, Facility ID No.9971) - Priority 2.6

Dear Mr. Farran:

This letter confirms the completion of corrective action requirements for the release incident at the above-referenced facility. Although contaminant concentrations were reported above Plan A Target screening levels, the following criteria were used as justification for site closure:

- A water well search indicated no water wells ½ a mile from the site.
- The contaminant plume appears to be confined on site and decreasing in contaminant concentrations.
- The extent of groundwater contamination appears to be delineated to MCL's in the downgradient direction.
- The shallow groundwater does not appear to have a local beneficial use. Domestic water for this area is provided by a municipal water supply.
- According to information provided, vapor calculations do not indicate a potential problem.
- The former UST system and presumably the source of contamination was removed from the site in 1994.

Based upon the submitted information and with the provision that the documentation provided to this agency was accurate and representative of site conditions, we accept your conclusions and recommendation that the site has met closure requirements. No further corrective action will be necessary.

Case closure is based on identified exposure pathways and any remaining contaminant levels. These potential exposure pathways should be evaluated when conducting future soil excavation or construction activities at this site. Additionally, all wastes generated from these activities must be handled in compliance with all applicable regulations.

For any subsequent release from an underground or aboveground storage tank at this site, the deductible will be increased in accordance with Section 26.3512 of the Texas Water Code. Please note that financial assurance must be maintained for all operational storage tanks at this site.

Please be advised that all monitor wells which are not now in use and/or will not be used in the next 180 days must be properly plugged and abandoned pursuant to Chapter 32.017 of the Texas Water Code and in accordance with Title 30, Texas Administrative Code (TAC), Section 338.48-338.50. A State of Texas Plugging Report (Form No. TNRCC-0055) is required to be submitted to the Water Well Drillers Section of the Texas Department of Licensing and Regulation, P.O. Box 12157, Capitol Station, Austin, Texas 78711, within thirty (30) days of plugging completion. If you have any questions regarding the future use of an existing monitor well, please contact the Texas Department of Licensing and Regulation at 512/463-7880 or 800/803-9202.

If there are to be any monitor well plugging or other necessary site restoration activities to complete site closure, complete a *Final Site Closure Report* and submit the report to both the local TNRCC Regional Field Office and to the Central Office in Austin to document actual site closure. For sites which are eligible for reimbursement through the Petroleum Storage Tank Remediation Fund, written preapproval should be obtained prior to initiation of site closure activities. Reimbursement claims for activities that are not preapproved will not be paid until all claims for preapproved work are processed and paid.

Please note that the *Final Site Closure Report*, if necessary, will be the last submittal associated with this case. This letter signifies the completion of corrective action associated with the release. No subsequent TNRCC correspondence will be issued in response to the *Final Site Closure Report*.

All correspondence must include the LPST ID Number and submitted to both the local TNRCC Regional Field Office and the Central Office in Austin. Should you have any questions, please contact me at 512/239-2200. **Please reference the LPST ID Number when making inquiries.** Your cooperation in this matter has been appreciated.

Sincerely,

Kenneth Klanika

Kenneth Klanika
Team I Leader
Petroleum Storage Tank Responsible Party Remediation Section
Remediation Division

AB/mel
108049.rba

cc: Mr. Terry McMillan, TNRCC Region 6 Field Office, 915/778-9634
7500 Viscount Blvd, Suite 147, El Paso, Texas 79925-5633

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

MAR 8 1999

RECEIVED
MAR 09 1999
TNRCC-REGION 6

Mr. Arturo Burgos
Petroleum Storage Tank Responsible Party Investigations
Remediation Division
Texas Natural Resource Conservation Commission
P.O. Box 13087
Austin, Texas 78711-3087

Re: Subsurface Release of Gasoline at American Dam, 2616 Paisano, El Paso (El Paso County), Texas (LPST ID No. 108049, Facility ID No. 9971)

Dear Mr. Burgos:

Pursuant to your letter of July 29, 1998, the U.S. Section of the International Boundary and Water Commission has plugged and abandoned the seven monitoring wells constructed for the monitoring activities associated with the petroleum storage tanks at American Dam. The State of Texas Plugging Reports were submitted to the Water Well Drillers Section of the Texas Department of Licensing and Regulation within the specified time. Enclosed please find the Final Site Closure Report. A copy of this letter and attachments will also be provided to the TNRCC, Region 6 office.

If you have any questions, please contact me at (915) 832-4148 or Ms. Sylvia A. Waggoner at (915) 832-4149 extension 2140.

Sincerely,

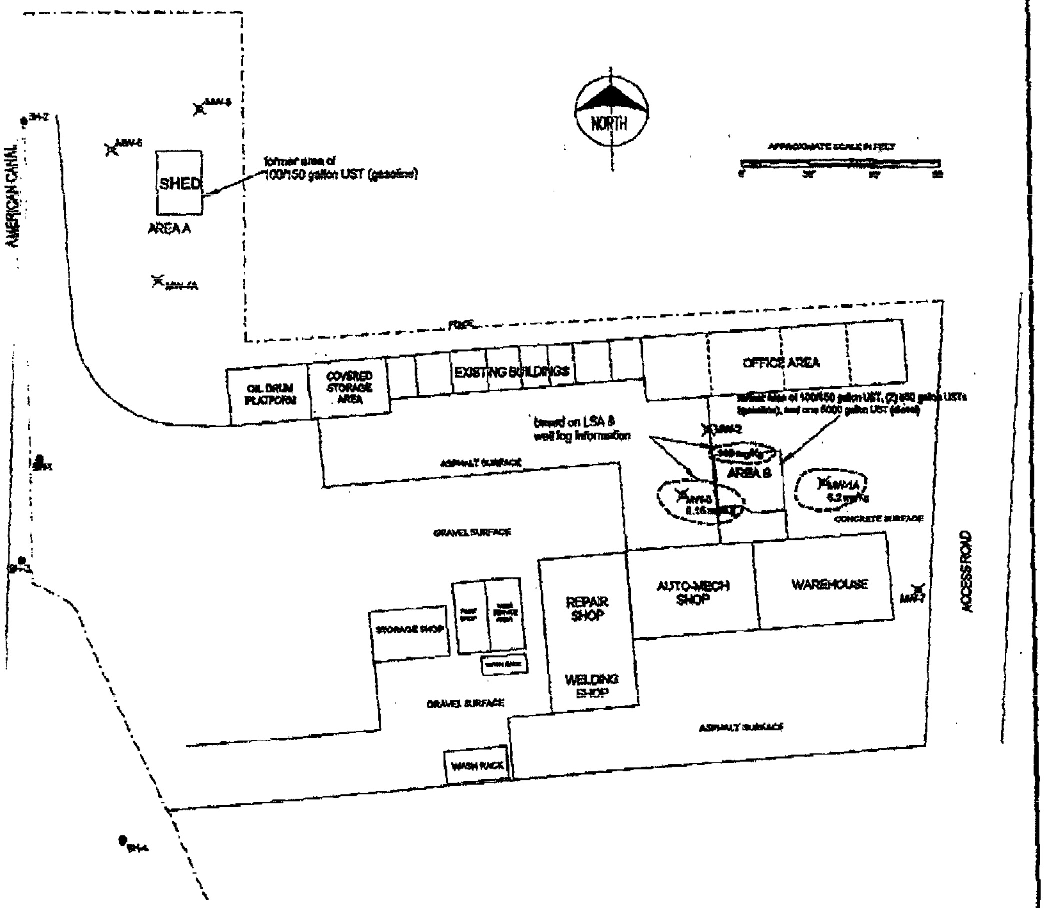
Yusuf E. Farran

Yusuf E. Farran, P.E.
Division Engineer, EMD

Enclosure: As Stated

cc: w/encl:
Mr. Frank Espino
TNRCC, Region 6 Field Office
7500 Viscount Blvd, Suite 147
El Paso, Texas 79925

The Commons, Building C, Suite 310 • 4171 N. Mesa Street • El Paso, Texas 79902



Site plan referenced from Limited Site Assessment
Report dated January 2, 1995

International Boundary & Water Commission
American Dam Facility 2616 W. Paisano
El Paso, Texas

Soil Contaminant Concentration Map
LPST ID NO. 108049

SCALE: 1" = 60'

DRAWING NO.: 980018

DRAWN BY:
FRONTERA ENVIRONMENTAL, L.L.C.
2310 MONTANA AVE.
EL PASO, TEXAS 79903

04/28/98

LEGEND

- monitor well (4-inch dia.) max. benzene conc.
- ● soil boring

LOG OF TEST BORING NO. MW-1 MONITOR WELL NO. MW-1A

PROJECT NAME: American Dam
LPST ID: 10849
Facility ID: 0009971

PROJECT LOCATION: 2616 West Paisano
EL Paso, Texas
El Paso County

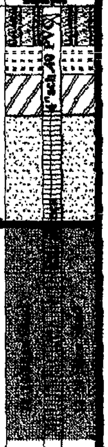
BORING EQUIPMENT & METHOD:
Truck-mounted B-61 Mobile Drill Rig & 6 5\8" I.D. 10" O.D. Hollowstem Auger

SURFACE ELEVATION: TOC= 99.80

BENCHMARK: Arbitrary Datum 100'

DESCRIPTION	Depth in Feet	Sample	Graphical Log	USCS	HEADSPACE (PPM)	TPH (418.1) ppm	Benzene (8020) ug/kg	Total BTEX (8020) ug/kg
1.5" of HMAC								
Sand, silty, loose, light brown.	5	☒		SM	3	10.0	<10.0	55.0
	10	☒		SM	3000	12000.0	6200.0	136800.
Sand, silty, very loose, light brown with gray staining, very strong hydrocarbon odor.						Water Table 11.26 11-17-97		
	15	☒		SM	200	<10.0	130.0	2640.0
Sand, clayey, with silt, loose, light brown with gray staining, hydrocarbon odor.	20	☒		SC	22			
Sand, clayey, with silt, loose, light brown.	25	☒		SC				
	30							
	35							
	40							

WELL CONSTRUCTION



REMARKS:
Boring Termination Depth 25'
Sampler Termination Depth 26.5'

DRILLED BY: John Miller
Well Replaced By G Goodwin Lic.[illegible] see State of Texas Well Report

LOGGED BY: Amy Castner
Susana Facio

CHECKED BY: Gerald Goodwin
3/29/97

DATE STARTED: 8/25/94

DATE COMPLETED: 8/25/94

GROUNDWATER-DEPTH 11.58' HOUR n/a DATE 3-28-97

SHEET 1 OF 1

SUNBELT LABORATORIES, INC.

SAMPLES FROM MONITORING WELLS*

3.10

Well Name	Sample Date	TPH¹ (ppm)	Benzene² (ppb)	Toluene² (ppb)	Ethyl-benzene² (ppb)	o-, m- & p-Xylenes² (ppb)	MTBE² (Methyl tert. Butyl Ether) (ppb)	TDS (Total Dissolved Solids) (ppm)
MW-1	09/14/94	**43**	**2200**	**2400**	<1.0	3,000	6	3100
	05/14/97	1.1	**31**	<1.0	3.4	8	<2.0	
	08/11/97	<1.0	**77**	<1.0	7.7	7	<2.0	
	11/17/97	**<1.0**	**60**	**<1.0**	**4.3**	**3.7**	**<2.0**	
MW-2	09/14/94	3	3	4	2	17.0	<2.0	3100
	05/14/97	<1.0	<1.0	<1.0	2.6	<1.0	<2.0	
	08/12/97	<1.0	<1.0	<1.0	2.1	<1.0	<2.0	
	11/17/97	**<1.0**	**<1.0**	**<1.0**	**3.1**	**<1.0**	**<2.0**	
MW-3	09/14/94	**900**	**10**	3	1	210	7	3000
	05/14/97	7.1	**5**	1.9	16	25	21	
	08/11/97	2.9	**6.4**	2.4	20	26	37	
	11/17/97	**11**	**4.6**	**<1.0**	**7.9**	**14**	**33**	
MW-4	09/14/94	<1.0	<1.0	<1.0	<1.0	<0.03	<2.0	1700
	05/14/97	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
	08/08/97	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
	11/14/97	**<1.0**	**<1.0**	**<1.0**	**<1.0**	**<1.0**	**<2.0**	
MW-5	09/14/94	<1.0	<1.0	<1.0	<1.0	<0.03	<2.0	
	05/14/97	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
	08/08/97	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
	11/14/97	**<1.0**	**<1.0**	**<1.0**	**<1.0**	**<1.0**	**<2.0**	
MW-6	09/14/94	7	**4600**	5100	1,500	5,700	290	
	05/14/97	<1.0	**32**	11	27	51	3.2	
	08/08/97	<1.0	**24**	9.1	24	36	2.8	
	11/14/97	**<1.0**	**12**	**18**	**6.7**	**3.9**	**2.1**	
MW-7	09/14/94	3.3	<1.0	<1.0	<2.0	9	<2.0	3100
	05/14/97	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
	08/11/97	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
	11/17/97	**<1.0**	**<1.0**	**<1.0**	**<1.0**	**<1.0**	**<2.0**	

* concentrations in boldface type indicates at or exceed TNRCC Action Levels

¹ EPA Method 418.1 Total Petroleum Fuel Hydrocarbons

² EPA Method 8020A

— not submitted for this analyte

tech
boratories
c.
he Quality People
Since 1955

10[illegible] Gateway West, No. 100
El Paso, Texas 79935
(915) 592-3591 • fax 592-3594

D & H Pump Service, Inc.
1201 Tower Trail
El Paso, TX 79907

SAMPLE NO. : 6400618
INVOICE NO.: 62140129
REPORT DATE: 02-22-94
REVIEWED BY:
PAGE : 1 OF 1

SAMPLE ID : #5
TYPE .....: Soil
D BY ......: S. Svoboda
TED BY ....: S. Svoboda
SOURCE ...: N+W Wall
T ....: C. Warner

AUTHORIZED BY : Steve Svoboda
CLIENT P.O. : --
SAMPLE DATE ...: 02-16-94
SUBMITTAL DATE : 02-16-94
EXTRACTION DATE: 02-19-94
ANALYSIS DATE .: 02-21-94

Method: Modified 418.1 (TPH) + 8020 (BTEX)

DATA TABLE

Parameter	Result	Unit	Detection Limit
l Petroleum Hydrocarbons .....:	4700	mg/Kg	10.
ene ....:	570	ug/Kg	10.
lbenzene ....:	44000	ug/Kg	10.
ene ....:	41000	ug/Kg	10.
l Xylenes ....:	96000	ug/Kg	3.0

(1) Copy to Client

Managing Director

boratories
c.
he Quality People
Since 1955

El Paso, Texas 79935
(915) 592-3591 • fax 592-3594

D & H Pump Service, Inc.
1201 Tower Trail
El Paso, TX 79907

SAMPLE NO. : 6400620
INVOICE NO.: 62140129
REPORT DATE: 02-22-94
REVIEWED BY:
PAGE : 1 OF 1

SAMPLE ID : #7
TYPE .....: Soil
D BY ......: S. Svoboda
TED BY ....: S. Svoboda
SOURCE ...: Botton of Excavation

AUTHORIZED BY : Steve Svoboda
CLIENT P.O. : --
SAMPLE DATE ...: 02-16-94
SUBMITTAL DATE : 02-16-94
EXTRACTION DATE: --

RKS -

orrected Certificate.

Inorganic Chemistry-Total Metals

DATA TABLE

Parameter	Result	Unit	Detection Limit	Analysis Date
tal Arsenic ....:	40	mg/Kg	0.50	02-24-94
tal Barium ....:	180	mg/Kg	10	02-21-94
tal Cadmium ....:	26	mg/Kg	2.5	02-21-94
tal Chromium ....:	<5.0	mg/Kg	5.0	02-21-94
tal Lead ....:	3200	mg/Kg	5.0	02-21-94
tal Mercury ....:	0.95	mg/Kg	0.50	02-23-94
tal Selenium ....:	0.81	mg/Kg	0.50	02-22-94
tal Silver ....:	<2.5	mg/Kg	2.5	02-21-94

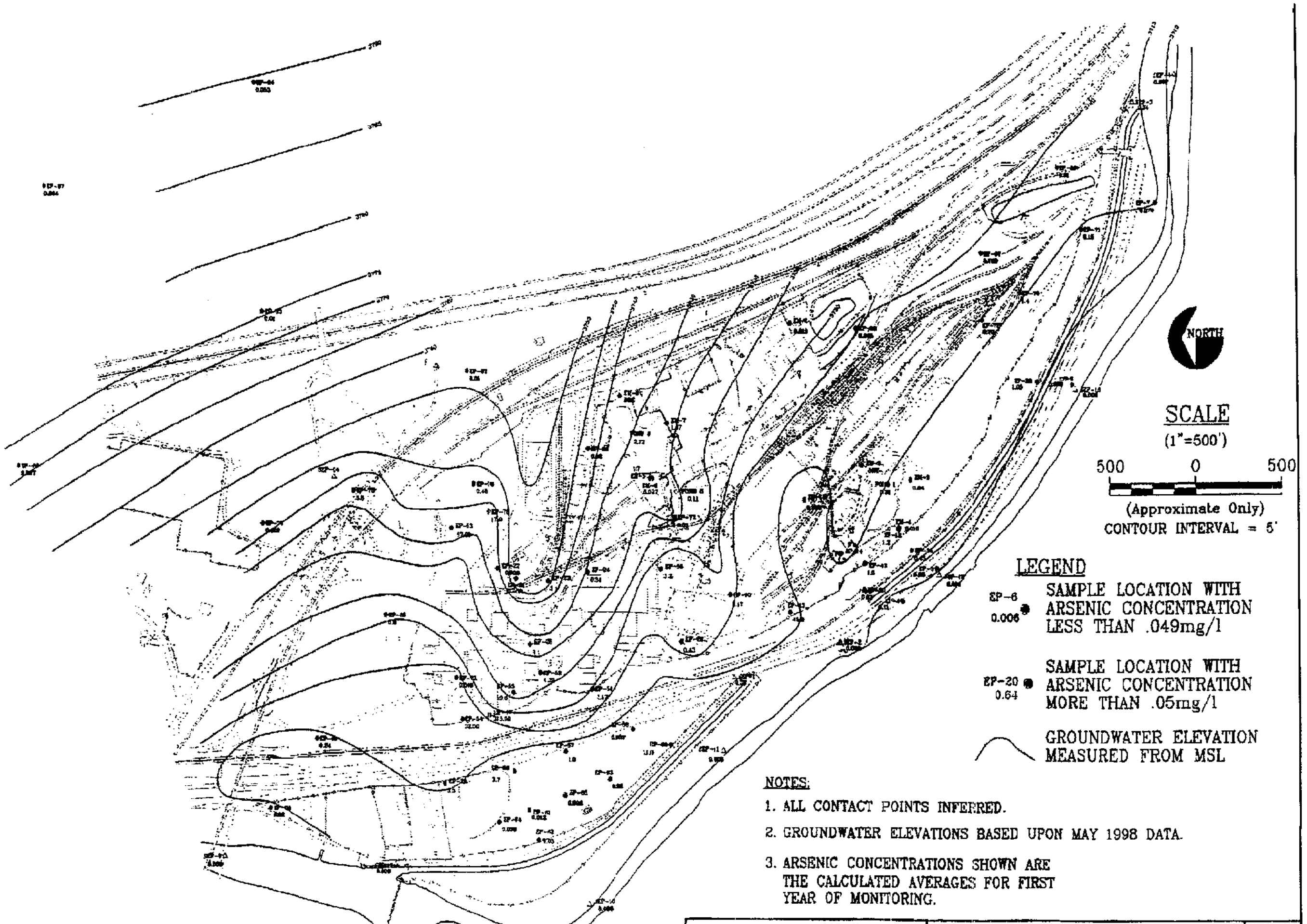
(1) Copy to Client

Managing Director

L.7 – UPPER & MIDDLE OPEN CHANNEL HEAVY METAL CONCENTRATIONS IN GROUNDWATER

ASARCO 1998 Monitoring Well Maps

(Source: ASARCO)



SCALE
(1"=500')
500 0 500
(Approximate Only)
CONTOUR INTERVAL = 5'

LEGEND

- EP-6 0.006 ● SAMPLE LOCATION WITH ARSENIC CONCENTRATION LESS THAN .049mg/l
- EP-20 0.64 ● SAMPLE LOCATION WITH ARSENIC CONCENTRATION MORE THAN .05mg/l
- GROUNDWATER ELEVATION MEASURED FROM MSL

NOTES:

1. ALL CONTACT POINTS INFERRED.
2. GROUNDWATER ELEVATIONS BASED UPON MAY 1998 DATA.
3. ARSENIC CONCENTRATIONS SHOWN ARE THE CALCULATED AVERAGES FOR FIRST YEAR OF MONITORING.

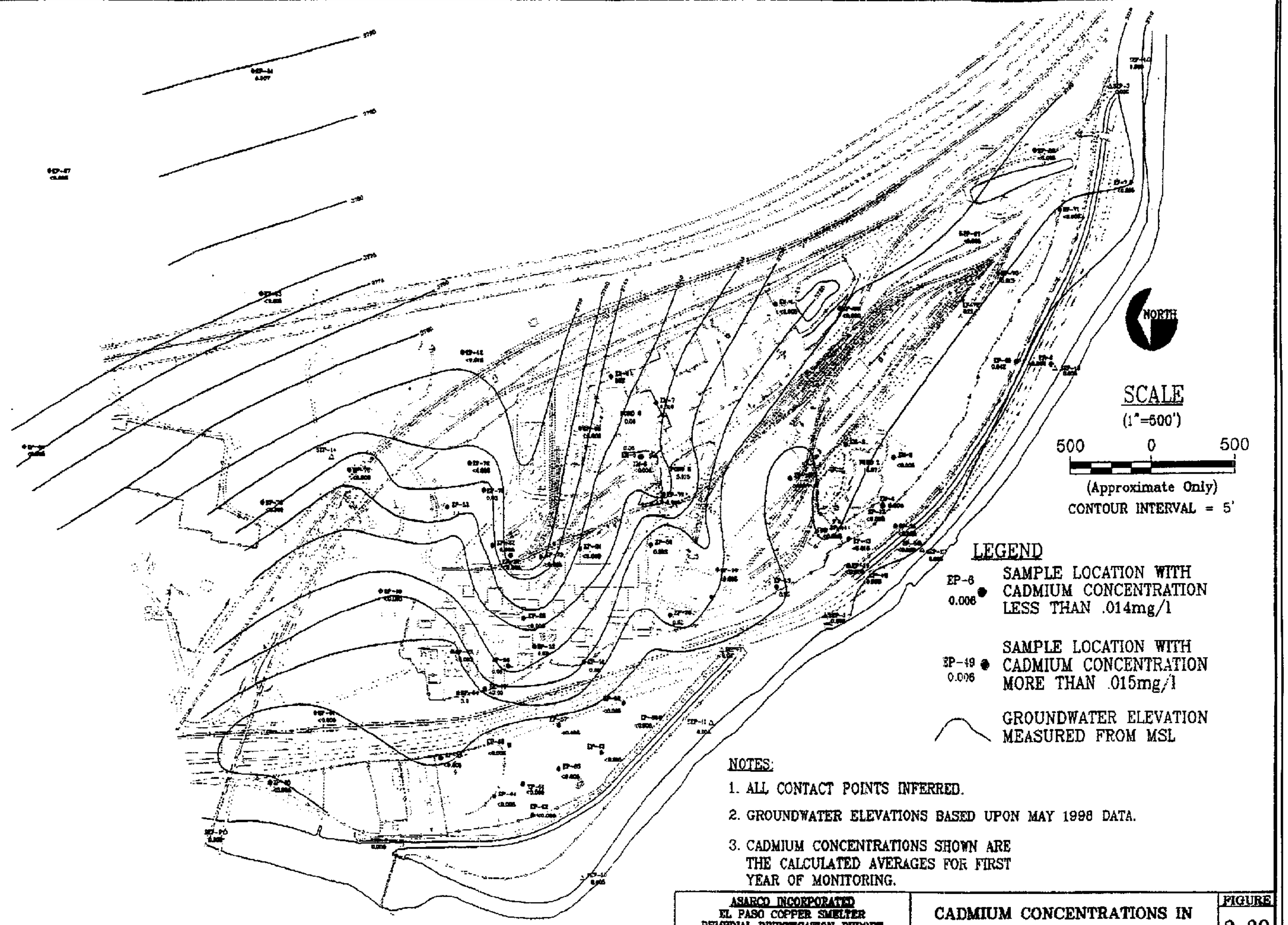
ASARCO INCORPORATED
EL PASO COPPER SMELTER
REMEDIAL INVESTIGATION REPORT
EL PASO, TEXAS

ARSENIC CONCENTRATIONS IN WATER

FIGURE
2-38

UPDATE TIME: 2:00
0008, 0734\065\0160\TUC\091498\I:\DRFT\ 73498U21.DWG

Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors



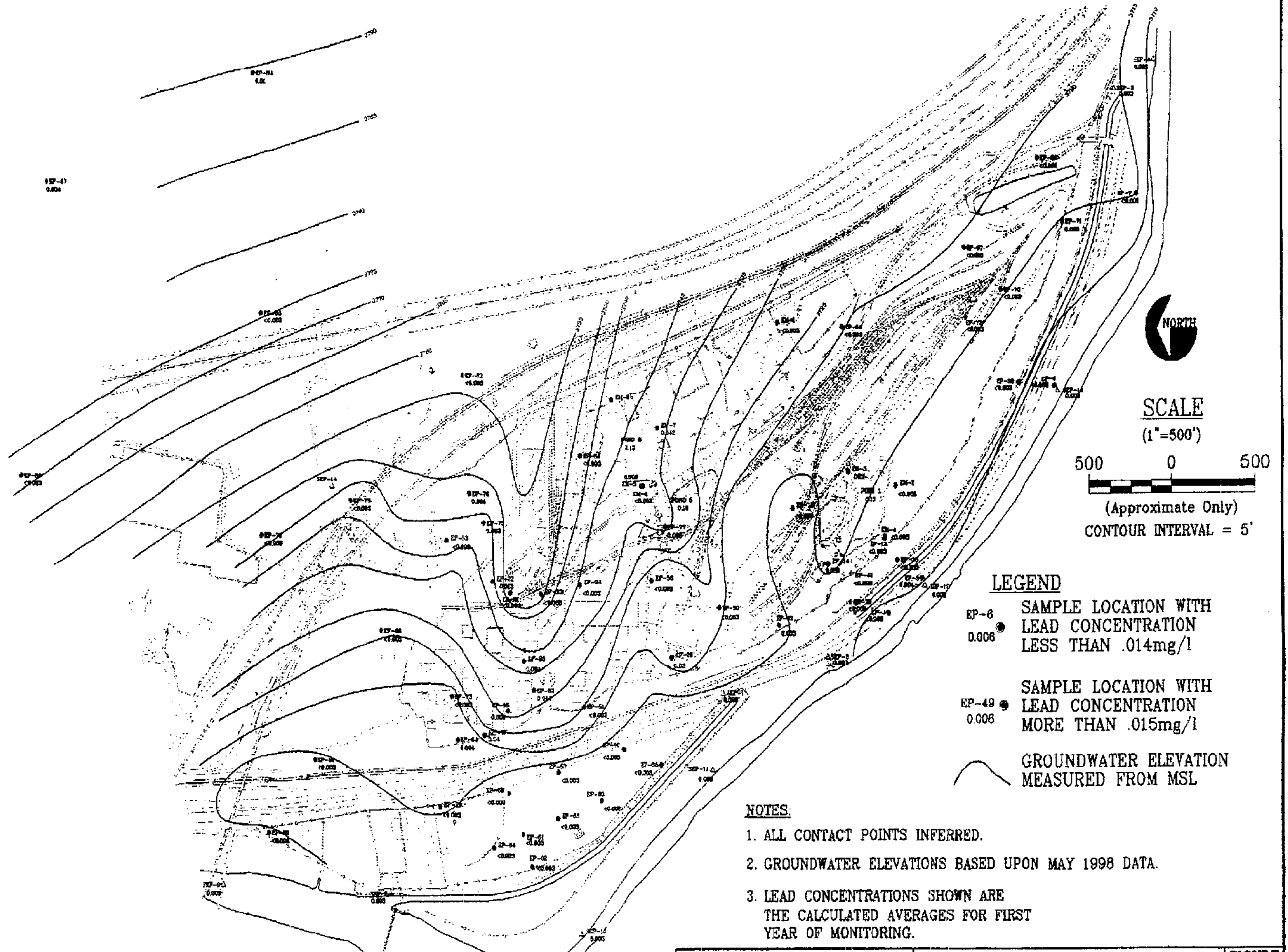
NOTES:

1. ALL CONTACT POINTS INFERRED.
2. GROUNDWATER ELEVATIONS BASED UPON MAY 1998 DATA.
3. CADMIUM CONCENTRATIONS SHOWN ARE THE CALCULATED AVERAGES FOR FIRST YEAR OF MONITORING.

ASARCO INCORPORATED EL PASO COPPER SMELTER REMEDIAL INVESTIGATION REPORT EL PASO, TEXAS	CADMIUM CONCENTRATIONS IN WATER	FIGURE 2-39

UPDATE TIME: 2:00
0008,0734\065\0180\TUC\091498\1:\DRFT\ 73498U38.DWG

Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors



NOTES:

1. ALL CONTACT POINTS INFERRED.
2. GROUNDWATER ELEVATIONS BASED UPON MAY 1998 DATA.
3. LEAD CONCENTRATIONS SHOWN ARE THE CALCULATED AVERAGES FOR FIRST YEAR OF MONITORING.

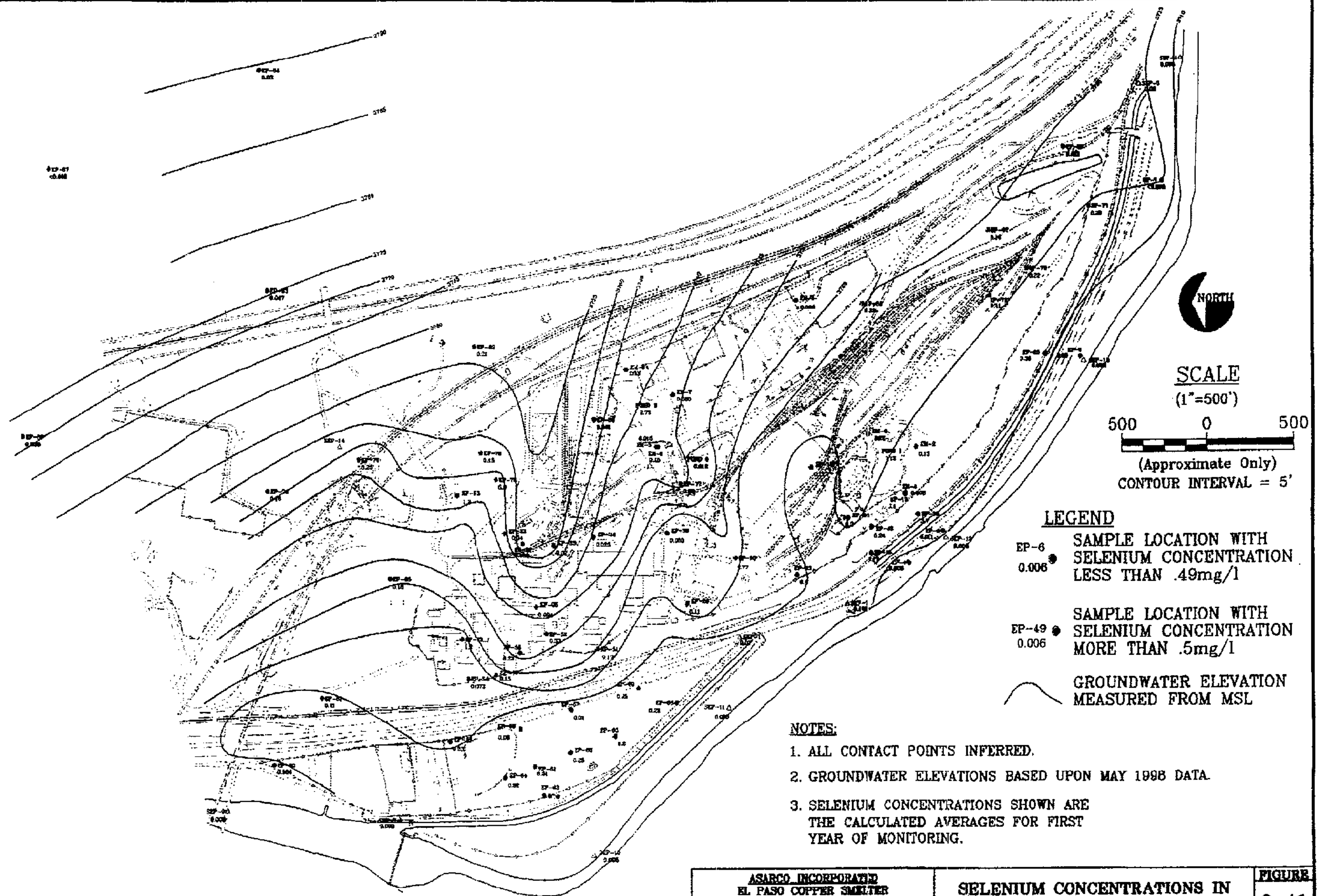
ASARCO INCORPORATED
EL PASO COPPER SMELTER
REMEDIAL INVESTIGATION REPORT
EL PASO, TEXAS

LEAD CONCENTRATIONS IN WATER

FIGURE
2-40

UPDATE TIME: 2:00
0000,0734\065\0180\TUC\091498\I:\DRFT\ 73498J41.DWG

Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors



NOTES:

1. ALL CONTACT POINTS INFERRED.
2. GROUNDWATER ELEVATIONS BASED UPON MAY 1998 DATA.
3. SELENIUM CONCENTRATIONS SHOWN ARE THE CALCULATED AVERAGES FOR FIRST YEAR OF MONITORING.

ASARCO INCORPORATED
EL PASO COPPER SMELTER
REMEDIAL INVESTIGATION REPORT
EL PASO, TEXAS

SELENIUM CONCENTRATIONS IN WATER

FIGURE 2-41

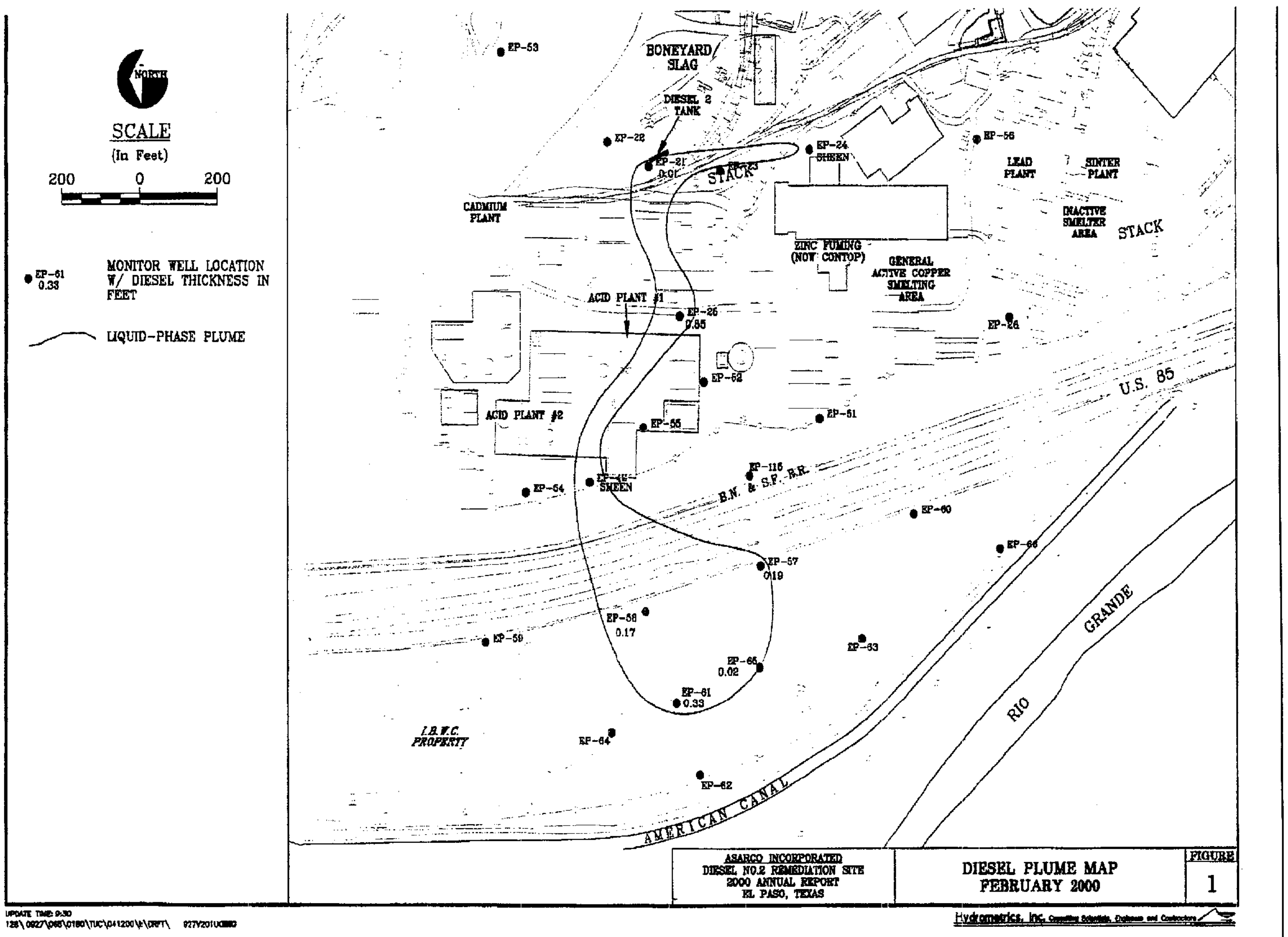
UPDATE TIME: 2:00
0000,0734\065\0180\TUC\091498\\:\DRFT\ 73498U40.DWG

Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors

L.8 – UPPER OPEN CHANNEL DIESEL PLUME MAPS

ASARCO Diesel No. 2 Plume Maps 1997-2000

(Source: ASARCO)

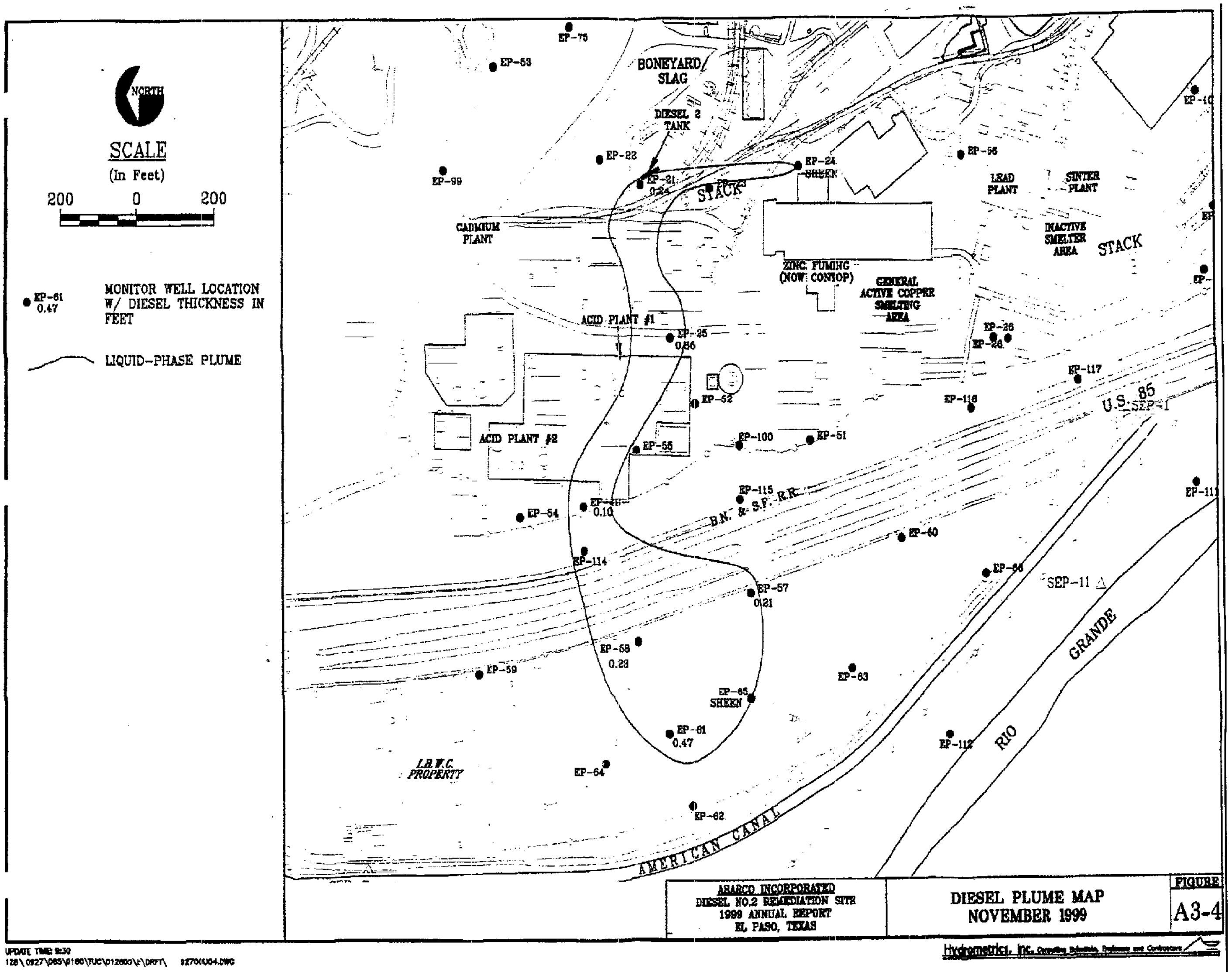


ASARCO INCORPORATED
DIESEL NO.2 REMEDIATION SITE
2000 ANNUAL REPORT
EL PASO, TEXAS

DIESEL PLUME MAP
FEBRUARY 2000

FIGURE
1

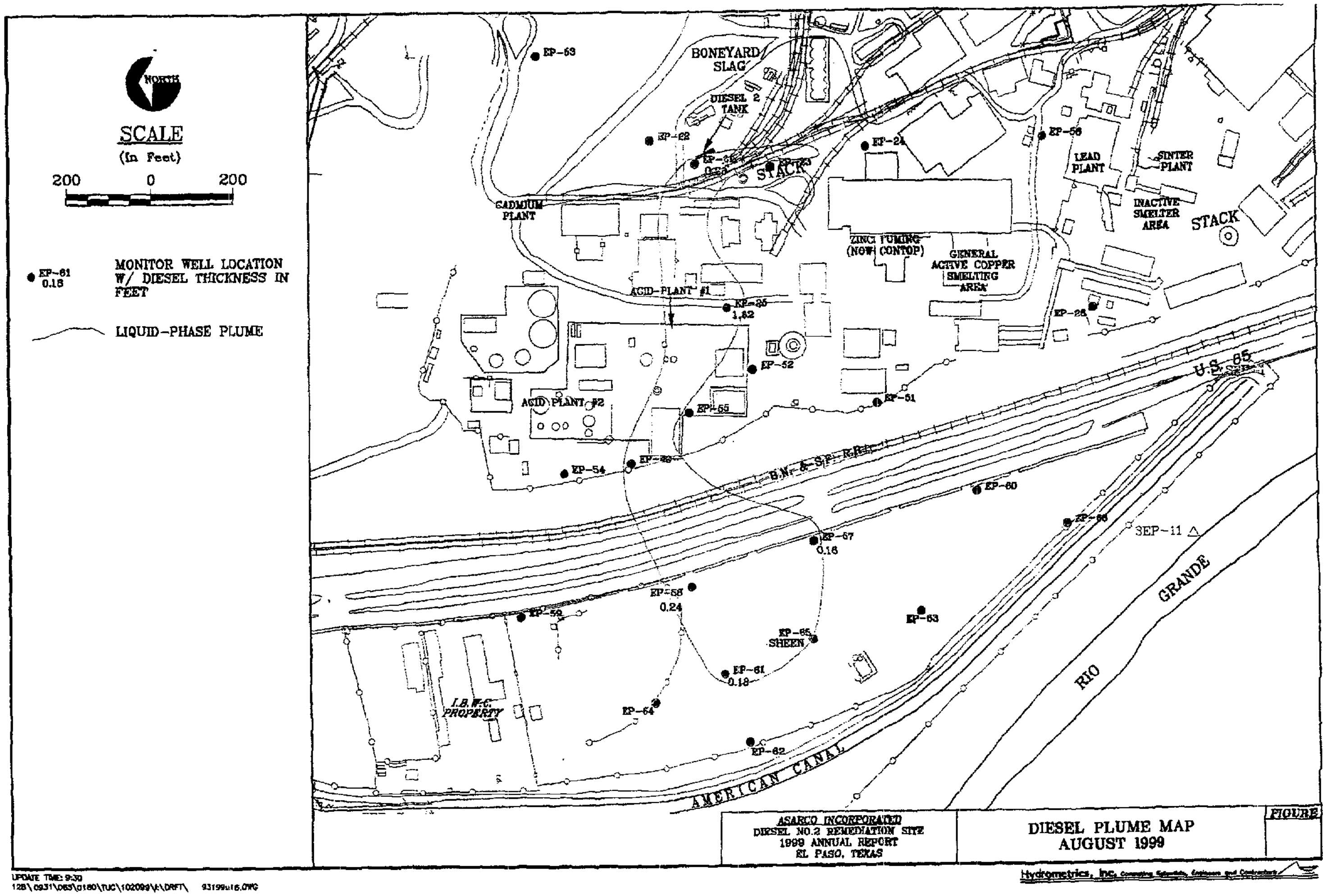
Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors

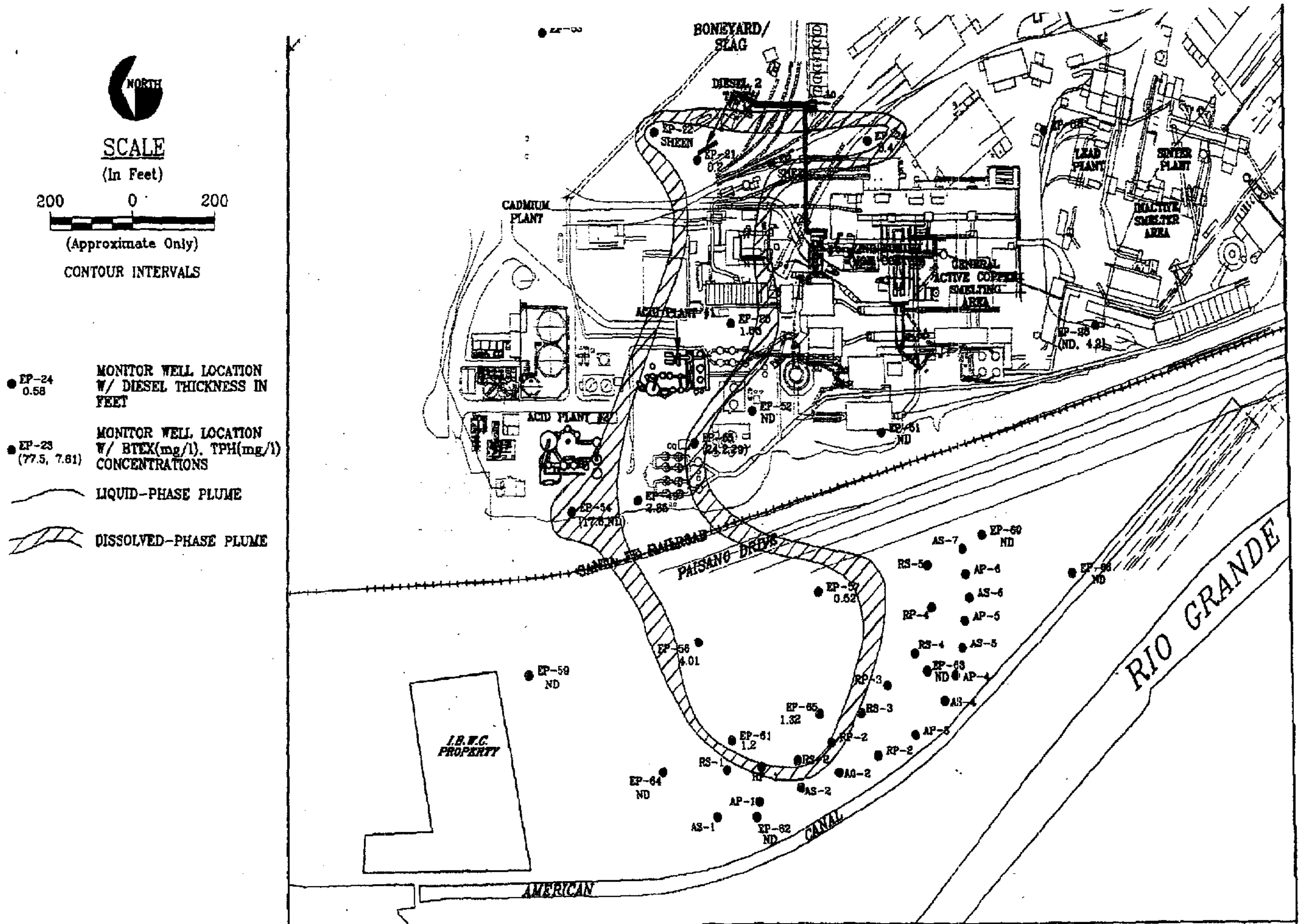


ASARCO INCORPORATED
DIESEL NO.2 REMEDIATION SITE
1999 ANNUAL REPORT
EL PASO, TEXAS

DIESEL PLUME MAP
NOVEMBER 1999

FIGURE
A3-4



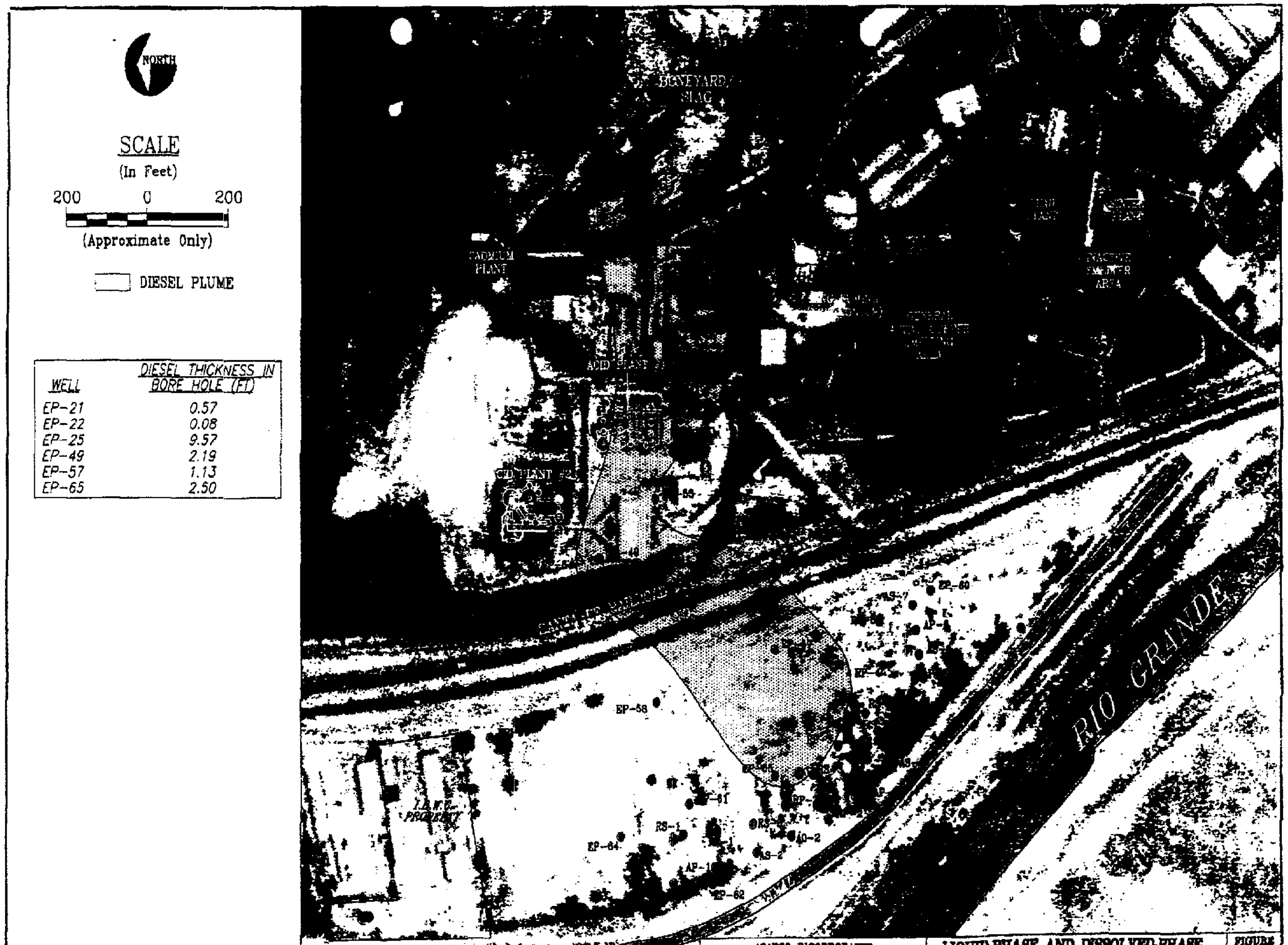


ASARCO INCORPORATED
EL PASO PLANT DIESEL NO.2
REMEDIATION SITE
EL PASO, TEXAS

LIQUID AND DISSOLVED PHASE
DIESEL PLUME MAP - DIESEL NO.2
FEBRUARY 1998

FIGURE

Hydrometrics, Inc.



WELL	DIESEL THICKNESS IN BORE HOLE (FT)
EP-21	0.57
EP-22	0.08
EP-25	9.57
EP-49	2.19
EP-57	1.13
EP-65	2.50

ASARCO INCORPORATED
EL PASO PLANT
ANNUAL STATUS REPORT

LIQUID-PHASE AND DISSOLVED-PHASE
DIESEL PLUME MAP DIESEL NO. 2
FEBRUARY 1997

FIGURE

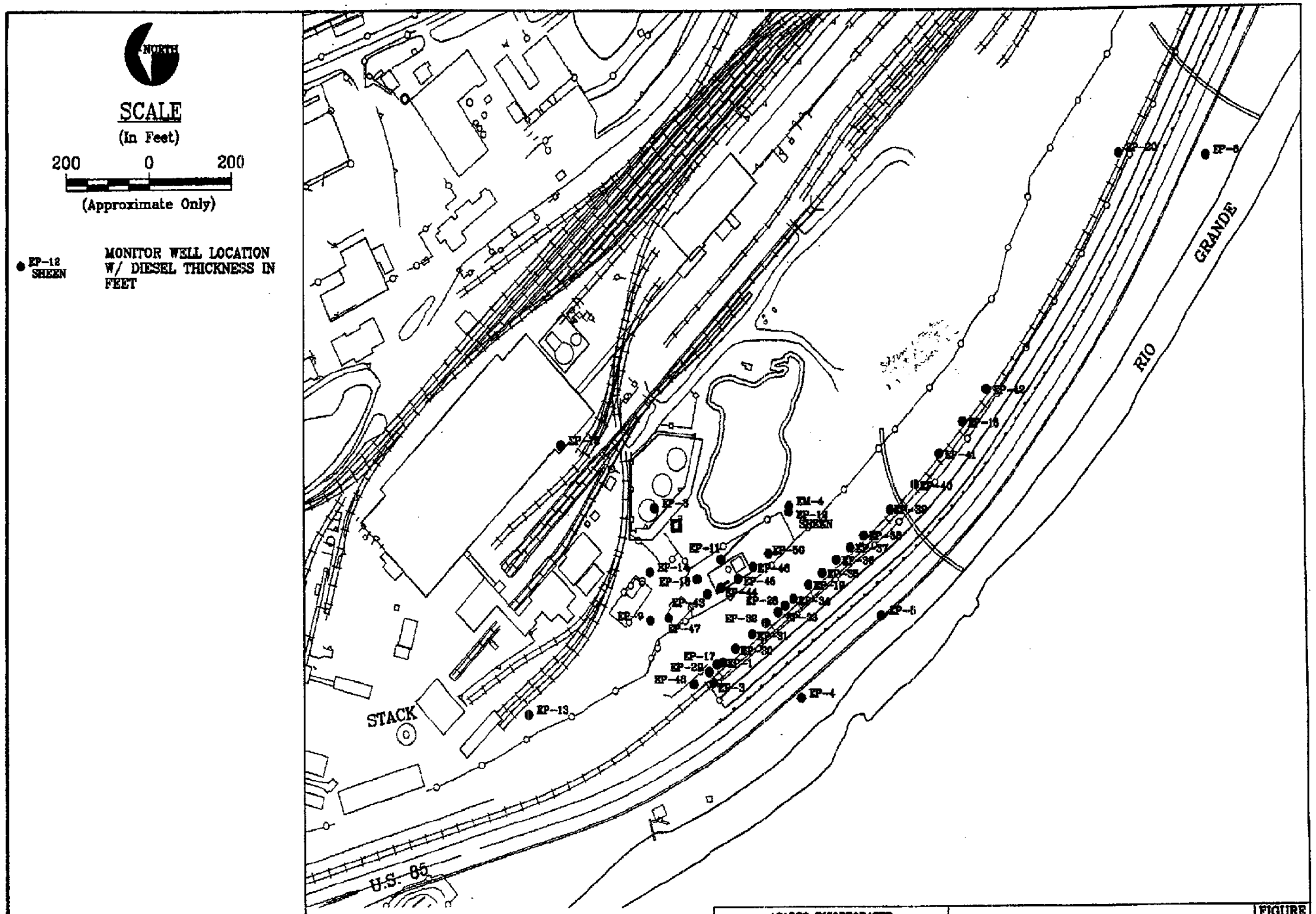
Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors

UPDATE TIME: 10:35AM
128\ 0714\065\0151\HEL\030497\I:\STORAGE\71497A30.DWG

L.9 – MIDDLE OPEN CHANNEL DIESEL PLUME MAPS

ASARCO Diesel No. 1 Plume Maps 1998-2000

(Source: ASARCO)



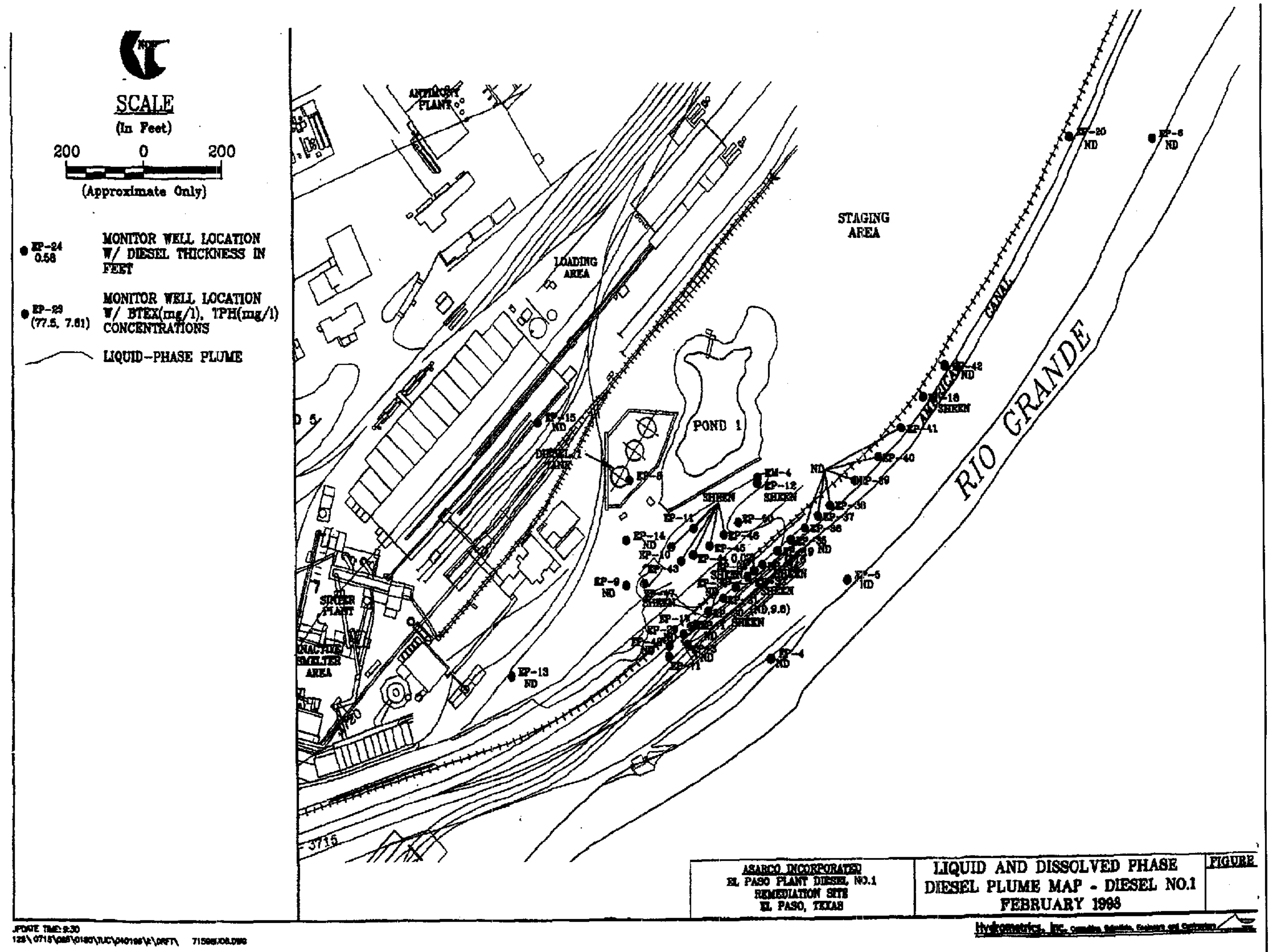
ASARCO INCORPORATED
1999 ANNUAL REPORT
DIESEL NO.1 REMEDIATION SITE
EL PASO, TEXAS

DIESEL SHEEN/ODOR BOUNDARY
AUGUST 1999

FIGURE

UPDATE TIME: 9:30
128\0831\085\0180\TUC\101899\I:\DRFT\ 93199U13.DWG

Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors



ASARCO INCORPORATED
EL PASO PLANT DIESEL NO.1
REMEDIATION SITE
EL PASO, TEXAS

LIQUID AND DISSOLVED PHASE
DIESEL PLUME MAP - DIESEL NO.1
FEBRUARY 1998

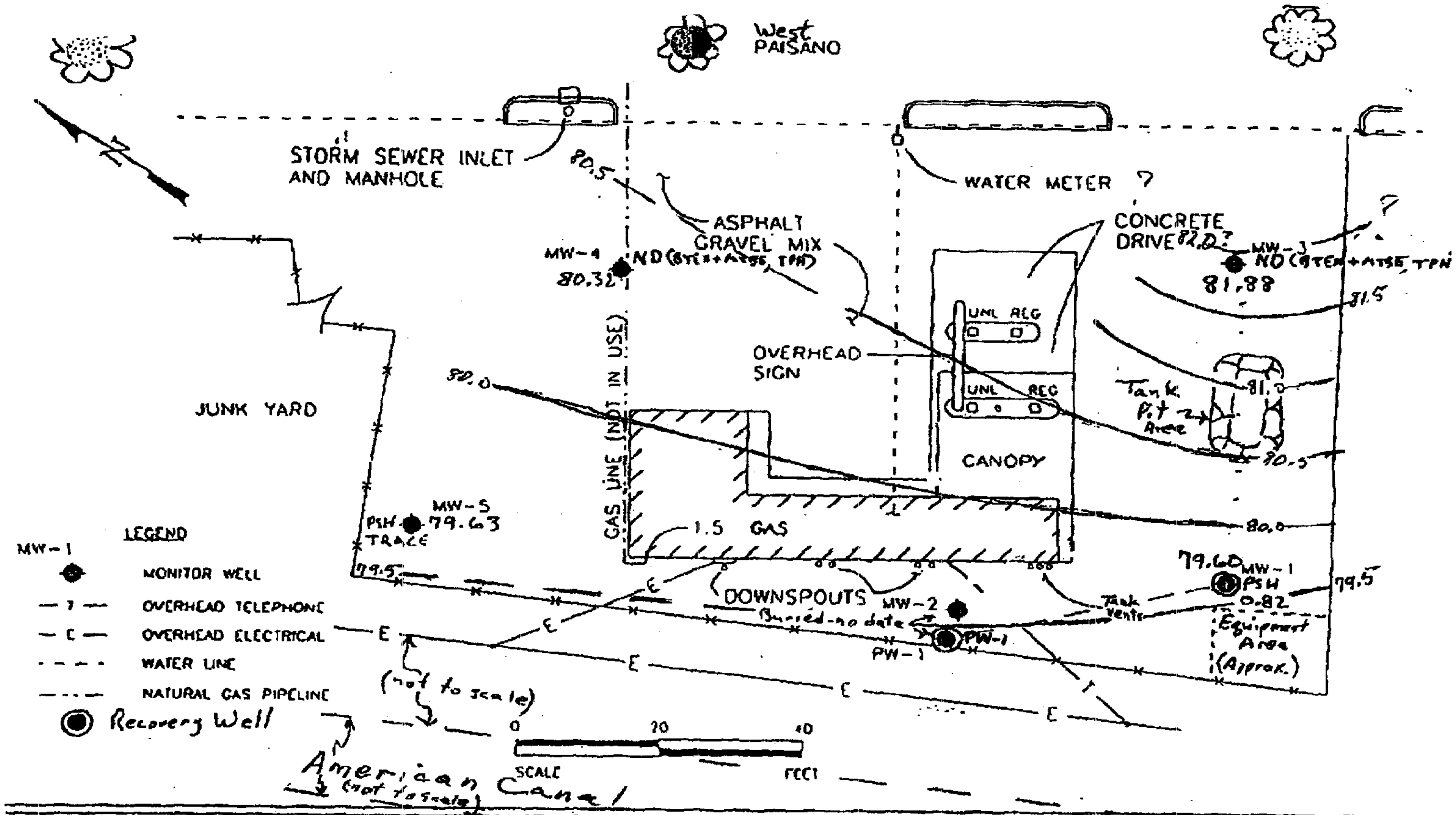
FIGURE

Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors

L.10 – BELL THUNDERBIRD UST FACILITY DOCUMENTS

- **UST Facility Diagram**
  (Source: TNRCC)

- **Monitor Well Water Data**
  (Source: ENCON, 1999)



Potentiometric Contours 1/15/97

RIO GRANDE THUNDERBIRD, 2000 W. Paisano, El Paso, TX
LPST # 096823

Date:	Contour Interval:	Prepared By:	SK ENGINEERING
1/15/97		RD 1/22/97	1122 S. Bryant Blvd., San Angelo, Texas 76903

ANALYTICAL REPORT

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
[illegible] Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

CLIENT ENCON
7307 REMCON CIRCLE
EL PASO, TX 79912

SAMPLE NO. : 993331
INVOICE NO.: 22104422
REPORT DATE: 08-07-99
REVIEWED BY:
PAGE : 1 OF 2

CLIENT SAMPLE ID : MW #1
SAMPLE TYPE .....: water
SAMPLED BY ......: R.K.
SUBMITTED BY ....: R.K.
SAMPLE SOURCE ...: 122-9
ANALYST ....: A. Donohue

AUTHORIZED BY : R. Kommajosyula
CLIENT P.O. : --
SAMPLE DATE ...: 07-23-99
SUBMITTAL DATE : 07-23-99
EXTRACTION DATE: --
ANALYSIS DATE .: 07-26-99

Petroleum Contaminants by 8021B

DATA TABLE

Parameter	Result	Unit	Detection Limit
Benzene ....:	900	ug/L	1.0
Toluene ....:	25.	ug/L	1.0
Ethylbenzene ....:	100	ug/L	1.0
Total Xylenes ....:	39.	ug/L	1.0
Methyl Tert-Butyl Ether ....:	18.	ug/L	5.0

(1) Copy to Client

MANAGING DIRECTOR

ANALYTICAL REPORT

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9   Lubbock, Texas 79424   800•378•1296   806•794•1296   FAX 806•794•1298
Ripley Avenue, Suite A   El Paso, Texas 79922   888•588•3443   915•585•3443   FAX 915•585•4944
E-Mail: lab@traceanalysis.com

CLIENT ENCON
7307 REMCON CIRCLE
EL PASO, TX 79912

SAMPLE NO.: 993331
INVOICE NO.: 22104422
REPORT DATE: 08-07-99
REVIEWED BY: ✓
PAGE : 1 OF 1

CLIENT SAMPLE ID : MW #1
SAMPLE TYPE .....: water
SAMPLED BY ......: R.K.
SUBMITTED BY ....: R.K.
SAMPLE SOURCE ...: 122-9
ANALYST ....: D.Guzman

AUTHORIZED BY : R. Kommajosyula
CLIENT P.O. : --
SAMPLE DATE ...: 07-23-99
SUBMITTAL DATE : 07-23-99
EXTRACTION DATE: 07-29-99
ANALYSIS DATE .: 07-29-99

TPH TX1005

DATA TABLE

Parameter	Result	Unit	Detection Limit
C6-C10 ....:	<5.0	mg/L	5.0
>C10-C28 ....:	8.8	mg/L	5.0
C6-C28 ....:	8.8	mg/L	5.0

(1) Copy to Client

MANAGING DIRECTOR

TRACEANALYSIS, INC.
6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

ANALYTICAL REPORT

CLIENT ENCON
7307 REMCON CIRCLE
EL PASO, TX 79912

SAMPLE NO.: 993332
INVOICE NO.: 22104422
REPORT DATE: 08-07-99
REVIEWED BY:
PAGE : 1 OF 2

CLIENT SAMPLE ID : MW #5
SAMPLE TYPE .....: water
SAMPLED BY ......: R.K.
SUBMITTED BY ....: R.K.
SAMPLE SOURCE ...: 122-9
ANALYST ....: A. Donohue

AUTHORIZED BY : R. Kommajosyula
CLIENT P.O. : --
SAMPLE DATE ...: 07-23-99
SUBMITTAL DATE : 07-23-99
EXTRACTION DATE: --
ANALYSIS DATE .: 07-26-99

REMARKS -

MTBE detection limit raised due to dilution.

Petroleum Contaminants by 8021B

DATA TABLE

Parameter	Result	Unit	Detection Limit
Benzene	15.	ug/L	1.0
Toluene	<1.0	ug/L	1.0
Ethylbenzene	3.5	ug/L	1.0
Total Xylenes	1.7	ug/L	1.0
Methyl Tert-Butyl Ether	<5.0	ug/L	5.0

(1) Copy to Client

MANAGING DIRECTOR

ANALYTICAL REPORT

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

CLIENT ENCON
7307 REMCON CIRCLE
EL PASO, TX 79912

SAMPLE NO.: 993332
INVOICE NO.: 22104422
REPORT DATE: 08-07-99
REVIEWED BY: ✓
PAGE : 1 OF 1

CLIENT SAMPLE ID : MW #5
SAMPLE TYPE .....: water
SAMPLED BY ......: R.K.
SUBMITTED BY ....: R.K.
SAMPLE SOURCE ...: 122-9
ANALYST ....: D.Guzman

AUTHORIZED BY : R. Kommajosyula
CLIENT P.O. : --
SAMPLE DATE ...: 07-23-99
SUBMITTAL DATE : 07-23-99
EXTRACTION DATE: 07-29-99
ANALYSIS DATE .: 07-29-99

TPH TX1005

DATA TABLE

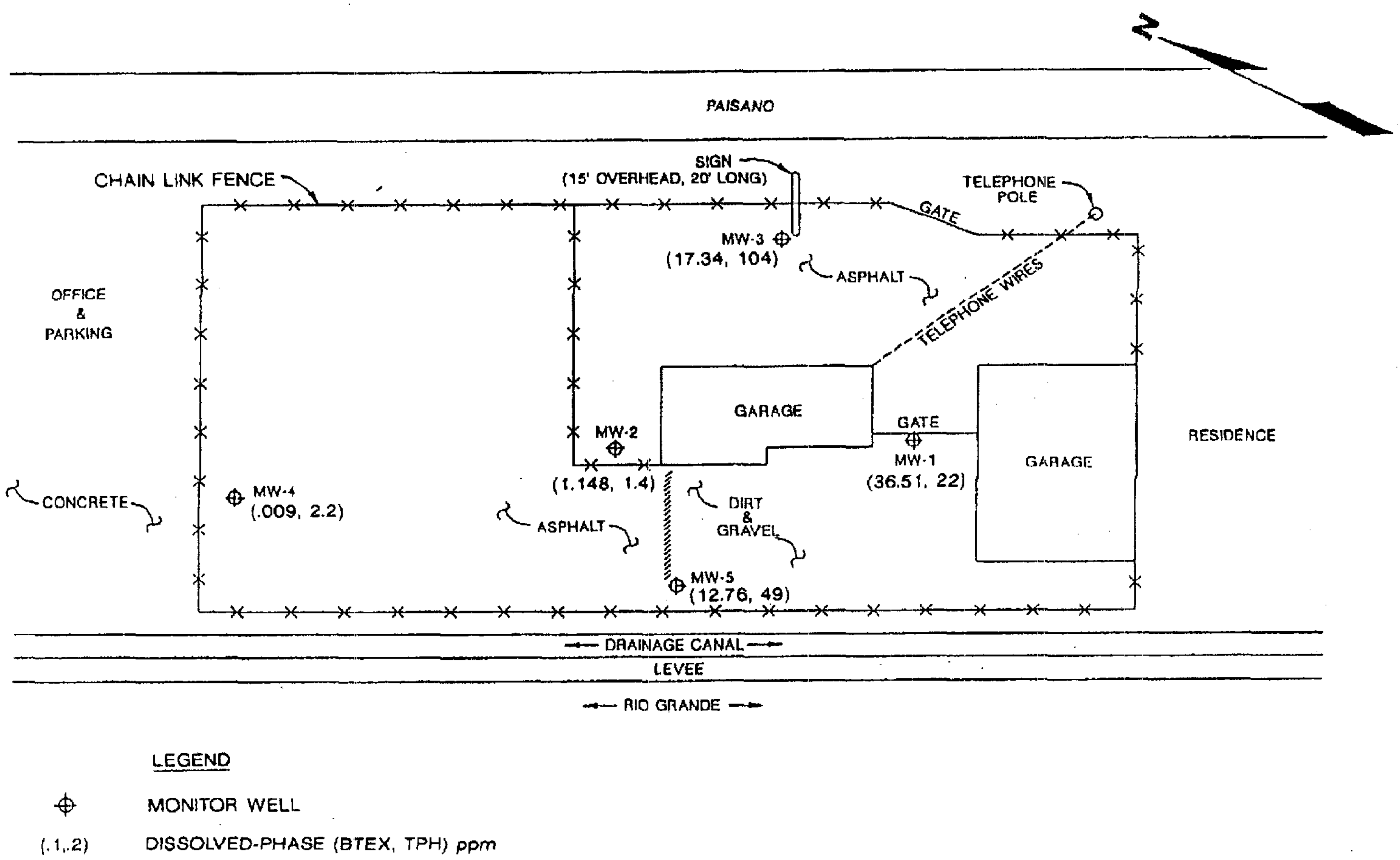
Parameter	Result	Unit	Detection Limit
C6-C10 ....:	<5.0	mg/L	5.0
>C10-C28 ....:	14.	mg/L	5.0
C6-C28 ....:	14.	mg/L	5.0

(1) Copy to Client

MANAGING DIRECTOR

L.11 – PAISANO AUTO SALVAGE UST MAPS

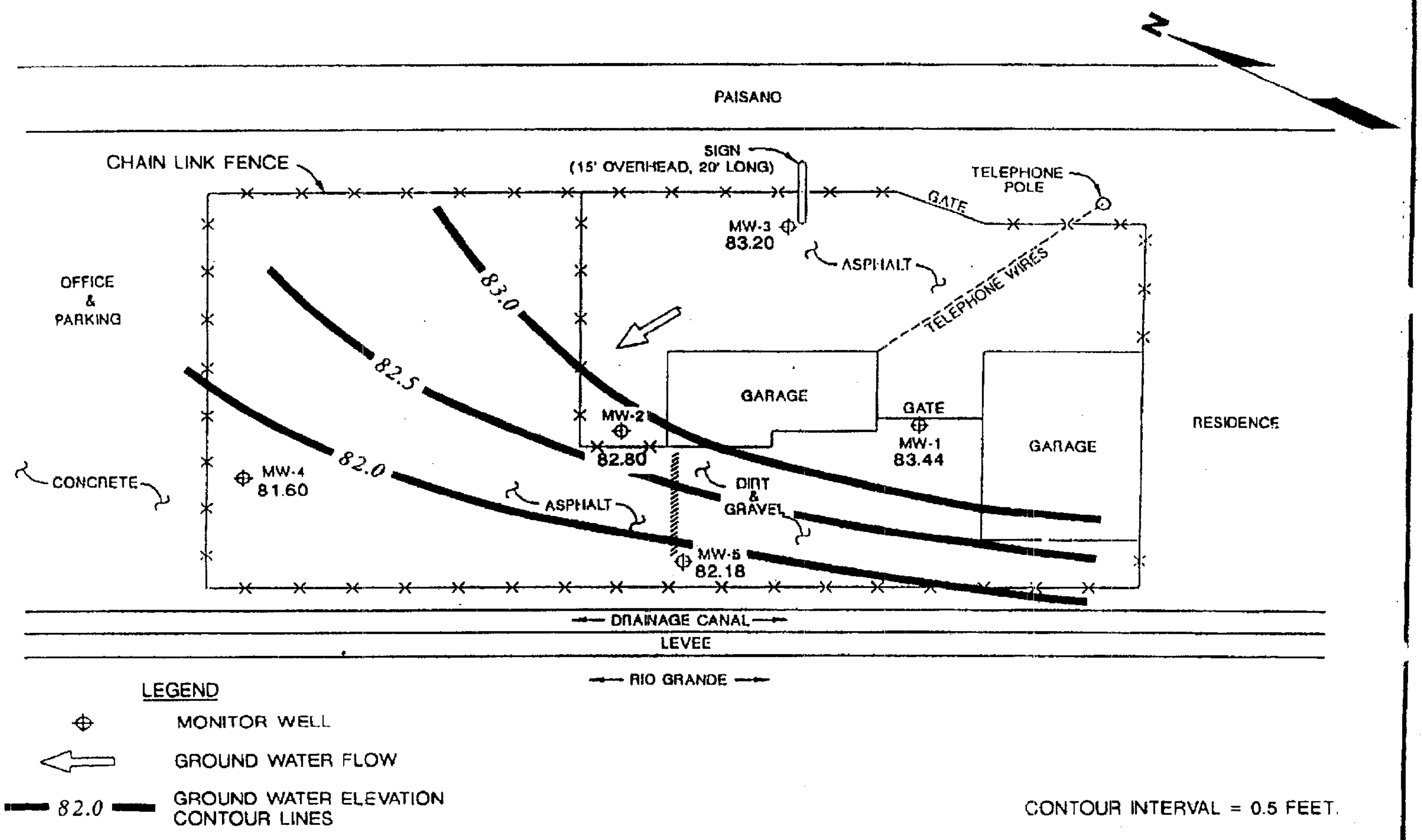
(Source: TNRCC, 1992)



ERM-Southwest, inc.
NEW ORLEANS, LOUISIANA HOUSTON, TEXAS

DATE	02/07/92	W.O.NO.	0426A013

FIGURE 3-1
DISSOLVED-PHASE HYDROCARBON CONCENTRATIONS
JANUARY 3, 1992
Paisano Auto Salvage
1900 W. Paisano
El Paso, Texas



ERM-Southwest, inc.
NEW ORLEANS, LOUISIANA HOUSTON, TEXAS

DATE 02/07/92 W.O.NO. 0426A012

FIGURE 2-1
WATER TABLE ELEVATION
JANUARY 3, 1992
Paisano Auto Salvage
1900 W. Paisano
El Paso, Texas

L.12 – USIBWC INTERNATIONAL DAM UST DOCUMENTS

(Source: USIBWC, 1997)

EMD file

Barry R. McBee, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
John M. Baker, *Commissioner*
Dan Pearson, *Executive Director*

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

February 3, 1997

Mr. Yusuf E. Farran
Division Engineer, EMD
International Boundary and Water Commission
4171 N. Mesa Street
El Paso, Texas 79902

Re: Leaking Product Storage Tank (LPST) Case Closure of Subsurface Contamination at the International Dam, Rio Grande Floodway, El Paso (El Paso County), Texas (LPST ID No. 107801 - Facility ID No. N/A)

Dear Mr. Farran:

This letter confirms the completion of corrective action requirements for the release incident at the above-referenced facility. Based upon the submitted information and with the provision that the documentation provided to this agency was accurate and representative of site conditions, we concur with your recommendation that the site has met the closure requirements. No further corrective action is necessary.

For any subsequent release after case closure from an underground or aboveground storage tank at sites eligible for reimbursement, the deductible will be increased in accordance with Section 26.3512 of the Texas Water Code. Please note that financial assurance must be maintained for all operational storage tanks at this site.

Please be advised that all monitor wells which are not now in use and/or will not be used in the next 180 days must be properly plugged and abandoned pursuant to Chapter 32.017 of the Texas Water Code and in accordance with Title 30, Texas Administrative Code (TAC), Section 338.48-338.50. Plugging and abandonment reports (Form No. WWD-009) are required to be submitted to the Water Well Drillers Program of the Texas Natural Resource Conservation Commission (TNRCC) within thirty (30) days of plugging completion. If you have any questions regarding the future use of an existing monitor well, please contact the TNRCC Water Well Drillers Unit of the Occupational Certification Section of the Environmental Training Division at 512/239-0530.

If any monitor well plugging or other necessary site restoration activities will be performed to complete site closure, please prepare a *Final Site Closure Report* to document the conclusion of actual site closure. For sites which are eligible for reimbursement through the Petroleum Storage

P.O. Box 13087 • Austin, Texas 78711-3087 • 512/239-1000
printed on recycled paper using soy-based ink

Int'l Dam

Tank Remediation Fund, written preapproval should be obtained prior to initiation of any remaining site closure activities. Reimbursement claims for activities that were not preapproved will not be paid until all claims for preapproved work are processed and paid.

Please note that the *Final Site Closure Report*, if necessary, will be the last submittal associated with this case. This final concurrence letter signifies the completion of corrective action associated with the release. No subsequent TNRCC correspondence will be issued in response to the *Final Site Closure Report*.

Please ensure that all correspondence with this Office includes the LPST ID Number and is submitted to both the local TNRCC Regional Field Office and to the Central Office in Austin.

Should you have any questions, please contact Richard Scharlach of my staff at 512/239-5806. Please reference the LPST ID Number when making inquiries. Your cooperation in this matter has been appreciated.

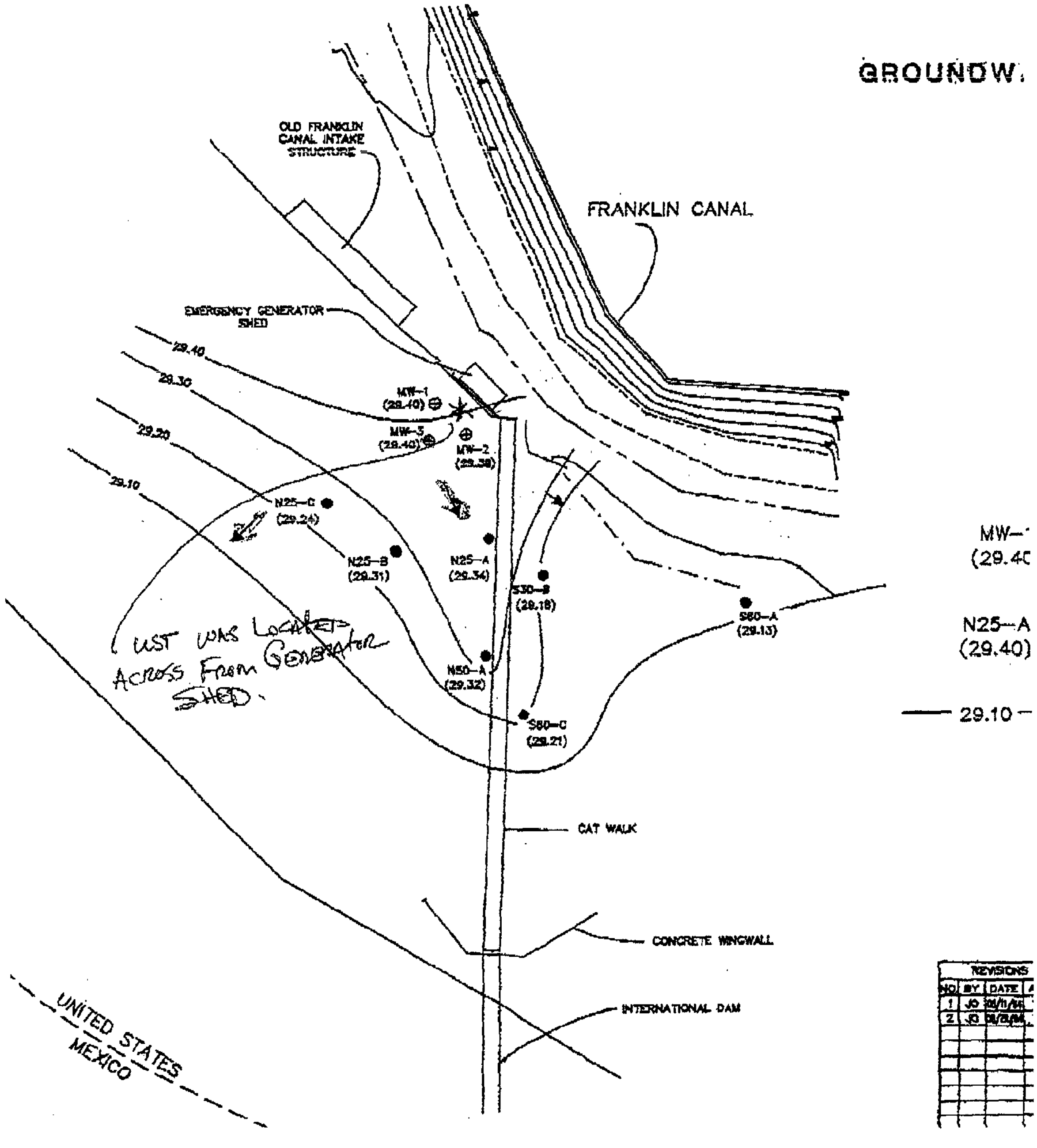
Sincerely,

Liz Scaggs, Team Leader
Responsible Party Remediation Section, Team II
Petroleum Storage Tank Division

LAS/RAS/keh
107801.fnn

cc: Terry McMillian, TNRCC Region 6 Field Office, 915/778-9634
(7500 Viscount Blvd., El Paso, Texas 79925)
Warren Samuelson, TNRCC Occupational Certification Section

International Dam

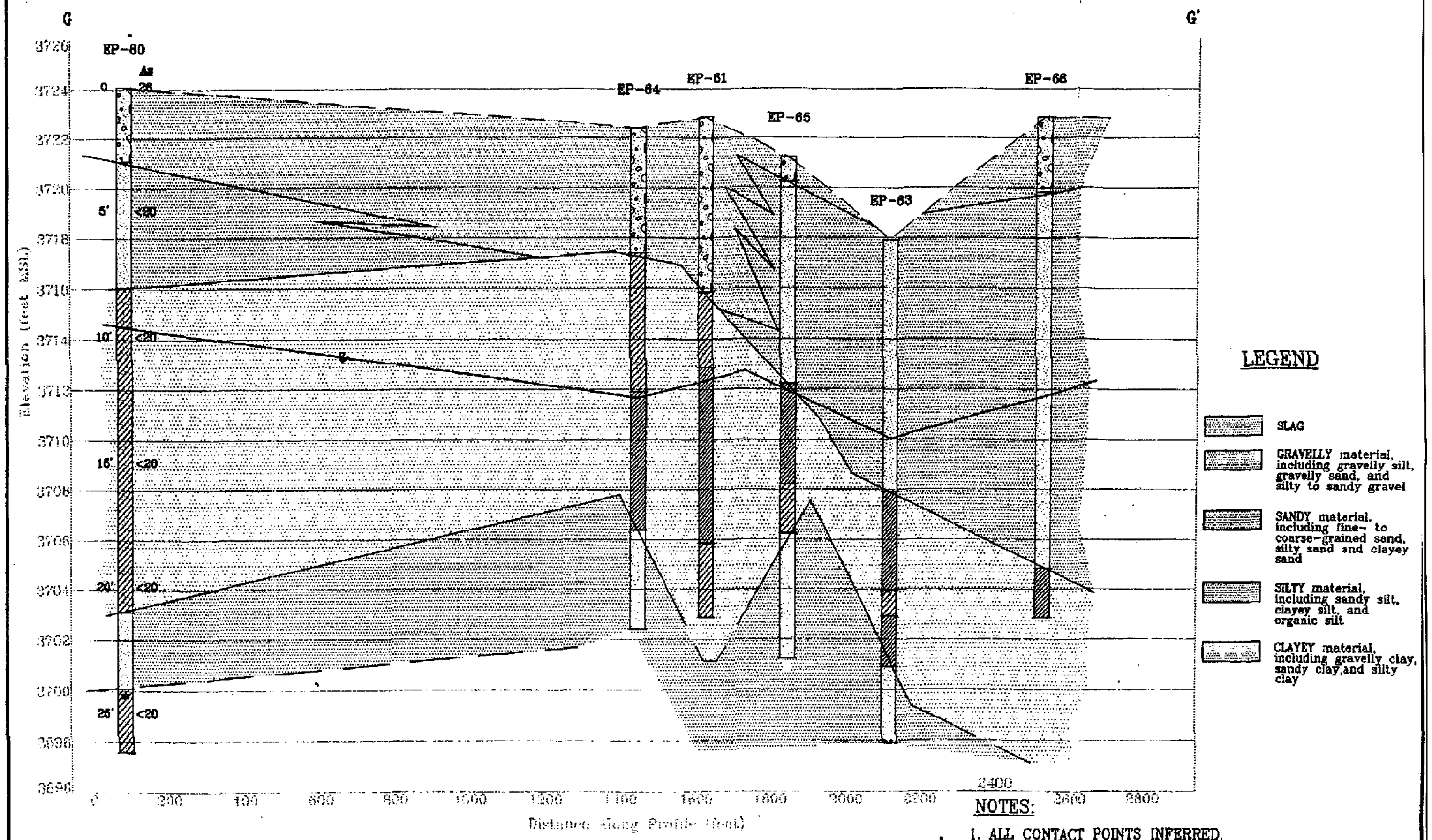


UST was Located Across From Generator Shed.

L.13 – HYDROGEOLOGIC CROSS-SECTION MAP

Hydrogeologic Cross-section Map for ASARCO Monitor Wells in Upper Open Channel Area

(Source: ASARCO, 1998)



GEOLOGIC CROSS-SECTION G – G'

(LOOKING WEST)
HORIZONTAL: 1"=240'
VERTICAL: 1"=4'

NOTES:

1. ALL CONTACT POINTS INFERRED.
2. WATER TABLE CALCULATED FROM FEB. 1998 DATA.
3. As = ARSENIC CONCENTRATION IN SOIL SAMPLE COLLECTED AT DEPTH INDICATED.

ASARCO INCORPORATED EL PASO COPPER SMELTER REMEDIAL INVESTIGATION REPORT EL PASO, TEXAS	HYDROGEOLOGIC CROSS-SECTION G - G'	FIGURE 2-33

UPDATE TIME: 11:00
0006, O:\74\065\0180\TUC\081898\V:\STORAGE\75498U28.DWG

Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors

L.14 – LOWER OPEN CHANNEL SOIL DATA

Lower Open Channel Levee Soil Laboratory Results

(Source: ENCON, 1999)

TRACEANALYSIS, INC. **ANALYTICAL REPORT**

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915
E-Mail: lab@traceanalysis.com

CLIENT ENCON INTERNATIONAL
7307 REMCON #101
EL PASO, TX 79912

SAMPLE NO. : 993213
INVOICE NO.: 22104393
REPORT DATE: 07-28-99
REVIEWED BY:
PAGE : 1 OF 2

CLIENT SAMPLE ID : GP #1
SAMPLE TYPE .....: soil
SAMPLED BY ......: R.K
SUBMITTED BY ....: R.K
SAMPLE SOURCE ...: 122-9

AUTHORIZED BY : R. Kommajosyula
CLIENT P.O. : --
SAMPLE DATE ...: 07-16-99
SUBMITTAL DATE : 07-16-99
EXTRACTION DATE: --

REMARKS -

Matrix spike and matrix spike duplicate were out of acceptance criteria range possibly due to matrix interference for the following parameters: Silver, Cadmium, Lead & Chromium.
Reporting limit for Selenium was raised as sample was analyzed diluted to avoid matrix interference.

METALS - SOLID

DATA TABLE

Parameter	Result	Unit	Detection Limit	Analysis Date	Test Method	Analyst
Total Silver ....:	<1.3	mg/Kg	1.30	07-26-99	3111B	N. Munir
Total Arsenic ....:	11.	mg/Kg	5.00	07-26-99	6010B	N. Munir
Total Barium ....:	190	mg/Kg	5.00	07-26-99	6010B	N. Munir
Total Cadmium ....:	<5.0	mg/Kg	5.00	07-26-99	6010B	N. Munir
Total Chromium ....:	5.8	mg/Kg	2.50	07-26-99	3050B/3111B	N. Munir
Total Lead ....:	56.	mg/Kg	5.00	07-26-99	6010B	N. Munir
Total Selenium ....:	<10.	mg/Kg	10.0	07-26-99	6010B	N. Munir

(1) Copy to Client

Karen Costa

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

ANALYTICAL REPORT

CLIENT **ENCON INTERNATIONAL**
7307 REMCON #101
EL PASO, TX 79912

SAMPLE NO. : 993213
INVOICE NO.: 22104393
REPORT DATE: 07-28-99
REVIEWED BY: V
PAGE : 2 OF 2

DATA TABLE (Continue)

Parameter	Result	Unit	Detection Limit	Analysis Date	Test Method	Analyst
Total Mercury ....:	<0.50	mg/Kg	0.50	07-21-99	SW-7470	N. Munir
Total Nickel ....:	3.9	mg/Kg	5.00	07-26-99	6010B	N. Munir

(1) Copy to Client

TRACEANALYSIS, INC.
6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

ANALYTICAL REPORT

CLIENT ENCON INTERNATIONAL
7307 REMCON #101
EL PASO, TX 79912

SAMPLE NO. : 993214
INVOICE NO.: 22104393
REPORT DATE: 07-28-99
REVIEWED BY: ✓
PAGE : 1 OF 1

CLIENT SAMPLE ID : GP #4
SAMPLE TYPE .....: soil
SAMPLED BY ......: R.K
SUBMITTED BY ....: R.K
SAMPLE SOURCE ...: 122-9

AUTHORIZED BY : R. Kommajosyula
CLIENT P.O. : --
SAMPLE DATE ...: 07-16-99
SUBMITTAL DATE : 07-16-99
EXTRACTION DATE: --

METALS - SOLID

DATA TABLE

Parameter	Result	Unit	Detection Limit	Analysis Date	Test Method	Analyst
Total Lead ....:	21.	mg/Kg	5.00	07-26-99	6010B	N. Munir

(1) Copy to Client

Karen Casto

TRACEANALYSIS, INC. ANALYTICAL REPORT

6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

CLIENT ENCON INTERNATIONAL
7307 REMCON #101
EL PASO, TX 79912

SAMPLE NO. : 993215
INVOICE NO.: 22104393
REPORT DATE: 07-28-99
REVIEWED BY:
PAGE : 1 OF 1

CLIENT SAMPLE ID : GP #5
SAMPLE TYPE .....: soil
SAMPLED BY ......: R.K
SUBMITTED BY ....: R.K
SAMPLE SOURCE ...: 122-9

AUTHORIZED BY : R. Kommajosyula
CLIENT P.O. : --
SAMPLE DATE ...: 07-16-99
SUBMITTAL DATE : 07-16-99
EXTRACTION DATE: --

METALS - SOLID

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date	Test Method	Analyst
Total Lead ....:	6.8	mg/Kg	5.00	07-26-99	6010B	N. Munir

(1) Copy to Client

Karen Costa

TRACEANALYSIS, INC.
ANALYTICAL REPORT
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

CLIENT ENCON INTERNATIONAL
7307 REMCON #101
EL PASO, TX 79912

SAMPLE NO. : 993216
INVOICE NO.: 22104393
REPORT DATE: 07-28-99
REVIEWED BY: K
PAGE : 1 OF 1

CLIENT SAMPLE ID : GP #6
SAMPLE TYPE .....: soil
SAMPLED BY ......: R.K
SUBMITTED BY ....: R.K
SAMPLE SOURCE ...: 122-9

AUTHORIZED BY : R. Kommajosyula
CLIENT P.O. : --
SAMPLE DATE ...: 07-16-99
SUBMITTAL DATE : 07-16-99
EXTRACTION DATE: --

METALS - SOLID

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date	Test Method	Analyst
Total Lead ....:	15.	mg/Kg	5.00	07-26-99	6010B	N. Munir

(1) Copy to Client

MANAGING DIRECTOR

L.15 – LETTER FROM US DEPT. OF THE ARMY, ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS

DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
El Paso Regulatory Office
P.O. Box 6096
FORT BLISS, TEXAS 79906-6096
FAX (915) 568-1348

September 24, 1999

REPLY TO
ATTENTION OF:

Operations Division
Regulatory Branch

Mr. John Knopp
ENCON International, Inc.
7307 Remcon Circle, Suite 101
El Paso, Texas 79912

Dear Mr. Knopp:

Reference is made to your telefax dated September 23, 1999 regarding International Boundary and Water Commission' proposed replacement of an approximately 2-mile segment of the American Canal in El Paso, El Paso County, Texas. (Action No. 1999-50132)

We have studied the project description, other records, and documents available to us. The project is not regulated under the provisions of Section 404 of the Clean Water Act and a Department of the Army permit will not be required. This determination was made because no dredged or fill material will be placed into waters of the United States, including wetlands.

Should you have any questions, please feel free to write or call me at (915) 568-1359.

Sincerely,

Daniel Malanchuk

Daniel Malanchuk
Chief, El Paso
Regulatory Office

Copies furnished w/cy incoming:

El Paso Reg Ofc

L.16 – RECORDS OF CONVERSATION

RECORD OF CONVERSATION - ENCON File # 122-9
Water

Name: Robert Riley

Agency: El Paso Water Utilities

Date/Time: 11/1/99

Phone No.: 915-594-5402

Canal Street Plant has been converted to treat only river water.

Treats 42 MGD

Plant can convert to groundwater treatment in 1 to 2 days, but only 5 MGD.

Recommended Action or Response

Name and Date: John Knopp 11/1/99

RECORD OF CONVERSATION - ENCON File # 122-9
Water

Name: Dr. Doug Rittman **Date/Time:** Nov. 7, 1999

Agency: EPWU - PSB, Water System Div. **Phone No.:** 915-594-5773

At present, there is a maximum production of 80 MGD from River Water and 150 MGD from wells for a maximum production of 2230 MGD. They are planning to expand Jonathan Rogers plant from 40 to 60 then 80 MGD in the next 5 years or so.
Later, they hope to build an 80 MGD plant in the Upper Valley near Anthony to increase river water treatment to 160 MGD. At present, a peak day demand is 150 MGD (70% from lawn watering) and a minimum day is about 60 MGD. But for peak demand, you need to include a 17% safety factor or 194 MGD.

They sell water for $1.50 per 1000 gal or $1500 per MG. If they lost both American Canal-fed plants due to a canal repair, they would lose approximately $150,000 per day or $4.5 million per 30 days. Also there would be extreme water rationing, especially to stop all yard watering.

Recommended Action or Response

Name and Date: John Knopp 11/7/99

RECORD OF CONVERSATION - ENCON File # 122-9
Water

Name: Wayne Treers

Agency: Bureau of Reclamation, Water Operations

Date/Time: 10/29/99 10:00 am

915-534-6299 fax

Phone No: 915-534-6321

BOR releases stored water from Caballo Dam at the request of

- EPCWID#1: Water diverted into Franklin Canal and transported through City to Lower Valley Farms
- EPWU-PSB: Diverts water for treatment at Jonathon Rogers and Canal Street Water Plants (City of El Paso). CEP uses approximately 52,000 acre feet of water per year.
- USIBWC (for Mexico): Mexico is considering taking its water allotment from the RGACE near the Zaragosa Bridge. At present Mexico still takes its allotment from International Bridge.

EPCWID#1, CEP, Mexico order water from BOR each day, but delivery takes about 3 days:

- Day 1: Caballo Dam to Leasburg Dam
- Day 2: Leasburg Dam to Mesilla Dam
- Day 3: Mesilla Dam to Courshesne Bridge near headgates of American Canal

USIBWC operates International Dam, but Mexico operates headgates of Acequia Madre. BOR owns the other diversion dams (Leasburg, Mesilla, American, Riverside). In 1996 BOR turned over title of canal systems to either Elephant Butte Irrigation District or El Paso County Water Improvement District #1.

American Canal includes water from 1) river, 2) rainfall spikes, and 3) runoff from Paisano Drive.

BOR does not have estimates of losses from Canal. However, "PAN Evaporation losses" are estimated as approximately 120 inches per year at Elephant Butte Dam and 112 inches per year at Caballo Dam. From RGACE experience, Mr. Treers believes that evaporation loss from the swift-flowing water in the Canal would be much less than from either dam, perhaps half. But he does not consider evaporation losses from the canal to be significant compared to other needs such as safety or maintenance.

National Weather Service for El Paso provides annual and monthly Climatological Data for the area on the Net. Mr. Treers suggests using Ysleta Station Data. Ken Rakestraw in Water Accounting at USIBWC might know evaporation losses.

Any rebuilding of the Canal needs to leave at least 100 feet of open channel downstream from the gauging shelter for BOR to be able to accurately measure the Canal flow. BOR does not have a preference for closed or open canal segments if the minimum 100-foot canal length is left as open channel.

Addendum June 1, 2000

For ease of gauging, BOR would prefer the Open Canal Alternative #4. However, any of the alternatives except the No Action Alternative would be acceptable as long as the gauging station remains in the same location and 100 feet or more open channel is left downstream from the gauging station for accurate flow measurements.

Name and Date: John Knopp, Oct. 29, 1999

RECORD OF CONVERSATION - ENCON File # 122-9

Water (Page 1 0f 2)

Name: Edd Fifer & Frank Marquez , Chairman, Supervisor

Date/Time: 10/29/99 10:00 am

Agency: El Paso County Water Improvement District #1

Phone No: 859-4186

Capacity issues of the American Canal:

- Average daily Canal flow ranges from approximately 900 – 1000 cfs in March, then drops to 750 cfs or less, then increases to between 1000 – 1200 cfs in the July peak summer irrigation season.
- If Mexico chooses to divert its 60,000 acre foot allotment of water from the RGACE near Riverside Dam, the canal will have to carry an extra 335 cfs.
- By July, the regular water allotment (Allotment #1) is generally exhausted. Then the principal source of "Allotment #2 water becomes "return flow" or rainfall runoff from Caballo Dam through El Paso. Return flow comprises approximately 41% of the flow in the Canal, and is essential for meeting irrigation needs.
- Stormwater flowing into the Canal from the College Arroyo near the International Dam can reach 250 – 400 cfs during a typical heavy July rainfall, but reached a maximum of 1500 cfs during one rainfall in the early 1970s. In a peak rainfall, runoff can be discharged from the Canal into the River through Wasteway #1 near the International Dam.
- Wasteway #1 is now automated, and can release up to 1500 cfs of water from the Canal into the river below the International Dam. However, if a heavy rain occurs between Caballo Dam and El Paso, the gates could go under water and cease to function, the dam could be destroyed, and flooding could occur all along the RGACE, the Franklin Canal, and especially the Acequia Madre in Juarez.

Telemetry Sites or "black boxes" upriver automatically gauge the river flow and transmit the data to BOR and IBWC, and EPCWID#1.

Name and Date: John Knopp June 1, 2000

RECORD OF CONVERSATION - ENCON File # 122-9
Water (Page 2 of 2)

Name: Edd Fifer (& Frank Marquez) **Date/Time:** 10/29/99 10:00 am

Agency: El Paso County Water Improvement District #1 **Phone No:** 859-859-4186

EPCWID#1 Fears concerning the American Canal (RGACE):

- The American Dam has eight sections, but the smaller International Dam has only four. It is more vulnerable to hydrological pressure in a flood. (This was a real fear with the heavy rains near Leasburg Dam in 1999. BOR diverted 1600 cfs into the RGACE to protect the aging International Dam from the 7000 cfs storm flow, then returned 1450 cfs back into the new RGACE extension below the Dam. Serious damage to the Dam and serious flooding was averted.

- Fast-moving surges of water in storm flows can destroy old concrete canal linings.
- Storm flows have popped the seals out from between new concrete sections of canal.
- A June 9, 1987 failure of the small downstream Riverside Dam put 32,000 acres of farmland at risk of having no irrigation water. EPCWID#1 employees worked 72 hours continuously to finish a temporary coffer dam to divert water from the Rio Grande to the Lower Valley. The EPCWID#1 was not reimbursed by any agency for paying the huge amount of money in overtime wages in the emergency.
- A failure in the aging RGACE (where there is no location to construct a temporary canal) would be much worse than the 1987 Riverside Dam failure. A failure in the high flow period in July could easily result in the canal being unusable for 30 days of emergency repairs. Thousands of farmers would lose their entire crop, and up to 500 farmers would lose their farms in bankruptcies. Farmers would suffer up to $20 Million in crop losses, and EPCWID#1 would lose approximately $0.5 Million in lost revenues. The local agribusiness ripple effect of the farm losses could reach up to $300 Million. Further, the City of El Paso would have insufficient water treat to meet its customer and fire demands.

Mr. Fifer's chief concern is that the aging canal be replaced to avert a possible catastrophe in Juarez or El Paso. Any of the construction alternatives are acceptable except the No Action Alternative which Mr. Fifer believes would guarantee future canal failure and economic disaster.

Addendum May 16, 2000

The snow runoff was down 83% this year, yielding only 17% of normal runoff being added to storage. Water is more critical than ever. The EPCWID#1 prefers Alternative 4, the Open Channel Alternative, but finds any of the others also acceptable except the No Action Alternative.

Name and Date: John Knopp June 1, 2000

APPENDIX M

(Hazardous Waste Disposal Section)

- **Hazardous Waste Disposal Text**

HAZARDOUS WASTE DISPOSAL

1.0 DEFINITION OF HAZARDOUS WASTE

In 1976, the US Congress defined "hazardous waste" in Section 1004 of the Resource Conservation and Recovery Act (RCRA) as:

> "….. a solid waste or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may …
>
> A) cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or
>
> B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed…."

It should be noted that the "solid waste" category used in the RCRA definition includes liquids, sludges, and containerized gases.

Hazardous wastes do not include wastes which are discharged directly into the air or water as those wastes are regulated under prior air and water laws which predated RCRA.

Under EPA regulations, there are three ways in which a solid waste is considered to be a "hazardous waste", viz.,

1) The known waste is specifically listed in EPA regulations, generally with an assigned hazardous waste number,
2) The waste meets one of the four EPA characteristics for hazardous wastes: ignitable, corrosive, reactive, or toxic, or
3) Based on knowledge of the waste, it is declared hazardous by the waste generator, the entity which produced the waste.

2.0 CLASSIFICATION OF HAZARDOUS WASTE

Ignitable wastes are either solids capable of causing a fire under standard temperature and pressure, or liquids with flashpoints below 60°Centigrade.

Corrosive wastes are aqueous (dissolved in water) wastes with a pH above 12.5 or below 2.0, or which corrode steel at a rate greater than 0.25 inches per year.

Reactive wastes are normally unstable, form potentially explosive mixtures with water, or react violently with air or water. This group includes materials capable of detonation and wastes that emit toxic fumes when mixed with water.

Toxic wastes are those toxic substances, which through the EPA laboratory Toxic Characteristic Leaching Procedure (TCLP), are shown to be likely to leach into groundwater if placed in a municipal landfill.

3.0 FEDERAL, STATE, AND LOCAL REGULATORY AUTHORITY

The Resource Conservation and Recovery Act of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984 authorized EPA and state environmental agencies to regulate and supervise the handling, storage, transportation, and disposal of hazardous wastes. In Texas, that task is supervised by the Texas Natural Resources Conservation Commission. Locally, the City and County of El Paso apply TNRCC regulations for hazardous wastes.

4.0 POTENTIAL HAZARDOUS WASTES LOCATED IN THE CANAL RECONSTRUCTION AREA

It is expected that during reconstruction activities, there may be no hazardous wastes as containerized gases, but there may be hazardous waste liquids or sludges (i.e., soil or groundwater contaminated with hydrocarbons, etc.)

As discussed in the Water Quality Section, hydrocarbon contamination in soil and groundwater has been found in the vicinity of all three Open Channel segments of the American Canal. Heavy metals have been detected in groundwater samples from the Upper and Middle Open Channel segments.

4.1 Heavy Metals In Groundwater and Soils

The heavy metals concerns in the Upper Open Channel area are lead in the soil (probably from airborne deposits), as well as arsenic and cadmium in the groundwater. In the Middle Open Channel area, elevated levels of arsenic, selenium, and cadmium have been found in monitor wells. The concentration of metals in the water varies greatly, even between monitor wells less than 50 feet apart. The principal source of these three metals is thought to be the old ponds at the nearby ASARCO smelter facility, but may also have been nearby brick plants, other area industries, and natural sources.

No data concerning heavy metals in soil or water were available for the Lower Open Channel area. Across West Paisano Drive from the Lower Open Channel is an historic manufacturing area where there may have been past releases of heavy metals. The El Paso City Directories list a former metal plating facility which was known as PMH Electroplating at 101 Ruhlin Court (located on the east side of Paisano Drive, approximately 200 yards east of the Lower Open Channel) from 1980 through 1982. Mr. Terry McMillan of TNRCC Region 6 remembered hearing of a possible release of plating chemicals from the facility, but no TNRCC records could be found. In an area of the Lower Open Channel east levee, that appeared to be "downstream" from any stormwater runoff from the former plating facility, ENCON personnel obtained surface soil samples and geoprobe subsurface soil samples. However, the results of the laboratory analyses (included in supporting documentation of Appendix L) did not indicate elevated levels of any heavy metals in these soil samples.

4.2 Hydrocarbons in Groundwater and Soils

Six known diesel or gasoline releases have been documented in the area of the American Canal: two which affected the Upper Open Channel area, one which affected the Middle Open Channel area, and three which affected the Lower Open Channel. Two former Underground Storage Tank (UST) facilities have received TNRCC closure. (A discussion of these UST facilities is included in the Water and Soil Section of this Report, Appendix L.)

5.0 POSSIBLE HAZARDOUS WASTE EXPOSURES OCCURRING DURING RECONSTRUCTION

Characteristics of the hazardous wastes likely to be encountered in soil and groundwater during reconstruction activities are summarized in the table below. Lead was not included in this table as a potentially significant contaminant since elevated lead levels have only been detected in shallow soils.

CHARACTERISTICS OF HAZARDOUS WASTE CONTAMINANTS

Substance→	**Hazardous Waste Contaminant**			
Parameter ↓	**Arsenic**	**Selenium**	**Cadmium**	**Hydrocarbons**
Unusual Characteristics	Can react with hydrogen gas to form highly toxic arsine	None	None	Flammable liquids
Carcinogenic?	Yes	No	Yes	Yes
IDLH Respiratory Concentration	5 mg/m^3	1 mg/m^3	9 mg/m^3	Not determined
8-hr OSHA Respiratory Exposure Limit (TWA)	0.010 mg/m^3	0.2 mg/m^3	0.005 mg/m^3	Not determined, but NIOSH recommends SCBA protection if free product is encountered
Flashpoint	• None in solid form • Slight explosion hazard as dust when exposed to flame	None	• None in solid form • Will burn in powder form	Gasoline = -45°F Diesel = 125°F
Is PPE recommended during worker exposure exceeding OSHA TWA?	Yes	Yes	Yes	Yes* (If free product encountered)
Is PPE needed for canal area residents or workers during construction?	No	No	No	No

Note: Gasoline and diesel have been grouped together as "hydrocarbons" due to their similar characteristics, even though flashpoints vary greatly.

6.0 SUMMARY OF HAZARDOUS WASTE EFFECTS FROM RECONSTRUCTION ALTERNATIVES

It is likely that hazardous wastes will be encountered in the soil (and possibly in the water) during reconstruction activities. However, without knowing the concentrations of the wastes in soil or groundwater, the quantity of any hazardous wastes needing disposal cannot be estimated at this time. Careful advance preparation and implementation of the suggested mitigations should help to prevent worker exposure or unplanned construction delays.

As hydrocarbons have been detected in soil and water samples from all three open channel areas of the study area, the indicator issue chosen is the need for Disposal of Hydrocarbon-Contaminated Soil or Water.

SUMMARY OF HAZARDOUS WASTE EFFECTS FROM FIVE ALTERNATIVES

Alternative→ **Effect ↓**	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**
Will canal reconstruction activities potentially produce airborne heavy metals concentrations putting the nearby residents at risk?	No	No	No	No	No
Will canal reconstruction activities potentially produce airborne hydrocarbons concentrations putting the nearby residents at risk?	No	No	No	No	No
Will canal reconstruction activities potentially produce airborne heavy metals concentrations putting construction workers at risk?	Yes	Yes	Yes	Yes	Yes*
Will canal reconstruction activities potentially produce airborne hydrocarbons concentrations putting construction workers at risk?	Yes	Yes	Yes	Yes	Yes*
Is it likely that during reconstruction activities, groundwater or soil contaminated with heavy metals will require disposal as a hazardous waste?	Yes	Yes	Yes	Yes	Yes*
Is it likely that during reconstruction activities, groundwater or soil contaminated with hydrocarbons will require disposal as a hazardous waste?	Yes	Yes	Yes	Yes	Yes*

*Since future reconstruction/repair will eventually be needed, hazardous waste disposal may similarly be required.

It should be noted that if Alternative 5 (the No Action Alternative) is chosen; original sections of the Canal are likely to need emergency repair or reconstruction within the next five years, and the heavier hydrocarbons in the soil (i.e., diesel) would probably require emergency handling, management and disposal at that time.

Depending on the location and quantity of hydrocarbon-contaminated groundwater pumped during dewatering operations from related reconstruction activities, the ASARCO "pump and treat" system may be available for water treatment. The ASARCO remediation system consists of an oil/water separator, aerator, and evaporation pond.

The likelihood of significant worker exposure to OSHA exposure limits from soil heavy metals or hydrocarbons should not be exaggerated. After dewatering, the hydrocarbons may volatilize more easily than before, and some of the heavy metals in the soil matrix may become airborne. As such, the concentrations previously detected in soil and/or water warrant routine, limited air monitoring. It is expected that construction activities can likely be performed in Level D (least stringent) Personal Protective Equipment if airborne metals or hydrocarbon concentrations exceed TWAs.

7.0 SUGGESTED MITIGATIONS

- During subsurface work for reconstruction activities, the soil should be monitored at intervals throughout the day with a photo-ionization detector for volatile hydrocarbons. This action will determine if soil must be treated as a hazardous waste, and will also safely prevent excessive hydrocarbon exposures to construction workers.

- Prior to reconstruction activities, an area should be set aside for temporary stockpiling of any soil which might require hazardous waste disposal, pending laboratory analyses. The stockpiled area should be properly designed to prevent runoff during rainfall and have an impermeable liner underneath. This stockpiled area would need to be included in the Construction Stormwater Pollution Prevention Plan.

- An environmental consulting firm, independent from the prime reconstruction contractor should perform routine air monitoring for hydrocarbons and heavy metals. Monitoring would safely prevent worker exposures and determine the need to handle any contaminated soil or groundwater as a hazardous waste. The firm should also be under contract to perform expedited groundwater or soil sampling, laboratory analysis, and consulting to minimize the possibility of very costly reconstruction delays.

APPENDIX N

- **References**

REFERENCES

Clark, J.W., Viessman, W., and Hammer, M.J., 1977. Water Supply and Pollution Control, New York: Harper & Row, Inc., p 857.

Council on Historic Preservation, 1999. The New 36 Code of Federal Registry Part 800: Highlights of Changes.

El Paso City Directory, 1982. R.L. Polk & Co Publishers.

Fetter, C.W., 1999. Contaminant Hydrogeology, New Jersey, Prentice Hall, Inc., p 500.

Freeman, L.H., and Jenson, S.L., 1998. How to write Quality EISs & EAs, Shipley Environmental, Inc., p 84.

Importance of Agribusiness to El Paso County, 1998. Texas Agricultural Extension System, Texas A & M University, El Paso, TX.

United States Section, International Boundary and Water Commission Memorandum, 1998. Field Inspection of American Canal Lining.

Johnson, R.B., and De Graf, J.V., 1988. Principles of Engineering Geology, John Wiley & Sons, Inc., p 497.

LaGrega, M.D., Buckingham, P.L., and Evans, J.C., 1994. Hazardous Waste Management, New York: McGraw-Hill, Inc., p 1146.

NIOSH Pocket Guide to Chemical Hazards, 1994. NIOSH Publications, p 398.

Noll, K.E., 1999. Fundamentals of Air Quality Systems: Design of Air Pollution Control Devices, Maryland: American Academy of Environmental Engineers, Inc., p 611.

North American Emergency Response Guidebook, 1996. A Guidebook for First Responders During the Initial Phase of a Hazardous Materials/Dangerous Goods Incident.

Parker, S.P., 1984. McGraw-Hill Dictionary of Science and Engineering, New York: McGraw-Hill, Inc., p 942.

Plog, B.A., 1988. Fundamentals of Industrial Hygiene, National Safety Council, Inc., p 915.

Shipley Group, Inc. 1996. How to Manage the NEPA Process.

Tchobanoglous, G., 1979. Wastewater Engineering: Treatment, Disposal, Reuse, New York: McGraw-Hill, Inc., p 920.

U.S. Environmental Protection Agency: Hazardous Air Pollutants, 1990. US Code of Federal Registry: Title 42, Section 7412, Washington, D.C.

APPENDIX O

- **Glossary of Abbreviations**

NMED	New Mexico Environment Department
NO_x	Nitrous Oxides
O_3	Ozone
OSHA	Occupational Safety and Health Administration
Pb	Lead
pH	A measure of acidity/alkalinity
PID	Photo Ionization Detector
PM-10	Airborne particulates measured to be greater than 10 microns in size
ppb	Parts per Billion
PPE	Personal protection equipment
ppm	Parts per Million (equivalent to mg/l in water)
RCRA	Resource Conservation and Recovery Act
RGACE	Rio Grande American Canal Extension
ROW	Right-of-Way
SAR	Sodium Adsorption Ratio
SCBA	Self-Contained Breathing Apparatus
Se	Selenium
SO	Sulfur Oxide
SO_2	Sulfur Dioxide
TCLP	Toxic Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TNRCC	Texas Natural Resource Conservation Commission
TPH	Total Petroleum Hydrocarbons
TWA	Time Weighted Average (a method of determining exposures)
TxDot	Texas Department of Transportation
UP	Union Pacific Railroad
USIBWC	United States Section International Boundary and Water Commission
UST	Underground Storage Tanks
UTEP	University of Texas El Paso
VOC	Volatile Organic Carbons (Hydrocarbon vapors)