SAN BENITO IRRIGATION SYSTEM, PUMP HOUSE HAER No TX-132-A
(Cameron County Irrigation District #2, Pump House)
San Benito vicinity
Cameron County
Texas

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, D.C. 20240-001

HISTORIC AMERICAN ENGINEERING RECORD

SAN BENITO IRRIGATION SYSTEM, PUMP HOUSE
(Cameron County Irrigation District #2)

HAER No. TX-132-A

Location: The San Benito Irrigation System covers approximately 100,000 acres of land in central Cameron County, Texas, in the Lower Rio Grande Valley. The district is bounded on the southern end by the Rio Grande and on the northern end by the Arroyo Colorado. It is roughly 10 miles wide and 24 miles long. Within the district are the cities of San Benito (where the irrigation district's offices are headquartered), Rio Hondo, and Los Indios. There are over 228 miles of canals throughout the system. The pumping plant—the primary structure of the system—is located in the southwest corner of the district, immediately southwest of the town of Los Indios. It is approximately 0.5 mile south of Military Highway on Weber Drive and is connected by a half-mile-long inlet to the Rio Grande. The pumping plant is located at latitude 26.04448, longitude -97.75563. This coordinate was taken near the headworks on November 17, 2011, using a Global Positioning System (GPS) mapping grade accurate to +/- 3 meter after differential correction. The coordinate's datum is North American Datum of 1983. The location of the resource has no restriction on its release to the public.

Present Owner/ Occupant: Cameron County Irrigation District #2

Present Use: The San Benito Irrigation System remains in use as an irrigation system providing water to more than 50,000 acres of agricultural lands. It also supplies water to two cities and two private water corporations for municipal water use, and to a regional power plant for industrial use. The historic pump house is no longer operational as a part of the system, though it is physically intact, with historic pumping equipment remaining in place.

Significance: The San Benito irrigation system was one of the early commercial irrigation systems constructed in the lower Rio Grande Valley and contributed to the development of the Valley and its status as leading agricultural center. It was the only irrigation system in the region designed to be primarily gravity-fed, to utilize dry river beds (known as *resacas)* as main canals, and to use locks for barge travel. Developed by the San Benito Land and Water Company in 1906–1912, the irrigation system was part of a greater speculative real estate venture focused on the establishment of the town of San Benito and a regional railway, which in turn spurred rapid settlement of the Valley in the early twentieth century.

Though modernized in part, the system retains many historic features, including the extensive canal system and pumping plant.

Historians: Caroline Wright, Melissa Wiedenfeld, and Kathryn Plimpton of HDR Environmental, Operations and Construction, Inc. (HDR EOC), December 2011

Project Information: This research and documentation project was conducted by HDR EOC under subcontract to Louis Berger and Associates, prime contractor to the U.S. Army Corps of Engineers, Galveston District. The project was sponsored and funded by the U.S. Department of Homeland Security, Customs and Border Protection. Caroline Wright was the Principal Investigator; historical research was completed by Melissa Wiedenfeld and Kathryn Plimpton. Large-format photography was completed by Timothy McGrath, principal of Image West, Colorado, as subcontractor to HDR on November 16–18, 2011. Fieldwork to document the pumping plant and irrigation system was conducted during several field sessions in September and November 2011.

Part I. Historical Information

A. Physical History:

1. Dates of construction: 1906–1912

2. Engineer: Samuel Arthur Robertson (1867–1938)

3. Builder: Samuel Arthur Robertson

4. Original plans and construction:
Original designs for the San Benito irrigation system called for a simplified version of the elements of most other systems built in the same region and time period but with several characteristics that took into account the unique characteristics of the site and its geography.[1] It included the same basic features—headworks and pumping plant, main and lateral canals, and various gates. Water

[1] If there was a single, complete set of plans for the headworks, pumping plan, or canals, its existence today is unknown. Information related to the planning of the original system is compiled from multiple sources, all referenced elsewhere in this document, including: promotional brochures which describe the features of the headgates and the overall system and include simple line maps of the canals; historic photographs produced by the San Benito Land and Water Company for promotional purposes; contemporary newspaper articles that describe the design of the system and some of its elements, ongoing construction work, and mechanical equipment; and various secondary sources that reference similar contemporary materials. While these resource materials give few specifics regarding many elements of the system, the conditions of the present-day system in comparison to these descriptions and other references indicate that no major deviations from the plans presented in these documents were made.

is diverted from the river by pumps, fed through the headworks, and into a system of canals. Main canals are fed directly by the headworks and, in turn, feed smaller lateral canals. Lateral canals connect, through various types of gates, to secondary and tertiary canals and eventually to farmlands.

Land in most of the Valley is at a higher elevation than the river, rising as it moves away from the river and the Gulf of Mexico, requiring that water be pumped up out of the river to enter the system of canals. The San Benito system, however, was planned for an area where the land is lower than the river. Less engineering is required to remove water from the river and pump it into and through the canals. The San Benito system, therefore, was designed to intake 90 percent of its water through gravity alone and 10 percent through the use of a small pumping plant.

The original circa 1907 headworks structure consisted of a rectangular water chamber or pit approximately 65' by 70' from front to rear. Its headwall was 250' long by 22' tall built into the bank of the Rio Grande, set at the river bottom. Built largely below grade of board-formed concrete, it ranged from 2' to 3' thick, with 17' deep steel and wood pilings. Eight 4' by 6' openings were located in the base of the wall, with wood and metal gates to control the flow of water through the openings. The gates were operated by large cast-iron turn wheels, connected by long threaded rods, set into concrete projections at the top of the wall. Drawings exist in promotional materials from the time of construction that show only the basic construction of this wall.[2] The rear wall, parallel to the headgates, had corresponding gates in its base to further regulate the flow of water passing into the main canal, east of the headworks.

Photographs dating circa 1909 show two separate wood framed and clad buildings that sat immediately south of the headworks. Both featured vertical board and batten siding, double-hung four-over-four wood windows and corrugated metal gable roofs. One building was oriented with gables on the north and south ends and had a monitor roof and two chimney stacks. This appeared to have been constructed to house boilers and other equipment related to the construction of the headworks. The second building was oriented with gables facing east and west and was constructed using the southern wall of the headworks as a foundation wall. It was setback from the headgate wall and, based on historic photographs, it appears that the original pumps were set into a separate pit from the large water chamber, between the building and the headgates. This building likely held the boiler and steam engines that powered the pumps, while the pumps themselves were left exposed. A water channel was located beneath the structure, formed by

[2] San Benito Land and Water Company. *A Statement of Facts Concerning the Farming Lands and Gravity Irrigation Canal of the San Benito Land and Water Company…* Houston: Cumming and Sons, 1910, 10-12 (Center for American History, The University of Texas at Austin).

the southern (side) wall of the headworks, to direct water from the pumps to the canal.

5. Alterations and additions:

The original circa 1907 pumping plant was demolished, and a new plant built sometime after 1917 when ownership of the system changed and new pumps were installed to increase the water flowing into the system. The exact date of construction is unknown. No plans or descriptions of the building exist, though it is visible in numerous historic photos. This new, larger pumping plant was constructed in the same general location as the original plant, utilizing the southern wall of the headworks as a foundation wall and retaining the water channel beneath the plant. The new pumping plant was rectangular in plan, with a canted corner over the water channel. It extended fully to the headgate wall, and enclosed all of the pumping equipment. It was clad in corrugated metal panels with a wood board and batten cornice. The plant had a roof with two parallel hips, one hip being the width of the canted wall section. Based on physical remnants at the site, the building likely had a low, board-formed concrete footer. A large brick chimney sat just east of the pumping plant, connected to it with a large duct, near an adjacent wood frame and clad workshop.

In 1917, a new main canal, the Low Line Canal, was begun. The new canal was constructed roughly perpendicular to the original canal, now dubbed the High Line Canal, to provide water to farmers in the southern end of the district. Multiple changes were made to the headworks to support the new canal, and new engines and pumps were purchased in 1919 and 1920. Large concrete foundations were installed along the riverside of the main pit of the headworks to support the new engines and pumps. Large suction pipes were inserted through the headgate wall to reach the river. An addition to the north end of the headworks was constructed, at the same level below grade, for the installation of a third new pump. This section is offset from the original pit and connects through an opening in the original north wall. A retaining wall was built along the river, extending the length of the original headgate wall.[3]

Additional water chambers, flumes, gates, and discharge sections were added to the headworks at unknown dates in a design that allowed pumped water to be sent to either the High Line or Low Line Canal as needed. Wood framed and clad roof structures were built to enclose the pump pits, constructed directly on top of the headgate wall and some of the new headworks structures. The rear wall of the original headworks remained largely untouched. At an unknown date, the southern wall of the headworks was removed to allow access from the main pumping pit to the original pumping pit. A large concrete canal was constructed to

[3] Again, no plans exist for any of the changes to the headworks and pumping plant. Information about the changes to the structure were gleaned from the minutes of Cameron County Irrigation District #2's board meetings, historic photographs, and current physical conditions of the structure.

connect the High Line Canal to its own discharge on the north side of the headworks.

A change in course of the Rio Grande in 1925 required the digging of a .5-mile-long inlet channel to reconnect the pumping plant to the river's water. This did not require any changes directly to the pumping plant itself.

The circa 1919 pumping plant structure was replaced in the period from 1947 through 1949, when new pumping equipment was again purchased to increase the plant's pumping capacity and to modernize it. All buildings constructed on top of the concrete headworks structures were removed, as was the stand-alone building to the south of the headworks. The southern wall of the headworks was removed and the pumping pit, including the original headgates wall, was extended to the south. The height of the headgates wall was also increased across its entire length. Two new pumps and engines were placed in the new southern section of the pumping pit. A new corrugated-metal-clad steel wall and roof structure were built over the entire pit, including both the earlier northern addition and the new southern extension, enclosing it as one structure. A small wood-framed and clad wing on the east side of the building, south of the original headworks, held an office and a small machine shop. A separate new warehouse structure was built just south of the office wing, east of the pumping plant, constructed to match the pumping plant in appearance, with a tall concrete-block base wall and the same upper wall and roof system. The circa 1947 pumping plant with east wing, interior equipment, pit and headworks, and warehouse building are extant, though unused, today. Details regarding machinery are given in Part III of this documentation.

A new vertical lift pump was installed at the plant in the 1970s. The pump was located in a steel pier structure built out over the river inlet, just north of the pump house, with underground piping connecting back to the headworks. The pump has been removed, though the support structure remains in place. The large brick chimney constructed circa 1919 was torn down in the 1980s after having been struck by lightning.

In 2004, a new pumping plant was built just to the north of the headworks. The inlet channel was slightly extended to the north and the new plant was constructed at the channel's end. An onsite residence of unknown date was torn down to allow for this construction. A new residence was constructed on the south end of the property. The new plant contains eight computer-operated vertical lift pumps underneath a simple open-sided shed roof structure. A long narrow concrete-block room to the rear of the pumps houses the computers and electronics used to control the pumps. The suction pipes are located behind steeply angled screens so that plants and debris are not pumped into the system with the water. The construction of this plant required the realignment of the entries to the two main canals, both of which are now fed by the new plant through underground pipes. A

portion of both canals were filled in as part of the realignment and a large area of the site has been paved over. A small concrete block office structure sits in the former path of the High Line Canal.

B. Historic Context:

The San Benito Irrigation District was one of many similar irrigation districts built by speculative land developers in the Lower Rio Grande Valley of Texas during the early years of the twentieth century. The Valley, as the southernmost part of the state along the Rio Grande is known, was largely unsettled before the arrival of the railroad in 1905. [4] Brownsville, at the southern tip of Texas was the only large, established city and most other land in the region was covered in brushy vegetation and used only for cattle. The land was fertile and promising for commercial agricultural ventures although rain was erratic and irrigation was necessary to move water from the Rio Grande to locations inland.

Though canal irrigation was common elsewhere in the United States, it was complicated in the Valley because the land rises in elevation as it moves inland away from the Rio Grande. To properly irrigate large amounts of land, or land far removed from the river, water had to be mechanically pumped up from the river in quantities larges enough to fill and flow through systems of canals. The earliest irrigation systems in the Valley, constructed in the 1880s and 1890s, were small in scale and built by individual farmers to water their own crops, generally only two or three hundred acres.[5] Early land speculators saw that, with investment in large-scale irrigation infrastructure, they could subdivide and sell large plots of land to prospective small-scale farmers who could not afford to construct their own irrigation systems. These speculators purchased extensive amounts of acreage for their developments, platted towns and farm plots, and constructed pump houses on the edge of the Rio Grande with canal systems extending throughout their districts. A great real estate boom began in the Valley, attracting would-be farmers from across the country with promises of fertile land, free-flowing water, and easy money.

The San Benito irrigation system was conceived of by Samuel Robertson, a self-trained civil engineer. Robertson built railroads in many parts of the United States and had come to the Valley after forming a small construction company specifically for the purpose of building portions of the St. Louis, Brownsville, and Mexico Railway. With extensive construction experience and having observed irrigation systems in other agricultural centers of the United States, Robertson was interested in the idea of developing an irrigation system and in the settling of this region.[6] For his irrigation system and development, he chose a rare spot, approximately 20 miles west of Brownsville, where the land was unusually lower in elevation than the river, requiring minimal pumping of

[4] James Lewellyn Allhands, *Gringo Builders* (private, 1931), 147-148.
[5] J. Lee Stambaugh and Jillian Stambaugh, *The Lower Rio Grande Valley of Texas* (Austin: The Jenkins Publishing Company, San Felipe Press, 1974), 183.
[6] Allhands, 147-148.

water to lift it into irrigation canals.[7] This area was also marked by *resacas*, relic oxbows or depressions left in the land after changes of course by the Rio Grande. Like at least one Valley visitor before him, Robertson recognized that these *resacas* could be used to increase the storage capacity of a canal system while minimizing construction.[8]

With several investors, namely Alba Heywood of Louisiana, Robertson formed the San Benito Land and Water Company, chartered in 1907.[9] By 1908, the group had purchased over 30,000 acres of land, established the town of San Benito and constructed large portions of the San Benito irrigation system, including the headworks and original pumping plant.[10] The headworks were constructed at a bend in the river closest to the southernmost *resaca* being incorporated into the canal system, at what would become the community of Los Indios.

The initial configuration of the system's headworks was a roughly rectangular chamber formed of simple walls built of board-formed, steel-reinforced concrete. The main headgate wall, built into the river bank with a protection levee on either side, was 250' in length and 22' tall with deep steel foundation pilings. Eight openings were built into the wall base, each with a vertical sliding gate controlled by a manual turn-wheel mechanism. The wall was constructed at an elevation on the river banks that would prevent water from overtopping it during flooding events and would ensure that the gates were never above low waters.[11] Behind the main wall were the other three walls of the headworks. Additional gates in the base of the wall parallel to the main headgates further regulated the amount and speed of water allowed to enter the main canal, which began just beyond the headworks.[12]

A small wood-frame structure built immediately south of the headworks, using the headworks as part of its foundations, contained the original pumps, engines, and boiler. Brick for the boiler stack was made on site. The company purchased a 45-horsepower launch with which to ship the equipment upriver from Brownsville, rather than delivering it over land from the depot in San Benito.[13] The first water was pumped through the

---

[7] Colonel Sam A. Robertson, "Oldtimer Recalls his First Meal at Lon Hill's Camp," *Valley Morning Star* (Harlingen, TX), July 29, 1932 (Samuel Robertson vertical files, Center for American History, the University of Texas at Austin).

[8] William H. Chatfield, *The Twin Cities of the Border and the Country of the Lower Rio Grande* (New Orleans: Brandao, 1893), 40.

[9] "New Company is Organized," *Brownsville Daily Herald*, April 5, 1907, http://texashistory.unt.edu/ark:/67531/metapth147424, accessed December 9, 2011.

[10] "Giving the Rio Grand Valley the Railroad that Will Be the Open Sesame to its Treasure Vaults," *San Antonio Express*, September 9, 1911 (Samuel Robertson vertical files, Center for American History, the University of Texas at Austin).

[11] San Benito Land and Water Company, 10–12.

[12] Observed from historic photographs and physical conditions at the headworks.

[13] Local Items, *Brownsville Daily Herald*, June 4, 1907, http://texashistory.unt.edu/ark:/67531/metapth147475, accessed December 9, 2011.

system on December 26, 1907, though the full extent of the canal system was not yet completed.[14]

Within a decade, many of the privately owned, large-scale irrigation systems were facing financial hardships. Most of the money made in these development schemes was made off the sale of lands—once the land in a development was sold, the major income source was gone. While farmers paid water usage fees to the companies that owned the systems, the fees did not provide adequate funding for operations and maintenance of the systems. Between this and other factors, including the Mexican Revolution and related border tensions, San Benito Land and Water Company, and its investors, were forced into receivership.[15]

Cameron County Irrigation District #2 and System

Laws passed in 1904 and 1913 enabled the establishment of public water districts. A public district had the benefit over a private district of being able to issue bonds for maintenance and upkeep. An election was held among landowners within the San Benito irrigation system and in July of 1916 approving the creation of Cameron County Irrigation District #2.[16] The assets and property of the San Benito Land and Water Company were foreclosed upon and sold to the new Irrigation District in 1917.[17]

Some of the first actions of the new district involved significant maintenance to the canal system and the pump house. In the process of improving the pump house, a portion of the headgates collapsed.[18] This led to a decision to replace the original structure in its entirety.[19] The new circa 1919 pumping plant was a larger metal and wood clad frame structure built on the same location as the original plant, with a corner canted over a pumping channel in the headworks. An immense brick smokestack was constructed along with a wooden shop building.

Additional minor changes were made to the original headworks in the next three decades, including: the flooring of the large open section of the headworks; the addition of new pumps; the construction of small shed structures over the pumps and headworks; the addition of new water storage chambers, flumes, gates and discharge pipes; and the

[14] "Pump Starts at San Benito," *Brownsville Daily Herald*, December 27, 1907, http://texashistory.unt.edu/ark:/67531/metapth147646, accessed December 9, 2011.

[15] Sonia Kaniger, "Historical Features Assessment of Cameron County Irrigation District No. 2" (unpublished report for Section 106 Review purposes submitted to the Texas Historical Commission August 26, 2004), San Benito, Texas, 8.

[16] Kaniger, 8.

[17] "Meeting Minutes," Cameron County Irrigation District #2, April 18, 1917.

[18] Ibid.

[19] "Meeting Minutes," Cameron County Irrigation District #2, August 20, 1917.

extension of the plant to the north. Many of these occurred at undocumented dates, though several new pumps were purchased in 1919 and 1921 which remain in the plant.[20]

The next major change to the plant was after World War II. Through the Great Depression and the war, the system received only minimal maintenance and was in poor condition. Having paid off the debts incurred during the 1930s, the Irrigation District set about making improvements to all elements of the system. Initially, this called for replacement of only a portion of the existing structure along with a new pump,[21] though eventually the entirety of the structure built over the concrete walls of the headwork was replaced.[22] This structure was completed in 1949 and constructed by the District itself, owing to the difficulty of finding a contractor to work on such an irregular structure.[23]

This late 1940s pumping plant is extant today but unused. A steel structural system was constructed directly on top of the concrete walls of the headworks and is clad with corrugated metal siding and roofing, with a wooden office wing on the east side. The structure encloses all of the headworks and pumping equipment, some of which dates to 1919. A warehouse was built near the pumping plant, of a similar metal structure on partial-height concrete block walls.

Despite other technological changes in agriculture, the irrigation system has not changed significantly since the mid-nineteenth century. The oil and diesel gas engines that operated the pumps were replaced with natural gas and electrical engines at unknown dates. An engineering report completed in the 1960s concluded that despite the deficiencies in the pumping plant it was not economically feasible to completely replace it.[24] In the 1970s, a vertical lift pump was installed on a steel pier structure over the water adjacent to the pump house.[25]

In recent years, the district has undertaken large projects under the federal Lower Rio Grande Valley Water Resources Conservation and Improvement Act of 2000. This act aimed to identify ways to improve water access and water systems along the Rio Grande and to provide funding for engineering and construction of identified projects. With this assistance Cameron County Irrigation District #2 constructed a major new pipeline to better serve the farms previously in District #13, which have been incorporated into District #2 and a new pumping plant in 2004. When the new plant was constructed, the

---

[20] A few specific changes to the pumping plant or the equipment that it houses can be dated through meeting minutes of the board of Cameron County Irrigation District #2, though many are undateable and are documented only in historic photos.

[21] "Meeting Minutes," Cameron County Irrigation District #2, September 26, 1946.

[22] "Water District Buys New Pump Equipment," *San Benito Light*, December 12, 1946.

[23] "Meeting Minutes," Cameron County Irrigation District #2, November 26, 1947.

[24] Johnson Consulting Engineers Planners. "Plan of Rehabilitation: Preliminary Engineering Report. Cameron County Water Improvement District #2." June 1967. http://idea.tamu.edu/documents/plan_of_rehabi.PDF, accessed December 9, 2011.

[25] Kaniger, 9.

late 1940s plant, with its six pumps ranging in age from 1918 to the 1970s, was able to pump only 510 cubic feet per second (cfs). The engines of the new plant have the capacity to pump 700 cfs, 100 cfs more water than the canal will hold, accommodating for shutting down pumps for maintenance. The new pumping plant was projected to save the district 2,171 acre-feet of water and 721,904 kilowatt-hours year.[26] Because of the cost of demolition, and considering the need for environmental clean-up associated with the materials used in construction and maintenance of the equipment, the Irrigation District has chosen to leave the late 1940s pumping plant in place for the time being.

Part II. Structural/Design Information

A. General Statement:

1. Character:

The San Benito Irrigation System, also known as Cameron County Irrigation District #2, is significant as an example of an early Lower Rio Grande Valley agricultural irrigation system. When originally designed circa 1907, the system was unique as the only one in the area intended to operate primarily as a gravity irrigation system taking advantage of the landscape where it was constructed. Although the gravity system never functioned on its own, due to the quick expansion of the district, it is representative of the spirit and intentions of its builder.

The historic, circa 1949 pumping plant stands as a symbol of the history of the district. The original headgates exist, clearly understandable, within the layers of later alterations. While much information regarding dates and exact plant configurations is unknown, the major changes to the plant can be traced. Minor modifications were carried out in the 1910s, but the plant structure has changed little in appearance and function since the last major alterations in the late 1940s. Though it is no longer operational, pumping equipment left in the plant spans a seventy year period of time, demonstrating that technological changes were few. A new pumping plant was constructed near the historic pumping plant in 2004. This plant still feeds water into the historic canal system which continues to provide water to farmers in the region, as well as the cities of San Benito and Rio Hondo.

2. Condition of fabric:

The pumping plant is in fair to poor condition. Major work to maintain the pumping plant was sparse. Vital mechanical equipment was well maintained while in use, though the building itself received only minor necessary work. The concrete headworks have been altered numerous times and experienced at least one occurrence of significant foundation damage, though a structural report completed in 2000 determined that there was no current movement. There are numerous large cracks

[26] "Cameron County Irrigation District #2," Border Environment Cooperation Commission http://www.cocef.org/aproyectos/ExComCameronCounty2003_09ing.htm, accessed December 12, 2011.

throughout the building and it has considerable problems with seepage from the river. Spalling is evident throughout the concrete work, and large reinforcing bars are visible in several locations. As a result of Hurricane Dolly in 2008, the main pump pits flooded with several feet of water. The lowest area of the pumping pit is constantly under water. The upper portions of the building are generally in good condition, due to the quality of materials used in their construction. It is unknown if the pumping equipment is functional and it has not been used since the plant was abandoned in 2004. Suction pipes were cut and sealed between the pumps and headgate wall to alleviate flooding, but their function is still understandable. Newer electrical engines were removed from the pumping pit when the plant was shut down so they would not flood. All other engines and historic pumps remain but have been inundated. When the new plant was constructed in 2004, the district determined that it would be too expensive to demolish the historic building and headworks, but they will likely receive no maintenance unless necessary for health or safety concerns. When the new plant was built, portions of the original High Line and Low Line canals connected to the original plant were infilled. The new plant connects to the canals through large, underground, concrete pipes. The location of the heads of the original canals can still be read in the landscape.

B. Description of pump house and headgates

All irrigation systems in the Valley consist of the same basic elements to move water from the river to farmland: pumping plants and headworks, main canals, lateral and other sub-canals, underground pipes, and various types of gates and standpipes. All systems have a pumping plant at the Rio Grande, to pump water from the river up into the system. Most systems utilize one or two additional pumping plants located at natural ridges in the landscape to move water up to canals at higher elevations as the land rises away from the river. The San Benito system is unique in that it has only one lift plant, at the Rio Grande, owing to the low slope of the land.

Irrigation pump stations contain numerous large centrifugal pumps powered by high-horsepower engines. The pumps are generally placed in concrete pits within simple industrial structures below ground level along the riverbank, or in some instances along the bank of a separate river channel. Large suction pipes extend out from the structure into the river to draw the water in. Early engines were steam powered and connected to large, wood-burning boilers and large brick chimneys. Through the course of the century, as plants were upgraded, engines were replaced with newer technology: first oil or diesel gasoline-driven engines, then electric with modern engines being controlled by computerized systems.

While the plants contain multiple pumps and engines, they are generally not run all at once and are turned on and off depending on the amount of water needed in the canals or for maintenance to the pumps. Each plant is overseen by a plant manager who is responsible for pumping operations and maintenance and often lives onsite or near the pumping plant. Plants operating with older mechanical equipment may be staffed twenty-

four hours a day to ensure that problems are addressed as quickly as possible. Older pumps need frequent maintenance, at considerable expense. Early annual budgets for Cameron County Irrigation District #2 included thousands of dollars for lubricant for the pumps and engines.

Pumping plants function in conjunction with the system's headworks. Headworks provide for control, regulation, and metering of water as it moves from the pumps into the canal system. They are constructed of a headwall and a series of chambers and stalls connected to the pumps inside the pumping plant structure. Within the headworks the various pipes, chambers, and canal discharges are separated by gates or flumes that control the amount, speed, and force of the water flowing into the main canal. The velocity of water as it enters different parts of the canal system is essential to maintain proper movement of the water through the canals.

The headwall is built directly into the riverbank or channel bank. At San Benito, the headworks were originally constructed at the banks of the Rio Grande, though the river changed course in 1925, moving away from the headworks and pumping plant. The district purchased the newly dry land from its owner and built a half-mile long channel to reconnect the headworks to the water source. The late 1940s pumping plant sits along one long side of the channel, while the 2004 plant sits roughly at the end of the channel.

The San Benito system was originally designed to operate with a simple headworks structure and minimal pumping plant built to the side to pull in only 10 percent of the system's water. This proved inadequate in terms of water supply and the pumping capabilities of the plant were increased several times in its history, to the point that the system was entirely fed with mechanically pumped water. Changes were made to the original headworks as new pumps were added to the system. This included flooring a portion of the open pit to house pumps and adding additional water chambers, pipes, flumes, gates, and a second discharge for the Low Line Canal. The addition of new equipment also prompted the construction, alteration, and reconstruction of upper portions of the pumping plant to provide enclosure to the equipment. The pumping plant as it is described here includes the concrete headworks, and alterations to it, and the metal structure (defined as a "roof" when constructed, but consisting of partial walls) built on top of the headworks.

From the pumping plant and headworks, water flows into a main canal, or into one of two main canals in the San Benito system. The main canals lead to lateral, secondary, and tertiary canals, which connected by various types of gates and cross the entirety of the irrigation district to provide water to cities and individual farms.

1. **Overall dimensions:**
   In plan, the pumping plant is composed of two rectangles arranged end-to-end and slightly offset. The larger rectangle is approximately 137' x 43'. The smaller section, to the north, is approximately 53' x 33'. The northern section is offset approximately

3’ to the east. The overall length of the structure is 190’. Located 42’ from the south end of the east façade is an office and machine shop wing. The wing is 38’ long, projecting from the pump house wall, and 22’ wide. Ground level varies around the site, but the pump house is roughly 26’ above grade to the ridge of the roof monitor. The office wing is 13’ in height to the ridge of the roof.

2. Foundations:

The upper, metal walls of the pumping plant are built atop the concrete walls of the headworks structure, incorporating the original walls and later additions to the north and south. The foundations for the original circa 1909 portion of the headworks structure are described in drawings in a 1909 promotional brochure as pilings 26’ deep. There is no mention of materials, though they are believed to be steel. If built as illustrated there are three rows of pilings beneath the 17’-6” wide wall base, one in the center and one along each side edge. According to drawings and descriptions published in promotional brochures at the time of construction, each line of pilings is paired with a wall of Wakefield sheet piling to the same depth. Wakefield sheet piling involves three rows of lumber of the same dimension stacked with the middle piece offset to create a tongue and groove system that becomes a nearly watertight wall as the stacks are interlocked and driven into the ground. This system has been damaged at least once by flooding. The extent and type of repairs are unknown. Little information exists regarding the addition of foundations within the original headworks for new pumps in the early 1920s or the north and south additions constructed in the late 1940s. It is assumed that they are also built on pilings. The 2000 structural engineering report made no investigation into the foundations except to note that timbers could be seen when the steel decking in the pump pit was lifted.

The remaining portions of the original headworks and 1920s modifications, constructed with the tops of the walls at grade level, now serve as the foundation for walls of the late1940s pumping plant.

The original 250’ long headgate wall with eight square openings is still clearly visible on the inlet side of the structure. According to the drawings published in promotional brochures, this wall has a 17’-6” wide base set on the riverbed. The wall is 3’-6” wide tapering to 2’ wide at the top and is board-formed concrete with steel reinforcement. Along the interior of the wall, concrete buttresses are six buttresses placed at irregular intervals. On the exterior of the wall, the original eight gate openings are visible depending on the height of the water. Above each opening is a rectilinear projection on which the mechanism for the gates is mounted. According to historic photographs only four of the openings, the two at each end, may have ever had gates. These four gates and their original lift mechanisms survive. The mechanisms consist of a large turn wheel in a cast-iron base set in the projections on the wall and connected to the gate by a long threaded pole. When turned, the gates, in vertical channels, are raised or lowered. As pumps were added to increase the water flow of the irrigation system, large holes were punctured in the wall for intake pipes to access the river. Additional

pipes were placed through the wall to provide water to cool the large engines. Various mechanical fasteners have also pierced the wall over time, contributing to the condition of the wall.

The rear wall of the headworks remains largely unchanged. The wall is 65’ long and 4’ wide across the top, where a walkway was added in the 1920s. This wall originally had eight openings, like the headgates, though all but three have been infilled on the west side of the wall at an unknown date. Portions of the original gate hinges remain on the east side of the wall.

Crossing the center of the original headworks chamber are later water chambers and gates. These various chambers are made of board-formed concrete like the original walls. They allowed for water pumped through the large pipes to be directed to either the Low Line Canal, which flowed immediately east of the headworks, or to the High Line Canal, which exited the north side of the headworks from its own large surge chamber. With the adjustment of gates, water could flow immediately towards the Low Line Canal or through additional chambers to the High Line Canal.

Walls in the north and south additions to the original headworks are simple board-formed concrete walls, with integrated structural columns, built to grade. The height of the below-grade walls differs as the floor deck is not at a consistent level where it crosses over pipes and other equipment. It is lowest in the southernmost section of the pit, where the original pumps were located. This section is also narrower at the pit level than the rest of the pump house.

3. Walls:

The walls of the late 1940s pump house are primarily composed of concrete and brick base walls and upper walls clad in corrugated metal sheets.

a. Base Walls (Headworks)

The base of the north, south, and east walls are constructed of 10” x 2’-1” concrete columns connected with a continuous concrete footer and header and infilled with brick. Columns are spaced 7’-2” on center. The brick infill sections panels are 10” thick and some have windows. These walls are constructed over earlier walls and headworks modifications. The brick is a standard brick in a running bond pattern, with concrete window sills and lintels. The exterior of the wall is painted and the interior is coated in a concrete plaster.

In two bays on the exterior of the east wall, over a water chamber that spans the interior and exterior of the structure, are two tall, narrow columns of brick infilled within the brick panels. The concrete footer at these points is divoted and sits on two concrete footings perpendicular to the wall. Patched-in holes aligned with these features in the interior wall of the water chamber, parallel to the exterior wall, indicate the presence of some mechanical feature at these points. This wall also has

several large openings allowing passage of water through the water chambers and flumes.

The western wall is the original headgate wall of board-formed concrete. A concrete catwalk was integrated into this wall when the original was extended in height. The catwalk is inside the structure at the top of the original headgate wall and sits on top of the buttresses of the headgate wall. This wall has no windows.

The height of the concrete walls varies due to irregular exterior grade and interior floor heights. The walls average from 17’ to 22’ on the interior, based on floor height, to 6’ to 8’ of exposure on the exterior.

b. Upper Walls

The upper walls of the entire pumping plant, including those of the roof monitor, are corrugated metal panels. This section of wall is a standard 6’-6” tall.

c. Office Walls

The office wing is clad in wood ship-lap siding with plain, 3/4” thick flat wood window, door, and corner trim.

4. Structural System/Framing:

The structural system is a pre-fabricated steel system composed nearly entirely of right-angle members. Vertical supports, composed of two thin vertical members connected by horizontal plates, sit on wall headers along the length of the building. Trusses sit on top of these supports, spanning the width of the building, with an angled brace adding additional support. Long right-angle members run the length of the building across the top and bottom of the trusses to add lateral stability. Also attached to the vertical supports are the right-angle members that create the simple wall structure to which the corrugated paneling is attached and in which the windows are set.

5. Openings:

a. Doors:

Doors on the pump house are simple rolling doors constructed of minimal steel frames and corrugated metal panels. There is a set of doors in place on the south end of the building, and at the southern end of the east façade. The door on the north end of the building has been removed, though it is still onsite. The doors are all roughly 10’ in height. The eastern door is 8’ tall while the northern and southern doors are 12’ in height.

The office and machine shop wing has one exterior door on the east side and one door between the office and shop halves of the wing. Both are traditional wood assembly doors in standard dimensions of 6’-8” x 3’-2”. The exterior door consists of three narrow horizontal panels in the lower section, a large window,

and one upper horizontal panel. The door between the office and pump house has five horizontal panels. Both openings also have wood-framed screen doors.

b. Windows:
Windows are all steel frame windows, with the same size panes in different configurations. Most of the windows have a center pivot sash in a three by two pane configuration measuring 2'-8" tall and 5'-1" wide. Windows with only this sash are in the base walls and clerestory walls of the pump house. Windows in the upper walls have a fixed sash with a single row of panes below the center pivot sash for an overall three-by-three pane configuration and 4'-1" height. Windows in the base walls of the north and south ends of the building have fixed sash windows in a two-by-two pane configuration and overall measurement of 3'-9" x 3'-9".

Windows in the machine shop portion of the office and shop wing have a single row fixed sash both above and below the center pivot sash. The overall measurement of these three-by-four pane windows are 5'-5" x 5'-1". The office portion of the wing has one-over-one double-hung wood windows measuring 4'-8" tall and 2'-5" wide. There are two windows of each type on each long side of the wing and two wooden windows flanking the center door on the east façade.

6. Roof:
The roof is a simple gable with a center gable monitor. The roofing material is the same corrugated metal panels as the walls. Some panels have been replaced due to rust and subsequent leaks.

7. Interior:
Visually, the interior of the pump house is the same as the exterior. All structure is exposed and corrugated cladding is visible throughout. The interior is largely one space, divided by pumps, engines, large pipes, walkways, and canal elements. Pumps and engines are mounted on large concrete foundations. Steel decking is laid in the pit at the same level to create the remainder of the floor surface. Steel stairs and platforms allow passage over large pipes. The northern addition is accessible through an arched entryway at the pit level. Pump #3 sits at a lower level in the southern end of the pumping pit.

Various metal stairs allow access between the ground level and the pit level. Catwalks provide access through the structure at the ground level. Two concrete platforms at the southeast end of the building allow for storage of equipment and access to the machine shop and office spaces. These spaces may have been part of the construction of an early pump house.

Walls inside the office, which encompasses the easternmost 20' of the wing, are clad in beaded board. The ceiling may have previously also been beaded board but is now

plywood. The center wall of the machine shop is covered with flush board siding. Other walls are clad in plywood. There is no wall dividing the machine shop and the interior of the pumping plant. Floors are concrete throughout.

8. Machines:

No historic engines are extant in the historic pumping plant. However, it still contains the following pumps (all dates are estimated and approximate):

Pump #1: 48” Fairbanks Morse angle flow pump, 1947
Pump #2: 42” A.S. Cameron double suction volute pumps, 1920
Pump #3: 42” A.S. Cameron double suction volute pumps, 1920
Pump #4: 36” Worthington volute pump, date unknown
Pump #5: 60” American Well Works double suction volute pump, 1919

The pumps have not been in use since 2004 and have been flooded since then. It is unknown whether they work. The suction pipes have been cut and sealed within the building to minimize water infiltration.

Crane systems are integrated into the structural system of both the main pumping room and the northern addition. An I-beam, to which the crane mechanism is connected, spans the width of the building and moves back and forth across the length of the building allowing the crane to be positioned where needed to move heavy equipment. Prior to the installation of this system, large equipment was moved on wheels on temporary tracks and assembled in place in the pump pit.

9. Other structures at pumping plant:

Immediately southeast of the pumping plant is a large warehouse. Constructed at the same time as the last pumping plant, it has a similar structure and appearance. The walls are constructed of concrete block, which has been painted. The building has a gable roof with a monitor, and its gable ends are clad in corrugated metal panels. The structural system is identical to that of the pump house. The overall dimensions of the structure are 42’ x 60’-1”. The building features large sliding doors on the north, south, and west façades. There are three windows on the north façade, two on the south, and four on the east and west façades. All windows are identical to the pump house windows of the three-by-four pane configuration with a center pivot sash.

There is a small brick structure of unknown date east of the warehouse. The building, approximately 20’ x 10’, houses a restroom and washroom. It has a corrugated gable roof, two standard wood doors, and steel windows matching those of the pump house and warehouse in the same three-by-two and two-by-two pane configurations.

C. Site Information

The pumping plant site has been altered over time with the demolition and construction of buildings, changes to the river course, construction of levees, and construction of the

U.S. Department of Homeland Security “border fence” on top of the levees. The immediate site is now smaller and more built-up with the new pumping plant, office, residence, and paving. The only notable historic landscape feature is the small alley of desert willows along a sidewalk east of the office wing. This sidewalk leads to steps that descend to a large paved concrete area in the space contained by the pump house, office wing, and warehouse. Concrete footers flank the stairs and edge the paved area. Although the sidewalk and alley are not visible in any known historic photographs, it likely led to the entrance of the circa 1920 pumping plant structure. With the construction of the new pumping plant, to the north of the historic structure, portions of the historic canals that connected to the headworks were infilled. Large, new underground pipes connect the new pumping plant to the canals. The former paths of the canals leading to the historic headworks, along with the site of the early steam chimney, are still visible in the landscape to some extent, although the visible alterations to the landscape may disappear over time.

Part III. Sources of Information

A. Primary Sources

Alba Heywood Collection, University of North Texas Archives/Rare Books Department.

Deed and Supplements, Frances R. and James L. Landrum to S. A. Robertson, May 20, 1905 (Filed October 18, 1910), Cameron County, Texas, Volume 4, pages 408–423.

Deed, San Benito Land and Water Company to Alba Heywood, February 12, 1909 (Filed March 11, 1909), Cameron County, Texas, Volume P, pages 308–315.

Abstract of Judgment, The Texas Nursery Company vs. The San Benito Nursery Company Unincorporated, October 28, 1912 (Filed December 12, 1912), Cameron County, Texas, Judgment Record Volume A, 72.

Release of Water Lien, Cameron County Water Improvement District #2 to Alba Heywood and Mrs. Alba Heywood, Dated October 19, 1917 (Filed November 5, 1917), Cameron County, Texas, Volume 56, 320–324.

Batts, Robert Lynn. *Abstract of Title of Lands of San Benito Land and Water Co. in Concepcion de Carricitos, Cameron County, Texas*. Austin, TX: Von Boeckmann-Jones, Company, 1910. Center for American History, The University of Texas at Austin.

Chatfield, W. H. *The Twin Cities of the Border and the Country of the Lower Rio Grande*. New Orleans, LA: E. P. Brandao, 1893. Center for American History, The University of Texas at Austin.

Compton, William R. and Company. *Irrigation in Rio Grande Valley, Texas*. Reprint. St. Louis, MO: William R. Compton Company, n.d. [publication estimated early 1910s].

Halff Associates, Inc. *Report on Structural Investigation, Pump Station Building, Los Indios Texas, Cameron County Irrigation District #2*. September 2000. http://idea.tamu.edu/documents/investigation_report.PDF, accessed December 9, 2011.

Johnson Consulting Engineers Planners. "Plan of Rehabilitation: Preliminary Engineering Report. Cameron County Water Improvement District #2." June 1967. http://idea.tamu.edu/documents/plan_of_rehabi.PDF, accessed December 9, 2011.

Meeting Minutes, Cameron County Irrigation District #2, San Benito, Texas. 1913-1958.

"Passenger Traffic Dept. Frisco Lines." *Irrigation in the Gulf Coast Country of Texas*, privately printed brochure, unattributed as to printer/publisher, 1910. Center for American History, The University of Texas at Austin.

Prospectus, San Benito Sugar Manufacturing Company. The S. A. Robertson Company, 1911. Center for American History, The University of Texas at Austin.

San Benito Land and Water Company. *A Statement of Facts Concerning the Farming Lands and Gravity Irrigation Canal of the San Benito Land and Water Company: Which are Located in the Fertile Lower Rio Grande Valley, Cameron County, Texas, on the Main Line of the St. Louis, Brownsville and Mexico Railway.* Houston: Cumming and Sons, 1910. Center for American History, The University of Texas at Austin.

B. Secondary Sources

"Agricultural Adjustment Administration." *North Carolina History Project* (http://www.northcarolinahistory.org/encyclopedia/290/entry), accessed December 12, 2011.

Allhands, James Lewellyn. *Gringo Builders*. Privately published, 1931.

Ashton, John. "Kenedy, Miflin." *Handbook of Texas Online,* Texas State Historical Association, http://www.tshaonline.org/handbook/online/articles/fke23, accessed December 9, 2011.

"Batts, Robert Lynn," *Handbook of Texas Online.* Texas State Historical Association, http://www.tshaonline.org/handbook/online/articles/fbaal, accessed December 9, 2011.

Bloodworth, Morris E., and Paul T. Gillett. "Irrigation." *Handbook of Texas Online*, Texas State Historical Association, http://www.tshaonline.org/handbook/online/articles/ahi01, accessed December 9, 2011.

Bowie, Augustus Jesse. "Irrigation in Southern Texas." *U.S. Department of Agriculture, Office of Experiment Stations Bulletin.* Washington, D.C.: Government Printing Office: 1904.

Border Environment Cooperation Commission. "Cameron County Irrigation District #2." http://www.cocef.org/aproyectos/ExComCameronCounty2003_09ing.htm, accessed December 12, 2011.

Bureau of Reclamation, U. S. Department of Interior. *Plan of Development for Valley Gravity Project, Lower Rio Grande, Texas*. Washington D.C.: Government Printing Office, 1948.

"Cameron County Irrigation District #2," Border Environment Cooperation Commission. http://www.cocef.org/aproyectos/ExComCameronCounty2003_09ing.htm, accessed December 12, 2011.

Center for American History, The University of Texas at Austin
John Closner vertical file
Lon C. Hill vertical file
Irrigation vertical file
Sam A. Robertson vertical file

Friend, W. H. "Citrus Fruit Culture," *Handbook of Texas Online.* Texas State Historical Association, http://www.tshaonline.org/handbook/online/articles/afc01, accessed December 08, 2011.

Foscue, Edwin, *Irrigation in the Lower Rio Grande Valley of Texas* (booklet reprinted from the Geographical Review, Vol. XXIII, No. 3, July 1933).

Haywood, John. "A Brief Legal History of the Irrigation Rights Controversy of Lands Originating in Spanish and Mexican Grants in the Rio Grande Valley of Texas," Thesis, Texas Southmost College, 1974.

Hobbs, Richard. *Glamour Valley*. San Benito, TX: Cameron County News and Farm Journal, 1943.

Holleran, Michael. "Statewide Historic Context Study: Irrigation Ditches and Canals (Colorado)." Denver: Colorado Historical Society, 2005.

Honor to These Pioneers: In the Vital Work of Bringing Transportation Facilities to the Lower Rio Grande Valley… Gulf Coast Lines of the Missouri Pacific System, 1925. Samuel Robertson vertical files, Center for American History, The University of Texas at Austin.

Huie, Trudie Waddell. "A History of the Water Problems in the Lower Rio Grande Valley of Texas." Thesis, Texas College of Arts and Industries, 1957.

JRP Historical Consulting Services. *Water Conveyance Systems in California: Historic Context Development and Evaluation Procedures*. California Department of Transportation, 2000.

Kaniger, Sonia. "Historical Features Assessment of Cameron County Irrigation District No. 2," unpublished report for Section 106 Review purposes, submitted to the Texas Historical Commission August 26, 2004. On file at the offices of the Cameron County Irrigation District #2, San Benito, Texas.

Kearney, Milo. "The Shifting Relationship Between Harlingen and San Benito in the First Three Decades of the Twentieth Century." In *Studies in Matamoros and Cameron County History*, ed. Milo Kearney, Anthony Knopp, and Antonio Zavaleta, 37–75. Brownsville, TX: University of Texas at Brownsville, 1997.

Knight and Associates. *A History of Irrigation in the Lower Rio Grande Valley*. Report prepared for Texas Department of Transportation Environmental Affairs Division. Buda, TX: Knight and Associates, 2007.

Knight and Associates. *Evaluation of the Irrigation System of Cameron County Irrigation District No. 2. (San Benito).* Report prepared for Texas Department of Transportation Environmental Affairs Division. Buda, TX: Knight and Associates, 2007.

Lower Rio Grande Valley Water Users Association. *Gravity Irrigation News*. McAllen, TX: privately published, 1922–1948.

Matthews, William Kenneth. "A History of Irrigation in the Lower Rio Grande Valley." Master's thesis, University of Texas, Austin, 1938.

Mayer, Alice H. *Pioneer Days in San Benito.* San Benito?: n.p., 1964?

McKenna, Verna. "Robertson, Samuel Arthur," *Handbook of Texas Online.* Texas State Historical Association, http://www.tshaonline.org/handbook/online/articles/fro32, accessed December 9, 2011.

McNail, J. L. "The History and Development of Irrigation in the Lower Rio Grande Valley." Master's thesis, Texas College of Arts and Industries, 1948.

Olin, W. H. *American Irrigation Farming*. Chicago: A.C. McClurg and Company, 1913.

Richards, John. *Centrifugal Pumps: An Essay on their construction and operation.…* San Francisco: The Industrial Publishing Company, 1894.

Robinson, Charles M., III. *A History of San Benito.* Harlingen, TX: Sand Dollar Graphics, 1982.

Robinson, III, Charles M. "San Benito." *The Handbook of Texas Online*. Texas State Historical Association, http://www.tshaonline.org/handbook/online/articles/SS/hes1.html, accessed on December 9, 2011.

"South Texas Industry Profile: Agriculture." Texas Comptroller of Public Accounts http://www.window.state.tx.us/specialrpt/tif/southtexas/sidebars/agriculture.html, accessed December 12, 2011.

Stambaugh, J. Lee, and Lillian J. Stambaugh. *The Lower Rio Grande Valley of Texas.* Austin, TX: Jenkins Publishing and San Felipe Press, 1974.

Taylor, Thomas Ulvan. "Irrigation Systems of Texas," *U.S. Geological Survey, Water-supply and Irrigation Paper*. Washington, D.C.: Government Printing Office, 1902.

Texas Almanac and State Industrial Guide. Dallas: A.H. Belo and Company, 1911, 1914, 1933, 1942.

Thompson, James Heaven. "A Nineteenth-Century History of Cameron County, Texas." Thesis, Texas Southmost College, 1965.

Watson, Mrs. James. *The Lower Rio Grande Valley of Texas and its Builders*. Mission, TX: privately printed, 1931.

"William Bankhead." *Encyclopedia of Alabama*, http://www.encyclopediaofalabama.org/face/Article.jsp?id=h-1366, accessed December 12, 2011.

Werner, George C. "St. Louis, Brownsville and Mexico Railway." *Handbook of Texas Online*, Texas State Historical Association, http://www.tshaonline.org/handbook/online/articles/eqs30, accessed December 9, 2011.

Wooster, Robert. "Heywood, Alba." *Handbook of Texas Online*. Texas State Historical Association, http://www.tshaonline.org/handbook/online/articles/fhe38, accessed December 9, 2011.

Appendix A. Photographs

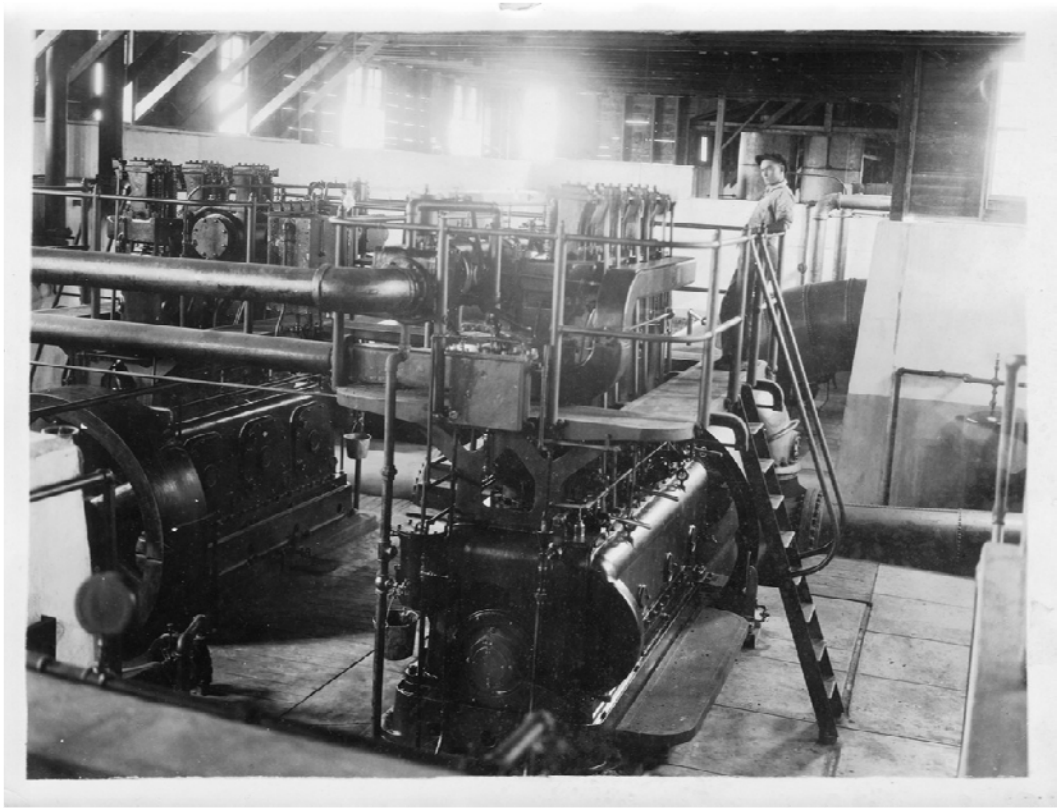
Circa 1909. Original headgates during construction viewed from Rio Grande. Structure on right is temporary construction building. Photograph: Alba Heywood Collection, University of North Texas Archives/Rare Books Department.

Circa 1909. Original headworks, looking towards Rio Grande. Pictured structure is the first pump house, with original pump pit. Photograph: Alba Heywood Collection, University of North Texas Archives/Rare Books Department.

Circa 1909. View of original headworks from main canal. Pumping plant water channel can be seen on far right beneath pump house. Photograph: Alba Heywood Collection, University of North Texas Archives/Rare Books Department.

Circa 1919. Second pumping plant during construction.
Photograph: Cameron County Irrigation District #2.

Circa 1920. Second (circa 1917) pumping plant with additions above headworks, looking south. Photograph: Cameron County Irrigation District #2.

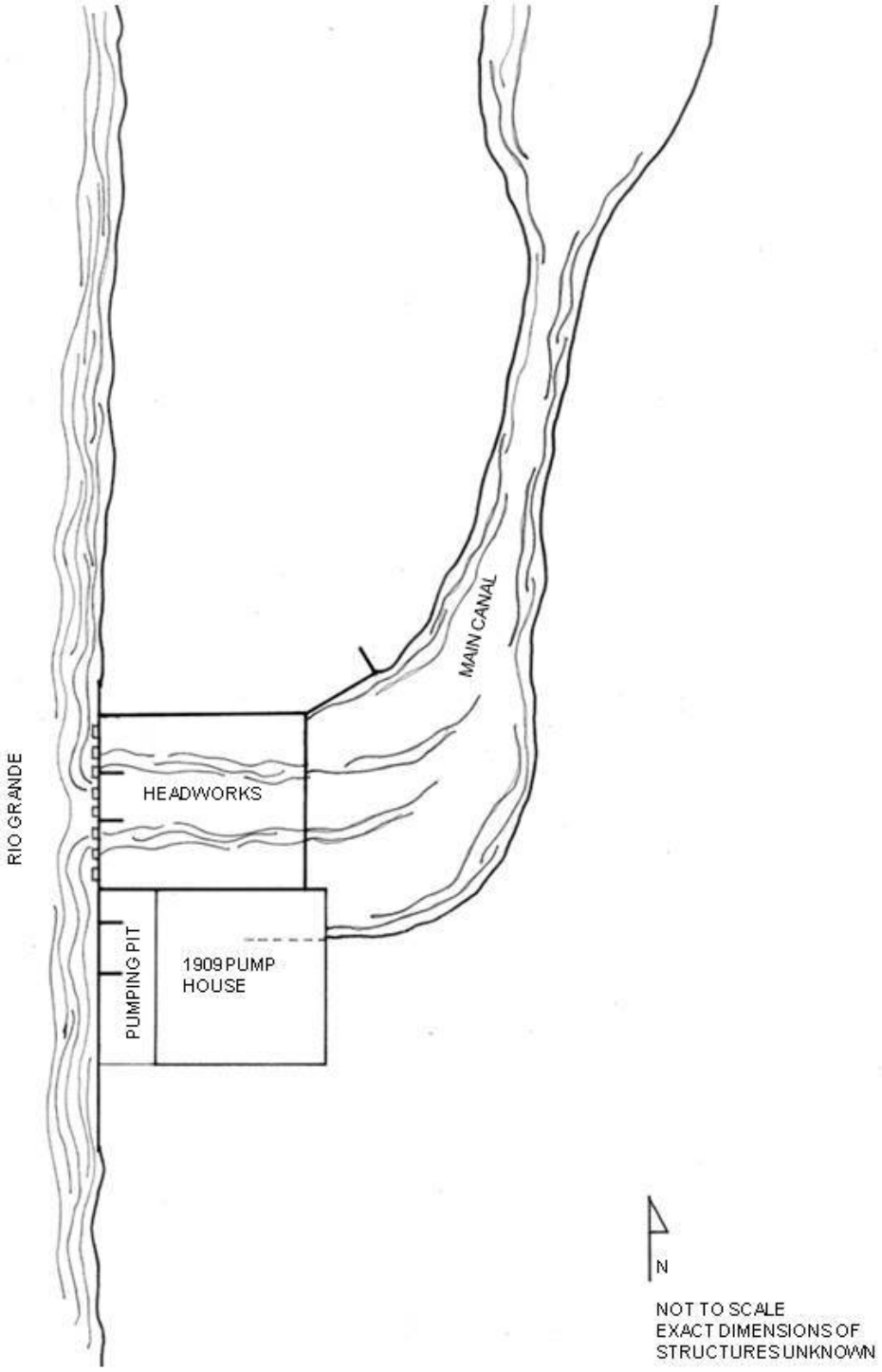


Circa 1920. Interior of pumping pit constructed within original headworks, looking north. Photograph: Cameron County Irrigation District #2.

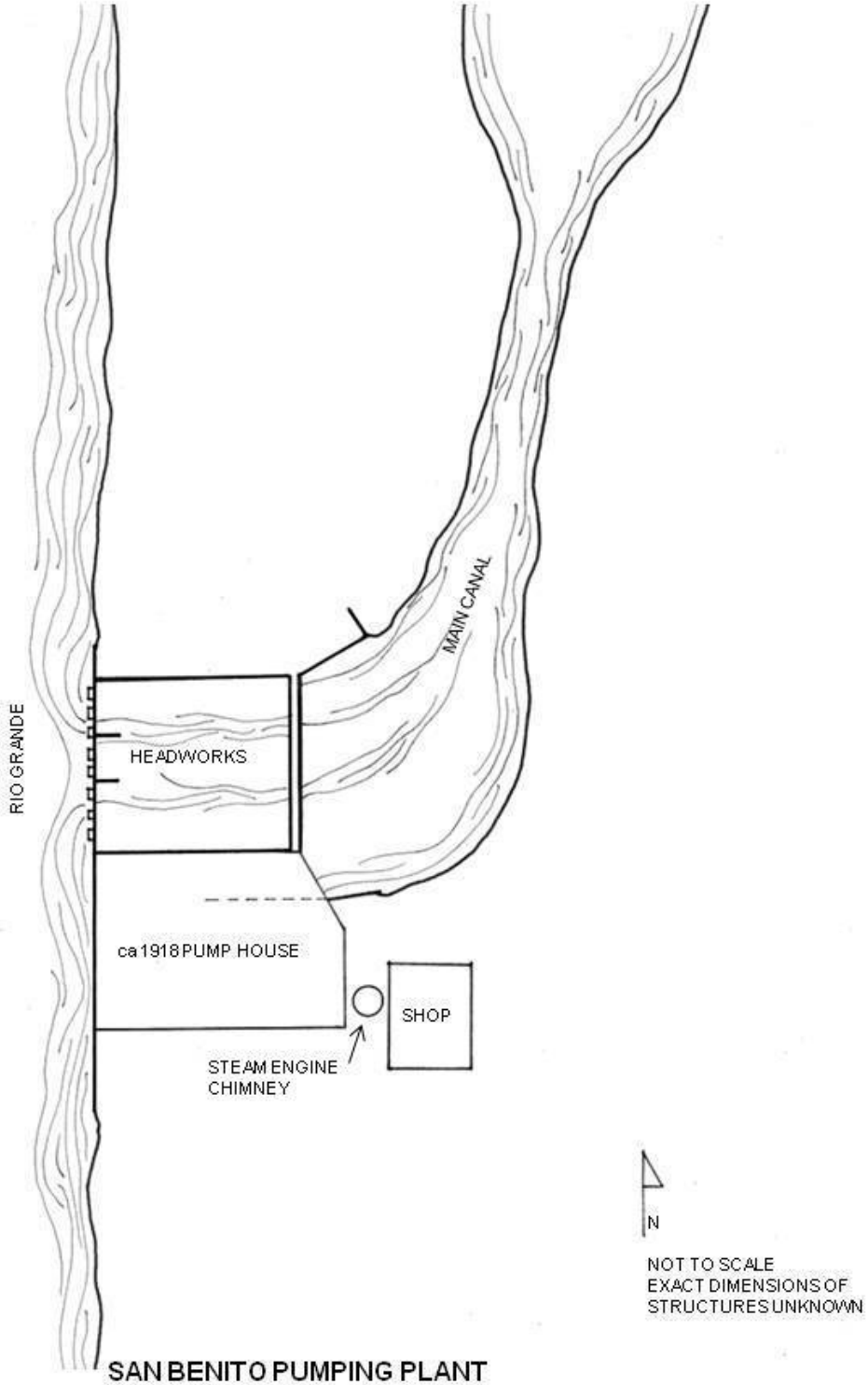
1951. Third (circa 1947) pumping plant looking across concrete connector to High Line Canal. Photograph: Cameron County Irrigation District #2.

2011. Sidewalk and tree alley. Photograph: Caroline Wright, HDR

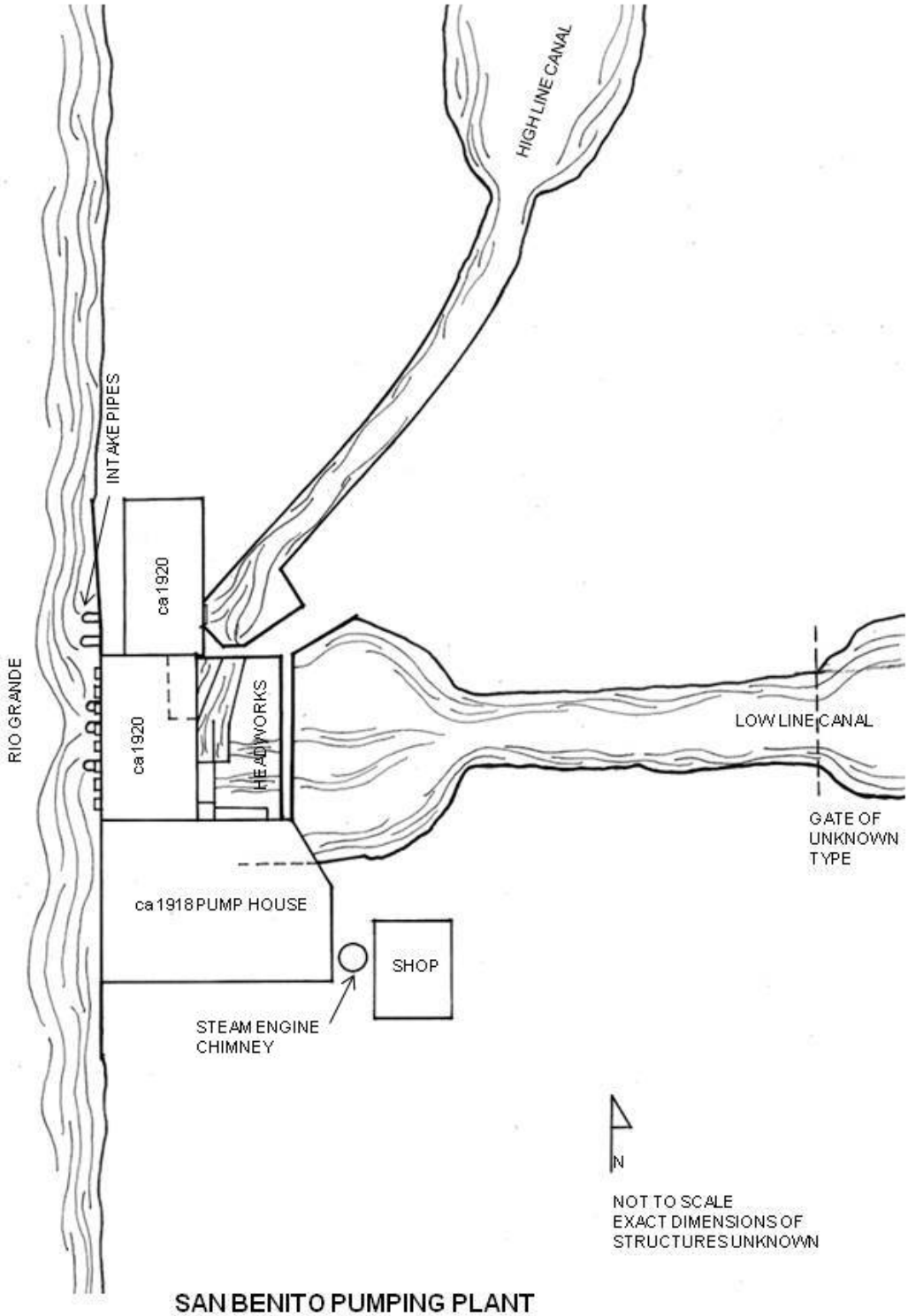
Appendix C. Site Drawings



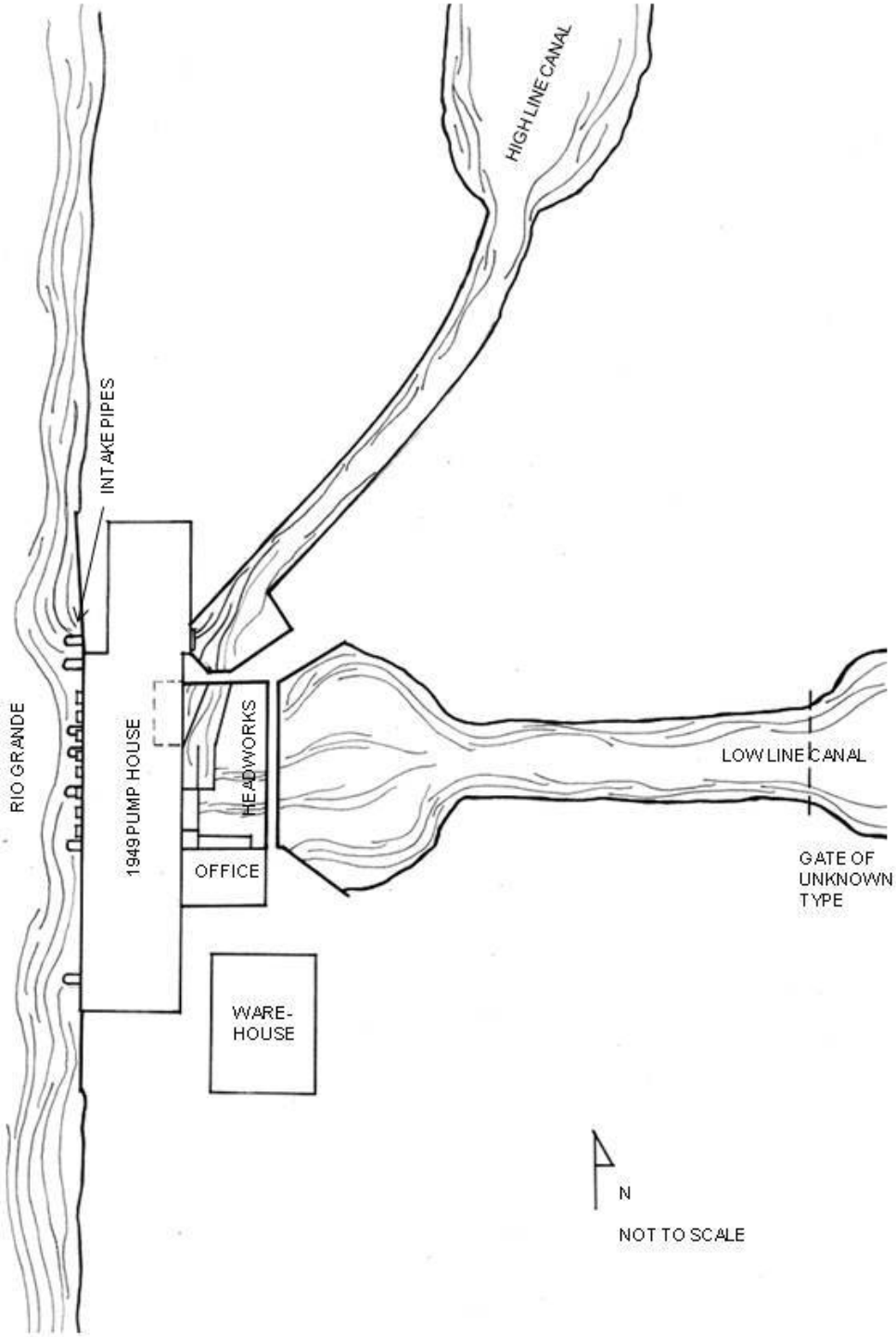
SAN BENITO PUMPING PLANT
1909-1918



SAN BENITO PUMPING PLANT
1918-1920



SAN BENITO PUMPING PLANT
1920-1947



SAN BENITO PUMPING PLANT
1949-2004