Gila Project

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The Gila Project

Project Location

The Gila Project is divided into two divisions, and is located in the southwestern corner of Arizona. The 40,000 acres of the Yuma Mesa Division are subdivided into three units. The Mesa Unit contains 25,000 acres and is located south and southeast of Yuma, Arizona. The remaining 15,000 acres are located in the North Gila Valley and South Gila Valley Units which lie east and northeast of Yuma. The Wellton-Mohawk Division consists of 65,000 acres which begin about twelve miles east of Yuma and run along the Gila River Valley roughly between the towns of Dome and Texas Hill, Arizona.[1] All project lands lie between elevations 140 and 350 feet above sea level.[2]

The region's climate is very similar to that of Phoenix, Arizona. The region is hot and arid with a mean maximum temperature of 83.7 degrees Fahrenheit, and a mean minimum temperature of 55.6 degrees. However, temperatures can range anywhere from 22 degrees to 118 degrees. Additionally, the area is subject to high velocity winds throughout the year. Precipitation in this desert region is minimal, with an average rainfall of less than ten inches, which is often delivered in a few concentrated storms. Because of this the region cannot support agriculture without the aid of irrigation water. However, with adequate water supplies, the warm climate supports a growing season which ranges from 330 to 350 days per year.[3]

Historic Setting

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1. Water and Power Resources Services, *Project Data*, (Denver: Government Printing Office, 1981), 507. Department of the Interior, Bureau of Reclamation, "Project Histories: Gila Project," 1947, 14-5 (hereafter referred to as "Project History" followed by the year and page).
2. "Project History," 1946, 16.
3. United States Department of the Interior, Bureau of Reclamation, *Report of the Feasibility of Gila Valley Project - Arizona, by Special Committee*, (Denver: Bureau of Reclamation, February 1936), a, 9-13; United States Department of the Interior, Bureau of Reclamation, *United States Bureau of Reclamation on Upper Gila River Investigations of 1929-1930, in Pursuance of Act of Congress Approved May 25, 1928*, (Denver: Bureau of Reclamation, November 15, 1930), 118.

It is believed that the earliest settlers in the vicinity of the Gila Project were Cocopah Indians. The next established group of Indians in the area were Apaches who hunted, fished, and farmed along the banks of the Colorado and Gila Rivers. The region's irrigation history began in 1538 when the Pima Indians, living in the Wellton-Mohawk area first irrigated some bottom land adjacent to the Gila River. The first Spanish visitor passed through the region by way of the Colorado River in 1542, beginning an era of Spanish domination which lasted 300 years. The region's first white settler was Fray Garces, a Jesuit Priest, who established two missions within a year. However the next 70 years consisted more of explorers, trappers, and travelers who passed through the area than of people who settled permanently.[4]

In 1848, following the war with Mexico, the United States took possession of the territory north of the Gila River. This opened the land for travelers on their way to California for the gold rush in 1849. However, the Indians who inhabited the territory objected to these white travelers crossing their lands. Indian attempts to stop these travelers led to the building of the U.S. Army Post, Fort Yuma, in 1850. Soon thereafter the town of Colorado City formed across from present day Yuma, on the California side of the Colorado River. A ferry was established to transport travelers across the river. Additionally, herds of cattle driven from Texas and Mexico into California were piloted across the river at this point by swimmers.[5]

In 1856 the lands south of the Gila River also came into possession of the United States Government. Within a year early pioneer settlements began dotting the region with the establishment of the Butterfield Stage Line through the area in 1857. The Butterfield Stages, which ran between St. Louis, Missouri and San Francisco, California, used the ferry at Colorado City to cross the Colorado River. During this era boat traffic on the river was frequent, as the

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4. "Project History," 1945, 53; Water and Power, *Project Data*, 509.
5. *Ibid.*

boats used the river to transport goods which had been shipped from San Francisco to the Gulf of California by way of ocean going steamers.[6]

In 1863 the Colorado River flooded, washing away with it, Colorado City. A short time later a new town known as Arizona City was built on the Arizona side of the river, and in 1872 the town's name was changed to Yuma. For the next several years Yuma's importance as a river port steadily increased. However, the year 1879 brought the region near Yuma service from the Southern Pacific Railroad. The coming of the railroad signaled the decline of shipping on the hazardous Colorado River. However, homesteaders continued to settle within the region. As the number of settlers grew so did the region's agriculture, and its need for irrigation water.[7]

The late 1800s saw the construction of the Mohawk Canal which had a diversion headworks on the Gila River at Texas Hill, and construction of Antelope Canal, which also diverted water from the Gila River, to serve the Wellton area. However, a series of disastrous floods washed out the diversion works and destroyed most crops in the area. These floods alternated with long drought periods which continually plagued the region's farmers. Thus, farmers eventually turned to digging wells to tap into the region's vast groundwater supply for irrigation and municipal water supplies.[8]

The Antelope Irrigation District formed and built a wood-burning steam generating plant in 1906 to produce power for pumping water from the wells. The Gila Valley Power District organized in 1921 to develop and supply electric power for pumping irrigation water to water users. Farmers continued to drill wells to maintain their water supplies, but between the late 1920s and mid-1930s they began facing another threat to their water supply. Over the years the

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6. *Ibid.*
7. *Ibid.*
8. Water and Power, *Project Data*, 509.

groundwater supply became increasingly salty and the water table dropped dramatically. This situation forced numbers of settlers to abandoned their farms. The farmers who remained in the region turned to Reclamation and requested that a stable sweet water supply be diverted from the Colorado and Gila Rivers. These requests led to development of the Gila Project.[9]

Project Authorization

Authorization for investigation of the Parker-Gila Project, as the Gila Project was originally known, came under Sections 11 and 15 of the Boulder Canyon Project Act, which was approved December 21, 1928. In November of 1933 the Public Works Administration allocated $100,000 to Reclamation for the purpose of conducting studies and developing plans and specifications for the Gila Project. Reclamation began initial surveys in January of 1934. In the original project plan the development of the Colorado Indian Reservation and the Gila River Valley were proposed under one project. However, subsequent field investigations proved that dividing the two areas into separate projects was far more practical. Thus, the plan to develop a potential 585,000 acres of land on the Yuma Mesa and in the lower Gila River Valley became known as the Gila Project.[10]

Project construction was initially authorized June 21, 1937, under a finding of feasibility approved by President Franklin Roosevelt, pursuant to section 4 of the act of June 25, 1910 (36 Stat. 836), and subsection B of section 4 of the act of December 5, 1924 (43 Stat. 701).[11] Following World War II, the project, with its irrigable acreage reduced to 115,000 acres [40,000 acres in the Yuma Mesa Division, and 75,000 acres in the Wellton-Mohawk Division], was reauthorized July 30, 1947 (61 Stat. 628). This act also limited the amount of water to be used

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9. *Ibid.*
10. "Project History," 1948, 16.
11. Water and Power, *Project Data*, 510.

by each division to 300,000 acre-feet annually. However, the Colorado River Basin Salinity Control Act of June 24, 1974 (88 Stat. 266) further reduced the irrigable acreage within the Wellton-Mohawk Division to 65,000 acres.[12]

Construction History

The main features of the Gila Project include the Gila Desilting Works, located at Imperial Dam, the Gila Gravity Main Canal, the Mesa Unit Canals and corresponding distribution system, the North Gila Valley lateral system, which was originally built as part of the Yuma Project, the South Gila Valley's canal and pipeline distribution system, and the distribution system (which includes Canals A and B), drainage system, and protective works of the Wellton-Mohawk Canal.[13] The water which flows through the Gila Project descends approximately 1,400 miles from its origin in the Rocky Mountains, it flows into Lake Mead via the Colorado River, and is then released downstream stopping periodically in the reservoirs behind Davis, Parker, Headgate Rock, and Imperial Dams.[14] From the Imperial Dam, which was built as part of, and also serves, the All-American Canal system of the Boulder Canyon Project, the water is diverted into the Gila Desilting Basin where it flows through the Gila Gravity Main Canal for a distance of just under twenty-one miles, skirting the Laguna Mountains and passing through two tunnels before it crosses the Gila River through the Gila River Siphon. From the siphon, the water flows to the eastern end of the South Gila Valley and into the Yuma Mesa Pumping Plant where it is lifted 52 feet into Canals A and B on the Yuma Mesa. Through a lateral system the A and B Canals distribute irrigation water to the land on the north end of the Yuma Mesa. The B Canal also diverts water to the southern end of the Yuma Mesa.

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12. *Ibid*.; "Project History," 1947, 18.
13. Water and Power, *Project Data*, 507.
14. "Yuma Homesteaders 'DeBug' Water," *The Reclamation Era* 36 (December 1950): 242.

Additionally, a turnout on the Gila Gravity Main Canal, just south of the Gila River, diverts water into the Wellton-Mohawk Canal, which after passing through a series of three pump lifts, delivers water to its branches, the Wellton Canal and the Mohawk Canal, which lateral systems distribute irrigation water to laterals throughout the Wellton-Mohawk Division.[15]

Reclamation began surveys of the present day Gila Project lands in the early 1930s. They discovered that with the proper water supply, land on the Yuma Mesa could be cultivated and used as a good source of agricultural production, just as the land on the nearby Yuma Project had been. Additionally, Reclamation reported that the lands in the present day Wellton-Mohawk Division needed a new supply of fresh water despite the fact that the Division already had an irrigation system consisting of wells, pumping equipment, distribution canals, and an electrical transmission line from Yuma. However, the increasing salt content in the well water, and the high costs of pumping made the Division lands in need of a new source of irrigation water. In 1934 Reclamation submitted a report which favored the construction of Gila Project. The project was initiated under Title II of the National Industrial Recovery Act of June 16, 1933, and was continued under the Emergency Relief Act of 1935. Authorization come under a finding of feasibility approved by the President in 1937. However, first stage construction, to serve approximately 139,000 acres of land on the Yuma Mesa, actually began in 1936, prior to the project's official approval.[16]

Although Imperial Dam is considered one of the features of the Gila Project because it diverts Colorado River water into the Gila Project irrigation system, it was originally planned as a feature of the Boulder Canyon Project. However, prior to its construction, Reclamation

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15. Water and Power, *Project Data*, 507; "Project History," 1943, 15-6; "Project History," 1944, 9-10.
16. Water and Power, *Project Data*, 510; "Project History," 1939, 15; United States Department of the Interior, Bureau of Reclamation, *Gila Project, Gila Gravity Main Canal, Arizona: Rehabilitation and Betterment Report*. (Denver, Bureau of Reclamation, November, 1971), IV.

decided to use the dam in connection with the Gila Project as well. Therefore, Imperial Dam, constructed eighteen miles northeast of Yuma from 1936 to 1938, was built with the dual purpose of diverting water from the Colorado River to the All-American Canal system in Southern California, and to the Gila Gravity Main Canal to deliver water to the Gila Project.[17]

Imperial Dam diverts water through a desilting basin and on into the Gila Gravity Main Canal. Construction of the desilting basin and diversion works for the Gila Canal, and the Gila Canal to Station 30, which begins the Gila Gravity Main Canal, was provided for under the Order for Changes Number 1 of the general contract for construction of Imperial Dam and the desilting works for the All-American Canal. The construction contract was awarded to three corporations, Utah Construction Company, Morrison-Knudsen Company, and Winston Brothers Company, on December 14, 1935. The Order for Changes Number 1 was approved July 7, 1936.[18] Construction of the Gila Canal occurred between September 28, 1936, and February 24, 1937. All construction under this contract was completed on July 30, 1938, in conjunction with completion of Imperial Dam.[19]

The desilting works has a 1,200 foot long sluiceway at a right angle to the dam's right abutment. The sluiceway is an earthfill embankment covered with gravel, and has a water prism lined with eight inch reinforced concrete on top of gravel. Water enters the settling basin through three sets of outlet units, each consisting of three radial gates. From the gates water flows into a concrete channel at right angles to the basin and flows into the Gila Canal. Sluicing is accomplished by eight, 16 by 7 foot gates placed directly under the canal gates. From the sluice gates the water flows under the diversion channel to the river.[20]

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17. "Project History," 1943, 15.
18. "Project History," 1937, 40.
19. *Ibid*., 43; "Project History," 1938, 39; "Project History," 14.
20. "Project History," 1936, 13; Water and Power, *Project Data*, 507.

The main features included on the Gila Gravity Main Canal consist of two tunnels, the Gila Siphon, which crosses the Gila River, storm water control structures, turnouts, and wasteways.[21] The construction process of the canal began on February 27, 1936, when bids for construction of the main canal from Station 30 to Station 931 opened. Construction specifications for the Gila Gravity Main Canal were broken into four schedules. The Government awarded the contract for Schedules I and IV to J. H. Boyce Sons Company and Roy L. Igo on March 25, 1936. Their contract provided for construction of the Gila Gravity Main Canal from Station 30 to Station 285+30, and from Station 408 to 931, excluding the Gila River Station.[22] The contract for Schedules II and III went to Mittry Brothers Construction Company. Their contract called for construction of the Gila Gravity Main Canal from Station 285+30 to Station 408. These sections included Tunnels 1 and 2.[23]

J. H. Boyce Sons Company and Roy L. Igo received notice to proceed on May 1, 1936 and began construction efforts shortly thereafter. By the end of 1936 the contractor completed much excavation work and completed the canal from Station 30 to Station 282. Additionally, they completed the surface drain dikes and cuts between Station 30 and Station 245. At the end of 1937 the contractor completed the specified sections of canal except for construction of temporary plugs at structure sites and removal of some rock in the canal. However contractors completed work in the spring of 1938.[24]

The Government awarded the contract for Schedules II and III of the Gila Gravity Main Canal to Mittry Brothers Construction Company on March 25, 1936, and the contractor acknowledged notice to proceed on May 4, 1936; construction began in June of 1936. By year's

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21. "Project History," 1936, 13.
22. *Ibid*., 8; "Project History," 1937, 35.
23. "Project History," 1936, 8; "Project History," 1937, 48.
24. "Project History," 1936, 8, 35; "Project History," 1937, 47.

end the contractor completed excavations of large portions of Tunnel 1, excavated the canal and surface drains, and placed 50,000 pounds of steel tunnel supports. The contractor made steady progress on construction of Schedules II and III during most of the year. The contractor holed through on Tunnel 1 on March 17, 1937. Excavation of Tunnel 2 began in April of 1937, and workers holed through the tunnel on October 18. At year's end, the contractor completed Tunnel 1 from Station 316 to Station 298+60.

However, the contractor did not complete as much work during 1937 as originally anticipated due to a brief labor strike which began at the end of April. For two weeks the contractor and workers disagreed on the subject of a wage increase. The workers desired a twenty cent per hour raise for all classes of labor. Mittry Brothers Construction Company did not wish to grant an across-the-board raise. On May 10, 1937, however, the contractor and the laborers reached an agreement. A compromise was made wherein miners received a ten cent per hour raise, and laborers with no recognition of the union received a five cent per hour raise. Thus, work resumed and progressed rapidly. There were no further labor problems.

The contractor began concrete placement in Tunnel 1 in January and February of 1938. Concrete placement for Tunnel 2 began in the spring. All remaining work for Schedules II and III were mostly completed during the summer months, with all construction being finished September 30, 1938, resulting in the completed Tunnel 1 being 1,740 feet long and twenty feet wide, and the completed Tunnel 2 being 4,125 feet long and twenty feet wide.[25]

Bids for the Gila River Crossing of the Gila Gravity Main Canal to be located at the Gila River Station opened January 4, 1938. Out of seventeen bids received, Reclamation awarded the contract to Metropolitan Construction Company on January 31, 1938. The contractor

25. "Project History," 1936, 8, 35; "Project History," 1937, 48; "Project History," 1938, 61; "Project History," 1942, 27.

acknowledged notice to proceed on March 2, 1938, but actually began construction prior to that date. The contract called for the Gila River Crossing to be a concrete siphon constructed below the channel of the Gila River, containing transitions at the inlet and outlet ends of the siphon, and gate structures consisting of fixed wheel gates at the entrance to the siphon. As with all the project features constructed between 1936 and 1947, the crossing was designed so it could be enlarged to allow the irrigation system to ultimately deliver water to an estimated 585,000 acres. However, under the initial development of the Gila Gravity Main Canal, the Gila River Crossing was constructed as a nineteen and one-half foot wide and 2,000 foot long single barrel siphon, with transitions, a gate, and enough rip rap on the canal embankments to protect the inlet and outlet ends of the siphon.[26]

The primary contractor subcontracted with two other construction companies for the specific items under the work schedule. On March 22, 1938 Charles M. Hill subcontracted with Metropolitan Construction Company for the placing and fabrication of reinforcement steel under item number seventeen of the schedule. August 31, 1938, J. B. Stringfellow subcontracted with the primary contractor for the placing of rip rap on the outside slope of the embankments, and for the placing of rockfill about the siphon barrel.[27]

Construction began with the excavation of the open and closed transitions of the siphon's outlet. Once this was completed, the contractor worked in both directions, working on the canal section downstream from the siphon, and working into the region of the siphon barrel upstream. Excavation work took place in April, May, and June 1938, and concrete placement occurred from the end of April to mid-December 1938. By the end of the year the contractor was nine and

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26. "Project History," 1938, 74-5; E. A. Blout, "Inverted Siphons, Gravity Main Canal," *The Reclamation Era* 30 (February 1940): 33.
27. "Project History," 1938, 74-5.

one-half months ahead of the construction schedule.[28] Work continued to progress swiftly, and most of the work done in 1939 consisted of clean-up work and backfilling. Thus, the contractor completed work, on February 24, 1939, eleven months ahead of schedule.[29] At the time of the construction, the Gila Siphon and the Fortuna Wash Siphon (see below) were the largest inverted siphons built by Reclamation to that point.[30]

On September 7, 1938, bids for construction of structures in the Gila Gravity Main Canal from Station 946+70 opened. The specifications called for construction of: thirteen drainage inlets, one automatic spillway and overchute designed to carry 2,700 cubic feet per second over the canal and discharge 1,000 cfs from the canal, one automatic spillway capable of discharging 3,000 cfs from the canal, two other automatic spillways designed for discharging 1,000 cfs each, one wasteway with an automatic spillway, a turnout and a corresponding short canal reach for delivering 106 cfs to the North Gila Irrigation District, a chute drop on a previously constructed channel above the canal, and construction of the Fortuna Wash Siphon. On October 31, the Government awarded this contract to Jahn and Bressi Construction Company, Incorporated, who received notice to proceed on December 20, 1938.[31]

The contractor began work in early December, prior to receiving notice to proceed, and by the end of the year had excavated the outlet for the siphon and roughed out the excavation for the adjacent barrel. Additionally, the contractor compacted the subbase for the concrete outlet transition.[32] Work on the contract progressed smoothly and quickly. Construction of the Fortuna Wash Siphon was practically identical to the construction of the Gila River Crossing. During construction, a set of steel forms which were built to the exact dimensions of the concrete were

28. *Ibid*., 75.
29. "Project History," 1939, 46, 48.
30. Blout, "Inverted Siphons," 33.
31. "Project History," 1938, 93; "Project History," 1939, 54.
32. "Project History," 1938, 94.

used for forming both sides of the barrel structure, except for the invert. These were the same forms used during construction of the Gila Siphon. By September 10, 1939 all work for the contract was completed. The contractor finished construction six months ahead of the specified completion date.[33]

The Government issued a contract for construction of Fortuna Spillway and two highway bridges to Norman I. Fadel on April 10, 1939. The Fortuna Spillway is located on the Gila Gravity Main Canal, 200 feet downstream from Fortuna Wash Siphon's outlet. The structure consists of an automatic spillway structure in the canal's right bank, and a spillway channel leading one mile to the Gila River. During 1939 the contractor completed construction of both highway bridges. The contractor also excavated the spillway channel, and began rock excavation for the control section of the spillway as well as beginning backfill operations. Most of the construction in 1940 consisted of finishing work on the spillway's gates structures and the spillway channel. The contractor also constructed two additional timber bridges under an Extra Work Order issued early in the year. All work on the Fortuna Spillway and the farm bridges was completed on April 15, 1940.[34]

Bids for construction of Pumping Plant Number 1, later renamed Yuma Mesa Pumping Plant, opened June 13, 1940. Reclamation awarded the contract to Charles J. Dorfman on July 11, 1940. The contractor acknowledged notice to proceed on August 28, 1940, which set the completion date for October 2, 1941. However, Dorfman actually began construction on August fifth, twenty-three days prior to receipt of official notice. Work progressed rapidly. By the end of 1940, the pump house was completely excavated and all the foundation piles had been driven. Additionally, the contractor had also finished placing 75 percent of the concrete in the building's

33. "Project History," 1939, 59; Blout, "Inverted Siphons," 33.
34. "Project History," 1939, 65, 67; "Project History," 1940, 9.

substructure. The contractor worked on the afterbay structures as well; and completed the excavation for a county road culvert, and part of the flume section and the check gate structures for the two pump canals.[35] During 1941 the contractor completed construction of the pumping plant structures and installed three pumping units of 400, 200, and 100 cfs capacity. He completed all contract work on October 2, 1941, the date specified by the contract.[36] The plant was constructed to lift water from the Gila Gravity Main Canal to the Yuma Mesa to deliver water to the desert lands in North and South Gila Valley Units of the Yuma Mesa Division.[37]

The plant's power supply comes from the Parker Power Plant. The stringing of 120 miles of 161 volt transmission line from Parker Dam and construction of the Gila Substation, which distributes the power, were conducted by the Parker Dam Power Project between 1939 and 1943.[38] The official beginning of plant operations occurred November 4, 1943. This also marked the date that the first irrigation water from the project was available for delivery.[39]

On January 28, 1941, bids opened for construction of earthwork, structures, and concrete lining of the Gila Gravity Main Canal's two main branch canals, Canals A and B, and their corresponding laterals in the first section of Unit 1. The contract called for construction of just under thirteen miles of canals with eight foot wide bottoms, and thirteen miles of canals with five foot wide bottoms. All canals were designed to be concrete lined throughout. Additionally, the contract included construction of farm turnouts, lateral turnouts, and the placement of check and measuring devices.[40]

Out of eight bids the lowest came from Mittry Brothers Construction Company who

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35. "Project History," 1949 (Part 1), 8; "Project History," 1940, 50.
36. "Project History," 1946, 67; "Project History," 1941, 57.
37. "Project History," 1940, 50, 52.
38. "Project History," 1939, 19; "Project History," 1943, 16.
39. "Project History," 1943, 6.
40. "Project History," 1941, 62.

received the contract and notice to proceed on May 16, 1941; thus, setting the completion date for July 1, 1943. Construction work began May 21, 1941. Most of the work during the rest of the year consisted of excavating the canals and building the canal embankments. The contractor also completed four farm turnouts and began placing concrete in December. Much of the construction which took place in 1942 included building a number of turnouts, farm bridges, foot bridges, flumes, and culverts. However, during 1942 the contractor faced labor shortages, and had difficulty in having equipment repaired. Thus, the contractor's progress was slowed by a significant degree, and by year's end only just over half the work was completed with more than 76 percent of the time elapsed. During 1943, however, labor shortages ceased to be a problem for Mittry Brothers construction Company, and the contractor completed the remainder of the work in a timely manner, finishing all work under the contract on November 2, 1943.[41]

Bids for earthwork, structures, and concrete lining of Canals A and B and their corresponding laterals in the second section of Unit 1 opened April 18, 1941. This contract mainly provided for construction of 52 miles of one and one-half foot bottom width concrete lined ditches leading from the A and B Canals and laterals to individual farm units on the Yuma Mesa. This contract also provided for construction of farm turnouts, checks, and measuring structures.[42]

Reclamation awarded this contract to Clyde W. Wood on May 9, 1941. The contractor received notice to proceed on August 4, 1942, setting the completion date for August 24, 1943. Construction of ditches began September 29, 1941.[43] From January to May of 1942 the contractor placed concrete in several lateral sections. In mid-May, Wood suspended work for

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41. *Ibid*., 62-3; "Project History," 1942, 36; "Project History," 1943, 31.
42. "Project History," 1941, 67.
43. *Ibid.*

the duration of the hot summer months, intending to resume work in the fall. However, by fall Wood encountered a shortage of labor and was unable to conduct any further work on the contract. Consequently, by the end of 1942, almost 70 percent of the time allotted in the contract had passed, and the contractor had completed less than 19 percent of the work.[44]

In December 1942, due to the demands of the war effort, the War Production Board issued an order restricting the amount of work Wood could perform, thereby making his contract unprofitable. However the War Production Board then had Reclamation issue an Order for Changes which, although it still specified a work load less than stated in the original contract, expanded the work which could be conducted by the contractor under the new contract. The Order for Changes also granted the contractor more money than specified in the original contract, even though he was to perform less work. Additionally, the Order for Changes altered the construction of the canals from concrete lines to non-concrete lined canals. The contractor resumed construction under the stipulations set forth in the Order for Changes in November of 1943, and all remaining work under the revised contract was completed on June 10, 1944.[45]

Project construction was greatly reduced during the duration of World War II. However, due to the establishment of the Yuma Army Air Field on one corner of the present day Mesa Unit, work on some project land was needed in order to control dust problems. In October of 1942, Army officials went to Reclamation with the claim that dust from project lands was blowing onto the airfield and damaging airplane motors. The two agencies then entered into negotiations which resulted in a plan for Reclamation to irrigate 5,500 acres of land near the airfield. The plan was approved by the War Production Board and Reclamation began leveling land and preparing it for growing alfalfa for the dual purpose of dust control and predevelopment

44. "Project History," 1942, 41, 44.
45. "Project History," 1943, 33; "Project History," 1944, 10.

of lands for eventual settlement. The area was later increased to 8,500 acres, and Reclamation rushed through work on the program in both 1943 and 1944.[46] Government forces constructed a number of canal structures on the predevelopment area in 1945. The Government used German Prisoners of War for this work beginning on June sixth and continuing throughout the year, except for brief periods when the prisoners were used to aid Yuma Valley farmers in the harvesting of crops.[47] After the war, predevelopment acreage was increased to 10,770 acres within the 25,000 acres of the Yuma Mesa Division. By the end of 1947 about 5,000 acres had successfully been predeveloped. The Government made some additional improvements to the land by replacing all wood structures in the upper portion of the farm ditches with concrete. They completed this process in early 1948, and soon after divided the 5,000 acres into 54 farm units to be sold to homesteaders. War veterans were given priority in the process of selecting potential homesteaders.[48]

Construction of canals and laterals on the rest of the project lands resumed shortly after the end of the war.[49] On July 23, 1946, bids opened for earthwork, lining, and construction of structures on Canal A and its laterals. Reclamation granted the contract to Macco Construction Company, which received notice to proceed on October 14, 1946. Work began in the fall of 1946. Construction progressed steadily, and the contractor was not confronted with any unusual problems. All work under the contract was completed on July 21, 1947, the date listed in the specifications.[50]

Bids for construction of just under sixteen miles of the A and B Canals and laterals to be lined with gunite, and the construction of 184 structures such as bridges, flumes, culverts,

46. "Project History," 1956, 5; "Project History," 1944, 10.
47. "Project History," 1945, 14.
48. "Project History," 1948, 39-40.
49. "Project History," 1956, 5.
50. "Project History," 1946, 26; "Project History," 1947, 7.

suppressed weirs, Ceppolleti weirs, checks, cut-off walls, and turnouts opened December 30, 1946. V.D. Case Company was awarded the contract and received notice to proceed on St. Patrick's Day in 1947, which fixed the completion date at November 22, 1947. The contractor began construction on April 2, 1947. The primary contractor subcontracted with Bennett Murray, Engineering Construction, for the embankment compaction and to excavate the laterals. V.D. Case Company also subcontracted with Case Gunite Company to conduct pneumatically applied mortar lining operations. Construction work progressed in a timely fashion, and all work was completed by the date specified by the contract.[51]

On June 30, 1947, Congress reauthorized the entire project. However, they relocated the project boundaries and reduced the project's service area to 115,000 acres, 40,000 acres in the Yuma Mesa Division, and 75,000 acres in the Wellton-Mohawk Division. An additional 3,400 acres of land, in and adjacent to the Yuma Auxiliary Project was included to be served by the Gila Gravity Main Canal. The canal's capacity was changed to 2,200 cfs.[52]

Reclamation began construction of the canals and laterals in the Wellton-Mohawk Division in August 1949.[53] On June 29, 1949, Reclamation opened bids for the contract providing for construction of earthwork and structures on the Wellton-Mohawk check and turnout, the Gila Gravity Main Canal, Station 790+90.17, and earthwork, concrete canal lining, and structures for the Wellton-Mohawk Canal, Station 1+84.13 to Station 449+00. The Government awarded the contract to Fisher Contracting Company who received notice to proceed on August 29, 1949, and began work on September 7, 1949. The contractor faced no serious construction problems and completed all work under the contract February 6, 1951.[54]

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51. *Ibid*., 69, 71.
52. Bureau of Reclamation, *Gila Project*, IV.
53. "Project History," 1965, 7.
54. "Project History," 1949 (Part 1), 38, 41; "Project History," 1951, 7.

The project plan called for the construction of the Wellton-Mohawk Canal beginning at the turnout and being constructed parallel to the Gila River on its south side. The plan provided for an eighteen and one-half mile long, 300 cfs capacity canal to begin diverting water from the Gila Gravity Main Canal fifteen miles below Imperial Dam. The canal's flow was designed to flow opposite to the direction of the river flow, thereby necessitating construction of three pumping plants along the canal.[55]

All work on the pumping plants, and remaining work on the Wellton-Mohawk Canal took place between 1950 and 1952. Bids for the contract providing for construction of earthwork, tunnel, canal lining, and structures for the canal, Station 456+00 to 969+65, opened on December 6, 1949. Morrison-Knudsen Company received the contract, and received notice to proceed on January 3, 1950. Work progressed on schedule and the contractor completed construction on May 25, 1951. Bids opened for construction of Wellton-Mohawk Pumping Plants 1, 2, and 3 on November 22, 1949. Out of twelve bids the contract went to United Concrete Pipe Corporation who received notice to proceed on December 29, 1949. Construction work began January 25, 1950. During the year the contractor placed most all intermediate structure concrete, installed the tapers, cylinder bends, and the 72 inch precast pipelines in Plant 1. Plant construction, however, did not progress as quickly as the contractor anticipated. By the end of 1950, with more than 69 percent of construction time elapsed, only 26 percent of construction was completed. The year 1951 saw an accelerated work schedule, and by year's end the contractor completed 90 percent of the construction work. Work accomplished in 1952 included installation of controls and electrical equipment in the pumping plants, and grading and surfacing the roadways leading to the pumping plants. United Concrete Pipe Corporation

55. "Project History," 1947, 16-7; Water and Power, *Project Data*, 509.

completed the contract on April 24, 1952. Reclamation placed the Wellton-Mohawk Canal and Pumping Plants 1, 2, and 3, in service in the spring of 1952, making that system's first water deliveries.[56]

The two main branches of the Wellton-Mohawk Canal consist of the Wellton Canal and the Mohawk Canal. Bids opened March 27, 1951 for construction of earthwork, canal lining and structures for the Wellton Canal, Station 1+00.29 to Station 618+25.75. Morrison-Knudsen Company submitted the lowest out of thirteen bids and received the contract and notice to proceed on April 12, 1951. They began work five days later. During that year the contractor completed the earthwork for the canal and flood protective dikes, and excavated the canal's structures. They began canal trimming in November and concrete lining in December. February 28, 1952, the company completed installing a siphon, and finished concrete work March twentieth. The contractor completed all work under the contract by April 8, 1952.[57] Bids for construction of the remainder of the Wellton Canal and its structures, and for construction of Unit 1 of the Wellton Distribution System, opened October 23, 1952. Once again the low bid came from Morrison-Knudsen Company, to whom the Government awarded the contract on November 7, 1952. The contractor received notice to proceed on November 17, 1952, setting the completion date for November 12, 1953. Morrison-Knudsen Company began work near the end of November 1952. They maintained an accelerated work program and completed the contract on June 26, 1953, a full 139 days ahead of schedule.[58] The remainder of the Wellton Distribution System was also constructed by Morrison-Knudsen Company who received the contract for construction of Unit 2 of the distribution system on August 9, 1954. This scheduled

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56. "Project History," 1949 (Part 1), 44; "Project History," 1950, 8; "Project History," 1951, 8; "Project History," 1952, 7; "Project History," 1965, 7.
57. "Project History," 1951, 9-10; "Project History," 1952, 8.
58. *Ibid*., 11; "Project History," 1953, 10.

completion of the contract for November 2, 1955. The contractor began work in early August 1954. Once again the company saw no problems during construction and completed the contract on August 5, 1955, three months early.[59]

Initial construction of the Mohawk Canal actually began in the late 1800s as it was one of the original canals built to distribute water from the Gila River. However, floods destroyed the canal's headworks located on the Gila River at Texas Hill; therefore during construction of the Gila Project, Reclamation planed to rehabilitate and expand the Mohawk Canal and integrate it into the project. Bids for earthwork, canal lining, and structures for Mohawk Canal, Station 0+98.66 to Station 1547+91.63, and Protective Dike 1, including the outlet channel, opened May 9, 1950. On May 22, 1950, the contract went to Western Contracting Corporation which received notice to proceed on June sixteenth of the same year. The primary contractor subcontracted with Bressi and Bevanda, Contractors, for construction of the protective dike and the earthwork of the outlet channel. All work accomplished in 1950 concentrated on the dike, channel, and the wash crossing. No work on the Mohawk Canal proper was conducted during the year. Weather conditions in 1951 caused the contractor considerable problems. Several cloudburst rainstorms from August, September, and October severely damaged incomplete canal work. As a result, the contractor spent much time and effort during the year on clean-up and repair work rather than new construction. Eventually, the contractor repaired all damaged areas of the canal and completed the contract work on March 31, 1952.[60]

Bids for earthwork, canal lining, and structures for Mohawk Canal, Station 1547+91 to 2056+74.12, and construction of Tyson Protective Dike and outlet channel, Kofa Dike, and Radium Dike opened June 21, 1951. Reclamation granted the contract to Marshall, Haas, and

59. "Project History," 1954, 10-1; "Project History," 1955, 10.
60. "Project History," 1950, 9-10; "Project History," 1951, 9; "Project History," 1952, 8.

Royce on June 29, 1951. They received notice to proceed on July 24, 1951, setting the completion date as February 8, 1952. The primary contractor began work on August 21, 1951. At that time the primary contractor also subcontracted J. E. Roberts, contractor, for construction of Kofa Dike. The subcontractor began work September 10, 1951. Torrential rains hindered work for both contractors in August, September, and October. At the close of 1951 the contractors completed Tyson Dike, most of Kofa Dike, and had a significant start on Radium Dike. All excavation work on the canal was completed, and most of the concrete work was as well. The contractors conducted finishing operations in the early months of 1952, and completed all contract work by April fourth of that same year.[61] Bids for construction of the final segment of the Mohawk Canal opened April 10, 1952. The contract also provided for construction of the Radium Hot Springs Flood Protection System. The Government again awarded the contract to Marshall, Haas, and Royce, who received notice to proceed May 8, 1952, fixing the date of completion on February 2, 1953. They began construction work the same day. By mid-December the contractor had excavated the flood channels, completed the protective dikes, and begun concrete placement in the channels. Work progressed without problems, and the contractor completed work on the appointed day.[62]

Construction of the Mohawk Distribution System occurred simultaneously with construction of Mohawk Canal. Reclamation divided construction of the distribution system into four units. Bids for construction of Unit 1 opened on January 24, 1952. The contract went to Macco Corporation on February 28, 1952, and the company received notice to proceed on March 10 of the same year. They began construction on St. Patrick's Day and had begun concrete placement by the first of May. However, the contractor stopped concrete operations twenty-one

61. "Project History," 1951, 10; "Project History," 1952, 9.
62. *Ibid*., 10; "Project History," 1953, 9-10.

days later because excessive temperatures made maintaining the concrete temperatures within limits very expensive. Concrete placement resumed in early September, and lateral excavation, trimming and lining operations began in October. The contractor experienced no further delays and completed all work by March 5, 1953, slightly more than a month behind the scheduled completion date.[63] Macco Corporation also received the contract for construction of Unit 2. They received notice to proceed on August 1, 1952, setting completion for May 26, 1953. Initial work began August nineteenth, and full scale construction began November 11, 1952. In February of the next year the contractor worked at an accelerated pace and completed all contracted work on April 29, 1953.[64]

Construction of Units 3 and 4 occurred between 1953 and 1956. The bids for Unit 3 opened December 10, 1953. Reclamation granted the contract to Peter Kiewit Son's Company, who acknowledged notice to proceed on January 9, 1953. Construction began on January 29, 1953. All work progressed smoothly for the contractor who completed the contract on March 19, 1954.[65] Bids for Unit 4 opened November 18, 1954. Morrison-Knudsen Company, received the contract on December 13, 1954, which set completion for December 13, 1955. The contractor began preliminary construction operations in the latter part of December. In 1955 excessive rain heavily damaged Unit 4's structures. Due to the amount of repairs required the contractor requested a time extension on their completion date. The Government granted the contractor a seventeen day extension, and all work was completed January 13, 1956.[66]

As part of the Gila Project the Wellton-Mohawk Division also contains the Dome Canal, Dome Distribution System, Texas Hill Canal, Texas Hill Distribution System, and the Mohawk

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63. "Project History," 1952, 9; "Project History," 1953, 9.
64. "Project History," 1952, 10-1; "Project History," 1953, 10.
65. *Ibid*., 10-1; "Project History,"1954, 10.
66. *Ibid*., 11; "Project History," 1955, 11; "Project History," 1956, 10.

Laterals in the Ralph's Mill area. Construction of Dome Canal and Dome Distribution System, Unit 1, began July 20, 1953 after the Government awarded the contract to Morrison-Knudsen Company on June 30, 1953. In September of 1954 a severe cloudburst heavily damaged laterals and three relift pumps near the construction site. Reclamation then incorporated repairs of these structures into the contract with Morrison-Knudsen Company. However, including these unexpected repairs, the contractor completed all work by November 2, 1954.[67] Morrison-Knudsen Company received the contract for construction of Unit 2 of the Dome Distribution System as well. They acknowledged notice to proceed on November 24, 1954 and began clearing operations in December. The contractor experienced no problems during operations, and completed construction efforts September 14, 1955.[68] The final contract for work on the Dome Canal and Dome Distribution System provided for construction of a protective dike. On April 30, 1957, Tanner Brothers Contracting Company received this contract. They acknowledged notice to proceed on May 24, 1957. The contractor encountered no problems during construction and work progressed rapidly. The contractor completed all work on June 14, 1957.[69]

Bids for construction of Texas Hill Canal and Texas Hill Distribution System opened June 9, 1955. The Government granted the contract to Vega Engineering and Grading Company on July 13, 1955. The contractor received notice to proceed, August 18, 1955, setting completion for October 31, 1956. However, construction actually began in July, prior to receipt of notice to proceed. Work progressed smoothly throughout the year and the contractor completed work by the specified date. Reclamation, however, delayed formal acceptance of the

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67. "Project History," 1953, 12; "Project History," 1954, 10.
68. *Ibid*., 11; "Project History," 1955, 10.
69. "Project History," 1957, 11.

work until December 7, 1956.[70]

Final construction work on the Gila Project consisted of building laterals for the Ralph's Mill area of the project. Bids for this work opened on Valentine's Day, 1956. Reclamation granted the contract to Marshal and Haas, who received notice to proceed on March 21, 1956. Construction began April eighteenth of the same year. The primary contractor subcontracted with Jack Fisher. However, because of a dispute between the labor union and Jack Fisher all construction work halted on June 20, 1956. After negotiations, the dispute was settled and work resumed in July. The contractor faced no other problems or delays, and with completion of this contract, work on the Gila Project concluded February 24, 1957.[71]

Post-Construction History

Since completion of the first features of the Gila Project a general maintenance program has been required to keep the system in operation. Some of these general maintenance operations include, repair of cracked concrete structures, controlling noxious weeds, repainting metal structures, cleaning drains, repairing gates and other structures as needed, and cleaning the canals. Canal cleaning has been a big part of the project's maintenance program due to the fact that strong winds continually cause sand to blow into and clog the canals. Battling blowing sand has required constant effort by the irrigation districts.[72]

Over the years some post construction work has also been required. From 1943 until completion of construction in 1957, several types of post construction work were conducted to keep the project's irrigation system running smoothly. Beginning in 1943 Reclamation

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70. "Project History," 1955, 12-3; "Project History," 1956, 11.
71. *Ibid*., 11-2; "Project History," 1957, 10.
72. "Project History," 1945, 46; "Project History," 1946, 87; "Project History," 1947, 76-81; "Project History," 1948, 50, 53-4; "Project History," 1949 (Part 1), 52-6; "Project History," 1952, 7, 11; "Project History," 1953, 7-8; "Project History," 1956, 12-3; "Project History," 1957, 14-20; "Project History," 1958, 9-12; "Project History," 1959, 10; "Project History," 1960, 10-1; "Project History," 1961, 11-3; "Project History," 1962, 11-3; "Project History," 1963, 13-4; "Project History," 1966, 19; "Project History," 1982, 20.

discovered that the Gila Gravity Main Canal had seepage problems in several areas. In order to help relieve land damage caused by this seepage, Government forces constructed three drains along the canal to collect the seepage waters before they reached adjacent farm lands. The Government completed construction of these drains in 1944.[73] Once these drains were in place Reclamation turned its attention to helping prevent seepage and erosion problems in the A and B Canals and laterals, and the canals and laterals in the Yuma Mesa Division. As a result, from 1944 to 1945, Reclamation contracted with M. H. Hasler and Macco Construction Corporation respectively to line the affected canals and laterals with gunite.[74]

The early to mid-1950s saw problems with the Gila Desilting Basin, the Yuma Mesa Pumping Plant, and Wellton-Mohawk Pumping Plants 1, 2, and 3. In 1950 a flood caused such severe damage to the Gila Desilting Basin that it required reconstruction. Reclamation opened bids for this reconstruction work on April 11, 1950. Macco Construction Corporation received the contract on April eighteenth, and began work on May 24, 1950. Due to the importance of the desilting basin to the irrigation system, the contractor worked on an accelerated schedule and finished all repair work on April 5, 1951.[75]

Trouble occurred at the Yuma Mesa Pumping Plant on June 5, 1954, when the pump was stopped by remote control after extensive damage caused by the flap gate entering the discharge tube. The gate closed against the pressure of the pump, which caused the gate hinges to break, and thus caused severe damage to the gate. In order to restore pumping as soon as possible, district maintenance crews worked through the night of June fifth and all day on Sunday, June sixth, to resume operations the morning of June 7, 1954.[76]

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73. "Project History," 1943, 6; "Project History," 1944, 11.
74. "Project History," 1945, 40-1.
75. "Project History," 1950, 9; "Project History," 1951, 8.
76. "Project History," 1954, 9.

Large rainstorms in August of 1955 damaged the Gila Gravity Main Canal, Wellton-Mohawk Pumping Plants 1, 2, and 3, the Dome Distribution System, Unit 1, and washed away several dikes within the Gila Project. Damage repair efforts were conducted through the end of 1955 and into the beginning of 1956. During this same year Wellton-Mohawk Pumping Plants 1, 2, and 3, also required installation of additional pumping units. McCollum Rock Company began this work on March 1, 1955, and completed it by September 24, 1955.[77]

At the end of the 1950s and in the early 1960s Reclamation identified drainage problems on the Gila Project. Irrigation caused the water table to rise which threatened to drown crops.[78] Reclamation constructed 67 drainage wells to remove the excess and highly saline groundwater and to discharge it into the Gila River. From early 1960 through the end of 1961 Reclamation constructed the Wellton-Mohawk Conveyance Channel, which runs the entire length of the Wellton-Mohawk Division. The channel was designed so the drainage wells could empty into it and be directed into the Colorado River Front Work and Levee System consisting of the Main Outlet Drain and the Gila River Pilot Channel. The Main Outlet Drain discharges into the Gila River Pilot Channel one-half mile upstream from its confluence with the Colorado River. Beginning in 1963, Reclamation constructed an additional 30 drainage wells to allow for selective pumping to reduce the salinity of the drainage water during the winter and to provide for additional drainage needs.[79]

During August, September, October, and November of 1965, Reclamation constructed a bypass channel which was designed to help reduce the salinity of the drainage water discharged into the Colorado River. This plan stemmed from a problem which arose in Mexico as a result

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77. "Project History," 1955, 9, 12-4.
78. Water and Power, *Project Data*, 509.
79. "Project History," 1965, 7-8; "Project History," 1959, 9; "Project History," 1960, 9; "Project History," 1961, 8-11.

of Gila Project drainage water being emptied into the river and increasing the salinity of the water delivered to Mexico. In the interest of retaining good relations with Mexico, the International Boundary and Water Commission adopted Minute 218, which within its recommendations for relieving the salinity problem, included the plan for the bypass channel.[80]

The mid-1960s also saw construction of the South Gila Canal and South Gila Distribution System. The system was designed to irrigate 10,700 acres, most of which had previously been irrigated by wells. The South Gila Canal was designed as an open, concrete-lined canal to receive water from the Gila Gravity Main Canal near the Yuma Mesa Pumping Plant and carry it just under eight miles to the South Gila Distribution System. From 1963 through 1965 Sandkay Construction Company, Incorporated; M. R. Latimer; American Concrete Pipe Company; Carleton Robb; and subcontractors, Concrete Form Builders, Incorporated, and N. J. Riebe Enterprises, Incorporated, constructed the canal and distribution system in four schedules.[81] The system's first water delivery occurred in January of 1965.[82]

During the late 1960s Reclamation began having trouble maintaining the maximum capacity of the first 14.7 miles of the Gila Gravity Main Canal due to rockslides and other debris being deposited into the canal. It was difficult for district forces to sufficiently clean the canal due to the canal's inadequacies. Although the districts cleaned out the canal as much as possible during the annual outages after irrigation season, this only allowed maximum flow for short periods at the beginning of each irrigation season. One of the reasons that rockslides and debris entering the canal caused such trouble was because of lack of access to tunnel portals and to portions of the canal for cleaning and maintenance. Additionally, insufficient capacity of

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80. "Project History," 1965, 7-8.
81. "Project History," 1963, 10-1; "Project History," 1964, 10-3, 14-7; "Project History," 1965, 13.
82. *Ibid*., 7-8.

drainage structures and lack of control of flood debris also needed to be fixed in order to help keep the canal flowing at maximum capacity. This prompted the districts to ask Reclamation to consider performing work on the canal under a Rehabilitation and Betterment program. In 1972 a proposal for Reclamation to construct access roads to many areas along the canal to make proper cleaning and maintenance efforts possible, and for construction of a wash overchute, modifications of drainage inlets, and construction of detention dikes to keep debris from entering the canal from various washes and with floodwaters, was approved through the Rehabilitation and Betterment Act of October 7, 1949, Public Law 335, as amended. All work rehabilitation work was accomplished by 1975.[83]

On June 27, 1982, a contract signed by Reclamation and the irrigation districts within the Gila Project, turning the operation an maintenance responsibilities for the project features, excepting the headworks, the desilting works, and the diversion works of the canal system, over to the irrigation districts, became effective. Therefore, all repairs and modifications to the Gila Project after that date have been conducted by the individual irrigation districts. This shift in operational responsibility has had an impact on issues faced by the districts since that time. One of these issues came to the forefront during 1993, 1994, and 1995, when the irrigation districts experienced high groundwater and flooding conditions. In 1995 the irrigation districts called for the installation of a ten million dollar system of drainage wells by Reclamation in order to cure high groundwater problems on project lands; however, Reclamation stated that fixing the problem was the responsibility of the irrigation districts.[84]

Settlement of Project Lands

83. United States Department of the Interior, Bureau of Reclamation, *Gila Gravity Main Canal, Rehabilitation and Betterment Report*, (Denver: Bureau of Reclamation, November 1971), IV, V, 1-19.

84. "Yuma Area Combined Project Histories," 1981, Appendix B; "Yuma Area Combined Project Histories," 1982, 5; Michele Cohen, "Groundwater Again Plagues Some Residents in Yuma Valley," *Yuma Daily Sun*, 20 October 1995; Doug Brown, "Irrigation District Costs Taxpayers," *Yuma Daily Sun*, 18 June 1995.

Settlement of the project's public lands began after June 29, 1948 when the first stages of a public drawing were held for 54 farm units which the Government made available for homesteading.[85] Veterans of World War I, World War II, the Spanish-American War, and the Philippine Insurrection were given preference when filing applications for the homesteads. In this first opening of public lands, the settlement lands included 4,940 acres divided into 54 farms which ranged in size from 40 acres to 160 acres. Out of 912 applications, 609 were approved for the drawing by the settlement board. Of those 609 names, 54 were drawn between June of 1948 and March of 1949. Each of the selected homesteaders was allowed to indicate which size farm he most preferred.[86] The Government again drew names from qualified applicants for 27 farm units in 1952, 28 farm units in 1954, and 29 farm units in 1955 on public and acquired lands in the Gila Project.[87]

The land onto which these homesteaders moved contained fields of pre-planted alfalfa. Reclamation leveled and planted the lands in an attempt to provide assistance to veterans who might not otherwise be able to own their own farms. Initial work on this program began during World War II when the United States Army airstrip located near the project lands experienced damage to the aircraft stationed there due to excessive blowing dust. The Army asked Reclamation to aid them with dust control. The Government approved Reclamation's plan to level mesa land, and prepare the land for growing alfalfa for the dual purpose of dust control and preparing the land for settlement.[88]

By predeveloping the land, the Government eliminated the gap between a homesteader

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85. "Project History," 1948, 8.
86. Ian A Briggs, "Gila Homesteaders Take Over," *The Reclamation Era* 34 (September 1948): 174; "Project History," 1949 (Part 1), 8.
87. "Project History," 1952, 7; "Project History," 1953, 7; "Project History," 1954, 7; "Project History," 1955, 7.
88. Briggs, "Gila Homesteaders," 173.

taking up the land and harvesting of the first crop. It was a difficult struggle to prepare the land before planting and wait for the first harvest. This hardship defeated many would-be farmers, especially in the Yuma Mesa area where land preparation was extremely expensive. Predevelopment of project lands provided the homesteaders with an immediate cash crop and a source of income. The Government program provided that the homesteaders repay the predevelopment and construction costs over a period of 60 years, with a ten year grace period on construction costs prior to the beginning of payments. However, new farmers had to begin repaying predevelopment costs immediately. The average costs for the homesteaders was $350 per acre; however, they had the advantage of using interest-free money advanced by the Government for predevelopment of the farms and construction of the irrigation system.[89]

Project Benefits and Uses of Project Water

Gila Project water is used for irrigation of crops and grazing lands. A Reclamation report from 1936 predicted of the Gila Project that, "It is believed that a permanently profitable agriculture can be developed on the land. ... Initiation of the project will preserve a water resource for eventual development of an empire of national importance." Indeed, the irrigation water provided by the Gila Project's distribution system created a profitable agricultural region. Prior to the project the Yuma Mesa Division's main crop was alfalfa. Additionally, even in the Wellton-Mohawk Division where a variety of crops were grown prior to the increase of the salt content of the Division's irrigation wells, by the beginning of the project, farmers were reduced to producing only alfalfa and Bermuda grass. Within two years of water being delivered to the Wellton-Mohawk Division there was a 75 percent increase in gross crop value because of reintroduction of crops like cotton and sorghums. One year later, in 1954, the Welton-Mohawk

89. *Ibid*., 173-4.

Division began growing sunflower seeds, broom corn, early new potatoes, watermelons, and cantaloupes; while farmers in the Yuma Mesa Division grew watermelons, tomatoes, squash, sweet potatoes, papago peas, star millet, and peanuts.[90]

This quick development of the Wellton-Mohawk Division in the early 1950s also brought new businesses to the area. Due to the agricultural boom brought by the irrigation water, the region received two new cotton gins, two seed houses, three grocery stores, three farm machinery stores, a lumber company, an additional gas station, a new variety store, and three new motels. Additionally, Division residents saw construction of two new school buildings, a post office, and twenty units of a planned 100-unit subdivision. This expansion occurred in the Division within one year of irrigation water being delivered to the area.[91]

By the late 1950s and into the 1960s citrus production quickly became another profitable agricultural industry for the region. Because of this trend, by 1960 three large citrus producers had already established plants near Yuma to process fruit from the Gila Project as well as the Yuma and Yuma Auxiliary Projects.[92] Farmers in the Yuma Mesa Division began planting citrus crops in 1954. Only eight years later, by 1962, citrus acreage increased sixteenfold.[93] Citrus continues to be a large money producer on project lands.

Today project farmers produce an abundance of citrus fruits, alfalfa hay and seed, cotton, peanuts, grains, melons, winter vegetables, and Bermuda grass seed. Additionally, irrigation water also maintains grazing lands for sheep which are brought from summer ranges to graze on irrigated pastures for the winter. Various cattle feed lots also operate on project lands.[94]

Another benefit to the Gila Project is recreation. The Gila Gravity Main Canal contains

90. "Project History," 1936, 22; "Project History," 1938, 98; "Project History," 1953, 8; "Project History," 8.
91. "Project History," 1952, 6.
92. "Project History," 1960, 13.
93. Jones Osborn, "Citrus Success Story," *The Reclamation Era* 48 (May 1962): 34.
94. Water and Power, *Project Data*, 510.

many types of fish which enter the canal at its heading at Imperial Dam. This provides recreational opportunities for many people who fish in the canal. Dove and quail hunting are also done along the canal banks. Canal bank roads also provide residents and tourists access to areas for outdoor activities.[95]

Conclusion

The Gila Project has provided irrigation water to a part of the country that would otherwise be desert. The project's irrigation water, combined with the region's mild temperatures and long growing season, have provided project farmers with opportunity to raise millions of dollars worth of crops, with as many as three harvests per year. The Gila Project has greatly enhanced agriculture along the Yuma Mesa, and provided the region with an economic base.

95. Bureau of Reclamation, *Gila Project*, 30-2.

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