



# Imperial Dam

## Background

Construction of Imperial Dam and its desilting works began in 1935 and was completed in 1938 under the authorization of the 1928 Boulder Canyon Project Act. The dam's main function is to divert Colorado River water into the All-American Canal, the Coachella Canal, the Yuma Project and the Gila Gravity Canal. Some of the dam's water also serves areas of northern Mexico.

The need for Imperial Dam as a diversion point dates back to the mid-1850s when settlers began searching for the means and the location to divert Colorado River water to the Imperial Valley.

Colorado River water was first delivered to the Imperial Valley through the Imperial (Alamo) Canal in June 1901. George Chaffey, president of the California Development Company, constructed headworks and a canal to take water from the Colorado River at a point in California immediately above the international boundary. The river headgate, known as Chaffey Gate, was constructed as a temporary wooden gate on the intake canal about 500 feet north of the international boundary to control inflow of water into the canal.

A more permanent headgate, known as Hanlon Heading, was constructed in 1906 to replace Chaffey Gate. The following year, the Southern Pacific Company assumed ownership of the bankrupt California Development Company. The Imperial Irrigation District was formed in 1911 and by 1916 had acquired the assets of the California Development Company.

There was a growing realization that a canal, located entirely within the United States, was needed; however, the Bureau of Reclamation reported that such a canal would be impractical without a dam to control flooding. The first field survey for what would become the All-American Canal was conducted in 1913.

In the meantime, IID found it increasingly difficult to control the amount of bedload silt brought into the canal system from the Alamo River. So, in 1918, the Rockwood Heading was built one and one-fourth miles upstream from Hanlon Heading to serve as a diversion point and a desilting works.

As part of a 1918 contract with the federal government, IID received the right to use Laguna Dam (completed in 1909 under the federal Reclamation Act) as a diversion point for an all-American canal. But this right was never exercised. In 1919, the Bureau issued a recommendation to construct the All-American Canal as well as build a storage reservoir on the Colorado River.

The final result of the negotiations with the Bureau was the Boulder Canyon Project Act of 1928, which authorized construction of Boulder (Hoover) Dam, Imperial Dam and the All-American Canal.

Today, the storage capacity of the reservoir above Imperial Dam is minor. Due to its shallow depth, the original storage space was soon filled with silt and



Imperial Irrigation District

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## A first in irrigation

Located about 20 miles northeast of Yuma, Ariz., Imperial Dam is the diversion point for water flowing from the Colorado River into the All-American Canal.

Imperial Dam was a first in the world of irrigation. The massive facility is a place where river water is held and diverted into giant desilting basins.

The water is then released to serve the farms, cities and industries of the Imperial and Coachella valleys and a thriving agricultural area just south of the border.



This Bureau photo shows: (A) Imperial Dam; (B) trashracks; (C) the three desilting basins; and (D) the California Sluiceway.



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sand. The reservoir area now consists of a shallow lake with well-defined channels to the All-American Canal and Gila Headworks.

## Structures

Imperial Dam straddles the California-Arizona border. The All-American Canal trashrack and headgates are located adjacent to the California abutment of the dam. Three desilting basins (each with a design capacity 4,000 cubic feet per second) remove sand and silt from the river water before it passes into the All-American Canal. The removed sand and silt accumulate in the California Sluiceway for eventual return to the Colorado River by occasional operation of the sluiceway's inlet gates.

The Gila Canal Headgates are located adjacent to the Arizona abutment of the dam. One desilting basin removes the sand from the water before it enters the Gila Gravity Main Canal, which serves the Yuma area. The removed sediment is returned to the river when necessary by opening the sluiceway gates located on the bottom and downstream end of the basin. The basin will handle a flow of 2,200 c.f.s.

## Operation

The Imperial Dam, Gila Headworks, All-American Canal Works and the All-American Canal are operated and maintained by the IID. Costs are shared by the Bureau, Coachella Valley Water District, Yuma County water users and other water users.



Vito Palumbo, IID water construction worker, operates the trashrack at Imperial Dam.

## Facts & Figures

- Overall length (including a 490-foot dike) .....3,485 feet
  - Overflow weir section
    - Length.....1,197 feet
    - Height.....31 feet (from base to crest at 181-foot elevation)
  - Operating bridges over non-overflow section
    - Elevation.....197 feet
    - Freeboard above crest of maximum calculated flood..... 6 feet
    - Maximum calculated flood over weir .....10 feet
  - Maximum diversion capacities
    - All-American Canal..... 15,155 c.f.s.
    - Gila Canal.....2,200 c.f.s.
  - Construction — Reinforced concrete slab and buttress type
  - Three desilting basins:
    - Length.....770 feet
    - Width.....540 feet
    - 72 scrapers ..... 125 feet in diameter
    - Flow capacity..... 4,000 c.f.s. each
    - Sediment removal capacity .....70,000 tons/day
  - Costs
    - Imperial Dam..... (approx.) \$3 million  
(includes Ariz. and Calif., California sluiceway and weir)
    - All-American Canal Headworks.....\$1.3 million
    - All-American Canal Desilting Basins .....\$4 million
    - Gila Headworks and Desilting Basin.....\$2 million
    - Total cost of works..... \$10-\$11 million
- (c.f.s. = cubic feet per second)