

# RECLAMATION

*Managing Water in the West*

**Shasta Dam:**

**A Tour Through Time**



U.S. Department of the Interior  
Bureau of Reclamation





## **Welcome to Shasta Dam**

Standing wide and tall across the Sacramento River in northern California, Shasta Dam backs up water for more than 35 miles to form beautiful Shasta Lake. Each year millions of visitors come to California's largest reservoir to enjoy camping, swimming, fishing, boating, or just taking in the scenery aboard a houseboat- but recreation is only one small benefit of the lake and the dam that forms it.





In addition to flood control, Shasta Dam provides a clean, dependable water supply for irrigation, municipal and industrial use, wildlife habitat maintenance, navigating the Sacramento River and power generation that benefits millions of people miles away from the shores of Shasta Lake's recreational paradise.

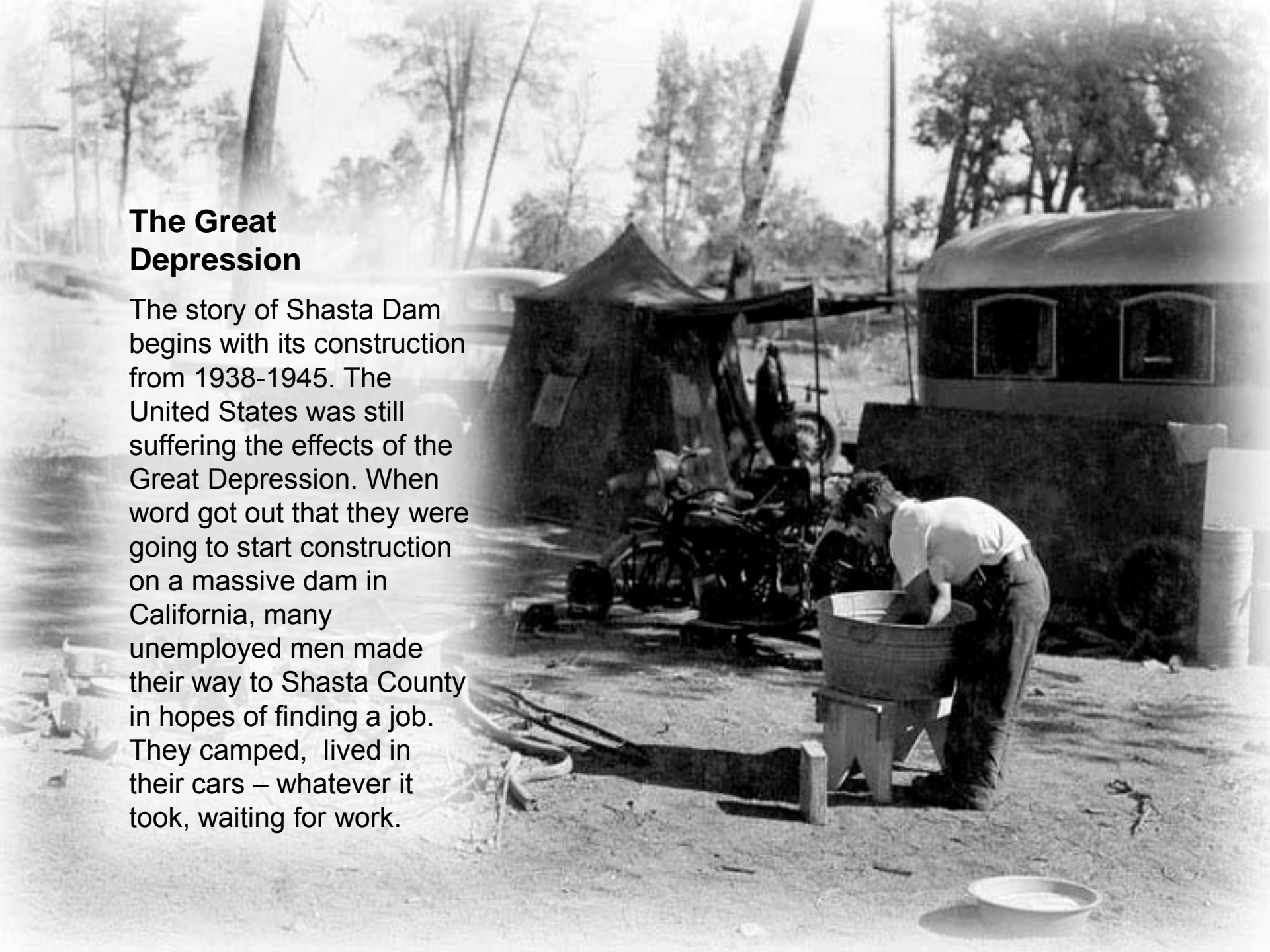
To begin our tour of this amazing structure, we will take a 428-foot elevator ride to near the base of the dam. Galleries (or tunnels) were built into the dam and are used for visual inspections. This particular gallery has been finished with green tile and terrazzo flooring, very reminiscent of the era in which the dam was built. If you clap your hands in this long gallery, you will be able to hear that clap as it travels down the gallery at the speed of sound and echoes back to you – at 758 miles per hour!





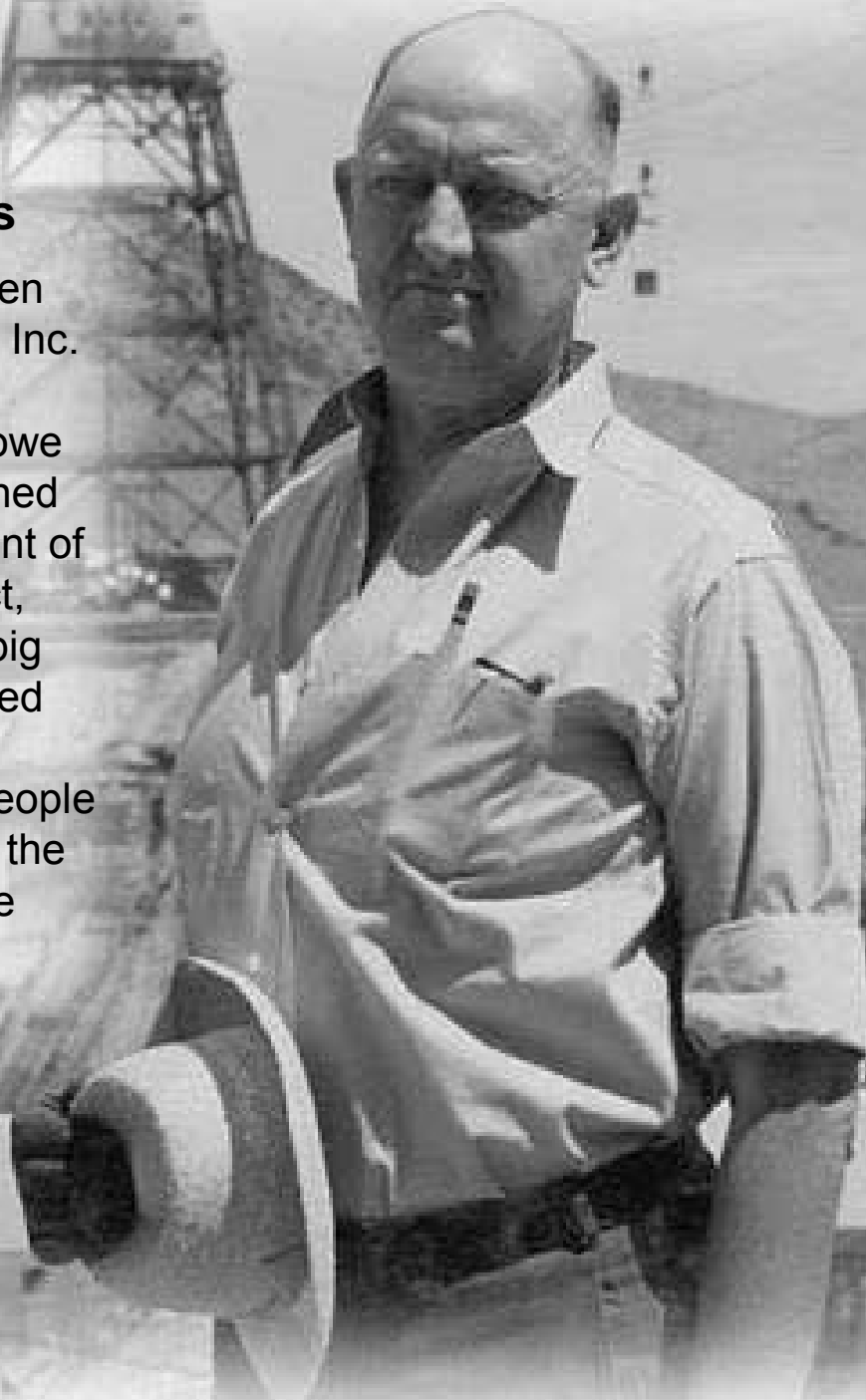
## The Great Depression

The story of Shasta Dam begins with its construction from 1938-1945. The United States was still suffering the effects of the Great Depression. When word got out that they were going to start construction on a massive dam in California, many unemployed men made their way to Shasta County in hopes of finding a job. They camped, lived in their cars – whatever it took, waiting for work.



## **Frank Crowe Engineering Genius**

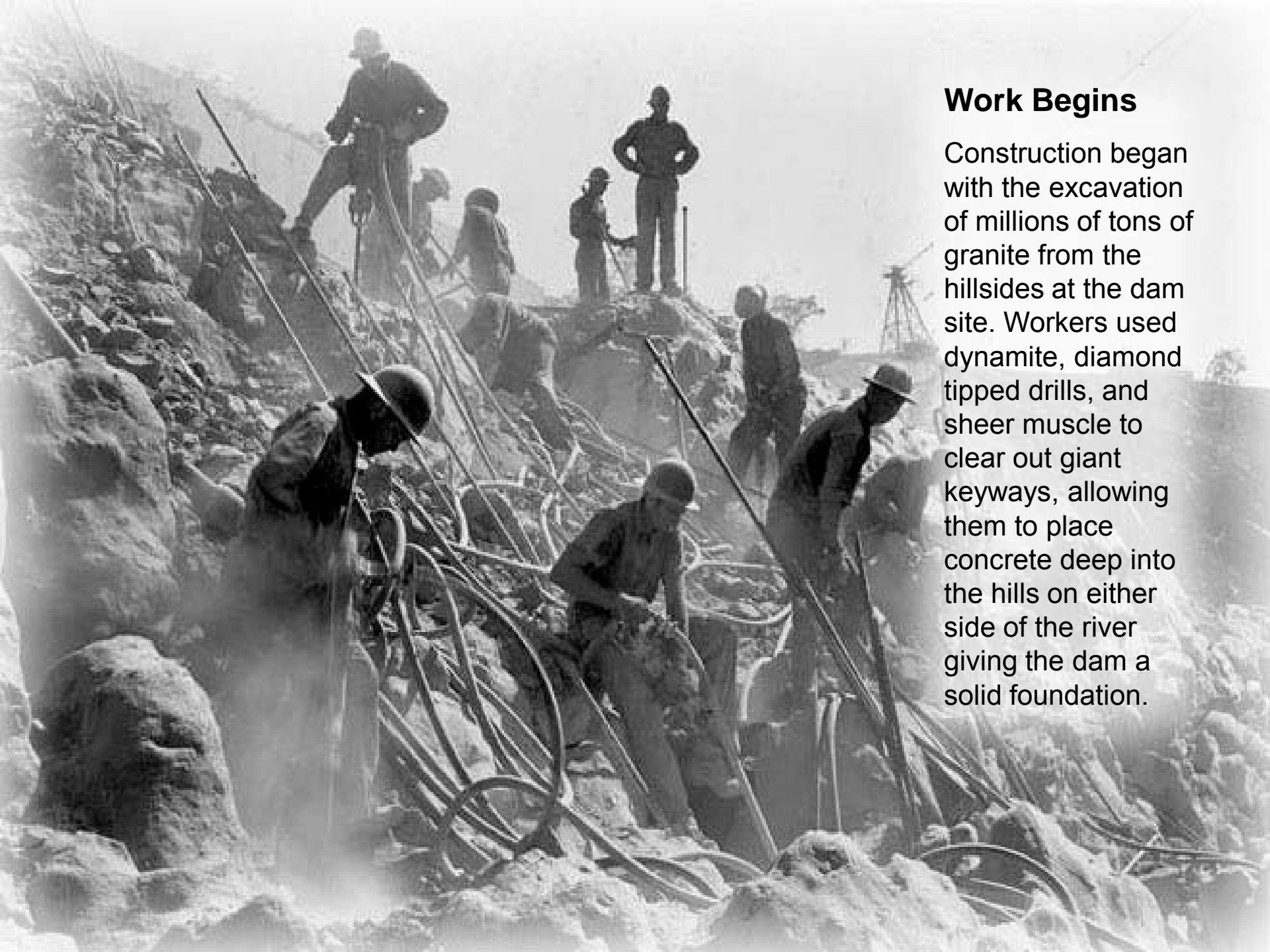
Frank Crowe was chosen by Pacific Constructors Inc. as their choice for job superintendent. Mr. Crowe had most recently finished his job as superintendant of the Hoover Dam project, and ready for his next big task. Shasta Dam offered him that challenge: he would oversee 4,700 people and the construction of the second largest concrete dam in the country.





## **Frank Crowe and Ralph Lowery: A Dynamic Duo**

After securing the bid to build Shasta Dam, Pacific Constructors Inc. turned to the engineering genius Frank Crowe to head up the construction. He would be responsible to oversee 4,700 employees, and the construction of the second largest concrete dam in the country. At his side as Chief Supervising Engineer for the Bureau of Reclamation would be Ralph Lowery- someone Mr. Crowe knew well. The two had just finished another big project together- the building of Hoover Dam.



## **Work Begins**

Construction began with the excavation of millions of tons of granite from the hillsides at the dam site. Workers used dynamite, diamond tipped drills, and sheer muscle to clear out giant keyways, allowing them to place concrete deep into the hills on either side of the river giving the dam a solid foundation.





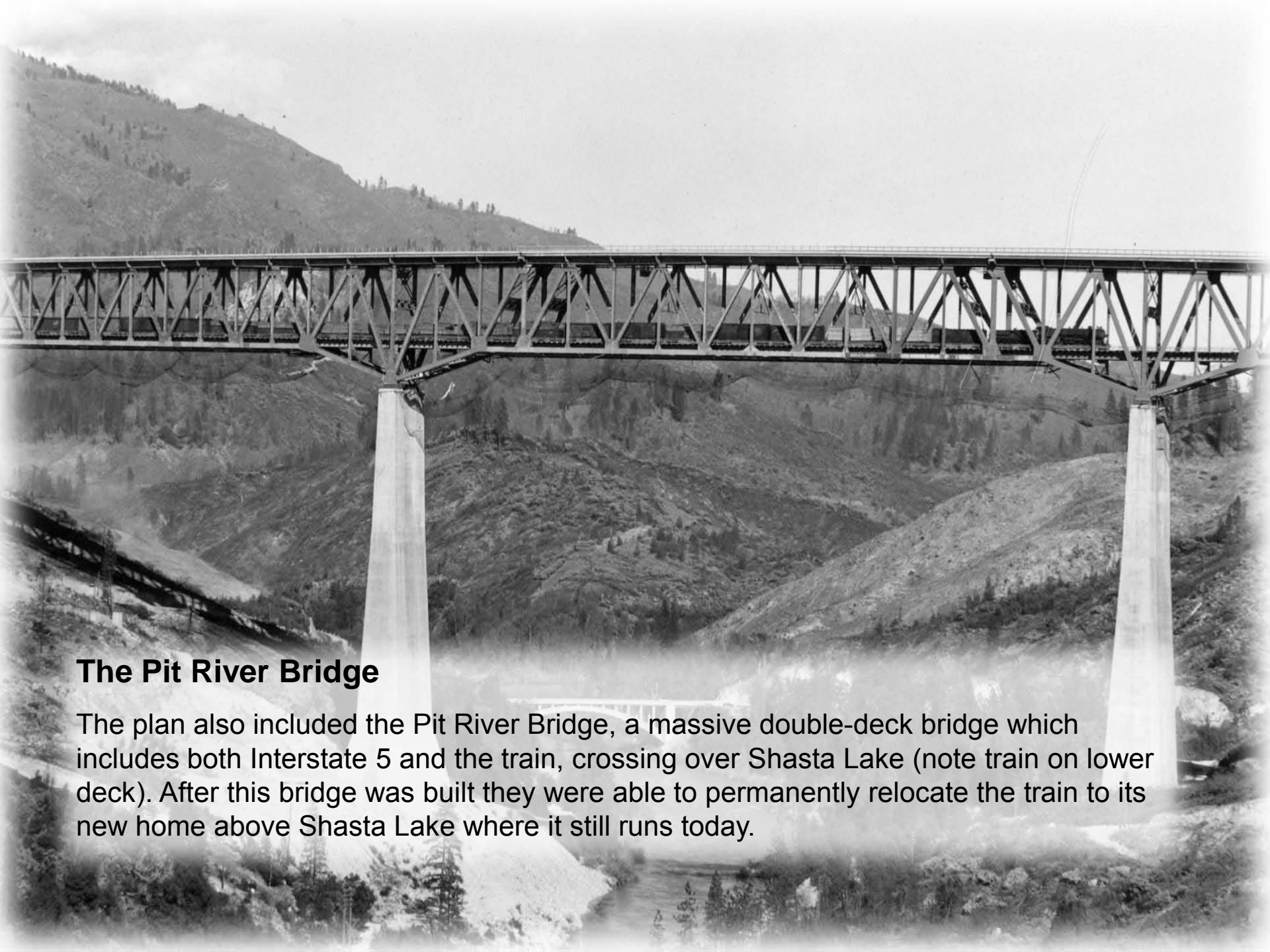
## The World's Longest Conveyor Belt

Over twelve million tons of gravel would be needed to build the massive dam, and a good supply was found along the Sacramento River in Redding, California. To transport all that gravel, the world's longest conveyor belt was built to deliver the gravel to the old mining town of Coram, just downstream of the dam site. The belt was an amazing 9.6 miles long and operated 24 hours a day for several years.

## Southern Pacific Railroad

The early phase of dam construction also included moving over 30 miles of Southern Pacific Railroad track which was running right through the dam site. Moving the train was a major undertaking, and required the building of many bridges, trestles and tunnels. One tunnel, shown here, was built right through the hillside to temporarily detour the train around the dam site so excavation of the western abutment could begin. This was just part of a much bigger plan.

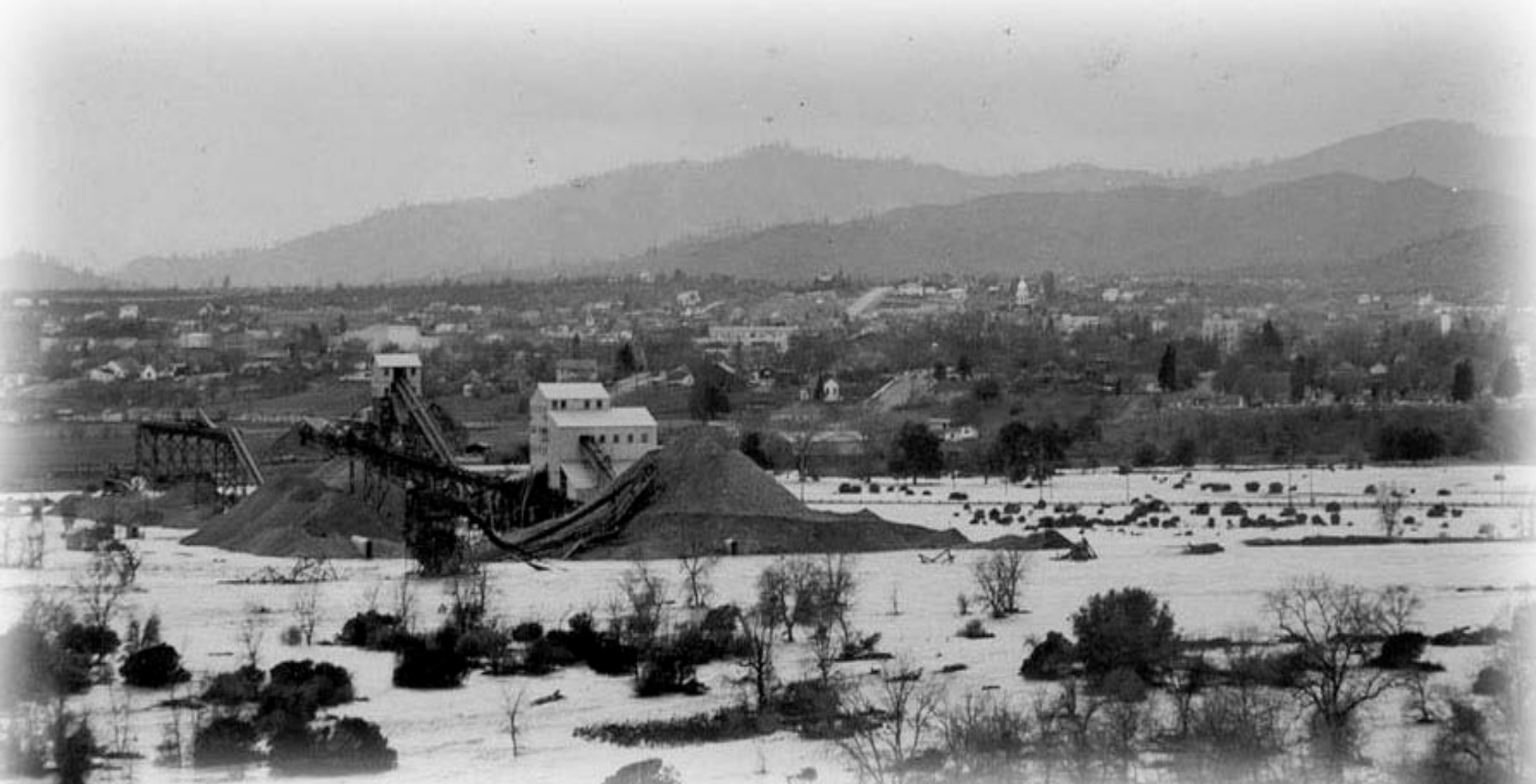




## **The Pit River Bridge**

The plan also included the Pit River Bridge, a massive double-deck bridge which includes both Interstate 5 and the train, crossing over Shasta Lake (note train on lower deck). After this bridge was built they were able to permanently relocate the train to its new home above Shasta Lake where it still runs today.



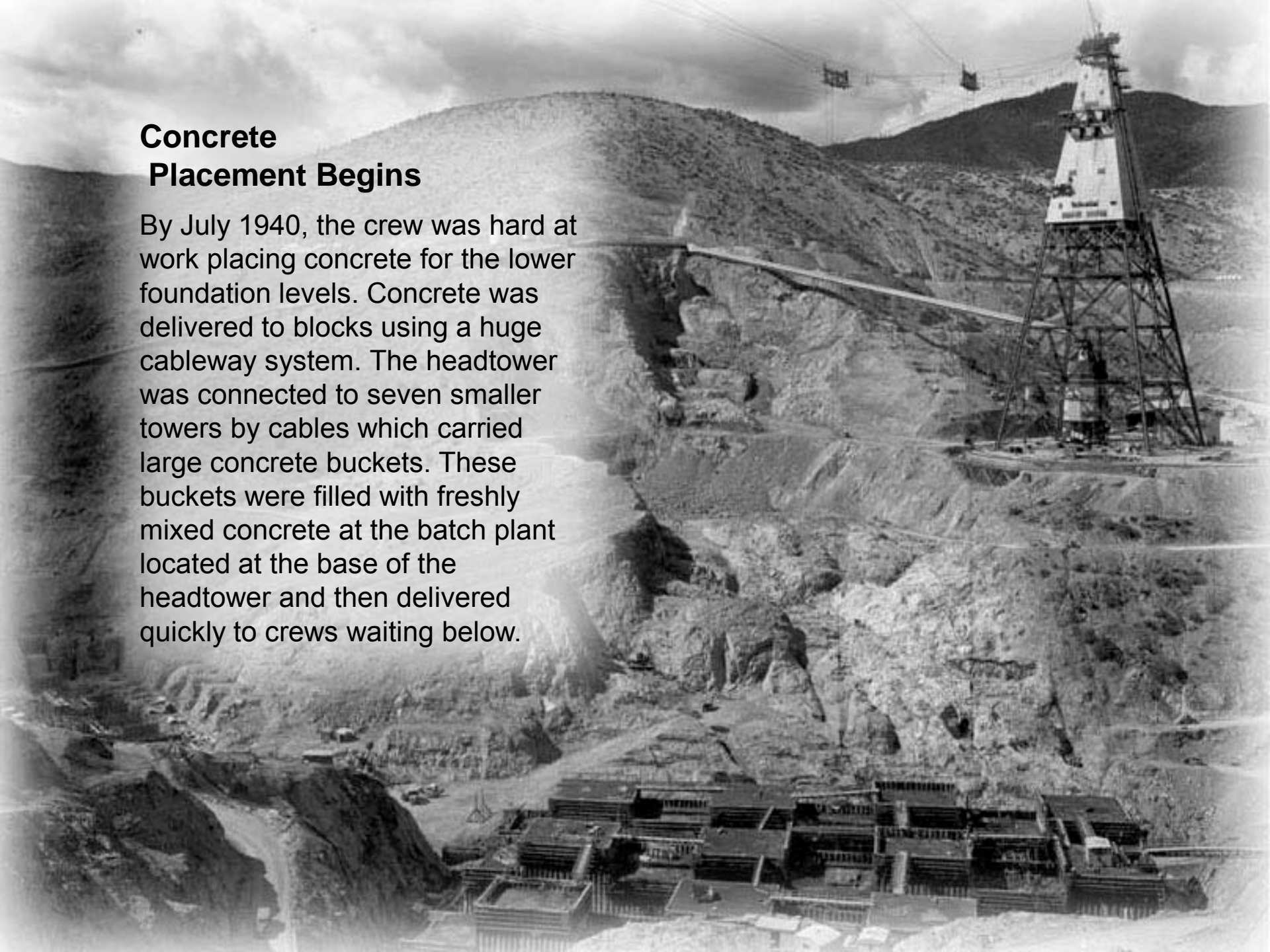


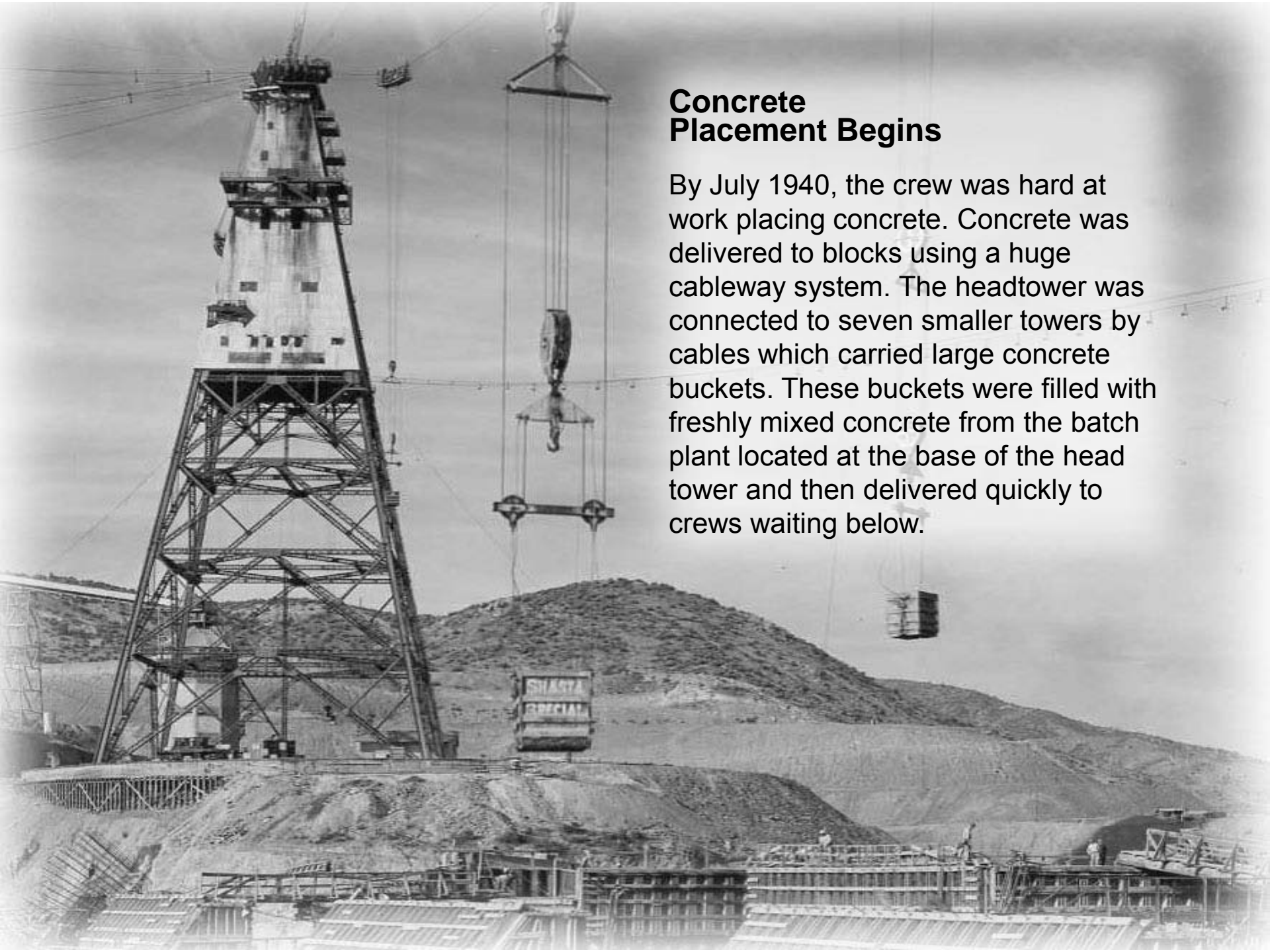
## **The Great Flood of 1940**

In early 1940, workers were reminded why they were building this huge project. The area was hit with the wettest season on record with 108 inches of rain falling for the year. When the dam was finished, downstream communities would be protected from massive floods like the one pictured here. This flood alone caused over 12 million dollars in damage.

## Concrete Placement Begins

By July 1940, the crew was hard at work placing concrete for the lower foundation levels. Concrete was delivered to blocks using a huge cableway system. The headtower was connected to seven smaller towers by cables which carried large concrete buckets. These buckets were filled with freshly mixed concrete at the batch plant located at the base of the headtower and then delivered quickly to crews waiting below.

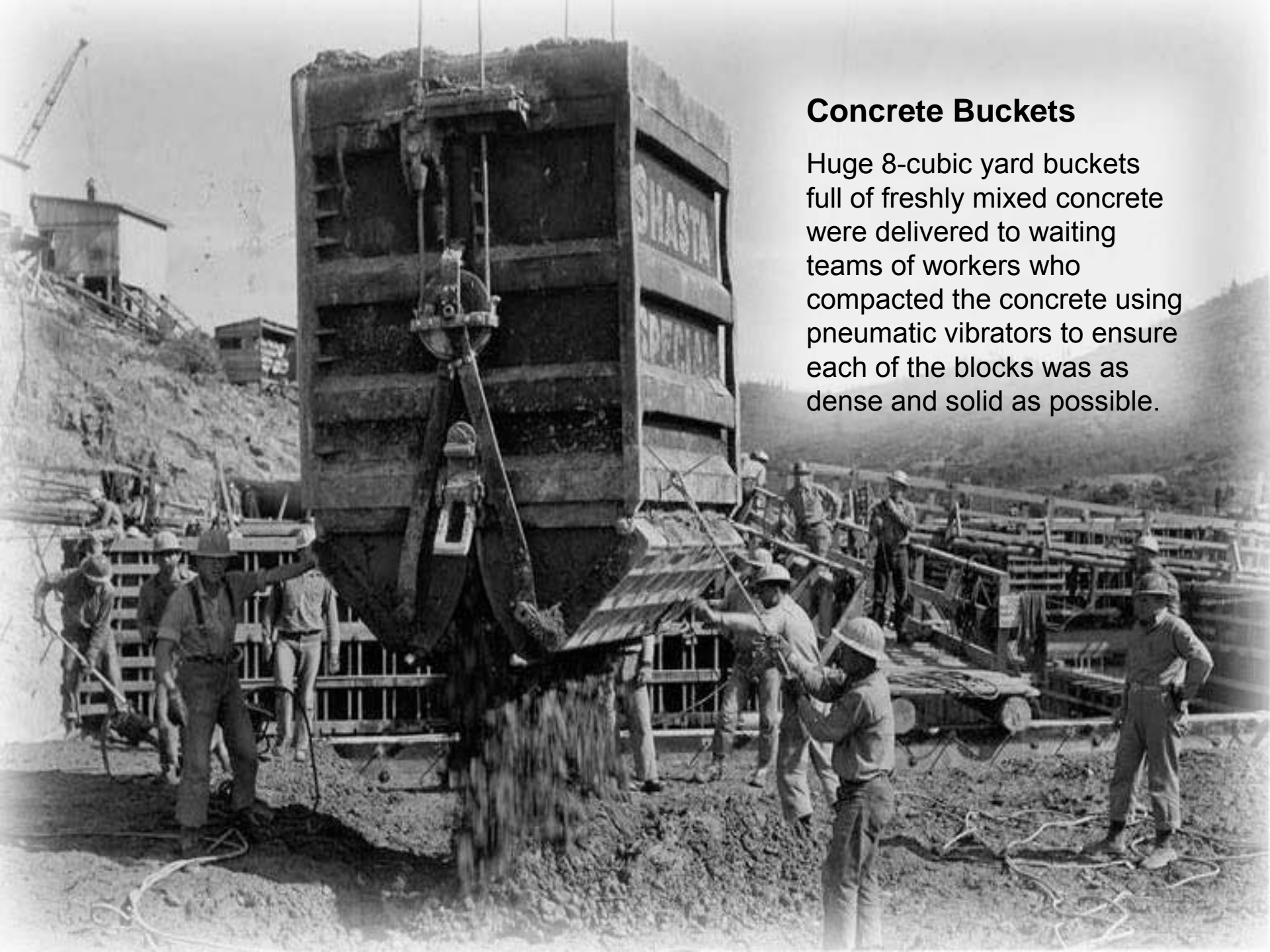




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## Concrete Buckets

Huge 8-cubic yard buckets full of freshly mixed concrete were delivered to waiting teams of workers who compacted the concrete using pneumatic vibrators to ensure each of the blocks was as dense and solid as possible.



## Concrete Placement

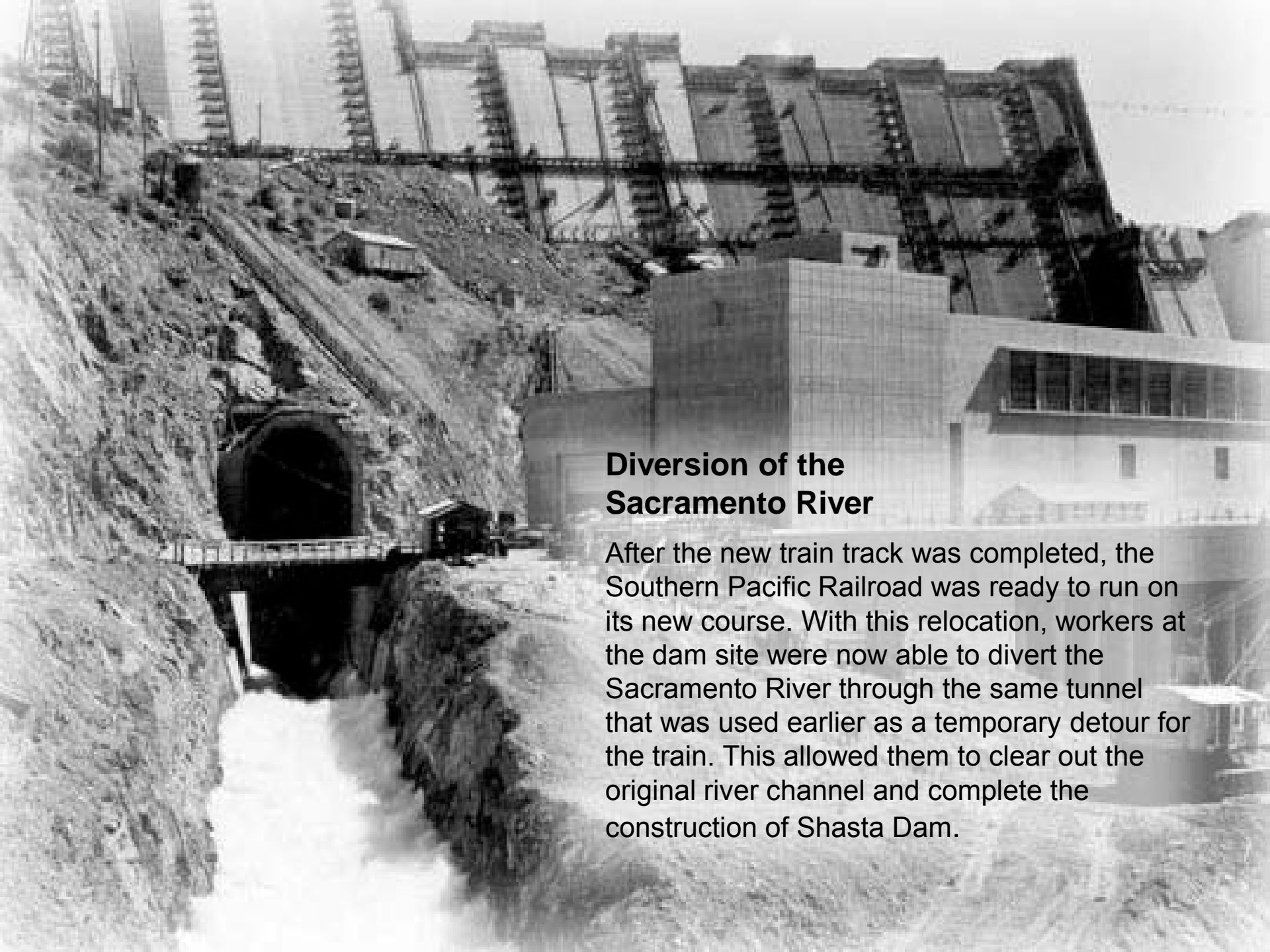
Workers labored 24 hours a day placing concrete in blocks that were 50 feet by 50 feet each, five feet in depth. By the time they had finished four and a half years later, they had placed an amazing 15 million tons of concrete, building 16,900 blocks. It is these massive blocks that give Shasta Dam its strength.



## The Spillway

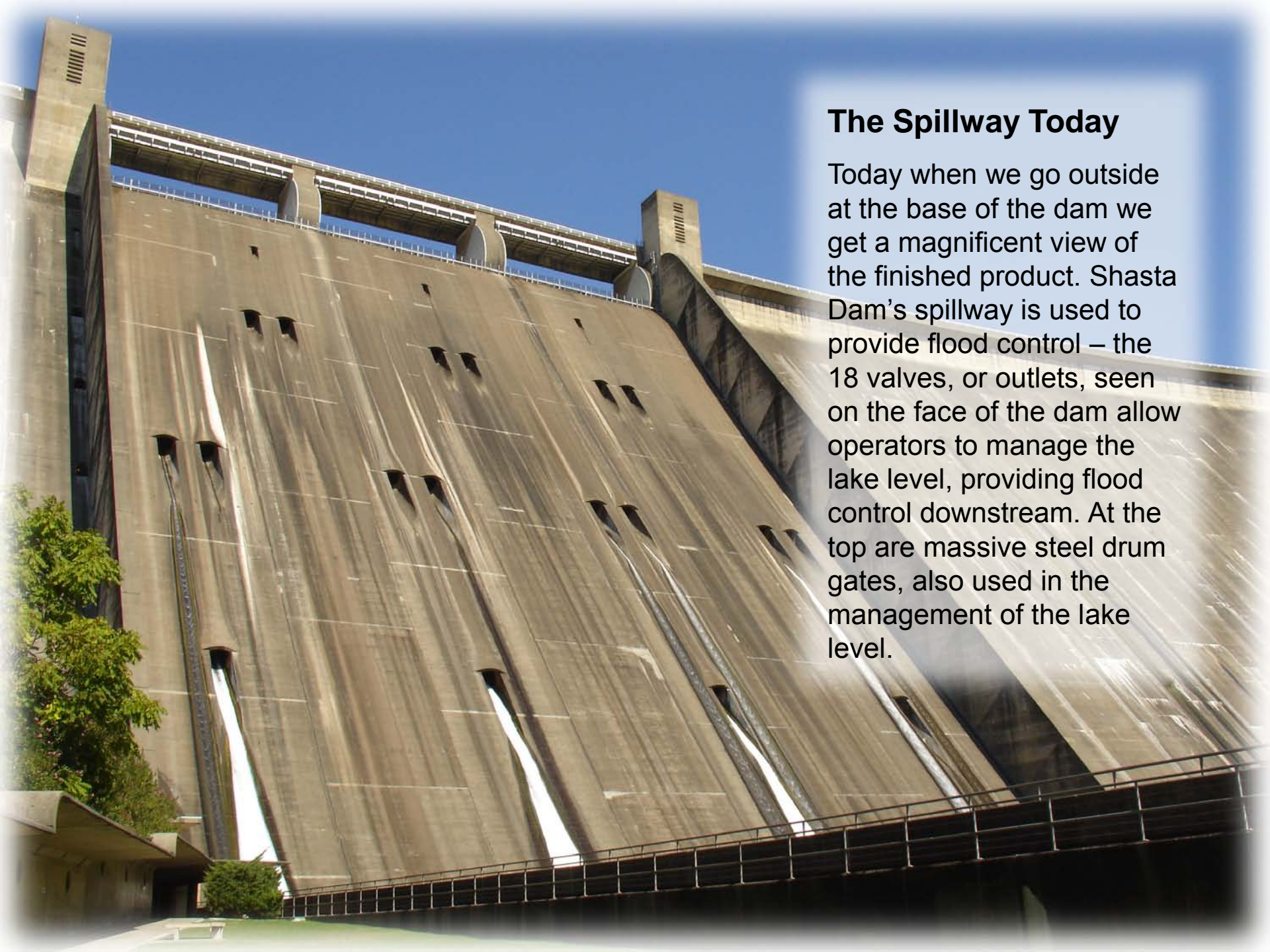
Workers were busy building the abutments of the dam until 1943, when it was time to start the spillway. Up until this time, the Sacramento River had continued to flow in its original channel, right through the middle of the dam site. During this same time workers were also busy working on completing a new path for the Southern Pacific Railroad.





## **Diversion of the Sacramento River**

After the new train track was completed, the Southern Pacific Railroad was ready to run on its new course. With this relocation, workers at the dam site were now able to divert the Sacramento River through the same tunnel that was used earlier as a temporary detour for the train. This allowed them to clear out the original river channel and complete the construction of Shasta Dam.

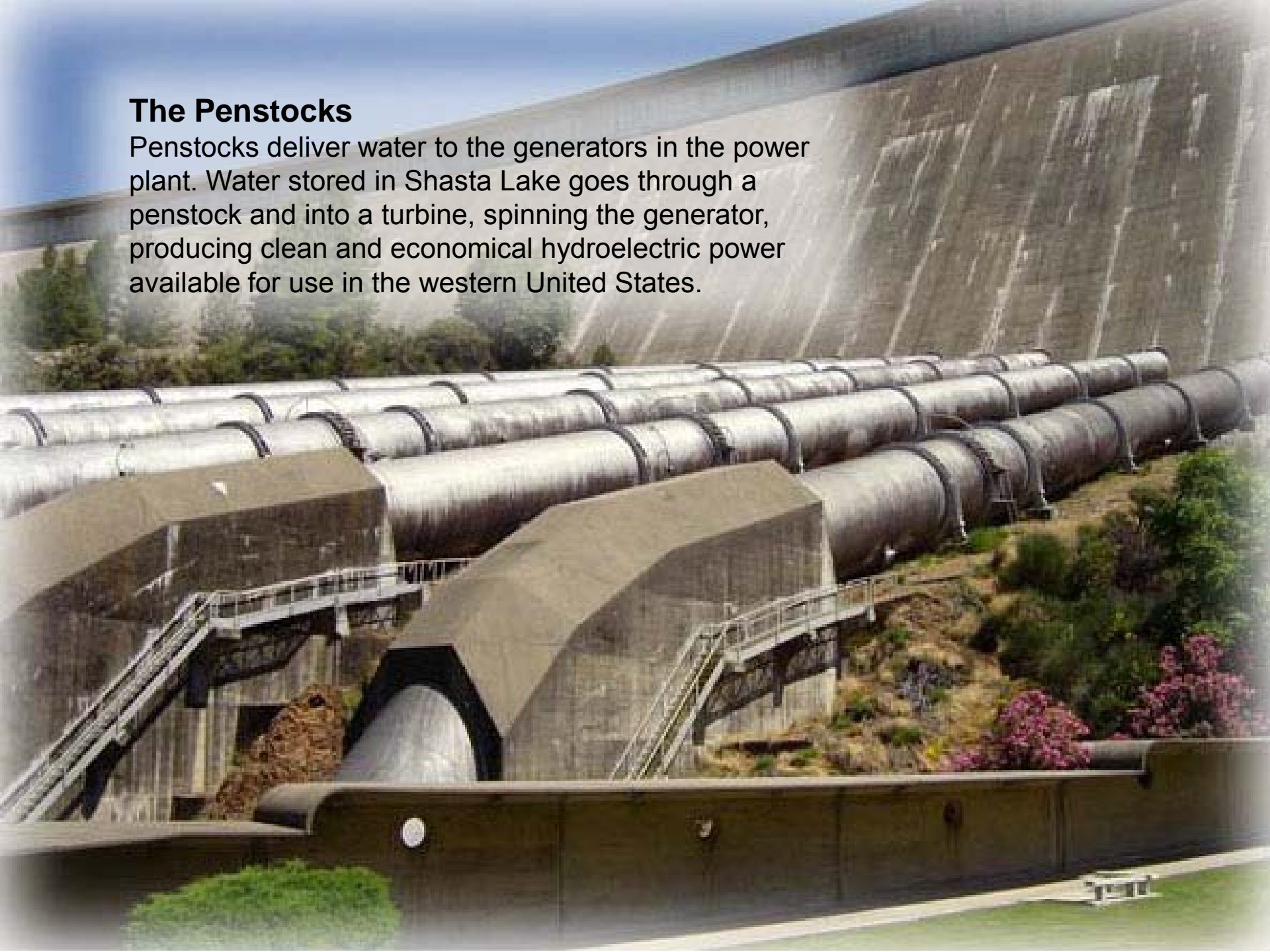


## **The Spillway Today**

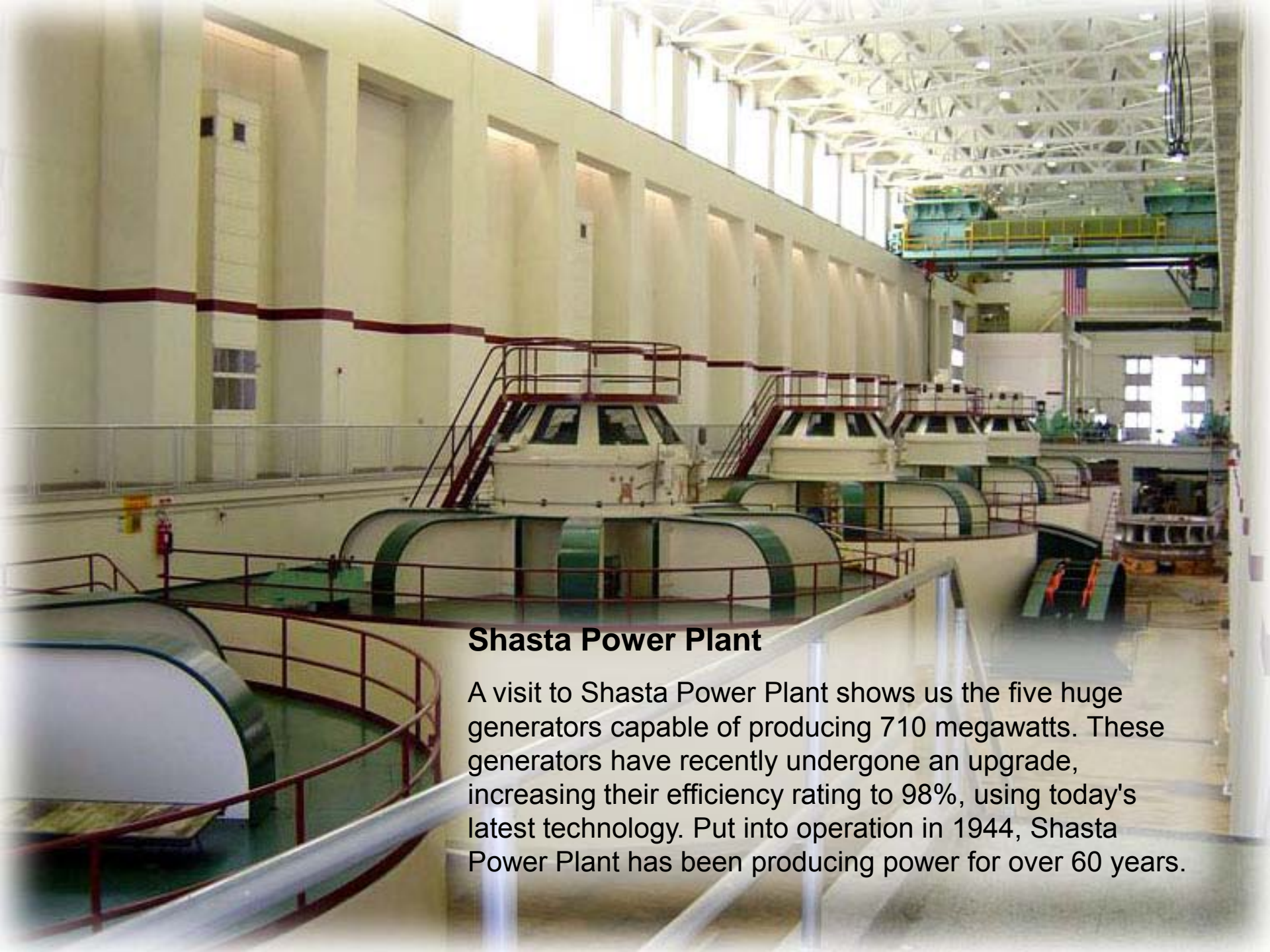
Today when we go outside at the base of the dam we get a magnificent view of the finished product. Shasta Dam's spillway is used to provide flood control – the 18 valves, or outlets, seen on the face of the dam allow operators to manage the lake level, providing flood control downstream. At the top are massive steel drum gates, also used in the management of the lake level.

## The Penstocks

Penstocks deliver water to the generators in the power plant. Water stored in Shasta Lake goes through a penstock and into a turbine, spinning the generator, producing clean and economical hydroelectric power available for use in the western United States.







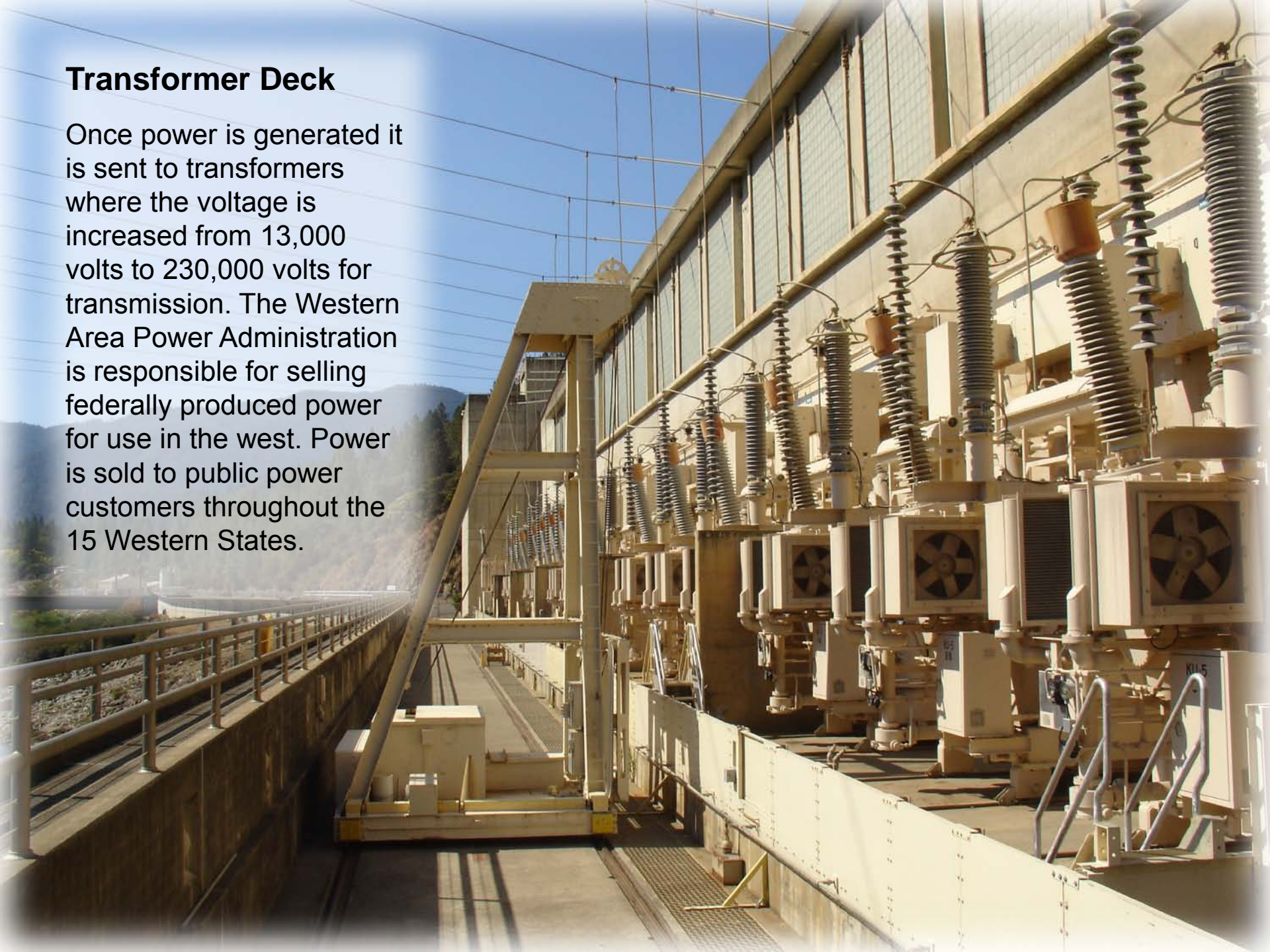
## **Shasta Power Plant**

A visit to Shasta Power Plant shows us the five huge generators capable of producing 710 megawatts. These generators have recently undergone an upgrade, increasing their efficiency rating to 98%, using today's latest technology. Put into operation in 1944, Shasta Power Plant has been producing power for over 60 years.



## Transformer Deck

Once power is generated it is sent to transformers where the voltage is increased from 13,000 volts to 230,000 volts for transmission. The Western Area Power Administration is responsible for selling federally produced power for use in the west. Power is sold to public power customers throughout the 15 Western States.

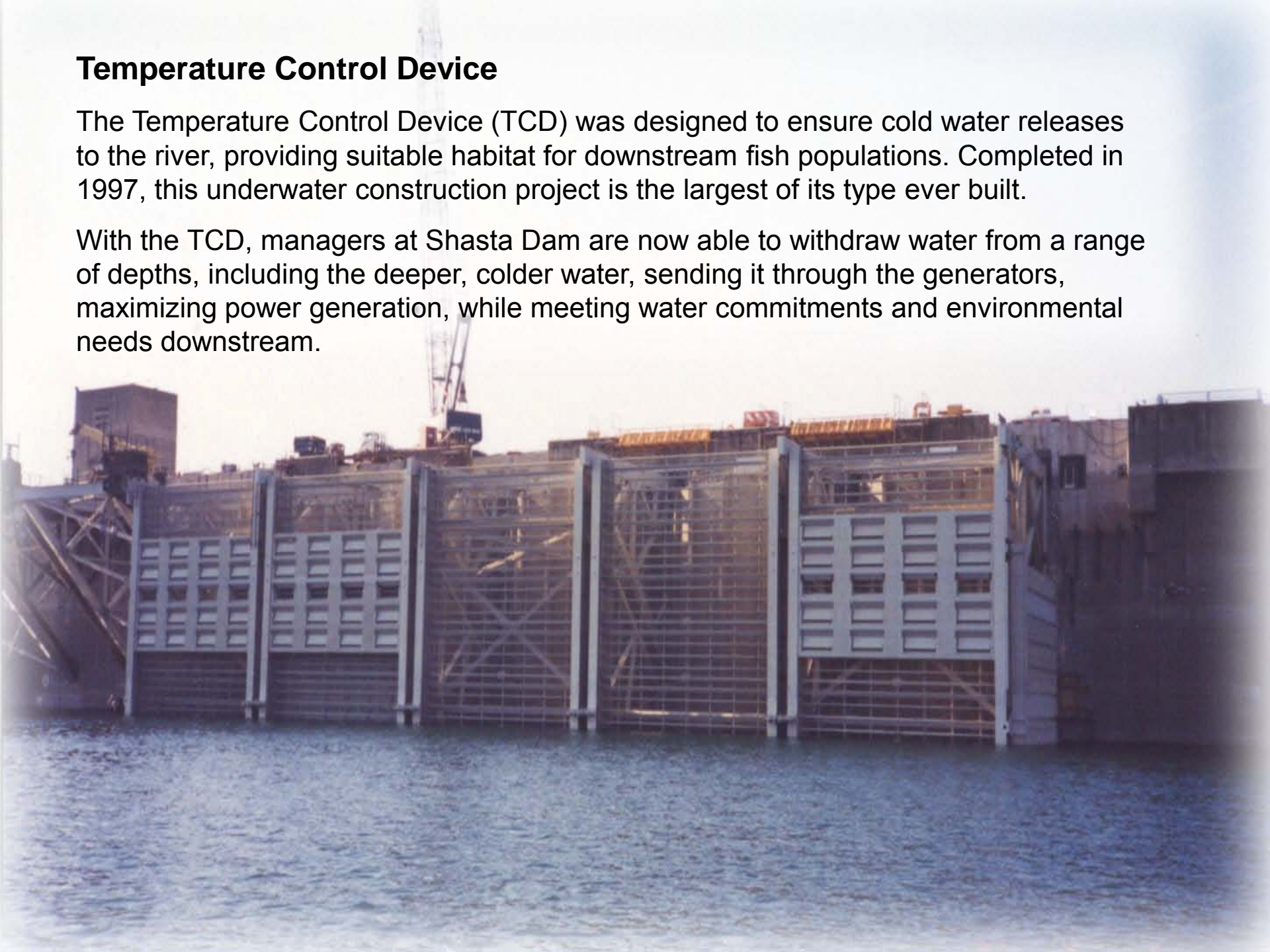




## Temperature Control Device

The Temperature Control Device (TCD) was designed to ensure cold water releases to the river, providing suitable habitat for downstream fish populations. Completed in 1997, this underwater construction project is the largest of its type ever built.

With the TCD, managers at Shasta Dam are now able to withdraw water from a range of depths, including the deeper, colder water, sending it through the generators, maximizing power generation, while meeting water commitments and environmental needs downstream.





## Shasta Dam has an amazing story...

...and we want to share it with you! Free guided tours are offered daily except winter holidays. Come join the friendly, knowledgeable guides on a visit through the Nation's second largest concrete dam. Tours include a visit to the power plant as well as the spillway area at the base of the dam. Come join us and learn more about the history and continued importance of this amazing structure!

**PLEASE NOTE: The following items are restricted and not allowed on the tour:**

- \*Electronic devices such as music players and hand-held games.
- \*Bags of any kind including purses.
- \*Weapons of any kind, including pocket knives.

We appreciate your support of these security measures.

**For tour information contact:  
Bureau of Reclamation  
16349 Shasta Dam Boulevard  
Shasta Lake, CA 96019  
530-275-4463**

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