

TURLOCK IRRIGATION DISTRICT  
**125** YEARS



If a picture is worth a thousand words, then what about a motion picture?

TID would learn the answer in early 2012, when it premiered its historical documentary, *The Irrigationist: The Story of the Turlock Irrigation District*, as a way to celebrate its 125th Anniversary with customers.

The 62-minute film with poignant imagery and music brought some to tears while captivating and educating countless others regarding the rich history of our customer-owned public utility. The film highlights many of the milestones appearing in this report, such as the 1887 formation of TID, when landowners imagined farming opportunities in the region yet were unsatisfied with the Tuolumne River that often ran bone dry.

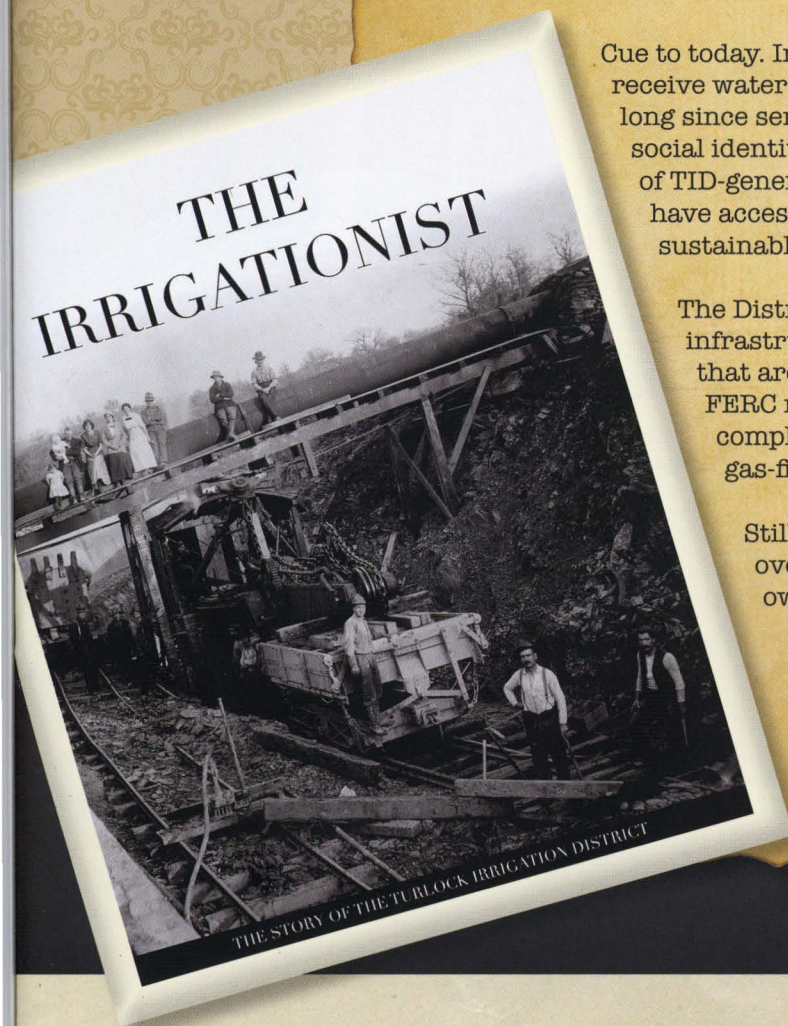
Cue to today. Irrigating land is a constant for thousands of farmers who receive water from TID to nourish and harvest crops. These crops have long since served as the backbone of our region's economy and collective social identity. Complement irrigation water with the distribution of TID-generated public power that began in 1923, and customers have access to a duo of services that have become a blueprint for sustainable growth and regional self-sufficiency.

The District continues to maintain and improve its water and power infrastructure in its effort to provide customers with resources that are affordable and reliable. Examples of this include ongoing FERC relicensing efforts for the Don Pedro Project and the 2012 completion of Almond 2 Power Plant, a 174-megawatt, natural gas-fired facility that has rapid-start capability.

Still, while TID has played a major role in the region's progress over the past 125 years, the privilege of serving our customer-owners is not done, nor should it ever be.

*Casey Hashimoto*

Casey Hashimoto, PE





# 1887-1914

## 1887 – First Irrigation District

In 1887, the Turlock Irrigation District became the first publicly owned irrigation district in California organized under the Wright Act. TID's formation set the stage for numerous other irrigation districts that would ultimately transform California's agricultural economy into the nation's largest and most productive.

## 1893 – La Grange Dam

In partnership with the neighboring Modesto Irrigation District, TID built La Grange Dam in 1893 to divert water from the Tuolumne River and into the Districts' respective canals. The dam cost \$550,000 to construct and was once the highest overflow dam in the world.

### *Original Specifications:*

- 127.5 feet high
- 336 feet crest
- 96 feet thick at base
- 24 feet wide at the top

### *Modifications:*

An 18-inch tall cement cap was added to the top of the dam in 1923. Another two foot cap was added in 1930, making the dam 131 feet tall.

### *Construction Method:*

Boulders set in concrete, faced with roughly dressed stone. It took 39,500 cubic feet of masonry, and 31,000 barrels of cement to complete.

## 1900 – Irrigation begins

In March of 1900, a Ceres area farmer named Henry Stirring opened a channel and let canal water flow into his newly planted corn crop. Since then, TID has been delivering irrigation water to growers via 250 miles of a gravity-fed water conveyance system of canals and laterals.

## 1914 – Turlock Lake

Davis Reservoir, a 46,000 acre-foot reservoir, was built to store enough water to extend irrigation seasons into September or October. The reservoir was renamed Turlock Lake in 1950.





# 1923: Old Don Pedro

Ground was officially broken in 1921 on Don Pedro Dam, and in summer of 1923, all the stores in Turlock closed as more than 2,500 people gathered for the dedication of the dam. At capacity, the reservoir stored 289,000 acre-feet of water.

The new dam included a powerhouse, capable of generating electric power for the area's towns and isolated farms. This energy, arriving in rural areas sooner than most anticipated, greatly benefitted life in the region.

The concrete arch dam provided storage, water for a full irrigation season, and cast TID into the role of an electric generator and distributor.

The dam required approximately 300,000 cubic yards of concrete. The powerhouse produced nearly 33 megawatts of energy.

*Original Specifications:*

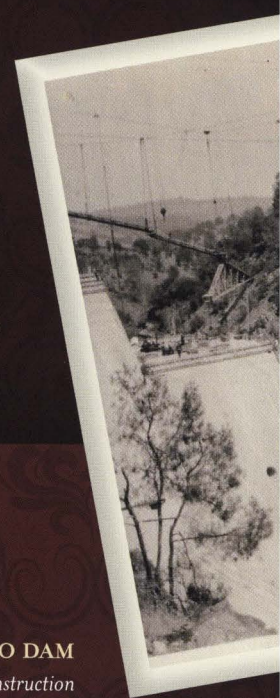
- 284 feet high
- 177 feet thick at base
- 16 feet wide at the top

*Ownership:*

- Turlock Irrigation District
- Modesto Irrigation District

*Purpose:*

- Water storage
- Extension of irrigation season
- Power production



**DON PEDRO DAM**  
*Original Construction*



# 1971: New Don Pedro

## Construction

Work began in October 1967 and was completed in 1970.  
The project was dedicated into service in May 1971.

## Dam Ownership

Turlock Irrigation District – 68.46% and operator  
Modesto Irrigation District – 31.54%

## Original Specifications

- 580 feet high
- 855 feet crest elevation
- 1900 feet crest length
- 40 feet crest width
- 2800 feet wide at its base

## Purpose

- Water storage
- Power production
- Flood control
- Recreation

Cost:  
\$105 million total

## Reservoir Statistics

Maximum storage capacity of 2,030,000 acre-feet at 830 feet above sea level. At capacity, the reservoir covers 13,000 acres of surface area. It is 26 miles long and boasts a shoreline of 160 miles. About seven times the size of the original Don Pedro Reservoir.

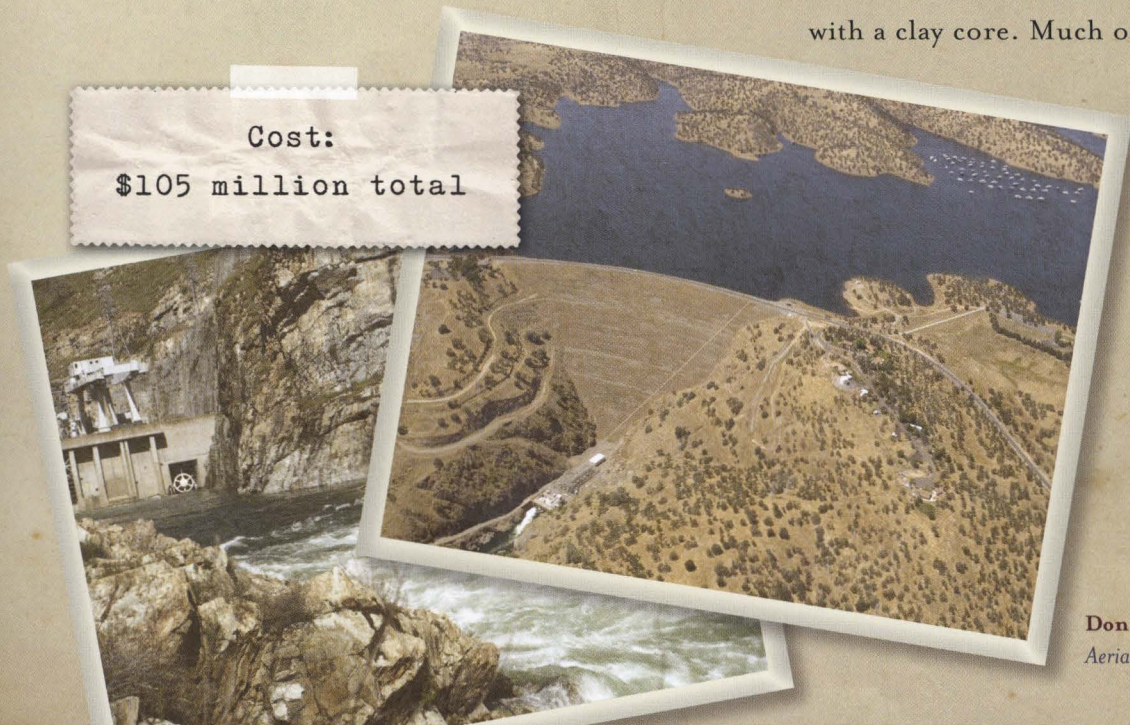
## Powerhouse Statistics

The powerhouse was constructed with three turbines each capable of generating 55 megawatts of power. A fourth turbine generator was added in 1989, capable of generating 38 megawatts. All told, the generating capacity is 203 megawatts.

## Construction Method

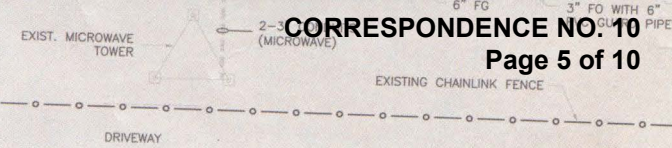
Don Pedro is an Earth and rock dam. Sixteen million cubic yards of fill materials were used in construction with a clay core. Much of the fill material came from

gold dredge tailings from the Tuolumne River near La Grange.



Don Pedro Dam and Powerhouse  
Aerial view





TURBINE YARD PLAN VIEW  
SCALE: 1"=20'

# 1979-1995

## Additional Power Supplies

PLOTTED: AUGUST 28, 2001

W.O.# 52835

REV.	DATE	DESCRIPTION	DR.	CHK.	APP.	REV.	DATE	DESCRIPTION	DR.	CHK.	APP.	REV.	DATE	DESCRIPTION

With the addition of the Walnut Power Plant, TID was able to generate more than 644 million kilowatt-hours of electricity in 1986.

### 1986

Walnut Power Plant, a natural gas-fired, dual-fuel power plant, begins operation with a generating capacity of 49.9 megawatts.

The plant was built to supply power to customers during peak periods, and consists of two General Electric 34,000 horsepower gas turbine generators.

### 1979

TID begins constructing the first of eight, small-scale hydroelectric power plants on its canal system and surrounding irrigation districts' canals.

### 1984

TID acquires interest in a geothermal power plant in the Geysers Steam Field located in Lake County.

### 1995

Almond Power Plant, a natural gas-fired plant, begins operation with a generating capacity of 48 megawatts.



# 2003-2006

## Expansion

### 2003

TID purchases 225 square-miles from Pacific Gas & Electric on the western side of the District.

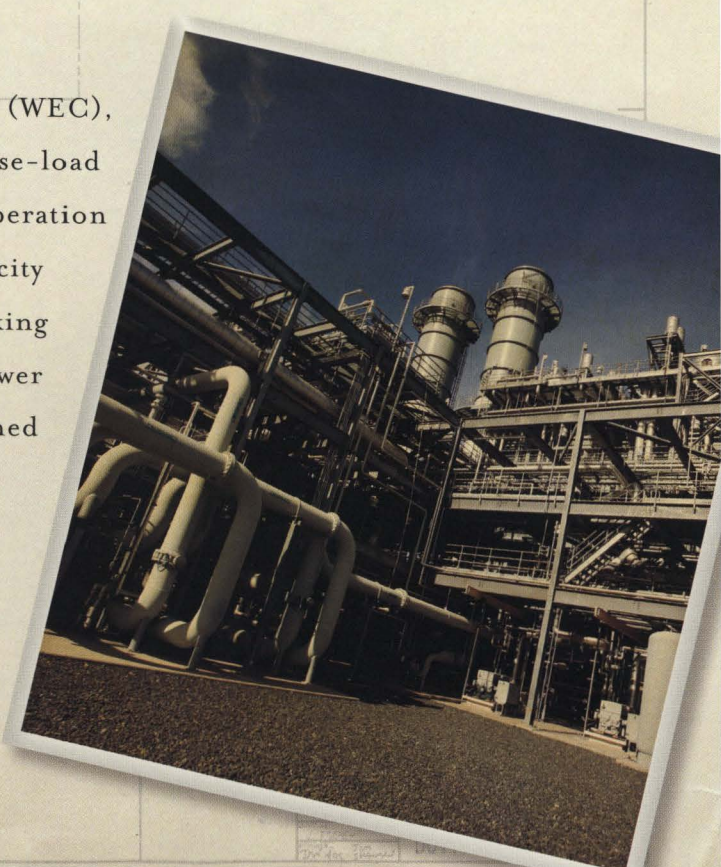
### 2005

TID obtains certification as an independent Balancing Authority, allowing the District to operate independently within the Western United States power grid. At its time of certification, TID was one of only four certified Balancing Authorities in California.

### 2006

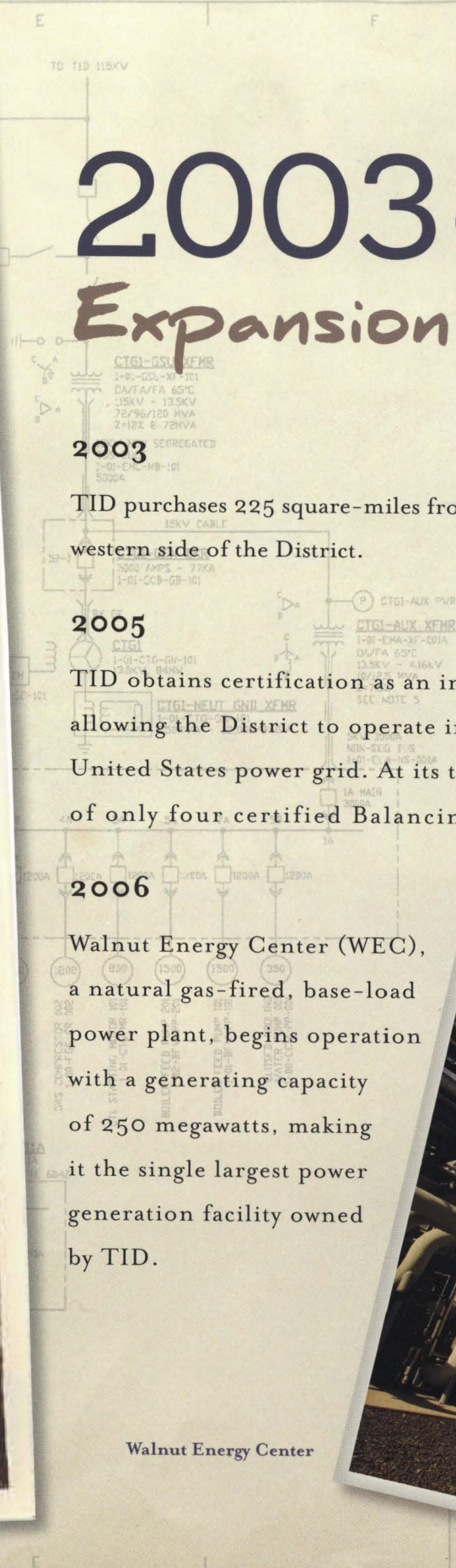
Walnut Energy Center (WEC), a natural gas-fired, base-load power plant, begins operation with a generating capacity of 250 megawatts, making it the single largest power generation facility owned by TID.

Walnut Energy Center



LEGEND:  
⬇ INDICATES INTERLOCK  
⎓ INDICATES 1SD PHASE BUS  
⎓ INDICATES 3DN SEC BUS

- GENERAL NOTES:
1. ALL MOTOR DRIVERS AND TRANSFORMER SIZES ARE PRELIMINARY.
  2. ALL 4160 VOLT SWITCHGEAR SHALL UTILIZE 125VDC FOR CONTROL FUNCTIONS.
  3. ALL 4160 VOLT MOTOR CONTROLLERS SHALL BE NON-LATCHING UNLESS OTHERWISE INDICATED AND USE INDIVIDUAL CONTROL POWER TRANSFORMERS FOR CONTROL FUNCTIONS.
  4. ALL 4160 VOLT SWITCHGEAR AND CONTROLLERS SHALL HAVE PROVISIONS TO BE EXTENDED.
  5. UNIT AUXILIARY TRANSFORMERS SHALL BE GROUNDED WITH 1000A GROUNDING RESISTORS.
  6. ALL 4160 VOLT BREAKERS AND CONTROLLERS SHALL BE CONTROLLED BY THE DCS WHEN IN THE CONNECTED (CRACKED-ON) POSITION AND BY THE DCS WHEN CLOSED USING THE POSITION. THE BREAKER OR CONTROLLER CAN ONLY BE OPENED AND CLOSED BY THE LOCAL SWITCH AND PROTECTIVE RELAY ACTION.
  7. 4160 VOLT SWITCHES SHALL BE KIRK-KEY INTERLOCKED SUCH THAT ONLY TWO OF THE THREE SWITCHES CAN BE CLOSED AT THE SAME TIME.
  8. ALL 480 VOLT FEEDER BREAKERS SHALL HAVE DCS INTERFACE.





# 2008-2012

## New ways to generate energy

2008

TID took its first ownership in wind facilities, known as the Tuolumne Wind Project. The project consists of a total of 62 turbine generator: 42 Siemens SWT 2.3 megawatt models and 20 REPower MMp3 2.0 megawatt models.

The project has a generation capacity of 136.6 megawatts. Located in Klickitat County, Washington, along the Columbia River, the site has been recognized as one of the most productive wind resource areas in the Western United States.

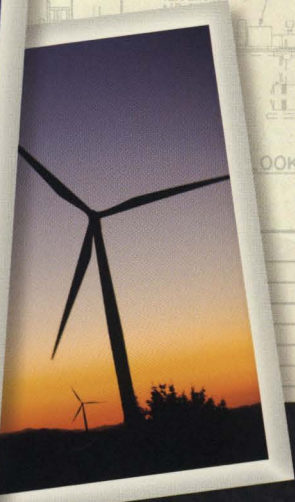
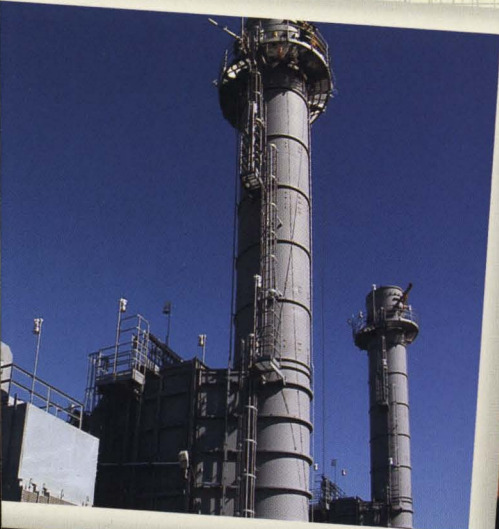
2012

An example of local control and self-sufficiency, Almond 2 Power Plant provides an additional 174 megawatts of TID-owned generation that furthers power supply reliability. A2PP uses efficient turbine technology fueled from clean-burning natural gas.

Almond 2 Power Plant provides an additional 174 megawatts of TID-owned generation that furthers power supply reliability.

Consisting of three, rapid-start generating units that can produce full output to TID's electrical system in a mere

10 minutes, A2PP integrates into TID's generation portfolio as a peaking power plant. Most effective when TID's system demand spikes, such as on hot summer days, or when intermittent energy resources like wind fluctuate, these units provide reserves that enable other base-load resources to improve their efficiency and economy.



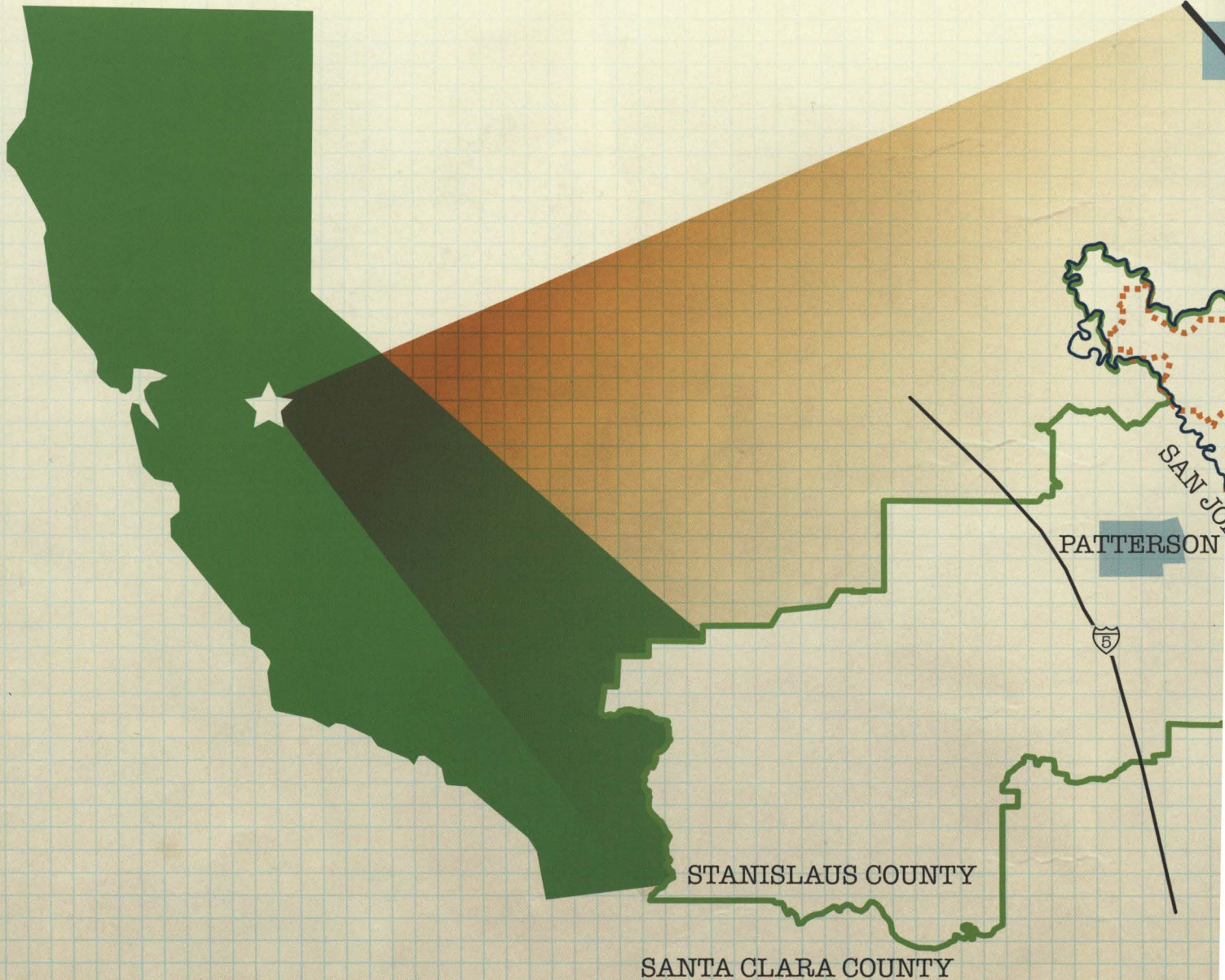
ISSUED	REV	DATE	DM*	SDE	PEM
PRELIMINARY	E	03/26/09	RP	RP	JH
FOR REVIEW AND APPROVAL	F	02/10/10	RP	RP	JH
APPROVED FOR CONSTRUCTION	G	04/19/10	RP	RP	JH
REVISED & APPROVED FOR CONSTRUCTION	H	08/12/12	RP	RP	JH

TURLOCK IRRIGATION DISTRICT  
Almond 2 Power Plant  
Ceres, CA  
PROJECT NO. 383416





# SERVICE AREA



### Service Area

Communities Served: Ballico, Ceres, Crows Landing, Delhi, Denair, Diablo Grande, Hickman, Hilmar, Hughson, Keyes, La Grange, Patterson, South Modesto, Turlock

### Electric Service

Electric Accounts: 99,913  
Electric Service Area: 662 square miles

### Water Service

Irrigation Service Area: 307 square miles  
Miles of Canals: 250 miles  
Irrigation Area: 145,559 acres

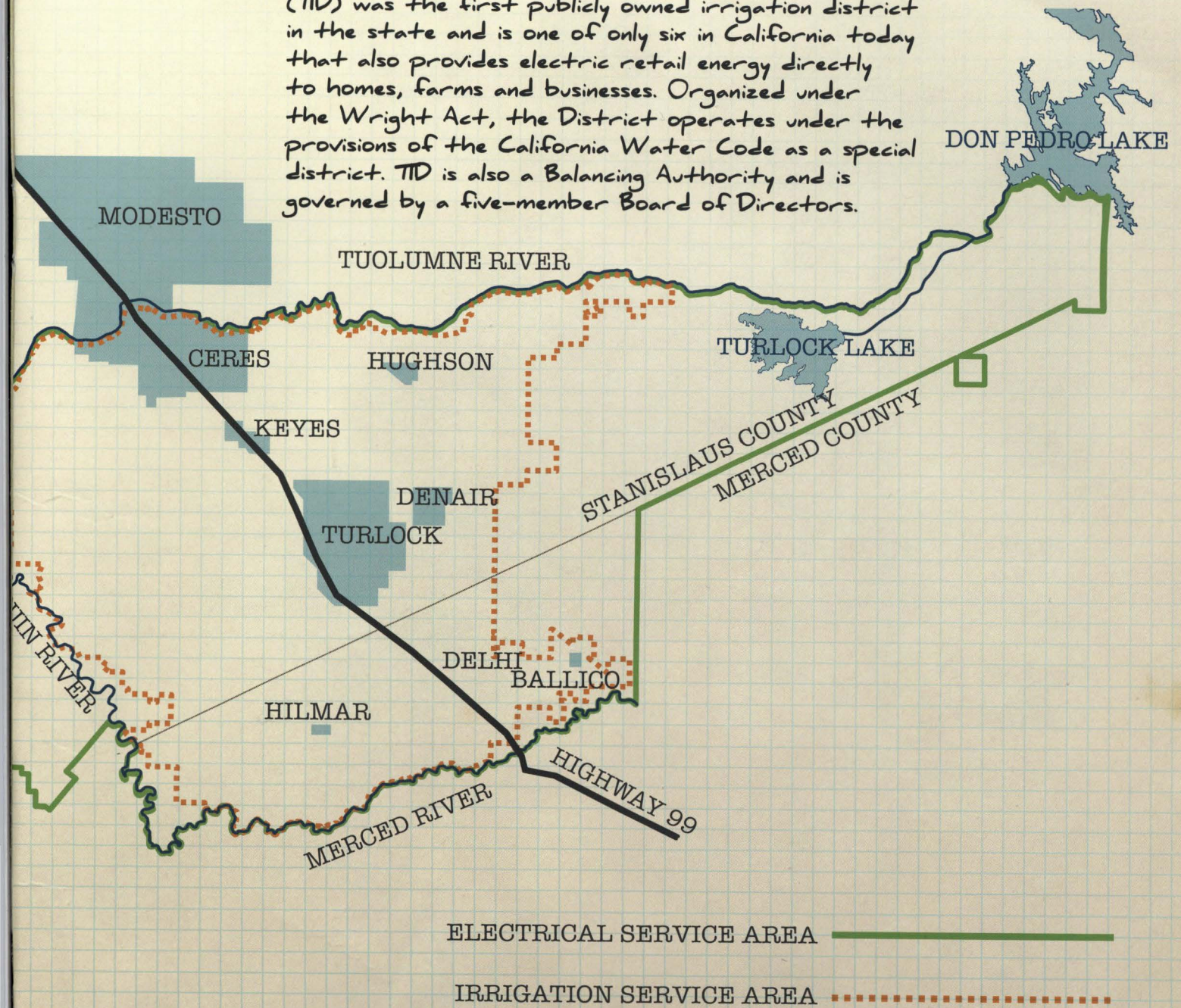
### Number of Employees

456



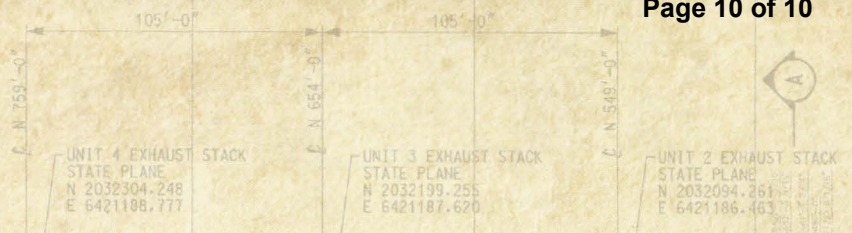
## Overview

Established in 1887, the Turlock Irrigation District, (TID) was the first publicly owned irrigation district in the state and is one of only six in California today that also provides electric retail energy directly to homes, farms and businesses. Organized under the Wright Act, the District operates under the provisions of the California Water Code as a special district. TID is also a Balancing Authority and is governed by a five-member Board of Directors.



Facility	Type	Capacity (megawatts)
Don Pedro Dam & Powerhouse	Hydroelectric	203 (TID's share is 139 MW)
Small Hydro Projects	Hydroelectric	15
Walnut Energy Center	Natural Gas	250
Almond Power Plant	Natural Gas	49.9
Walnut Power Plant	Natural Gas	49.6
Almond 2 Power Plant	Natural Gas	174
Tuolumne Wind Project	Wind	136.6





**WATER & POWER**  
Serving Central California since 1887



**MANAGEMENT TEAM**

- Casey Hashimoto | General Manager
- Joseph Malaski | AGM, Financial Services & CFO
- James Farrar | AGM, Resource Management, Planning, & Rates
- Larry Gilbertson | AGM, Electrical Engineering & Operations
- Brian LaFollette | AGM, Power Supply
- Robert Nees | AGM, Water Resource

**BOARD OF DIRECTORS**

- Michael Frantz | Division 1
- Charles Fernandes (VP) | Division 2
- Joe Alamo | Division 3
- Rob Santos (President) | Division 4
- Ron Macedo | Division 5

**REVENUE BOND RATINGS**

- Moody's | A2
- Fitch | A+
- Standard & Poor's | A+

**ADVISORS**

- Griffith & Masuda | General Counsel
- Orrick, Herrington & Sutcliffe LLP | Bond Counsel
- PricewaterhouseCoopers LLP | Independent Accountants
- Public Financial Management, Inc. | Financial Advisor
- SAIC Energy, Environment & Infrastructure, LLC | Consulting Engineers

FOR SUBSTATION LAYOUT  
SEE ELECTRICAL DWG. NO.  
E-EHV-W-0-1480

NO.	DATE	REVISION	BY	CHK	REVISION APPROVAL	
					DISCIPLINE	REVIEWED
1	08/12/10	REVISED AS NOTED - ISSUED FOR CONSTRUCTION	ERC			
B	01/19/09	REVISED SWITCHYARD	EFC	TBJ	CIVIL	JMP
C	02/09/09	REVISED PLANT FENCE	EFC	TBJ	STRUCTURAL	MNS
D	02/24/09	REVISED SWITCHYARD, PROPERTY AND FENCE LINES	EFC	TBJ	MECHANICAL	AJ