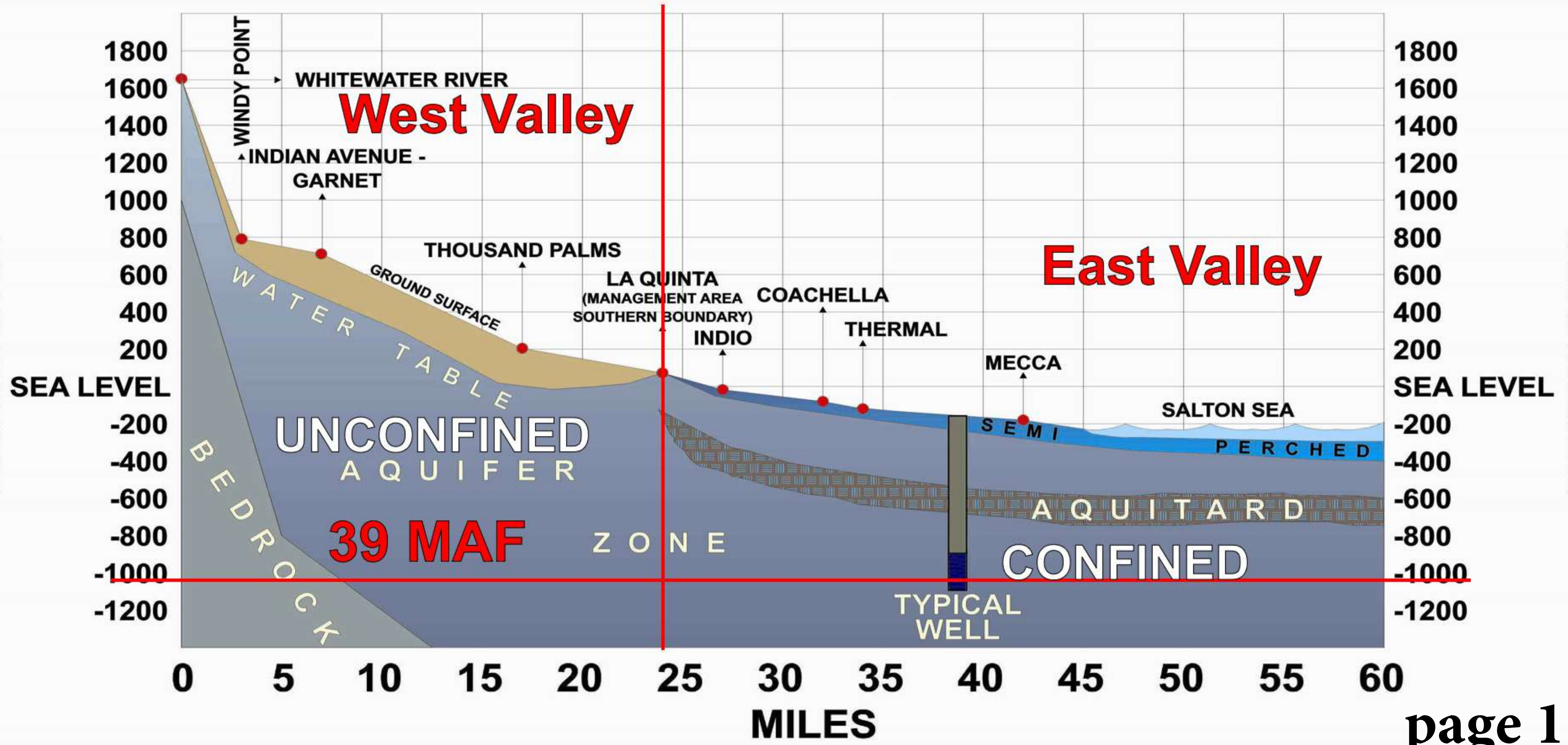
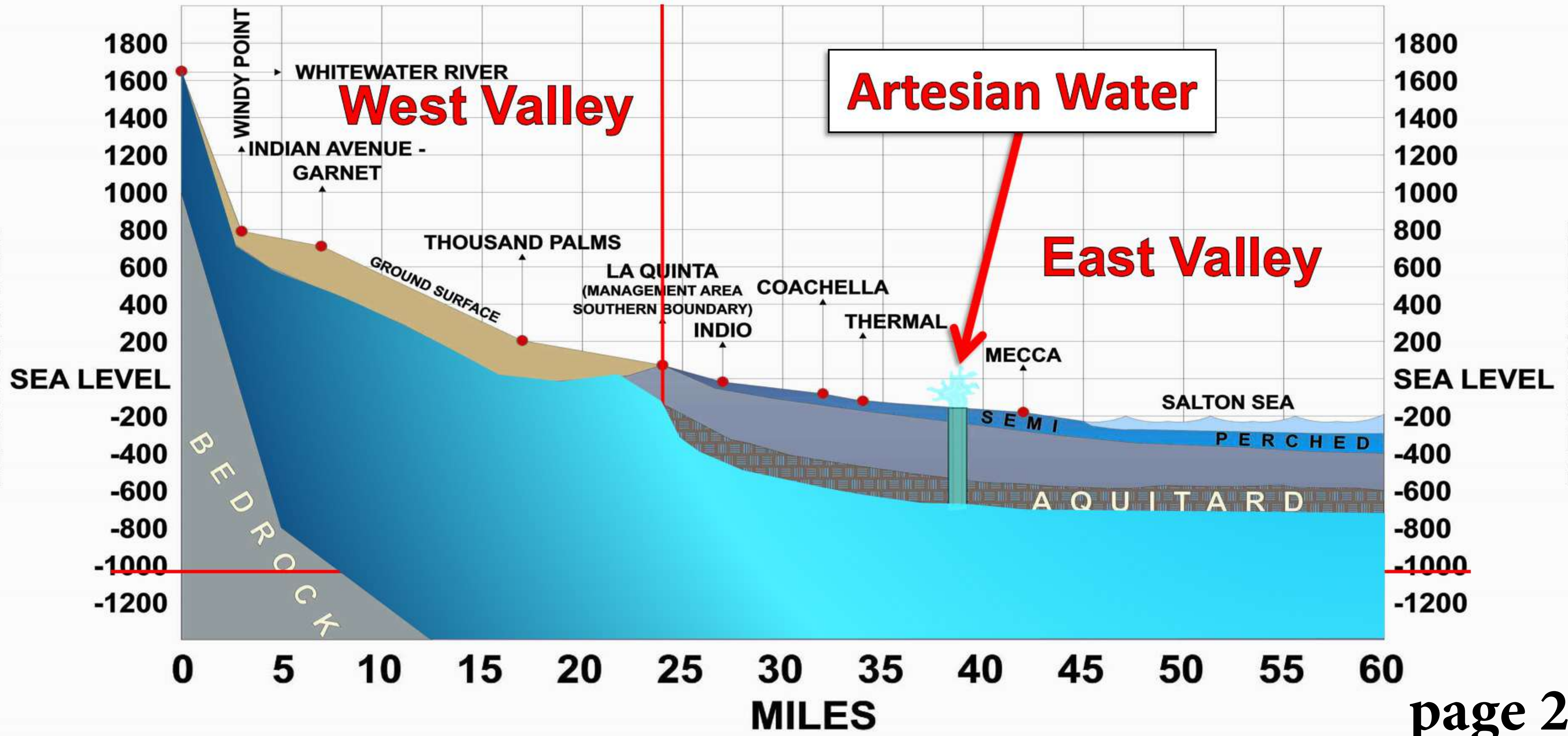


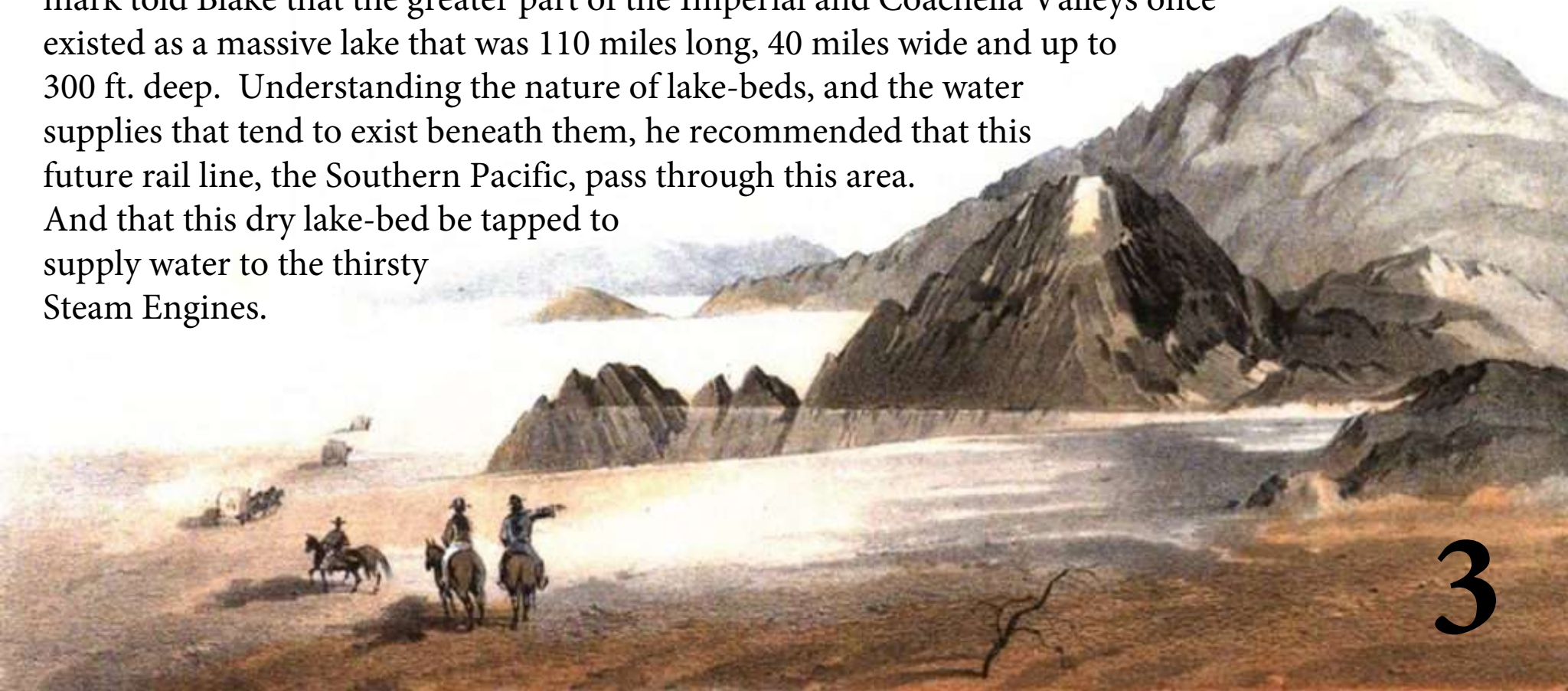
COACHELLA VALLEY GROUNDWATER BASIN PROFILE



COACHELLA VALLEY GROUNDWATER BASIN PROFILE



The Williamson Expedition of 1853 marks the beginning of modern development in the Coachella Valley. The survey party was searching out a feasible railroad route that would extend from New Orleans to Los Angeles. Pictured below are geologist William Blake and Lt. R.S. Williamson. Blake is pointing at the iconic water line that, locally, is simply called, "The Bathtub Ring". This high water mark told Blake that the greater part of the Imperial and Coachella Valleys once existed as a massive lake that was 110 miles long, 40 miles wide and up to 300 ft. deep. Understanding the nature of lake-beds, and the water supplies that tend to exist beneath them, he recommended that this future rail line, the Southern Pacific, pass through this area. And that this dry lake-bed be tapped to supply water to the thirsty Steam Engines.



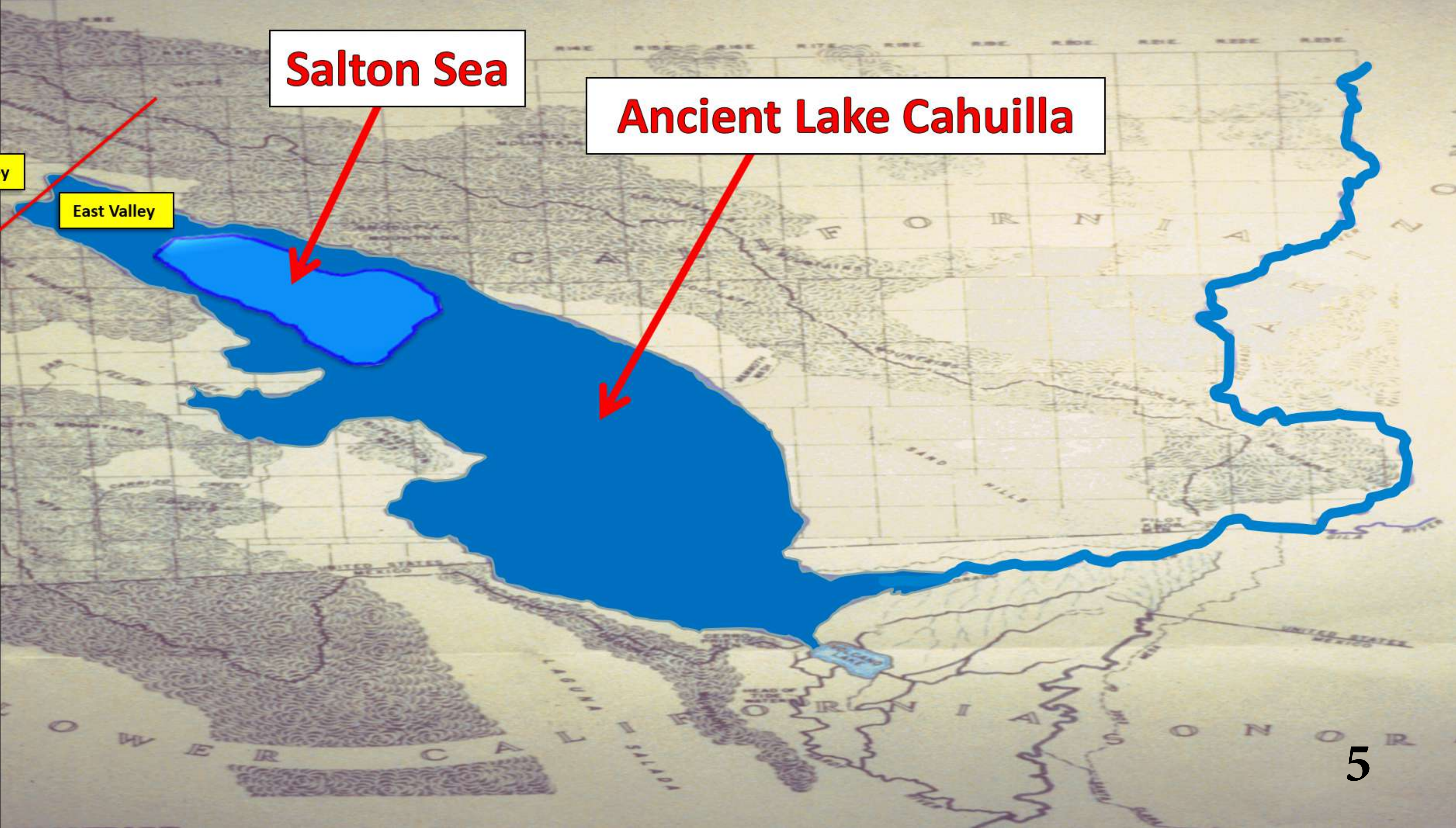
Travertine Point and the water line
(West side of the Salton Sea)



Salton Sea

Ancient Lake Cahuilla

East Valley



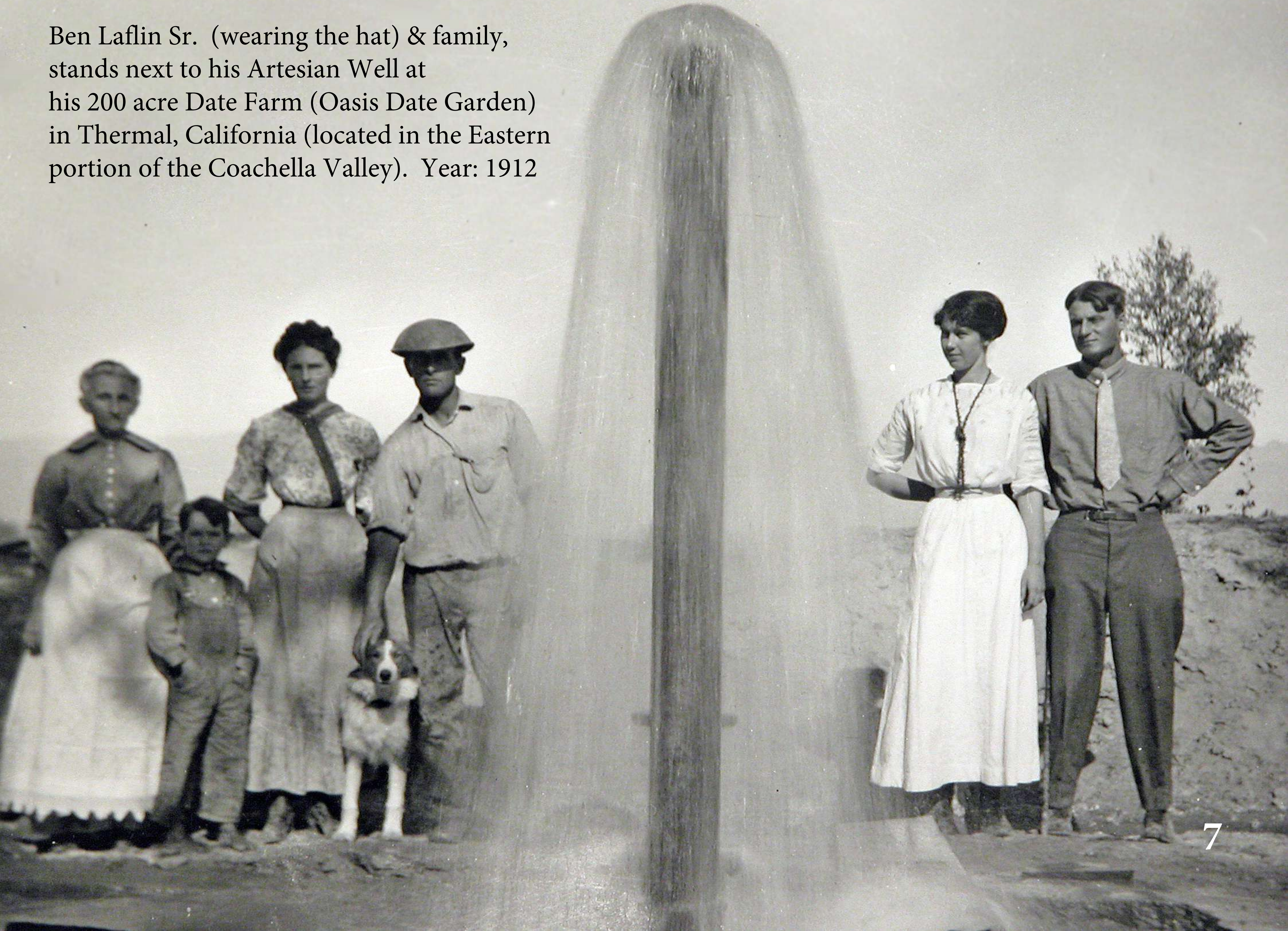


West Valley

East Valley

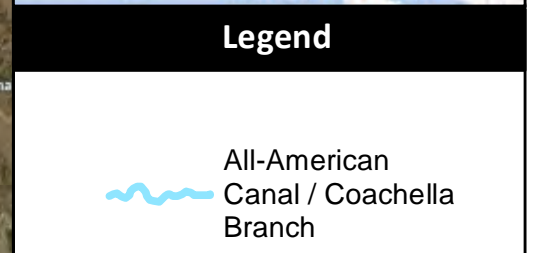
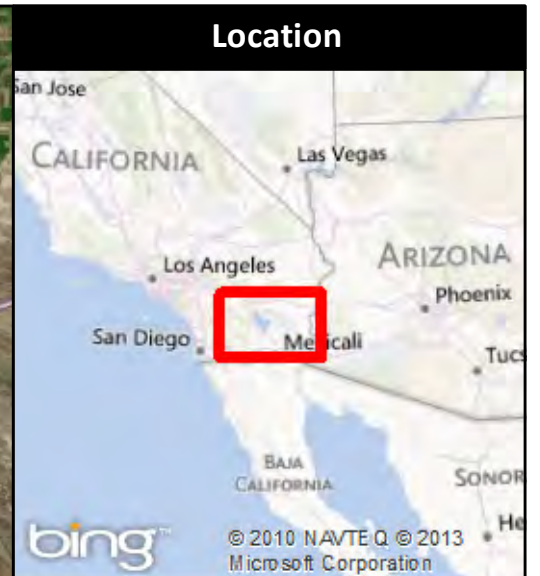
Salton Sea

Ben Laflin Sr. (wearing the hat) & family, stands next to his Artesian Well at his 200 acre Date Farm (Oasis Date Garden) in Thermal, California (located in the Eastern portion of the Coachella Valley). Year: 1912



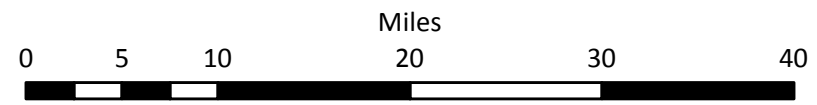
Artesian Wells
Still flow today!





Coachella Valley Water District

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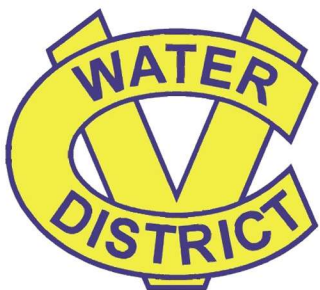
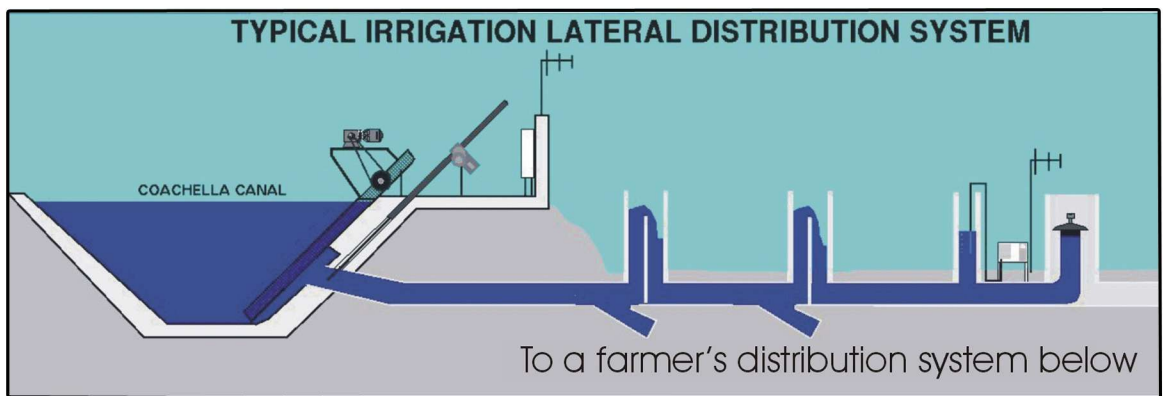


This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

All-American Canal Coachella Branch

File Name: AllAmericanCanal_11x17.mxd
File Location: J:\ENGCAD\GIS\Projects\Canal\Mxd\
Date Updated: Wednesday, May 08, 2013 @ 8:49:18 AM
Updated By: MP1138
Department: CVWD Engineering - GIS/CAD

9



Coachella Canal

Lining project complete



From left, Bureau of Reclamation Commissioner Bob Johnson and CVWD General Manager-Chief Engineer Steve Robbins open the gate to start the water flowing in the newly lined section of canal during a dedication ceremony in November.

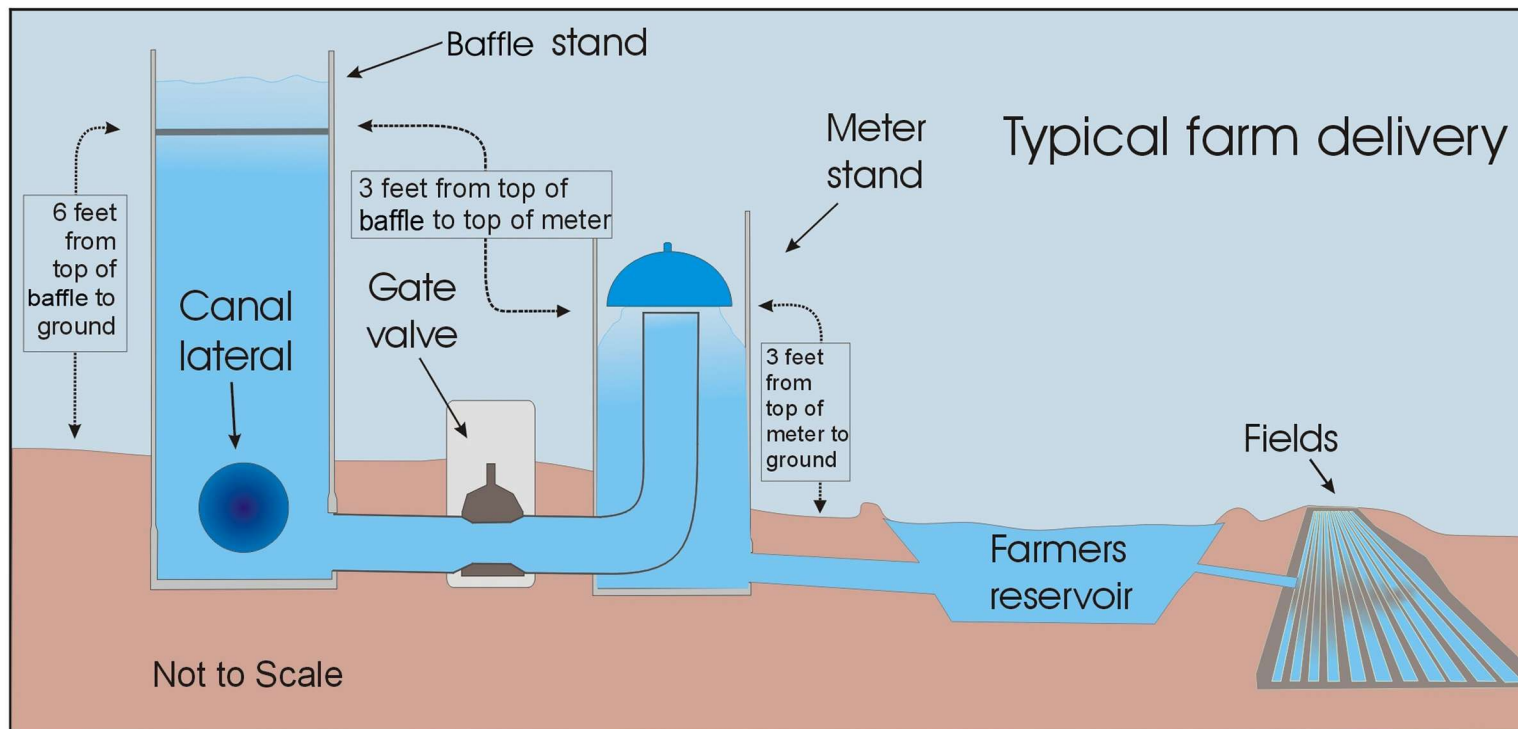
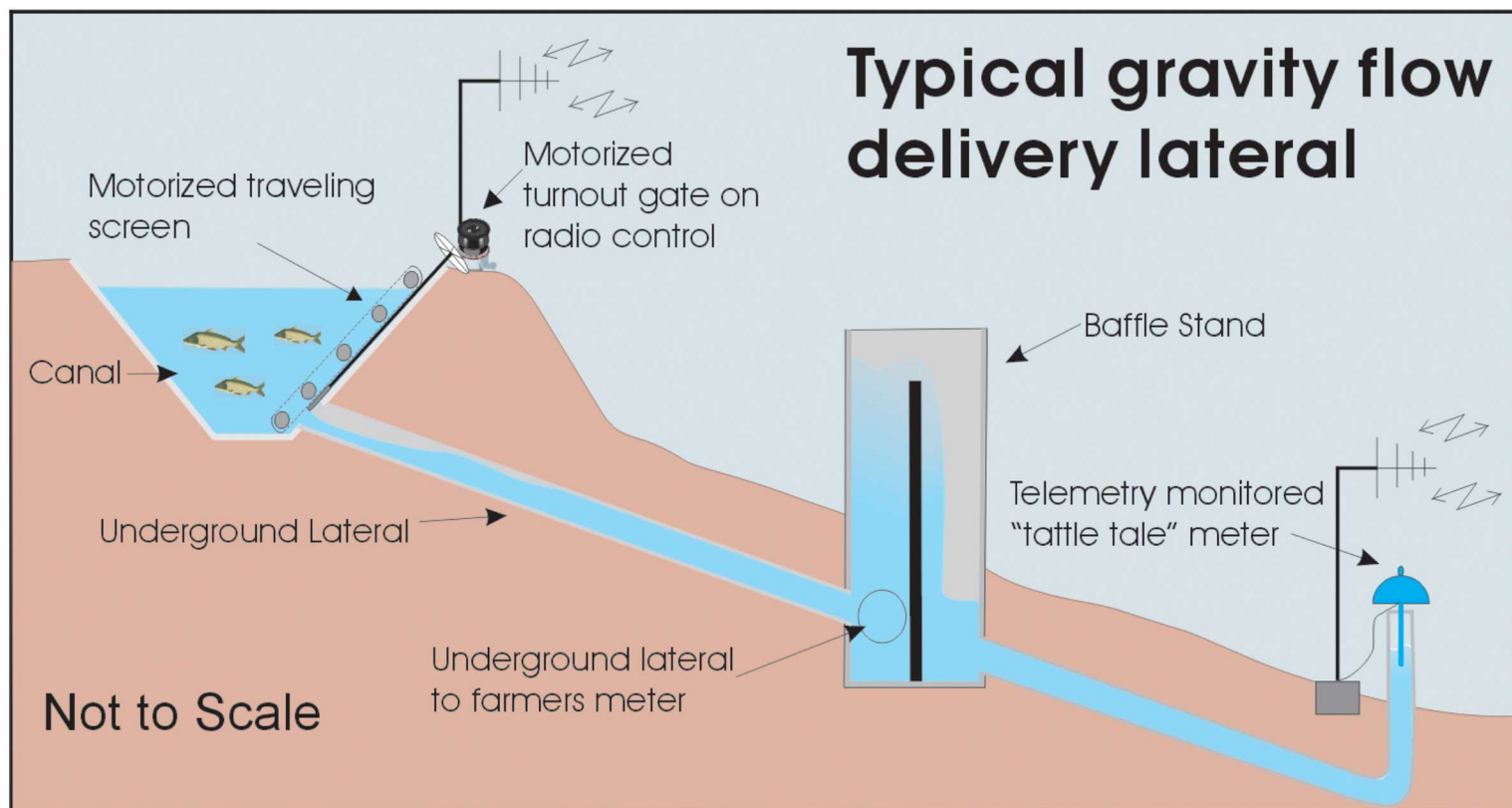
More than 932 million gallons of water that was once lost annually to seepage into the desert from the Coachella Canal now goes toward meeting the drinking water and irrigation needs of urban areas of coastal Southern California.

Completion of the two-year project was celebrated with a dedication ceremony in November. San Diego County Water Authority officials and a consortium of San Diego area Indian tribes were among the most enthusiastic participants, since they are receiving the rights to a portion of the conserved water as part of settling a long-term dispute over water rights. They receive the saved water as part of an accord reached during negotiations that led to the Quantification Settlement Agreement. That agreement in turn protects CVWD's annual entitlement to Colorado River water from possible encroachment by other agencies in the event of shortages brought about by drought or other circumstances.

A net of 26,000 acre-feet of Colorado River water is being conserved as a result of the lining project. That is enough water to meet the annual needs of about 120,000 people.

The \$100 million project was funded by the state government. It involved construction of a 34.8-mile concrete waterway to replace the still earthen portions of the original canal, which was completed in the late 1940s. The remainder of the 122-mile canal was either lined when built or in the 1980s to conserve water.

Environmental mitigation efforts associated with the canal lining project include relocating fish; building scores of watering "holes," fed by the canal for deer and other animals; and constructing dozens of miles of fencing to keep mammals from wandering into the canal in search of water.



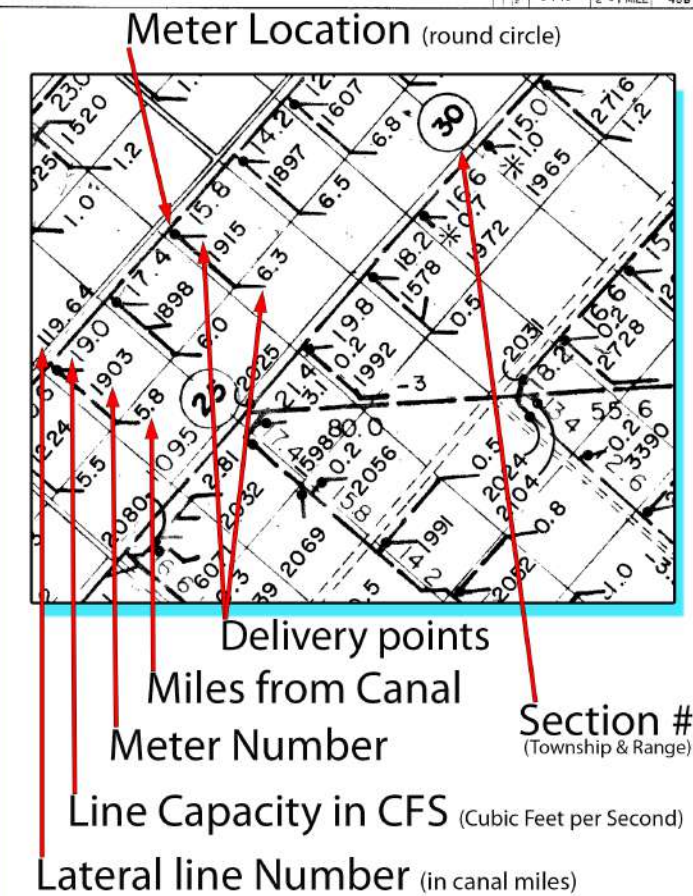
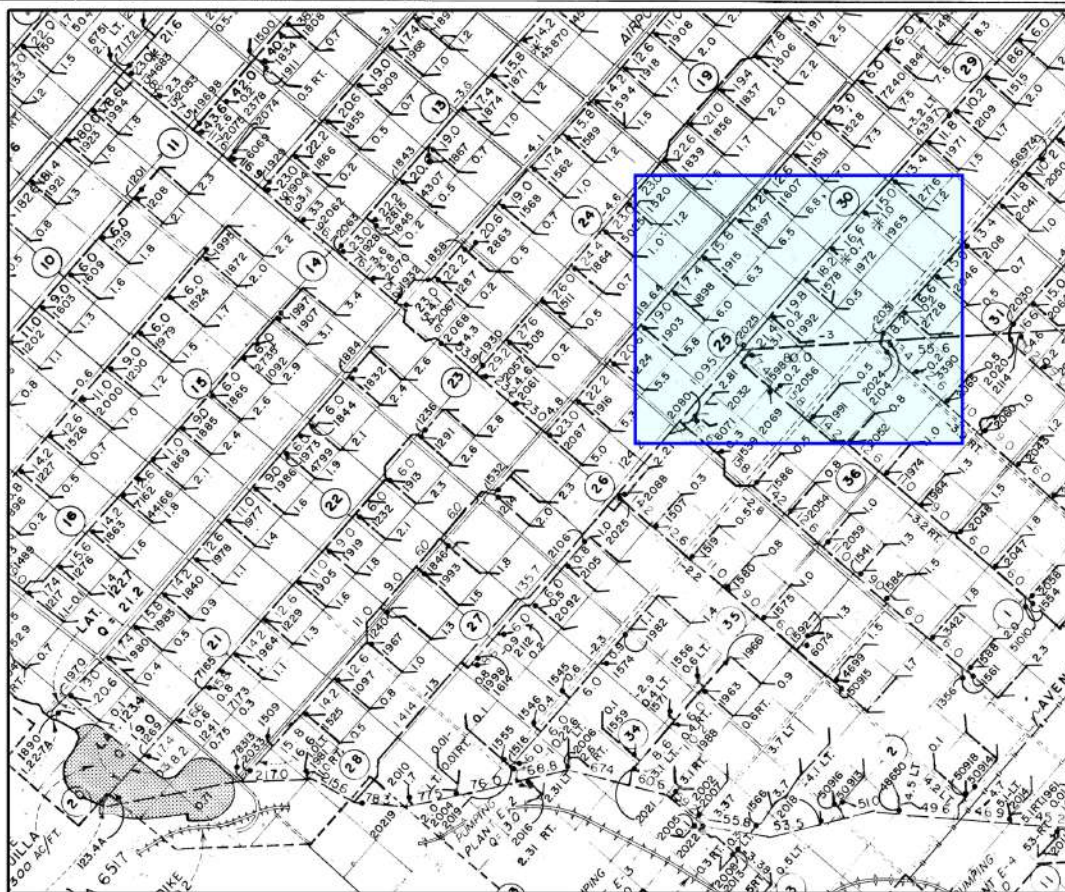
The newly lined section of canal was built parallel to the unlined version to avoid a disruption of service. The unlined section was taken out of use shortly after the lined version was completed.



Irrigation Distribution map

2012 By the Numbers for Canal Water

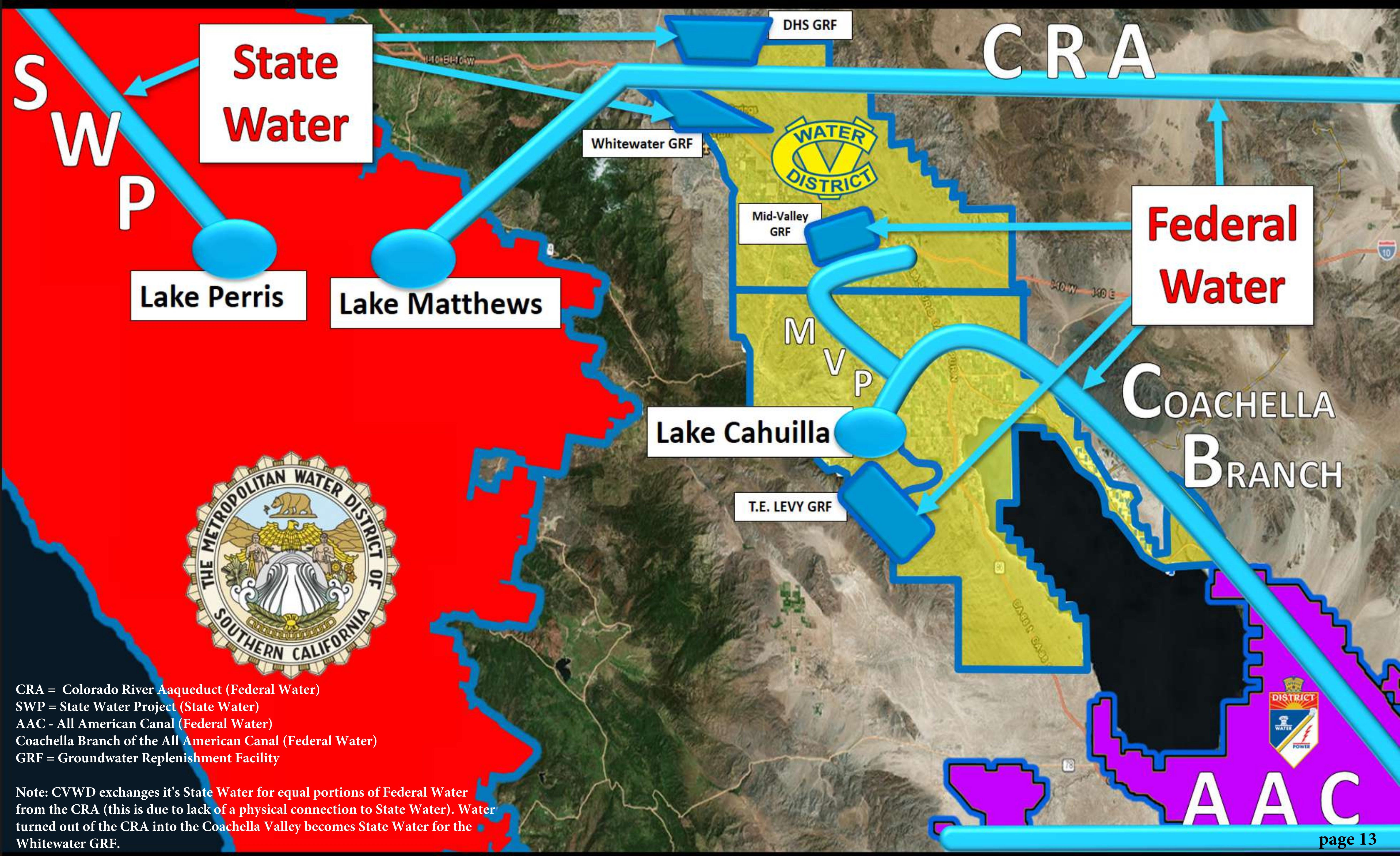
- Irrigable acres for service 66,227
- Active accounts 1,145
- Total water delivered 278,398 af
- Average daily demand 777 af
- Maximum daily demand 1,361 af
- System information
- Reservoirs 2
- Storage capacity 1,301 af
- Distribution system 485 miles
- Pumping plants 16
- Length of canal 123 miles





Agricultural Drainage

- Total on-farm drains 2,298 miles
- Acreage with farm drains 37,425
- Open ditch drains 21 miles
- Underground pipeline drains 166 miles



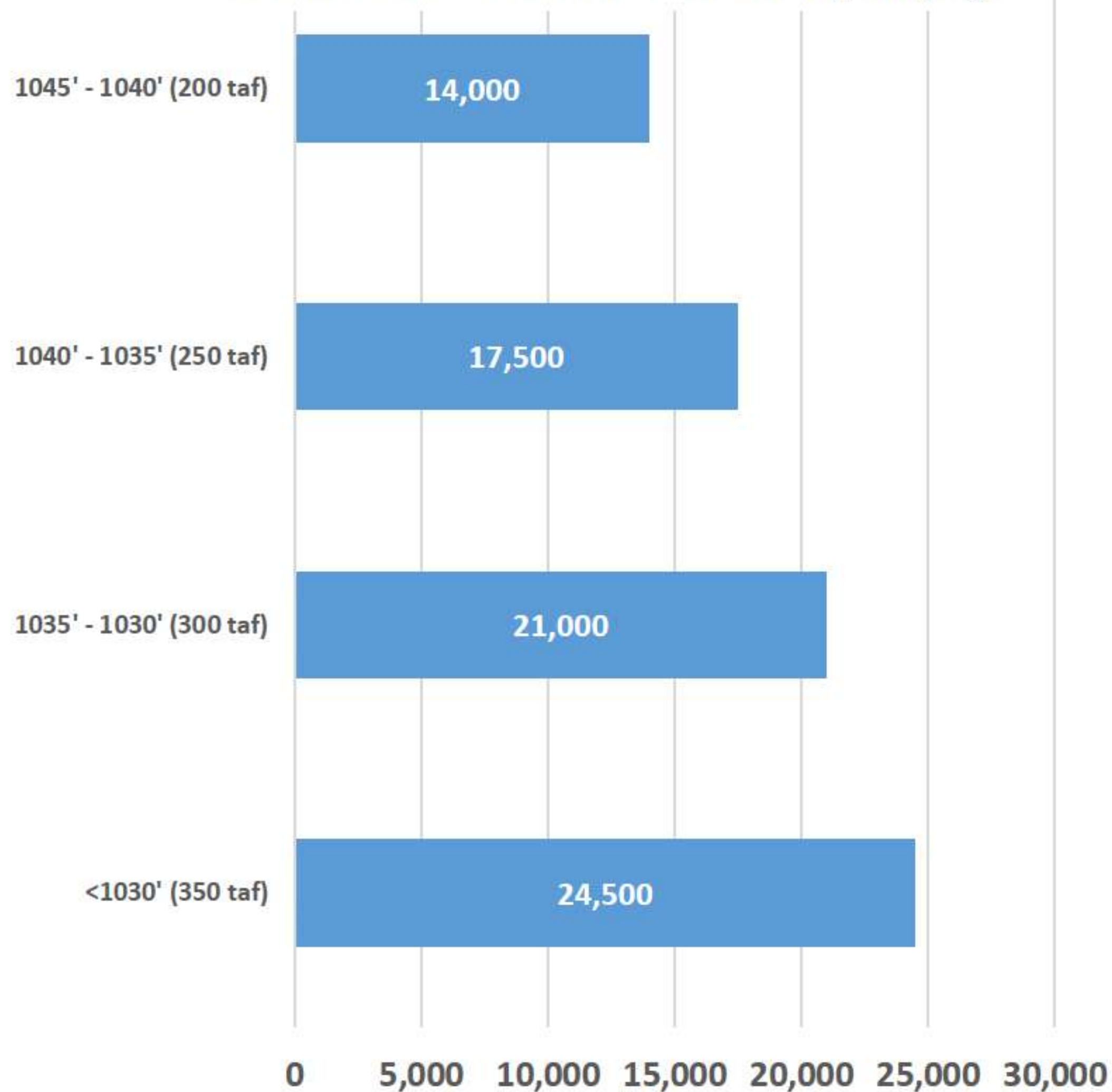
CRA = Colorado River Aqueduct (Federal Water)
 SWP = State Water Project (State Water)
 AAC - All American Canal (Federal Water)
 Coachella Branch of the All American Canal (Federal Water)
 GRF = Groundwater Replenishment Facility

Note: CVWD exchanges it's State Water for equal portions of Federal Water from the CRA (this is due to lack of a physical connection to State Water). Water turned out of the CRA into the Coachella Valley becomes State Water for the Whitewater GRF.

Drought Contingency Plan Implementation Agreement between MWD and CVWD

- ❑ CVWD's portion of contribution is 7%
- ❑ Contributions made through
 - ✓ *reducing call on 35 taf Exchange Agreement water (water is not banked or returned)*
 - ✓ *creating & converting EC ICS to DCP ICS water (water can be returned)*

CVWD's contributions (af/yr)



Dams of the Colorado River

The Colorado River, source of irrigation water for most agriculture in Coachella Valley, is described as the most regulated river in the world. It got this reputation, in part, because of all the dams it has, which help with flood control, creating energy and diverting water to farms, homes and businesses. Best known of the dams is HOOVER DAM, below, among the most recognizable structures in the United States. The dam has 3.25 million cubic yards of concrete, is 726 feet high and 1,244 feet wide. Hoover Dam took five years to build and was completed in 1936.



DAVIS DAM, above, is 67 miles downstream from Hoover Dam, 88 miles upstream from Parker Dam. The Mexican Treaty of 1944 required the United States to build the dam for regulation of water delivered south of the border.



PALO VERDE DIVERSION DAM, right, serves Palo Verde Irrigation District. It was built during World War II, replacing a rock weir.



IMPERIAL DAM, above, raises the Colorado River 25 feet and diverts water into the All-American and Gila Gravity Main canals. Much of the sediment that could clog the canals is removed here at the desilting works near Yuma.



LAGUNA DAM, left, originally was used to divert water to the Yuma Project. It now serves as a regulatory dam, helping to protect Imperial Dam.



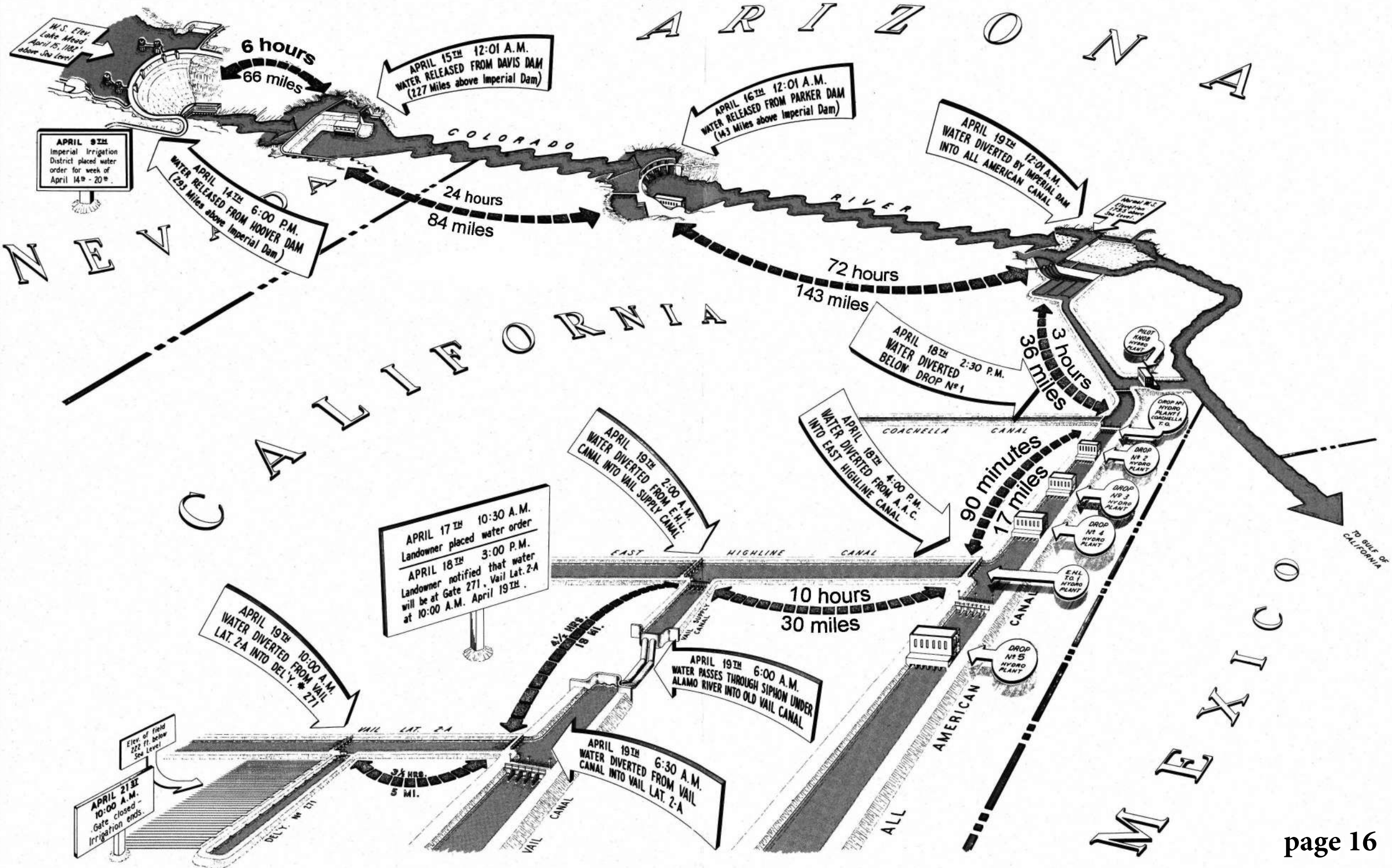
PARKER DAM, left, is the “deepest dam in the world.” Its reservoir, Lake Havasu, is the dam’s reservoir and from where Metropolitan Water District draws its entitlement to Colorado River water.

SENATOR WASH DAM, right, and its reservoir are used to improve water delivery scheduling. Colorado River water released from Hoover Dam but not immediately needed is stored here until it is needed, then released.



IMPERIAL IRRIGATION DISTRICT WATER TRANSPORTATION HOOVER DAM TO USER

(Times are estimated averages)





Coachella Valley Water District (CVWD) and Desert Water Agency (DWA) became State Water Contractors to supplement the natural groundwater replenishment from snow melt and rainfall with imported water. Since the imported supply first arrived in 1973, more than 2.8 million acre-feet of water has been replenished at the facility. Combined, CVWD and DWA have the third largest entitlement to State Water Project water at 194,100 acre-feet annually. There is no physical connection from state facilities to the Coachella Valley, so the two agencies trade with Metropolitan Water District of Southern California (MWD) for an equal amount of Colorado River water released from the Colorado Aqueduct. MWD also can “bank” water in the aquifer during wet years and get back an equivalent amount during dry seasons.



Replenishment at the Mission Creek Groundwater Replenishment Facility began in 2002 as a joint effort between CVWD and DWA. The agencies divert a portion of their State Water Project entitlement to the facility near Desert Hot Springs. To date, more than 143,438 acre-feet of water has been replenished at the site. Although the aquifer exists beneath the entire valley, subbasins restrict distribution of replenishment water so facilities are built where they will do the most good in reversing aquifer overdraft and ensuring reliable water supplies are available throughout the region. Groundwater replenishment is an important tool in reducing overdraft of the aquifer and a key component to CVWD and DWA’s long-term groundwater management plans.



In 2009, CVWD’s Thomas E. Levy Groundwater Replenishment Facility in La Quinta became fully operational with the ability to replenish up to 40,000 acre-feet of water annually. The facility started as a pilot project in 1997. To date, more than 147,000 acre-feet of water has been replenished at this facility. Groundwater levels at many nearby wells have risen dramatically, showing the importance of the groundwater replenishment program in reducing overdraft of the aquifer. Replenishment is among many methods used to protect and preserve local groundwater supplies, including conservation and the use of Colorado River water or recycled water for irrigation, instead of groundwater.



On February 20, 2019 CVWD celebrated the completion of Phase 1 of the Palm Desert Groundwater Replenishment Facility. When fully completed it will percolate an additional 25,000 acre feet of imported Colorado River water into the Mid-Valley aquifer each year.

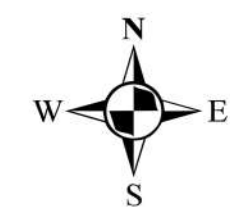
Groundwater Replenishment Throughout the Coachella Valley



Irrigation Water Sources for Golf Courses Update: Jan 11, 2018

Legend

- CVWD Boundary
- ID #1 Boundary
- RAC Boundaries**
- East WW River Subbasin Area of Benefit
- West WW River Subbasin Area of Benefit
- City Boundaries
- 54" Mid Valley Pipeline
- 6" Canal Water
- RECYCLED WATER (HIGH PRESSURE)
- RECYCLED WATER (LOW PRESSURE)
- Groundwater Customers
- Future NPW Customers
- Future Canal Water Customer
- Existing Canal Water Customer
- Letter of Intent Customer
- Existing RW Customers
- Existing MVP Customers
- School



ID = Improvement District
RAC = Replenishment Assessment Charge (the cost of importing water for groundwater replenishment is passed along to groundwater pumpers who use more that 25 Acre Feet per year)
NPW = Non-Potable Water
RW = Recycled Water
MVP = Mid-Valley Pipeline (The MVP is a 6.7 mile long, 54" diameter pipeline that conveys Colorado River water from the Coachella Canal to Mid-Valley Golf Courses. This reduces demand for groundwater.)



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