



# FIXING WHAT LIES BENEATH

## Dewatering the Friant-Kern Canal for Major Maintenance

Friant Water Authority (FWA) performs many critical functions on behalf of the Central Valley Project (CVP) Friant Division contractors, including operating, maintaining, and repairing the 152-mile Friant-Kern Canal. Our crews do this work day in and out, but with the canal carrying water year-round, many maintenance challenges can lurk beneath the water line hidden from the naked eye or difficult to access.

About every three years, FWA undertakes a major effort to completely empty the canal of water and address maintenance needs below the water line along the canal's entire 152 miles – activities such as repairing damaged concrete liners, fixing or replacing equipment, inspecting bridges and other structures, and removing aquatic weeds. This “dewatering” lasts approximately three months, from November through January, during which our crews work with districts and cities along the canal, the California Department of Transportation (Caltrans), and counties to minimize water supply and transportation impacts.

### DEWATERING TIMELINE AND STEPS



#### 24 - 12 MONTHS BEFORE

Crews inventory projects to complete during dewatering and develop a budget.



#### 10 MONTHS BEFORE

FWA releases dewatering schedule and begins coordinating with Friant districts monthly to plan for water operations during dewatering.



#### NOVEMBER

FWA stops release of water into the canal from Millerton Lake and the canal empties as districts receive its remaining water; in some unlined portions, crews pump out water. Beginning in the northernmost portion of the canal, crews progress southward.



#### JANUARY

Dewatering is complete and water is released back into the canal to resume service.



## A 90-DAY MARATHON

During the triannual dewatering of the canal, a tremendous amount of work must be accomplished within a tight 90-day window.

During this time, crews make major infrastructure repairs and upgrades, along with many other important maintenance tasks that are vital to ensuring reliable water service well into the future.

At 152-miles long, crews must cover an average of 1.7 miles per day along the canal, in order to meet the deadline.

### 1 DEBRIS REMOVAL

- Collecting and removing trash, organic matter, and other debris that has accumulated under the waterline. This has included cars, a boat, tires, and garbage.
- Dredging and hauling away sediment that has collected in the bottom of the canal from water flowing out of Millerton Lake.

### 2 BRIDGE INSPECTIONS AND REPAIRS

- Working with CalTrans to check each abutment holding 300 bridges in place across the canal for structural integrity.
- Helping Caltrans repair or replace abutments that are damaged.

### 3 LINER INSPECTION AND REPAIRS

- Identifying breaches, cracks, buckled concrete along the 127 lined miles of the canal.
- Repairing damaged liners with fast-set concrete or an aqua flex sealer along the joints.

### 4 RADIAL GATE COATING

- Inspecting 15 radial gate structures and 8 wasteway structures to determine if water is causing rust or other problems.
- Sandblasting and recoating the radial gates where rust is identified to prevent water damage.

### 5 AQUATIC WEED (WESTERN MILFOIL) ERADICATION

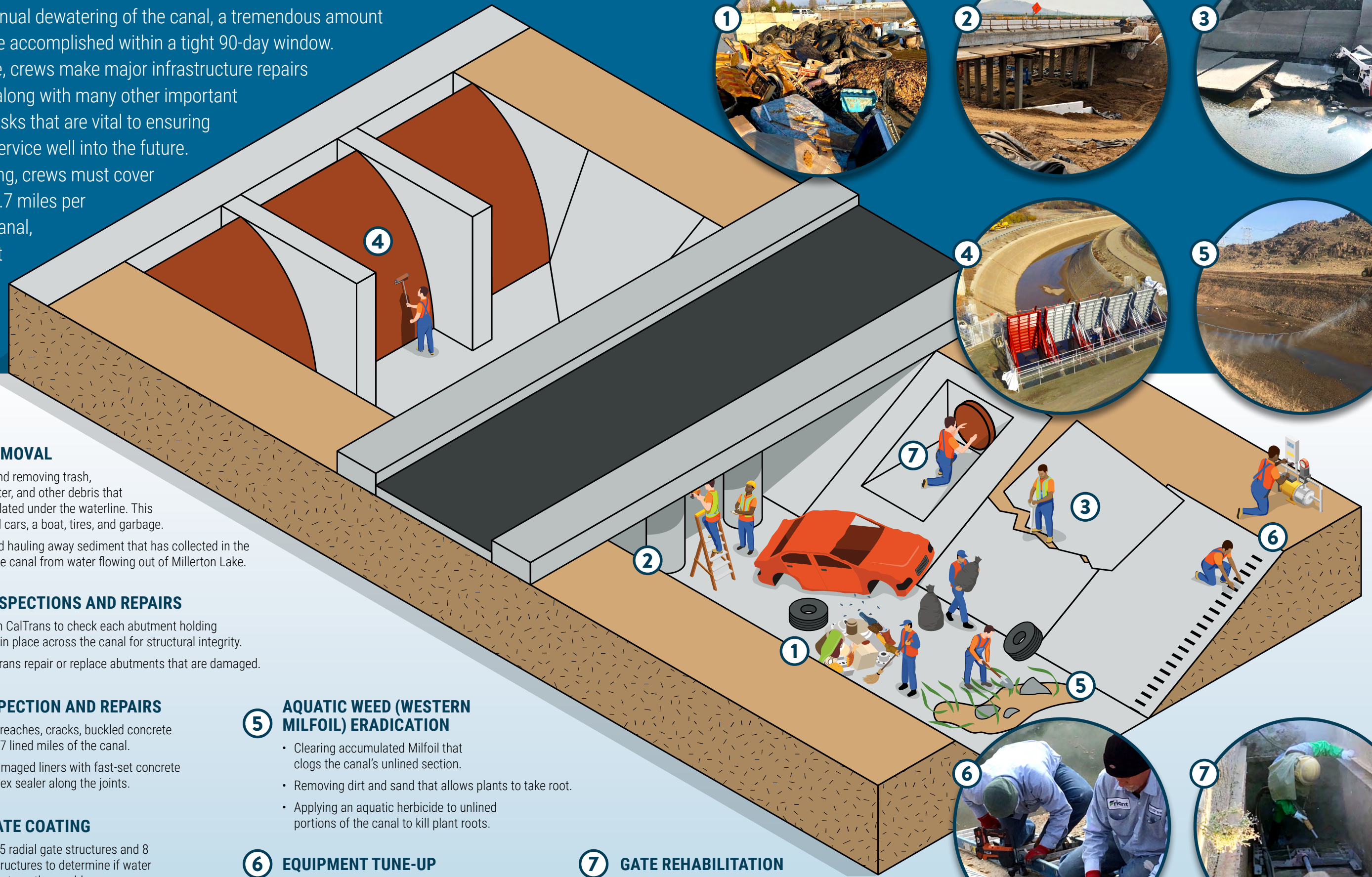
- Clearing accumulated Milfoil that clogs the canal's unlined section.
- Removing dirt and sand that allows plants to take root.
- Applying an aquatic herbicide to unlined portions of the canal to kill plant roots.

### 6 EQUIPMENT TUNE-UP

- Cleaning out, repairing, or calibrating gates, turnouts, check structures, and flow gauges to ensure accurate measurement and delivery of water.

### 7 GATE REHABILITATION

- Inspecting, repairing, or replacing slide gates or flap gates.





# IN THE KNOW

## HOW DO WE MAKE SURE THAT CANAL OPERATIONS AREN'T SIGNIFICANTLY AFFECTED DURING DEWATERING AND HOW DO PEOPLE GET WATER WHEN THE CANAL IS DEWATERED?

A great deal of coordination and advance notice is provided, both with farmers and with the municipal users along the canal. As an example, coordination of these critical activities allows for the City of Orange Cove to install a small coffer dam to pool water for later use and fill its storage ponds, and for Lindsay-Strathmore Irrigation District to install small coffer dams to hold water for potable uses by communities within the district's boundaries.



*Crews install a temporary coffer dam to store water for use by communities during dewatering.*

## DOES FWA PERFORM THE SAME SORT OF MAINTENANCE ACTIVITIES ON THE CANAL EACH TIME IT IS DEWATERED?

There are standard projects that take place every time the canal is dewatered, like repairing concrete panels, and the refurbishing of radial gates. There are also specialty projects, like this year's removal of the invasive Western Milfoil within the unlined section of the canal.

In addition to construction and maintenance projects, FWA's engineering department takes advantage of the empty canal to conduct inspections, review and update documentation, and begin the planning of future projects.

## WHAT ARE SOME UNUSUAL OR ODD THINGS THAT FWA HAS DISCOVERED IN THE CANAL WHILE DEWATERED?

Over the past few dewatering projects, FWA staff has removed five stolen cars, sunken boats, car parts, and other miscellaneous items. One year, a cow decided to take a stroll to the bottom of an empty section of canal. Stranded, the cow needed FWA staff and local animal control authorities to help properly care for the cow while we mobilized to lift it out with one of our cranes. Not surprisingly, the FWA team has also removed a stunning amount of trash: twenty-five dump truckloads of trash was taken out of the canal this year alone.

## WHAT HAPPENS IF WEATHER INTERFERES WITH DEWATERING WORK?

If heavy rains occur, we continue to work through the weather as long as conditions remain safe. When the reservoirs begin to fill during flood conditions, the Bureau of Reclamation gives FWA about a week to wrap up, so that we can return the canal to service in a safe and reliable manner and free up flood space at Millerton Lake.

## 2020-2021 DEWATERING ACCOMPLISHMENTS

- Overhauled and replaced 4 sump pumps.
- Painted numbers on our shark fin gauges for all 42 check gates.
- Refurbished and replaced 28 staff gauges.
- Repaired and upgraded 24 propeller meters throughout the system.
- Cleaned 61 venturis from top to bottom.
- Calibrated all gate sensors and set gate limit switches at every check structure and wasteway.
- Calibrated and set limits for all actuators at the open ditch turnouts.
- Replaced all head test valves in every venturi well.
- Flushed out and cleaned all 28 upstream and downstream stilling wells in every blockhouse.
- Mounted 4" perforated pipes at all the check structures for upcoming water quality sensors to be installed inside the pipes.
- Replaced 4 actuators at Arvin Edison.
- Installed railing for a flow meter at the measuring bridge.
- Upgraded 5 blockhouses with new grating and tables.
- Installed 4 doppler meters in the southern section of the canal.
- Sandblasted and coated 37 slide gates and 81 flap gates.