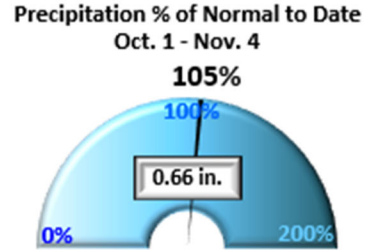
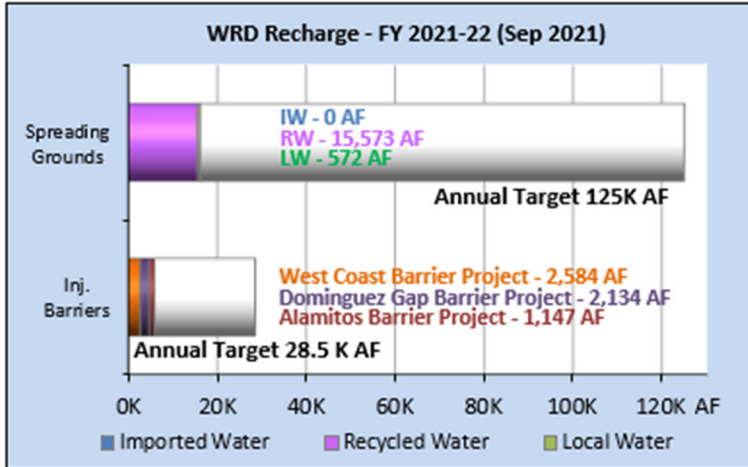
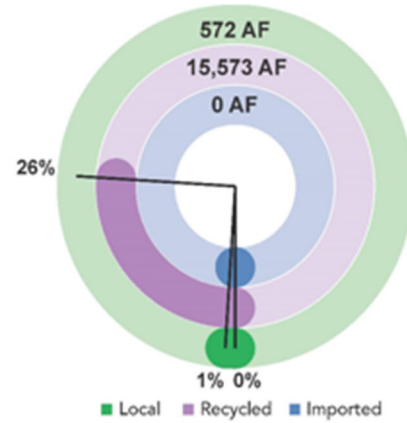


# GROUNDWATER BASIN UPDATE FOR NOVEMBER 2021

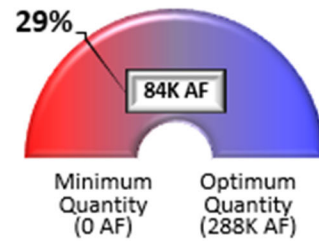
## GROUNDWATER BASINS AT A GLANCE\*



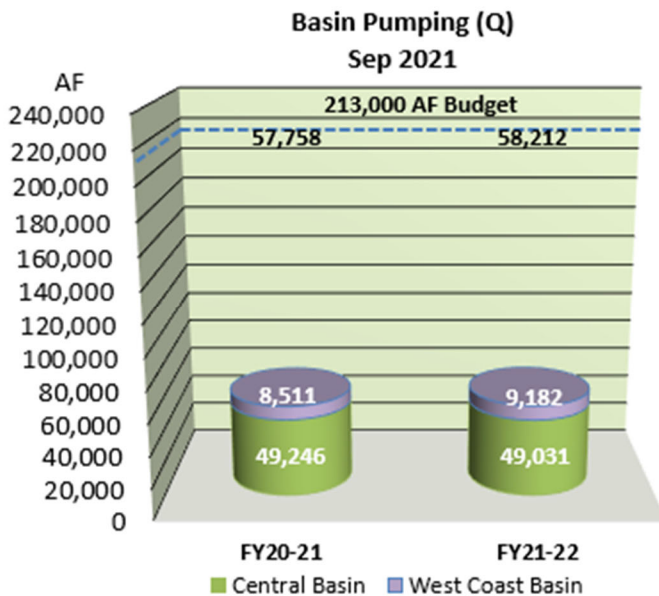
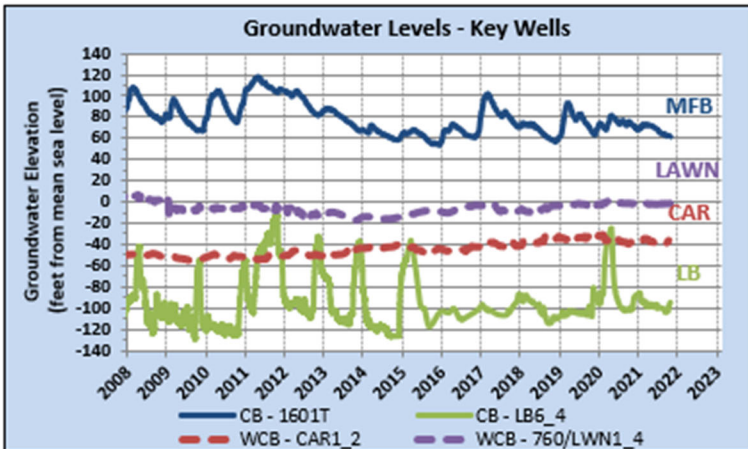
Spreading Grounds Recharge  
Fiscal Year to Date



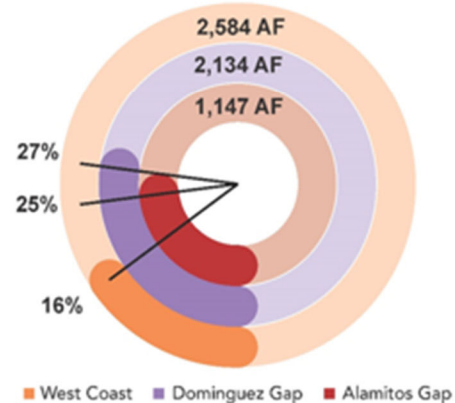
GW Basin Operating Range



Minimum Quantity (0 AF)      Optimum Quantity (288K AF)



Seawater Barrier Recharge  
Fiscal Year to Date



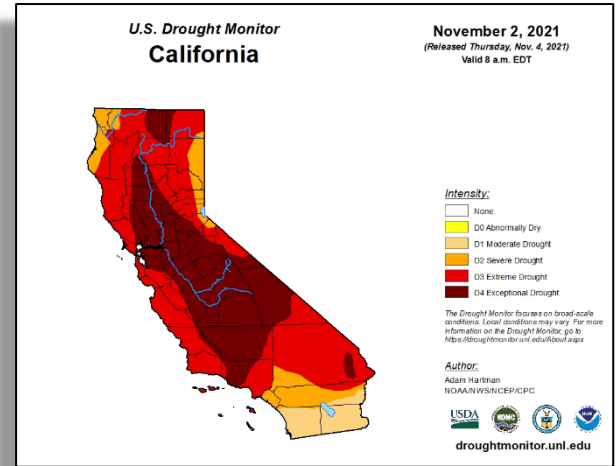
\* - Preliminary numbers, subject to change.

## SUMMARY

Staff monitors groundwater conditions in the District's service area throughout the year. A summary of the latest information is presented below.

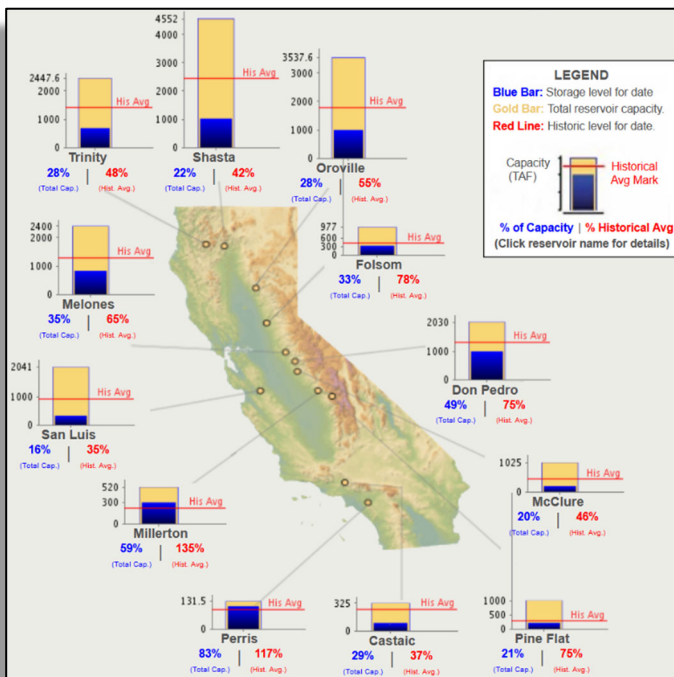
### Precipitation (Oct. 1, 2021 – Nov. 4, 2021)

The WRD precipitation index reports that for the 2021-22 Water Year, there has been slightly above average rainfall (0.66 inches) through November 4, 2021. The normal rainfall for this time period is 0.63 inches, so the District is 105% of normal. As of November 2, 2021, the U.S. Drought Monitor is reporting 100% of the State is under moderate, 94% under severe, 83% under extreme (-5%), and 39% exceptional (-7%) drought conditions.



### Reservoirs (as of November 4, 2021)

For the 16 reservoirs reported monthly to the committee, water levels have increased in 6 of 16 reservoirs. The largest increase occurred at Lake Oroville (0.2 million acre feet, MAF) and the smallest increases occurred at Lakes Castaic and Silverwood (<0.00 MAF). The largest decrease (-0.12 MAF) occurred at Lake Mead. The smallest decrease (<0.0 MAF) occurred at Lakes Trinity, McClure, Millerton, and Perris and Don Pedro Reservoir.



#### MWD Reservoirs (SWP) Storage in Million Acre Feet

Reservoir	Capacity	Storage	% Full	Change
Trinity Lake	2.45	0.68	28%	0.00
Lake Shasta	4.55	1.02	22%	-0.03
Lake Oroville	3.54	0.99	28%	0.20
Folsom Lake	0.98	0.32	33%	0.10
New Melones L.	2.40	0.83	35%	-0.01
Don Pedro Res	2.03	1.00	49%	0.00
Lake McClure	1.02	0.20	20%	0.00
San Luis Res	2.04	0.33	16%	0.09
Millerton Lake	0.52	0.30	59%	0.00
Pine Flat	1.00	0.21	21%	0.01
Castaic Lake	0.33	0.09	29%	0.00
Lake Perris	0.13	0.11	83%	0.00
L. Silverwood	0.08	0.07	88%	0.00

#### MWD Reservoirs (CRA) Storage in Million Acre Feet

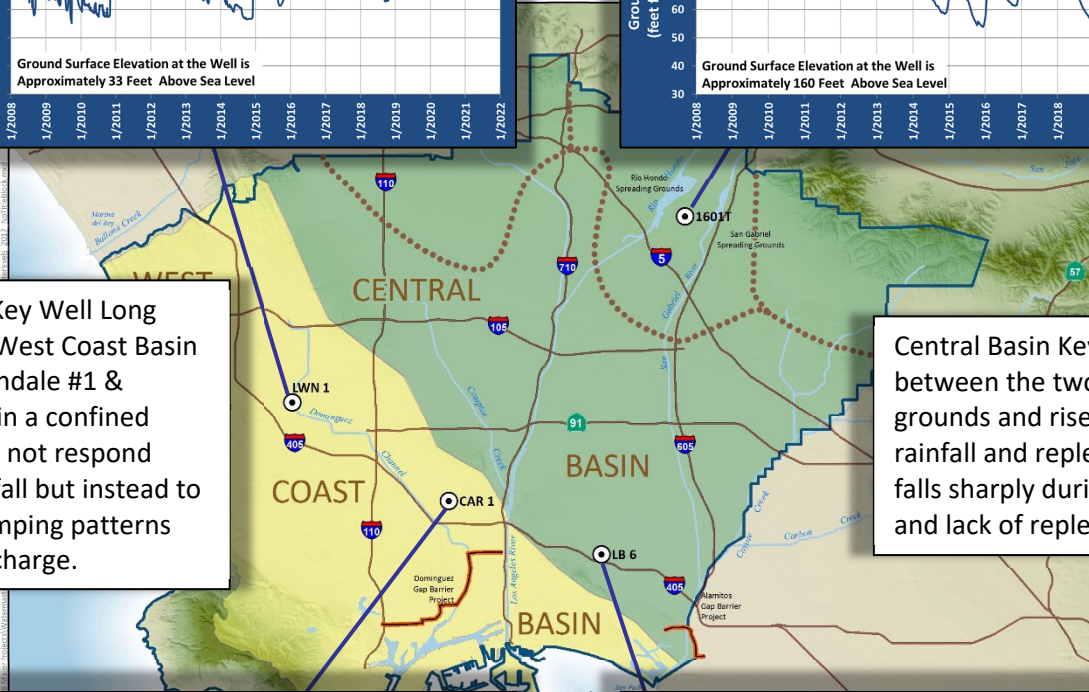
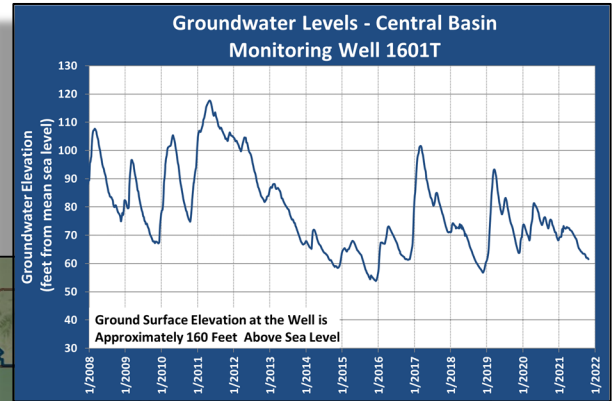
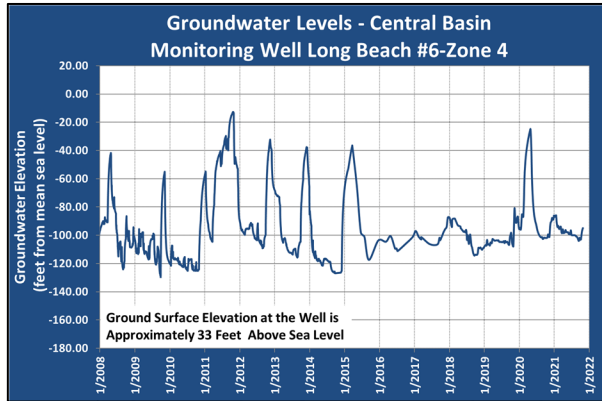
Reservoir	Capacity	Storage	% Full	Change
Powell	24.32	7.17	29%	-0.09
Mead	26.12	8.90	34%	-0.12
DVL	0.81	0.61	75%	-0.01

Black Text - Decrease or no change in storage since the last report.  
Green Text - Increase in storage since the last report.

These 16 reservoirs are at 32% capacity (22.84 MAF) which is up 0.14 MAF from the prior month (0.36 MAF State Water Project [SWP] and -0.21 MAF Colorado River Aqueduct [CRA]).

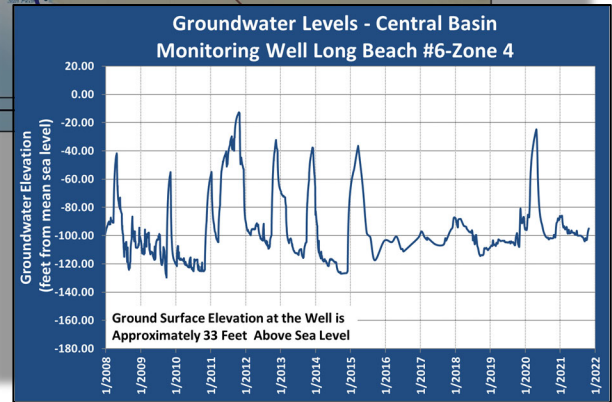
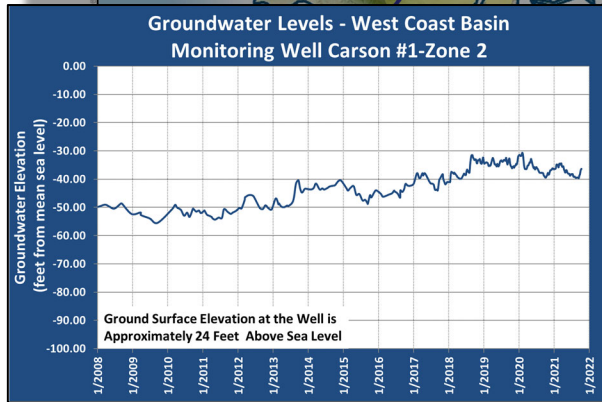
Groundwater Levels (through October 29, 2021)

Groundwater levels in key monitoring wells are shown in the hydrographs below.



Central Basin Key Well Long Beach #6 and West Coast Basin Key Wells Lawndale #1 & Carson #1 are in a confined aquifer and do not respond readily to rainfall but instead to changes in pumping patterns and barrier recharge.

Central Basin Key Well 1601T is between the two spreading grounds and rises rapidly with rainfall and replenishment but falls sharply during dry spells and lack of replenishment.



**Groundwater Level Changes in Key Wells**

Well Name	Since Last Report	Since Same Time the Previous Year
Central Basin Key Well 1601T	Decreased 1.1 feet	Decreased 12.2 feet
Central Basin Key Well Long Beach #6 4	<b>Increased 8.2 feet</b>	<b>Increased 4.5 feet</b>
West Coast Basin Key Well Lawndale #1 4	<b>Increased 0.1 foot</b>	Decreased 0.1 foot
West Coast Basin Key Well Carson #1 2	Increased 2.1 feet	Increased 1.5 feet

**Bold** indicates a change in direction (decreasing or increasing) since the last report.

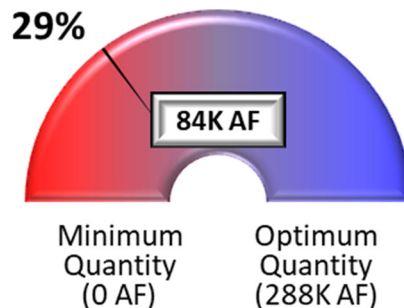
## Optimum and Minimum Groundwater Quantity

In response to a 2002 State audit of the District's activities, the Board of Directors adopted an Optimum and Minimum Quantity for groundwater in the District to define an appropriate operating range that would sustain adjudicated pumping rights, leave room for future storage projects, and identify a lower limit. The amounts are based on the accumulated overdraft concept, which the District tracks year by year based on changes in groundwater storage.

After an extensive review of over 70 years of water level fluctuations and discussions with the Board and pumping community, Water Year 1999/2000 was recognized as a representative year for the Optimum Quantity, which equated to an accumulated overdraft of approximately 612,000 acre feet. The Minimum Quantity was defined as an accumulated overdraft of 900,000 acre feet, which allowed an operating range from 0 acre feet (minimum) to 288,000 acre feet (optimum). The Board also adopted a policy to make-up the groundwater deficit should the accumulated overdraft fall too far below the Optimum Quantity.

The Accumulated Overdraft as of October 29, 2021, has been estimated at 816,112 acre feet (subject to change), which is 83,888 acre feet above the Minimum Quantity and 204,112 acre feet below the Optimum Quantity. The Basin is at 29% of Optimum Quantity which is 2% lower than what was reported last month (~4,000 AF lower).

### GW Basin Operating Range



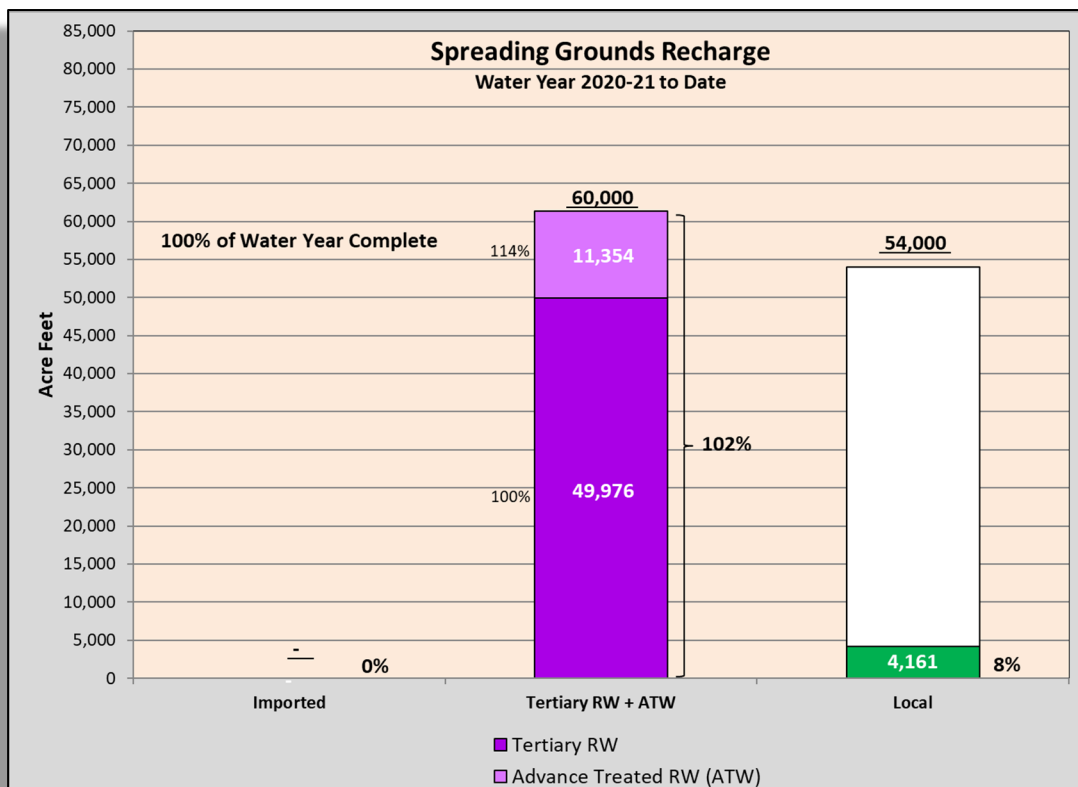
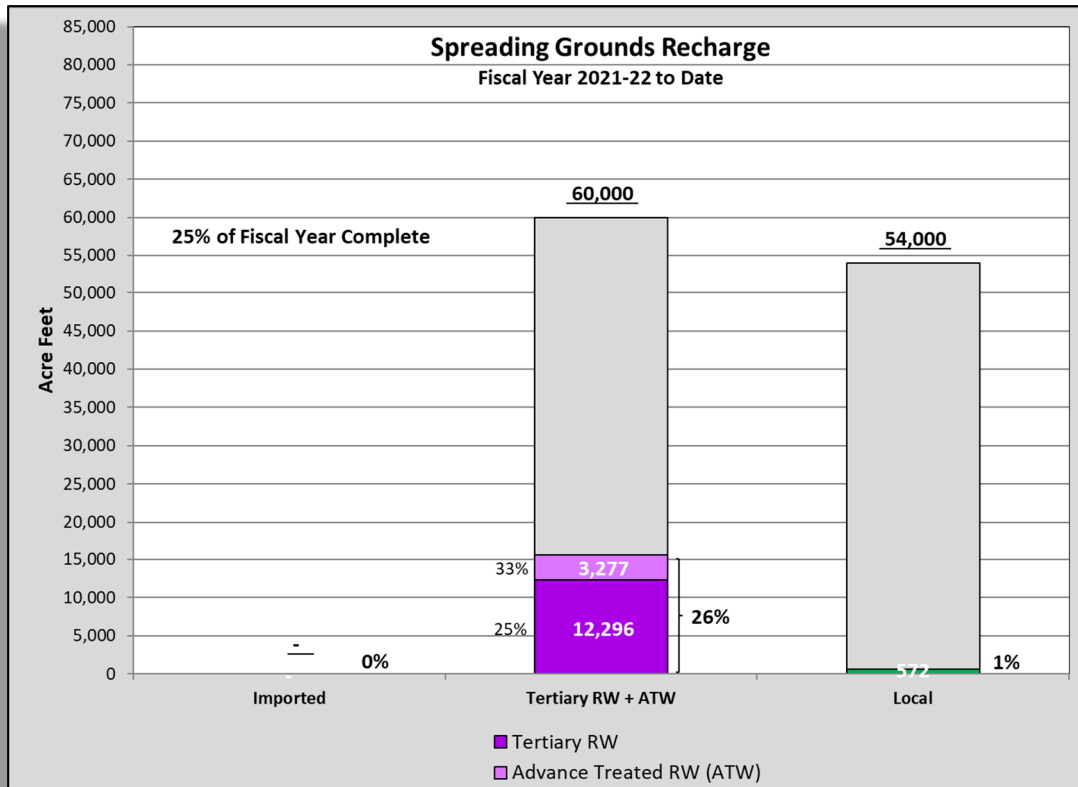
### Did you know?

Irrigation accounts for the largest use of groundwater in the United States. Some 57.2 billion gallons of groundwater are used daily for agricultural irrigation from 475,796 wells. In 1900, the U.S. used only 2.2 billion gallons of groundwater daily for irrigation from 17,000 wells.



Montebello Forebay Spreading Grounds (July - September 2021)

The following Charts shows the preliminary spreading grounds replenishment water for the current Fiscal Year (2021-22; 3 months) and Water Year (2020-21; 12 months):



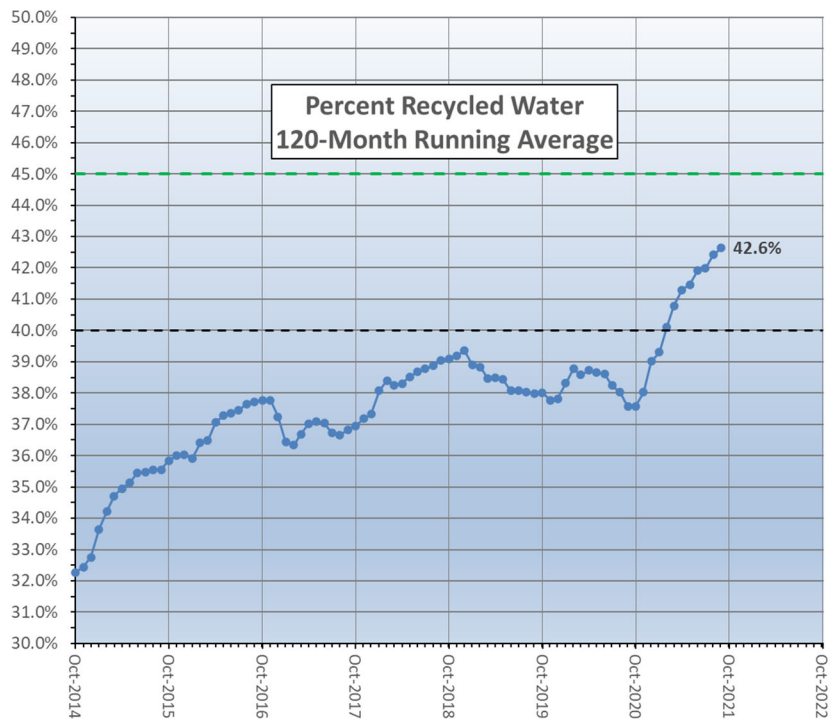
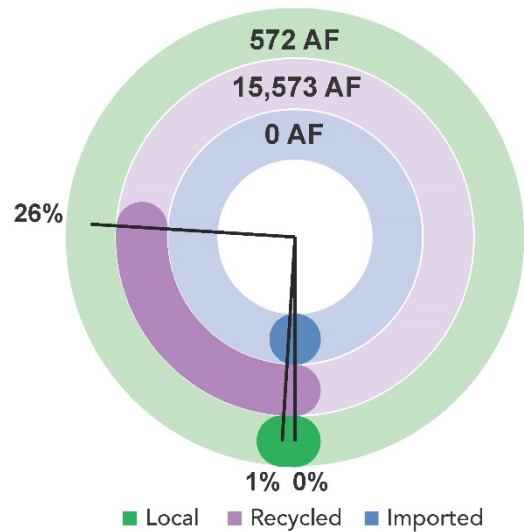
No imported water purchases are planned for Fiscal Year 2021-22.

Local water (stormwater plus dry weather urban runoff) is captured by the Los Angeles County Department of Public Works (LACDPW) at the spreading grounds for recharge. Local water amounts are determined as the sum of the total waters conserved at the spreading grounds less the imported and recycled water deliveries. For the 2021-22 Fiscal Year, approximately 572 acre feet of local water capture has been reported by the LACDPW.

Preliminary numbers for the 2021-22 Fiscal Year show that approximately 15,573 acre feet of recycled water has been recharged with 3,277 acre feet consisting of advanced treat water from the ARC AWTF and 12,296 acre feet of tertiary recycled water.

Presuming the advanced treated water as “Null Water”, the 120-month running average of the recycled water contribution in the Montebello Forebay is 42.6% and the regulatory maximum is 45%, with additional monitoring being required once 40% is reached. WRD and LACSD submitted the additional monitoring plan on May 26, 2021. Implementation of the plan will commence upon acceptance by the RWQCB.

### Spreading Grounds Recharge Fiscal Year to Date

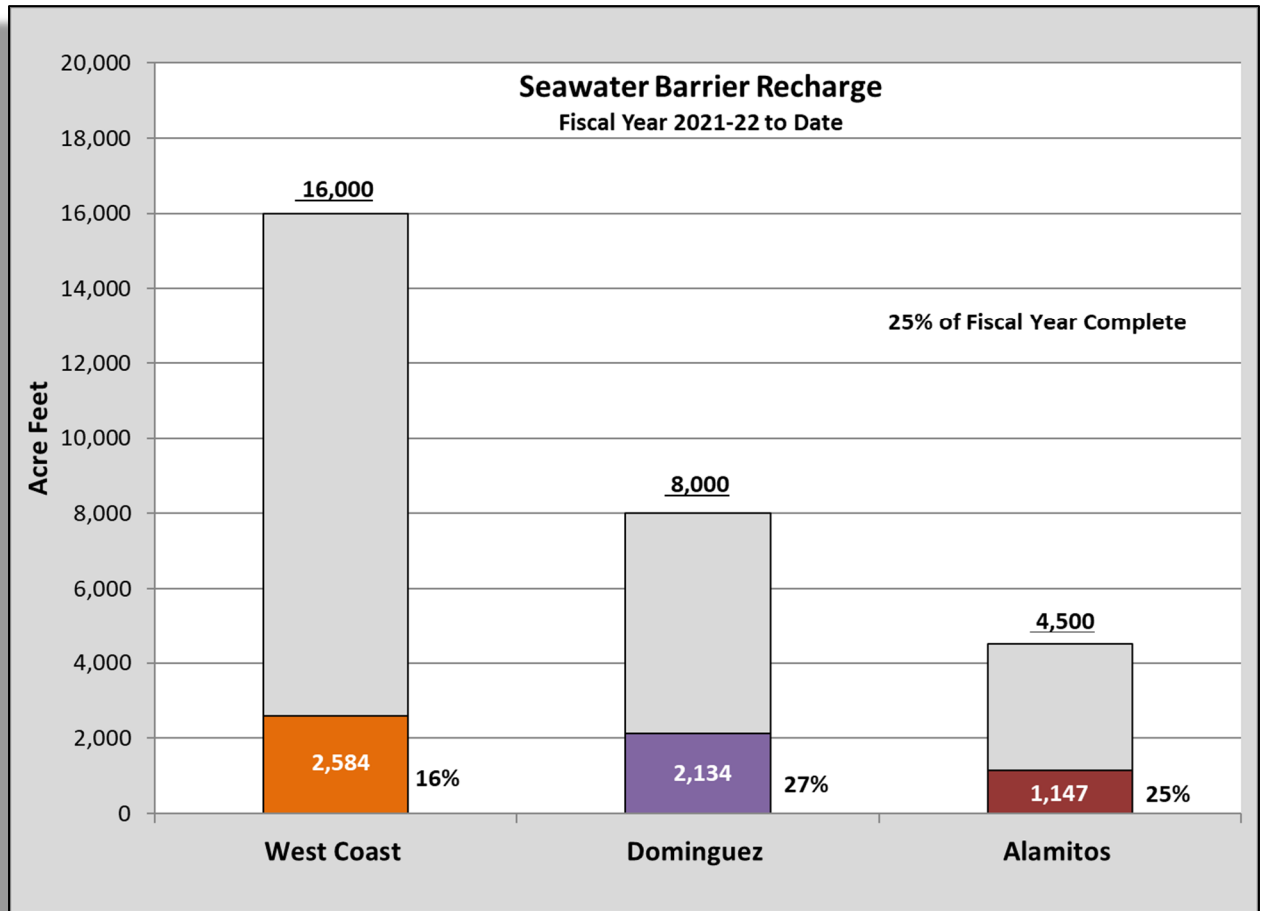


### Tertiary Recycle Water Permit Update

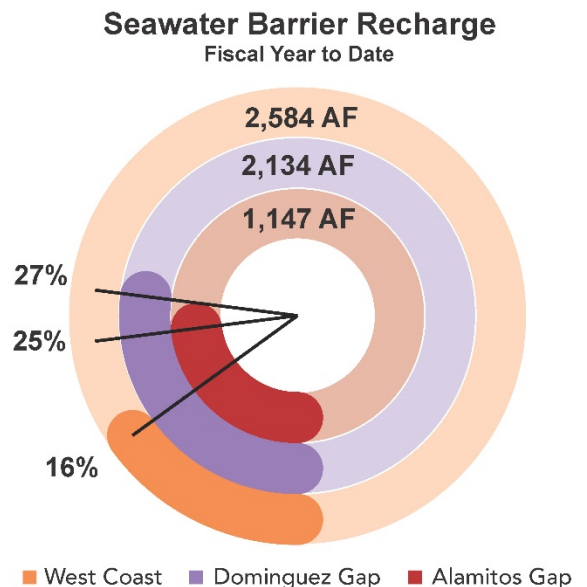
The permit is progressing with LACSD and WRD staff working with both LARWQCB and CA-DDW regulators to respond the questions and update pertinent sections of the new Title 22 Engineering Report. LACSD continues to work on two major studies needed for the new Title 22 Engineering Report – Biodegradable Dissolve Organic Carbon (BDOC) Study and Virus Logarithmic Reduction Value (LRV) Study.

Seawater Barrier Well Injection and Replenishment (July - September 2021)

The following Chart shows the barrier water injection:

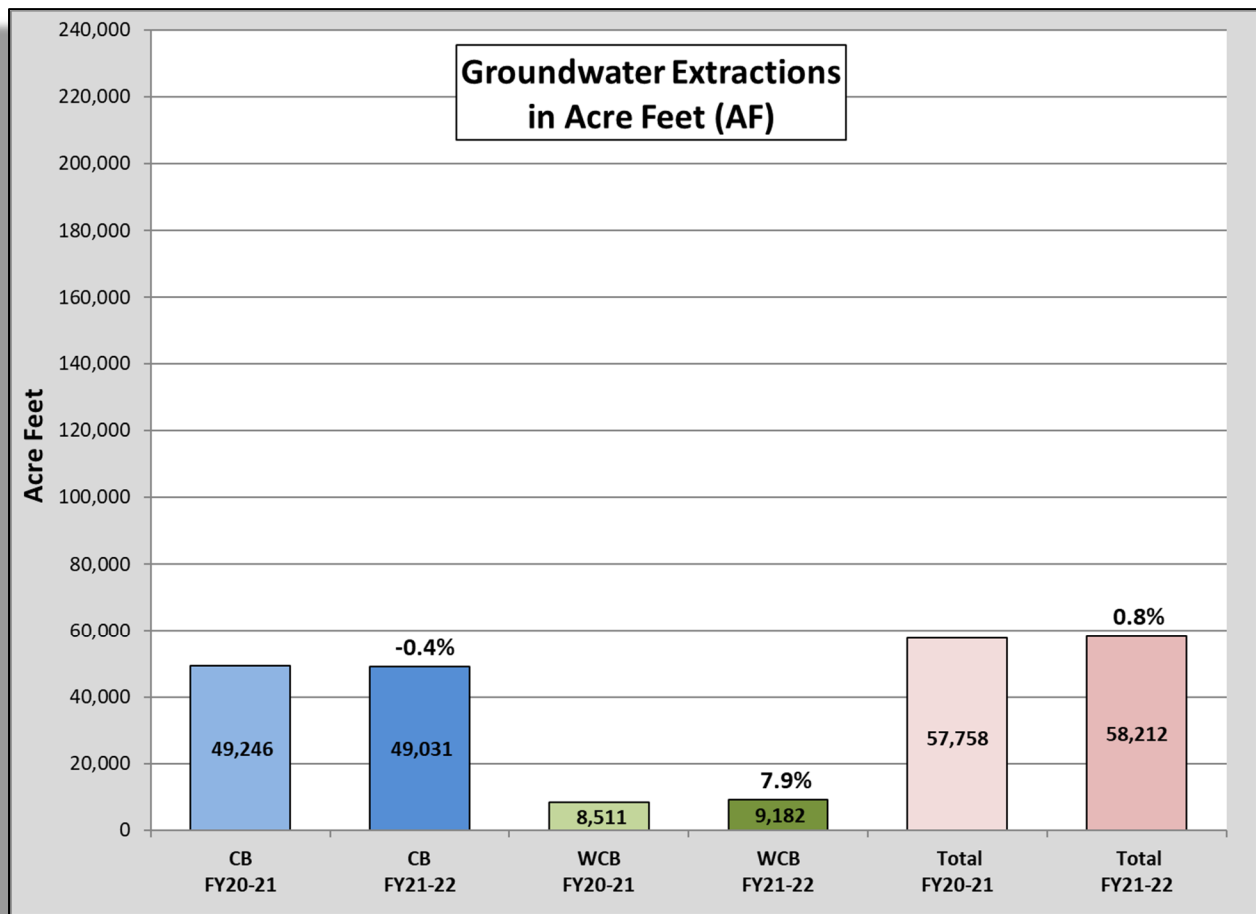


Preliminary numbers for the 2021-22 Fiscal Year show that the West Coast Barrier has used 2,584 acre feet of the total 16,000 acre feet planned for injection, 16% of total for the Fiscal Year. The Dominguez Gap Barrier used 2,134 acre feet of the total 8,000 acre feet planned for injection, 27% of the total for the Fiscal Year. The Alamitos Barrier, on the WRD side, used 1,147 acre feet of the total 4,500 acre feet planned for injection, 25% of the total for the Fiscal Year.



### Assessable Pumping (Fiscal Year 2021-2022)

Preliminary numbers for groundwater production in the District for the Fiscal Year 2021-22 (July-September 2021) indicate pumping in the Central Basin was down 215 acre feet from the same time of the previous fiscal year (-0.4%) and the West Coast Basin pumping was 671 acre feet higher than the previous fiscal year (+7.9%). The total pumping is 58,212 acre feet compared to 57,758 acre feet during the same time the previous year for an increase of 454 acre feet, or +0.8%. The current pumping data do not include six (6) Central Basin pumpers and two (2) West Coast Basin pumper who have not yet reported for an estimated 6 additional acre feet.

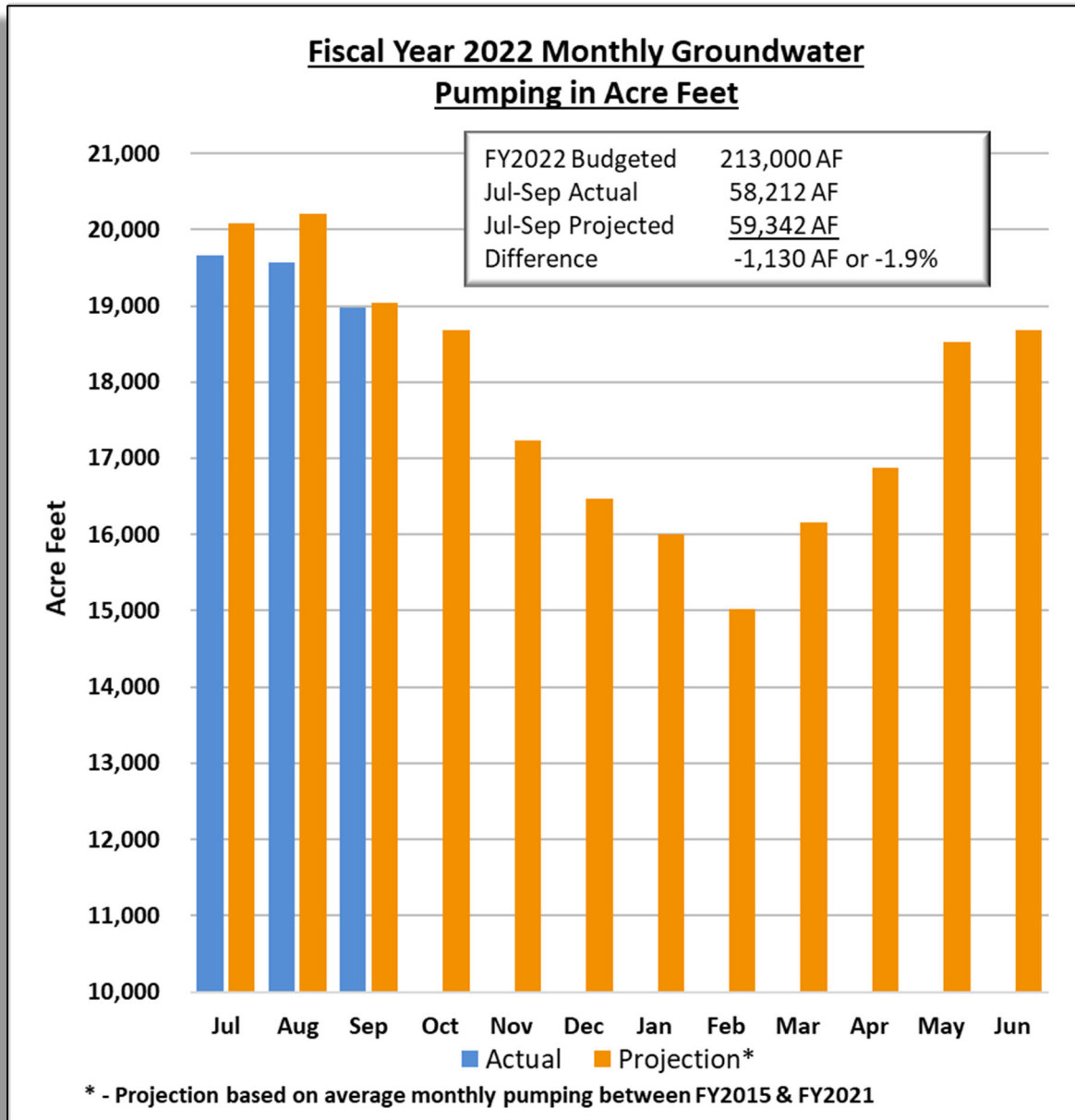


*Interesting...*

*... More than 15.9 million water wells for all purposes serve the United States.*



Preliminary numbers indicate 58,212 acre feet have been pumped this fiscal year and is 1.9% below the projected goal of 59,342 acre feet (or -1,130 acre feet). Monthly actual production versus the 7-year average monthly production projections (FY 2015 through 2021) are included in the chart below.



"Still waters run deep. Shallow waters run dry frequently."

- *Thomas County Cat, June 5, 1890, Pg 3*



For the Fiscal Year 2021-22 (July-Sep 2021), staff has tracked the production trends of the top five (5) producing pumpers and the bottom five (5) producing pumpers in each basin. These pumpers are identified in the following tables and are based on the change in volume (in acre feet) compared to the same time period for the previous Fiscal Year.

<b>Production Trends - Central Basin</b>				
<b>Top 5 Producing <u>by Volume</u> (AF)</b>	Jul-Sep 2020	Jul-Sep 2021	Difference	% Change
San Gabriel Valley Water Co.	3.71	691.75	688.04	99.46
Los Angeles, City - CB	3.46	381.13	377.67	99.09
Downey, City	3,911.23	4,169.35	258.12	6.19
Vernon, City	1,558.69	1,776.25	217.56	12.25
Santa Fe Springs, City	445.66	622.80	177.14	28.44
<b>Bottom 5 Producing <u>by Volume</u> (AF)</b>	Jul-Sep 2020-21	Jul-Sep 2021-22	Difference	% Change
Golden State Water Co.	5,833.15	5,134.27	-698.88	-13.61
Cal. Water Service Co. (East LA)	2,704.71	2,287.26	-417.45	-18.25
Paramount, City	1,089.30	715.75	-373.55	-52.19
Signal Hill, City	551.52	198.39	-353.13	-178.00
Cerritos, City	2,411.01	2,280.07	-130.94	-5.74

<b>Production Trends – West Coast Basin</b>				
<b>Top 5 Producing <u>by Volume</u> (AF)</b>	Jul-Sep 2020	Jul-Sep 2021	Difference	% Change
Phillips 66 Co. - Alpha 7093	1,245.58	1,617.25	371.67	22.98
Tesoro Refining & Marketing Co., LLC	2,103.94	2,429.86	325.92	13.41
Cal. Water Service Co. Alpha 7050	211.38	523.12	311.74	59.59
Golden State Water Co. - WB	1,014.63	1,219.96	205.33	16.83
Torrance Refining & Marketing Co.	53.18	233.16	179.98	77.19
<b>Bottom 5 Producing <u>by Volume</u> (AF)</b>	Jul-Sep 2020	Jul-Sep 2021	Difference	% Change
Torrance, City	1,551.24	436.81	-1114.43	-255.13
West Basin Brewer Desalter	324.40	0.00	-324.40	-100.00
Inglewood, City	812.60	588.18	-224.42	-38.15
Cal. Water Service Co. Dominguez	639.08	447.79	-191.29	-42.72
L.A. County Department of Parks & Rec	173.93	124.26	-49.67	-39.97

Water Replenishment District (WRD) publishes the Groundwater Basin Update (GWBU) monthly. All information contained herein is preliminary and is meant to be a snapshot the status of the basins at the time of publication and should not constitute an official WRD report. All the information presented in the GWBU utilizes the best available data at the time of publication. Data provided herein is a compilation of WRD data and publicly available information from several of our partners including, by not limited to, the Los Angeles County Department of Public Works - Stormwater Engineering Division, Metropolitan Water District of Southern California, California Department of Water Resources, US Bureau of Reclamation, University of Nebraska - Lincoln, and the US Department of Agriculture - Natural Resources Conservation Service. The GWBU is prepared by Senior Hydrogeologist, Everett Ferguson, who can be contacted directly with questions at [eferguson@wrd.org](mailto:eferguson@wrd.org).