



September 3, 2020

## **Advisory Committee for County GSAs**

### **Item 9: Allocation Discussion and Recommendation**

#### **Overview**

The Groundwater Sustainability Agencies (GSAs) managed by Madera County (“Madera County GSAs”) have identified several methods for reducing demand to achieve sustainability from 2020-2040:

- allocations
- allocations with a market
- land easements/resting/retirement
- a fee structure to pay for projects, including incentives for land easements/resting/retirement and recharge basins (dedicated as well as on-farm)<sup>1</sup>

In this report, a proposal for using allocations for irrigated acres of the Madera County GSAs is discussed.

#### **History of Allocation Discussions within Madera County GSAs**

As part of the development of the joint GSP in the Madera Subbasin and the GSP in the Chowchilla Subbasin, allocations have been discussed as an approach by the Madera County GSAs.

The timeline below discusses the public opportunities for feedback on the allocation concepts and options at the Madera County GSAs’ Advisory Committee (“Advisory Committee”) and the Madera County GSAs meetings.

- May 15 and 23, 2019 – Advisory Committee – Presentations and discussions about allocation approaches including allocations by crop type, equally across crop types, and with a pool are presented for feedback
- December 17, 2019 – Madera County GSAs adopt the Joint GSP in the Madera Subbasin, GSP in the Chowchilla Subbasin and Exchange Contractors GSP in the Delta-Mendota Subbasin
- July 9, 2020 – Advisory Committee - land use change presentation to Advisory Committee and staff recommendation of an allocation approach

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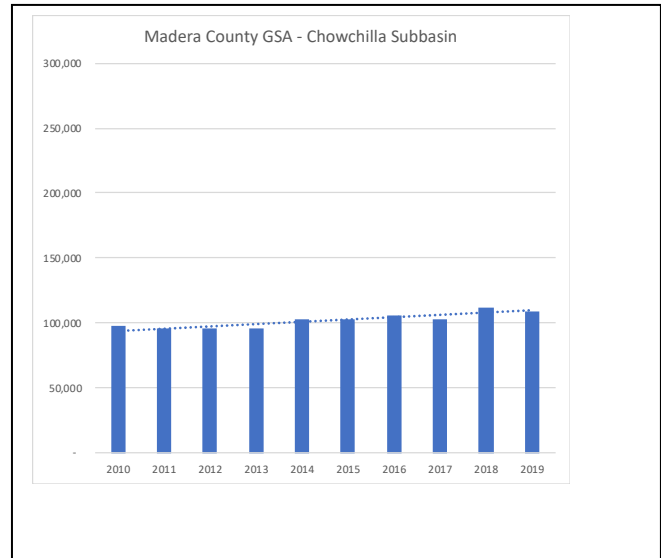
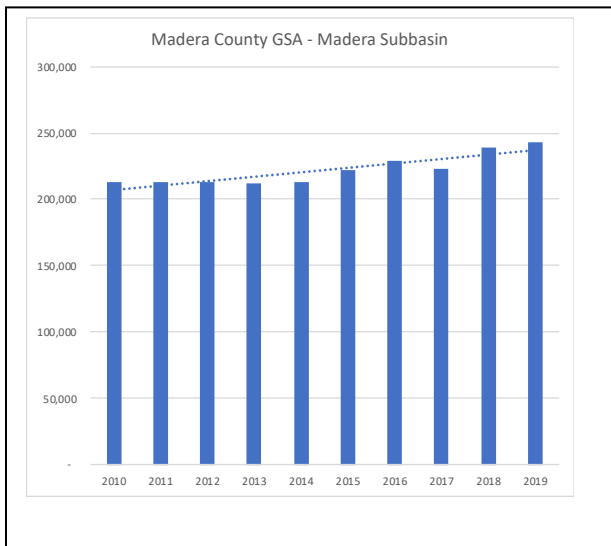
<sup>1</sup> Rates and fees cannot be used explicitly to drive down demand. That said, they may also result in demand reduction.





- July 21, 2020 – County GSAs – land use change presentation to Board and recommendation of an allocation approach
- August 6, 2020 – Advisory Committee – A conceptual presentation on allocations is presented for feedback.
- September 2020 – County GSAs – A conceptual presentation on allocations to the Board.
- September 2020 – Advisory Committee – Allocation presentation to Advisory Committee with scenarios; Recommendation from Committee?
- October 2020 – County GSAs – Allocation presentation to Advisory Committee with scenarios; Adoption by Board?
- 2021 – Established budgets/allocation are used as informational as QA/QC is performed and a rate structure is developed.
- 2022 – Budgets/allocation are tied to a rate structure.

In order to gauge the urgency of adoption of an allocation, Madera County GSAs analyzed consumptive water use (and ETAW) over a decade to show trends. What is obvious from even a cursory look is an upward trend in water use even amid SGMA GSP development and early implementation.



Because of the upward trend in consumptive water use, it is imperative that the Madera County GSAs continue to discuss allocations, and choose an approach so that demand can be reduced to meet groundwater sustainability.





## Principles

The principles below describe an approach to allocations that is fair and flexible, gives certainty, is no more complicated than necessary, protects groundwater rights and water for domestic use by disadvantaged communities and others.

- Fairness – An allocation approach must equitably reflect for all agricultural types and operations in the Madera County GSAs.
- Flexibility – An allocation approach will provide flexibility to agricultural in the County GSAs as it transitions to consuming significantly less groundwater.
- Certainty – An allocation approach should provide users certainty on water quantities and predicted annual costs.
- Simplicity – An allocation approach should have rules that are easy to understand and follow and be helpful for future decisions.
- DAC Protection – An allocation approach will seek to maintain/enhance groundwater conditions for DACs and other residential users.
- Overlying Rights Protection – An allocation approach will not affect a landowner’s overlying right to groundwater.

## Proposed Allocation Rules

The proposed allocation for agricultural water users has three types of water:

1. Sustainable yield of native groundwater is water that naturally exists through seepage and percolation. It is available to the entire subbasin as a whole and has been allocated within the subbasin proportionally based on acreage. This water could be offered as “opt in” or “opt out”. If someone were to “opt in” as an approach, they would also be opting in for fees associated with the management of the sustainable yield. If someone chooses to opt-out, they would still have access to domestic water and stock water (e.g., ranching and cattle uses), but not access to the sustainable yield allocation or to a potential future water market. There would be a process to opt back in after a period of being out by paying for back charges as well as current charges, at a minimum.
2. Transitional water is water that is continued overdraft within the Madera County GSAs and is accepted by the other GSAs as a strategy to manage the economic transition to lower





consumptive use of groundwater over time. During the first 10 years of GSP implementation, this type of water could be offered in two pools:

- a. Pool #1 – 70% of the available transitional water
- b. Pool #2 – the remaining 30% of the available transitional water, plus any water not allocated from Pool #1

### **Farming Units**

To allow for both flexibility and to mimic real-world farming conditions in which resources are shared among commonly-owned lands, allocations would be given on the “farm unit” basis (as defined by the Madera County GSAs). More than one acre or parcel could be grouped together as a farm unit. In order for the grouping to exist, the acres or parcels would likely need to be owned by the same company or same family, be within certain proximity to one another and otherwise be appropriately limited (e.g. maximum acreage threshold).

### **Monitoring**

Monitoring of ET and ETAW would be done with satellite technology provided by an external vendor. Quality assurance and quality control would be performed by both the external vendor and by Madera County staff.

### **How An Allocation Approach Might Work**

The proposed allocation approach must begin with the Madera County GSAs having a quantifiable volume of water to offer to participants annually. While the determination of the annual volume available will be a function of several factors, including the conditions of groundwater levels as monitored and reported per the governing GSPs within each basin, proxy values can be used to illustrate the practical operations of the proposed allocation approach.

Working within the Madera Subbasin, County GSAs, here is a hypothetical annual volume available to the GSA for an allocation to participants:

1. Sustainable Yield = 90,000 acre-feet per year
2. Transitional Water (decreasing per year until zero after 20 years) as shown in the table:



Transitional Water (acre-feet available per year) (Example only)										
Year	1	2	3	4	5	6	7	8	9	10
Total	140,000	136,500	133,000	129,500	126,000	117,600	109,200	100,800	92,400	84,000
Year	11	12	13	14	15	16	17	18	19	20
Total	75,600	67,200	58,800	50,400	42,000	33,600	25,200	16,800	8,400	-

The allocation approach would then follow the more detailed steps and example assumptions and calculations outlined here:

Step	County GSA Action in the Madera Subbasin	Grower Action	Math Calculations/Assumptions for Purposes of an Example
	<b>Sustainable Yield</b> To preserve overlying water rights, County GSA offers the ability to access Sustainable Yield (SY) to those with overlying water rights.	Choose to opt in for SY (or not) at some point in time. Track estimated ETAW online.	110,000 acres (AC) of 185,000 AC opts in
<b>Year 1</b>			
1	<b>Sustainable Yield for the Year</b> County GSA offers the ability to pump SY in Year 1 to those overlying landowners who have opted in for SY.	Indicate intent to pump SY (or not). Track estimated ETAW online.	90,000 AC of the 110,000 AC indicates intent to pump in Year 1  SY allocation = 90,000 AF/90,000 AC = 1 AF/AC (for Year 1)
2	<b>Transitional Water – Pool 1</b> County GSA offers Transitional Water (TW) Pool 1 to those who indicated intent to pump the SY in Year 1.	Indicate intent to purchase from TW Pool 1 or not. Track estimated ETAW online.	Pool 1 = 70% of Year 1 TW available = 70% of 140,000 AF or 98,000 AF  Pool 1 allocation = 98,000 AF/90,000 AC = 1.1 AF/AC
3	<b>Transitional Water – Pool 2</b> County GSA allocates remaining TW through Pool 2, which is a combination of remaining quantity of TW not allocated in Pool 1 plus any unrequested Pool 1 (TW Pool 2 would most likely be	Indicate intent to purchase from TW Pool 2 or not. Track estimated ETAW online.	Pool 2 TW= 30% of 140,000 AF or 42,000 AF  Pool 2 TW also has any unused water from Pool 1. For our purposes, this is 10,000 AF.  Pool 1 – 80,000 ac (of 90,000 ac) intend





	offered to those who signed up for Pool 1).		<p>= 80,000 ac at 1.1 af/ac          = 88,000 af of Pool 1 taken</p> <p>So, Pool 2 is 42,000 AF + 10,000 AF          = 52,000 AF</p>
4	<b>Adjustment</b> – Make a mid-year adjustment based on conditions (e.g. heavy rainfall has reduced need).	Indicate need for more water if available. Track estimated ETAW online.	
5	<b>Allocation Evaluation</b> – Evaluate participants’ total ETAW from groundwater (consumptive use of applied groundwater) and compare to the participants’ allocation for the farm unit. Fees may apply. There will be an appeals process.	Log into on-line portal to reconcile estimated ETAW with allocation.	
<b>Years 2-10</b>			
<p>Step 1 is repeated and adjusted if more/less indicate planned pumping of SY for each year          Steps 2 and 3 are repeated, with total TW adjusted downward according to table and based upon trends in relation to the governing GSPs.          Steps 4 and 5 are repeated each year.</p>			
<b>Years 11-20</b>			
<p>Steps 1 through 2 are repeated          Step 3 is eliminated          Steps 4 and 5 are repeated</p>			





### Allocation Approach Implementation Example

For purposes of illustrating the functionality of the proposed allocation approach, several farming scenarios have been created. Example crop and field management decisions are tracked over a 10-year period to illustrate a possible use of allocations. The steps presented above, including the assumptions and calculations, form the basis for the examples.

The following farming units were created to represent “Year 1” cropping conditions:

- Farm Unit #1 – 1,120 acres of almonds and pistachios across 5 non-adjacent parcels
- Farm Unit #2 – 4,000 head dairy with 1,500 acres of adjacent field crops and orchards
- Farm Unit #3 – 800 acres of non-irrigated and 500 acres of pistachios
- Farm Unit #4 – 500 acres of low-water use permanent crop

For the scenarios, the following additional assumptions are made:

1. Participants indicating intent to pump SY increases after Year 5 from 90,000 acres to 110,000 acres. This adjusts the SY allocation from 1.0 AF/AC to 0.82 AF/AC at Year 6.
2. Participants requesting TW water remain at 90,000 acres for the entire 10 years.
3. Use of TW Pool 1 increase to full take after Year 5, so available TW Pool 1 is divided by 90,000 acres instead of 80,000 acres starting in Year 6.

Based upon the suggested steps and the additional assumptions, the resulting annual per-acre allocations could be anticipated for the example scenarios could be as follows:

Conceptual Madera County GSA Groundwater Allocations for Consumptive Use (af/ac/yr)										
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
SY Allocation	1.00	1.00	1.00	1.00	1.00	0.82	0.82	0.82	0.82	0.82
TW: Pool 1	1.10	1.10	1.00	1.00	1.00	0.70	0.70	0.60	0.60	0.50
TW: Pool 2	0.87	0.88	0.96	0.90	0.92	1.39	0.73	0.67	0.62	0.56
Total	2.97	2.98	2.96	2.90	2.92	2.91	2.25	2.09	2.03	1.88
	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Y19	Y20
SY Allocation	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
TW: Pool 1	0.70	0.60	0.50	0.50	0.40	0.30	0.20	0.20	0.10	0.00
TW: Pool 2	not available									
Total	1.52	1.42	1.32	1.32	1.22	1.12	1.02	1.02	0.92	0.82





### Sample Results for Farm Unit Examples

Based upon the assumptions discussed and the sample allocation shown in the table, the following summarizes likely outcomes for each of the example farm unit scenarios.

#### Farm Unit #1 – 1,120 acres of almonds and pistachios across 5 non-adjacent parcels

1. Field Management
  - a. Unchanged Year 1 thru 3
  - b. Fallow 80 AC almond (17-year old) parcel after Year 3 harvest; replant in Year 5 to pistachios
  - c. Fallow 400-AC almond (19-year old) parcel as follows:
    - i. 100 AC after Year 5 harvest
    - ii. +50 AC after Year 6 harvest
    - iii. +100 AC after Year 7 harvest
    - iv. +50 AC after Year 8 harvest
    - v. Fully fallowed after Year 9 harvest
2. Use of Allocations
  - a. Fully use SY in all years
  - b. Fully use TW Pool 1 in all years
  - c. Significant use of TW Pool 2 in all years

#### Farm Unit #2 – 4,000 head dairy with 1,500 acres of adjacent field crops and orchards

1. Field Management
  - a. Unchanged through Year 10
  - b. Likely will need change or alternative source of water after Year 10
2. Use of Allocations
  - a. Fully use SY in all years
  - b. Use about 75% of TW Pool 1 through Year 5
  - c. Fully use TW Pool 1 Year 6 through 10
  - d. No use of TW Pool 2 through Year 5
  - e. Slight to full use of TW Pool 2 for Year 6 through 10
  - f. Will be short after Year 10

#### Farm Unit #3 – 800 acres of non-irrigated and 500 acres of pistachios

1. Field Management
  - a. Unchanged through Year 5
  - b. Year 6 planted 250 acres of non-irrigated to low-water use permanent crop
2. Use of Allocations
  - a. Fully use SY in all years
  - b. Very minor use of TW Pool 1 through Year 5







- c. About 50% use of offered TW Pool 1 starting in Year 6
- d. No use of TW Pool 2

Farm Unit #4 – 500 acres of low-water use permanent crop

- 1. Field Management
  - a. Unchanged through Year 10 (including increased consumption from new field planted in Year 1)
- 2. Use of Allocations
  - a. Does not fully use SY
  - b. May have SY available to transfer (if a market is established)
  - c. Never uses TW

