

## **ARTICLE 1. REGULATIONS FOR THE GROUNDWATER ALLOCATION PROGRAM AND USE OF GROUNDWATER WITHIN THE WESTSIDE SUBBASIN**

### **1.1 PURPOSE**

Westlands Water District serving as the Groundwater Sustainability Agency (District) of the Westside Subbasin adopted the Westside Subbasin Groundwater Sustainability Plan on January 8<sup>th</sup>, 2020. The Westside Subbasin Groundwater Sustainability Plan (GSP) requires that the District develop Rules and Regulations to implement the GSP. These Rules and Regulations shall be construed consistent with applicable law and the GSP. Specifically, where authorized, delegations of authority under these Rules and Regulations shall be made consistent with applicable law and discretion applied in a manner consistent with the GSP. The District intends to manage and establish reasonable regulations for the production and beneficial use of groundwater and the Subbasin, as contemplated by the GSP. However, specific Rules and Regulations may require actions that are more stringent and protective of groundwater and the Subbasin, than those generally described in GSP, provided that they are consistent with the District's powers and authorities as a GSA under applicable law. (See, e.g., Water Code Sections 10725, 10725.2, 10725.4, 10725.6, 10725.8, 10726.2, 10726.4, 10726.8.) If a provision of these rules and regulations directly conflicts with either law and/or the GSP, the provisions of law and/or GSP shall control.

### **1.2 GLOSSARY OF TERMS AND DEFINITIONS**

- A. Applicant – a Groundwater User who submitted a Groundwater Allocation Application and Agreement.
- B. Aquifer Storage and Recovery (ASR) – a recharge activity of injecting Qualifying Surface Water into the aquifer using an agricultural Groundwater Well or dry well

for temporary storage, which is then later recovered for irrigation or other beneficial use.

- C. ASR Program – the “Agricultural Aquifer Storage and Recovery Program” approved by the District in 2019 and subject to the Central Valley Regional Water Quality Control Board Monitoring And Reporting Program R5-2020-0809, as may be amended or supplemented.
- D. Carryover - the amount of unused annual Groundwater Allocation, Provisional Allocation, or Groundwater Credit in a Groundwater Account as of February 28/29. Carryover groundwater supplies are carried forward and available for use in a future year and may be subject to then applicable rate of extraction limitations (i.e., 225%), depletion and loss as provided herein.
- E. Contract Year—each 12-month period that begins on March 1 and ends on the last day of February following.
- F. Delinquent Groundwater User - a Groundwater User who failed to pay any charges, assessments, land-based charges, or any other money owed to the District by the due day.
- G. De Minimis User— consistent with the definition in Water Code section 10721(e), a person who extracts, for domestic purposes, two acre-feet or less per year.
- H. Dry Well – - a well screened above the water table, that is normally dry but available to inject water into the Upper Aquifer and/or Lower Aquifer.
- I. Eligible Land— land that is Gross Acre and that is not owned or operated by a Delinquent Groundwater User.
- J. Evaporation Loss— - a reduction in the quantity of liquid water resulting from water changing its property from a liquid to a gas.
- K. General Manager— the General Manager of Westlands Water District or designee.
- L. Gross Acre – an acre within the Westside Subbasin assessed by Fresno or Kings

county, that has been irrigated prior to December 31, 2015, or is suitable for reasonable and beneficial use of groundwater. Land that does not meet this definition may be deemed to meet the definition pursuant to an approved request for variance. Gross Acre includes land designated as Eligible Cropland pursuant to the Westlands Water District Rules and Regulations.

- M. Groundwater Account - is a record or statement of the total amount of groundwater available to a Groundwater User pursuant to the Groundwater User's Groundwater Allocation and adjusted for all authorized transactions, inclusive of Groundwater Credits, Transfers, Carryover, in-lieu delivery of surface water and pumped by the Groundwater User.
- N. Groundwater Allocation – the portion of the Westside Subbasin groundwater Sustainable Yield ratably distributed to Eligible Lands.
- O. Groundwater Allocation Application and Agreement – is an application and agreement between the District and a Groundwater User which, among other things, describes the land and well(s) available to the Groundwater User and the Groundwater User's Eligible Lands.
- P. Groundwater Allocation Program - the actions contemplated in this Article 1.
- Q. Groundwater Allocation Program Benefit - the opportunity to develop Carryover, Groundwater Credit, and Trade Groundwater.
- R. Groundwater Credit - a credit a Groundwater User receives for recharging Qualifying Surface Water the Westside Subbasin.
- S. Groundwater User – a landowner or lessee of land who has submitted and executed a District approved Groundwater Allocation Application and Agreement.
- T. Groundwater Well – a groundwater well or other groundwater extraction facility overlying or pumping groundwater from aquifers within the Westside Subbasin, except those Groundwater Wells exempt under Sections 1.13 and 1.14, regardless of whether the Groundwater Well Owner is a qualifying Groundwater User.

- U. Groundwater Well Owner – a Groundwater User, any person, or entity that holds an interest in a Groundwater Well.
- V. Leave Behind - a quantity of water, expressed as a uniform percentage of the quantity of the Qualifying Surface Water recharged and stored within the Subbasin.
- W. Lower Aquifer – generally, the aquifer below the Corcoran Clay or deeper than approximately 400 feet below ground surface, in areas where the Corcoran Clay is absent.
- X. Meter a District-approved groundwater flow meter or other measuring device equipped with telemetry (automatic meter infrastructure capable of remote data transmission) to allow for continuous monitoring and data collection of groundwater pumping by the District.
- Y. Negative Balance – the circumstance when a Groundwater User pumps more groundwater than available from Groundwater Allocation(s), Groundwater Credits, Transfer, and Carryover.
- Z. Provisional Allocation – a supplemental Groundwater Allocation made available to Groundwater Users.
- AA. Qualifying Surface Water – surface water that is “non-native” or “foreign” water, meaning water that under natural conditions would not contribute to the recharge of the Westside Subbasin.
- BB. Shallow Aquifer – the first 100 feet below ground surface of the Upper Aquifer and is not hydrologically connected to the rest of the Upper Aquifer.
- CC. Sublateral – a recharge method that delivers water directly below the root zone into the aquifer through a perforated pipeline.
- DD. Subsidence Prone Areas – areas that have experienced subsidence. Figure 2, titled “Subsidence Prone Areas”, depicts those areas and, based on then current data, may be updated by the Board of Directors.

- EE. Sustainable Yield – consistent with Water Code section 10721(w), the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result.
- FF. Technical Issue – an issue relating to or arising from the application of a science (e.g., geology, hydrogeology, groundwater conditions, etc) or engineering.
- GG. Transfer – the conveyance of an approved Groundwater Allocation or Groundwater Credit from one Groundwater User to another Groundwater User.
- HH. Transition Period – the period from 2022-2030 to 2030 during which the allocation to Groundwater Users will be reduced.
- II. Transition Allocation – the amount of water available for allocation during the Transition Period above the Groundwater Allocation.
- JJ. Unclaimed Groundwater – Groundwater for which no registration and application are filed.
- KK. Unused Groundwater – the supply made available to a Groundwater User during the Contract Year that remains in the Groundwater User’s Groundwater Account at the end of the Contract Year.
- LL. Vadose Zone – the unsaturated zone of the aquifer.
- MM. Variance – is the relief (excuse from compliance) from any portion of the GSP, program, policy, rule, regulation, or project.
- NN. Upper Aquifer – is generally described as the aquifer above the Corcoran Clay or from ground surface to a depth of approximately 400 feet, in areas where the Corcoran Clay is absent.

### **1.3 SUSTAINABLE YIELD OF THE WESTSIDE SUBBASIN**

- A. The Sustainable Yield of the Westside Subbasin is approximately 305,000 acre-feet (AF). Subject to the terms and conditions of SGMA, the GSP and these rules

and regulations, this quantity will be available for allocation to Groundwater Users for all Gross Acres in each Contract Year under the Groundwater Allocation Program. However, the allocation in any Contract Year may be subject to adjustment as may be prudent and necessary to avoid “undesirable results”, as described in Section 1.8.

- B. Of the approximate 622,000 acres overlying the Westside Subbasin, there are approximately 525,000 acres that will be eligible to receive a Groundwater Allocation.
- C. No groundwater shall be allocated to District owned land, land where the District reserved the overlying right to pump groundwater, or De Minimis Users.

#### **1.4 GROUNDWATER FLOW METER**

- A. The District will furnish, own, and install a groundwater flow meter (also referred to as a meter) on each agricultural Groundwater Well in the District. Each Groundwater Well must be equipped with a Meter, regardless of the Groundwater Well Owner’s participation in the Groundwater Allocation Program, pursuant to the GSP and Water Code section 10725.8(a). A Groundwater Well Owner shall permit the District to install a Meter on each Groundwater Well, subject to reasonable notice. A Groundwater Well Owner’s refusal to permit the District to install a Meter, following reasonable notice, constitutes a violation.
- B. All costs associated with maintaining the Meters on a Groundwater Well will be borne by the Groundwater Well Owners.
- C. The Groundwater Well Owner is responsible for coordinating with the District to ensure the Meter remains operational. A Groundwater Well Owner shall notify the District of any damage to a Meter within 15 days. Failure to notify the District of Meter damage or intentional tampering with a Meter shall constitute a violation.
- D. The District reserves the right to inspect each Meter for every Groundwater Well, subject to reasonable notice and consistent with Water Code section 10725.4(c).

- E. The District reserves the right to use any other reasonable method to determine groundwater extractions in addition to installing a Meter.

#### **1.5 GROUNDWATER USER REGISTRATION AND GROUNDWATER ALLOCATION: APPLICATION FOR GROUNDWATER**

- A. To receive a Groundwater Allocation for agricultural purposes in a Contract Year, a Groundwater User must register for voluntary participation in the Groundwater Allocation Program by filing a completed Groundwater Allocation Application and Agreement at a designated District office annually on or before January 15 of the prior Contract Year. Applications received after January 15 shall be considered “late”. A Groundwater Allocation Application and Agreement that is late shall be accepted; provided, the application is received no later than July 31, in which case the Groundwater Allocation may not be available until 45 days from the date the late application is accepted.
  - 1. Each year, the District will review a Groundwater User’s registration in the Groundwater Allocation Program.
  - 2. For each Application, the District will verify the information contained therein to determine, among other information, whether the land on which groundwater would be used is within the Westside Subbasin. Supplemental information may be required from the Applicant in those cases where the submitted information is inadequate.
  - 3. A Groundwater User may seek authorization of their use of groundwater pursuant to the Variance procedures set forth in Section 1.19, if the application includes land that is not identified as a Gross Acre in the Westside Subbasin.
- B. Timely Applications shall receive the Groundwater Allocation by March 1, subject to available groundwater pumping and groundwater elevation data. The District, however, may reasonably delay assigning a Groundwater Allocation until groundwater pumping data and groundwater elevation data is available.
- C. If more than one Groundwater Allocation Application and Agreement for the same parcel of land is received, the Groundwater Allocation Application and Agreement

submitted by the landowner shall have priority. Other than in the case of a final binding court determination declaring the respective rights of multiple Applicants, if there is a dispute between or among Applicants, the landowner's Groundwater Allocation Application will have priority.

1. Disputes between or among co-tenants or joint owners will be resolved by allocating groundwater based on the pro-rata ownership share. If no Applicant owns the land, priority will be given to the Applicant who can provide satisfactory evidence of landowner's authorization to occupy the land, receive the Groundwater Allocation and apply groundwater for beneficial use. A lease or written instrument demonstrating consent to occupancy from the landowner is sufficient evidence.
- D. No Groundwater Allocation or Groundwater Credit shall be made to any land for which water charges, assessments, land-based charges, or any other money owed to the District have been delinquent for 30 days or more at the time the Groundwater Allocation is made or delinquent with respect to any land for which advance payment is required until such advance payment is received, or in lieu thereof security, in a form acceptable to the General Manager, for such payment has been provided.
- E. The failure to register for a Groundwater Allocation in any Contract Year, does not preclude a Groundwater User from the right to participate in the Groundwater Allocation Program in a future Contract Year. However, registration in any Contract Year does not cure the failure to register in any previous year and a new or intermittent registrant does not obtain any right to Unclaimed Groundwater.
- F. Unclaimed Groundwater will be held in reserve by the District for the benefit of the Subbasin and may be used in furtherance of the District's sustainability goals, including the District making the groundwater available for pumping: (1) pursuant to a Groundwater Allocation; (2) for use in furtherance of other GSP management objectives, including, but not limited to, groundwater quality and subsidence management; or (3) as a Provisional Allocation. Any Provisional Allocation shall be based on the total Gross Acres of Eligible Lands in a Groundwater Allocation

Application and Agreement for Contract Year. The decision on use of Unclaimed Groundwater will be made by the District.

## 1.6 GROUNDWATER ALLOCATION DURING THE TRANSITION PERIOD

- A. The Groundwater Allocation Program will begin with an eight (8) year Transition Period from 2022-2030 ("Transition Period") in which a uniform annual allocation is established at 1.3 AF per gross acre in 2022 and 2023 and then subsequently reduced each year by 0.1 AF per Gross Acre until 2030 (Table 1).

**Table 1: Groundwater Allocation Transition Period (2022-2030)**

Contract Year	Sustainable Yield	Transition Allocation	Allocation Cap
		(AF per Gross Acre)	
<b>2022</b>	0.6	0.7	1.3
<b>2023</b>	0.6	0.7	1.3
<b>2024</b>	0.6	0.6	1.2
<b>2025</b>	0.6	0.5	1.1
<b>2026</b>	0.6	0.4	1.0
<b>2027</b>	0.6	0.3	0.9
<b>2028</b>	0.6	0.2	0.8
<b>2029</b>	0.6	0.1	0.7
<b>2030</b>	0.6	0.0	0.6

- B. In Year 1 of the Groundwater Allocation Program (March 1, 2022, through February 28, 2023), the District will implement a pumping cap of 1.3 AF per acre as an aggregate in the Subbasin and monitor the conditions, except for Groundwater Wells located in the Subsidence Prone Areas, as identified in Figure 2. In Year 1 only, Section 1.5 will not be applicable.
- C. During the Transition Period:
1. Groundwater withdrawals will be measured and tallied in total. Withdraws **will not** be accounted for by aquifer.
  2. The Transition Allocation is eligible for Carryover. However, the use of the Carryover Transition Allocation and current year's Transition Allocation shall not exceed 0.4 AF per gross acre from 2026 and beyond. In years 2024 and

2025, Table 1 will govern.

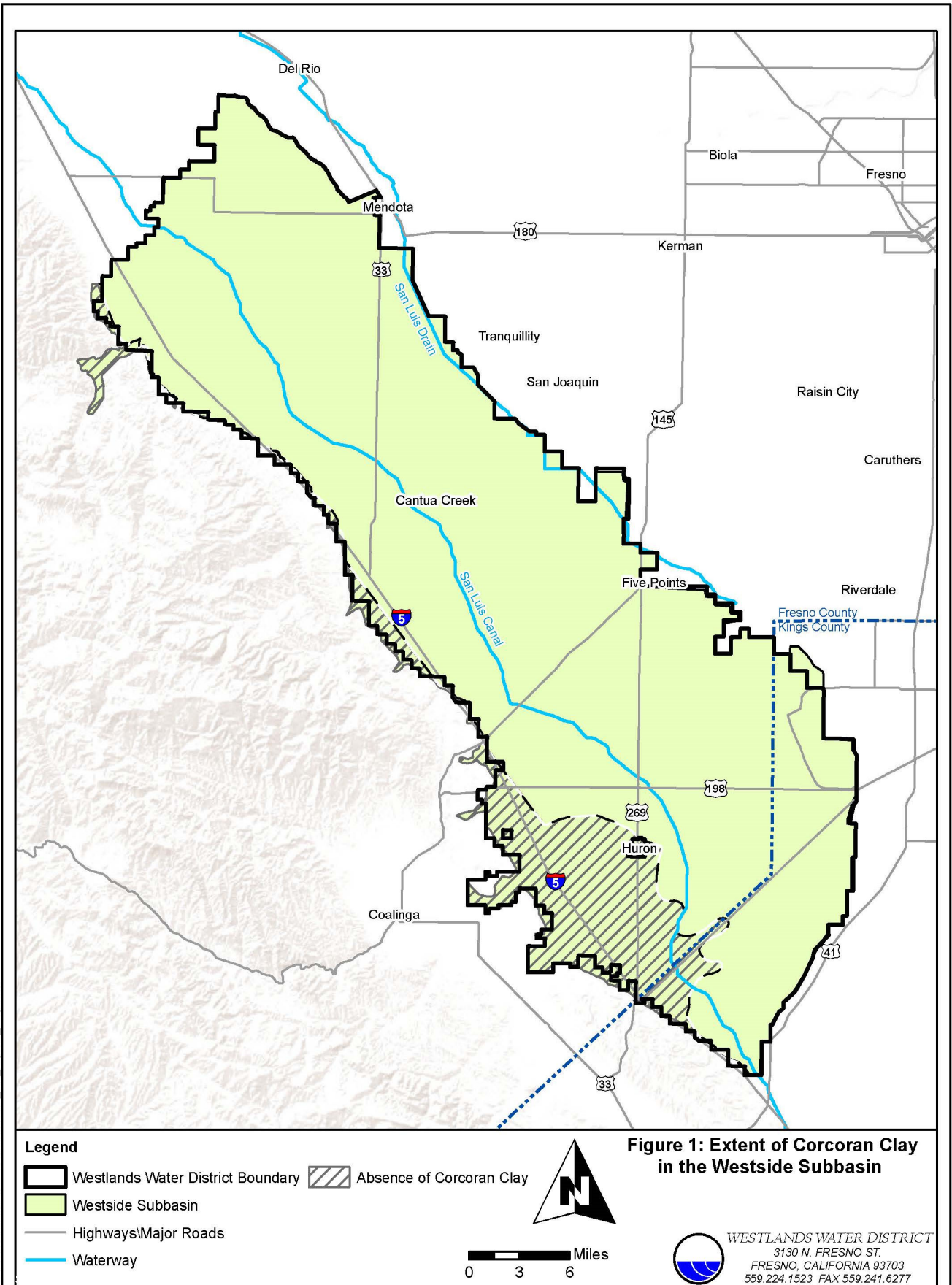
**1.7 GROUNDWATER ALLOCATION (Not Applicable on or until March 1, 2030)**

- A. For the Groundwater Allocation beginning in the 2030 Contract Year, the Groundwater Allocation will be made to Eligible Lands based on the Gross Acres in the District. Subject to the conditions identified, the following options are available for Groundwater Allocation and which option a Groundwater User may select may be revised by the Groundwater User at any time, so long as the Groundwater Allocation is still available in the Groundwater Account.
1. Option 1: A Groundwater User with a well(s) that allows for pumping from the Upper Aquifer and Lower Aquifer may opt for an allocation of 0.6 AF per Gross Acre, 40 percent of which shall be deemed available from the Upper Aquifer and 60 percent of which shall be deemed available from the Lower Aquifer. The tallied amount will be determined based on the location of the well's screened intervals.
  2. Option 2: A Groundwater User with a well(s) that allows for pumping from the Upper Aquifer and/or Lower Aquifer who wishes to exclusively access only one aquifer may opt to have the Groundwater Allocation set at 0.45 AF per Gross Acre, all of which would be deemed available in the accessible aquifer.
  3. Option 3: A Groundwater User that overlies the aquifer where it is not bifurcated into the Upper Aquifer and Lower Aquifer may opt for an allocation of 0.6 AF per Gross Acre. Presently, this section applies only to that portion of the Westside Subbasin shown in Figure 1.
- B. For allocations under (1) or (2) above, if the District does not have evidence that the Groundwater User owns or has a legal right to use a well that allows for pumping from the Upper Aquifer and Lower Aquifer in the designated proportions, the Groundwater User will provide the District evidence that the Groundwater User owns or has a legal right to use a well from the two aquifers in the designated proportions. Upon the Groundwater User providing such evidence and the General Manager

determining the Groundwater has access to the Upper Aquifer and Lower Aquifer in the designated proportions, the allocation shall be made pursuant to (1) or (2) above, as may be applicable.

- C. The District may adjust the allocation, higher or lower, as currently presented in Table 1, after considering relevant data or other information acquired during the Transition Period, including but not limited to then prevailing groundwater conditions, and total number of Gross Acres, to ensure that the sustainable indicators' Minimum Thresholds are maintained.
- D. Production of all groundwater under the Groundwater Allocation Program is subject to the District's continued implementation of the GSP and the Groundwater Allocation Program, including but not limited to the avoidance of undesirable results and maintenance of water level elevations as described in Section 1.8.

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## 1.8 GROUNDWATER PUMPING LIMITATIONS

- A. The General Manager will:
1. On or about March 15, provide a projection of groundwater levels that may exist in the fall of the then current Contract Year; and
  2. By no later than January 15, identify the status of groundwater level conditions in the Subbasin as they existed in the fall of the prior calendar year and determine the “classification” for the upcoming Contract Year.
- B. The District will implement management actions based upon the following classifications: (1) during the Transition Period if groundwater levels are below 50 percent of the established Measurable Objectives in the Subbasin, and (2) in all Contract Years starting in 2030.
1. **Green.** The Green classification occurs when Groundwater levels in the Subbasin are 50 percent or greater than the established Minimum Threshold in the Subbasin. If the Subbasin receives a Green classification, then the District will implement the following:
    - a) **Limit a Groundwater Users pumping to 225% (1.35 AF per Gross Acre) of the current years’ allocation.**
    - b) Enforce pumping limitations in each month that the Groundwater Users exceed its Groundwater Allocation. If limits are exceeded, the Groundwater User shall balance their Groundwater Account by the end of the following month. Failure to balance their Groundwater Account could impact a Groundwater User’s future Groundwater Allocation as described in Section 1.7.
    - c) Take additional measures that, in its reasonable discretion are reasonably calculated to avoid undesirable results. These include but are not limited to, conditional pumping restrictions either in Subsidence Prone Areas identified on Figure 2 or areas

experiencing water quality degradation, restrictions on allocation trading, and in-lieu water use incentives or requirements.

2. **Yellow.** The Yellow classification occurs when groundwater levels in the Subbasin exceed the established Minimum Thresholds in the Subbasin by 15 percent or are 50 percent below the Measurable Objectives. If the Subbasin receives a Yellow classification, then the District will implement the following:
  - a) Pumping limited to the current Contract Year Groundwater Allocation plus any Carryover, Transfers, or Groundwater Credit.
  - b) Enforce pumping limitations in each month that the Groundwater User exceeds their Groundwater Account balance. If limits are exceeded, the Groundwater User shall balance their Groundwater Account by the end of the following month. Failure to balance their Groundwater Account could result in an assessment of mitigation fees related to the cost of curing the impact, locking the well from future pumping, and restrict future Groundwater Allocations as described in Section 1.17.
  - c) Take additional measures that, in its reasonable discretion are reasonably calculated to avoid undesirable results including but not limited to, conditionally restricting pumping in Subsidence Prone Areas identified on Figure 2 or areas experiencing water quality degradation, restrictions on allocation trading, and in-lieu water use incentives or requirements.
3. **Red.** The Red classification occurs when groundwater levels in the Subbasin are within 15 percent or less of established Minimum Thresholds in the Subbasin. If the Subbasin receives a Red classification, then the District will implement the following:
  - a) Limit pumping of groundwater to the current Contract Year

Groundwater Allocation, plus any eligible Carryover or Groundwater Credits.

- b) If the District determines that there is a reasonable probability that undesirable results will occur unless additional measures are taken, then additional extraordinary measures authorized under the GSP may include, but not limited to:
  - i. Reducing that years' Contract Year Groundwater Allocation; or
  - ii. Requiring the delivery of surface water in- lieu of groundwater; or
  - iii. Limiting and potentially prohibiting the transfer of Groundwater Allocation as described in the Section 1.9 Use and Transfer of Groundwater; or
  - iv. Restrictions on pumping; or
  - v. Other measures that, in the reasonable discretion of the District, are reasonably calculated to avoid undesirable results.
- c) A Groundwater User with a Groundwater Account that has a Negative Balance will not be eligible to pump groundwater. A Groundwater User may resume pumping when the groundwater account has a positive balance.

### **1.9 USE AND TRANSFER OF GROUNDWATER**

- A. A Groundwater User that receives a Groundwater Allocation may use it on any Eligible Land within the Westside Subbasin.
- B. The priority of groundwater use (considered the first water pumped) shall be as follows: (1) Carryover, (2) Groundwater Credits, and (3) the current years Groundwater Allocation. A Groundwater User may request an alternative priority of use.

- C. Except as limited by Section 1.6, a Groundwater User may pump groundwater for use on Eligible Land each Contract Year, bank any unused quantity as carryover and/or Transfer any unused portion of the Groundwater Allocation.
1. If the total groundwater allocated to the Groundwater Account exceeds the amount pumped, then the unused Groundwater Allocation as a Carryover that may be pumped or transferred in a subsequent Contract Year.
  2. If the total groundwater pumped exceeds the amount allocated, inclusive of Carryover, transfers, and Groundwater Credits, then the Groundwater Account will have a Negative Balance. A Groundwater User may not transfer any portion of its Allocation to a third party where there is a Negative Balance; provided that the Groundwater User with a Negative Balance may procure a Groundwater Allocation from a third party to balance its Groundwater Account and thereafter may continue to trade any portion of the groundwater in its Groundwater Account.
  3. A Groundwater User may transfer any portion of their Groundwater Allocation and Groundwater Credits(excluding the Transition Allocation), to another Groundwater User for use in the current and a subsequent Contract Year, provided that the transfer of an aquifer specific allocation is expressly limited to the transferee Groundwater User pumping groundwater from the same aquifer for which the Allocation was approved.
- D. All requests to transfer a Groundwater Allocation and Groundwater Credits (excluding the Transition Allocation), must be submitted in writing and approved in advance, by the General Manager. Transfers and use of previously approved Transfers are subject to an annual approval. Within 5 business days of receiving a request to transfer, the General Manager shall approve the transfer if they determine the following conditions are satisfied:
1. The Groundwater User making the groundwater available for transfer has sufficient groundwater supplies in its Groundwater Account;

2. The Groundwater User approved the transfer of groundwater from its Groundwater Account to another Groundwater User; and
  3. The transfer would not violate any other provision of these Rules and Regulations.
  4. GSA may place groundwater pumping limitations on transfer groundwater according to Article 1.8.
- E. The Board of Directors may prohibit or impose additional limitations on the transfer of a Groundwater Allocation, including Carryover and Groundwater Credits, into the Subsidence Prone Area. When considering a request to transfer, the General Manager will follow the “Westlands Water District Groundwater Sustainability Agency Guidance For Processing Groundwater Transfer”, which the Board of Directors may update from time to time without amendment to these Rules and Regulation.
- F. The General Manager may impose reasonable conditions on a transfer if necessary to support the findings required under paragraph D above. If the transfer of groundwater is subject to Section 1.7.A.3 and is transferred to an area of the Subbasin where the Corcoran Clay is present, then the credit shall be allocated per section 1.7.A.1 or 1.7.A.2.
- G. The General Manager may not re-assign during the Contract Year unused groundwater from a Groundwater Account to another Groundwater Account based on a change in ownership or lease of land, except where the transferor, upon the transfer of land through a change in ownership or lease, would no longer owns or leases any land in the Westside Subbasin, the transferor may request that the unused Groundwater Allocation be assigned to the successor in interest. In that circumstance, the unused Groundwater Allocation shall be assigned to the successor in interest upon the successor in interest filing a Groundwater Application with the District to retain the groundwater available previously available to the transferor.

- H. Consistent with the District's Groundwater Management Plan prepared pursuant to Water Code Section 10750 et seq. (Assembly Bill 3030) and the GSP, the District will continue to prohibit unconditioned export of groundwater from the Westside Subbasin.
- I. The General Manager may restrict or prohibit the use or Transfer of groundwater if a dispute exists between or among Groundwater Users regarding the allocation or use of such groundwater.

#### **1.10 GROUNDWATER RECHARGE PROJECTS**

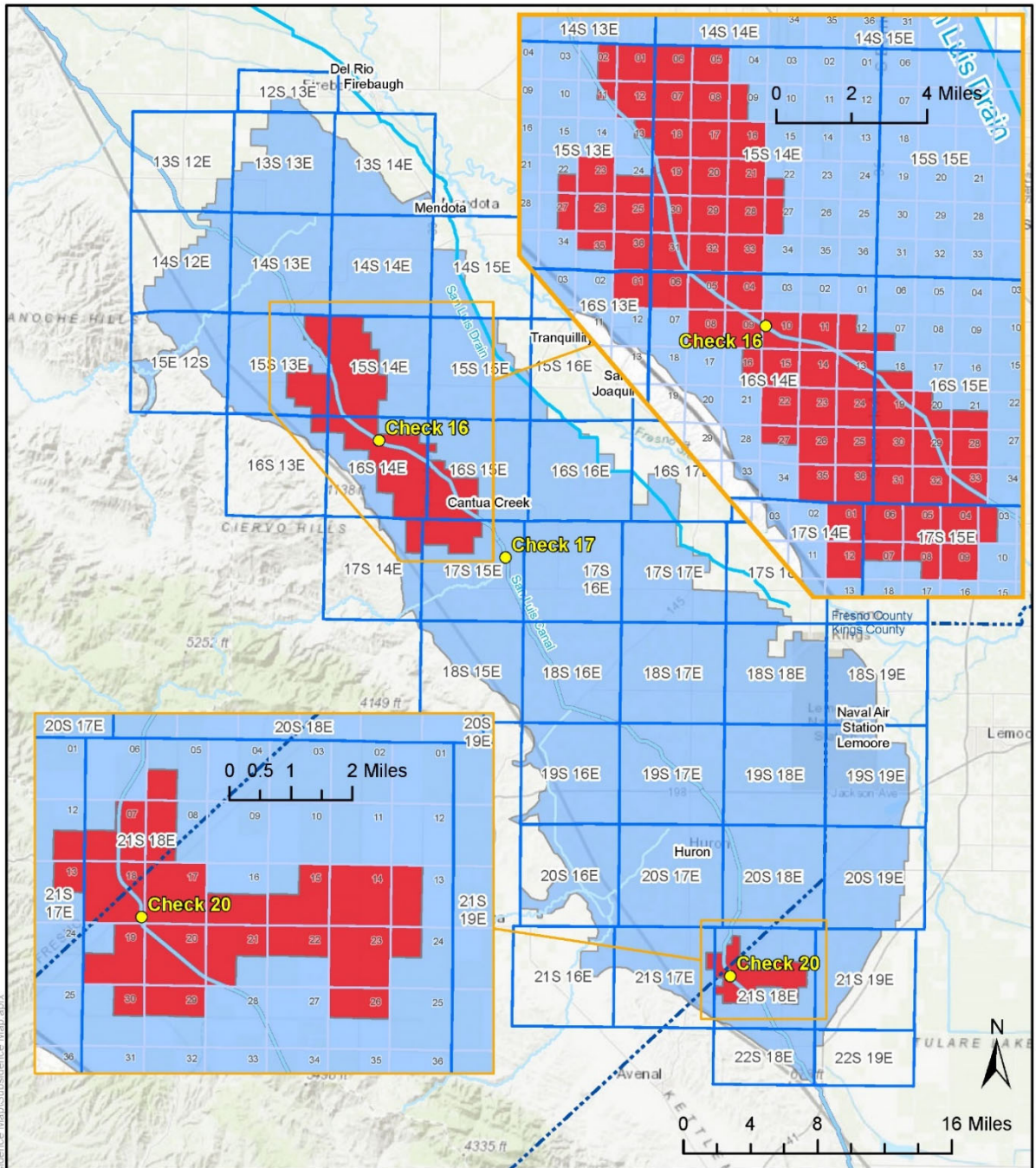
- A. The District anticipates that Groundwater Users will continue to implement projects to augment groundwater through recharge of Qualifying Surface Water and will request that the District provide Groundwater Credits to support or offset the Groundwater User's future groundwater pumping.
- B. The General Manager is directed to provide Groundwater Credits to Groundwater Users, consistent with the terms and conditions of this Section.
- C. The General Manager will review each Groundwater User's completed application for Groundwater Credit in the order applications are submitted.
- D. When considering an application for Groundwater Credit, the General Manager will (1) follow the "Westlands Water District Groundwater Sustainability Agency Guidance For Processing Groundwater Recharge Projects Application", as may be updated by the Board of Directors from time to time without amendment to these Rules and Regulations, (2) base decisions on the best available technical data (such as boring, cone penetration testing or a detail well log), and (3) limit the determination to whether the proposed recharge (a) involves Qualifying Surface Water, and (b) the extent it would recharge the Upper and Lower Aquifers.
- E. The General Manager will provide Groundwater Credits based on the amount of Qualifying Surface Water reasonably calculated as replenishing the Westside Subbasin.

- F. Groundwater Credits will be provided for Groundwater User projects identified in Chapter 4 of the Westside GSP, which include:
1. Aquifer Storage and Recovery (ASR) wells,
  2. Recharge Basins,
  3. Dry Well Injection,
  4. Sublateral, and
  5. Over Irrigation Recharge Projects.
- G. When Groundwater Credits are requested for a project that recharges Qualifying Surface Water to the Westside Subbasin by a method that infiltrates water through the vadose zone or the unsaturated zone, the General Manager shall impose a one-time ten percent (10%) Leave Behind to mitigate for consumptive loss and migration.
- H. Available Groundwater Credits will be posted to each Groundwater Account at the end of each month. Groundwater Credits posted to a Groundwater Account will remain in the Groundwater Account until used or transferred.
- I. Groundwater Credits developed prior to 2030 will follow the rules set forth in the year the Groundwater Credits were developed.

#### **1.11 SUBSIDENCE PRONE AREAS**

- A. As referenced in Section 4.4 of the Westside Subbasin GSP, there are areas along the San Luis Canal that have experienced a large amount of subsidence during persistent drought periods. Land subsidence near Checks 16, 17, and 20 of the San Luis Canal/California Aqueduct during the 2013-2016 drought, also known as the “subsidence areas of concern” and depicted on attached Figure 2, highlighted the need to reduce reliance on groundwater pumping from the Lower Aquifer to avoid undesirable results. The Subsidence Prone Areas (SPA) boundaries were developed from the 2016 Jet Propulsion Laboratory Report using Interferometric Synthetic Aperture Radar (InSAR) data between July 2013 and June 2016. The SPA near Checks 16 and 17 was revised based on the InSAR data collected

between January 2016 and January 2021. Approximately 3,000 acres were removed from the western boundary where the vertical displacement in the SPA is stable and not declining.



- Westside Subbasin
- Subsidence Prone Areas

**Figure 2: Westside Subbasin  
Subsidence Prone Areas**

Ver. 3: SPA Boundary Modified 08/11/2022



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FRESNO, CALIFORNIA 93703  
559.224.1523 FAX 559.241.6277

Date: 8/30/2022

B. In Subsidence Prone Areas:

1. A Groundwater User shall have the right to pump all, or part of Groundwater supply in its Groundwater Account from the Upper Aquifer.
2. If the District prohibits a Groundwater User from pumping more groundwater than the Groundwater User's share of a Groundwater Allocation (Reduced Supply) from the Lower Aquifer:
  - a. The District, in its capacity as the GSA, shall acquire and deliver to the Groundwater User a quantity of surface water (SGMA Substitute Water) equal to the Reduced Supply.
  - b. The Groundwater User shall: (a) accept from the District the delivery of the SGMA Substitute Water, and (b) be precluded from pumping an amount of groundwater equal to the quantity of SGMA Substitute Water delivered.
  - c. The District will debit the Groundwater User's Groundwater Account by an amount equal to the quantity of SGMA Substitute Water delivered to the Groundwater User by the District.
  - d. The Groundwater User shall pay for SGMA Substitute Water pursuant to this subsection at the lesser of: (a) the cost incurred by the District to acquire the SGMA Substitute Water, or (b) the cost the Groundwater User would have incurred if it were pumping groundwater from the Lower Aquifer. For purposes of this section, the cost of pumping groundwater, shall include but not be limited to the amortized capital cost of wells, facilities, appurtenances, operations and maintenance, power, measurement, and treatment. If the Groundwater User pays the cost the Groundwater User would have incurred if it were pumping groundwater from the Lower Aquifer, then the District, in its capacity as the GSA, will be responsible for the difference between the costs to deliver SGMA Substitute Water and the costs the Groundwater User would have incurred if it were pumping groundwater.

## 1.12 CARRYOVER, OTHER ALLOCATION RULES AND PROCEDURES

- A. Subject to then available aquifer capacity, a Groundwater User may obtain Carryover for Unused Groundwater, regardless of source, from one Contract Year to the next as set forth in Section 1.12.
- B. A Carryover may be earned, when in a Contract Year the quantity of groundwater allocated to the Groundwater User's account exceeds the amount of the actual quantity pumped.
- C. *Equation:* 
$$GW\ Allocation - GW\ Extracted = Carryover$$
- D. The District may impose on Carryover a Leave Behind percentage in an amount no greater than ten percent (10%) after the unpumped groundwater has been stored for five consecutive water Contract Water Years to account for the potential risk to the Westside Subbasin associated with deferred recovery of the unpumped groundwater.
  - a. A uniform leave behind percentage for Carryover water stored for more than five consecutive years will be established by the District, in advance of the Carryover being made available to the Groundwater Users.
  - b. The Carryover leave behind percentage will be set in an amount sufficient to avoid unreasonable risk that the cumulative pumping of Carryover by Groundwater Users will cause undesirable results and impair the District's ability to achieve sustainability in the Westside Subbasin during the implementation horizon but in amount not greater than ten percent (10%) per year.

### **1.13 DOMESTIC USERS**

- A. Domestic users that are De Minimis Users are exempt from Article 1 requirements. The District, however, will reassess the De Minimis User metering requirement before the 2025 GSP Amendment Update.

### **1.14 MUNICIPAL AND INDUSTRIAL USERS**

- A. All wells that serve Municipal and Industrial (M&I) users will be subject to Section 1.4. If the M&I User pumps more than two acre-feet a year, then the M&I user will not be a De Minimis User and will be subject to all other applicable requirements of this Article.

### **1.15 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)**

- A. Compliance with the California Environmental Quality Act (CEQA) will occur pursuant to the Article 15 of the District's rules and regulations (providing for the general rules and procedures for operation of the District), as has been and may be amended.

### **1.16 PAYMENT FOR GROUNDWATER CHARGE OR AGREEMENT**

- A. No groundwater shall be allocated to Delinquent Groundwater Users.
- B. The District's SGMA Land Based Charges are set forth through a cost recovery rate. Rates are established at the beginning of each Contract Year at a noticed public hearing through the District's Proposition 218 process. All lands in the Westside Subbasin are required to pay the SGMA Land Based Charges by September 25th of the Contract Year. If the September 25th due date falls on a weekend, then the payment will be due the following business day. A Groundwater User that does not pay the SGMA Land Based Charges by the due date shall be deemed a Delinquent Groundwater User. Delinquent Groundwater Users will be subject to penalty based on Section 1.17b, will not be eligible for a Groundwater Allocation for the following Contract Year, and shall be delinquent for purposes of Articles 2.5.D and 2.8 of the Rules and Regulations for the Allocation and Use of Agricultural Water within

Westlands Water District. A notice will be sent to a Groundwater User to cease pumping on the 1<sup>st</sup> of the following month.

- C. Per Section 1.4 of these Rules and Regulations, all Groundwater Wells are required to be mounted with a Meter to be eligible to participate in the Groundwater Allocation Program. All costs associated with the groundwater flow meter installation on the well are borne by the Groundwater Well Owner. The Groundwater Well Owner will pay for the costs to furnish and install each groundwater flow meter on the well.
- D. All costs associated with implementation of the ASR Program will be borne by the Groundwater Users that participate in the ASR Program. These costs include but are not limited to all capital, operations and maintenance costs and the costs incurred by the District in managing the ASR Program, as well conducting testing and monitoring. A Groundwater User participating in the ASR Program that fails to pay the cost associated with implementation of the ASR Program within 30 days of invoice shall not be entitled to receive Groundwater Credits through the ASR Program.

## **1.17 PENALTIES AND MITIGATION REMEDIES**

### **A. Penalties**

1. Any person that pumps groundwater in excess of the amount that is authorized under this Article shall be subject to a civil penalty not to exceed five-hundred dollars (\$500) per acre-foot pumped in excess of the amount the Groundwater User is authorized to extract. (Wat. Code. §10725.2 and §10732(a)(1).). Accrual of a negative account balance does not, by itself, constitute a violation.
2. A person who violates any provision, rule, regulation, ordinance or resolution of this Article shall be subject to:
  - a. A civil penalty not to exceed one thousand dollars (\$1,000) plus one hundred dollars (\$100) for each additional day the violation continues if the person fails to comply within thirty (30) days of notification by the District;
  - b. Restrictions on all water furnished by the District in accordance with Water Code Section 35423;
  - c. The penalties and mitigation remedies set forth (A) and (B) of this Section are cumulative and not exclusive.
3. In addition to the penalties and mitigation remedies provided in (A) and (B) in this Section, the District may initiate legal action against a person who violates any rule, regulation, ordinance or resolution of this Article and seek common law remedies under applicable law, including but not limited to public and private nuisance and Article X, Section 2 of the California Constitution.

B. Mitigation Remedies.

1. As a condition of the Groundwater Allocation Application and Agreement required by these Rules and Regulations, the Groundwater User covenants and agrees to mitigate the adverse impacts arising from their cumulative extractions exceeding its Allocation in quantities greater than 25 AFY, by the acquisition of supplemental replacement water in the same quantity as the exceedance.
  - a. The Groundwater User expressly authorizes the District, as its agent, to act on its behalf for purpose of identifying and acquiring supplemental replacement water as soon as practicable under then prevailing conditions.
  - b. The Groundwater User will reimburse the District for the actual costs incurred, as its agent, in acquiring supplemental replacement water to mitigate the adverse impacts of the exceedance, including but not limited to legal, administrative, engineering and water supply costs.
  - c. The “actual cost” of supplemental replacement water shall be equal to the per AF weighted average cost of all supplemental replacement water acquired by the District immediately following the issuance of a Notice of Violation to the Groundwater User. If no acquisitions are completed by the District for the benefit of the Groundwater User, then the actual costs will be those incurred thereafter for supplemental replacement water in amounts equal to or greater than the Groundwater User’s exceedance.
  - d. “Supplemental replacement water” means water acquired by the District from sources of supply outside the Westside Subbasin for the purpose of avoiding and minimizing undesirable results identified in the GSP as the agent for the Groundwater User.
  - e. “Notice of Violation” means written notification provided by the General Manager to the Groundwater User that identifies the specific quantity

of the exceedance and informs the Groundwater User that the District will be acting as its agent to acquire supplemental replacement water to mitigate the adverse impacts on the Basin on its behalf along with a summary estimate of the projected cost per AF. The Groundwater User will make a deposit of the District's estimated administrative and legal expenses attributable to the acquisition within 15 days of the Notice of Violation.

- f. Payments for the actual cost of supplemental replacement water will be paid within 30 days of the date of the invoice issued by the District.
- g. In years in which the District determines, in the exercise of its reasonable discretion, that prevailing conditions do not require a Groundwater User to acquire supplemental replacement water as a mitigation remedy to avoid undesirable results, the District will debit the Groundwater User's account, including future allocations, by an amount equal to the exceedance.

**C.     Consent and Acknowledgement**

The Groundwater Allocation Application and Agreement shall include an express condition that provides in substantially the same form: "The Groundwater User acknowledges and consents to comply with the Rules and Regulations, including but not limited to the Penalties and Mitigation Remedies set forth in §1.17".

### **1.18 YEAR-END PROCEDURES**

- A. After final groundwater use and supply accounting is completed for the Contract Year, the District will determine the amounts of Unused Groundwater or overuse for each Groundwater User's Groundwater Account.
- B. A Groundwater User may Carryover Unused Groundwater as provided in Section 1.12 of these Rules and Regulations.
- C. A Groundwater Account in which pumping exceeds the Groundwater Allocation plus Carryover will have a negative Groundwater Allocation balance carried forward to the following water year and attributed to all the land associated with the Groundwater User account.
- D. When there is change in ownership or Groundwater User status for lands that were registered in the Groundwater Allocation Program, the negative or positive allocation balance, inclusive of any Carryover or Groundwater Credit water, will be assigned to the Groundwater User's account associated with the land. A new Groundwater User for the same lands that seeks a new Groundwater Allocation in a subsequent year may apply for a Groundwater Allocation subject to any outstanding negative allocation balance for the associated lands. This means both negative and positive balances run with the land to future Groundwater Users as successors and assigns.

### **1.19 VARIANCE PROCEDURES**

- A. Where a Groundwater Users seeks a Variance, the Groundwater User shall make the request pursuant to a form provided by the District.
- B. The request shall:
  - 1. Identify the specific measure that is subject of the request;
  - 2. the reason(s) for the request;
  - 3. whether the approval is required to avoid physical and economic harm to the Groundwater User and an explanation thereof; and
  - 4. A statement of the requested relief.
- C. Except in the event of the emergency:
  - a. Prior to the Board of Directors considering a request for Variance, the Technical Advisory Committee shall be provided an opportunity to consider the Technical Issue(s) raised by the request for Variance, if there are any identified by the General Manager, and, on said issue(s), may provide advice or recommendations to the Board of Directors for its consideration. The Board of Directors shall consider the request for Variance expeditiously and, if possible, at the first regularly scheduled meeting following the Technical Advisory Committee's consideration of the Technical Issue(s) but no later than 90 days from the Variance request filing date.
  - b. If the General Manager's determinates that the request for Variance does not raise a Technical Issue, the request for Variance will not be considered by the Technical Advisory Committee. The Board of Directors will directly consider such a request and do so expeditiously, and, if possible, at the next regularly scheduled meeting but no later than 90 days from the Variance request filing date.
- D. Prior to taking action on a request for Variance, the Board of Directors will consult with the County of Fresno GSA representative to ensure that the granting of the requested Variance does not contribute to or cause undesirable results.

- E. The Board of Directors may grant a Variance upon making the following findings:
- a. Issuing the Variance will not undermine the effective implementation of the GSP;
  - b. The actions authorized under the Variance are not anticipated to cause material harm to others who have rights to use groundwater within the Westside Subbasin;
  - c. The Variance and the authorized actions are reasonably necessary and narrowly tailored to avoid unreasonable physical and economic harm to the Groundwater User; and
- F. The decision of the Board of Directors shall constitute final action on the Variance, subject to judicial review pursuant to California Code of Civil Procedure section 1094.5.

## **1.20 APPEAL**

- A. A Groundwater User (“appellant”) may appeal any decision made by the General Manager pursuant to these Rules and Regulations, by filing within 20 calendar days of that decision, a written notice of appeal with the District Secretary. The written notice of appeal shall include:
1. Name and address of the appellant,
  2. Brief description of the project (if applicable),
  3. The specific decision which appellant appeals,
  4. The date on which the decision was made,
  5. The basis or bases for the appeal,
  6. The specific action which appellant requests be taken on appeal, and
  7. All information appellant relies upon to support appellant’s appeal.
- B. Prior to the Board of Directors considering the appeal, the Technical Advisory Committee shall be provided an opportunity to consider the Technical Issue(s) raised by the appeal, if there are any identified by the General Manager, and, on said issue(s), may provide advice or recommendations to the Board of Directors for its consideration. The Board of Directors shall consider the appeal expeditiously and, if possible, at the first regularly scheduled meeting following the Technical Advisory Committee’s consideration of the Technical Issue(s).
- C. If the General Manager’s determinates that the appeal does not raise a Technical Issue, the appeal will not be considered by the Technical Advisory Committee and will be directly considered by the Board of Directors. The decision of the Board of Directors shall be final.
- D. The Board of Directors consideration of an appeal pursuant to (B) or (C) no later than 90 days from the date the appeal was filed.
- E. Upon the request of the project proponent or sua sponte by the District, the General Manager may reconsider a prior decision made pursuant to these Rules and Regulations, if there is new material information that was not reasonably available to the project proponent at the time the prior decision was made. For a decision on an

application for credits, (1) reconsideration may not occur until 5 years after the credits were provided, unless reconsideration is required to avoid a significant and undesirable result, and (2) if upon reconsideration the credits are reduced, the reduction shall be implemented over 6-year period, so long as the 6-year reduction would not result in a significant and undesirable result.

- F. The decision of the Board of Directors shall constitute final action on the appeal, subject to judicial review pursuant to California Code of Civil Procedure section 1094.5.

#### **1.21 MISCELLANEOUS**

- A. The General Manager is authorized and directed to do any and all things necessary to implement and effectuate these Rules and Regulations.
- B. The Board of Directors shall consider any changes or revisions to these Rules and Regulations at a public meeting.
- C. The General Manager shall provide notice of any Board of Director's approved changes or revision to these Rules and Regulations to all District landowners and Groundwater Users.
- D. These Rules and Regulations implement the GSP and are intended to avoid Undesirable Results within the Westside Subbasin. As such, the Rules and Regulations shall not be construed to authorize or direct action, of any kind, that would cause Undesirable Results.

**Attachment 1: Westlands Water District Groundwater Sustainability Agency  
Guidance For Processing Groundwater Transfer**

# **WESTLANDS WATER DISTRICT GROUNDWATER SUSTAINABILITY AGENCY GUIDANCE FOR PROCESSING GROUNDWATER TRANSFERS**

## **BACKGROUND**

Westlands Water District (District), serving as the Groundwater Sustainability Agency (GSA) of the Westside Subbasin, adopted the Westside Subbasin Groundwater Sustainability Plan on January 8<sup>th</sup>, 2020. The Westside Subbasin Groundwater Sustainability Plan (GSP) supports the utilization of Groundwater Transfers. Additionally, the District's Article 1: Regulations for Groundwater Allocation Program and Use of Groundwater within the Westside Subbasin Section 1.9 D describes the Groundwater Transfer Process.

The purpose of this guidance document is to clarify the District's review process when a groundwater transfer application is submitted for the District's consideration.

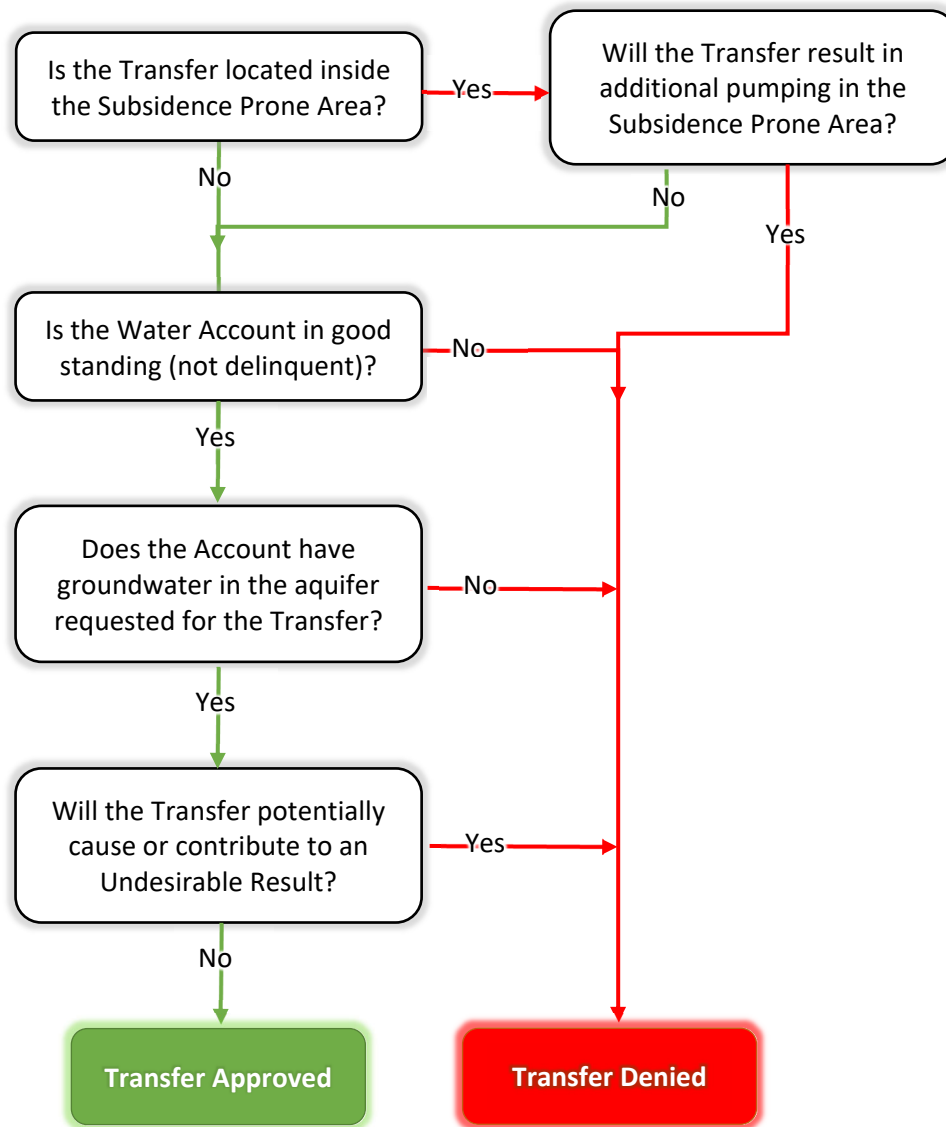
## **GOALS AND OBJECTIVES**

1. Ensure the Westside Subbasin is sustainably managed
2. Ensure groundwater use in the District is optimized
3. Review and approve projects effectively, efficiently, and timely
4. Ensure any transfers do not cause an undesirable result
5. Enhance groundwater management flexibility

## **FACTORS TO BE CONSIDERED**

1. Is the Groundwater User delinquent?
2. Is Groundwater available in the aquifer requested (if applicable) for the transfer?
3. Will the transfer potentially cause or contribute to an undesirable result? The attached figures describe the water levels by monitoring network location that could result in an undesirable result. Transfers shall be approved so long as the most recent fall or spring groundwater levels for the pumping location are greater than the listed parameters in the attached figures.

## GROUNDWATER TRANSFER PROCESS



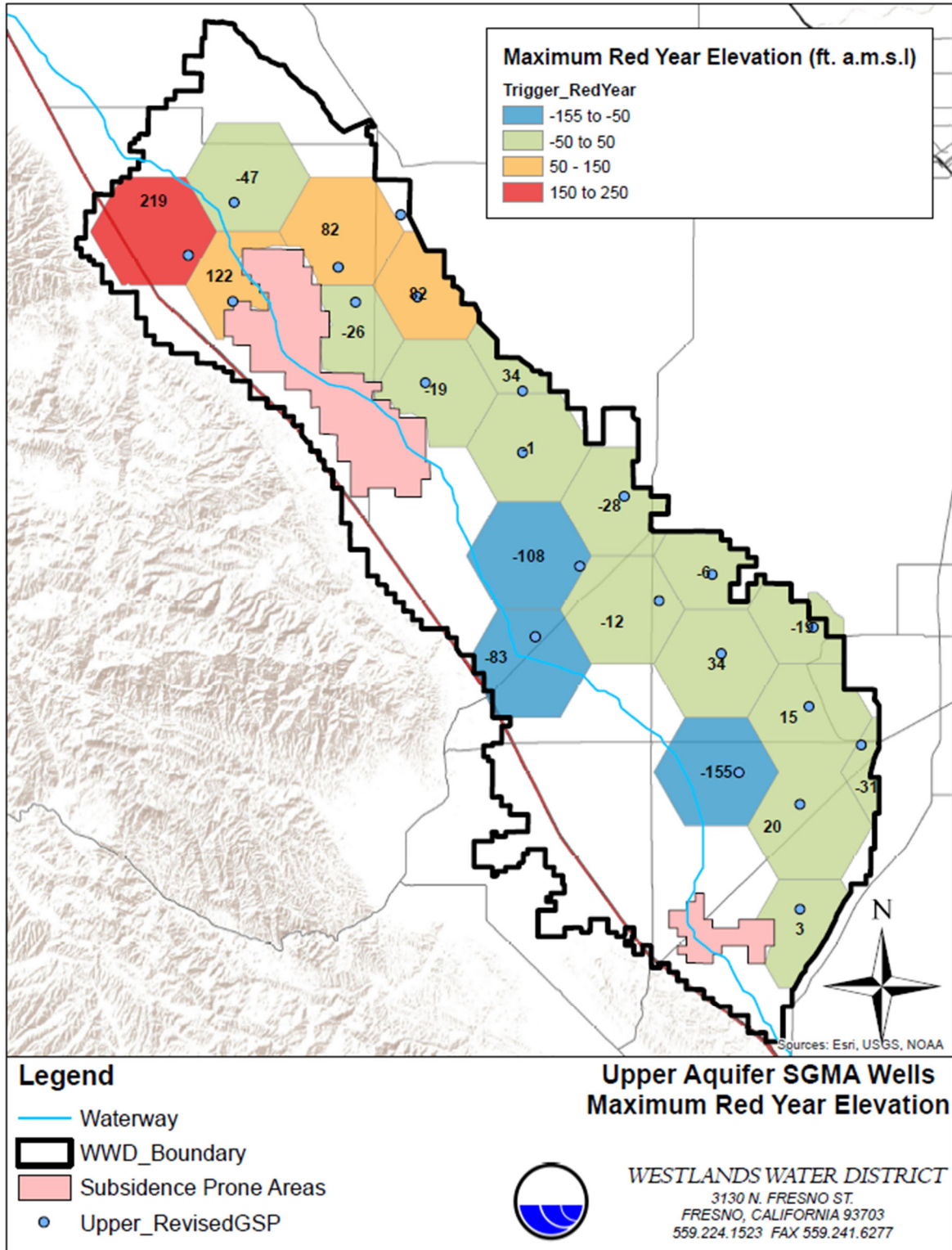


Figure 1: Upper Aquifer Red Year Trigger

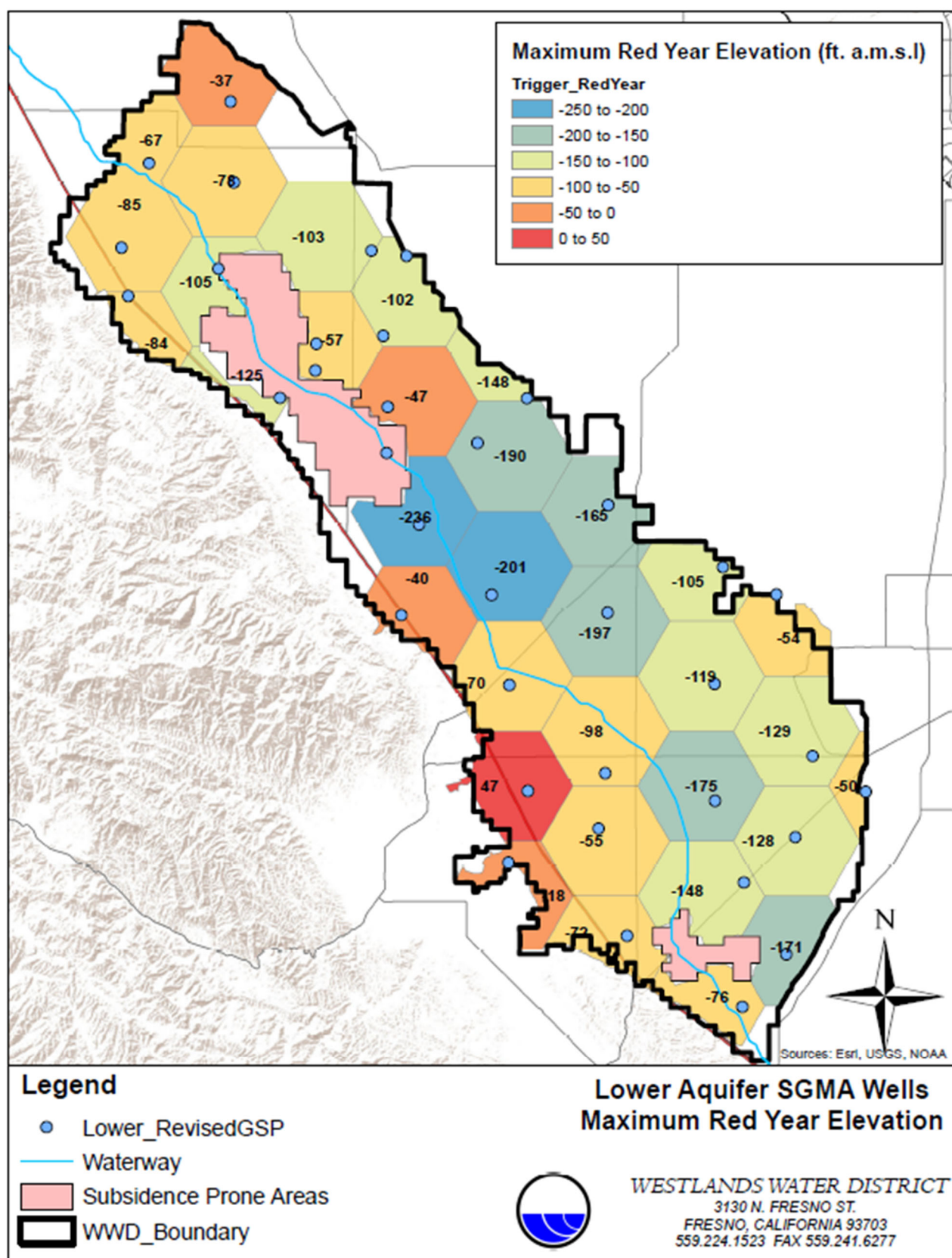


Figure 2: Lower Aquifer Red Year Trigger

**Attachment 2: Westlands Water District Groundwater Sustainability Agency  
Guidance For Processing Groundwater Recharge Projects Application**

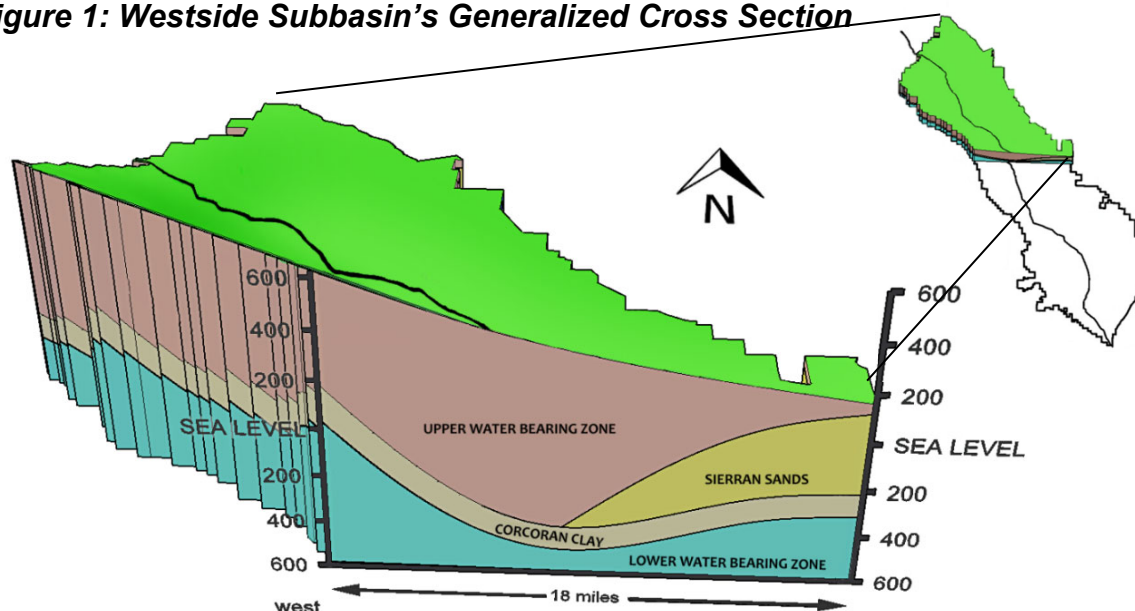
## WESTLANDS WATER DISTRICT GROUNDWATER SUSTAINABILITY AGENCY GUIDANCE FOR PROCESSING GROUNDWATER RECHARGE PROJECT APPLICATIONS

### BACKGROUND

Westlands Water District (District), serving as the Groundwater Sustainability Agency (GSA) of the Westside Subbasin, adopted the Westside Subbasin Groundwater Sustainability Plan on January 8<sup>th</sup>, 2020. The Westside Subbasin Groundwater Sustainability Plan (GSP) supports the development of recharge activities.

The Westside Subbasin (Subbasin) includes 622,000 acres in Fresno and Kings counties. Fresh groundwater bearing geologic deposits in the Subbasin are subdivided into three units: the Upper Aquifer, the Lower Aquifer, and the Corcoran Clay, which separates the two water bearing aquifers. The Corcoran Clay underlies approximately 544,000 acres of the Subbasin, absent only in a small southwest area of the Subbasin where the Upper Aquifer and Lower Aquifer is a single aquifer unit. Figure 1 titled “Westside Subbasin’s Generalized Cross Section” depicts the Corcoran Clay as the confining layer that separates the Upper Aquifer and Lower Aquifer.

**Figure 1: Westside Subbasin’s Generalized Cross Section**



The purpose of this guidance document is to clarify the District's review process when a groundwater recharge project application is submitted for the District's consideration. Specific guidance is enclosed regarding recharge projects that overlie the Corcoran Clay.

## **GOALS AND OBJECTIVES**

1. Develop feasible recharge projects
2. Review and approve projects effectively, efficiently, and timely
3. Ensure water use in the District is optimized through enhancing: (a) the quantity of water in the Subbasin, and (b) conjunctive use of available surface water and groundwater from the Subbasin
4. Ensure the credits provided to a project are for water that would not be in the Subbasin absent the project
5. Encourage the right recharge project in the right area of the Subbasin
6. Enhance water supply management

## **FACTORS TO BE CONSIDERED**

1. Project location and geology
2. Location of the Corcoran Clay
3. Credits requested in the Upper Aquifer and/or Lower Aquifer
4. Drainage impaired lands
5. Well data availability
6. Water quality impacts

## **DISTRICT PROCESS TO REVIEW FILED APPLICATIONS**

The District takes the following steps in reviewing applications:

1. Check the project application for completeness and notify the applicant if additional information is required to complete staff's review
2. Evaluate the project's potential for recharge
  - a. If clarification or additional information is needed, staff will contact the applicant to resolve any issues

- b. If the project application is complete and in order, staff may approve the application.
  - c. The criteria for evaluating aquifer credit are described below.
- 3. Confer with the applicant to determine if staff linked all water user accounts correctly
- 4. Review the wells associated with application and request opening meter readings prior to start of the project
- 5. Email approval, which includes the following:
  - a. Surface water meter location used to determine the amount of water recharged;
  - b. Reference term 1 of the application, which required the applicant not to pump groundwater or receive surface water from entity that pumped groundwater for the balance of the Contract Water Year; and
  - c. Aquifer credit location (See the Section titled Determination of Aquifer Credit Criteria), which is determined based on Corcoran Clay depth or extent, and presence of other clay layers in the Upper Aquifer
- 6. Project operation review includes:
  - a. Collecting weekly meter reading data;
  - b. Monitoring by the applicant; and
  - c. Validating the evaporation assumptions provided by the applicant
- 7. At the conclusion of the Contract Water Year, the District will send an email notifying the applicant of the Groundwater Credit Developed by Aquifer.

## **DETERMINATION OF AQUIFER CREDIT CRITERIA**

The determination of an aquifer credit location and amount is dependent on the project type.

### **Aquifer Storage and Recovery**

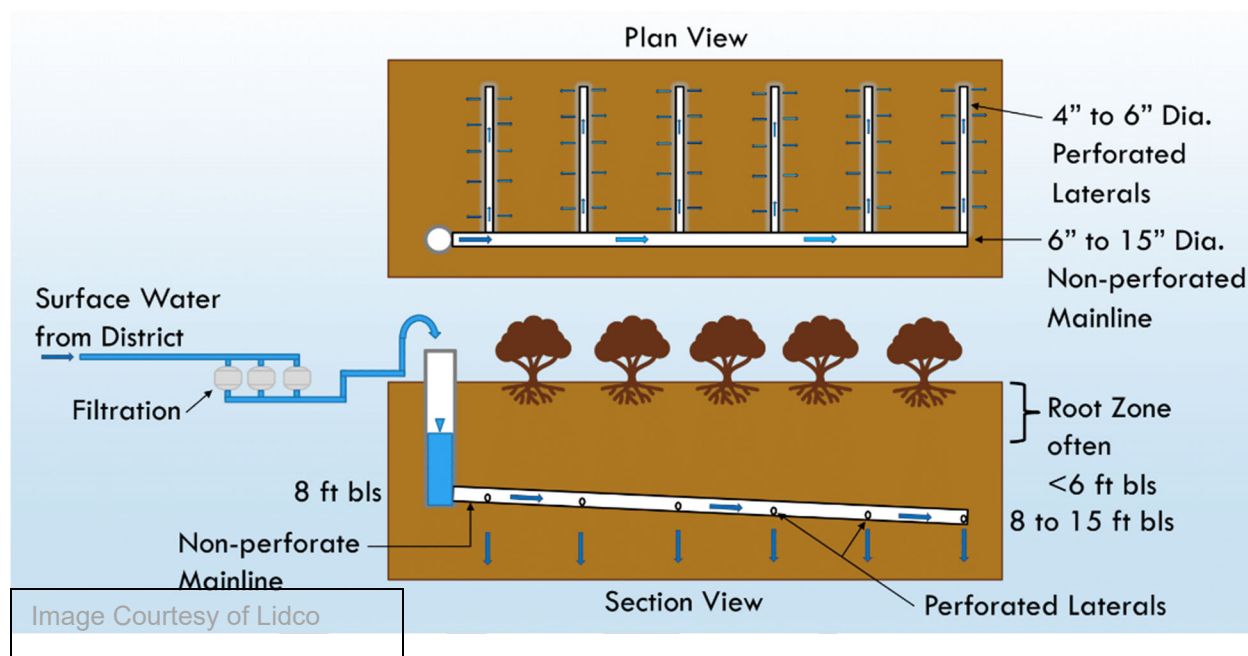
Aquifer Storage and Recovery (ASR) refers to the recharge activity of injecting surface water into the aquifer using a groundwater well or dry well for temporary storage, which is then later recovered for irrigation or other beneficial use. Figure 2 titled “Typical ASR

**Figure 2 Typical ASR Layout**



## Recharge Basins, Sublateral Recharge, and Over Irrigation

Recharge basin refers to an above ground location that is designed to infiltrate surface water through permeable soils into the aquifer. Figure 3 titled, “Sublateral Recharge Project Example” illustrates a typical infiltration schematic of a sublateral recharge project completed below the root zone, using perforated pipelines.



**Figure 3: Sublateral Recharge Project Example**

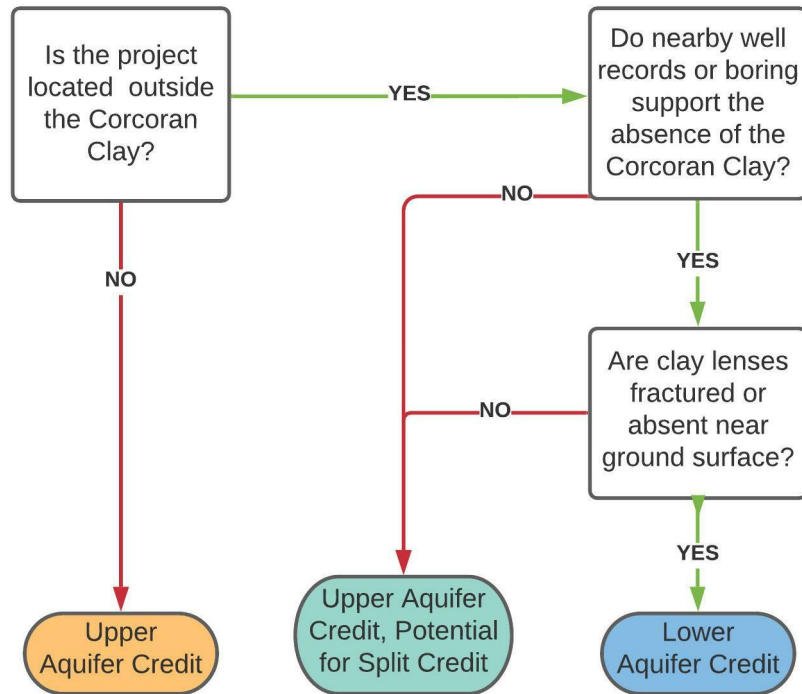
Applications submitted for a recharge basin, sublateral recharge and over irrigation type projects receive an aquifer credit based on the underlying geologic conditions. Staff confirms that the proposed location is not designated as drainage impaired or located in an area with a shallow water table.

If the project location overlies the Corcoran Clay, then an Upper Aquifer credit is provided.

**Figure 4** shows sections in the subbasin where the Corcoran Clay is present, absent, or a combination of both. If the project location does not overlie the Corcoran Clay, as listed in **Table 1**, then staff investigates the project questions below for concurrence:

1. Do the well completion report(s) in the vicinity of the project support the absence of the Corcoran Clay?
2. Are clay lenses absent or fractured near ground surface?

3. Does the supplemental information, such as exploratory borings, support infiltration potential to the Lower Aquifer?



If the answer to these questions is yes, then the project's credits are attributed to the Lower Aquifer.

**Table 1: Unconfined Aquifer Sections in the Westside Subbasin**

Township	Sections									
T. 19S R. 16E	29	30	32	33						
T. 20S R. 16E	3	4	5	8	9	10	11	12	13	
	14	15	16	19	20	21	22	23	24	
	25	26	27	28	29	30	32	35	36	
T. 20S R. 17E	5	6	7	8	9	10	14	15	16	
	17	18	19	20	21	22	23	26	27	
	28	29	30	31	32	33	34	35	36	
T. 21S R. 16E	1	2	11	12	13	14				
T. 21S R. 17E	1	2	3	4	5	6	7	8	9	
	10	11	12	13	14	15	16	18	22	
	23	24	25	26						
T. 21S R. 18E	7	8	17	18	19	30	31			



## POTENTIAL UPPER AQUIFER RECHARGE AREAS

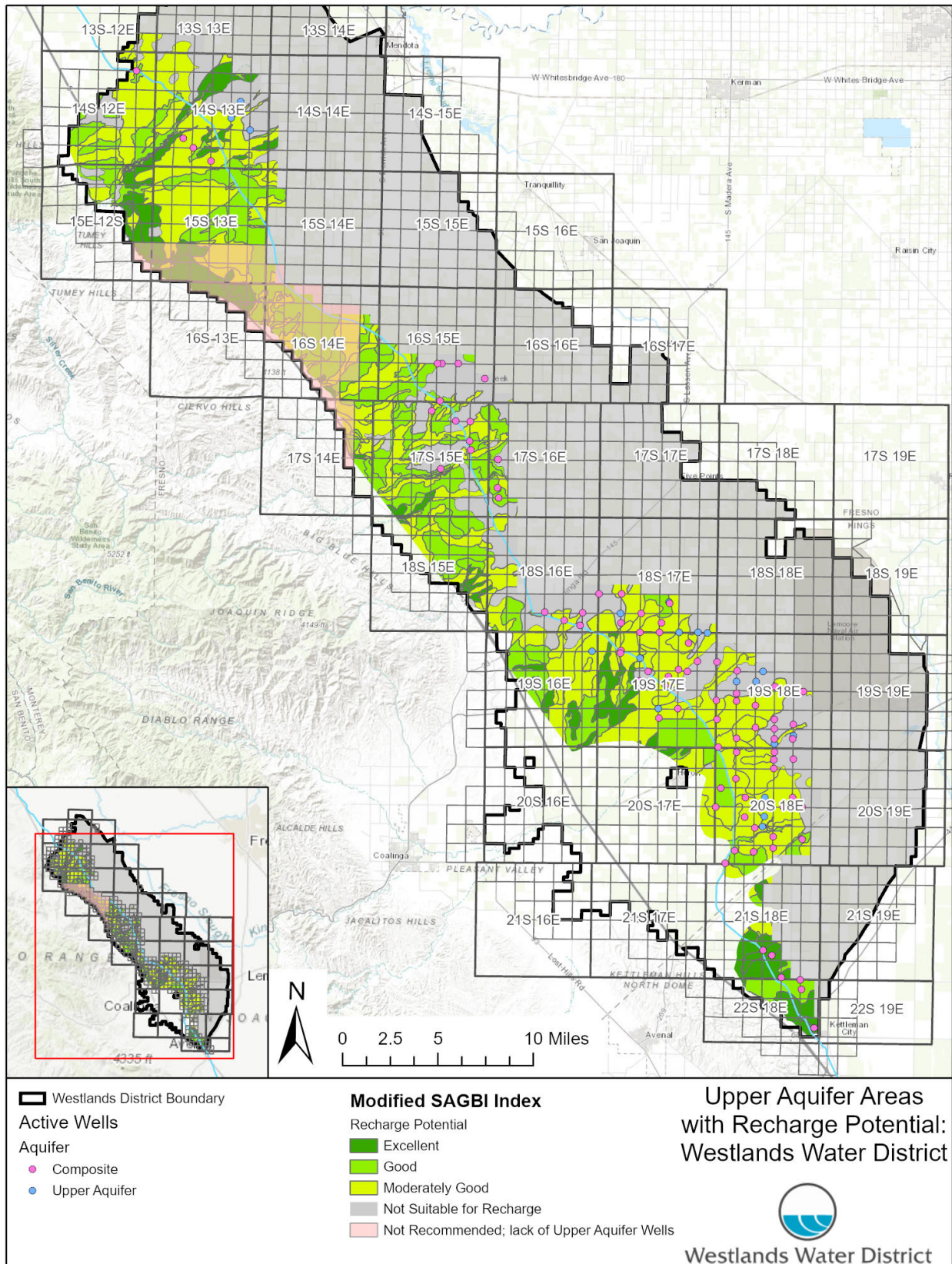
Recharge projects that overly the Corcoran Clay and recharge through the vadose zone are eligible for 100% of the net water recharged to be credited to the Upper Aquifer. Figure 5 shows areas of the subbasin that have potential for Upper Aquifer recharge based on the modified Soil Agricultural Groundwater Banking Index (SAGBI)<sup>1</sup> developed by UC Davis, drainage impaired lands designated by USBR (2004), and availability of Upper Aquifer and composite wells, for extraction. The modified SAGBI index was developed using five site specific factors to determine recharge potential:

1. **Deep percolation:** soils must be able to transmit water beyond the root zone (5 ft)
2. **Root zone residence time:** the duration of saturated/near saturated conditions after water application
3. **Topography:** less steep slopes hold water better and score higher than steeper slopes
4. **Chemical limitations:** high salinity soils may result in saline leachate and poor water quality
5. **Soil surface conditions:** certain soils may be susceptible to compaction and erosion if large volumes of water are applied

The SAGBI index was intended to be used by growers as a tool for determining feasibility of off-season over-crop recharge and only focuses on the top 5-10 feet of soil as a result. Underlying aquifer materials vary widely, and the SAGBI index may not offer a complete view of recharge potential. The GSA highly recommends and may require geotechnical support (borings, penetration tests, etc.) be undertaken prior to application and/or construction of any recharge projects.

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<sup>1</sup> O'Geen A, Saal M, Dahlke H, Doll D, Elkins R, Fulton A, Fogg G, Harter T, Hopmans J, Ingels C, Niederholzer F, Sandoval Solis S, Verdegaal P, Walkinshaw M. 2015. Soil suitability index identifies potential areas for groundwater banking on agricultural lands. Calif Agr 69(2):75-84. <https://doi.org/10.3733/ca.v069n02p75>.



**Table 2: Favorable Sections for Upper Aquifer Recharge**

<b>Township</b>	<b>Sections</b>								
14S/12E	02 28	11 33	12 34	13 35	14 36	24	25	26	27
14S/13E	18 31	19 32	20 33	21 34	22 35	27	28	29	30
15S/12E	01	02	12	13					
15S/13E	01 10 20	02 11 21	03 12 22	04 13 23	05 14 24	06 15	07 16	08 17	09 18
15S/14E	07								
16S/14E	13	14	24	25	35	36			
16S/15E	19	29	30	31					
17S/14E	01	13							
17S/15E	06 32	08 33	12 34	13	17	19	27	28	29
17S/16E	07								
18S/15E	02	03	04	10	11	13	14	24	
18S/17E	27	28	33	34					
19S/16E	01 14	04 15	08 16	09 22	10 23	11 24	12 25	13 26	
19S/17E	03 19 34	04 20 35	05 21 36	06 25	07 26	08 27	10 28	15 29	18 30
19S/18E	29	30	31	32					
20S/17E	02								
20S/18E	04 18	05 19	06 20	07 21	08 22	09 27	15 28	16 29	17 32
21S/18E	27	28	33	34					
22S/18E	02	03							

### **Other Losses**

Percolation basins, over irrigation, or any other projects where water is applied to the ground surface are subject to evaporation losses. Subsurface lateral recharge or other underground recharge projects may not be subject to evaporation losses. All projects that recharge through the vadose zone (the unsaturated zone between the surface and the top of the water table) are subject to a 10% loss.