

The City of
MADERA

City of Madera

WATER SUPPLY ASSESSMENT

FOR

GRANITE CREEK DEVELOPMENT

DRAFT

March 2025

Prepared for:



Prepared by:



March 31, 2025

Crawford & Bowen Planning, Inc.
113 N. Church Street, Suite 310
Visalia, CA 93291

Draft

Attention: Emily Bowen, LEED AP
Principal Environmental Planner

Subject: Water Supply Assessment for Granite Creek Development - Draft
(SB 610 Requirements)

Dear Emily:

We are pleased to submit this Water Supply Assessment (WSA) draft report for the Granite Creek Development. This report is intended to satisfy the requirements of SB 610 by evaluating the impact of this project on existing and future water supplies.

This report quantifies the project's water supply requirements, identifies the potential impact on the City's supply availability, includes discussions on the supply reliability, and provides supply vs. demand comparisons, along with conclusions on supply availability to meet the project. The report concludes that the City's total projected water supply availability during normal, single-dry, and multiple-dry water years will meet the projected water demand for the Project over the next 20 years (through 2045).

We are extending our thanks to you, and the other development team, for the guidance and valuable input and reviews during the completion of this study.

Sincerely,

AKEL ENGINEERING GROUP, INC.

Tony Akel, P.E.
Principal

Enclosure: Report

**City of Madera
Water Supply Assessment
For Granite Creek Development**

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City of Madera Water Supply Assessment For Granite Creek Development

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Definitions and Abbreviations

af	acre-foot/feet
afy	acre-foot/feet per year
afy/ac	acre-foot/feet per year per acre
Akel	Akel Engineering Group, Inc.
CEQA	California Environmental Quality Act
CMGSA	City of Madera Groundwater Sustainability Agency
City	City of Madera
ENSO	El Nino Southern Oscillation
DWR	Department of Water Resources
SGMA	Sustainable Groundwater Management Act
GP	General Plan
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
MID	Madera Irrigation District
MJGSP	Madera Subbasin Joint Groundwater Sustainability Plan
SB	Senate Bill
SOI	Sphere of Influence
sqft	square foot
UWMP	Urban Water Management Plan
WSMP	Water System Master Plan
WSA	Water Supply Assessment

WATER SUPPLY ASSESSMENT FOR GRANITE CREEK DEVELOPMENT

1.0 PURPOSE

Law

- 10910 (a) ...Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.
- 10912 (a)(5) ... “Project” means any of the following:
- (1) A proposed residential development of more than 500 dwelling units.
 - (2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.
 - (3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.
 - (4) A proposed hotel or motel, or both, having more than 500 rooms.
 - (5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.
 - (6) A mixed-use project that includes one or more of the projects specified in this subdivision.
 - (7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.
- SB 610 (2) ...The bill would require the assessment to include, among other information, an identification of existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project and water received in prior years pursuant to those entitlements, rights, and contracts. The bill would require the city or county, if it is not able to identify any public water system that may supply water for the project, to prepare the water supply assessment after a prescribed consultation.

This Water Supply Assessment (WSA) report is intended to satisfy the requirements of Senate Bill (SB) 610, which was adopted by the California State Legislature to address some of the uncertainties in the water supply and gain a more detailed understanding of the water availability for different projects.

The subject of this WSA is the proposed Granite Creek Development (Project) within the City of Madera (City). This WSA assesses the water supply sufficiency of the projected water demands by evaluating the impact of the Project’s water demands on the water supply through 2045, as stipulated in the SB 610 requirements.

Pursuant to the California Water Code Division 6, Part 2.10, Sections 10910-10915, any city or county, which has proposed larger developments or land use plans that are subject to California Environmental Quality Act (CEQA), is required to prepare a WSA to document potential environmental impacts of the projects.

The total area of the proposed Project is estimated at 203.6 acres. Since the project area is transitioning to a mixed use, which includes residential, commercial, open space, and public uses, the proposed development qualifies as a *Project* and requires a WSA pursuant to Sections 10912(a)(5). The WSA must be included in the environmental document addressing the potential environmental impacts of the project. To ensure project approval, the WSA must conclude that the supply of domestic water available to the development is adequate and will continue to be adequate over the next 20 years during normal, single-dry, and multiple-dry years.

This WSA is developed with the objective of aiding the City of Madera in meeting the requirements of SB 610.

2.0 PROJECT BACKGROUND

The following section includes a description of the proposed Granite Creek Development as well as the relevant documentation.

2.1 Project Description

The Project is a proposed development of 203.6 acres, located in Madera County. The Project is bounded between Road 23 and Road 24, just North of Avenue 14 1/2 ([Figure 1](#)).

Based on the Project's description and assumptions received from Crawford and Bowen Planning, Inc. on March 5, 2025, the Project changed from agricultural land use to a mixed-use land use designation that is analyzed in this WSA. The Project's conceptual plan includes 146.27 acres designated for residential use, 25.25 acres designated for commercial use, 22.34 acres designated for public and semi-public use, and 9.74 acres designated for open space ([Table 1](#)).

A 5-year buildout is assumed by Akel Engineering Inc. (Akel), with construction beginning in 2026 and being completed by 2030 as shown on [Table 2](#).

2.2 Relevant Documentation

The City has either completed or participated in studies intended to document the water supply sufficiency. This section documents several reports that were consulted during the preparation of this water supply assessment.

- [City of Madera Urban Water Management Plan 2020 Update, September 2022 \(2020 UWMP Update\)](#): This report includes a summary of the City’s current water supply and demand conditions, water shortage contingency plan, and detailed documentation of their future water supply and demand strategies for the City. The report also includes the recycled water discussion and future planning.
- [City of Madera 2014 Water System Master Plan, September 2014 \(2014 WSMP\)](#): This plan is based on the City’s 2009 General Plan. It documents the City’s existing and future water use, projected water duty factors, water supply, and water infrastructure. It evaluates the City’s water system and recommends capacity improvements necessary to service the needs of existing users and for servicing the future growth of the City.
- [Madera Subbasin Sustainable Groundwater Management Act - Joint Groundwater Sustainability Plan, Updated March 2023 \(2020 Joint GSP\)](#): This act documents the latest groundwater basins’ prioritization, adjudication, and overdraft conditions. It allows for multiple groundwater sustainability plans implemented by groundwater sustainability agencies and coordinated under a single coordination agreement that covers the entire basin (Water Code §10727).
- [Sustainable Groundwater Management Act 2019 Basin Prioritization, May 2020 \(2019 SGMA-BP\)](#): This map documents the latest groundwater basins’ prioritization, adjudication, and overdraft conditions.
- [City of Madera 2009 General Plan \(2009 GP\)](#): This plan documents the preparations of Vision Madera 2025, which listed the direction of future City growth, the guiding framework for land uses, the policies of public services and urban design, and the approaches of sustainable development.

3.0 REQUIRED SB 610 DETERMINATIONS

3.1 SB 610 Determinations

Water Code Sections 10910 and 10912 state:

10910(a) Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.

10912(a) “Project” means any of the following:

- (1) A proposed residential development of more than 500 dwelling units.*
- (2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.*

- (3) *A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.*
- (4) *A proposed hotel or motel, or both, having more than 500 rooms.*
- (5) *A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.*
- (6) *A mixed-use project that includes one or more of the projects specified in this subdivision.*
- (7) *A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling unit project.*

Based on the following assumptions, SB 610 does apply to the Proposed Project.

- The Proposed Project is subject to the California Environmental Quality Act (CEQA); therefore, an Environmental Impact Report (EIR) is required.
- The Proposed Project is a mixed-use project that includes residential, commercial, public, and open space land use. Because of the inclusion of more than one type of land use that is listed in Water Code Section 109129(a), section (6) defines this as a “Project”.

3.2 Identified Public Water System

Water Code Sections 10910 states:

10910(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined by Section 10912, that may supply water for the project.

10910(c) “Public water system” means a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections...

The Project is located on the western edge of the City of Madera, just outside of the City’s limits but, according to the Madera Local Agency Formation Commission, Resolution No. 2018-009, the City’s Sphere of Influence (SOI) is approved to expand and include the Project Site area. Therefore, the City of Madera is identified as the public water system for this project.

3.3 City’s UWMP Update and Demand Determination

Water Code Section 10910 states:

10910(c)(1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).

The City of Madera adopted the City's 2009 General Plan in October 2009. The updated General Plan includes the City's future growth through the year 2025 with the guiding framework for land uses, the policies of public services and urban design, and the approaches of sustainable development.

The City of Madera adopted their 2020 UWMP Update in September 2022 which includes the City's future water demands for future developments within the existing city limits, as well as future developments within future service areas currently outside the existing city limits. Currently, the Project is not within the City limits and only half of the area is within the SOI. Therefore, the Project is not included in the 2020 UWMP Update and requires an additional demand that is discussed in [Section 5](#).

4.0 CITY OF MADERA WATER SERVICE AREA

4.1 City of Madera Service Area

Figure 1 details the City of Madera's city limits, urban growth boundary, and the City's sphere of influence. The City of Madera's current limits encompass approximately 10,100 acres.

4.2 Population

A population of 65,526 people in the City of Madera were served water in 2020 and this is expected to increase to 81,552 people by 2040 with an assumed 1.1% growth rate (**Table 3**). An increase in population is likely to impact the City's climate conditions.

4.3 Climate

The City of Madera's climate plays a role in the amount of supply available. They have a Mediterranean climate where summers are hot and dry, and winters are cold and wet. The average temperature ranges from 80°F in July to 45 °F in January. **Table 4** displays the average temperature (including high and low) from the past 90 years, with higher records during summer months.

The City of Madera typically receives 10.8 inches of rain per year. **Table 5** displays the average precipitation values. It is important to note that while previous trends have associated increasing

temperatures with decreasing rainfall, increasing temperatures can also intensify the El Niño Southern Oscillation (ENSO) thereby increasing precipitation.

5.0 PROJECTED WATER DEMAND

This section includes a summary of the water duty factors, the City's water demand, the estimated water demand for the Project, and a comparison between the estimated demand in the 2020 UWMP Update and this 2025 WSA.

5.1 Water Duty Factor

Domestic water duty factors are coefficients commonly used in the planning level analysis to estimate future average daily demands for predetermined land uses of a specific area. The water duty factor is multiplied by the number of gross acres to yield the average daily demand projections.

5.1.1 2020 UWMP Update Water Duty Factor

The 2020 UWMP Update did not list the water duty factors used for the various land uses. However, it indicated that the projected water use is based on the 2020 Water Use Target of 167 gpcd in 2030 for residential uses (including residential landscaping). Akel derived the water duty factors for commercial and public institutional uses by dividing the land use area for each respective use by the corresponding annual water usage recorded in the City's 2020 UWMP Update tables.

5.1.2 2025 WSA Water Duty Factor

In determining the projected indoor and outdoor water duty factors, Akel consulted documents including the 2020 UWMP Update, the 2020 Infrastructure Master Plan, the 2014 Madera WSMP, and other San Joaquin Valley water system master plans that document duty factors, as well as the water demand factor database used by Akel Engineering Group. Thus, the Project's indoor water duty factor for residential is estimated at 160 gpd/DU, the indoor water duty factor for commercial is estimated at 700 gpd/ac, and the indoor water duty factor for public and semi-public is estimated at 126 gpd/ac. The Project's outdoor water duty factor for residential is estimated at 7 gpd/DU, the outdoor water duty factor for residential is estimated at 179 gpd/ac, and the outdoor water duty factor for commercial is estimated at 294 gpd/ac ([Table 6](#)).

5.2 Project's Water Demand

Based on applying the water duty factor for each land use type and multiplying them to their respective areas, the Project's indoor water demand is calculated at 267,210 gpd (equivalent to 299.28 afy), and the outdoor water demand is calculated at 21,882 gpd (equivalent to 24.51

afy). The total water demand for this Project is calculated at 289,092 gpd (equivalent to 323.78 afy), as shown on [Table 6](#).

5.3 Total Water Demand

The projected water demand of this mixed-use development is not included in the 2020 UWMP Update because it was initially designed for agricultural use. Therefore, the total proposed water demand will be added to the future water demand of 2020 UWMP Update table, as shown on [Table 7](#). The total water demand of the development and the 2020 UWMP Update is calculated at 14,870 afy by 2025. The UWMP Update does not include projections for the year 2045; however, based on the average annual changes between 2025 and 2040, the total projections (including the Granite Creek development) are assumed to be 17,278 afy by 2045.

6.0 CITY OF MADERA WATER SUPPLY

This section includes the City's water supply projection under different water years (normal, single-dry, and multiple-dry years). Groundwater is currently the City's only supply of water, which can also be impacted by both surface water and stormwater. Potential opportunities may arise for the City to receive small portions of surface water through exchanges with the Madera Irrigation District (MID). Drought planning efforts and the City's contingency plan are also discussed in this section.

6.1 City of Madera Water Supply (Normal Year)

The City currently receives the entirety of their water supply from groundwater. There is some groundwater that is recharged from both surface water and stormwater. There are no current plans to participate in any transfer or exchange agreements.

6.1.1 Groundwater

Groundwater is the only source of the City's potable water supply. The groundwater basin underlying the City is the Madera Subbasin (5.022-06) within the San Joaquin Valley Basin (5.022) (2020 UWMP Update Table 6-1) ([Figure 3](#)). Although the Madera Subbasin is not adjudicated, the Department of Water Resources (DWR) has identified the Madera Subbasin as a critically over-drafted basin and is classified as high priority, based on the 2019 SGMA-BP.

There are seven GSAs within the Madera Subbasin that work to manage the groundwater aquifer. The City created their own GSA, known as the City of Madera Groundwater Sustainability Agency (CMGSA). The CMGSA works collaboratively with the other six GSAs to implement projects that are aimed at obtaining sustainable groundwater conditions by 2040. They have adopted the Madera Subbasin Joint Groundwater Sustainability Plan (MJGSP) that was updated in 2023 to achieve compliance with the Sustainable Groundwater Management Act of 2014 (SGMA). The City has two projects listed in their GSP:

- *Berry Basin (Implemented in 2018)*: Objective is to increase recharge of the Berry Basin in conjunction with MID.
- *Meters and Volumetric Pricing (Implemented in 2015)*: Objective is to install water meters and implement volumetric billing for single-family homes to reduce evaporation and groundwater pumping.

Historically, groundwater pumping has decreased over time to ensure that the water demand usage remains below their 2020 target. Based on the City's 2020 UWMP Update, the City's confirmed 2020 target was 196 GPCD, but their actual 2020 GPCD was 119 GPCD. The UWMP Update documents 9,203 AF of groundwater pumped in 2016, and only 8,754 AF pumped by 2020. This is largely due to mitigation efforts.

According to the 2020 UWMP Update, the City maintains a conservative expectation where groundwater pumping will increase from 14,870 afy to 17,278 afy based on the 2020 water use target over the next twenty years ([Table 8](#)).

The supply total is assumed to match the demand total since groundwater pumping will operate to meet demands per 2020 UWMP Update. Therefore, the city won't meet the water deficit in a normal year, as shown on [Table 9](#).

6.1.2 Surface Water

The City may receive some surface water through the overflow of the Fresno River during wet months. This is an important source of groundwater recharge; however, the City does not have water rights or contracts from the government to claim this supply. The City has purchased small amounts of surface water from MID in the past to aid with groundwater recharge.

6.1.3 Stormwater

There are stormwater basins throughout the City that have been connected to MID facilities and are used for groundwater recharge.

6.1.4 Recycled Water

The City currently does not have any programs implementing recycled water. The City has conducted a recycled water feasibility study in 2013, where the analysis predicted a recycled water supply up to 3,300 AF/year. However, the costs from treatment and distribution prevented further action on implementation.

6.1.5 Exchanges and Transfers

The City currently does not have any agreements to exchange or transfer water with other agencies. However, opportunities may arise to exchange treated wastewater for surface water with MID.

6.2 Drought Planning

This section summarizes the City's effort to increase drought resiliency, which includes the response to climate change by integrating mitigation programs. This section also summarizes the City's projected water supply under single and multiple-dry years.

6.2.1 Response to Climate Change

Due to the notable changes within the climate, the City's 2020 UWMP Update warns that drastic changes in temperatures, precipitation, etc. may impact the available water supply. The City plans to address these changes by reducing the per capita demands by potentially initiating the use of recycled water in the future. By using recycled water, as well as other mitigation strategies, the water demand for landscapes will not increase.

6.2.2 Water Supply (Dry-Years)

According to the 2020 UWMP Update, the City's available water supply during a single dry year will be largely unaffected by dry weather conditions due to the City's reliance on groundwater. Therefore, the City's water supply will consistently meet the water demands through 2045, as shown on [Table 10](#). Similarly, the available water supply during multiple dry years will also remain unaffected by dry weather conditions through 2045, as shown on [Table 11](#). However, because the groundwater basins are critically over-drafted, caution is still advised.

6.2.3 Demand and Supply Comparison (Dry Years)

The total water supply and demand can be compared during single-dry and multiple-dry years. These results are summarized in [Table 10](#) and [Table 11](#). The tables verify that the City's total water supplies are sufficient to meet the City's water demands with the addition of the Project under different water years. Per the 2020 UWMP Update, the supply is assumed to match the demand since groundwater pumping will continue to operate until demands are met even though state-wide conservation mandates are required.

6.2.4 Water Shortage Contingency Plan

In the event of a water shortage, the City has outlined their response levels and respective conservation targets ([Table 12](#)), as well as the specific actions that will be taken to meet that criteria ([Table 13](#)). When existing conditions (stage 1) become strained, the conservation target grows from stage 2 through stage 4 where there would be a 5-10%, 10-35%, and 35-50% decrease in water usage, respectively. Actions to meet the conservation target include limits on when and what kind of water usage is permissible.

7.0 SUMMARY

This water supply assessment was prepared for the Project with the intent of meeting the requirements of SB 610. The analysis and findings in this WSA indicate the following:

- The City is identified as the public water distributor for the Granite Creek Development Project. It should be noted that the Madera Subbasin, which underlies the City, is not adjudicated and the projected supply volumes do not comprise a determination of water rights or maximum allowable pumping.
- The proposed land use types, net acreage, and units for the project were provided by Crawford and Bowen Planning, Inc. on March 5, 2025.
- A 5-year buildout of the Granite Creek Development with construction beginning in 2026 and being completed by 2030 was assumed by Akel Engineering Group, Inc. on March 6, 2025.
- The Granite Creek Project was designed as an agricultural land use type and was not accounted for in the 2020 UWMP Update. The Development switched to this mixed-use project with residential, commercial, public and semi-public, and open space land uses and is analyzed in this 2025 WSA.
- The estimated water demand of the project site was calculated as 323.78 afy. This total proposed water demand will be added to the future water demand of 2020 UWMP Update table. The total water demand of the development and the 2020 UWMP Update is calculated at 14,870 afy by 2025, increasing to 17,278 afy by 2045.
- The supply total is assumed to match the demand total since groundwater pumping will operate to meet demands per 2020 UWMP Update. Therefore, the City's total projected water supply availability during normal, single-dry, and multiple-dry water years will meet the projected water demand for the Project over the next 20 years (through 2045).

Tables

Table 1 Future Land Use Inventory

Granite Creek Precise Plan - Water Supply Assessment
City of Madera

PRELIMINARY

Land Use Type	Total Area (acre)	Maximum Dwelling Units per Gross Acre or Maximum Non- Residential Floor Area Ratio	Maximum Dwelling Units (DU)	Maximum Development Potential (sqft)
Demand Generating				
Residential				
Low Density Residential	105.44	2.1 - 7.0 dwelling units	738	-
Medium Density Residential	35.35	7.1 - 15.0 dwelling units	530	-
High Density Residential	5.48	15.1 - 50.0 dwelling units	274	-
Subtotal	146.27	-	1,542	-
Commercial				
Village Mixed Use	10.06	0.5 Maximum Non-Residential FAR	-	219,106
Neighborhood Commercial	15.19	0.3 Maximum Non-Residential FAR	-	198,503
Subtotal	25.25	-	-	417,609
Public and Semi-Public Land Use				
Public Institutional	22.34	0.2 (Assumed Maximum FAR)	-	194,626
Subtotal	22.34	0.2 (Assumed Maximum FAR)	-	194,626
Total Area of Demand- Generating Land Use	193.86	-	1,542	612,235
Non-Demand Generating				
Open Space	9.74	0.2 (Assumed Maximum FAR)	-	84,854
Total Area of Non-Demand Generating Land Use	9.74	0.2 (Assumed Maximum FAR)	-	84,854
Total				
	203.60	-	1,542	697,089



Note:

1. Project information provided by Crawford & Bowen Planning, Inc. on March 5, 2025.

Table 2 Future Land Use Inventory in 5-year Increments

Granite Creek Precise Plan - Water Supply Assessment
 City of Madera

PRELIMINARY

Land Use Type	Units	2025	2030	2035	2040	2045	Buildout
Residential							
Low Density Residential	acre		105.44				
Medium Density Residential	acre		35.35				
High Density Residential	acre		5.48				
Commercial							
Village Mixed Use Commercial	acre		10.06				
Neighborhood Mixed Use	acre		15.19				
Public and Semi-Public Land Use							
Public Institutional	acre		22.34				
Non-Demand Generating							
Open Space	acre		9.74				



3/6/2025

Note:

1. A 5-year buildout, with construction beginning in 2026 and completion expected by 2030, is assumed by Akel Engineering Group as of March 6, 2025.

Table 3 Population - Current and Projected
 Granite Creek Precise Plan - Water Supply Assessment
 City of Madera

PRELIMINARY

Population	Current and Projected Years ^{1,2}				
	2020	2025	2030	2035	2040
Population Served	65,526	69,210	73,101	77,211	81,552



3/7/2025

Notes:

1. Source: 2020 Madera UWMP Update, Table 3-1.
2. A 1.1% population growth rate assumption was extracted from the 2020 UWMP Update.

Table 4 90-Year Climate Data

Granite Creek Precise Plan - Water Supply Assessment
 City of Madera

PRELIMINARY

Climate Data for Madera													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average (F)	45	50	55	60	68	74	80	78	73	64	53	46	62
Average High (F)	55	61	67	75	84	92	98	96	91	80	66	55	77
Average Low (F)	36	39	42	46	51	57	62	60	56	48	40	36	48



3/28/2025

Note:

1. Source: 2020 Madera UWMP Update, Table 3-1.

Table 5 Evapotranspiration & Precipitation Data

Granite Creek Precise Plan - Water Supply Assessment
 City of Madera

PRELIMINARY

Precipitation Data for Madera													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average ETo (inches)	1.18	2.01	3.73	5.42	7.35	8.42	8.81	7.81	5.67	3.69	1.86	1.11	57.06
Average Rainfall (inches)	1.91	1.86	1.82	1.11	0.37	0.09	0.01	0.01	0.13	0.53	1.17	1.78	10.80



3/28/2025

Note:

1. Source: 2020 Madera UWMP Update, Table 3-1.

Table 6 Proposed Development and Projected Potable Water Demand

Granite Creek Precise Plan - Water Supply Assessment
City of Madera

PRELIMINARY

Proposed Land Use ¹	Lot Area (ac)	Maximum Dwelling Units (DU)	Unit	Water Duty Factor ² (gpd/Unit)	Water Demand	
					(gpd)	(afy)
Indoor Water Demand						
Residential						
Low Density Residential	105.44	738	DU	160	118,080	132.25
Medium Density Residential	35.35	530	DU	160	84,800	94.98
High Density Residential	5.48	274	DU	160	43,840	49.10
Subtotal	146.27	1,542	DU	160	246,720	276.33
Commercial						
Village Mixed Use	10.06	-	acre	700	7,042	7.89
Neighborhood Commercial	15.19	-	acre	700	10,633	11.91
Subtotal	25.25	-	acre	-	17,675	19.80
Public and Semi-Public Land Use						
Public Institutional	22.34	-	acre	126	2,815	3.15
Subtotal	22.34	-	acre	126	2,815	3.15
Total Indoor Water Demand		1,542	-	-	267,210	299.28
Outdoor Water Demand						
Residential	146.27	1,542	DU	7	10,794	12.09
Commercial	25.25	-	acre	179	4,520	5.06
Public Institutional	22.34	-	acre	294	6,568	7.36
Total Outdoor Water Demand		1,542	-	-	21,882	24.51
Total Water Demand						
Total		1,542			289,092	323.78



3/28/2025

Notes:

1. Project information provided by Crawford & Bowen Planning, Inc. on March 5, 2025.
2. The water duty factors are determined based on 2020 Madera UWMP Update, 2020 Infrastructure Master Plan, 2020 Water Use Target, and Akel Engineering Group, Inc. experience.

Table 7 Future Water Demand Projections

Granite Creek Precise Plan - Water Supply Assessment
City of Madera

PRELIMINARY

Land Use	Projected Future Potable Water Demand				
	2025 (afy)	2030 (afy)	2035 (afy)	2040 (afy)	2045 (afy)
2020 UWMP Update¹					
Single Family Residential	8,450	8,145	8,603	9,087	-
Multi Family Residential	2,517	2,426	2,563	2,707	-
Commercial / Institutional	2,225	2,350	2,482	2,622	-
Industrial	138	146	154	163	-
Landscape	955	1,008	1,065	1,125	-
Other	0	0	0	0	-
Losses (Non-revenue water)	585	618	653	689	-
Recycled Water	0	0	0	0	-
Total Water Demand of 2020 UWMP Update²	14,870	14,694	15,520	16,392	16,941
Granite Creek Precise Plan³					
Demand Increased from 2020 UWMP Update Projection	0	324	324	324	324
Total Water Demand (2020 UWMP Update + Granite Creek Precise Plan³)					
Total	14,870	15,018	15,844	16,716	17,265



3/14/2025

Notes:

1. Source: 2020 Madera UWMP Update, Tables 4-2 and 4-3.
2. Total water demand of 2020 UWMP Update FY2045 is assumed based on Akel Engineering Group, Inc. experience and the increased water demand percentage of the annual year between 2025 and 2040.
3. A 5-year buildout, with construction beginning in 2026 and completion expected by 2030, is assumed by Akel Engineering Group as of March 6, 2025.

Table 8 Future Water Supply Projections for Normal Year
 Granite Creek Precise Plan - Water Supply Assessment
 City of Madera

PRELIMINARY

Water Supply Source	Projected Future Potable Water Supply				
	2025 (afy)	2030 (afy)	2035 (afy)	2040 (afy)	2045 (afy)
Groundwater (not desalinated) ^{1,2}	14,870	15,018	15,844	16,716	17,265
Total³	14,870	15,018	15,844	16,716	17,265



3/17/2025

Notes:

1. Water supply of FY2045 is assumed to be the same as the estimated water demand of 2020 UWMP Update FY 2045.
2. 336.89 afy potable water demand is added to the total future supply projections extracted from the 2020 UWMP Update.
3. The source of supply is entirely groundwater and does not represent the total supply available in the aquifer but rather the supply utilized by the City to meet its customers' demands.

Table 9 Normal Year Demand and Supply Comparison
 Granite Creek Precise Plan - Water Supply Assessment
 City of Madera

PRELIMINARY

	2025	2030	2035	2040	2045
	(afy)	(afy)	(afy)	(afy)	(afy)
Demand^{1,2,3}					
Madera 2020 UWMP Update ⁴ + Granite Creek Precise Plan	14,870	15,018	15,844	16,716	17,265
Supply⁵					
Groundwater (not desalinated)	14,870	15,018	15,844	16,716	17,265
Demand vs. Supply					
Surplus (+) / Deficit (-)	0	0	0	0	0



3/28/2025

Notes:

1. A 5-year buildout, with construction beginning in 2026 and completion expected by 2030, is assumed by Akel Engineering Group as of March 6, 2025.
2. 336.89 afy potable water demand is added to the total demand projections extracted from the 2020 UWMP Update.
3. Total water demand of FY2045 is assumed based on Akel Engineering Group, Inc. experience and the increased water demand percentage of the annual year between 2025 and 2040.
4. Source: 2020 Madera UWMP Update, Table 7-2.
5. From 2020 UWMP Update Chapter 6.2.9.1.1, the City plans to continue using groundwater to meet their water demands.

Table 10 Single Dry Year Demand and Supply Comparison

Granite Creek Precise Plan - Water Supply Assessment

City of Madera

PRELIMINARY

	2025	2030	2035	2040	2045
	(afy)	(afy)	(afy)	(afy)	(afy)
Demand^{1,2,3}					
Madera 2020 UWMP Update ⁴ + Granite Creek Precise Plan	14,870	15,018	15,844	16,716	17,265
Supply⁵					
Groundwater (not desalinated)	14,870	15,018	15,844	16,716	17,265
Demand vs. Supply					
Surplus (+) / Deficit (-)	0	0	0	0	0



3/28/2025

Notes:

1. A 5-year buildout, with construction beginning in 2026 and completion expected by 2030, is assumed by Akel Engineering Group as of March 6, 2025.
2. 336.89 afy potable water demand is added to the total demand projections extracted from the 2020 UWMP Update.
3. Total water demand of FY2045 is assumed based on Akel Engineering Group, Inc. experience and the increased water demand percentage of the annual year between 2025 and 2040.
4. Source: 2020 Madera UWMP Update, Table 7-3.
5. From 2020 UWMP Update Chapter 6.2.9.1.1, the City plans to continue using groundwater to meet their water demands.

Table 11 Multiple Dry Years Demand and Supply Comparison
 Granite Creek Precise Plan - Water Supply Assessment
 City of Madera

PRELIMINARY

	2025	2030	2035	2040	2045
	(afy)	(afy)	(afy)	(afy)	(afy)
First Year					
Demand totals	14,870	15,018	15,844	16,716	17,265
Supply totals	14,870	15,018	15,844	16,716	17,265
Surplus (+) / Deficit (-)	0	0	0	0	0
Second Year					
Demand totals	14,870	15,018	15,844	16,716	17,265
Supply totals	14,870	15,018	15,844	16,716	17,265
Surplus (+) / Deficit (-)	0	0	0	0	0
Third Year					
Demand totals	14,870	15,018	15,844	16,716	17,265
Supply totals	14,870	15,018	15,844	16,716	17,265
Surplus (+) / Deficit (-)	0	0	0	0	0
Fourth Year					
Demand totals	14,870	15,018	15,844	16,716	17,265
Supply totals	14,870	15,018	15,844	16,716	17,265
Surplus (+) / Deficit (-)	0	0	0	0	0
Fifth Year					
Demand totals	14,870	15,018	15,844	16,716	17,265
Supply totals	14,870	15,018	15,844	16,716	17,265
Surplus (+) / Deficit (-)	0	0	0	0	0



3/28/2025

Notes:

1. A 5-year buildout, with construction beginning in 2026 and completion expected by 2030, is assumed by Akel Engineering Group as of March 6, 2025.
2. Source: 2020 Madera UWMP Update, Table 7-4.
3. 336.89 afy potable water demand is added to the total demand projections extracted from the 2020 UWMP Update.
4. Total water demand of FY2045 is assumed based on Akel Engineering Group, Inc. experience and the increased water demand percentage of the annual year between 2025 and 2040.
5. From 2020 UWMP Update Chapter 6.2.9.1.1, the City plans to continue using groundwater to meet their water demands.

Table 12 Water Shortage Plan Response Levels

Granite Creek Precise Plan - Water Supply Assessment City of Madera

PRELIMINARY

Response Levels	Restrictions	Conservation Target
Stage 1 - Existing Conditions	Voluntary	Limit water use increase to population increase
Stage 2 - Potential Moderate Shortage	Mandatory	5 - 10%
Stage 3 - Serious Shortage	Mandatory	10 - 35%
Stage 4 - Critical Emergency Shortage	Mandatory	35 - 50%

AKEL
ENGINEERING GROUP, INC.

3/17/2025

Note:

1. Source: 2015 Madera UWMP Update, Table 8-2.

Table 13 Water Shortage Plan Prohibitions on End Users
 Granite Creek Precise Plan - Water Supply Assessment
 City of Madera

PRELIMINARY

Response Levels	Restrictions	Explanation	Penalty
Stage 1 - Existing Conditions	Voluntary	Outside irrigation limited to 3 days per week based on street address No hosing of paved surfaces No irrigation between 11 a.m. and 7 p.m. No water is allowed to run into street or gutter Water leaks must be repaired within 5 days of citation Evaporation coolers must be equipped with water recirculation devices No washing down of buildings other than for painting or other maintenance No continuous flow for recreational purposes Require recirculation of water in new commercial car washes	Yes
Stage 2 - Potential Moderate Shortage	Mandatory	All Stage 1 prohibitions become mandatory Voluntary reduction of water consumption by stricter adherence to Water Use Regulations	Yes
Stage 3 - Serious Shortage	Mandatory	All Stage 1 and Stage 2 prohibitions Stricter adherence to Water Use Regulations Outside watering is limited to two days a week Water served to restaurant customers only upon request to promote conservation and public awareness of drought conditions Existing commercial carwashes required to install water recirculation equipment	Yes
Stage 4 - Critical Emergency Shortage	Mandatory	All Stage 1 through Stage 3 prohibitions Outside watering limited to one day per week Installing low-flow showerheads and toilet tank displacement devices	Yes

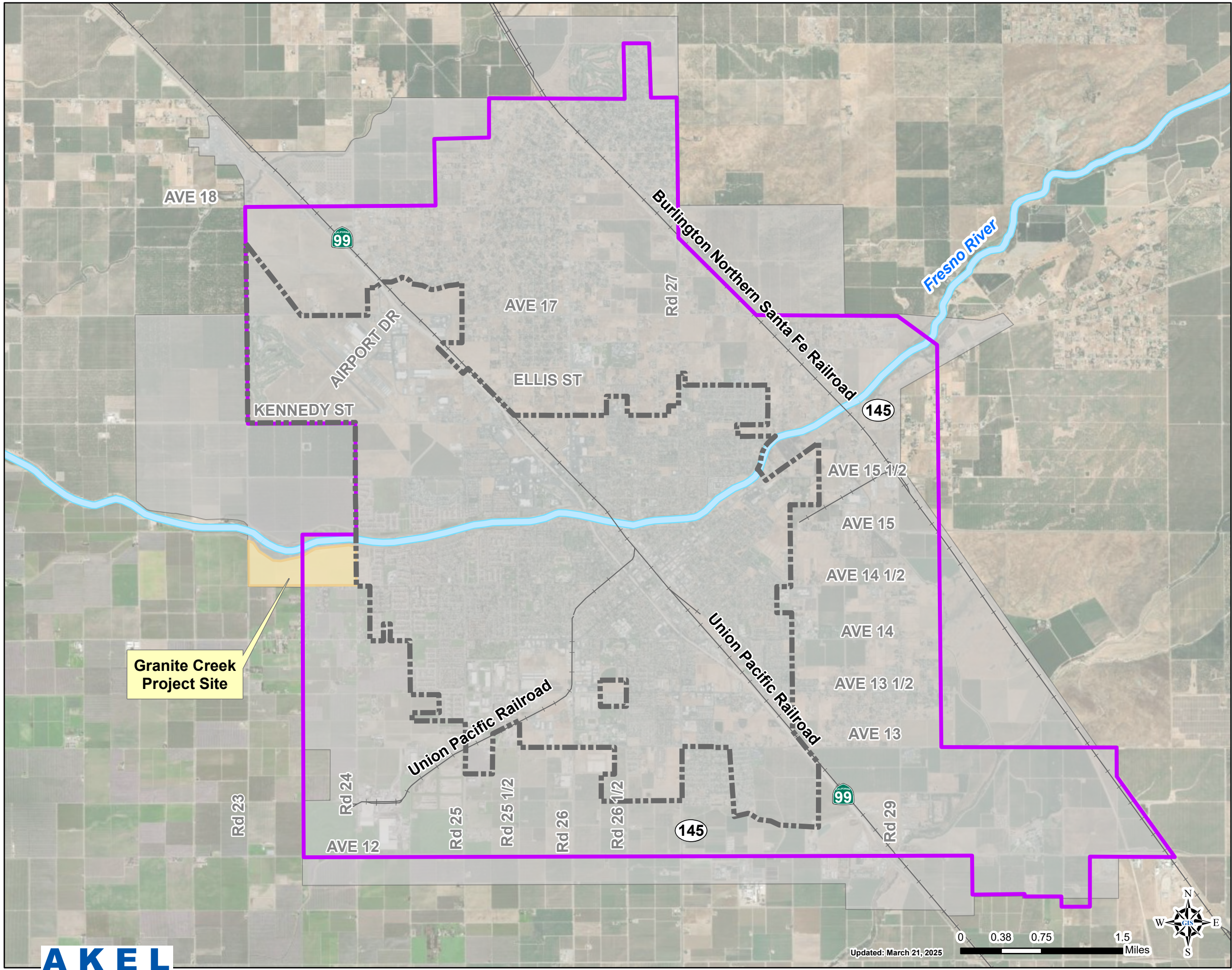


3/17/2025

Note:

1. Source: 2015 Madera UWMP Update, Table 8-3.

Figures



Legend

- Development Site**
- Granite Creek Development
- Other Features**
- Railroads
- Fresno River
- City Limits
- Sphere of Influence
- Urban Growth Boundary

PRELIMINARY

Figure 1
Project Site
 Granite Creek
 Water Supply Assessment
 City of Madera

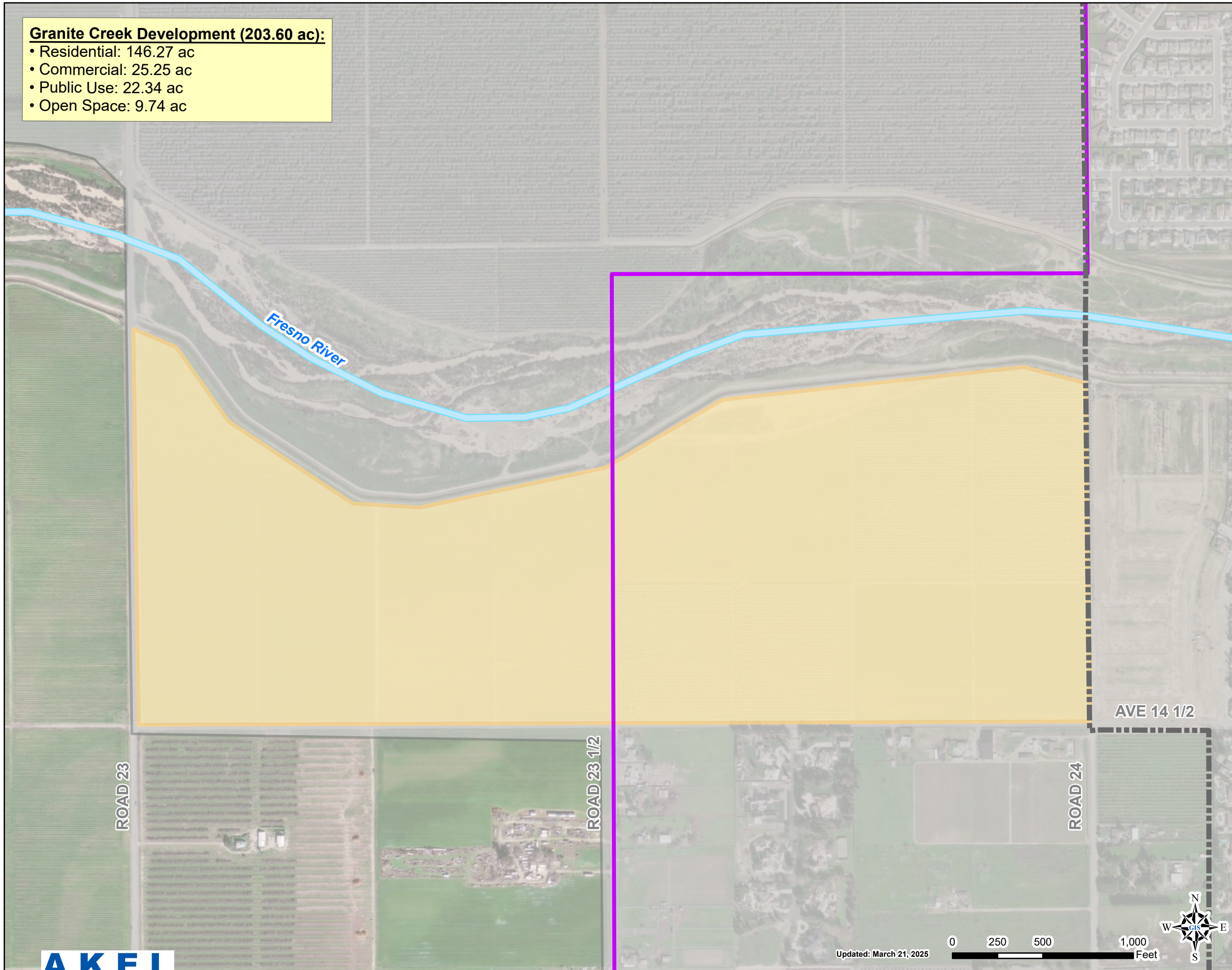


Granite Creek Development (203.60 ac):

- Residential: 146.27 ac
- Commercial: 25.25 ac
- Public Use: 22.34 ac
- Open Space: 9.74 ac

Legend

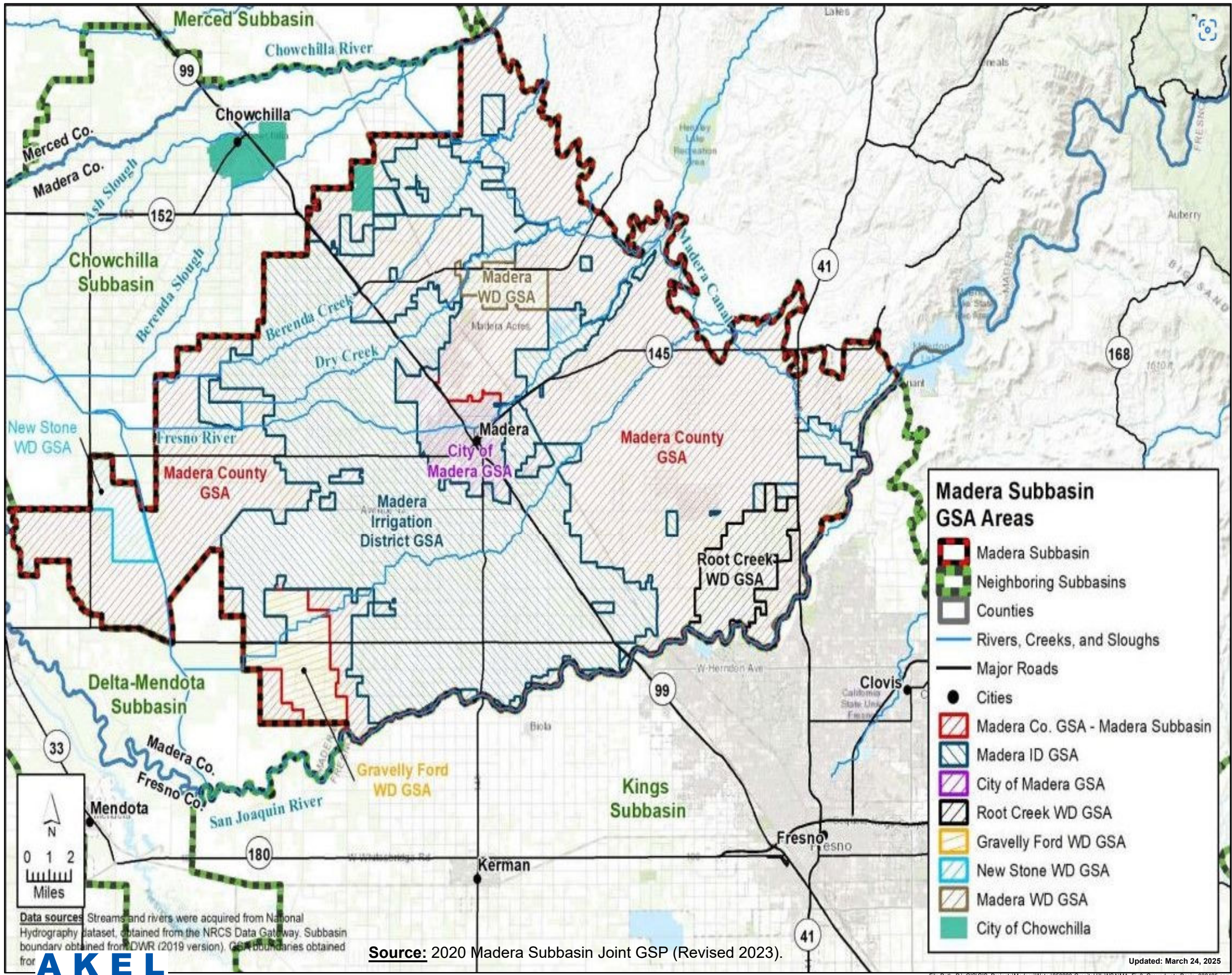
- Development Site**
- Granite Creek Development
- Other Features**
- Fresno River
 - City Limits
 - Sphere of Influence
 - Urban Growth Boundary



PRELIMINARY

Figure 2
On-Site Land Use Plans
Granite Creek
Water Supply Assessment
City of Madera





PRELIMINARY

Figure 3
Groundwater Basins
 Granite Creek
 Water Supply Assessment
 City of Madera



Updated: March 24, 2025

Data sources: Streams and rivers were acquired from National Hydrography Dataset, obtained from the NRCS Data Gateway. Subbasin boundary obtained from DWR (2019 version). GSA boundaries obtained from

Source: 2020 Madera Subbasin Joint GSP (Revised 2023).

