PORTERVILLE
IRRIGATION DISTRICT
GSA
GROUNDWATER SUSTAINABILITY AGENCY

BOARD MEETING AGENDA

Tuesday, February 17, 2026, Convenes at 11:00 a.m.

Or immediately following the PID Board Meeting.

http://www.portervilleid.org / PIDGSA@ocsnet.net

22086 Avenue 160, Porterville, CA 93257

Web Meeting Attendance Available for Interested Parties:

Join Zoom Meeting
https://us06web.zoom.us/j/84319138554

Meeting ID: 843 1913 8554
Passcode: Hu9n5p
One tap mobile
+16694449171,,6707587901#,,,,*478530# US
+17207072699,,6707587901#,,,,*478530# US

---------------------------------**AGENDA**---------------------------------

Action items are listed in **bold**.

1. CALL TO ORDER

Roll Call
Flag Salute

All items on this agenda, whether or not expressly listed for action, may be deliberated upon and may be subject to action by the Board of Directors. The Board of Directors may consider agenda items in any order. Materials related to an item on this agenda submitted to the Board of Directors after distribution of the agenda packet are available for public inspection at the Porterville Irrigation District, 22086 Avenue 160, Porterville, CA 93257, during regular business hours.

2. PUBLIC COMMENT

At this time, members of the public may comment on any item not appearing on the agenda. Under state law, matters presented under this item cannot be discussed or acted upon by the Board at this time. For items appearing on the agenda, the public is invited to provide comments at the time the Board considers the item. Any person addressing the Board will be limited to a maximum of three (3) minutes, or at the Chairman's discretion. At all times, please state your name for the record.

3. ANNOUNCEMENTS

a. Ongoing efforts for the transition from ETGSA to PID GSA.

b. Letter Submitted to the Tule Subbasin Managers and Consultants, regarding the Tule Subbasin Land Subsidence Coordination to Protect Friant-Kern Canal.

4. CONSENT CALENDAR

a. Consideration and Approval of January 15, 2026, GSA Board Minutes (Action).

5. ADMINISTRATION

a. Consider and Approve Draft PID Hydrogeologic Conceptual Model provided by Luhdorff & Scalmanini, Consulting Engineers. (Action).
b. Consider and Approve Draft PID Water Budget provided by Luhdorff & Scalmanini, Consulting Engineers. (Action).

6. REPORTS FROM COMMITTEES

a. Report on February 5, 2026, Stakeholder Committee Meeting.
b. Tule Subbasin Managers Group Report from February 3, 2026 Meeting.
c. Tule Subbasin Policy Group Report from January 26, 2026, and February 9, 2026, Meeting.

7. CLOSED SESSION: No closed session.

8. CLOSED SESSION ITEMS: No Report.

a. Report Action Taken in Closed Session Required by Government Code 54957.1

9. NEXT MEETING DATE

a. Next Regular Meeting – Thursday, March 19, 2026, at 2:00 p.m.

10. ADJOURNMENT

A person with a qualifying disability under the Americans with Disabilities Act of 1990 may request that the PIDGSA provide a disability-related modification or accommodation to participate in any public meeting. Such assistance includes appropriate alternative formats for the agendas and agenda packets used for any public meetings of the GSA.

Requests for such assistance and for agendas and agenda packets shall be made in person, by telephone, facsimile, or written correspondence to the General Manager of the Porterville Irrigation District GSA at (559) 782-6321, at least 48 hours before a public meeting.

Agenda Item 3.b

ANNOUNCEMENT
Staff Report to the Porterville Irrigation District GSA Board of Directors

Subject: ANNOUNCEMENT / Letter Submitted to the Tule Subbasin Managers and Consultants, regarding the Tule Subbasin Land Subsidence Coordination to Protect Friant-Kern Canal.

Submitted By: General Manager

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January 30, 2026

Via Email to:

Tule Subbasin GSA Managers and Consultants

Re: Tule Subbasin Land Subsidence Coordination to Protect Friant-Kern Canal

Dear Tule Subbasin:

This letter is submitted on behalf of Saucelito Irrigation District (SID), Porterville Irrigation District (PID), and Terra Bella Irrigation District (TBID), collectively, the "Districts." The purpose of this letter is to set forth the Districts' position that the Tule Subbasin (Subbasin) as a whole is responsible for protecting the Friant-Kern Canal (FKC) from undesirable impacts of land subsidence and that, accordingly, all Groundwater Sustainability Plans (GSPs) in the Subbasin must subscribe to a coordinated management plan to achieve that end.[1]

The Districts are concerned that two major disconnects are plaguing the Subbasin's ability to coordinate on the issue of FKC land subsidence impacts. First, the Department of Water Resources has released a final version of its Best Management Practices for Land Subsidence (BMPs) that embraces INTERA's land subsidence and critical head modelling simulations, which suggest arresting land subsidence by raising groundwater to levels that are disconnected from the amount of water actually available to raise groundwater levels. Second, land in the Tule Subbasin that is outside the FKC Land Subsidence Management Zone is not being managed in a manner to either stabilize or increase groundwater levels beneath the FKC, which means that the Subbasin's management of groundwater levels is disconnected from managing land subsidence impacts to the FKC. These two disconnects are standing in the way of the Subbasin adequately addressing the State Water Resources Control Board's (SWRCB) finding of deficiency concerning the Subbasin's plan to avoid serious impacts to the FKC.[2]

This letter briefly summarizes (1) the correlation between the Districts' management actions, the BMPs, and the stabilization and raising of groundwater levels; (2) why INTERA's critical head and land subsidence simulations for site "PORT" is not the best available science; (3) the water

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[1] Section 7.2 of the Department of Water Resources' Best Management Practices for Land Subsidence January 2026) describes coordinated regional land subsidence management as necessary due to the lateral movement of groundwater across Groundwater Sustainability Agency boundaries, https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Land_Subsidence_BMP.pdf.

[2] State Water Resources Control Board Resolution No. 2024-0030 at p. 7, https://www.waterboards.ca.gov/water_issues/programs/sgma/docs/tule/202409-tule-pbh-final-staff-report.pdf. A summary of the deficiency relating to FKC land subsidence can be found at page A-9 of Appendix A to the August 2024 Final Staff Report for the Tule Subbasin Probationary Hearing, https://www.waterboards.ca.gov/water_issues/programs/sgma/docs/tule/202409-tule-pbh-final-staff-report.pdf.

availability constraint on raising groundwater levels to the critical head or higher; (4) the contribution of the cones of depression in the western portion of the Subbasin to falling groundwater levels beneath the FKC making Subbasin-wide coordination necessary to address protection of the FKC; (5) the BMPs' inter-GSA coordination prescription for combatting the lateral movement of groundwater within a Subbasin; and (6) the Districts' request for contributions from all GSAs in the Tule Subbasin to maintain or raise groundwater levels beneath the FKC to the levels necessary to avoid undesirable results to the FKC caused by land subsidence resulting from post-2015 pumping.

1. **Districts' management actions are the most feasible Best Management Practices.**

In Fall 2024 immediately following State Water Resources Control Board Resolution No. 2024-0030, the Districts began to develop and subsequently adopted groundwater pumping rules that completely eliminated overdraft pumping within their jurisdictional boundaries and limited pumping to the Sustainable Yield (0.99 acre-feet per acre per year).[3] Based on groundwater pumping and land subsidence data collected from 2020 through 2025, the Districts anticipate that this management action will be key to arresting land subsidence beneath the Friant-Kern Canal resulting from the District's groundwater management activities. A trend-based analysis[4] of SID's groundwater level and land subsidence data from those years—which will be available when the Districts' draft GSPs are released—show a correlation between one acre-foot per acre per year of extraction and the cessation of new subsidence with very low levels of residual land subsidence. The data also show that groundwater levels in the lower aquifer within SID have been very stable from 2020 to present (inclusive), a period that includes both very dry and very wet conditions, with a period of increasing groundwater levels since the end of 2022.

The data discussed above align with guidance in section 7.4.3 of DWR's Land Subsidence BMP for areas with historical or ongoing subsidence, the BMP suggests "stabiliz[ing] and . . . raising groundwater levels as soon as possible so the groundwater manager is only managing residual subsidence."[5] Groundwater levels within the Districts are stabilizing due to the Districts' management actions and recent hydrological conditions.

SID's historical groundwater budget for the years 1986 through 2024 (Attachment 1 to this letter) shows an average total change in storage of -10,600 acre-feet and average total annual groundwater pumping of 30,700 acre-feet. Years with greater negative total changes in storage typically correspond to dry years and years with greater positive total changes in storage typically correspond to wet years. Under SID's current Sustainable Yield pumping limit, the maximum amount of groundwater that can be pumped within SID's jurisdictional boundaries per year is approximately 19,387 acre-feet because SID has 19,387 acres within its jurisdictional boundaries. Accordingly, the difference between average historical groundwater pumping and the maximum permissible under SID's Sustainable Yield pumping limit is 11,313 acre-feet per year, which is greater than the average annual storage loss of 10,600 acre-feet by 712 acre-feet.

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[3] Sustainable Yield is defined in Tom Harder & Co.'s groundwater flow model for the Tule Subbasin, which is coordinated across all Subbasin GSAs.
[4] *Land Subsidence Best Management Practices*, Department of Water Resources, at p. 5-14 (January 2026).
[5] *Id*., at p. 7-9.

This recovery of groundwater storage, and, correspondingly, groundwater levels, should reduce rates of residual subsidence in SID. This result aligns with section 7.4.3 of the BMPs, which states that "the total amount [of residual subsidence] can be managed based on how high and how quickly groundwater levels are raised above the critical head by the groundwater manager."[6] However, due to the east to west gradient of the Subbasin and the cones of depression in the western portion of the Subbasin, groundwater pumping in the western portion of the Subbasin will negate the groundwater level gains that the Districts' groundwater management actions are designed to achieve.

2. **<u>INTERA's critical head and subsidence simulations for locations within the Districts' jurisdictional boundaries is not best science.</u>**

The BMPs describe three approaches to estimating critical head: (1) trend-based, (2) empirical, and (3) modeling analyses. A modeling analysis requires "more data . . . than trend-based and empirical analyses."[7] Modeling analyses "make use of reasonably long time series of groundwater levels in applicable aquifer units, subsidence information from historical and contemporary sources, and lithology records to capture the aquifer response to aquifer system stresses."[8] By its own admission during its Fall 2025 presentation of its Tule Subbasin Subsidence Simulations at the Tule Subbasin Managers Meeting (Presentation),[9] INTERA acknowledged that its simulations for the site "PORT"—located within the boundary of SID and adjacent to the FKC—are based on historical subsidence data that is "deficient." INTERA reported using topographical maps to determine historical subsidence at the site. Accordingly, the Districts do not find INTERA's modeling analysis of critical head and land subsidence at site "PORT" compelling and will continue to develop trend-based and empirical analyses to monitor and manage land subsidence along the FKC.

3. **<u>Available water is insufficient for raising groundwater levels to the critical head or above.</u>**

Setting aside the data deficiency referenced in section 2 above for the sake of discussion, INTERA's critical head model suggests that 2024 groundwater levels at site "PORT" are 80 feet below the critical head for the Pliocene. INTERA's model projects that, even if groundwater levels are raised 50 feet above the critical head (for a total of 130 feet above 2024 groundwater levels), residual subsidence will still occur. Even if this projection is accurate, the questions INTERA left open ended include: How much water is required to raise groundwater levels 150 feet or more?

According to INTERA's simulated groundwater levels for the Pliocene at site "PORT," raising groundwater levels by 150 feet would restore 1990 groundwater levels (the last time groundwater levels were 150 feet above 2024 levels). To determine the amount of water required to restore 1990 groundwater levels at site "PORT," SID's Historical Groundwater Budget (GW Budget) is informative. The GW Budget indicates an average annual total loss in storage of approximately 10,600 acre-feet since 1990. Using groundwater storage levels as a proxy for groundwater levels, returning to 1990 groundwater levels would require a storage increase of 371,000 acre-feet of

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[6] *Id*.
[7] *Id*. at p. 5-13.
[8] *Id.* at p. 5-16.
[9] INTERA representatives presented the Tule Subbasin Subsidence Simulations to Tule Subbasin Groundwater Sustainability Managers at their meeting dated, October 7, 2025.

groundwater (35 years multiplied by 10,600 acre-feet per year). Given that SID's current rules limit pumping within SID to approximately 20,000 acre-feet per year (Sustainable Yield multiplied by its 19,387 acres under production), restoring 1990 groundwater levels would require more than 18 years if SID ceased all pumping (371,000 acre-feet divided by 20,000 acre-feet per year).

It is important to acknowledge that the above analysis is oversimplified. Available data is currently insufficient for determining how much of the historical storage losses are due to extractions from the Pliocene versus other aquifers. The data is also insufficient for determining which portions of historical land subsidence occurred in the various lithographic units beneath SID. However, the above analysis is a blunt method of concluding that there is insufficient water available in SID to restore groundwater levels to levels that INTERA suggests are necessary to prevent future subsidence, let alone arrest residual subsidence (even if groundwater levels beneath the FKC in SID are restored to 1990 levels, INTERA's simulations still project the occurrence of residual subsidence).

A similar analysis is likely applicable within Delano-Earlimart Irrigation District Groundwater Sustainability Agency's (DEID) jurisdictional boundary as well where INTERA's modeling shows groundwater levels in the Pliocene below the critical head at site "D-454." DEID has not released detailed well registration data or monitoring data showing how many wells are pumping in the Pliocene near site "D-454" or what quantity of groundwater such wells are pumping.

4. **<u>Protection of the FKC requires inter-GSA coordination due to the east to west gradient in the Subbasin and cones of depression in the western portion of the Subbasin.</u>**

Even if enough water was available to restore groundwater levels to 1990 levels, the responsibility of doing so must be shared by the entire Subbasin. The Districts' respective hydrological conceptual models (HCMs)—available upon the release of the Districts' forthcoming draft GSPs—indicate that the groundwater flow direction and gradient is east to west. Accordingly, attempts at significantly increasing groundwater elevations near the FKC will be unsuccessful unless corresponding increases in groundwater levels also occur west of SID.

The historical and current groundwater gradients and flow directions play a major role in determining the subsurface inflows and outflows of the respective Subbasin GSAs. For example, SID, which is located in the eastern portion of the Subbasin, has an average annual subsurface outflow of 38,500 acre-feet to other GSAs to the west in the Subbasin, while only having an average annual subsurface inflow of 33,400 from other GSAs to the east.[10] This subsurface inflow and outflow results in an average annual net loss of 5,100 acre-feet, which is nearly half of SID's average annual groundwater storage losses.

The Districts are concerned that, even if they undertook management actions to aggressively raise groundwater levels at rates above the current positive trend, they would be swimming upstream as a portion of their recharge or forbearance efforts would be lost due to the above referenced flows, gradients and cones of depression. In effect, the Districts would be subsidizing other "downstream" GSAs' continued overdraft, i.e., "transitional pumping." In sum, if recharge on a large scale within the Districts will likely increase the existing net subsurface outflow to areas

[10] SID Historical Groundwater Budget 1986/87 to 2023/24.

west of the Districts, then such recharge actions are unlikely to effect the arrest of land subsidence beneath the FKC.

5. **<u>The BMPs prescribe inter-GSA coordination for managing land subsidence when groundwater management in one GSA affects the ability of another GSA to prevent undesirable results from land subsidence.</u>**

Due to the above hydrological characteristics of the Subbasin, the Districts urge the Subbasin to pursue coordinated management actions to protect the FKC from undesirable results. The BMPs provide:[11]

> While SGMA and the GSP Regulations generally focus on local groundwater management and the avoidance of adverse conditions that may occur within a GSA's respective subbasin, it is important to consider that not all pumping-related depletions will necessarily occur within a given basin's boundaries. Groundwater level declines and subsidence can result from local pumping or groundwater level declines in nearby or adjacent management areas, GSAs, or subbasins.
>
> GSAs should seek regional coordination beyond individual groundwater subbasins to establish sustainable management criteria and implement management actions to halt the decline of groundwater levels, or—where needed—raise groundwater levels to avoid or minimize subsidence. GSAs should compare and coordinate sustainable management criteria for groundwater levels and land subsidence across jurisdictional boundaries within and across subbasins to ensure regional and local groundwater trends are not adversely impacting subsidence in management areas, GSAs, or subbasins.

As referenced in previous correspondence with the Subbasin, the Districts support the development of a monitoring network of nested wells along the Friant-Kern Canal and in other areas of the Subbasin where subsidence is most prevalent. These nested monitoring wells should be equipped with pressure transducers. The network would monitor groundwater levels in each primary aquifer zone beneath the Friant-Kern Canal. In parallel with this network would be a network of injection wells that would recharge water into the layers beneath the FKC that the monitoring network indicates are at risk of depressurizing. This focused approach in conducting recharge along vulnerable stretches of the FKC would potentially reduce the likelihood of other macro-scale recharge projects from simply increasing subsurface outflow to areas west of PID and SID. Although this project and management action would come at a large capital cost, it would provide for (i) a targeted approach to a problem caused by over-pumping both locally and regionally, (ii) an efficient use of water for the Subbasin as a whole, and (iii) monitoring of the effectiveness of this project both locally and regionally within the Subbasin.

6. **<u>Conclusion: The Districts request contributions from all GSAs in the Subbasin to help protect the FKC from undesirable results.</u>**

The Districts request contributions from all GSAs in the Subbasin to protect the FKC from land subsidence undesirable results. As a starting place, the Districts suggest that the Subbasin pursue a joint analysis of the water that could be available for increasing groundwater levels beneath the Friant-Kern Canal. The discussion would involve an analysis of a projection of

[11] Land Subsidence BMPs, at p. 7-4.

average historical recharge from precipitation and average available surface supplies. What amount of water represents an equitable contribution for each GSA/stakeholder?

Sincerely,

LAW OFFICE OF PETER KIEL PC

Vincent Goble, Esq.

ATTACHMENT 1

Saucelito Irrigation District Historical Groundwater Budget 1986/87 to 2023/24

[attached behind]

Table 2-7

Saucelito Irrigation District
Historical Groundwater Budget 1986/87 to 2023/24

Water Year	Groundwater Inflows (acre-ft)																			
	Areal Recharge from Precipitation	Tule River				Deer Creek				White River	Imported Water Deliveries			Agricultural Pumping (Groundwater)	Municipal Pumping			Subsurface Inflow		Mountain-Block Recharge	Total In
																Recycled Water					
		Success to Oettle Bridge Infiltration	Recharge in Basins	Canal Loss	Return Flow of Applied Irrigation Water	Infiltration Before Trenton Weir	Canal Loss	Recharge in Basin	Return Flows of Applied Irrigation Water	Infiltration Before DEID	Recharge in Basins	Canal Loss	Return Flows	Irrigated Agriculture (Return Flows of Applied Irrigation Water)	Return Flow of Applied Irrigation Water	Agricultural Return Flow	Artificial Recharge	From Outside Subbasin	From Other GSAs		
1987	300	NA	NA	NA	NA	2,000	0	0	0	NA	0	700	10,800	8,100	0	0	0	0	44,400	0	66,300
1988	100	NA	NA	NA	NA	1,400	0	0	0	NA	0	400	9,500	9,400	0	0	0	0	41,200	0	62,000
1989	0	NA	NA	NA	NA	2,000	0	0	0	NA	0	300	7,900	8,700	0	0	0	0	39,600	0	58,500
1990	200	NA	NA	NA	NA	1,200	0	0	0	NA	0	100	6,800	9,800	0	0	0	0	39,100	0	57,200
1991	1,600	NA	NA	NA	NA	1,900	0	0	0	NA	0	300	6,900	6,600	0	0	0	0	38,300	0	55,600
1992	0	NA	NA	NA	NA	700	0	0	0	NA	0	200	6,500	9,700	0	0	0	0	37,100	0	54,200
1993	3,300	NA	NA	NA	NA	3,400	0	0	0	NA	0	1,900	18,700	5,200	0	0	0	0	35,100	0	67,600
1994	0	NA	NA	NA	NA	1,100	0	0	0	NA	0	500	6,700	8,900	0	0	0	0	34,200	0	51,400
1995	7,400	NA	NA	NA	NA	5,100	0	0	0	NA	0	1,600	15,600	4,500	0	0	0	0	34,500	0	68,700
1996	0	NA	NA	NA	NA	3,300	0	0	0	NA	0	1,100	19,700	5,200	0	0	0	0	33,100	0	62,400
1997	2,600	NA	NA	NA	NA	12,000	0	0	0	NA	0	1,100	17,100	4,200	0	0	0	0	32,200	0	69,200
1998	11,500	NA	NA	NA	NA	4,300	0	0	0	NA	0	1,800	9,100	2,800	0	0	0	0	32,100	0	61,600
1999	0	NA	NA	NA	NA	2,600	0	0	0	NA	0	700	13,600	4,800	0	0	0	0	32,400	0	54,100
2000	0	NA	NA	NA	NA	2,700	0	0	0	NA	0	700	18,300	5,600	0	0	0	0	32,500	0	59,800
2001	0	NA	NA	NA	NA	1,400	0	0	0	NA	0	300	8,700	6,800	0	0	0	0	31,700	0	48,900
2002	0	NA	NA	NA	NA	2,100	0	0	0	NA	0	300	9,300	8,600	0	0	0	0	33,000	0	53,300
2003	0	NA	NA	NA	NA	3,500	0	0	0	NA	0	700	11,500	4,700	0	0	0	0	31,300	0	51,700
2004	0	NA	NA	NA	NA	1,400	0	0	0	NA	0	300	8,600	7,600	0	0	0	0	31,500	0	49,400
2005	4,800	NA	NA	NA	NA	3,900	0	0	0	NA	0	1,100	18,500	2,100	0	0	0	0	28,700	0	59,100
2006	3,800	NA	NA	NA	NA	3,800	0	0	0	NA	0	1,100	22,300	1,200	0	0	0	0	26,300	0	58,500
2007	0	NA	NA	NA	NA	1,800	0	0	0	NA	0	200	4,600	7,600	0	0	0	0	29,800	0	44,000
2008	0	NA	NA	NA	NA	2,100	0	0	0	NA	0	400	7,700	6,000	0	0	0	0	32,000	0	48,200
2009	0	NA	NA	NA	NA	900	0	0	0	NA	0	500	7,000	3,900	0	0	0	0	30,500	0	42,800
2010	900	NA	NA	NA	NA	3,600	0	0	0	NA	0	1,000	19,500	1,500	0	0	0	0	27,300	0	53,800
2011	6,500	NA	NA	NA	NA	6,700	0	0	100	NA	0	1,700	26,800	1,700	0	0	0	0	26,600	0	70,100
2012	2,100	NA	NA	NA	NA	1,800	0	0	100	NA	0	400	8,500	4,600	0	0	0	0	28,600	0	46,100
2013	0	NA	NA	NA	NA	900	0	0	100	NA	0	200	3,400	8,400	0	0	0	0	33,400	0	46,400
2014	0	NA	NA	NA	NA	700	0	0	200	NA	0	0	2,500	11,000	0	0	0	0	35,300	0	49,700
2015	0	NA	NA	NA	NA	400	0	0	200	NA	0	0	300	9,300	0	0	0	0	38,100	0	48,300
2016	300	NA	NA	NA	NA	3,800	0	0	200	NA	0	400	7,100	5,900	0	0	0	0	36,800	0	54,500
2017	4,200	NA	NA	NA	NA	13,900	0	0	200	NA	0	1,900	23,300	3,800	0	0	0	0	32,700	0	80,000
2018	0	NA	NA	NA	NA	2,300	0	0	300	NA	0	700	9,400	6,100	0	0	0	0	31,000	0	49,800
2019	4,500	NA	NA	NA	NA	7,900	0	0	300	NA	0	1,400	30,800	3,200	0	0	0	0	33,100	0	81,200
2020	0	NA	NA	NA	NA	2,100	0	0	0	NA	600	500	4,800	7,100	0	0	0	0	33,400	0	48,500
2021	0	NA	NA	NA	NA	700	0	0	0	NA	0	0	2,400	10,500	0	0	0	0	33,400	0	47,000
2022	0	NA	NA	NA	NA	1,300	0	0	0	NA	4,700	300	1,700	8,800	0	0	0	0	33,400	0	50,200
2023	7,000	NA	NA	NA	NA	7,600	0	0	0	NA	55,900	1,800	3,200	6,300	0	0	0	0	33,400	0	115,200
2024	0	NA	NA	NA	NA	5,500	0	0	0	NA	37,200	1,000	900	9,300	0	0	0	0	33,400	0	87,300
Average	**1,600**	**NA**	**NA**	**NA**	**NA**	**3,300**	**0**	**0**	**0**	**NA**	**2,600**	**700**	**10,800**	**6,300**	**0**	**0**	**0**	0	**33,400**	**0**	**58,800**

Groundwater Inflows to be Included in the Native Yield Estimate

Groundwater Inflows to be Excluded from the Native Yield Estimate

Surface Water or Groundwater Outflows Not Included in Native Yield Estimate

Note: 2019/20 to 2023/24: Aquitard change in storage from analysis of InSAR land subsidence. Sub-surface Inflow and Outflow equal to 2015/16 to 2018/19 average

Saucelito Irrigation District
Historical Groundwater Budget 1986/87 to 2023/24

Groundwater Outflows (acre-ft)					Change in Storage (acre-ft)		
Groundwater Pumping		Sub-surface Outflow		Total Out	Aquitard Change in Storage	Aquifer Change in Storage	Total Change in Storage
Municipal	Agriculture	To Outside Subbasin	To Other GSAs				
0	-34,000	0	-44,900	-78,900	-8,800	-3,600	-12,500
0	-39,500	0	-40,400	-79,800	-9,800	-8,100	-17,900
0	-36,600	0	-39,600	-76,200	-9,000	-8,800	-17,800
0	-41,100	0	-37,100	-78,200	-12,200	-8,800	-20,900
0	-27,900	0	-36,300	-64,200	-5,400	-3,300	-8,700
0	-40,600	0	-39,200	-79,800	-16,000	-9,800	-25,800
0	-22,200	0	-37,300	-59,500	-3,700	11,800	8,100
0	-37,800	0	-39,600	-77,300	-11,700	-14,300	-25,900
0	-19,300	0	-38,400	-57,700	-1,600	12,600	10,900
0	-22,300	0	-42,000	-64,300	-1,900	0	-1,900
0	-18,000	0	-43,100	-61,100	-100	8,300	8,200
0	-12,000	0	-36,200	-48,200	1,200	12,100	13,300
0	-20,600	0	-40,800	-61,500	-1,000	-6,300	-7,300
0	-23,700	0	-39,600	-63,300	-700	-3,000	-3,600
0	-28,800	0	-39,100	-67,900	-5,300	-13,700	-19,100
0	-36,600	0	-41,300	-77,900	-11,800	-12,800	-24,500
0	-24,700	0	-39,400	-64,100	-6,500	-5,900	-12,400
0	-41,200	0	-41,900	-83,100	-19,400	-14,500	-33,900
0	-11,700	0	-37,700	-49,300	-1,300	11,000	9,700
0	-6,400	0	-37,800	-44,200	1,400	12,900	14,300
0	-41,300	0	-41,800	-83,100	-10,100	-28,900	-39,000
0	-32,500	0	-42,100	-74,600	-11,800	-14,700	-26,500
0	-21,300	0	-41,400	-62,700	-8,000	-12,000	-20,000
0	-8,400	0	-38,600	-46,900	-2,000	9,000	7,000
0	-9,000	0	-35,400	-44,400	1,100	24,400	25,500
0	-24,800	0	-36,300	-61,100	-2,300	-12,800	-15,100
0	-45,300	0	-40,400	-85,700	-10,200	-29,300	-39,600
0	-59,100	0	-39,300	-98,300	-21,500	-27,300	-48,800
0	-50,000	0	-35,600	-85,600	-16,000	-21,500	-37,500
0	-31,900	0	-33,200	-65,100	-6,600	-4,300	-10,900
0	-20,200	0	-34,200	-54,400	-2,500	27,900	25,300
0	-32,700	0	-40,200	-72,800	-2,500	-20,900	-23,400
0	-16,900	0	-35,200	-52,100	-500	29,100	28,600
0	-38,700	0	-35,700	-74,400	-6,800	-19,100	-25,900
0	-56,800	0	-35,700	-92,500	-8,300	-37,200	-45,500
0	-47,900	0	-35,700	-83,600	-8,600	-24,800	-33,400
0	-34,400	0	-35,700	-70,100	-1,300	46,400	45,100
0	-50,800	0	-35,700	-86,500	-3,100	3,900	800
0	**-30,700**	**0**	**-38,500**	**-69,200**	**-6,400**	**-4,100**	**-10,600**

Groundwater Inflows to be Included in the Native Yield Estimate

Surface Water or Groundwater Outflows Not Included in Native Yield Estimate

Agenda Item 4.a

CONSENT CALENDAR
Staff Report to the Porterville Irrigation District GSA Board of Directors

Subject: CONSENT CALENDAR / Consideration and approval of January 15, 2026, GSA Board Minutes (Action).

Submitted By: General Manager

PORTERVILLE IRRIGATION DISTRICT GSA GROUNDWATER SUSTAINABILITY AGENCY

MINUTES OF THE
GSA BOARD OF DIRECTORS
MEETING HELD JANUARY 15, 2026

At approximately 3:00 p.m. on January 15, 2026, at the Porterville Irrigation District, Board Room, President Eric Borba called to order the meeting of the Board of Directors of the Porterville Irrigation District Groundwater Sustainability Agency ("PIDGSA"). The meeting was also conducted remotely for members of the public.

Members Present: Eric Borba, Timothy Witzel, David Gisler, Brett McCowan

Members Absent:

Others Present:
Michael Knight, *GSA Manager*
Sean Geivet, *District Manager*
Aubrey Mauritson, *District Legal Counsel*
Nick Keller, *District Engineer*
Jeff Row, *District Secretary-Treasurer*

List of signed-in attendees:

Dyson Schneider	Blake Wallace
David Payne	Robert Alvarez
Armando Leal	Douglas Jackson
Adam Mendoza	Matt Kidder

1. <u>CALL TO ORDER</u>

President Eric Borba called the meeting to order at 3:00 p.m.
Flag salute, Michael Knight.

2. PUBLIC COMMENT

President Borba opened the floor for public comment.

- Question and discussion on Probationary Status,
- Status on Basinsafe transition, and future GSA reporting,
- Question on the Policy Group Meeting (discussed in Reports from Committees)

3. ANNOUNCEMENTS

Noted Items that were received from the Consultant (HCM, and Water Budget) and will be presented to the Stakeholder Committee at its Thursday, February 5, 2026, meeting.

4. CONSENT CALENDAR

a. Consider Approval of December 18, 2025, GSA Board Minutes.

Action: Motion by Director Witzel, seconded by Vice-President Gisler, to approve the GSA Minutes of December 18, 2025. Motion carried unanimously.

b. Consider Approval of Thomas Harder & Co. Proposed Scope of Work and 2026 Budget Costs for Hydrogeological Services in the Tule Subbasin, Budgeted by Acreage 3.26% for a Cost of $24,313.73.

Action: Motion by Director McCowan, seconded by Director Witzel, to approve the Thomas Harder & Co. Proposed Scope of Work and 2026 Budget Costs for Hydrogeological Services in the Tule Subbasin, Budgeted by Acreage 3.26% for a Cost of $24,313.73.

c. Consider Approval of 4Creeks Proposed 2026 Budget for Tule Subbasin Coordination Agreement Related Services Budgeted by Acreage 3.26% for a Cost of $26,686.03.

Action: Motion by Vice-President Gisler, seconded by Director McCowan, to approve the 4Creeks Proposed 2026 Budget for Tule Subbasin Coordination Agreement Related Services Budgeted by Acreage 3.26% for a Cost of $26,686.03.73.

5. ADMINISTRATION

a. Water Year 2026 Sustainable Yield Allocation Setting (Announcement).

The GSA Manager provided an informational update on the Water Year 2026 Sustainable Yield Allocations, noting that the allocation framework had been previously presented and refined through coordination with the Tule Subbasin. The final allocations are documented in the January 9, 2026, Technical Memorandum prepared by 4Creeks, Inc. *(Native Sustainable Yield, ET Allocation of 0.15, Extraction Allocation 0.27, Total Precipitation 0.86, Providing a Sustainable Yield ET Allocation Total of 1.01, Sustainable Yield Extraction Allocation of 0.27)*

The Board was advised that this item served as an announcement only and that no Board action was required.

6. REPORTS FROM COMMITTEES

   a. No Report, January 1, 2026, Stakeholder Committee Meeting was Canceled.

No report. The January 1, 2026, Stakeholder Committee meeting was canceled.

   b. Tule Subbasin Managers Group Report from January 6, 2026 Meeting.

The GSA Manager provided an informational update summarizing coordination activities related to SGMA implementation, consultant scopes and budgets, monitoring requirements, and ongoing engagement with the State Water Board.

   c. Tule Subbasin Policy Group Report from January 12, 2026 Meeting.

Board members provided an informational update on recent Policy Group discussions, including coordination on land subsidence, modeling assumptions, and regulatory response strategies.

7. CLOSED SESSION: No closed session.

8. CLOSED SESSION ITEMS: No Report.

   a. Report Action Taken in Closed Session Required by Government Code 54957.1

There was no reportable action pursuant to Government Code Section 54957.1.

9. NEXT MEETING DATE

The next meeting of the Porterville Irrigation District Groundwater Sustainability Agency Board of Directors was to be scheduled for Thursday, February 19, 2026, at 2:00 p.m.

Due to scheduling conflicts and the World Ag Expo, the next GSA Board Meeting was rescheduled. A motion by Director McCowan, seconded by Director Witzel, to reschedule the February 19, 2026, GSA Board Meeting to February 17, 2026, at 11:00 a.m. was approved.

The next meeting of the Porterville Irrigation District GSA Board of Directors will be held on **Tuesday, February 17, 2026, at 11:00 a.m. or immediately following the PID Board Meeting**.

10. <u>ADJOURNMENT</u>

There being no further business before the Board, President Borba adjourned the meeting at 3:54 p.m.

Respectfully submitted,

____

Michael Knight, GSA General Manager

Agenda Item 5.a

ADMINISTRATION
Staff Report to the Porterville Irrigation District GSA Board of Directors

Subject: ADMINISTRATION / Consider and Approve Draft PID Hydrogeologic Conceptual Model provided by Luhdorff & Scalmanini, Consulting Engineers. (Action).

Submitted By: General Manager

The purpose of this staff report is to present the Hydrogeologic Conceptual Model (HCM) developed for the PID GSA and to explain how it informs groundwater management decisions under the Sustainable Groundwater Management Act (SGMA). This item is informational and intended to support stakeholder understanding of local groundwater conditions, recharge potential, and the physical framework used for future modeling, monitoring, and management actions.

SGMA requires each Groundwater Sustainability Agency to develop a clear understanding of how groundwater moves through its basin, how it interacts with surface water and land use, and how pumping and recharge affect long-term sustainability. This understanding is documented in the Hydrogeologic Conceptual Model (HCM).

The PID GSA HCM was developed in accordance with California Code of Regulations, Title 23, Section 354.14, and consistent with DWR Best Management Practices. The HCM builds upon work completed at the Tule Subbasin level and incorporates PID-specific data, including soils, geology, well information, aquifer properties, and recharge potential. The HCM serves as the foundation for numerical groundwater modeling, water budgets, monitoring network design, and sustainability management actions.

Summary of the Hydrogeologic Conceptual Model

Geographic and Basin Setting

The PID GSA is located within the Tule Groundwater Subbasin, bounded by the Sierra Nevada foothills to the east and adjacent GSAs to the north, west, and south. The GSA spans approximately five miles east-to-west and exhibits a gentle westward slope averaging about one percent. Land surface elevations range from roughly 450 feet above mean sea level (amsl) in the east to approximately 370 feet amsl toward the west.

Soils and Recharge Characteristics

Soil conditions within PID vary considerably and strongly influence recharge potential:

- Tagus and Nord Loams are deep, permeable soils without hardpan layers and provide the most favorable conditions for groundwater recharge.
- Exeter and Flamen Loams contain duripans (hardpans) at varying depths, which restrict vertical percolation unless mechanically altered.

Recharge potential mapping using the Soil Agricultural Groundwater Banking Index (SAGBI) indicates that most of PID is classified as poor to moderately poor for natural recharge. Higher recharge potential areas occur primarily along the Tule River corridor and portions of the central GSA. SAGBI is a screening-level tool and does not replace site-specific feasibility analyses for recharge projects.

Geologic Framework

The PID GSA is underlain by layered alluvial deposits typical of the eastern San Joaquin Valley. Key geologic units include:

- Upper Aquifer: Shallow, unconfined to semi-confined, extending approximately 150-200 feet below ground surface.
- Lower Aquifer: Semi-confined at greater depths, thickening toward the west.
- Pliocene Marine Deposits: Low-permeability confining unit separating deeper aquifers.
- Santa Margarita Formation: Deep, permeable formation that supplies water to some agricultural wells but is largely disconnected from shallow groundwater dynamics.
- Granitic Basement: Forms the bottom of the groundwater basin and is considered impermeable.

Unlike western portions of the Tule Subbasin, the Corcoran Clay is not present beneath PID, although localized confining layers may occur.

Aquifer Properties

Aquifer testing and regional analyses indicate:

- Upper Aquifer hydraulic conductivity: Approximately 10-20 ft/day in the southeast, increasing to 60-80 ft/day in northern and central areas.
- Lower Aquifer hydraulic conductivity: Generally lower, ranging from less than 10 ft/day to approximately 40 ft/day, depending on location.
- Specific yield (Upper Aquifer): Ranges from very low values (0.001) to greater than 0.25, reflecting variable sediment texture. In other words, in the upper water layer, the amount of water we can actually pump out varies significantly. In some areas, the ground retains water tightly (like thick clay), while in others, it allows water to flow freely (like loose gravel).
- Storativity (Lower Aquifer): Consistent with confined to semi-confined conditions, with values ranging from approximately 8.0e-06 to 3.6e-04. The lower water layer is tightly packed and under pressure. The data indicate it behaves like a sealed system, with water released sparingly compared with the more open upper layers.

These properties influence how groundwater levels respond to pumping, recharge, and drought conditions.

Recharge and Discharge Processes

Groundwater recharge within PID occurs primarily through:

- Deep percolation of applied irrigation water
- Seepage from unlined canals and river reaches
- Infiltration along the Tule River corridor

Groundwater discharge occurs mainly through agricultural and municipal pumping, with limited natural discharge to surface waters. No springs or wetlands are present within the PID GSA.

Stakeholder Considerations

For stakeholders, the HCM helps answer key questions such as:

- Why do groundwater conditions vary across PID
- Where recharge is most feasible and where it is limited
- How local geology affects pumping impacts
- Why management actions may differ by area

Stakeholder input is important as the PID GSA transitions from conceptual understanding to the implementation of management actions.

Next Steps

- Incorporate HCM into ongoing groundwater modeling efforts
- Use HCM outputs to inform future allocation, recharge, and monitoring discussions
- Continue coordination with neighboring GSAs at the Tule Subbasin level
- Periodically update the HCM as new data becomes available

Staff Recommended Actions

Is that the Board receives the update to the GSP section and approval of the Hydrogeologic Conceptual Model (HCM) for the Porterville Irrigation District Groundwater Sustainability Agency (PID GSA).

SECTION 2

2.2. Hydrogeologic Conceptual Model

The hydrogeologic conceptual model (HCM) provides information on the groundwater flow system of the PID GSA, and it describes the Subbasin's interactions with land use and surface water of the area. The HCM provides descriptions of the geologic setting, geologic structure, boundary conditions, and principal aquifers and aquitards. Additionally, it provides a framework to develop a numerical groundwater flow model of the Subbasin, water budgets, and monitoring networks. This HCM for PID GSA has been developed in accordance with the requirements of California Code of Regulations, Title 23, Division 2, Chapter 1.5, Subchapter 2, Article 5, Subarticle 2 (§354.14) and in consideration of DWR's Best Management Practices (BMP).

The HCM was developed utilizing information included in the *Tule Subbasin Setting* (Thomas Harder & Co., 2024b) of the Tule Subbasin Coordination Agreement and the ETGSA GSP (Thomas Harder & Co., 2024c), along with additional public and local data sets.

2.2.1. Topography

The terrain throughout the Subbasin is relatively level, with a gentle slope falling from east to west. The low-lying foothills of the Sierra Nevada Mountain Range in the east are the only major topographical feature within the Subbasin. Land surface elevation throughout the Subbasin ranges from approximately 850 ft amsl, along the eastern edge, to approximately 200 ft amsl along the western edge (Thomas Harder & Co., 2024b).

A map of ground surface elevation across PID is presented in **Figure 2-8**. PID is characterized by an increasingly flat topography moving east to west across the GSA. In the eastern portion of PID, adjacent to the foothills of the Sierra Nevada Mountains, land surface elevation is approximately 450 ft amsl. Moving to the west, land surface elevation within the GSA is approximately 370 ft amsl. The PID GSA is approximately 5 miles wide, with an average slope of 1% falling west.

2.2.2. Soils

Soil characteristics are described for the Subbasin in Section 2.1.6 of the *Subbasin Setting*. A map of soils within PID was developed from the USDA's Natural Resources Conservation Service (NRCS, 2025) and is presented in **Figure 2-9**. As part of the NRCS soil surveys, soil map units are defined to express similarities between soils within similar landform and landscape position. The dominant soil types within the GSA include naturally fertile soils like Mollisols and Alfisols. Mollisols are thick, dark, organic rich (mollic epipedon) which typically form under long-term grassland vegetation. These soils are highly fertile and have excellent vertical permeability. Alfisols on the other hand have greater clay content which results in the development of a duripan (i.e. hardpan) which limits vertical permeability. Soils series that dominate PID include Exeter, Tagus, Flamen, and Nord loam (NRCS, 2025).

2.2.2.1 Exeter Loam

The Exeter Loam is a moderately deep, well-developed soil found on stable alluvial fans and terraces on the eastern San Joaquin Valley. This soil is categorized as Alfisol. It is characterized by a brown, medium-textured loam surface that transitions into a reddish-brown clay loam subsoil with depth. This profile development is a result of long-term weathering of granitic alluvium, leading to a gradual accumulation of clay and iron oxides. At a depth typically between 20 and 40 inches lies a critical feature of this soil which is a silica-cemented duripan (i.e. hardpan). This hardpan is extremely dense and indurated, creating a nearly impenetrable barrier to both root growth and the downward movement of water.

From a hydrogeologic perspective, the Exeter Loam acts as a restrictive layer that significantly influences local water dynamics near PID GSA. Because the saturated hydraulic conductivity drops off sharply at the duripan, the vertical recharge to the Upper Aquifer is negligible in undisturbed areas. This soil requires mechanical ripping to break down the duripan, a process that artificially increases permeability.

2.2.2.2 Tagus Loam

In contrast to the Exeter Loam, the Tagus loam is a very deep, well drained soil that lacks a restrictive duripan, making it a much more favorable profile for vertical water movement. This soil is categorized as a Mollisol. The Tagus series formed from granitic alluvium and is characterized by a thick, dark, organic-rich surface layer. The profile typically consists of a grayish-brown loam that transitions into a light yellowish-brown fine sandy loam or loam with depth. A key feature of this soil is its calcic horizon, where secondary calcium carbonate (lime) has accumulated as filaments or soft masses, usually starting between 10 and 20 inches below the surface.

From a hydrogeologic perspective, this soil is categorized as having moderate permeability throughout its entire depth, which can extend well beyond 60 inches. For this reason, the Tagus Loam is ideal for recharge projects because it is very deep and lacks a hardpan.

2.2.2.3 Flamen Loam

The Flamen Loam is a deep, moderately well drained soil found on nearly level stream terraces around PID GSA. It is characterized by a thick, dark mollic epipedon (i.e. a nutrient-rich surface layer) that typically extends 20 to 40 inches deep. This grayish-brown loam surface transitions into a brown or dark brown loam or clay loam subsoil. While it shares many characteristics with the Tagus series due to its dark subsurface, the defining feature of the Flamen Loam is the presence of a silica rich hardpan at a depth between 40 and 60 inches.

From a hydrogeologic perspective, this soil is a middle ground between the restrictive Exeter Loam and the permeable Tagus Loam. With a deeper hardpan at a depth around four feet, the Flamen Loam allows for a greater volume of moisture storage and deeper root zone penetration before reaching a restrictive boundary. This unit may not be as ideal for recharge projects as the Tagus Loam as a restrictive hardpan is present.

2.2.2.4 Nord Loam

The Nord Loam consists of very deep, well-drained soils that are formed in mixed alluvium derived from granitic and sedimentary rocks sources. This soil is categorized as a Mollisol. Typically found on level floodplains and alluvial plains with slopes less than 2%, these soils are widely distributed along the eastern side of the San Joaquin Valley. The profile is characterized by a thick, dark-colored surface layer that is a grayish-brown loam or fine sandy loam. Similar to the Tagus Loam, the Nord Loam completely lacks a hardpan within 60 inches of the surface.

From a hydrogeologic perspective, this soil is ideal for recharge projects. It possesses moderate to high permeability (0.6 to 2 inches per hour).

2.2.3. Geological and Structural Setting

The regional geologic and structural setting describing the entire Subbasin is described in **Chapter 2.2.2** of the *Tule Subbasin Setting* (Thomas Harder & Co., 2024b).

PID is located within California's Great Valley Geologic Province (**Figures 2-1** and **2-2**). A map of the surficial geology is presented in **Figure 2-10**. PID GSA is underlain by alluvium (Q). This unit is Quaternary in age and is made up of unconsolidated to semi-consolidated sand, gravel, and clay, forming alluvial plains, fans, and terraces (Thomas Harder & Co., 2022; 2024b).

Five geologic formations have been identified across the Subbasin and under PID. Descriptions of these geologic formations are provided below and are depicted in **Figures 2-11 and 2-12**.

Unconsolidated Continental Deposits

Sediment consisting of fluvial (i.e. streambed deposits), alluvial, flood plain, and lacustrine (i.e. lakebed) deposits. Within the PID GSA, the deposits are estimated to be up to approximately 1,200 ft (Thomas Harder & Co., 2022; 2024b). Subsurface alluvial sediments consist of highly stratified layers of sand and gravel (relatively high permeability) interbedded with silt and clay (lower permeability). Correlation of individual sand and clay layers that extend laterally across the Subbasin can be unclear due to the interbedded nature of the sediments.

The unconsolidated continental deposits form the primary groundwater reservoir in the Subbasin, and they range in age from recent near-surface stream channels to Upper Pliocene (approximately 2.6 mya) at depth. East of the PID GSA and the Subbasin, Pleistocene sediments (2.6 million to 11,700 years before present) crop out at the land surface along the base of the Sierra Nevada Mountains, forming the dissected uplands (Lofgren and Klausing, 1969). The older continental deposits are semi-consolidated and contain a high percentage of clay; therefore, they typically do not yield significant water to wells.

The lowermost portion of unconsolidated continental deposits is correlated with the Tulare Formation, which includes the Corcoran Clay confining layer, also referred to as the *E-Clay* (Frink and Kues, 1954), which is located west of the PID GSA area. The Corcoran Clay consists of a Pleistocene diatomaceous fine-grained lacustrine deposit (primarily clay; Faunt, 2009). In the Subbasin, the Corcoran Clay is 150 ft thick at its maximum beneath the Tulare Lake, becomes progressively thinner to the east, and it pinches out on the east side of Highway 99 (Lofgren and Klausing, 1969).

Pliocene Marine Deposits

Consolidated to loosely consolidated marine siltstone with minor interbedded sandstone beds that underlie the continental deposits. The marine siltstone unit ranges in thickness from approximately 250 ft along the eastern region of the PID GSA to greater than 500 ft at its western boundary (Lofgren and Klausing, 1969; Thomas Harder & Co., 2022). The marine siltstone beds dip sharply from the base of the Sierra Nevada Mountains on the east to the central region of the valley in the west. The Pliocene marine strata do not yield significant water to wells due to its relatively low permeability.

Santa Margarita Formation

This formation underlies the Pliocene marine strata and consists of Miocene (approximately 5.3 to 23 million years before present) sand and gravel that is relatively permeable and yields water to wells. Within the PID GSA, the formation is approximately 250 to 650 feet thick, and its depth beneath the GSA ranges from 1,000 feet near State Highway 65 to approximately 2,500 ft beneath the western boundary of the GSA.

Tertiary Sedimentary Deposits

An interbedded assemblage of semi-consolidated to consolidated sandstone, siltstone and claystone of Tertiary age (approximately 2.6 to 66 million years before present) that underlie the Santa Margarita Formation. Some irrigation wells in the southeastern region of the Tule Subbasin produce fresh water sourced by the Olcese Sand Formation within this formation (Ken Schmidt, 2019). Most of the groundwater in the unit is not usable for crop irrigation or municipal supply, except near Highway 65, due to increased salinity to the southwest.

Granitic Crystalline Basement

Basement rock consisting of Mesozoic granitic rocks that compose the Sierra Nevada batholith (Faunt, 2009) and are assumed to be relatively impermeable.

2.2.4. Lateral Basin Boundary

The lateral basin boundaries for the Subbasin, including natural and political boundaries, are described in DWR Bulletin 118 (DWR, 2016). To the north of the Tule is the Kaweah Subbasin, to the west is the Tulare Lake Subbasin, and to the south is the Kern County Subbasin. To the east of the Subbasin is the Sierra Nevada Mountain Range which is outside of the San Joaquin Valley Groundwater Basin (**Figure 2-1**).

PID GSA is bounded by the following jurisdictions: the City of Porterville to the east, LTRID to the west, the Kaweah subbasin to the north, and portions of Tule East and LTRID GSA to the south (**Figure 2-2**).

2.2.5. Bottom of Basin

The bottom of the Tule Subbasin and the PID GSA is defined by the interface between the Tertiary sedimentary deposits and the underlying, relatively impermeable granitic basement rock (Thomas Harder & Co., 2022; 2024a) (**Figures 2-11 and 2-12**). The depth of this interface is approximately 2,000 ft bgs beneath the eastern boundary of the GSA and Highway 65 and increases westward to greater than 2,500 ft (Thomas Harder & Co., 2022, 2024b).

The interface between freshwater and brackish water is thought to occur at depths ranging from less than 1,200 ft bgs in the northeastern region of the Tule Subbasin near the PID GSA area to greater than 2,500 ft bgs near the Tulare/Kern County line (south of the PID GSA). Groundwater quality parameters determine the efficacy of a fresh groundwater basin and determine if it is suitable for municipal, irrigation, or other uses. For example, a measure of the bottom of the basin is determined by an electrical conductivity of 3,000 micromhos per centimeter (µmohs/cm), which is approximately correlative to a total dissolved solids (TDS) concentration of 2,000 milligrams per liter (mg/L) (Thomas Harder & Co., 2024b). Aquifer groundwater quality of the PID GSA is discussed in greater detail in Section 2.3.8 of this GSP.

2.2.6. Principal Aquifers and Aquitards

2.2.6.1 Aquifer Formations

Five aquifer formations have been identified within the subsurface of the Subbasin. These layers include the Upper Aquifer, Corcoran Clay, the Lower Aquifer, Pliocene Marine Deposits, and the Santa Margarita. All but the Corcoran Clay are present with PID GSA (**Figures 2-11 and 2-12**). A summary of the four aquifer/aquitard units that are present in PID, as well as their approximate thicknesses, is described below. Descriptions are based on information presented in (Thomas Harder & Co., 2022; 2024b).

1. **Upper Aquifer** – An unconfined to semi-confined aquifer occurring throughout the entire Subbasin, shallowing from west to east. The Upper Aquifer is generally considered unsaturated near the southern region of the Subbasin, with local areas of groundwater. Within the PID GSA, the Upper Aquifer is located within the upper 150 ft of sediment, increasing to approximately 200 ft near the western boundary.
2. **Lower Aquifer** – Confined beneath the Corcoran Clay, where it is present (west of Highway 99), and conceptualized to be semi-confined in the northeastern portion of the Subbasin. The Lower Aquifer is separated from the underlying Santa Margarita Formation Aquifer by a thick layer of Pliocene Marine Deposits. In the eastern region of the GSA, the Lower Aquifer has an estimated thickness of approximately 500 ft bgs and increases in depth westward to approximately 1,000 ft bgs near the western boundary of the GSA.
3. **Pliocene Marine Deposits** – A layer of marine deposits (confining unit) in the southeastern portion of the Subbasin that separates the Lower Aquifer from the underlying Santa Margarita Aquifer. Due to its low permeability, the Pliocene marine deposits do not yield significant water to wells. The confining marine deposits are between 500 ft to 1,600 ft thick throughout the Subbasin.

4. **Santa Margarita Formation and Olcese Formation** – Tertiary sedimentary deposits occurring at depths greater than 2,000 ft, forming a localized aquifer in the southeastern portion of the Subbasin. The aquifer underlies the Pliocene Marine Deposits and is conceptualized as hydrologically disconnected from the rest of the identified aquifers in the Subbasin. It is relatively permeable and is a major water source for agricultural irrigation.

2.2.6.2 Aquifer Physical Properties

The principal water-bearing aquifers of the Subbasin are formed from permeable sand and gravel layers that are interbedded with low-permeability silt and clay lenses. Shallower saturated sediments are generally unconfined to semi-confined, while confined aquifers in the western region of the basin occur beneath the Corcoran Clay, west of the PID GSA. The ability of aquifer sediments to transmit and store water is based on the aquifer's transmissivity, hydraulic conductivity, and storativity. Aquifer parameters were derived using short-term pump tests and long-term pump tests (24 hours or more at a constant rate).

Transmissivity/Hydraulic Conductivity

Transmissivity is a measure of the ability of groundwater to flow within an aquifer. It is defined as the rate of groundwater flow through a unit width of an aquifer under a unit hydraulic gradient (Fetter, 1994), and it was estimated from short-term pumping test data based on Theis et al. (1963) and the following relationship:

$$T = \frac{S_c \, x \, 2{,}000}{E}$$

Where:

T = Transmissivity (gpd/ft);
S_c = Specific Capacity (gpm/ft);
E = Well Efficiency (assumed to be 0.7)

The transmissivity values at individual wells within the Subbasin were converted into hydraulic conductivity (i.e. aquifer permeability) by dividing by the aquifer thickness using the perforation interval of the well.

Horizontal hydraulic conductivity for the Upper Aquifer ranges from 10-20 ft/day in the southeastern region of the Porterville GSA up to 60-80 ft/day in the northeastern and central regions of the GSA (**Figure 2-13**). Whereas horizontal hydraulic conductivity in the Lower Aquifer range from less than 10 ft/day in the northwest region of the PID GSA to 20-40 ft/day in the eastern region of the GSA (**Figure 2-14**). Higher hydraulic conductivity values in the northern region of the PID GSA indicate that the sediments are more permeable than in the southern region, which derived lower conductivity values.

Additional details on hydraulic conductivity in the region are described in Chapter 2.1.7.2 of the Tule Subbasin Setting.

Specific Yield/Storativity

Specific yield refers to the ratio of the volume of water that sediment will yield by gravity drainage to the volume of the sediment. The majority of the Upper Aquifer is characterized as unconfined; therefore, its storage properties are expressed in terms of specific yield, and its values were assigned based on a USGS texture analysis published in Faunt (2009). Textural descriptions of sediment in terms of coarse-grain percentages were based on drillers' logs generated from boreholes or wells drilled within or immediately outside the Subbasin. Higher percent coarse-grained sediment is directly proportionate to higher specific yields. Across the Subbasin, specific yield values range from 0.001 in the western portions of the subbasin, to as high as 0.25 in the areas where the FKC intersect the White River. Within PID GSA in the Upper Aquifer, specific yield values range from approximately 0.001 to 0.05 in the southeastern region of the GSA near Tule River, and >0.25 in the northwestern region (**Figure 2-15**).

The Lower Aquifer in the Subbasin is confined to semi-confined; therefore, its storage properties are expressed in terms of storativity. Storativity is a measure of the volume of water that an aquifer can release from, or take into, storage per unit of aquifer surface area per unit change in hydraulic head. Storativity is based on long-term pumping tests, during which pumping interference is measured in a monitoring well located a known distance from the pumping well. Pumping interference data for the Tule Subbasin were not available. Therefore, storativity values for the lower alluvial aquifer were originally based on values published in Faunt (2009) and were modified during calibration of the Subbasin's numerical model. Storativity values in the Lower Aquifer under confined conditions range from 8.0e-06 to 3.6e-04, which are indicative of confined aquifer conditions. The storativity values tend to increase from east to west. Within PID, storativity values are estimated to be between 8.0e-06 and 3.6e-04 (**Figure 2-16**).

2.2.7. Geologic Structures that Affect Groundwater Flow

Across the Subbasin, the Corcoran Clay confining unit is the most significant geologic feature that affects groundwater flow. The unit is not within PID, though localized confining beds may be present. Groundwater flow within the PID is described in Section 2.5.1.

No significant faults have been mapped within the PID GSA that would affect groundwater flow. A concealed fault is present in the northeastern corner of the Subbasin (**Figure 2-10**).

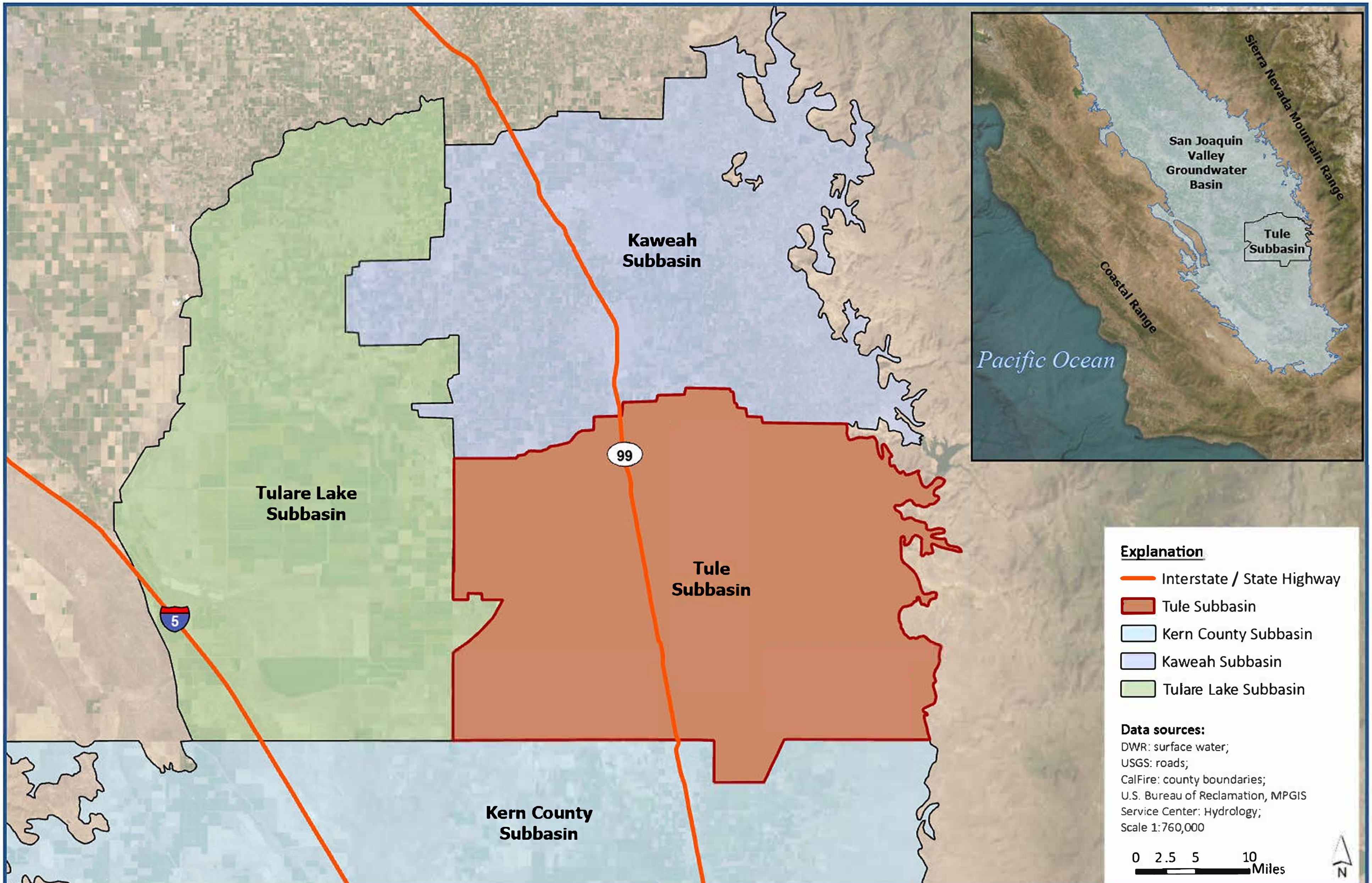
2.2.8. Areas of Groundwater Recharge and Discharge

Groundwater recharge occurs primarily through deep percolation of surface water flow and infiltration of applied irrigation water. Deep percolation can occur over relatively permeable surface soils when there is a lack of subsurface impediments. As described in Section 2.2.2, greater recharge is likely to occur in the Tagus and Nord Loams due to their high vertical permeability and lack of duripan. Areas of recharge within the Subbasin are identified for the Subbasin in Chapter 2.1.6 of the *Subbasin Setting*, and generally occur along or within stream channels, unlined canals, in managed recharge basins, and on irrigated agricultural lands. Within PID, areas suitable for recharge occur throughout the central portion of the GSA and in areas along the Tule River.

The Soil Agricultural Groundwater Banking Index (SAGBI) was developed by the University of California Davis and identifies effective areas of recharge based on deep percolation potential, root zone residence time, topography, chemical limitations, and soil surface conditions. The SAGBI is intended to provide a preliminary indicator of potential recharge and where enhanced recharge could be implemented. SAGBI may not represent the complete view of recharge potential and additional geotechnical studies should be conducted prior to the implementation of recharge projects. Classifications of potential recharge in the SAGBI include Very Poor; Poor; Moderately Poor; Moderately Good; Good; and Excellent, in order of increasing recharge potential.

Figure 2-17 contains the SAGBI rating of potential recharge within the PID GSA without consideration for soil modifications, such as deep tillage, that may have occurred historically or could potentially occur. Based on the SAGBI Index, PID generally consists of soils that are “poor” for groundwater recharge. Areas of high recharge potential are in the central portion of the GSA, extending diagonally to the northwest from the east, following the Tule River.

Groundwater discharge within PID occurs through groundwater pumping and baseflow contributions to surface water systems (Tule River). No springs or wetlands are present within PID.



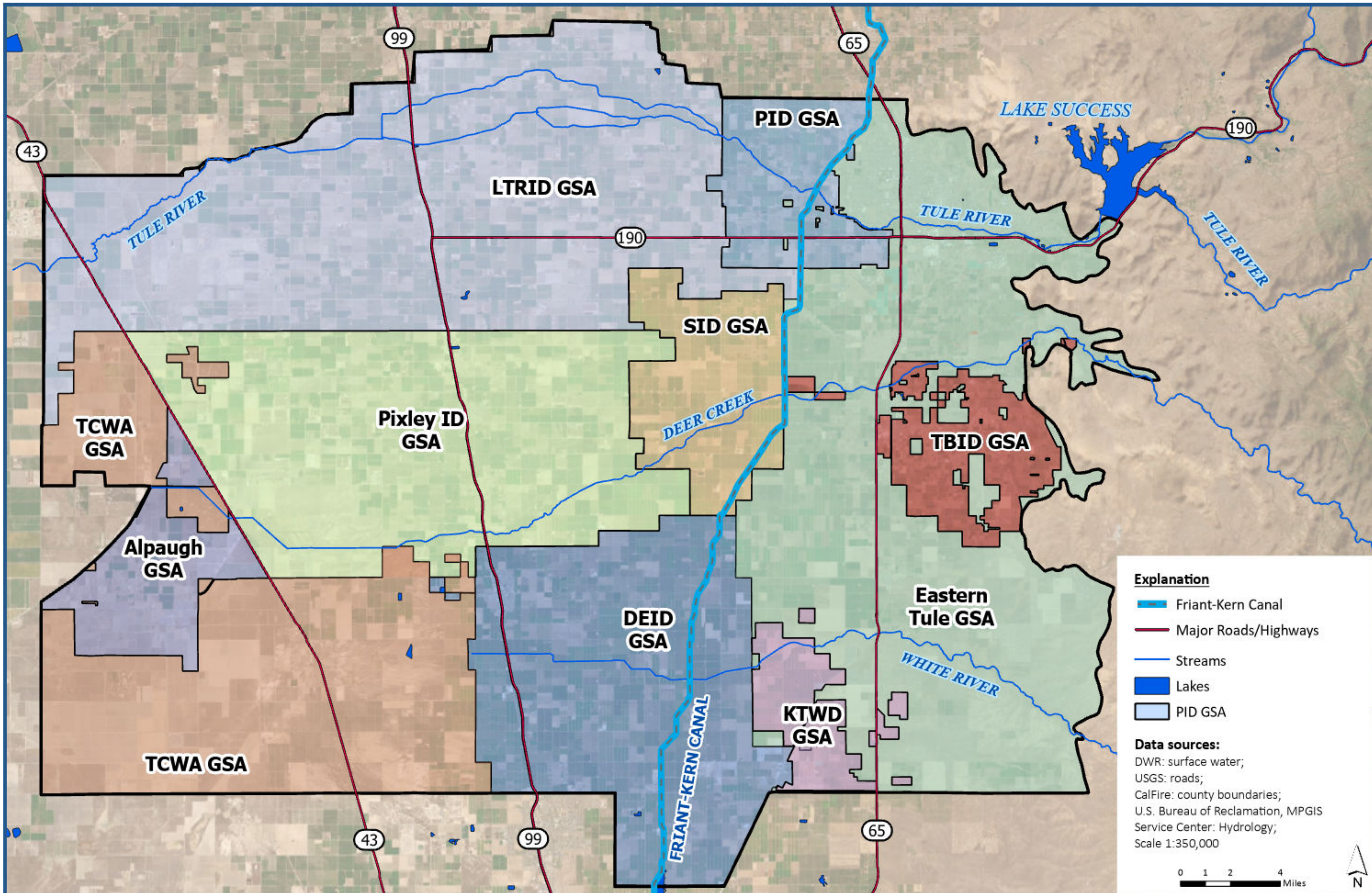
Luhdorff & Scalmanini Consulting Engineers

Tule Subbasin Location Map

Figure 2-1

PID GSA GSP

Porterville Irrigation District GSA/Tule Subbasin



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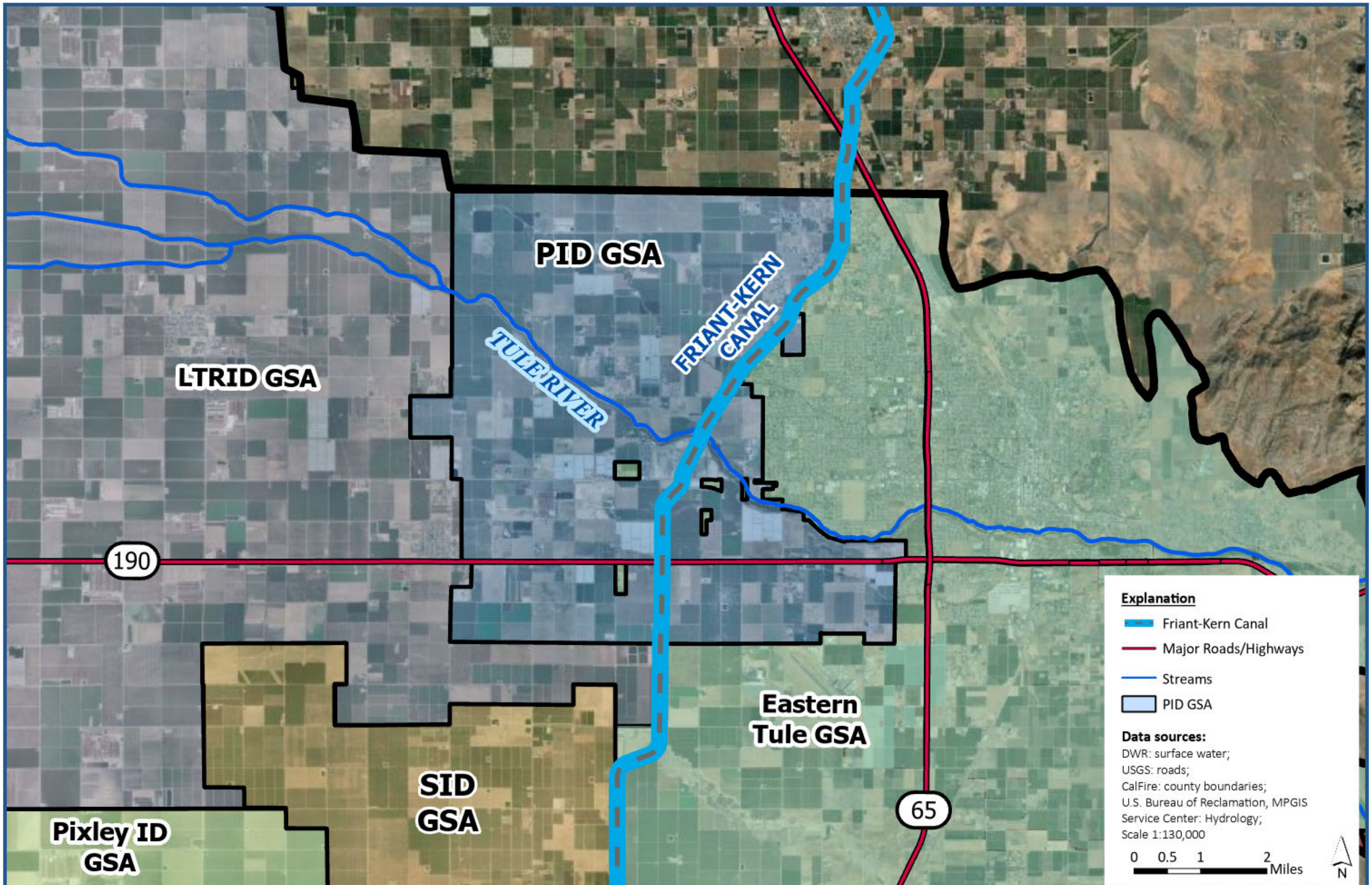
GSA Location Map

PID GSA GSP
Porterville Irrigation District GSA/Tule Subbasin

Figure 2-2



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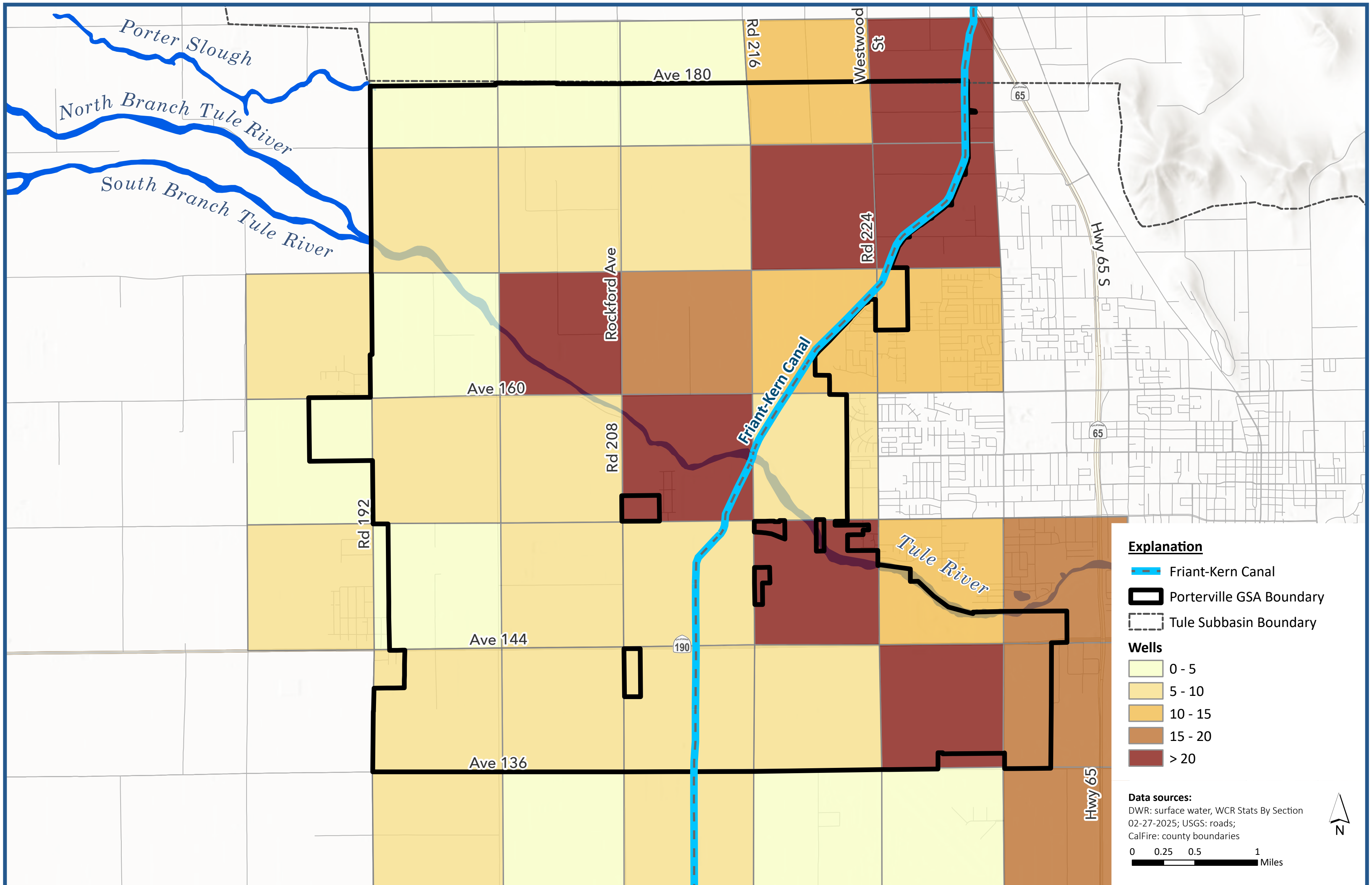
PID GSA Location Map

Figure 2-3

PID GSA GSP
Porterville Irrigation District GSA/Tule Subbasin



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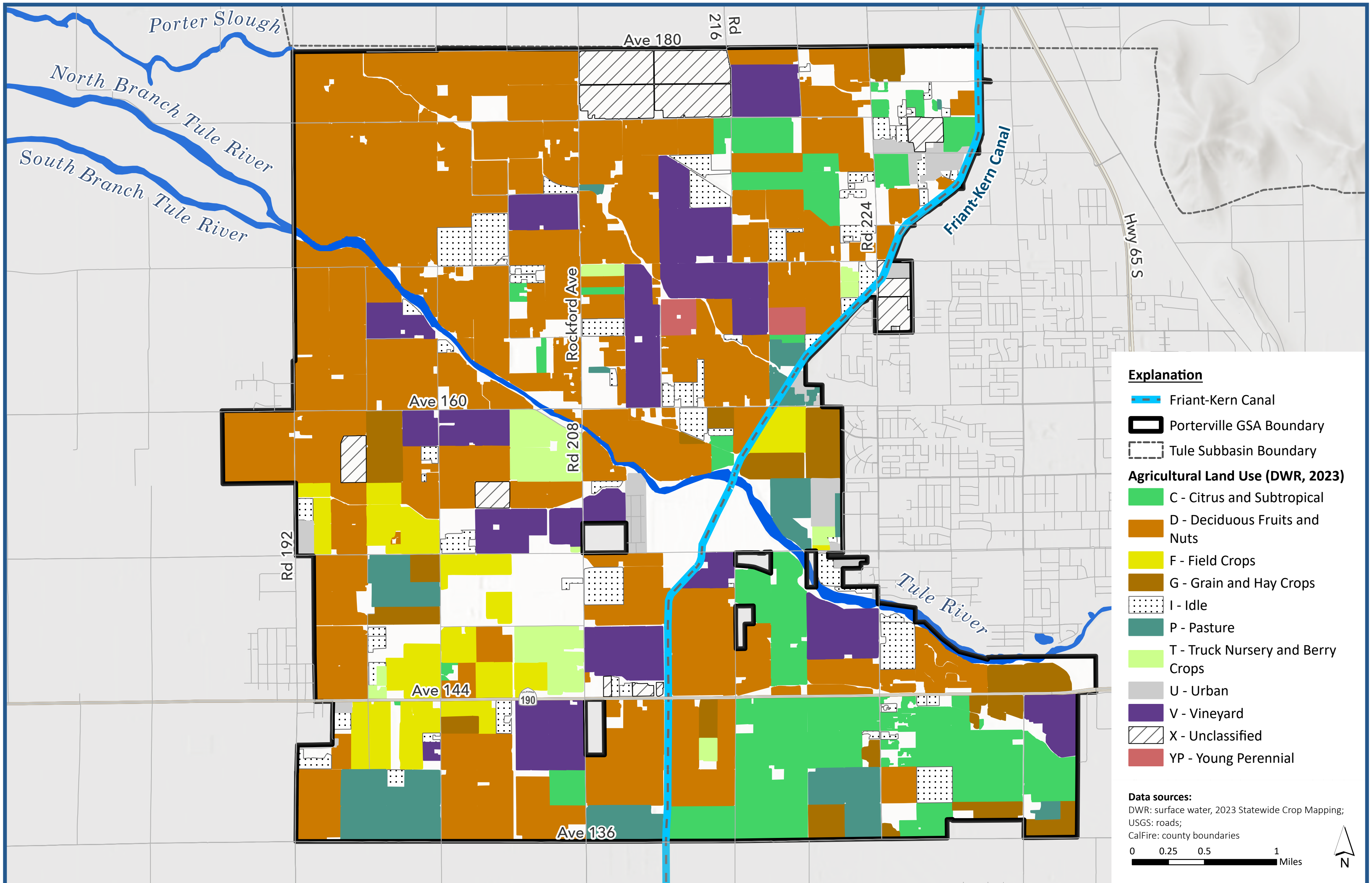
Well Density Map

Figure 2-4

Groundwater Sustainability Plan
Porterville Irrigation District GSA, Tule Subbasin



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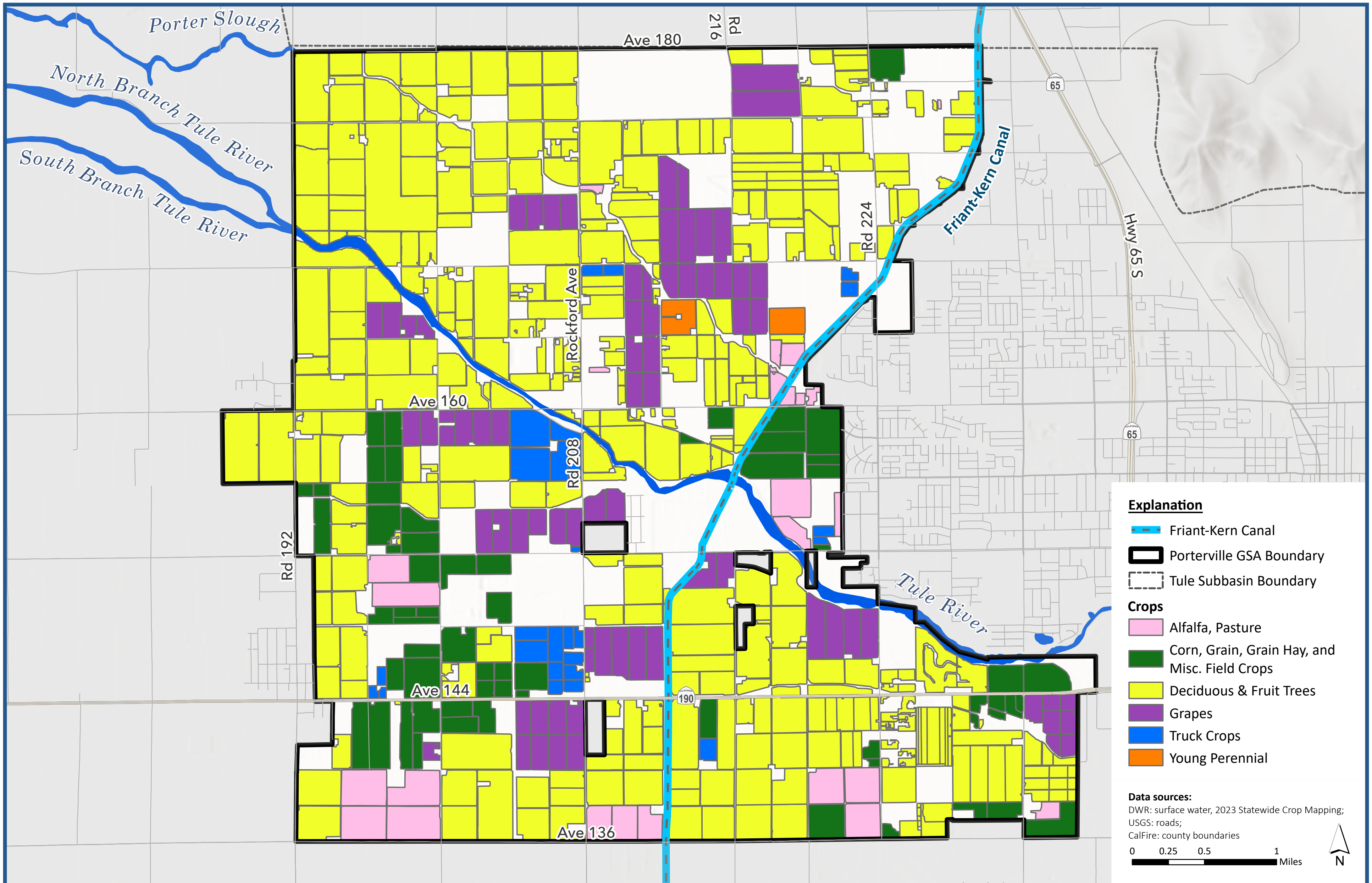
2023 General Land Use Designation

Figure 2-6

Groundwater Sustainability Plan
Porterville Irrigation District GSA, Tule Subbasin



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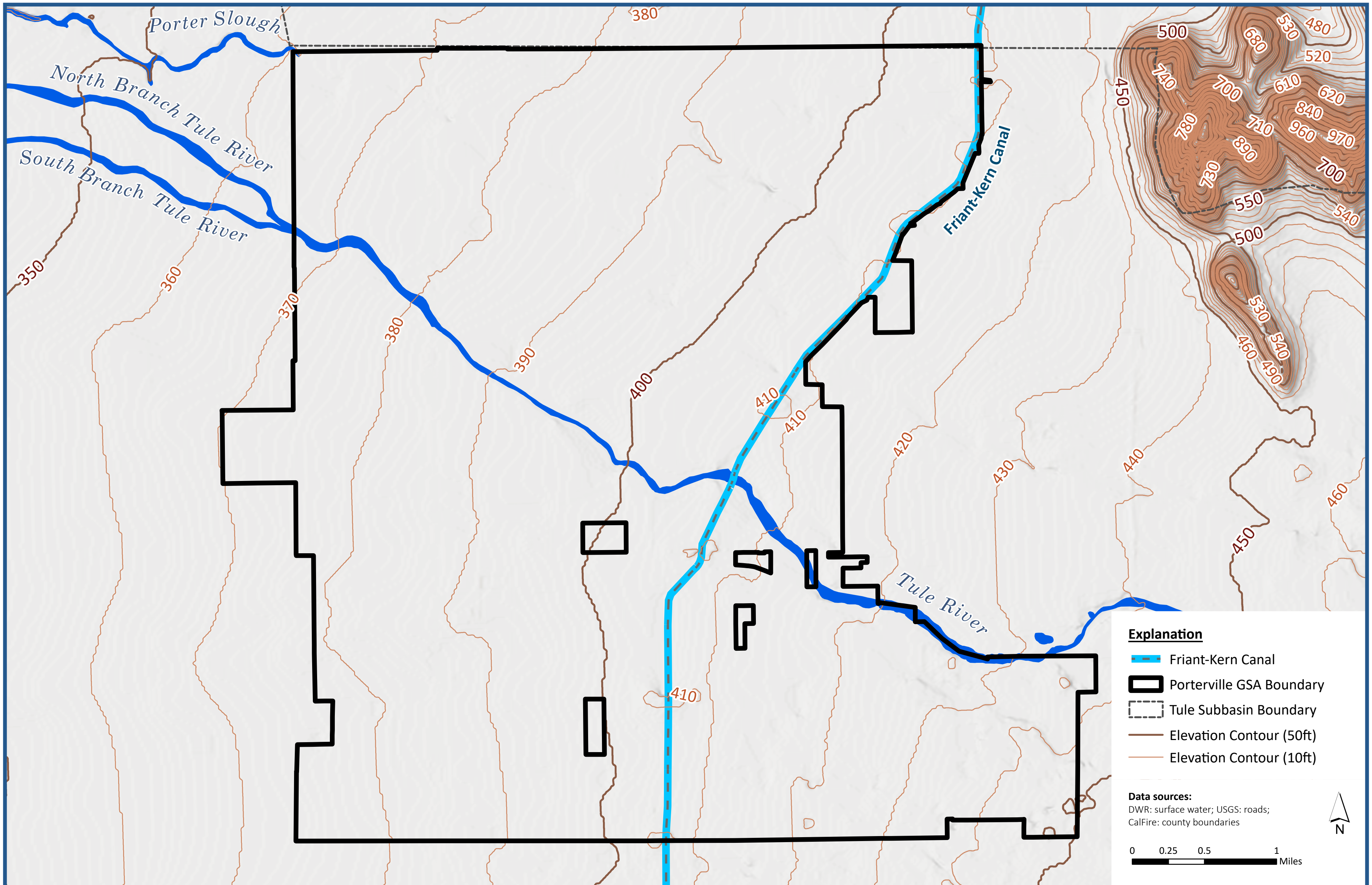
2023 Irrigated Crops

Figure 2-7

Groundwater Sustainability Plan
Porterville Irrigation District GSA, Tule Subbasin



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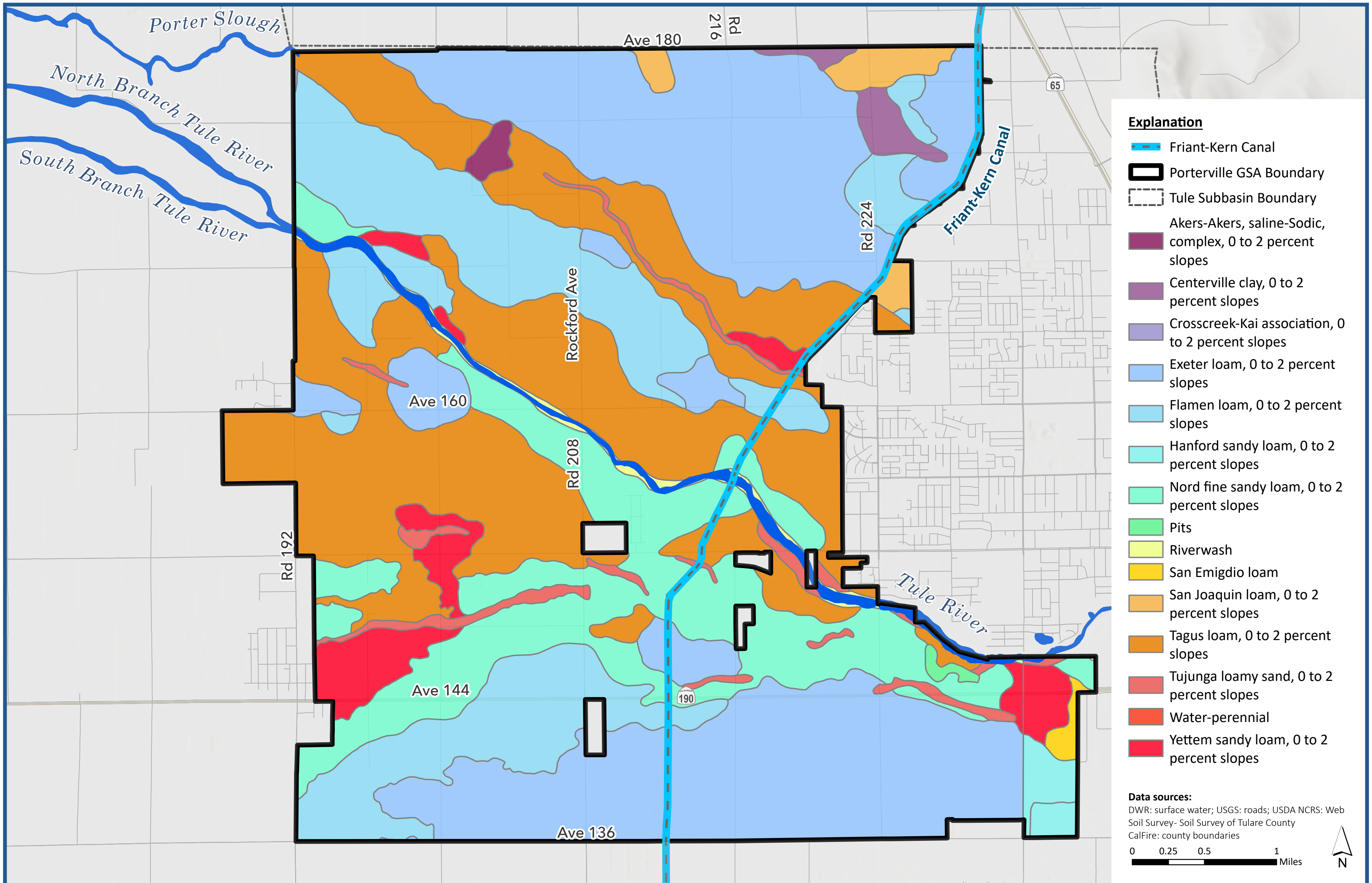
Map of Ground Surface Elevation

Figure 2-8

Groundwater Sustainability Plan
Porterville Irrigation District GSA, Tule Subbasin



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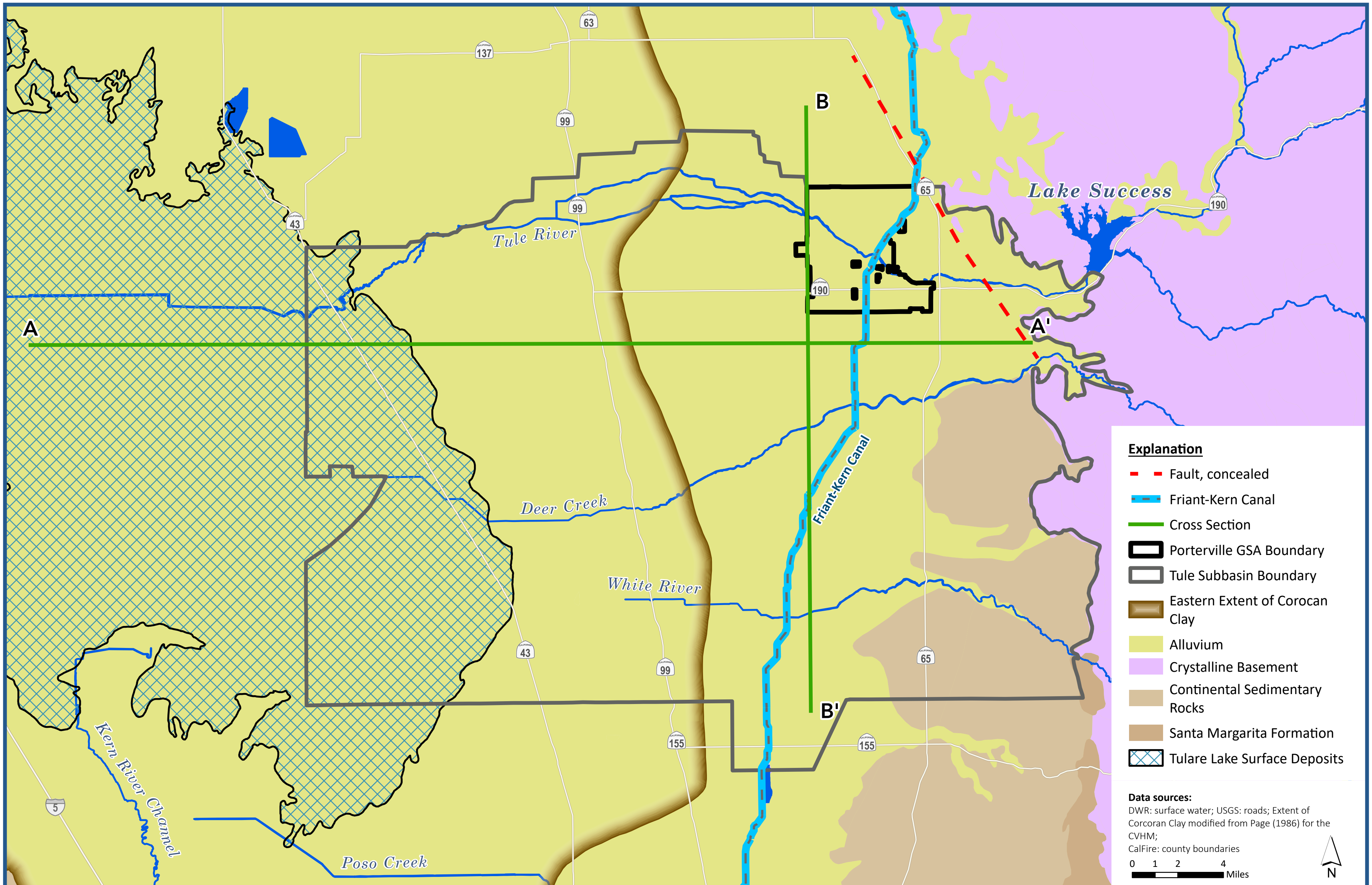
PID Soils

Figure 2-9

Groundwater Sustainability Plan
Porterville Irrigation District GSA, Tule Subbasin



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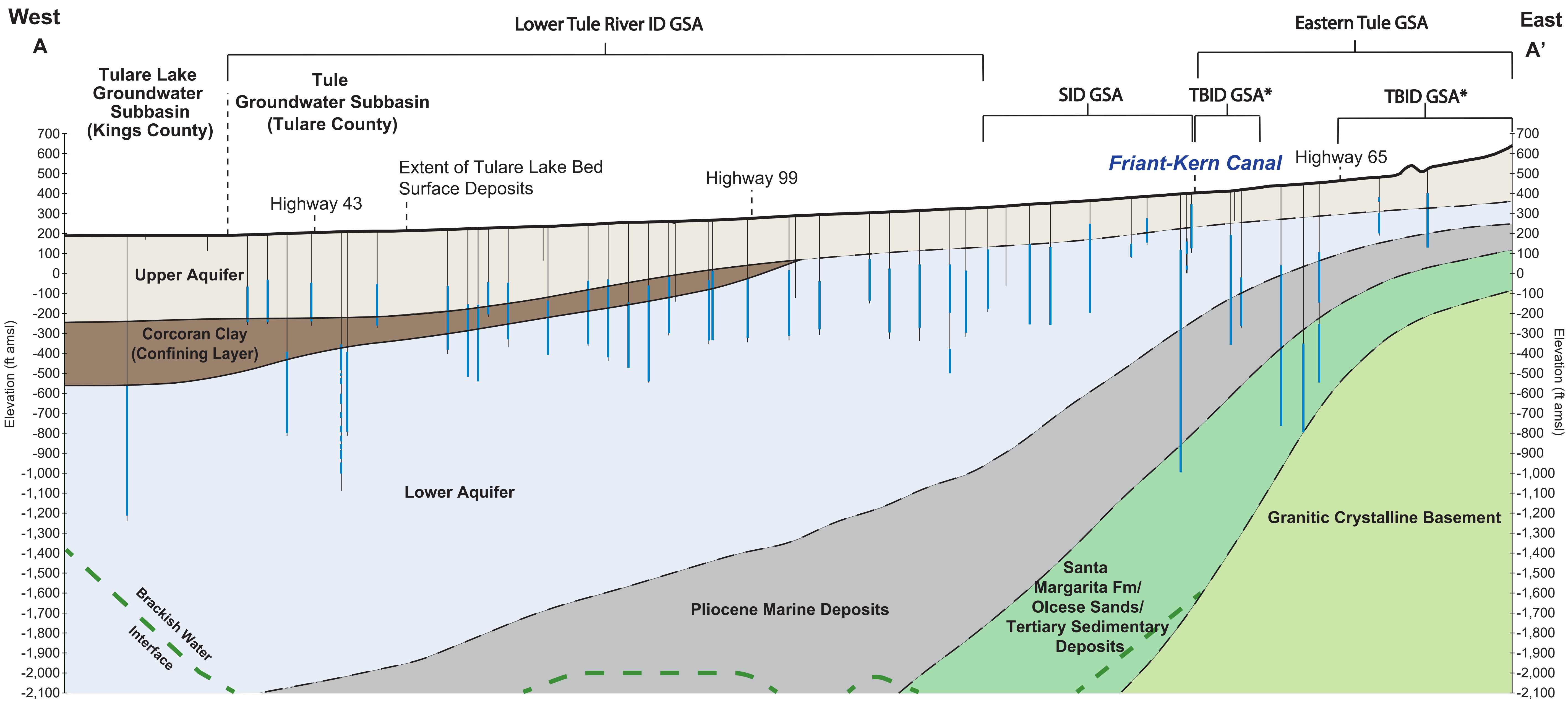
Surficial Geology and Cross Section Locations

Figure 2-10

Groundwater Sustainability Plan
Porterville Irrigation District GSA, Tule Subbasin



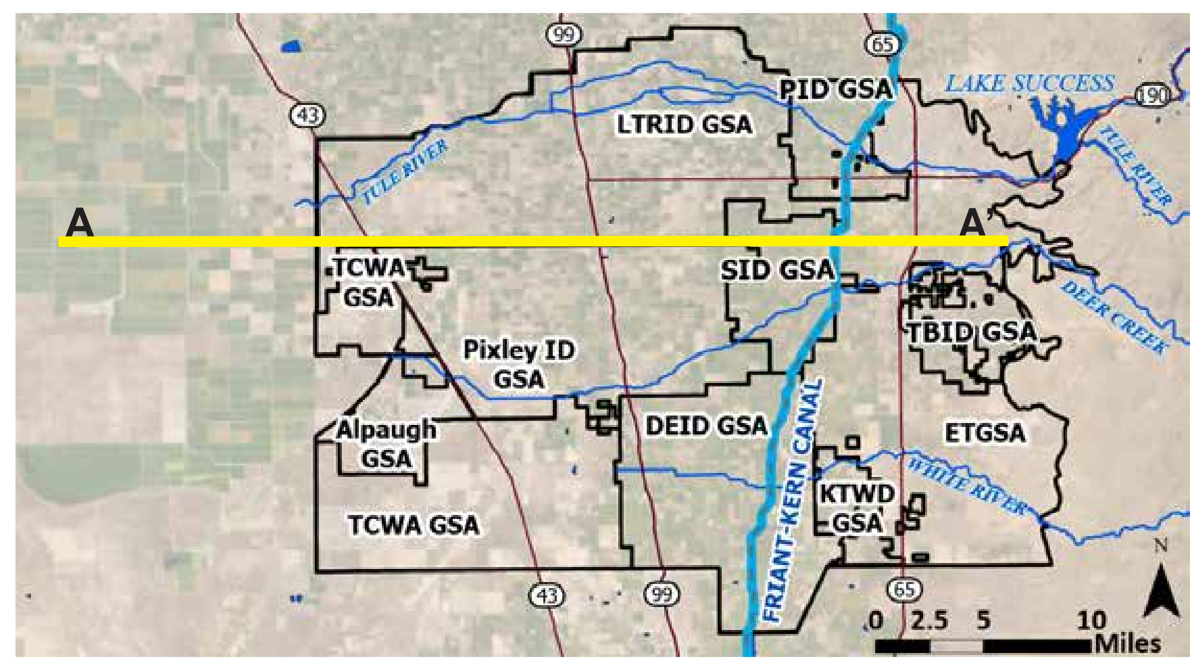
Notes: Modified cross-section from Thomas Harder & Co. (2024)
Lithologic data from Department of Water Resources Well Compeletion Reports.
Wells are located within one half mile from A-A' line.
*TBID GSA boundaries are located within 2 miles south of the A-A' cross-section line.
Corcoran Clay from USGS Professional Paper 1766, http://water.usgs.gov/GIS/dsdl/pp1766_CorcoranClay.zip

Brackish Water Interface based on Planert and Williams, 1995 and Page, 1973 USGS Atlas HA-489

Vertical Scale: 0, 100, 200, 300, 400 Feet

Horizontal Scale: 0, 1/2, 1, 2 Miles

= Well perforation interval
= A - A' cross-section line
Fm = Formation



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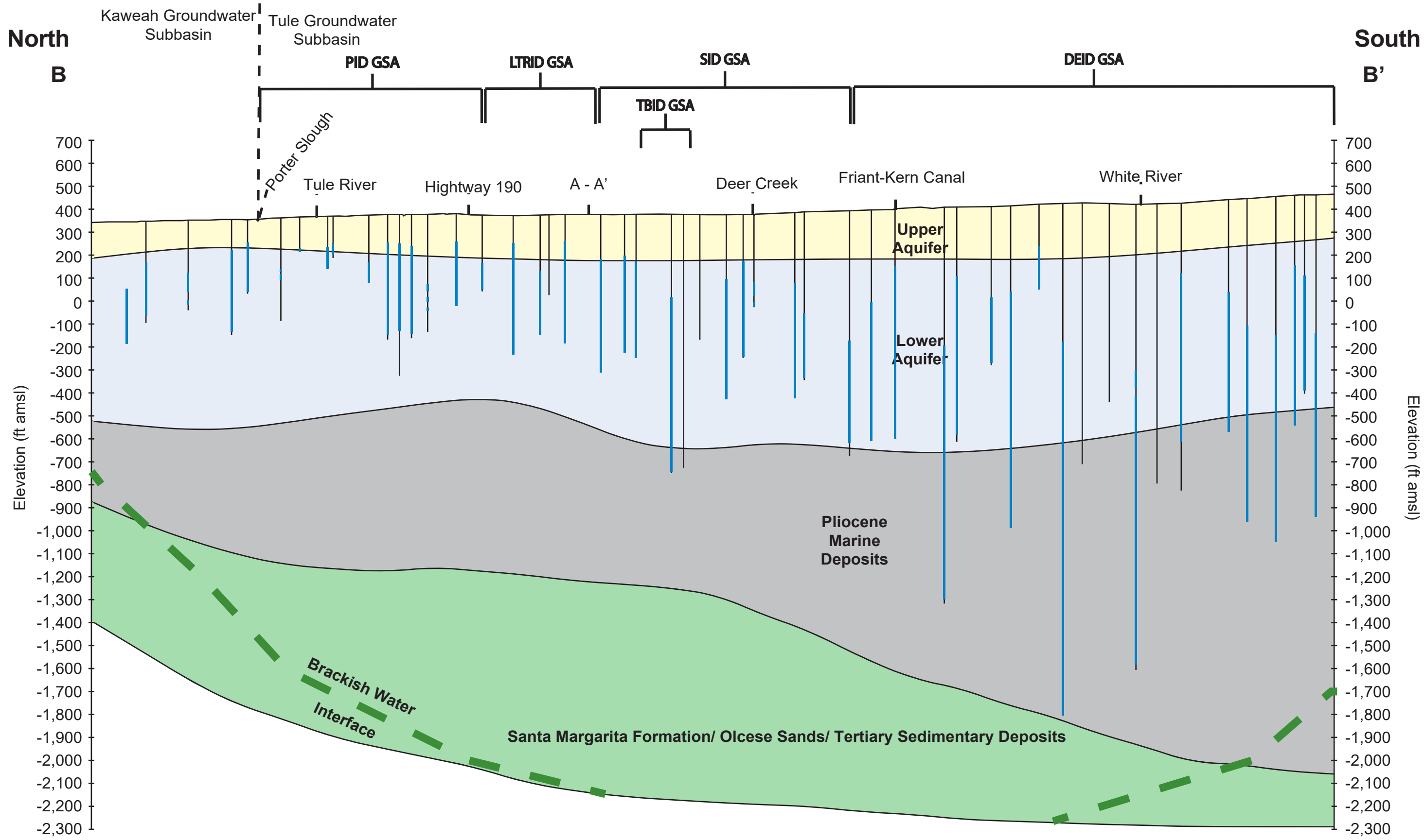
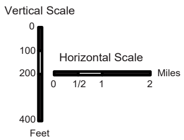
Geologic Cross-Section: A-A'

Figure 2-11

Groundwater Sustainability Plan
Porterville Irrigation District GSA, Tule Subbasin

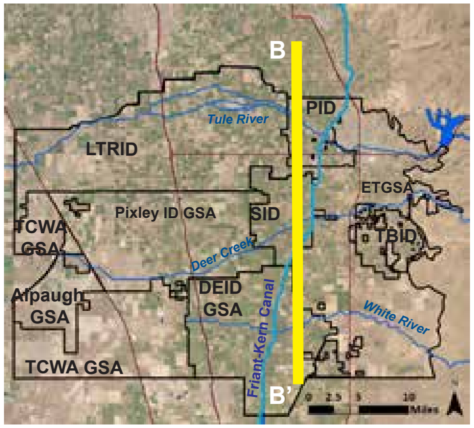




Notes: Modified cross-section from Thomas Harder & Co. (2024)
Lithologic data from Department of Water Resources Well Compeletion Reports.
Wells are located within one half mile of cross-section line.
Corcoran Clay from USGS Professional Paper 1766,
http://water.usgs.gov/GIS/dsdl/pp1766_CorcoranClay.zip

Brackish Water Interface based on Planert and Williams, 1995 and Page, 1973 USGS Atlas HA-489

| = Well perforation interval
▬ = B - B' cross-section line
Fm = Formation



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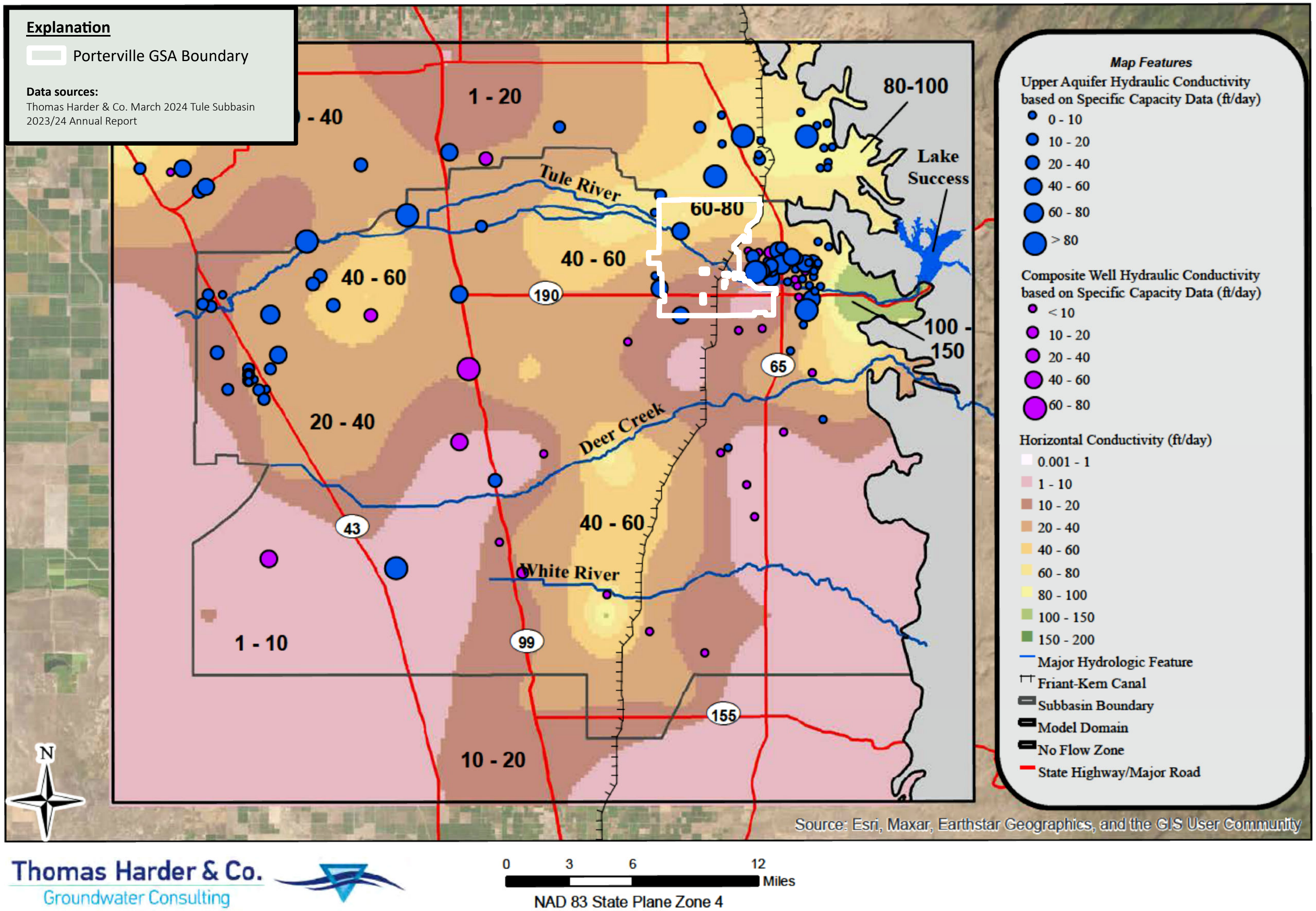
Geologic Cross-Section B-B'

Figure 2-12

Groundwater Sustainability Plan
Porterville Irrigation District GSA, Tule Subbasin

Tule Subbasin Technical Advisory Committee
2023/2024 Annual Report



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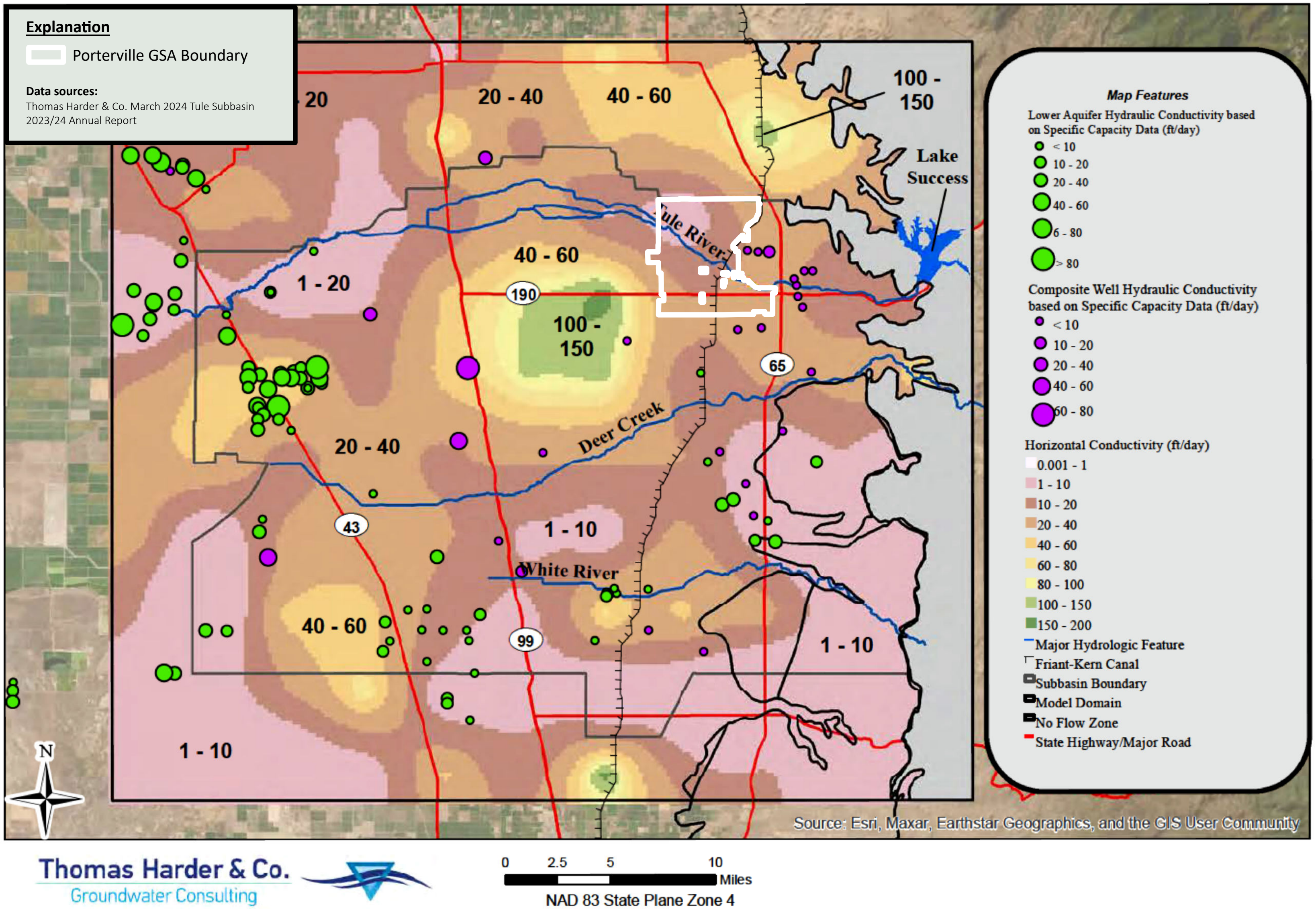
Upper Aquifer Horizontal Hydraulic Conductivity

Figure 2-13

Groundwater Sustainability Plan
Porterville Irrigation District GSA, Tule Subbasin

Tule Subbasin Technical Advisory Committee
2023/2024 Annual Report



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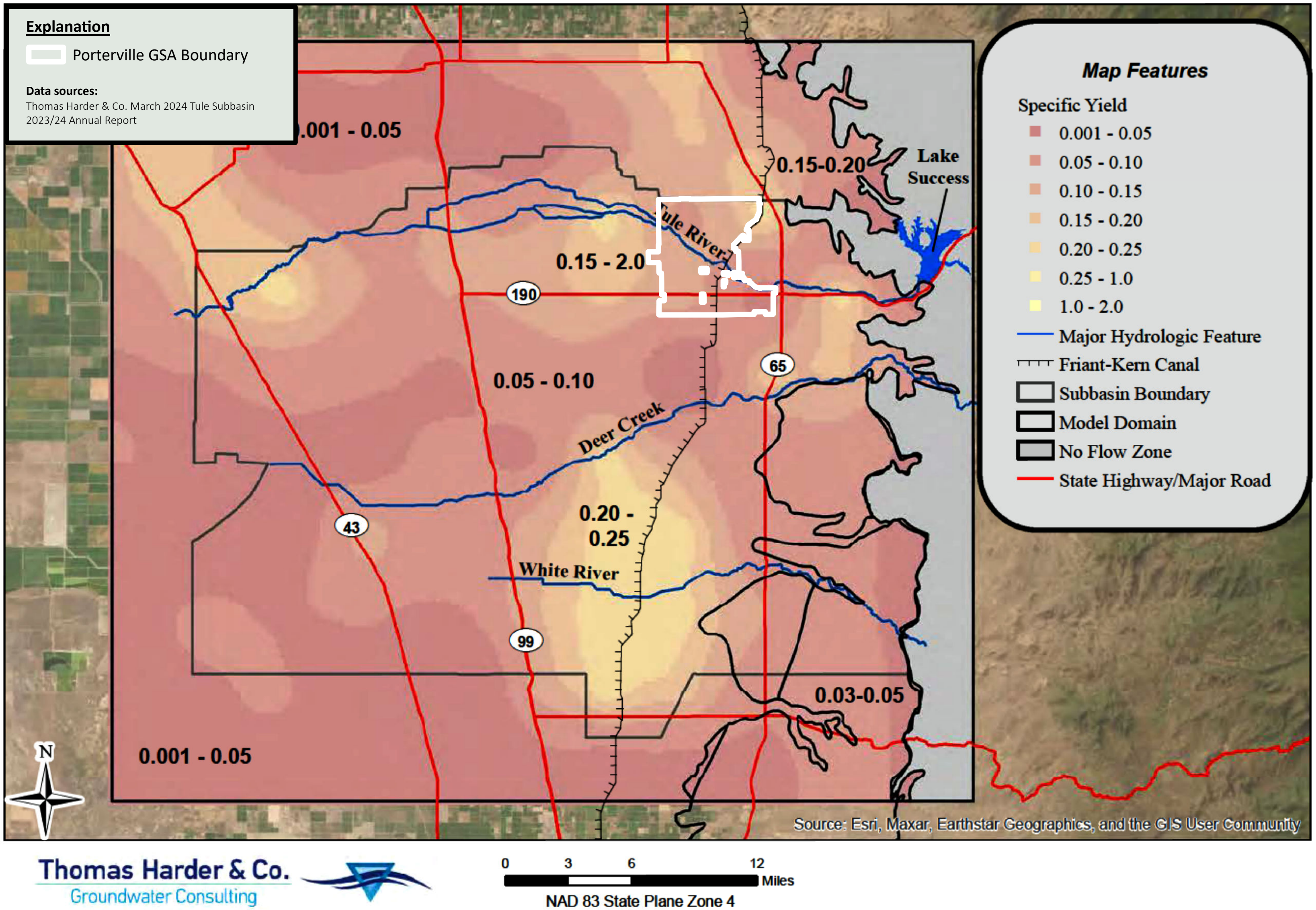
Lower Aquifer Horizontal Hydraulic Conductivity

Figure 2-14

Groundwater Sustainability Plan
Porterville Irrigation District GSA, Tule Subbasin

Tule Subbasin Technical Advisory Committee
2023/2024 Annual Report



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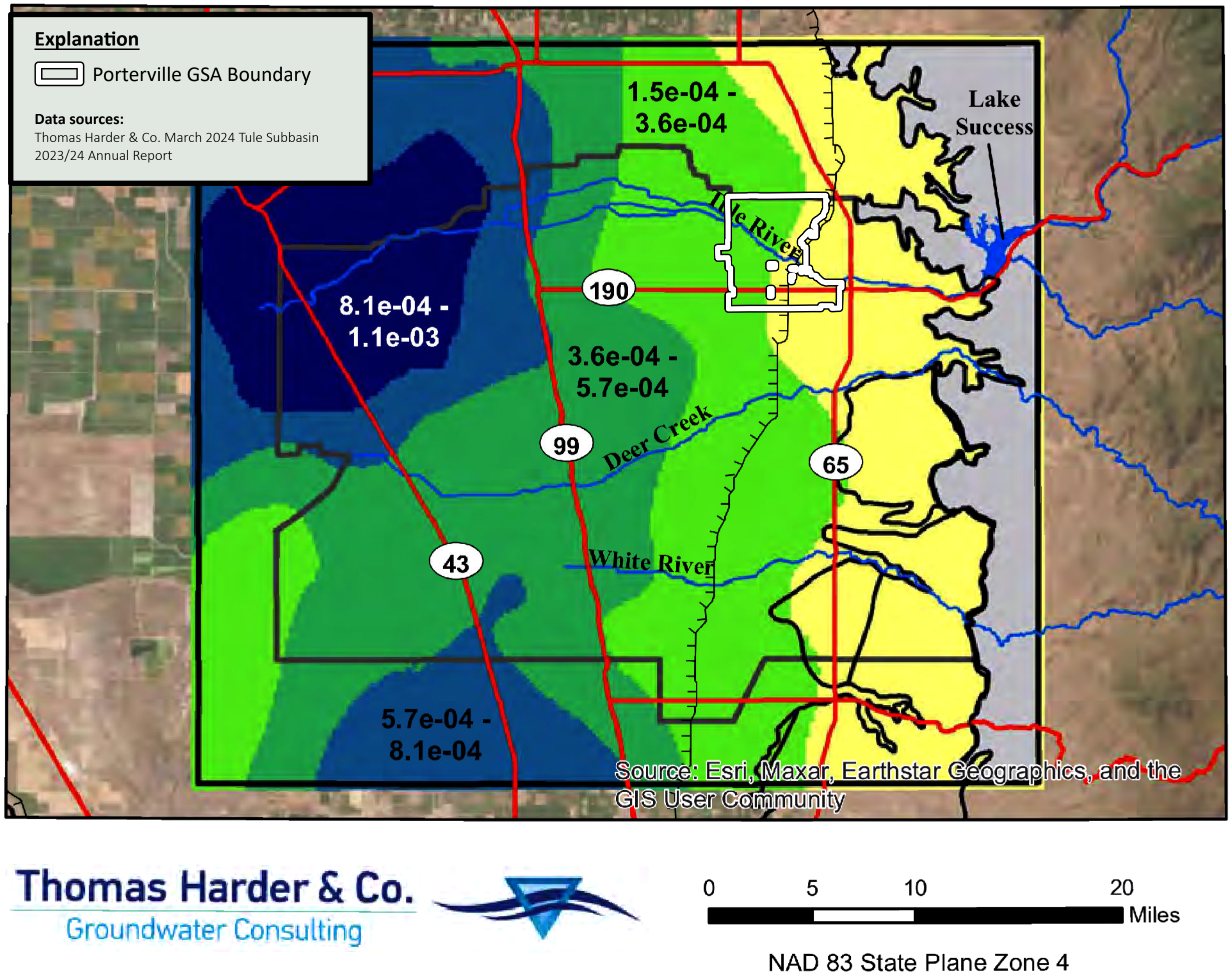
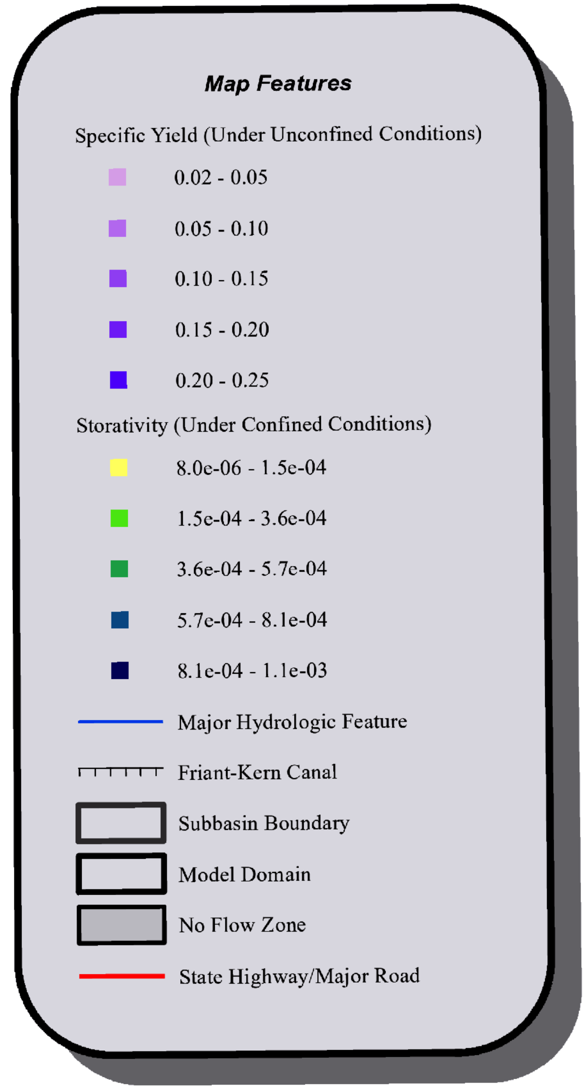
Lower Aquifer Horizontal Hydraulic Conductivity

Figure 2-15

Groundwater Sustainability Plan
Porterville Irrigation District GSA, Tule Subbasin

Tule Subbasin Technical Advisory Committee
2023/2024 Annual Report





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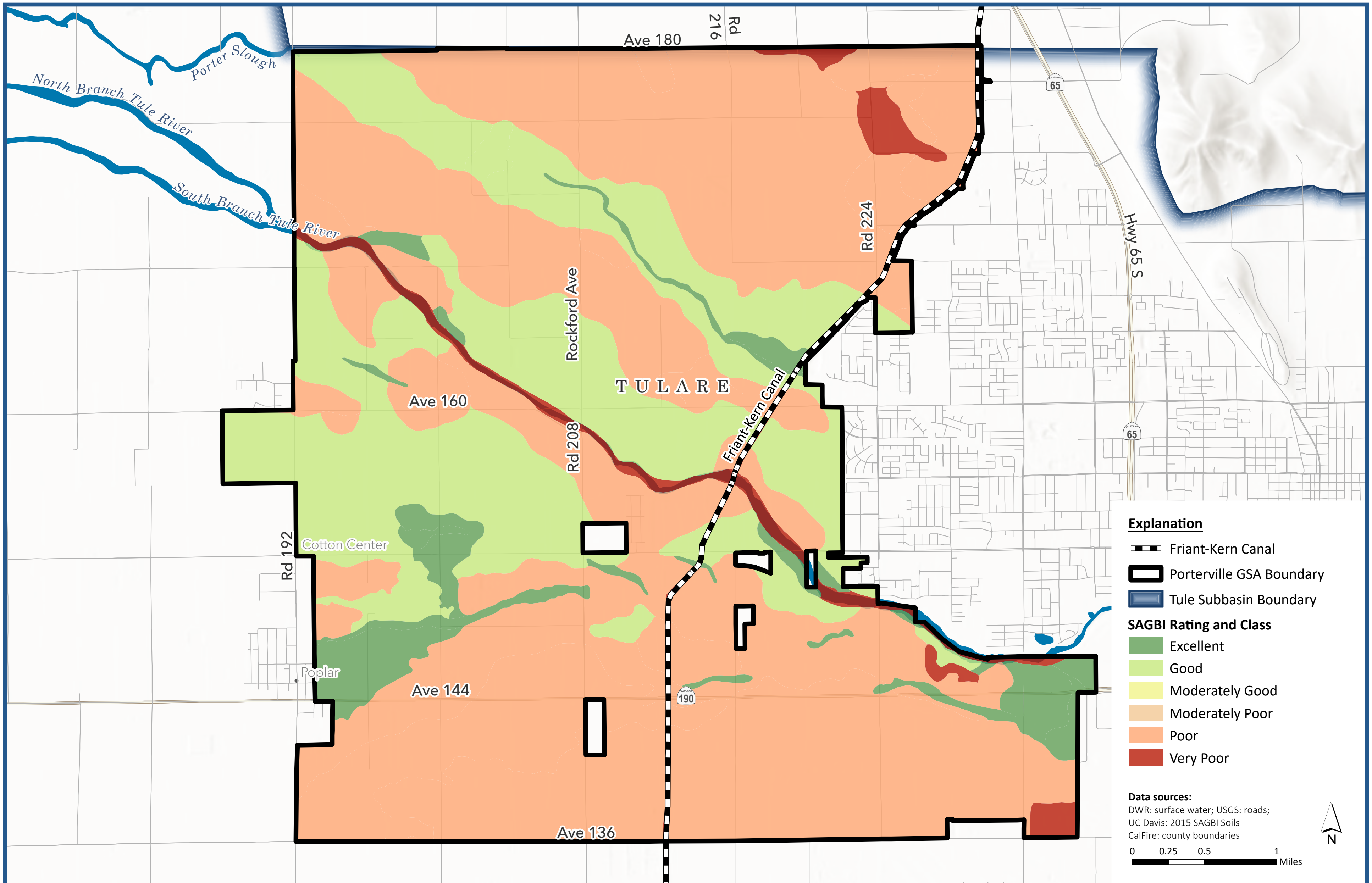
Lower Aquifer Storage Properties: Storativity

Figure 2-16b

Groundwater Sustainability Plan
Porterville Irrigation District GSA, Tule Subbasin



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SAGBI Recharge Potential Map (Unmodified)

Figure 2-17

Groundwater Sustainability Plan
Porterville Irrigation District GSA, Tule Subbasin

Agenda Item 5.b

ADMINISTRATION
Staff Report to the Porterville Irrigation District GSA Board of Directors

Subject: ADMINISTRATION / Consider and Approve Draft PID Water Budget provided by Luhdorff & Scalmanini, Consulting Engineers. (Action).

Submitted By: General Manager

The Groundwater Sustainability Act (SGMA) requires each Groundwater Sustainability Agency (GSA) to understand, quantify, and manage the balance between water entering and leaving its groundwater system. A central tool for evaluating this balance is the Water Budget.

The Porterville Irrigation District (PID) GSA Water Budget is derived from the Tule Subbasin Groundwater Flow Model and evaluates historical conditions from Water Year (WY) 1987 through WY 2024, as well as projected conditions through 2070. The Water Budget supports SGMA compliance by:

- Quantifying groundwater and surface water inflows and outflows;
- Evaluating long-term trends in groundwater storage;
- Informing sustainable yield and groundwater allocation decisions; and
- Assessing the effectiveness of management actions and recharge efforts.

This staff report summarizes key Water Budget concepts and findings to support stakeholder understanding and discussion.

DISCUSSION

What Is the Water Budget?

The Water Budget is an accounting framework that tracks all water entering (inflows) and leaving (outflows) the PID GSA boundary over time. It is divided into two interconnected components:

- Surface Water Budget - Tracks precipitation, river flows, imported water, diversions, recharge, and evapotranspiration.
- Groundwater Budget - Tracks recharge to groundwater, pumping, subsurface flows, and changes in groundwater storage.

Together, these budgets describe how water moves through the system and whether groundwater use is sustainable over the long term.

Surface Water Budget - Key Components

Surface Water Inflows

Major inflows to PID include:

- Precipitation over the District;
- Tule River flows, primarily controlled by releases from Lake Success;
- Imported surface water, including Friant-Kern Canal supplies and Tule River entitlements; and
- Groundwater pumping is applied to crops, which enters the surface system as an irrigation supply.

Over the historical period, precipitation within PID averaged approximately 13,500 acre-feet per year, while surface water deliveries averaged approximately 15,400 acre-feet per year, with significant year-to-year variability.

Surface Water Outflows

Surface water leaves the system through:

- Evapotranspiration (ET) from crops and native vegetation;
- Deep percolation, which becomes groundwater recharge;
- Streambed infiltration along the Tule River;
- Canal losses from conveyance systems; and
- Surface water outflow continuing downstream.

These outflows illustrate how surface water use directly supports groundwater recharge and long-term basin sustainability.

Groundwater Budget - Key Components

Groundwater Inflows

Groundwater recharge within PID occurs through:

- Areal recharge from precipitation;
- Streambed infiltration from the Tule River;
- Deep percolation of applied irrigation water;
- Managed recharge in basins, particularly since 2017; and
- Subsurface inflows from adjacent GSAs.

Average total groundwater inflows within PID are approximately 45,100 acre-feet per year under historical conditions.

Groundwater Outflows

Groundwater leaves the system primarily through:

- Agricultural groundwater pumping;
- Municipal groundwater pumping; and
- Subsurface outflows to adjacent GSAs.

Average groundwater outflows total approximately 47,300 acre-feet per year, resulting in a small historical decline in groundwater storage when all components are included.

Change in Groundwater Storage

From WY 1987 to WY 2024, the groundwater budget indicates:

- An average annual storage decline of approximately 2,200 acre-feet per year when subsurface flows are included.
- When focusing only on in-GSA recharge versus pumping, storage shows an average annual increase of approximately 6,200 acre-feet per year, underscoring the importance of recharge and management actions.

In WY 2024, a wet year with substantial surface water availability and recharge, PID experienced a net increase in groundwater storage of approximately 30,700 acre-feet.

Projected Water Budget and Sustainability

A projected Water Budget was developed for 2025–2070 to evaluate future conditions under:

- Planned recharge and management actions;
- Climate change-adjusted hydrology;
- Reduced surface water reliability; and
- Implementation of PID's groundwater allocation framework.

The projections are used to:

- Test whether management actions achieve sustainability;
- Evaluate interactions between GSAs; and
- Support the determination of sustainable yield.

Connection to Groundwater Allocations

PID has taken a proactive approach to sustainability by:

- Eliminating Tier 1Transitional pumping credits through Resolution No. 2024-09-20; and

- Requiring pumping at the sustainable yield of 0.99 acre-feet per acre beginning in WY 2025.

This represents an approximate 27% reduction in historical average pumping and accelerates sustainability by roughly 10 years relative to the original Eastern Tule GSA ramp-down period.

Stakeholder Considerations

For the Stakeholder Committee, the Water Budget:

- Provides transparency into how water moves through the PID GSA;
- Demonstrates the role of surface water and recharge in reducing reliance on groundwater;
- Highlights the importance of continued recharge opportunities during wet years; and
- Supports informed discussion on groundwater allocations, recharge investments, and long-term planning.

Next Steps

- Continue refining projected Water Budgets as Sustainable Management Criteria and Projects/Management Actions are finalized.
- Use Water Budget results to inform stakeholder outreach and future policy discussions.
- Incorporate updated hydrology and climate data as it becomes available.

Staff Recommended Actions

Is that the Board receives the update to the GSP section and approval of the Water Budget for the Porterville Irrigation District Groundwater Sustainability Agency (PID GSA).

SECTION 2

2.4. Water Budget

Detailed water budget information is documented in *Chapter 2.3* of the *Subbasin Setting*. These budgets are derived from the Tule Subbasin Groundwater Flow Model, covering the period from Water Year (WY) 1987 through WY2024.

This section summarizes inflows and outflows components for the Subbasin and the PID GSA. The water budgets for the Subbasin and PID are divided into a surface water system water budget and a groundwater system water budget. Water budget tables are highly detailed and identify inflow and outflow components by source of water (e.g., evapotranspiration (ET) and deep percolation from Tule River). Water budget results for the Subbasin are presented in *Tables 2-2* and 2-3 in the *Subbasin Setting*. PID water budget results in included in this document and presented in **Tables 2-5** through **2-7** with a schematic of the different inflow and outflow components for the PID water budget is presented in **Figure 2-38.**

2.4.1. Surface Water Budget

The surface water budget for the Subbasin is described in *Chapter 2.3.1* of the *Tule Subbasin Setting*. Inflows to the surface water system include precipitation, applied imported surface water (irrigation), discharge from wells, and surface water inflows. Surface water budget for the Subbasin is presented in *Table 2-2a* in the *Subbasin Setting* and for PID is presented in **Table 2-5**. Surface water outflow includes recharge from precipitation, streambed infiltration and surface water outflows, canal losses, deep percolation of applied water, and evapotranspiration (ET). Surface water outflows for the Subbasin are presented in *Table 2-2b* for the Subbasin and for PID are presented in **Table 2-6**. The surface water outflows are color coded to show different components that are included with the estimate for native yield.

- Blue: Groundwater inflows to be included in the native yield estimate
- Magenta: Groundwater inflows to be excluded from the native yield estimate
- Yellow: Surface water or groundwater outflows not included in the native yield estimate.

2.4.1.1 Surface Water Inflows

Surface water inflows are for PID presented in **Table 2-5**.

2.4.1.1.1 Precipitation

The methodology used to determine annual average precipitation in the Subbasin is described in *Chapter 2.3.1.1.1* of the *Tule Subbasin Setting*. Annual precipitation values for the Subbasin were estimated based on the long-term average annual isohyetal map and using the annual precipitation data from the Porterville Station.

Across the Subbasin, the total annual precipitation ranged from 147,000 AF to 761,000 AF with an average of 361,000 AFY. The total annual precipitation within PID ranged from 4,300 AF to 28,100 AF between WY1987 to WY2024, with an average of 13,500 AFY.

2.4.1.1.2 Stream Inflows

Stream inflows into the Subbasin include inflows from the Tule River, Deer Creek and the White River. Flowing through PID is the Tule River. Flows in the Tule River are controlled through releases from Lake Success, which are documented in the TRA annual reports. During the historical water budget period, flows released from Lake Success ranged from 8,820 to 627,000 AF with an average value of 120,100 AFY. Both Deer Creek and the White River are located to the south of PID. Inflows from Deer Creek into the Subbasin are measured at Fountain Springs by the USGS. Over the historical water budget period, values have ranged from 2,000 to 88,000 AF with an average of 18,400 AFY. Flow measurements in the White River are based on the USGS stream gage station near Ducor. The estimated inflow into Subbasin from the White River ranged from 250 to 37,000 AF with an average of 6,000 AFY.

The Tule River first crosses the Tule East GSA (City of Porterville) before entering PID GSA. Flows into PID are estimated based on the calculated infiltration, evaporation, and diversions that occur prior to PID. Annual inflows into PID ranged from 300 to 487,100 AF with an average of 83,100 AFY.

2.4.1.1.3 Imported Water

Surface water is imported into the Subbasin and PID GSA via the FKC and the Tule River. Data from the USBR Central Valley Operation Annual Reports and Tule River Asociation Annual Reports were compiled to calculate the average amount of imported surface water, as described in *Chapter 2.3.1.1.3* of the *Tule Subbasin Setting.* PID holds a long-term contract for 15,000 AFY of Class 1 water and 30,000 AF of Class 2 water from the Friant Division. PID also manages a supply of Tule River water through agreements with four entities: the Porter Slough, Hubbs & Miner, Rhodes-Fine, and Gilliam-McGee Ditch Companies. Combined, these companies hold an average annual entitlement of approximately 12,900 AFY measured at Success Dam.

For the entire Subbasin, surface water deliveries ranged from 18,900 to 587,400 AF with an average of 352,900 AFY. Within PID, surface water deliveries ranged from 100 AF to 65,300 AF with an average of 15,400 AFY.

2.4.1.1.4 Discharge to Crops from Wells

Chapter 2.3.1.1.4 of the *Subbasin Setting* describes the water applied to crops from wells to be the total applied water minus imported surface water delivers and diverted streamflow. Estimates of crop ET were used to estimate total crop demand, with an assumed irrigation efficiency of 79 percent.

Across the Subbasin, the average groundwater pumping over the historical period was 651,000 AFY. Within PID, the simulated groundwater pumping ranged from 9,400 AF to 38,500 AF with an average of 23,300 AFY.

2.4.1.1.5 Municipal Deliveries from Wells

Chapter 2.3.1.1.5 of the *Subbasin Setting* describes the methodology used to determine the average annual groundwater production for municipal use within the Subbasin for the historical period. Groundwater pumping for municipal supply is conducted by the City of Porterville and other local communities. The average municipal pumping across the Subbasin over the historical period was 19,600 AFY. For PID the average municipal pumping was 100 AFY.

2.4.1.2 Surface Water Outflows

Surface water outflows for PID are presented in **Table 2-6**.

2.4.1.2.1 Areal Recharge from Precipitation

Areal recharge from precipitation on the Subbasin valley floor was estimated using the methodology developed by Williamson et al. (1989). As part of a regional hydrogeological study of the California Central Valley, Williamson et al. developed a monthly soil-moisture budget for the Sacramento and San Joaquin Valleys based on a 50-year period of record (1922–1971). This budget accounts for potential evapotranspiration, assumed plant root depth, soil moisture-holding capacity, and precipitation.

In this model, monthly precipitation that exceeds both potential evapotranspiration and soil-moisture storage is categorized as net infiltration to the groundwater system. These results were simplified into a linear regression model, known as the Williamson Method, to estimate net infiltration from annual precipitation:

$$PPT_{ex} = (0.64)\ PPT - 6.2$$

Where:

- PPT_{ex}: Excess Annual Precipitation (net infiltration/recharge) in ft/yr.
- PPT: Total Annual Precipitation in ft/yr.

For the Subbasin, groundwater recharge from precipitation ranged from 0 to 241,000 AF with an average of 33,000 AFY. For PID, the areal recharge from precipitation ranged between 0 to 10,000 AF, with an average of 1,700 AFY.

2.4.1.2.2 Streambed Infiltration

As discussed in 2.4.1.2 of this GSP, the three primary surface water bodies in the Subbasin are the Tule River, Deerk Creek, and the White River. Streambed infiltration from each of these surface water bodies is discussed in full detail in 2.3.1.2.2 of the *Subbasin Setting.* Average recharge from the Tule River was 19,700. Average recharge from Deer Creek over the historical water budget period 11,500 AF. Average recharge from the White River was 5,800 AF. The average annual streambed infiltration before within PID for the historical period is estimated to be 4,500 AFY, ranging from 300 to 10,400 AF.

2.4.1.2.3 Canal Losses

Chapter 2.3.1.2.3 of the *Subbasin Setting* contains a detailed description and methodology to calculate canal losses for the entire Subbasin. Canal losses are attributed to three sources, water from the natural surface water bodies (Tule River and Deer Creek) diverted to unlined canals, and water losses from imported water from the FKC.

For the entire Subbasin, losses from Tule River water diversion were on average 23,300 AFY, losses from water from Deer Creek was on average 2,500 AFY, and losses from imported water was on average 52,800 AFY. There are no canal losses attributed to water from the White River within the Subbasin. For PID, canal losses attributed to imported water ranged from 0 to 500 AF with and average of 200 AFY. Canal losses attributed to Tule River water ranged from 0 to 6,900 AF with an average e of 1,600 AFY.

2.4.1.2.4 Deep Percolation of Applied Water

The deep percolation of applied water for the entire Subbasin is described in detail in *Chapter 2.3.1.2.5* of the *Subbasin Setting*. Sources of water for irrigation include the Tule River, Deer Creek, imported water, recycled water, and groundwater. Sources of deep percolation within PID include imported water and agricultural irrigation from groundwater pumping.

Across the Subbasin, deep percolation from Tule River water on average 22,000 AFY. Deep percolation from water diverted off of Deer Creek was 1,100 AFY. Deep percolation of imported water was approximately 96,900 AFY. Groundwater pumping contributed the greatest amount of deep percolation with an annual average of 148,200 AFY. Within PID, sources of deep percolation include imported surface water, Tule River water, and groundwater. For imported water, annual values ranged from 0 to 14,200 AF with an annual average of 5,800 AFY. Deep percolation of Tule River water ranged from 0 to 25,700 AF with an average of 6,200 AFY. Deep percolation of applied groundwater for agricultural use ranged from 2,200 to 8,000 AF with an average 5,200 AFY.

2.4.1.2.5 Managed Recharge in Basins

Over the historical water budget period for the entire Subbasin, imported surface water used for artificial recharge was on average 14,500 AFY. Within PID, there was a large increase in the recharge of imported water starting in 2017. From 2017 through 2024, recharge of imported surface water ranged from 0 AF during the dry years of WY2020 and WY2021 and was as high as 73,700 AF during WY2023.

2.4.1.2.6 Evapotranspiration

Sources of ET for the entire Subbasin are described in detail in *Chapter 2.3.1.2.6* of the *Subbasin Setting*. Sources of ET within PID include precipitation from crops and native vegetation and agricultural consumptive use, including groundwater pumping and imported surface water.

Evapotranspiration of Precipitation from Crops and Native Vegetation

ET of precipitation is estimated to be equal to total precipitation minus areal recharge and includes estimates for both crops and native vegetation.

Over the historical period, ET from precipitation for the entire Subbasin was on average 328,000 AFY. Within PID, ET from crops and native vegetation ranged from 4,300 to 18,000 AF with an average of 11,800 AFY.

Agricultural Consumptive Use

Agricultural consumptive for the entire subbasin includes all sources of irrigation excluding precipitation. The methodology used to estimate agricultural consumptive use within the Subbasin is described in *Chapter 2.3.1.2.6* of the *Subbasin Setting*. ET from agricultural consumptive use within PID is calculated separately for imported water, Tule River water, and groundwater (pumping) for the historical period.

For the entire Subbasin, the estimated average annual agricultural consumptive use was 724,000 AFY. Within PID, ET from agricultural consumptive use of imported water ranged from 100 to 12,600 AF with an average of 6,600 AFY. For ET from Tule River water, the annual ET values ranged from 0 to 15,400 AF with an average of 4,400 AFY. ET from groundwater pumping ranged from 6,700 to 30,500 AF with an average of 17,900 AFY.

2.4.1.2.7 Surface Water Outflows

Surface water outflow within the Subbasin for Tule River is described in *Chapter 2.3.1.2.7* of the *Subbasin Setting.* Over the historical period, Tule River outflows ranged form 0 to 121,000 AF with an average of 12,000 AFY

Surface water outflows of PID were estimated based on the surface water inflows minus diversions and deep percolation. Surface water outflow through Tule River ranged from 0 to 477,600 AF with an average of 78,900 AFY. It should be noted that flows out of PID are greater than flows out of the Subbasin because of the additional infiltration that occurs in the GSAs to the west of PID within the Subbasin.

2.4.2. Groundwater Budget

As shown in **Table 2-7**, the groundwater budget for the Tule Subbasin tracks all water entering and leaving the system. This balance is defined by the core equation:

$$Inflow - Outflow = \pm \Delta S$$

Inflows for the groundwater budget consists of areal recharge from precipitation, streambed infiltration, managed infiltration of water in basins for the purpose of groundwater storage, canal losses, return flows of applied irrigation water, and subsurface inflows. Groundwater outflows include all groundwater pumping (agricultural) and subsurface outflows. The subsurface inflow and outflow components in the groundwater budget are excluded when determining whether the water budget is balanced, and therefore, groundwater pumping is directly compared to all in-GSA recharge components.

Following the format of the surface water budget tables, the groundwater budget (**Table 2-7**) distinguishes between different water sources using specific colors:

- Blue: Groundwater inflows to be included in the native yield estimate

- Magenta: Groundwater inflows to be excluded from the native yield estimate
- Yellow: Surface water or groundwater outflows not included in the native yield estimate.

A chart describing the average annual values for each inflow and outflow component of the groundwater budget is presented in **Figure 2-39.** Average inflows were 45,100 AFY while the average outflows were 47,300 AFY. The average change in storage from WY1987 to WY2024 was a decline of -2,200 AFY. When excluding subsurface inflows and outflows, the average change in storage was an increase of 6,200 AFY.

2.4.2.1 Groundwater Inflows

Most of the groundwater inflow components are equal to the items described in the *Surface Water Outflow Section 2.4.1.2.* The only additional component to groundwater inflow is subsurface inflows.

2.4.2.1.1 Area Recharge from Precipitation

Areal recharge for the Subbasin is described in *Chapter 2.3.2.1.1* of the *Subbasin Setting*. Additional details are provided in section 2.4.1.2.1 of this GSP. For PID, the areal recharge from precipitation ranged between 0 to 10,000 AF, with an average of 1,700 AFY.

2.4.2.1.2 Streambed Infiltration

Streambed infiltration for Deer Creek across the Subbasin is discussed Chapter 2.3.2.1.3 of the *Subbasin Setting*. Additional details are provided in section 2.4.1.2.2 of this GSP. The average annual streambed infiltration before within PID for the historical period is estimated to be 4,500 AFY, ranging from 300 to 10,400 AF.

2.4.2.1.3 Canal Losses

Canal losses for imported water across the Subbasin are discussed in Chapter 2.3.1.2.3 of the *Subbasin Setting*. Additional details are provided in section 2.4.1.2.3 of this GSP. Canal losses attributed to imported water ranged from 0 to 500 AF with an average of 200 AFY. Canal losses attributed to Tule River water ranged from 0 to 6,900 AF with an average e of 1,600 AFY.

2.4.2.1.4 Return Flows from Applied Water

Return flows are from both applied surface water and groundwater. Groundwater recharge from applied groundwater is discussed in *Chapter 2.3.2.1.7* of the *Subbasin Setting*. Additional details are provided in section 2.4.1.2.4 Within PID, sources of deep percolation include imported surface water, Tule River water, and groundwater. For imported water, annual values ranged from 0 to 14,200 AF with an annual average of 5,800 AFY. Deep percolation of Tule River water ranged from 0 to 25,700 AF with an average of 6,200 AFY. Deep percolation of applied groundwater for agricultural use ranged from 2,200 to 8,000 AF with an average 5,200 AFY.

2.4.2.1.5 Managed Recharge in Basin

Managed recharge in basis is discussed in *Chapter 2.3.1.2.4* of the *Subbasin Setting*. Additional details are provided in section 2.4.1.2.5 of this GSP. Within PID, there was a large increase in the recharge of imported water starting in 2017. From 2017 through 2024, recharge of imported surface water ranged from 0 AF during the dry years of WY2020 and WY2021 and was as high as 73,700 AF during WY2023.

2.4.2.1.6 Subsurface Inflows

Chapter 2.3.2.1.9 of the *Subbasin Setting* describes subsurface inflow for the entire Subbasin. Average inflows into the Subbasin from adjacent subbasins was on average 75,000 AFY. This does not account for flows between GSAs within the Subbasin. For PID, subsurface inflow from other GSAs ranged between 10,900 and 20,100 AF with an average 15,200 AFY. As discussed in the *Groundwater Conditions* section of this GSP and presented in **Figures 2-20** through **2-23**, groundwater flow is generally east to west or northeast to southwest which would suggest that most of the water flowing out of PID is to the west where a cone of depression is located within the Subbasin.

2.4.2.2 Groundwater Outflows

2.4.2.2.1 Agricultural Groundwater Pumping

Chapter 2.3.2.3.2 of the *Subbasin Setting* describes agricultural groundwater pumping throughout the entire Subbasin. Groundwater pumping for the entire subbasin was on average 651,000 AFY. Within PID agricultural groundwater pumping for the historical period ranged from 9,400 AF to 38,500 AF, with an average of 23,600 AFY. Average municipal pumping within PID was 100 AFY.

2.4.2.2.2 Subsurface Outflows

Subsurface outflows for the Subbasin are described in *Chapter 2.3.2.3.4* of the *Subbasin Setting*. For the entire Subbasin, the average subsurface outflow was approximately 82,000 AFY. This does not account for flow between GSAs within the Subbasin. Within PID, subsurface outflows into adjacent GSAs ranged from 19,000 to 29,100 AF, with an average of 23,700 AFY, which is greater than the average inflows of 15,200 AFY.

2.4.3. Current Water Budget

The current water budget for PID is presented in the historical water budget tables as the most recent water year (**Table 2-5** through **Table 2-7)**. In WY 2024, the total groundwater inflow into the GSA was approximately 77,400 AF and the total groundwater outflow was 46,700 AF. Change in storage was an increase of approximately 30,700 AF. When excluding for subsurface inflows and outflows, the change in storage was an increase of 38,300 AF.

2.4.4. Projected Water Budget

To achieve long-term sustainability, a projected water budget was developed for the Tule Subbasin, incorporating the specific projects and management actions proposed by each of the GSAs. The projected water budget is for the time period 2025 through 2070. Using a groundwater flow model for the 45-year projection period, the subbasin aimed to:

- Verify Sustainability: Assess whether planned actions successfully meet sustainability goals.

- Analyze GSA Interactions: Evaluate how groundwater levels in one GSA are affected by the actions of neighboring GSAs.
- Determine Sustainable Yield: Estimate the maximum amount of water that can be withdrawn annually without causing undesirable results.
- Climate Change Integration

The model accounts for future climate variability by adjusting baseline hydrology and water deliveries. These adjustments—derived from the DWR's CalSim-II model and recommendations from the Climate Change Technical Advisory Group—affect three primary water sources:

1. Tule River flows
2. Friant-Kern Canal deliveries
3. State Water Project (California Aqueduct) deliveries

Climate-related adjustments to hydrology and surface water deliveries were applied over two distinct planning horizons:

- 2030 Central Tendency: Provides near-term projections of climate impacts on hydrology, centered on the year 2030.
- 2070 Central Tendency: Provides long-term projections of potential climate impacts, centered on the year 2070. These adjustments were applied to the model projection for the period from 2050 to 2070.
- Imported Water Supply Adjustments

For supplies arriving via the Friant-Kern Canal, TH&Co utilized delivery schedules from the Friant Water Authority (2018). These projections account for two major factors:

1. San Joaquin River Restoration Project (SJRRP): Projected deliveries include adjustments associated with this restoration effort.
2. Implementation Timeline**:** Adjustments for climate change and the SJRRP begin in 2025.
    - Changes are applied incrementally between 2025 and 2030.
    - The full suite of adjustments reaches 100% implementation by 2030.

The projected groundwater budget for PID is presented in **Table 2-8.**

2.4.5. Sustainable Yield [PLACEHOLDER – will be updated as SMCs/PMAs are finalized]

PID was previously a member of the ETGSA, which developed a groundwater accounting system to track groundwater use and implement a groundwater allocation program. This ETGSA program allowed for pumping in excess of the sustainable yield through 2035 (**Table 2-9**). These percentages allow for pumping in excess of the sustainable yield and are referred to as transitional pumping credits. In an effort to achieve sustainable conditions and address subsidence, PID has adopted resolution 2024-09-20, which eliminated all transitional pumping credits and permit pumping at the sustainable yield ten years sooner than what was originally agreed to by the ETGSA and the rest of the Tule Subbasin.

Table 2-9. Percentage of Historical Annual Avg. Use Above Sustainable Limit (ETGSA GSP)			
2021-2025	2026-2030	2031-2035	2035-2040
90%	80%	30%	0%

The sustainable yield for PID is 0.99 AF/acre. The historical average pumping for PID is 23,100 AF or 1.37 AF/acre. Although the ETGSA planned on having a glide path to achieve the sustainable yield allocation by 2035 as noted in **Table 2-9**, PID elected—through Resolution No. 2024-09-20—to disregard the glide path and achieve the sustainable yield pumping allocation by WY2025. This resolution also eliminated the ability of landowners within PID to use transition credits accumulated when pumping below the Table 5 target percentages and using those credits in future years to allow for increases in pumping above glide path target percentages. Sustainable yield for PID has been established at 0.99 AF/acre. For WY2025, by pumping at the sustainable yield limit and not allowing for any transitional pumping credits, PID has reduced pumping by approximately 6,400 AF/year or 27% of the historical average.

Table 2-5. PID Surface Water Inflow (acre-ft)															
Water Year	Precipitation	Stream Inflow			Imported Water							Recyled Water	Discharge from Wells		Total In
		Tule River	Deer Creek	White River	Saucelito ID	Terra Bella ID	Porterville ID	Tea Pot Dome WD	City of Porterville	Hope WD	Ducor ID		Agricultural	Municipal	
1987	14,900	44,100	NA	NA	NA	NA	15,300	NA	NA	NA	NA	NA	18,000	100	92,400
1988	13,100	16,600	NA	NA	NA	NA	13,100	NA	NA	NA	NA	NA	23,100	100	66,000
1989	10,500	25,600	NA	NA	NA	NA	13,100	NA	NA	NA	NA	NA	28,400	100	77,700
1990	12,400	8,900	NA	NA	NA	NA	11,500	NA	NA	NA	NA	NA	28,000	100	60,900
1991	15,500	25,000	NA	NA	NA	NA	11,300	NA	NA	NA	NA	NA	21,000	100	72,900
1992	10,900	11,300	NA	NA	NA	NA	15,600	NA	NA	NA	NA	NA	27,500	100	65,400
1993	17,900	61,700	NA	NA	NA	NA	12,300	NA	NA	NA	NA	NA	16,800	100	108,800
1994	11,600	33,400	NA	NA	NA	NA	12,900	NA	NA	NA	NA	NA	27,500	100	85,500
1995	23,400	151,000	NA	NA	NA	NA	9,500	NA	NA	NA	NA	NA	12,500	100	196,500
1996	12,400	111,000	NA	NA	NA	NA	13,800	NA	NA	NA	NA	NA	20,000	100	157,300
1997	17,000	258,500	NA	NA	NA	NA	13,400	NA	NA	NA	NA	NA	17,400	100	306,400
1998	28,100	295,200	NA	NA	NA	NA	10,200	NA	NA	NA	NA	NA	9,400	100	343,000
1999	13,200	75,200	NA	NA	NA	NA	16,100	NA	NA	NA	NA	NA	19,200	100	123,800
2000	13,700	69,100	NA	NA	NA	NA	15,500	NA	NA	NA	NA	NA	28,800	100	127,200
2001	10,800	30,900	NA	NA	NA	NA	15,400	NA	NA	NA	NA	NA	23,300	100	80,500
2002	10,500	37,500	NA	NA	NA	NA	13,600	NA	NA	NA	NA	NA	31,100	100	92,800
2003	13,100	83,800	NA	NA	NA	NA	14,600	NA	NA	NA	NA	NA	26,400	100	138,000
2004	9,500	27,400	NA	NA	NA	NA	14,700	NA	NA	NA	NA	NA	34,800	100	86,500
2005	18,900	98,000	NA	NA	NA	NA	14,700	NA	NA	NA	NA	NA	15,300	100	147,000
2006	18,400	136,100	NA	NA	NA	NA	13,300	NA	NA	NA	NA	NA	15,500	100	183,400
2007	7,300	22,200	NA	NA	NA	NA	9,800	NA	NA	NA	NA	NA	34,500	100	73,900
2008	10,500	46,300	NA	NA	NA	NA	13,000	NA	NA	NA	NA	NA	30,900	100	100,800
2009	8,600	32,000	NA	NA	NA	NA	18,000	NA	NA	NA	NA	NA	19,200	100	77,900
2010	14,700	89,200	NA	NA	NA	NA	14,300	NA	NA	NA	NA	NA	10,900	100	129,200
2011	22,200	200,400	NA	NA	NA	NA	9,400	NA	NA	NA	NA	NA	15,800	100	247,900
2012	15,900	62,800	NA	NA	NA	NA	9,300	NA	NA	NA	NA	NA	18,300	100	106,400
2013	5,600	16,100	NA	NA	NA	NA	10,300	NA	NA	NA	NA	NA	30,700	100	62,800
2014	5,700	700	NA	NA	NA	NA	200	NA	NA	NA	NA	NA	37,700	100	44,400
2015	9,100	300	NA	NA	NA	NA	100	NA	NA	NA	NA	NA	32,400	100	42,000
2016	14,900	40,000	NA	NA	NA	NA	13,300	NA	NA	NA	NA	NA	16,300	100	84,600
2017	17,500	197,200	NA	NA	NA	NA	21,700	NA	NA	NA	NA	NA	24,200	100	260,700
2018	8,300	33,400	NA	NA	NA	NA	12,700	NA	NA	NA	NA	NA	32,300	100	86,800
2019	19,300	152,800	NA	NA	NA	NA	60,900	NA	NA	NA	NA	NA	15,300	100	248,400
2020	9,400	29,100	NA	NA	NA	NA	11,500	NA	NA	NA	NA	NA	26,597	100	76,697
2021	4,300	600	NA	NA	NA	NA	3,100	NA	NA	NA	NA	NA	38,482	100	46,582
2022	9,900	13,200	NA	NA	NA	NA	9,700	NA	NA	NA	NA	NA	28,298	100	61,198
2023	22,400	487,100	NA	NA	NA	NA	65,300	NA	NA	NA	NA	NA	17,119	100	592,019
2024	12,200	133,200	NA	NA	NA	NA	34,000	NA	NA	NA	NA	NA	23,425	100	202,925

Table 2-6. PID Surface Water Outflow (acre-ft)

Water Year	Areal Recharge of Precipitation	Streambed Infiltration			Recharge in Basins				Canal Loss			Deep Percolation of Applied Water					
		Tule River Success to Oettle Bridge Infiltration	Deer Creek Before Trenton Weir Infiltration	White River	Tule River	Deer Creek	Imported Water	Recyled Water	Tule River	Deer Creek	Imported Water	Tule River	Deer Creek	Imported Water	Recycled Water	Agricultural Pumping	Municipal Pumping
1987	1,600	3,700	NA	NA	0	NA	0	0	400	NA	200	4,100	NA	6,900	0	4,300	0
1988	700	1,900	NA	NA	0	NA	0	0	900	NA	100	4,900	NA	6,900	0	5,600	0
1989	0	2,800	NA	NA	0	NA	0	0	300	NA	100	1,200	NA	6,100	0	6,900	0
1990	700	1,800	NA	NA	0	NA	0	0	0	NA	0	600	NA	4,900	0	6,800	0
1991	1,900	2,300	NA	NA	0	NA	0	0	0	NA	100	600	NA	4,300	0	5,100	0
1992	0	1,400	NA	NA	0	NA	0	0	100	NA	100	500	NA	4,800	0	6,600	0
1993	3,500	4,100	NA	NA	0	NA	0	0	2,400	NA	400	9,700	NA	6,200	0	4,000	0
1994	0	2,200	NA	NA	0	NA	0	0	0	NA	100	3,000	NA	4,900	0	6,500	0
1995	7,100	8,100	NA	NA	0	NA	0	0	4,700	NA	400	19,200	NA	5,400	0	2,900	0
1996	0	5,100	NA	NA	0	NA	0	0	2,200	NA	300	17,500	NA	7,300	0	4,700	0
1997	3,000	8,200	NA	NA	0	NA	0	0	3,900	NA	300	19,000	NA	8,300	0	4,100	0
1998	10,000	8,500	NA	NA	0	NA	0	0	5,800	NA	300	20,400	NA	6,500	0	2,200	0
1999	500	4,200	NA	NA	0	NA	0	0	800	NA	200	3,900	NA	6,600	0	4,500	0
2000	800	5,000	NA	NA	0	NA	0	0	1,000	NA	200	3,200	NA	8,000	0	6,900	0
2001	0	3,400	NA	NA	0	NA	0	0	900	NA	100	1,700	NA	6,000	0	5,500	0
2002	0	4,600	NA	NA	0	NA	0	0	600	NA	100	3,900	NA	6,900	0	7,400	0
2003	400	6,200	NA	NA	0	NA	0	0	800	NA	200	1,400	NA	4,800	0	5,400	0
2004	0	2,900	NA	NA	0	NA	0	0	600	NA	100	1,000	NA	4,300	0	6,900	0
2005	4,100	6,400	NA	NA	0	NA	0	0	2,100	NA	300	8,600	NA	7,900	0	3,000	0
2006	3,900	6,900	NA	NA	0	NA	0	0	2,900	NA	300	24,100	NA	10,500	0	3,200	0
2007	0	2,200	NA	NA	0	NA	0	0	0	NA	0	300	NA	2,400	0	6,900	0
2008	0	3,600	NA	NA	0	NA	0	0	600	NA	100	1,700	NA	5,500	0	6,200	0
2009	0	2,800	NA	NA	0	NA	0	0	500	NA	100	1,400	NA	5,400	0	3,800	0
2010	1,500	6,700	NA	NA	0	NA	0	0	2,300	NA	300	14,000	NA	8,600	0	2,200	0
2011	6,300	8,600	NA	NA	0	NA	0	0	4,400	NA	400	25,400	NA	8,000	0	3,200	0
2012	2,200	4,100	NA	NA	0	NA	0	0	700	NA	100	900	NA	3,800	0	3,800	0
2013	0	1,700	NA	NA	0	NA	0	0	0	NA	0	0	NA	2,100	0	6,300	0
2014	0	700	NA	NA	0	NA	0	0	100	NA	0	0	NA	0	0	7,700	0
2015	0	300	NA	NA	0	NA	0	0	0	NA	0	100	NA	0	0	6,600	0
2016	1,600	4,600	NA	NA	0	NA	0	0	1,100	NA	100	1,600	NA	5,600	0	3,300	100
2017	3,300	9,400	NA	NA	0	NA	14,500	0	5,500	NA	500	25,700	NA	12,700	0	5,000	100
2018	0	3,100	NA	NA	0	NA	2,900	0	300	NA	200	200	NA	3,400	0	6,600	100
2019	4,400	7,100	NA	NA	0	NA	43,800	0	3,700	NA	300	3,300	NA	13,700	0	3,100	100
2020	0	3,800	NA	NA	0	NA	0	0	500	NA	100	1,600	NA	3,800	0	5,500	100
2021	0	600	NA	NA	0	NA	0	0	0	NA	0	500	NA	600	0	8,000	100
2022	0	4,300	NA	NA	0	NA	4,500	0	100	NA	100	500	NA	1,400	0	5,900	100
2023	6,400	9,400	NA	NA	0	NA	73,700	0	6,900	NA	400	9,700	NA	14,200	0	3,500	100
2024	0	10,400	NA	NA	0	NA	40,400	0	2,800	NA	300	1,100	NA	1,800	0	4,900	100
Average	**1,700**	**4,600**	**NA**	**NA**	**0**	**NA**	**4,900**	**0**	**1,600**	**NA**	**200**	**6,300**	**NA**	**5,800**	**0**	**5,200**	**0**

Groundwater Inflows to be Included in the Native Yield Estimate

Groundwater Inflows to be Excluded from the Native Yield Estimate

Surface Water or Groundwater Outflows Not Included in Native Yield Estimate

	PID Surface Water Outflow (acre-ft)														
Water Year	Evapotransportation										Surface Outflow				Total Out
	Precipitation Crops/Native	Tule River		Deer Creek		White River	Imported Water	Ag. Cons. Use from Pumping	Recycled Water	Municipal (Landscape ET)	Tule River		Deer Creek	White River	
		Agricultural Cons. Use	Stream Channel	Agricultural Cons. Use	Stream Channel	Stream Channel	Agricultural Cons. Use		Agricultural Cons. Use		To LTIRD GSA	To FKC	MODIFIED (To ETGSA)	To DEID GSA	
1987	13,300	4,900	200	NA	NA	NA	8,400	13,300	NA	NA	40,400	0	NA	NA	101,700
1988	12,400	4,400	100	NA	NA	NA	6,100	17,000	NA	NA	14,700	0	NA	NA	75,700
1989	10,500	1,400	100	NA	NA	NA	7,000	21,000	NA	NA	22,900	0	NA	NA	80,300
1990	11,700	900	200	NA	NA	NA	6,700	20,700	NA	NA	7,100	0	NA	NA	62,100
1991	13,600	1,000	100	NA	NA	NA	7,000	15,600	NA	NA	22,700	0	NA	NA	74,300
1992	10,900	1,100	200	NA	NA	NA	10,700	20,200	NA	NA	9,900	0	NA	NA	66,500
1993	14,400	9,600	200	NA	NA	NA	6,100	12,200	NA	NA	57,600	0	NA	NA	130,400
1994	11,600	4,900	100	NA	NA	NA	8,000	20,000	NA	NA	31,300	0	NA	NA	92,600
1995	16,400	14,400	200	NA	NA	NA	4,000	8,800	NA	NA	142,900	0	NA	NA	234,500
1996	12,400	15,400	200	NA	NA	NA	6,500	14,300	NA	NA	105,900	0	NA	NA	191,800
1997	14,100	11,800	200	NA	NA	NA	5,100	12,500	NA	NA	250,300	0	NA	NA	340,800
1998	18,000	11,400	200	NA	NA	NA	3,600	6,700	NA	NA	286,700	0	NA	NA	380,300
1999	12,700	5,600	200	NA	NA	NA	9,500	13,900	NA	NA	71,000	0	NA	NA	133,600
2000	12,900	3,000	200	NA	NA	NA	7,500	21,200	NA	NA	64,000	0	NA	NA	133,900
2001	10,800	2,700	100	NA	NA	NA	9,500	16,900	NA	NA	27,500	0	NA	NA	85,100
2002	10,500	3,800	200	NA	NA	NA	6,700	22,700	NA	NA	32,900	0	NA	NA	100,300
2003	12,700	2,900	200	NA	NA	NA	9,900	20,100	NA	NA	77,600	0	NA	NA	142,600
2004	9,500	2,400	200	NA	NA	NA	10,400	26,500	NA	NA	24,500	0	NA	NA	89,300
2005	14,700	7,400	200	NA	NA	NA	6,800	11,600	NA	NA	91,500	0	NA	NA	164,600
2006	14,600	6,200	200	NA	NA	NA	2,700	12,100	NA	NA	129,200	0	NA	NA	216,800
2007	7,300	800	100	NA	NA	NA	7,400	26,500	NA	NA	20,000	0	NA	NA	73,900
2008	10,500	2,300	100	NA	NA	NA	7,500	23,800	NA	NA	42,700	0	NA	NA	104,600
2009	8,600	3,300	200	NA	NA	NA	12,600	14,500	NA	NA	29,200	0	NA	NA	82,400
2010	13,200	9,200	200	NA	NA	NA	5,700	8,200	NA	NA	82,500	0	NA	NA	154,600
2011	15,900	4,400	200	NA	NA	NA	1,400	12,400	NA	NA	191,800	0	NA	NA	282,400
2012	13,700	1,300	200	NA	NA	NA	5,500	14,400	NA	NA	58,800	0	NA	NA	109,500
2013	5,600	0	200	NA	NA	NA	8,200	24,000	NA	NA	14,400	0	NA	NA	62,500
2014	5,700	200	100	NA	NA	NA	100	29,500	NA	NA	0	0	NA	NA	44,100
2015	9,100	400	100	NA	NA	NA	100	25,300	NA	NA	0	0	NA	NA	42,000
2016	13,300	2,100	100	NA	NA	NA	7,600	12,700	NA	NA	35,400	0	NA	NA	89,200
2017	14,200	8,300	200	NA	NA	NA	4,100	19,000	NA	NA	187,800	0	NA	NA	310,300
2018	8,300	400	200	NA	NA	NA	6,600	25,400	NA	NA	30,200	0	NA	NA	87,900
2019	14,900	2,900	400	NA	NA	NA	11,900	12,000	NA	NA	145,700	0	NA	NA	267,300
2020	9,400	3,200	200	NA	NA	NA	7,700	21,100	NA	NA	25,300	0	NA	NA	82,300
2021	4,300	2,000	200	NA	NA	NA	2,400	30,500	NA	NA	0	0	NA	NA	49,200
2022	9,900	1,700	200	NA	NA	NA	4,900	22,400	NA	NA	8,800	0	NA	NA	64,800
2023	16,000	5,000	200	NA	NA	NA	7,300	13,600	NA	NA	477,600	0	NA	NA	644,000
2024	12,200	4,000	200	NA	NA	NA	6,800	18,600	NA	NA	122,800	0	NA	NA	226,400
Average	**11,800**	**4,400**	**200**	**NA**	**NA**	**NA**	**6,500**	**18,100**	**NA**	**NA**	**79,500**	**0**	**NA**	**NA**	150,600

Groundwater Inflows to be Included in the Native Yield Estimate

Groundwater Inflows to be Excluded from the Native Yield Estimate

Surface Water or Groundwater Outflows Not Included in Native Yield Estimate

Table 2-7

Porterville Irrigation District
Historical Groundwater Budget 1986/87 to 2023/24

Water Year	Groundwater Inflows (acre-ft)																				
	Areal Recharge from Precipitation	Tule River				Deer Creek				White River	Imported Water Deliveries			Agricultural Pumping (Groundwater)	Municipal Pumping	Recycled Water		Subsurface Inflow		Mountain-Block Recharge	Total In
		Success to Oettle Bridge Infiltration	Recharge in Basins	Canal Loss	Return Flow of Applied Irrigation Water	Infiltration Before Trenton Weir	Canal Loss	Recharge in Basin	Return Flows of Applied Irrigation Water	Infiltration Before DEID	Recharge in Basins	Canal Loss	Return Flows	Irrigated Agriculture (Return Flows of Applied Irrigation Water)	Return Flow of Applied Irrigation Water	Agricultural Return Flow	Artificial Recharge	From Outside Subbasin	From Other GSAs		
1987	1,600	3,700	0	400	4,100	NA	NA	NA	NA	NA	0	200	6,900	4,300	0	0	0	0	17,000	0	38,200
1988	700	1,900	0	900	4,900	NA	NA	NA	NA	NA	0	100	6,900	5,600	0	0	0	0	19,000	0	40,000
1989	0	2,800	0	300	1,200	NA	NA	NA	NA	NA	0	100	6,100	6,900	0	0	0	0	20,100	0	37,500
1990	700	1,800	0	0	600	NA	NA	NA	NA	NA	0	0	4,900	6,800	0	0	0	0	19,700	0	34,500
1991	1,900	2,300	0	0	600	NA	NA	NA	NA	NA	0	100	4,300	5,100	0	0	0	0	17,900	0	32,200
1992	0	1,400	0	100	500	NA	NA	NA	NA	NA	0	100	4,800	6,600	0	0	0	0	19,000	0	32,500
1993	3,500	4,100	0	2,400	9,700	NA	NA	NA	NA	NA	0	400	6,200	4,000	0	0	0	0	15,900	0	46,200
1994	0	2,200	0	0	3,000	NA	NA	NA	NA	NA	0	100	4,900	6,500	0	0	0	0	16,100	0	32,800
1995	7,100	8,100	0	4,700	19,200	NA	NA	NA	NA	NA	0	400	5,400	2,900	0	0	0	0	13,100	0	60,900
1996	0	5,100	0	2,200	17,500	NA	NA	NA	NA	NA	0	300	7,300	4,700	0	0	0	0	13,300	0	50,400
1997	3,000	8,200	0	3,900	19,000	NA	NA	NA	NA	NA	0	300	8,300	4,100	0	0	0	0	13,100	0	59,900
1998	10,000	8,500	0	5,800	20,400	NA	NA	NA	NA	NA	0	300	6,500	2,200	0	0	0	0	11,600	0	65,300
1999	500	4,200	0	800	3,900	NA	NA	NA	NA	NA	0	200	6,600	4,500	0	0	0	0	13,300	0	34,000
2000	800	5,000	0	1,000	3,200	NA	NA	NA	NA	NA	0	200	8,000	6,900	0	0	0	0	15,500	0	40,600
2001	0	3,400	0	900	1,700	NA	NA	NA	NA	NA	0	100	6,000	5,500	0	0	0	0	14,100	0	31,700
2002	0	4,600	0	600	3,900	NA	NA	NA	NA	NA	0	100	6,900	7,400	0	0	0	0	15,500	0	39,000
2003	400	6,200	0	800	1,400	NA	NA	NA	NA	NA	0	200	4,800	5,400	0	0	0	0	14,800	0	34,000
2004	0	2,900	0	600	1,000	NA	NA	NA	NA	NA	0	100	4,300	6,900	0	0	0	0	15,800	0	31,600
2005	4,100	6,400	0	2,100	8,600	NA	NA	NA	NA	NA	0	300	7,900	3,000	0	0	0	0	13,500	0	45,900
2006	3,900	6,900	0	2,900	24,100	NA	NA	NA	NA	NA	0	300	10,500	3,200	0	0	0	0	12,300	0	64,100
2007	0	2,200	0	0	300	NA	NA	NA	NA	NA	0	0	2,400	6,900	0	0	0	0	14,800	0	26,600
2008	0	3,600	0	600	1,700	NA	NA	NA	NA	NA	0	100	5,500	6,200	0	0	0	0	15,300	0	33,000
2009	0	2,800	0	500	1,400	NA	NA	NA	NA	NA	0	100	5,400	3,800	0	0	0	0	12,900	0	26,900
2010	1,500	6,700	0	2,300	14,000	NA	NA	NA	NA	NA	0	300	8,600	2,200	0	0	0	0	10,900	0	46,500
2011	6,300	8,600	0	4,400	25,400	NA	NA	NA	NA	NA	0	400	8,000	3,200	0	0	0	0	12,100	0	68,400
2012	2,200	4,100	0	700	900	NA	NA	NA	NA	NA	0	100	3,800	3,800	0	0	0	0	12,200	0	27,800
2013	0	1,700	0	0	0	NA	NA	NA	NA	NA	0	0	2,100	6,300	0	0	0	0	15,300	0	25,400
2014	0	700	0	100	0	NA	NA	NA	NA	NA	0	0	0	7,700	0	0	0	0	16,600	0	25,100
2015	0	300	0	0	100	NA	NA	NA	NA	NA	0	0	0	6,600	0	0	0	0	16,000	0	23,000
2016	1,600	4,600	0	1,100	1,600	NA	NA	NA	NA	NA	0	100	5,600	3,300	100	0	0	0	14,400	0	32,400
2017	3,300	9,400	0	5,500	25,700	NA	NA	NA	NA	NA	14,500	500	12,700	5,000	100	0	0	0	15,000	0	91,700
2018	0	3,100	0	300	200	NA	NA	NA	NA	NA	2,900	200	3,400	6,600	100	0	0	0	15,900	0	32,700
2019	4,400	7,100	0	3,700	3,300	NA	NA	NA	NA	NA	43,800	300	13,700	3,100	100	0	0	0	16,900	0	96,400
2020	0	3,800	0	500	1,600	NA	NA	NA	NA	NA	0	100	3,800	5,500	100	0	0	0	15,600	0	31,000
2021	0	600	0	0	500	NA	NA	NA	NA	NA	0	0	600	8,000	100	0	0	0	15,600	0	25,400
2022	0	4,300	0	100	500	NA	NA	NA	NA	NA	4,500	100	1,400	5,900	100	0	0	0	15,600	0	32,500
2023	6,400	9,400	0	6,900	9,700	NA	NA	NA	NA	NA	73,700	400	14,200	3,500	100	0	0	0	15,600	0	139,900
2024	0	10,400	0	2,800	1,100	NA	NA	NA	NA	NA	40,400	300	1,800	4,900	100	0	0	0	15,600	0	77,400
Average	**1,700**	**4,600**	**0**	**1,600**	**6,200**	**NA**	**NA**	**NA**	**NA**	**NA**	**4,700**	**200**	**5,800**	**5,100**	**0**	**0**	**0**	**0**	**15,200**	**0**	**45,100**

Groundwater Inflows to be Included in the Native Yield Estimate

Groundwater Inflows to be Excluded from the Native Yield Estimate

Surface Water or Groundwater Outflows Not Included in Native Yield Estimate

Note: 2019/20 to 2023/24: Aquitard change in storage from analysis of InSAR land subsidence. Sub-surface Inflow and Outflow equal to 2015/16 to 2018/19 average

Porterville Irrigation District
Historical Groundwater Budget 1986/87 to 2023/24

Groundwater Outflows (acre-ft)					Change in Storage (acre-ft)		
Groundwater Pumping		Sub-surface Outflow		Total Out	Aquitard Change in Storage	Aquifer Change in Storage	Total Change in Storage
Municipal	Agriculture	To Outside Subbasin	To Other GSAs				
-100	-18,000	0	-24,700	-42,800	-2,800	-1,800	-4,600
-100	-23,100	0	-25,200	-48,400	-1,300	-7,000	-8,300
-100	-28,400	0	-23,300	-51,900	-1,000	-13,400	-14,400
-100	-28,000	0	-23,300	-51,500	-800	-16,100	-17,000
-100	-21,000	0	-21,900	-43,000	0	-10,800	-10,800
-100	-27,500	0	-23,200	-50,800	-1,700	-16,500	-18,200
-100	-16,800	0	-20,900	-37,800	500	7,900	8,400
-100	-27,500	0	-23,100	-50,700	-2,200	-15,900	-18,000
-100	-12,500	0	-24,000	-36,600	700	23,500	24,200
-100	-20,000	0	-26,200	-46,300	-800	4,900	4,000
-100	-17,400	0	-28,000	-45,400	300	14,100	14,400
-100	-9,400	0	-29,100	-38,500	1,200	25,800	27,000
-100	-19,200	0	-27,200	-46,500	-900	-11,300	-12,200
-100	-28,800	0	-24,900	-53,800	-800	-12,300	-13,100
-100	-23,300	0	-25,500	-48,800	-800	-16,200	-17,100
-100	-31,100	0	-25,800	-57,000	-1,500	-16,400	-17,900
-100	-26,400	0	-22,400	-48,900	-1,400	-13,500	-14,900
-100	-34,800	0	-22,700	-57,500	-4,100	-21,800	-25,900
-100	-15,300	0	-21,300	-36,700	-100	9,500	9,400
-100	-15,500	0	-24,100	-39,700	600	23,800	24,400
-100	-34,500	0	-24,100	-58,600	-3,000	-29,000	-32,000
-100	-30,900	0	-23,500	-54,400	-3,300	-18,200	-21,500
-100	-19,200	0	-22,900	-42,200	-2,000	-13,200	-15,200
-100	-10,900	0	-23,000	-34,000	-300	12,800	12,500
-100	-15,800	0	-24,700	-40,600	500	27,500	28,000
-100	-18,300	0	-22,000	-40,400	-600	-12,000	-12,600
-100	-30,700	0	-22,800	-53,600	-2,300	-25,700	-28,000
-100	-37,700	0	-21,300	-59,200	-5,900	-28,100	-33,900
-100	-32,400	0	-19,500	-51,900	-6,200	-22,600	-28,700
-100	-16,300	0	-19,000	-35,400	-2,300	-700	-3,000
-100	-24,200	0	-24,700	-48,900	-1,200	43,700	42,600
-100	-32,300	0	-20,600	-53,000	-2,600	-17,700	-20,300
-100	-15,300	0	-28,400	-43,800	300	52,100	52,500
-100	-26,600	0	-23,200	-49,900	-1,900	-17,000	-18,900
-100	-38,500	0	-23,200	-61,800	-2,100	-34,300	-36,400
-100	-28,300	0	-23,200	-51,600	-2,800	-16,300	-19,100
-100	-17,100	0	-23,200	-40,400	-300	99,800	99,500
-100	-23,400	0	-23,200	-46,700	-700	31,400	30,700
-100	**-23,600**	**0**	**-23,700**	**-47,300**	**-1,400**	**-800**	**-2,200**

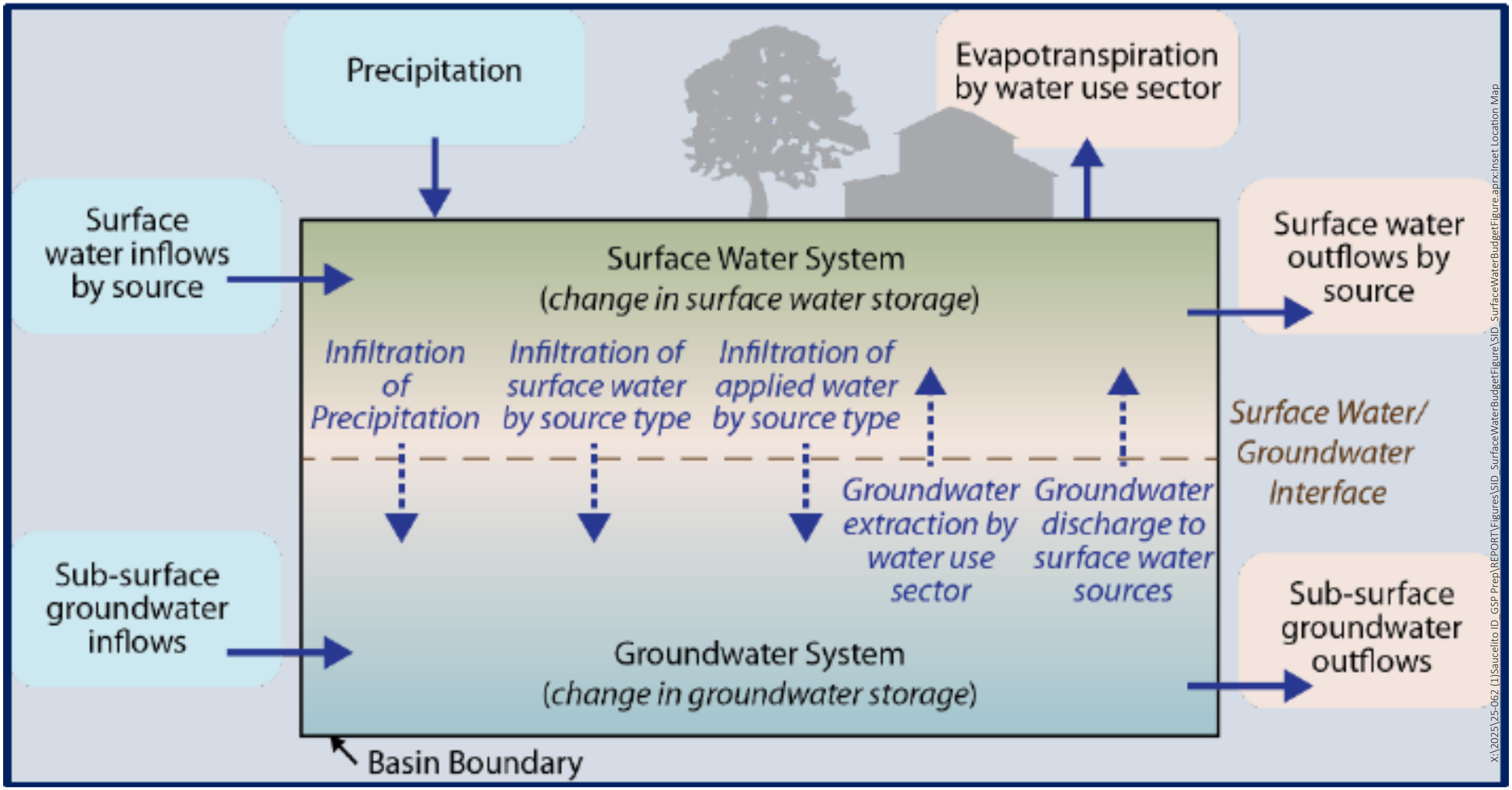
Groundwater Inflows to be Included in the Native Yield Estimate

Surface Water or Groundwater Outflows Not Included in Native Yield Estimate

Table 2-8. PID Water Budget Historical and Projected												
Water Year	Mountain-Block Recharge	Recharge (Deep Percolation, Streambed Infiltration, Artifical Recharge)	Agricultural Return Flows	Municpal Pumping	Agricultural Wells	Lateral Subsurface Flow	Vertical Flows (Top)	Vertical Flows (bottom)	IN	OUT	Total Pumping	Storage Change
2025	0	12,500	8,700	-100	-18,000	-7,700	16,500	-16,500	60,700	-60,700	-18,100	-4,600
2026	0	12,100	9,000	-100	-23,100	-6,200	17,300	-17,300	70,500	-70,500	-23,200	-8,300
2027	0	7,800	9,600	-100	-28,400	-3,200	17,800	-17,800	70,500	-70,500	-28,600	-14,400
2028	0	5,600	9,200	-100	-28,000	-3,700	18,400	-18,400	69,800	-69,800	-28,100	-17,000
2029	0	6,600	7,700	-100	-21,000	-4,000	16,500	-16,500	61,800	-61,800	-21,100	-10,800
2030	0	3,000	10,500	-100	-27,500	-4,200	17,800	-17,800	68,200	-68,200	-27,600	-18,200
2031	0	21,200	9,100	-100	-16,800	-5,000	17,800	-17,800	69,200	-69,200	-16,900	8,400
2032	0	5,900	10,800	-100	-27,500	-7,000	19,500	-19,500	71,400	-71,400	-27,700	-18,000
2033	0	38,800	8,900	-100	-12,500	-10,900	18,100	-18,100	83,400	-83,300	-12,600	24,200
2034	0	25,200	11,800	-100	-20,000	-12,900	19,700	-19,700	78,800	-78,800	-20,100	4,000
2035	0	37,200	9,600	-100	-17,400	-14,900	20,700	-20,700	88,600	-88,500	-17,400	14,400
2036	0	46,800	7,100	-100	-9,400	-17,500	18,900	-18,900	89,100	-89,100	-9,500	27,000
2037	0	11,400	9,500	-100	-19,200	-13,800	19,600	-19,600	70,500	-70,500	-19,300	-12,200
2038	0	14,800	10,400	-100	-28,800	-9,300	21,200	-21,200	79,700	-79,700	-28,900	-13,100
2039	0	8,100	9,500	-100	-23,300	-11,400	20,500	-20,500	72,500	-72,500	-23,300	-17,100
2040	0	12,800	10,900	-100	-31,100	-10,300	22,500	-22,500	82,400	-82,400	-31,200	-17,900
2041	0	10,400	8,800	-100	-26,400	-7,600	20,400	-20,400	70,800	-70,800	-26,500	-14,900
2042	0	5,600	10,300	-100	-34,800	-6,900	20,700	-20,700	78,000	-78,100	-34,900	-25,900
2043	0	25,800	6,800	-100	-15,300	-7,800	17,700	-17,700	73,900	-73,900	-15,400	9,400
2044	0	46,300	5,500	-100	-15,500	-11,800	17,900	-17,900	92,100	-92,200	-15,600	24,400
2045	0	2,800	9,100	-100	-34,500	-9,200	20,500	-20,500	76,600	-76,600	-34,500	-32,000
2046	0	8,900	8,800	-100	-30,900	-8,200	20,500	-20,500	76,800	-76,800	-31,000	-21,500
2047	0	6,200	8,000	-100	-19,200	-10,000	18,400	-18,400	65,300	-65,300	-19,300	-15,200
2048	0	29,500	6,000	-100	-10,900	-12,100	16,500	-16,500	69,600	-69,600	-11,000	12,500
2049	0	51,600	4,800	-100	-15,800	-12,500	17,200	-17,200	94,000	-94,100	-15,900	28,000
2050	0	10,100	5,500	-100	-18,300	-9,800	17,100	-17,100	62,100	-62,100	-18,400	-12,600
2051	0	1,800	8,400	-100	-30,700	-7,500	18,900	-18,900	71,900	-71,900	-30,800	-28,000
2052	0	900	7,800	-100	-37,700	-4,800	18,900	-18,900	78,000	-78,000	-37,800	-33,900
2053	0	400	6,700	-100	-32,400	-3,500	16,900	-16,900	73,700	-73,700	-32,500	-28,700
2054	0	12,100	5,900	-100	-16,300	-4,600	14,800	-14,800	63,900	-63,900	-16,400	-3,000
2055	0	68,400	8,200	-100	-24,200	-9,700	17,200	-17,200	122,200	-122,200	-24,300	42,600
2056	0	8,300	8,400	-100	-32,300	-4,700	16,200	-16,200	76,700	-76,700	-32,300	-20,300
2057	0	72,300	7,000	-100	-15,300	-11,500	20,000	-20,000	125,300	-125,400	-15,300	52,500
2058	0	24,700	7,200	-100	-10,800	-18,900	17,400	-17,400	62,500	-62,500	-10,900	2,200
2059	0	24,800	7,200	-100	-10,700	-20,100	17,200	-17,200	61,100	-61,100	-10,800	1,000
2060	0	24,800	7,200	-100	-10,800	-20,900	17,400	-17,400	61,400	-61,400	-10,900	200
2061	0	24,800	7,200	-100	-10,800	-21,500	17,600	-17,600	61,700	-61,700	-10,900	-400
2062	0	24,700	7,200	-100	-10,700	-20,900	17,400	-17,400	60,700	-60,700	-10,800	300
2063	0	24,800	7,200	-100	-10,700	-21,100	17,400	-17,400	60,400	-60,300	-10,800	200
2064	0	24,700	7,200	-100	-10,600	-21,400	17,400	-17,400	60,300	-60,300	-10,700	-100
2065	0	24,700	7,200	-100	-10,500	-21,600	17,600	-17,600	60,300	-60,300	-10,600	-300
2066	0	24,700	7,200	-100	-10,500	-22,000	17,800	-17,800	60,600	-60,600	-10,600	-600
2067	0	24,700	7,200	-100	-10,300	-22,200	17,800	-17,800	60,600	-60,500	-10,400	-700
2068	0	24,700	7,200	-100	-10,200	-21,900	17,700	-17,700	59,800	-59,700	-10,300	-400
2069	0	24,700	7,200	-100	-10,200	-21,800	17,600	-17,600	59,400	-59,200	-10,300	-300
2070	0	24,600	7,200	-100	-10,300	-21,800	17,600	-17,600	59,100	-59,100	-10,400	-300

Table 2-8. PID Water Budget Historical and Projected

Water Year	Mountain-Block Recharge	Recharge (Deep Percolation, Streambed Infiltration, Artifical Recharge)	Agricultural Return Flows	Municpal Pumping	Agricultural Wells	Lateral Subsurface Flow	Vertical Flows (Top)	Vertical Flows (bottom)	IN	OUT	Total Pumping	Storage Change
Historical Average	0	24,700	7,200	-100	-10,300	-21,700	17,500	-17,500	58,600	-58,600	-10,400	-200
Projected Average	0	24,700	7,200	-100	-10,200	-21,700	17,500	-17,500	58,300	-58,300	-10,300	-100



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Data sources:
DWR (2016)

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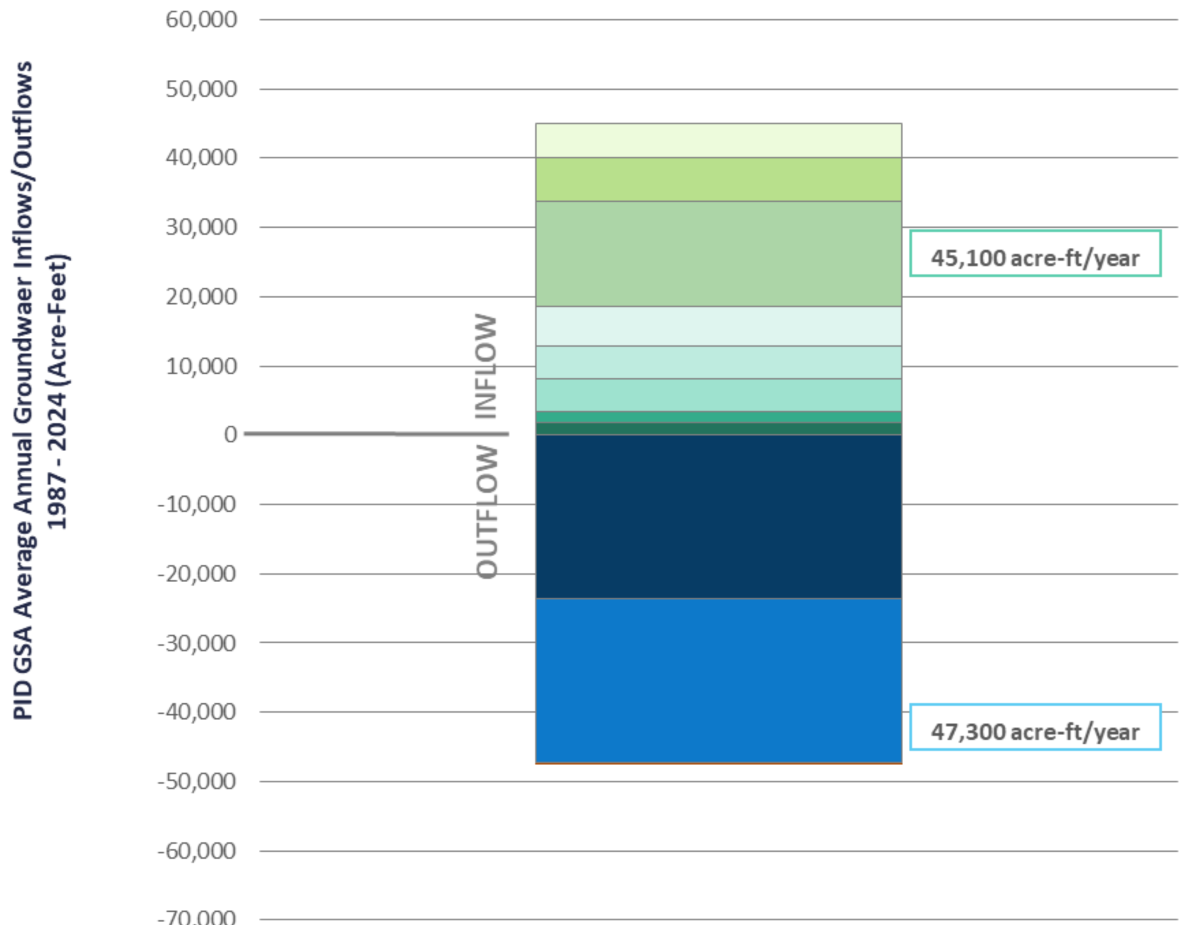
Surface Water Inflow and Outflow Components

Groundwater Sustainability Plan
Porterville Irrigation District GSA, Tule Subbasin

Figure 2-38



	Inflow/Outflow
Irrigated Agriculture Return Flows	5,100
Irrigation Water Return Flow from Streams	6,200
Subsurface Inflow (Other GSAs)	15,200
Imported Water Return Flow	5,800
Stream Infiltration	4,600
Recharge In Basins	4,700
Aerial Recharge from Precipitation	1,700
Canal Seepage	1,800
Municipal Pumping	-100
Subsurface Outflow (to Other GSAs)	-23,700
Agricultural Pumping	-23,600

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Porterville Irrigation District Groundwater Budget

Figure 2-39

Groundwater Sustainability Plan
Porterville Irrigation District, Tule Subbasin