

Regional Water Management Group

LOCATION: Online (ZOOM)

MINUTES

Monday, March 28, 2022 1:30 pm

1. The meeting was called to order at 1:32 pm, by Tom Wheeler, chairman.

Those present included:

Tom Wheeler – Madera County
Jeannie Habben – Madera County
Kristi Robinson – Water Wise/Triangle T
Jacob Roberson – RWMG Coordinator
Keith Helmuth – City of Madera
Jason Rogers – City of Chowchilla
Brandon Tomlinson – Chowchilla WD
Carl Janzen – Madera ID
Gretchen Heisdorf – Root Creek WD
Don Roberts – Gravelly Ford WD
Stephanie Anagnoson – Madera County
Sam Cunningham – Madera County
Melanie Aldridge – Madera WD
Jennifer Morales – DWR
Clyde Wheeler – Indian Lakes
Jack Rice – MAWA

Mary Sholler – North Fork Rancheria
Eddie Mendez – Madera County
Emily Garcia – Madera County
Jacklynn Kouzougian – Greystone Equities
Rogell Rogers – Sustainable Conservation
Aysha Massell – Sustainable Conservation
Pete Leffler – Luhdorff & Scalmanini
Kim Witten – Madera County
Steve Hatchett – ERA Economics
Al Solis – SEMCU
Julie Konno – Coarsegold RCD
Dina Nolan – MID
Nicole Wynd – SHE
Armando Ortiz – SHE
Ronnie – Member of the Public

2. Review & Approval - Agenda & Minutes

- A motion to approve the March agenda was made by Carl J; Gretchen H second; all voted; Motion passed unanimously.
- A motion to approve the February minutes was made by Gretchen H; Kristi R second; all voted; Motion passed unanimously.

3. Approval – Resolution No. 2022-03

- A motion to approve meeting resolution no. 2022-03 was made by Jason R; Gretchen H second; all voted; Motion passed unanimously.

4. Public Comment

- Tom W commented that up in Ahwahnee they have received a little over half an inch of rain (.55”) which is more than what has been recorded for the past 3 months.
- Items of interest were mentioned by Jacob R (for more information, reach out to Jacob):
 - The State Water Resources Control Board has opened a County-wide and Regional Funding Solicitation **for counties or eligible partner entities** to receive funding to implement county-wide or regional programs that address drought-related and/or contamination issues for state small water

systems and domestic wells serving disadvantaged communities and low-income households.

For additional information and application instructions, please visit their website:

https://www.waterboards.ca.gov/safer/funding_solicitation.html

- The 11th International Symposium on Managed Aquifer Recharge is taking place April 11th – 15th. With the continued reliance on groundwater in many areas of the world, Managed Aquifer Recharge continues to be an important tool for recovering depleted aquifers and developing resilient groundwater supplies for the future. In California, Managed Aquifer Recharge will play a central role in many basins to meet the requirement of the Sustainable Groundwater Management Act.
- The next Irrigated Lands Regulatory Program stakeholder meeting is scheduled for April 13th from 10 am – 12 pm. The meeting will focus on the development of Groundwater Protection Targets. The meeting is open to the public and all interested stakeholders.

To receive the Zoom meeting link, RSVP by emailing Sue McConnell by April 12th:

Sue.mcconnell@waterboards.ca.gov

- The Bureau of Reclamation announced a funding opportunity for WaterSMART: Drought Resiliency Projects. This program provides federal cost-share funds for entities to take a proactive approach to drought through building projects that increase water supply reliability and improve water management.

Applications are due on June 15th on www.grants.gov.

- [DWR announced last week](#) 62 projects that have received funding under the Urban and Multibenefit Drought Relief Grant Program totaling \$180 million for the second phase of funding.

One of the projects funded is the Madera Ranchos Well Rehabilitation Project for \$320,000. The grantee for this project is Madera County Public Works.

NEW BUSINESS

5. Discussion & Action - Financial Report/Warrant Approvals

- March 2022 Financial Report
 - Carl J reported that two more group members paid their dues for the year, leaving Madera County and MAWA as the only two members that have not paid yet. \$2,000 was spent for Jacob R's position as the group's coordinator, leaving us with \$36,870.05 at the end of the month.
 - Tom W commented that he will check with Madera County on paying their member dues for the year.

- A motion to approve the financial report was made by Carl J; Gretchen H second; all voted; Motion passed unanimously.

6. Discussion – Proposition 1 Disadvantaged Community Involvement Funding

- San Joaquin Valley
 - Self-Help Enterprises and Chowchilla Management Zone – Projects 12 and 13
 - Jacob R introduced Armando Ortiz, who will be taking on the role that Angela I held with SHE, and Armando will be working on Projects 12 and 13 in collaboration with CMZ. Angela took a new position with Civic Well.
 - Armando commented that he is transitioning from the Sustainable Energy Solutions team at SHE. Armando is reviewing the documents for Projects 12 and 13 and is getting himself familiarized with the projects. Armando is looking to expedite the tasks for the projects once he has reviewed everything to see what has been done, and what deliverables still need to be completed. Armando is looking forward to working on these two projects.
- Chowchilla Nitrate Control Program
 - Kristi R reported that they are still testing wells for Projects 12 and 13, and they have received 11 applications for homeowners to have their domestic wells tested. They have tested five wells so far and are providing bottled water to those five homes. They are also waiting on multiple homes to get CMZ additional information so they can test their wells.
 - Tom W commented that he saw some of CMZ's Facebook ads asking people who are interested to sign up to have their wells tested. Kristi mentioned that they recently did a U.S. Postal route mailer to 2,300 homes within CMZ's subbasin. They have been actively targeting residents within the community. They have been doing a lot of paid advertisements on Facebook which target specific people based on where they live, their age range, and other things.

7. Discussion – Proposition 1 IRWM Implementation Funding

- Mountain Counties and San Joaquin Valley Counties
 - Indian Lakes and Parkwood
 - Eddie M reported that most of the meters have arrived for these two projects. They are waiting for the smart point component that allows for the meters to communicate remotely with the drive-by meter reading devices. Eddie also added that there is no estimated date yet for the smart point components to arrive, there is no ship date from the factory right now. Indian Lakes is getting composite meters, and Parkwood is getting brass meters.
 - Tom commented that they are dealing with a similar situation with five trucks they ordered for the Sheriff's department. The manufacturer ended up canceling the order on them due to not being able to get different components needed to build the trucks.
 - City of Madera

- Keith H commented that they are not in the position yet where they are ordering meters, but their consultant has completed the inspections for the meters, and they are currently working on the report for that.
- Parksdale
 - Eddie M reported that this project is mostly complete. A couple of weeks ago they turned the pump on, and it was pumping out clean water as far as inspection goes visually. There were a few minor repairs they had to do, like a cracked flange and a few other things which they went back and cleaned up. They are currently waiting on the Variable Frequency Drive (VFD) to arrive. Once the VFD arrives, it will be installed along with a meter on the well. After that, they will be running the testing that they do on the County side and along with a pump test. When Eddie went out there to do a visual inspection, they had a stable water level when they were running the pump for about 15 to 20 minutes.
- City of Chowchilla
 - Jason R reported that they are still waiting on the revised funding agreement from DWR. Jason reached out to them, and they said that they are trying to follow up with their financial division. Jason is hoping that DWR gets the revised agreement to them soon so the City of Chowchilla can get started on their project.

8. Discussion – Domestic Wells – Prop 68 Funding

- Stephanie A introduced Pete L from Luhdorff & Scalmanini who provided an updated on the domestic well inventory project for the County of Madera. Pete's PowerPoint slides are attached to the end of these minutes.
- Melanie A commented that she has been working on the outline for the potential domestic well remediation program based on the draft study that she received. She is working on an agenda for a series of meetings so the GSAs can spend more time together. One of the issues that came up is that if a well is drilled and it is assumed that it is going to have a 30-year life, but it is no longer functioning properly after 15-years of use. One thing that Melanie thinks should be considered is pro rating the amount that should be donated to that new well because it did in fact get 15-years of use rather than the assumed 30-years. Melanie asked if there is some sort of guideline on depreciation of a well or decay of a well. Is it evenly over the years, or does it drop dramatically after a certain number of years? Melanie is trying to come up with a fair way for everyone. The landowner in the absence of GSAs would have to take on the entire cost/loss of a new 30-year well when it was only usable for 15-years. With this scenario, Melanie thinks the landowner should get credited for 50% of the well that failed after 15-years, when it has a 30-year assumed life. Melanie is asking for further discussion on how wells decay and how GSAs would figure that out.
 - Pete L commented that from a technical point-of-view, the well produces enough water or it doesn't. When a well fails, it's abrupt. It may be producing enough water, but in the next few days it isn't. If the well has a life expectancy of 40-years but stops producing after 20-years, then you only get 50% of the expected use and cost of the well when it stops

producing water. Pete added that Melanie's question is one of several that need to be discussed among the GSAs and during the development of the domestic well mitigation program.

- Melanie added that she was just wondering if there is some engineering standard where wells decay more after a certain number of years after the well is drilled (i.e., in years 10 to 20 compared to in years 1 to 10). It is an aquifer problem, but in the absence of the GSAs, the landowner would have been replacing their own well. Melanie is trying to be fair to both sides, being the GSAs and the landowners with domestic wells. Pete added that this is kind of like a tax accountant depreciation question for equipment. Pete wonders if tax accounts have a calculation that they use when it comes to well depreciation, which Pete presumes they have. Melanie added that they do have calculations for the depreciation of wells, where you have either a straight-line depreciation or an accelerated depreciation. When drilling a new well, some landowners set aside an amount of funds each year knowing that the well will need to be replaced eventually since it will not last forever, which not all landowners generally do.
- Tom W commented that his current well up in Ahwahnee has lasted almost 50-years, and before that his well lasted approximately 20-years but most times it's between 10 and 15-years when the pump goes bad and needs to be replaced.
- Carl J had a question for Steve H with ERA Economics regarding the economic study for this project. For the study, pumping 6-inches of water was used for the annual usage rate, is that a total of all minus pumping costs and the economic reduction income for 50% of the land?
 - Steve answered that is uses the same kind of analysis that they used for some of the other demand management programs. They look at what the net return of land that would need to come out of production on an economic basis over time to achieve whatever the target demand reduction and sustainable yield target is. What they look at for this alternative well replacement program that they are using for comparison for this domestic well inventory project is demand management. That would have to go in to play immediately was the assumption rather than delay it and phase it in over 20-years as the SGMA law and GSPs force. The short answer is yes, they do look at what the loss net return is on land that would have to come out of production sooner and count that in the cost comparison.

9. Discussion – NRCS Cost-Share Pilot Program for Recharge Projects

- Jacob R reported that Chowchilla WD and Madera ID held workshops early this month about this funding opportunity for property owners within their boundaries.
- Aysha M reported that there were a few workshops held during the month of March for this funding opportunity. Madera ID held a series of 3 workshops where 25 farmers attended in total, and they received 11 applications as well. Not sure if anyone else within Madera ID boundaries applied outside of the workshop series held for interested applicants. They also held a virtual training with Chowchilla WD in March. Aysha is not sure if anyone turned in an application because of that virtual training with Chowchilla WD. Aysha reminded

everyone that the deadline to apply is April 1st. To apply, landowners will need to first sign up with [NRCS' Form 1200](#), which is a simple form to complete. Completing the form essentially holds your place in line, which means you do not need to have everything figured out for your project. The form just determines if you're eligible to apply. A NRCS representative will reach out once the form is reviewed and help you fill out a recharge plan. That plan will then be ranked along with the others that are completed, and the best will be chosen for funding.

10. Discussion – Creek Fire / Forest Management / Watershed

- Tom W thanked Jacob R for the Creek Fire newsletter that he put together for the Creek Fire Tour that the Madera RWMG hosted on December 4th last year.
 - A motion to approve the Creek Fire Tour newsletter was made by Gretchen H; Carl J second; all voted; Motion passed unanimously.
- Jeannie H shared a video created by Mariposa County RCD about the Creek Fire. If you are interested in viewing the video, please reach out to Jeannie H or Jacob R and they can email the link to you. Mariposa County RCD has asked for the video link to not be broadly distributed.
 - Jeannie H added that the forest service received funds in the form of a grant from the Wildlife Conservation Board, and they are looking to expand on it. They want to make it a full movie. The video that Jeannie shared may become the trailer for that movie.
- Tom W commented that about 15-years ago, Sequoia National Park got a grant to log around all the Sequoias and do a fuel reduction project too. The environmentalists sued them, and the judge ruled in their favor to stop the projects. About 2-years after the ruling, a fire went through and burned down a lot of the trees. Tom made a statement at the US Forest Service Recreation Resource Advisory Committee (RRAC) meeting not long after stating that the trees were destroyed due to the projects being stopped. The projects were very important to avoid catastrophic damage. With logging being greatly reduced in California, these large wildfires are what we will be dealing with in the years to come. Stopping these large wildfires is not going to happen overnight. Tom added that videos like the one that Jeannie shared are needed to show people in California what the reality is with these forest fires and how much damage is being done.

11. Discussion – Drought Working Group

- Jeannie H reported that the Madera County Drought Working Group will be meeting again on Friday, April 15th, at 10 am on Zoom. If you are not signed up to get the notices for these monthly meetings, please reach out to Jeannie H to be added to the email list. The meetings are usually 30 – 40 minutes long. The meetings are to give participants references and places/websites to go to do research on their own about the California drought.

12. Discussion – 2022 IRWM Implementation Grant Prop 1 Round 2 Funding

- There has been no update since the public comment period for the round 2 draft materials ended on February 18th. Jacob attended a webinar, and DWR is leaning towards having two deadlines to apply, October 2022 and February 2023. Jacob mentioned this last month during the Madera RWMG, and Tom W

would like the group to plan on applying in October for the remaining funds we have for the Mountain County Funding Area (MCFA). Jacob will be keeping the group informed as he hears more. Due to an agreement signed by the Madera RWMG and the other 8 regions in the MCFA, the Madera RWMG \$594,782.67 to apply for in round 2.

- Jacob also added that he sent out a draft request letter to the voting members last week. The request is for \$510 million in state-wide funding to be included in a final drought relief package for the 2022/23 fiscal year (July 1, 2022, to June 30, 2023). The letter will be addressed to Governor Newsom, Pro Tem Atkins, Speaker Rendon, Chair Skinner, and Chair Ting. This letter was sent to all 48 IRWM regions to sign.
 - A motion to approve the IRWM FY 2022-23 Budget Funding request Letter was made by Gretchen H; Kristi R second; all voted; Motion passed unanimously.

13. Discussion – IRWM Project List – 2022 Call for Projects

- Jacob R sent out email on March 3rd to start the 40-day period for the 2022 IRWM Project List Call for Projects, and it will close on April 12th. Members will vote on projects to add them to the project list during the April 25th meeting.

OLD BUSINESS

14. Report – Sustainable Groundwater Management – SGMA

- Stephanie A reported that the Madera County GSA is in the process of completing a rates study. They have a special meeting tomorrow at 10 am with the Board of Supervisors to make sure they choose a rate structure, then they will complete the rates study. In the Chowchilla Subbasin, they are revising the GSP to turn in mid-year. Same thing with the 6 GSPs in the Delta-Mendota Subbasin. The Madera Subbasin received a 28-page letter last week from the State Board describing perceived flaws in all the GSPs. The 1st page does suggest that perhaps the GSAs would benefit from doing 1 plan together. This letter is available on the SGMA portal for those who would like to read it under “letters submitted after the comment period”. Stephanie added that no GSPs in the Valley have been approved yet, but there are some on the coast and in Southern California that have been approved.

15. New/ Suggested Members for the Madera RWMG

- No new members suggested.

16. Future Agenda Items

- Jacob R’s contract as coordinator for the Madera RWMG will be added to the agenda for renewal (contract is good for 1 year, May 4th through May 3rd).

17. Next Meeting

- Next meeting is scheduled for Monday, April 25th, 2022, at 1:30 pm on Zoom for now until COVID restrictions are lifted and allow us to meet in person.

18. The meeting was adjourned at 3:02 pm.



Madera County Domestic Well Inventory Update



Project Background/Objectives

- DWR Prop 68 Grant Funding
- GSPs included Domestic Well Mitigation Programs to avoid adverse impacts to this group of beneficial users
- Need for improved understanding of locations, density, construction of active domestic wells, and costs (Part 1: Domestic Well Inventory)
- Provide Input to Domestic Well Mitigation Program
- Identify/address additional monitoring needs with dedicated MWs (Part 2: Install new MWs in areas with clusters of domestic wells)

Project Background/Purpose

- Wells can experience three general types of problems: Pump, Well, Aquifer
- Pump Problem: Most wells pumps are designed to last up to 10-15 years before needing replacement (not related to declining water levels)
- Well Problem: Wells typically made of PVC or steel materials that degrade over time; typical well life may be 30-50 years (not related to declining water levels)
- Aquifer Problem: Declining water levels that may go below the bottom of a well, thereby causing no water to be available to well
- Intent of Domestic Well Mitigation Program is to assist well owners with “Aquifer” problem that occurs after submittal of GSP in January 2020.

June 2021 DWR Review of GSPs

- Cuyama Valley and Paso Robles Subbasin GSPs were not approved in part because of deficiencies related to handling of Groundwater Level SMC and mitigation specific to domestic wells
- DWR evaluations state, “While SGMA does not require all impacts to groundwater uses and users be mitigated, the GSA should consider including mitigation strategies describing how drinking water impacts that may occur due to continued overdraft during the period between the start of GSP implementation and achievement of the sustainability goal will be addressed.”

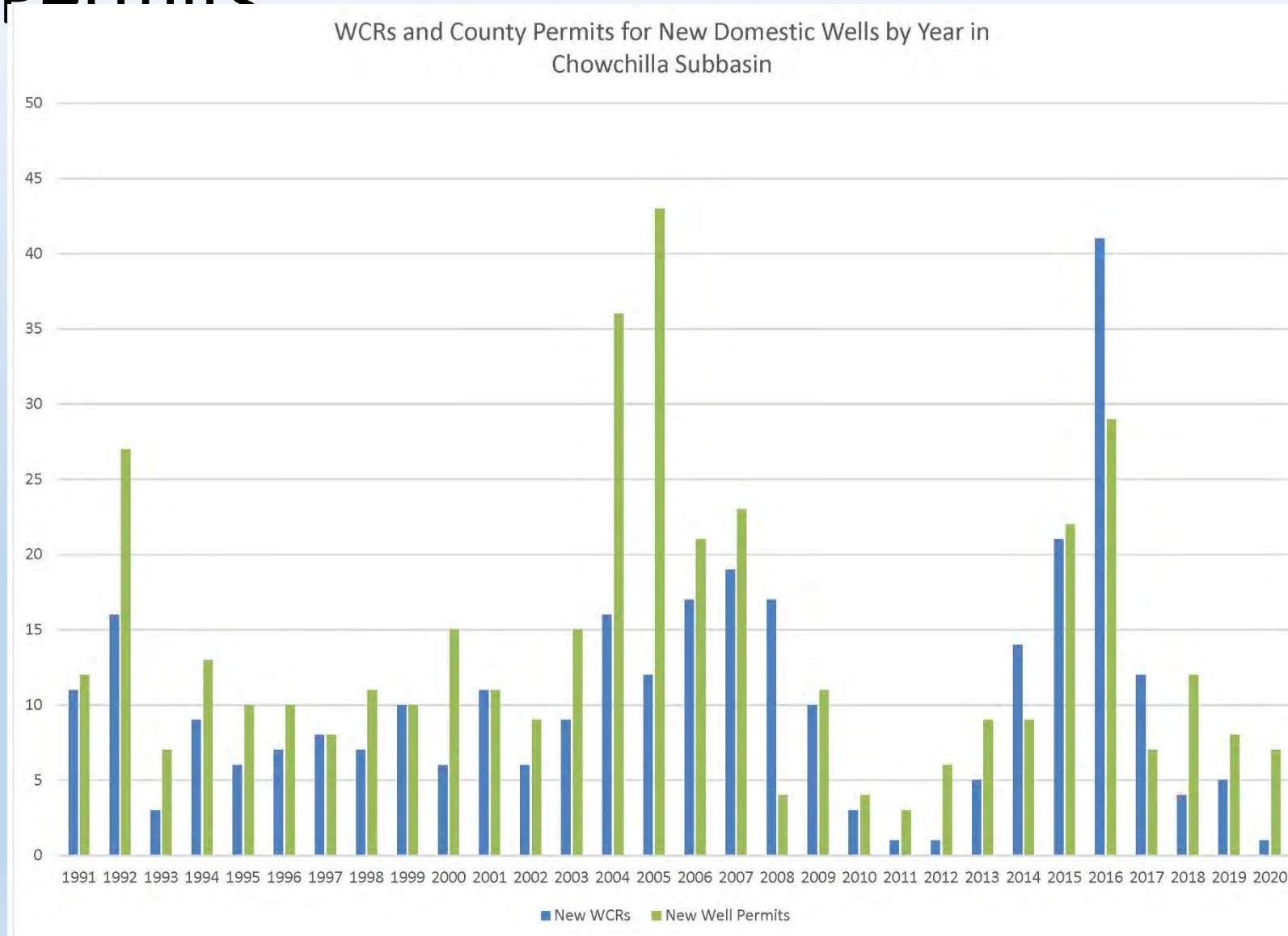
November 2021 DWR Review of GSPs

- Chowchilla Subbasin GSP was not approved in part because insufficient details of Domestic Well Mitigation Program were included in GSP. DWR evaluation states, “...it is unclear when the program will be implemented and financed by the GSAs in the Subbasin, or how rapidly the GSAs will be able to respond to developing domestic well impacts.”
- Merced Subbasin GSP was not approved in part because of not having project/management actions to address drinking water impacts included in GSP. DWR evaluation states, “The GSAs should revise the GSP to describe how they would address drinking water impacts caused by continued overdraft during the period between the start of GSP implementation and achieving the sustainability goal.”

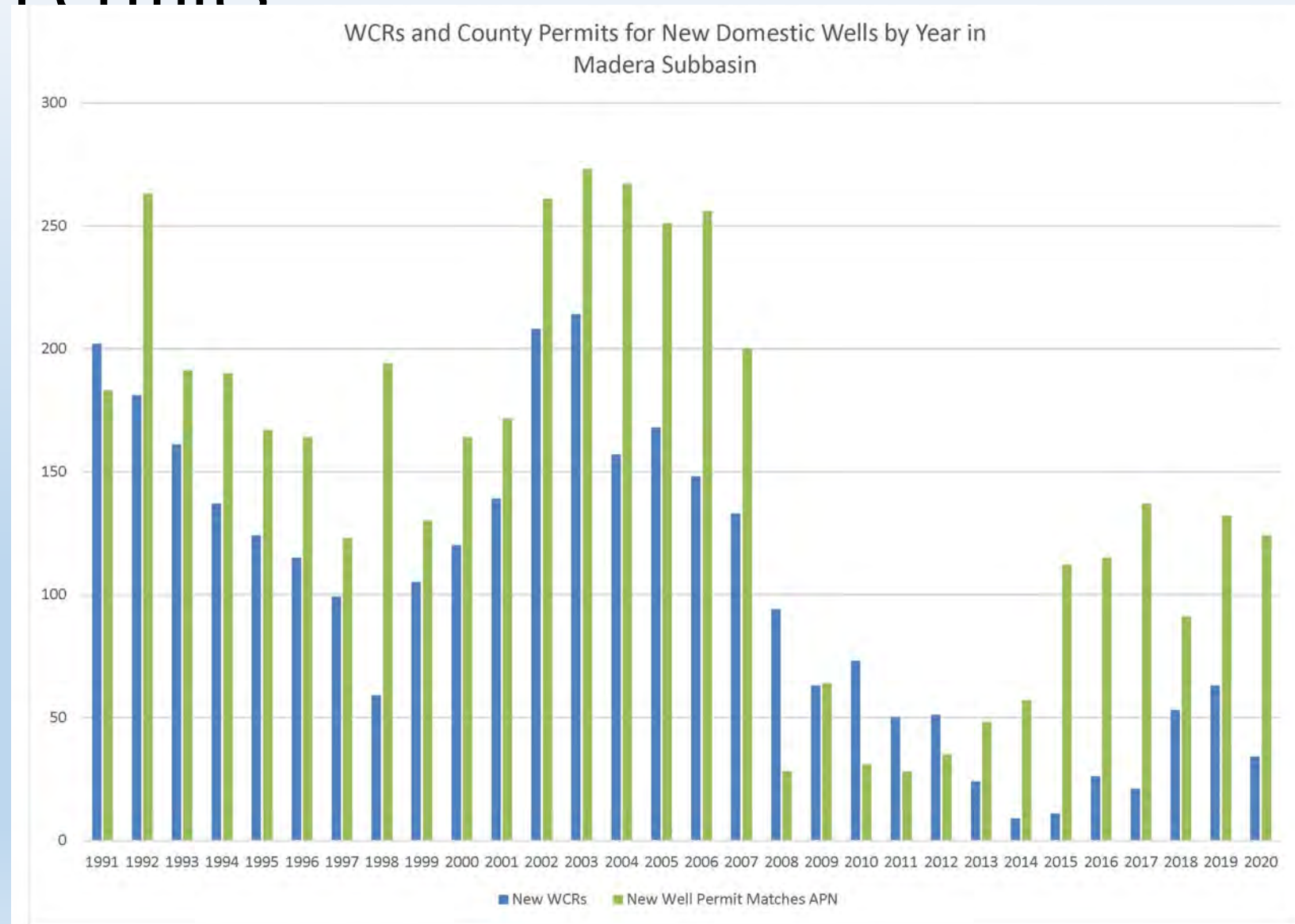
Inventory Dataset Characteristics

Data Source	Historical Well Presence	Well Status (active)	Location Accuracy	Construction (depth, screens)
DWR Well Completion Report Database	Since early 1900s	No	Variable (some only to PLSS section)	Usually included
County Well Permit Database	Since 1990s (Mad=1990, Mer=1998)	No	By APN (not all match parcel GIS data) or Address	No (only seal depth)
County Parcel Data	Inferred from Use/Dwelling Code	No	By APN	No
Census Information	Inferred from # Households	No	By Census Block	No

Domestic Well WCRs vs. County Permits



Domestic Well WCRs vs. County Permits



Comparison of Total Numbers of WCRs and Permits to Estimated Number of Parcels with a Dwelling Outside of Water System Boundaries

Years	Chowchilla Subbasin	Madera Subbasin
WCRs (since 1970)	500	4822
WCRs (since 1990)	374	3446
Permits (since 1990)	439	4210
<i>Ratio Permits to WCRs (since 1990)</i>	1.2	1.22
Estimated Potential Domestic Wells from Upscaled WCR Data (since 1970)	600	5883
Parcels with Dwellings Outside Water Systems	967	5898

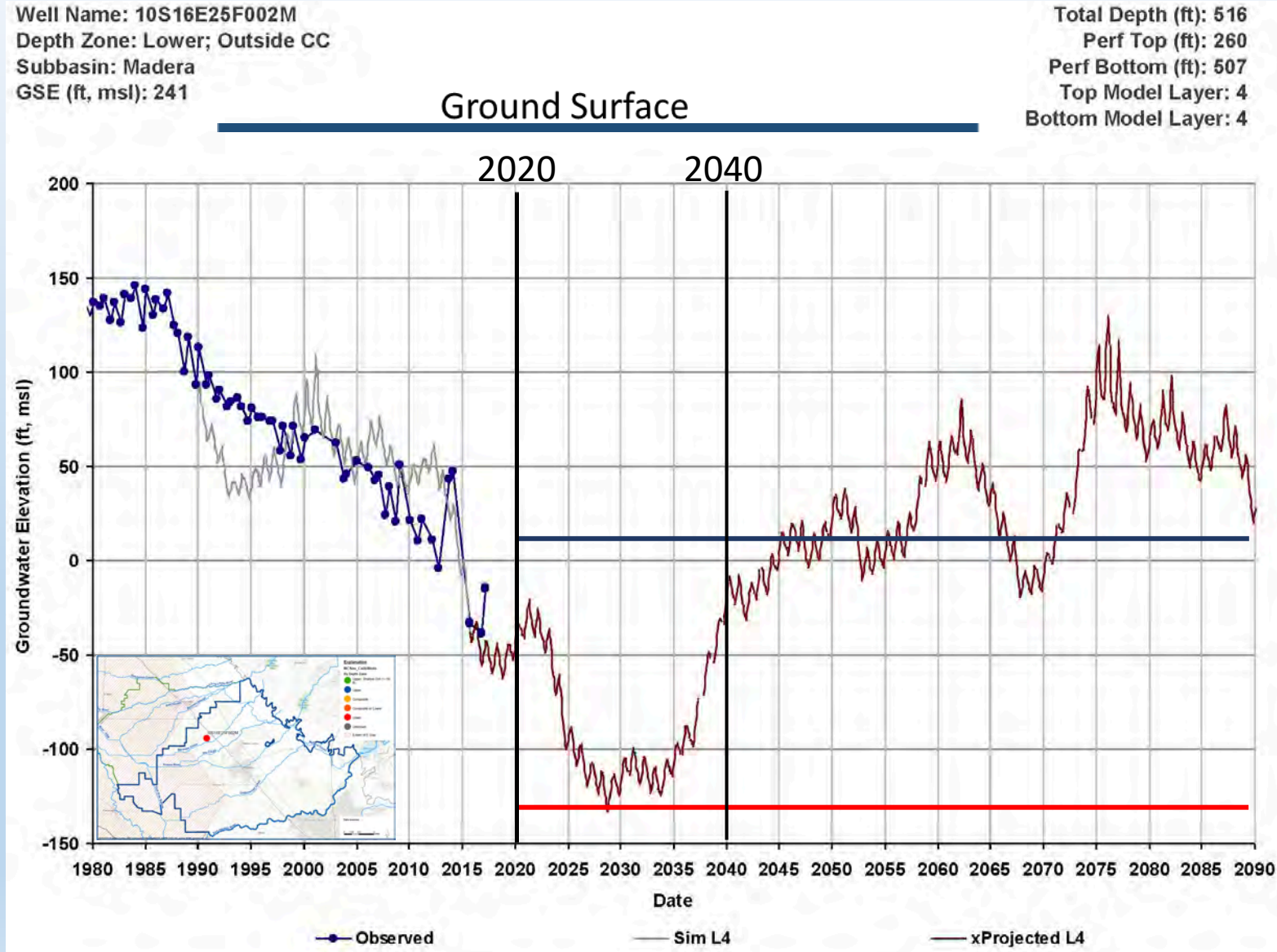
Note: This table provides WCRs since 1990 to allow comparison to permits. However, the analyses are based on WCRs since 1970.

Refined Analysis of Dry Domestic Wells

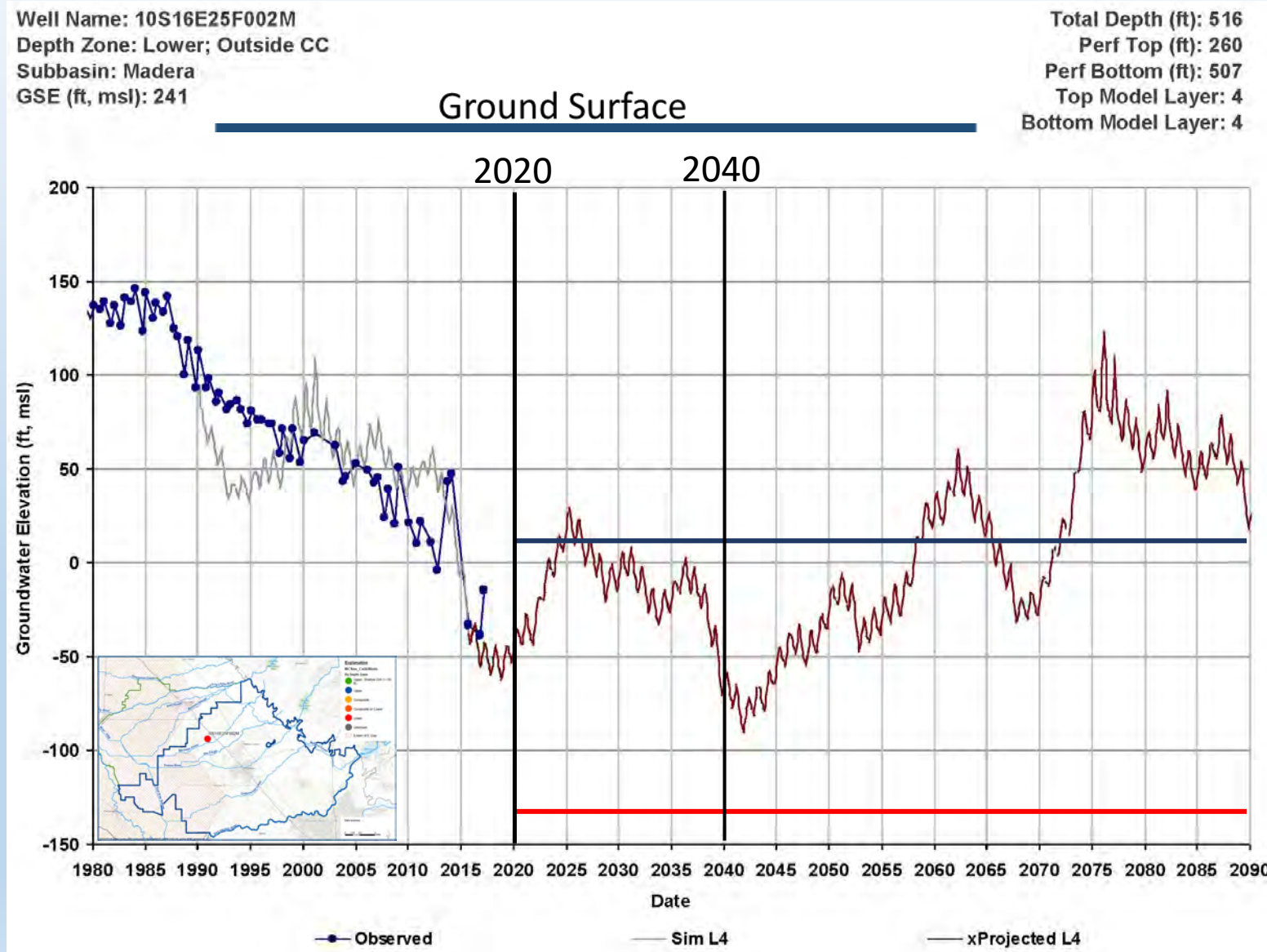
Typical Definition of Dry Well: Regional groundwater level below bottom of well or insufficient well saturation (e.g., 10 feet above bottom of well).

Note: A water level below a pump does not necessarily constitute a dry well – pump may just need to be lowered.

Sensitivity Run – Outside CC, with Projects, Dry Years Start to IP



Alternative – Outside CC, with Projects, Wet Years Start to IP



GSP Baseline – Outside CC, with Projects, Avg Years Start to IP

Well Name: MID RMS-3

Depth Zone: Lower; Outside CC

Subbasin: Madera

GSE (ft, msl): 241

Total Depth (ft): 516

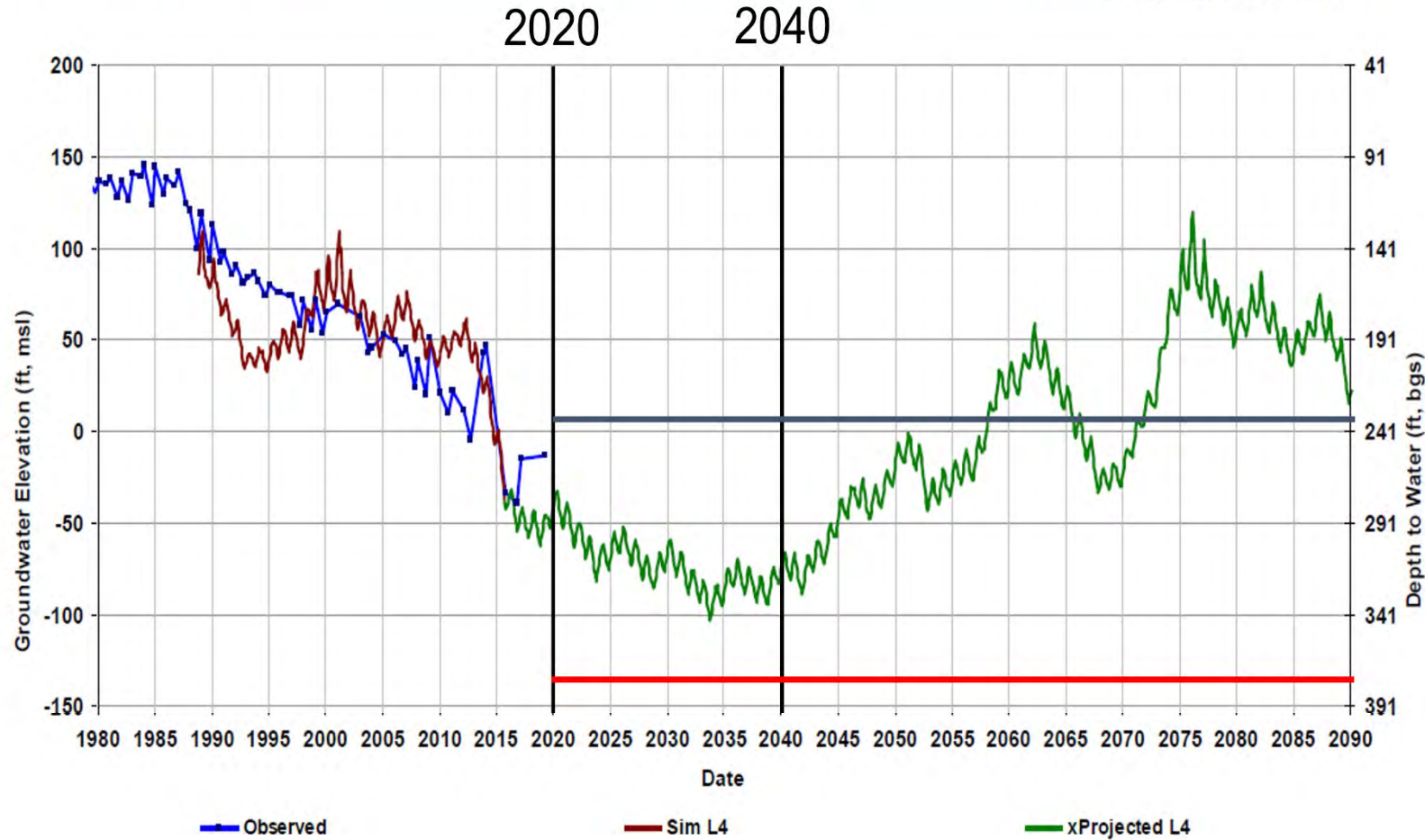
Perf Top (ft): 260

Perf Bottom (ft): 507

Top Model Layer: 4

Bottom Model Layer: 4

Ground Surface



Potential Domestic Well Impacts Analyses Completed

Analysis Components	GSP Projected Base Case Hydrology	Alternative Projected Dry Start Hydrology	Comment
Domestic WCR Well Counts (since 1970)	X	X	
Domestic WCRs (since 1970) Upscaled to County Permits	X	X	
Domestic WCRs (since 1990) Upscaled to County Permits	X		Corresponds to Well Permit Period
Based on Fall GWL in Years 2019/2024/2029/2034/2039 (5-Year Updates and IMs)	X	X	More dry wells after 2020 than in Min Years
Based on Fall GWL Years 2018/2023/2028/2033/2038 (Min GW Levels)	X	X	
Dry Well Saturation Thresholds 0-100 ft	X	X	Max. # dry wells occurred at 30 feet

Results Summary

- Dry-Year Sequence to Start GSP Implementation Period (for initial cost estimates)
- Adjusted domestic well WCR count for County Domestic Well Permits with a scaling factor
- Using all wells since 1970
- Using a 10-foot well saturation threshold

Analysis of Dry Domestic Wells Using Average-Year and Dry-Year Start Sequences to Start GSP Implementation Period Adjusted for County Permits (Chowchilla Subbasin)

Years	Total Number of Wells	Base Case Hydrology	Dry Start Hydrology	Average of Two Sequences
2020 to 2024	480	48	102	75
2025 to 2029	378	0	73	37
2030 to 2034	305	50	1	25
2035 to 2039	304	1	0	1
Total 2020 to 2040		99	176	138

Notes: Analysis includes wells drilled since 1970 and assumes dry well threshold is 10 feet of well saturation above bottom of well. Total Number of Wells is based on Dry Year Sequence, and does not include dry wells occurring before 2020.

Analysis of Dry Domestic Wells Using Average-Year and Dry-Year Start Sequences to Start GSP Implementation Period Adjusted for County Permits (Madera Subbasin)

Years	Total Number of Wells	Base Case Hydrology	Dry Start Hydrology	Average of Two Sequences
2020 to 2024	4962	350	427	389
2025 to 2029	4535	185	1,017	601
2030 to 2034	3518	406	134	270
2035 to 2039	3384	0	0	0
Total 2020 to 2040		941	1,578	1,260

Notes: Analysis includes wells drilled since 1970 and assumes dry well threshold is 10 feet of well saturation above bottom of well. Total Number of Wells is based on Dry Year Sequence, and does not include dry wells occurring before 2020.

Refined Analysis of Dry Domestic Wells

Issue	Type of Problem	Solution	Related to GSP	Typical Cost
Water level in well below pump setting depth	Pump	Lower Pump	Yes/No	\$1,000 to \$2,000
Pump not working (old age or pump-related issue)	Pump	Replace Pump and Equipment	No	\$5,000 to \$7,000
Well casing/screen failure (due to old age)	Well	Replace Well	No	\$25,000 to \$35,000
Water level below bottom of well	Aquifer	Replace Well	Yes	\$25,000 to \$35,000

Notes: Costs for lowering pump based on lowering pump by 100 to 150 feet; Pump replacement cost includes column pipe, wiring, control box, etc.; Replacement well cost is for drilling/installing new 600-foot deep well and does not include new pump/equipment; Well deepening for domestic wells is not a realistic option

Cost Analysis of Dry Domestic Wells Using the Dry-Year Sequence to Start GSP Implementation Period Adjusted for County Permits (Chowchilla Subbasin)

Years	Average Year Sequence	Dry Year Sequence	Average of Two Sequences	Replacement Well Cost (Million \$)
2020 to 2024	48	102	75	3.1
2025 to 2029	0	73	37	2.2
2030 to 2034	50	1	25	0.0
2035 to 2039	1	0	1	0.0
Total 2020 to 2040	99	176	138	5.3

Notes: Replacement Well Costs based on Dry Year Start Climatic Sequence and \$30,000/well

Cost Analysis of Dry Domestic Wells Using the Dry-Year Sequence to Start GSP Implementation Period Adjusted for County Permits (Madera Subbasin)

Years	Average Year Sequence	Dry Year Sequence	Average of Two Sequences	Replacement Well Cost (Million \$)
2020 to 2024	350	427	389	12.8
2025 to 2029	185	1,017	601	30.5
2030 to 2034	406	134	270	4.0
2035 to 2039	0	0	0	0.0
Total 2020 to 2040	941	1,578	1,260	47.3

Notes: Replacement Well Costs based on Dry Year Start Climatic Sequence and \$30,000/well

Comparison of Modeled Results to Dry Well Reports – Chowchilla Subbasin

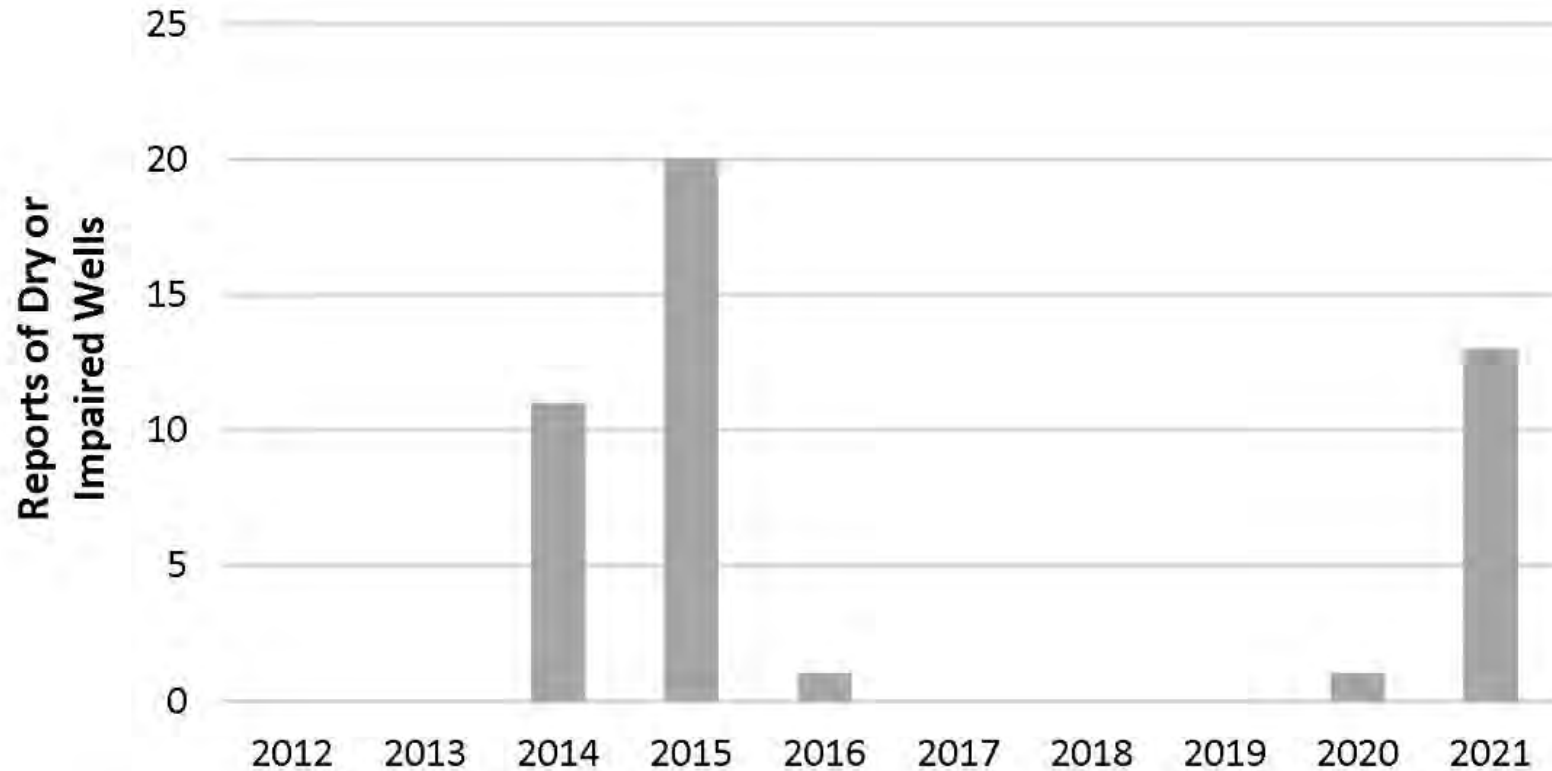


Figure 1. Chart of Household Water Supply Shortage Report Records in Chowchilla Subbasin

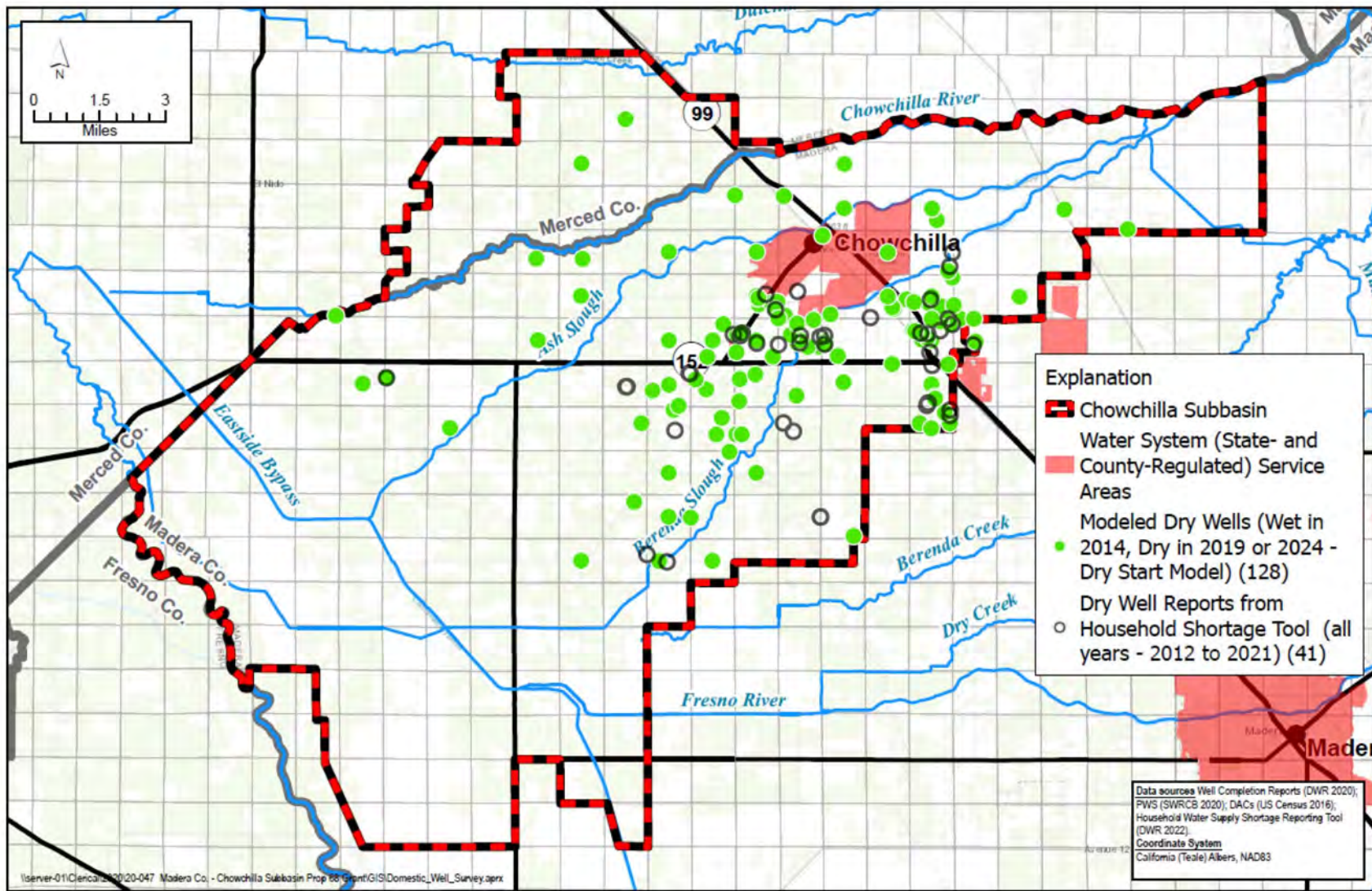


Figure 5
Comparison of DWR Dry Well Reports with Modeled Dry Wells Between 2015 and 2024

*Chowchilla Subbasin
 Groundwater Sustainability Planning*

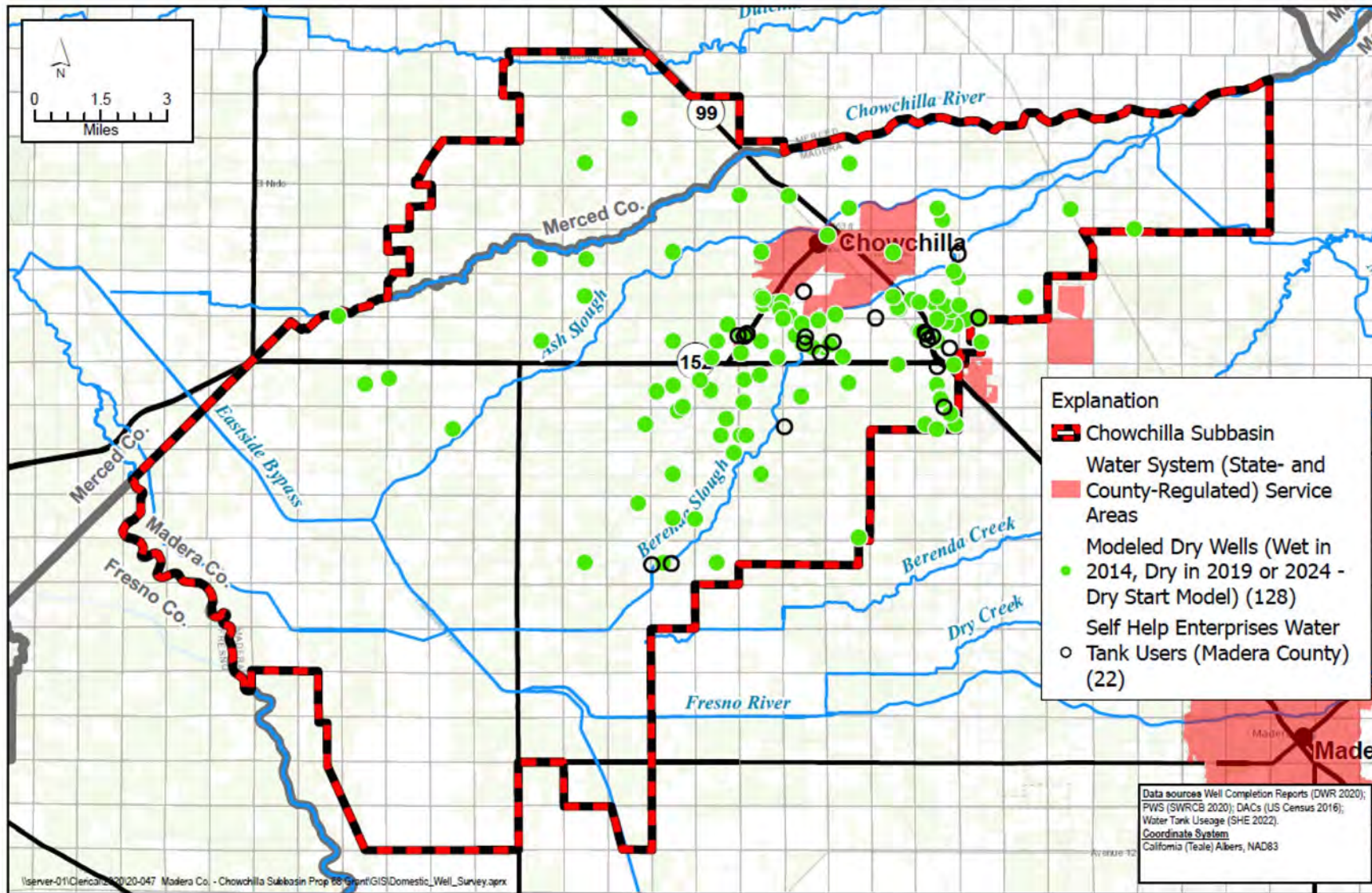


Figure 7
Comparison of SHE Tank Water Participants
with Modeled Dry Wells Between 2015 and 2024
Chowchilla Subbasin

Comparison of Modeled Results to Dry Well Reports – Madera Subbasin

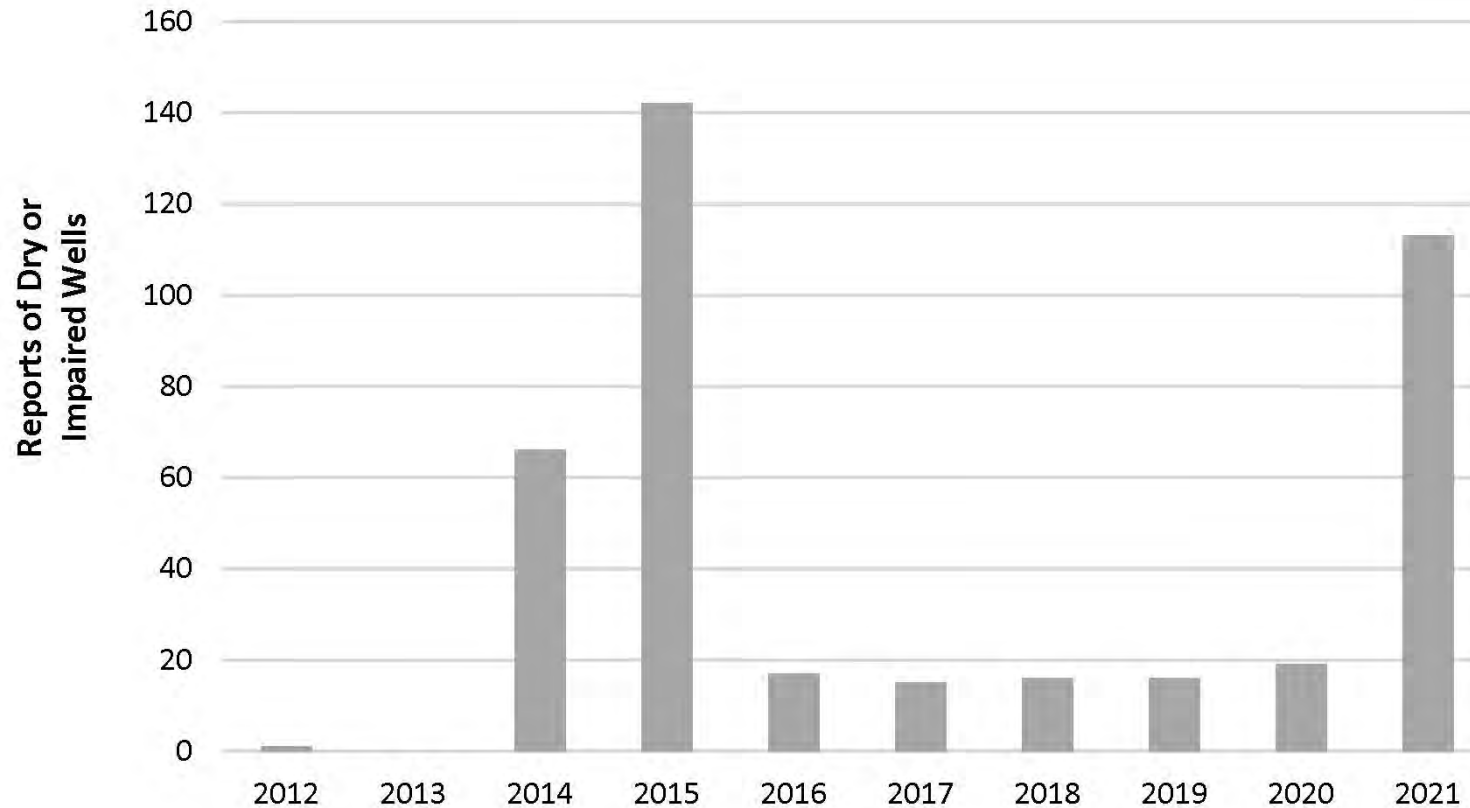


Figure 1. Chart of Household Water Supply Shortage Report Records in Madera Subbasin

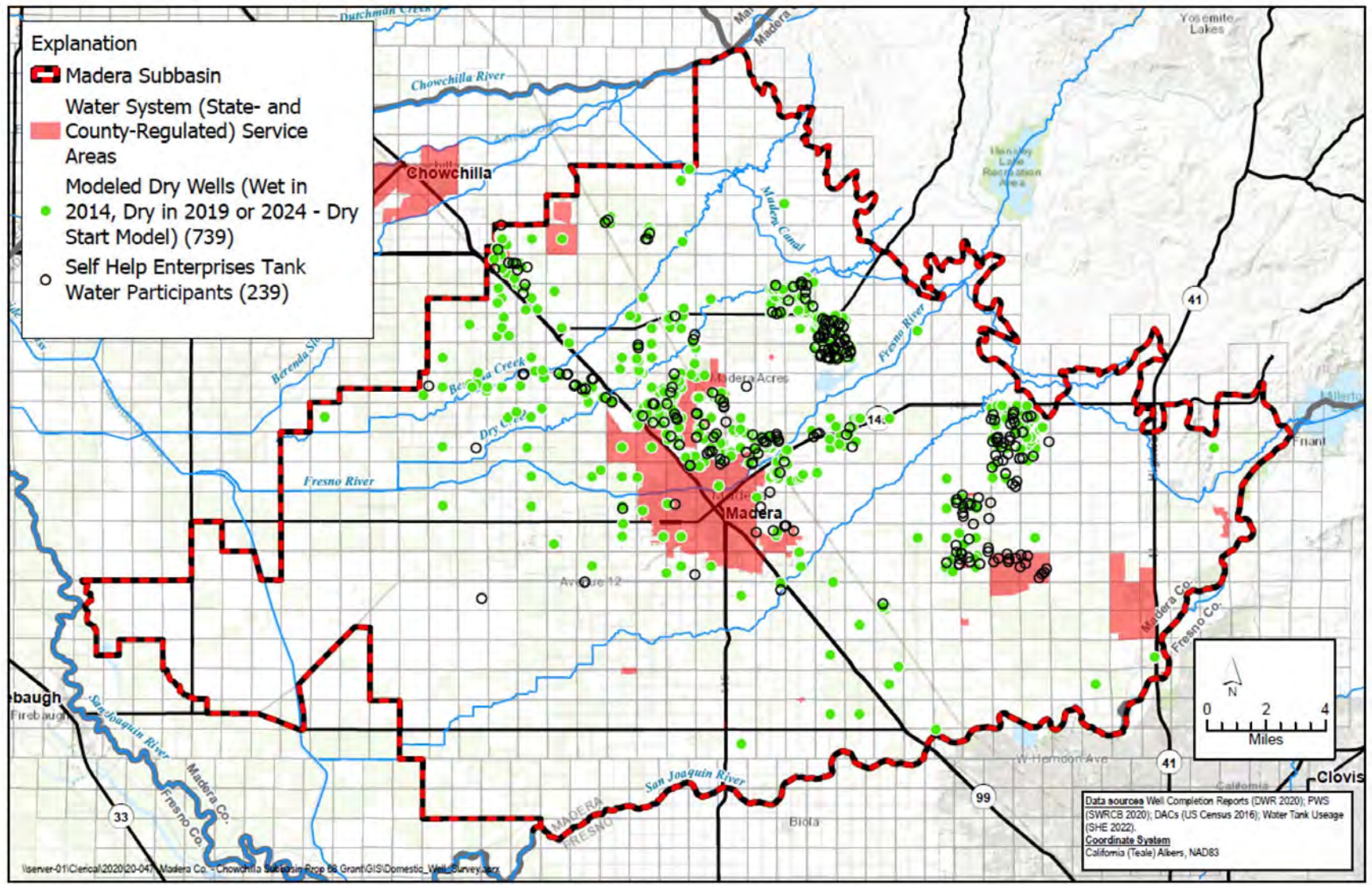


Figure 7
Comparison of SHE Tank Water Participants
with Modeled Dry Wells Between 2015 and 2024
Madera Subbasin
Groundwater Sustainability Planning

Economic Analysis of Potential Domestic Well Mitigation Program

- Purpose is to compare costs associated with domestic wells affected by groundwater decline
- Two cases compared
 - Costs to replace affected domestic wells during the planned GSP implementation period
 - Costs of avoiding well impacts by implementing GSP projects and management actions immediately
- Note that in both cases, sustainable GW conditions are achieved – the difference is when (i.e., by 2040 versus immediately)

What Costs Were Compared?

- For Current GSP plan - all PMAs implemented as planned with estimated GW use and levels):
 - Costs of replacing domestic wells affected
- For alternative, immediate PMA implementation
 - Loss of crop net return starts immediately (the largest cost)
 - Costs to build/operate projects start sooner (not included but would make conclusion stronger)
 - GW pumping costs are lower for all users (a benefit)

Economic Analysis Summary of Results

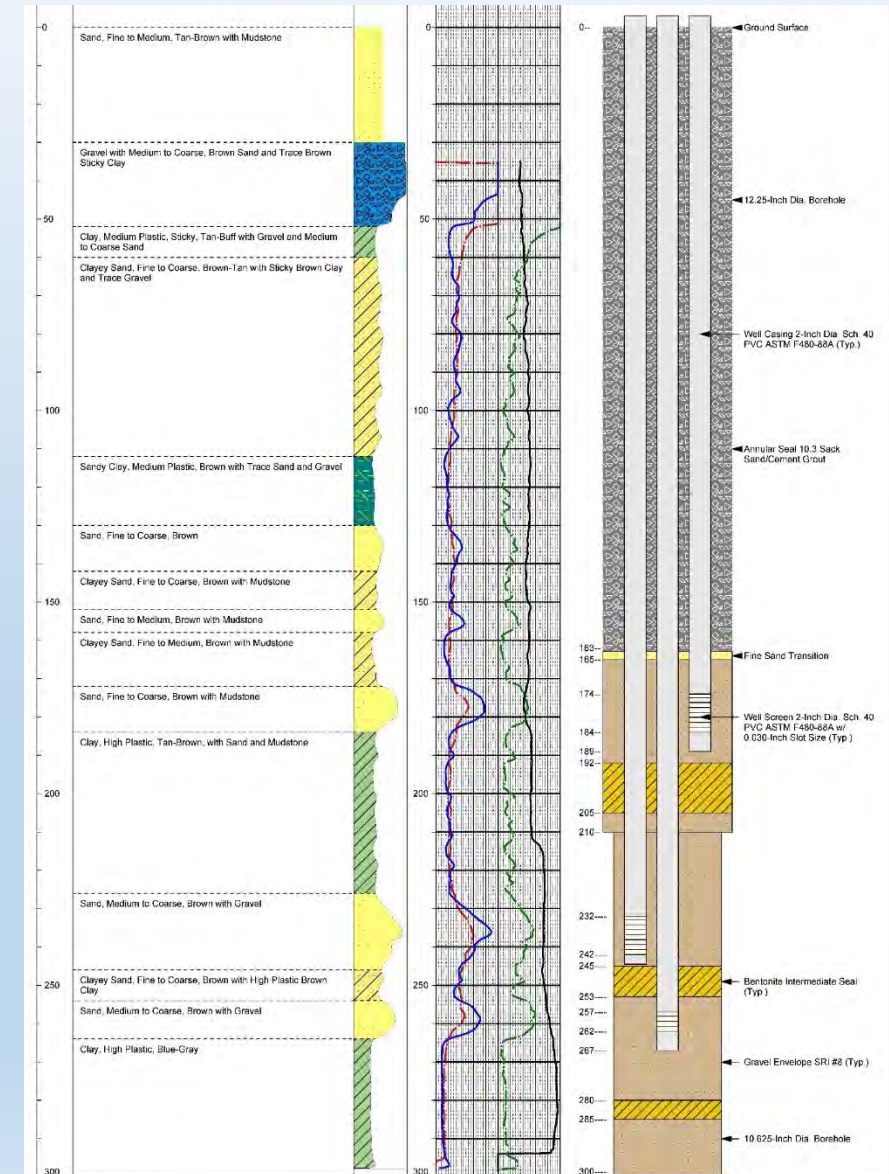
- Madera Subbasin costs (all in present value 2021 \$):
 - Cost of well replacement = \$39 million
 - Cost of immediate demand reduction = \$252 million
 - Pumping cost savings due to immediate demand reduction = \$92 million
 - ***Net cost advantage of well replacement = \$121 million***
- Chowchilla Subbasin costs
 - Cost of well replacement = \$5 million
 - Cost of immediate demand reduction = \$123 million
 - Pumping cost savings due to immediate demand reduction = \$82 million
 - ***Net cost advantage of well replacement = \$36 million***

Conclusions of Economic Comparison

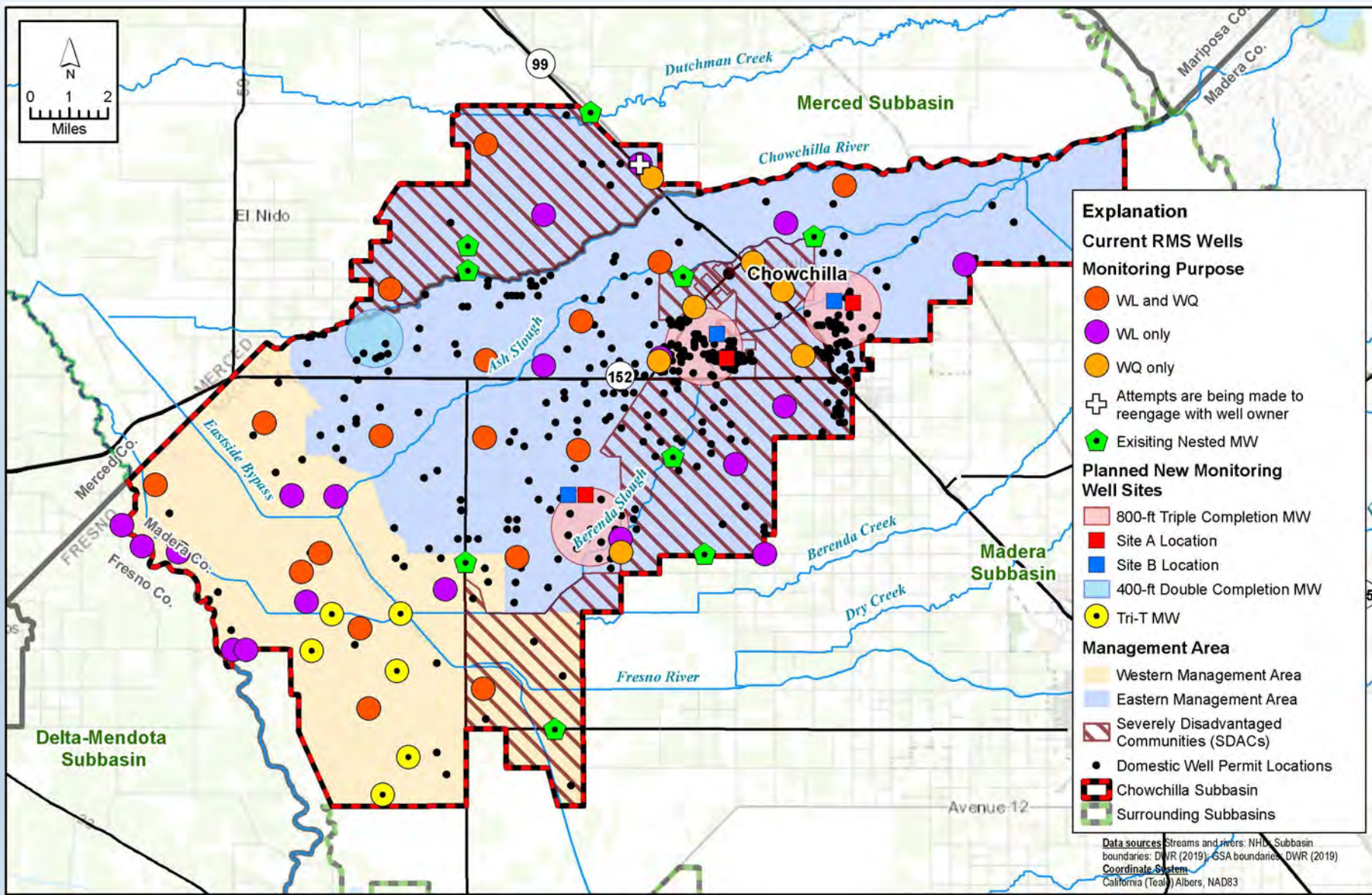
- Costs of replacing domestic wells as needed during GSP's planned implementation is ***cheaper than*** immediately implementing projects and full demand management
- Conclusion holds for both Madera and Chowchilla subbasins
- Conclusion would still hold within a reasonable range of well replacement costs

Monitoring Well Construction and Instrumentation

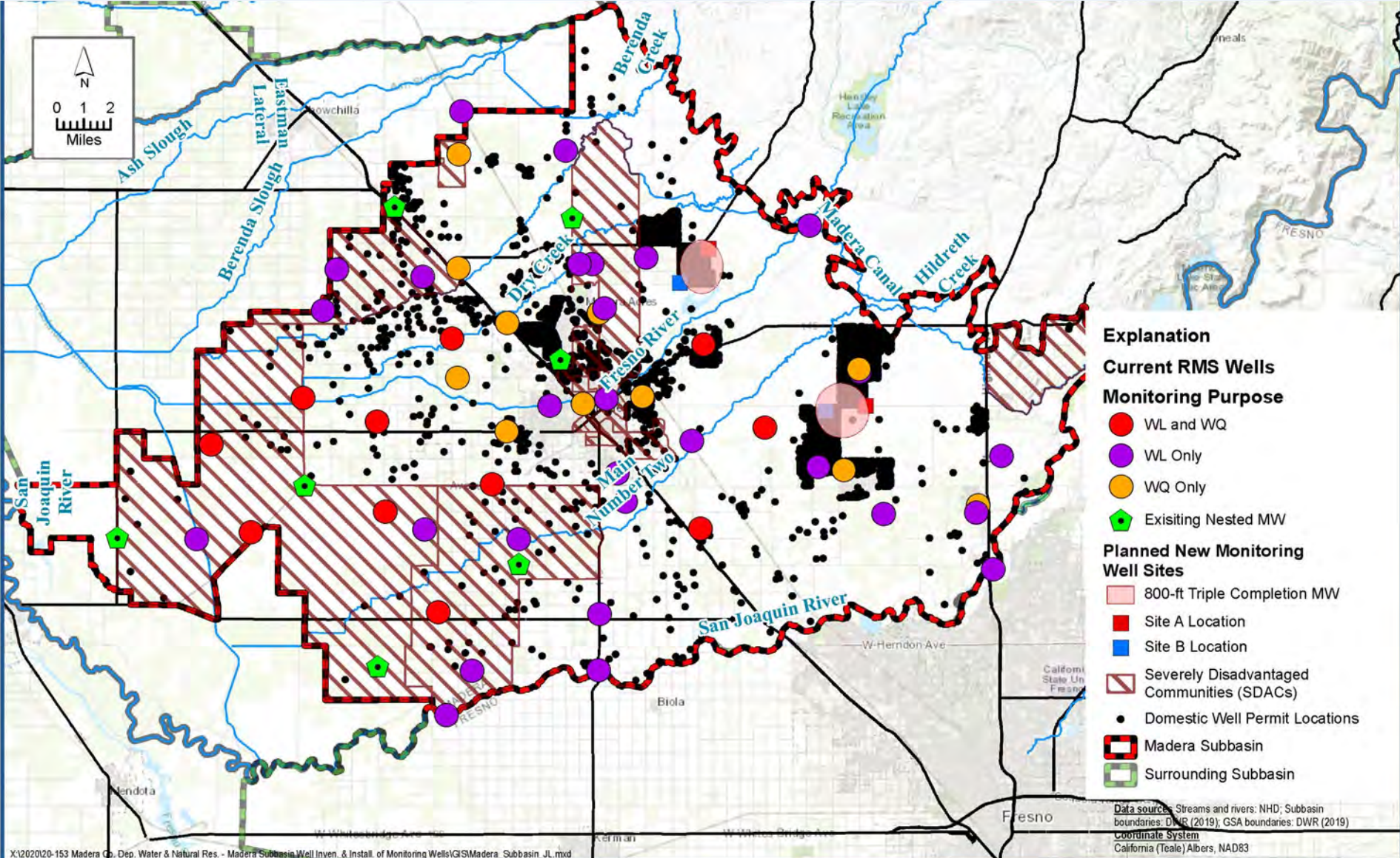
- Test hole drilling to 800 feet at three locations in Chowchilla Subbasin and two locations in Madera Subbasin
- Lithologic and geophysical logging of each test hole
- Construction of up to three wells at each location screened in different depth zones
- Measurement of groundwater levels and collection of groundwater quality samples from each well
- Install instrumentation for long-term water level monitoring; surveying



Monitoring Well Construction and Instrumentation – Chowchilla Subbasin



Monitoring Well Construction and Instrumentation – Madera Subbasin



Next Steps for Domestic Well Inventory

- Finalize Domestic Well Inventory Reports (in progress)
- Confirm proposed nested monitoring well locations (in progress)
- Drill/install new nested monitoring wells (Summer/Fall 2022)
- Install transducers and collect GW quality samples (Fall 2022)
- Prepare Well Installation Reports (Fall 2022)

Discussion