PLEASE NOTE REVISED LINK TO ACCESS MEETING

Fillmore and Piru Basins
Groundwater Sustainability Agency

SPECIAL Board of Directors Meeting
Wednesday
November 4, 2020
5:00p.m.

In accordance with the California Governor's Executive Stay at Home Order and the County of Ventura Health Officer Declared Local Health Emergency and Be Well at Home Order resulting from the novel coronavirus (COVID-19), the Fillmore City Hall is closed to the public. Therefore, the FPB GSA will be holding its Regular Board of Directors meeting virtually using the ZOOM video conferencing application.

If you are new to ZOOM video conferencing, please visit this help page in advance of the meeting date and time:
https://support.zoom.us/hc/en-us/articles/201362193-How-Do-I-Join-A-Meeting-

To participate in the Board of Directors meeting via Zoom, please access: REVISED LINK!!!
https://us02web.zoom.us/j/82299029624?pwd=R3NDR1lZcUFoQVdWNTZLVFpuRUdPdz09

Meeting ID: 822 9902 9624 Password: 948981

To hear just the audio portion of the meeting, phone into the toll-free number 877 853 5247
Meeting ID: **822 9902 9624**

All participants are asked to join the meeting at least five minutes in advance of the 5pm start time and be aware that all participants will be "muted" until recognized by the host. If your computer has a camera, please enable it so we can ensure better engagement between participants.

If you would like to address the Board with a question or offer a comment, please follow these simple instructions to engage the host (Clerk of the Board):

1. During a meeting, click on the icon labeled "Participants" at the bottom center of your computer screen.
2. At the bottom of the window on the right side of the screen, click the button labeled "Raise Hand."
3. Once you've been recognized by the Chair, please click on "Raise Hand" again to remove the signal.

Similarly, if you have a comment or question for the Board, you can use the "Chat" button to convey your question or comment to the HOST, who will put you in line to address the Board.

The Fillmore and Piru Basins GSA Board of Directors appreciates your participation and patience in using Zoom to conduct its public meeting.

AGENDA

1. Call to Order – First Open Session

   1A Pledge of Allegiance

   1B Directors Roll Call

1C Public Comments

Fillmore and Piru Basins Groundwater Sustainability Agency (Agency) will accept public comment concerning agenda items at the time the item is considered and on any non-agenda item within the jurisdiction of the Board during the agendized Public Comment period. No action will be taken by the Board on any non-agenda item. In accordance with Government Code § 54954.3(b)(1), public comment will be limited to three (3) minutes per speaker per issue.

2. MOTION ITEMS

2.A Sustainable Management Criteria

Motion

The Board will receive a presentation from representatives of Daniel B. Stephens & Associates on the Agency's "Straw Man" Draft Sustainable Groundwater Management Criteria (SMC) and will provide comments and recommendations regarding developing the Agency's Draft SMC for further analysis during the groundwater sustainability planning process.

ADJOURNMENT

The Board will adjourn to the next **Regular Board Meeting** on Thursday**, November 19, 2020** or call of the Chair

Materials, which are non-exempt public records and are provided to the Board of Directors to be used in consideration of the above agenda items, including any documents provided subsequent to the publishing of this agenda, are available for inspection at UWCD's offices at 1701 N. Lombard Street in Oxnard during normal business hours.

The Americans with Disabilities Act provides that no qualified individual with a disability shall be excluded from participation in, or denied the benefits of, the District's services, programs or activities because of any disability. If you need special assistance to participate in this meeting, or if you require agenda materials in an alternative format, please contact the UWCD Office at (805) 525-4431 or the City of Fillmore at (805) 524-1500. Notification of at least 48 hours prior to the meeting will enable the District to make appropriate arrangements.

Approved: Kelly Long

Board Chair Kelly Long

Posted: (date) November 2, 2020 **(time)** 6:15p.m. **(attest)** ***Eva Ibarra***
At: https://www.FPBGSA.org

Posted: (date) November 2, 2020 **(time)** 6:20p.m. **(attest)** ***Eva Ibarra***
At: https://www.facebook.com/FPBGSA/

Posted: (date) November 3, 2020 **(time)** **(attest)** ***Julie Latshaw***
At: Fillmore City Hall, 250 Central Avenue, Fillmore CA 93015

Posted: (date) November 2, 2020 **(time)** 6:25p.m. **(attest)** ***Eva Ibarra***
At: UWCD, 1701 N. Lombard Street, Oxnard CA 93030

Fillmore and Piru Basins Groundwater Sustainability Agency

Item No. **4.A Motion Item**

DATE: **October 26, 2020 (for November 4, 2020 meeting)**

TO: **Board of Directors**

FROM: **Anthony Emmert, Executive Director**

SUBJECT: **Sustainable Management Criteria**

SUMMARY:

The Agency formed a Sustainable Management Criteria Ad Hoc Committee to develop a "Straw Man" set of Sustainability Goals and Undesirable Results, to provide a starting point for discussions with stakeholders. After significant effort, the Ad Hoc Committee recommended that the Sustainability Goals and Undesirable Results would be better developed by the whole Board and requested that the Daniel B. Stephens & Associates team develop the "Straw Man" proposal. The Board agreed and scheduled a single-purpose special Board meeting to discuss and receive comments on the initial Sustainability Goals and Undesirable Results. The Agency also posted several technical documents on its website that can be referenced by stakeholders to inform their comments regarding Sustainable Management Criteria. Representatives from Daniel B. Stephens & Associates will provide the Board with a presentation on the Agency's "Straw Man" Draft Sustainable Groundwater Management Criteria and currently available technical documents that can inform stakeholders' comments regarding the Sustainable Management Criteria development and groundwater sustainability planning process.

RECCOMENDATION:

The Board will receive a presentation from representatives of Daniel B. Stephens & Associates on the Agency's "Straw Man" Draft Sustainable Groundwater Management Criteria (SMC) and will provide comments and recommendations regarding developing the Agency's Draft SMC for further analysis during the groundwater sustainability planning process.

BACKGROUND

The Agency Sustainable Management Criteria Ad Hoc Committee, assisted by staff from Daniel B. Stephens and Associates, worked diligently for several weeks toward development of a draft set of Sustainable Management Criteria (SMC), or "Straw Man" SMC, to present to the Board and stakeholders for consideration. The effort focused primarily on the development of draft Sustainability Goals and Undesirable Results. Progress was slow and the Ad Hoc Committee recommended that the effort would be more effective if the whole Agency Board worked through the SMC development. On October 13, 2020, the Agency received a letter from the Fillmore Basin Pumpers Association and the Piru Basin Pumpers Association (copy attached) recommending a more public SMC development process, confirming the recommendation of the Committee.

On October 1, 2020, the Agency held a workshop to provide information on the SMC development process and to receive comments and questions from stakeholders regarding Sustainability Goals and Undesirable Results. At its October 15, 2020 meeting, the Board agreed that the SMC development process needs to be a focus of the whole board and stakeholders and scheduled a special board meeting to further the process, and scheduled a special meeting for November 4, 2020.

To provide background information on the basin conditions on which stakeholders can provide their comments, the Agency has posted several technical documents on its website, under the "Resources" drop-down menu, under "Technical Data." Reports include those regarding groundwater conditions, groundwater management, water quality, historical ecology, and riparian vegetation mapping. Agency staff and consultants are also working to complete and post various technical memoranda that stakeholders may also wish to reference when forming their comments on the Sustainability Goals and Undesirable Results.

For the Agency to maintain its groundwater sustainability planning schedule and produce Sustainable Groundwater Management Act (SGMA) compliant groundwater sustainability plans by December 2021, the Agency must finalize its draft SMCs in the very near future. Agency consultants and staff will use these draft SMC's to conduct forward-looking modeling, as required by SGMA. If the Agency develops its draft SMC's soon, there may be time amend the SMCs following the first round of forward-looking modeling. Staff recommends the Agency set a special board meeting to complete the draft SMCs.

FISCAL IMPACT

None.

ATTACHMENTS

Letter dated October 13, 2020 from the Fillmore Basin Pumpers Association and Piru Basin Pumpers Association regarding the Agency's SMC development process

Proposed Motion:

1st: Director_____ 2nd: Director _____

Voice/Roll call vote: Director Holmgren: Director Kimball: Director Long: Director McFadden Director Meneghin:

Fillmore & Piru Basin Pumpers Association
PO Box 987, Fillmore CA 93016

October 13, 2020

Board of Directors, Staff, and Consultants
Fillmore and Piru Basins Groundwater Sustainability Agency
C/o Tony Emmert, Executive Director
United Water Conservation District
1701 N. Lombard St. Suite 200
Oxnard CA, 93030

Transmitted via email attachment to tonye@unitedwater.org

Re: Sustainable Management Criteria Development Input

Dear Directors and Staff:

As you know the Fillmore and Piru Pumpers Associations were formed to engage on behalf of agricultural landowners with the GSA concerning development of the Fillmore and Piru Groundwater Sustainability Plans (GSPs). The Pumper Associations desire to work cooperatively and collaboratively with the GSAs on planning issues that will impact sustainable management of the groundwater basin and our businesses. To this end, we are sending this letter to offer input that we believe will further our ability to effectively engage with the GSA in the GSP development process.

This letter focusses on Sustainable Management Criteria (SMC) development. SMC are the GSP element where the "rubber meets the road." The SMC will ultimately control how much groundwater we as landowners can pump, how much we will pay to pump going forward, and what the impacts to our property values will be. Therefore, we cannot underemphasize the importance of ensuring that SMC development proceeds with the most deliberate, thoughtful, and transparent process possible. It is critical that meaningful stakeholder input be obtained and seriously considered to design the most equitable SMC and most cost-effective overall basin management approach possible.

The Pumpers Associations would like the highlight the following areas for your consideration:

1. <u>SMC Development Process</u>: The process for developing SMC is not clear to us as stakeholders. We recommend the GSA create and approve a clear and deliberate process for SMC development that incorporates Project and Management Actions (PMA) development. The preferred process would identify multiple entry points for stakeholder input and an iterative approach to arriving at achievable and acceptable SMC and PMA. An example process taken from another GSA is attached for your reference.

2. Stakeholder Input and Transparency: Thus far, the majority of SMC deliberations have taken place in an Ad Hoc Committee setting, which is not open to the public. To our knowledge, at least six Ad Hoc Committee meetings have been held. While we understand the utility of having a small group tee-up some ideas for broader consideration, we are becoming concerned that the process may have already gone too far without stakeholder visibility and opportunities for input. It feels contrary to the intent of SGMA, which is expressly a stakeholder inclusive process. Developing and adopting a formal process, as mentioned in the prior bullet, would help in this regard. We also desire to understand the following:
    a. How can stakeholders obtain the information that the Ad Hoc Committee is reviewing to aid us in developing stakeholder recommendations concurrently with the Ad Hoc Committee process?
    b. What will be the opportunities for stakeholder input on SMCs?
    c. What methods will be used to seek stakeholders to input? When?
    d. Is consideration being given to appointing an advisory committee to provide input on SMC?

3. Foundational Information for SMC Development Is Needed: SMCs are intended to be policy decisions based on a solid technical foundation. Specifically, SGMA requires that the SMC be "supported by information provided in the basin setting, and other data or models as appropriate, and qualified by uncertainty in the understanding of the basin setting." We applaud the GSAs efforts to make raw data available, but we are concerned that the basin setting section of the GSP, which is intended to synthesize the raw data into an understandable form, is not available to the Board and stakeholders to provide a foundational understanding for SMC development. The basin setting section will include information about historical conditions relative to each of the applicable sustainability indicator, which we feel is vital pre-requisite information for SMC development. We note that technical memoranda are planned for GDEs and subsidence, but these memoranda appear to be scheduled for release around the same time the SMC technical memorandum will be completed. How can informed SMC decisions be made in the absence of the basin setting GSP section and the forthcoming GDE and subsidence memoranda?

SGMA is clear that its chief goal is to avoid undesirable results (significant and unreasonable effects for applicable sustainability indicators). Therefore, we believe defining the significant and unreasonable effects that are to be avoided is the most important step in the GSP development process. We offer the following specific questions that are designed to identify information that we believe is needed to help everyone in the process collaborate effectively on determining the significant and unreasonable effects that should be avoided in the basins for each sustainability indicator. The questions are based on the GSP regulations and are intended to identify the types of foundational information we believe is a prerequisite to making informed

SMC decisions. The list is not intended to be exhaustive; other information needs may be identified as the SMC process progresses.

- Chronic Lowering of Groundwater Levels
    - What are the groundwater level trends at key representative wells for each aquifer in each basin (hydrographs)?
    - What are the groundwater levels that would impact the ability of existing domestic, municipal, agricultural wells of average depth to produce adequate water beneficial uses?
    - What is the groundwater level that would cause significant financial burdens to those who rely on the groundwater basin if sustained over an extended number of years?
    - Is there a subset of wells that are particularly susceptible to impacts that should be considered in the SMC analysis of or be considered for mitigation (i.e. a GSP project)?
    - Absent projects, approximately how many years of drought conditions would be required to reach the above-described levels?
    - What is the deepest groundwater level that could be fully recovered from following a drought?
    - Are there confirmed groundwater dependent ecosystem (GDE) vegetation communities located within the basins that rely on groundwater as their principal source of water (map)?
        - What are the historical groundwater levels trends in the GDE vegetation community areas?
        - What is the relationship between those trends and groundwater pumping and non-native sources of water?
    - Have significant impacts to the GDE vegetation communities caused by groundwater pumping been documented historically and/or are any significant impacts anticipated in the future?
        - If any, can the impacts be mitigated? If so, what is the estimated cost?

- Reduction of Groundwater Storage
    - What are the groundwater level trends at key representative wells for each aquifer in each basin (hydrographs)?
    - How deep can groundwater levels be drawn down during a drought without causing a net decline in storage following the subsequent wet period?
    - See also questions for chronic lowering of groundwater levels.

- Land Subsidence
    - What is the extent, cumulative total, and annual rate of land subsidence (maps)?

- Is there evidence (anecdotal or otherwise) of subsidence or subsidence-related impacts during the prolonged period of low groundwater levels experienced during the 1950s-60s?
- What are the sensitive receptors for subsidence? Canals or gravity water systems, if any? Sewer systems? 100-year floodplains? Other?
- What are the potential significant impacts from subsidence to the sensitive receptors?
  - Can those potential impacts be mitigated? If so, what is the estimated cost?
- What is the best available estimate of the subsidence amount that would be required to cause significant impacts to the sensitive receptors?

- <u>Depletions of Interconnected Surface Water</u>
  - Where is groundwater and surface water interconnected (maps)?
  - How do the area(s) ofw interconnection vary over time, seasonally and drought versus wet periods?
  - Does groundwater pumping deplete interconnected surface water?
    - If so, how much, where, and under what conditions? What is the variability over time – seasonal and long-term?
  - How do surface water discharges / releases affect the analysis of interconnection and depletion?
  - Do beneficial uses of surface water exist in the areas with identified interconnection?
  - Have significant impacts to those beneficial uses caused by depletion from groundwater pumping been documented historically and/or are any significant impacts anticipated in the future?
    - If any, can the impacts be mitigated? If so, what is the estimated cost?

- <u>Degraded Water Quality</u>
  - What is the current distribution of water quality for key indicator constituents in the basins (tables and maps)?
  - What are the relevant local, state, and federal water quality standards applicable to the basin for key indicator constituents (table)?
  - How do the local, state, and federal standards compare with water quality needs of the beneficial users in the basins (input from beneficial users is needed) and current/anticipated water quality?
  - Are there any historical, current, or anticipated groundwater quality issues *caused by or exacerbated by groundwater pumping* that have or

are anticipated to have a widespread effect on beneficial uses of groundwater?
  - If so, where (map)?
  - If so, what mitigation options are available and what are the costs?

- Is migration of chloride-rich surface water emanating from Los Angeles County significantly exacerbated by groundwater pumping?
  - How is chloride loading expected to change during the SGMA implementation period?

<u>Closing</u>

Please understand that the Pumpers Associations supports the GSA. We are ready and willing to participate in a collaborative manner to enhance the overall outcome. Please reach out on how we can work together on this important effort.

Sincerely,

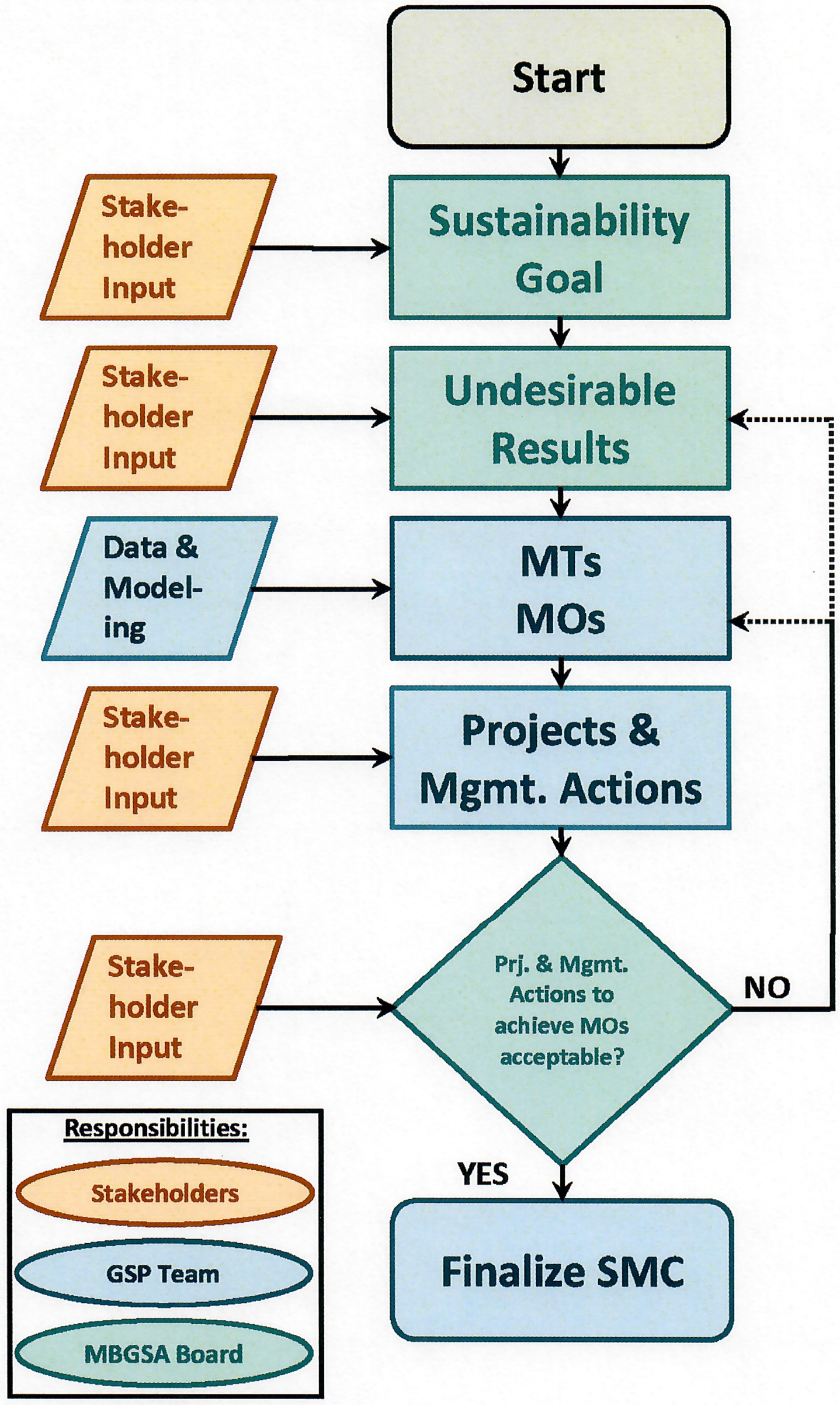
Gordon Kimball
President, Fillmore Basin Pumpers Association

Glen Pace
President, Piru Basin Pumpers Association

Attachment: Example SMC and PMA Development Process

cc: Fillmore Basin Pumpers Association Members
Piru Basinn Pumpers Association Members
Bryan Bondy, Bondy Groundwater Consulting, Inc.

Attachment
Example SMC and PMA Development Process



Fillmore and Piru Basins
Groundwater Sustainability Agency

Special Board Meeting

Nov 4, 2020

Sustainable Management Criteria

Sustainable Groundwater Management Act (SGMA)
Background

What is SGMA?

Sustainable Groundwater Management Act

SGMA is a State law that requires the management of *high and medium priority* groundwater basins to ensure their sustainability

Preliminary Draft - For Discussion Purposes Only

Six Sustainability Indicators
(aka *6 Deadly Sins of SGMA*)

- Chronic lowering of GW levels indicating S&U depletion of supply
- Depletions of interconnected SW that have S&U impacts on beneficial uses of SW
- S&U degraded water quality
- S&U land subsidence that interferes with surface land uses
- S&U seawater intrusion
- S&U reduction of GW storage

S&U = significant and unreasonable

undesirable results have these effects

Sustainable Groundwater Management Act (SGMA) Definitions

Significant and Unreasonable – defined by GSA. Basic element of "local control" inherent to SGMA.

Minumum Threshold – a numeric value for each sustainability indicator used to define undesirable results. A quantitative value that if exceeded may cause an "undesirable result" - cannot be an arbitrary number.

Measurable Objective – specific, quantifiable goals for the maintenance or improvement of specified groundwater conditions. Included in an adopted Plan to document progress towards achieving the sustainability goal for the basin.

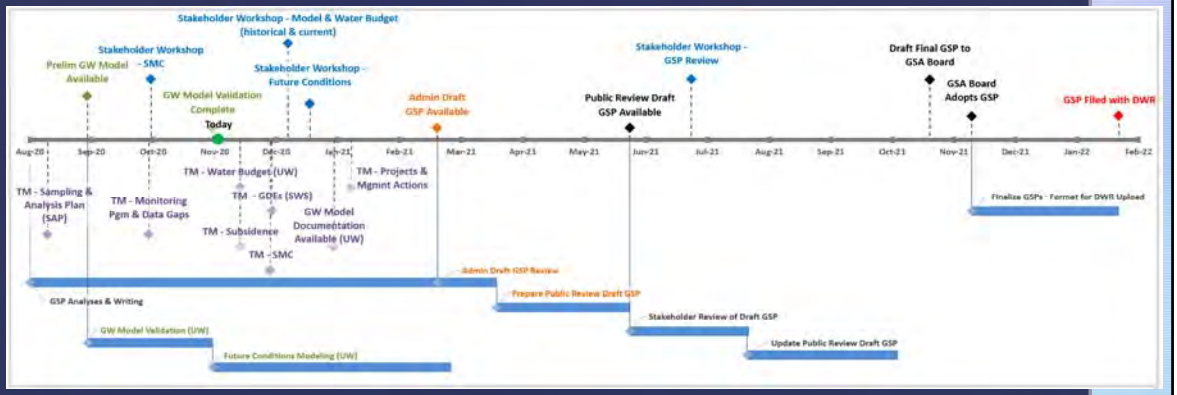
Preliminary Draft - For Discussion Purposes Only

How did we get to this point?

- SMC ad hoc committee sessions
- Presentations to Board of Directors
- Stakeholder Workshops
- Technical consultant to craft draft SMC for stakeholder and Board of Directors consideration
  - Simple "fact sheet" for each SM indicator to provide context and summarize the proposed language

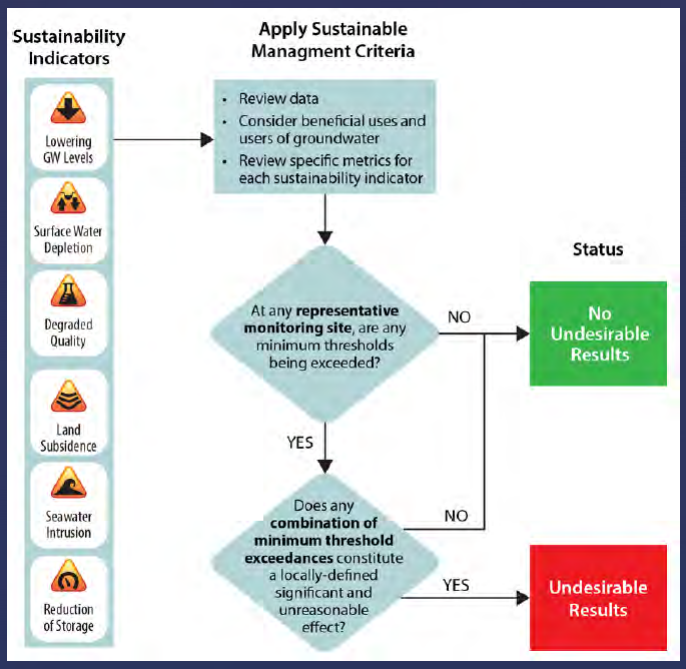
Preliminary Draft - For Discussion Purposes Only

GSP timeline



Preliminary Draft - For Discussion Purposes Only

DWR Flowchart for Application of SMC



Fillmore and Piru Basins Groundwater Sustainability Agency

Special Board Meeting

Nov 4, 2020

Potential Sustainable Management Criteria

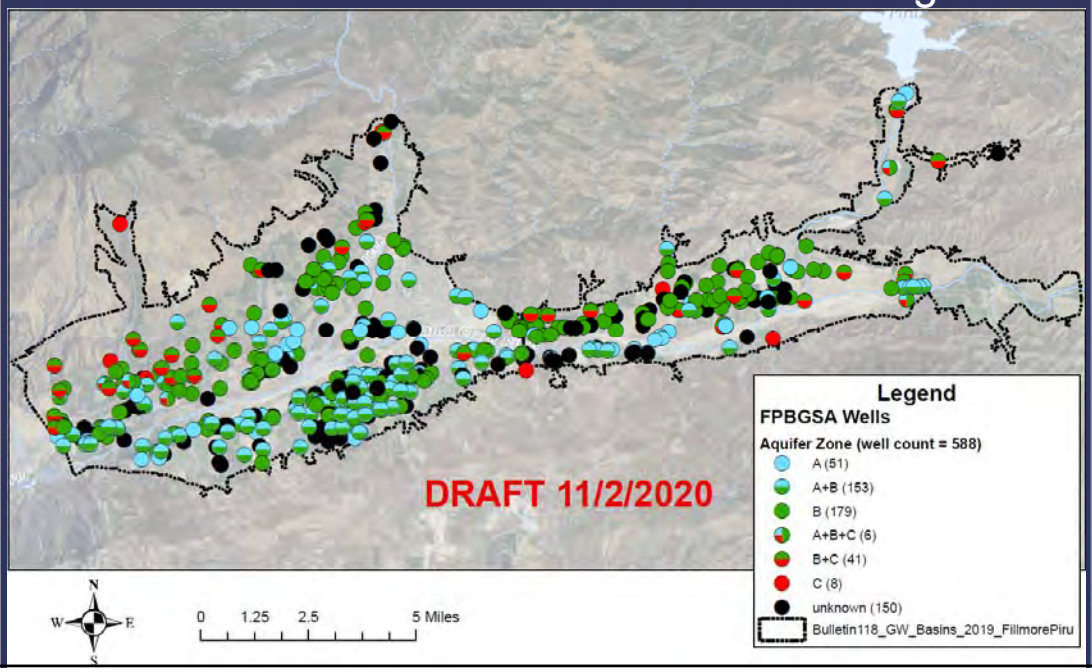
Preliminary Draft - For Discussion Purposes Only

Draft SMC Matrix

SM Indicator	Example Possible Undesirable Results	Metric / Measurement Method	MT	MO
GW Elevation	*Option A* - Static GW levels decline below the top of the well screen	GW level measurements / Depth to water / Future simulated GW levels	Static GW levels equal to the top of the well screen	Static water levels at or near 2011 water levels
GW Elevation	*Option B* - Static GW levels decline below the bottom of the well	GW level measurements / Depth to water / Future simulated GW levels	Static GW levels at or below the bottom of the well screen	Static water levels at least 70 feet above the bottom of the well screen
GW Storage Reduction	inadequate GW storage to last through multi-year drought without GW extraction limitations	GW level measurements / Depth to water / Future simulated GW levels	Static water levels equal to the top of the well screen.	Static water levels equivalent to 2011-2016 water level decline above the top of the well screen.
SW Depletion	Surface water flows are depleted by groundwater extractions or GSA projects and management actions that impairs the beneficial use of the resource	GW level measurements / Depth to water / Future simulated GW levels	?	?
Land Subsidence	land subsidence amounts that interfere with critical infrastructure operations / >1 ft of subsidence in a single year OR 1 ft of cumulative net subsidence over 5 years	InSAR data for recent historical monitoring / Potential Subsidence Screening Tool for potential future subsidence	Water levels twenty (20) feet below the historic low water levels	Water levels at (or above) historical low levels
Degraded WQ	water quality degradation that occurs due to GSA projects or management actions that impairs the beneficial use of the resource	Groundwater and surface water sampling and laboratory analyses	Option A - Water quality values included in existing or future regulations.	Option A - The authority to regulate water quality is afforded to State and Federal agencies other than the FPBGSA. FPBGSA is not a water purveyor and does not have the authority for water quality compliance but will cooperate with appropriately empowered entities.
Degraded WQ	water quality degradation that occurs due to GSA projects or management actions that impairs the beneficial use of the resource	Groundwater and surface water sampling and laboratory analyses	Option B - Maximum Contaminant Level (MCL), Health Goal, or other value specific to beneficial use (e.g., agriculture, vegetation, industrial), as appropriate.	Option B - FPBGSA is not a groundwater producer, and as such, does not function as a potable or irrigation water purveyor. FPBGSA does not have the authority for water quality compliance but will cooperate with appropriately empowered entities.
Seawater Intrusion	Not Applicable	Not Applicable	Not Applicable	Not Applicable

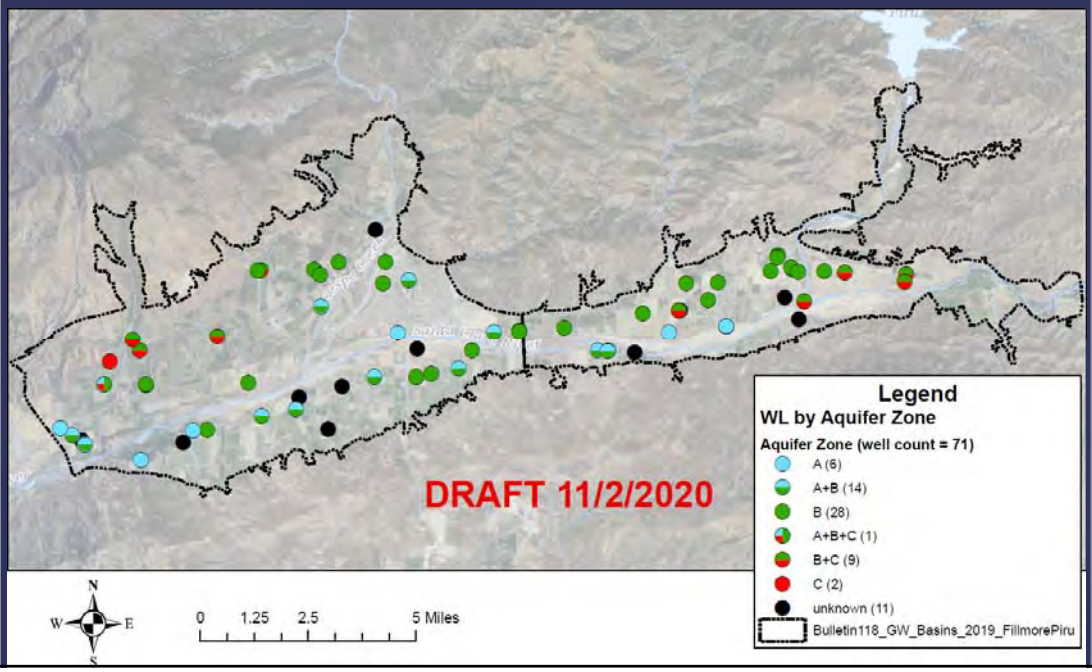
Preliminary Draft - For Discussion Purposes Only

Active/Monitoring Wells



Preliminary Draft - For Discussion Purposes Only

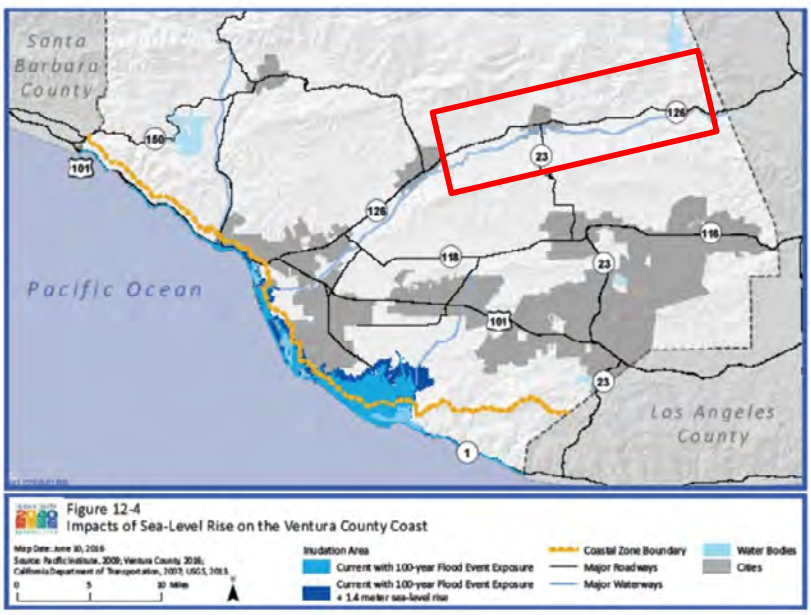
Possible Water Level Indicator Wells



Preliminary Draft - For Discussion Purposes Only

Sea-Water Intrusion

- Too far inland (~15 mi from coastline)
- Several hundred feet above sea level (~300 ft western end of Fillmore basin, ~480 ft western end of Piru basin)
- Not a realistic issue for these basins



Preliminary Draft - For Discussion Purposes Only

Water Quality Degradation

- ✓ **DWR has not prepared BMP or Guidance Document**
- ✓ **Regulations focused on contaminated sites - do not address naturally occurring compounds (e.g., TDS, arsenic)**
- ✓ **GSAs generally do not have authority over water quality (RWQCB, DTSC, EPA) or some of the aspects that can impact water quality (e.g., land use)**
  - **Not responsible for enforcing water quality standards or collecting data to support existing water quality programs**
- ✓ **GSA not required to "fix" issues existing prior to 01 Jan 2015 (when SGMA became effective)**
  - **...but GSP should not make conditions worse**

Preliminary Draft - For Discussion Purposes Only

Water Quality Degradation

- ✓ **GSAs have broad powers "*...perform any act necessary or proper to carry out the purposes of SGMA...*"**

Gray Zone:

- **Are GSAs responsible to address WQ problems that were present prior to 01Jan15 and have gotten worse?**
- **Are GSAs responsible for WQ problems not being addressed by other regulatory agencies?**

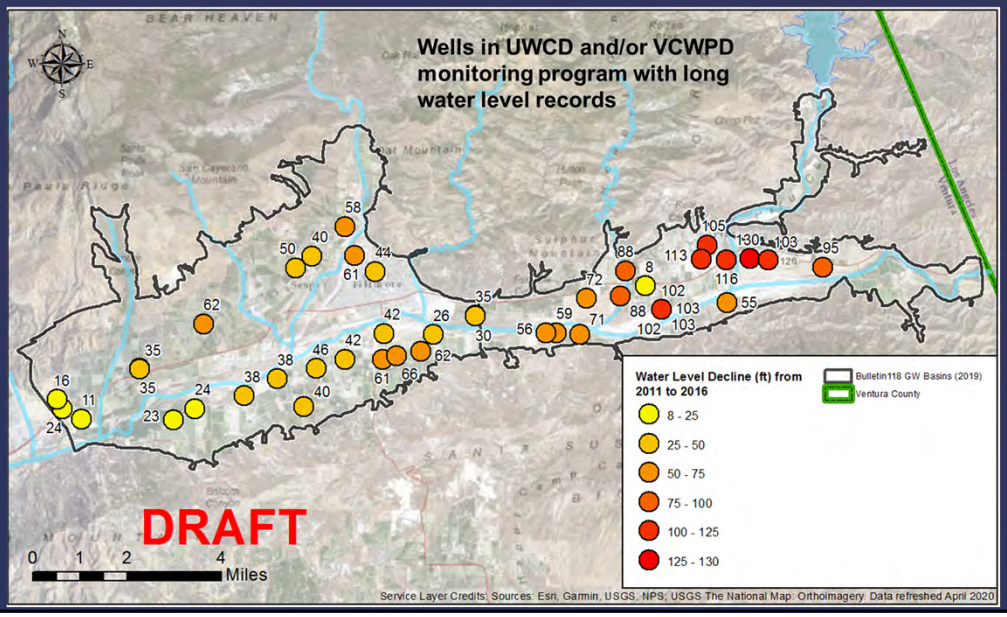
Preliminary Draft - For Discussion Purposes Only

Water Quality Degradation - draft SMC language

SM Indicator	Example Possible Undesirable Results	Metric / Measurement Method	MT	MO
Degraded WQ	water quality degradation that occurs due to GSA projects or management actions that impairs the beneficial use of the resource	Groundwater and surface water sampling and laboratory analyses	Option A - Water quality values included in existing or future regulations.	Option A - The authority to regulate water quality is afforded to State and Federal agencies other than the FPBGSA. FPBGSA is not a water purveyor and does not have the authority for water quality compliance but will cooperate with appropriately empowered entities.
Degraded WQ	water quality degradation that occurs due to GSA projects or management actions that impairs the beneficial use of the resource	Groundwater and surface water sampling and laboratory analyses	Option B - Maximum Contaminant Level (MCL), Health Goal, or other value specific to beneficial use (e.g., agriculture, vegetation, industrial), as appropriate.	Option B - FPBGSA is not a groundwater producer, and as such, does not function as a potable or irrigation water purveyor. FPBGSA does not have the authority for water quality compliance but will cooperate with appropriately empowered entities.

Preliminary Draft - For Discussion Purposes Only

Groundwater Levels



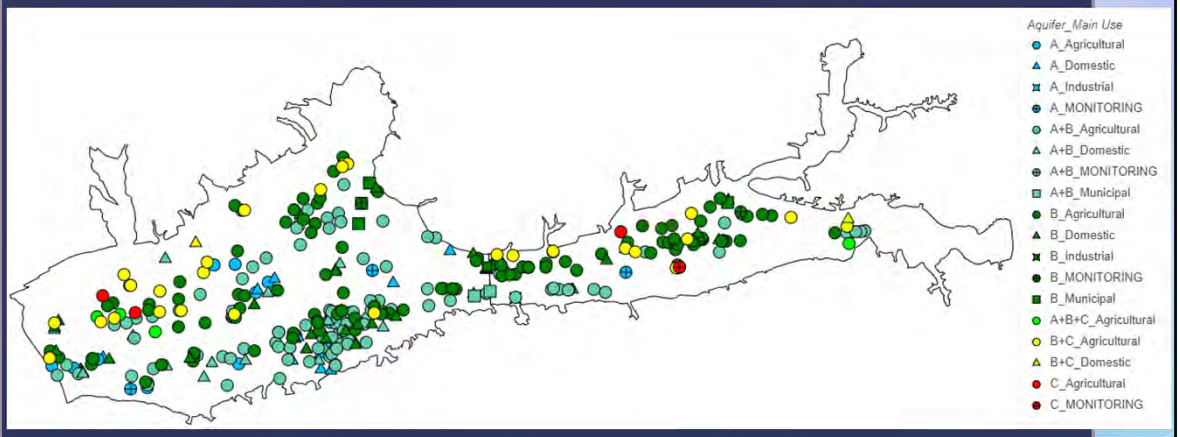
Preliminary Draft - For Discussion Purposes Only

Groundwater Levels - draft SMC language

SM Indicator	Example Possible Undesirable Results	Metric / Measurement Method	MT	MO
GW Elevation	*Option A* - Static GW levels decline below the top of the well screen	GW level measurements / Depth to water / Future simulated GW levels	Static GW levels equal to the top of the well screen	Static water levels at or near 2011 water levels
GW Elevation	*Option B* - Static GW levels decline below the bottom of the well	GW level measurements / Depth to water / Future simulated GW levels	Static GW levels at or below the bottom of the well screen	Static water levels at least 70 feet above the bottom of the well screen

Preliminary Draft - For Discussion Purposes Only

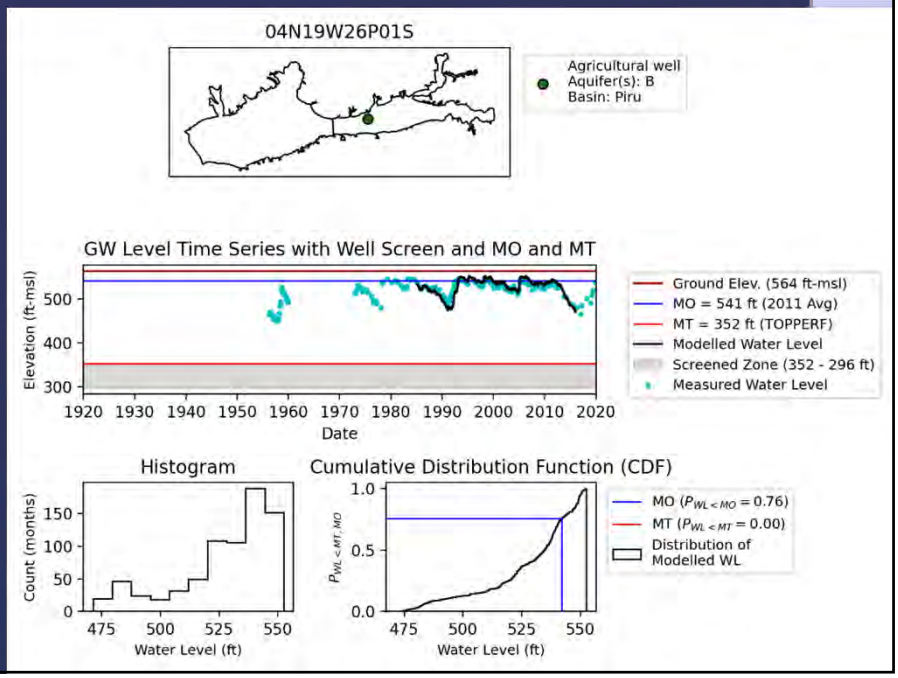
Active/Monitoring Wells (with Screen Info) in GW Model



Preliminary Draft - For Discussion Purposes Only

Groundwater Levels – Historical Water Levels

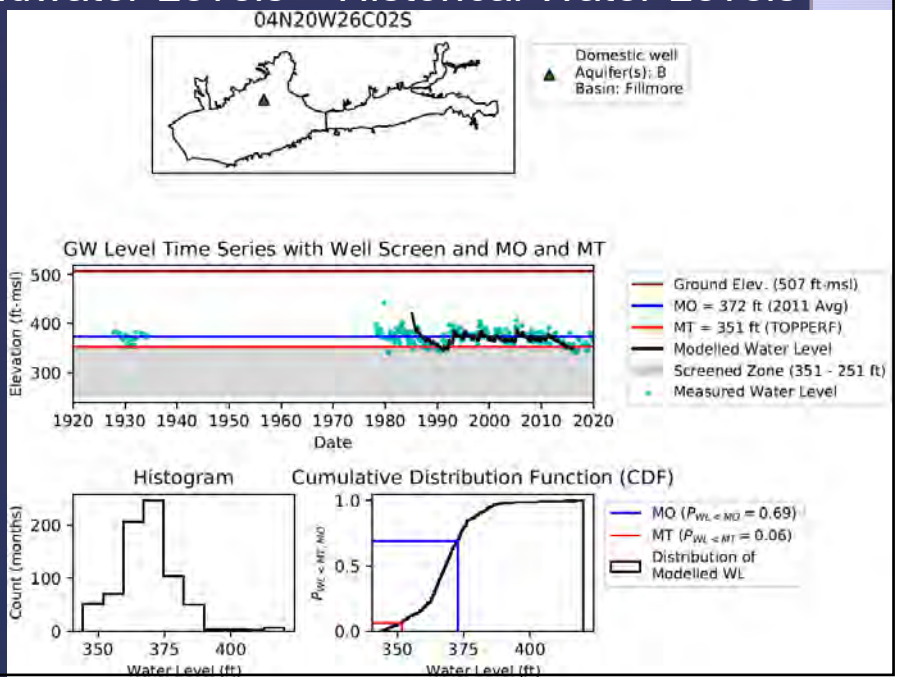
- WLs always above well screen



Preliminary Draft - For Discussion Purposes Only

Groundwater Levels – Historical Water Levels

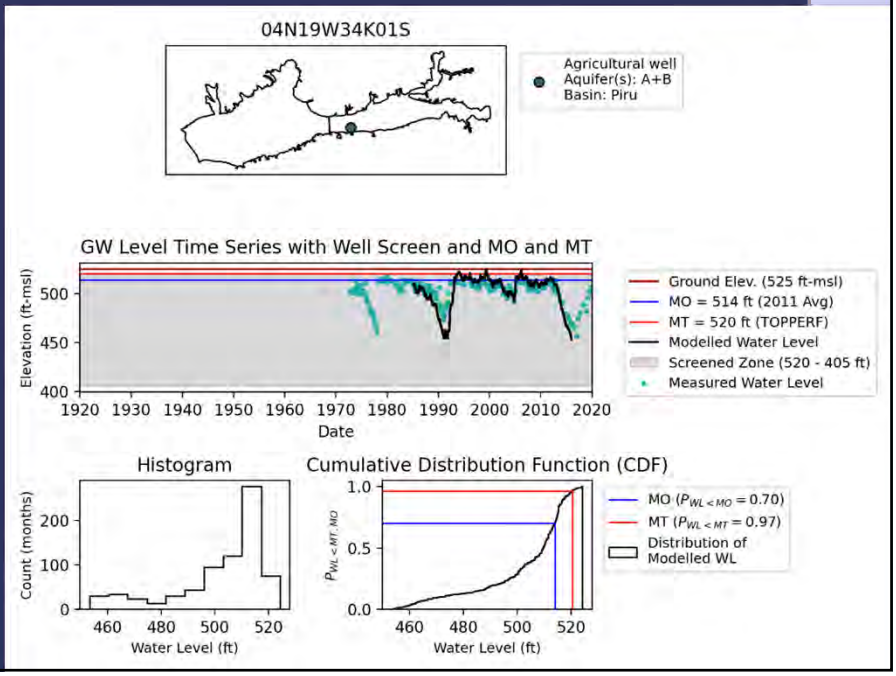
- WLs usually above well screen



Preliminary Draft - For Discussion Purposes Only

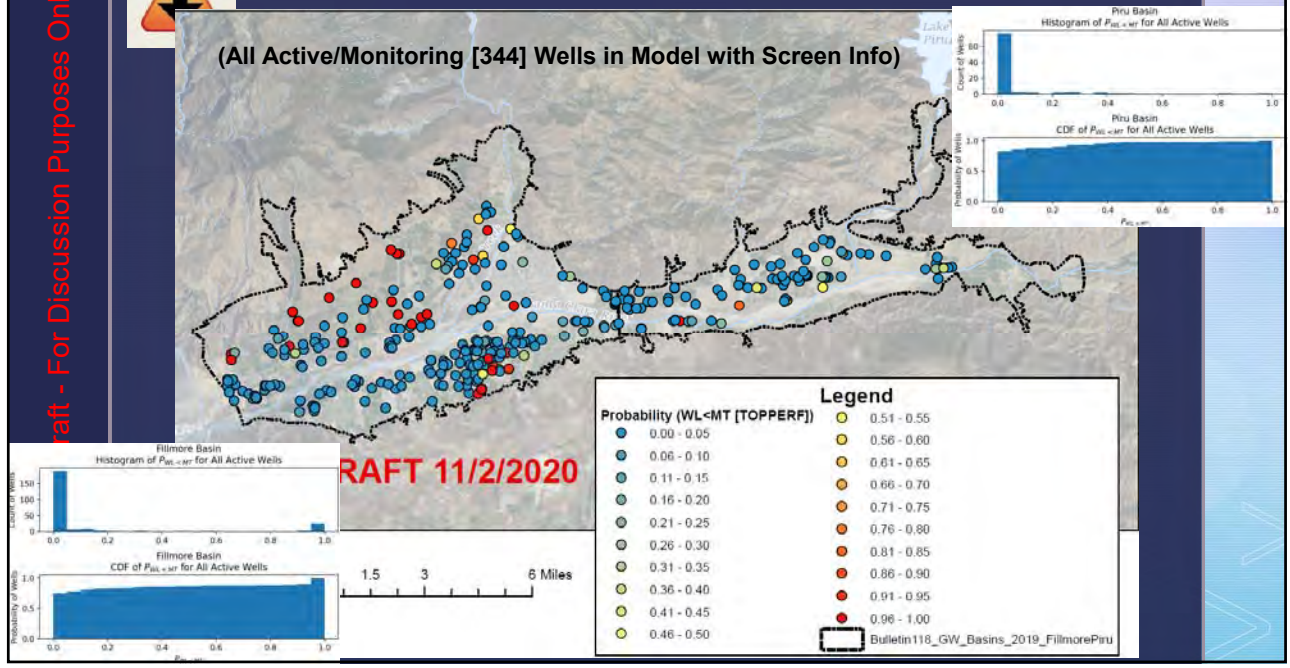
Groundwater Levels – Historical Water Levels

- WLs always below well screen



Preliminary Draft - For Discussion Purposes Only

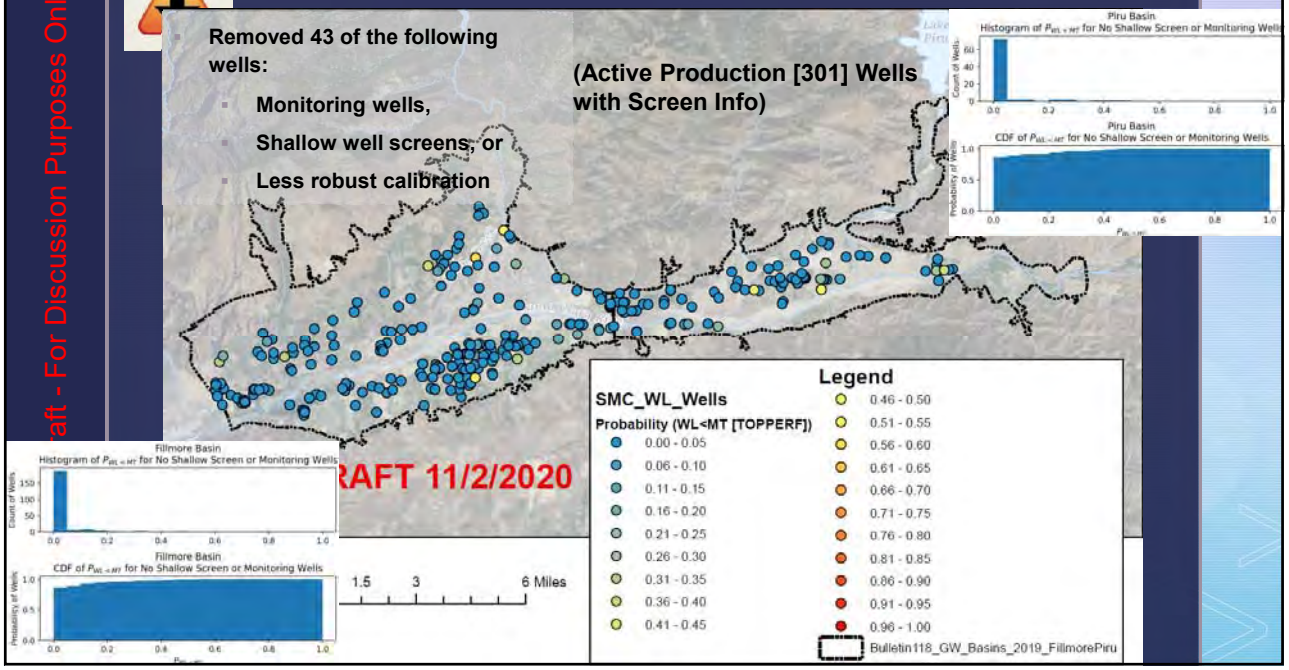
Groundwater Levels – Probability Water Level < MT



Groundwater Levels – Probability Water Level < MT

- Removed 43 of the following wells:
  - Monitoring wells,
  - Shallow well screens, or
  - Less robust calibration

(Active Production [301] Wells with Screen Info)



Preliminary Draft - For Discussion Purposes Only

Groundwater Storage

- adequate groundwater reserves to last through a typical drought
- in 2011-2016 drought, Fillmore extracted ~46,829 acft/year (not much more than the long-term average of ~46,150 acft/year)
- in 2011-2016 drought, Piru extracted ~12,066 acft/year (not much more than the long-term average of ~11,079 acft/year)
- "adequate groundwater reserves" defined (for the GSP) that correspond to the water level decline experienced in 2011-2016 drought

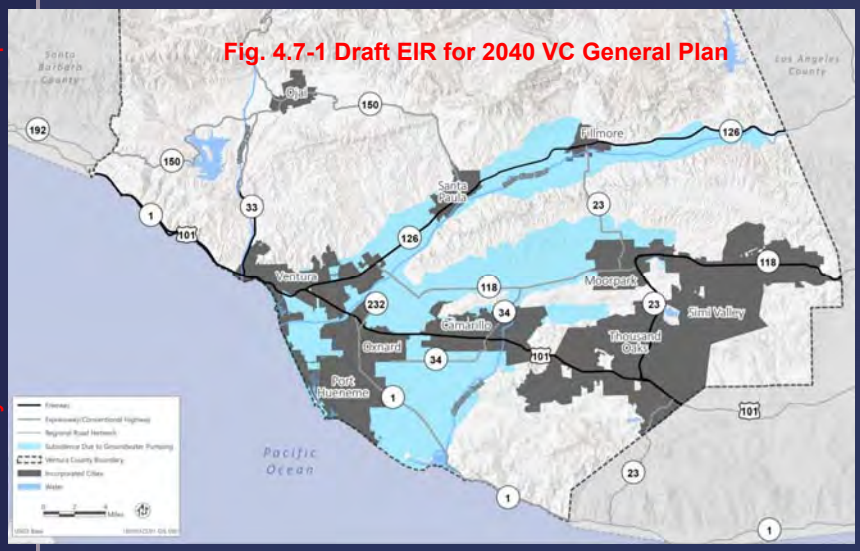
Preliminary Draft - For Discussion Purposes Only

Groundwater Storage - draft SMC language

SM Indicator	Example Possible Undesirable Results	Metric / Measurement Method	MT	MO
GW Storage Reduction	inadequate GW storage to last through multi-year drought without GW extraction limitations	GW level measurements / Depth to water / Future simulated GW levels	Static water levels equal to the top of the well screen.	Static water levels equivalent to 2011-2016 water level decline above the top of the well screen.

Preliminary Draft - For Discussion Purposes Only

Subsidence

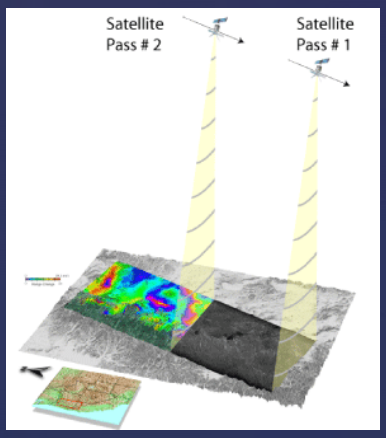


- Subsidence due to GW pumping in both Fillmore & Piru basins
- No data or report to substantiate

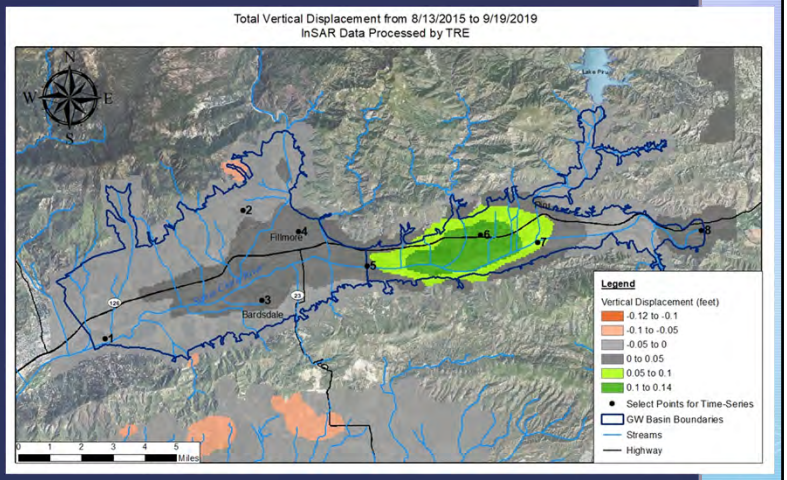
Preliminary Draft - For Discussion Purposes Only

Subsidence Metrics

recent historical estimates of subsidence



InSAR - Interferometric Synthetic Aperature Radar

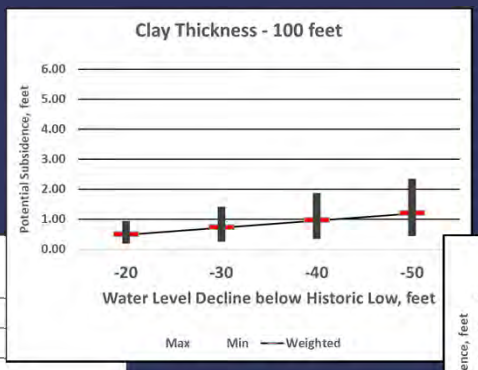


Preliminary Draft - For Discussion Purposes Only

Subsidence Metrics

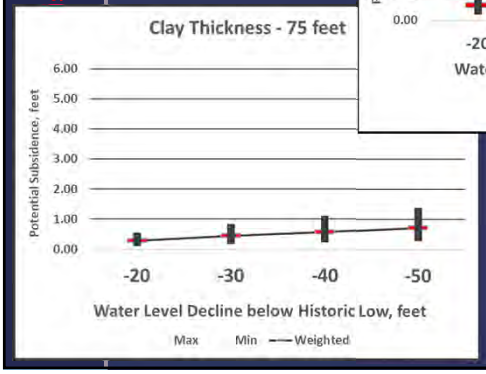
future estimates of subsidence

Influence of Clay Thickness & Water Level on Potential Subsidence

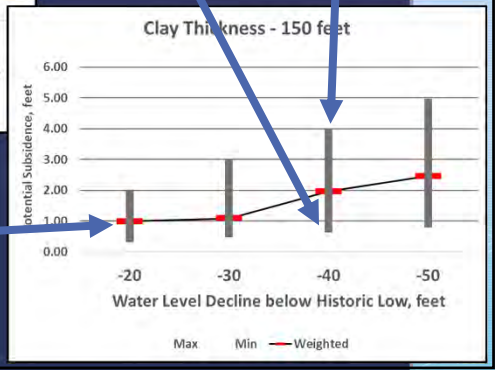


Max estimated subsidence

Min estimated subsidence



Weighted estimated subsidence



Preliminary Draft - For Discussion Purposes Only

Subsidence MT

- WL data from wells with long records often suggest that water levels in 1940 - 1970 were lower than 2016 drought low
- Data from 1940 - 1970 sparse, but useful
- **Subsidence MT**
  - 2016 low WL
  - minus 20 ft to estimate historical WLs
  - minus 20 ft to approximate a maximum of 1 ft of allowable subsidence
  - So, MT = 2016 low WL - 40 ft

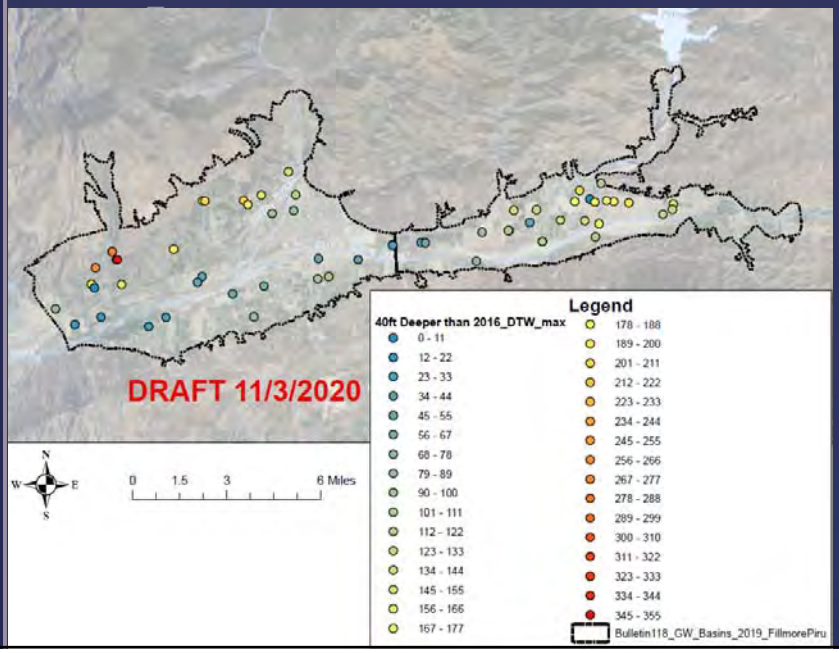
Preliminary Draft - For Discussion Purposes Only

Subsidence - draft SMC language

SM Indicator	Example Possible Undesirable Results	Metric / Measurement Method	MT	MO
Land Subsidence	land subsidence amounts that interfere with critical infrastructure operations / >1 ft of subsidence in a single year OR 1 ft of cumulative net subsidence over 5 years	InSAR data for recent historical monitoring / Potential Subsidence Screening Tool for potential future subsidence	Water levels twenty (20) feet below the historic low water levels	Water levels at (or above) historical low levels

Preliminary Draft - For Discussion Purposes Only

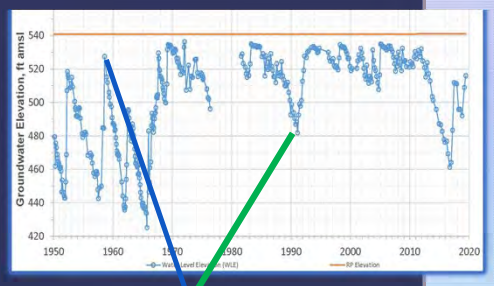
Proposed Subsidence MT

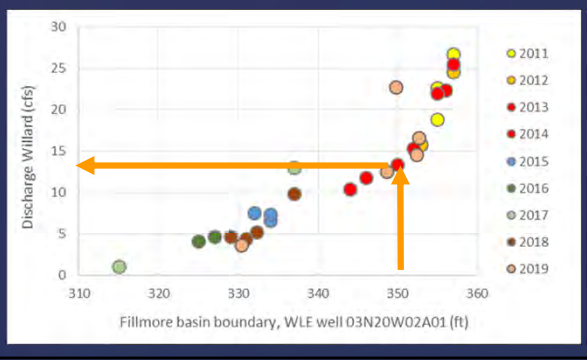


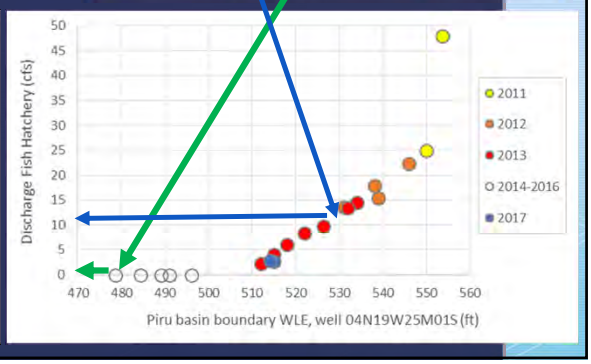
Preliminary Draft - For Discussion Purposes Only

Depletion of Interconnected Surface Waters

Use SW flow rate v. WLE relationship to predict historic SW flows & future flows







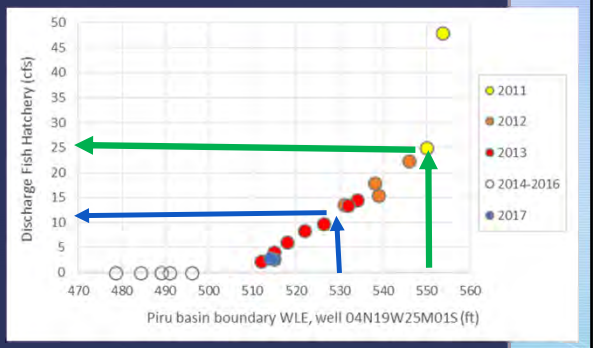
Preliminary Draft - For Discussion Purposes Only

Depletion of Interconnected Surface Waters

Use SW flow rate v. WLE relationship with GW pumping = 0 to estimate impact of pumping on SW flow

If WLE =530 ft with pumping, but 550 ft w/o pumping

550 ft = 25 cfs
530 ft = 12 cfs
Estimated pumping impact is 13 cfs



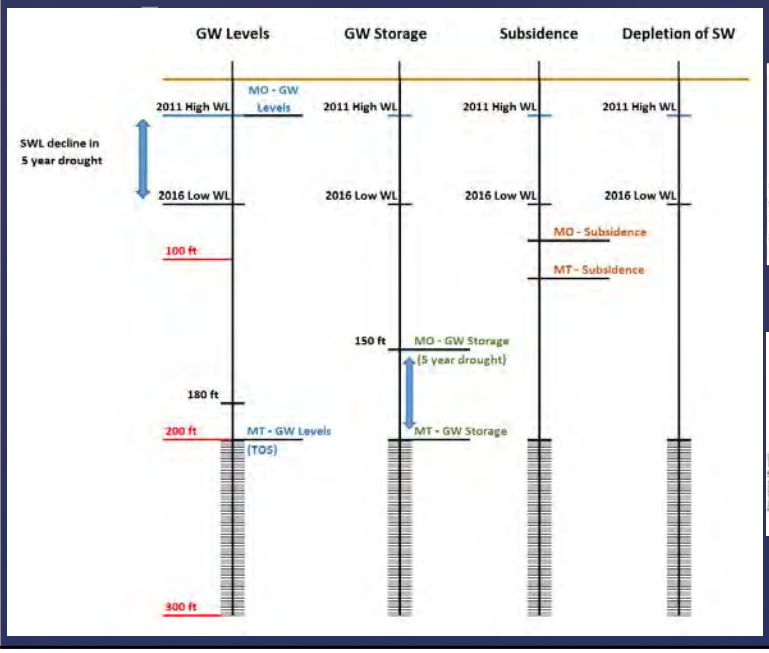
Preliminary Draft - For Discussion Purposes Only

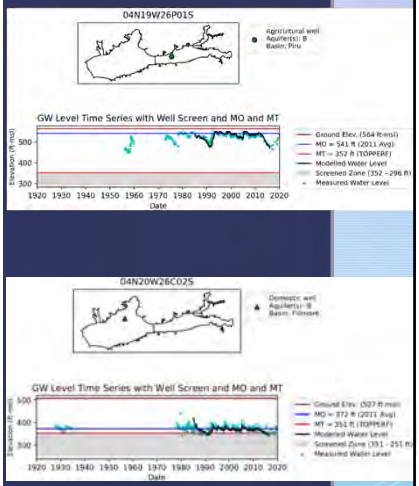
Depletion of Interconnected Surface Waters - draft SMC language

SM Indicator	Example Possible Undesirable Results	Metric / Measurement Method	MT	MO
SW Depletion	Surface water flows are depleted by groundwater extractions or GSA projects and management actions that impairs the beneficial use of the resource	GW level measurements / Depth to water / Future simulated GW levels	?	?

Preliminary Draft - For Discussion Purposes Only

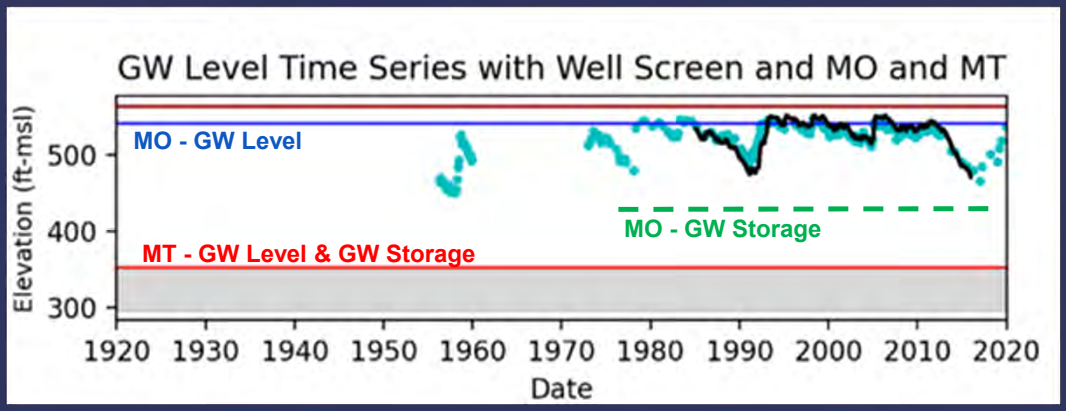
MT - MO Summary





Preliminary Draft - For Discussion Purposes Only

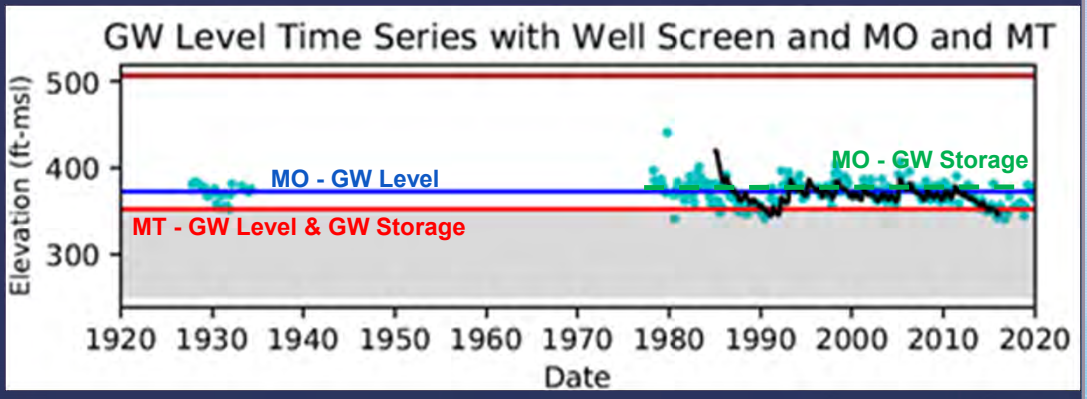
MT - MO Summary



Preliminary Draft - For Discussion Purposes Only

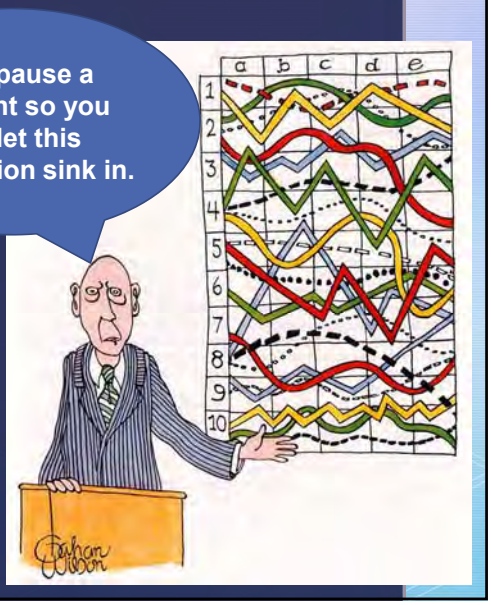
MT - MO Summary

for this specific well, MO for GW level ≃ MO for GW Storage



Fillmore and Piru Basins Groundwater Sustainability Agency

Special Board Meeting
Nov 4, 2020



SUSTAINABLE MANAGEMENT CRITIERA MATRIX (DRAFT - FOR INTERNAL DISCUSSIONS ONLY) 04Nov20

SM Indicator	Example Possible Undesirable Results	Metric / Measurement Method	MT	MO
GW Elevation	*Option A* - Static GW levels decline below the top of the well screen	GW level measurements / Depth to water / Future simulated GW levels	Static GW levels equal to the top of the well screen	Static water levels at or near 2011 water levels
GW Elevation	*Option B* - Static GW levels decline below the bottom of the well	GW level measurements / Depth to water / Future simulated GW levels	Static GW levels at or below the bottom of the well screen	Static water levels at least 70 feet above the bottom of the well screen
GW Storage Reduction	inadequate GW storage to last through multi-year drought without GW extraction limitations	GW level measurements / Depth to water / Future simulated GW levels	Static water levels equal to the top of the well screen.	Static water levels equivalent to 2011-2016 water level decline above the top of the well screen.
SW Depletion	Surface water flows are depleted by groundwater extractions or GSA projects and management actions that impairs the beneficial use of the resource	GW level measurements / Depth to water / Future simulated GW levels	?	?
Land Subsidence	land subsidence amounts that interfere with critical infrastructure operations / >1 ft of subsidence in a single year OR 1 ft of cumulative net subsidence over 5 years	InSAR data for recent historical monitoring / Potential Subsidence Screening Tool for potential future subsidence	Water levels twenty (20) feet below the historic low water levels	Water levels at (or above) historical low levels
Degraded WQ	water quality degradation that occurs due to GSA projects or management actions that impairs the beneficial use of the resource	Groundwater and surface water sampling and laboratory analyses	Option A - Water quality values included in existing or future regulations.	Option A - The authority to regulate water quality is afforded to State and Federal agencies other than the FPBGSA. FPBGSA is not a water purveyor and does not have the authority for water quality compliance but will cooperate with appropriately empowered entities.
Degraded WQ	water quality degradation that occurs due to GSA projects or management actions that impairs the beneficial use of the resource	Groundwater and surface water sampling and laboratory analyses	Option B - Maximum Contaminant Level (MCL), Health Goal, or other value specific to beneficial use (e.g., agriculture, vegetation, industrial), as appropriate.	Option B - FPBGSA is not a groundwater producer, and as such, does not function as a potable or irrigation water purveyor. FPBGSA does not have the authority for water quality compliance but will cooperate with appropriately empowered entities.
Seawater Intrusion	Not Applicable	Not Applicable	Not Applicable	Not Applicable

SUSTAINABLE MANAGEMENT INDICATOR - Groundwater Levels (Fillmore and Piru basins)

BACKGROUND

DWR (2017) provides the following considerations "...when establishing minimum thresholds for groundwater levels at a given representative monitoring site may include, but are not limited to..."

What are the historical groundwater conditions in the basin?

Groundwater conditions (i.e., water levels) in these basins vary based on water year type, the amount of reservoir releases or imports of State Water Project water, and groundwater extractions (see key well hydrographs attached at the end of this document).

What are the average, minimum, and maximum *screen and casing* depths of municipal, agricultural, and domestic wells?

Depth to Top of Screen (ft)

Basin	Fillmore					Piru				
Use	Agricultural	Domestic	Industrial	Monitoring	Municipal	Agricultural	Domestic	Industrial	Monitoring	Municipal
count	214	86	2	5	8	87	15	2	12	3
min	11	26	200	1	50	5	20	57	18	160
50%	120	98	200	10	95	180	140	209	75	160
max	633	294	200	120	260	568	220	360	590	400

Depth to Bottom of Screen (ft)

Basin	Fillmore					Piru				
Use	Agricultural	Domestic	Industrial	Monitoring	Municipal	Agricultural	Domestic	Industrial	Monitoring	Municipal
count	214	86	2	5	8	87	15	2	12	3
min	86	68	600	12	150	40	47	93	43	450
50%	280	200	600	40	269	304	200	307	110	470
max	1580	555	600	300	502	800	420	520	610	480

Total Depth of Well Casing (ft)

Basin	Fillmore					Piru				
Use	Agricultural	Domestic	Industrial	Monitoring	Municipal	Agricultural	Domestic	Industrial	Monitoring	Municipal
count	212	90	2	5	9	86	15	2	12	3
min	30	52	600	12	150	60	47	103	43	450
50%	300	183	600	40	270	330	200	312	114	480
max	1620	575	600	300	502	820	428	520	610	490

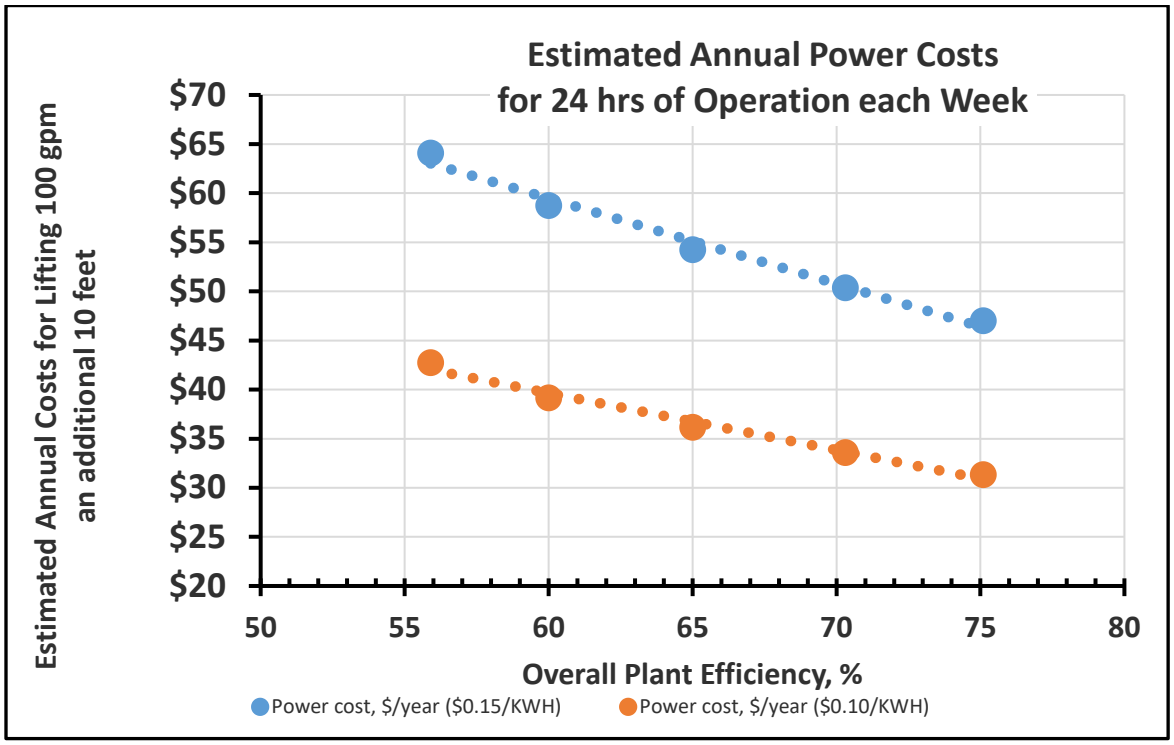
What are the screen intervals of the wells?

See above for general statistics - for individual wells, please refer to *Appendix A Groundwater Level Hydrographs in Fillmore and Piru Groundwater Basins Monitoring Program and Data Gap Analysis DRAFT Technical Memorandum* OR the online database at www.fillmore-piru.gladata.com.

SUSTAINABLE MANAGEMENT INDICATOR - Groundwater Levels (Fillmore and Piru basins)

What impacts do water levels have on pumping costs (e.g., energy cost to lift water)?

Calculation of the additional costs to lift groundwater depends on the amount of water (i.e., flow rate [gpm]), amount of the additional lift, overall plant efficiency [OPE], and cost of power. These variables are often well specific, but the general relationship of energy cost to increasing lift and groundwater extraction amount are shown in the graph below:



What are the adjacent basin's minimum thresholds for groundwater elevations?

The Santa Paula basin is located down gradient and immediately west of the Fillmore basin. This basin is adjudicated and is not required to develop sustainable management criteria (e.g., minimum thresholds).

The Upper Santa Clara River basin is located east of the Piru basin and immediately upgradient of the basin. The draft GSP for this basin proposes a minimum threshold of _____.

What are the potential impacts of changing groundwater levels on groundwater dependent ecosystems?

TBD (see the Surface Water – Groundwater Interactions Fact Sheet).

Which principal aquifer, or aquifers, is the representative monitoring site evaluating?

TBD

SUSTAINABLE MANAGEMENT INDICATOR - Groundwater Levels (Fillmore and Piru basins)

UNDESIRABLE RESULT(S)

Proposed language: **Option A** - An *Undesirable Result* occurs when static groundwater levels decline below the top of the well screen.

Proposed language: **Option B** - An *Undesirable Result* occurs when static groundwater levels decline below the bottom of the well.

METRIC AND MEASUREMENT METHODOLOGY

Proposed metric: Groundwater level measurements / Depth to water

Proposed Measurement Methodology: The groundwater level measurements performed for several wells in the basins by UWCD and VCWPD will be used to monitor recent historical and ongoing groundwater level fluctuations.

Future groundwater fluctuations will be evaluated using the future conditions water levels predicted by the groundwater flow model developed by United Water Conservation District (UWCD).

MINIMUM THRESHOLD (MT)

Proposed language: **Option A** - Static water levels equal to the top of the well screen.

Proposed language: **Option B** - Static water levels at or below the bottom of the well screen.

MEASURABLE OBJECTIVE (MO)

Proposed language: **Option A** - Static water levels at or near 2011 levels.

Proposed language: **Option B** - Static water levels at least 70 ft above the bottom of the well screen.

Assumptions:

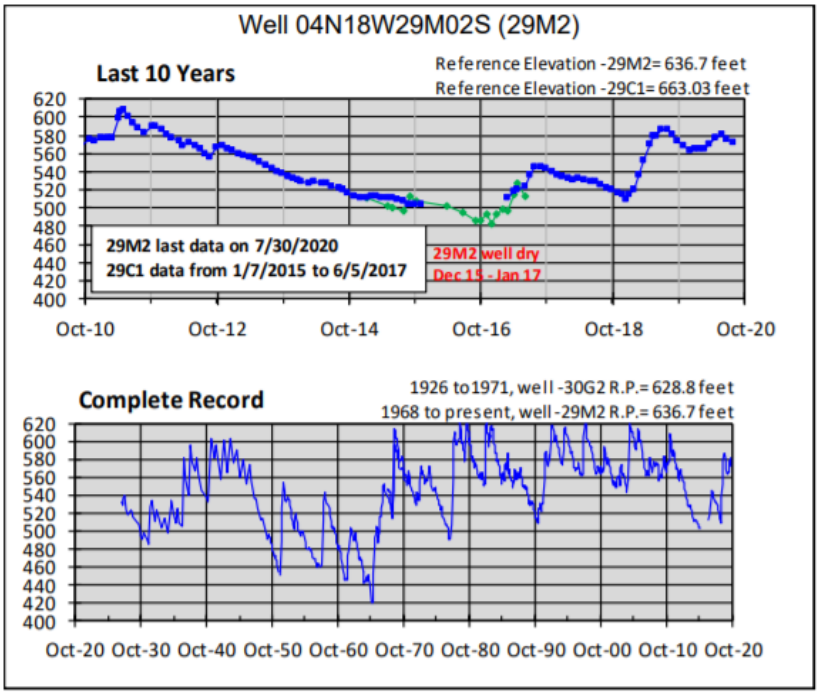
- 8 ft long pump bowls
- 10 ft of water above the top of bowls
- 50 ft of drawdown due to pumping (1,000 gpm for a well with 20 gpm/ft specific capacity)
- About 70 ft of water level

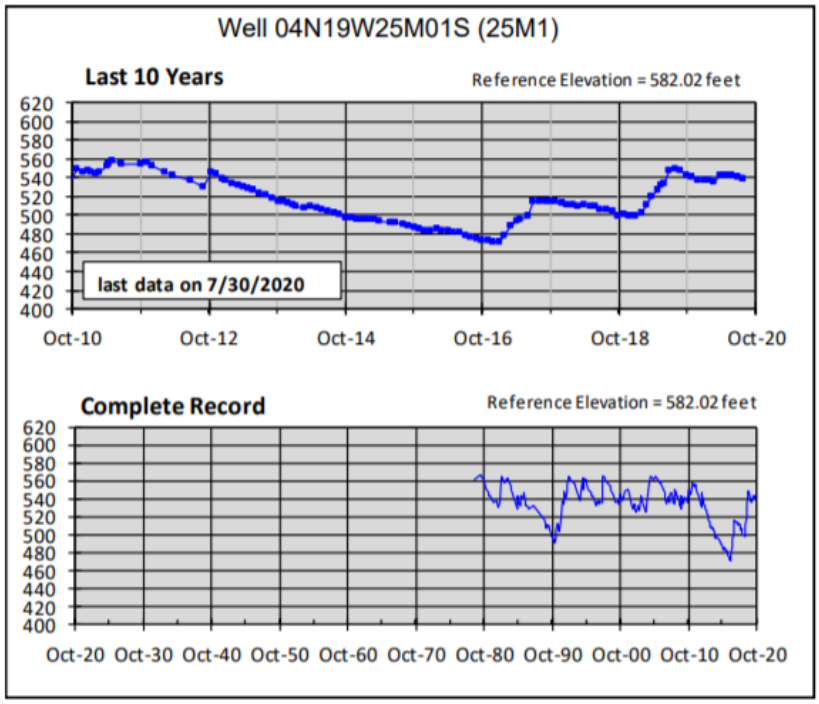
REFERENCES

California Dept of Water Resources, 2017, Sustainable Management Criteria Best Management Practices - Draft, November 2017.

SUSTAINABLE MANAGEMENT INDICATOR - Groundwater Levels (Fillmore and Piru basins)

Piru Basin Key Wells
Groundwater Elevation Records

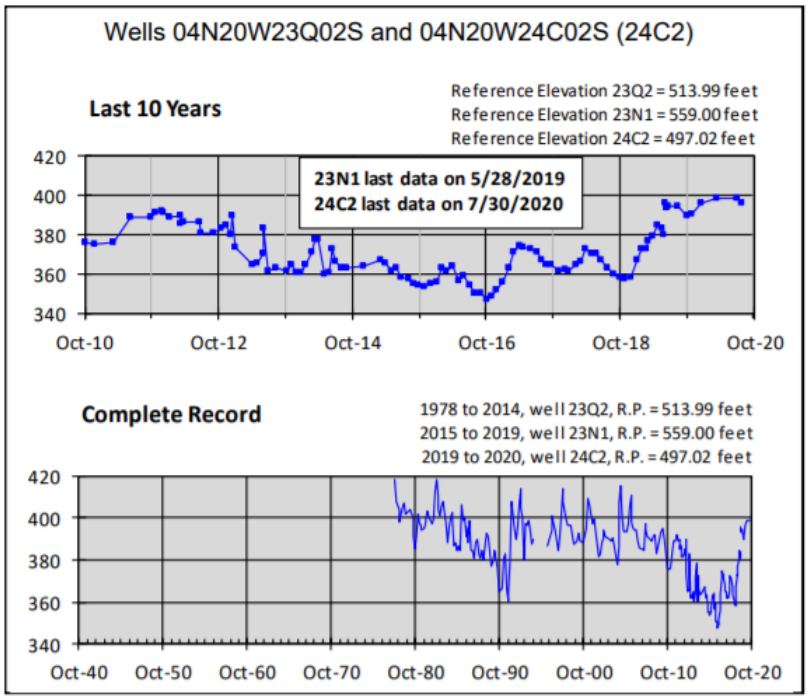


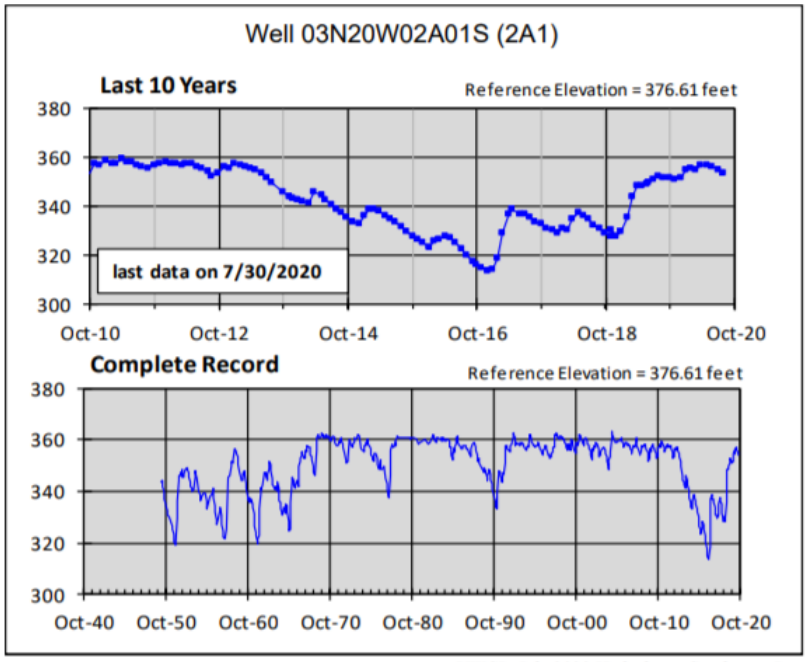


UWCD July 2020 Hydrologic Conditions Report. Page 4

SUSTAINABLE MANAGEMENT INDICATOR - Groundwater Levels (Fillmore and Piru basins)

Fillmore Basin Key Wells
Groundwater Elevation Records





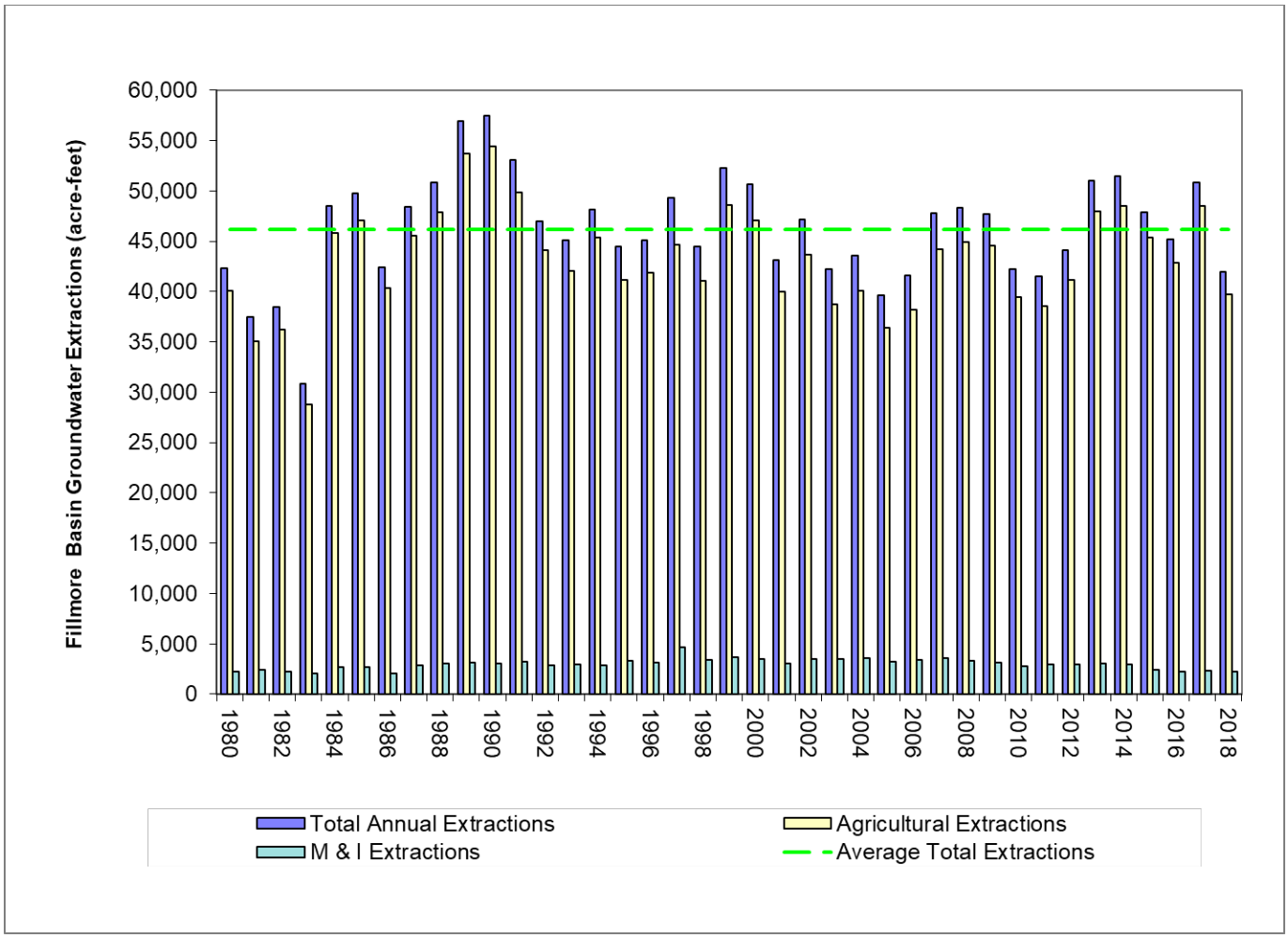
UWCD July 2020 Hydrologic Conditions Report. Page 5

SUSTAINABLE MANAGEMENT INDICATOR - Groundwater Storage (Fillmore and Piru basins)

BACKGROUND

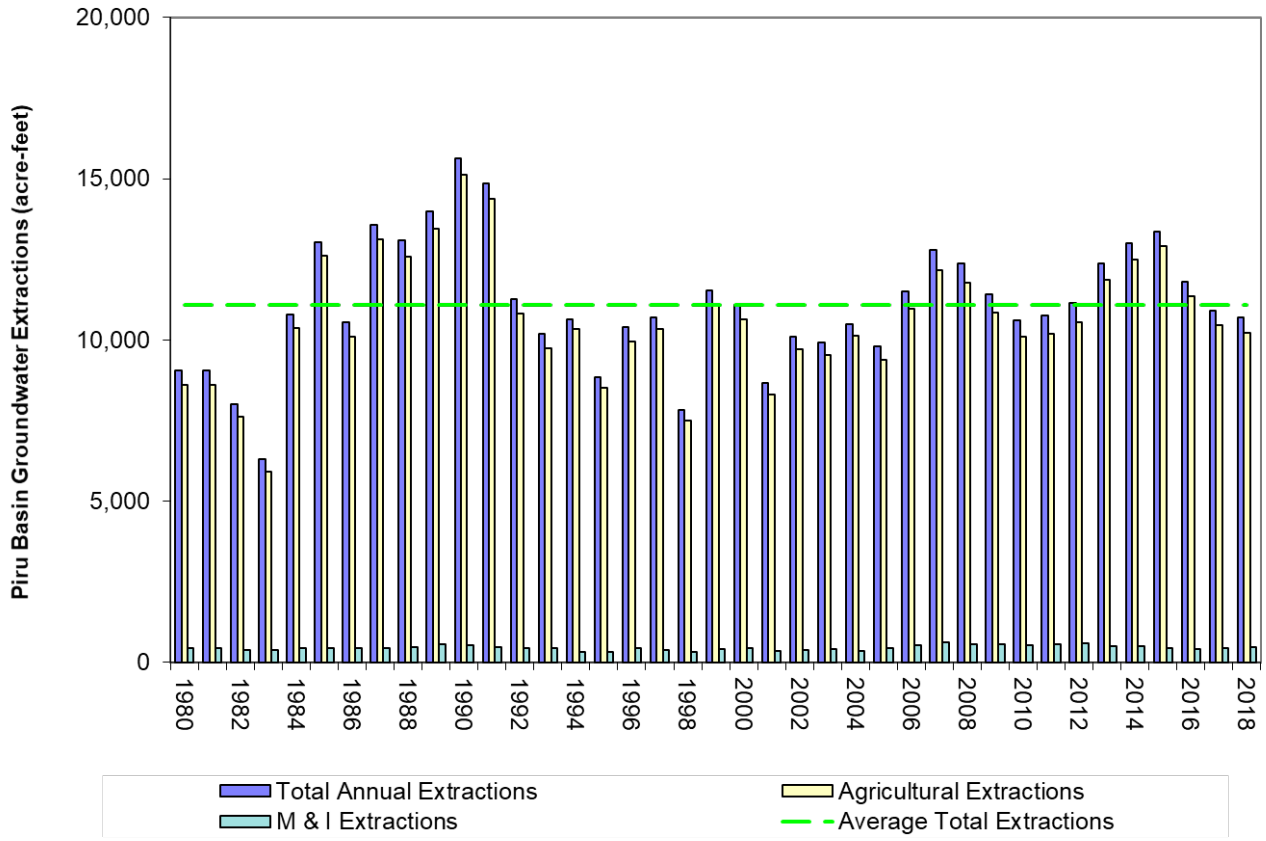
DWR (2017) provides the following considerations "...when establishing minimum thresholds for groundwater storage may include, but are not limited to..."

What are the historical trends, water year types, and projected water use in the basin?



	Acre-feet
average 1980-2018	46,150
average 1984-1991	50,918
average 1992-2018	46,054
median 1980-2018	46,948
2011-2016 drought extractions	280,974
2011-2016 average annual drought extractions	46,829

SUSTAINABLE MANAGEMENT INDICATOR - Groundwater Storage (Fillmore and Piru basins)



	Acre-feet
average 1980-2018	**11,079**
average 1984-1991	**13,187**
average 1992-2018	**10,895**
median 1980-2018	**10,790**
2011-2016 drought extractions	**72,397**
2011-2016 average annual drought extractions	**12,066**

What groundwater reserves are needed to withstand future droughts?

Based on historical pumping (2011-2016), Fillmore Basin pumped about 47,000 AFY and Piru pumped about 12,000 AFY. For future projections, we will rely on the groundwater flow model to estimate how much storage reserves are needed to withstand expected droughts.

SUSTAINABLE MANAGEMENT INDICATOR - Groundwater Storage (Fillmore and Piru basins)

Have production wells ever gone dry?

There is no substantiated record of a potable water well going dry in either basin. Based on water level declines in the 2011-2016 drought period, a single agricultural irrigation well is thought to have had water levels drop below the bottom of the well.

What is the effective storage of the basin? This may include understanding of the:

TBD

- ✓ Average, minimum, and maximum depth *well screen and casing* of municipal, agricultural, and domestic wells.

	Depth to Top of Screen (ft)									
Basin	Fillmore					Piru				
Use	Agricultural	Domestic	Industrial	Monitoring	Municipal	Agricultural	Domestic	Industrial	Monitoring	Municipal
count	214	86	2	5	8	87	15	2	12	3
min	11	26	200	1	50	5	20	57	18	160
50%	120	98	200	10	95	180	140	209	75	160
max	633	294	200	120	260	568	220	360	590	400

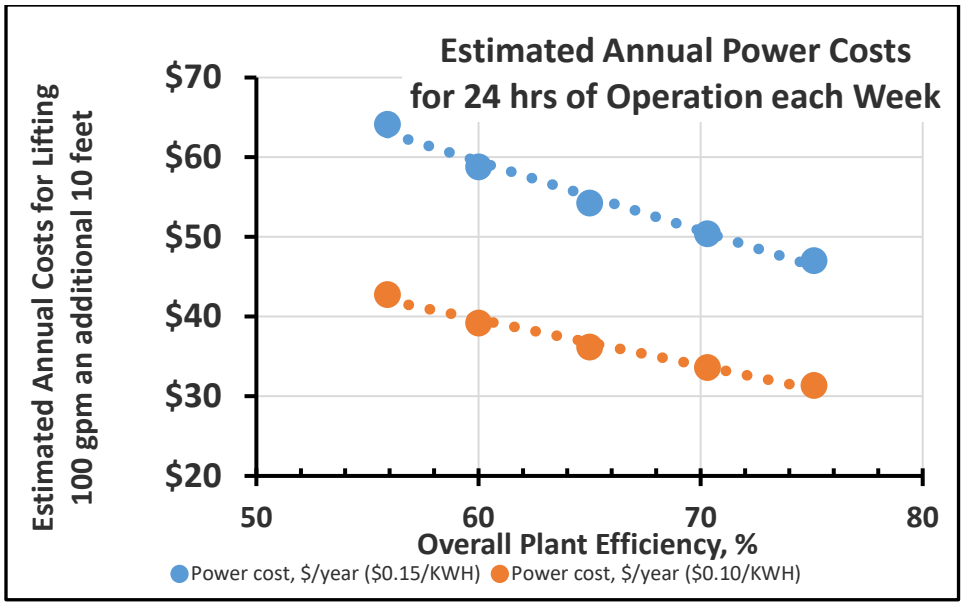
	Depth to Bottom of Screen (ft)									
Basin	Fillmore					Piru				
Use	Agricultural	Domestic	Industrial	Monitoring	Municipal	Agricultural	Domestic	Industrial	Monitoring	Municipal
count	214	86	2	5	8	87	15	2	12	3
min	86	68	600	12	150	40	47	93	43	450
50%	280	200	600	40	269	304	200	307	110	470
max	1580	555	600	300	502	800	420	520	610	480

	Total Depth of Well Casing (ft)									
Basin	Fillmore					Piru				
Use	Agricultural	Domestic	Industrial	Monitoring	Municipal	Agricultural	Domestic	Industrial	Monitoring	Municipal
count	212	90	2	5	9	86	15	2	12	3
min	30	52	600	12	150	60	47	103	43	450
50%	300	183	600	40	270	330	200	312	114	480
max	1620	575	600	300	502	820	428	520	610	490

- ✓ Impacts on pumping costs (i.e., energy cost to lift water).

Calculation of the additional costs to lift groundwater depends on the amount of water (i.e., flow rate [gpm]), amount of the additional lift, overall plant efficiency [OPE], and cost of power. These variables are often well specific, but the general relationship of energy cost to increasing lift and groundwater extraction amount are shown in the graph below:

SUSTAINABLE MANAGEMENT INDICATOR - Groundwater Storage (Fillmore and Piru basins)



What are the adjacent basin's minimum thresholds?

The Santa Paula basin is located down gradient and immediately west of the Fillmore basin. This basin is adjudicated and is not required to develop sustainable management criteria (e.g., minimum thresholds).

The Upper Santa Clara River basin is located east of the Piru basin and immediately upgradient of the basin. The draft GSP for this basin proposes a minimum threshold of _____.

UNDESIRABLE RESULT(S)

Proposed language: **Option A** - An *Undesirable Result* occurs when there is inadequate groundwater storage to last through a multi-year drought (e.g., 5 years) without groundwater extraction limitations

METRIC AND MEASUREMENT METHODOLOGY

Proposed metric: Groundwater level measurements / Depth to water

Proposed Measurement Methodology: The groundwater level measurements performed for several wells in the basins by UWCD and VCWPD will be used to monitor recent historical and ongoing groundwater level fluctuations.

Future groundwater fluctuations will be evaluated using the future conditions water levels predicted by the groundwater flow model developed by United Water Conservation District (UWCD).

MINIMUM THRESHOLD (MT)

Proposed language: **Option A** - Static water levels equal to the top of the well screen.

SUSTAINABLE MANAGEMENT INDICATOR - Groundwater Storage (Fillmore and Piru basins)

MEASURABLE OBJECTIVE (MO)

Proposed language: **Option A** - Static water levels equivalent to the 2011-2016 water level decline above the top of the well screen.

REFERENCES

California Dept of Water Resources, 2017, Sustainable Management Criteria Best Management Practices - Draft, November 2017.

SUSTAINABLE MANAGEMENT INDICATOR - SUBSIDENCE (Fillmore and Piru basins)

BACKGROUND

DWR (2014) lists Fillmore basin with low potential for future subsidence. The ranking was determined from long term water level trends (well records greater than 10 years) above historical lows and one active continuous GPS monitoring station (see *Geodetic Data*) showing 0.03 feet of maximum decrease in ground elevation. The Piru basin had insufficient data to establish a subsidence ranking.

DWR (2017) provides the following considerations "...when establishing minimum thresholds for land subsidence at a given representative monitoring site may include, but are not limited to..."

Do principal aquifers in the basin contain aquifer material susceptible to subsidence?

A review of driller's logs and borehole geophysical logs from representative wells in the basin indicate that aquifer zones A, B, and C contain fine-grained sediments that may be susceptible to subsidence. The thickness of those materials varies at each well location.

What is the historical rate and extent of subsidence?

Subsidence has not been documented by historical anecdotal observations, physical manifestations (e.g., well heads suspended above ground, collapsed well casings, offset roadways) or quantitative methods in these basins. DWR (2014) reports Low subsidence potential for the Fillmore basin and insufficient data to make an evaluation for the Piru basin.

What are the land uses and property interests in areas susceptible to subsidence?

Land use in these basins is predominately agriculture with municipal development associated with the City of Fillmore and Town of Piru and numerous single family residences/farms scattered throughout the basins.

What is the location of infrastructure and facilities susceptible to subsidence (e.g., canals, levees, pipelines, major transportation corridors)?

Conveyance infrastructure in the basin includes:

- ✓ transportation routes such as Highway 126 and other local roadways, as well as related structures (e.g., bridges, overpasses);
- ✓ pipelines for water distribution in the City of Fillmore and Town of Piru;
- ✓ pipelines for sewage collection in the City of Fillmore and Town of Piru and delivery of that sewage to their respective treatment plants;
- ✓ pipelines for natural gas distribution - major pipelines for natural gas transmission generally follow the Hwy 126 alignment except near the City of Fillmore where the alignment deviates to the north near Sespe Creek (https://socalgas.maps.arcgis.com/apps/webappviewer/index.html?id=12cb8fddd6184f1bafc565ed09e4f631). Additionally, a natural gas pipeline oriented north-south extends from Torrey Canyon south the the Santa Clara River northward along Torrey Road/Bridge and into the Town of Piru (https://pvnpms.phmsa.dot.gov/PublicViewer/) ;
- ✓ field-scale irrigation systems; and
- ✓ surface-water diversion structures (e.g., Piru Mutual Water Company structures on Piru Creek).

These features are considered critical infrastructure.

What are the adjacent basin's minimum thresholds?

The Santa Paula basin is located down gradient and immediately west of the Fillmore basin. This basin is adjudicated and is not required to develop sustainable management criteria (e.g., minimum thresholds).

The Upper Santa Clara River basin is located east of the Piru basin and immediately upgradient of the basin. The draft GSP for this basin proposes a minimum threshold of _____.

UNDESIRABLE RESULT(S)

Proposed language: An *Undesirable Result* is inelastic land subsidence amounts that interfere with critical infrastructure operations. *Undesirable Results* are expected to occur when net subsidence rates are greater than or equal to 1 ft/year or a cumulative net subsidence greater than or equal to 1 foot over a 5 year period.

METRIC AND MEASUREMENT METHODOLOGY

Proposed metric: Subsidence rate (e.g., feet/year) and cumulative net subsidence.

Proposed Measurement Methodology: Recent historical subsidence (May 2015 - September 2019) will be evaluated using InSAR data provided by the CA DWR. The InSAR data set will be used to monitor subsidence amounts and rates in arrears for each year the data sets are provided by CA DWR.

Future subsidence potential will be evaluated using the Texas Water Development Board (TWDB) Potential Subsidence Prediction Screening Tool (LRE, Inc., 2018). Future water levels at key indicator wells in each basin will be predicted by using the groundwater elevation output from the groundwater flow model developed by United Water Conservation District (UWCD) in the screening tool and using the tool to estimate future potential subsidence under various future hydrologic conditions.

MINIMUM THRESHOLD (MT)

Proposed language: **Proxy MT** - Water levels twenty (20) feet below the historic low water levels (2016 low water level minus 20 feet). The TWDB Subsidence Prediction Screening Tool suggests that water levels can decline by at least 20 feet below their historical low levels and the predicted total subsidence will be less than 1 foot.

MEASURABLE OBJECTIVE (MO)

Proposed language: **Proxy MO** - Water levels at or above the historical low values will be sufficient to preclude subsidence.

REFERENCES

Borchers, James W., Grabert, Vicki Kretsinger, Carpenter, Michael, Dalgish, Barbara, and Cannon Debra, 2014, Land Subsidence from Groundwater Use in California, prepared by Luhdorff & Scalmanni Consulting Engineers.

SUSTAINABLE MANAGEMENT INDICATOR - SUBSIDENCE (Fillmore and Piru basins)

California Dept of Water Resources, 2017, Sustainable Management Criteria Best Management Practices - Draft, November 2017.

California Department of Water Resources, 2014, Summary of Recent, Historical, and Estimated Future Land Subsidence in California.

LRE Water, LLC, 2018, Texas Aquifer Potential Subsidence Prediction Screening Tool User's Guide, Version 1.0, TWDB Contract Number 1648302062, March 21, 2018.

SUSTAINABLE MANAGEMENT INDICATOR - Depletion of Interconnected Surface Waters
(Fillmore and Piru basins)

BACKGROUND

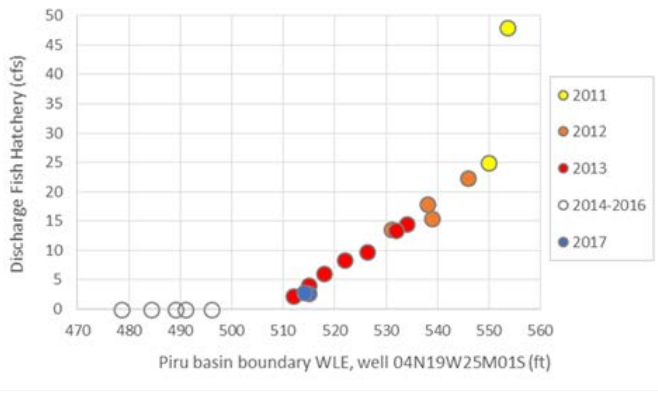
DWR (2017) provides the following considerations "...when establishing minimum thresholds for groundwater levels at a given representative monitoring site may include, but are not limited to..."

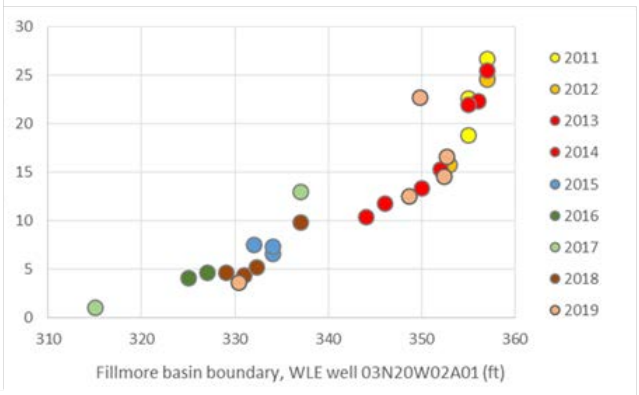
What are the historical rates of stream depletion *(from groundwater extractions)* for different water year types?

TBD - see discussion below

What is the uncertainty in streamflow depletion estimates *(from groundwater extractions)* from analytical and numerical tools?

This question is currently being explored using two different methods. At the basin boundaries in the areas of the rising groundwater, there are apparent relationships between surface water flow rates and the water levels in a nearby well (graphs below). UWCD staff are researching their database to determine if other wells have a similar relationship. The goal is to identify, where possible, a relationship between surface water flows and groundwater elevations in the shallow aquifers near the areas with rising groundwater. Using this relationship, it would be possible to estimate the surface water flow rates when the groundwater elevations are known from direct measurement or from model simulations.





The second analytical approach being explored uses the UWCD groundwater flow model. UWCD staff are running a scenario (over the historical and validation timeline [1985-2019]) where the groundwater extractions in the shallow aquifers (Aquifer Zones A and B) are terminated and the differences in groundwater elevations compared to the water levels from the historical (i.e., status quo) scenario. Groundwater elevations from the simulation can then be used to infer the degree of impact pumping has on surface water flow.

What is the proximity of pumping to streams?

There are several wells in close proximity to the streams in the Fillmore and Piru basins. The streams are ephemeral in nature with gaining reaches of the Santa Clara River associated with the boundaries between

SUSTAINABLE MANAGEMENT INDICATOR - Depletion of Interconnected Surface Waters
(Fillmore and Piru basins)

Piru/Fillmore basins and Fillmore/Santa Paula basins. The potential impacts of groundwater extraction on surface water flow in the gaining reaches of the Santa Clara River are being studied (see above).

Where are groundwater dependent ecosystems in the basin?

Groundwater dependent ecosystems (GDEs) are primarily focused in the gaining reaches of the Santa Clara River (i.e., boundaries between Piru/Fillmore basins and Fillmore/Santa Paula basins). Much of the remaining reaches of the Santa Clara River are characterized as naturally occurring losing reaches that remain dry except due to storm runoff and/or man-made releases of water from nearby reservoirs.

What are the agricultural and municipal surface water needs in the basin?

Agricultural and municipal water demand is not significantly satisfied by the surface water sources in these basins. The ephemeral nature of the Santa Clara River does not provide a reliable water source. Piru Mutual Water Company has a surface water diversion facility on Piru Creek.

What are the applicable State or federally mandated flow requirements?

Currently, Federally mandated flow rates are restricted to the Santa Clara River and Piru Creek downstream of Santa Felicia Dam. The flow rates were established to enhance the potential for fish passage during storm events (Santa Clara River) and to augment fish passage and spawning habitats along Piru Creek. UWCD releases water from Lake Piru via the Santa Felicia Dam in accordance with regulatory requirements. The FPBGSA does not own or control the operation of Santa Felicia Dam, and therefore has no direct involvement in compliance with the Federally mandated flow rates.

UNDESIRABLE RESULT(S)

Proposed language: **Option A -** An *Undesirable Result* occurs when surface water flows are depleted by groundwater extractions or GSA projects and management actions that impairs the beneficial use of the resource.

METRIC AND MEASUREMENT METHODOLOGY

Proposed metric: Groundwater level measurements / Depth to water

Proposed Measurement Methodology: The groundwater level measurements performed for several wells in the basins by UWCD and VCWPD will be used to monitor recent historical and ongoing groundwater level fluctuations.

Future groundwater fluctuations will be evaluated using the future conditions water levels predicted by the groundwater flow model developed by United Water Conservation District (UWCD).

MINIMUM THRESHOLD (MT)

Proposed language: **Option A** - Surface water flows...

SUSTAINABLE MANAGEMENT INDICATOR - Depletion of Interconnected Surface Waters
(Fillmore and Piru basins)

MEASURABLE OBJECTIVE (MO)

Proposed language: **Option A** - Surface water flows...

REFERENCES

California Dept of Water Resources, 2017, Sustainable Management Criteria Best Management Practices - Draft, November 2017.

SUSTAINABLE MANAGEMENT INDICATOR - Water Quality Degradation (Fillmore and Piru basins)

BACKGROUND

DWR (2017) provides the following considerations "...when establishing minimum thresholds for groundwater storage may include, but are not limited to..."

What are the historical and spatial water quality trends in the basin?

Historically water quality chemicals (analytes or constituents) of concern (COCs) in the basins have generally included, but are not necessarily limited to, the following analytes:

- Total Dissolved Solids (TDS)
- Sulfate
- Chloride
- Nitrate
- Boron (UWCD monitoring program only)

See Tables 4-3 and 4-4 (attached) for more details.

What is the number of impacted supply wells?

TBD – see the Draft Monitoring Program and Data Gap Analysis Technical Memorandum for more details.

What aquifers are primarily used for providing water supply?

Fillmore Basin Pumping				Piru Basin Pumping			
Aquifer Zone(s)	Number of Wells	Extractions in AFY	Percent of Total	Aquifer Zone(s)	Number of Wells	Extractions in AFY	Percent of Total
A	24	422	1.0	A	3	35	0.3
A-B	97	13,857	33.0	A-B	12	809	7.6
B	86	16,556	39.4	B	55	5,765	53.9
A-C	3	804	1.9	A-C	1	93	0.9
B-C	18	3,660	8.7	B-C	12	1,801	16.8
C	2	340	0.8	C	2	338	3.2
Unknown	71	6,338	15.1	Unknown	22	1,849	17.3
2018 Total	301	41,977	100	**2018 Total**	107	10,689	100

Table 5-5: Summary of Fillmore and Piru basins wells accessing groundwater from each aquifer zone or zones in 2018.

Approximately 72% of the groundwater extractions came from Aquifer Zone A-B and B in the Fillmore basin with ~61% of the groundwater extractions came from these same Aquifer Zones in the Piru basin. The Piru basin also had another ~17% of extractions from Aquifer Zone B-C.

SUSTAINABLE MANAGEMENT INDICATOR - Water Quality Degradation (Fillmore and Piru basins)

What is the estimated volume of contaminated water in the basin?

TBD – see the Draft Monitoring Program and Data Gap Analysis Technical Memorandum for more details.

What are the spatial and vertical extents of major contaminant plumes in the basin, and how could plume migration be affected by regional pumping patterns?

From (UWCD, 2016): "Over the past 15 years the main water quality concern for agricultural users in the Piru basin has been impacts associated with high chloride concentrations in the Santa Clara River flows sourcing from Los Angeles County. The high chloride concentrations in the eastern portion of the basin associated with these discharges has made a steady advance westward with groundwater flow down the Piru basin. The Piru basin generally does not have problems with nitrate contamination, and samples collected in 2015 show only two wells exceeding the MCL of 45 mg/L."

From (UWCD, 2016): "The Fillmore basin is not known for having any pervasive water quality issues. TDS concentrations can be somewhat elevated in some locations, as in other groundwater basins along the Santa Clara River Valley. The City of Fillmore no longer uses wells near the Santa Clara River favoring locations near Sespe Creek where TDS tends to be lower. Naturally-occurring boron sourcing from the Sespe watershed, however, is sometimes a concern for citrus growers and the City of Fillmore. Deeper aquifer units may have elevated concentrations of iron and manganese, a common occurrence throughout Ventura County."

What are the applicable local, State, and federal water quality standards?

Major regulating agencies include:

SUSTAINABLE MANAGEMENT INDICATOR - Water Quality Degradation (Fillmore and Piru basins)

Jurisdictions	Regulating agency
Waste discharge requirements (WDRs and waivers); underground storage tanks; and groundwater clean-up programs	SWRCB
Overall groundwater quality (policies & enforcement); underground storage tanks; groundwater clean-up programs; Bay-Delta region; aquifer exemptions (SDWA)	SWRCB
Safe drinking water quality requirements	Division of Drinking Water (SWRCB, CalEPA)
Hazardous waste management and remediation requirements	Department of Toxic Substances Control (CalEPA)
Superfund requirements; aquifer exemptions (SDWA)	United States Environmental Protection Agency
Underground injection wells (Class II); aquifer exemptions (under SDWA)	Division of Oil, Gas, and Geothermal Resources (DOC)
Pesticide use and reporting requirements	Department of Pesticide Regulation (CalEPA)
Well construction/destruction; wellhead protection; septic systems; storage/leaking of hazardous materials, etc.; pesticides; SDWA enforcement (where delegated by DDW)	Counties and cities

(modified from Moran and Belin, 2019)

Water quality standards include, for example, Maximum Contaminant Levels (MCLs), Basin Plan Water Quality Objectives (WBOs) from RWQCB, and informal suitability assessments (e.g., 117mg/L maximum chloride for avocados).

SUSTAINABLE MANAGEMENT INDICATOR - Water Quality Degradation (Fillmore and Piru basins)

Chemical	Chemical Formula	EPA MCL (mg/l) *unless noted*	CCR, Title 22 MCL (mg/l)
Gross Alpha		15 pCi/L	
Lead	Pb	0.015*	
Nitrate (as Nitrogen)	N	10	10
Nitrate	NO_3		45
Selenium	Se	0.05	0.05
Uranium	U	0.03 (~20 pCi/L)	
		Secondary MCL (mg/l)	
Boron	B		1**
Chloride	Cl	250	
Iron	Fe	0.3	
Manganese	Mn	0.05	
Sulfate	SO_4	250	
Total Dissolved Solids	TDS	500	
*0.015 mg/L (15 µg/L) is the Action Level for Lead, the public health goal is zero.			
**California State Notification Level, Boron is an unregulated chemical without an established			

Table 4-2. Select U.S. Environmental Protection Agency Primary and Secondary Standards (May 2009) and California Code of Regulations, Title 22 Maximum Contaminant Levels (February 2012).

What are the major sources of point and nonpoint source pollution in the basin, and what are their chemical constituents?

Point sources include, but are not limited to, the following:

- City of Fillmore Waste Water Treatment Plant (chloride, TDS, TSS);
- County of Ventura (VCWWD No.16) serving Town of Piru (chloride, TDS, TSS); and
- Saugus and Valencia Wastewater Reclamation Plants (chloride).

Non-point sources include, but are not limited to, the following:

- Legacy oilfield brine disposal in the Santa Clara River (chloride in Piru basin east of Piru Creek); and
- Legacy Saugus and Valencia Wastewater Reclamation Plants (chloride).

SUSTAINABLE MANAGEMENT INDICATOR - Water Quality Degradation (Fillmore and Piru basins)

What regulatory projects and actions are currently established to address water quality degradation in the basin (e.g., an existing groundwater pump and treat system), and how could they be impacted by future groundwater management actions?

TBD

What are the adjacent basin's minimum thresholds?

The Santa Paula basin is located down gradient and immediately west of the Fillmore basin. This basin is adjudicated and is not required to develop sustainable management criteria (e.g., minimum thresholds).

The Upper Santa Clara River basin is located east of the Piru basin and immediately upgradient of the basin. The draft GSP for this basin proposes a minimum threshold of _____.

UNDESIRABLE RESULT(S)

Proposed language: **Option A** - An *Undesirable Result* occurs when water quality degradation that occurs due to GSA projects or management actions that impair the beneficial use of the resource.

METRIC AND MEASUREMENT METHODOLOGY

Proposed metric: Groundwater and surface water sampling and laboratory analyses results.

Proposed Measurement Methodology: The groundwater quality sampling and laboratory analyses are routinely performed by VCWPD, UWCD, City of Fillmore, and Waring Water. Surface water quality sampling is conducted by UWCD.

MINIMUM THRESHOLD (MT)

Proposed language: **Option A** - Water quality values included in existing or future regulations.

Proposed language: **Option B** - Maximum Contaminant Level (MCL), Health Goal, or other value specific to beneficial use (e.g., agriculture, vegetation, industrial), as appropriate.

MEASURABLE OBJECTIVE (MO)

Proposed language: **Option A** - The authority to regulate water quality is afforded to State and Federal agencies other than the FPBGSA. FPBGSA is not a water purveyor and does not have the authority for water quality compliance but will cooperate with appropriately empowered entities.

Proposed language: **Option B** - FPBGSA is not a groundwater producer, and as such, does not function as a potable or irrigation water purveyor. FPBGSA does not have the authority for water quality compliance but will cooperate with appropriately empowered entities.

REFERENCES

California Dept of Water Resources, 2017, Sustainable Management Criteria Best Management Practices - Draft, November 2017.

SUSTAINABLE MANAGEMENT INDICATOR - Water Quality Degradation (Fillmore and Piru basins)

Moran, T. and Belin, A. (2019), A Guide to Water Quality Requirements under the Sustainable Groundwater Management Act, Stanford Digital Repository, https://purl.stanford.edu/dw122nb4780.

UWCD, 2016, 2014 and 2015 Piru and Fillmore Basins Biennial Groundwater Conditions Report, Open-File Report 216-01, June 2016

SUSTAINABLE MANAGEMENT INDICATOR - Water Quality Degradation (Fillmore and Piru basins)

SWN	DWR Basin (2019)	Screen, ft bgs	Short-Term TDS Trend	Short-Term Sulfate (SO4) Trend	Short-Term Chloride (Cl) Tend	Short-Term Nitrate (NO3) Trend	Short-Term Boron (B) Trend
03N19W06D03S	Fillmore	184-400	Decreasing	Decreasing	Increasing	Increasing	Decreasing
03N20W01D03S	Fillmore	Unknown	Decreasing	Decreasing	Decreasing	Decreasing	Relatively Stable
03N20W01F05S	Fillmore	100-200	Decreasing	Decreasing	Relatively Stable	Decreasing	Relatively Stable
03N20W02R05S	Fillmore	93-133	Relatively Stable	Relatively Stable	Increasing	Trend Reversal	Relatively Stable
03N20W03D03S	Fillmore	102-397	Insufficient Data	Insufficient Data	Insufficient Data	Increasing	Insufficient Data
03N20W03D05S	Fillmore	274-436	Relatively Stable	Relatively Stable	Increasing	Relatively Stable	Relatively Stable
03N20W03D07S	Fillmore	224-484	Decreasing	Decreasing	Relatively Stable	Decreasing	Increasing
03N20W05C04S	Fillmore	221-362	Insufficient Data	Insufficient Data	Insufficient Data	Increasing	Insufficient Data
03N20W06N02S	Fillmore	240-350	Decreasing	Decreasing	Increasing	Decreasing	Relatively Stable
03N20W08F01S	Fillmore	100-152	Insufficient Data	Insufficient Data	Insufficient Data	Increasing	Insufficient Data
03N21W01P05/8S	Fillmore	180-380 160-260	Decreasing	Decreasing	Relatively Stable	No Clear Trend	Relatively Stable
03N21W12H01S	Fillmore	74-150	Increasing	Relatively Stable	Increasing	Increasing	Relatively Stable
04N19W30D01S	Fillmore	60-380	Increasing	Increasing	Increasing	Increasing	Relatively Stable
04N19W31F01S	Fillmore	60-100	Insufficient Data	Relatively Stable	Relatively Stable	Relatively Stable	Relatively Stable
04N19W33M05S	Fillmore	37-107	Decreasing	Decreasing	Increasing	Relatively Stable	Decreasing
04N20W24E01S	Fillmore	80-500	Insufficient Data	Insufficient Data	Insufficient Data	Relatively Stable	Insufficient Data
04N20W24G01S	Fillmore	100-260	Increasing	Insufficient Data	No Clear Trend	Decreasing	Increasing
04N20W24Q04S	Fillmore	90-300	Increasing	Increasing	Increasing	Increasing	Increasing
04N20W25B01S	Fillmore	50-280	Increasing	Increasing	Increasing	Increasing	Relatively Stable
04N20W25D01S	Fillmore	67-187	Relatively Stable	Relatively Stable	Increasing	Relatively Stable	Insufficient Data
04N20W26G03S	Fillmore	294-374	Decreasing	Relatively Stable	Decreasing	Trend Reversal	Relatively Stable
04N20W33C03S	Fillmore	470-700	Decreasing	Relatively Stable	Increasing	No Clear Trend	Relatively Stable
04N20W36D07S	Fillmore	120-280	Insufficient Data	Decreasing	Increasing	Relatively Stable	Relatively Stable
04N20W36MW104	Fillmore	10-40	Increasing	Increasing	Increasing	Increasing	Increasing

SWN	DWR Basin (2019)	Screen, ft bgs	Long-Term TDS Trend	Long-Term Sulfate (SO4) Trend	Long-Term Chloride (Cl) Tend	Long-Term Nitrate (NO3) Trend	Long-Term Boron (B) Trend
03N20W03D05S	Fillmore	274-436	Relatively Stable	Insufficient Data	Trend Reversal	Decreasing	Insufficient Data
03N20W03D07S	Fillmore	224-484	Relatively Stable	Relatively Stable	Relatively Stable	Decreasing	Insufficient Data
03N20W05C04S	Fillmore	221-362	Insufficient Data	Insufficient Data	Insufficient Data	Trend Reversal	Insufficient Data
03N20W06N02S	Fillmore	240-350	Relatively Stable	Relatively Stable	Increasing	Decreasing	Relatively Stable
03N21W01P05/8S	Fillmore	180-380 160-260	Insufficient Data	Relatively Stable	Increasing	Increasing	Relatively Stable
04N19W30D01S	Fillmore	60-380	Increasing	Insufficient Data	Increasing	Relatively Stable	Insufficient Data
04N20W25B01S	Fillmore	50-280	Increasing	Increasing	Increasing	Increasing	Insufficient Data
04N20W25D01S	Fillmore	67-187	Relatively Stable	Relatively Stable	Trend Reversal	Decreasing	Insufficient Data

Table 4-3: Fillmore basin groundwater quality Trend Analysis summary.

SUSTAINABLE MANAGEMENT INDICATOR - Water Quality Degradation (Fillmore and Piru basins)

SWN	DWR Basin (2019)	Screen, ft bgs	Short-Term TDS Trend	Short-Term Sulfate (SO4) Trend	Short-Term Chloride (Cl) Tend	Short-Term Nitrate (NO3) Trend	Short-Term Boron (B) Trend
04N18W20M01S	Piru	220-420	Increasing	Increasing	Increasing	Relatively Stable	Relatively Stable
04N18W20M02S	Piru	160-369	Increasing	Relatively Stable	Increasing	Relatively Stable	Increasing
04N18W20M03S	Piru	160-450	Increasing	Increasing	Increasing	Increasing	Increasing
04N18W20P02S	Piru	137-177	Decreasing	Decreasing	No Clear Trend	Relatively Stable	Increasing
04N18W20P04S	Piru	100-140	Decreasing	Decreasing	No Clear Trend	No Clear Trend	Relatively Stable
04N18W20R01S	Piru	190-319	Increasing	Relatively Stable	Trend Reversal	Increasing	Relatively Stable
04N18W27B01S	Piru	156-280	Increasing	Increasing	Increasing	Increasing	Relatively Stable
04N18W27H01S	Piru	40-120	Relatively Stable	Relatively Stable	Insufficient Data	Increasing	Relatively Stable
04N18W29C01S	Piru	356-500	Relatively Stable	Relatively Stable	No Clear Trend	Relatively Stable	Relatively Stable
04N18W29F01S	Piru	110-275	Relatively Stable	Relatively Stable	No Clear Trend	Decreasing	No Clear Trend
04N18W30J04S	Piru	79-250	Increasing	Increasing	Increasing	Increasing	Increasing
04N18W31D03S	Piru	590-610	Relatively Stable	Relatively Stable	Increasing	Increasing	Relatively Stable
04N18W31D04S	Piru	310-330	Decreasing	Decreasing	Relatively Stable	Relatively Stable	Decreasing
04N18W31D05S	Piru	220-240	Trend Reversal	Relatively Stable	Increasing	Relatively Stable	Relatively Stable
04N18W31D06S	Piru	140-160	Increasing	Increasing	Increasing	Increasing	Increasing
04N18W31D07S	Piru	50-70	Relatively Stable	Relatively Stable	No Clear Trend	Increasing	Relatively Stable
04N19W25K03S	Piru	400-480	Insufficient Data	Insufficient Data	Insufficient Data	Decreasing	Insufficient Data
04N19W25K04S	Piru	220-370	Relatively Stable	Relatively Stable	Relatively Stable	Relatively Stable	Relatively Stable
04N19W25M03S	Piru	210-250	Increasing	Relatively Stable	Increasing	Increasing	Increasing
04N19W26H01S	Piru	568-612	Decreasing	Decreasing	Increasing	Decreasing	Relatively Stable
04N19W26J02S	Piru	Unknown	Insufficient Data	Decreasing	Decreasing	Decreasing	Relatively Stable
04N19W26J03S	Piru	400-650	Decreasing	Relatively Stable	Relatively Stable	Decreasing	Relatively Stable
04N19W26J05S	Piru	200-250	Relatively Stable	Relatively Stable	Relatively Stable	Increasing	Relatively Stable
04N19W33B01S	Piru	206-306	Trend Reversal	Relatively Stable	Trend Reversal	Increasing	Decreasing
04N19W34J04S	Piru	60-160	Relatively Stable	Relatively Stable	Increasing	Increasing	Relatively Stable
04N19W35G01S	Piru	24-79	Relatively Stable	Relatively Stable	No Clear Trend	Relatively Stable	Relatively Stable
04N19W36D01S	Piru	18-73	Increasing	Relatively Stable	Increasing	Increasing	Relatively Stable

SWN	DWR Basin (2019)	Screen, ft bgs	Long-Term TDS Trend	Long-Term Sulfate (SO4) Trend	Long-Term Chloride (Cl) Tend	Long-Term Nitrate (NO3) Trend	Long-Term Boron (B) Trend
04N18W20M01S	Piru	220-420	No Clear Trend	Relatively Stable	No Clear Trend	Relatively Stable	Insufficient Data

Table 4-4: Piru basin groundwater quality Trend Analysis summary.