

Public Webinar

Progress Update On Development of the GSP for the Red Bluff Subbasin

December 9, 2020



GSP Section Preparation





GROUNDWATER MONITORING





- A friendly, "good read"
- Supported by Technical Memorandums and other appendices
- Draft Sections: Periodic Review in Advance of Full Draft GSP Delivery

Tehama County Subbasins Groundwater Sustainability Plans





SGMA Terms Explained



Sustainable Management Criteria for all applicable Sustainability Indicators



SGMA Terms Explained





Presentation Outline

Introduction

- Antelope Subbasin
- Sustainability Goal

<u>Plan Area</u>

- General Area
- Existing Land Use Designation
- Existing Land Use
- Existing Water Sources & Users
- Density of Wells
- Existing Monitoring Networks Water Level
- Existing Monitoring Networks Water Quality
- Existing Monitoring Networks Land Subsidence
- Well Construction Policies
- Well Abandonment Policies
- Notice and Communication

Basin Setting

- Cross-sections
- Topography info
- Surficial geology
- Soil characteristics
- Existing recharge areas
- Surface water bodies
- Current and Historical Groundwater Conditions
 - Elevation data
 - Groundwater quality
 - Land Subsidence



Water Budget Information





GSP Development – Technical Foundation

Groundwater Sustainability Plan (GSP)

1. Administrative Information

2. Basin Setting

- Hydrogeologic Conceptual Model
- Groundwater Conditions
- Water Budgets

3. Sustainable Management Criteria

- Sustainability Goal
- Undesirable Results
- Minimum Thresholds
- Measurable Objectives
- Monitoring Network
- Representative Monitoring
- Assessment & Improvement
- Reporting Monitoring Data
- 4. Projects and Management Actions
- 5. GSP Implementation



TEHAMA COUNTY Flood Control and Water Conservation Distric

Red Bluff Subbasin





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Sustainability Goal (Draft)



"The Tehama County Flood Control and Water Conservation District (FCWCD) will manage groundwater resources responsibly and sustainably in order to maintain acceptable standards and prevent undesirable groundwater levels, groundwater quality, groundwater storage, depletion of surface water resources, and subsidence while recognizing the importance of maintaining groundwater supplies and quality for the beneficial users of groundwater within the Subbasin over the 50-year-planning and implementation horizon."



Existing Land Use Designation







Existing Land Use





Existing Land Use





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Existing Water Sources & Users







Density of Wells







Production

Public Supply



Existing Monitoring Networks – Water Level







Existing Monitoring Networks – Water Quality





Existing Monitoring Networks – Subsidence







Migration of Contaminated Groundwater







Well Construction Policies



Well Permitting



19

Well Construction Policies

Well Permitting

Tehama County Code of Ordinances <u>Section 9.42</u> includes requirements for:

- ➢ Well Location
- Annular Seal
- Surface Construction Features
- ➢ Well Labeling
- Disinfection and Sanitary Requirements
- Sealing off Strata
- Casing
- Well Development, Redevelopment, and Conditioning
- Water Quality Testing
- Large Diameter Shallow Wells
- Driven Wells
- Rehabilitation, Repair, or Deepening of Wells
- > Inspection
- Well Driller's Report
- Well Maintenance

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TEHAMA COUNTY Flood Control and Water Conservation Distric

Well Abandonment Policies





Managed by the Tehama County Department of Environmental Health

Destruction Requirements are provided in Section 9.42 of the Tehama County Code of Ordinances for:

- Preliminary Work \geq
- Filling and Sealing Conditions \geqslant
- Placement of Material

https://www.co.tehama.ca.us/env-health-header/abandoned-or-unused-wells



Notice and Communication



- Beneficial uses and users of groundwater were identified and are encouraged to be involved in GSP development
- **Public Hearings** are held prior to adoption of fees and GSP elements
- Tehama County Website hosts GSP and GSA information: <u>https://tehamacountywater.org/</u>
- Tehama County Groundwater Commission Meetings are open to the public and held on the 4th Wednesday of each Month
- Encourage Stakeholder Specific Meetings (i.e. October 6, 2020 Thomes Creek Domestic Well
 Owners Tailgate)



Inter-basin Coordination



Northern California Water Agencies

- November 3, 2020
 - Groundwater Quality
 - Interconnected GW/SW white paper
- December 1, 2020
 - Groundwater Dependent Ecosystems
 - Subsidence
- Corning Subbasin
 - November 12, 2020 •

 - Land Use Changes GDEs along Thomes Creek
 - SMCs •

 - Projects and Management Actions DMS development for the GSPs and the County
 - Modeling/water budgets
- Northern Sacramento Valley
 - December 1, 2020
 - Interbasin Flow
 - Surface water/groundwater interaction



Geologic Cross-sections



TEHAMA COUNTY Flood Control and Water Conservation District

Topography



Ground Surface Elevation





Explanation

≤ 2

2.1 - 5

5.1 - 10

25.1 - 50

> 50

10.1 - 25

Red Bluff Subbasin

Tehama County

Coordinate System: NAD 1983 California (Teale) Albers

Data sources: DWR - subbasin boundaries

0 0.75 1.5 3

Other Groundwater Subbasins

Topographic Slope (percent)

Surficial Geology







Characteristics of Soil



Soil Texture



Soil Hydrologic Groups



Group A - Low runoff potential Group C – Moderately high runoff potential Group B – Moderate runoff potential Group D - High runoff potential

Characteristics of Soil



Soil pH

Soil Salinity (Electrical Conductance)



Very low (close to zero)

About 1

US HWY

— State HWY

Groundwater Recharge Areas



Deep Percolation Potential (SAGBI)



Saturated Hydraulic Conductivity of Soil



Surface Water Features







Groundwater Quality – Total Dissolved Solids (TDS)

Maximum TDS Concentration (since 1950)



Upper Aquifer Zone Wells

Lower Aquifer Zone Wells

All Wells

TEHAMA COUNTY Flood Control and Water Conservation District

Groundwater Quality - Nitrate



Maximum Nitrate Concentration (since 1950)



All Wells

Upper Aquifer Zone Wells

Lower Aquifer Zone Wells

Groundwater Quality - Arsenic



Maximum Arsenic Concentration (since 1950)





Lower Aquifer Zone Wells

Land Subsidence





Cumulative Vertical displacement at P345 (since 10/02/2005)

Groundwater Wells



Construction of Wells over Time



Constructed Year

Number of new wells constructed in 10-years

-- Red Bluff: Non-domestic -- Red Bluff: Domestic Data Source: DWR well completion reports Average Depth of New Well (ft) Year of Well Construction

Average Depth of a new well



Groundwater Wells



Number of Wells in Depth Ranges (constructed in or after 1960)



Screen Bottom Depth (if available) or Well Depth (ft)



Groundwater Levels





Groundwater Elevation Change



Spring 2011 to Spring 2019





Groundwater Elevation Change



Spring 2015 to Spring 2019



Introduction : What Are Groundwater Dependent Ecosystems?

 GDE definition from SGMA: "ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface."



Groundwater Dependent Ecosystems







Land Use (2016)







Land Use (LandIQ 2018)







Account for Water with a "Budget"

Inflows

- Precipitation;
- SW inflow & infiltration;
- Intentional recharge (ponds, ditches, etc.);
- Applied water, net recharge (e.g., irrigation);
- Unintentional recharge (leaky pipelines);
- Subsurface inflows from outside basin.

Outflows

- GW extraction by wells;
- GW discharge to SW/springs;
- Evapotranspiration; and
- Subsurface outflow from basin.



Tehama County Integrated Hydrologic Model: Water Budgets

Water Budget	Analysis Period	Hydrology	Land Use	Water Supplies
Historical Simulation	1990-2018	Historical	Historical	Historical
Current Conditions	1971-2018	Historical	TBD (2016/2018)	TBD (Current)
Future Conditions (No Climate Change)	1971-2018	Historical	Current, adjusted based on Tehama County General Plan	Current and projected Ag/Urban Demands
Future Conditions, 2030 Climate Change	1971-2018	Historical, Adjusted based on 2030 climate change	Current, adjusted based on General Plan	Current, adjusted based on climate change
Future Conditions, 2070 Climate Change	1971-2018	Historical, adjusted based on 2070 climate change	Current, adjusted based on General Plan	Current, adjusted based on climate change

Tehama County Integrated Hydrologic Model: Model Development

Model Domain

Total Acreage	942,227		
Nodes	5,209		
Elements	5,398		
Min. Element Size (ac)	0.7		
Max. Element Size (ac)	2,122		
Avg. Element Size (ac)	175		
Streams	13		
Stream Nodes	599		
Layers	9		



Data Gaps/Technical Support (TSS) Discussion

TEHAMA COUNTY Flood Control and Water Conservation District

- Identified
 Monitoring Well
 Locations
 - County Owned Parcels





What's Next?



- 1. Calibrate Groundwater Flow Model
- 2. Develop Monitoring Network
- 3. Develop Sustainable Management Criteria
- 4. Finalize New Monitoring Well Locations
- 5. Additional Webinars Planned for Spring/Summer 2021



