YSGA Working Group Meeting

SEPTEMBER 10, 2020

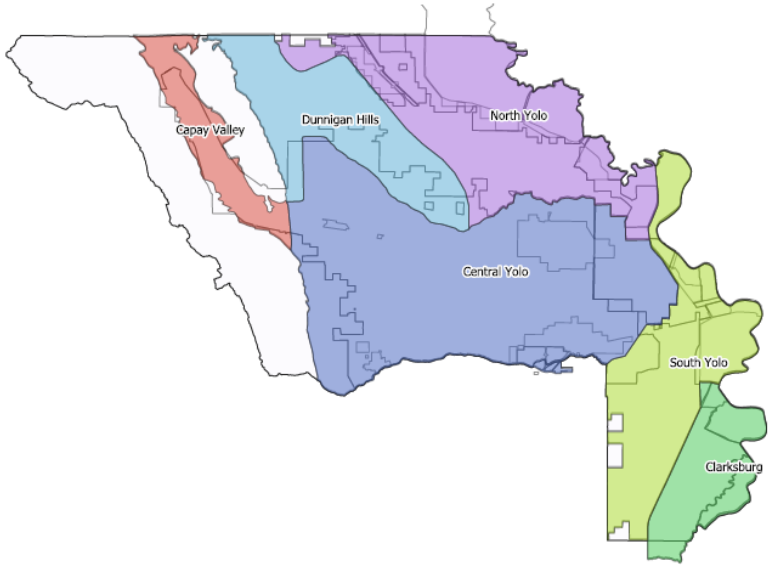
Agenda

- Approve Minutes
- Executive Officer Update – Kristin Sicke
- GSP Development
  - Groundwater Monitoring Program – Max Stevenson
  - TAC Committee Update on Sustainable Management Criteria – Satya Gala and Larry Rodriguez
  - Scheduling Management Area Workshops and Draft Chapters of the GSP – Kristin Sicke and Working Group
- BOD Meeting Agenda

Approve Minutes

Executive Officer Update

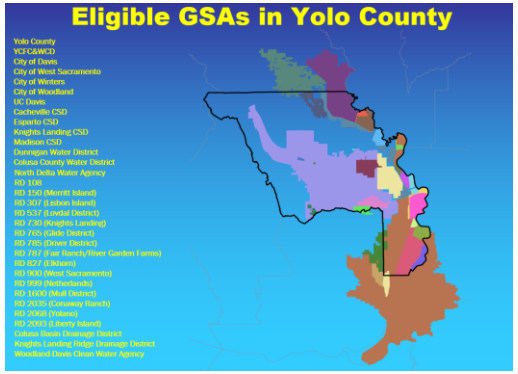
Draft – For internal discussion purposes only
June 11, 2020



Yolo Subbasin Groundwater Agency

25 Members

- Limited Authority
- For regional planning & reporting
- JPA defines authorities & responsibilities of GSA, Management Areas, and Eligible Entities



Groundwater Sustainability Plan

Management Areas are used to define sustainability goals and objectives for a hydrogeologic setting.

Capay Valley

YCFC&WCD
Yocha Dehe Wintun Nation
Yolo County (white area)
Yolo County Farm Bureau
Environmental Representative

Advisory Committee
Public

North Yolo

Dunnigan WD
Colusa Drain Mutual Water Co.
California American Water
RDs 108, 730, and 787
Yolo County (white area)
Yolo County Farm Bureau
Environmental Representative

Advisory Committee
Public

Central Yolo

Cities of Davis, Woodland &Winters
UC Davis
YCFC&WCD
RD 2035
Esparto and Madison CSDs
Yolo County (white area)
Yolo County Farm Bureau
Environmental Representative

Advisory Committee
Public

Dunnigan Hills

YCFC&WCD
Yolo County Farm Bureau
Yolo County (white area)
Environmental Representative

Advisory Committee
Public

South Yolo

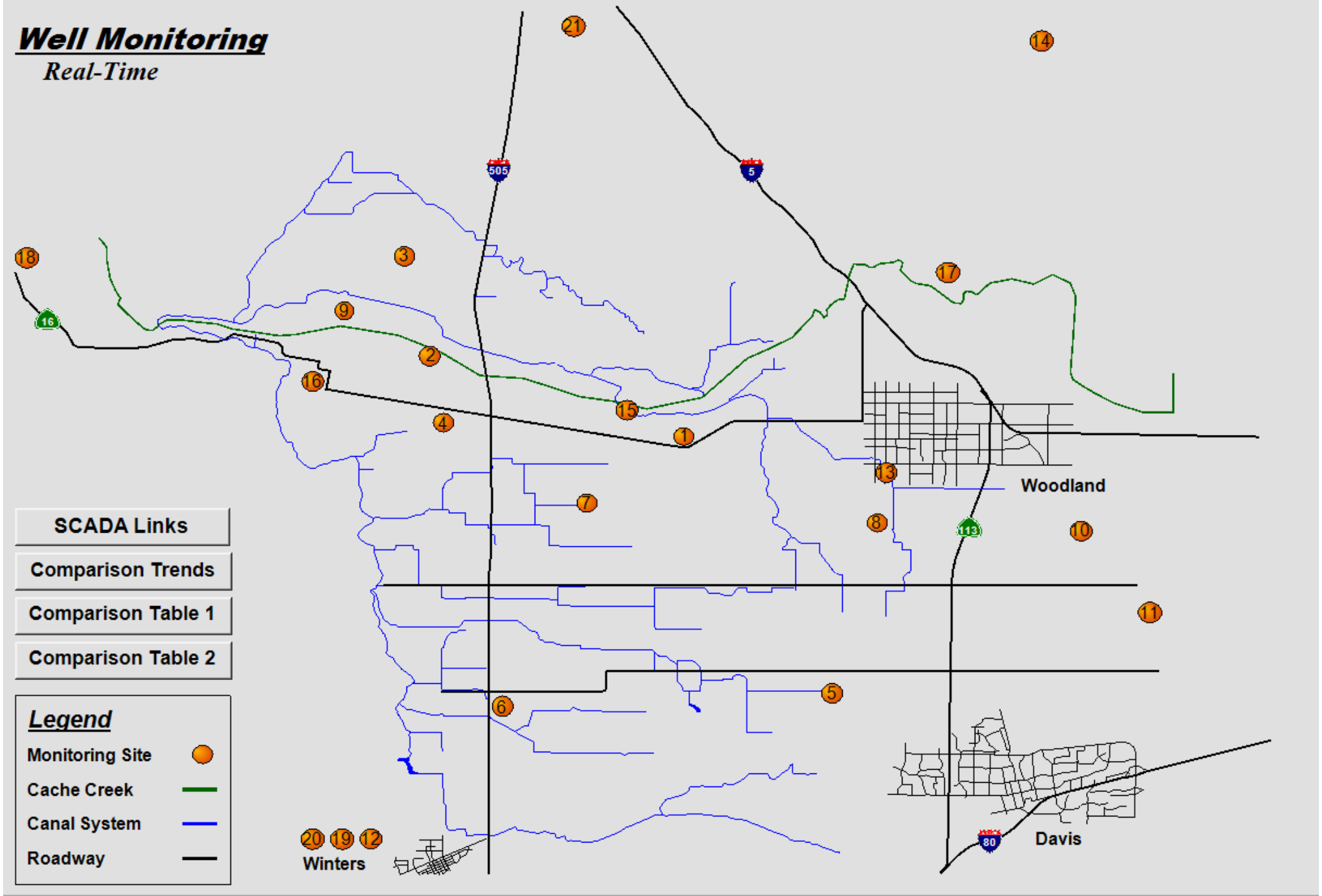
City of West Sacramento
RDs 537 and 1600
Yolo County Farm Bureau
Yolo County (white area)
Environmental Representative

Advisory Committee
Public

Clarksburg

RDs 150, 307, 765, and 999
Yolo County Farm Bureau
Environmental Representative

Advisory Committee
Public


Well Monitoring
Real-Time
SCADA Links
Comparison Trends
Comparison Table 1
Comparison Table 2
Legend
Monitoring Site
Cache Creek
Canal System
Roadway
Woodland
Davis
Winters
505
5
16
113
80

Well Monitoring

Depth to Water Historical Comparison

(Daily Average DTW in feet)

SCADA Links | Well Map | Select Date | 09/09/20

Comparison Trends | Comparison Table 2

Well	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Δ 2019 - 2020	Δ 2015 - 2020
1.	96.4	96.0	99.3	108.1	130.9	133.9	122.4	111.0	112.3	106.9	114.8	-8.0	19.0
2.	45.2	31.7	35.7	37.9	55.5	60.1	44.4	30.4	33.4	30.7	32.0	-1.2	28.2
3.	48.1	39.7	45.8	52.5	83.6	77.6	63.8	40.3	44.8	38.6	43.5	-4.9	34.0
4.		32.0	35.0	44.3	53.3	59.9	43.3	32.5	31.8	32.7	36.8	-4.1	23.1
5.	17.2	17.2	19.3	21.6		35.4	35.8	23.7	25.3	18.4	22.6	-4.2	12.8
6.			44.5	45.2	78.3	74.4	46.3	36.4	40.8	32.7	37.5	-4.8	36.9
7.				16.1	41.5	49.7	27.0	21.0	21.8	18.6	24.4	-5.7	25.4
8.				63.2	83.4	82.5	79.8	59.8	65.1	50.6	58.3	-7.7	24.2
9.					77.2	72.6	59.5	42.0	45.3	41.3	43.3	-2.0	29.2
10.					102.5		110.9	48.8	74.3	56.6	75.9	-19.3	
11.					33.5	26.9	28.6	16.7	26.4	18.2	24.7	-6.6	2.1
12.									123.9	113.5	122.1	-8.7	
13.									96.7	94.7	92.0	2.7	
14.									10.2	10.4	10.4	.0	
15s.									41.9	36.4	46.1	-9.7	
16.										40.1	40.5	-.5	

GSP Development Schedule

Task Name	Estimated Start	Estimated Finish
Develop Sustainable Management Criteria	6/1/20	11/27/20
Develop Projects and Management Actions	11/2/20	1/1/21
Communication and Engagement		
C & E Plan	9/30/20	8/3/21
TAC Meetings	7/9/20	4/7/21
Working Group Meetings *MA Workshops – Round 1 (9/14-10/30)* *MA Workshops – Round 2 (12/1-1/11)*	9/10/20	3/3/21
GSA Board Meetings *Public Meeting – November 16* *Public Meeting – January 25*	6/15/20	6/21/21
GSP Report – *TAC/Working Group Review*	10/12/20	8/31/21
Introduction Chapter	10/12/20	10/23/20
Basin Setting	11/2/20	11/13/20
SMC	12/28/20	1/8/21
Projects and Management Actions	2/1/21	2/12/21
Admin Draft Review	3/29/21	4/9/21
Public Draft Review	4/26/21	7/19/21
Final GSP	8/31/21	8/31/21

Groundwater Monitoring Program Foundational Components

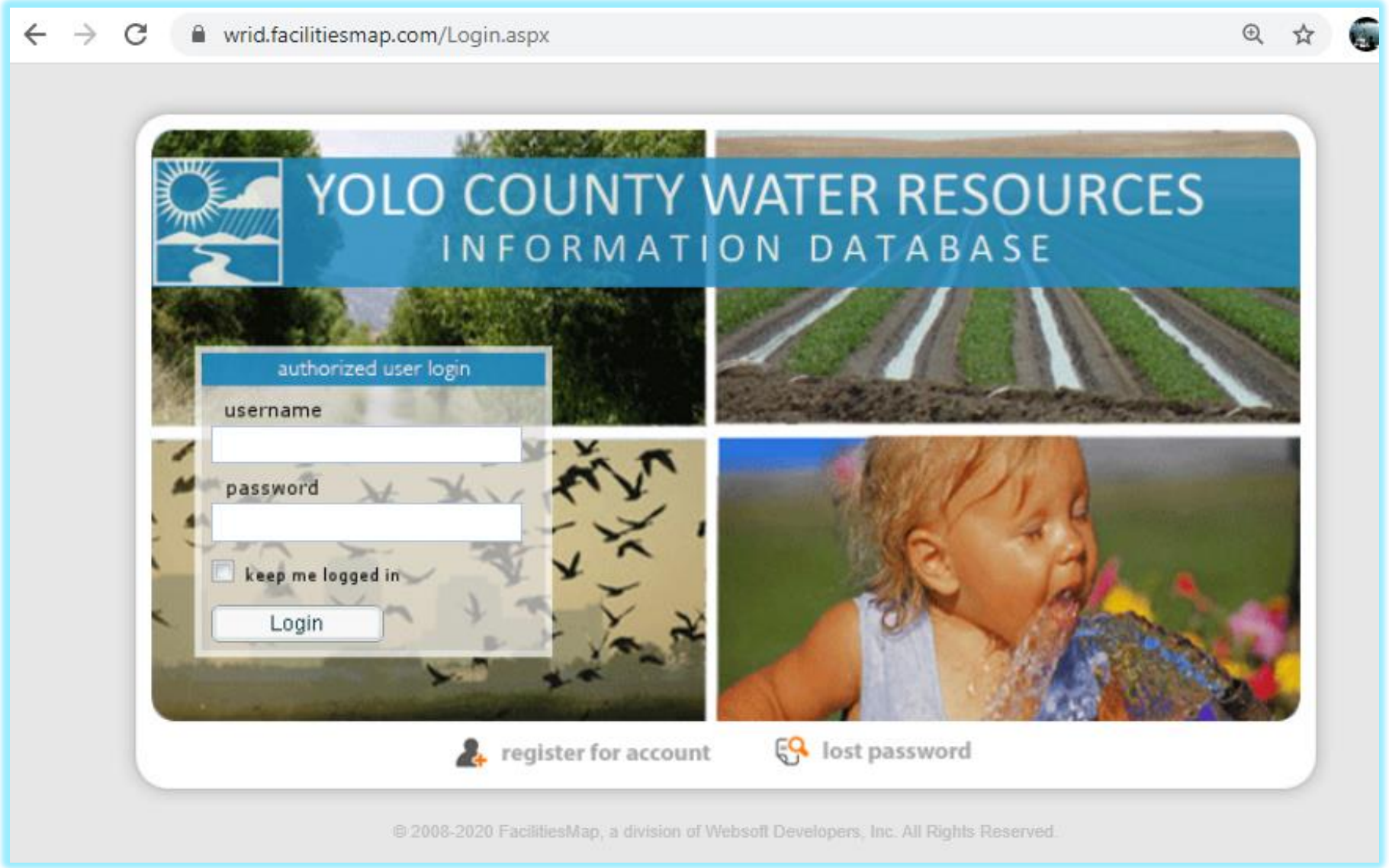
1. **W**ater **R**esources **I**nformation **D**atabase

WRID

2. **S**tate **W**ell **N**umber

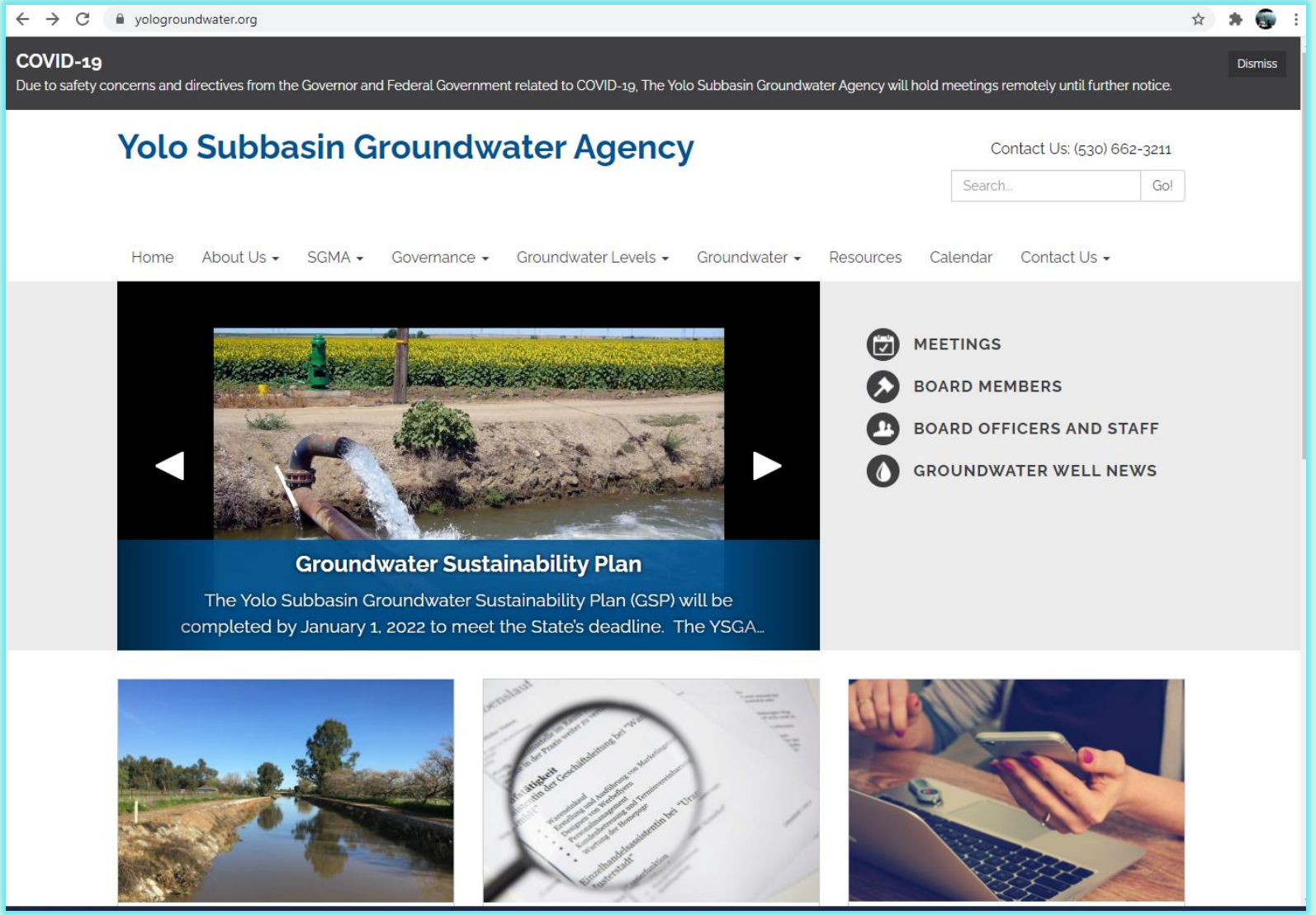
SWN

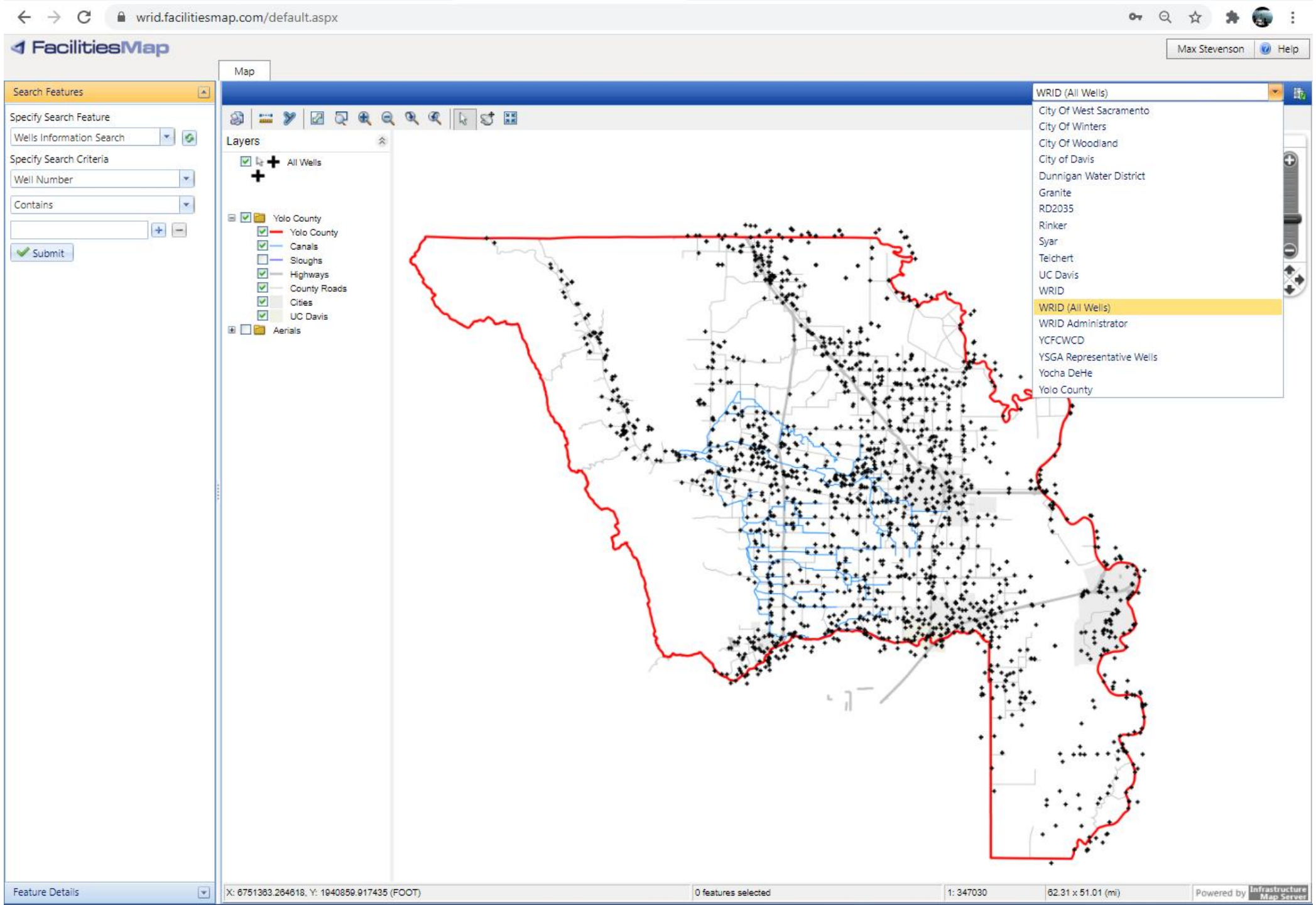
WRID



wrid.facilitiesmap.com

www.yologroundwater.org

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Syar
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YCFCWCD
YSGA Representative Wells
Yocha DeHe
Yolo County
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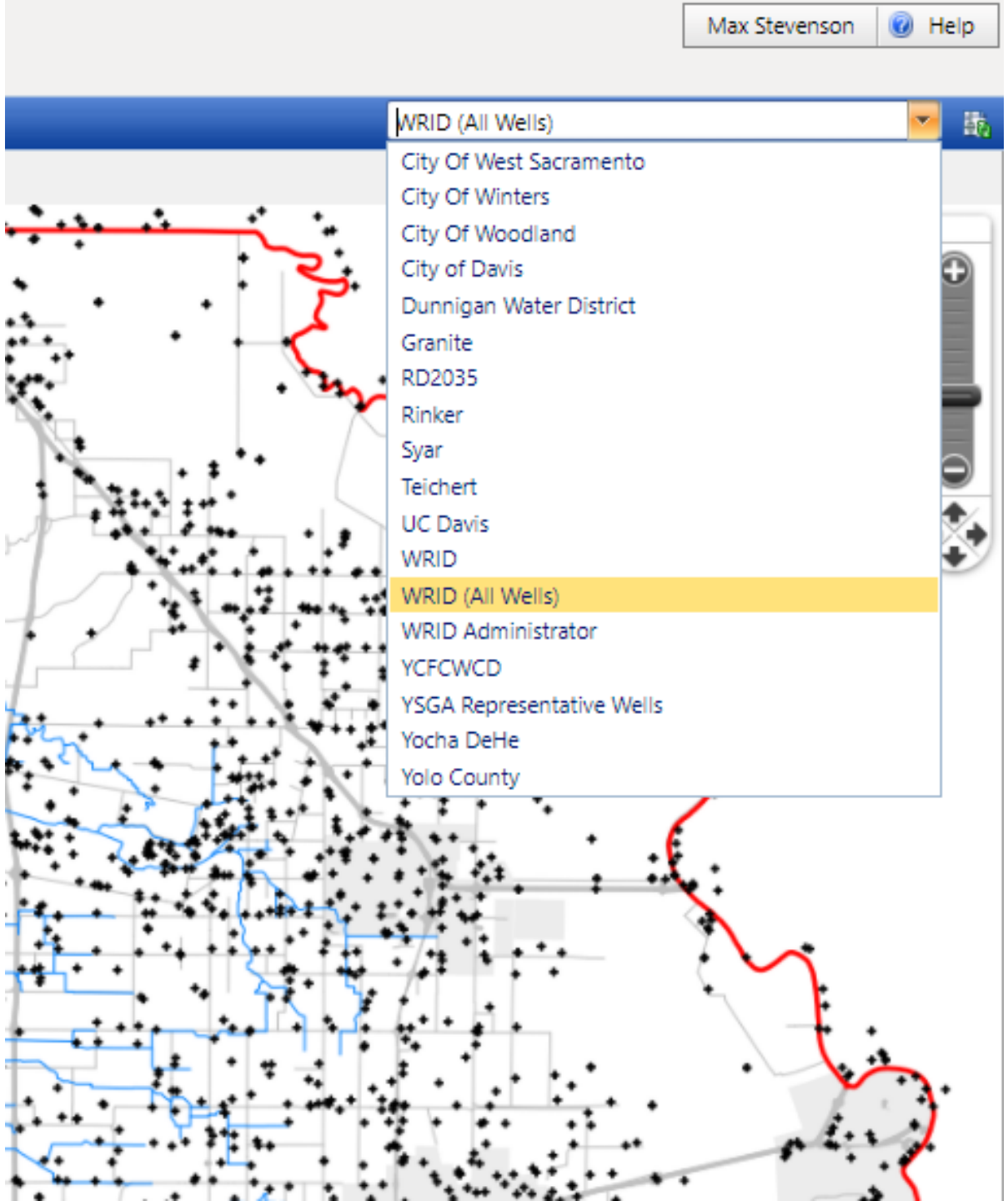
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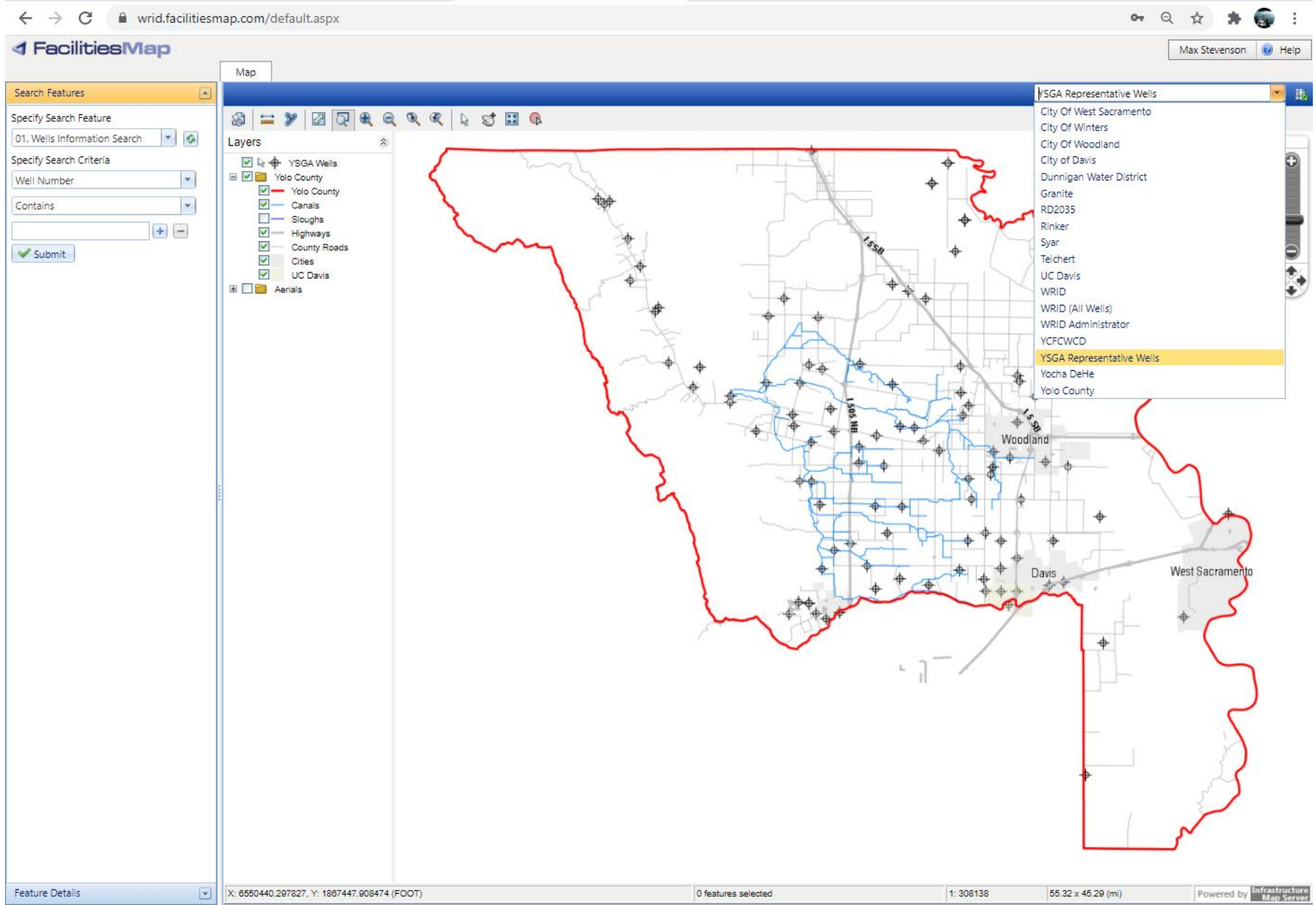
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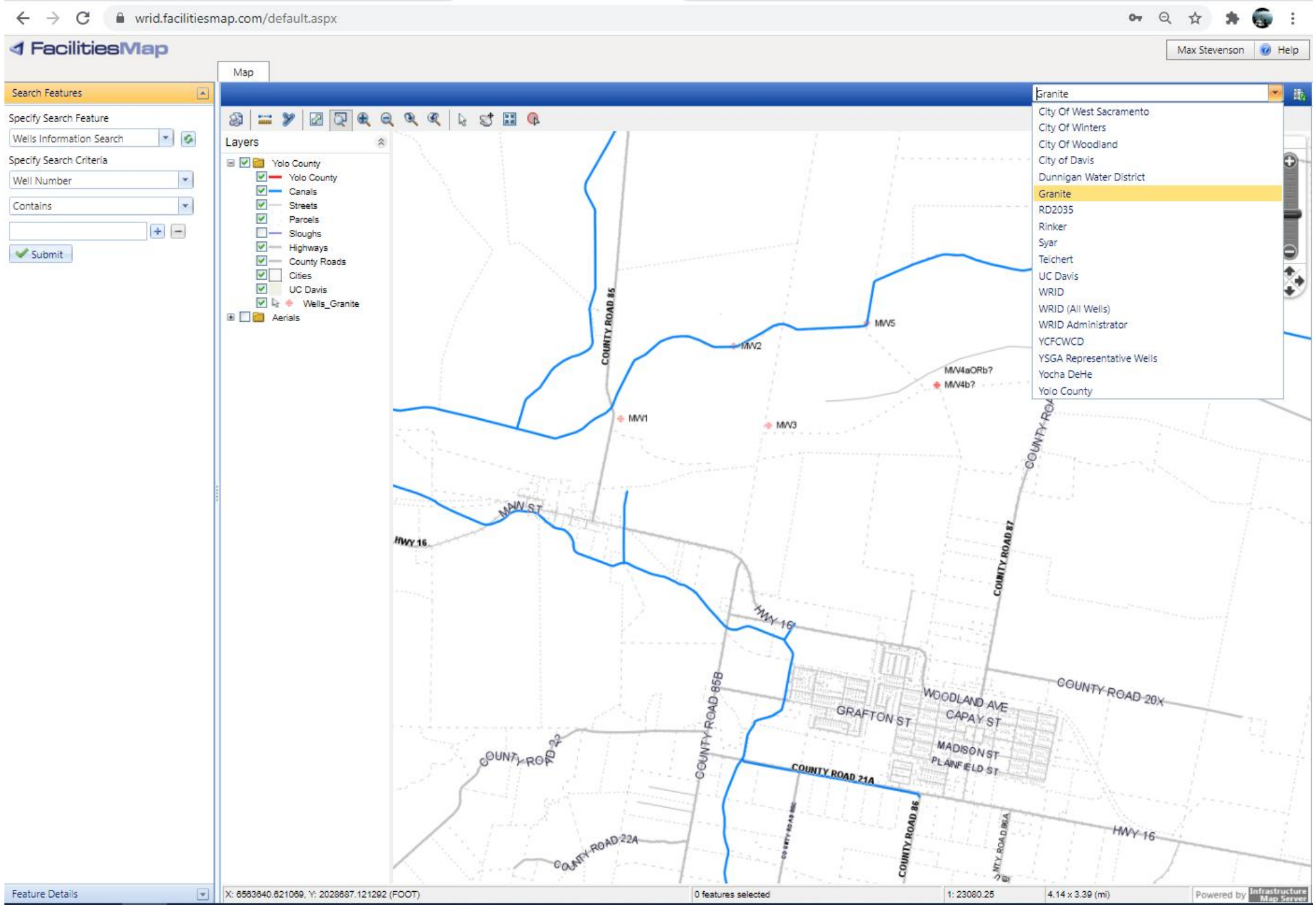
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YSGA Representative Wells
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Yolo County
COUNTY ROAD 85
MW1
MW2
MW3
MW5
MW4aORb?
MW4b?
MAIN ST
HWY 16
COUNTY ROAD 87
COUNTY ROAD 85B
COUNTY ROAD 22
COUNTY ROAD 22A
COUNTY ROAD 21A
COUNTY ROAD 86
COUNTY ROAD 20X
GRAFTON ST
WOODLAND AVE
CAPAY ST
MADISON ST
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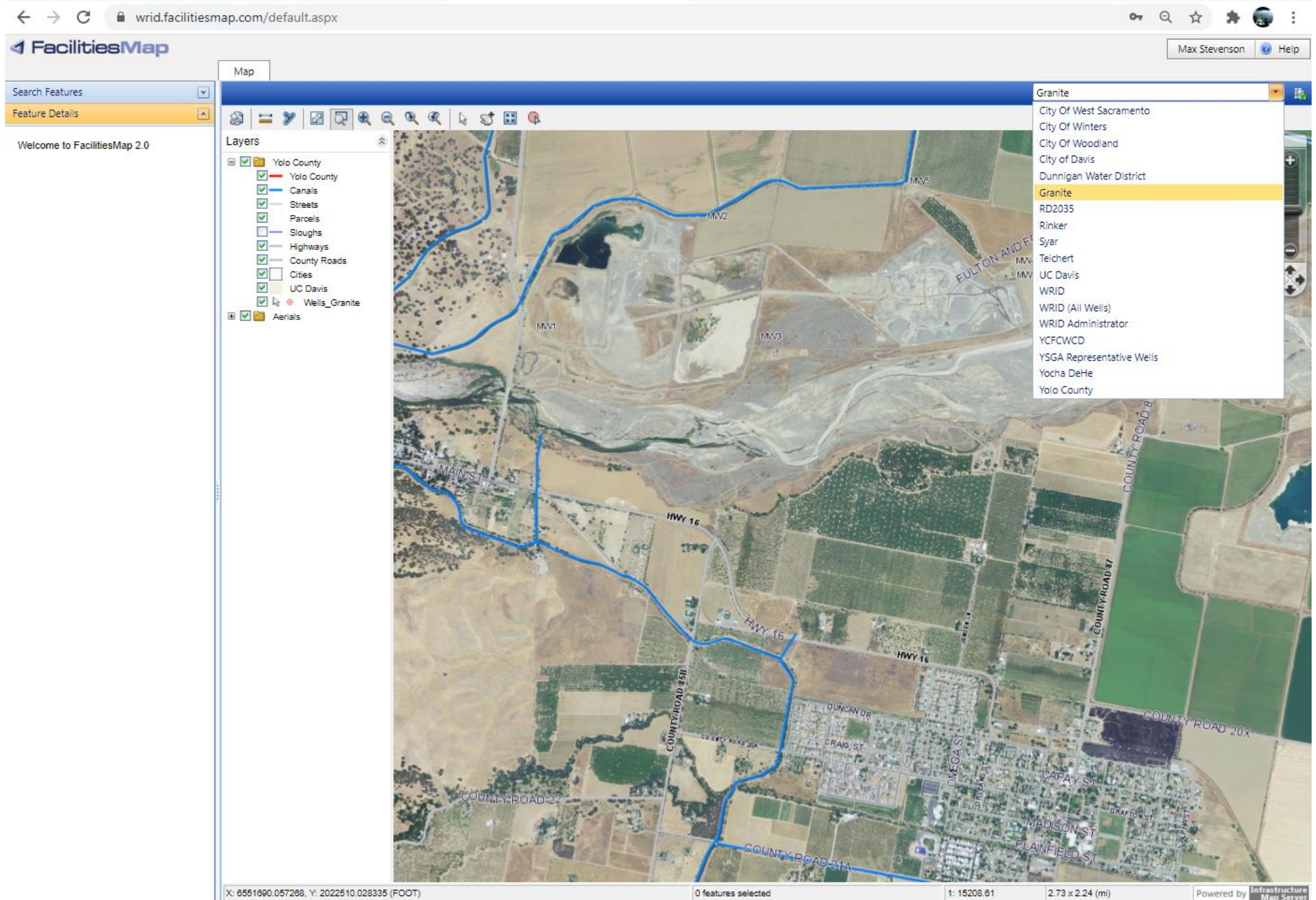
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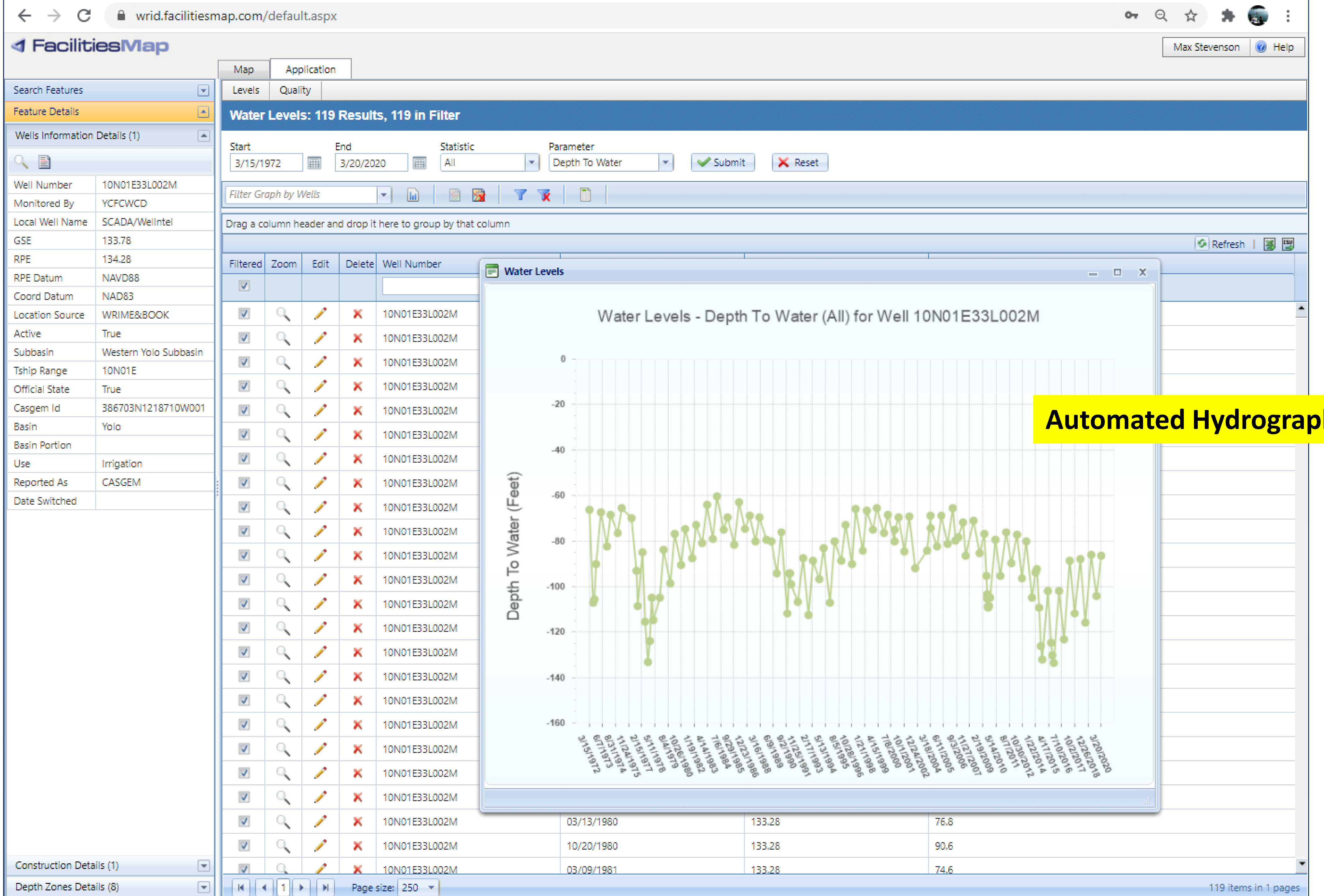
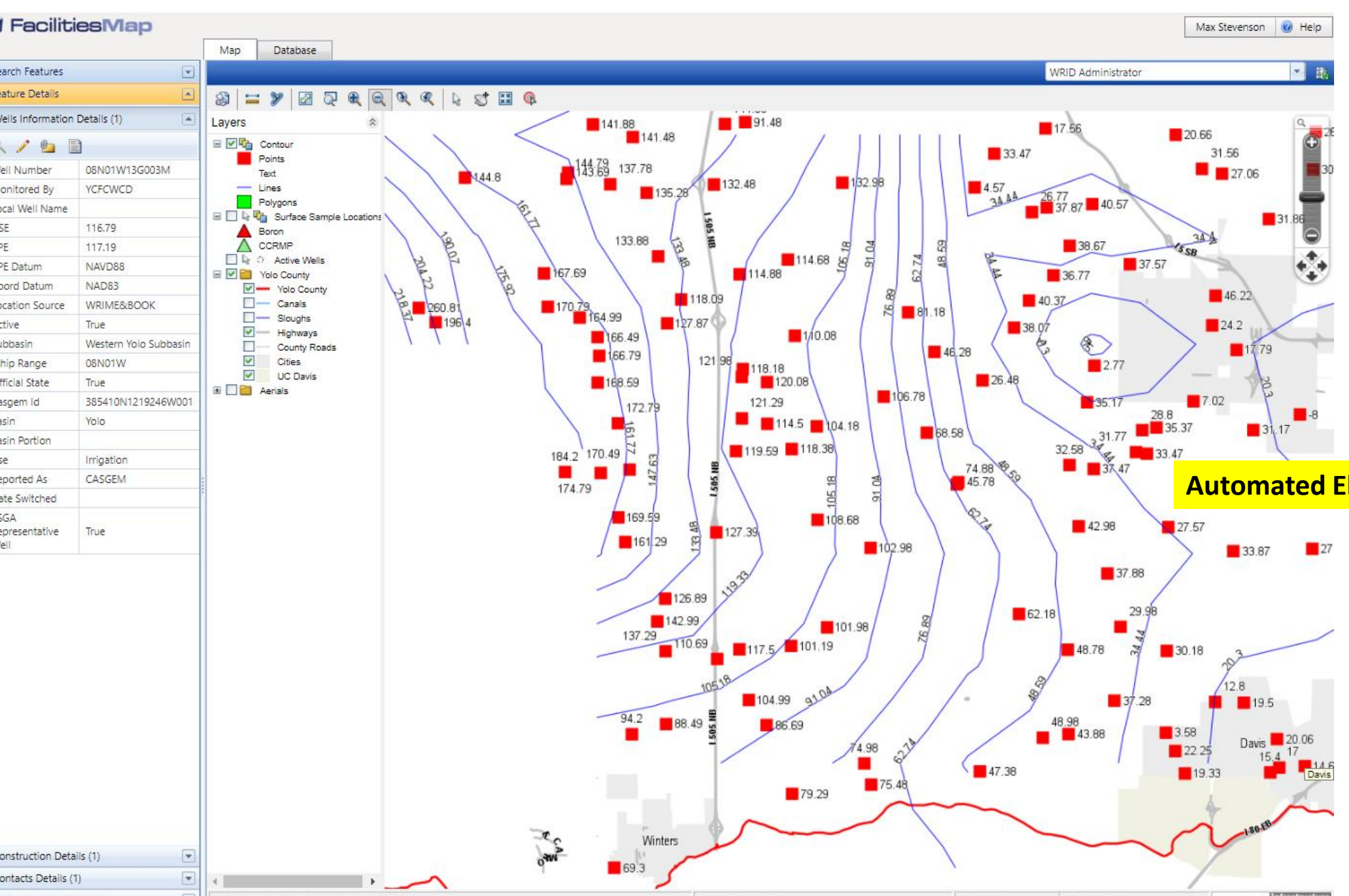


Automated Hydrographs



Automated Elevation Contours

WRID Admin Features

1. 150+ registered users
2. Customized permission/privacy settings
3. Built-in Excel Exports
4. CASGEM/State Database uploads
5. Well Owner Contact listings
6. Well documents and photos linked to each well
7. Sustainable Finances spread over many agencies
8. Available on-line to anyone

State **W**ell **N**umber

SWN


10N02E31N500M
City of Woodland MW-2B
Yolo Subasin Groundwater Agency
yologroundwater.org 530-662-0265
10N02E33N002M
Yolo Subasin Groundwater Agency
530-662-0265 yologroundwater.org


08N02E15A002M
City of Davis Well 24
Yolo Subasin Groundwater Agency
yologroundwater.org 530-662-0265

GSP Development – TAC Update on Sustainable Management Criteria Development

Yolo Subbasin Groundwater Sustainability Plan

Working Group Meeting
September 10, 2020

Agenda

- Sustainable Management Criteria
  - Sustainability Goal
  - Undesirable Results
  - Minimum Thresholds
  - Measurable Objectives
  - Monitoring Network

Sustainability

- SGMA Definition
  - "The management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results."
    - Undesirable results are:
      - Chronic lowering of groundwater levels
      - Reduction of groundwater storage
      - Degraded water quality / contaminant plume migration
      - Land Subsidence
      - Depletion of interconnected surface water
      - Seawater intrusion

Sustainability Goal

- As partially identified in the City of Davis and YCFC&WCD GMPs:
  - Achieve sustainable groundwater management in the Yolo Subbasin by maintaining or enhancing groundwater quantity and quality through the implementation of projects and management actions to support beneficial uses and users.
  - Maintain surface water flows and quality to support conjunctive use programs in the basin that promote increased groundwater levels and quality.
  - Operate within the established sustainable management criteria and maintain sustainable groundwater use, which will be satisfied through continued implementation of a monitoring and reporting program.
  - Maintain sustainable operations to maintain sustainability over the implementation and planning horizon.

Sustainable Management Criteria

- Sustainability Goal
- Undesirable Results
- Monitoring Network
- Minimum Thresholds
- Measurable Objectives
- Interim Milestones

Undesirable Results

- Chronic lowering of groundwater levels
  - The point at which significant and unreasonable impacts over the planning and implementation horizon, as determined by depth/elevation of water, affect the reasonable and beneficial use of, and access to, groundwater by overlying users
- Reduction of groundwater storage
  - The point at which significant and unreasonable impacts over the planning and implementation horizon, as determined by the amount of groundwater in the basin, affect the reasonable and beneficial use of, and access to, groundwater by overlying users.

Sustainable Management Criteria

- Sustainability Goal
- Undesirable Results
- Minimum Thresholds
- Measurable Objectives
- Monitoring Network

Sustainable Management Criteria

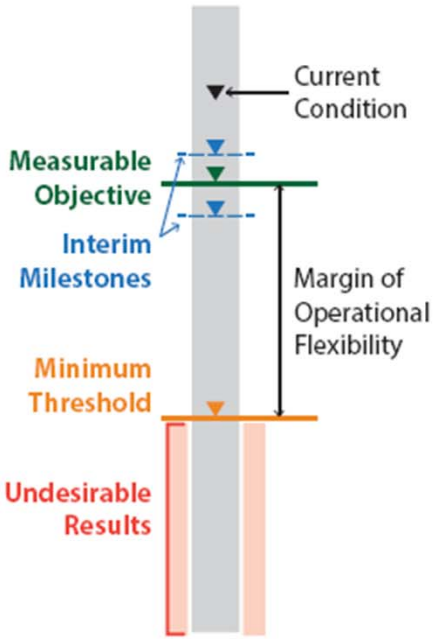
➢ Minimum Threshold

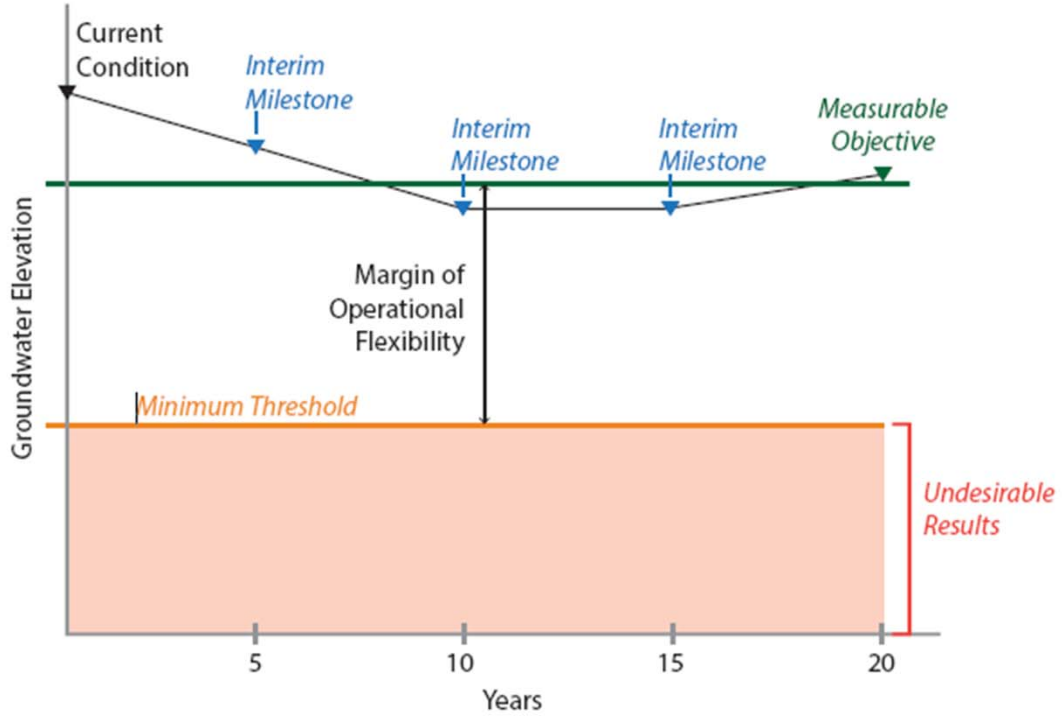
- The level that you never want to go below or exceed
- Violation of Minimum Threshold is an indication that a portion of the Subbasin is not being managed sustainably
- Local call to action to avoid further declines
- YSGA's goal is to proactively manage the basin and to take local action to keep the basin above MT

➢ Measurable Objective

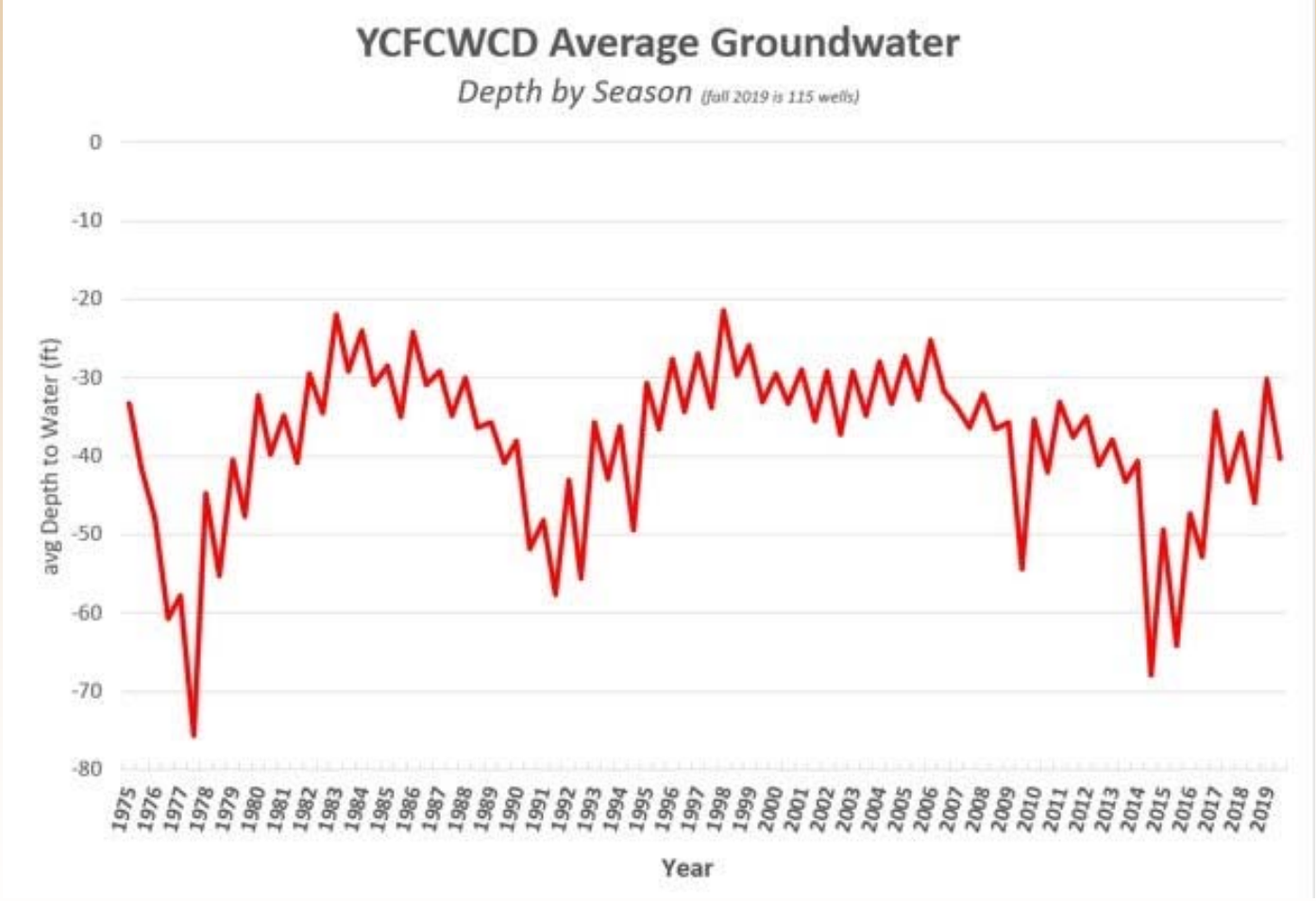
- Where you want to be operating most of the time
- Represents a long-term average, not annual values

Sustainable Management Criteria

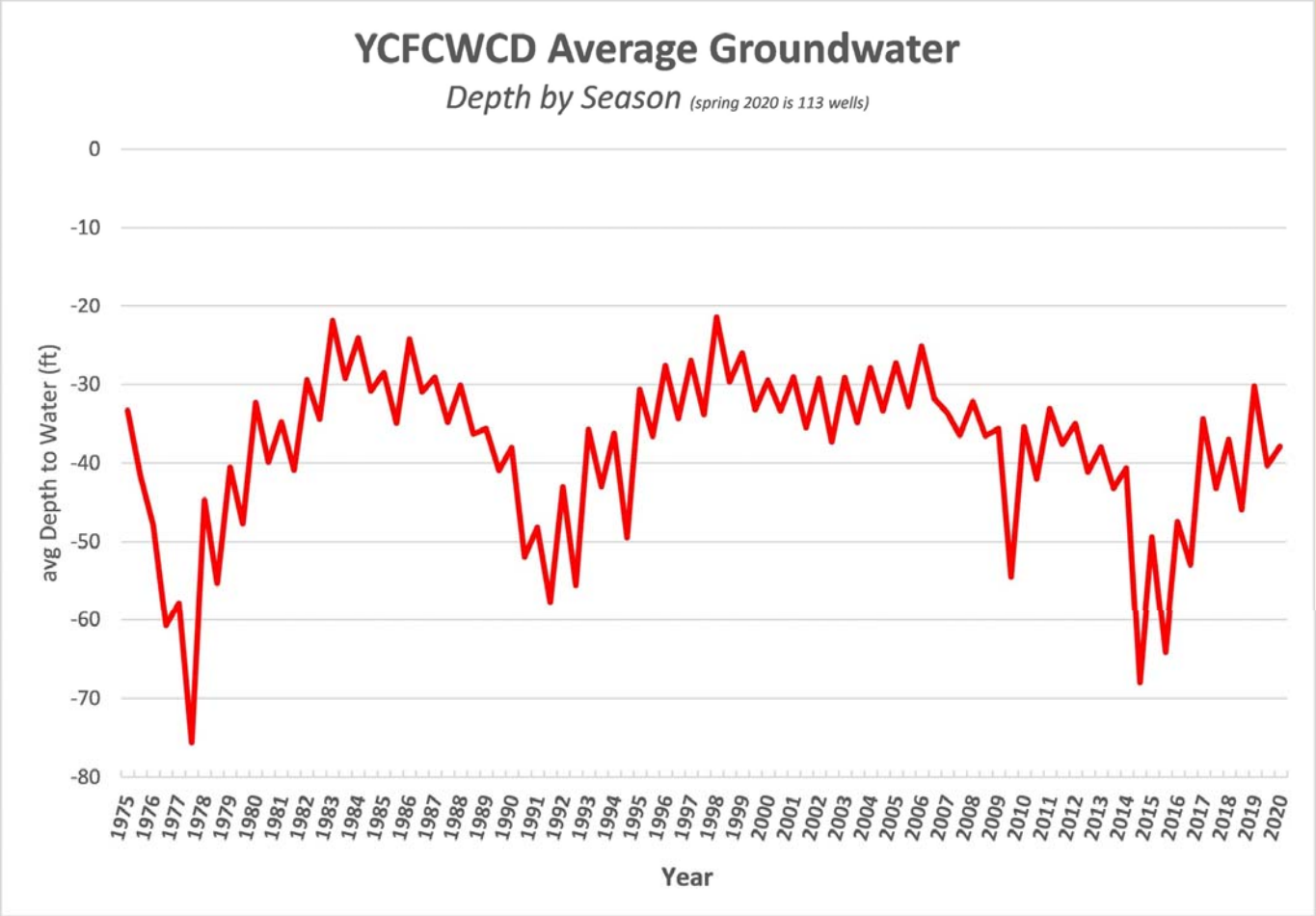




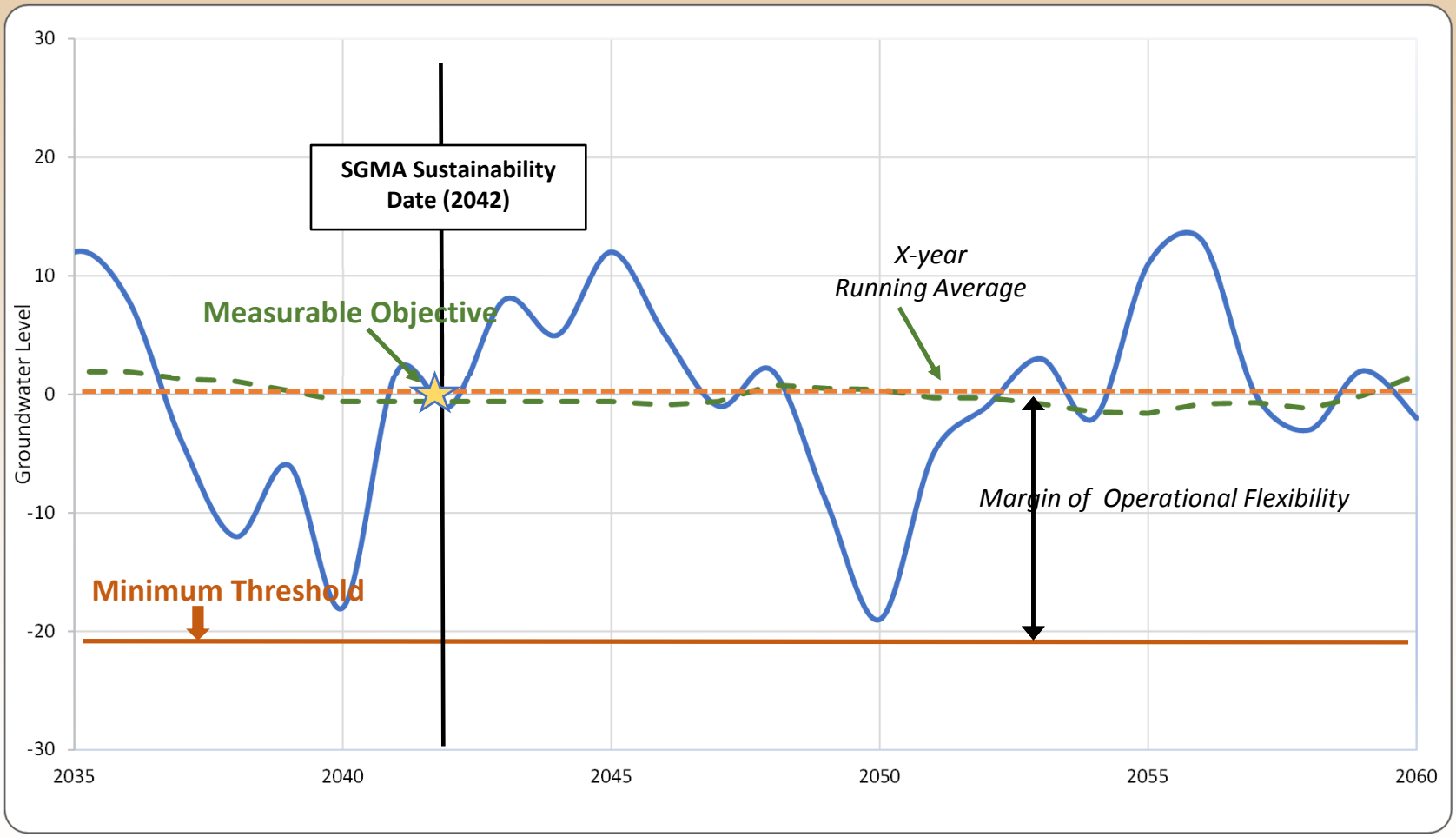
Historical Average Depth to Groundwater in YCFCWCD



Historical Average Depth to Groundwater in YCFCWCD



Groundwater Levels



Water Year Types

Sacramento Valley Index						
Year	Index	Year Type		Year	Index	Year Type
2019	10.34	W		1999	9.80	W
2018	7.14	BN		1998	13.31	W
2017	14.14	W		1997	10.82	W
2016	6.71	BN		1996	10.26	W
2015	4.00	C		1995	12.89	W
2014	4.07	C		1994	5.02	C
2013	5.83	D		1993	8.54	AN
2012	6.89	BN		1992	4.06	C
2011	10.54	W		1991	4.21	C
2010	7.08	BN		1990	4.81	C
2009	5.78	D		1989	6.13	D
2008	5.16	C		1988	4.65	C
2007	6.19	D		1987	5.86	D
2006	13.20	W		1986	9.96	W
2005	8.49	AN		1985	6.47	D
2004	7.51	BN		1984	10.00	W
2003	8.21	AN		1983	15.29	W
2002	6.35	D		1982	12.76	W
2001	5.76	D		1981	6.21	D
2000	8.94	AN		1980	9.04	AN

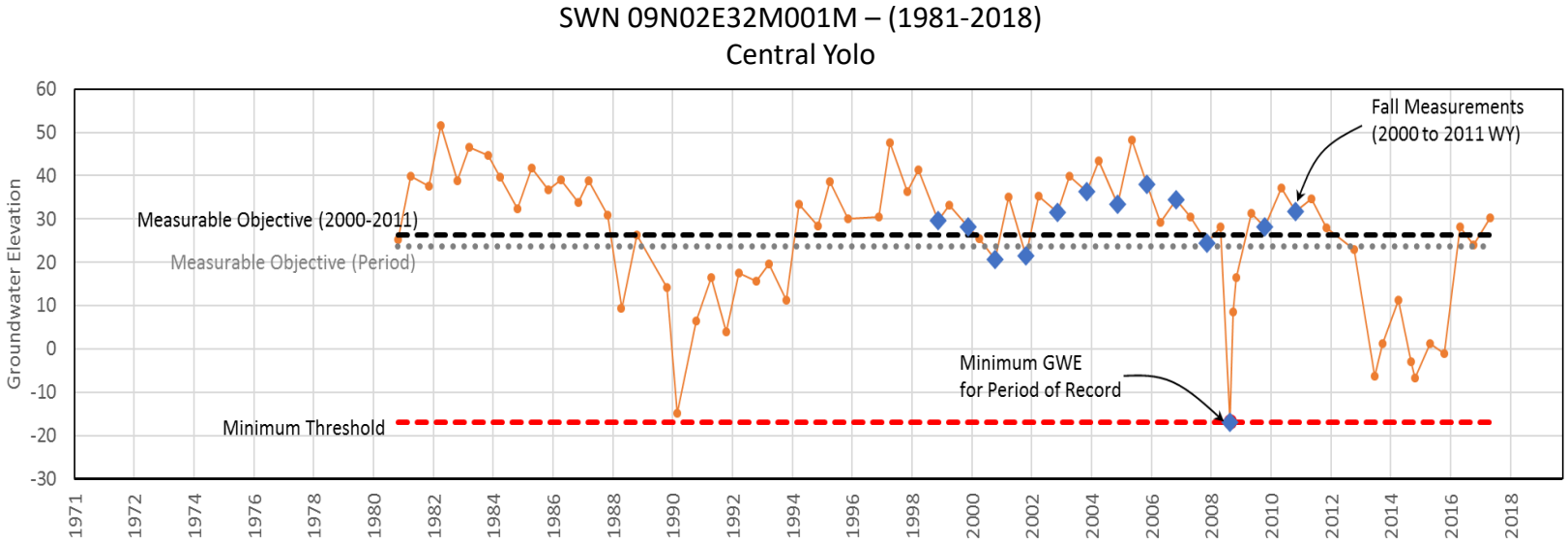
Sustainable Management Criteria

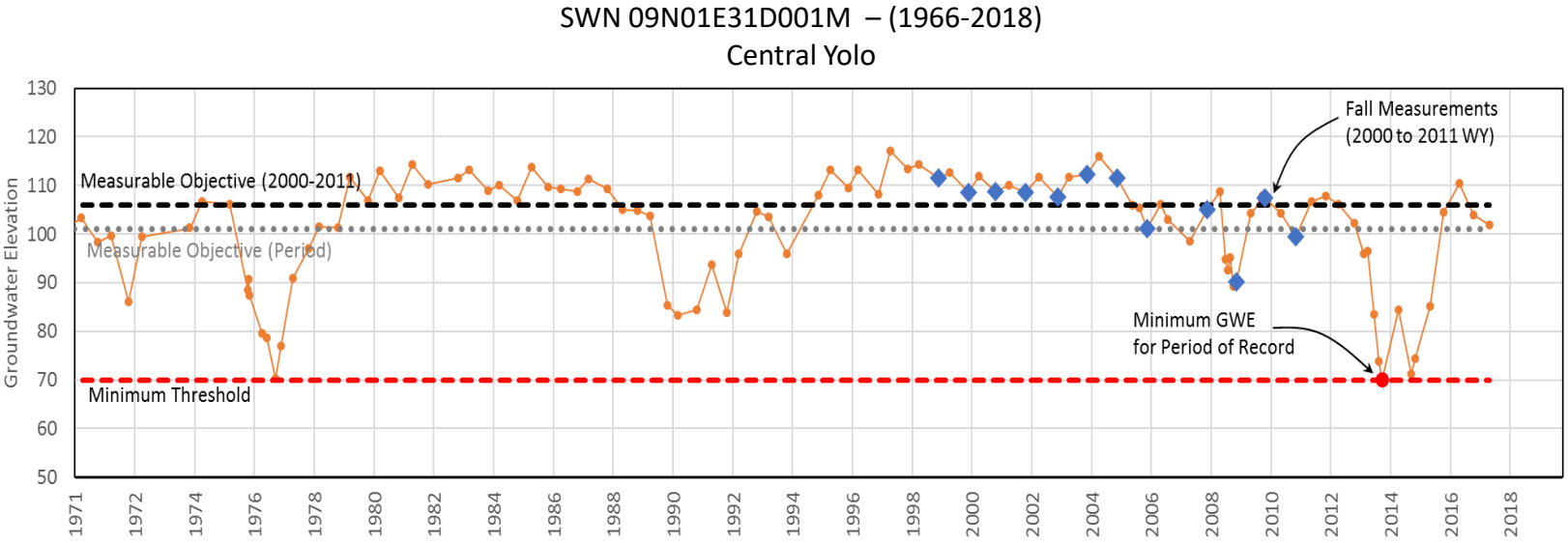
- Minimum Threshold
  - Established as the minimum Fall (Sep-Dec) groundwater elevation for the period of record for the representative monitoring site
- Measurable Objective
  - Established as either:
    - Average minimum Fall (Sep-Dec) groundwater elevation for the 2000-2011 water year period

      or

    - Average minimum Fall (Sep-Dec) groundwater elevation for the period of record for the representative monitoring site

Central Yolo Management Area





Sustainable Management Criteria

- Minimum Threshold (MT)
  - Established as the minimum Fall (Sep-Dec) groundwater elevation for the period of record for the representative monitoring site
- Measurable Objective (MO)
  - Established as either:
    - Average minimum Fall (Sep-Dec) groundwater elevation for the 2000-2011 water year period

Sustainable Management Criteria

- MT and MO developed act as a starting point
- Will be refined with further coordination with Management Areas (MA)
- Refined MT/MO will then be coordinated between MA's

Sustainable Management Criteria

- Sustainability Goal
- Undesirable Results
- Minimum Thresholds
- Measurable Objectives
- Monitoring Network

SGMA Requirements

§ 354.34 Monitoring Network

(d) The monitoring network shall be designed to ensure adequate coverage of sustainability indicators. If management areas are established, the quantity and density of monitoring sites in those areas shall be sufficient to evaluate conditions of the basin setting and sustainable management criteria specific to that area.

(e) A Plan may utilize site information and monitoring data from existing sources as part of the monitoring network.

SGMA BMPs

- Monitoring Networks and Identification of Data Gaps BMP

  *There is **no definitive rule** for the density of groundwater monitoring points needed in a basin.*

- Monitoring Well Density Considerations

  CASGEM Groundwater Elevation Monitoring Guidelines (DWR, 2010)

Reference	Monitoring Well Density (wells per 100 miles^2)
Heath (1976)	0.2 - 10
Sophocleous (1983)	6.3
Hopkins (1984)	
Basins pumping more than 10,000 acre- feet/year per 100 miles2	4.0
Basins pumping between 1,000 and 10,000 acre-feet/year per 100 miles^2	2.0
Basins pumping between 250 and 1,000 acre-feet/year per 100 miles^2	1.0
Basins pumping between 100 and 250 acre-feet/year per 100 miles^2	0.7

Yolo Subbasin

- Total Area
  - 540,000 acres
  - 845 sq. miles
- Average GW Pumping
  - 400,000 ac-ft/year
  - 47,500 ac-ft per 100 square miles

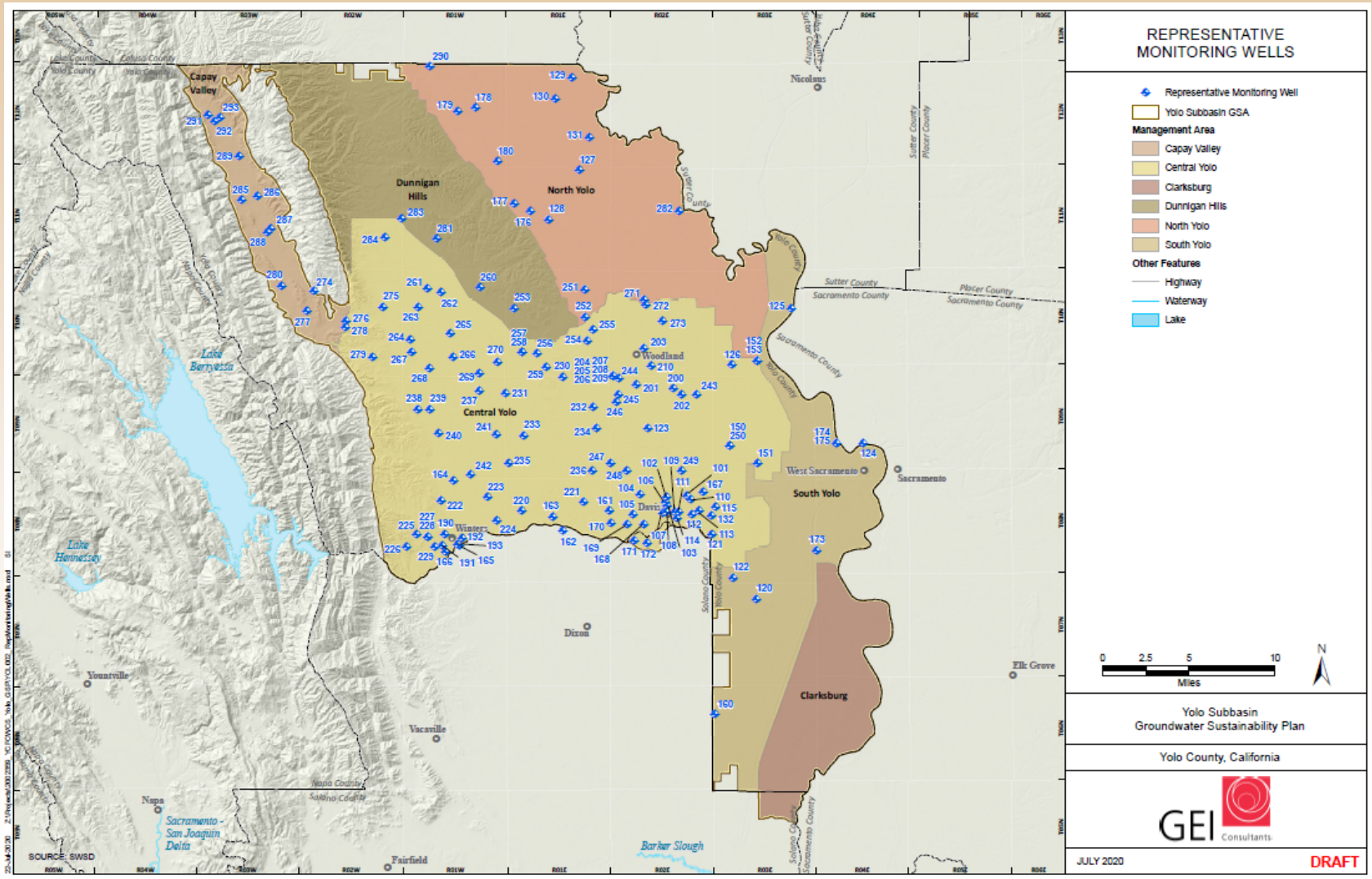
Goals

- Adequate coverage
- Reflective of current and future conditions
- To evaluate current and future conditions
- Determine impacts to beneficial water use

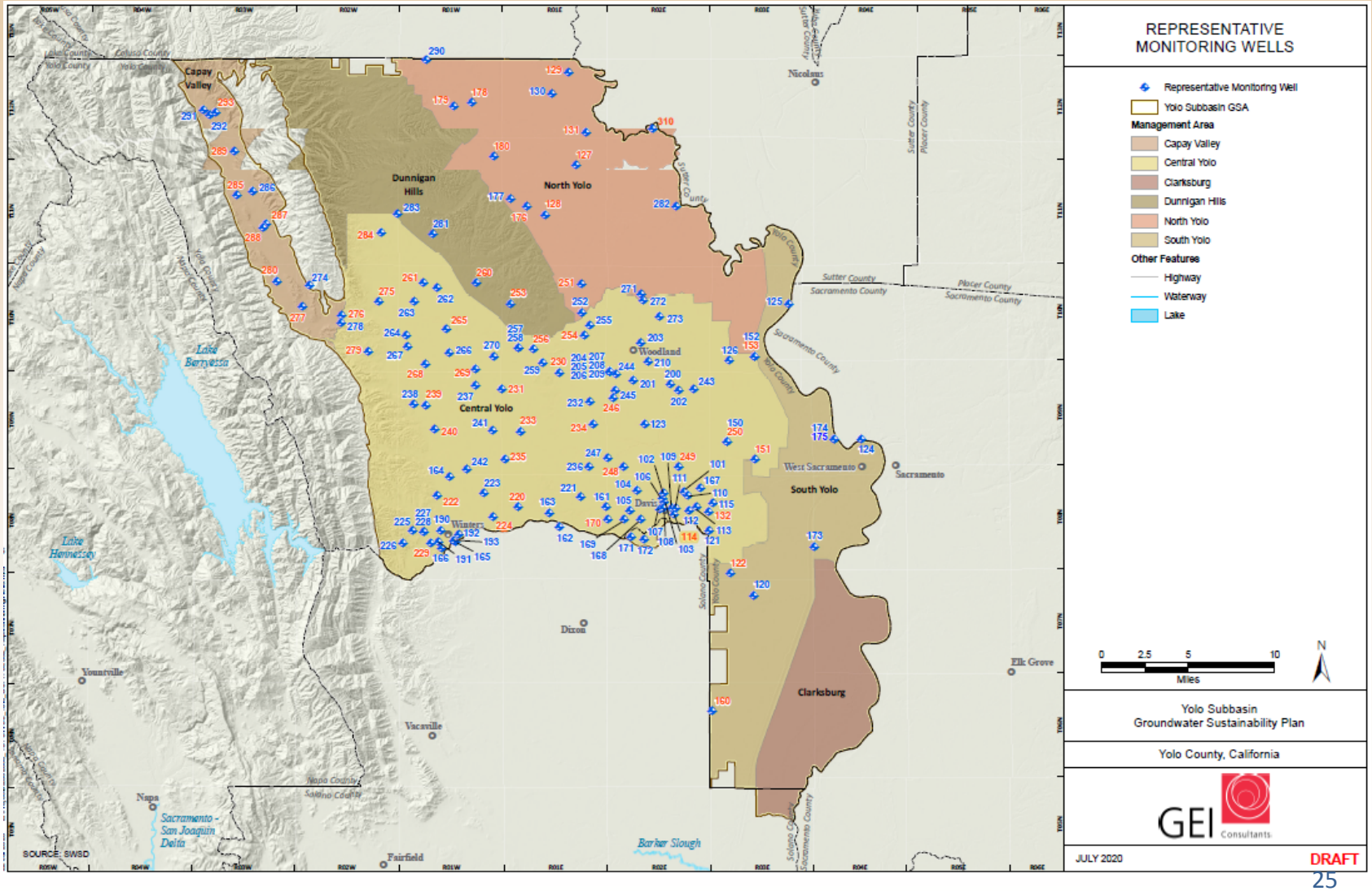
Methodology

- Identify Sustainability Indicators
  - Groundwater Elevations
  - Groundwater Storage
- Collect existing information
  - YCFCWCD
- Select Representative Monitoring Wells
  - Verify adequate spatial distribution
  - Reflective of current and future conditions
  - Identify gaps
    - Fill gaps with other wells

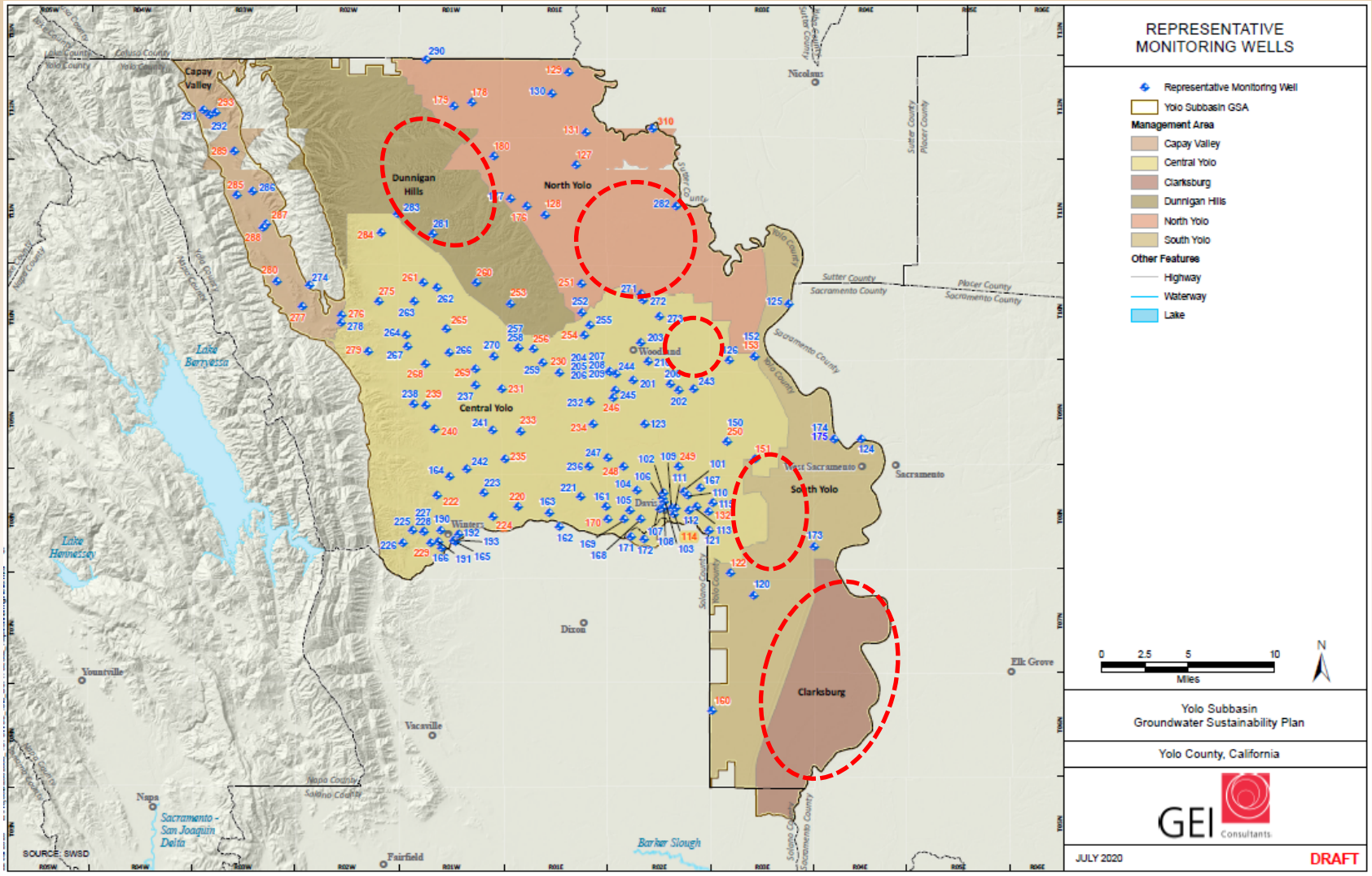
Preliminary



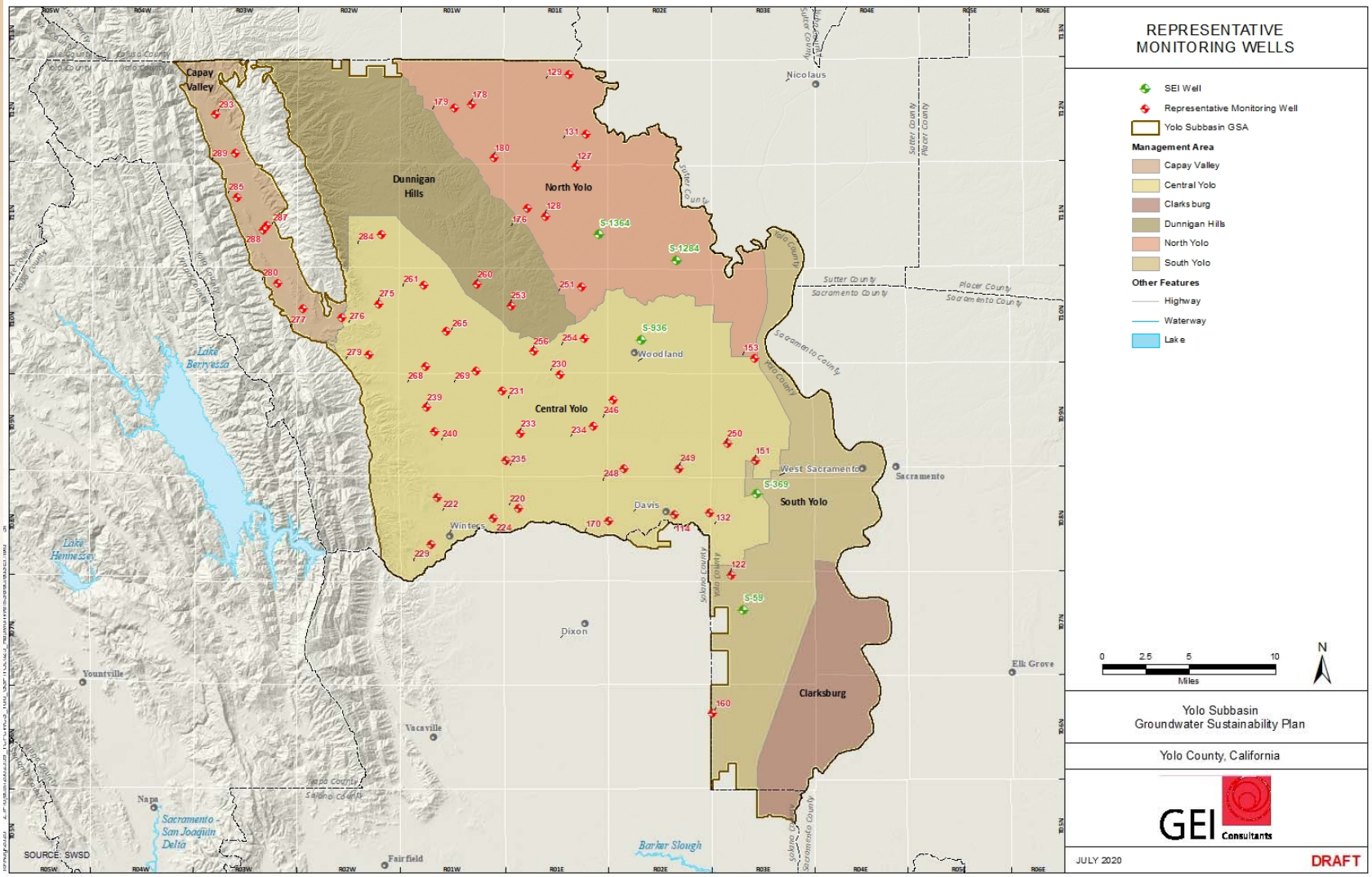
Spatial Distribution & Time Period



Gaps Identified



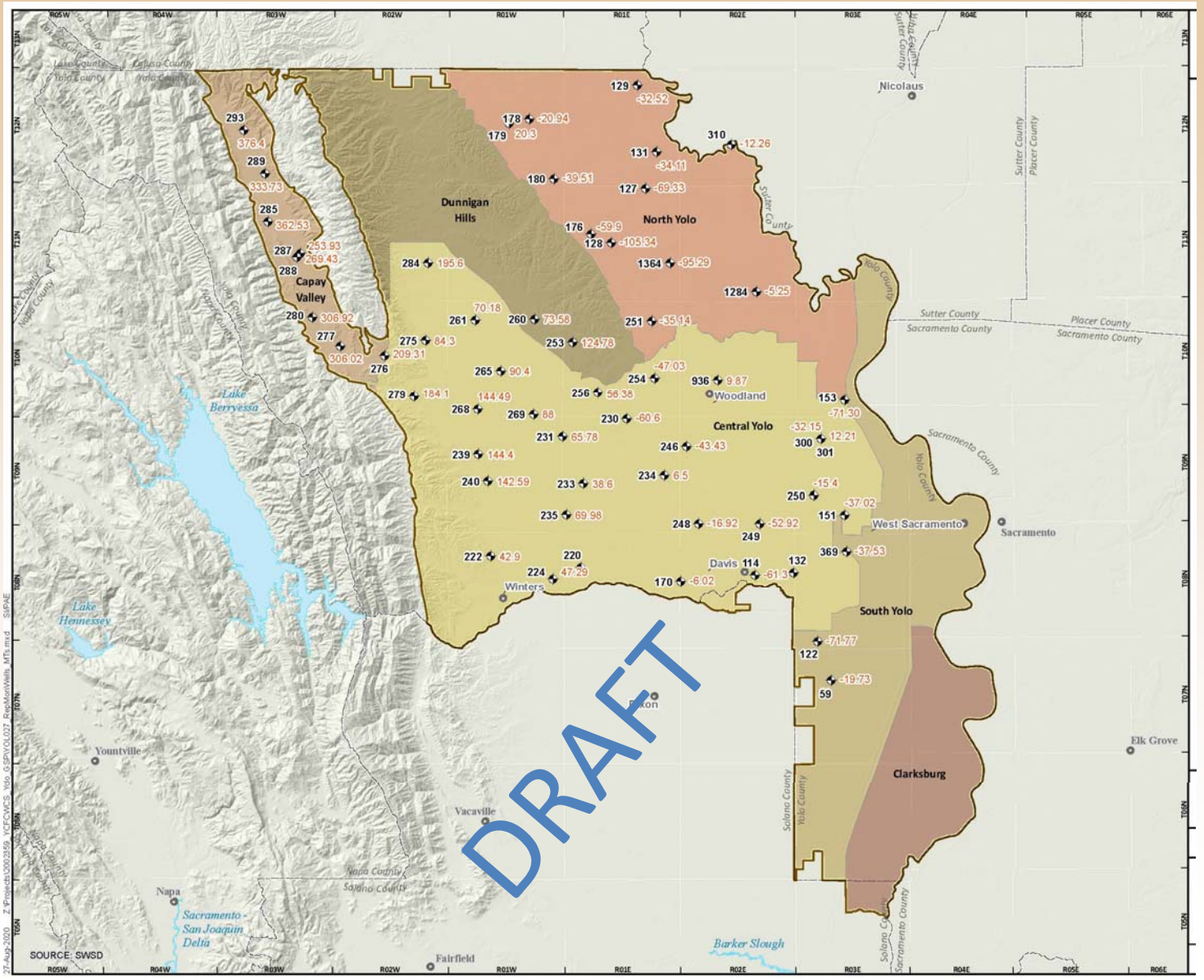
Representative Monitoring Wells



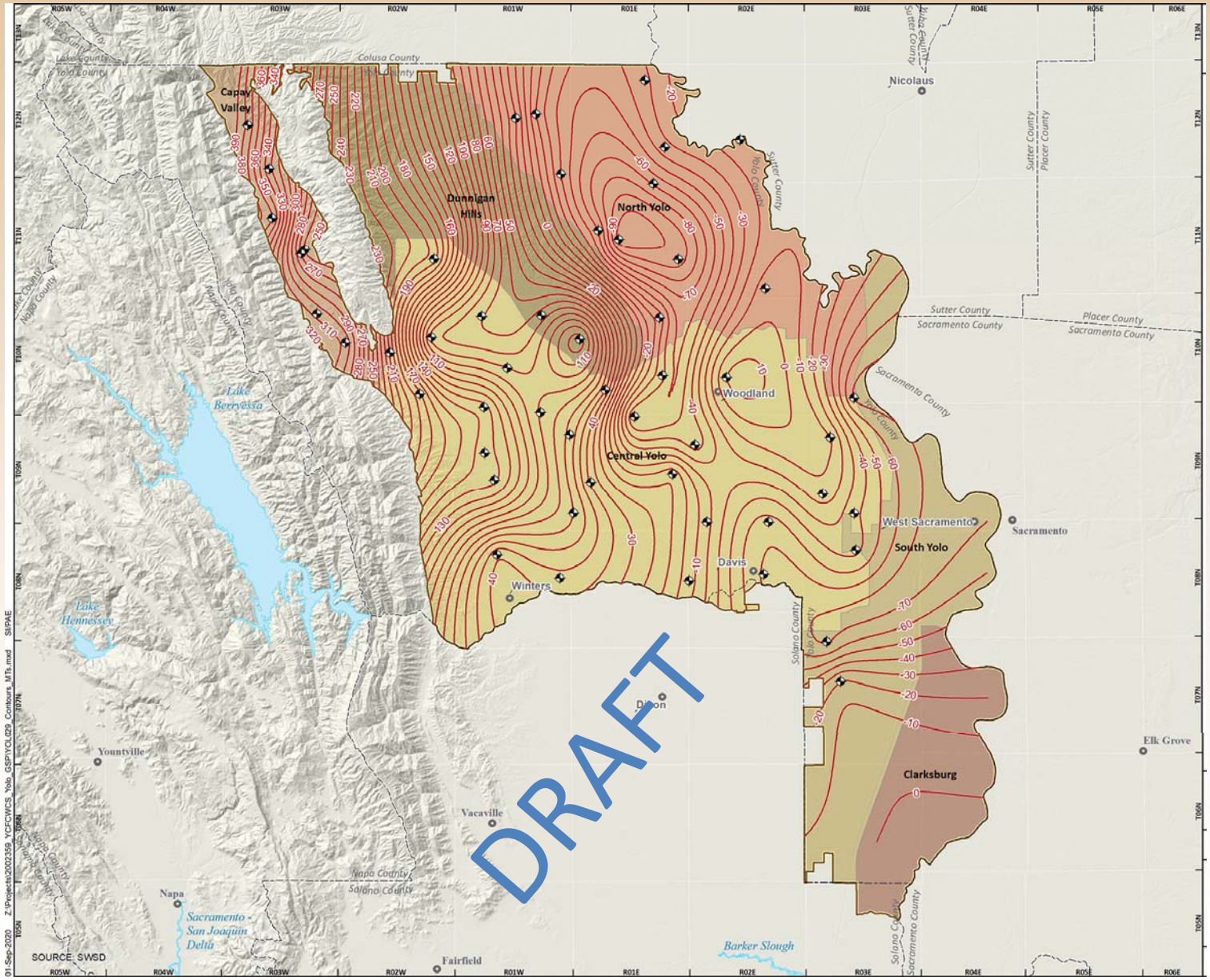
Monitoring Wells Density

Management Area	Area		Proposed Monitoring Wells	Wells per 100 Sq Miles
	Acres	Sq Miles		
Capay Valley	27,897	44	8	18.4
Central Yolo	218,395	341	31	9.1
Dunnigan Hills	38,484	60	2	3.3
North Yolo	76,263	119	11	9.2
South Yolo	104,368	163	3	1.8
Clarksburg	75,210	118	??	??
Total:	**540,617**	**845**	**55**	**6.5**

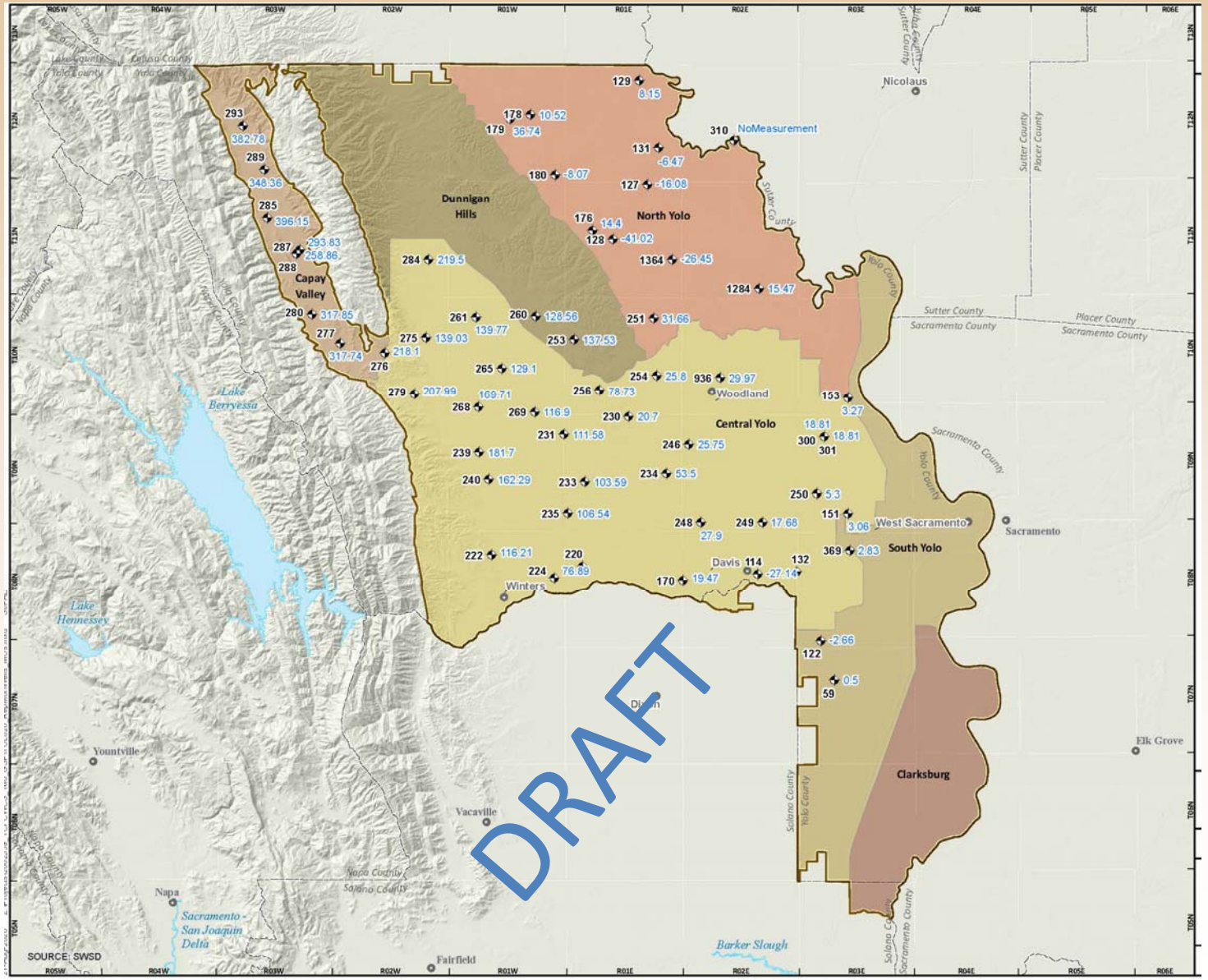
Minimum Threshold



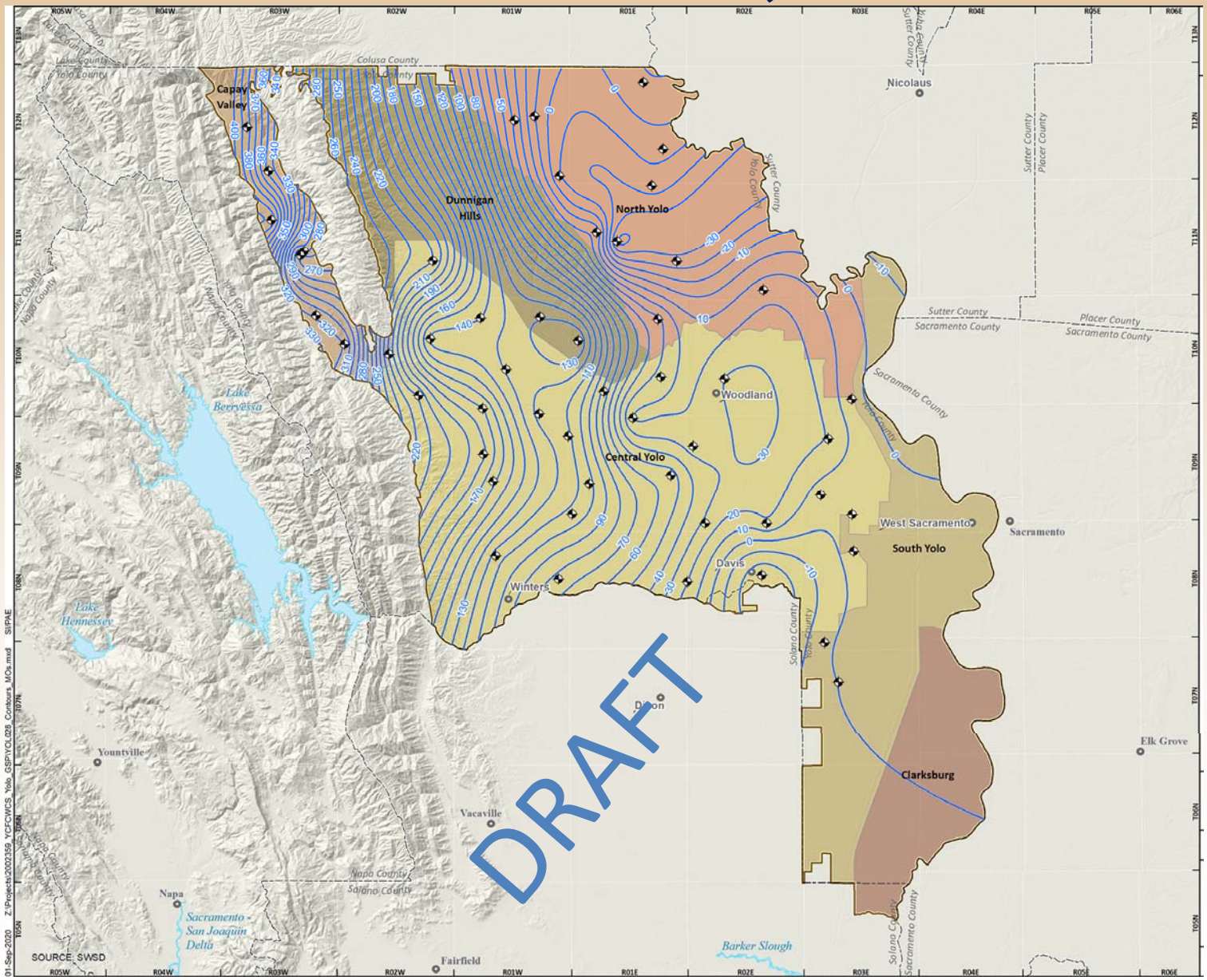
Minimum Threshold



Measurable Objectives



Measurable Objectives



Undesirable Results

§ 354.26. Undesirable Results

(a) Each Agency shall describe in its Plan the processes and criteria relied upon to define undesirable results applicable to the basin.

Undesirable results occur when significant and unreasonable effects for any of the sustainability indicators are caused by groundwater conditions occurring throughout the basin.

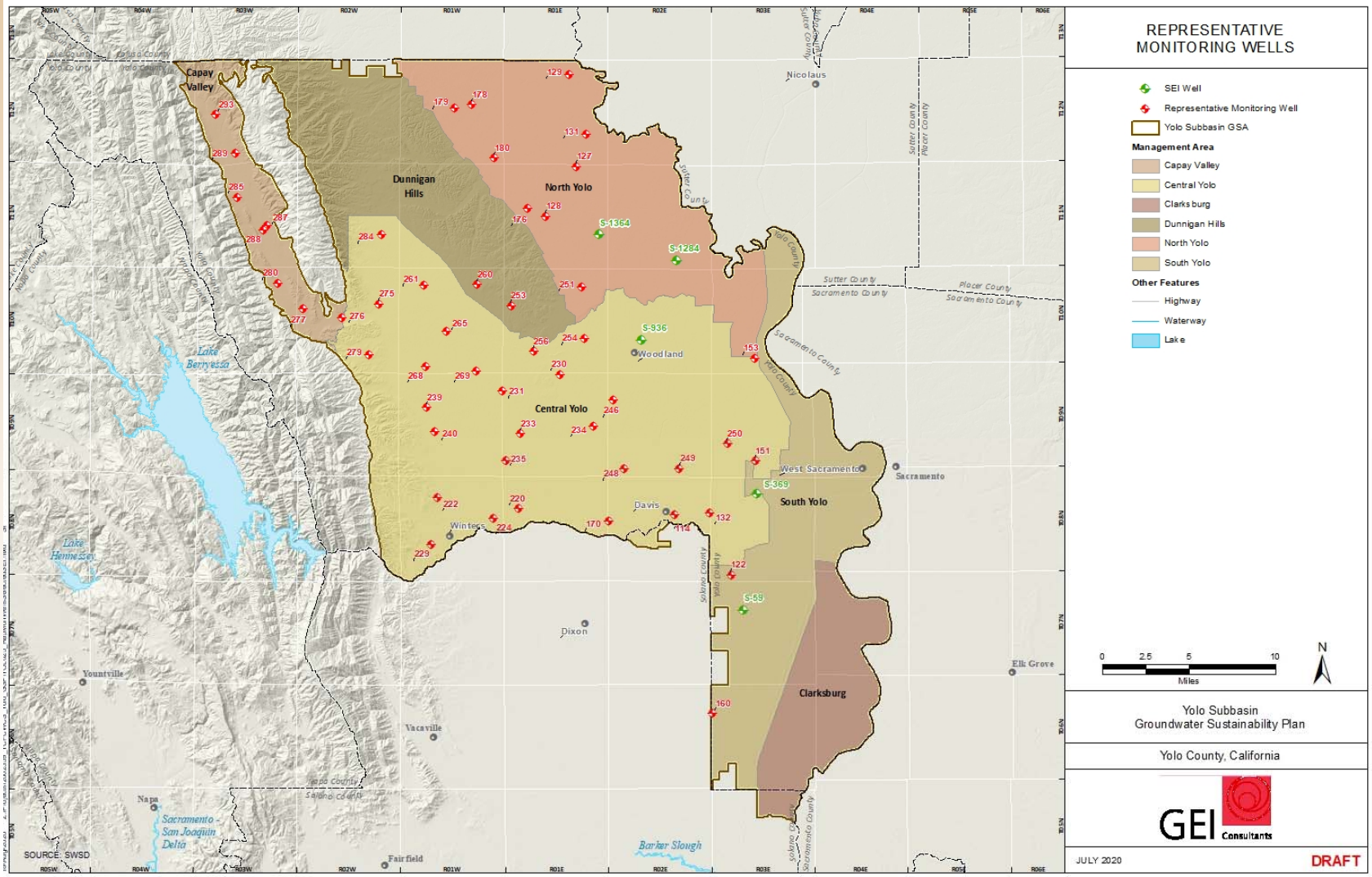
Management Areas

§ 354.20. Management Areas – SGMA Definition

(a) Each Agency may define one or more management areas within a basin if the Agency has determined that creation of management areas will facilitate implementation of the Plan.

Management areas may define different minimum thresholds and be operated to different measurable objectives than the basin at large, provided that undesirable results are defined consistently throughout the basin.

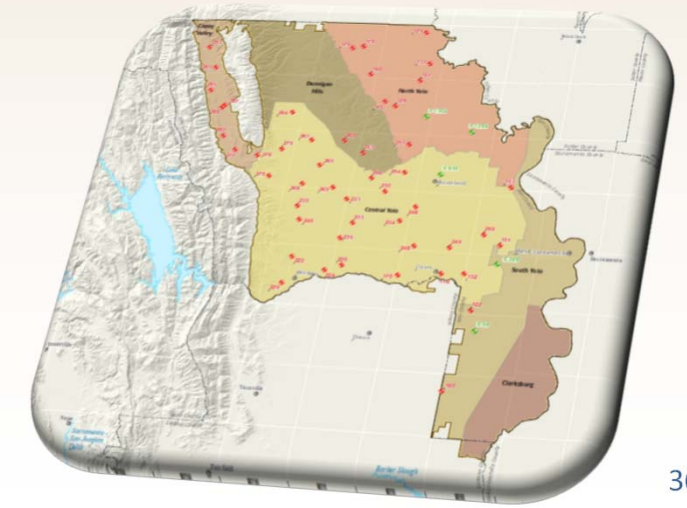
Yolo GSP Management Areas



Management Area – Undesirable Result Relationship

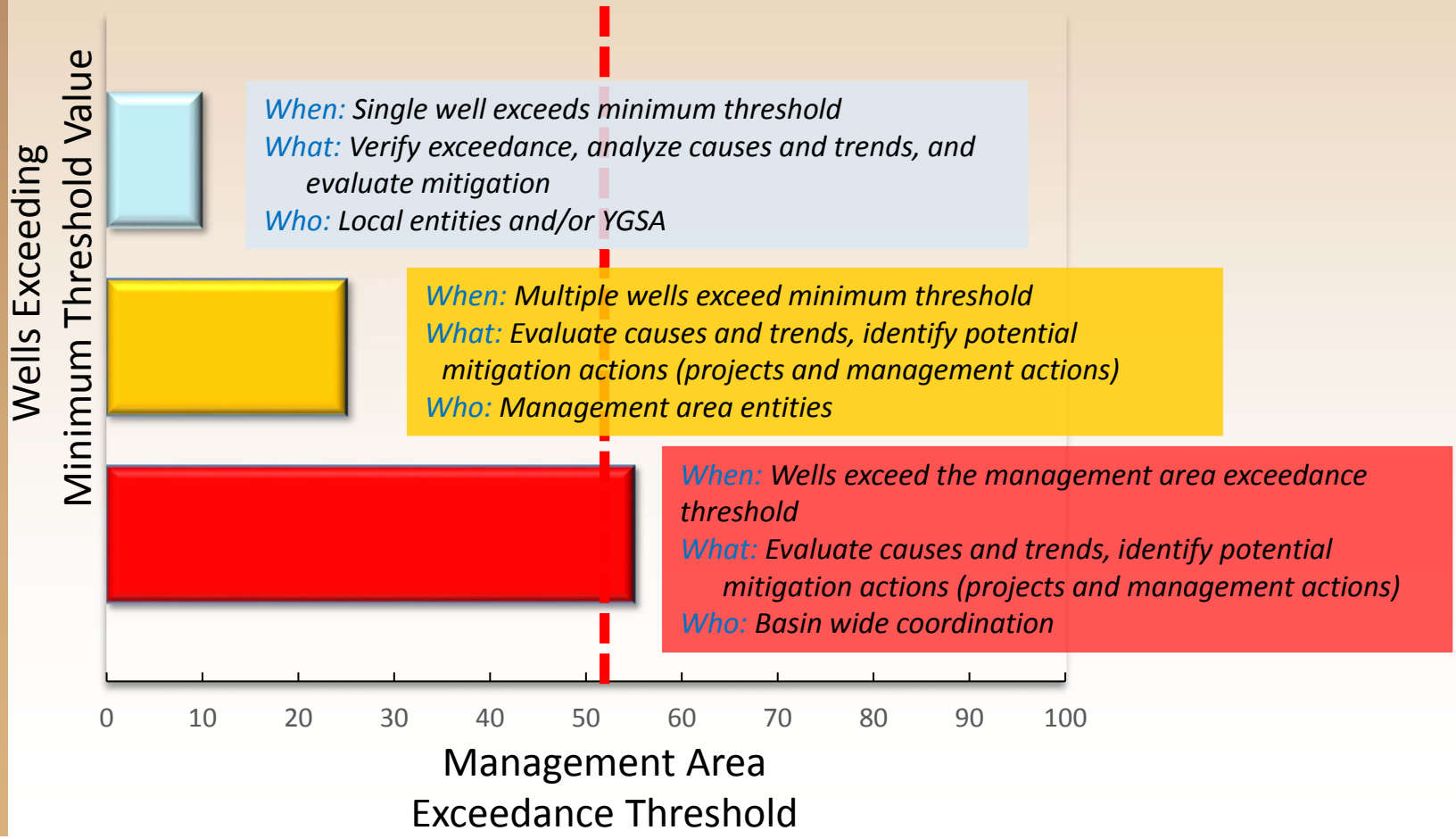
- Potential Alternatives
  - Basin-wide Trigger
    - Percent of wells exceeding MTs in Entire Basin (Ex: 51%)
  - Management Area Trigger
    - Percent of wells exceeding MTs in a Management Area (Ex: 51%)
    - Two or more MAs that exceeded MTs

Management Area	Representative Monitoring Wells
Capay Valley	8
Central Yolo	31
Dunnigan Hills	2*
North Yolo	11
South Yolo	3*
Clarksburg	??



Minimum Thresholds - Undesirable Results

Exceeding the Minimum Threshold in any well is important and will be addressed



Minimum Thresholds - Undesirable Results

➢ Minimum Threshold Exceedances

- Minimum thresholds exceedances represent local conditions, at specific SGMA representative monitoring wells, that create an impact to beneficial uses of groundwater resources.
- YSGA's goal is to proactively manage the basin and to take local action to keep the basin above MT

➢ Undesirable Results

- When a specified number of minimum threshold exceedance occurs that represent a basin-wide condition of mismanagement and significant impacts to beneficial uses of the groundwater resource.
- When two (2) or more management areas exceed the minimum threshold exceedance value, the basin will be considered to reach an undesirable results status and DWR and the State Board can intervene.

Management Area Exceedance Threshold

- Groundwater Levels
  - When the minimum threshold for groundwater levels are exceeded in 51% or more of all groundwater elevation representative monitoring sites.
- Groundwater Storage
  - Groundwater elevations provide a proxy for groundwater storage
  - When the volume of storage is depleted to an elevation lower than the groundwater level minimum threshold in 51% or more of all groundwater level representative monitoring sites.

Approach to Water Quality SMC

- Define Undesirable Result for water quality
  - What is the condition that we want to avoid (degraded water quality)
  - SGMA does not require that we necessarily improve the condition, but our management of the basin should not make conditions undesirable for groundwater uses and users in the Subbasin

- Need to consider/demonstrate interaction between water levels and water quality (Sustainability Indicators)
  - Water levels are relatively stable in the Subbasin
  - Water quality is influenced by manmade effects and natural-geologic conditions
  - With some constituents, water quality changes with depth in the aquifer, but not with changes in groundwater levels

Undesirable Results Definition

- The point at which water quality is degraded to the extent of causing significant and unreasonable impacts from groundwater management actions in the Sub-Basin, that affect the reasonable and beneficial use of, and access to, groundwater by overlying users.

Undesirable Results Definition

➢ An Undesirable Result for water quality occurs when the minimum threshold for any water quality constituents of concern is exceeded in 25-percent of the monitoring wells specified for that constituent over two sampling collection periods, without implementation of a predetermined mitigation action.

➢ Key Points:

- Develop a list of Constituents of Concern – those constituents for which we want to set Minimum Thresholds and Measurable Objectives
- Trigger – spatial and temporal trigger for determination of Undesirable Result
- Mitigation – identify mitigation actions for water quality exceedances,
  - For example, existing or planned treatment for existing or future exceedance of drinking water standards

List of Constituents of Concern

- Approach
  - Carefully consider the which constituents will be included in the list for the 2022 GSP
  - Include those constituents which can be managed through groundwater management actions
  - Recognize the presence of other constituents that will be monitored to develop a better understanding and for future consideration under SGMA

Minimum Threshold Approach

- For each Constituent of Concern, set the MT appropriate for the beneficial use and user

Water Quality - Update

➢ List of Constituents

- Salinity – Additional evaluation
  Additional analysis ongoing
- Nitrate – MT for Drinking water wells
  Evaluating concerns for PWS, consideration of CV-SALTS objectives
- Boron – No MT
  No change to initial assessment
- Arsenic – MT for Drinking and Ag
  Limited presence in PWS, conducting additional analyses
- Chromium – No MT
  Evaluating hexavalent chromium
- Manganese – No MT
  Reviewing PWS data and trends and basin-wide prevalence
- Selenium – Verify (No MT)
  Limited presence in PWS, no change to initial assessment
- Other Constituents?

Next Steps

- Land Subsidence
- Surface Water – Groundwater Interaction
- Seawater Intrusion
- Water Budget – Historical and Future
- Projects and Management Actions

Questions/Comments

GSP Development – Scheduling Management Area
Workshops and Draft Chapters of the GSP

GSP Development Schedule

Task Name	Estimated Start	Estimated Finish
Develop Sustainable Management Criteria	6/1/20	11/27/20
Develop Projects and Management Actions	11/2/20	1/1/21
Communication and Engagement		
C & E Plan	9/30/20	8/3/21
TAC Meetings	7/9/20	4/7/21
Working Group Meetings *MA Workshops – Round 1 (9/14-10/30)* *MA Workshops – Round 2 (12/1-1/11)*	9/10/20	3/3/21
GSA Board Meetings *Public Meeting – November 16* *Public Meeting – January 25*	6/15/20	6/21/21
GSP Report – *TAC/Working Group Review*	10/12/20	8/31/21
Introduction Chapter	10/12/20	10/23/20
Basin Setting	11/2/20	11/13/20
SMC	12/28/20	1/8/21
Projects and Management Actions	2/1/21	2/12/21
Admin Draft Review	3/29/21	4/9/21
Public Draft Review	4/26/21	7/19/21
Final GSP	8/31/21	8/31/21

YSGA Board of Directors' Meeting on September 21, 2020

Next Steps

- Scheduling MA Workshops with Entities
    - Round 1: September 14 – October 30
    - Round 2: December 1 – January 11

- Next Working Group Meetings – December 2, 2020

    (dependent on MA workshop schedule and progress with TAC)