Groundwater Status Report

Appendix A

Well Numbering System

APPENDIX A
WELL NUMBERING SYSTEMS

To develop the groundwater level Basin Management Objectives (BMOs), all existing monitoring wells were identified for each BMO subinventory unit. These wells are currently monitored either by public or private entities, or they are monitored as part of the DWR, Northern District groundwater level monitoring program. To distinguish and locate these monitored wells an alphanumeric name, or identifier (ID), is used. All BMO wells are referenced by these unique ID's. Wells that are not part of the DWR monitoring network are typically assigned a local ID. Wells that are part of the DWR monitoring network are identified by the State Well Numbering System. This system is very useful in locating points on the ground, such as groundwater wells in areas with few identifying landmarks. Under this system, each well is assigned a unique number referred to as the State Well Number. This system is described further below.

State Well Numbering System

(Reference: Water Facts: Numbering Water Wells in California, No. 7, June 2000)

The State's well-numbering system is based on a rectangular system called the "United States System of Surveying in the Public Lands," commonly referred to as the "*Public Lands Survey*," established by the Continental Congress in 1784. The Public Lands Survey system has been employed by DWR, USGS, and other agencies for over 50 years. This system allows for a unique ID to be assigned to each well. These unique ID's are made up of several components, each of which is described below.

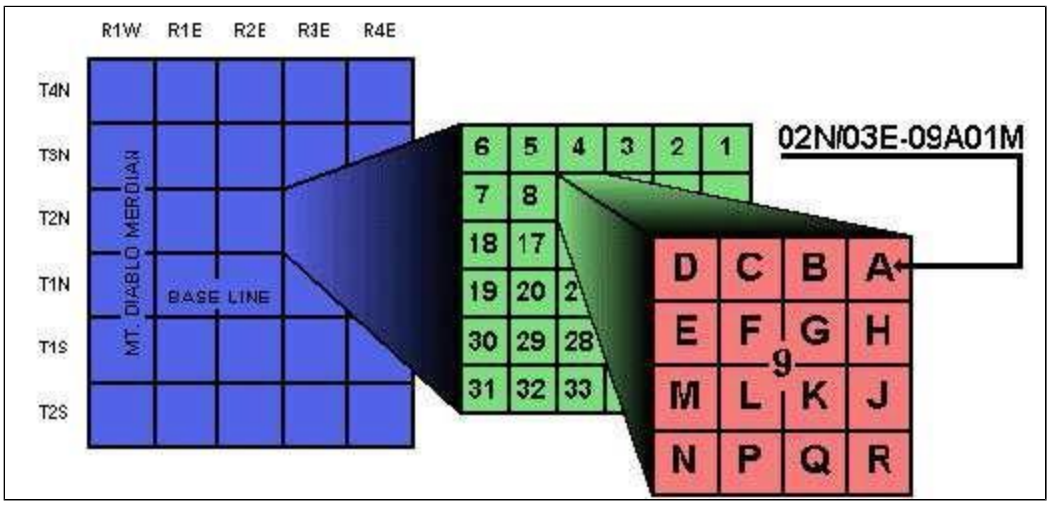
Initial Point and Corresponding Base & Meridian Pair. Under this system all tracts of land are referenced to an Initial Point. This Initial Point is defined by the intersection of a north-south line called the Meridian and an east-west line called the Base. In California there are three Initial Points each with a corresponding Base and Meridian Pair, and all of the BMO wells are referenced to the Mt. Diablo Base and Meridian.

Range and Township Lines. Longitudinal lines are established at six-mile increments from the Initial Point and are east or west of the Meridian. These longitudinal lines are called Range Lines. Latitudinal lines also set at six-mile increments from the Initial Point are parallel to, and north or south of the Base. These latitudinal lines are known as Township Lines. This pattern of longitudinal and latitudinal lines defines a grid pattern consisting of 36-square-mile parcels of land. These 36-square-mile parcels are referred to as Townships. Each Township is referenced to an Initial Point by the number of 36-square-mile parcels and direction from that Initial Point.

Sections. Every Township is further divided in to 36 parts called Sections. A Section is a square parcel of land one-mile on a side, containing 640 acres.

Tract. Each Section is further divided into sixteen 40-acre parcels called Tracts. Each Tract is labeled with a letter. Once the well's location is established in the 40-acre Tract it is assigned a Sequence Number. These Sequence Numbers are assigned in chronological order (see Figure G).

State Well Number. The State Well Number is composed of the various components described above, including Township, Range, Section, Tract, Sequence Number, and Base & Meridian Pair.

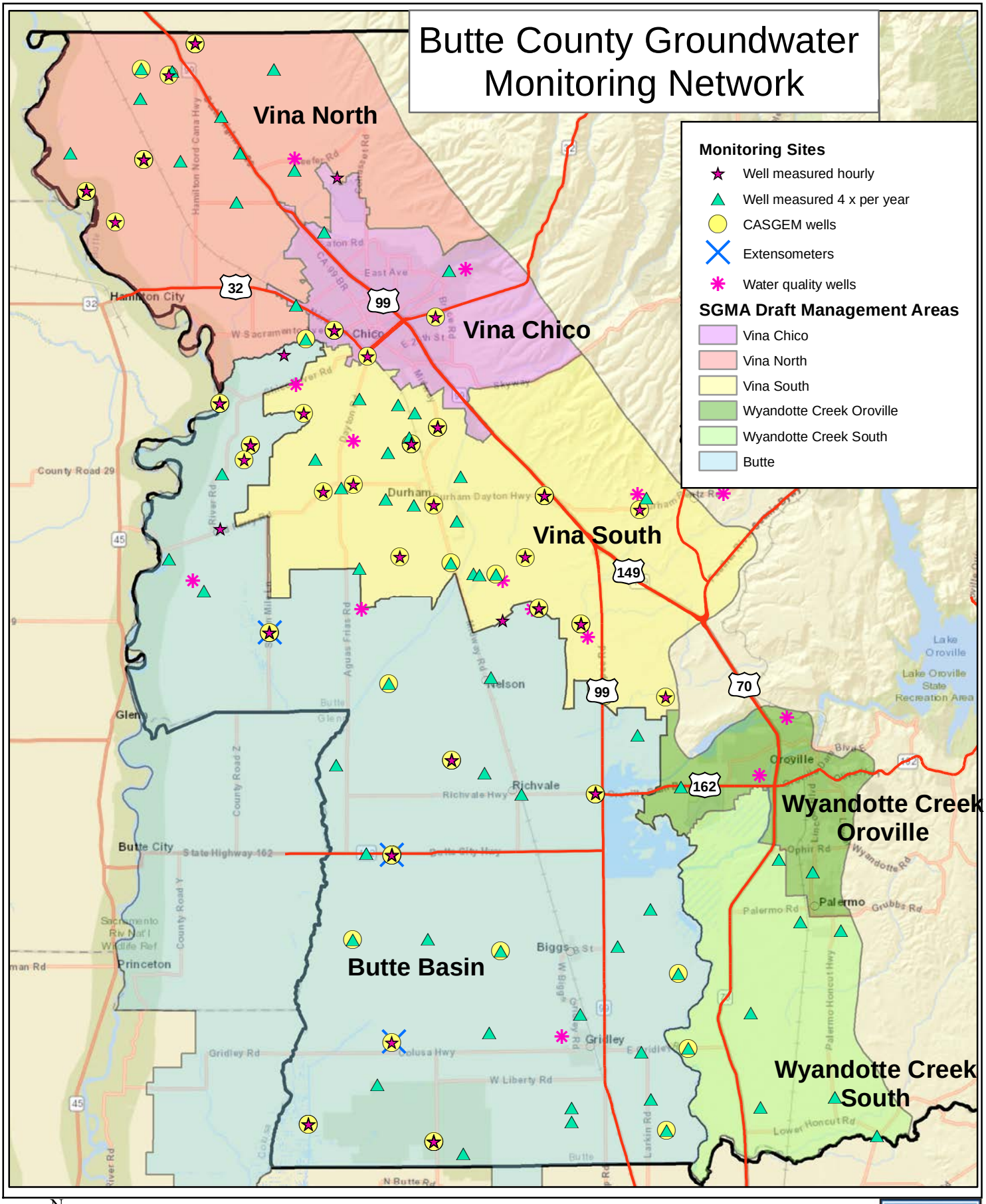


Groundwater Status Report

Appendix B

Butte County Monitoring & CASGEM Network

Butte County Groundwater Monitoring Network



revised 1/31/20 DWRC

0 2.5 5 10 Miles

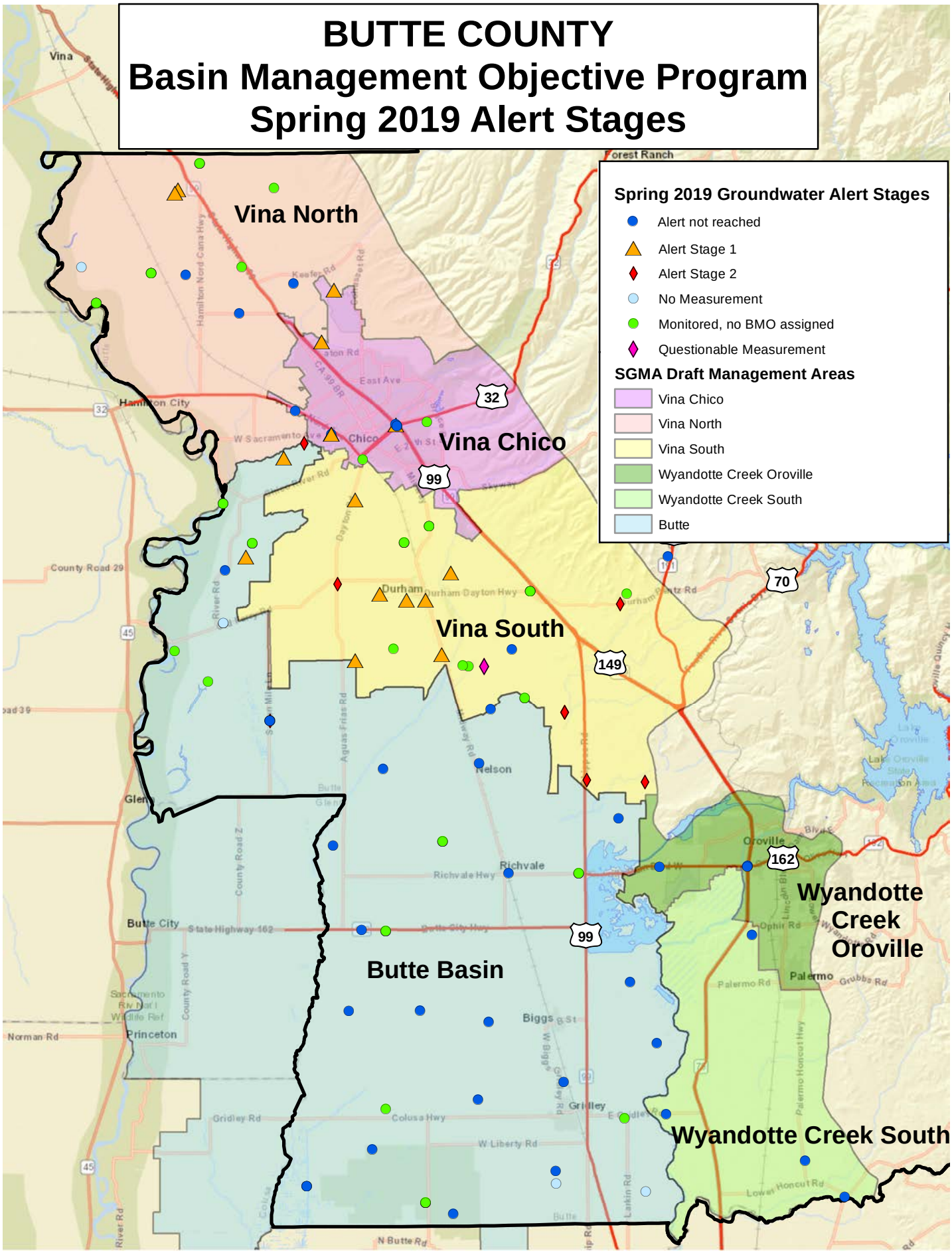
N W E S

Groundwater Status Report

Appendix C

Groundwater Level Alert Stage Maps

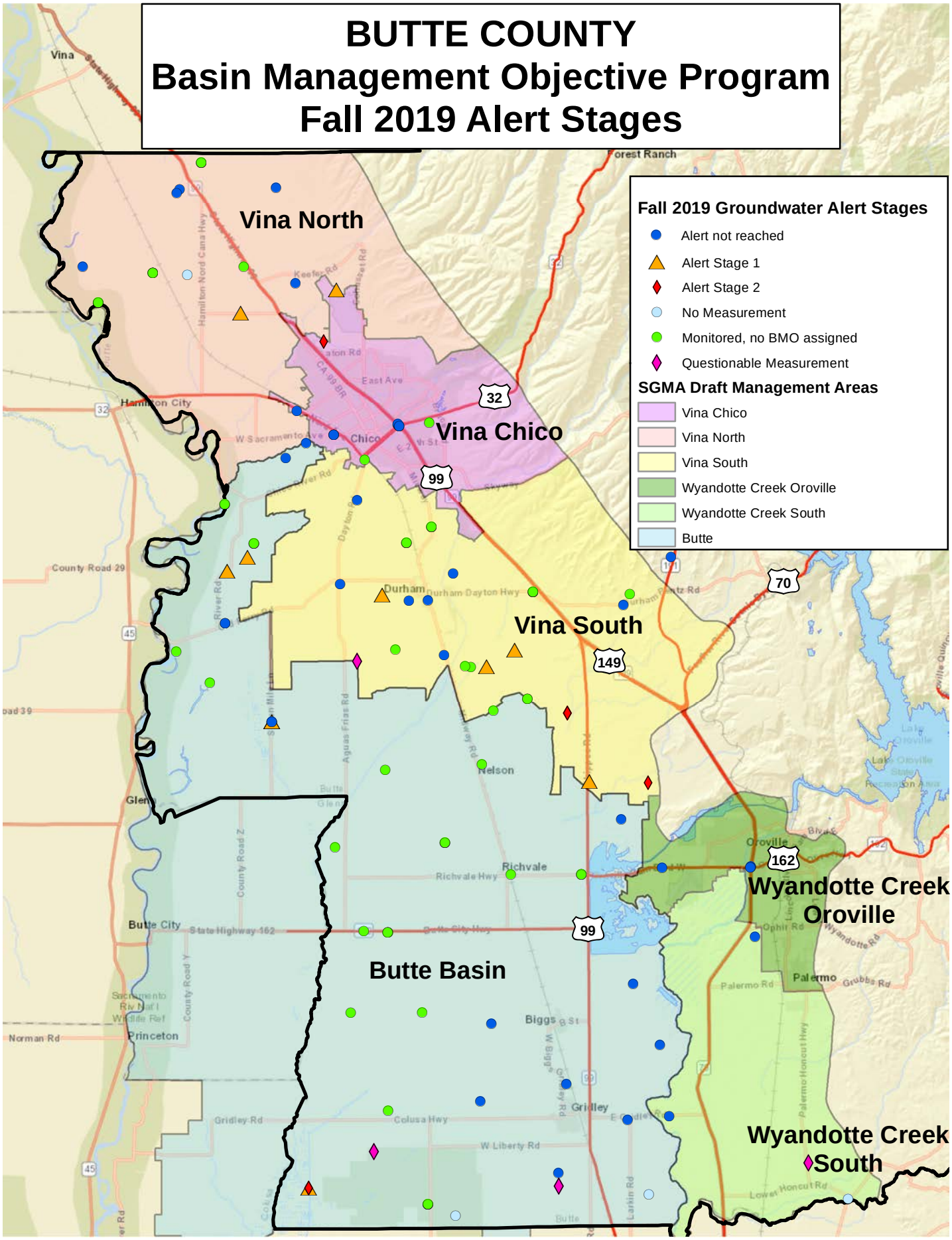
BUTTE COUNTY
Basin Management Objective Program
Spring 2019 Alert Stages



revised 1/31/2020 DWRC

0 2.5 5 10 Miles

BUTTE COUNTY
Basin Management Objective Program
Fall 2019 Alert Stages



revised 1/31/2020 DWRC

0 2.5 5 10 Miles

Groundwater Status Report

Appendix D

Water Quality Trend Monitoring Report

Butte County Water and Resource Conservation

Water and Resource Conservation Paul Gosselin, Director

308 Nelson Avenue
Oroville, California 95965

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buttecounty.net/waterresourceconservation
bcwater@buttecounty.net

INTERDEPARTMENTAL MEMORANDUM

TO: Butte County Water Commission

FROM: Kelly Peterson, Water Resources Scientist

SUBJECT: 2019 Groundwater Quality Trend Monitoring Update

DATE: February 5, 2020

INTRODUCTION AND BACKGROUND

The Butte County Department of Water and Resource Conservation (Department) conducted its eighteenth year of groundwater quality trend monitoring within the county July 31, 2019 - August 2, 2019. As required by Chapter 33A, the parameters monitored were temperature, pH, and electrical conductivity (EC). These parameters are the basic water quality characteristics needed to evaluate a basin for evidence of saline intrusion. The groundwater quality trend monitoring serves to establish baseline levels for these parameters throughout the county so that any future changes can be identified and further investigation and / or monitoring can subsequently be developed. In 2019, all samples fell within the acceptable range of water quality values set forth by State and Federal agencies and Basin Management Objectives (BMOs) defined in Chapter 33A and described in Table 1.

Table 1. Butte County Basin Management Objectives for Water Quality

Parameter	Basin Management Objective
Temperature	Within 5 ° Celsius of the historic range (all but current year) of temperatures for that well
pH	Between 6.5 and 8.5
Electrical Conductivity *	< 900 µS/cm for drinking water < 700 µS/cm for agricultural water

METHODOLOGY AND RESULTS

In 2013, Department purchased a Hach HQd portable meter with a pH and conductivity probe. This was the seventh year this meter was used to do the groundwater quality testing. The sites visited in Butte County are on private land and many of the wells are used for agricultural purposes (irrigating orchards, rice or pasture). However, the two Thermalito wells, the Chico Urban Area well, the Pentz well, the Vina well and the Llano Seco wells provide domestic water supply. The sampling grid spans from north of the Chico Urban Area (Vina sub-inventory unit), west towards the Sacramento River (Llano Seco and M&T sub-inventory units), east towards the foothills (Pentz sub-inventory unit), and south towards Gridley (Biggs-West Gridley sub-inventory unit). Figure 1 shows the approximate locations of the water quality wells in relation to wells monitored four times per year for groundwater level in the Basin Management Objectives Program.

As in previous years, we are fortunate to have support and permission from local property owners who coordinate timing of sampling and allow access to their wells. We have provided them with the preliminary results from this year's monitoring.

All thirteen wells in the network were sampled this year. The Western Canal (West) well had been inaccessible the previous two years due to irrigation infrastructure changes that prevented sampling. Following standard sampling procedures, a water sample is pulled from a discharge location at or near the well and values for temperature, pH and EC are recorded when the pH reading from three subsequent water samples stabilizes. Temperature is a standard parameter measured when assessing water quality, mostly to indicate that water being sampled is representative of aquifer water and not water standing in the well itself.

The US Environmental Protection Agency (US EPA) establishes drinking water quality standards using two categories, Primary Standards and Secondary Standards[1]. Primary Standards are based on health considerations and Secondary Standards are based on taste, odor, color, corrosivity, foaming, and staining properties of water. Secondary water quality thresholds for pH and EC compared to the range of 2019 values are presented in 2.

Table 2. US EPA Secondary Standards for measured parameters

Parameter	Secondary Standard or Secondary WQ Threshold	Range of 2019 Values	Notes re: Butte County Results
pH	6.5 to 8.5	6.9 – 8.1	Within range of secondary water quality thresholds.
Electrical Conductivity *	< 900 µS/cm – drinking water < 700 µS/cm – ag water	188 – 515	Within range of secondary water quality thresholds.

* A positive correction factor was applied to the 2019 results per recommendation of the Butte County Water Commission Technical Advisory Committee, due to an error in calibration of the probe.

Temperature is an important parameter because it affects chemical reactions that may occur in groundwater. Also, considerable changes in temperature could be an indication of other source waters migrating into the aquifer system such as stream seepage or flow from a different aquifer system. To date, temperature has been relatively consistent in all wells. Chapter 33A states that "the BMO Alert Stage for temperature will be reached when the measurement is more than five (5) degrees (°) outside of the historic range of measurements." All 2019 well measurements were within their respective temperature BMO and within 5.0° Celcius (C) of their historic ranges.

All 2019 groundwater quality measurements were within their respective temperature BMO and within 5.0 degrees Celcius (° C) of their historical ranges. All but one of the 2019 measurements were within 1.0° C of each well's average historic temperature (Table 3). The Thermalito domestic well was 2.9° C higher than the well's recorded 11-year average. The lowest groundwater temperature reading was in the M & T well (17.5° C) and the highest was in the Thermalito domestic well (22.6° C). At the Thermalito domestic well, the groundwater temperature was recorded from water sample taken after purging the well with the outdoor household hose versus irrigating with sprinklers to purge the well as had been done in previous years which may have affected the high readings.

Measurements for pH remained relatively stable compared to previous years, in all wells sampled. The lowest pH was found in the Western Canal East area well (6.9) and the highest pH was found in the Llano Seco well (8.1). All measurements for pH were within the secondary water quality thresholds of 6.5 - 8.5 (Table 1, Table 4 and included graphs).

[1] http://www.epa.gov/safewater/consumer/2ndstandards.html

Electrical conductivity (EC) measures the ability of a solution to conduct an electrical current due to the presence of ions. Observed readings for electrical conductivity can have a large range, up to 447 µS/cm at one particular well (Western Canal-west), yet 2019 measurements were all well within the secondary water quality thresholds established by State and Federal regulatory agencies (Table 5, Table 6 and included graphs). A positive correction factor was applied to the 2019 results per recommendation of the Butte County Water Commission Technical Advisory Committee, due to an error in calibration of the probe. Calibration was originally performed using standards too high in concentration for the instrument; hence the low readings observed in the field. Using corrected results, the highest EC measurement was from the Esquon well (515 µS/cm) and the lowest was from the Llano Seco well (188 µS/cm). The greatest change compared to 2018 EC levels occurred in the Thermalito domestic area well which increased in value by 102 µS/cm; however, this may be due to the well purging method used at the well this year as described above.

CONCLUSIONS

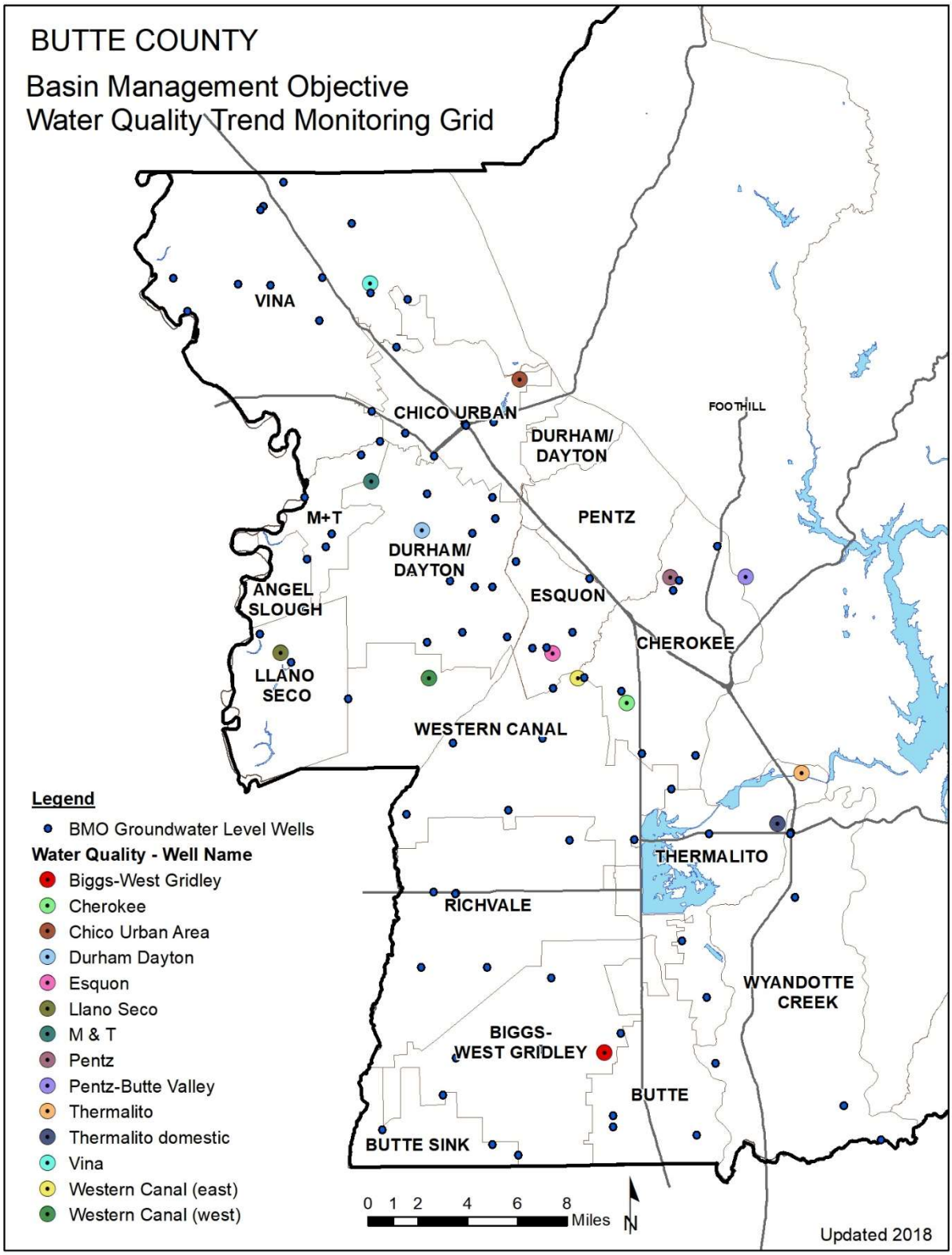
This was the eighteenth season the Department collected groundwater quality information. Overall, the results of the water quality sampling indicate no significant changes in groundwater quality with respect to temperature, pH or electrical conductivity. All samples were within the acceptable range for electrical conductivity and pH, and temperatures remained relatively consistent. The greatest change compared to 2018 was observed in the EC levels measured at the Thermalito domestic area well which increased in value by 102 µS/cm; however, this may be due to the well purging method used at the well this year as described above.

Water quality parameters have naturally occurring variability, so year to year changes are expected and nothing in this year's measurements gives cause for concern or immediate further investigation or analysis. Further investigation would be advisable if values were to fall outside of the acceptable range.

The focus of this trend monitoring program is to evaluate the basin for evidence of saline intrusion. No major shifts occurred in the EC measurements in the sampled wells and the basin appears to be free of saline intrusion in these areas. This data continues to help establish baseline levels for these parameters across the county so that any future changes in water quality can be evaluated and further investigation and / or monitoring can be developed.

Further information on water quality standards for different constituents can be found at www.swrcb.ca.gov or in the *Compilation of Water Quality Goals*, published by the State Water Resources Control Board.

Figure 1. Approximate well locations for water quality wells in relation to wells monitored annually (four times) for water level.



DATA TABLES AND GRAPHS

Table 1. Annual groundwater temperature (°C)

Well / Area	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Biggs-West Gridley	18.5	18.5	18.1	20.5	18.2	18.3	18.7	19.0	19.2	20.1	18.0	18.4	19.0	18.5	18.4	18.6	19.3	18.9
Cherokee	22.4	21.9	21.2	21.4	21.1	20.7	21.0	20.9	21.9	21.8	21.8	21.3	21.9	21.2	20.8	21.2	21.3	21.1
Chico Urban Area						18.4	20.1	18.2	18.8	19.5	21.6	18.0	NM	18.4	17.8	19.0	22.6	18.0
Durham Dayton	18.8	19.9	21.8	20.4	17.4	NM	19.3	NM	18.9	18.0	NM	18.5	19.1	18.1	18.0	18.8	19.9	18.0
Esquon	19.7	18.9	19.6	20.1	20.7	19.0	19.6	19.0	19.1	20.0	21.4	18.1	20.2	18.9	18.0	19.1	18.6	18.4
Llano Seco							20.8	20.6	20.7	20.6	21.7	20.4	23.5	19.9	20.0	19.9	20.1	20.0
M & T	17.6	18.2	17.8	19.2	18.6	18.0	17.7	18.6	17.8	NM	18.3	17.9	NM	17.1	17.2	17.2	17.9	17.5
Pentz						22.2	21.5	21.3	21.5	23.9	21.9	21.9	21.9	21.5	21.5	21.6	22.1	21.2
*Pentz-Butte Valley	27.0	26.4	26.7	23.2														
Thermalito	18.3	17.9	17.1	17.1	18.4	17.7	18.9	17.6	NM	NM	17.8	17.3	17.5	17.3	17.4	17.5	17.8	17.6
Thermalito (domestic)							19.4	19.4	19.4	NM	NM	19.8	NM	19.9	19.8	20.0	20.3	22.6
Vina	19.6	20.3	19.2	19.2	19.6	18.9	19.6	18.9	18.8	22.8	18.8	20.2	21.4	19.5	19.8	19.5	20.5	19.6
Western Canal (East)	18.4	18.2	19.9	20.5	18.8	18.6	19.1	19.0	18.8	19.0	NM	18.3	18.9	18.5	19.1	18.6	20.1	19.5
Western Canal (West)	19.0	18.1	19.8	20.8	18.5	20.6	21.8	18.5	19.1	20.5	20.1	19.1	20.2	18.6	18.8	NM	NM	18.7

*Pentz-Butte Valley well discontinued in 2006

NM – No measurement

Table 2. 2019 Groundwater temperature results, historic averages, ranges and years measured (° C)

Well / Area	Years Measured	Historic Average (°C)	2019 Results (°C)	Historic Range (°C)
Biggs-West Gridley	18	18.8	18.9	18.0 - 20.5
Cherokee	18	21.4	21.1	20.7 - 22.4
Chico Urban Area	12	19.2	18.0	17.8 - 22.6
Durham Dayton	15	19.0	18.0	17.4 - 21.8
Esquon	18	19.4	18.4	18.0 - 21.4
Llano Seco	12	20.7	20.0	19.9 - 23.5
M & T	16	17.9	17.5	17.1 - 19.2
Pentz	13	21.8	21.2	21.3 - 23.9
*Pentz-Butte Valley	4	25.8	--	23.2 - 27.0
Thermalito	16	17.7	17.6	17.1 - 18.9
Thermalito (domestic)	9	20.1	22.6	19.4 - 20.3
Vina	18	19.8	19.6	18.8 - 22.8
Western Canal (East)	17	19.0	19.5	18.2 - 20.5
Western Canal (West)	16	19.5	18.7	18.1 - 21.8

*Pentz-Butte Valley well discontinued in 2006
NM – No measurement

Table 3. Annual groundwater pH

Well / Area	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Biggs-West Gridley	7.6	7.5	7.5	7.0	7.6	7.6	7.7	7.9	7.9	7.2	7.9	7.9	7.1	7.6	7.6	7.7	7.7	7.5
Cherokee	7.5	7.5	7.1	7.4	7.4	7.3	7.3	7.3	7.2	7.6	7.3	7.3	6.9	7.2	7.2	7.1	6.9	7.2
Chico Urban Area						6.9	6.9	6.9	7.0	7.5	7.3	7.1	NM	6.9	7.0	7.0	7.1	7.0
Durham Dayton	7.7	7.2	7.6	7.6	7.5	NM	7.5	NM	7.4	7.7	NM	7.5	NM	7.5	7.5	7.3	6.7	7.2
Esquon	7.3	7.5	7.1	7.4	7.5	7.4	7.2	7.4	7.4	7.6	7.2	7.3		7.4	7.2	7.3	6.9	7.2
Llano Seco							7.9	8.1	8.2	8.1	7.9	8.0	7.0	7.8	7.8	7.7	7.8	8.1
M & T	7.2	7.5	6.9	7.8	7.9	7.6	7.7	7.6	7.6	NM	7.2	7.9	NM	7.4	7.7	7.6	7.6	7.6
Pentz						7.6	7.4	7.5	7.4	7.3	7.8	7.5	6.7	7.0	7.4	7.2	7.3	7.2
*Pentz-Butte Valley	7.1	6.9	7.3	6.2														
Thermalito	7.0	6.5	7.1	7.1	7.9	7.4	7.4	7.4	NM	NM	8.0	7.7	7.5	7.1	7.1	7.1	7.4	7.4
Thermalito domestic							7.7	7.8	7.7	NM	NM	7.8	NM	6.9	7.6	7.6	7.4	7.5
Vina	7.5	7.6	6.9	6.2	7.7	7.5	7.5	7.4	7.6	8.0	7.3	7.8	7.9	7.1	7.4	7.3	7.4	7.6
Western Canal (East)	7.0	6.6	6.8	6.9	7.3	6.9	7.0	7.0	7.1	7.0	NM	7.2	6.5	7.1	7.0	7.0	7.0	6.9
Western Canal (West)	7.8	8.1	7.1	6.9	7.9	7.9	7.8	6.6	7.8	7.5	7.7	7.5	7.1	7.5	7.4	NM	NM	7.7

*Pentz-Butte Valley well discontinued in 2006
NM – No measurement

Table 4. 2019 Groundwater pH results, historic averages and ranges.

Well / Area	Historic Average	2019 Results	Historic Range
Biggs-West Gridley	7.6	7.5	7.0 - 7.9
Cherokee	7.3	7.2	6.9 - 7.6
Chico Urban Area	7.0	7.0	6.9 - 7.5
Durham Dayton	7.4	7.2	6.7 - 7.7
Esquon	7.3	7.2	6.9 - 7.6
Llano Seco	7.9	8.1	7.0 - 8.2
M & T	7.6	7.6	6.9 - 7.9
Pentz	7.3	7.2	6.7 - 7.8
*Pentz-Butte Valley	6.9	--	6.2 - 7.3
Thermalito	7.3	7.4	6.5 - 8.0
Thermalito domestic	7.6	7.5	6.9 - 7.8
Vina	7.4	7.6	6.2 - 8.0
Western Canal (East)	7.0	6.9	6.5 - 7.3
Western Canal (West)	7.5	7.7	6.6 - 8.1

*Pentz-Butte Valley well discontinued in 2006

Table 5. Annual groundwater electrical conductivity [micro Siemens / centimeter (µS/cm)]

Well / Area	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019**
Biggs-West Gridley	346	370	323	361	351	382	354	331	343	320	300	291	326	288	296	290	297	306
Cherokee	222	232	215	266	242	267	268	243	270	275	245	260	330	255	261	284	293	299
Chico Urban Area						280	291	260	249	250	248	217	NM	214	221	254	295	243
Durham Dayton	315	348	259	340	322	NM	327	NM	307	315	NM	298	304	322	316	322	355	358
Esquon	388	526	470	557	507	480	439	419	427	415	408	512	443	417	499	416	529	515
Llano Seco							204	195	196	198	192	184	240	180	182	179	186	188
M & T	418	551	678	504	465	451	667	445	592	NM	427	391	NM	362	333	498	337	360
Pentz						218	229	227	225	224	204	204	231	210	204	207	213	221
*Pentz-Butte Valley	195	186	211	240														
Thermalito	132	164	149	150	152	242	205	158	NM	NM	292	179	181	136	159	136	204	306
Thermalito domestic							374	350	354	NM	NM	342	NM	320	324	327	333	364
Vina	197	225	180	216	192	224	203	200	199	194	174	188	201	200	186	181	190	191
Western Canal (East)	447	344	400	524	492	471	482	488	465	459	NM	447	442	449	444	441	422	418
Western Canal (West)	464	248	407	501	309	477	469	462	455	460	630	629	695	428	581	NM	NM	450

*Pentz-Butte Valley well discontinued in 2006

** A positive correction factor was applied to the 2019 electrical conductivity (EC) results per recommendation of the Butte County Water Commission Technical Advisory Committee due to an error in calibration of the EC probe.

NM – No measurement

Table 6. 2019 Groundwater electrical conductivity results, historic averages, ranges and years measured [micro Siemens / centimeter (µS/cm)]

Well / Area	Years Measured	Historic Average (µS/cm)	2019 Results** (µS/cm)	Historic Range (µS/cm)
Biggs-West Gridley	18	328	306	288 - 382
Cherokee	18	260	299	215 - 330
Chico Urban Area	12	253	243	214 - 295
Durham Dayton	15	318	358	259 - 355
Esquon	18	462	515	388 - 557
Llano Seco	12	194	188	179 - 240
M & T	16	475	360	333 - 678
Pentz	13	216	221	204 - 231
*Pentz-Butte Valley	4	208	--	186 - 240
Thermalito	16	176	306	132 - 292
Thermalito domestic	9	341	364	320 - 374
Vina	18	197	191	174 - 225
Western Canal (East)	17	451	418	344 - 524
Western Canal (West)	16	481	450	248 - 695

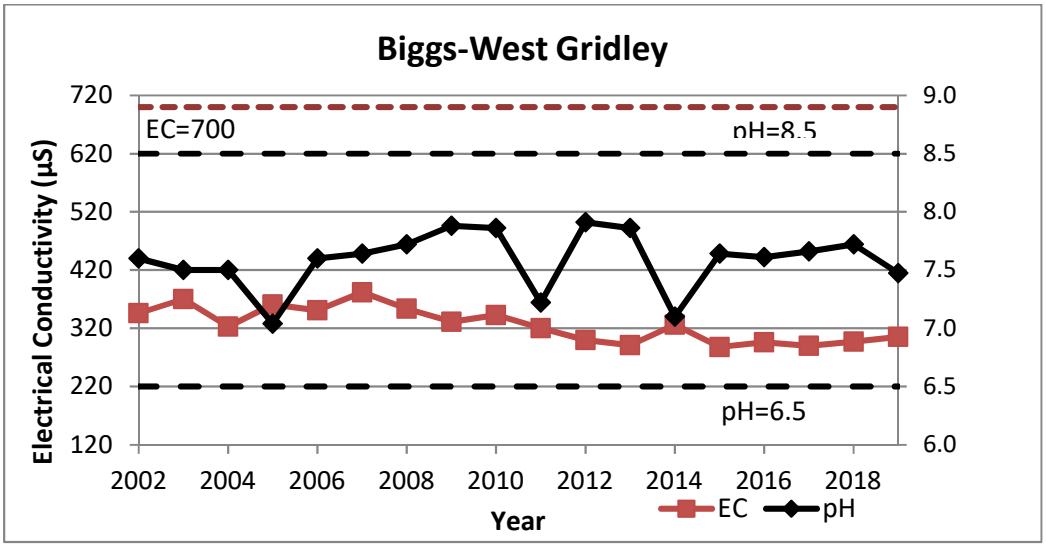
*Pentz-Butte Valley well discontinued in 2006

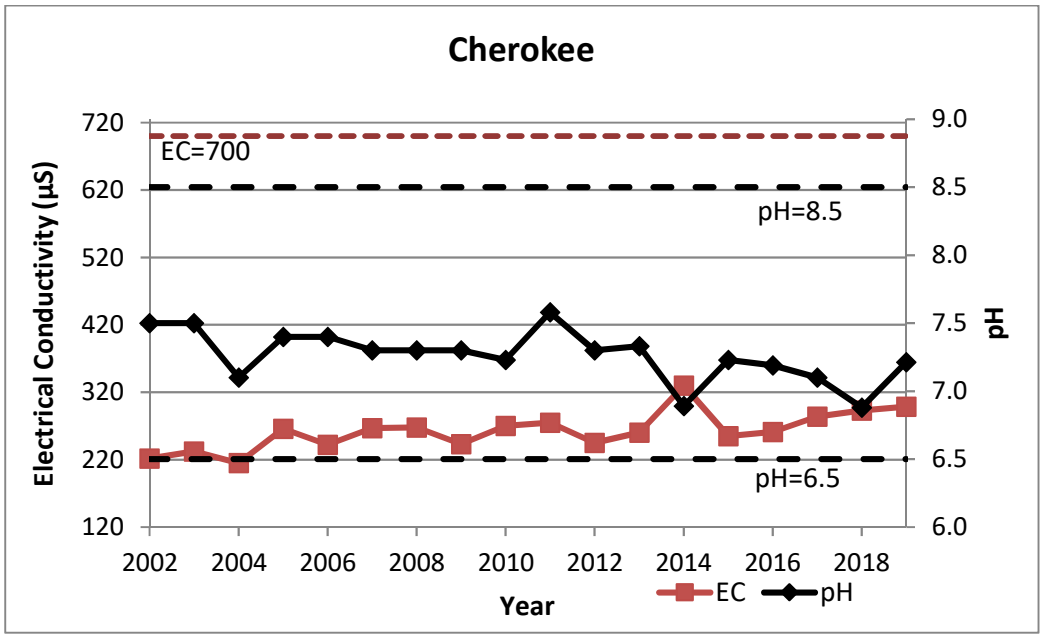
** A positive correction factor was applied to the 2019 electrical conductivity (EC) results per recommendation of the Butte County Water Commission Technical Advisory Committee due to an error in calibration of the EC probe.

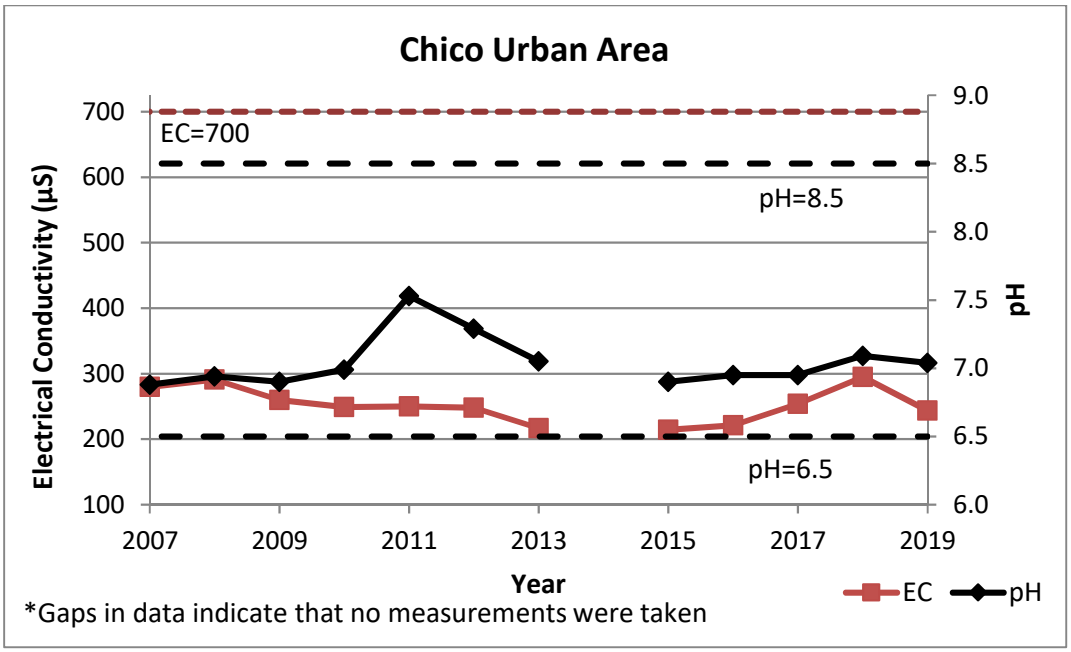
NM – No measurement

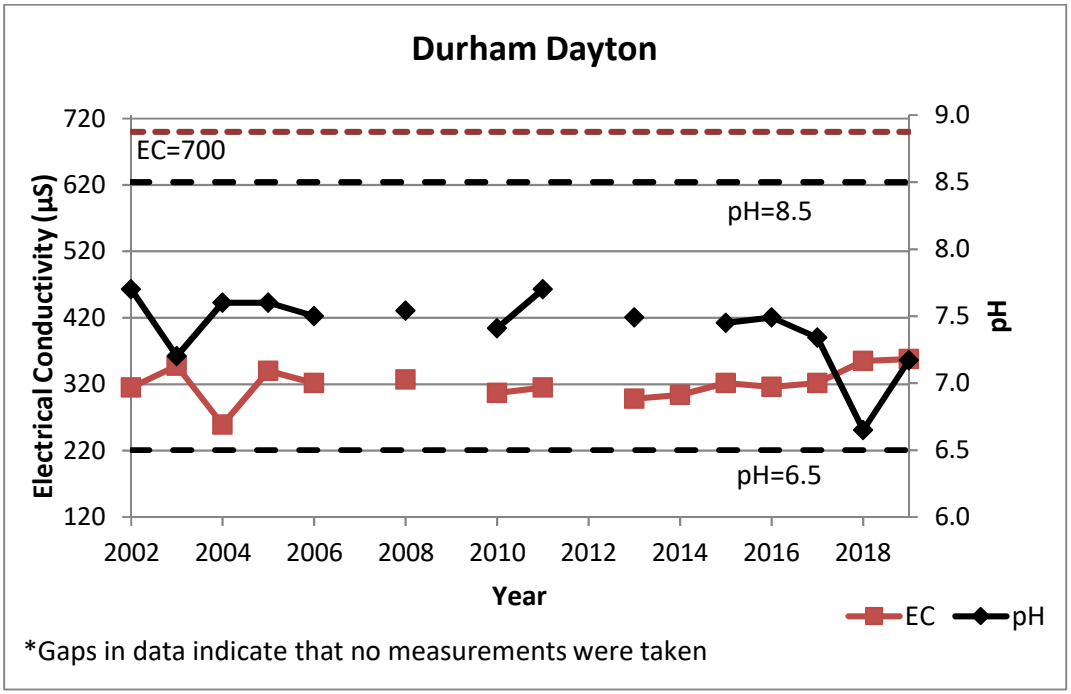
In the figures below, the red dashed line indicates the preferred maximum level for EC for agricultural uses (700 µS/cm) which is lower than the preferred maximum level for EC for drinking water (900 µS/cm). Therefore, when the red plot of EC values is below the red dashed line, the measured EC is within the EPAs limits for secondary standards for agricultural water (< 700 µS/cm), and drinking water (< 900 µS/cm). The black dashed lines bound the acceptable pH range of 6.5 - 8.5. To be within the acceptable pH range, the solid black line should be within the black dashed lines.

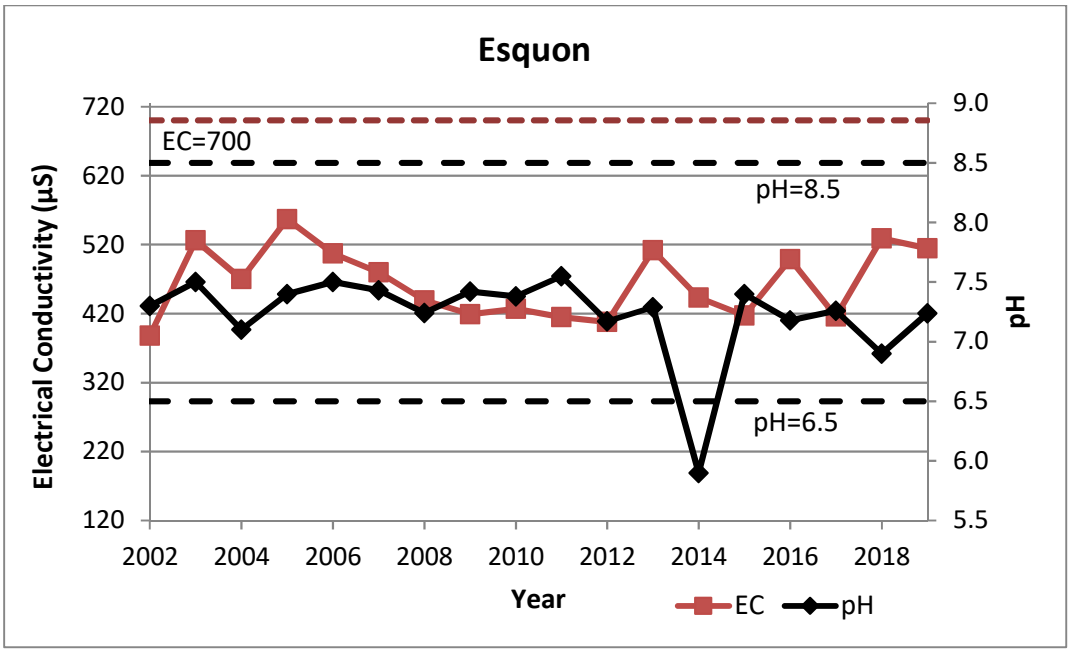
Figures 2. – 15. Annual Electrical Conductivity (EC) [micro Siemens per centimeter (µS/cm)] and pH for each water quality sampling well.

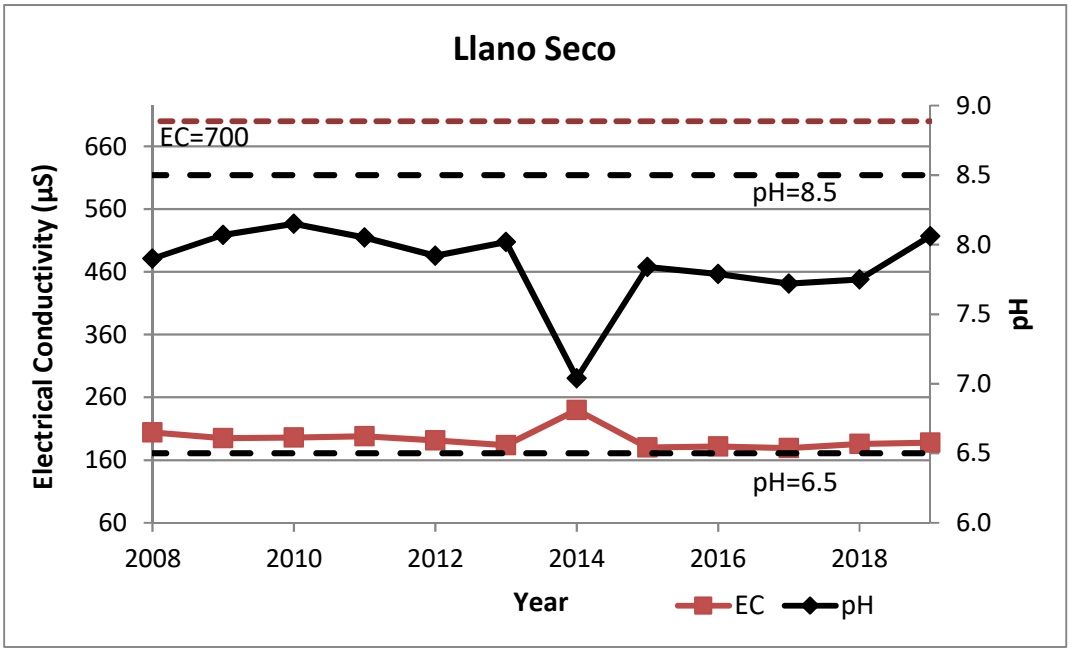


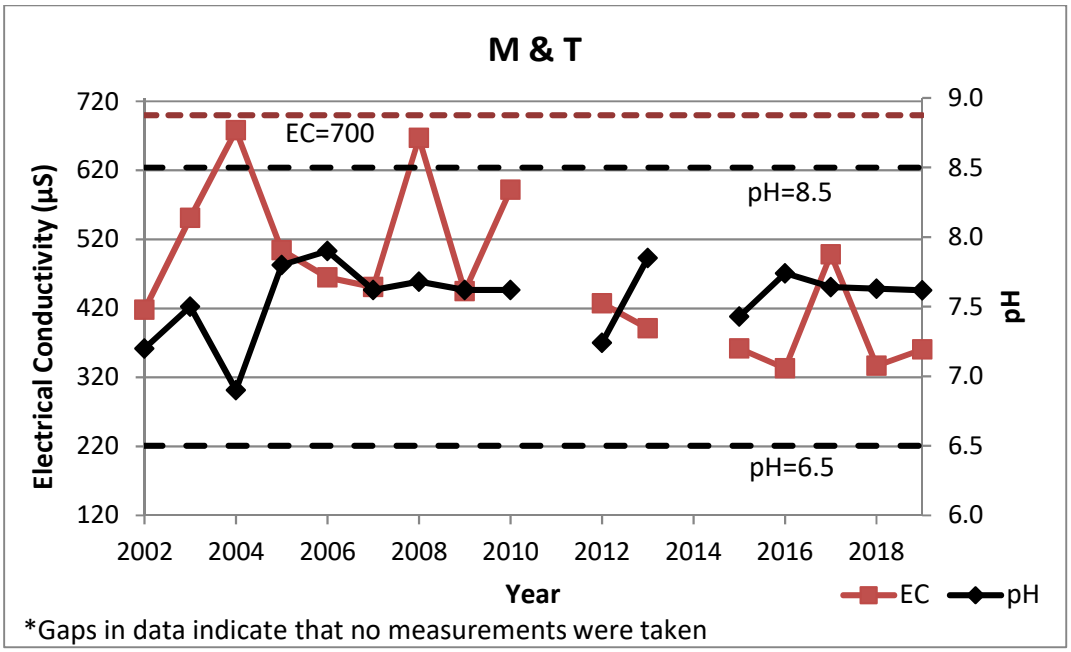


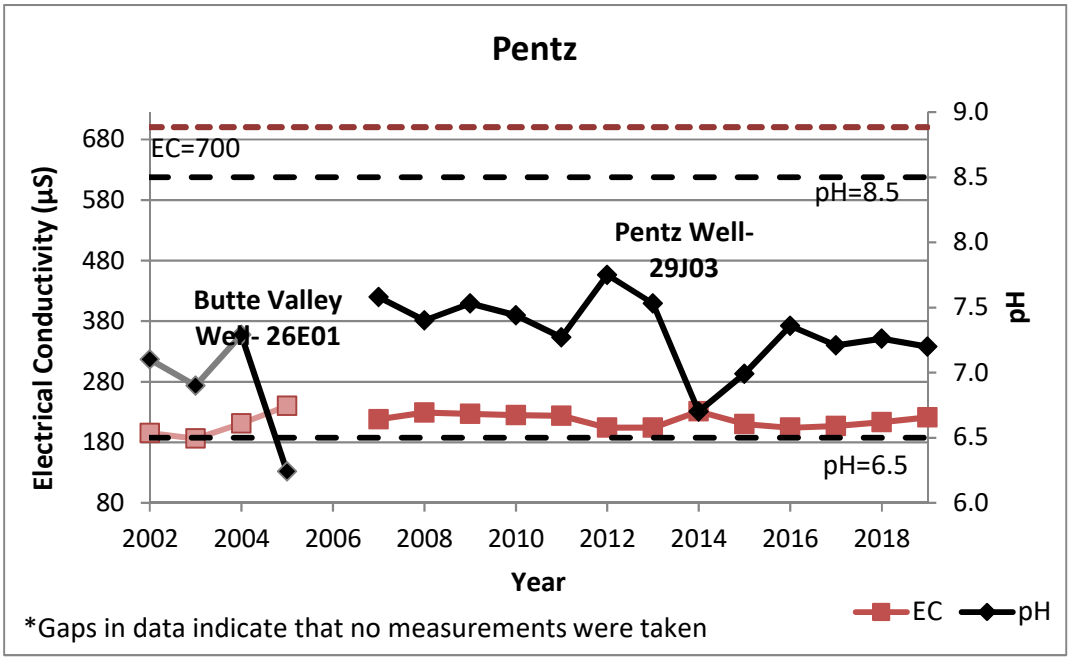

Chico Urban Area
EC=700
pH=8.5
pH=6.5
Electrical Conductivity (µS)
pH
Year
700
600
500
400
300
200
100
9.0
8.5
8.0
7.5
7.0
6.5
6.0
2007
2009
2011
2013
2015
2017
2019
EC
pH
*Gaps in data indicate that no measurements were taken

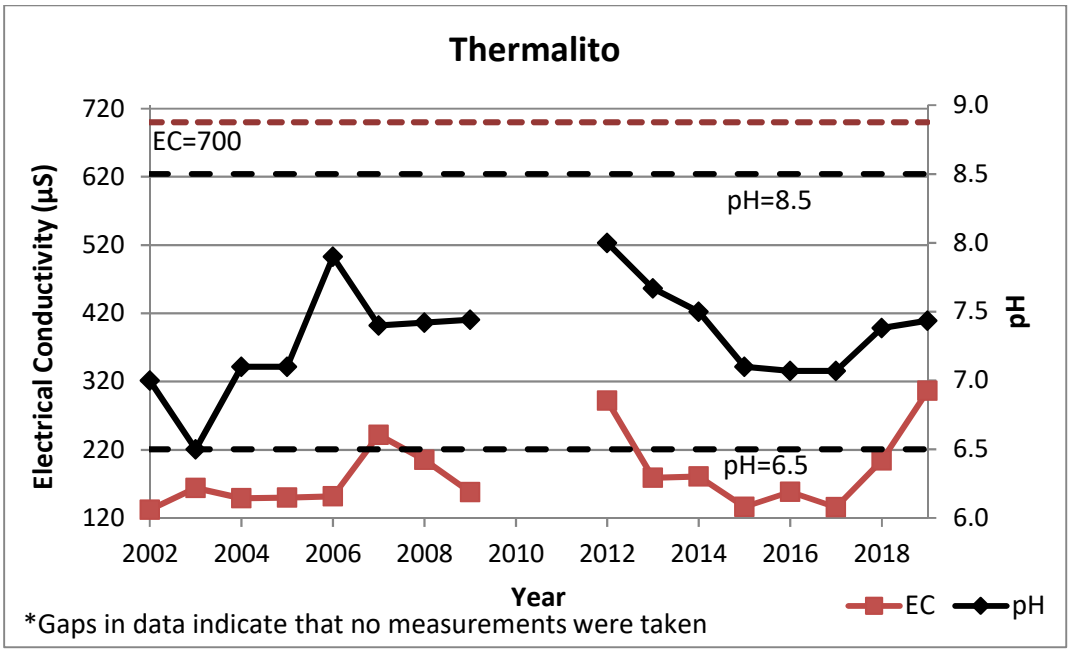

Durham Dayton
EC=700
pH=8.5
pH=6.5
Electrical Conductivity (µS)
pH
Year
720
620
520
420
320
220
120
9.0
8.5
8.0
7.5
7.0
6.5
6.0
2002
2004
2006
2008
2010
2012
2014
2016
2018
EC
pH
*Gaps in data indicate that no measurements were taken

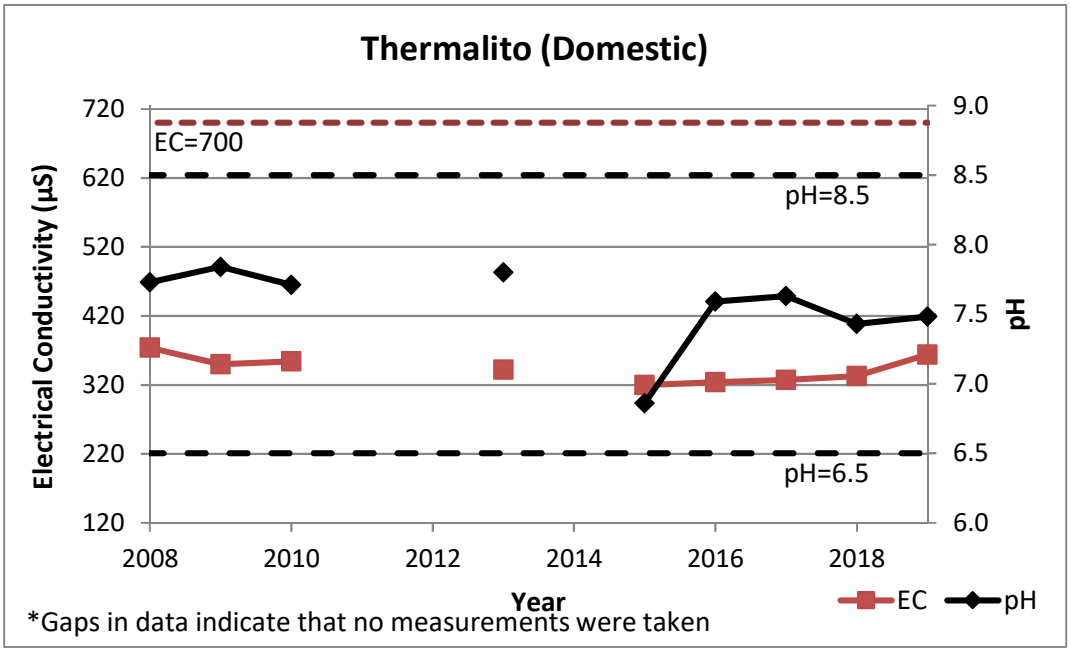

Esquon
EC=700
pH=8.5
pH=6.5
Electrical Conductivity (µS)
720
620
520
420
320
220
120
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
pH
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year
EC
pH

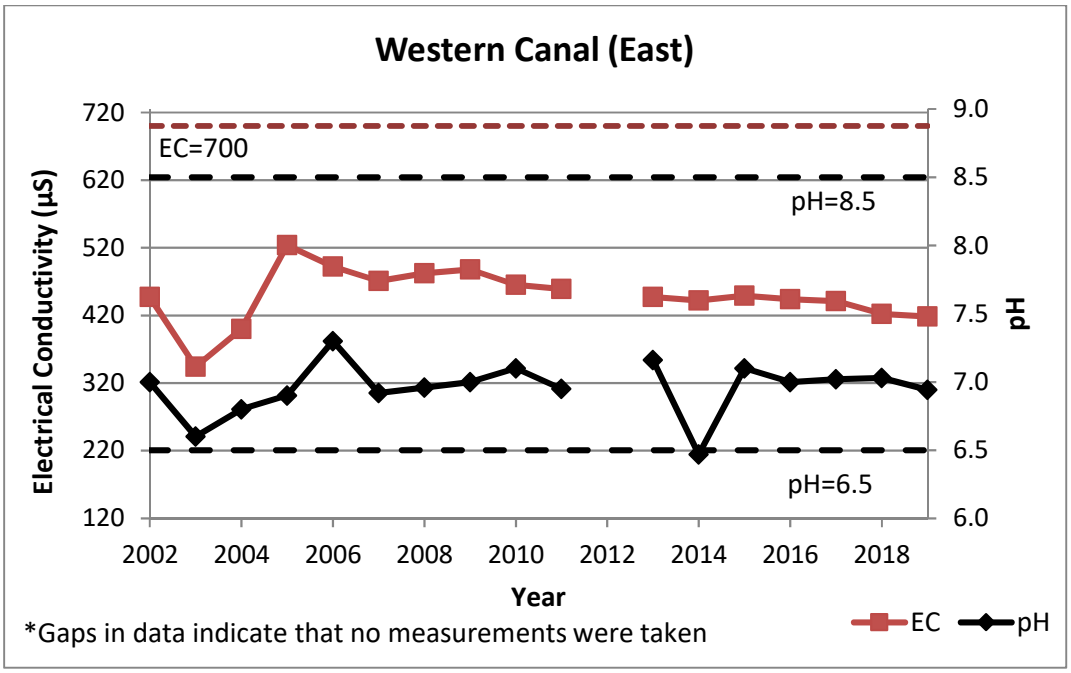

Llano Seco
EC=700
pH=8.5
pH=6.5
Electrical Conductivity (µS)
660
560
460
360
260
160
60
9.0
8.5
8.0
7.5
7.0
6.5
6.0
pH
2008
2010
2012
2014
2016
2018
Year
EC
pH

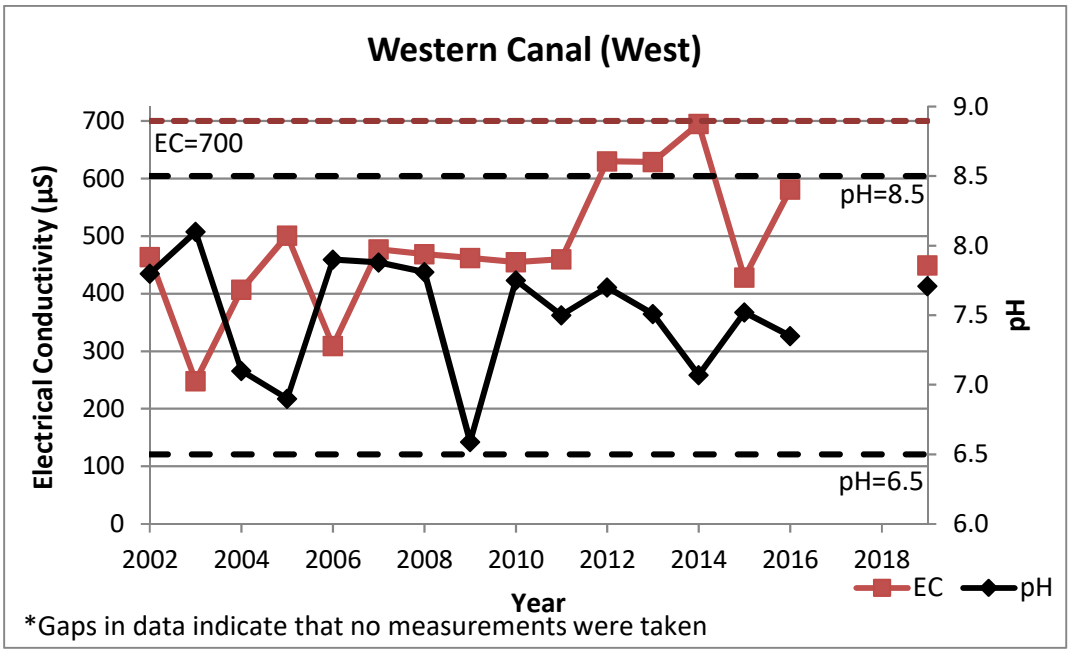

M & T
720
620
520
420
320
220
120
9.0
8.5
8.0
7.5
7.0
6.5
6.0
EC=700
pH=8.5
pH=6.5
Electrical Conductivity (µS)
pH
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year
EC
pH
*Gaps in data indicate that no measurements were taken

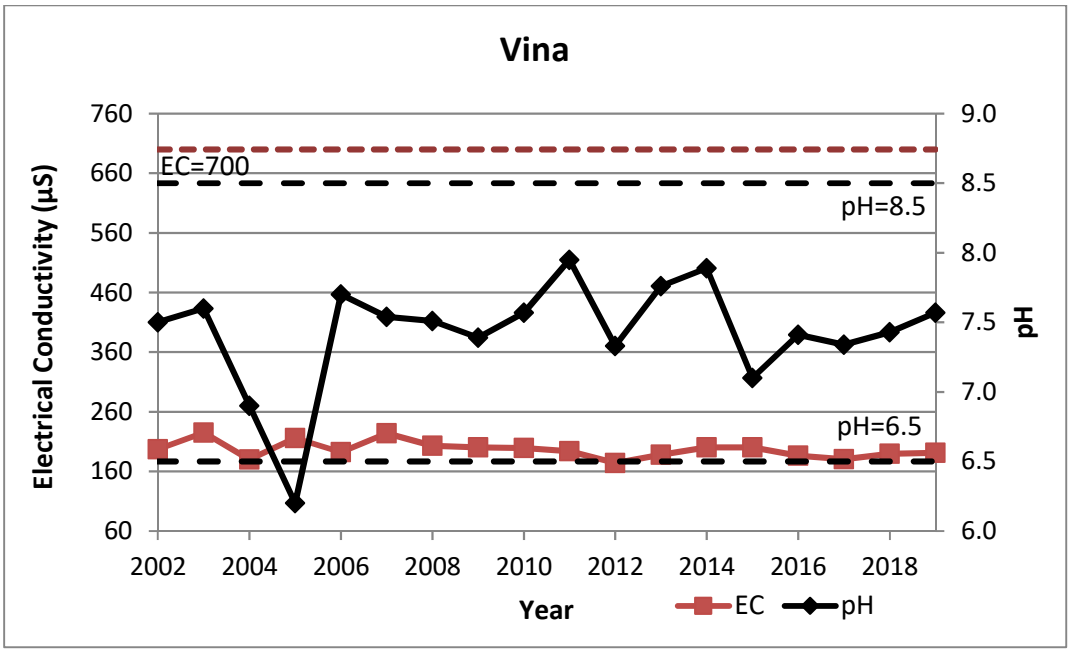

Pentz
680
580
480
380
280
180
80
9.0
8.5
8.0
7.5
7.0
6.5
6.0
EC=700
pH=8.5
pH=6.5
Pentz Well-
29J03
Butte Valley
Well- 26E01
Electrical Conductivity (µS)
pH
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year
EC
pH
*Gaps in data indicate that no measurements were taken


Thermalito
720
620
520
420
320
220
120
9.0
8.5
8.0
7.5
7.0
6.5
6.0
EC=700
pH=8.5
pH=6.5
Electrical Conductivity (µS)
pH
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year
EC
pH
*Gaps in data indicate that no measurements were taken


Thermalito (Domestic)
720
620
520
420
320
220
120
9.0
8.5
8.0
7.5
7.0
6.5
6.0
EC=700
pH=8.5
pH=6.5
Electrical Conductivity (µS)
pH
2008
2010
2012
2014
2016
2018
Year
EC
pH
*Gaps in data indicate that no measurements were taken


Western Canal (East)
Electrical Conductivity (µS)
720
620
520
420
320
220
120
EC=700
pH=8.5
pH=6.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
pH
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year
EC
pH
*Gaps in data indicate that no measurements were taken


Western Canal (West)
Electrical Conductivity (µS)
700
600
500
400
300
200
100
0
EC=700
pH=8.5
pH=6.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
pH
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year
EC
pH
*Gaps in data indicate that no measurements were taken

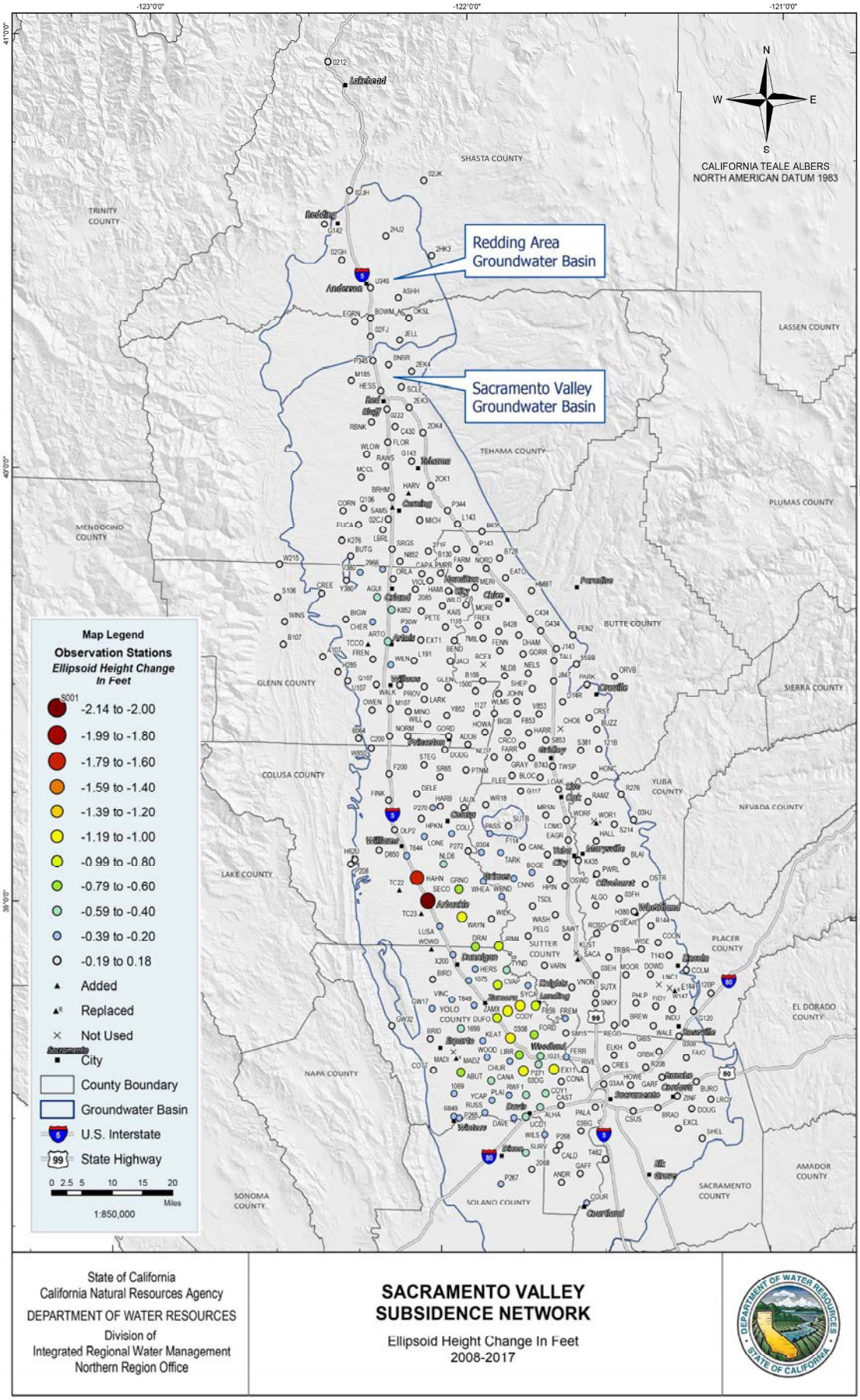

Vina
Electrical Conductivity (µS)
760
660
560
460
360
260
160
60
EC=700
pH=8.5
pH=6.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
pH
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year
EC
pH

Groundwater Status Report

Appendix E

Sacramento Valley Subsidence Monitoring Network Observation Stations

Figure ES-1 Height Change at Monuments between 2008 and 2017



Groundwater Status Report

Appendix F

Butte Spring, Summer, & Fall BMO Summary Tables

Spring 2008 - 2019 Groundwater Elevations - CASGEM

Sub Basin	Subregion	Monitoring Wells	Well Type	Well Depth	First Record	Groundwater Water Surface Elevations (WSEs) (feet)												BMO Alert 1 Level (feet)	BMO Alert 2 Level (feet)	Analysis		
						2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019			Elevation Above (+) or Below (-) Alert Stage 1 (ft)	Change Spring 2018 to Spring 2019 (ft)	Spring 2019 Depth to Water (ft)
VINA	Vina North	22N01E09B001M	D	S	2001	144.9	140.7	141.0	145.0	142.6	138.0	131.5	131.6	130.6	137.9	137.2	138.4	146.0	138.2	-7.6	1.2	39.9
		22N01E20K001M	D	S	1961	132.9	129.0	134.1	138.2	134.6	130.5	NM	121.7	125.6	136.5	132.3	136.1	132.3	127.2	3.8	3.8	31.7
		23N01E29P002M	D	S/I	1990	156.1	152.3	152.5	155.9	152.6	150.2	NM	141.5	143.4	152.4	146.4	150.2	148.4	131.9	1.8	3.8	55.1
		23N01E33A001M	I	S/I	2001	154.6	151.4	150.5	152.6	151.5	149.5	144.6	142.2	141.7	144.3	144.2	144.6	155.3	144.1	-10.8	0.3	107.8
		23N01W10E001M	I	I	2001	165.7	163.2	164.7	166.6	163.6	159.0	153.4	153.5	155.9	162.7	157.2	164.7	166.8	160.9	-2.1	7.5	24.7
		23N01W10M001M	M	S	2001	165.5	164.5	165.2	167.8	163.3	166.0	156.0	155.6	158.4	166.1	158.8	165.9	168.4	162.6	-2.5	7.0	21.5
		23N01W27L001M	D	S	1976	145.2	142.4	145.3	NM	142.7	142.7	136.3	139.9	140.8	149.2	138.9	148.9	137.1	114.8	11.8	10.0	13.5
		23N01W36P001M	D	S	1959	142.1	138.5	139.6	143.5	137.3	137.3	134.5	132.4	130.5	144.7	140.5	145.0	134.8	128.3	10.2	4.5	17.8
		23N02W25C001M	I	S/I	1967	139.1	139.3	140.5	144.2	136.1	137.7	133.9	136.3	136.4	149.0	137.7	NM	136.3	133.0	NM		NM
		23N01W25G001M	I	I	2007	148.4	150.0	150.7	134.5	149.8	149.0	141.2	141.0	142.3	150.4	145.0	147.1	*	*			33.3
		23N01W03H002M	M	I	2012					179.0	178.0	171.1	173.3	173.0	176.1	174.1	175.9	*	*		1.8	41.0
		23N01W03H003M	M	I	2012					179.4	178.9	173.0	174.0	173.5	177.2	174.8	175.9	*	*		1.2	41.0
		23N01W03H004M	M	S	2012					182.9	181.8	175.9	177.3	174.9	180.5	177.2	179.8	*	*		2.6	37.1
		23N01W28M002M	M	D	2009		145.2	148.9	148.0	147.8	148.0	140.1	143.0	142.6	148.8	143.1	147.7	*	*		4.6	11.3
		23N01W28M003M	M	D	2009		145.6	148.6	147.1	146.7	147.2	140.1	143.1	143.6	151.0	142.8	149.9	*	*		7.1	9.2
		23N01W28M004M	M	S	2009		147.9	146.5	152.2	143.6	143.6	137.8	141.3	144.3	150.1	140.3	150.1	*	*		9.8	8.9
		23N01W28M005M	M	S	2009		148.2	146.5	152.6	142.9	143.6	130.2	141.6	143.4	150.3	139.8	150.3	*	*		10.5	8.8
		23N01W31M001M	M	D	2008		138.1	141.2	143.6	139.6	140.9	130.8	135.1	135.1	141.0	136.9	139.3	*	*		2.4	15.5
		23N01W31M002M	M	I	2008		144.2	144.9	148.1	141.9	142.7	136.9	139.9	141.4	148.8	138.6	147.5	*	*		8.9	7.3
		23N01W31M003M	M	S	2008		141.2	142.2	146.6	140.5	138.8	137.2	137.0	142.5	147.8	137.9	147.2	*	*		9.3	7.5
		23N01E07H001M	D	S	2019												168.6	*	*			113.4
		23N01W31M004M	M	S	2008		138.8	139.2	142.3	138.5	137.8	136.0	137.6	141.3	141.7	136.4	141.8	*	*		5.5	12.9
	Vina Chico	CWSCH01b	M&I	U	1988	127.0	132.0	130.0	131.0	131.0	126.0	123.0	120.0	123.0	131.0	124.0	130.0	*	*		6.0	130.0
		CWSCH02	M&I	U	1988	138.0	136.0	138.0	141.0	136.0	128.0	110.0	121.0	121.0	125.0	126.0	131.0	123.0	91.0	8.0	5.0	131.0
		CWSCH03	M&I	U	1988	123.0	128.0	129.0	123.0	126.0	122.0	120.0	118.0	122.0	123.0	123.0	123.0	128.0	81.0	-5.0	0.0	123.0
		CWSCH04	M&I	U	1988	118.0	117.0	QM	123.0	119.0	122.0	105.0	NM	118.0	142.0	130.0	132.0	126.0	106.0	6.0	2.0	132.0
		CWSCH05	M&I	U	1988	122.0	118.0	124.0	125.0	122.0	120.0	113.0	111.0	116.0	122.0	119.0	122.0	119.0	95.0	3.0	3.0	122.0
		CWSCH06	M&I	U	1988	118.0	115.0	126.0	115.0	117.0	117.0	96.0	105.0	121.0	131.0	128.0	133.0	116.0	93.0	17.0	5.0	133.0
		CWSCH07	M&I	U	1991	115.0	115.0	118.0	117.0	123.0	117.0	113.0	112.0	113.0	118.0	114.0	120.0	115.0	95.0	5.0	6.0	120.0
		22N01E28J001M	M	I	1958	139.3	131.9	136.5	140.5	137.7	134.9	126.9	126.6	126.0	137.7	132.8	138.1	140.4	135.6	-2.3	5.3	40.8
		22N01E28J003M	M	I	1958	143.8	138.9	140.7	145.2	141.7	139.4	131.1	130.5	129.2	141.6	136.5	143.1	136.2	130.2	6.9	6.6	35.2
		22N01E28J005M	M	D	1958	136.6	131.3	133.0	135.9	133.7	134.2	123.3	125.0	123.6	132.8	128.6	132.5	135.1	130.8	-2.6	3.9	46.4
		22N01E35E001M	I	S/I	2005	131.1	127.1	129.3	131.8	129.6	125.4	119.7	119.0	121.8	129.6	126.8	130.4	*	*		3.6	52.0
		22N02E30C002M	M	S	2002	131.1	127.5	127.3	128.7	127.6	123.6	120.5	117.9	NM	126.5	126.2	126.6	*	*		0.3	117.1
	Vina South	20N02E24C001M	M	S	1999	121.0	119.5	118.9	121.2	119.3	115.4	109.7	107.0	105.8	109.5	112.1	111.0	122.8	117.6	-11.9	-1.1	46.8
		20N02E24C002M	M	I	1999	120.9	119.5	118.9	121.2	119.5	115.4	109.1	107.1	105.8	109.4	111.6	110.8	122.8	117.7	-12.0	-0.7	46.9
		20N02E24C003M	M	I	1999	121.0	119.6	118.9	121.2	119.4	115.4	109.4	107.1	105.8	109.9	111.1	110.8	122.5	117.0	-11.7	-0.3	46.9
		20N03E31M001M	M	S	2001	118.6	118.2	117.6	118.3	115.0	113.5	110.8	110.6	110.0	115.5	114.7	113.4	120.1	117.1	-6.7	-1.3	19.6
		20N03E33L001M	I	S	1999	124.0	122.3	120.9	123.6	119.1	118.8	116.5	115.1	NM	116.5	117.5	117.4	124.5	120.6	-7.2	-0.2	34.0
		21N03E22C001M	D	S	2001	380.9	381.7	382.7	381.8	381.2	380.2	373.9	367.0	360.0	373.5	NM	382.9	372.1	360.7	10.8		-0.5
		21N03E29J003M	D	S/I	2007	224.3	230.3	230.4	NM	NM	230.7	226.9	226.9	229.6	227.3	230.0	227.1	*	*		-2.9	44.9
		21N03E32B001M	I	S	1999	225.2	224.7	223.9	225.1	226.0	224.2	221.9	221.9	221.6	222.6	222.8	222.8	225.8	224.5	-3.1	-0.1	15.7
		20N02E08H003M	D	S	2008	123.3	121.5	122.6	122.8	120.7	116.5	116.1	114.5	117.3	121.1	116.2	122.3	*	*		6.1	10.0
		20N02E09G001M	M	S	2001	124.4	121.7	121.9	124.7	120.4	116.7	114.4	110.7	113.6	116.8	115.6	118.8	114.5	99.8	4.3	3.2	30.0
		20N02E09L001M	I	I	1953	123.8	123.5	122.9	125.3	122.4	118.6	116.9	114.0	117.7	121.0	118.0	123.9	125.5	122.7	-1.6		15.4
		20N02E08C001M	I	D	2018												117.2	*	*			16.8
		21N02E20P001M	I	S/I	1995	122.8	118.5	121.0	112.3	118.8	111.6	107.3	98.9	107.8	111.9	114.2	120.5	129.4	115.1	-8.9	6.3	47.6
		21N02E26E003M	M	D	2007	124.3	121.4	121.0	122.9	123.3	118.4	115.1	113.6	112.5	114.1	115.5	115.6	*	*		0.1	66.7
		21N02E26E004M	M	I	2007	123.5	120.4	120.3	122.0	122.8	117.8	114.7	113.1	112.3	113.4	115.2	115.9	*	*		0.6	66.4
		21N02E26E005M	M	I	2007	122.6	119.4	119.2	120.8	121.6	116.6	113.9	112.1	111.1	112.2	114.3	114.9	*	*		0.5	67.4
		21N02E26E006M	M	S	2007	116.3	113.1	112.1	113.9	116.4	110.9	108.8	107.9	105.4	105.8	109.6	109.5	*	*		-0.1	72.7
		20N01E02H003M	M	S	2001	108.8	104.8	106.5	109.5	106.8	103.7	96.0	95.0	96.2	105.9	100.5	107.0	*	*		6.5	25.4
		20N01E10C002M	I	S	1947	110.9	104.0	108.5	110.7	108.6	NM	NM	102.3	98.1	108.8	104.2	110.3	110.3	106.1	0.0	6.1	17.1
		20N02E06Q001M	I	S/I	1947	119.8	117.1	117.8	120.1	117.3	114.6	109.5	109.6	109.6	117.1	112.5	118.6	120.4	116.9	-1.8	6.1	19.0
		21N01E10B003M	I	I	1995	126.6	121.8	123.3	126.0	124.9	NM	113.7	111.6	114.6	123.2	119.0	124.1	128.2	110.6	-4.1	5.1	46.2
		21N01E13L002M	M	D	2012					113.4	114.4	108.2	104.9	110.2	117.1	114.2	120.4	*	*		6.2	59.5
		21N01E13L003M	M	I	2012					109.5	114.5	108.1	105.0	102.0	117.1	114.2	120.5	*	*		6.3	59.4
		21N01E13L004M	M	I	2012					106.0	114.8	108.0	105.2	109.7	116.9	114.1	120.5	*	*		6.5	59.3
		21N01E25K001M	D	S	1993	113.7	108.3	110.6	113.6	112.2	106.5	95.9	99.2	97.7	106.2	103.6	109.6	118.5	100.4	-8.9	6.0	44.7
		21N01E26K001M	I	I	1993	111.2	104.3	101.1	106.7	103.4	102.9	93.9	95.7	94.9	107.1	103.1	110.8	115.9	97.4	-5.1	7.7	42.0
		21N01E27D001M	D	S	1946	109.7	103.9	106.6	110.4	108.1	104.4	95.2	94.7	95.9	103.3	96.3	105.2	111.0	105.7	-5.8	8.9	38.1
		21N02E18C001M	M	D	2010				120.2	121.4	114.7	109.1	104.8	111.0	116.2	113.5	118.9	*	*		5.5	70.2

Well Type:D-Domestic, I-Irrigation, M-Monitoring, M/I-Municipal and Industrial
Well Depth: S-Shallow, I-Intermediate, D-Deep

Spring 2008 - 2019 Groundwater Elevations - CASGEM

Sub Basin	Subregion	Monitoring Wells	Well Type	Well Depth	First Record	Groundwater Water Surface Elevations (WSEs) (feet)												BMO Alert 1 Level (feet)	BMO Alert 2 Level (feet)	Analysis		
						2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019			Elevation Above (+) or Below (-) Alert Stage 1 (ft)	Change Spring 2018 to Spring 2019 (ft)	Spring 2019 Depth to Water (ft)
		21N02E18C002M	M	I	2010				117.7	121.8	115.2	109.0	104.1	111.2	116.5	113.9	119.4	*	*		5.5	69.7
		21N02E18C003M	M	S	2010				160.8	149.0	150.7	142.4	149.7	151.7	167.4	158.3	171.5	*	*		13.2	17.6
		21N02E30L001M	D	S/I	1995	120.8	115.8	118.0	120.0	118.7	113.8	105.7	105.0	105.7	NM	110.6	118.2	126.3	109.8	-8.1	7.7	41.1
BUTTE	Butte*	17N01E10A001M	D	S	1953	59.6	59.2	59.7	60.5	63.7	57.7	59.8	58.9	61.0	59.6	58.9	59.5	52.9	51.2	6.6	0.6	5.8
		18N01E35L001M	M	D	2005	74.7	74.6	74.7	75.1	74.1	74.1	NM	72.2	72.3	75.0	73.3	74.8	*	*		1.4	-4.8
		18N02E16F001M	I	S	1947	76.7	76.4	76.6	77.2	76.5	75.8	76.9	76.0	78.8	77.4	77.8	77.8	75.3	74.6	2.5	0.0	4.5
		18N02E25M001M	I	S	1959	83.4	83.4	82.9	84.6	82.4	67.1	NM	81.5	85.7	83.9	82.2	84.7	82.7	81.9	2.0	2.5	4.6
		18N02E32H001M	D	S	2001	71.9	71.7	NM	72.9	71.4	70.9	72.0	72.7	75.4	71.8	71.8	72.9	70.8	68.2	2.1	1.1	5.4
		17N02E14A001M	I	S	1947	81.5	81.5	81.3	81.2	80.4	79.6	80.8	78.9	82.8	81.9	79.7	82.6	78.5	77.0	4.1	2.9	2.2
		17N02E14H001M	D	S	2000	79.8	80.0	79.8	82.2	79.5	78.5	79.0	79.4	80.6	80.7	77.6	NM	79.0	76.2	NM		NM
		17N03E16N001M	D	S	1953	77.3	77.4	77.6	79.6	75.9	76.1	75.7	NM	NM	NM	NM	NM	74.3	72.2	NM		NM
		17N01E17F001M	M	S	1992	54.8	54.7	54.8	56.0	54.8	54.3	54.8	53.8	56.3	56.7	56.0	57.2	54.1	51.3	3.1	1.2	1.8
		17N01E17F002M	M	I	1992	57.2	57.1	57.0	58.0	56.7	56.5	56.7	55.5	57.1	57.8	57.0	58.2	56.9	54.9	1.3	1.3	1.2
		17N01E17F003M	M	I	1992	58.4	57.9	58.1	58.7	57.6	57.5	57.4	56.3	57.2	59.0	58.0	59.3	57.5	55.0	1.8	1.3	0.1
		17N01E24A003M	M	D	2007	75.2	74.7	74.4	74.8	74.4	74.3	73.1	71.7	71.0	74.9	73.4	74.1	*	*		0.7	-1.3
		17N01E24A004M	M	I	2007	65.8	65.4	66.0	67.2	65.2	64.0	63.7	61.9	62.5	64.5	62.6	65.7	*	*		3.1	7.1
		17N01E24A005M	M	I	2007	65.8	65.4	65.9	67.1	65.2	64.0	63.0	61.7	62.1	64.5	62.4	65.6	*	*		3.2	7.2
		17N01E24A006M	M	S	2007	68.1	68.1	68.2	69.2	68.3	68.7	69.5	67.8	69.3	68.7	68.3	68.8	*	*		0.5	4.1
		17N02E19J001M	I	S/I	2000	64.1	66.2	66.9	67.2	66.7	66.6	66.1	66.6	66.2	67.1	66.8	66.9	66.0	62.8	0.9	0.1	5.4
		18N01E13A002M	I	S/I	2001	75.7	75.3	75.6	75.6	75.1	75.0	75.6	74.8	77.3	76.0	75.2	76.5	70.7	65.7	5.8		2.8
		18N01E15D002M	D	S	1976	70.8	70.4	70.6	70.8	68.2	70.5	70.8	70.3	72.4	71.3	71.3	71.8	65.3	60.3	6.5	0.5	0.6
		19N01E27Q001M	M	I	1978	84.7	84.0	84.4	85.2	84.1	83.6	84.2	83.6	85.0	84.7	83.9	85.0	79.7	74.7	5.3	1.1	2.4
		19N01E35B001M	M	S	2002	82.7	82.4	82.7	83.5	82.7	82.1	82.9	82.2	84.3	83.5	83.3	83.3	77.5	72.5	5.8	0.0	3.2
		19N01E35B002M	M	D	2005	91.6	90.9	91.1	91.4	90.7	90.5	89.8	89.5	88.6	91.2	90.5	90.9	*	*		0.5	-4.4
		19N01E35B003M	M	I	2005	86.0	85.2	85.7	86.4	85.3	84.9	85.2	84.5	85.2	86.2	85.2	86.2	*	*		1.0	0.4
		19N02E15N002M	I	U	2000	102.9	102.5	102.8	103.3	102.4	101.4	102.8	101.9	103.9	103.4	103.6	103.5	98.2	93.2	5.3	0.1	3.8
		18N03E08B003M	I	S/I	2001	101.0	95.8	100.7	102.3	99.9	97.9	99.6	99.7	NM	103.2	99.8	102.2	100.3	96.4	1.9	2.4	10.1
		18N03E21G001M	I	S	1953	86.7	84.7	87.0	89.2	87.6	87.2	85.1	85.2	83.8	93.1	90.6	89.5	86.7	84.1	2.8	-1.1	16.8
		19N03E05N002M	D	S	1967	121.6	120.6	121.9	122.1	119.6	116.3	116.7	117.9	116.5	119.0	119.4	119.0	114.4	96.5	4.6	-0.4	23.3
		19N01E09Q001M	I	S	1991	89.5	88.8	88.3	89.4	88.8	NM	NM	87.8	NM	NM	88.9	88.4	84.5	79.5	3.9	-0.5	4.0
		19N02E07K002M	M	I	2006	NM	102.6	102.9	103.4	102.3	101.7	101.4	100.9	100.9	102.4	102.0	102.7	*	*		0.7	-0.02
		19N02E07K003M	M	I	2006	NM	99.4	99.5	100.0	99.8	99.0	99.5	98.8	100.7	99.9	100.4	100.0	*	*		-0.4	2.7
		19N02E07K004M	M	S	2006	NM	99.6	99.7	100.2	99.9	99.2	99.7	98.9	100.7	100.1	100.4	100.2	*	*		-0.2	2.5
		19N02E13Q001M	M	S	2002	115.8	114.1	114.7	115.5	114.8	114.3	115.4	116.2	116.9	117.0	115.9	116.8	*	*		0.9	3.1
		19N02E13Q002M	M	I	2006	116.6	115.3	115.7	116.5	115.7	114.8	116.0	116.4	117.1	117.4	116.4	117.3	*	*		0.9	2.6
		19N02E13Q003M	M	D	2006	117.0	115.7	116.1	117.0	116.0	115.2	116.3	116.6	117.2	117.7	116.7	117.5	*	*		0.8	2.4
		20N01E35C001M	D	S	1947	99.4	98.5	98.4	99.9	NM	98.8	NM	NM	NM	NM	NM	99.9	94.3	89.3	5.6		2.5
		20N02E15H001M	M	S	1995	124.0	122.9	122.2	124.5	122.1	118.8	NM	112.1	113.3	116.3	115.5	118.0	*	*		2.5	26.0
		20N02E15H002M	M	S	1995	134.5	133.7	134.2	135.7	132.7	129.9	NM	122.7	122.3	130.6	121.6	130.3	*	*		8.7	13.9
		20N02E16P001M	I	U	1990	123.0	122.2	NM	123.3	121.8	118.9	116.1	113.3	118.0	119.9	118.1	120.9	119.3	114.3	1.6	2.8	10.9
		20N02E28N001M	D	S/I	1947	118.5	118.6	118.6	119.1	122.3	117.7	118.5	117.7	120.0	118.9	118.7	119.1	113.8	108.8	5.3	0.4	4.3
		21N01W23J001M	I	S	1941	112.7	113.0	112.4	117.1	112.0	109.1	110.2	109.3	115.1	115.8	106.7	117.0	110.7	108.2	6.3	10.3	4.4
		21N01W35K002M	I	S/I	1994	102.4	102.2	103.0	107.5	100.9	100.5	99.7	101.0	103.9	107.5	99.3	NM	94.9	80.9	NM		NM
		20N01E18L001M	M	D	2000	106.3	104.3	105.2	106.6	104.1	103.4	99.4	100.7	99.9	104.5	101.4	104.9	107.7	105.2	-2.9	3.4	2.5
		20N01E18L002M	M	I	2001	103.0	102.4	102.6	104.3	102.1	101.8	101.0	101.1	102.3	103.9	101.3	104.3	102.9	100.2	1.4	3.0	3.1
		20N01E18L003M	M	S	2001	104.2	103.6	104.0	104.7	103.4	103.2	103.1	102.8	105.5	104.3	104.3	104.9	103.6	101.5	1.3	0.7	2.4
		20N01W04J001M	I	S	2008	82.9	82.8	82.8	91.1	82.9	82.1	81.8	81.5	86.1	NM	82.0	NM	*	*			NM
		20N01W11N002M	I	S	2008	96.9	96.6	97.4	101.7	95.8	94.4	95.9	96.3	97.5	NM	94.6	102.6	*	*		8.0	4.8
		21N01W11A001M	M	D	2010				121.2	119.8	118.8	113.1	114.0	115.6	122.5	115.5	122.6	*	*		7.1	6.7
		21N01W11A002M	M	S	2010				117.0	119.2	115.1	114.5	113.9	122.0	120.2	115.5	122.6	*	*		7.1	6.7
		21N01W11A003M	M	S	2010				116.7	119.8	114.9	114.4	113.9	122.6	119.8	115.7	122.2	*	*		6.6	7.1
		21N01W13J001M	M	D	2012					115.7	114.2	108.6	109.1	110.9	117.5	110.3	118.2	*	*		8.0	9.4
		21N01W13J002M	M	I	2012					115.8	114.5	109.1	109.7	111.7	118.1	110.6	118.9	*	*		8.3	8.8
		21N01W13J003M	M	I	2012					116.0	114.7	109.5	110.2	112.3	118.6	111.0	119.3	*	*		8.3	8.4
		21N01W24B001M	M	D	1995	115.7	113.0	114.4	114.9	113.0	111.9	106.7	107.4	108.9	115.2	108.0	115.8	117.8	108.5	-1.9	7.9	11.2
		22N01E29R001M	I	I	1947	138.2	138.3	132.4	137.5	133.7	131.3	122.5	120.6	124.2	134.7	128.9	134.6	140.6	136.6	-6.0	5.8	29.1
		22N01E32E004M	D	S	1992	127.1	125.5	124.6	126.6	126.7	125.4	117.4	117.5	119.8	129.4	123.0	128.6	130.9	117.8	-2.3	5.6	22.4
W CRK.	Wyandotte Creek Oroville	19N03E16Q001M	D	S	2000	138.7	136.7	138.7	139.8	139.0	138.1	NM	140.3	138.9	140.7	149.9	140.0	137.8	135.4	2.2		39.3
		CWS-01	M&I	150	1978	103.0	124.0	129.0	128.0	122.0	124.0	123.0	124.0	128.0	139.0	135.0	137.0	119.0	99.0	18.0	2.0	23.0
		CWS-02	M&I	180	1978	152.0	144.0	144.0	148.0	142.0	147.0	145.0	148.0	142.0	153.0	150.0	153.0	135.0	111.0	18.0	3.0	25.0
		CWS-03	M&I	U	1978	163.0	151.0	165.0	159.0	163.0	159.0	154.0	149.0	155.0	174.0	168.0	173.0	154.0	135.0	19.0	5.0	22.0
		17N03E03D001M	I	S	1947	72.6	71.5	72.4	76.0	70.2	67.8	71.1	71.1	71.3	85.3	72.2	75.4	72.8	69.8	2.6	3.2	21.9

Well Type:D-Domestic, I-Irrigation, M-Monitoring, M/I-Municipal and Industrial
Well Depth: S-Shallow, I-Intermediate, D-Deep

Spring 2008 - 2019 Groundwater Elevations - CASGEM

Sub Basin	Subregion	Monitoring Wells	Well Type	Well Depth	First Record	Groundwater Water Surface Elevations (WSEs) (feet)														Analysis		
						2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	BMO Alert 1 Level (feet)	BMO Alert 2 Level (feet)	Elevation Above (+) or Below (-) Alert Stage 1 (ft)	Change Spring 2018 to Spring 2019 (ft)	Spring 2019 Depth to Water (ft)
W.C.	Wyandotte Creek South	17N04E09N002M	I	S/I	2001	82.0	***77.9***	***76.2***	***78.5***	***78.6***	***78.1***	***74.9***	73.5	***74.7***	75.9	NM	NM	79.2	71.1	NM		NM
		17N04E22B001M	D	S	1976	104.8	103.3	101.3	106.1	103.6	104.2	101.8	103.4	104.3	106.8	NM	105.4	98.6	96.1	6.8		11.9
		19N04E31F001M	D	S	2001	125.8	124.8	124.9	127.1	131.2	124.4	123.9	119.0	140.2	127.1	139.2	128.5	108.1	70.8	20.4	-10.7	130.8

* Wells that do not have alert levels established as detailed below:

Subregion	Well ID	Date Added to the Monitoring
Vina North	23N01W03H002M	2012
Vina North	23N01W03H003M	2012
Vina North	23N01W03H004M	2012
Vina North	23N01W25G001M	2007
Vina North	23N01W28M002M	2008
Vina North	23N01W28M003M	2008
Vina North	23N01W28M004M	2008
Vina North	23N01W28M005M	2008
Vina North	23N01W31M001M	2008
Vina North	23N01W31M002M	2008
Vina North	23N01W31M003M	2008
Vina North	23N01W31M004M	2008
Vina Chico	22N01E35E001M	2005
Vina Chico	22N02E30C002M	2002
Vina Chico	CWSCH01b (replacement for CWS 01)	2016
Vina South	20N01E02H003M	2001
Vina South	20N02E08C001M	2018
Vina South	20N02E08H003M	2008
Vina South	21N01E13L002M	2012
Vina South	21N01E13L003M	2012
Vina South	21N01E13L004M	2012
Vina South	21N02E18C001M	2010
Vina South	21N02E18C002M	2010
Vina South	21N02E18C003M	2010
Vina South	21N02E26E003M	2007
Vina South	21N02E26E004M	2007
Vina South	21N02E26E005M	2007
Vina South	21N02E26E006M	2007
Vina South	21N02E30L001M	1995
Vina South	21N03E29J003M	2007
Butte	17N01E24A003M	2007
Butte	17N01E24A004M	2007
Butte	17N01E24A005M	2007
Butte	17N01E24A006M	2007
Butte	18N01E35L001M	2005
Butte	19N01E35B002M	2005
Butte	19N01E35B003M	2005
Butte	19N02E07K002M	2006
Butte	19N02E07K003M	2006
Butte	19N02E07K004M	2006
Butte	19N02E13Q001M	2002
Butte	19N02E13Q002M	2006
Butte	19N02E13Q003M	2006
Butte	20N02E15H001M	1995
Butte	20N02E15H002M	1995
Butte	20N01W04J001M	2008
Butte	20N01W11N002M	2008
Butte	21N01W11A001M	2010
Butte	21N01W11A002M	2010
Butte	21N01W11A003M	2010
Butte	21N01W13J001M	2012
Butte	21N01W13J002M	2012
Butte	21N01W13J003M	2012

Depth Categories:

S- Shallow: indicates total well depth or screening interval is less than 200 feet below ground surface
I- Intermediate: total well depth or screening interval is 200-600 feet
S/I- Shallow/Intermediate: screened interval spans portions of the shallow and intermediate depth intervals
D- Deep: total well depth or screening interval is greater than 600 feet

Note: Red font indicates Questionable Measurement (QM), Yellow highlight is Alert Stage 1, Red higlight is Alert Stage 2
** Indicates subasin primarily served by surface water supplies versus groundwater

Alert Stage 1
Alert Stage 2

Alert Stage Count

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Alert 1	27	33	25	24	25	20	26	22	17	13	19	16
Alert 2	0	6	3	0	4	15	21	25	25	11	19	9
Total	27	39	28	24	29	35	47	47	42	24	38	25

Well Type:D-Domestic, I-Irrigation, M-Monitoring, M/I-Municipal and Industrial
Well Depth: S-Shallow, I-Intermediate, D-Deep

Summer 2011 - 2019 Groundwater Elevations - CASGEM

Sub Basin	Subregion	Monitoring Wells	Well Type	Well Depth	First Record	Groundwater Elevations											Analysis		
						Summer 2011 Average WSE (ft)	Summer 2012 Average WSE (ft)	Summer 2013 Average WSE (ft)	Summer 2014 Average WSE (ft)	Summer 2015 Average WSE (ft)	Summer 2016 Average WSE (ft)	Summer 2017 Average WSE (ft)	Summer 2018 Average WSE (ft)	Spring 2019 (WSE) (ft)	7/1/19 - 7/11/19 WSE (ft)	7/28/19 - 8/21/19 WSE (ft)	2019 Average Summer WSE (ft)	Change Avg. Summer WSE 2018 to 2019 (ft)	Change Spring to Avg. Summer 2019 (ft)
VINA	Vina North	23N01E07H001M	D	S	2018									168.6	166.0	165.9	166.0	N/A	-2.65
		23N01E29P002M	D	S/I	1990	145.6	139.4	128.0	138.7	133.3	132.4	139.7	131.0	150.24	139.8	141.3	140.6	9.5	-9.7
		23N01W10E001M	I	I	2001	156.2	163.4	166.8	146.2	146.2	143.7	149.6	NM	**164.68**	NM	152.5	152.5	N/A	-12.2
		23N01W10M001M	M	S	2001	158.6	148.8	148.4	145.4	147.1	147.9	152.2	149.5	**165.86**	154.2	153.3	153.8	4.2	-12.1
		23N01W27L001M	D	S	1976	137.2	128.7	125.1	126.5	121.1	123.5	NA	123.3	148.87	135.9	133.5	134.7	11.4	-14.2
		23N01W36P001M	D	S	1959	131.6	112.4	113.2	109.6	108.4	108.6	119.5	112.8	144.95	136.4	125.7	131.0	18.2	-14.0
		23N02W25C001M	I	S/I	1967	136.8	137.3	132.3	130.0	131.1	133.9	137.1	123.0	NM	139.0	137.3	138.2	15.2	N/A
		23N01W25G001M	I	I	2007	125.5	134.1	134.4	132.8	127.4	121.9	131.7	126.6	147.05	136.5	132.2	134.3	7.7	-12.8
		23N01W03H002M	M	I	2012	NW	166.3	163.4	166.0	165.5	164.5	165.4	165.6	175.89	167.1	167.2	167.1	1.5	-8.8
		23N01W03H003M	M	I	2012	NW	168.3	166.0	162.4	166.6	166.1	168.4	167.2	175.91	170.2	170.8	170.5	3.3	-5.4
		23N01W03H004M	M	S	2012	NW	178.3	175.8	172.9	172.4	173.8	178.2	174.5	179.77	180.6	178.8	179.7	5.2	0.0
		23N01W28M002M	M	D	2009	141.1	135.3	129.8	127.2	125.1	130.0	136.0	129.6	147.73	141.7	137.8	139.8	10.2	-8.0
		23N01W28M003M	M	D	2009	137.9	131.7	127.4	124.9	124.6	128.6	135.2	129.0	149.87	140.2	136.1	138.2	9.2	-11.7
		23N01W28M004M	M	S	2009	137.1	127.7	127.6	125.3	124.1	128.0	134.6	128.8	150.1	139.2	136.4	137.8	9.0	-12.3
		23N01W28M005M	M	S	2009	138.2	130.8	128.9	126.4	127.0	129.4	135.6	129.8	150.25	140.0	137.0	138.5	8.6	-11.8
		23N01W31M001M	M	D	2008	133.4	127.8	111.4	118.7	106.6	123.8	131.0	121.7	139.26	136.9	132.0	134.4	12.8	-4.8
		23N01W31M002M	M	I	2008	129.0	122.1	117.8	112.7	117.1	117.6	126.1	115.7	147.46	133.7	126.8	130.3	14.6	-17.2
		23N01W31M003M	M	S	2008	123.1	120.1	119.9	118.5	118.7	116.9	121.2	116.9	147.23	130.6	124.2	127.4	10.5	-19.9
		23N01W31M004M	M	S	2008	136.5	134.2	133.7	132.2	132.0	133.0	135.5	133.6	141.83	137.2	135.8	136.5	2.9	-5.3
	Vina Chico	22N01E09B001M	D	S	2001	141.7	129.6	126.7	125.8	126.2	126.0	134.5	128.3	**138.43**	138.7	135.5	137.1	8.8	-1.3
		22N01E20K001M	D	S	1961	130.4	121.8	121.7	125.1	115.5	116.2	127.6	119.6	136.14	134.3	132.7	133.5	13.9	-2.6
		23N01E33A001M	I	S/I	2001	147.8	144.1	141.7	138.9	136.8	136.5	141.2	139.8	**144.59**	144.3	142.0	143.2	3.4	-1.4
		CWSCH01b	M&I	U	1988	NA	NA	NA	NA	NA	NA	NA	105.0	130	108	113.0	110.5	5.5	-19.5
		CWSCH02	M&I	U	1988	NA	NA	NA	NA	NA	NA	NA	104.5	131	109	110.0	109.5	5.0	-21.5
		CWSCH03	M&I	U	1988	NA	NA	NA	NA	NA	NA	NA	108.5	**123**	110	117.0	113.5	5.0	-9.5
		CWSCH04	M&I	U	1988	NA	NA	NA	NA	NA	NA	NA	105.5	132	114	118.0	116.0	10.5	-16.0
		CWSCH05	M&I	U	1988	NA	NA	NA	NA	NA	NA	NA	103.5	122	114	101.0	107.5	4.0	-14.5
		CWSCH06	M&I	U	1988	NA	NA	NA	NA	NA	NA	NA	99.5	133	95	112.0	103.5	4.0	-29.5
		CWSCH07	M&I	U	1991	NA	NA	NA	NA	NA	NA	NA	102.0	120	93	98.0	95.5	-6.5	-24.5
		22N01E28J001M	M	I	1958	126.2	118.1	NM	118.1	116.9	115.5	124.6	120.1	**138.07**	130.5	126.8	128.7	8.6	-9.4
		22N01E28J003M	M	I	1958	132.7	125.9	NM	122.4	120.4	120.9	130.0	126.3	143.09	137.2	133.7	135.5	9.2	-7.6
		22N01E28J005M	M	D	1958	126.8	118.9	NM	114.2	114.8	119.0	125.2	119.2	**132.54**	131.3	128.0	129.6	10.5	-2.9
		22N01E35E001M	I	S/I	2005	116.2	103.7	104.2	104.5	105.7	105.6	112.7	107.0	130.37	NM	116.5	116.5	9.5	-13.9
		22N02E30C002M	M	S	2002	117.7	112.8	NM	111.8	NM	112.8	117.2	115.0	126.56	123.5	NM	123.5	8.5	-3.0
		20N01E02H003M	M	S	2001	102.0	92.2	NM	87.1	81.8	86.0	94.2	89.8	106.99	NM	99.0	99.0	9.3	-7.9
		20N01E10C002M	I	S	1947	NM	NM	NM	94.0	86.3	95.2	101.5	89.4	**110.25**	103.5	99.6	101.5	12.2	-8.8
		20N02E06Q001M	I	S/I	1947	112.7	101.4	99.2	98.5	92.5	96.6	105.2	94.0	**118.63**	112.6	106.8	109.7	15.7	-8.9
		20N02E08C001M	I	D	2018								89.5	117.2	NM	NM	N/A	N/A	N/A
		21N01E10B003M	I	I	1995	110.2	99.4	93.0	92.7	99.5	95.2	103.2	98.0	**124.13**	111.1	107.1	109.1	11.2	-15.0
		21N01E13L002M	M	D	2012	NW	90.9	77.1	81.4	86.6	87.9	95.0	85.4	120.35	104.3	102.2	103.2	17.8	-17.1
		21N01E13L003M	M	I	2012	NW	89.8	76.5	81.3	83.8	86.6	94.0	83.3	120.49	104.4	101.8	103.1	19.8	-17.4

Well Type
D-Domestic, I-Irrigation
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Well Depth
S-Shallow, I-Intermediate
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Summer 2011 - 2019 Groundwater Elevations - CASGEM

Sub Basin	Subregion	Monitoring Wells	Well Type	Well Depth	First Record	Groundwater Elevations											Analysis		
						Summer 2011 Average WSE (ft)	Summer 2012 Average WSE (ft)	Summer 2013 Average WSE (ft)	Summer 2014 Average WSE (ft)	Summer 2015 Average WSE (ft)	Summer 2016 Average WSE (ft)	Summer 2017 Average WSE (ft)	Summer 2018 Average WSE (ft)	Spring 2019 (WSE) (ft)	7/1/19 - 7/11/19 WSE (ft)	7/28/19 - 8/21/19 WSE (ft)	2019 Average Summer WSE (ft)	Change Avg. Summer WSE 2018 to 2019 (ft)	Change Spring to Avg. Summer 2019 (ft)
	Vina South	21N01E13L004M	M	I	2012	NW	92.6	78.6	83.3	86.4	88.7	95.9	86.8	120.51	105.3	103.9	104.6	17.8	-15.9
		21N01E25K001M	D	S	1993	104.1	NM	NM	83.8	83.5	85.7	95.8	91.1	109.63	107.6	102.4	105.0	14.0	-4.6
		21N01E26K001M	I	I	1993	97.6	92.7	90.6	71.6	79.5	81.4	84.8	77.1	110.84	87.0	NM	87.0	9.9	-23.8
		21N01E27D001M	D	S	NM	102.0	91.4	88.6	82.1	80.2	81.5	91.3	84.0	105.24	NM	NM	N/A	N/A	N/A
		21N02E18C001M	M	D	2010	104.4	95.5	86.6	90.0	89.5	91.9	97.5	89.7	118.91	102.8	102.9	102.8	13.2	-16.1
		21N02E18C002M	M	I	2010	105.1	95.5	87.9	90.7	89.7	91.3	97.6	90.1	119.42	104.9	104.0	104.5	14.4	-15.0
		21N02E18C003M	M	S	2010	154.4	145.4	143.6	140.4	142.9	149.2	162.8	158.0	171.5	166.4	165.1	165.8	7.8	-5.7
		21N02E30L001M	D	S/I	1995	110.1	98.7	93.3	92.6	90.2	92.4	99.1	93.8	118.23	112.3	108.5	110.4	16.6	-7.9
		20N02E24C001M	M	S	1999	104.6	103.7	98.1	94.2	89.9	92.3	101.4	97.2	110.95	103.0	99.9	101.5	4.2	-9.5
		20N02E24C002M	M	I	1999	104.6	103.8	98.1	94.3	90.0	92.4	101.3	97.4	110.84	102.3	99.9	101.1	3.7	-9.7
		20N02E24C003M	M	I	1999	107.6	103.3	98.0	94.4	90.0	92.4	101.3	97.5	110.84	102.4	99.8	101.1	3.7	-9.7
		20N03E31M001M	M	S	2001	101.5	98.6	96.3	93.9	89.0	92.5	100.1	96.1	113.42	100.8	98.5	99.6	3.6	-13.8
		20N03E33L001M	I	S	1999	97.2	94.6	94.4	91.1	89.0	91.0	96.6	89.3	117.38	90.5	88.7	89.6	0.4	-27.8
		21N03E22C001M	D	S	2001	367.3	365.4	371.0	365.0	358.8	360.2	365.3	N/A	382.87	378.4	376.9	377.6	N/A	-5.3
		21N03E29J003M	D	S/I	2007	NM	NM	NM	NM	206.8	208.3	208.3	203.4	227.1	226.6	222.2	224.4	20.9	-2.7
		21N03E32B001M	I	S	1999	224.0	221.7	222.0	217.8	217.9	217.9	220.8	219.3	222.78	223.7	223.1	223.4	4.1	0.6
		20N02E08H003M	D	S	2008	119.7	111.2	109.3	106.2	100.7	107.0	108.6	101.9	122.33	116.1	114.6	115.4	13.5	-7.0
		20N02E09G001M	M	S	2001	114.8	97.1	93.4	92.2	89.0	94.8	97.9	95.7	118.84	116.3	112.3	114.3	18.6	-4.5
		20N02E09L001M	I	I	1953	110.4	96.8	94.2	98.6	88.5	100.7	99.1	91.1	123.93	NM	112.7	112.7	21.7	-11.2
		21N02E20P001M	I	S/I	1995	103.4	89.4	90.8	93.5	89.6	93.4	94.1	75.9	120.53	97.3	103.8	100.6	24.7	-20.0
		21N02E26E003M	M	D	2007	112.0	102.5	95.4	98.8	100.8	97.7	106.4	102.6	115.57	117.4	114.6	116.0	13.4	0.4
		21N02E26E004M	M	I	2007	109.1	100.5	85.9	98.0	101.1	96.0	106.7	101.3	115.88	117.0	114.7	115.9	14.6	0.0
		21N02E26E005M	M	I	2007	106.3	97.8	90.0	95.6	99.9	94.1	106.0	98.9	114.88	116.3	114.0	115.2	16.3	0.3
		21N02E26E006M	M	S	2007	114.1	110.4	103.5	103.2	102.1	102.4	108.3	108.4	109.53	113.2	113.7	113.4	5.1	3.9
BUTTE	Butte*	17N03E05C003M	I	S	2001	86.3	N/A	N/A	N/A	67.8	85.0	85.8	83.5	N/A	87.5	85.7	86.6	3.1	N/A
		17N01E10A001M	D	S	1953	58.2	54.2	NM	59.6	35.0	58.4	58.3	59.4	59.5	56.8	57.3	57.1	-2.3	-2.4
		18N01E35L001M	M	D	2005	73.1	71.7	71.1	68.2	54.9	70.5	71.4	69.9	74.75	NM	72.1	72.1	2.2	-2.6
		18N02E16F001M	I	S	1947	78.3	77.5	77.9	78.1	74.3	78.5	78.5	78.0	77.82	77.9	78.9	78.4	0.4	0.6
		18N02E25M001M	I	S	1959	82.0	NM	80.6	80.3	79.3	79.9	79.4	80.5	84.7	60.8	NM	60.8	-19.7	-23.9
		18N02E32H001M	D	S	2001	75.4	73.8	75.5	70.6	73.5	76.0	73.8	75.3	72.92	75.5	72.6	74.1	-1.2	1.1
		17N02E14A001M	I	S	1947	77.8	77.0	76.6	76.9	76.0	79.3	77.6	76.9	82.59	76.8	76.6	76.7	-0.3	-5.9
		17N02E14H001M	D	S	2000	73.3	63.2	75.1	72.9	58.0	68.3	72.4	67.1	NM	76.0	74.2	75.1	8.0	N/A
		17N03E16N001M	D	S	1953	72.3	66.3	71.7	68.0	NM	NM	NM	66.3	NM	64.7	66.8	65.7	-0.5	N/A
		17N01E17F001M	M	S	1992	52.3	51.7	51.6	47.1	45.1	50.9	51.7	49.9	57.17	52.2	52.1	52.2	2.2	-5.0
		17N01E17F002M	M	I	1992	53.5	52.4	51.8	45.7	41.2	50.1	52.5	47.9	58.2	52.5	52.1	52.3	4.4	-5.9
		17N01E17F003M	M	I	1992	54.2	53.3	52.5	44.6	38.9	50.3	53.4	47.3	59.3	53.3	52.7	53.0	5.6	-6.3
		17N01E24A003M	M	D	2007	74.6	72.6	72.4	68.0	60.8	70.6	72.9	70.0	74.05	73.6	72.9	73.2	3.2	-0.8
		17N01E24A004M	M	I	2007	51.6	52.7	47.3	47.7	42.1	51.6	52.8	46.5	65.68	50.6	50.0	50.3	3.7	-15.4
		17N01E24A005M	M	I	2007	51.6	52.8	47.3	47.7	42.2	51.7	52.9	48.1	65.6	50.6	50.0	50.3	2.2	-15.3
		17N01E24A006M	M	S	2007	66.3	66.7	66.3	64.8	65.0	66.7	65.6	65.8	68.75	67.3	66.7	67.0	1.2	-1.8
		17N02E19J001M	I	S/I	2000	64.3	61.4	61.8	53.7	61.2	65.3	64.3	64.8	66.93	63.5	63.0	63.3	-1.6	-3.7
		18N01E13A002M	I	S/I	2001	77.2	76.5	76.7	76.5	55.0	76.5	76.7	76.8	76.54	76.5	75.6	76.1	-0.7	-0.5
		18N01E15D002M	D	S	1976	69.9	70.7	70.6	70.2	33.6	70.7	70.3	71.1	71.75	70.7	69.9	70.3	-0.8	-1.4
		19N01E27Q001M	M	I	1978	84.0	83.0	83.4	83.2	72.3	83.6	83.2	83.2	84.95	83.9	84.1	84.0	0.7	-1.0
		19N01E35B001M	M	S	2002	84.0	83.6	84.0	83.4	74.7	84.2	84.1	83.7	83.3	NM	83.9	83.9	0.2	0.6
		19N01E35B002M	M	D	2005	90.7	89.2	88.8	87.5	74.4	88.1	89.7	88.5	90.91	NM	90.1	90.1	1.6	-0.8
		19N01E35B003M	M	I	2005	85.2	84.1	84.2	83.3	67.6	84.0	84.3	84.0	86.15	NM	84.9	84.9	0.9	-1.3
		19N02E15N002M	I	U	2000	103.1	101.9	103.5	101.6	99.7	103.2	103.0	102.2	103.52	102.8	103.2	103.0	0.8	-0.5
		18N03E08B003M	I	S/I	2001	91.2	87.4	88.7	88.3	86.8	80.3	91.4	90.2	102.2	91.9	89.8	90.9	0.7	-11.4
		18N03E21G001M	I	S	1953	88.1	85.0	84.2	80.1	82.3	83.5	89.2	83.2	89.48	89.1	88.0	88.5	5.3	-1.0
		19N03E05N002M	D	S	1967	117.9	110.5	107.5	106.8	109.2	113.0	111.9	113.2	119.01	111.8	110.8	111.3	-1.9	-7.7
		19N01E09Q001M	I	S	1991	89.7	89.0	NM	NM	NM	NM	90.0	89.2	88.36	89.1	90.1	89.6	0.4	1.2
		19N02E07K002M	M	I	2006	101.7	99.9	98.9	98.3	85.1	98.9	100.6	99.3	102.72	100.7	100.2	100.5	1.1	-2.3
		19N02E07K003M	M	I	2006	100.7	100.1	100.3	100.3	92.3	100.5	100.5	100.1	100.02	100.1	100.6	100.3	0.2	0.3
		19N02E07K004M	M	S	2006	99.7	100.0	100.2	106.2	90.6	100.4	100.5	100.1	100.21	99.9	100.5	100.2	0.2	0.0

Well Type
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Summer 2011 - 2019 Groundwater Elevations - CASGEM

Sub Basin	Subregion	Monitoring Wells	Well Type	Well Depth	First Record	Groundwater Elevations											Analysis		
						Summer 2011 Average WSE (ft)	Summer 2012 Average WSE (ft)	Summer 2013 Average WSE (ft)	Summer 2014 Average WSE (ft)	Summer 2015 Average WSE (ft)	Summer 2016 Average WSE (ft)	Summer 2017 Average WSE (ft)	Summer 2018 Average WSE (ft)	Spring 2019 (WSE) (ft)	7/1/19 - 7/11/19 WSE (ft)	7/28/19 - 8/21/19 WSE (ft)	2019 Average Summer WSE (ft)	Change Avg. Summer WSE 2018 to 2019 (ft)	Change Spring to Avg. Summer 2019 (ft)
		19N02E13Q001M	M	S	2002	114.5	112.9	113.6	113.4	110.3	114.2	113.3	113.9	116.82	113.9	113.2	113.5	-0.3	-3.3
		19N02E13Q002M	M	I	2006	114.7	113.3	113.2	113.2	109.4	114.0	114.3	113.7	117.28	114.1	113.3	113.7	0.0	-3.6
		19N02E13Q003M	M	D	2006	115.0	113.6	113.2	113.4	109.2	114.1	114.7	113.7	117.53	114.3	113.5	113.9	0.1	-3.7
		20N01E18L001M	M	D	2000	101.2	96.4	93.5	93.0	78.4	93.7	97.7	94.8	**104.87**	NM	99.8	99.8	5.0	-5.1
		20N01E18L002M	M	I	2001	100.8	97.9	97.6	96.3	89.9	97.3	98.5	98.2	104.3	NM	99.4	99.4	1.3	-4.9
		20N01E18L003M	M	S	2001	103.3	101.0	101.8	99.3	104.3	103.8	103.5	103.9	104.91	NM	103.2	103.2	-0.6	-1.7
		20N01E35C001M	D	S	1947	100.8	NM	NM	NM	98.2	100.1	NA	99.4	99.85	100.4	100.9	100.6	1.2	0.8
		20N02E15H001M	M	S	1995	113.5	102.7	97.9	90.9	89.4	94.7	96.1	92.6	118.01	99.2	96.4	97.8	5.3	-20.2
		20N02E15H002M	M	S	1995	134.3	132.4	123.7	117.6	116.7	118.4	124.4	118.0	130.27	NM	124.3	124.3	6.3	-6.0
		20N02E16P001M	I	U	1990	117.1	NM	NM	103.2	88.8	100.0	102.5	102.9	120.93	113.0	111.3	112.2	9.2	-8.8
		20N02E28N001M	D	S/I	1947	117.4	116.5	115.8	116.1	116.0	117.3	116.4	117.2	119.13	117.2	117.8	117.5	0.3	-1.6
		21N01W23J001M	I	S	1941	107.6	107.4	106.5	102.0	102.8	103.5	106.2	103.5	116.96	103.7	106.3	105.0	1.5	-12.0
		21N01W35K002M	I	S/I	1994	98.9	97.0	95.2	94.1	94.9	95.4	96.9	96.0	NM	99.1	97.7	98.4	2.3	N/A
		20N01E18L001M	M	D	2000	101.2	96.4	93.5	93.0	78.4	93.7	97.7	94.8	104.87	NM	99.8	99.8	5.0	-5.1
		20N01E18L002M	M	I	2001	100.8	97.9	97.6	96.3	89.9	97.3	98.5	98.2	104.3	NM	99.4	99.4	1.3	-4.9
		20N01E18L003M	M	S	2001	103.3	101.0	101.8	99.3	104.3	103.8	103.5	103.9	104.91	NM	103.2	103.2	-0.6	-1.7
		20N01W04J001M	I	S	2008	82.9	83.0	82.2	80.1	80.4	81.0	81.9	81.8	NM	82.3	82.0	82.1	0.3	N/A
		20N01W11N002M	I	S	2008	95.7	93.1	93.5	91.4	91.6	92.1	93.0	91.1	102.57	94.4	93.5	93.9	2.8	-8.6
		21N01W35K002M	I	S/I	1994	98.9	97.0	95.2	94.1	94.9	95.4	96.9	96.0	NM	99.1	97.7	98.4	2.3	N/A
		21N01W11A001M	M	D	2010	108.2	107.5	104.2	102.8	99.2	104.1	111.6	107.3	122.62	NM	113.5	113.5	6.2	-9.1
		21N01W11A002M	M	S	2010	115.0	114.3	113.8	113.5	111.9	112.3	114.5	114.2	122.56	NM	115.4	115.4	1.2	-7.2
		21N01W11A003M	M	S	2010	115.8	115.8	115.5	114.5	113.5	114.2	115.6	115.7	122.23	NM	115.8	115.8	0.1	-6.4
		21N01W13J001M	M	D	2012	NW	101.5	97.8	96.3	92.5	97.0	103.9	99.6	118.24	107.6	106.0	106.8	7.2	-11.4
		21N01W13J002M	M	I	2012	NW	103.1	101.3	97.1	95.0	98.6	105.1	100.0	118.91	107.3	105.4	106.4	6.4	-12.6
		21N01W13J003M	M	I	2012	NW	104.9	97.2	87.9	96.4	100.2	106.4	91.0	119.26	98.4	95.8	97.1	6.1	-22.2
		21N01W24B001M	M	D	1995	103.3	98.9	93.8	94.5	89.0	93.8	102.4	94.4	**115.84**	NM	103.3	103.3	8.9	-12.6
		22N01E29R001M	I	I	1947	126.5	121.2	113.0	100.0	94.8	107.3	123.0	127.1	**134.64**	NM	124.7	124.7	-2.4	-9.9
		22N01E32E004M	D	S	1992	119.8	111.3	112.9	107.3	105.0	107.2	116.6	110.8	**128.59**	125.3	121.5	123.4	12.6	-5.2
WYANDOTTE CREEK	Wyandotte Creek Oroville	CWS-01	M&I	U	1978	NA	NA	NA	NA	NA	NA	NA	132.0	137	135	126	130.5	-1.5	-6.5
		CWS-02	M&I	U	1978	NA	NA	NA	NA	NA	NA	NA	148.0	153	152	140	146.0	-2.0	-7.0
		CWS-03	M&I	U	1978	NA	NA	NA	NA	NA	NA	NA	166.0	173	168	163	165.5	-0.5	-7.5
		19N03E16Q001M	D	S	2000	140.0	137.5	137.4	137.7	139.4	140.0	140.1	138.8	140.02	140.2	139.9	140.1	1.3	0.05
	Wyandotte Creek South	17N03E03D001M	I	S	1947	73.0	71.0	69.8	67.9	70.8	72.8	75.2	68.8	75.37	72.1	73.2	72.6	3.8	-2.8
		17N04E09N002M	I	S/I	2001	73.5	71.4	NM	59.1	NM	58.8	64.3	N/A	NM	63.1	61.4	62.2	N/A	N/A
		17N04E22B001M	D	S	1976	99.0	96.6	67.5	81.4	63.7	93.9	93.5	N/A	105.36	NM	NM	N/A	N/A	N/A
		19N04E31F001M	D	S	2001	125.4	118.7	116.6	118.4	120.5	122.5	125.3	124.2	128.47	125.5	126.3	125.9	1.7	-2.6

* Indicates subregion corresponding to an Irrigation District primarily served by surface water

Note: Red font indicates Questionable Measurement (QM)

NA- Not available, NM- No measurement, NW- New well

Depth Category

S- Shallow: indicates total well depth or screening interval is less than 200 feet below ground surface

I- Intermediate: total well depth or screening interval is 200-600 feet

S/I- Shallow/Intermediate: screened interval spans portions of the shallow and intermediate depth intervals

D- Deep: total well depth or screening interval is greater than 600 feet

Alert Stage 1

Alert Stage 2

Well Type

D-Domestic, I-Irrigation

M-Monitoring, M/I-Municipal and Industrial

Well Depth

S-Shallow, I-Intermediate

D-Deep

Fall 2008 - 2019 Groundwater Elevations - CASGEM

Sub Basin	Subregion	Monitoring Wells	Well Type	Well Depth	First Record	Groundwater Elevations: Fall 2008 Water Surface Elevation (WSE) (ft)	Fall 2009 Water Surface Elevation (WSE) (ft)	Fall 2010 Water Surface Elevation (WSE) (ft)	Fall 2011 Water Surface Elevation (WSE) (ft)	Fall 2012 Water Surface Elevation (WSE) (ft)	Fall 2013 Water Surface Elevation (WSE) (ft)	Fall 2014 Water Surface Elevation (WSE) (ft)	Fall 2015 Water Surface Elevation (WSE) (ft)	Fall 2016 Water Surface Elevation (WSE) (ft)	Fall 2017 Water Surface Elevation (WSE) (ft)	Fall 2018 Water Surface Elevation (WSE) (ft)	Fall 2019 Water Surface Elevation (WSE) (ft)	Fall BMO Stage 1 Alert Level	Fall BMO Stage 2 Alert Level (Elev. ft)	Analysis: Elevation Above (+) or Below (-) Alert Stage 1 (ft)	Change Fall 2018 to Fall 2019 (ft)	Fall 2019 Depth to Water (ft)
VINA	Vina North	23N01E07H001M	D	S	2018											162.8	167.6	*	*			114.4
		22N01E20K001M	D	S	1961	121.5	121.0	124.6	129.1	120.7	118.3	NM	114.1	114.3	126.5	119.6	130.1	124.9	120.0	-5.3	10.5	37.7
		23N01E29P002M	D	S/I	1990	143.8	138.5	141.9	144.2	140.6	NM	136.5	134.9	133.9	140.4	136.6	142.2	129.8	100.8	6.8	5.6	63.1
		23N01E33A001M	I	S/I	2001	146.7	145.4	145.3	147.5	143.5	140.5	NM	136.3	136.9	140.2	138.6	142.2	149.3	136.3	-10.8	3.6	110.2
		23N01W10E001M	I	I	2001	149.3	156.3	157.2	159.9	NM	NM	142.7	141.9	145.1	NM	151.7	154.8	152.6	144.2	-0.9	3.1	34.6
		23N01W10M001M	M	S	2001	153.6	155.6	157.1	159.9	NM	148.6	147.5	144.5	149.6	154.0	150.1	156.8	154.3	145.5	-4.2	6.7	30.6
		23N01W27L001M	D	S	1976	140.3	133.4	135.3	137.4	130.7	NM	126.4	126.4	129.4	133.4	127.3	NM	131.6	116.0	-4.3		NM
		23N01W36P001M	D	S	1959	122.8	124.7	125.9	129.8	120.7	118.7	117.5	116.8	119.6	125.2	119.9	126.7	128.9	124.1	-9.0	6.8	36.1
		23N02W25C001M	I	S/I	1967	132.1	133.9	134.4	135.8	130.6	130.5	131.0	130.9	133.9	135.4	134.0	135.5	128.8	123.7	5.2	1.5	21.9
		23N01W25G001M	I	I	2007	140.3	139.8	134.5	129.1	134.4	131.5	131.4	130.5	139.1	NM	133.7	137.2	*	*		QM	43.2
		23N01W03H002M	M	I	2012					172.6	169.8	168.0	167.0	167.7	170.2	168.3	171.6	*	*		3.3	45.3
		23N01W03H003M	M	I	2012					173.2	170.3	168.4	167.1	168.1	171.2	167.7	171.4	*	*		3.7	45.5
		23N01W03H004M	M	S	2012					175.8	173.9	171.3	170.4	171.1	174.8	171.6	175.8	*	*		4.2	41.1
		23N01W28M002M	M	D	2009		136.9	134.4	138.3	136.6	127.5	131.3	129.9	133.0	136.2	133.2	137.9	*	*		4.7	21.1
		23N01W28M003M	M	D	2009		136.8	135.4	138.8	137.1	129.0	130.6	129.8	132.8	135.7	133.3	138.1	*	*		4.8	20.9
		23N01W28M004M	M	S	2009		133.9	139.3	137.1	131.7	130.6	128.0	128.0	130.6	133.9	130.6	134.9	*	*		4.3	24.2
		23N01W28M005M	M	S	2009		133.4	141.4	136.6	131.4	130.2	127.7	127.8	130.1	133.7	130.3	134.8	*	*		4.6	24.2
		23N01W31M001M	M	D	2008	131.1	126.8	134.0	126.0	129.7	110.9	121.6	119.9	125.3	128.2	124.4	128.5	*	*		4.2	26.2
		23N01W31M002M	M	I	2008	132.5	131.6	133.0	132.2	129.4	125.8	126.0	124.5	129.5	129.4	123.8	131.8	*	*		8.0	23.0
		23N01W31M003M	M	S	2008	133.1	135.1	133.8	137.1	132.0	129.5	128.9	126.2	132.2	132.1	126.5	132.2	*	*		5.7	22.5
		23N01W31M004M	M	S	2008	134.0	134.1	134.5	135.7	133.5	133.2	132.2	132.3	133.4	134.5	133.2	134.5	*	*		1.3	20.2
	Vina Chico	CWSCH01b	M&I	U	1988	123.0	118.0	122.0	120.0	115.0	114.0	110.0	108.0	113.0	117.0	116.0	117.0	*	*		1.0	83.0
		CWSCH02	M&I	U	1988	117.0	123.0	130.0	132.0	86.0	113.0	112.0	111.0	112.0	111.0	115.0	121.0	103.0	63.0	12.0	6.0	62.0
		CWSCH03	M&I	U	1988	121.0	120.0	116.0	120.0	117.0	114.0	110.0	113.0	113.0	115.0	114.0	118.0	116.0	100.0	-2.0	4.0	140.0
		CWSCH04	M&I	U	1988	107.0	91.0	NM	110.0	108.0	107.0	107.0	117.0	124.0	118.0	115.0	121.0	103.0	66.0	12.0	6.0	91.0
		CWSCH05	M&I	U	1988	111.0	115.0	113.0	118.0	110.0	108.0	100.0	102.0	107.0	111.0	105.0	112.0	98.0	61.0	7.0	7.0	103.0
		CWSCH06	M&I	U	1988	116.0	113.0	109.0	113.0	101.0	101.0	97.0	108.0	109.0	116.0	116.0	117.0	115.0	61.0	1.0	1.0	64.0
		CWSCH07	M&I	U	1991	111.0	106.0	110.0	114.0	105.0	103.0	101.0	105.0	105.0	110.0	114.0	111.0	103.0	80.0	11.0	-3.0	159.0
		22N01E09B001M	D	S	2001	131.7	131.0	132.0	136.1	129.5	128.0	125.6	125.5	126.5	132.0	128.6	134.5	143.5	136.3	-14.9	5.9	43.8
		22N01E28J001M	M	I	1958	122.6	123.8	125.5	130.4	121.4	119.6	114.7	114.7	117.8	125.0	122.2	128.5	126.7	120.8	-4.5	6.3	50.4
		22N01E28J003M	M	I	1958	126.5	128.0	129.7	135.0	126.7	124.7	119.8	118.2	121.0	129.4	126.8	133.7	129.1	123.7	-2.3	6.9	44.6
		22N01E28J005M	M	D	1958	120.5	121.5	122.2	127.4	116.4	117.5	113.8	113.1	114.0	122.1	118.2	125.2	122.3	117.3	-4.1	7.1	53.7
		22N01E35E001M	I	S/I	2005	116.3	116.0	116.0	122.4	112.5	110.8	107.5	107.5	NM	116.0	114.4	119.1	*	*		4.7	63.3
		22N02E30C002M	M	S	2002	116.3	115.5	114.8	119.2	112.3	111.4	109.5	NM	113.4	116.0	115.9	120.4	*	*		4.4	123.3
	Vina South	20N01E02H003M	M	S	2001	95.1	95.6	95.9	101.7	93.1	90.3	86.9	83.9	88.3	95.2	91.3	100.5	*	*		9.2	31.9
		20N01E10C002M	I	S	1947	100.5	101.1	100.9	NM	95.0	94.4	94.4	90.1	94.7	100.7	94.6	101.3	101.5	97.6	-6.8	QM	26.1
		20N02E06Q001M	I	S/I	1947	109.5	108.3	108.1	113.9	106.8	103.9	102.1	95.9	100.4	108.0	104.7	110.3	106.2	101.2	-1.5	5.6	27.3
		20N02E08C001M	I	D	2018											130.9	108.1	*** No Fall BMO			-22.8	25.9
		20N02E08H003M	D	S	2008	116.4	116.5	117.7	117.9	100.4	NM	109.9	NM	NM	110.0	110.7	113.9	*	*		3.2	18.4
		20N02E09G001M	M	S	2001	105.7	NM	108.8	113.6	100.6	103.8	98.3	90.6	95.7	103.9	98.5	105.3	108.9	97.5	-10.4	6.8	43.6
		20N02E09L001M	I	I	1953	109.7	108.6	110.9	112.5	109.7	106.4	105.1	97.2	104.4	109.9	104.2	111.0	112.1	106.8	-7.9	QM	28.3
		20N02E24C001M	M	S	1999	112.2	111.5	110.7	114.9	109.8	105.0	99.3	95.8	98.1	105.1	101.1	106.3	113.6	108.8	-12.6	5.3	51.5
		20N02E24C002M	M	I	1999	112.1	111.6	112.1	115.0	109.9	105.1	99.4	96.0	98.3	105.0	101.2	106.3	113.4	107.8	-12.3	5.1	51.5
		20N02E24C003M	M	I	1999	112.1	111.5	110.9	114.9	109.9	105.2	99.4	96.1	98.8	105.0	101.2	106.3	113.5	107.9	-12.4	5.1	51.5
		20N03E31M001M	M	S	2001	109.2	108.1	105.7	105.6	106.0	104.2	103.9	99.3	103.8	108.9	104.9	107.0	111.4	106.5	-6.5	2.1	26.0
		20N03E33L001M	I	S	1999	116.8	115.4	115.2	114.8	112.6	109.6	110.1	108.3	108.9	111.9	111.1	111.0	116.7	113.3	-5.7	0.0	40.3
		21N01E10B003M	I	I	1995	110.6	111.8	112.4	119.1	107.1	104.2	100.7	96.3	102.2	109.9	106.6	116.5	114.7	93.2	-8.2	10.0	53.8
		21N01E13L002M	M	D	2012					102.2	98.7	95.7	90.6	96.1	105.0	102.2	112.0	*	*		9.8	67.9
		21N01E13L003M	M	I	2012					102.1	98.9	95.8	90.9	96.0	105.3	102.2	111.6	*	*		9.4	68.2
		21N01E13L004M	M	I	2012					102.4	99.1	95.8	91.4	96.2	105.5	102.3	112.0	*	*		9.7	67.9
		21N01E25K001M	D	S	1993	98.5	96.9	98.8	103.9	NM	90.4	87.5	85.6	87.9	95.9	92.0	103.5	99.6	74.5	-7.6	11.5	50.8
		21N01E26K001M	I	I	1993	92.9	85.6	98.2	92.9	88.1	86.8	78.5	84.5	79.1	88.3	85.0	94.7	95.9	72.3	-10.9	9.7	58.1
		21N01E27D001M	D	S	1946	94.9	94.3	94.9	100.0	91.4	86.6	83.8	83.2	NM	94.5	89.0	98.1	97.1	90.9	-8.1	9.1	45.2
		21N02E18C001M	M	D	2010				115.7	103.2	100.5	97.5	90.9	97.3	104.8	103.5	111.6	*	*		8.1	77.5
		21N02E18C002M	M	I	2010				115.8	102.7	101.1	97.5	92.4	97.9	105.4	104.0	112.1	*	*		8.2	77.0
		21N02E18C003M	M	S	2010				154.0	144.6	143.5	139.7	140.2	149.6	161.0	156.9	162.9	*	*		6.0	26.2
		21N02E20P001M	I	S/I	1995	111.9	111.6	106.4	114.1	106.4	99.0	98.2	94.1	95.9	106.3	100.2	111.0	108.7	87.7	-8.5	10.8	57.1
		21N02E26E003M	M	D	2007	107.9	109.4	107.0	119.1	105.5	111.3	108.3	103.4	106.4	110.5	110.0	114.9	*	*		4.9	67.4
		21N02E26E004M	M	I	2007	94.4	106.9	104.7	118.3	103.6	111.2	108.9	102.4	106.1	110.5	110.5	115.1	*	*		4.6	67.1
		21N02E26E005M	M	I	2007	98.8	104.2	101.7	117.0	100.7	110.3	108.1	100.9	105.0	110.0	109.7	114.2	*	*		4.5	68.0
		21N02E26E006M	M	S	2007	108.9	108.0	107.6	113.5	107.1	105.5	104.6	102.7	102.6	107.0	107.0	113.8	*	*		6.8	68.4
		21N02E30L001M	D	S/I	1995	106.9	105.6	106.3	112.6	101.8	98.8	95.6	93.3	95.9	103.2	99.8	110.8	110.5	95.1	-10.7	11.0	48.6
		21N03E22C001M	D	S	2001	361.5	366.0	367.1	363.2	354.3	366.9	358.8	360.0	366.0	371.9	375.2	375.9	357.9	347.9	17.3	0.7	39.0
		21N03E29J003M	D	S/I	2007	NM	216.5	212.2	NM	NM	205.1	NM	217.6	NM	210.7	215.7	213.5	*	*		-2.2	60.8
		21N03E32B001M	I	S	1999	218.8	218.1	218.3	222.1	218.3	224.1	216.1	215.8	215.6	217.9	216.9	221.3	218.6	215.3	-1.8	4.4	17.2
		17N03E05C003M	I	S	2001	85.2	85.5	NM	86.2	NM	NM	82.9	81.2	83.8	85.1	84.4	84.4	*** No Fall BMO			0.0	12.9
		17N01E10A001M	D	S	1953	52.9	55.3	55.2	57.0	NM	56.1	57.5	52.8	57.2	56.3	54.3	57.0	34.0	28.1	20.3	QM	8.3
		18N01E35L001M	M	D	2005	69.2	67.2	68.0	71.8	69.0	69.7	67.8	60.0	69.9	69.9	68.8	70.3	*	*		1.6	-0.3
		18N02E16F001M	I	S	1947	75.9	75.9	75.7	76.5	77.8	76.3	76.6	75.4	76.7	75.9	75.6	75.9	74.8	74.2	0.8	0.3	6.4
		18N02E25M001M	I	S	1959	80.7	81.7	80.8	82.1	80.9	81.1	80.1	78.9	80.5	80.0	79.7	80.6	67.9	64.0	11.8	0.9	8.7
		18N02E32H001M	D	S	2001	NM	NM	NM	73.7	71.8	71.6	71.6	71.6	71.9	71.9	72.0	72.2	70.1	68.0	1.9	0.2	6.1
		17N02E14A001M	I	S	1947	78.1	80.6	77.8	78.4	77.9	76.9	77.5	75.3	77.6	76.4	75.9	76.4	72.9	70.3	3.0	0.5	8.4
		17N02E14H001M	D	S	2000	75.3	75.8	75.4	76.9	74.9	NM	74.5	65.9	74.0	67.1	68.8	69.1	66.0	54.3	2.8	QM	17.2
		17N03E16N001M	D	S	1953	74.8	74.1	74.5	75.7	74.4	73.7	72.5	NM	NM	NM	NM	NM	74.0	73.2			NM
		17N01E17F001M	M	S	1992	51.9	52.3	50.8	51.3	51.6	50.1	47.0	43.5	48.3	49.1	51.2	49.0	50.9	47.5	0.3	-2.3	10.0
		17N01E17F002M	M	I	1992	50.6	51.0	48.9	49.8	51.7	47.2	44.2	38.2	44.9	46.1	47.2	44.8	51.1	47.4	-3.9	-2.4	14.6
		17N01E17F003M	M	I	1992	50.0	50.0	47.6	48.8	51.3	46.6	42.7	35.3	44.0	45.7	45.4	43.3	51.0	47.0	-5.6	-2.2	16.1
		17N01E24A003M	M	D	2007	70.7	67.4	68.6	72.5	71.1	68.3	66.7	62.9	70.1	71.6	67.5	71.1	*	*		3.6	1.7
		17N01E24A004M	M	I	2007	28.2	22.9	27.2	51.7	41.7	30.0	23.3	21.0	49.1	37.7	38.9	32.9	*	*		-6.1	39.9
		17N01E24A005M	M	I	2007	28.5	23.1	27.4	51.7	41.8	29.9	23.3	20.9	49.1	37.7	38.9	32.8	*	*		-6.1	40.0
		17N01E24A006M	M	S	2007	68.4	68.3	67.3	67.1	69.1	68.6	67.7	66.4	67.2	66.7	68.2	68.1	*	*		-0.1	4.8

Well Type:D-Domestic, I-Irrigation, M-Monitoring, M/I-Municipal and Industrial
Well Depth: S-Shallow, I-Intermediate, D-Deep

Fall 2008 - 2019 Groundwater Elevations - CASGEM

Sub Basin	Subregion	Monitoring Wells	Well Type	Well Depth	First Record	Groundwater Elevations: Fall 2008 Water Surface Elevation (WSE) (ft)	Fall 2009 Water Surface Elevation (WSE) (ft)	Fall 2010 Water Surface Elevation (WSE) (ft)	Fall 2011 Water Surface Elevation (WSE) (ft)	Fall 2012 Water Surface Elevation (WSE) (ft)	Fall 2013 Water Surface Elevation (WSE) (ft)	Fall 2014 Water Surface Elevation (WSE) (ft)	Fall 2015 Water Surface Elevation (WSE) (ft)	Fall 2016 Water Surface Elevation (WSE) (ft)	Fall 2017 Water Surface Elevation (WSE) (ft)	Fall 2018 Water Surface Elevation (WSE) (ft)	Fall 2019 Water Surface Elevation (WSE) (ft)	Fall BMO Stage 1 Alert Level	Fall BMO Stage 2 Alert Level (Elev. ft)	Analysis: Elevation Above (+) or Below (-) Alert Stage 1 (ft)	Change Fall 2018 to Fall 2019 (ft)	Fall 2019 Depth to Water (ft)
Butte	Butte**	17N02E19J001M	I	S/I	2000	NM	NM	66.1	67.2	NM	NM	NM	NM	66.7	NM	NM	NM	62.8	55.7			NM
		18N01E13A002M	I	S/I	2001	75.6	75.2	74.3	74.7	74.3	74.6	75.7	72.1	74.8	74.6	74.6	74.6	*** No Fall BMO			0.0	4.7
		18N01E15D002M	D	S	1976	68.7	62.9	40.5	41.2	52.8	68.1	61.2	35.3	70.0	70.2	69.9	51.4				-18.5	21.0
		19N01E27Q001M	M	I	1978	83.1	82.6	82.2	83.1	81.2	82.7	83.0	76.8	82.1	82.2	81.8	82.4				0.6	5.0
		19N01E35B001M	M	S	2002	83.6	83.4	81.7	82.2	81.5	82.0	83.6	80.1	81.8	82.0	82.5	82.0				-0.5	4.5
		19N01E35B002M	M	D	2005	88.8	88.3	88.6	89.9	88.3	88.3	87.1	81.9	87.8	88.9	87.6	89.1				1.5	-2.6
		19N01E35B003M	M	I	2005	83.8	82.7	83.1	84.2	82.9	83.5	82.9	76.0	82.6	83.0	82.7	83.6				0.8	2.9
		19N02E15N002M	I	U	2000	101.2	100.9	101.1	102.9	101.0	101.3	100.9	100.1	101.5	101.4	101.3	101.5				0.2	5.9
		18N03E08B003M	I	S/I	2001	95.2	NM	89.6	99.0	97.3	96.4	94.6	94.8	96.8	97.4	87.2	98.2	91.7	83.8	-4.5	11.0	14.1
		18N03E21G001M	I	S	1953	82.2	83.9	85.1	87.0	85.3	83.6	82.7	82.3	83.0	87.2	84.6	86.9	83.5	81.2	1.1	2.3	19.4
		19N03E05N002M	D	S	1967	119.7	117.0	115.1	119.8	117.9	114.7	113.6	113.7	114.2	117.6	113.9	116.9	109.2	92.4	4.7	3.0	25.4
		19N01E09Q001M	I	S	1991	88.5	89.1	85.7	86.8	86.5	87.0	NM	NM	NM	87.0	NM	86.7	*** No Fall BMO				5.7
		19N02E07K002M	M	I	2006	98.7	99.6	99.8	101.5	99.8	99.5	98.2	91.8	99.2	100.0	99.0	100.4				1.5	2.3
		19N02E07K003M	M	I	2006	96.3	98.4	98.4	99.4	98.2	97.7	98.1	96.1	99.4	98.2	98.1	98.2				0.1	4.5
		19N02E07K004M	M	S	2006	95.7	98.4	98.5	99.5	98.3	98.2	99.3	95.4	99.2	98.3	98.1	100.5				2.4	2.2
		19N02E13Q001M	M	S	2002	112.0	112.8	113.3	115.6	114.0	114.1	114.4	111.9	115.0	114.9	114.3	115.4				1.1	4.5
		19N02E13Q002M	M	I	2006	113.2	113.3	114.1	115.9	114.5	114.3	114.7	112.3	115.4	115.3	114.5	115.6				1.1	4.3
		19N02E13Q003M	M	D	2006	113.8	113.7	114.5	116.2	114.8	114.6	114.8	112.7	115.7	115.6	114.7	115.9				1.1	4.0
		20N01E35C001M	D	S	1947	99.3	99.7	98.1	99.0	97.8	NM	NM	NM	NM	NM	97.4	98.3				0.9	4.1
		20N02E15H001M	M	S	1995	110.4	106.9	111.4	112.7	108.8	NM	100.4	96.6	96.8	102.8	99.7	107.2				7.5	36.8
		20N02E15H002M	M	S	1995	129.6	128.1	131.0	144.1	129.1	NM	116.8	115.3	116.3	121.1	117.0	122.5				5.5	21.7
		20N02E16P001M	I	U	1990	108.2	107.5	NM	109.2	112.7	111.6	109.0	105.0	107.3	110.9	109.1	112.7				3.6	19.1
		20N02E28N001M	D	S/I	1947	114.4	115.2	117.9	118.5	117.5	117.2	116.8	117.5	117.5	117.3	117.0	117.1				0.1	6.3
		21N01W23J001M	I	S	1941	107.6	107.2	107.2	108.1	106.0	103.9	103.7	103.0	103.7	105.0	104.3	105.6	108.5	105.4	-4.2	1.3	15.8
		20N01E18L001M	M	D	2000	99.4	99.3	100.7	101.0	97.1	95.5	95.0	90.7	96.0	104.5	96.4	100.1	99.4	94.1	-3.1	3.8	7.2
		20N01E18L002M	M	I	2001	99.0	99.5	99.8	100.3	97.9	97.3	97.5	94.9	97.7	98.7	98.0	98.8	99.3	96.3	-1.3	0.8	8.5
		20N01E18L003M	M	S	2001	101.3	102.0	102.4	102.9	100.7	100.4	100.2	99.3	101.0	101.2	100.9	101.6	101.2	98.5	-0.4	0.7	5.8
		20N01W04J001M	I	S	2008	81.18	80.98	81.28	81.58	80.98	80.98	80.58	81.0	81.1	81.6	81.3	81.5	*	*		0.2	20.9
		20N01W11N002M	I	S	2008	93.17	92.97	92.47	93.77	93.27	92.17	93.27	91.7	92.2	92.7	92.3	95.7	*	*		3.4	11.7
		21N01W35K002M	I	S/I	1994	97.5	97.7	97.8	98.8	96.7	95.4	96.4	96.0	96.7	97.2	96.9	97.5	97.5	95.5	-0.5	0.5	16.9
		21N01W11A001M	M	D	2010				112.4	110.0	105.8	105.6	104.0	106.6	111.1	108.7	113.7	*	*		5.0	15.6
		21N01W11A002M	M	S	2010				114.8	113.4	113.2	112.8	113.3	113.4	113.4	113.2	114.1	*	*		0.9	15.2
		21N01W11A003M	M	S	2010				114.4	113.8	113.7	113.4	114.1	114.1	115.3	114.8	115.4	*	*		0.6	13.9
		21N01W13J001M	M	D	2012					105.9	103.1	102.0	98.6	101.3	103.9	102.7	107.8	*	*		5.1	19.8
		21N01W13J002M	M	I	2012					107.0	104.7	102.3	100.0	102.5	103.4	103.5	108.1	*	*		4.6	19.6
		21N01W13J003M	M	I	2012					107.7	105.7	103.4	101.1	103.2	103.8	104.1	108.5	*	*		4.3	19.2
		21N01W24B001M	M	D	1995	106.1	105.7	107.2	106.9	103.7	100.7	99.0	97.1	99.5	103.3	100.1	105.4	109.1	100.3	-9.0	5.3	21.7
		22N01E29R001M	I	I	1947	118.1	119.3	123.0	127.4	118.3	115.9	90.2	110.1	113.4	121.9	118.0	126.5	118.6	109.4	-0.6	8.5	37.2
		22N01E32E004M	D	S	1992	113.4	114.5	118.0	121.5	113.6	110.5	104.6	106.6	108.8	117.0	112.5	121.1	111.5	90.1	1.0	8.6	29.9
WYANDOTTE CREEK	Wyandotte Creek Oroville	CWS-01	M&I	U	1978	101.0	132.0	131.0	131.0	124.0	130.0	120.0	134.0	134.0	124.0	129.0	132.0	82.0	31.0	47.0	3.0	28.0
		CWS-02	M&I	U	1978	146.0	143.0	146.0	148.0	146.0	144.0	148.0	140.0	140.0	148.0	149.0	147.0	98.0	43.0	51.0	-2.0	31.0
		CWS-03	M&I	U	1978	163.0	165.0	164.0	164.0	161.0	163.0	149.0	165.0	165.0	161.0	163.0	162.0	123.0	78.0	40.0	-1.0	33.0
		19N03E16Q001M	D	S	2000	137.4	138.0	138.4	139.3	138.8	137.6	139.3	139.4	140.0	NM	138.9	139.6	136.3	133.0	2.6	0.7	39.7
	Wyandotte Creek South	17N03E03D001M	I	S	1947	71.5	70.5	72.3	73.2	72.6	71.4	69.6	70.3	71.5	73.9	72.7	73.8	68.4	66.9	4.3	1.1	23.5
		17N04E09N002M	I	S/I	2001	69.9	66.0	64.4	72.5	NM	66.7	53.6	52.4	53.7	65.2	66.7	65.7	69.1	60.3	-2.4	QM	36.6
		17N04E22B001M	D	S	1976	88.4	85.4	95.1	100.4	98.2	95.7	84.3	93.2	94.8	NM	NM	NM	81.3	76.3			NM
		19N04E31F001M	D	S	2001	122.1	123.2	122.5	123.9	120.3	108.0	121.1	120.8	121.6	124.0	122.6	122.5	120.0	114.6	2.6	-0.1	136.8

* Wells that do not have alert levels established as detailed below:

Subregion	Well ID	Date Added to the Monitoring Network	Subregion	Well ID	Date Added to the Monitoring Network
Vina North	23N01E07H001M	2018	Butte	17N03E05C003M	2001
Vina North	23N01W03H002M	2012	Butte	17N01E24A003M	2007
Vina North	23N01W03H003M	2012	Butte	17N01E24A004M	2007
Vina North	23N01W03H004M	2007	Butte	17N01E24A005M	2007
Vina North	23N01W25G001M	2008	Butte	17N01E24A006M	2007
Vina North	23N01W28M002M	2008	Butte	18N01E13A002M	2001
Vina North	23N01W28M003M	2008	Butte	18N01E15D002M	1976
Vina North	23N01W28M004M	2008	Butte	18N01E35L001M	2008
Vina North	23N01W28M005M	2008	Butte	19N01E09Q001M	1991
Vina North	23N01W31M001M	2008	Butte	19N01E27Q001M	1978
Vina North	23N01W31M002M	2008	Butte	19N01E35B001M	2002
Vina North	23N01W31M003M	2008	Butte	19N01E35B002M	2005
Vina North	23N01W31M004M	2008	Butte	19N01E35B003M	2005
Vina Chico	CWSCH01b	2012	Butte	19N02E07K002M	2006
Vina Chico	22N01E35E001M	2002	Butte	19N02E07K003M	2006
Vina Chico	22N02E30C002M	2016	Butte	19N02E07K004M	2006
Vina South	20N01E02H003M	2001	Butte	19N02E13Q001M	2002
Vina South	20N02E08H003M	2008	Butte	19N02E13Q002M	2006
Vina South	21N01E13L002M	2012	Butte	19N02E13Q003M	2006
Vina South	21N01E13L003M	2012	Butte	19N02E15N002M	2000
Vina South	21N01E13L004M	2012	Butte	20N01E35C001M	1947
Vina South	21N02E18C001M	2010	Butte	20N01W04J001M	2008
Vina South	21N02E18C002M	2010	Butte	20N01W11N002M	2010
Vina South	21N02E18C003M	2010	Butte	21N01W11A001M	2010
Vina South	21N02E26E003M	2007	Butte	21N01W11A002M	2010
Vina South	21N02E26E004M	2007	Butte	21N01W11A003M	2012
Vina South	21N02E26E005M	2007	Butte	21N01W13J001M	2012
Vina South	21N02E26E006M	2007	Butte	21N01W13J002M	2012
Vina South	21N03E29J003M	2007	Butte	21N01W13J003M	2012
			Butte	20N02E15H001M	1995
			Butte	20N02E15H002M	1995
			Butte	20N02E16P001M	1990
			Butte	20N02E28N001M	1947

Depth Categories:

S- Shallow: indicates total well depth or screening interval is less than 200 feet below ground surface
I- Intermediate: total well depth or screening interval is 200-600 feet
S/I- Shallow/Intermediate: screened interval spans portions of the shallow and intermediate depth intervals
D- Deep: total well depth or screening interval is greater than 600 feet

Note: Red font indicates Questionable Measurement (QM), Yellow highlight is Alert Stage 1, Red highlight is Alert Stage 2
** Indicates subregion primarily served by surface water supplies versus groundwater
***No Fall BMO - Wells within the Richvale Irrigation District and Western Canal District boundaries use the Specific Depth Method which establishes alert levels for spring only (per Chapter 33A)

Alert Stage Count

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Alert Stage 1	**Alert 1**	26	27	24	5	24	21	19	13	20	21	22	10
Alert Stage 2	**Alert 2**	2	1	2	2	6	14	18	26	18	8	13	7
	Total	28	28	26	7	30	35	37	39	38	29	35	17

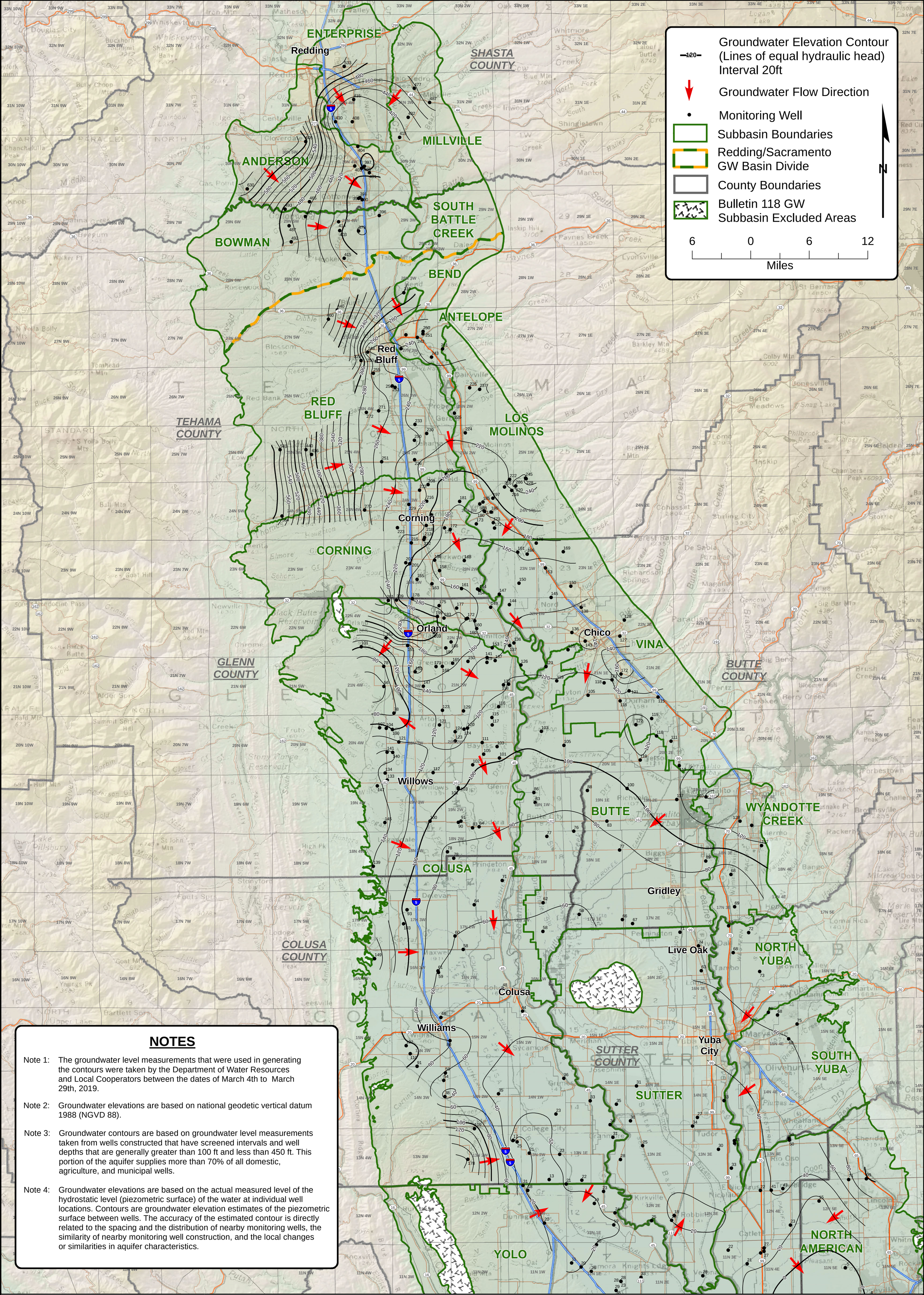
Well Type:D-Domestic, I-Irrigation, M-Monitoring, M/I-Municipal and Industrial
Well Depth: S-Shallow, I-Intermediate, D-Deep

Groundwater Status Report

Appendix G

DWR Groundwater Level Contour and Change Maps

https://data.cnra.ca.gov/dataset/northern-sacramento-valley-groundwater-elevation-change-maps/resource/0aaccf45-6654-4ad2-8201-1db52848b0c3



NOTES

Note 1: The groundwater level measurements that were used in generating the contours were taken by the Department of Water Resources and Local Cooperators between the dates of March 4th to March 29th, 2019.

Note 2: Groundwater elevations are based on national geodetic vertical datum 1988 (NGVD 88).

Note 3: Groundwater contours are based on groundwater level measurements taken from wells constructed that have screened intervals and well depths that are generally greater than 100 ft and less than 450 ft. This portion of the aquifer supplies more than 70% of all domestic, agriculture, and municipal wells.

Note 4: Groundwater elevations are based on the actual measured level of the hydrostatic level (piezometric surface) of the water at individual well locations. Contours are groundwater elevation estimates of the piezometric surface between wells. The accuracy of the estimated contour is directly related to the spacing and the distribution of nearby monitoring wells, the similarity of nearby monitoring well construction, and the local changes or similarities in aquifer characteristics.

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NORTHERN SACRAMENTO VALLEY GROUNDWATER ELEVATION MAP

Spring 2019

100 to 450 ft Well Depths

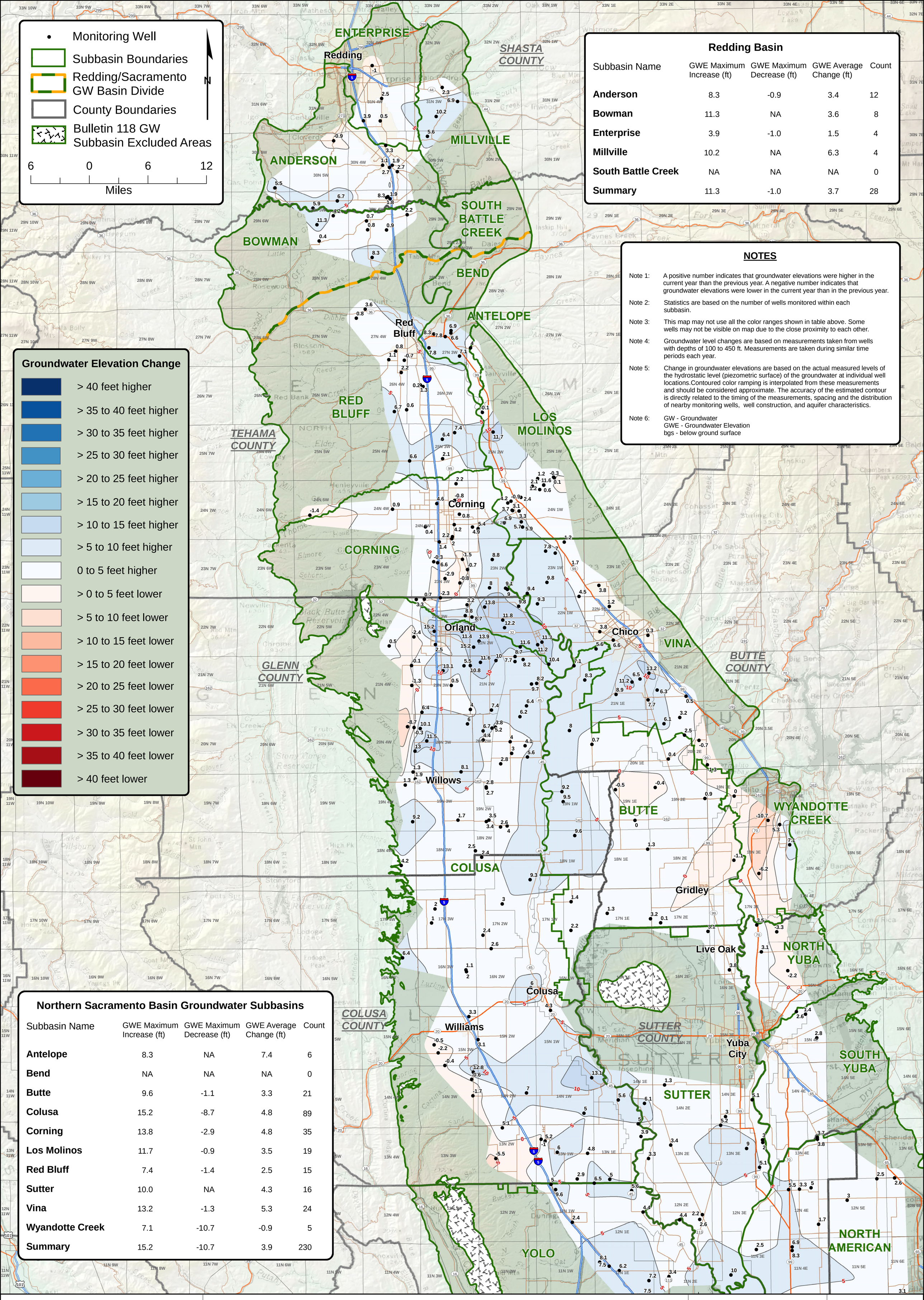
(Well depths greater than 100 ft and less than 450 ft deep bgs)

PLATE 1

Date: August 2019

BY: A. Scholzen

https://data.ca.gov/dataset/northern-sacramento-valley-groundwater-elevation-change-maps



Redding Basin

Subbasin Name	GWE Maximum Increase (ft)	GWE Maximum Decrease (ft)	GWE Average Change (ft)	Count
Anderson	8.3	-0.9	3.4	12
Bowman	11.3	NA	3.6	8
Enterprise	3.9	-1.0	1.5	4
Millville	10.2	NA	6.3	4
South Battle Creek	NA	NA	NA	0
Summary	11.3	-1.0	3.7	28

NOTES

Note 1: A positive number indicates that groundwater elevations were higher in the current year than the previous year. A negative number indicates that groundwater elevations were lower in the current year than in the previous year.

Note 2: Statistics are based on the number of wells monitored within each subbasin.

Note 3: This map may not use all the color ranges shown in table above. Some wells may not be visible on map due to the close proximity to each other.

Note 4: Groundwater level changes are based on measurements taken from wells with depths of 100 to 450 ft. Measurements are taken during similar time periods each year.

Note 5: Change in groundwater elevations are based on the actual measured levels of the hydrostatic level (piezometric surface) of the groundwater at individual well locations.Contoured color ramping is interpolated from these measurements and should be considered approximate. The accuracy of the estimated contour is directly related to the timing of the measurements, spacing and the distribution of nearby monitoring wells, well construction, and aquifer characteristics.

Note 6: GW - Groundwater
GWE - Groundwater Elevation
bgs - below ground surface

Northern Sacramento Basin Groundwater Subbasins

Subbasin Name	GWE Maximum Increase (ft)	GWE Maximum Decrease (ft)	GWE Average Change (ft)	Count
Antelope	8.3	NA	7.4	6
Bend	NA	NA	NA	0
Butte	9.6	-1.1	3.3	21
Colusa	15.2	-8.7	4.8	89
Corning	13.8	-2.9	4.8	35
Los Molinos	11.7	-0.9	3.5	19
Red Bluff	7.4	-1.4	2.5	15
Sutter	10.0	NA	4.3	16
Vina	13.2	-1.3	5.3	24
Wyandotte Creek	7.1	-10.7	-0.9	5
Summary	15.2	-10.7	3.9	230

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NORTHERN SACRAMENTO VALLEY CHANGE IN GROUNDWATER ELEVATION MAP SPRING 2018 TO SPRING 2019

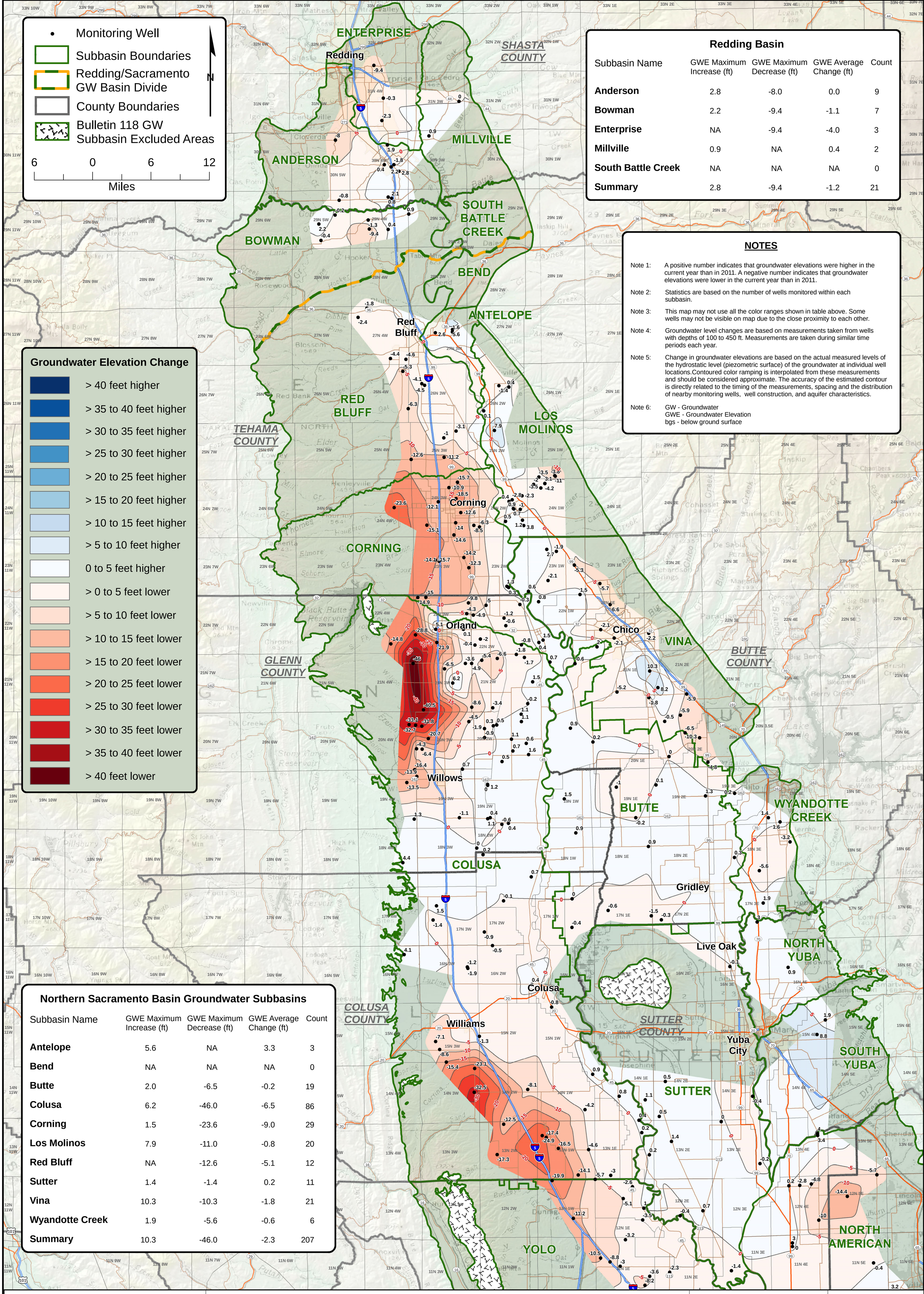
100 to 450 ft WELL DEPTHS

(Well depths greater than 100 ft and less than 450 ft deep bgs)

PLATE 1C-B

Date: May 2019

BY: A. Scholzen



Redding Basin

Subbasin Name	GWE Maximum Increase (ft)	GWE Maximum Decrease (ft)	GWE Average Change (ft)	Count
Anderson	2.8	-8.0	0.0	9
Bowman	2.2	-9.4	-1.1	7
Enterprise	NA	-9.4	-4.0	3
Millville	0.9	NA	0.4	2
South Battle Creek	NA	NA	NA	0
Summary	2.8	-9.4	-1.2	21

NOTES

Note 1: A positive number indicates that groundwater elevations were higher in the current year than in 2011. A negative number indicates that groundwater elevations were lower in the current year than in 2011.

Note 2: Statistics are based on the number of wells monitored within each subbasin.

Note 3: This map may not use all the color ranges shown in table above. Some wells may not be visible on map due to the close proximity to each other.

Note 4: Groundwater level changes are based on measurements taken from wells with depths of 100 to 450 ft. Measurements are taken during similar time periods each year.

Note 5: Change in groundwater elevations are based on the actual measured levels of the hydrostatic level (piezometric surface) of the groundwater at individual well locations.Contoured color ramping is interpolated from these measurements and should be considered approximate. The accuracy of the estimated contour is directly related to the timing of the measurements, spacing and the distribution of nearby monitoring wells, well construction, and aquifer characteristics.

Note 6: GW - Groundwater
GWE - Groundwater Elevation
bgs - below ground surface

Northern Sacramento Basin Groundwater Subbasins

Subbasin Name	GWE Maximum Increase (ft)	GWE Maximum Decrease (ft)	GWE Average Change (ft)	Count
Antelope	5.6	NA	3.3	3
Bend	NA	NA	NA	0
Butte	2.0	-6.5	-0.2	19
Colusa	6.2	-46.0	-6.5	86
Corning	1.5	-23.6	-9.0	29
Los Molinos	7.9	-11.0	-0.8	20
Red Bluff	NA	-12.6	-5.1	12
Sutter	1.4	-1.4	0.2	11
Vina	10.3	-10.3	-1.8	21
Wyandotte Creek	1.9	-5.6	-0.6	6
Summary	10.3	-46.0	-2.3	207

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NORTHERN SACRAMENTO VALLEY CHANGE IN GROUNDWATER ELEVATION MAP SPRING 2011 TO SPRING 2019

100 to 450 ft WELL DEPTHS

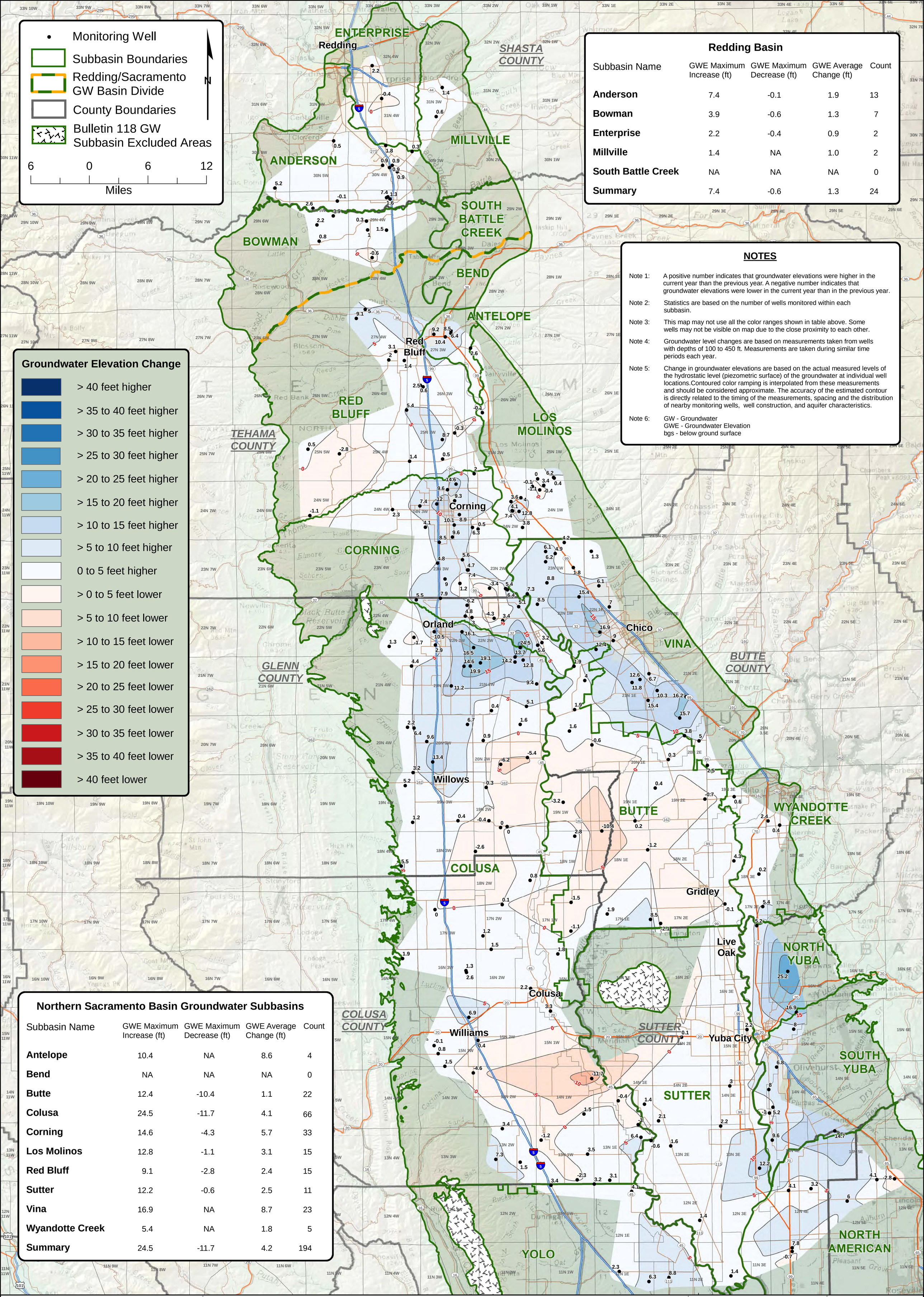
(Well depths greater than 100 ft and less than 450 ft deep bgs)

PLATE 1C-D

Date: May 2019

BY: A. Scholzen

https://data.ca.gov/dataset/northern-sacramento-valley-groundwater-elevation-change-maps



Redding Basin

Subbasin Name	GWE Maximum Increase (ft)	GWE Maximum Decrease (ft)	GWE Average Change (ft)	Count
Anderson	7.4	-0.1	1.9	13
Bowman	3.9	-0.6	1.3	7
Enterprise	2.2	-0.4	0.9	2
Millville	1.4	NA	1.0	2
South Battle Creek	NA	NA	NA	0
Summary	7.4	-0.6	1.3	24

NOTES

Note 1: A positive number indicates that groundwater elevations were higher in the current year than the previous year. A negative number indicates that groundwater elevations were lower in the current year than in the previous year.

Note 2: Statistics are based on the number of wells monitored within each subbasin.

Note 3: This map may not use all the color ranges shown in table above. Some wells may not be visible on map due to the close proximity to each other.

Note 4: Groundwater level changes are based on measurements taken from wells with depths of 100 to 450 ft. Measurements are taken during similar time periods each year.

Note 5: Change in groundwater elevations are based on the actual measured levels of the hydrostatic level (piezometric surface) of the groundwater at individual well locations.Contoured color ramping is interpolated from these measurements and should be considered approximate. The accuracy of the estimated contour is directly related to the timing of the measurements, spacing and the distribution of nearby monitoring wells, well construction, and aquifer characteristics.

Note 6: GW - Groundwater
GWE - Groundwater Elevation
bgs - below ground surface

Groundwater Elevation Change

- > 40 feet higher
- > 35 to 40 feet higher
- > 30 to 35 feet higher
- > 25 to 30 feet higher
- > 20 to 25 feet higher
- > 15 to 20 feet higher
- > 10 to 15 feet higher
- > 5 to 10 feet higher
- 0 to 5 feet higher
- > 0 to 5 feet lower
- > 5 to 10 feet lower
- > 10 to 15 feet lower
- > 15 to 20 feet lower
- > 20 to 25 feet lower
- > 25 to 30 feet lower
- > 30 to 35 feet lower
- > 35 to 40 feet lower
- > 40 feet lower

Northern Sacramento Basin Groundwater Subbasins

Subbasin Name	GWE Maximum Increase (ft)	GWE Maximum Decrease (ft)	GWE Average Change (ft)	Count
Antelope	10.4	NA	8.6	4
Bend	NA	NA	NA	0
Butte	12.4	-10.4	1.1	22
Colusa	24.5	-11.7	4.1	66
Corning	14.6	-4.3	5.7	33
Los Molinos	12.8	-1.1	3.1	15
Red Bluff	9.1	-2.8	2.4	15
Sutter	12.2	-0.6	2.5	11
Vina	16.9	NA	8.7	23
Wyandotte Creek	5.4	NA	1.8	5
Summary	24.5	-11.7	4.2	194

STATE OF CALIFORNIA
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NORTHERN SACRAMENTO VALLEY CHANGE IN GROUNDWATER ELEVATION MAP SUMMER 2018 TO SUMMER 2019

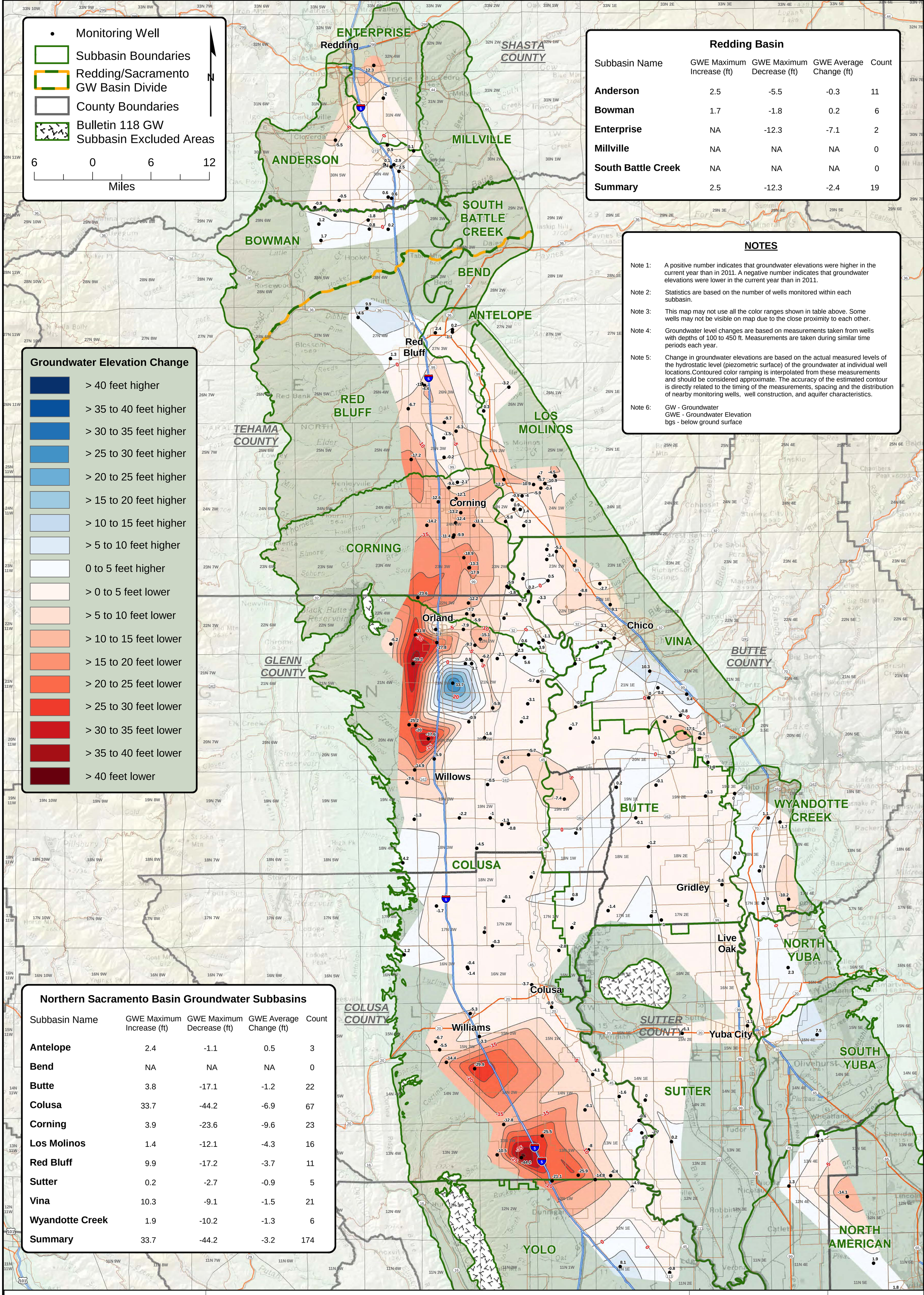
100 to 450 ft WELL DEPTHS

(Well depths greater than 100 ft and less than 450 ft deep bgs)

PLATE 2C-B

Date: November 2019

BY: A. Scholzen



Redding Basin

Subbasin Name	GWE Maximum Increase (ft)	GWE Maximum Decrease (ft)	GWE Average Change (ft)	Count
Anderson	2.5	-5.5	-0.3	11
Bowman	1.7	-1.8	0.2	6
Enterprise	NA	-12.3	-7.1	2
Millville	NA	NA	NA	0
South Battle Creek	NA	NA	NA	0
Summary	2.5	-12.3	-2.4	19

NOTES

Note 1: A positive number indicates that groundwater elevations were higher in the current year than in 2011. A negative number indicates that groundwater elevations were lower in the current year than in 2011.

Note 2: Statistics are based on the number of wells monitored within each subbasin.

Note 3: This map may not use all the color ranges shown in table above. Some wells may not be visible on map due to the close proximity to each other.

Note 4: Groundwater level changes are based on measurements taken from wells with depths of 100 to 450 ft. Measurements are taken during similar time periods each year.

Note 5: Change in groundwater elevations are based on the actual measured levels of the hydrostatic level (piezometric surface) of the groundwater at individual well locations.Contoured color ramping is interpolated from these measurements and should be considered approximate. The accuracy of the estimated contour is directly related to the timing of the measurements, spacing and the distribution of nearby monitoring wells, well construction, and aquifer characteristics.

Note 6: GW - Groundwater
GWE - Groundwater Elevation
bgs - below ground surface

Northern Sacramento Basin Groundwater Subbasins

Subbasin Name	GWE Maximum Increase (ft)	GWE Maximum Decrease (ft)	GWE Average Change (ft)	Count
Antelope	2.4	-1.1	0.5	3
Bend	NA	NA	NA	0
Butte	3.8	-17.1	-1.2	22
Colusa	33.7	-44.2	-6.9	67
Corning	3.9	-23.6	-9.6	23
Los Molinos	1.4	-12.1	-4.3	16
Red Bluff	9.9	-17.2	-3.7	11
Sutter	0.2	-2.7	-0.9	5
Vina	10.3	-9.1	-1.5	21
Wyandotte Creek	1.9	-10.2	-1.3	6
Summary	33.7	-44.2	-3.2	174

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NORTHERN SACRAMENTO VALLEY CHANGE IN GROUNDWATER ELEVATION MAP SUMMER 2011 TO SUMMER 2019

100 to 450 ft WELL DEPTHS

(Well depths greater than 100 ft and less than 450 ft deep bgs)

PLATE 2C-D

Date: November 2019

BY: A. Scholzen