

Napa County Comprehensive Groundwater Monitoring Program 2015 Annual Report and CASGEM Update

April 5, 2016

By Vicki Kretsinger Grabert



Overview

- Evolving groundwater monitoring program

 Background
- Highlights 2015 Annual Report
- GW-SW interaction
- Recommendations
 - NE area
 - Baseline WQ
 - Network well info



Napa County Comprehensive Groundwater Monitoring Program 2014 Annual Report and CASGEM Update

February 2015



Groundwater Basins

- Napa Sonoma Valley Basin
 - Napa Valley Subbasin
 - Napa-Sonoma Lowlands Subbasin
- **Berryessa Valley Basin**
- **Pope Valley Basin**
- Suisun-Fairfield Valley Basin



Groundwater Basins: Initial SGMA Prioritization

- Napa Sonoma Valley Basin
 - Napa ValleySubbasin (Med)
 - Napa-Sonoma
 Lowlands Subbasin
 (VL)
- Berryessa Valley Basin(VL)
- Pope Valley Basin(VL)
- Suisun-Fairfield Valley Basin(VL)



LAKE

Napa Subareas

17 Subareas

 Napa Valley Floor includes 5 Subareas

Based on:

- Watershed Boundaries
- Groundwater Basins
- Planning Subareas



Subsurface Geology

Very Complex in Napa Valley Especially Complex in Hillsides





Water Budget: Core Element of Groundwater Sustainability

Inflows – Outflows = AS Change in GW Storage



Water Budgets Involve More than the Groundwater Basin





Watershed Water Budget: Napa River Near Napa

- Precipitation: >400,000 AF/Yr (Avg.)
- Recharge: ~ 70,600 AF/Yr (Avg.)
- Pumping: ~21,300 AF/yr (2004)



	Average Annual (acre-feet)					Range (acre-feet)	Recharge (% of Precip.)
Watershed	Precip.	Outflow	Infilt.	ET	Recharge	Recharge	Recharge
Napa River near Napa	418,500	146,800	271,700	201,900	70,600	8,300 - 185,900	17%
- Conn Creek	98,200	24,600	73,600	52,200	21,100	4,300 - 40,700	21%
- Dry Creek	33,000	14,200	18,700	16,400	2,000	500 - 6,300	6%
- Napa River at St. Helena	161,400	67,000	94,400	72,500	22,000	2,500 - 60,900	14%
- Napa River at Calistoga	54,200	23,600	30,600	19,700	10,500	2,000 - 17,200	19%
Milliken Creek	33,000	16,800	16,200	13,500	2,500	100 - 7,100	8%
Tulucay Creek	19,500	9,100	10,400	9,500	1,000	100 - 2,300	5%
Redwood Creek	19,300	7,800	11,500	9,500	1,900	400 - 5,000	10%
Napa Creek at Napa	32,100	14,800	17,300	13,700	3,600	600 - 6,900	11%

LSCE and MBK, Napa Hydrogeologic Characterization, 2013

GROUNDWATER CONDITIONS:

Highlights 2015 Annual Report



Napa County Comprehensive Groundwater Monitoring Program 2015 Annual Report and CASGEM Update

March 2016



S LUHDORFF & SCALMANINI

Groundwater Conditions: Napa Valley Subbasin



GW Level Monitoring, 2015



Napa Co., 100 (incld. 48 volun., 10 SW/GW) DWR, 4 GeoTracker, 9



Total Wells = 113 Sites



Groundwater Monitoring

Direct Connection Maintains/Recharges Stream



Courtesy TNC

Depth to Groundwater

Feet below ground surface

0 - 10
10.01 - 20
20.01 - 30
30.01 - 40
40.01 - 131.64



Spring 2015 GW Elevations



North Napa



South Napa





Northeast Napa Area: Spring 2015



Groundwater/Surface Water Interaction

Surface Water/ Groundwater

Monitoring at 5 Sites

- Shallow MWs each site
 Levels & quality
- Stream gauge each site
 Streamflow &
 - quality
- Depths to water (when drilled) ranged from
 16–34 ft [20ft at St.
 Helena]



GW Monitoring Wells Near River

Looking Down at MWs

2-inch dia. casings 🧲



Above Ground Locked Protection

Below Ground "Nested" Monitoring Wells

40 ft Deep

2-inch dia. casings

100 ft Deep

Not to Scale

SW/GW Interaction: Site 5: St. Helena, Oct. 2014 & Dec. 2014



SW/GW Interaction: Site 5 St. Helena





SW/GW Interaction: Site 5 St. Helena



WL Difference Shallow and Deep Oct. 2015 = 17 ft.

SW/GW Interaction: Site 4 Yountville



SW/GW Site 4 Compared to Historical GW Levels







Groundwater Quality

GW Quality Data

Data

by Source

Napa County (15)

Geotracker (3)

• 78 Sites



Nitrate

• Low NO₃-N conc.

MCL = 10 mg/L

Maximum Nitrate Concentration (mg/L as N)

- Non-Detect (28)
- <5 (37)
- >5-10 (5)
 - >10 (1)



TDS

- Generally low TDS VF
- May be susceptible to seawater intrusion from San Pablo Bay
 - Elevated chloride, EC/TDS levels
- TDS much higher on avg south of VF than in the VF



Maximum TDS Concentration (mg/L)

- <250 (18)</p>
- >250-500 (13)
- >500-1000 (11)
- >1000 (6)



TDS Trends

- Long historical records (from 1960/70s)
- Generally stable trends



Summary of GW Quality Conditions

- Generally Good GW Quality
- Selected Areas of Nat'ly Occurring Elevated Constituents
- Calistoga Area of the Napa Valley Floor
 Geothermal Influences
- Southern Napa County
 Elevated TDS and Chloride

Summary

- GW level trends stable majority of wells Napa Valley Floor
 - Year-to-year declines observed in a few wells (SE St. Helena area; SW Yountville area; NE Napa area)
- Some response to drought conditions
- Recent GW levels generally higher than for same wells in 1976-1977
- GW level declines in MST moderated some wells since 2008; some WLs still declining



Napa County and Next Steps Towards Groundwater Sustainability

- Ongoing (and evolving)
 SW and GW monitoring
- Enhancing understanding of SW/GW interaction
- Conducting education and outreach
- Sustainable Groundwater Management Act, next steps



Water Education Foundation Groundwater Tour, Fall 2015

Recommendations

- Northeast Napa Area Investigation
- Addn'l Evaluation of Network Wells

 Well construction
- Baseline WQ Sampling
- MST Activities
 - Recycled water
 - Continued monitoring





Thank You