

Groundwater Quality Information: GeoTracker GAMA

Water Quality Monitoring Council
May 19, 2009

John Borkovich, PG
GAMA Program
State Water Resources Control Board



Presentation Overview

- GAMA Program Overview
 - Goals of working with WQMC
 - Statutory Requirements of GAMA
 - Projects - Current Status & Financial
- GW Quality Info via Internet Database
 - GeoTracker GAMA
 - Development
 - Overview of Beta

GAMA Program – Background

Concern about groundwater quality and well closures by California's citizens and leaders

40 – Percentage of the State's water supply is from groundwater

1999 – Legislature required a comprehensive ambient groundwater monitoring plan

2000 - Legislature funds GAMA Program

2001 – AB 599 created Groundwater Quality Monitoring Act

2008 – AB 2222 requires recommendation for GAMA funding until 2024

GAMA Background

- Partners with USGS and LLNL
- Sampled over 4,000 wells of 1,000 well owners since 2000
- Tests Raw groundwater
- Well Owners Volunteer to have wells sampled – at no cost
- Tests for commonly found chemicals AND unregulated chemicals of concern, often at low levels for use as tracers
- Works with stakeholders to share groundwater data – including 100's of hours of outreach and public meetings

GAMA Program – Statutory Requirements

- Created by Legislature in 2000
- Enhanced by Groundwater Quality Monitoring Act of 2001 (AB 599 – Liu)
 - Required the convening of an ITF and Advisory Committee (PAC)
 - PAC endorsed in Report to Legislature to create groundwater monitoring database (GeoTracker GAMA).

GAMA Program – Statutory Requirements

- PAC was in consensus that the data shown in GeoTracker GAMA - via tiered access - be clear that the data were raw or untreated groundwater source

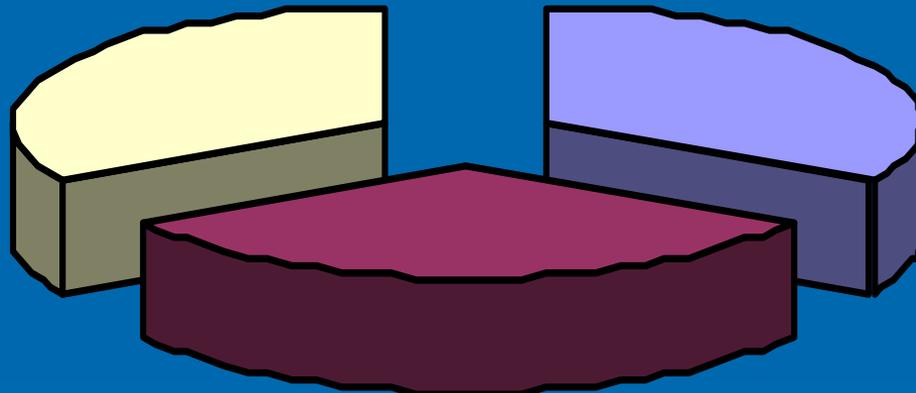
Goals of Working with WQMC

- Collaborate with WQMC in development of the “Safe To Drink” portal
- GAMA team manages data, its presentation, and public access to GeoTracker GAMA
- Data in GAMA is raw/untreated
- Public drinking water quality is typically treated and is regulated by CDPH

GAMA Program - Current Projects

Domestic Wells - *SWRCB*

Priority Basins - *USGS*



Special Studies - *LLNL*

GAMA sampling conducted in Voluntary Cooperation of Participants

Current Project Status

- Publicly accessible database – GeoTracker
GAMA (*more in demo*)
- Priority Basins – affected by Exec Order
- Special Studies – LLNL continues
- Domestic Well Project - recently completed
San Diego County

GAMA Domestic Well Project

- Samples for chemicals commonly found
- Provides Water quality info to well owners
- Educates to public in understanding well their water quality
- Coordinate with local environmental agencies (data availability)
- Cost for testing incurred by State Water Board

GAMA Domestic Well Project

Number of Wells Tested:

- Yuba (2002) 128 Wells
- El Dorado (2003-04) 398 Wells
- Tehama (2005) 223 Wells
- Tulare (2006) 181 Wells
- San Diego (2008-09) 137 Wells

➤ **Cumulative Total: 1067 Wells Tested**

GAMA Domestic Well Project

- Test Results of Interest from 2003 to 2006
(*El Dorado, Yuba, Tehama, and Tulare Counties*)
 - 27% (248 of 928) positive for total coliform
 - Fewer than 2% (11 of 749) combined
(*excluding Tulare*) were above nitrate MCL
 - Tulare County 41% (75 of 181) above the
nitrate MCL

GAMA Priority Basins Project

- As of mid-December, 2008:
 - 1,986 wells sampled
 - >1,200 participants including:
 - 208 districts
 - 159 cities
 - 80 schools

GAMA Priority Basins Project

As of mid-December, 2008:

- 50 Public meetings
- 1,703 Well owner reports delivered
- Several Reports Published
- Initial Findings:
 - “Naturally” occurring compounds most prevalent
 - Low Level pharma, wastewater indicators indicate connection between surface activities and gw quality

2004-2006

Study Units Sampled



2007-2008

Study Units Sampled



GAMA Special Studies - LLNL

- Groundwater Age Dating & Tracers
 - Groundwater recharge & flow
 - Aquifer susceptibility to contaminants
 - Assessment of gw management practices
- Isotope & Dissolved Gases
 - Water source - stable isotopes
 - Contaminant source - nitrate
 - Contaminant degradation - denitrification
- VOCs & Emerging Contaminants
 - Aquifer susceptibility/Contaminant source tracers
 - Occurrence, transport & fate of emerging contaminants

Current Financial Status

- GAMA funding comes from:
 - Proposition 50 for AB 599 Priority Basin Project (*through 2012*)
 - Annual fees for other GAMA projects (*annually*)
- Governor's Executive Order in December
 - Stopped work on Prop 50 Priority Basin Project

Internet-Accessible Groundwater Information

- Helps Achieve Goals of GAMA (AB 599):
 - Design a database capable of supporting GAMA compatible with GeoTracker
 - Increase availability to the public on information about groundwater contamination
- Assists Local, Regional, State Decision-Makers
- Provides opportunity to look at basic Trends

GeoTracker GAMA Database

- Uses existing GW Quality Data
- Adds new Data as it is available
- Collaborate with data-sharing partners of AB 599 ITF including:
 - CDPH, DWR, DPR, USGS, LLNL, RWQCBs
- Water quality data used is from “raw” (untreated) groundwater source

GeoTracker GAMA Database Development

- Regular testing to ensure database usable to public and private stakeholders
- Meet with data stakeholders (ITF) to review database status and solicit input
- Privacy kept intact

GeoTracker GAMA

Provides a user-friendly internet site that helps all groundwater quality stakeholders:

- Public
- Government
- Drinking water agencies
- Environmental advocates

...Access accurate and timely groundwater quality data

GeoTracker GAMA – Data Sources

- Brings together and standardizes several datasets, with the ability to integrate even more data
- Includes datasets from
 - California State Agencies – DPH, DWR, DPR, and Water Boards
 - USGS and Lawrence Livermore National Laboratory

GeoTracker GAMA - Tools

- Provides tools to analyze data, allowing for a clearer picture of groundwater quality across the state and answers questions
- Combines tens-of-millions of analytical results with water levels and site lithologies
- Provides data from over 100,000 sampling locations

GeoTracker GAMA – Raw Groundwater Data

- Monitoring of public drinking water quality delivered to consumers is the responsibility of the CDPH
- One of the GAMA program's main goals is to assess ambient groundwater quality
- The data to assess its quality is collected from raw or untreated ("ambient") public and private/domestic groundwater sources

GeoTracker GAMA Beta Overview

- Full public release - soon
- Working closely with cooperating agencies
- System overview:
 - Current status
 - What the system can do
 - Improvements and additions will continue to be made



- [Cal/EPA](#)
- [State and Regional Water Boards' Map](#)
- [Laws/Regulations](#)
- [Plans/Policies](#)
- [Programs](#)
- [Decisions Pending and Opportunities for Public Participation](#)

GAMA RESOURCES

- [GAMA Home](#)
- [Priority Basin Project](#)
- [Domestic Well Project](#)
- [...](#)



Water Boards

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GAMA – Groundwater Ambient Monitoring & Assessment Program

Californians are concerned about groundwater quality, especially since groundwater accounts for up to 40 percent of the state's water supply. Since 1984, over 8,000 public water wells have been shut down - some due to the detection of chemicals such as MTBE, solvents, and perchlorate. To address these concerns, the state legislature* required that the State Water Board develop a comprehensive ambient groundwater quality monitoring plan. The Groundwater Ambient Monitoring Assessment (GAMA) Program was created by the State Water Board as a result of these concerns.

The main objectives of the GAMA Program are to improve statewide ambient groundwater quality monitoring and assessment and to increase the availability of information about groundwater quality to the public. Participation in the GAMA Program is voluntary.

GAMA has produced several products on groundwater quality investigations throughout California. These products can be found [here](#).

The GAMA Program has the following projects:

- [Priority Basin Project](#)
 - [Project Status](#) (Updated 12/15/08)
 - [List of Analytes](#)
- [Domestic Well Project](#)

[Map of High-Use Groundwater Basins](#)

[Map of Hydrogeologically Vulnerable Areas](#)

[Table with References](#)

[More Information on Water Quality in your Area](#)

[Where Does My Water Come From?](#)

[Domestic Well Presentation at GRA Biennial](#)

[Questions About the Water in your Well?](#)

[Data Reports Available](#)

[GAMA Press Releases Available!](#)



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My Drinking Water

The Water Boards regulate discharges to California's water bodies (streams, rivers, lakes, etc.) to protect our water and the State Water Board allocates water rights, but we do not regulate drinking water. Nevertheless, many people come to our website looking for water quality information.

In California, drinking water is regulated by the California Department of Public Health's Division of Drinking Water and Environmental Management. Pertinent links are here:

- [Division of Drinking Water and Environmental Management \(DDWEM\)](#) (California Department of Public Health)
 - [Drinking Water Program](#)
- [Food and Drug Branch](#) (California Department of Public Health)
 - [Bottled and Vended Water](#)
- [Additional information for public water systems](#)

You can also find links to required annual reports from water suppliers as well as other information on drinking water at the U.S. Environmental Protection Agency's Website "[Local Drinking Water Information/California Drinking Water.](#)"

Please Note: The links above are NOT a State Water Board sites and we do not control or edit the information on them.

Currently on SWRCB Website



Home -> Water Issues -> Programs -> Gamatest

GAMA - DRAFT

GAMA is the comprehensive groundwater quality monitoring program California. This innovative program partners with state, federal, and local agencies to assess groundwater quality throughout the state.

GROUNDWATER AMBIENT MONITORING AND ASSESSMENT (GAMA)



About Tools Groundwater Domestic Wells Questions

- What is GAMA? Ambient Groundwater Monitoring GeoTracker GAMA My Private Domestic Well Why is GAMA Necessary? GAMA Projects - Current and Past Drinking Water Quality Monitoring

- GAMA RESOURCES: GAMA Home, About, GeoTracker GAMA, Groundwater Quality in CA, Priority Basin Project

(updated 5/11/09)

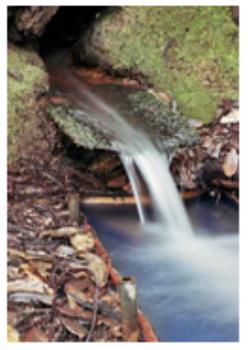


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- About Tools Groundwater Domestic Wells Questions
-> What is GAMA?
-> Ambient Groundwater Monitoring
-> GeoTracker GAMA
-> My Private Domestic Well
-> Why is GAMA Necessary?
-> GAMA Projects - Current and Past
-> Drinking Water Quality Monitoring

- GAMA RESOURCES
-> GAMA Home
-> About
-> GeoTracker GAMA
-> Groundwater Quality in CA
-> Priority Basin Project

(updated 5/11/09)



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GAMA: GeoTracker GAMA - DRAFT

The GeoTracker GAMA system provides a user-friendly internet site that helps all groundwater quality stakeholders - including the public, government and drinking water agencies, and environmental advocates - access accurate and timely groundwater quality data.

GeoTracker GAMA brings together and standardizes several datasets, with the ability to integrate even more data. The system includes datasets from California State Agencies including Public Health, Water Resources, Pesticide Regulation, and the Water Boards. It also includes data from the US Geological Survey and Lawrence Livermore National Laboratory.

GeoTracker GAMA provides tools to analyze these datasets, allowing for a clearer picture of groundwater quality across the state and answering groundwater quality questions. The datasets combine tens of millions of analytical results with water level and site lithologies, and provide data from over 100,000 sampling locations.

Monitoring of public drinking water quality delivered to consumers is the responsibility of the [California Department of Public Health](#). One of the GAMA program's main goals is to assess groundwater quality. The data to assess its quality is collected from raw or untreated ("ambient") public and private/domestic groundwater sources. The State of California does not regulate the water quality of private/domestic wells. It is the responsibility of private/domestic well owners to test their well water to ensure it is safe.

To get started using GeoTracker GAMA, please visit:

- [GeoTracker GAMA Tutorial](#)
- [Start GeoTracker GAMA](#)



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[GeoTracker GAMA Home](#) [GAMA Home](#) [SWRCB Home](#) [GAMA Tutorial](#)

Welcome to GeoTracker GAMA

GeoTracker GAMA (Groundwater Ambient Monitoring and Assessment) is an online database using Google Maps that:

- Makes searchable a number of groundwater quality databases
- Provides links to other groundwater quality data
- Provides links to other information about groundwater basics and groundwater protection

FIND WATER QUALITY INFORMATION

e.g., "10 market st, san francisco, ca" - [INFO](#)

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GEOTRACKER GAMA

LOCAL INFORMATION

CITY
CARMICHAEL

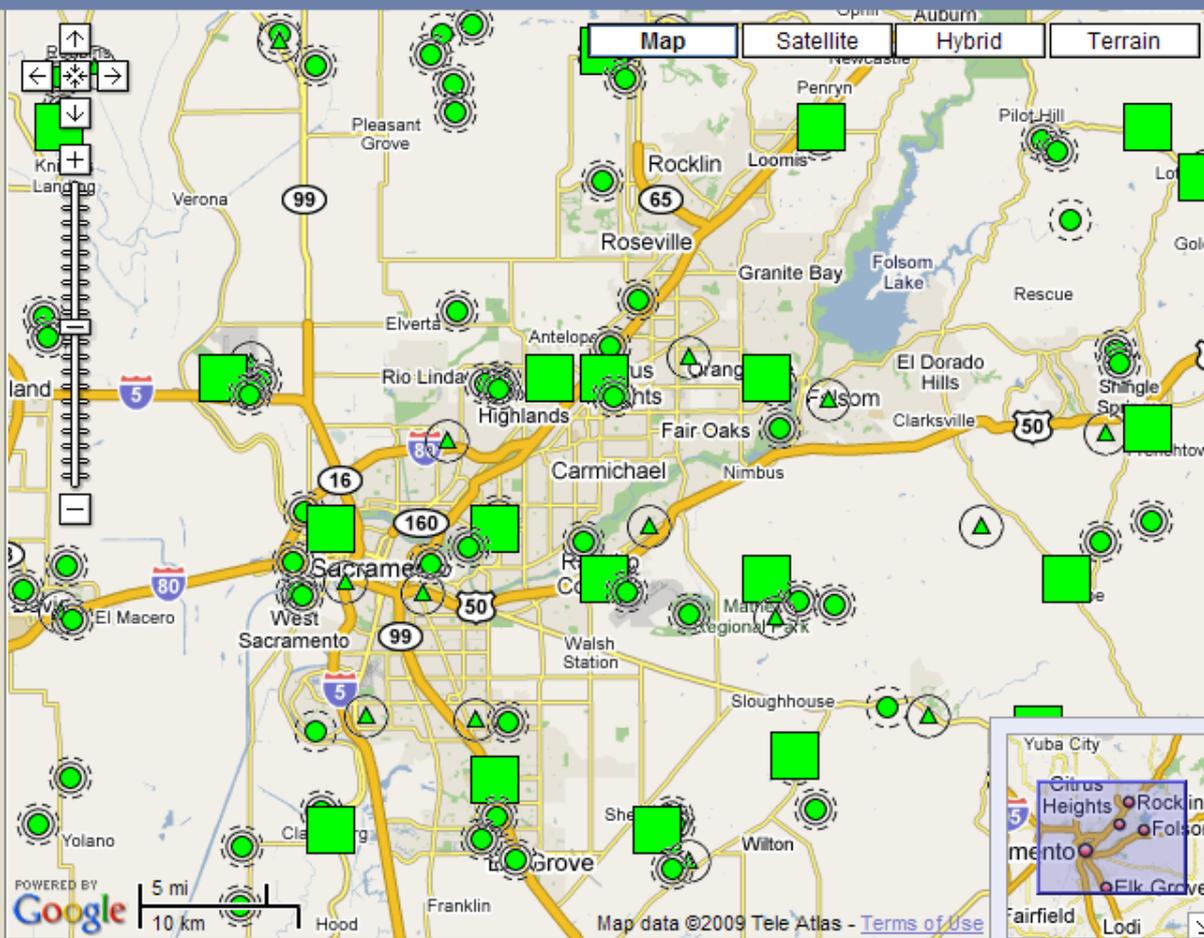
COUNTY
SACRAMENTO - [VIEW WATER REPORTS](#)

GROUNDWATER BASIN
SACRAMENTO VALLEY (5-21)

LEGEND

-  SQUARE ICONS REPRESENT ONE OR MORE CDPH WELLS
-  CIRCLE ICONS REPRESENT OTHER WATER SUPPLIES
-  TRIANGLE ICONS REPRESENT ENVIRONMENTAL MONITORING WELLS
-  ICONS WITH A CIRCLE AROUND THEM SIGNIFY A CLUSTER OF WELLS
-  ICONS WITH A DOTTED LINE AROUND THEM SIGNIFY AN APPROX LOCATION

THE [GEOTRACKER GAMA TUTORIAL](#) HAS COLOR CODE INFORMATION AS WELL AS ADDITIONAL INFORMATION ABOUT THE MAP



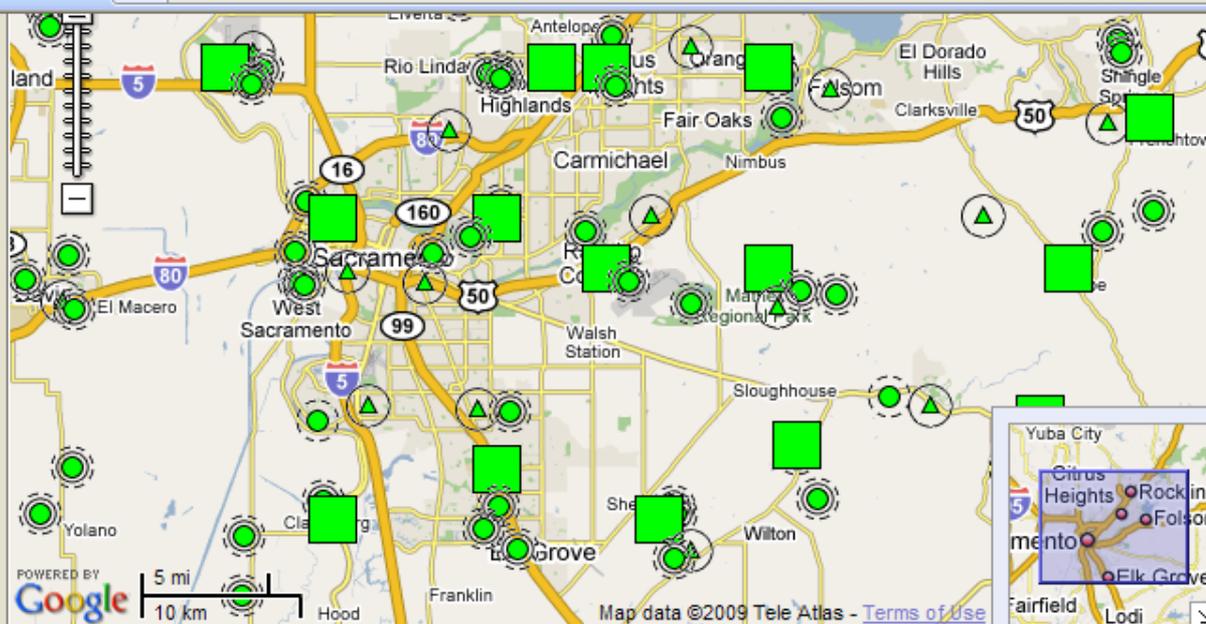
SHOW ADVANCED QUERY OPTIONS

MAP SIZE: 640x480

7515 MATCHING WELLS

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SHOW ADVANCED QUERY OPTIONS

MAP SIZE: 640x480

7515 MATCHING WELLS

DATASETS - ADDITIONAL INFORMATION

- Water Supply Wells (CDPH)
- Water Supply Wells (Other)
- ▲ Environmental Monitoring (Wells)

SHOW ME: All Wells that Have Been Sampled

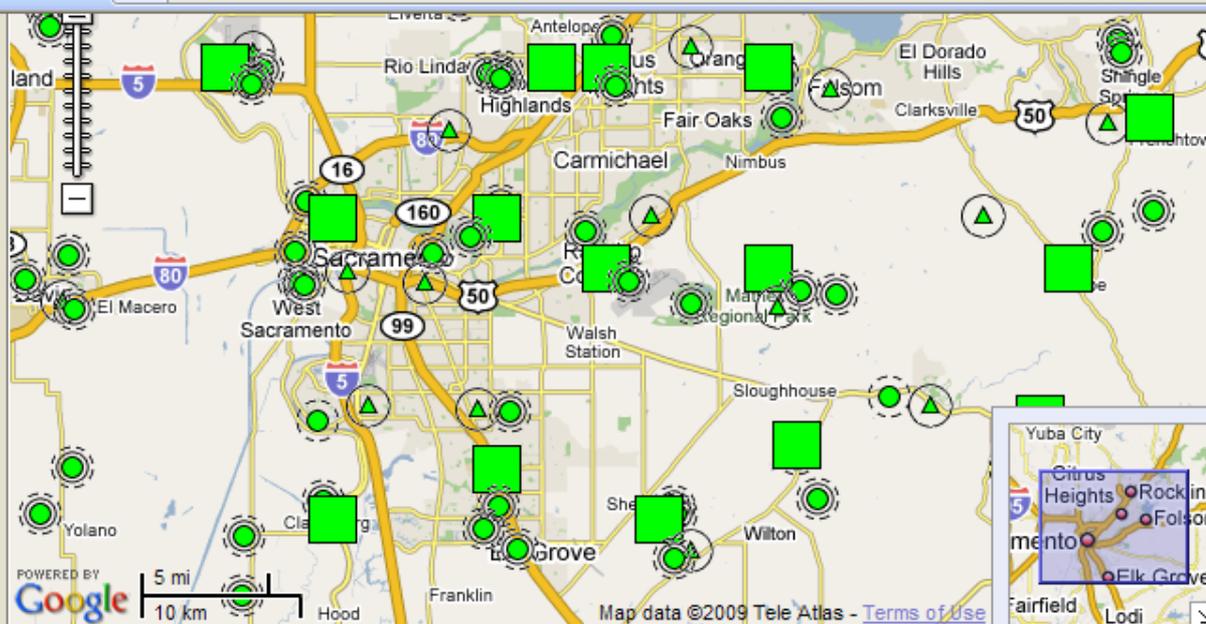
LOCATIONS FOUND

- 11 WELL CLUSTER [\[ZOOM IN ON CLUSTER\]](#) [\[VIEW WELLS IN CLUSTER\]](#)
- 5 WELL CLUSTER [\[ZOOM IN ON CLUSTER\]](#) [\[VIEW WELLS IN CLUSTER\]](#)
- 1 WELL [\[ZOOM IN ON CLUSTER\]](#) [\[VIEW WELLS IN CLUSTER\]](#)
- 27 WELL CLUSTER [\[ZOOM IN ON CLUSTER\]](#) [\[VIEW WELLS IN CLUSTER\]](#)

MAP AN ADDRESS: 95608

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7515 MATCHING WELLS

DATASETS - ADDITIONAL INFORMATION

-  Water Supply Wells (CDPH)
-  Water Supply Wells (Other)
-  Environmental Monitoring (Wells)

SHOW ME: Wells With Results

OF: Methyl-tert-butyl ether (MTBE) - (SMCL = 5 UGL)

IN THE PAST: 1 YEAR

Go

LOCATIONS FOR

Wells With Results Above Drinking Water Standard

 11 WELL CLU

Wells With Results

[\[ZOOM IN ON CLUSTER\]](#)

[\[VIEW WELLS IN CLUSTER\]](#)

 5 WELL CLUSTER

[\[ZOOM IN ON CLUSTER\]](#)

[\[VIEW WELLS IN CLUSTER\]](#)

 1 WELL

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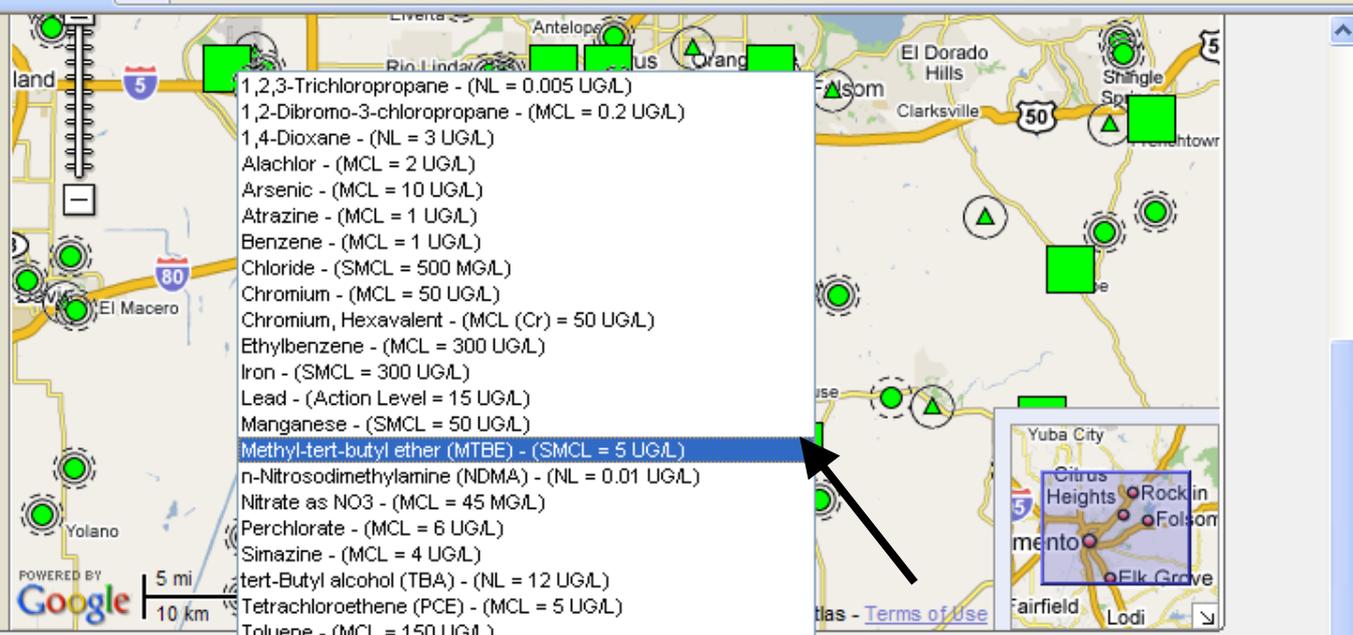
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Go!

GeoTracker GAMA

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SHOW ADVANCED QUERY OPTIONS

DATASETS - ADDITIONAL INFORMATION

Water Supply Wells (CDPH)

SHOW ME Wells With Results OF Methyl-tert-butyl ether (MTBE) - (SMCL = 5 UG/L) IN THE PAST 1 YEAR Go

LOCATIONS FOUND

11 WELL CLUSTER	[ZOOM IN ON CLUSTER]	[VIEW WELLS IN CLUSTER]
5 WELL CLUSTER	[ZOOM IN ON CLUSTER]	[VIEW WELLS IN CLUSTER]
1 WELL	[ZOOM IN ON CLUSTER]	[VIEW WELLS IN CLUSTER]
27 WELL CLUSTER	[ZOOM IN ON CLUSTER]	[VIEW WELLS IN CLUSTER]

MAP AN ADDRESS: 95608

UNINCORPORATED

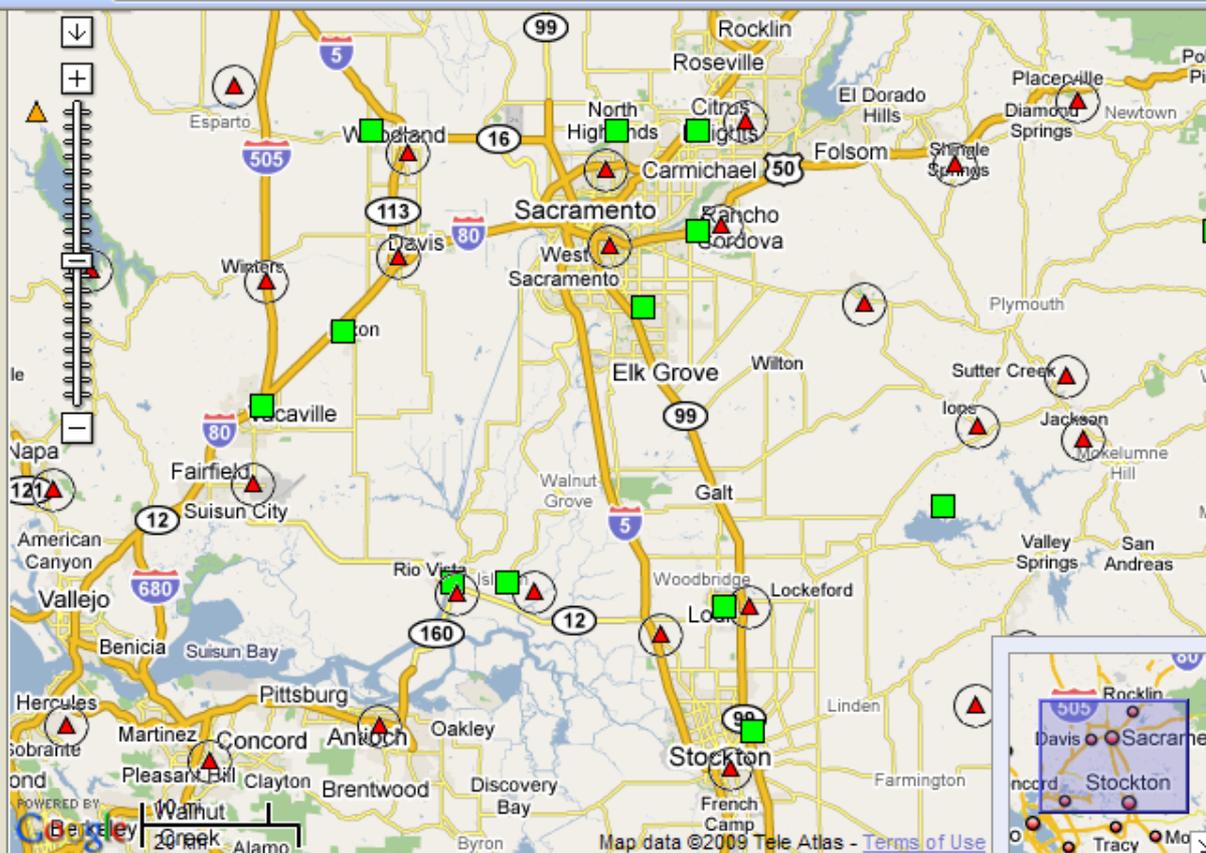
COUNTY
SACRAMENTO - [VIEW WATER REPORTS](#)

GROUNDWATER BASIN
SACRAMENTO VALLEY (5-21)

LEGEND

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SHOW ADVANCED QUERY OPTIONS

MAP SIZE: 640x480

7415 MATCHING WELLS (29.55% ABOVE DRINKING WATER STANDARD)

DATASETS - ADDITIONAL INFORMATION

- Water Supply Wells (CDPH)
- Water Supply Wells (Other)
- ▲ Environmental Monitoring (Wells)

SHOW ME Wells With Results

OF Methyl-tert-butyl ether (MTBE) - (SMCL = 5 UGL)

1 YEAR

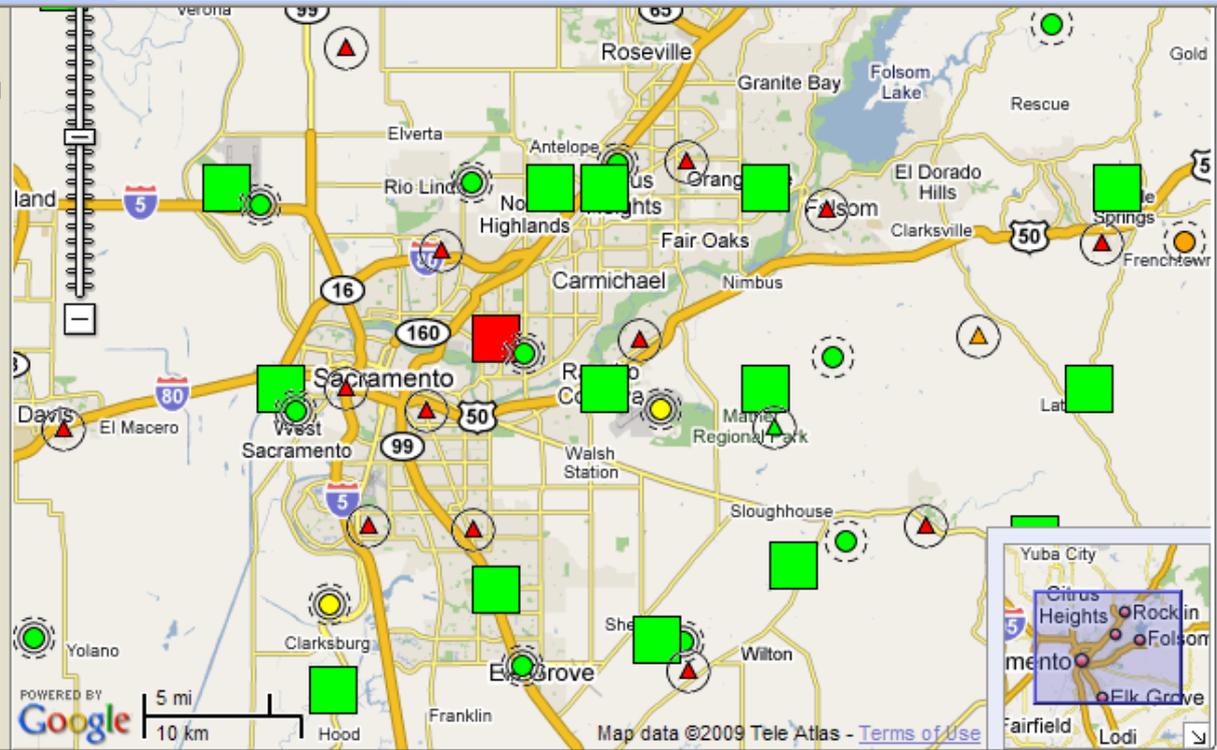
Go

GROUNDWATER BASIN
SACRAMENTO VALLEY (5-21)

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SHOW ADVANCED QUERY OPTIONS

MAP SIZE: 640x480

4516 MATCHING WELLS (35.72% ABOVE DRINKING WATER STANDARD)

[DATASETS - ADDITIONAL INFORMATION](#)

- Water Supply Wells (CDPH)
- Water Supply Wells (Other)
- ▲ Environmental Monitoring (Wells)

SHOW ME OF IN THE PAST

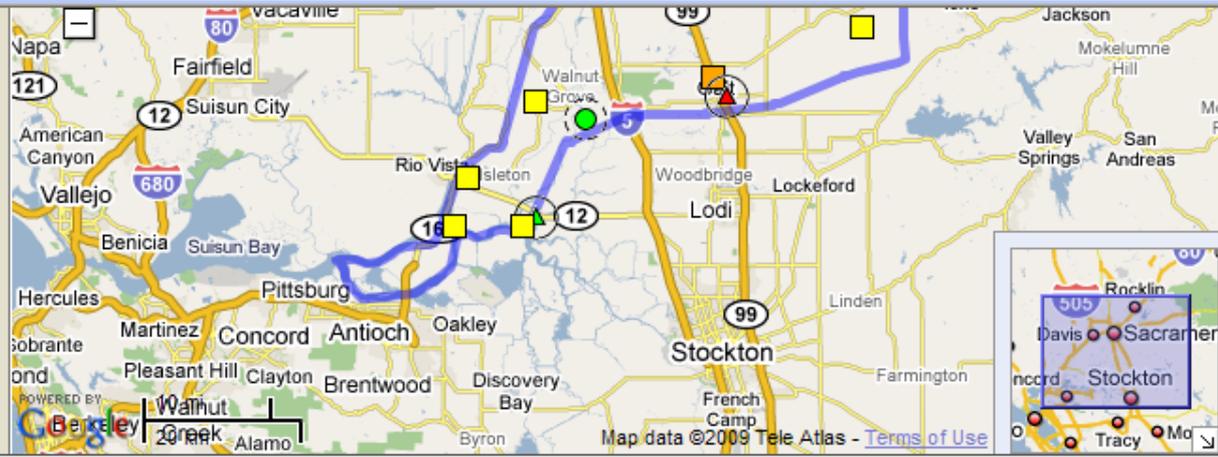
LOCATIONS FOUND

▲ 1552 WELL CLUSTER	820000	[ZOOM IN ON CLUSTER]	[VIEW WELLS IN CLUSTER]
▲ 157 WELL CLUSTER	190000	[ZOOM IN ON CLUSTER]	[VIEW WELLS IN CLUSTER]



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SHOW ADVANCED QUERY OPTIONS MAP SIZE: 640x480 809 MATCHING WELLS (2.72% ABOVE DRINKING WATER STANDARD)

DATASETS: - [ADDITIONAL INFORMATION](#)

- ENVIRONMENTAL MONITORING:**
 Environmental Monitoring Wells (SWRCB/RWQCB)
- WATER SUPPLY WELLS:**
 GAMA Domestic Wells Water Supply Wells (CDPH) GAMA (USGS) GAMA (LLNL) DPR DWR

GIS LAYER - SELECTING A GIS LAYER WILL LIMIT YOUR QUERY TO RESULTS IN THAT GIS LAYER

Counties SACRAMENTO COUNTY

SHOW ME Wells With Results OF Nitrate as NO3 - (MCL = 45 MG/L) IN THE PAST 10 YEARS Go

LOCATIONS FOUND			
▲ 178 WELL CLUSTER	345.306	[ZOOM IN ON CLUSTER]	[VIEW WELLS IN CLUSTER]
▲ 13 WELL CLUSTER	88.54	[ZOOM IN ON CLUSTER]	[VIEW WELLS IN CLUSTER]
▲ 12 WELL CLUSTER	80	[ZOOM IN ON CLUSTER]	[VIEW WELLS IN CLUSTER]
■ 134 WELL CLUSTER	60	[ZOOM IN ON CLUSTER]	[VIEW WELLS IN CLUSTER]

MAP AN ADDRESS: 95608 Go!

COUNTY

SACRAMENTO - [VIEW WATER REPORTS](#)

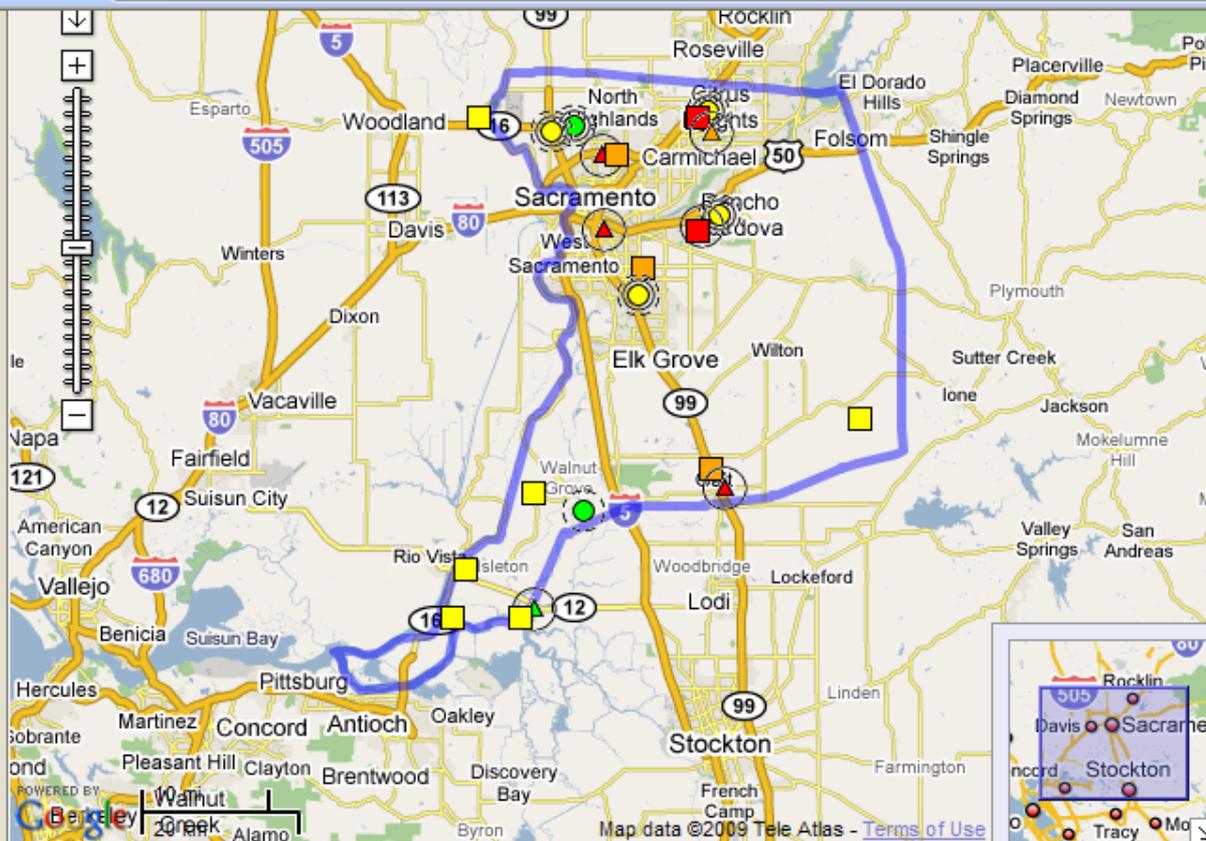
GROUNDWATER BASIN

SACRAMENTO VALLEY (5-21)

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SHOW ADVANCED QUERY OPTIONS

MAP SIZE: 640x480

809 MATCHING WELLS (2.72% ABOVE DRINKING WATER STANDARD)

DATA SETS: [ADDITIONAL INFORMATION](#)

ENVIRONMENTAL MONITORING:

Environmental Monitoring Wells (SWRCB/RWQCB)

WATER SUPPLY WELLS:

GAMA Domestic Wells Water Supply Wells (CDPH) GAMA (USGS) GAMA (LLNL) DPR DWR

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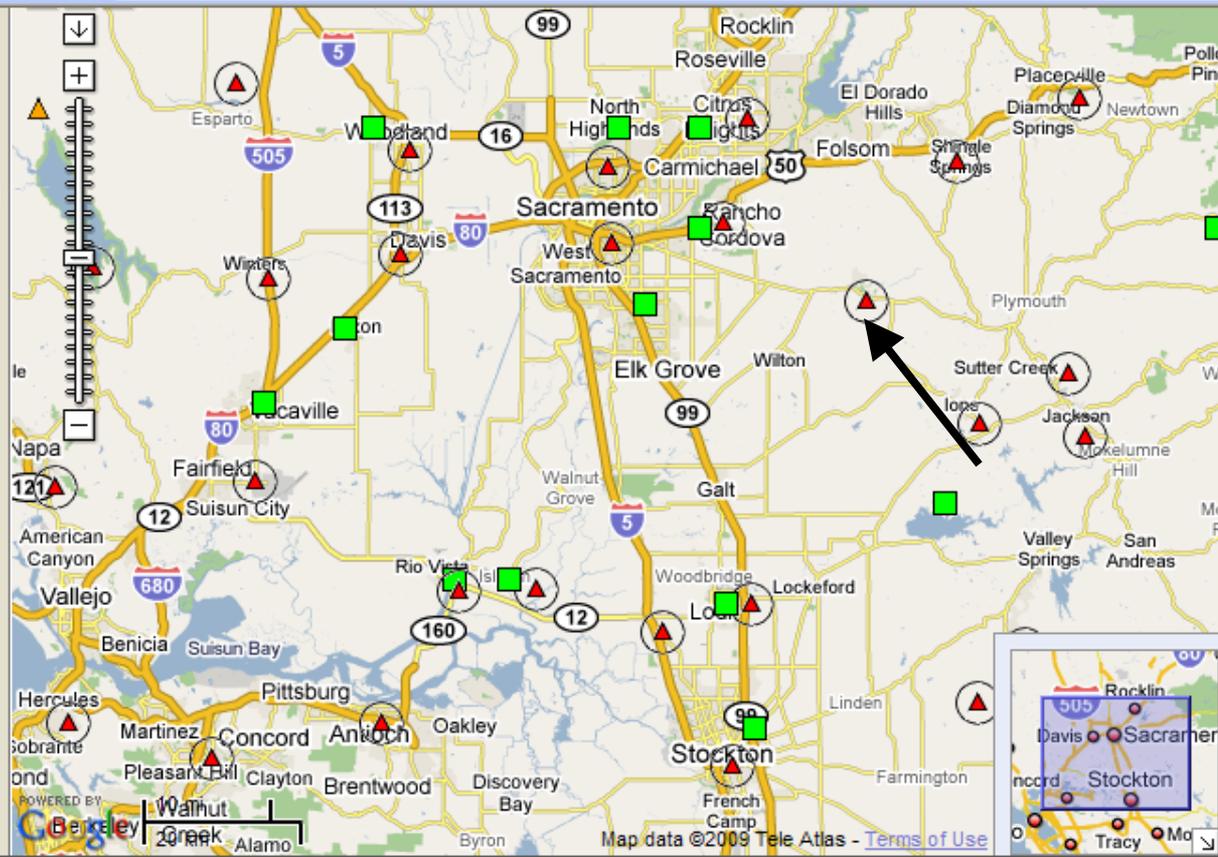
UNINCORPORATED

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GROUNDWATER BASIN
SACRAMENTO VALLEY (5-21)

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SHOW ADVANCED QUERY OPTIONS MAP SIZE: 640x480 **7415 MATCHING WELLS (29.55% ABOVE DRINKING WATER STANDARD)**

DATASETS - ADDITIONAL INFORMATION

■ Water Supply Wells (CDPH) ● Water Supply Wells (Other) ▲ Environmental Monitoring (Wells)

SHOW ME OF IN THE PAST

147 WELLS IN THIS CLUSTER

WELL NAME	DATASET CATEGORY	DATASET	COUNTY	REGIONAL BOARD	GW BASIN NAME	MAX MTBE (UG/L)	MAX MTBE DAT
MW-9	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	6900	10/3/2008
S-3	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	6100	6/3/2008
MW-5	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	6000	6/3/2008
V-7	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	4300	8/19/2008
MW-2	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	3800	1/7/2009
S-4	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	2400	6/3/2008
MW-2	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	1200	6/3/2008
S-1	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	1000	9/3/2008
MW-8	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	680	10/6/2008
MW-2R	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	284	6/27/2008
MW-2	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	280	12/22/2008
VW-2B	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	182	6/27/2008
MW-4	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	170	6/3/2008
MW-5	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	170	11/10/2008
V-6	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	170	11/10/2008
MW-2	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	140	4/29/2008
S-2	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	140	6/3/2008
EW-1	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	130	8/22/2008
VE-8	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	110	8/22/2008
MW-15	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	110	9/8/2008
VW-4	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	97	9/8/2008
MW-8	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	84	11/24/2008
MW-10	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	64	10/3/2008
AS-5	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	60	8/22/2008
MW-1	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	50	6/24/2008
MW-5	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	42	7/21/2008
VE-12	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	40	8/22/2008
MW-13	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	33	9/24/2008
MW-1R	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	31	6/27/2008
MW-27	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	27	6/23/2008
MW-1	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	26	10/21/2008
MW-104	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	20	3/11/2009
MW-103	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	20	3/11/2009
VE-11	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	20	8/22/2008
MW-4	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	15	6/26/2008
MW-17	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	15	9/24/2008
AS-4	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	10	12/22/2008
AS-1	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	9.4	12/22/2008
S-5	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	9.4	6/3/2008
MW-11	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	9	6/23/2008
V-8	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	5.7	8/19/2008
MW-1	ENVIRONMENTAL MONITORING (WELLS)	EDF	SACRAMENTO	5	SACRAMENTO VALLEY - SOUTH AMERICAN (5-21.65)	5.7	6/3/2008



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SHELL SERVICE STATION (T0606795914) - (MAP)

9100 HARBOUR POINT DRIVE
 ELK GROVE, CA
 SACRAMENTO COUNTY
 LUST CLEANUP SITE

CLEANUP OVERSIGHT AGENCIES
 SACRAMENTO COUNTY LOP (LEAD) - CASE #: G090
 CASEWORKER: [BARRY MARCUS](#)
 CENTRAL VALLEY RWQCB (REGION 5S) - CASE #: 341472
 CASEWORKER: [VERA FISCHER](#)

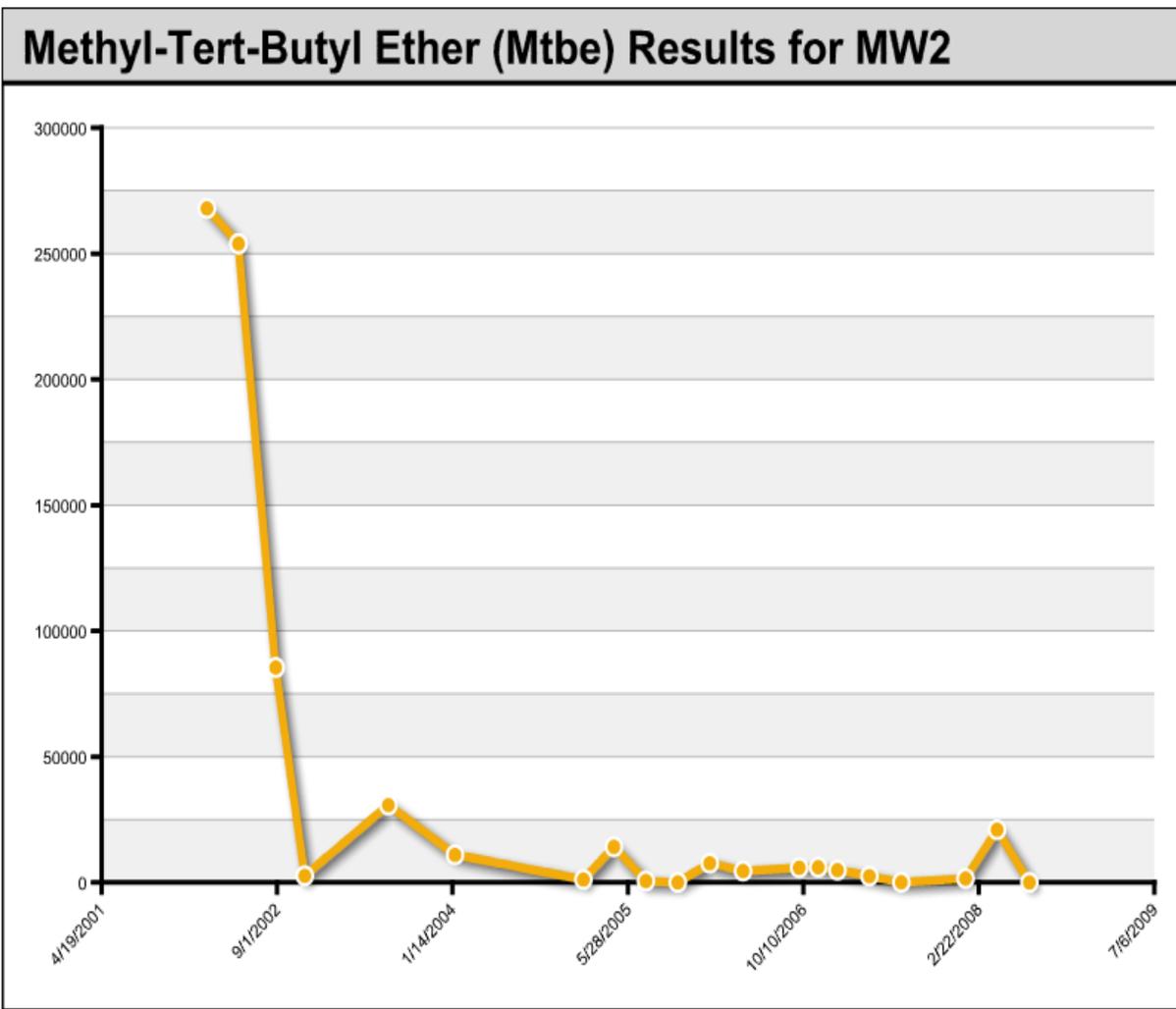
Analytical Results - MW-2 - [BACK TO REPORT](#)

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[Most Recent](#) [All Data](#) [Maximum Concentrations](#)

Plot Selected Chemicals PLOT DEPTH-TO-WATER LOGARITHMIC PLOT [EXPORT TO EXCEL](#)

PLOT	NAME	DATE	PARAMETER	MATRIX	QUALIFIER	RESULT	UNITS	RL NOTE
<input type="checkbox"/>	MW-2	3/26/2009	ACETONE	W	ND	500	UG/L	
<input type="checkbox"/>	MW-2	3/26/2009	BROMODICHLOROMETHANE	W	ND	10	UG/L	
<input type="checkbox"/>	MW-2	3/26/2009	BROMOBENZENE	W	ND	10	UG/L	
<input type="checkbox"/>	MW-2	3/26/2009	BROMOCHLOROMETHANE	W	ND	10	UG/L	
<input type="checkbox"/>	MW-2	3/26/2009	BROMOMETHANE	W	ND	100	UG/L	
<input type="checkbox"/>	MW-2	3/26/2009	N-BUTYLBENZENE	W	ND	10	UG/L	
<input type="checkbox"/>	MW-2	3/26/2009	SEC-BUTYLBENZENE	W	ND	10	UG/L	
<input type="checkbox"/>	MW-2	3/26/2009	TERT-BUTYLBENZENE	W	ND	10	UG/L	
<input type="checkbox"/>	MW-2	3/26/2009	BENZENE	W	ND	5	UG/L	



114 WELLS IN THIS CLUSTER

EXPORT TO EXCEL

WELL NAME	DATASET CATEGORY	DATASET	COUNTY	REGIONAL BOARD	GW BASIN NAME	MAX MTBE (UG/L)	MAX MTBE DATE	MCL (UG/L)		
LF-03	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	100000	8/25/2006	5	VIEW GRAPH	VIEW NATIVE DATA
MW2	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	268000	2/13/2002	5	VIEW GRAPH	VIEW NATIVE DATA
MW-29A	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	230000	2/19/2007	5	VIEW GRAPH	VIEW NATIVE DATA
LF-10	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	140000	5/12/2005	5	VIEW GRAPH	VIEW NATIVE DATA
MW-28A	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	130000	5/23/2007	5	VIEW GRAPH	VIEW NATIVE DATA
MW-6	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	100000	12/13/2002	5	VIEW GRAPH	VIEW NATIVE DATA
EX-03B	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	93000	5/18/2006	5	VIEW GRAPH	VIEW NATIVE DATA
MW-6	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	93000	12/21/2004	5	VIEW GRAPH	VIEW NATIVE DATA
LF-11	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	72000	5/18/2006	5	VIEW GRAPH	VIEW NATIVE DATA
DEC-12B	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	64000	8/25/2006	5	VIEW GRAPH	VIEW NATIVE DATA
EX-06B	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	49000	2/19/2007	5	VIEW GRAPH	VIEW NATIVE DATA
MW2D	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	45000	4/21/2006	5	VIEW GRAPH	VIEW NATIVE DATA
EX-05B	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	44000	8/14/2007	5	VIEW GRAPH	VIEW NATIVE DATA
EX-07B	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	43000	11/16/2006	5	VIEW GRAPH	VIEW NATIVE DATA
MW-17	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	32000	2/25/2003	5	VIEW GRAPH	VIEW NATIVE DATA
MW-4	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	25000	8/20/2003	5	VIEW GRAPH	VIEW NATIVE DATA
MW-2	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	24900	7/18/2005	5	VIEW GRAPH	VIEW NATIVE DATA
MW-18B	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	19000	8/25/2006	5	VIEW GRAPH	VIEW NATIVE DATA
LF-02	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	15000	3/6/2006	5	VIEW GRAPH	VIEW NATIVE DATA
OB-1	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	14000	3/23/2007	5	VIEW GRAPH	VIEW NATIVE DATA
MW-2	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	12000	2/25/2003	5	VIEW GRAPH	VIEW NATIVE DATA
MW-21C	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	10000	11/13/2006	5	VIEW GRAPH	VIEW NATIVE DATA
MW-21B	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	8900	5/12/2005	5	VIEW GRAPH	VIEW NATIVE DATA
EX-04B	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	8200	8/14/2007	5	VIEW GRAPH	VIEW NATIVE DATA
MW-13	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	8100	2/1/2005	5	VIEW GRAPH	VIEW NATIVE DATA
MW-9D	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	6100	5/19/2003	5	VIEW GRAPH	VIEW NATIVE DATA
MW-8	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	4900	10/15/2002	5	VIEW GRAPH	VIEW NATIVE DATA
MW-4	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	3400	12/7/2002	5	VIEW GRAPH	VIEW NATIVE DATA
EX-08B	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	3000	2/20/2007	5	VIEW GRAPH	VIEW NATIVE DATA
MW-2	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	2500	10/22/2002	5	VIEW GRAPH	VIEW NATIVE DATA
MW-7	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	1900	3/5/2003	5	VIEW GRAPH	VIEW NATIVE DATA
MW-3	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	1900	2/25/2003	5	VIEW GRAPH	VIEW NATIVE DATA
MW-5	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	1800	6/18/2002	5	VIEW GRAPH	VIEW NATIVE DATA
MW-22A	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	1800	5/12/2005	5	VIEW GRAPH	VIEW NATIVE DATA
MW-10	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	1800	6/19/2003	5	VIEW GRAPH	VIEW NATIVE DATA
MW-4	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	1200	5/24/2002	5	VIEW GRAPH	VIEW NATIVE DATA
MW-3	ENVIRONMENTAL MONITORING (WELLS)	EDF	SOLANO	5	SACRAMENTO VALLEY (5-21)	1200	11/19/2004	5	VIEW GRAPH	VIEW NATIVE DATA

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21 record(s) retrieved.

LOCID	LOGDATE	LOGTIME	LOGCODE	SAMPID	MATRIX	PROJNAME	LABWO	GLOBAL_ID	LABCODE	LABSAMPID	QCCODE	ANMCODE	MODPARLS
MW2	5/14/2002	1445	ERIN	MW2	W	7-6237	284830	T0609500448	TAN	02-A79816	CS	SW8260A	T
MW2	1/21/2005	1530	ERIN	MW2	W	7-6237	404087	T0609500448	TAN	05-A10155	CS	SW8260B	T
MW2	4/18/2005	1520	ERIP	MW2	W	7-6237	413565	T0609500448	TAN	05-A56302	CS	SW8260B	T
MW2	5/14/2002	1445	ERIN	MW2	W	7-6237	284830	T0609500448	TAN	02-A79816	CS	SW8260A	T
MW2	8/28/2002	1240	ERIN	MW2	W	7-6237	299422	T0609500448	TAN	02-A143839	CS	SW8260B	T
MW2	7/15/2003	1736	ERIN	MW2	W	7-6237	339695	T0609500448	TAN	03-A110521	CS	SW8260B	T
MW2	4/14/2008	1730	ERIP	MW2	W	Exxon 7-6237	MRD0685	T0609500448	TAMC	MRD068503R1	CS	SW8260B	T
MW2	7/18/2005	1350	ERIN	MW2	W	7-6237	423556	T0609500448	TAN	05-A104634	CS	SW8260B	T
MW2	7/16/2007	1330	ERIP	MW2	W	Exxon 7-6237	MQG0705	T0609500448	TAMC	MQG070502	CS	SW8260B	T
MW2	11/21/2006	1829	ERIP	MW2	W	Exxon 7-6237	MPK0854	T0609500448	TAMC	MPK085402	CS	8260FA	T
MW2	10/17/2005	1455	ERIP	MW2	W	Exxon 7-6237 PO:45058846	NOJ2234	T0609500448	TAN	NOJ223403	CS	8260+OX	T
MW2	9/28/2006	1545	ERIP	MW2	W	Exxon 7-6237	MPI0732	T0609500448	TAMC	MPI073202	CS	8260FA	T
MW2	2/13/2002	1530	ERIN	MW2	W	7-6237	272016	T0609500448	TAN	02-A23485	CS	SW8260B	T
MW2	1/21/2004	1345	ERIN	MW2	W	7-6237	361767	T0609500448	TAN	04-A9736	CS	SW8260B	T
MW2	4/16/2007	1440	ERIP	MW2	W	Exxon 7-6237	NQD2599	T0609500448	TAN	NQD259902	CS	SW8260B	T
MW2	11/19/2002	1857	ERIN	MW2	W	7-6237	310594	T0609500448	TAN	02-A193521	CS	SW8260B	T

GEOTRACKER GAMA

LOCAL INFORMATION

CITY
CARMICHAEL

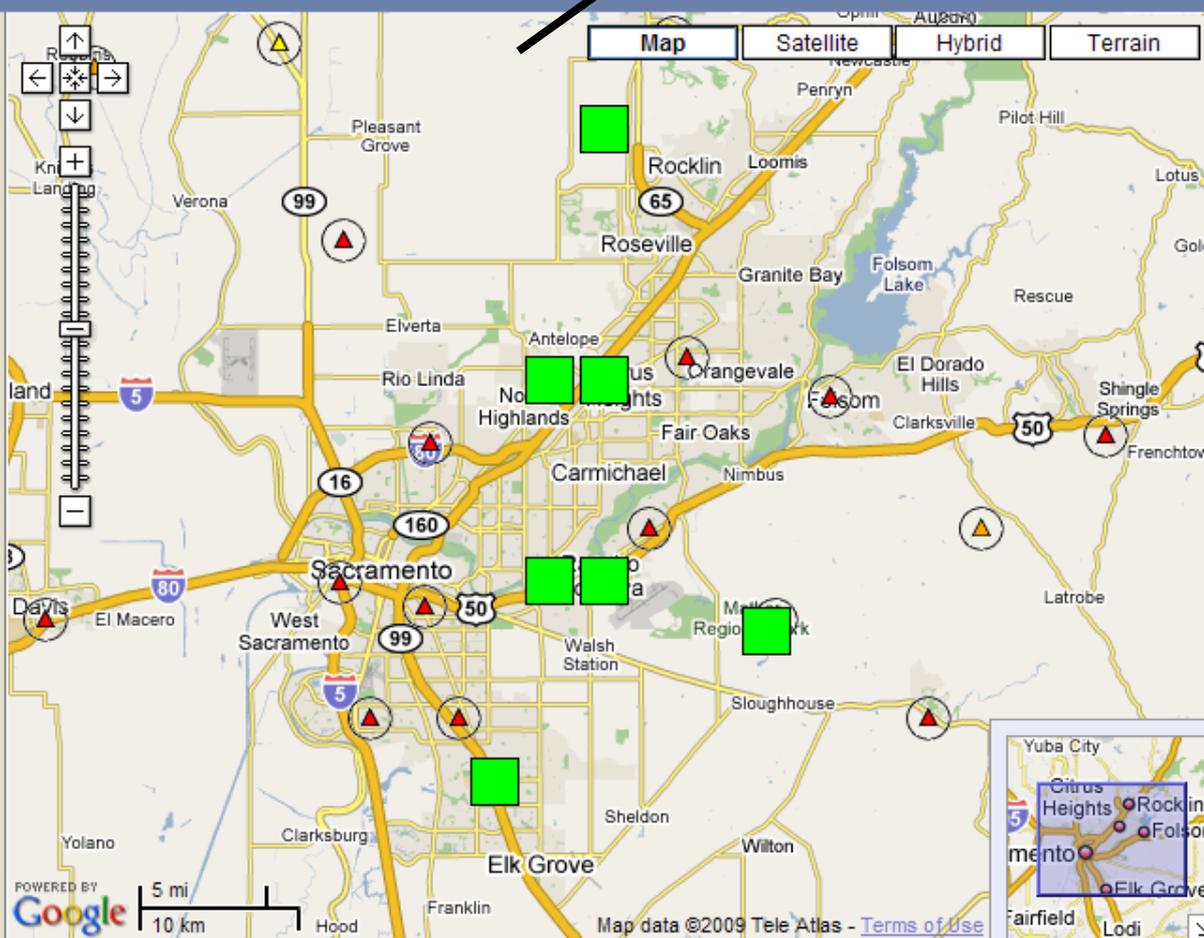
COUNTY
SACRAMENTO - [VIEW WATER REPORTS](#)

GROUNDWATER BASIN
SACRAMENTO VALLEY (5-21)

LEGEND

-  SQUARE ICONS REPRESENT ONE OR MORE CDPH WELLS
-  CIRCLE ICONS REPRESENT OTHER WATER SUPPLIES
-  TRIANGLE ICONS REPRESENT ENVIRONMENTAL MONITORING WELLS
-  ICONS WITH A CIRCLE AROUND THEM SIGNIFY A CLUSTER OF WELLS
-  ICONS WITH A DOTTED LINE AROUND THEM SIGNIFY AN APPROX LOCATION

THE [GEOTRACKER GAMA TUTORIAL](#) HAS COLOR CODE INFORMATION AS WELL AS ADDITIONAL INFORMATION ABOUT THE MAP



SHOW ADVANCED QUERY OPTIONS

MAP SIZE: 640x480

2838 MATCHING WELLS (25.69% ABOVE DRINKING WATER STANDARD)

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Note: Generally, red indicates the value is above the MCL, orange indicates the value is above 1/2 of the MCL, yellow indicates the value is a detection less than 1/2 of the MCL and green (not shown) represents non-detects.

CHEMICAL HOTSPOT LEGEND		
CHEMICAL	<u>DRINKING WATER STANDARD FOR PUBLIC SUPPLY WELLS (MAXIMUM CONTAMINATION LEVEL - MCL) OR OTHER STANDARD</u>	<u>BREAK 2</u>
1,2,3-Trichloropropane	0.005 UG/L	0.0025 UG/L
1,2-Dibromo-3-chloropropane	0.2 UG/L	0.1 UG/L
1,4-Dioxane	3 UG/L	1.5 UG/L
Alachlor	2 UG/L	1 UG/L
Arsenic	10 UG/L	5 UG/L
Atrazine	1 UG/L	0.5 UG/L
Benzene	1 UG/L	0.5 UG/L
Chloride	500 MG/L	250 MG/L
Chromium	50 UG/L	25 UG/L
Chromium, Hexavalent	50 UG/L	25 UG/L
Ethylbenzene	300 UG/L	150 UG/L
Iron	300 UG/L	150 UG/L
Lead	15 UG/L	7.5 UG/L
Manganese	50 UG/L	25 UG/L
Methyl-tert-butyl ether (MTBE)	5 UG/L	2.5 UG/L
Nitrate as NO3	45 MG/L	22.5 MG/L
Perchlorate	6 UG/L	3 UG/L
Simazine	4 UG/L	2 UG/L
Tetrachloroethene (PCE)	5 UG/L	2.5 UG/L
Toluene	150 UG/L	75 UG/L
Total Dissolved Solids	1000 MG/L	500 MG/L

GEOTRACKER GAMA

LOCAL INFORMATION

CITY
CARMICHAEL

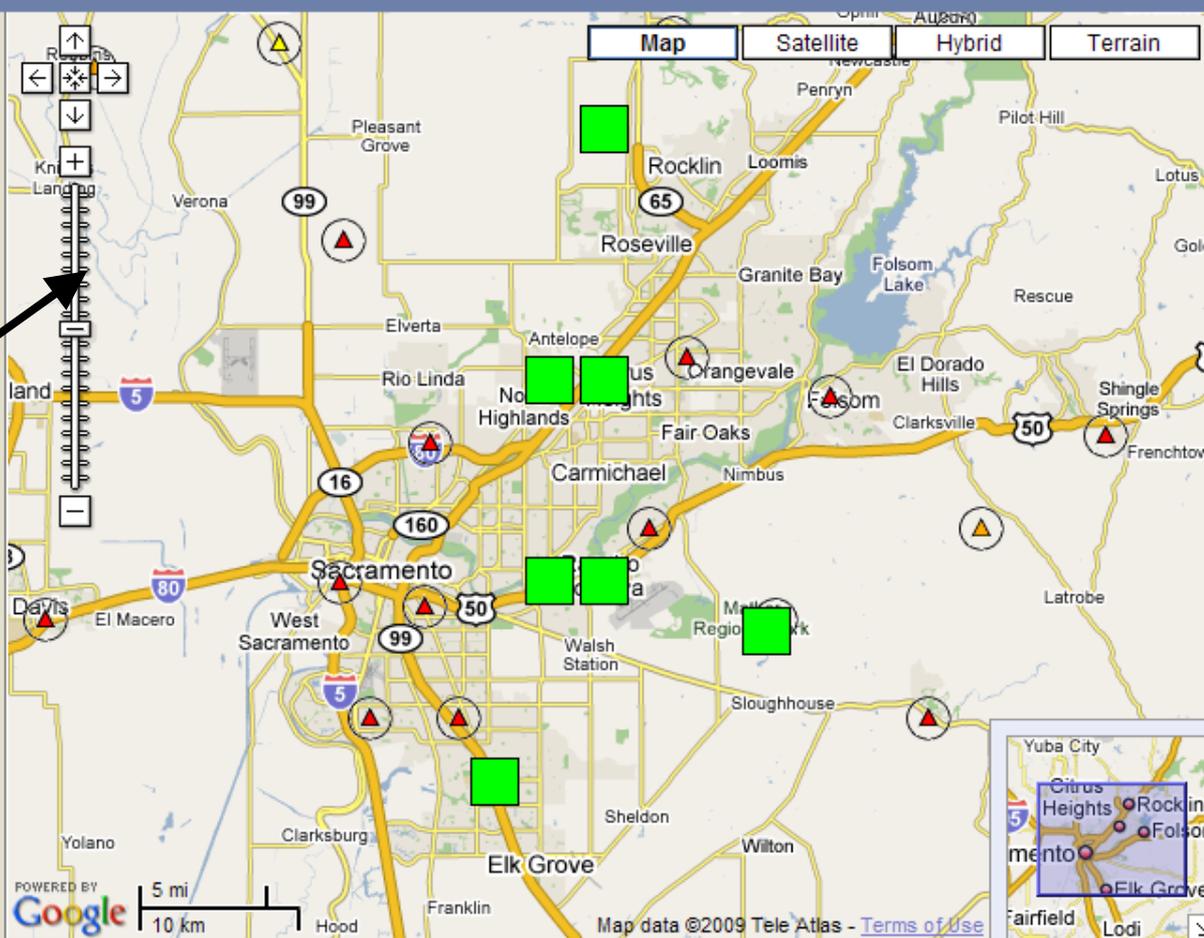
COUNTY
SACRAMENTO - [VIEW WATER REPORTS](#)

GROUNDWATER BASIN
SACRAMENTO VALLEY (5-21)

LEGEND

-  SQUARE ICONS REPRESENT ONE OR MORE CDPH WELLS
-  CIRCLE ICONS REPRESENT OTHER WATER SUPPLIES
-  TRIANGLE ICONS REPRESENT ENVIRONMENTAL MONITORING WELLS
-  ICONS WITH A CIRCLE AROUND THEM SIGNIFY A CLUSTER OF WELLS
-  ICONS WITH A DOTTED LINE AROUND THEM SIGNIFY AN APPROX LOCATION

THE [GEOTRACKER GAMA TUTORIAL](#) HAS COLOR CODE INFORMATION AS WELL AS ADDITIONAL INFORMATION ABOUT THE MAP



SHOW ADVANCED QUERY OPTIONS

MAP SIZE: 640x480

2838 MATCHING WELLS (25.69% ABOVE DRINKING WATER STANDARD)

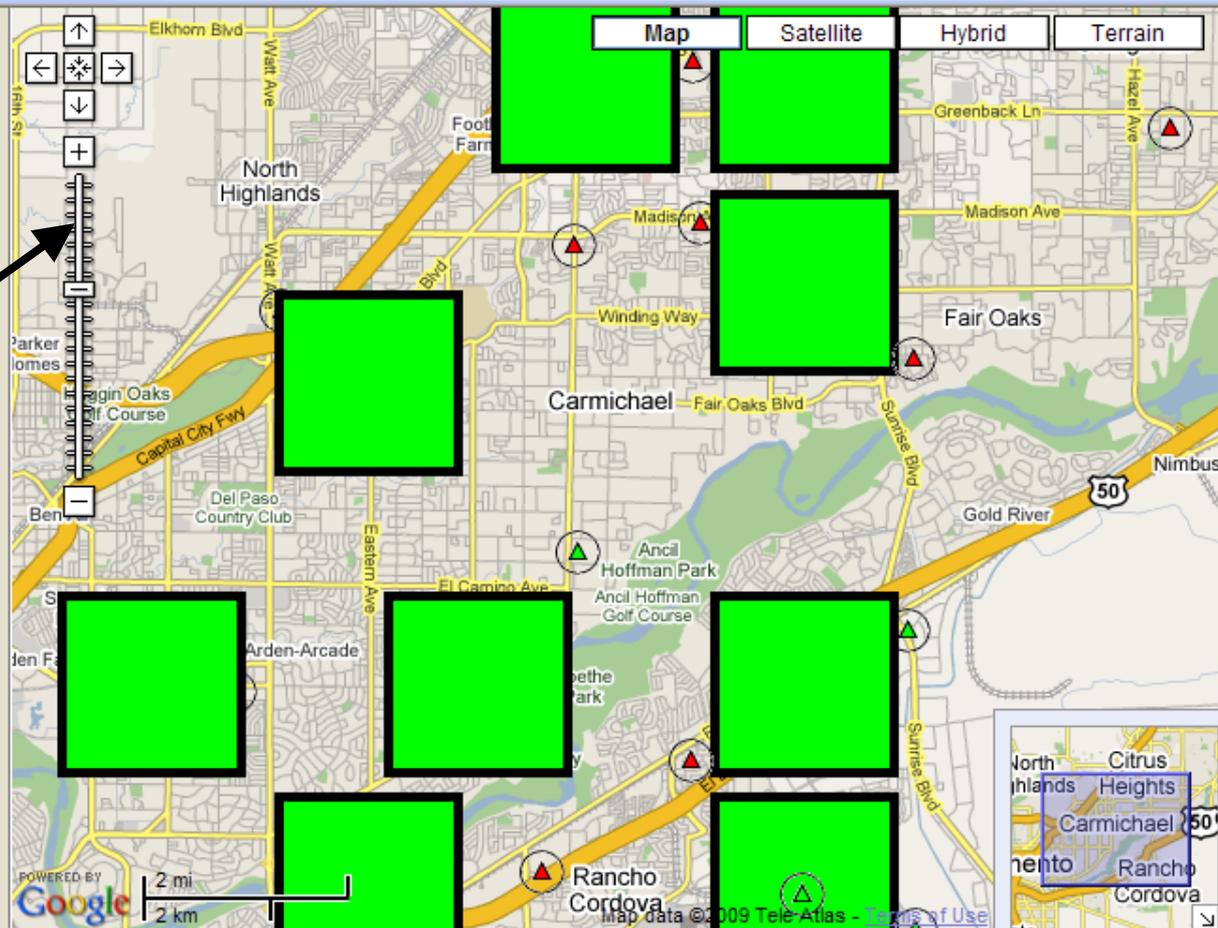
LOCAL INFORMATION

CITY CARMICHAEL
COUNTY SACRAMENTO - [VIEW WATER REPORTS](#)
GROUNDWATER BASIN SACRAMENTO VALLEY (5-21)

LEGEND

-  SQUARE ICONS REPRESENT ONE OR MORE CDPH WELLS
-  CIRCLE ICONS REPRESENT OTHER WATER SUPPLIES
-  TRIANGLE ICONS REPRESENT ENVIRONMENTAL MONITORING WELLS
-  ICONS WITH A CIRCLE AROUND THEM SIGNIFY A CLUSTER OF WELLS
-  ICONS WITH A DOTTED LINE AROUND THEM SIGNIFY AN APPROX LOCATION

THE [GEOTRACKER GAMA TUTORIAL](#) HAS COLOR CODE INFORMATION AS WELL AS ADDITIONAL INFORMATION ABOUT THE MAP



SHOW ADVANCED QUERY OPTIONS MAP SIZE: 640x480 467 MATCHING WELLS (17.77% ABOVE DRINKING WATER STANDARD)

DATASETS - [ADDITIONAL INFORMATION](#)

-  Water Supply Wells (CDPH)
-  Water Supply Wells (Other)
-  Environmental Monitoring (Wells)

LOCAL INFORMATION

CITY
CARMICHAEL

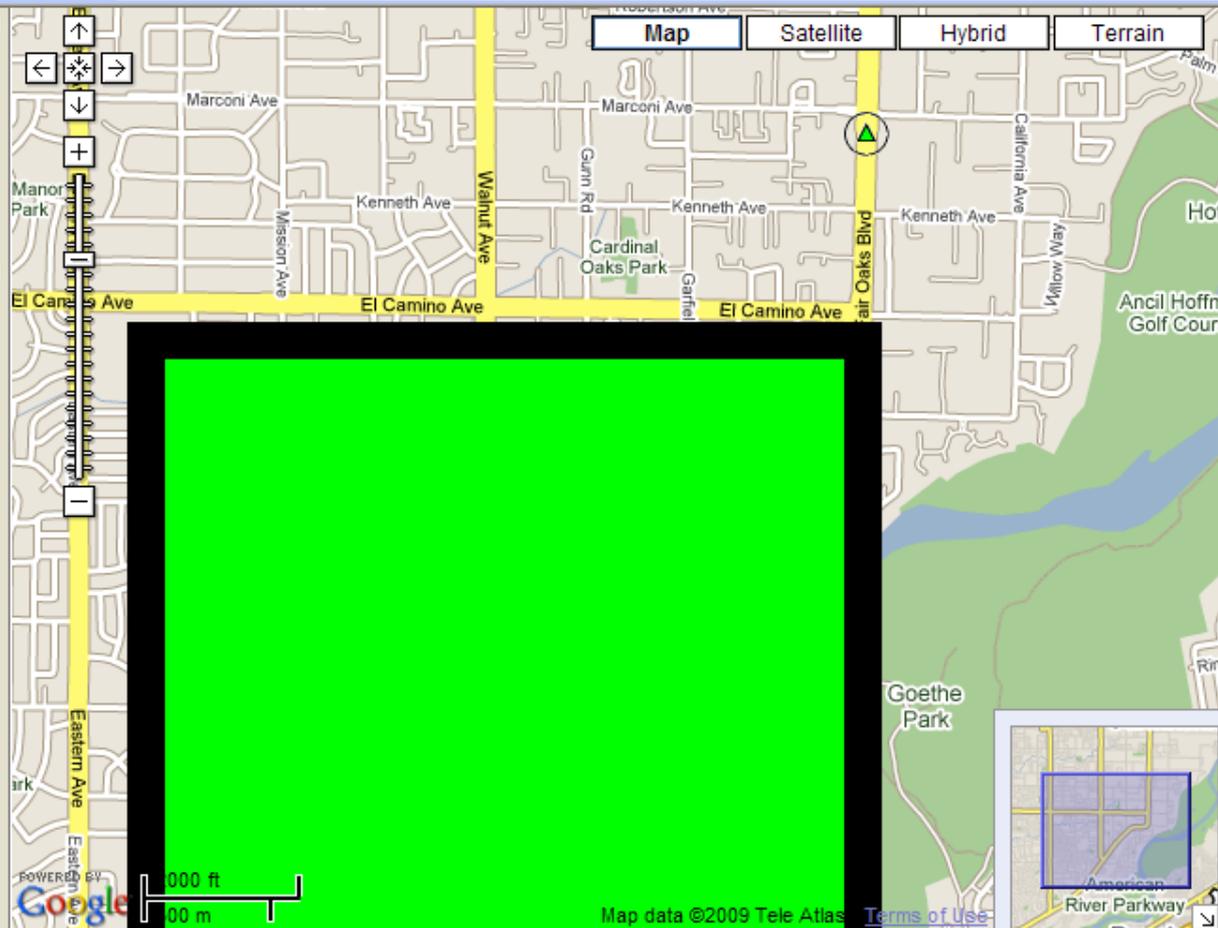
COUNTY
SACRAMENTO - [VIEW WATER REPORTS](#)

GROUNDWATER BASIN
SACRAMENTO VALLEY (5-21)

LEGEND

-  SQUARE ICONS REPRESENT ONE OR MORE CDPH WELLS
-  CIRCLE ICONS REPRESENT OTHER WATER SUPPLIES
-  TRIANGLE ICONS REPRESENT ENVIRONMENTAL MONITORING WELLS
-  ICONS WITH A CIRCLE AROUND THEM SIGNIFY A CLUSTER OF WELLS
-  ICONS WITH A DOTTED LINE AROUND THEM SIGNIFY AN APPROX LOCATION

THE [GEOTRACKER GAMA TUTORIAL](#) HAS COLOR CODE INFORMATION AS WELL AS ADDITIONAL INFORMATION ABOUT THE MAP



SHOW ADVANCED QUERY OPTIONS

MAP SIZE: 640x480

18 MATCHING WELLS (0% ABOVE DRINKING WATER STANDARD)

DATASETS - [ADDITIONAL INFORMATION](#)

-  Water Supply Wells (CDPH)
-  Water Supply Wells (Other)
-  Environmental Monitoring (Wells)

Thanks

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