

Data Collection and Management for Local and State Small Water Systems January 2014

Scope of this Report

A Working Group was tasked by the Governor's Drinking Water Stakeholder Group (Stakeholder Group) to identify what data the state has regarding nitrate contamination of small water systems (2-14 connections), particularly in the Tulare Basin and Salinas Valley, and to recommend actions that would improve nitrate data collection and management practices. The Stakeholder Group previously recommended that the state "continue to establish, maintain, integrate, and improve data collection tools to help inform planning, prioritization and implementation of interim and long-term solutions" to nitrate contamination.¹ This report expands that recommendation and is organized under the following headings:

- Summary of Findings
- Issues Statement
- Background
- Existing Data Collection and Management Mechanisms
- Data Gaps
- Conclusions
- Recommendations
- Implementation Challenges
- Non-consensus issues

In addition, the report includes the following attachments, which provide more detailed references used to develop our conclusions and recommendations:

- Attachment A – Water System Definitions,
- Attachment B – Small Systems (2-14 Connections) Nitrate Testing in the Salinas Valley and Tulare Lake Basin.

Summary of Findings

The Stakeholder Group has concluded that there is no uniform, statewide system for testing small water systems for nitrate contamination. The State Water Resources Control Board (State Water Board) has sampled [private domestic wells](#) through its Groundwater Ambient Monitoring and Assessment (GAMA) Program and some regional water boards require testing of domestic wells located on farms. However, there is no state program for testing state and local small water systems (2-14 connections) and the state thus has limited data on these systems.

¹ Governor's Drinking Water Stakeholder Group Final Report to the Governor's Office, August, 20, 2012.

To the degree data is collected on small water systems, it is being done almost entirely at the county level. The five counties in the Tulare Basin and Salinas Valley have adopted very different nitrate testing requirements; the Stakeholder Group assumes this same pattern exists statewide. For [state small water systems](#) (5-14 connections), nitrate testing may occur only upon the initial permitting of a water system well (Kern), annually (Fresno, Tulare), or on a different schedule based on nitrate concentration levels (Monterey, Kings). For [local small water systems](#) (2-4 connections), several counties do not require testing (Tulare, Fresno, Kings), although some require testing upon the initial permitting of the well (Kern, Monterey) or at a frequency based on concentration levels in initial and follow-up testing (Monterey). These data are not linked to well completion reports (WCRs), which are reports that contain details of well construction such as location and screening depth. County data are sometimes forwarded to the state but are often not maintained in a format that can be used in various state databases.

The nitrate data collection and management practices of the state and the counties in the Tulare Basin and Salinas Valley are summarized in matrix form in Attachment B.

Issue Statement

As the Stakeholder Group reported to the Governor in August 2012, “the scope and magnitude of the drinking water problems for disadvantaged communities and small water systems in unincorporated areas is not fully understood, due to limits in or a lack of current and ongoing assessment of conditions. Additional efforts are necessary to collect and manage information to inform planning and implementation of solutions.”² Water users, especially those near or within rural agricultural areas are at risk of drinking water containing nitrate at concentrations in excess of health standards and may not know it.

Regular and systematic collection and reporting of nitrate data from state small and local small water systems will help identify the locations and needs of populations at risk of being served water that exceeds drinking water standards. According to the California Department of Public Health (CDPH), an estimated 95% of Californians are served by [public water systems](#)³ subject to rigorous drinking water quality testing and reporting requirements. However, drinking water quality oversight for water systems below the public water system threshold of 15 service connections is either less stringent or nonexistent. Moreover, what limited data are collected at the county level for domestic wells and these small water systems is often maintained in disparate non-electronic formats – this includes both water quality and well location data.

² Ibid.

³ See the State Water Resources Control Board’s *AB2222 Report*, available at http://www.waterboards.ca.gov/water_issues/programs/gama/ab2222/docs/ab2222.pdf

Background

The following discussion provides background information regarding current state and county level drinking water program regulatory oversight for water systems below the “public water system” service connection threshold with respect to data collection and management.

Water System Terminology

Attachment A to this report provides excerpted water system definitions from applicable drinking water statutes and regulations. Water system terminology is very important given applicable state drinking water statutes and regulations can be confusing with respect to the use of similar terminology with different legal definitions depending the source and context of the applicable statute or regulation. For consistency within this report, the Stakeholder Group will be using the definitions of state small water systems for 5-14 connection systems, local small water systems for 2-4 connection systems, and private domestic wells for single connection systems. As the matrix in Attachment B reveals, state agencies and county agencies have adopted different definitions for under-15 connection systems, which may generate confusion; *we recommend that the “state small” and “local small” definitions be standardized, as indicated above.* In addition, although applicable statutes and regulations define “small water systems” as varying subsets of public/community water systems⁴, the use of the term “small water systems” within this report refers to water systems/wells below the public water system threshold of 15 service connections.

State Small Water Systems

Title 22 of the California Code of Regulations and the Health and Safety Code currently only addresses state small water systems via minimal sampling and consumer reporting requirements. The Health and Safety Code (§116275(n)) defines a “state small water system” as “a system for the provision of piped water to the public for human consumption that serves at least five, but not more than 14, service connections and does not regularly serve drinking water to more than an average of 25 individuals daily for more than 60 days out of the year.” Regulations currently require state small water systems to conduct quarterly bacteriological sampling within the distribution system and one time sampling at the point of initial water system/well permitting, prior to any treatment, for various minerals (fluoride, iron, manganese, chlorides and total dissolved solids) and inorganic chemicals, including nitrate, with Maximum Contaminant Levels (MCLs) listed within Table 64431-A, section 64431(a) of Title 22 of the California Code of

⁴ There are numerous types of water systems that are referred to using a variation of the term “small water system,” which may confuse the lay reader. For example, depending on context or the legal text at issue:

- “**State** small water system” refers to a system with 5-14 connections;
- “Small **community** water system” refers to a community water system with 15-3,300 connections; and
- “Small **public** water system” refers to a system with 5 to 200 connections.

Attachment A provides an overview of and citations for the different water system definitions used in the state.

Regulations (CCR). (See 22 CFR §64211 through §64213.) No additional or follow-up sampling is specifically required unless ordered by the local health officer. Current regulations delegate decisions about additional testing to the local health officer, although statute allows CDPH to promulgate more stringent regulations. (Health and Safety Code §116340) For systems/wells with initial sampling results above the MCL, the local oversight agency requires either an alternative source of supply or treatment with verification of MCL compliance, but typically does not require follow-up sampling to verify the system continues to comply with drinking water standards. Our survey of county practices, summarized in Attachment B, found that Kern county requires nitrate testing upon the initial permitting of a well (the regulatory minimum), Fresno and Tulare require annual testing, and that Monterey and Kings require a nitrate testing schedule based on nitrate concentration levels found during previous tests.

Local Small Water Systems

Neither Title 22 nor the Health and Safety Code currently define or address water systems below the state small water system threshold of five service connections. Consequently, there are no statewide requirements for systems with less than five service connections unless otherwise required by an individual county; county level drinking water programs typically do not regulate these systems/wells beyond the initial point of permit application and the level of initial sampling requirements vary from county to county. The California Department of Public Health (CDPH) and various county public/environmental health agencies (i.e., county level drinking water programs) throughout the state generally define private domestic wells as wells serving up to four (4) service connections (i.e., individual residences). However, some local health agencies define a private domestic well as serving an individual residence (single connection) and “local small (or shared) water systems” as having 2 to 4 service connections. This report adopts the definition of local small water systems as one with 2-4 connections.

Our survey of county practices, summarized in Attachment B, found that Tulare, Fresno, and Kings counties do not require testing of local smalls (although Tulare and Fresno offer voluntary, one-time testing), that Kern requires one-time testing upon well permitting, and that Monterey requires repeat testing once every three years at a minimum with increased sampling frequencies based on nitrate concentration levels.

Private Domestic Wells

Adopting the State Water Board’s approach, the Work Group defines private domestic wells as those serving a single connection. Although private domestic wells were not within the scope of the project study, the Work Group found that several county (Fresno, Tulare) and state programs (State Water Board, Central Coast Regional Board, Central Valley Regional Board) offer voluntary nitrate testing of private domestic wells. Some counties (Monterey, Kern, Tulare) require one-time nitrate testing of newly installed private domestic wells, and some regional boards (Central Coast Regional Board, Central Valley Regional Board) require ongoing testing of private domestic located on some farms or dairies.

Local Agency Oversight Programs

Health and Safety Code section 116340 dictates that state small water system requirements be enforced by the local health officer or a local health agency designated by the local health officer. As such, local county public health or environmental health departments are typically the oversight agency for state small water systems, local small water systems, and private domestic wells (for drinking water quality and sometimes well permitting). An evaluation of county level drinking water programs within the Central Coast and Central Valley regions indicates that local health officers/programs are implementing varying requirements for water systems below the public water system threshold, as detailed above. These requirements range from the minimum state regulations to more protective requirements that include tiered sampling frequencies based on drinking water pollutant concentration ranges and sampling of water systems/wells below the state small water system threshold of five service connections (required sampling frequencies and analyses vary).

There are currently no requirements governing the management of data generated by state small water systems or smaller entities or for reporting data beyond the county level. Each county manages its data differently, often only in a hard copy format or in a non-searchable electronic format.

Existing Data Collection and Management Mechanisms

Existing Data Collection Programs for 2-14 connections

The Working Group surveyed agencies responsible for collecting and/or storing groundwater quality data for systems with fewer than 15 connections. The results are organized in the accompanying matrix in Attachment B.

Public Water System Data Management

Drinking water quality data associated with public water systems is currently reported to and managed through CDPH's Water Quality Management database. These data are submitted to CDPH by private and commercial laboratories that are approved by CDPH's Environmental Laboratory Accreditation Program. These laboratories are required to electronically transmit the public water system water quality data, often through a Laboratory Management Information System (LIMS) utilized by larger commercial laboratories or through a program provided by CDPH for use by the smaller and county agency laboratories. The CDPH water quality data are also regularly integrated to the State Water Board's GeoTracker GAMA information system.

GeoTracker GAMA additionally integrates available groundwater water quality data from Water Board regulatory programs (e.g., UST program, etc.) and projects (i.e., GAMA Priority Basin Project, GAMA Domestic Well Project, and GAMA Special Studies). Regulatory data are predominantly uploaded by responsible party representatives (environmental consultants and laboratories) using the GeoTracker ESI tool. Other datasets are also shared with the State Water Board and are integrated into GeoTracker GAMA using other methods.

Analytical data associated with existing regulatory programs that are currently not uploaded to the GeoTracker GAMA information system, data collected voluntarily, or data collected as part of a county monitoring plan from domestic wells and unregulated water systems could potentially be integrated into either the CDPH Water Quality Management database or GeoTracker GAMA if provided in the appropriate format.

Local Public/Environmental Health Agency Data Management

Many county public/environmental health agencies manage water quality data at the local level collected from state small and local small water systems by utilizing third-party software (e.g. Decade Software-Envision Connect), a Microsoft-Access based database, or a Microsoft-Excel spreadsheet, which may have the ability to query the information, if requested. Even though a majority of the counties statewide uses third-party software for small water system drinking water quality data management, this not the case for all counties. Some counties may not track this information electronically and the water quality analyses may be retained in the individual water system files as hard copies. Currently, if water quality data are available electronically at the local level, they are not integrated into either the CDPH Water Quality Management or GeoTracker GAMA databases.

Data Gaps

Local Small Water Systems

Currently, Title 22 requirements for county level monitoring and reporting only address state small water systems, to the exclusion of systems with fewer than five connections. In its AB 2222 Report to the Legislature, the State Water Board concluded that “[w]ater quality data from [local and state small systems] do not exist or are not easily available in a centralized database.”⁵ Our survey of county practices confirmed this finding; many counties imposed no testing requirements on local smalls, and any data that is collected at the local level is not being reported to the state. This is significant because, in certain counties, there are a large number of local smalls. Using Monterey County as an example, which requires ongoing monitoring of systems with as few as two (2) connections, it is clear that these systems are at no lower risk than state small water systems. Monterey County has a much greater number of local small water systems than state small (694 to 276), and water quality monitoring of these systems indicates that local small water systems are exposed to greater levels of nitrate contamination.⁶

⁵ AB 2222 Report, p. 22, available at, <http://www.waterboards.ca.gov/gama/ab2222/docs/ab2222.pdf>

⁶ Based on Environmental Justice Coalition for Water analysis of 2010 Monterey County state and local small monitoring data.

Identification of Disadvantaged Communities (DAC) and/or Individuals

The Stakeholder Group has already identified the lack of information about DACs and their water quality as a major data gap and recommended the allocation of resources to address that gap. An issue identified by the Working Group is the difficulty of using census block or tract⁷ data to map out DACs and SDACs⁸. The scale of these data, particularly in rural areas, may not be of a sufficiently fine scale to identify very small DACs or individuals served by small water systems, or even public water systems. For example, California Rural Legal Assistance recently completed a Median Household Income (MHI) survey for Alpine Court Labor Camp, a 19-household farmworker community in the Salinas Valley. The census tract which includes Alpine Court stretches 16 miles north to south and covers half the town of Gonzales. While census income data did indicate the community was a DAC at \$42,300, the MHI survey revealed that Alpine Court has a much smaller MHI at \$24,000, well below the SDAC MHI threshold. It takes only a few affluent households within a block or tract, depending on the number of households with them (the population within census blocks can vary greatly), to drive the MHI above the DAC MHI thresholds. Subsequently, an even more localized evaluation scale supported by grass-roots efforts is likely needed to adequately identify DACs and DAC drinking water needs within rural areas. In addition, new DAC vocabulary and criteria needs to be developed that addresses small groups or individuals living below the MHI that are not part of a specific community or are not sufficiently represented by census block data.

Access to Well Completion Reports

Well completion reports (WCRs), which provide information including well location, depth, and screening level are maintained by the Department of Water Resources (DWR). California Water Code Section 13752 provides that the reports “shall not be made available for inspection by the public, but shall be made available to governmental agencies for use in making studies, or to any person who obtains a written authorization from the owner of the well.” DWR has scanned several hundred thousand hard copy well reports into TIFF or pdf format so that they may be stored electronically. However, the files are not searchable and are not linked to individual water system well locations or other information such as water quality data, making it difficult for authorized agencies and representatives to find needed information.

⁷ A census block is the smallest geographic unit used by the United States Census Bureau for tabulation of 100-percent data (data collected from all houses, rather than a sample of houses). Several blocks make up block groups, which themselves are aggregated to make up census tracts.

⁸ California Water Code Section 79505.5 defines a disadvantaged community as one with a median household income that is less than 80% of the state median household income. California Health and Safety Code Section 116760.2(n) defines a severely disadvantaged community as one with a median household incomes that is less than 60% of the state median household income.

Conclusions

Monitoring and Reporting

- Testing of local small water systems is inconsistent; little regular testing of these wells for nitrate contamination occurs;
- State small system nitrate sampling varies greatly by county; some require testing only upon submission of a permit application (the minimum requirement), some require annual testing, and some require testing based upon initial nitrate concentration levels;
- Sampling is done by county officials or by well operators self-reporting, which may create inconsistent sampling methods;
- Counties do not report the nitrate testing data to the state.

Data Management

- At the county level there is often a lack of fully electronic and searchable records;
- There is no comprehensive statewide database of voluntary or county-collected nitrate sampling data;
- Water quality data are not linked to Well Completion Reports (WCRs);
- Agency and/or public access to critical information in WCRs is severely limited or nonexistent;
- Available data are not in consistent formats or compatible with GIS applications;
- Most local data are often only accessible through PRA request;
- The State does not have a comprehensive accounting of state small and local small water systems and associated wells.

Recommendations

	Implementation steps	Resource needs
<p>Monitoring and Reporting</p> <p>Increased County-level monitoring and reporting for state small and local small water systems:</p> <ol style="list-style-type: none"> 1. CDPH should consider expanding current regulations to require nitrate sampling of local small and state small water systems/wells. Sampling could be conducted at different frequencies based upon historic water quality information. CDPH regulations already direct the local health officer to require testing of state small system for constituents of concern as determined by local health officer (in consultation with CDPH and State Water Board). 	<p>CDPH should inventory counties to determine their current testing requirements and use this to inform a regulatory update or other appropriate actions.</p>	<p>Additional funding will be needed to support additional sampling, analysis and reporting.</p> <p>Insufficient data are available to determine what additional local or state resources might be needed.</p> <p>Recommend that resource needs - for the counties and the systems they regulate - be included as part of the CDPH inventory</p> <p>CDPH will need funding to conduct this comprehensive inventory and to develop regulations, if needed. This could be incorporated into their Drinking Water Plan, which is in development now and is supposed to be updated every five years.</p>

Recommendations

	Implementation steps	Resource needs
<p>Monitoring and Reporting</p> <p>Consumer Reporting for state small water systems:</p> <p>2. Currently required customer notifications, which are delivered annually or continuously posted at a central location, should additionally include (a) contact information for local public/environmental health agency program who oversees state small water systems and (b) provide translation where needed.</p> <p>3. Similar reporting should be required for local small water systems.</p>	<p>Update regulations; provide translation of basic notice in most common languages.</p> <p>Update regulations to include local small water systems.</p>	<p>CDPH resources for regulatory update translation services.</p> <p>Local resources would be needed as new systems would need to be advised of notification requirements.</p>

Recommendations

	Implementation steps	Resource needs
<p data-bbox="422 272 915 347">One Stop Shop or Common Portal for Water Quality Data:</p> <p data-bbox="186 423 401 509">Data Management</p> <p data-bbox="422 402 932 769">4. All county-level water quality data associated with water systems/wells would need to be reported (in a format compatible) to the California Department of Public Health (CDPH) Water Quality Management database. (Most certified labs should already have the capability to do this.)</p>	<p data-bbox="957 402 1360 932">CDPH would provide notices to certified labs with a requirement to provide data in an appropriate format. CDPH should include this requirement as part of the lab certification process. CDPH should consider including these changes within Environmental Laboratory Accreditation Program (ELAP) regulatory revisions that are currently under development.</p> <p data-bbox="957 987 1335 1143">Counties and systems doing sampling would need to provide the same direction to their labs.</p>	<p data-bbox="1394 402 1822 477">Resources may be needed for any regulatory update required.</p> <p data-bbox="1394 526 1957 682">Laboratories may have a potential need for new or updated software that could result in costs being passed on to counties and systems using their services.</p>

Recommendations

		Implementation steps	Resources needs
Data Management	<p>Well Completion Reports (WCRs):</p> <p>5. Require that future WCRs be reported/uploaded electronically into a robust searchable online database system, maintained by DWR that can be linked with water quality data in GeoTracker, with access to that data consistent with existing statute.</p>	<p>DWR, in coordination with the State Water Board, should develop database software and secure website for drillers to generate electronic WCRs and make data available to appropriate county and state level agencies (investigate other states that already do this).</p>	<p>Costs for new or revised data systems.</p>

Implementation Challenges for Recommendations

Expansion of County Monitoring and Reporting Requirements

At the county level a local drinking water program agency is tasked with fulfilling the Health Officer's regulatory obligations for state small water systems. New or expanded regulations to require more water quality analyses at greater frequencies and expanding those requirements to local small water systems will present cost and resource challenges on two basic levels. First, state and local small water systems, with a small and often disadvantaged rate-payer base, may find it difficult to absorb the increased expense of additional testing. Certified analytical labs can submit sample results to the CDPH database in the standard format so that expense is not borne by the state small water system. If reporting to the customers or local Health Officer is required that cost will be borne by the system and can vary. Typically the state small water system conducts operations with volunteer labor.

A second level of cost and resource challenges is at the local public/environmental health agency which presently regulates state small water systems. New water quality monitoring, reporting and data management may require increased staff time and related expenses.

Data Management and Access Issues/Concerns

Concerns with identification and sampling of currently unregulated water systems/wells include well location confidentiality (i.e., public safety), decreased property values associated with poor water quality, and potential third party liability associated with the sources of pollution.

Identifying Disadvantaged Communities

This report is concerned with identifying the needs of disadvantaged communities.⁹ However, identifying disadvantaged or severely disadvantaged¹⁰ communities can be difficult. The difficulty of identifying communities using census data is compounded by the fact that the 2010 long-form census survey did not include income as a question. The annual (and smaller) American Communities Survey is used as a substitute, but has an even greater margin of error for small communities than prior census information. Currently NGOs and service providers conduct income surveys of communities that are trying to qualify for funding. Trying to distinguish disadvantaged communities from the rest of the population for the purposes of this report would not be a good use of resources. However, because these surveys must be done before an application for funding is submitted there is a need to ensure that funding is available to conduct what is often an expensive and time consuming process.

⁹ Ibid

¹⁰ Ibid

Non-Consensus Issues

Private Domestic Wells Serving DACs

Although private domestic wells were not included in the workgroup's charge, several members expressed concern that a significant number of DACs rely on private domestic wells as a drinking water source.¹¹ Groundwater quality data collected from private domestic wells serving a DAC will help identify potential drinking water threats to nearby DACs. To address disadvantaged community drinking water needs and ensure all communities have access to safe drinking water, there must be a better mechanism to identify the water quality of DACs that rely on private domestic wells.

There is no statewide regulatory requirement for testing groundwater quality from private domestic wells, whether serving a DAC or not. Of the five counties surveyed for this report, four require testing or provide voluntary water testing at the time that a well permit is obtained. Follow-up testing is not required in any of the counties surveyed. Data generated by any testing are maintained in a variety of formats, none of which are submitted to the state, and which are only made publicly available through a Public Records Act request. As the State Water Board reported in its AB 2222 Report, there is no "comprehensive database for these groundwater sources."¹²

Several efforts, most conducted by the State Water Board's GAMA program¹³, have tested the water quality of private domestic wells in these counties. The results indicate that nitrate contamination in private domestic wells is significant, ranging from 11% of wells tested (Monterey County, 2011) to 41% (Tulare County, 2006).

¹¹ The number of DACs relying on private domestic wells in the Tulare Lake Basin and Salinas Valley regions alone is likely in excess of 200 communities (with a total population of over 100,000), based on the preliminary inventory of communities under development for the Tulare Lake Basin Disadvantaged Community Water Study (TLB Study) and The UC Davis Nitrate Report, 2012. The TLB Study, which is still finalizing its database of unincorporated communities in the Tulare Lake Basin, is funded by the Department of Water Resources and administered by Tulare County. Thus far, the database includes nearly 200 unincorporated communities that rely at least in part on private domestic wells in the Tulare Lake Basin alone. A final report with final number estimates is due in late 2014. More information is available at <http://www.tularecounty.ca.gov/cao/index.cfm/tulare-lake-basin-disadvantaged-community-water-study/>. According to *Addressing Nitrate in California's Drinking Water* (UC Davis Nitrate Report, 2012), approximately 245,000 people rely on about 74,000 domestic wells within the Tulare Lake Basin and Salinas Valley. There are an estimated 20,000 private domestic wells in Tulare County alone.

¹² AB 2222 Report, p. 31 (<http://www.waterboards.ca.gov/gama/ab2222/docs/ab2222.pdf>).

¹³ The State Board's GAMA Program has sampled private domestic wells in five county focus areas since 2002, including Tulare and Monterey Counties. Through its continuing collaboration with the USGS, GAMA is also testing private domestic wells as part of its Priority Basin Project (called Shallow Aquifer Assessment). In addition, the Central Coast Water Board is implementing domestic well projects as part of its Central Coast Ambient Monitoring Program – Groundwater Assessment and Protection (CCAMP-GAP)

While not a consensus, some members of the group recommended:

1. Sampling and reporting requirements for local small water systems should be extended to private domestic wells serving known DACs.
2. State and county agencies should expand efforts to educate private domestic well owners about the need to regularly test their well water, and provide resources to disadvantaged communities to assist in testing efforts. Data collected by a voluntary well sampling program should be included in the GeoTracker GAMA groundwater information system. As part of these voluntary programs, private domestic well owners must be clearly informed that the water quality results will be made public and that precise well locations and ownership information will remain confidential.¹⁴

Well Completion Reports

The Stakeholder Group held divergent opinions on the need for public availability of information contained in WCRs. Current state law¹⁵ limits access to the information in these reports to governmental agencies for use in making studies. This makes California unique among the western states.

Some stakeholders believe that this information – particularly information about well location and screening depth – is critical for homeowners and/or communities investigating the potential for a new well. The alternative practice of drilling a test well is cost prohibitive for many disadvantaged communities and is often only accessible after a water system has received funding for planning and/or feasibility studies. Access to location and screening depth information in relation to local water quality would provide these communities a preliminary evaluation of local conditions and better inform the process for selecting a new water source. Moreover, disclosure of such information would help empower communities relying on private domestic wells to take the appropriate precautionary measures if and when they find themselves at risk of water contamination, whether it be seeking out water quality sampling or consolidating with neighbors and/or a local water provider to secure a new drinking water source.

Other stakeholders believe the current practice of making this information available to public water systems, state agencies, or consultants working for public agencies is sufficient to generate needed information. Others thought that the law could be amended to allow access to a broader list of experts, including academia, under certain conditions.

¹⁴ Currently GeoTracker GAMA keeps well owner and precise well location information confidential, except for environmental monitoring wells associated with groundwater cleanup sites.

¹⁵ California Water Code Section 13752.

Stakeholder Group Report
Data Collection and Management for Domestic Wells and State Small Water Systems

Attachment A – Water System Definitions

Private domestic wells and local small water systems

Neither the California Health and Safety Code or Title 22 of the California Health and Safety Code define private domestic wells or water systems with 2-4 service connections. The California Department of Public Health (CDPH) and various county environmental health agencies throughout the state acting as the drinking water program primacy agency for “state small water systems” or “small public water systems” generally define private domestic wells as wells serving up to four (4) service connections. However, some local health agencies define a domestic well as serving an individual residence (single connection) and “local small (or shared) waster systems” as having 2 to 4 service connections.

Water system type legal definitions

The following water system definitions are taken directly from the California Health and Safety Code and Title 22 of the California Code of Regulations as noted. The hyperlinks preceding the excerpted definitions are to CDPH’s compilation documents for drinking water related statutes and regulations:

<http://www.cdph.ca.gov/certlic/drinkingwater/Documents/Lawbook/DWstatutes-2012-01-01a.pdf>

HEALTH AND SAFETY CODE

DIVISION 104. ENVIRONMENTAL HEALTH

PART 12. DRINKING WATER

CHAPTER 4. CALIFORNIA SAFE DRINKING WATER ACT

Article 1. Pure and Safe Drinking Water

§116275. Definitions.¹⁶

(h) “**Public water system**” means a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year. A public water system includes the following:

- (1) Any collection, treatment, storage, and distribution facilities under control of the operator of the system that are used primarily in connection with the system.

¹⁶ Note: the Title 22 definitions of a “public water system” and “community water system” are consistent with the Federal Safe Drinking Water Act definition of a public water system;
<http://water.epa.gov/infrastructure/drinkingwater/pws/pwsdef2.cfm>

(2) Any collection or pretreatment storage facilities not under the control of the operator that are used primarily in connection with the system.

(3) Any water system that treats water on behalf of one or more public water systems for the purpose of rendering it safe for human consumption.

(i) “**Community water system**” means a public water system which serves at least 15 service connections used by yearlong residents or regularly serves at least 25 yearlong residents.

(n) “**State small water system**” means a system for the provision of piped water to the public for human consumption that serves at least five, but not more than 14, service connections and does not regularly serve drinking water to more than an average of 25 individuals daily for more than 60 days out of the year.

(j) “**Noncommunity water system**” means a public water system that is not a community water system.

(k) “**Nontransient noncommunity water system**” means a public water system that is not a community water system and that regularly serves at least 25 of the same persons over six months per year.

(o) “**Transient noncommunity water system**” means a noncommunity water system that does not regularly serve at least 25 of the same persons over six months per year.

(aa) “**Small community water system**” means a community water system that serves no more than 3,300 service connections or a yearlong population of no more than 10,000 persons.

§116395. County evaluation of small public water systems.

(b) For purposes of this section, “**small public water system**” means a system with 200 connections or less, and is one of the following:

(1) A community water system that serves at least 15 service connections used by yearlong residents or regularly serves at least 25 yearlong residents.

(2) A state small water system.

(3) A noncommunity water system such as a school, labor camp, institution, or place of employment, as designated by the department.

Article 3. Operations

§116350. Department responsibilities.

(c) The department may conduct studies and investigations as it deems necessary to assess the quality of private domestic water wells.

<http://www.cdph.ca.gov/certlic/drinkingwater/Documents/Lawbook/dwregulations-2012-06-21c.pdf>

**TITLE 22 CODE OF REGULATIONS
DIVISION 4. ENVIRONMENTAL HEALTH
Chapter 14. Water Permits**

Article 3. State Small Water Systems

§64214. Service Connection Limitation.

No state small water system shall add additional service connections to the system such that the total number of service connections served by the system exceeds 14 before the water system has applied for and received a permit to operate as a public water system from the Department.

Article 4. Local Primacy Delegation

§64251. Definitions.

(a) For the purpose of this Article the following definitions shall apply:

- (1) **“Small Water System”** means a community water system except those serving 200 or more service connections, or any noncommunity or nontransient noncommunity water system.

CHAPTER 15. DOMESTIC WATER QUALITY AND MONITORING REGULATIONS

Article1. Definitions

§64400.10. Community Water System.

“Community water system” means a public water system which serves at least 15 service connections used by yearlong residents or regularly serves at least 25 yearlong residents.

§64400.80. Nontransient-noncommunity Water System.

“Nontransient-noncommunity water system” means a public water system that is not a community water system and that regularly serves at least the same 25 persons over 6 months per year.

§64401.85. Transient-noncommunity Water System.

“Transient-noncommunity water system” means a public water system that is not a community water system or a nontransient-noncommunity water system.

CHAPTER 17.5. LEAD AND COPPER

Article 1. General Requirements and Definitions

§64671.70. Small Water System.

"Small water system", for the purpose of this chapter only, means a water system that serves 3,300 persons or fewer.

Attachment B

Small Systems (2-14 Connections) Nitrate Testing in the Salinas Valley and Tulare Lake Basin

Data Source	Number of Wells Tested (2000-present)	Testing Requirements & Frequency	Data linked to Well Completion Reports (WCRs)?	Data Format & Public Accessibility	How does the agency use the data?	Data shared with CDPH or the SWRCB?	Funding
<p>California Department of Public Health (CDPH) – Drinking Water Program – Water Quality Management Database</p> <p>(Data Source: locally-reported data)</p>	<p><u>Domestic wells (1-4), statewide:</u> 619 wells tested</p> <ul style="list-style-type: none"> • Fresno: 5 • Kern: 42 • Kings: 3 • Monterey: 15 • Tulare: 4 <p><u>State Smalls (5-14) statewide:</u> 894 wells tested</p> <ul style="list-style-type: none"> • Fresno: 19 • Kern: 20 • Kings: 6 • Monterey: 155 • Tulare: 2 <p><i>May be some overlap with county data. Data may include inactive wells.</i></p>	<ul style="list-style-type: none"> • Counties voluntarily report this data to CDPH. • Local regulations determine the testing frequency and whether testing is voluntary or mandatory. 	No.	<ul style="list-style-type: none"> • Data is stored in the Water Quality Management Database (PC Focus), which is not publicly available. • Data is provided online in zipped .dbf files. Searchable via Access (or compatible program). • Well location information (GPS coordinates) is in the database, but is not publicly available. 	CDPH archives the data for informational purposes.	<ul style="list-style-type: none"> • SWRCB: This data is integrated into GeoTracker GAMA information system. CDPH forwards location coordinates with an approved non-disclosure agreement. 	No funding associated with this; data is uploaded as part of current operations.

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<p>State Water Resources Control Board (SWRCB) - Groundwater Ambient Monitoring and Assessment (GAMA) Program, Domestic Well Project. (Data Source: SWRCB staff, as close to the wellhead as possible)</p>	<p>Statewide: 1,146 private domestic wells (1) tested</p> <ul style="list-style-type: none"> • Monterey: 79 • Tulare: 181 	<p>2002-present: Voluntary, one-time well sampling on a county focus area basis.</p>	<p>SWRCB requests well details, information, and WCRs from the owner. Well information (which occasionally includes WCRs) was provided for 18 of the 79 wells in Monterey and 141 of the 181 wells in Tulare. Well test information is not directly linked to WCRs.</p>	<ul style="list-style-type: none"> • Data is stored in the GeoTracker GAMA information system. GeoTracker has an agency portal and a public portal. • GeoTracker data can be displayed in tables or on maps, and is exportable into excel. • Data summary reports are available to the public on the GAMA website. • Well ownership information and exact well location is not publicly available. 	<ul style="list-style-type: none"> • Test results are provided to well owners. • Data is used for research and for the preparation of reports to assess the groundwater zones used for private domestic water supply. • Data is used by the public and interest groups to learn more about groundwater resources. 	<ul style="list-style-type: none"> • <u>SWRCB:</u> This data is integrated into GeoTracker GAMA information system. 	<p>Funding comes from the Waste Discharge Permit Fund (WDPF).</p>
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<p>State Water Resources Control Board - GAMA Program, Priority Basins Project</p> <p>(Data Source: USGS, as close to the wellhead as possible)</p>	<p><u>Statewide:</u> 417 private domestic wells (1) tested.</p> <ul style="list-style-type: none"> • Monterey: 183 • Tulare: 2 • Kern: 20 • Fresno*: 77 (*expected in 2014) 	<p><u>2004-present:</u> Voluntary, one-time well sampling with trend sampling for a subset of wells. Sampling occurs on a Study Unit (typically a group of groundwater basins) basis. Currently, trend sampling has occurred on 20 private domestic wells in the Monterey Bay/Salinas Valley area.</p>	<p>USGS collects available WCRs from the DWR database. Well test information is not directly linked to WCRs.</p>	<p>Same as above (GeoTracker). Priority Basins Project also includes Assessment Reports and associated fact sheets.</p>	<ul style="list-style-type: none"> • The USGS publishes data summary reports, assessment reports, and factsheets. • This information is used by the SWRCB GAMA program for information and research purposes. • Data is used by the public and interest groups to learn more about groundwater resources. 	<p>Same as above (GeoTracker GAMA).</p>	<p>In 2003, Proposition 50 funding allowed for \$45 million in contracts over a 10 year period for statewide, comprehensive GAMA Priority Basins sampling. This funding source will soon expire so a stable funding source is needed to continue sampling after 2014.</p>
<p>Central Coast Regional Water Quality Control Board – Central Coast Ambient Monitoring Program – Groundwater Assessment and Protection (CCAMP-GAP)</p> <p>(Data Source:</p>	<p><u>Pajaro and Salinas Valleys:</u> 70 domestic wells (1) tested (data pending USGS).</p> <ul style="list-style-type: none"> • Monterey: 52 	<p><u>Winter/Spring 2013:</u> Voluntary, one-time well sampling.</p>	<p><u>Expected:</u> CC RWQCB intends to link available WCRs to testing data.</p>	<p><u>Expected:</u> USGS will</p> <ul style="list-style-type: none"> • Upload the data to the GeoTracker GAMA information system. GeoTracker has an agency portal and a public portal. • GeoTracker data is can be displayed in tables or on maps, 	<ul style="list-style-type: none"> • Test results are provided to well owners by direct mail. • The data assists the CC RWQCB in making informed decisions on source control and outreach. 	<ul style="list-style-type: none"> • <u>SWRCB:</u> This data is integrated into GeoTracker GAMA information system. 	<p>CCAMP-GAP funding of \$50K along with 40% Federal Matching Funds of \$20K. (Note: CC RWQCB is pursuing \$450k in Cleanup and</p>

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<p>USGS, likely from a hose bib or sink tap)</p>				<p>and is exportable into excel.</p> <ul style="list-style-type: none"> •The data will also be available in excel worksheets with location information • Well ownership information and exact well location is not publicly available. 			<p>Abatement (CAA) funding for a region-wide sampling program of 2,000 domestic wells.)</p>
<p>Central Coast Regional Water Quality Control Board - Agriculture Order Compliance Monitoring</p> <p>(Data Source: Well-owner self-reports, test could be at the well or downstream)</p>	<p><u>CC region-wide:</u> 292 domestic wells (1) tested</p> <ul style="list-style-type: none"> • Monterey: 31 <p>Note: Because this data is self-reported, it could include tests from local smalls (2-4) that are incorrectly designated as domestic wells.</p>	<p><u>Since 2012:</u> Mandatory, semi-annual well sampling (for growers opting for individual monitoring). The Ag Order may be expanded to require sampling of all on-farm wells, including those in cooperative monitoring programs.</p>	<p>WCRs may be available on file, but are not linked to tested wells.</p>	<ul style="list-style-type: none"> • Data is stored in the GeoTracker GAMA information system. GeoTracker has an agency portal and a public portal. • GeoTracker data can be displayed in tables or on maps, and is exportable into excel. • Data summary reports are available to the public on the GAMA website. • Well ownership information and exact well location is not publicly available. 	<ul style="list-style-type: none"> • For wells that exceed MCL standards, CC RWQCB sends out notices to the farmers and recommends corrective measures to protect public health. • Data used to prioritize implementation of the Ag. Order and to provide information to well-owners. 	<p>Same as above (GeoTracker).</p>	<p>Since this is compliance monitoring the farmers cover the cost of testing. CC RWQCB provided \$10k to assist limited resource farmers in conducting testing; this fund is exhausted.</p>

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<p>Central Valley Regional Water Quality Control Board – Dairy General Order (Data Source: well-owner self-reports, tested at the wellhead or the tap nearest the well head)</p>	<p><u>CV region-wide:</u> 1,411 domestic wells (1-4)* tested</p> <ul style="list-style-type: none"> • Fresno: 185 • Tulare: 726 • Kings: 409 • Kern: 91 <p>*Note: Dairies self-report this data as being for domestic wells, but some of this information may relate to agriculture wells or wells supplying milk barns. A few wells may even be state smalls. Wells are tested at the well head, unless there is a pressure tank, in which case the nearest tap is tested.</p>	<p><u>2007-present:</u> Mandatory, annual well sampling.</p>	<p>WCRs are not asked for and are not linked to tested wells.</p>	<ul style="list-style-type: none"> • Data submitted in paper form by dairies, scanned into PDF. • The data is translated into excel spreadsheets. Since 2012 the data includes lat. & long. coordinates for the dairy (not the well). • The public can review the file at CCRVWQ offices. Test results data (electronic or hard copy) is also publicly available through a PRA request. 	<ul style="list-style-type: none"> • This data enables CV RWQC to survey groundwater quality and changes over time as management practices improve. • When inspectors go out they may review the file. • Data was also used for the UC Davis Nitrate Report. 	<p>Test data is not shared with other state agencies.</p>	<p>Dairy owner/operator pays for testing.</p>
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<p>Central Valley Regional Water Quality Control Board – Seville Area Special Study</p> <p>(Data Source: Regional Board staff, tested at the wellhead or the tap nearest the well head)</p>	<p><u>Tulare:</u> 7 domestic wells (1) tested</p>	<p><u>June 2011:</u> Voluntary, one-time well sampling.</p>	<p>WCRs are on file for these wells, but are not linked to test data.</p>	<ul style="list-style-type: none"> • Data is kept in non-searchable PDF format (scanned forms). • The public can review the file at CCRVWQ offices. Test results data (electronic or hard copy) is also publicly available through a PRA request. 	<ul style="list-style-type: none"> • Test results provided to well owners and to Tulare County. • This project was to assist disadvantaged communities in Seville in addressing Nitrate contamination problems. 	<p>Same as above (not shared).</p>	<p>Done within normal funding operations.</p>
<p>Dept. of Pesticide Regulation – Groundwater Protection Program.</p> <p>(Data Source: DPR collects from a port as close to the well head as possible)</p>	<p><u>Tulare & Fresno:</u> 75 (now 68) domestic wells (1) tested as part of an ongoing well network study.</p> <ul style="list-style-type: none"> • Fresno: 47 • Tulare: 21 	<ul style="list-style-type: none"> • <u>2001-2002:</u> Voluntary, semi-annual well sampling in spring and fall. • <u>2003+:</u> Voluntary, annual well sampling in spring. 	<p>DPR has WCRs for 32 wells, but they are not linked to the test results.</p>	<ul style="list-style-type: none"> • Data is kept on Excel worksheets with associated well numbers. • Test results data (hard copy or electronic) is publicly available through a PRA request. • Exact well location and well owner information is kept confidential. 	<ul style="list-style-type: none"> • Well owners receive letters that detail the pesticide and nitrate sampling results. • DPR maintains pesticide sampling data in a database for program and public use. Nitrate data is only collected as part of the well network study in Fresno and Tulare, representing a very small portion of all sampling conducted by DPR, as a favor to participating well-owners. 	<p>Test data is not submitted to other state agencies.</p>	<p>The DPR Fund provides ongoing support for the Ground Water Protection Program. Sampling for nitrate as part of the well network study costs about \$1,500 per year.</p>

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<p>Fresno County Dep. Of Pub. Health – Water Program, Consumer Protection.</p> <p>(Data Source: <u>Domestic wells</u>: tested by county at the well head, where possible. <u>State smalls</u>: well-owner self-reports.)</p>	<p><u>Fresno</u></p> <ul style="list-style-type: none"> • Domestic wells (1-4): 5,137 wells permitted, approximately 40% of which were tested.* • State small (5-14): 17 systems tested <p>* Note: This is a rough estimate. The database does not separate out the number of private domestic wells or well tests.</p>	<ul style="list-style-type: none"> • <u>Domestic wells</u>: Voluntary, one-time well sampling of new domestic wells (1-4); best estimate is about half accept.* • <u>State smalls</u>: Mandatory, annual testing; best estimate is about half of the state small systems half have been tested at least twice.* <p>* Note: This is a rough estimate. The database does not track this information.</p>	<ul style="list-style-type: none"> • <u>Domestic wells</u>: WCRs are digitized (non-searchable PDF) but are not linked to well tests; best estimate is that about 80% have WCRs on file.* • <u>State smalls</u>: 10 of 17 have WCRs on file; other 7 have inspection reports with limited construction data. Data is not linked to test results. <p>*Note: This information is not tracked.</p>	<ul style="list-style-type: none"> • Data is stored in the Envision Database (not publicly accessible). • Some of the data is database searchable; some data is stored in the form of non-searchable, scanned PDFs. • Test results data (hard copy or electronic) is publicly available through a PRA request. • Well ownership information might be kept confidential. 	<ul style="list-style-type: none"> • <u>Domestic wells</u>: well-owners are notified of their test results. • <u>State smalls</u>: If nitrate levels are exceeded, notice must be given to consumers. Data is collected pursuant to state law. 	<p>Test data is not regularly submitted to state agencies.</p>	<ul style="list-style-type: none"> • <u>Single-family domestic wells</u>: Testing for new water wells is covered by well permit fees (\$605 one-time). • <u>State smalls</u>: Water systems are required to perform the tests at their cost. <p>Note: Lab costs for a nitrate test is \$8 + staff processing cost (~\$98 /hr).</p>
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<p>Tulare County Environmental Health Dept. -- Private Water Sampling Program</p> <p>(Data Source: <u>Domestic wells</u>: tested by county at the well head, where possible. <u>State smalls</u>: well-owner self-reports.)</p>	<p><u>Tulare:</u></p> <ul style="list-style-type: none"> • Private Domestic wells (1): 528 wells • Public domestic wells (2-4) : 47 wells • State smalls (5-14) : 39 wells 	<ul style="list-style-type: none"> • <u>Private & Public Domestic wells (1-4):</u> Voluntary, one-time well sampling (since 2008). From 2005-2008, testing was mandatory. • <u>State smalls:</u> Mandatory, annual well sampling; 22 wells have been tested more than once. 	<ul style="list-style-type: none"> • WCRs on file for domestic wells; unknown for state smalls (rough estimate is 50%). • Data is not linked to the tests, but could be through the APN #. 	<ul style="list-style-type: none"> • Data is stored in the Envision Database (not publicly accessible). • Data can be exported to excel. • Test results data (hard copy or electronic) is publicly available through a PRA request. 	<ul style="list-style-type: none"> • Letter mailed to well-owner indicating if they meet standards or not. • If exceeds an MCL, CDPH health statements are provided. 	<p>Test data is not submitted to state agencies.</p>	<p>Paid for by owner. Lab fees are around \$120 for valley wells (includes water collection fee and tests for nitrate and other contaminants).</p>
<p>Monterey Environmental Health Bureau</p> <p>(Data Source: <u>Single-connection</u> well-owners self-report; <u>2-14 connection wells</u> county officials test, usually a tap at the home.)</p>	<p><u>Monterey:</u></p> <ul style="list-style-type: none"> • Domestic Wells (1 connection): ~35 wells drilled in 2012, test results pending. • Local smalls (2-4): 694 systems* tested • State Smalls (5-14): 276 systems* tested <p>*The database is</p>	<ul style="list-style-type: none"> • <u>Domestic wells:</u> ▶ Pre-2012: Sporadic testing for water quality sometimes included nitrate ▶ 2012+: Mandatory, one-time well sampling for new wells or wells for buildings converted to residential use. No new test for well repairs. 	<p><u>All wells:</u></p> <p>Newer wells generally have WCRs. WCR records are more spotty for older wells (sometime other data is available). WCR is in paper files or non-searchable PDFs, and is not linked to testing data.</p>	<ul style="list-style-type: none"> • Data is stored in the EnvisionConnect Database (not publicly available). • Data is available in Excel. • Location information is available for most water systems (not wells). Some location information is available for wells. • Summary test result data for every 	<p>The data is used to order corrective action, where appropriate.</p>	<p>Test data is not submitted to state agencies. (Note: CDPH system is not equipped to receive EnvisionConnect data.)</p>	<p>Single domestic well connections pay for these tests themselves.</p> <p>Water Well Permit Fees and Annual Water System Permit Fees pay for 2-14 connection systems testing. \$185 -</p>

	<p>not set up to indicate how many wells tested; tests are conducted on the distribution system, not well.</p>	<p>• <u>Local and State Smalls:</u> Mandatory, repeat testing. Internal policy, at the director's discretion, is to test based on nitrate concentration:</p> <ul style="list-style-type: none"> ▶ <5 ppm - every 3 years ▶ 5-22 ppm – every 2 years ▶ 23-45ppm – annually (but up to quarterly for state smalls between 35-45 ppm) ▶ 45+ ppm – annually or, if nitrate levels are consistently over 45ppm, every three years. ▶ Nitrate treatment: If system has nitrate treatment, collect with every coliform sample. 	<p><u>Local and state smalls:</u> For 2-14 connection systems, water system parcel locations and certain well information (including well depth, and well seal depth) has been inputted into a spreadsheet which includes nitrate test results.</p>	<p>well in the County is publicly available online at the County website (data is currently 4+ year old, though soon to be updated).</p> <ul style="list-style-type: none"> • Test results data (electronic or hard copy) is also publicly available through a PRA request. 			<p>\$736</p>
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<p>Kern County Public Health Services Department (Data Source: well-owner self-report, generally at the sample tap installed at the well)</p>	<p><u>Kern:</u></p> <ul style="list-style-type: none"> • Sole connection (1): 1,082 wells tested • Non-public (2-4): 226 wells tested • State Smalls (5-14): 17 wells tested 	<p><u>All wells:</u> Since 1970, mandatory one-time well sampling has been required as part of the Title 22 test at the initial permitting stage or (for old, untested wells) at point of parcel development. New testing is required only if a well is deepened.</p>	<p>Hard copy of the WCR is kept in the same physical file as the testing results. From 2006 on, the electronic database indicates that a WCR has been submitted (but is not linked to it).</p>	<ul style="list-style-type: none"> • Data is stored in the Envision and SearchExpress databases (not publicly available) • Scanned hard copies of recent water testing for wells are in the database. • From 2006+, wells that exceed nitrate MCL levels are manually uploaded into the software program file in a searchable format. • From 2006+, wells are tagged with location information. • Test results data (electronic or hard copy) is publicly available through a PRA request. 	<p><u>All wells:</u> are required to submit a Title 22 analysis to be certified for occupancy. Wells found exceeding MCLs get a nitrate advisory and have those constituents recorded on the property deed.</p> <p><u>State Smalls:</u> If exceed MCLs must notify all consumers annually. The County encourages treatment.</p> <p>All wells exceeding nitrate levels are tracked in a database.</p>	<p>Test data is not submitted to state agencies.</p>	<p>Owner pays for the sample.</p>
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<p>Kings County Health Department (Data Source: well-owner self-reports)</p>	<p><u>Kings:</u></p> <ul style="list-style-type: none"> • State smalls (5-14): 6 water systems tested <p>Note: Kings does not test domestic wells.</p>	<p><u>State smalls:</u></p> <ul style="list-style-type: none"> • Mandatory, one-time well sampling when the well is first goes into production. • Mandatory, repeat well sampling if the initial test reveals nitrate levels at: <ul style="list-style-type: none"> ▶ 23-45ppm – annually ▶ 45+ ppm – quarterly • If nitrate levels are below 23ppm, testing is voluntary; two systems are voluntarily testing annually. 	<p>WCRs are on file for 5 of 6 water systems.</p>	<ul style="list-style-type: none"> • Data is stored in the EnvisionConnect database (not publicly accessible) • Paper records of testing data is kept in paper files • Test results data (hard copy) is publicly available through a PRA request. 	<p>If the initial well test exceeds MCLs, additional testing would be required.</p>	<p>Test data is not submitted to state agencies.</p>	<p>Testing is done at operator expense.</p>
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Other agencies consulted: Cal. Department of Food and Agriculture (no nitrate data for under-15 connection systems), Cal. Department of Water Resources (same), and the U.S. Geological Survey (all nitrate data for under-15 connection systems provided to the Water Boards).