



# California Regional Water Quality Control Board



## Lahontan Region

Linda S. Adams  
Secretary for  
Environmental Protection

Victorville Office

Arnold Schwarzenegger  
Governor

14440 Civic Drive, Suite 200, Victorville, California 92392  
(760) 241-6583 • Fax (760) 241-7308  
<http://www.waterboards.ca.gov/lahontan>

February 6, 2008

TO INTERESTED PARTIES:

*File: Gen - Dry Wells*

### LAHONTAN REGIONAL BOARD MEETING, FEBRUARY 13 AND 14, 2008 IN VICTORVILLE, CALIFORNIA

Enclosed for your information is a copy of Agenda Item No. 12 for your review. This item is an information item only scheduled for the **February 13 and 14, 2008** meeting in Victorville, California.

If you need further information regarding this meeting, please contact our office.

Sincerely,

Rebecca Phillips  
Office Technician

Enclosures: Staff Report  
Agenda Announcement

cc: Attached Mailing List

DRY WELL MAILING LIST

REGIONAL BOARD MEMBERS  
REGION 6

DAVID COUPE  
SWRCB  
1001 I STREET  
SACRAMENTO CA 95814

JOHN LEVELLE, CITY ENGINEER  
CITY OF HESPERIA  
9700 SEVENTH AVENUE  
HESPERIA CA 92345

CALIFORNIA REGIONAL WATER  
QUALITY CONTROL BOARD  
SOUTH LAKE TAHOE  
OFFICE

BRIAN CENGLER  
DEPT OF ENGINEER  
CITY OF VICTORVILLE  
14343 CIVIC DR  
VICTORVILLE CA 92393

CALIFORNIA REGIONAL WATER  
QUALITY CONTROL BOARD  
VICTORVILLE OFFICE

BRAD MILLER, TOWN ENGINEER  
TOWN OF APPLE VALLEY  
14955 DALE EVANS PARKWAY  
APPLE VALLEY CA 92307

WILSON F. SO, P.E., CITY ENGINEER  
CITY OF ADELANTO  
11600 AIR EXPRESSWAY  
ADELANTO CA 92301

DAN ILKAY, STORMWATER DEPT  
SAN BERNARDINO COUNTY  
222 W. HOSPITALITY LANE  
SAN BERNARDINO CA 92415

MIKE MISCHEL  
CITY ENGINEERING OFFICE  
CITY OF PALMDALE  
38250 SIERRA HWY STE A  
PALMDALE CA 93550

STEVE DASSLER  
ASSISTANT PUBLIC WORKS  
DIRECTOR  
CITY OF LANCASTER  
44933 N FERN AVENUE  
LANCASTER CA 93534

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
LAHONTAN REGION  
MEETING OF FEBRUARY 13 AND 14, 2008  
VICTORVILLE, CALIFORNIA**

**ITEM:** 12

**SUBJECT:** USE OF INFILTRATION WELLS FOR STORMWATER MANAGEMENT AND APPROACH FOR REGULATION

**CHRONOLOGY:** This is a new item.

**ISSUE:** How should Lahontan Regional Water Quality Control Board ensure that the design, placement, and maintenance of dry wells in the southern Lahontan basin are adequately protective of groundwater quality?

**DISCUSSION:** This item provides information on the current use of dry wells in the urban areas of the southern portion of the Region. Dry wells are one type of infiltration system used in many communities to control both stormwater and nuisance water (non-stormwater runoff). Dry wells typically range in depth from about 25 feet deep to 80 feet deep, depending on location. Dry wells that are properly designed, located, and maintained pose minimal risk to groundwater quality. However, because stormwater and nuisance water often contain contaminants, disposal by dry well raises concerns for protection of groundwater. Additionally, spills or illicit discharges that reach storm drains could be discharged to a dry well.

This staff report presents a recommended approach to regulation of dry wells in the southern Lahontan basin. The approach focuses on the following key components for a regulatory program.

1. Track location and data for individual dry wells;
2. Include dry well protection and cleanup in spill response plans;
3. Provide a mechanism for evaluating site specific criteria prior to installation of dry wells; and
4. Ensure that dry wells are maintained frequently enough for pretreatment features to work effectively.

The cities in the high desert that use dry wells have a program to review design and construction, and require minimum design standards. The cities also maintain wells on public property. However, each city implements the program somewhat differently. Staff plans to work with the cities to develop a uniform program that is protective of water quality and implements the above recommendations. The specific minimum standards and regulatory mechanism that will be recommended by Board staff will be brought to the Board at a later date after further meetings with the cities.

**RECOMMENDATION:** This is an information item only. The Board may provide direction to staff.

**Enclosure:** Staff Report

12-0001

**STAFF REPORT**

**USE OF DRY WELLS FOR STORMWATER MANAGEMENT  
AND APPROACH FOR REGULATION**

**February 5, 2008**

**California Regional Water Quality Control Board, Lahontan Region  
14440 Civic Drive, Suite 200  
Victorville, CA 92392**

**Prepared by: Mary Dellavalle, Environmental Scientist  
Reviewed by: Cindi Mitton, Senior Engineer  
Harold J. Singer, Executive Officer**

12-0002

## STAFF REPORT

### USE OF DRY WELLS FOR STORMWATER MANAGEMENT PROPOSED APPROACH FOR REGULATION OF DRY WELLS IN THE SOUTHERN LAHONTAN BASIN

#### 1. Purpose

This report provides information on the current use of dry wells in the urban areas of the southern Lahontan basin. Dry wells are used in the high desert for control of storm water and nuisance water (non-storm water runoff, such as from landscape irrigation). There are currently no known groundwater problems associated with these dry well uses in the high desert; however, very little monitoring exists to detect problems. As urbanization continues, mechanisms are needed to ensure that contaminants associated with urban runoff are not transported by dry wells to the groundwater.

Dry wells are one of several infiltration devices that are used to percolate storm water and nuisance water into the ground. Dry wells that are properly designed, located, and maintained pose minimal risk to groundwater quality. In some cases infiltration of storm water and urban surface water runoff could potentially result in increased groundwater supplies and improved water quality. On the other hand, poor management of dry wells could result in pollution of groundwater. Given that most of the water supply in the southern portion of the region is provided by ground water, the potential threat of dry well use should be evaluated.

This report describes a strategy to ensure that the design, placement, and maintenance of dry wells in the southern Lahontan basin are adequately protective of groundwater quality. To allow advantageous uses of dry wells while minimizing potential degradation to groundwater quality, Water Board staff proposes the following approach to dry well regulation:

1. Track location and design information for individual dry wells;
2. Encourage programs to detect and prevent illicit discharges to dry wells, including public education programs and the inclusion of measures for dry well protection in spill response plans;
3. Ensure a permitting and inspection process is in place that, a) evaluates types of land uses and dry well construction as part of review and approval process, b) evaluates depth of dry well, in relation to water table and proximity of dry well to water supply wells, and c) provides for inspections and maintenance of dry wells so that pretreatment features work effectively.

#### 2. Reasons for Regulatory Approach

Storm water and urban runoff carries pollutants from human activities. Runoff from roads, parking lots, landscaped areas and industrial use areas may contain metals, oils, nutrients, and other contaminants. While dry wells may be an appropriate discharge location for this runoff, associated risks need to be managed in order to protect groundwater quality. Groundwater is a critical drinking water supply in many areas of the

Lahontan Region. In many portions of the high desert, depth to groundwater is over 100 feet and may range up to hundreds of feet. However, in some areas, such as on the Mojave River Flood Plain, depth to ground water is shallow with depths of about 50 feet below ground surface. Dry wells used in the high desert range in depth from about 25 feet deep to about 80 feet deep depending on location. Because water is percolated at depth, it does not receive the same amount of filtration by the soil as water percolating from the surface. Some soils may not have sufficient characteristics, (organic content, biological activity, or percentage of clay particles) to adequately filter contaminants from storm water.

Dry wells in industrial areas pose increased risk of contamination from leaks and spills or storm water runoff from inadequately cleaned spills. Untreated road runoff and sewage spills may also contribute contamination. Additionally, dry wells can inadvertently be the receptor of wastes such as used automotive fluids disposed by pouring them into the gutters and storm drains. Control measures are needed to prevent degradation of groundwater aquifers while allowing legitimate uses of dry wells.

The Water Board can regulate the discharge of waste to each dry well under its Water Code authority. Municipalities currently permit and install dry wells. However, local programs vary in who ultimately owns and maintains the dry well; the frequency of inspection and maintenance; and, how records of dry well installations, inspection and maintenance are tracked. The goal of the proposed regulatory approach is to ensure that the oversight of the use of dry wells is consistent and protective of water quality.

### **3. Applicable Regulations In California**

#### Federal Regulation

EPA currently regulates dry wells nationwide as class V wells pursuant to the underground injection control (UIC) program. Dry wells are allowed under "rule authorization" if they meet two minimum requirements: (1) they must be listed on the federal inventory of injection wells, and (2) they must not be used in a manner that may endanger underground sources of drinking water. EPA's Fact Sheet "Municipal Storm Water and Groundwater Discharge Regulations in California" provides information on EPA requirements and guidance for municipalities to follow when using dry wells.

#### State Regulation

The State of California addresses pollutants that may contaminate storm water through the storm water and non-point source pollution control programs. Requirements are established under several State Water Resources Control Board (State Water Board) National Pollutant Discharge Elimination System (NPDES) permits including construction storm water permits, industrial storm water permits, municipal storm water permits, sanitary sewer overflow (SSO) permits, and through Regional Water Board general and individual permits or waivers. The goal of these requirements is to control pollutants that may be transported by storm water through the use of appropriate controls such as Best Management Practices (BMPs).

The Water Boards regulate storm water discharges in many urban areas through municipal storm water permits. Large and medium sized municipalities are defined as Phase I dischargers and smaller municipalities are considered Phase II dischargers. The cities of Victorville, Hesperia and Apple Valley as well as the Victor Valley portion of San Bernardino County are Phase II dischargers and are regulated by the Small Municipal MS4 General Permit (Board Order No. 2003-0005-DWQ). These municipalities are required to develop and implement a Storm Water Management Plan that describes BMPs, measurable goals, and time tables for implementation in the following program areas: public education, public participation, illicit discharge detection and elimination, construction site storm water runoff control, post construction storm water management, and pollution prevention/good housekeeping. The municipalities are also required to reduce the discharge of pollutants to storm water to the maximum extent possible, and to annually report on the progress of implementation of the storm water management plan.

The Phase II General Permit establishes design considerations for post construction BMPs, including dry wells, for development and redevelopment projects, and for individual categories of projects such as: commercial developments, restaurants, gasoline stations, etc. The Phase II General Stormwater Permit requires the following for stormwater dry wells.

1. Site specific conditions must be evaluated when determining the most appropriate BMP. The permit includes a list of references for guidance in BMP selection and use. A combination of BMPs is often the best approach.
2. Monitoring and maintenance must be provided to ensure that ground water is protected and the BMP is not rendered ineffective by overload.

Additionally, the General Construction Permit requires installation of post construction BMPs that reduce pollutants in post construction storm water runoff. Proper selection and use of post-construction BMPs can prevent excess water volume and potential pollutants entering dry wells.

#### **4. Local Oversight Activities**

Some of the municipalities in the southern Lahontan basin, such as Victorville, Apple Valley and Hesperia, are responsible for implementing the requirements and provisions established in the Phase II General Permit. Other municipalities, such as Adelanto, Palmdale and Lancaster, are not currently regulated under the Phase II General Permit. However, all of these municipalities review projects that include dry wells for storm water and/or nuisance water management. Each municipality evaluates site plans with dry wells. The plan checking process and requirements are somewhat different between municipalities. The municipalities check dry well design and construction to ensure that the dry wells will work. Most municipalities require an engineered system that includes treatment of the storm water to remove sediment, and some municipalities also require treatment to remove hydrocarbons from the water prior to discharge by percolation via the dry well. Attachment 1 summarizes review processes followed by each city. Attachment 2 summarizes the number of dry wells, dry well ownership and maintenance by each city.

## 5. Proposed Regulatory Approach

An adequate oversight program is an important component to allowing public and private parties to benefit from prudent use of dry wells while maintaining optimal groundwater quality. There needs to be a mechanism for verifying that dry wells are located where they pose minimal threat to ground water quality. First responders to spills need to be able to quickly determine where dry wells are located to select response actions that do not result in the spill reaching these wells. Additionally, if a spill reaches a dry well, knowledge of locations will allow quicker response to minimize effect on groundwater. A mechanism for verifying that dry wells are adequately maintained and that pretreatment measures are performing as expected is an essential component to maintaining effective performance of the well. To avoid discouraging the advantageous uses of dry wells, the regulatory strategy should be implemented in a manner that is as stream-lined and cost effective as possible. Water Board staff recommend that existing programs and regulatory mechanisms be used where applicable.

### Components to a Program

Water Board staff recommends that the following four components be part of a dry well regulatory approach. Some of the components should be implemented soon and others would require additional development in coordination with municipalities.

1. Develop an area-wide mechanism to track location and general construction information for dry wells.
2. Ensure that spill responders are aware of the risk of contaminants reaching groundwater through dry-wells and have the tools available to them to identify the locations of these wells.
3. Ensure that dry wells are appropriately sited, that designs provide necessary separation between the bottom of the well and that necessary pre-treatment be incorporated into the design.
4. Ensure that routine inspections and maintenance be performed.

### Implementation Strategy

Given that storm water being disposed in these dry wells contains waste, the Water Board has the authority to regulate the use of the wells. However, given the existing actions by local government, it would be more appropriate to work with them to develop consistent programs that incorporate the necessary details to ensure that the water quality protections described in components 3 and 4 are incorporated. The two implementation strategies are: (1) the Water Board would regulate each dry well (using either individual or general permits or waivers); or (2) the Water Board would waive waste discharge requirements based on the oversight being provided by local agencies. We believe the second alternative is the preferred approach.

Water Board staff plan to develop a data base to track important information about each dry well. This data base would be populated by information from municipalities and would be available to first responders. Additionally, Water Board staff will assist municipalities in training first responders about the need to prevent pollutants from spills reaching groundwater through dry wells.

## **6. Future Actions**

Staff plans to work with local governments to develop specific ways to incorporate the above recommendations when dry wells are used. Local governments have developed a good baseline program that can be further developed to ensure dry wells are used in a way that is protective of water quality. Where local programs incorporate these recommendations and provide adequate local oversight, the local program would be used, in lieu of separate regulation by the Water Board. This would provide a more streamlined process to permit dry wells.

Staff will hold collaborative meeting with local governments to further define the specifics for a permitting / inspection program addressing siting and construction standards, minimum measures necessary for water quality protection, inspections and maintenance, to develop a minimum program that would be applied consistently throughout the south Lahontan basin. Staff will encourage grant-funded studies if additional data are needed to develop site-specific criteria. The specific regulatory mechanism for implementation that staff would recommend will be brought to the Board at a later date.

## References

1. SWRCB 2003. Water Quality Order No. 2003-0005-DWQ, NPDES General Permit No. CAS000004, Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems.
2. The Los Angeles and San Gabriel Rivers Watershed Council with assistance from Geomatrix Consultants, Inc., 2005. Los Angeles Basin Water Augmentation Study, Phase II Final Report.
3. EPA, 1999. The Class V Underground Injection Control Study, Volume 3, Storm Water Drainage Wells. US EPA Office of Ground Water and Drinking Water (4601), EPA/816-R-99-014c. September 1999.
4. CASQA (California Storm Water Quality Association), 2003. California Storm water BMP Handbook for New Development and Redevelopment. [www.cabmphandbooks.com](http://www.cabmphandbooks.com). 2ndNature, LLC, 2006. Lake Tahoe BMP Monitoring Evaluation Process, Synthesis of Existing Research. Santa Cruz, California.
5. United State Environmental Protection Agency (EPA), 1994. Potential Groundwater Contamination from Intentional and Nonintentional Storm water Infiltration. U.S. EPA Center for Environmental Research Information. May 1994.
6. EPA, 2001. Technical Program Overview: Underground injection regulations. US EPA Office of Water 4606, EPA 816-R-02-025. <http://www.epa.gov>. Revised July 2001; December, 2002.
7. EPA, 2008. Superfund (CERCLIS) Query Form. [http://www.epa.gov/enviro/html/cerclis/cerclis\\_query.html](http://www.epa.gov/enviro/html/cerclis/cerclis_query.html). Queried January 2008.
8. EPA 2002. Fact Sheet "Municipal Storm Water and Groundwater Discharge Regulations in California"
9. 2<sup>nd</sup> Nature, LLC, 2006, Lake Tahoe BMP Monitoring Evaluation Process, Synthesis of Existing Research, Santa Cruz, California.
10. Schmidt, Kenneth DI, 1985. Results of a Dry Well Monitoring Project for a Commercial Site in the Phoenix Urban Area.

**Attachment 1**

**Town of Apple Valley**

Dry wells in Apple Valley are primarily used to infiltrate storm water. The Town of Apple Valley, engineering division staff evaluates proposed dry well installation for projects on a case by case basis. Town staff evaluates dry well design, site hydrology, and location relative to drinking water wells. Staff requires a hydrology study to determine the drainage impacts of the project and appropriateness of storm water BMPs. Sites must retain all rainwater and 10% of flow through. When they are used, dry well design requirements are site specific depending on site hydrology, potential contaminants, and location relative to drinking wells. The Town requires that new dry wells have two chambers and be designed to trap sediment and remove oils prior to infiltration.

The grading plans in town records include dry well locations, dry well installation dates, and dry well inspection dates. A master list of dry wells on private (Including commercial and residential) sites is not currently maintained by the Town. Town staff is in the process of assembling a master list of dry wells on public property. Town staff is using GPS to document dry well locations - Town staff maintains dry wells on public property. Town staff does not inspect or maintain dry wells on private property.

**City of Hesperia**

Dry wells in Hesperia are used for infiltration of both storm water and nuisance water. The City of Hesperia's Development Review Committee reviews project proposals and creates site specific requirements for dry wells prior to approval of the development. The developer uses the input from the review committee to create construction drawings that may include dry well design and installation. The Engineering Division reviews all the plans and drawings to ensure the well design meets City standards. Design review is included in the plan check process. Since 2003, the City's Standard Detail for dry well design and installation requires a two stage treatment device with the first stage being sediment treatment which traps sediment and floating debris. The second stage of treatment includes absorbent pillows/sponges to remove oils.

Prior to Water Board staff recent requests for information on dry well use, the City did not maintain a "log" of dry wells and their locations. However, the site development plans are on record with the City unless the dry wells were installed prior to incorporation as a City in 1988. Hesperia is now beginning the lengthy process of forming a GIS data base of dry well locations and has submitted the first portion to Water Board staff. The City will eventually have all the dry wells in a GIS database. Dry wells in Hesperia are maintained as needed. The City is in the planning stages of creating a scheduled maintenance program.

### **City of Lancaster**

Dry wells in Lancaster are primarily used to infiltrate storm water. Lancaster checks dry well design during the plan check process. The applicant is responsible for submitting a soils report and showing how the dry well would work. The City checks to see if the design incorporates silt removal. Other than silt removal, the City doesn't require pretreatment prior to infiltration.

The City is developing a GIS database and dry well locations will be included. The City clears sediment and debris from publicly owned dry wells.

### **City of Palmdale**

Dry wells in Palmdale are mostly used for nuisance water, not storm water. City staff meets with the applicant in a pre application meeting. The City follows up by sending the applicant a letter with comments in written form. Projects get circulated to water purveyors and for comment on proximity to drinking wells. City staff is aware of the well head protection program and dry wells are not allowed in the well head protection zone. Staff requires a site specific soil report. The report may include seismic data, soil boring values, over excavation, logs of test pits, compressibility, and soil strength. This report is used to determine if the site is suitable for dry wells. The City requires standard detail for construction of dry wells. They must have two chambers. One chamber is for settling and the second chamber is for percolation. The percolation chamber has absorptive pillows that adsorb oils. Dry wells are tracked with a GIS database. Most dry wells are maintained by a publicly owned landscaping district. Inspection or maintenance of dry wells on private property is not done by City staff.

### **City of Victorville**

Dry wells in the City of Victorville are primarily used to infiltrate nuisance water. Private parties proposing to install a dry well submit a proposed plan to the City. City staff checks the plan to determine if it is necessary to use dry wells for storm water or nuisance water infiltration. A percolation test of the soil is required to determine if soil characteristics are suitable for a dry well site. The dry well installation must conform to the approved plans and City Engineering Dept. standard plans. The Engineering Department requires a two chambered dry well with absorbent pillows that pre-treat discharge water prior to discharge. Dry well installation is inspected by the City Engineering Dept.

These wells are listed in a handwritten book that includes a well number and other information such as: address, cross street, APN, parcel book number, etc. A list is not kept for dry wells on private property. City Records Department maintains site plans for development on private property. These plans would include dry wells, if they exist, and may be accessed by location. Dry wells in city right-of-ways are maintained, inspected and tracked by the city. At present, the city is not aware of any dry wells on private property.

**Attachment 2**

<b>Entity</b>	<b>Primary Use</b>	<b># Dry Wells</b>	<b>City Owned</b>	<b>Privately Owned</b>	<b>City Maintained</b>	<b>Tracking</b>
Victorville	Nuisance Water	83	Yes	No	Yes	Hand Written Maintenance Log
Hesperia	Storm Water/ Nuisance Water	37 sites, many with multiple wells.	Few	Yes	Wells on public property maintained by City	Some in GIS data base, from Hesperia Rd East
Adelanto	Storm Water/ Nuisance Water	Data not available	Yes	Deeded to the City	Yes	Need a tracking system
Palmdale	Nuisance Water	600	Most	Few	Wells on public property maintained by City	GIS data base
Apple Valley	Storm Water	75	Most	10 privately owned	Yes	GIS data base
San Bernardino County	Not applicable	0	No dry wells in County	Not applicable	Not applicable	Not applicable
Lancaster	Storm Water	10	Most	3 privately owned	Wells on public property maintained by City	Currently no. City is developing a GIS data base and dry well locations will be included