American Water Works Association
California-Nevada Section

BEST MANAGEMENT PRACTICES (BMP) MANUAL

FOR DRINKING WATER SYSTEM RELEASES

2014 Edition

CA-NV AWWA Environmental, Health & Safety Committee

Developed by the CA-NV AWWA
Environmental, Health & Safety Committee

First Edition 2005, Second Edition 2014

DISCLAIMER

This Best Management Practices Manual for Drinking Water System Releases (BMP Manual) was developed by the California-Nevada Section of the American Water Works Association (CA-NV AWWA), Environmental, Health & Safety (EHS) Committee. Neither CA-NV AWWA nor the EHS assumes responsibility for the content of this BMP Manual or for the opinions or statements of fact expressed herein. The mention of trade names for commercial products does not represent or imply the approval or endorsement by CA-NV AWWA or the EHS. This BMP Manual is presented solely for informational purposes.

This BMP Manual was developed by representatives from California and Nevada water utilities, and is intended to be used as a guidance document by water utilities located in California and Nevada. It is not a substitute for, or a legal interpretation of Federal, State or local regulations. Users of this BMP Manual are cautioned to refer directly to applicable rules and regulations and to contact governing agencies to obtain additional guidance and clarification. This document does not, and cannot impose any legally binding requirements on AWWA, CA-NV AWWA, the EHS Committee or any water utilities. Water utilities retain discretion to adopt their own water quality and environmental protection approaches on a case-by-case basis that differ from those presented in this BMP Manual based on an analysis of site-specific circumstances. In addition, users of this BMP Manual must test any devices, chemicals, or procedures contained herein for their ability to meet applicable regulatory/permit requirements, as results may vary depending on the water release and site-specific conditions. Accordingly, users of this BMP Manual do so at their own risk and are solely and exclusively responsible for any consequences resulting from such use.

This disclaimer is applicable whether information from the BMP Manual is obtained in hard copy form or downloaded from the Internet.

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PREFACE

This Best Management Practices Manual for Drinking Water System Releases (BMP Manual) is intended to be a living document that will be periodically revised and updated to reflect applicable changes in: regulatory and permitting requirements; BMP technology; and industry practices related to drinking water system releases. The most recent version of this BMP Manual can be found on the Environmental, Health & Safety Committee Page at www.ca-nv.awwa.org.

As a living document, we encourage you to send any comments, suggestions, changes, or corrections regarding the BMP Manual to help ensure that this document continues to provide the most current and accurate information for water utilities in California and Nevada. Please send your comments to:

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ACKNOWLEDGEMENTS

This Best Management Practices Manual for Drinking Water System Releases (BMP Manual) was developed by the California-Nevada Section of the American Water Works Association (CA-NV AWWA). For over 90 years, CA-NV AWWA has been a leader in developing practical water industry guidelines, standards, procedures, training, and newsletters. CA-NV AWWA also promotes educational opportunities including conferences, workshops, symposia, and the Water College. It is the largest AWWA regional section, with more than 7,000 members.

CA-NV AWWA members and volunteers have enhanced the industry with their commitment and dedication to leading, educating, and serving the drinking water community to ensure public health and to provide safe and sufficient water for all. CA-NV AWWA would like to specifically thank the volunteer members of the Environmental, Health & Safety (EHS) Committee, formerly the Environmental Compliance Committee, who dedicated their time, technical expertise, and diverse experience to develop and revise the BMP Manual.

The second edition of this manual was created in 2014 thanks to the efforts of the following individuals:

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Brandy (O'Gorman) Hancocks, Golden State Water Company
David Kimbrough, City of Pasadena
Uzi Daniel, West Basin Municipal Water District

CA-NV AWWA would also like to specially thank the individuals that contributed to the technical review of the BMP manual, including Mike Ambrose, East Bay Municipal Utility District; Lori Schectel, San Francisco Water; Jason Wen, City of Downey; Roger Turner, Roger Turner & Associates, Inc.; Calvin Liu, Alameda County Water District.

The first edition of this manual was created in 2005 thanks to the efforts of the following individuals:

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Sunil Kesavapillai, Golden State Water Company
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Technical review contributors for the first edition included Steve Dennis, Alameda County Water District; Scott Taylor, RBF Consulting; Gary Lynch, Park Water Company; Susan Damron, Los Angeles Department of Water & Power; Gilbert Mells, Sacramento County Water Agency; John Schroeter, East Bay Municipal Utility District; and Steve Ross, Las Vegas Valley Water District.

1 INTRODUCTION

1.1 Background Information

Water utilities, as drinking water suppliers, are required to provide safe and reliable drinking water to the public. As a part of this effort to ensure quality drinking water, water utilities must at times release water to drain, flush, inspect, and/or repair their treatment, storage, conveyance, or distribution systems. Drinking water system releases are critical and essential public service discharge activities that must be performed in order to maintain and meet drinking water quality standards and system reliability requirements. These types of essential drinking water system releases can include raw water, surface water, groundwater, and potable water associated with drinking water supply, treatment, storage, and distribution systems.

Although water utilities strive to conserve the water or reuse it for other purposes, there are occasions where this is not a feasible or economical alternative. When there is no other viable option for these discharges, the water must be released to the environment or to an improved or unimproved local municipal storm drain system or flood control system (depending on the specific location of the release).

Drinking water system releases are a potential concern because they may contain constituents or cause conditions that can pose a threat to freshwater and/or saltwater aquatic life. For example, chlorine is widely used as a disinfectant in drinking water to protect humans from pathogens. However, chlorine at or above certain concentrations in the receiving water is known to be toxic to aquatic life. In a similar way, sediment and debris discharged as part of a drinking water system release have the potential to impact downstream water quality. Despite these potential impacts, however, drinking water system releases generally pose a minimal, often insignificant, threat to the environment and are an essential non-storm water discharge. A 2007 AWWARF (WaterRF) report on the environmental impacts of drinking water system discharges to receiving waters concluded that there are no impacts from these water discharges to the environment.

For these reasons, water utilities are (and must continue to be) allowed to discharge essential drinking water system releases when appropriate and effective Best Management Practices (BMPs) are implemented that are consistent with this BMP Manual and/or equivalent industry standards. Regulatory agencies with jurisdiction over these types of activities allow drinking water system releases as a special category or type of authorized non-storm water discharge when BMPs are implemented to minimize, or reduce, to the maximum extent practicable (MEP), the introduction of pollutants. However, this specific authorization can vary widely and may be regulated under a municipal separate storm sewer system (MS4) permit, a General Permit, or some other type of permit or exemption/waiver. Therefore, it is critical for each water utility to determine the applicable requirements for each water release location.

1.2 Purpose and Scope of the Best Management Practices Manual

The purpose of this BMP Manual is to make available general guidance for water utilities and promote the implementation of BMPs that minimize and/or reduce, to the MEP, the introduction of pollutants from drinking water system releases to receiving waters. This BMP Manual includes

technically feasible, practicable, and cost-effective BMPs, which are reasonably expected to minimize and/or reduce the discharge of pollutants to the MEP. At this time, it is impractical and economically infeasible to provide treatment methods for drinking water system discharges from drinking water treatment, conveyance, and distribution systems to beyond appropriate industry standard BMPs and control measures.

This BMP Manual provides practical guidance to better manage water releases for water agencies, water suppliers (distributors and purveyors), water districts, municipalities, and private water companies. Drinking water system releases may include (but are not limited to):

- Water line draining for the addition of new service connections;
- Valve replacements;
- Internal inspections and repairs;
- Hydrostatic testing of pipelines, tanks, and vessels;
- Fire hydrant flushing or line flushing for water quality reasons;
- Regulator releases;
- Storage tank overflows;
- System failures or emergency releases; and,
- Dewatering for other operations and maintenance activities.

This guidance manual is limited in scope to BMPs for the following drinking water source types:

- Water dedicated for municipal drinking water supply, including treated and non-treated;
- Raw water; and,
- Groundwater (e.g. aqueduct water, reservoir water, and drinking well water).

This BMP Manual does not apply to reclaimed/recycled water releases. Additionally, this BMP Manual is not intended to replace or supersede any local, regional, State, or Federal laws, regulations, permits, or ordinances that may regulate drinking water system releases.

Drinking water system releases are typically directed to flood channels, storm drains, creeks, streams, rivers, or other receiving waters. In some cases, these receiving waters (including ephemeral waterbodies) may be considered "Waters of the State" and/or "Waters of the U.S.". Additionally, these types of releases are categorized as "waste" because the water is being released for the purpose of disposal [pursuant to state laws (California Porter-Cologne Water Quality Control Act, Chapter 2, Section 13050 and Nevada Revised Statutes and Waste Discharge Requirements].

This BMP Manual provides general information and example procedures used by the drinking water industry to better manage drinking water system releases and compliance with regulatory requirements. Site-specific field conditions and associated pollutants of concerns must be taken into account. To ensure compliance, each water utility must also review and follow their own applicable regulatory and permitting requirements.

1.3 How to Use the BMP Manual

This BMP Manual can be used as follows:

a) As a source of general information on drinking water releases to surface waters;
b) To look up specific types of drinking water system releases (See Section 3, Table 3-1);
c) To identify potential pollutants of concern;
d) To review the general BMP information for a release type;
e) To use the procedures in Appendix A, along with your own regulatory requirements; and
f) To create standard operating procedures that can be customized for your organization.

Section 2 of the BMP Manual provides an overview of regulatory requirements, information on agency notification, and safety priorities.

Section 3 of the BMP Manual, Table 1, provides a List of Drinking Water System Releases and Potential Pollutants of Concern. This table is divided into the following four release categories and identifies the potential pollutants of concern and applicable BMPs associated with each release category:

- Drinking Water
- Raw water
- Groundwater
- Potential Low Volume Drinking Water System Releases

Section 4 of the BMP Manual provides information regarding the implementation of BMPs. Due to site-specific conditions and varying regulatory requirements, the BMP implementation guidance does not provide specific design details or maintenance requirements. Additional BMP controls, or a combination and/or series of BMP control mechanisms, may also be required depending on site-specific conditions.

Additional informational resources and references are provided in Appendix B of the BMP Manual to help users locate supplementary information and support tools. Another good method of obtaining information and identifying practical BMPs is networking with other water utilities. Water agencies can be contacted individually or through industry groups such as CA-NV AWWA's Environmental, Health & Safety Committee.

It is strongly recommended that this BMP Manual be used in conjunction with employee training programs to ensure that drinking water system releases are minimized and BMPs are properly implemented. Regular training and education are essential for a successful pollution prevention program.

1.4 Future Revisions & Updates to the BMP Manual

This BMP Manual is intended to be a living document that will be periodically revised and updated to reflect applicable changes in regulatory and permitting requirements; BMP technology; and industry standards and practices related to drinking water system releases. As a

living document, water utilities are encouraged to review the BMP Manual and send any comments, suggestions, changes, or corrections to help ensure that this document continues to provide the most current and accurate information for water utilities in California and Nevada. *Information on submitting comments is provided in the preface of this BMP Manual*.

2 GENERAL INFORMATION

2.1 Overview of Regulatory Requirements

In 1972, the Federal Clean Water Act (CWA) was passed, substantially amending the 1948 Water Pollution Control Act and authorizing the United States Environmental Protection Agency (USEPA) to regulate discharges to surface waters and prevent pollution. To comply with this law, the USEPA requires that a facility must have a National Pollutant Discharge Elimination System (NPDES) permit for discharging pollutants to Waters of the U.S. In 1990, under the authority of the CWA, USEPA adopted regulations for regulating storm water and non-stormwater discharges to surface water and storm drain conveyances by incorporating such discharges into the NPDES system.

In California and Nevada, the USEPA has delegated the authority to issue NPDES permits for discharges and to prescribe requirements necessary to carry out the provisions of the CWA to the states [pursuant to 40 Code of Federal Regulations (CFR) Sections 122 and 123]. In California, the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCB), have the responsibility for implementing the Clean Water Act, including setting water-quality standards and issuing discharge permits. In Nevada, the Nevada Division of Environmental Protection (NDEP) has the responsibility for implementing the Clean Water Act, including setting water-quality standards necessary to protect the quality of the waters of the State of Nevada, enforce water pollution control laws and regulations, and issue NPDES permits for discharges to surface waters.

USEPA considers drinking water system releases to pose a minimal threat to the environment. Therefore, such releases are allowed as non-storm water releases pursuant to 40 CFR, Part 122.28. Each state has the authority to further regulate drinking water system releases. For example, in California and Nevada, there are stringent chlorine residual discharge limits for discharges that reach receiving waters. To implement these types of requirements, drinking water system releases in California and Nevada are regulated in a variety of ways, including, but not limited to:

- Coverage under a Municipal Separate Storm Sewer System NPDES Permit (MS4 Permit);
- Coverage under a General NPDES Permit for De Minimis or Low Threat Discharges;
- Coverage under a General NPDES Permit for Potable Water Discharges;
- Coverage under a General NPDES Permit for Discharges of Hydrostatic Test Water;
- An Individual NPDES permit; or
- A categorical exemption from NPDES permit requirements (may include additional conditions and limitations).

Whether the drinking water system release is categorically exempt or is captured under a General NPDES Permit or MS4 Permit, these types of releases are typically allowed only if BMPs are implemented during the release and the release does not violate water quality standards. The objective of the BMPs is to minimize, to the maximum extent practicable (MEP), adverse environmental impacts on receiving waters and prevent degradation of aquatic habitat or water

quality. Water utilities are required to implement BMPs to minimize and/or reduce the introduction of potential pollutants from drinking water system releases into a receiving water. Additionally, contractors working for water utilities and performing dewatering activities must also comply with BMP requirements and obtain the appropriate NPDES permits, if necessary.

Since each city, county, region, or state may impose requirements that vary significantly, **it is critical that each water utility identify the specific criteria and requirements that are applicable for its respective jurisdiction in which it operates in order to ensure compliance.**

Specifically, in California, there are significant regional differences in the regulations governing releases from drinking water systems to Waters of the United States. Initially, in the 1990's, a General NPDES Permit was sought from the SWRCB to specifically regulate these types of releases. However, due to a potential conflict of interest that existed at that time on the part of the Board members within the SWRCB, a statewide General NPDES Permit was not developed. In 2009, the SWRCB asserted that municipal separate storm sewer system (MS4) permits were an appropriate mechanism to regulate drinking water system discharges (letter from SWRCB to Los Angeles RWQCB, July 23, 2009). Subsequently, each RWQCB assumed responsibility for establishing requirements to allow drinking water system releases within their jurisdiction. Examples of some of the various RWQCB permits and requirements for drinking water system releases are included in Appendix B.

2.2 Agency Notifications

Depending on local agency requirements and field conditions, water utilities may be required to contact regional agencies having jurisdiction in advance of a large planned drinking water system release to ensure that all parties are aware of the release and can agree upon any measures that should be implemented to protect public safety, worker safety, and the environment. In addition, when an unplanned release occurs, appropriate agency notifications should also be made as soon as possible after the event. Notifications and coordination may be necessary with the following types of agencies (depending on the location, volume, flow rate, and duration of the release):

- Regional Water Quality Control Board
- Regional Flood Control District
- City or County Department of Public Works
- County Department of Public Health
- Regional Vector Control Agency (if a release could result in ponded water that has the potential to cause or lead to vector nuisances).
- Non-Governmental Organizations (NGO)
- Other agencies that manage, regulate, or conduct activities in the release location

2.3 Safety Priorities

One of the primary concerns when dealing with planned and unplanned drinking water system releases is safety, including both worker and public safety. All necessary planning and precautions should be undertaken to ensure that field personnel and the general public are not

endangered during dewatering or release activities. Environmental protection and protection of property is also a priority issue for water utilities.

All activities that involve water releases and the implementation of BMPs should be prioritized in order of the following concerns:

a) Worker and Public Safety
    - Worker safety issues may include: providing appropriate personal protective equipment (PPE), setting up adequate traffic control, identifying site-specific contamination concerns, mitigating or eliminating uneven or slippery work areas, preventing flooding, and providing sufficient lighting for night visibility. For larger projects, the development of a health and safety plan may be necessary.
    - Public safety concerns may include: stopping or diverting main breaks that are impeding traffic, or operating valves as necessary to prevent contamination of mains and minimize the number of customers that would need to have their water shut off.

b) Environmental Protection
    - Environmental protection concerns may include the need to immediately divert or shut down water flow if a pipeline rupture may be entering a sensitive habitat area (e.g., wetland).
    - Preventing or reducing potential environmental damage may include implementing (when safe to do so) dechlorination methods, sediment control, and/or other BMPs to limit environmental impact.

c) Protection of Private and Public Property
    - Preventing damage to private and public property may include actions to stop or divert flows that are causing flooding and threatening homes or businesses.

3 TYPES OF DRINKING WATER SYSTEM RELEASES

3.1 Planned Releases

Drinking water system releases are typically classified as planned releases and unplanned releases. Planned releases typically result from routine operation and maintenance activities such as disinfection of mains, testing of hydrants, storage tank maintenance, cleaning and lining a section of pipe, and routine flushing of distribution systems for maintenance. The volume, flow, duration and potential pollutants of concern vary with each type of activity and the source of the release. Planned releases may involve drinking water, raw water, groundwater, or low volume drinking water system releases. In general, planned releases are easier to control as the BMPs can be prepared and implemented in advance.

3.2 Unplanned Releases

Unplanned releases are the result of accidents or incidents that cannot be scheduled or planned for in advance. Unplanned releases may include water main breaks, leaks, overflows, fire hydrant shearing, and emergency flushing activities.

In some cases, an emergency response situation may exist as a result of, or in addition to, the unplanned release. For example, a water main break (caused by an earthquake) could flood a highway and cause traffic accidents. This presents an emergency situation where public safety is the immediate and primary concern. In this situation, the implementation of BMPs should not interfere with immediate emergency response operations or impact public health and safety. Additionally, emergency response coordination, worker safety, traffic control, and protection of the environment and private property must also be considered when assessing safe implementation of BMPs during an emergency event.

AWWA recognizes that BMPs are most effective when implemented before a release occurs. In emergency situations, it is critical that BMPs be implemented immediately and to make sure that such actions and mitigation measures do not compromise public or worker safety. After the initial emergency response or emergency repairs have been completed, additional consideration should be given to augmenting the BMPs. For more information on procedures for unplanned releases, refer to Section 4.1.5.

3.3 Potential Pollutants of Concern for Drinking Water System Releases

Each type of drinking water system release has potential pollutants of concern that must be considered when planning release activities and determining what BMPs need to be implemented. There are some common potential pollutants that are typically present in certain categories of releases. For example, releases from drinking water pipeline flushing typically contain chlorine requiring dechlorination BMPs. Depending on various factors, such as the type of release, source of the release, or location of the release, there can be other potential pollutants of concern that must be considered requiring treatment to ensure that the release does not impact water quality in receiving waters. Each water utility should have a thorough understanding of the potential pollutants present in their drinking water supply system. Accordingly, each water

utility must individually evaluate all factors related to their specific operations to determine which BMPs are most appropriate for use.

Table 3-1 provides a general list of the various types of drinking water system releases that may occur, potential pollutants of concern associated with each release, and the applicable BMPs that may be implemented for each type of release. This table is intended to be applicable to most water utility operations, but may not include minor or facility-specific releases for all planned and unplanned releases. The table is divided into the following categories of releases:

- Drinking Water
- Raw Water
- Groundwater
- Low Volume Drinking Water System Releases

Table 3-1 can be used as a reference tool to look up specific types of releases and determine the potential pollutants of concern and the appropriate BMP controls or combinations of BMP control measures that should be implemented. Further details on BMP controls are included in Section 4.

TABLE 3-1
POTENTIAL POLLUTANTS OF CONCERN FOR DRINKING WATER SYSTEM RELEASES

Type of Release	Release Activity	Potential Pollutants of Concern	Applicable BMPs *(see Section 4 for details)*
DRINKING WATER	Drinking Water System Leak	Chlorine Sediment	• Administrative • Dechlorination • Erosion and Sediment Control
	Pipeline Flushing (line/main dewatering/flushing)	Chlorine Sediment Biofilm Metals	• Administrative • Dechlorination • Erosion and Sediment Control
	Pipeline Disinfection	Chlorine Sediment Biofilm	• Administrative • Dechlorination • Erosion and Sediment Control
	Water Quality Sampling	Chlorine Sediment Other organic or inorganics	• Administrative • Dechlorination • Erosion and Sediment Control
	Storage Reservoir and Tank Dewatering	Chlorine Sediment Metals Biofilm Other organics or inorganics	• Administrative • Dechlorination • Erosion and Sediment Control • On-Site Treatment
	Storage Reservoir and Tank Cleaning	Chlorine Sediment Metals Biofilm Other organics or inorganics	• Administrative • Dechlorination • Erosion and Sediment Control • On-Site Treatment
	Fire Hydrant Flushing & Testing	Chlorine Sediment (including rust particles)	• Administrative • Dechlorination • Erosion and Sediment Control

Type of Release	Release Activity	Potential Pollutants of Concern	Applicable BMPs *(see Section 4 for details)*
DRINKING WATER ***(Continued)***	Aqueduct Dewatering	Chlorine Sediment	• Administrative • Dechlorination • Erosion and Sediment Control
	Hydrostatic Testing	Chlorine Sediment	• Administrative • Dechlorination • Erosion and Sediment Control • On-Site Treatment
	Substructure Dewatering (vault/sump dewatering)	Chlorine Sediment Oil & Grease Biofilm	• Administrative • Dechlorination • Erosion and Sediment Control • On-Site Treatment
	Non-Contact Cooling Water Releases	Chlorine Oil & Grease	• Administrative • Dechlorination • Erosion and Sediment Control • On-Site Treatment
	Pump Station Releases/Maintenance	Chlorine Sediment Oil & Grease	• Administrative • Dechlorination • Erosion and Sediment Control • On-Site Treatment
	Unplanned Releases (broken water main, etc.)	Chlorine Sediment Biofilm	• Administrative • Dechlorination • Erosion and Sediment Control
	Virgin Granular Activated Carbon (GAC) Backwash	Chlorine Particulates	• Administrative • Dechlorination • Erosion and Sediment Control
	Used GAC Backwash (ex. Filter Ripening Overflow)	Chlorine Particulate Other organics, or inorganics	• Administrative • Dechlorination • Erosion and Sediment Control

Type of Release	Release Activity	Potential Pollutants of Concern	Applicable BMPs *(see Section 4 for details)*
RAW WATER	Reservoir Dewatering (draining)	Sediment Metals Biofilm	• Administrative • Erosion and Sediment Control • On-Site Treatment
	Reservoir Cleaning	Sediment Metals Biofilm	• Administrative • Erosion and Sediment Control • On-Site Treatment
	Unplanned Raw Water Release	Sediment Biofilm	• Administrative • Erosion and Sediment Control
	Hydrostatic Testing	Sediment Oil & Grease	• Administrative • Erosion and Sediment Control • On-Site Treatment
	Substructure Dewatering (vault/sump dewatering)	Sediment Oil & Grease Biofilm	• Administrative • Erosion and Sediment Control • On-Site Treatment
	Non-Contact Cooling Water Releases	Sediment Metals Oil & Grease	• Administrative • Erosion and Sediment Control • On-Site Treatment
	Aqueduct Dewatering	Sediment Biofilm Other organics or inorganics	• Administrative • Erosion and Sediment Control • On-Site Treatment
	Construction Dewatering	Sediment Other organics or inorganics	• Administrative • Erosion and Sediment Control

Type of Release	Release Activity	Potential Pollutants of Concern	Applicable BMPs *(see Section 4 for details)*
GROUND-WATER	Well Development / Drilling	Sediment Other organics or inorganics	• Administrative • Erosion and Sediment Control • On-Site Treatment
	Well Maintenance	Chlorine Sediment Other organics or inorganics	• Administrative • Dechlorination • Erosion and Sediment Control • On-Site Treatment
	Well Purging / Flushing	Chlorine Sediment Other organics or inorganics	• Administrative • Dechlorination • Erosion and Sediment Control • On-Site Treatment
	Construction Dewatering/ Tunnel Dewatering (groundwater seepage)	Sediment Other organics or inorganics	• Administrative • Erosion and Sediment Control • On-Site Treatment
POTENTIAL LOW VOLUME DRINKING WATER SYSTEM RELEASES	*BMP's may apply to the following low volume releases:*		
	Meter Calibration	Chlorine Sediment	• Administrative • Dechlorination
	Pressure Relief Valve Releases	Chlorine Sediment	• Administrative • Dechlorination • Erosion and Sediment Control
	Pressure Regulator Station Release/ Maintenance	Chlorine Sediment	• Administrative • Dechlorination • Erosion and Sediment Control
	Chlorination Station Release/Maintenance	Chlorine Sediment	• Administrative • Dechlorination • Erosion and Sediment Control

4 BMPs FOR DRINKING WATER SYSTEM RELEASES

4.1 Administrative BMPs

The following sections describe the different types of administrative BMPs that may be implemented as additional measures in the overall effort to reduce the potential water quality impacts of pollutants during drinking water system releases. Administrative BMPs are non-structural BMPs, such as managerial practices, operations and maintenance procedures, or other measures designed to reduce or prevent potential pollutants from being discharged during drinking water system releases. Administrative BMPs may also be characterized as source controls. Such administrative BMPs can be applied before, during, and/or after water release activities.

4.1.1 Conservation and Reuse of Water

Conservation, which includes the reuse of water resulting from planned water releases, is the first administrative BMP that should be considered when facilities are planning drinking water system releases. Although feasible options may be limited, they should be considered as the first priority. Possible options for reuse of the water releases include discharge to a sanitary sewer system (for possible reuse as reclaimed/recycled water), or use of the water for soil compaction, street sweeping, dust control, percolation, or irrigation.

Specifically in California, the Porter-Cologne Water Quality Control Act (Water Code - Chapter 7, Article 7, Section 13550) includes provisions to prevent waste and unreasonable use of Waters of the State. Under this provision, the SWRCB and the RWQCBs must encourage, wherever practicable, water conservation and/or re-use of wastewater. General NPDES Permits and individual NPDES Permits issued by the RWQCBs typically contain language requiring that the discharger must first investigate the feasibility of conservation and/or re-use of the water. Only after such options have been considered, can the water utility apply for coverage under a NPDES Permit.

4.1.2 Training

Training and education are essential tools to effectively implement BMPs for planned and unplanned releases. Water utilities should ensure that employees are thoroughly knowledgeable of all the requirements of drinking water system releases and know how to properly implement appropriate BMPs. Overall competence in BMP selection, application, techniques, and procedures are essential to ensuring compliance with regulatory requirements. Additional training on field sample collection and analyses should be provided to appropriate field personnel. Employees also need to be trained on the health and safety issues related to drinking water system releases and appropriate BMP implementation.

4.1.3 Planning, Scheduling, and Operating Procedures

Planning, scheduling, and establishing operating procedures are all helpful management tools that can reduce potential pollutants from drinking water system releases. The first step in implementing these tools involves carefully planning and scheduling when, where, and how drinking water system releases will need to occur. Planning and scheduling efforts should also take into account such factors as: location of the release and condition of the area, volume, flow rate, frequency, site access, public safety, worker safety, environmental protection concerns, proximity to private property, traffic flow, weather conditions, and staffing and equipment needs. By properly planning and scheduling operation and maintenance activities, water releases can be effectively controlled and managed to minimize erosion and reduce the potential for pollutants entering the receiving waterbody.

Operating procedures are also considered an essential BMP for water utilities to ensure that all water releases are managed safely and effectively. Operating procedures may include standard industry procedures that are available for use by water utilities. Water utilities may develop their own site-specific operating procedures that are customized for their own operations. Whatever types of operating procedures are used, the procedures should include instructions for effectively controlling drinking water system releases and implementing appropriate BMPs. It is also critical to provide employees with training on operating procedures. Periodic audits should also be conducted to ensure that BMPs are being properly implemented.

4.1.4 Material Storage and Waste Management

The methods by which materials and wastes are stored and handled in the field can also impact the potential for water pollution. Water utilities should ensure that all materials and wastes are properly managed and stored to prevent spills, leaks, or exposure to stormwater runoff. Preventative measures should be established that include providing procedures and training for safe use and storage of materials and waste during field operations. When planning field activities, the following should be considered to minimize potential pollution:

- Types and quantities of materials that will be stored on-site
- Location where materials are received, stored, transferred, handled, and disposed
- Receiving and loading operations
- Spill or leak prevention and response
- Containment equipment and/or containment structures

4.1.5 Procedures for Unplanned Releases

Establishing procedures to address unplanned release events is a proactive measure that can help in responding quickly and efficiently to unplanned release events (e.g. water main breaks). Personnel that have been trained and are familiar with these procedures can act quickly and more effectively when responding to such emergency situations. The

following types of procedures can be established to provide instructions on responding to unplanned release events:

a) Immediate notification to appropriate water utility personnel and affected emergency response agencies, local city government, etc.
b) Initial assessment of emergency situation
c) Priority safety considerations
d) Environment and private property protection
e) Isolation/evacuation of the area
f) Actions necessary to prevent further release
h) BMP implementation
i) Evaluation of impacts on the environment and property
g) Assessment for repairs
j) Repair and maintenance activities
k) Disinfection/flushing of repaired line
l) Returning line to service
m) Clean-up operations

4.1.6 Documentation

The development of documentation procedures is an administrative BMP that can be of value to water utilities. Documenting field activities can assist personnel with the appropriate implementation of BMPs and is periodically required by regulatory agencies. Procedures for documenting planned and unplanned releases may include: inspections and visual observations; sampling and monitoring information; BMP implementation; and follow-up activities. Specific forms can be created to help field personnel record pertinent information. Photographs can also be a useful method to document activities in the field.

4.2 Guidelines for Erosion & Sediment Control BMPs

Purpose	These guidelines describe BMPs that will minimize erosion and the transport of sediment to storm drains or receiving waters during drinking water system releases. Such releases may potentially contain small amounts of sediment. More commonly, they have the potential to erode, suspend and transport sediments as they pass over barren soil or along street gutters. High flow releases may also cause erosion, particularly on unpaved surfaces.
Quick Checklist	1. Evaluate release volume and character. Compare with release point and conveyance to determine appropriate BMP use. 2. Ensure worker safety, public safety, and private property protections. 3. Where feasible, remove loose debris, such as trash and dirt, from flow path. 4. Place erosion and sediment control devices in flow path. 5. Implement diffusers or flow control devices for high pressure flows. 6. Monitor flow and control devices. 7. Cleanup and dispose of sediment and control materials appropriately.

Field Adaptation	These guidelines must be adapted to field conditions and available resources. It cannot be expected that BMPs will be successful in the complete control of erosion or removal of sediment. Success of these guidelines depends on site-specific factors, appropriate placement of materials, number of drain inlets affected, and release flow rate. When properly designed, implemented and/or maintained, erosion and sediment control, to the MEP, should be achieved. Erosion and sediment control: 1. Slows the flow of water, preventing erosion and/or allowing some portion of the sediment to settle out and/or; 2. Protects bare earth surfaces to preclude the detachment of soil particles from the flow of water; 3. Bypasses sediment using piping to move flow around potential pollutants; 4. Prevents the flow of water from reaching or picking up sediment by using berms or dikes. First, assess the flow rate of the release, the point of release and the path of the release. A release point and alluvial (earthen) drainage conveyance is the worst-case scenario while a concrete paved storm water channel is the best-case scenario. Whenever possible, it may be appropriate to route water releases to paved surfaces or well vegetated areas to prevent soil erosion. Erosion and sediment control can be achieved by placing wattles or gravel bags perpendicular to the flow to form small dams between the release source and the point at which the flow enters a storm drain or receiving water. The purpose of barrier dams is to slow the discharge velocity to prevent erosion, and allow sediment that is in the water to settle out. In high flow situations, special care must be taken to prevent flooding, ensuring public safety and protection of private property. For high flow conditions, riprap, or other materials can be used for energy dissipation. Another BMP that can be used for channel stabilization is geo-textile materials to line earthen channels to prevent erosion. In some cases, temporary drain inlet sediment filters can be used in conjunction with dams as long as they do not promote flooding.
Materials	The following materials can be used, either alone or in combination, as control devices: • Weighted Straw Wattles • Sediment Retention Wattles • Filter Bags • Mesh Gravel Bags • Snake Bag Rock Wattles • Flat Blade Shovel • Temporary Drain Inlet (DI) Sediment Filter bags or mats • Diffuser

Materials ***(Continued)***	• Portable Storage Tank (e.g. Baker Tank) • Rip- rap • Naturally Vegetated Areas • Geo-textile Materials There are various materials readily available on the market. The above is only a sample listing and is not intended to be all-inclusive. See references in Appendix B for additional information on erosion and sediment control equipment.
Limitations	Erosion & Sediment Control BMPs: • May not remove all sediments or fine particulate matter. If more complete removal is desired, treatment BMPs may be necessary. • May not be appropriate if ponding could cause potential flooding. • Effectiveness depends on many factors including site characteristics, volume of flow, and BMP design. • May not be appropriate in all circumstances and can only be employed where reasonable and/or feasible.

4.3 Guidelines for Dechlorination BMPs

Purpose	These guidelines describe BMPs for dechlorination or dechloramination of drinking water system releases to storm drains or receiving waters.
Quick Checklist	1. Evaluate work area and determine appropriate BMP implementation. 2. Ensure worker safety, public safety, and protection of private property. 3. Implement other BMPs for erosion and sediment control, as necessary. 4. Evaluate chlorine residual level and determine if passive non-chemical methods of dechlorination are feasible. If not, set up dechlorination control devices. 5. Measure initial chlorine level. 6. Monitor control devices and chlorine level as required. Use additional control measures, if necessary, to reduce chlorine levels. 7. Cleanup and dispose of control materials appropriately.
Materials	The following materials and equipment can be used for dechlorination: Dechlorination Agents- • Calcium Thiosulfate • Sodium Sulfite tablets • Sodium Thiosulfate • Sodium Bisulfite • Ascorbic Acid, Sodium Ascorbate (Vitamin C) • Alternate Dechlorination Solutions Dechlorination Equipment available- • Dechlor mats • Dechlor strips • Dechlorinating Diffuser (variety of sizes) • Drip Tank • Chlorine Colorimeter & Reagent ** Always use personal protective equipment when handling chemicals.*
Measuring Chlorine Residual	Sampling and field measurement methods vary significantly among water utilities. It is recommended that each water utility develop monitoring strategies that meet their own needs. Key elements of a successful monitoring program include determining sampling objectives, sampling locations, sampling frequencies, and field methods. Criteria for selecting a field method include ease of use, detection limits, precision, accuracy, cost, and regulatory requirements. Field methods commonly used for residual chlorine include: • Field Colorimetric Test Kits • Orthotolodine Indicator Kits • Water Quality Test Strips • Swimming Pool Test Kits

Measuring Chlorine Residual *(Continued)*	• DPD Titration Method • Amperometric Titration Method For additional details concerning each of these methods, see the Guidance Manual for Disposal of Chlorinated Water (AWWARF/WaterRF 2001).
Chemical Handling	Dechlorination agents are stable chemicals with low toxicities. However, these types of chemicals can react with other chemicals and cause a potentially hazardous situation. Inhalation of chemicals can cause irritation of the respiratory tract. Exposure to chemicals is negligible when the chemical is in tablet or liquid form. Personal protective equipment is necessary when handling solid or liquid chlorine. Dechlorination equipment and materials (new or used) should be stored in vehicles in secondary containment to prevent the chemical from being deposited directly onto vehicles, tools or other surfaces. Plastic containers that can completely contain the diffuser and dechlorination agent constitute adequate secondary containment. Refer to specific chemical Safety Data Sheet (SDS) for safe use and handling instructions and appropriate personal protection equipment required.
WARNING!	Some water utilities that use sodium sulfite for dechlorination also use calcium hypochlorite (HTH) or sodium hypochlorite to disinfect water distribution system mains or appurtenances. These two chemicals can react when mixed in the presence of water. The reaction can produce heat and both hydrogen and chlorine gas, creating both a potentially toxic and explosive/flammable atmosphere. These chemicals and associated mixing and dispensing equipment must be kept segregated from each other at all times. Refer to SDS information.
Limitations	Dechlorination BMPs: • Amount of dechlorination agent may need to be adjusted to achieve desired result. • Effectiveness depends on many factors including site characteristics, volume of flow, and BMP design. • May not be appropriate in all circumstances and can only be employed where reasonable. • Over-application of dechlorination agents can serve to deplete the dissolved oxygen concentration and reduce pH in discharge/receiving waters.

4.4 Guidelines for On-Site Treatment BMPs

Purpose	These guidelines describe types of on-site treatment options available for drinking water system releases that cannot be directly released to the storm drain system or surface waters due to specific constituents contained in the water. These BMPs apply to drinking water system releases.
Quick Checklist	1. Identify and analyze contaminants/constituents in the water. 2. Determine what on-site storage and treatment options are available. 3. Evaluate all options and select best approach based on effectiveness, cost, time constraints, regulatory agency requirements, etc. 4. Once a treatment option or combination of options are selected, ensure that proper permits are in place and all treatment activities comply with federal, state and local laws, regulations, and ordinances.
On-Site Treatment Options	In certain circumstances, drinking water system releases cannot be released directly into the storm drain system or surface waters because they contain constituents or contaminants that must first be removed or treated. Various types of on-site storage and treatment can be preformed either by the water utility (if appropriate) or by a contractor that utilizes portable storage tanks and on-site treatment units. In some cases, storage and/or treatment units and equipment may require specific regulatory agency permits. Examples of on-site treatment options available include: • BOD reduction • pH adjustment • Oil separation/removal • Metals precipitation and removal • VOC removal • Semi VOC removal • Sedimentation/Filtration using portable tanks
Limitations	Successful on-site storage and treatment of water releases to remove contaminants depends on numerous conditions and may not always be a viable option. Factors related to on-site treatment include: • Storage capacity on-site • Complexity of treatment process • Availability of appropriate treatment equipment • Cost of treatment • Time requirement to obtain permits, storage and treatment equipment or start up and complete the treatment process • Location restrictions (lack of space or proximity to residential areas) • Management of residual treatment solids. If on-site treatment is not an option, off-site disposal is another alternative. Possible off-site disposal options include disposal at a sanitary sewer connection (with an appropriate permit) or disposal at an off-site industrial waste /treatment facility. These options may not be available or allowed depending on the nature of the contaminants, volume of drinking water system release, sewer capacity limits, or availability of permitted off-site

Limitations ***(Continued)***	treatment facilities. Prior approval must be obtained before discharge to the sanitary sewer or disposal at an off-site industrial waste /treatment facility. Sampling and analytical data may be required. Compliance with all applicable transportation regulations is also required.

Acronyms

AWWA	American Water Works Association
AWWARF	American Water Works Association Research Foundation (now called WaterRF)
BAT	Best Available Technology (economically available)
BCT	Best Conventional Technology (pollution control)
BMPs	Best Management Practices
BOD	Biological Oxygen Demand
Cal EPA	California Environmental Protection Agency
Cal-OSHA	California Division of Occupational Safety and Health Administration
CASQA	California Stormwater Quality Association
CCR	California Code of Regulations
CDPH	California Department of Public Health
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CTR	California Toxics Rule
CWA	Clean Water Act (Federal Water Pollution Control Act of 1972 as amended in 1987)
DI	Drain Inlet (for Stormdrain)
DPD	N,N-diethyl-p-phenylenediamine (reagent)
DTSC	California Department of Toxic Substances Control
GAC	Granular Activated Carbon
Hazmat	Hazardous Material
HTH	High Test Hypochlorite, also known as Calcium Hypochlorite
MBAS	Methylene Blue Active Substances

MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NDEP	Nevada Division of Environmental Protection (NDEP)
NGO	Non-Governmental Agency
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollution Discharge Elimination System
O&G	Oil and Grease
O&M	Operations and Maintenance
OSHA	Occupational Safety and Health Administration
P^2	Pollution Prevention
PCB	Polychlorinated Biphenyls
PCE	Perchloroethylene, also known as Tetrachloroethylene
POTW	Publicly Owned Treatment Works
PPE	Personal Protective Equipment
PPP	Pollution Prevention Plan
RCRA	Resource Conservation and Recovery Act
RWQCB	Regional Water Quality Control Board
SDS	Safety Data Sheet
SWRCB	State Water Resources Control Board
TCE	Trichloroethylene
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon

TPH	Total Petroleum Hydrocarbons
TSDF	Treatment, Storage & Disposal Facility
TSS	Total Suspended Solids
TTU	Transportable Treatment Unit
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds
WDR	Waste Discharge Requirements
WaterRF	Water Research Foundation (formerly AWWARF)

Glossary

Administrative BMPs: Operational practices that reduce potential pollutants at the source, including maintenance procedures, managerial practices, operational practices and scheduling of activities that aim to prevent storm water pollution by reducing the potential for contamination at the source of pollution.

Adverse Impact: A detrimental effect upon water quality caused by a discharge or loading of a pollutant or pollutants.

Basin Plan: The Water Quality Control Plan adopted by each Regional Water Quality Control Board to protect and preserve the watersheds within their jurisdiction.

Best Management Practices (BMPs): Any program, technology, process, operating criteria, methods, schedules, measures, or device that controls, prevents, removes, or reduces pollution. Also includes any practices designed and selected to reduce or eliminate the discharge of pollutants to surface waters. BMPs include structural and nonstructural controls, and operation and maintenance procedures, which can be applied before, during, and/or after pollution producing activities.

Biofilm: General term referring to thin, usually resistant, layer of microorganisms (algae and various aquatic photosynthetic organisms) that form on and coat various surfaces such as water pipes.

Dechlorination: A treatment method that removes or replaces chlorine atoms in water. Dechlorination can be accomplished by physical and/or chemical treatment and also can occur naturally due to other parameters (i.e., time, temperature, etc). The term dechlorination applies whether the water is disinfected with free chlorine or with chloramines.

Discharge of a Pollutant: Means addition of any "pollutant" or combination of pollutants to "waters of the United States". The term discharge includes additions of pollutants into storm drains, surface waters, etc, from surface runoff, channels, pipes, sewers, or other conveyances that do not lead to a treatment works.

Drinking Water: Water that meets established drinking water standards and is suitable for drinking. This water is commonly treated and delivered to municipal customers through distribution system pipelines. Synonym: potable water.

Drinking Water System: Facilities utilized in the management of source water, treatment, and/or distribution of municipal drinking water. This system may include raw surface water, groundwater, and/or treated/non-treated drinking water. Types of facilities include, but are not limited to, pipelines, tanks, vessels, and reservoirs.

Drinking Water System Releases: Discharge of water from facilities utilized in the management of source water, treatment, and/or distribution of municipal drinking water. The cause of these releases may include, but are not limited to, system failures, pressure releases, system maintenance/repairs, distribution line testing, system disinfection, fire hydrant flow testing, pipeline flushing, system dewatering, and well maintenance activities.

Erosion: The wearing away of land surface by wind or water. Erosion may occur naturally from weather or runoff but can be the result of man-made activities.

Field Measurements: Refers to water quality testing performed in the field with portable field-testing kits or meters.

General NPDES Permit: NPDES Regulations, 40 CFR 122.28, provides for the issuance of general permits to regulate discharges of wastewater which result from similar operations, are the same type of waste, require the same effluent limitations, require similar monitoring, and are more appropriately regulated under a general permit rather than individual permits.

Granular Activated Carbon (GAC): A highly adsorbent form of carbon used to remove dissolved organic matter from wastewater.

Hazardous Waste: A waste or combination of wastes that, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either cause or significantly contribute to an increase in mortality or an increase in serious irreversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of or otherwise managed. Possesses at least one of four characteristics (ignitability, corrosivity, reactivity or toxicity) or appears on special USEPA or state lists. Regulated under the federal Resource Conservation and Recovery Act and the California Health and Safety Code.

Hydrostatic Test Water: Water used as part of a test method to check for leaks and/or structural integrity of pipelines, tanks, and /or vessels. For the purposes of the BMP Manual, the tested vessels described herein are dedicated to drinking water purveyance and storage.

Hydrostatic Testing: Test performed by filling pipelines, tanks, and /or other vessels with water to check for leaks and/or structural integrity. Testing can be performed with or without raising the atmospheric pressure within the vessel. For the purposes of the BMP Manual, the tested vessels described herein are dedicated to drinking water purveyance and storage.

Individual NPDES Permit: A National Pollutant Discharge Elimination System (NPDES) Permit issued by the Regional Water Quality Control Board for a facility specific discharge of wastewater to receiving waters.

Low Volume Releases: These types of releases are usually flows smaller than 50 gpm and typically last for less than 2 hours.

Maximum Extent Practicable (MEP): The standard for implementation of storm water management programs to reduce pollutants in storm water. CWA § 402(p)(3)(B)(iii) requires that municipal permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants. See State Board Order WQ 2000-11.

Municipal Separate Storm Sewer System (MS4): A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) designed or used for collecting or conveying storm water; (ii) which is not a combined sewer; and (iii) which is not part of a Publicly Owned Treatment Works (POTW) as defined at Title 40 of the Code of Federal Regulations (CFR) 122.2.

Nevada Division of Environmental Protection (NDEP): The Nevada regulatory agency responsible for implementing the Clean Water Act, including setting water-quality standards necessary to protect the quality of the waters of the State of Nevada, enforce water pollution control laws and regulations, and issue NPDES permits for discharges to surface waters.

National Pollutant Discharge Elimination System (NPDES): The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under CWA §307, 402, 318, and 405.

Passive Non-Chemical Dechlorination: Using the relatively stable, moderately reactive nature of chlorine to neutralize it upon reaction with air, sunlight, and contact with organic and inorganic impurities in soil, paved surfaces, water and wastewater.

Pollutant: Generally, any substance introduced into the environment that adversely affects the usefulness of a resource. Pollutants may include sediment, debris, litter, toxic substances, solid wastes, etc. (The exact definition for "pollutants" is defined in CWA §502(6) 33.U.S.C. §1362(6)), and incorporated by reference into California Water Code §13373).

Porter-Cologne Water Quality Control Act: (California Water Code – Chapter 7, Article 7, Section 13550) The California law which contains the principal laws governing the discharge of wastewaters in the State.

Potable Water: Water that meets established drinking water standards and is suitable for drinking. See drinking water.

Raw Water: Specifically refers to non-treated water that a water utility has dedicated for providing potable drinking water.

Receiving Waters: All surface water bodies identified in the Regional Water Quality Control Board Basin Plan. This includes inland surface waters, enclosed bays, harbors, lagoons, estuaries, and the ocean.

Reclaimed/Recycled Water: Wastewater that, as a result of treatment, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource.

Regional Water Quality Control Board (RWQCB): In California, there are nine RWQCBs that develop and enforce water quality objectives and implementation plans to protect the beneficial uses of the State's waters, while recognizing local differences in climate, topography, geology and hydrology. The RWQCBs develop Basin Plans for their specific hydrologic areas, govern requirements/issue waste discharge permits, take enforcement action against violators, and monitor water quality.

Runoff: Water originating from rainfall, melted snow, and other sources (e.g., sprinkler irrigation) that flows over the land surface to drainage facilities, surface waters, rivers, streams, springs, seeps, ponds, lakes, and wetlands.

Sediment: Solid particulate matter, both mineral and organic, that becomes entrained or in suspension and is transported, or moved from its site of origin by air, water, or other means. Sediment includes soil particles, clays, sands, and other natural or man-made materials that may be picked up when water is discharged over a surface.

State Water Resources Control Board (SWRCB): California State regulatory agency that formulates and adopts state policy for water quality control in accordance with the provisions of the Porter-Cologne Water Quality Control Act. The SWRCB is designated as the state water pollution control agency for all purposes stated in the Federal Water Pollution Control Act and any other federal act and is authorized to administer the NPDES Program in California.

Storm Drain: Above- and below-ground conveyance systems and structures for transporting stormwater to streams or outfalls for flood control purposes.

Storm Water: Runoff that consists solely of discharges that originates from a precipitation event (rain or snowmelt). Storm water is that portion of precipitation that flows across a surface to the storm drain system or receiving waters.

Total Chlorine Residual: A measurement of the amount of remaining chlorine concentration (the sum of free and combined chlorine) in fresh water that has not yet degraded or dissipated after the water has been treated with chlorine.

Toxicity: Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies.

Treatment BMPs: Any engineered system or train of treatment methods designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unplanned Release: A release that occurs as the result of an accident or incident that cannot be scheduled or anticipated in advance, including main breaks, leaks and overflows.

Water Quality Standards & Water Quality Objectives: Water quality criteria contained in the Basin Plan, the California Ocean Plan, the National Toxics Rule, the California Toxics Rule, and other state or federally approved surface water quality plans. Such plans are used by the Regional Board to regulate all discharges, including storm water discharges and non-storm water discharges.

Water Utility: Drinking water supplier, system operator, distributor, purveyor, municipality, district, agency, or private water company.

Waters of the State: Any surface water or groundwater, including saline waters, within boundaries of the state.

Waters of the United States (US):

a. All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
b. All interstate waters, including interstate "wetlands";
c. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
    1. Which are or could be used by interstate or foreign travelers for recreational or other purposes;
    2. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    3. Which are used or could be used for industrial purposes by industries in interstate commerce;
d. All impoundments of waters otherwise defined as waters of the United States under this definition;
e. Tributaries of waters identified in paragraphs (a) through (d) of this definition;
f. The territorial sea; and
g. "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraph (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.22(m), which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to man-made bodies of water, which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with USEPA.

APPENDICES

Appendix A
Example Procedures

Ex. 1: Dechlorination: Measuring Chlorine Residual

Ex. 2: Dechlorination: Using Mats / Strips and Tablets

Ex. 3: Dechlorination: Using Hydrants Diffuser with Dechlorination Tablets

Ex. 4: Dechlorination: Using Liquid Drip Tank

Ex. 5: Dechlorination: Disposal of Tablet and Reagent Waste

Ex. 6: Erosion & Sediment Control: Using Filters & Dams

Ex. 7: Erosion and Sediment Control: Using a Portable Storage Tank

Example 1
Dechlorination: Measuring Chlorine Residual

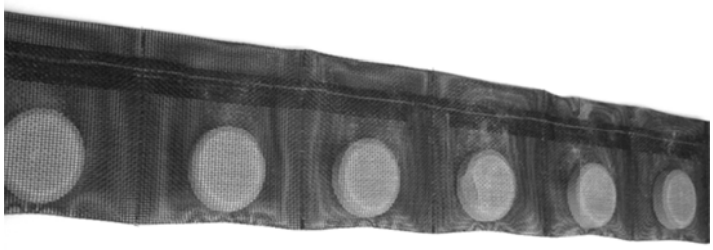
Appropriate Applications	This method of analyses can only be used for relatively clean, clear water during drinking water system releases.
Limitations	• This procedure cannot be used to detect the presence or absence of chlorine in opaque muddy water, such as that discharged from trench dewatering operations. There is no simple and accurate field method for detection of chlorine residual in opaque muddy water; therefore, in cases where the discharge is opaque, field staff will need to rely solely on the dechlorinating agent dosing guidance given in this procedure (i.e., there is plenty of visible tablet remaining and there is contact between the flow and the tablets) to ensure effective dechlorination. • Field instruments must have the ability to measure low levels of total chlorine.
Method of Measurement	Chlorine residual is typically measured by performing a colorimetric analysis for total chlorine. Total Chlorine DPD reagent is added to a sample and reacts if chlorine is present. If a pink or red color develops when reagent is added to the sample, chlorine is present. Absence of color indicates there is no detectable chlorine present. The amount of DPD reagent must be adequate enough to handle the highest concentration of total chlorine stated in the analytical range. Excess or undissolved reagent does not affect the accuracy of the measurement. Note: Total Chlorine reagent must be used to detect the presence of chloramines
Measuring Equipment	Select an appropriate hand-held colorimeter capable of measuring low levels of total chlorine residual. Follow the manufacturer specifications for sample containers and reagent quantities.

Task	Procedure
1. Prepare Instrument	• Ensure colorimeter is set to read low range Total Chlorine. • Perform calibration/blank analysis as specified by instrument manufacturer.
2. Collect Sample	• Collect the sample as far downstream of the point of dechlorination as possible before the flow enters a storm drain or receiving water. • Rinse the sample container in the discharge flow. • Collect the sample in a clean and clear container. The sample container type and size is based upon the instrument used.
3. Add Reagent	• Add Total Chlorine DPD reagent to the sample. - Powder DPD reagent for Total Chlorine analysis is stored in pillow packets or a pop dispenser. Ensure full dose of reagent is added to the sample.
4. Mix Reagent	• Cap and gently swirl or invert the sample container for 20 seconds to dissolve the powder.

	- Excess or undisolved reagent does not affect the accuracy of the measurement. However, insufficient DPD reagent can result in underdevelopment. • Allow to stand for 3 minutes to allow the color to fully develop. Note: this time may vary based upon instrument specifications.
5. Visual Assessment	• Visually assess the sample after 3 minutes. If a pink or red color is clearly visible, chlorine is present and dechlorination BMPs must be adjusted. - *You will know chlorine is present as soon as color develops, so if it takes less than 3 minutes for color to develop you need not wait the entire 3 minutes before assessing the color.* - *Holding the sample container up against a blank piece of white paper and/or comparing the sample with reagent to a sample without reagent is often helpful in determining whether color is present.* • If a pink or red color is not immediately obvious after 3 minutes, you cannot conclude the sample is free of chlorine residual until it is analyzed in the colorimeter.
6. Colorimeter Analysis	• To obtain a total chlorine reading, refer to manufacturer instructions for the colorimeter used. • If chlorine is detected above the detection limit or required regulatory limit, dechlorination BMPs must be adjusted.
7. Cleanup	• The sample (with or without reagent) may be disposed of in the flow stream. • Rinse sample container(s) with clean water (if available), wipe or shake off excess water and store appropriately. • Store the DPD Powder-Pop Dispenser in a dry area. The reagent will tend to cake if it becomes moist and the dispenser rendered unusable. • Storage inside a dry plastic bag is recommended.

Example 2
Dechlorination: Using Mats / Strips and Tablets

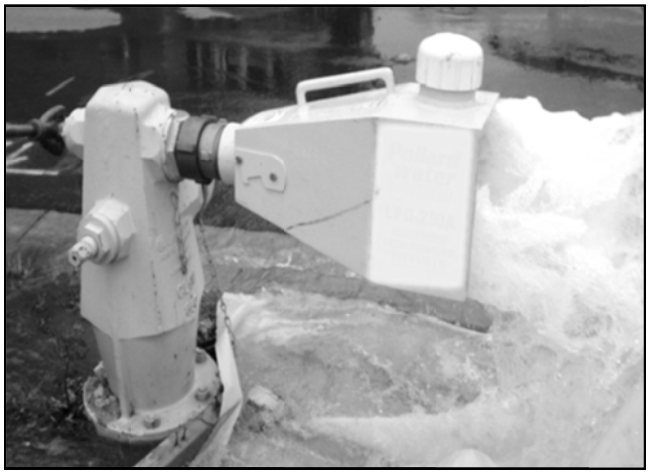
Appropriate Applications	▪ Pipeline flushing/dewatering ▪ Pipeline disinfection ▪ Pipeline leaks ▪ Fire hydrants flow testing ▪ Hydrostatic and meter testing ▪ Well maintenance and monitoring/sampling ▪ Water quality testing ▪ Construction dewatering ▪ Tank and reservoir maintenance and/or monitoring
Limitations	If the discharge contains other potential contaminants, very high flow volumes/rates, or very high chlorine residual (e.g., super chlorinated water), additional BMPs may be needed.

Task	Procedure
1. Add tablets to dechlor mat/strip	• Place one tablet in each pocket of the dechlor mat (3' x 4') or strip (6" x 36"). If a pocket contains a partially-used tablet, add another tablet only if there is room. Example dechlor strip: 
2. Place dechlor mat/ strip in flow path	• Place the dechlor mat or strip perpendicularly across the flow path downstream of sediment control devices (e.g., gravel bags). • If the flow path is wider than the dechlor mat /strip, or there is more than one flow path (flow is spreading out in more than one direction), use additional mats to ensure all water from the source is crossing a mat. • If the flow is deep (more than 1" above the top of the dechlor mat) and/or the flowrate is very high (>300 GPM), a second mat should be placed downstream of the first mat to ensure adequate dechlorination.
3. Monitor	• Check chlorine residual from a downstream sample to ensure adequate dechlorination is taking place. Modify as necessary. • Document chlorine residual readings as necessary. • Inspect dechlor mats /strips periodically to ensure some tablet remains in each pocket and that all flow is crossing at least one mat / strip.

4. Clean up	• When discharge is complete, move the dechlor mats /strips to the upstream side of storm drain(s) the discharge will enter during cleanup. • Clean the flow path to remove tablet residual, ensuring that the flow enters the storm drain(s) where the dechlor mats / strips are located. If the flow path separates and some flow travels to a different storm drain, a dechlor mat/strip should be installed at that location as well. • Retreive the dechlor mats / strips and store in a secondary container on the field vehicle.

Example 3
Dechlorination: Using Hydrants Diffuser with Dechlorination Tablets

Appropriate Applications	▪ Pipeline flushing/dewatering ▪ Pipeline disinfection ▪ Fire hydrants flow testing ▪ Hydrostatic and meter testing ▪ Well maintenance and monitoring/sampling ▪ Water quality testing ▪ Construction dewatering ▪ Tank and reservoir maintenance and/or monitoring
Limitations	If the discharge contains other potential contaminants, very high flow volumes/rates, or very high chlorine residual (e.g., super chlorinated water), additional BMPs may be needed.

Task	Procedure
1. Fill diffuser with tablets	• If using a flow diffuser outfitted with a cylindrical tablet chamber: - Fill the chamber with dechlorination tablets. - If the chamber is partially filled with partially used tablets, add as many new tablets as will fit while still allowing the cap to be screwed back on. • If using a flow diffuser with a dechlor mat attached to the face of the diffuser: - Put one tablet in each pocket and close the snap on each pocket. - If a pocket contains a partially-used tablet, only add another tablet if there is room.
2. Install diffuser	• Screw the diffuser to the hydrant, fire hose or blowoff as you normally would. Example hydrant diffuser set-up:  
3. Monitor	• Check chlorine residual from a downstream sample to ensure adequate dechlorination is taking place. Modify as necessary.

	• Document chlorine residual readings as necessary. • Periodically check the supply of tablets in the tablet chamber or mesh pockets to ensure that there is tablet remaining throughout the discharge.
4. Cleanup	• Remove the diffuser from the hydrant, fire hose or blowoff as you normally would.

Example 4
Dechlorination: Using Liquid Drip Tank

Appropriate Applications	▪ Pipeline flushing/dewatering ▪ Pipeline disinfection ▪ Fire hydrants flow testing ▪ Hydrostatic and meter testing ▪ Well maintenance and monitoring/sampling ▪ Water quality testing ▪ Construction dewatering ▪ Tank and reservoir maintenance and/or monitoring
Limitations	If the discharge contains other potential contaminants or very high flow volumes/rates, additional BMPs may needed.

Task	Procedure
1. Prepare Dechlor Solution	• A 10% sodium thiosulfate solution can be prepared by mixing 6.0 lb of dry sodium thiosulfate in 5.0 gallons of water in a drip tank (carboy with spigot). • When preparing the solution, be sure to use proper PPE. • It is recommended that a label is placed on the drip tank indicating the contents inside and the date it was prepared.
2. Place Drip Tank in flow path.	• Set the drip tank in or near the flow path of the discharge, at a location as far upstream from the storm drain as possible, preferable at a point of turbulence. • Open the drip tank lid to allow air to enter the tank. • Open the drip tank valve to produce a steady drip into the discharged water.
3. Monitor	• Collect a sample approximately 10 feet downstream of the drip tank, to allow sufficient contact time, and analyze for chlorine residual. If residual is detected, adjust application rate and retest. • Document chlorine residual readings as necessary. • Periodically check the drip tank to ensure adequate application rates throughout the discharge.
4. Cleanup	• When discharge is complete, retrieve the drip tank.

Example 5 Dechlorination: Disposal of Tablet and Reagent Waste	
Shelf Life of Tablets	Tablets have a relatively long shelf life unless exposed to high temperatures (>85°F). At higher temperatures, tablets may crumble. During the summer months, crews may need to place enough tablets for daily use in coolers for storage on trucks at the beginning of each work day. Supply buckets stored in the yard must be kept in a cool location.
Disposal of Powdered Tablet Waste	As long as tablets are in large enough pieces to be retained within the mesh dechlor mat, diffuser chamber or diffuser mesh pockets, they can be used for dechlorination per the recommended procedures. Small amounts of powdery or granular tablet waste from tablet supply buckets or secondary containers should be mixed with water and discharged to the sanitary sewer via a utility sink.
Disposal of Contaminated Tablets	Please see SDS for guidance on proper disposal methods or consult with your Environmental Compliance Coordinator.
Disposal of Unused DPD Reagent	Empty DPD reagent dispensers may be disposed of in the regular trash. DPD reagent dispensers that can no longer be used but still contain reagent (i.e., the reagent powdered has become solidified) should be stored in hazardous waste storage areas for pick up by hazardous waste disposal contractors.
Disposal of Dechlorination Solution	Small amounts of 10% sodium thiosulfate Solution from Drip Tanks should be diluted with water and discharged to the sanitary sewer via a utility sink.

Example 6 – Erosion & Sediment Control: Using Filters & Dams

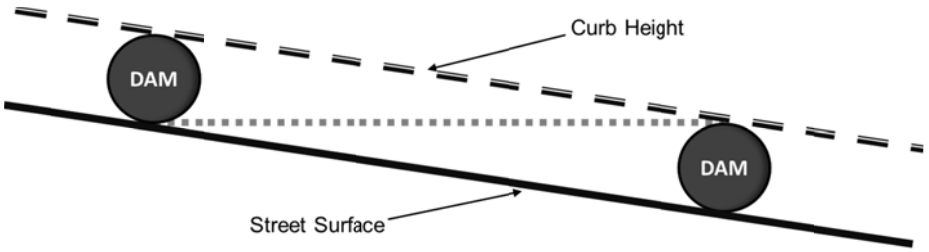
Appropriate Applications	Planned ▪ Pipeline flushing/dewatering ▪ Pipeline disinfection ▪ Fire hydrant flow testing ▪ Hydrostatic and meter testing ▪ Well maintenance and monitoring/sampling ▪ Water quality testing ▪ Tank and reservoir maintenance and/or monitoring Unplanned ▪ Sheared fire hydrants ▪ Broken water mains ▪ System leaks
Limitations	▪ If the discharge has high flow rates and/or volumes, additional BMPs may be needed (i.e. Baker tanks, settling ponds) to prevent potential erosion. ▪ If the discharge contains other naturally occurring or man-made contaminants, other treatment BMPs may need to be implemented.

Task	Procedure
1. Evaluate site conditions	• Stop or limit the discharge if possible. For unplanned main break repairs, isolate the main or service line prior to additional excavation if possible. • Evaluate the anticipated release area, water volume, and flow path. Select appropriate BMP based on whether discharge flows over paved or unpaved areas. For discharges to paved streets, ensure that control devices fit properly for receiving system (i.e. curb inlet, drop inlet, culvert, creek, etc.) • Locate denuded or exposed areas that may be especially susceptible to erosion. If possible, divert the discharge flow path away from the erosion prone areas and/or use additional wattles as necessary to protect bare soil. Where feasible, divert flows to well vegetated areas where erosion is not a concern. • For high flow rate discharges, conduct water quality testing to determine if additional control measures are necessary.
2. Clear path for discharge	• Remove debris from discharge flow path to the extent possible. Use broom to sweep up gutters and remove loose material. • Check nearest storm drain to make sure it is not clogged. For planned discharges, clogged storm drains can be reported to flood control, city maintenance or other appropriate agency. • For planned discharges, it may be possible to coordinate discharge event with the street sweeping schedule.
3. Place sediment control devices in flow path	• Place bags to form dams perpendicularly across the flow path and curb with the end of the dam (furthest from curb) curving slightly upstream. Dam height, length, the number of bags used and the interval between dams will vary depending upon site conditions and the resources available. It is recognized that there will be some circumstances where steep topography and/or high flow rates

will preclude effective sediment removal using any of the current technologies.

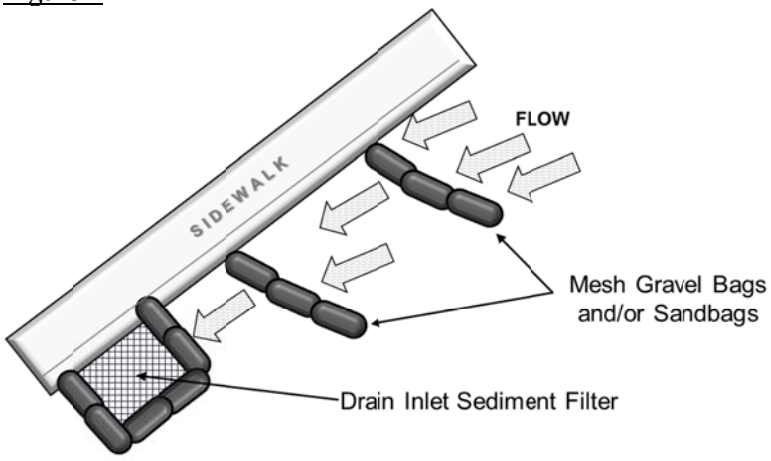
- The following criteria should be used to determine bag placement:
  - Dam Height - The height of each dam should be slightly less than the height of the curb or other retaining structure that is acting to channel the flow. If the dam is equal to or higher than the curb, flow will be diverted onto the sidewalk and cause flooding.
  - Dam Length - The longer the dam, the greater the ponding area and the better the retention of sediment. However, dam length is limited by the number of bags available, traffic flow considerations and potential for flooding of property. Bags and ponded water should not extend outside of coned areas into traffic lanes or onto private property.
  - Number of Dams & Distance Between Dams – In general, the greater the number of dam locations between the discharge source and entry into storm drains or receiving waters, the greater the retention of sediment. A minimum of two dams should be used in all cases. The interval between dams must shorten as the ground surface gradient (slope) increases to maintain equivalent sediment removal rates. The rule of thumb for dam spacing is to place dams at intervals such that the elevation of the top of the downstream dam is equal to the elevation of the bottom of the dam immediately upstream (see Figure 1 below).

Figure 1



- Dams should also be installed around drain inlets (DIs) affected by the water flow and a filter used over the DI to help contain sediment flowing into the DI. All impacted DIs should have BMPs implemented within reason. A dam and filter should be built around and over the first DI impacted by the flow.

Figure 2



	• For unplanned discharges, the storm drain system may be clogged resulting in water flowing to downstream DIs. Sediment control equipment must be used to contain flow within reasonable conditions.
4. Monitor	• Check the dams periodically to ensure they are staying in place and performing their function. Modify as necessary. • If sediment build-up approaches the top of the dam, remove sediment when flow has temporarily ceased and an opportunity occurs. Do not attempt to remove sediment during discharge. • Document flow volumes, other measurements and observations as necessary.
5. Site Clean-up	• When the discharge is complete, allow water ponded behind the dams to drain. Be sure storm drain inlets remain protected. • Shovel as much sediment as possible into a backhoe bucket or container. If available, a vacuum truck may be utilized for sediment clean-up. • Clean the flow path to remove residual sediment from the street. If clean-up water is available: o Remove upstream dams, ensuring one dam remains at the point where cleanup discharge water will enter the DI or receiving water. o Spray down sediments to the last dam. o Shovel and/or sweep sediments accumulated behind the last dam. If clean-up water is not available, residual sediment should be swept up with a broom or by using another method. • Retrieve all dam and filter material and store in appropriate location. • Soil may be temporarily stockpiled in the vicinity of the work for a few days. If the soil must remain at the location for an extended period of time, additional protections such as tarps or berms should be employed to contain the soil.
6. Disposal	• The sediment may be 1) spread out on an unpaved surface locally, if an appropriate location exists, 2) transported to an approved facility and deposited on an appropriate unpaved surface, if an appropriate location exists, 3) added to a spoils collection stockpile for disposed at an approved landfill. • Non-sediment debris, such as trash, must be disposed of in a dumpster or garbage can.

Example 7
Erosion and Sediment Control: Using a Portable Storage Tank

Appropriate Applications	Planned activities with a discharge flow rate, duration and/or volume that cannot be effectively managed by filters and dams. Examples may include: • Well development • Reservoir/tank cleaning
Limitations	• This procedure requires prior planning and is not appropriate for unplanned discharges. • Baker Tanks may be difficult to stage when space is limited. Multiple tanks may be necessary to capture large volumes. • Drowning hazard exists, particularly if tanks are used in an unsecured public location.

Task	Procedure
1. Evaluate discharge	• Estimate volume and rate of discharge. Ensure the portable storage tank system has the capacity to accommodate inflow and has a drainage rate that allows sufficient settling of sediment. • Determine if additional screening material is needed to filter out fine sediments. Fit storage tanks with screening material as necessary.
2. Set-up	• Configure tank(s) without impeding public right-of-ways.
3. Monitor	• Conduct water quality testing to determine if additional control measures are needed. On-site treatment equipment may need to allow for removal of man-made and naturally occurring pollutants. • Allow sediments to settle out • Sediments may need to be periodically removed to retain holding capacity
4. Clean up and disposal	• The sediment may be 1) spread out on an appropriate unpaved ground locally, if an appropriate location exists, 2) transported to a utility facility and deposited on an appropriate unpaved surface, if an appropriate location exists, 3) added to open trench spoils bins, or disposed of in a dumpster. Non-sediment debris, such as trash, must be disposed of in a dumpster or garbage can. • Additional arrangements for disposal of collected material in Baker tanks may be necessary.

Appendix B
Informational Resources and References

GENERAL RESOURCES ON-LINE

California Stormwater Quality Association (CASQA)
- Homepage: www.casqa.org
- BMP Handbooks: www.cabmphandbooks.com

U.S. Environmental Protection Agency
- NPDES Stormwater Home Page http://cfpub.epa.gov/npdes/home.cfm?program_id=6
- Storm Water Discharges from Municipal Separate Storm Sewer Systems (MS4s): http://cfpub.epa.gov/npdes/stormwater/munic.cfm
- Stormwater Link Categories: http://cfpub.epa.gov/npdes/links.cfm?program_id=6
- National Menu of Best Management Practices for Stormwater Phase II: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm

Water Research Foundation (formerly AWWARF):
- Guidance Manual for Disposal of Chlorinated Water: www.vita-d-chlor.com/specs/AWWARFDechlorGuides.htm and www.waterrf.org/Pages/Projects.aspx?PID=2513 (Subscription Required)

CALIFORNIA REGULATORY RESOURCES ON-LINE

California State Water Resources Control Board
- Homepage: www.waterboards.ca.gov
- Storm Water Program: www.waterboards.ca.gov/water_issues/programs/stormwater

Central Coast (San Luis Obispo) Regional Water Quality Control Board (Region 3)
- Homepage: www.waterboards.ca.gov/centralcoast
- Storm Water Program with links to municipal MS4 permits: www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater
- General NPDES Permit for Discharges with Low Threat to Water Quality (R3-2011-0223): www.waterboards.ca.gov/centralcoast/board_decisions/adopted_orders/2011/2011_0223_order.pdf
- Adopted Orders, Permits, Resolutions, and Settlements: www.waterboards.ca.gov/centralcoast/board_decisions/adopted_orders/index.shtml

Central Valley Regional Water Quality Control Board (Region 5)
- Homepage: http://www.waterboards.ca.gov/centralvalley
- Waste Discharges to Surface Water - NPDES Program: www.waterboards.ca.gov/centralvalley/water_issues/waste_to_surface_water/index.shtml
- Waste Discharge Requirements/NPDES Permit for Dewatering and Other Low Threat Discharges to Surface Waters:

www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0074.pdf

- Waste Discharge Requirements/NPDES Permit for Limited Threat Discharges of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Super chlorination Projects, and Other Limited Threat Wastewaters to Surface Waters: www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0073.pdf
- Storm Water: www.waterboards.ca.gov/centralvalley/water_issues/storm_water/index.shtml
- MS4 Permits (East Contra Costa County, Sacramento County, City of Stockton/San Joaquin, Port of Stockton, City of Modesto, Fresno County, City of Bakersfield, and small regional municipalities): www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits

Colorado River Basin Regional Water Quality Control Board (Region 7)

- Homepage: www.waterboards.ca.gov/coloradoriver
- NPDES Program: www.waterboards.ca.gov/coloradoriver/water_issues/programs/npdes
- Storm Water: www.waterboards.ca.gov/coloradoriver/water_issues/programs/stormwater
- Regional MS4 Permit: www.waterboards.ca.gov/coloradoriver/board_decisions/adopted_orders/orders/2008/08_0001ms4_permit.pdf

Lahontan Regional Water Quality Control Board (Region 6)

- Homepage: www.waterboards.ca.gov/lahontan
- Storm Water: www.waterboards.ca.gov/lahontan/water_issues/programs/storm_water/index.shtml
- Lake Tahoe Municipal NPDES Permit (El Dorado County, Placer County, City of South Lake Tahoe): www.waterboards.ca.gov/lahontan/board_decisions/adopted_orders/2011/docs/r6t_2011_101a1.pdf
- BMP Planning Guidance: www.waterboards.ca.gov/lahontan/water_issues/programs/storm_water/storm_water_planning_guidance.shtml

Los Angeles Regional Water Quality Control Board (Region 4)

- Homepage: www.waterboards.ca.gov/losangeles
- Storm Water: www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater
- Municipal Permits for (1) County of Los Angeles, (2) County of Ventura, (3) City of Long Beach: www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/index.shtml
- Standard Urban Storm Water Mitigation Plan (SUSMP): www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/index.shtml

- General NPDES Permits, including (1) Discharges of Low Threat Hydrostatic Test Water to Surface Waters and (2) Discharges of Groundwater from Potable Water Supply Wells to Surface Water www.waterboards.ca.gov/losangeles/board_decisions/adopted_orders

North Coast Regional Water Quality Control Board (Region 1)

- Homepage: www.waterboards.ca.gov/northcoast
- NPDES Stormwater: www.waterboards.ca.gov/northcoast/water_issues/programs/npdes_stormwater.shtml
- Regional Permits: Search Order Type = NPDES Permits: www.waterboards.ca.gov/northcoast/board_decisions

San Diego Regional Water Quality Control Board (Region 9)

- Homepage: www.waterboards.ca.gov/sandiego
- Storm Water with links to Regional MS4 Permit and Municipal Stormwater Permits for San Diego, Orange County, and Riverside County): www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml
- General NPDES Permits, including (1) Discharges of Hydrostatic Test Water and Potable Water to Surface Waters and Storm Drains or other Conveyance Systems, (2) Discharges From Utility Vaults And Underground Structures To Surface Waters, (3) Groundwater Extraction And Similar Discharges To Surface Waters Within The San Diego Region Except For San Diego Bay, and (4) Discharges From Temporary Groundwater Extraction And Similar Waste Discharges To San Diego Bay, Tributaries Thereto Under Tidal Influence, and Storm Drains or Other Conveyance Systems Tributary Thereto: www.waterboards.ca.gov/sandiego/water_issues/programs/regulatory/index.shtml

San Francisco Regional Water Quality Control Board (Region 2)

- Homepage: www.waterboards.ca.gov/sanfranciscobay
- Municipal Stormwater Program: www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/stormwater/Municipal/index.shtml
- Municipal Regional Permit (MRP): www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/stormwater/mrp.shtml
- General NPDES Permits, including (1) Discharges from Surface Water Treatment Facilities for Potable Supply and (2) Discharge or Reuse of Extracted Brackish Groundwater, Reverse Osmosis Concentrate Resulting from Treated Brackish Groundwater (Desalination): www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/general_permits.shtml

Santa Ana Regional Water Quality Control Board (Region 8)

- Homepage: www.waterboards.ca.gov/santaana
- Storm Water Unit with links to Municipal NPDES Permits for Orange County, Riverside County, San Bernardino County, plus: www.waterboards.ca.gov/santaana/water_issues/programs/stormwater
- Adopted Orders and Resolution: www.waterboards.ca.gov/santaana/board_decisions/adopted_orders

NEVADA REGULATORY RESOURCES ON-LINE

Clark County Regional Flood Control District

- Stormwater Quality Management Committee Homepage: www.lvstormwater.com
- NPDES Permits: http://gustfront.ccrfcd.org/FileLibrary2/FileLibrary.aspx

City Of Reno

- Regional Stormwater Quality Management Program: www.reno.gov/index.aspx?page=366
- Truckee Meadows Regional Storm Water Quality Management Program Storm Water Management Program (SWMP): www.reno.gov/Modules/ShowDocument.aspx?documentid=33578

Nevada Division of Environmental Protection (NDEP)

- http://ndep.nv.gov/bwpc/storm01.htm

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