Storm Water Resource Plan

Guidelines

Revised November 16, 2015

STATE WATER RESOURCES CONTROL BOARD

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

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Foreword

Traditional approaches to storm water management have focused on implementation of management practices and limited treatment prior to conveyance off-site and ultimately into surface waters. The municipal separate storm sewer systems (MS4s), combined sewer systems, and flood control infrastructure used for this purpose is successful in terms of flood control and some degree of treatment; however these traditional approaches do not fully address the water quality impacts from storm water discharges while providing multiple benefits such as water supply augmentation and ecological enhancement of the local watershed. In general, the transport of storm water from the location of rainfall via constructed municipal storm drain systems (pipelines, reinforced channels, outfalls, etc.) has caused downstream hydromodification and destabilization of surface water bodies, and has impacted beneficial uses of those receiving waters.

More recent watershed-based approaches to storm water management seek to replicate natural hydrology and watershed processes by managing storm water and dry weather runoff onsite or within the watershed where rainfall occurs. These watershed-based approaches yield multiple water quality benefits by reducing the volume of runoff delivered to receiving waters, thus reducing the pollutants discharged. Watershed-based approaches to storm water management also yield non-measurable social and community benefits that traditional projects do not provide. The watershed approach to storm water management is in accordance with recent regulatory compliance approaches implemented by the Regional Water Quality Control Boards, and the State Water Resources Control Board's (State Water Board's) guiding principles that view storm water and dry weather runoff as a resource, potentially contributing to the following benefits in addition to flood control:

- Supply of fresh water to surface water bodies to enhance stream flows (that are hydrologically-connected to groundwater aquifers) and to sustain aquatic life and wildlife habitats;
- Recharge of groundwater aquifers through pervious urban or agricultural areas to support sustainable groundwater levels and increase local water supplies;
- Supply of fresh water to increase recreational uses including hunting, swimming, fishing, and boating;
- Augmentation of water supplies through rainwater harvesting and/or recharge;
- Elimination or minimization of erosion and/or destabilized land; and
- Minimization of hydromodification (unnatural alteration of natural drainage features) of streams, rivers, wetlands, and lakes.

The nature and water quality impacts of storm water discharges vary from region to region; therefore, municipalities and other participating stakeholders may identify ways to tailor watershed storm water management measures to best address site-specific watershed conditions while complying with regulatory requirements to control storm water discharges. The State Water Board's objective for the adoption of these Guidelines is to provide baseline requirements for watershed-based (or sub-watershed-based) Storm Water Resource Plans required as a condition of receiving funding of storm water and dry weather runoff capture projects funded partially or entirely with state funds. The guidance provided in these Guidelines applies to the development of the Storm Water Resource Plans and is not necessarily to be applied to individual projects within those Plans.

Acronyms and Key Words

Guidelines	Storm Water Resource Plan Guidelines
IRWM	Integrated Regional Water Management
IRWMP	Integrated Regional Water Management Plan
MS4	Municipal separate storm sewer system
NPDES	National Pollutant Discharge Elimination System
Plan	Storm Water Resource Plan
Regional Water Board	Regional Water Quality Control Board
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
U.S. EPA	United States Environmental Protection Agency
USGS	United State Geological Survey

Definitions

303(d) List – refers to section 303(d) of the Clean Water Act (CWA) that requires each state to periodically submit a list of impaired water to the U.S. EPA. Impaired waters are identified and listed surface water bodies that do not comply with established water quality standards for one or more constituent/parameter. Once the impaired waters are identified and placed on the adopted 303(d) list, section 303(d) requires that the state establish total maximum daily loads (TMDLS) that provide waste load allocations and load allocations for the listed water body's compliance with water quality standards.

85th Percentile 24-hour Storm Event - the 85th percentile rainfall event is the event whose precipitation total is greater than or equal to 85 percent of all 24-hour storms on an annual basis. The 85th percentile 24-hour storm measure is based on local precipitation data within the watershed and differs geographically.

Basin Plan – a Water Quality Control Plan adopted by a Regional Water Board that identifies: (1) beneficial uses to be protected; (2) water quality objectives for the reasonable protection of beneficial uses; and (3) a program of implementation for achieving the water quality objectives as established by the State or Regional Water Boards.

Beneficial Uses - the uses of a water body (streams, lakes, rivers, and other water bodies) that support human health, aquatic life and wildlife. Beneficial uses of a water body are identified in a Basin Plan. The applicable Basin Plan and/or water quality control plans set forth narrative and numeric water quality objectives to protect the beneficial uses. Example of common beneficial uses include: domestic use, municipal use, fish and wildlife preservation and enhancement, aquaculture, recreational use, water quality use, stockwatering, irrigation, frost protection, heat control, power use, mining use, and industrial use.

Best Management Practices (BMPs) – practices that have been proven to manage storm water and dry weather runoff. Guidance for design, construction and implementation of best management practices is available through guidance documents provided by municipalities and/or professional associations such as the California Stormwater Quality Association (CASQA) BMP Handbooks (Industrial & Commercial BMP Handbook, Municipal BMP Handbook, New Development & Redevelopment BMP Handbook, and BMP Handbook Training) located at https://www.casqa.org/resources/bmp-handbooks. Additional information and guidance is available on the International Stormwater BMP Database website at: http://www.bmpdatabase.org/.

Clean Water Act – the Clean Water Act was enacted as an amendment to the federal Water Pollution Control Act of 1972, which outlined the basic structure for regulating discharges of pollutants to waters of the United States. The Clean Water Act serves as the primary federal law protecting the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands.

Combined Sewer System – sewers that are designed to collect storm water and dry weather runoff, domestic sewage, and industrial wastewater in the same pipe.

Community – a population of persons residing in the same locality under the same local governance.

Disadvantaged Community – a community with a median household income less than 80 percent of the statewide average (PRC § 75005[g]).

Dry Weather Runoff - surface water runoff and flow in storm drains, flood control channels, or other means of runoff conveyance produced by non-storm water resulting from irrigation, residential, commercial, and industrial activities.

Geographic Information System (GIS) – a database system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographic data.

Green Infrastructure - site-specific practices and infrastructure that mimic storm water management from natural hydrology and reduces effective imperviousness. Examples of green infrastructure include green street medians, green roofs, and porous/pervious pavement.

Groundwater - subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated. Where groundwater occurs in a saturated geologic unit that contains sufficient permeable thickness to yield significant quantities of water to wells and springs may be defined as an aquifer. A groundwater basin is defined as a hydrogeologic unit containing one large aquifer or several connected and interrelated aquifers.

Groundwater Recharge - the augmentation of groundwater by natural or artificial means.

Impaired Water Body – surface waters identified and assessed by a State and Regional Water Board as impaired due to non-compliance with water quality objectives and potential impact on designated beneficial uses after application of technology-based controls. Further information on the 303(d) list of impaired water bodies compiled by the State Water Resources Control Board pursuant to section 303(d) of the Clean Water Act (CWA) is located at the following website: http://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/.

Integrated Regional Water Management Plan – an integrated regional water management plan is a plan that describes the major water-related objectives and conflicts within a region. The plan: (1) considers a broad variety of water management strategies, (2) identifies water demand and supply management alternatives, water quality protections, and environmental stewardship actions to provide long-term, reliable, and high-quality water supply while protecting the environment. An integrated regional water management plan identifies disadvantaged communities in the region and takes the water-related needs of those communities into consideration.

Low Impact Development – a storm water management strategy aimed at maintaining or restoring the natural hydrologic functions of a site or project to achieve natural resource protection objectives and fulfill environmental regulatory requirements; low impact development employs a variety of natural and constructed features that reduce the rate of runoff, filter pollutants out of runoff, facilitate the infiltration of water into the ground and replenishment of local natural surface water systems, and/or allow for on-site storage of water for a beneficial use.

Multi-Benefit / Multiple Benefit Projects – storm water and dry weather runoff capture projects that provide more than one of the following benefits or meet more than one of the following objectives:

- Creates and restores wetlands (Wat. Code, § 10561(g))
- Riverside [riparian] habitats (Wat. Code, § 10561(g))
- Instream flows (Wat. Code, § 10561(g))
- Increase in park and recreation lands (Wat. Code, § 10561(g))
- Urban green space (Wat. Code, § 10561(g))
- Augments recreation opportunities for communities (Wat. Code, § 10561(h))
- Increases tree canopy (Wat. Code, § 10561(h))
- Reduces heat island effect (Wat. Code, § 10561(h))
- Improves air quality (Wat. Code, § 10561(h)
- Maximizes water quality (Wat. Code, § 10562(b)(2))
- Maximizes water supply (Wat. Code, § 10562(b)(2))
- Maximizes flood management (Wat. Code, § 10562(b)(2))
- Maximizes environmental benefits (Wat. Code, § 10562(b)(2))
- Maximizes other community benefits (Wat. Code, § 10562(b)(2))

National Pollutant Discharge Elimination System (NPDES) Permit Program – a federal regulatory permitting program administered to control water pollution from regulated point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. The United States Environmental Protection Agency has authorized the State and Regional Water Boards to administer the federal NPDES permit program in California.

Project – includes “project type” and consists of an entire set or group of opportunities, programs, actions or activities (including structural and non-structural implementation of management measures and practices).

Public Agency – a state agency or department, special district, joint powers authority, city, county, city and county, or other political subdivision of the state. An entity or entities that act on behalf of a public agency is considered a public agency for the purpose of these Guidelines.

Rain Water – precipitation on any public or private parcel that has not entered an offsite storm drain system or channel, a flood control channel, or any other stream channel, and has not previously been placed to a beneficial use.

Safe Drinking Water Act – Federal law that ensures drinking water quality by establishing standards for drinking water quality and oversight of the states, localities, and water suppliers who implement those standards. The Safe Drinking Water Act was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells. (The Safe Drinking Water Act does not regulate private wells which serve fewer than 25 individuals.)

Small Disadvantaged Community – a community with a population of 20,000 persons or less with a median household income less than 80 percent of the statewide average (PRC § 75005[g]).

Stakeholder – an individual, group, coalition, agency, or other entity that is involved in, affected by, or has an interest in the implementation of a specific program or project.

Storm Water – temporary surface water runoff and drainage generated by immediately preceding storms.

Storm Water and Dry Weather Runoff Capture – to intercept, store, manage, and use storm water and dry weather runoff, thereby reducing the volume of runoff exiting a site.

Structural Control - often associated with low impact development, structural control measures are designed and sized to achieve a specific numeric storm water control performance (e.g., storm water capture, water quality treatment, etc.). Examples include, but are not limited to: bioretention areas, pervious pavements, green roofs, cisterns, and storm water infiltration basins.

Sustainable - resources used at a rate that maintains long-term replenishment.

Total Maximum Daily Load (TMDL) – a written plan that describes how an impaired water body will meet water quality standards. A TMDL contains: (1) a measurable feature to describe attainment of the water quality standard(s); (2) a description of required actions to remove the impairment; and, (3) an allocation of responsibility among dischargers to act, either in the form of actions or through the establishment of water quality conditions for which each discharger is responsible. A TMDL must be adopted by both the applicable Regional Water Board and the State Water Board, and approved by the Office of Administrative Law. TMDLs developed by and subsequently adopted by the U.S. EPA shall be considered as an adopted and approved TMDL for purposes of these Guidelines.

Waste Discharge Requirements – requirements that are adopted by the State Water Resources Control Board or Regional Water Quality Control Boards to protect the beneficial uses of the waters of the state.

Water Supply – supply of water for beneficial uses that include, but are not limited to, municipal and domestic supply, stream flow, aquatic life and wildlife, agricultural irrigation and non-potable water uses.

Water Quality Control Plan – a plan adopted by a State or Regional Water Board, and approved by the U.S. Environmental Protection Agency, that identifies: (1) beneficial uses to be protected; (2) water quality objectives for the reasonable protection of beneficial uses; and (3) a program of implementation for achieving the water quality objectives as established by the State or Regional Water Boards.

Water Quality Objectives – state-adopted regulatory criteria for water quality elements or biological characteristics to reasonably protect the beneficial uses of water. Water quality objectives may be numeric or narrative. Under the Porter-Cologne Water Quality Control Act (Porter-Cologne), the State Water Board and Regional Water Boards have primary responsibility for the coordination and control of water quality, including the authority to implement the Clean Water Act. Porter-Cologne (§ 13240) directs the Water Boards to set water quality objectives through adoption of Water Quality Control Basin Plans that conform to all state policies for water quality control.

Water Quality Standards - state-adopted and U.S. EPA-approved ambient standards for water bodies that prescribe the use of the water body and establish the water quality criteria that must be met to protect these uses. The three components of water quality standards include: the beneficial designated use or uses of a water body (for example, drinking water supply, direct/indirect contact, and aquatic life support), the numerical and narrative water-quality criteria that are necessary to protect the use or uses of that particular water body, and antidegradation provisions. The federal Clean Water Act (CWA) is the primary federal water pollution control regulation. The State Water Board is designated as the State Water Pollution Control Agency for all purposes under the CWA.

Wetlands - areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

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Section I: Purpose

The purpose of the Storm Water Resource Plan Guidelines (Guidelines) is to establish guidance for public agencies for the development of Storm Water Resource Plans consistent with Water Code sections 10560 et seq. (as amended by Senate Bill 985, Stats. 2014, ch. 555, § 5).[1] Water Code section 10563, subdivision (c)(1), requires a Storm Water Resource Plan (Plan) as a condition of receiving funds for storm water and dry weather runoff capture projects from any bond approved by voters after January 2014. This requirement applies to Proposition 1, the water bond measure approved by voters in November 2014, which authorized $200 million in grants for multi-benefit storm water management projects.

These Guidelines are set forth in accordance with Water Code section 10565, which requires the State Water Board to establish guidance for the development of Storm Water Resources Plans. A watershed-based Storm Water Resource Plan must comply with the relevant Water Code provisions enacted by SB 985, in order for individual storm water and dry weather runoff capture projects in the Plan to be eligible for bond funds. A Plan meeting the provisions of the Water Code need not be referred to as a "Storm Water Resource Plan." Existing planning documents and local ordinances may be utilized as a functionally equivalent Plan, including but not limited to: watershed management plans,[2] integrated resource plans, urban water management plans, green infrastructure plans,[3] water quality improvement plans,[4] salt and nutrient management plans, total maximum daily load (TMDL) implementation plans, or similar plans that include storm water and dry weather runoff capture and use as a component of the watershed goals and objectives. The watershed approach is essential to integrate storm water management with other basic aspects of aquatic resource protection and overall water management including flood control, water supply, and habitat conservation. If an individual planning document does not meet the standards of the Water Code, a collection of local plans and ordinances and regional plans may constitute a functional equivalent, if the plans and ordinances collectively meet all of the requirements of Water Code section 10560 et seq. (see Checklist and Self-Certification in Appendix A).

These Guidelines serve as a guide for the State Water Board and other bond fund-dispensing agencies to use in determining whether an adequate Storm Water Resource Plan has been prepared prior to the granting of funds for storm water and dry weather runoff capture projects. These Guidelines will not result in a direct or indirect physical change in the environment, and do not serve as a commitment to any specific project. (Cal. Code of Regs, tit. 14, § 15378(b)(4).)

Section II: Introduction and Background

Until recent years, the State Water Board and Regional Water Quality Control Board (Regional Water Board) National Pollutant Discharge Elimination System (NPDES) permitting program for municipal separate storm sewer systems (MS4s) has historically focused requirements for storm water and dry weather runoff capture and use on new development and significant

[1] General references in these Guidelines to "Water Code requirements" are to the requirements laid out in Water Code sections 10561 through 10565 as those sections were amended by SB 985.
[2] This may encompass Watershed Management Programs and Enhanced Watershed Management Programs as set forth in the LA County and City of Long Beach MS4 Permits (Order Nos. R4-21012-0175 and R4-2014-0024).
[3] This may encompass Green Infrastructure Planning and Implementation as set forth in the San Francisco Bay Area Municipal Regional Permit (Order R2-2015-XXXX, NPDES Permit No. CAS612008).
[4] This may encompass Water Quality Improvement Plans as set forth in the San Diego Regional Water Quality Control Board Permit (Order R9-2013-0001, NPDES No. CAS010266, as amended by Order R9-2015-0100).

redevelopment, rather than on modifications to existing landscapes to increase storm water and dry weather runoff capture and use. Watershed-based planning and implementation efforts to retrofit the existing developed landscapes with green infrastructure are needed to restore storm water and dry weather runoff infiltration capacity that was previously overlooked in existing traditional storm water management infrastructure and practices. Existing technologies and engineering approaches, coupled with the use of the natural physical and biological functions of soils and plants, allow concurrent capture, treatment and use of storm water and dry weather runoff, and provide cost-effective approaches to achieving healthy watersheds and other positive environmental outcomes. Individual projects within a watershed can range from small retrofits such as standardized parkway curb cuts and tree wells in public rights-of-way, to creation of constructed natural wetlands and/or installation of underground vaults that store and infiltrate or use the captured runoff. Increasing storm water and dry weather runoff capture and infiltration restores lost watershed processes and provides multiple tangible and intangible benefits, including but not limited to: improved water supply sustainability, increased groundwater supplies, increased base-flow in creeks, increased riparian tree canopy providing a cooling effect on the earth's surface, reduced greenhouse gas emissions inherent in water transport and treatment, reduced local flooding, reduced pollutant loads discharged to surface waters, restored native habitat, and increased recreational and green space.

Many recent MS4 permits include requirements for low impact development and green infrastructure through watershed-based implementation that contribute to storm water and dry weather runoff capture and infiltration of drainage areas beyond the development site. Watershed-based storm water management offers an effective approach to complying with MS4 permit requirements. Regional Water Boards are starting to allow alternative permit compliance pathways that emphasize more wide-scale storm water and dry weather runoff capture planning, analysis, and implementation on a watershed or regional basis.[5] The Lahontan, Los Angeles, San Diego, and San Francisco Bay Regional Water Boards are among the first of the Regional Water Boards to incorporate a watershed storm water management approach and green infrastructure master planning that provides strong incentives for storm water and dry weather runoff capture across the jurisdictional watersheds.

Effective storm water planning and management on a watershed basis involves collaboration of local and regional governments, utilities, and other stakeholder groups to analyze the hydrology, storm drain/runoff conveyances systems, opportunity sites, and other habitat or community needs within sub-watersheds. Design of green infrastructure to capture dry weather runoff should correspond to a watershed-based plan to achieve multiple benefits that supports water quality protection of surface and ground waters within the watershed. Coordinated storm water management, monitoring, and evaluation on a watershed basis minimizes monitoring costs and maximizes the value of monitoring results across programs intended to protect beneficial uses.

In the 1990s, local storm water agencies and professional associations began to develop guidance documents for the design and implementation of storm water capture for specified percentiles of rainfall frequencies (e.g., the volume associated with the 85th percentile 24-hour rain event); however, there have been many challenges associated with compliance with storm water waste load allocations established in existing TMDLs. In the early 2000s, literature and guidance documents based on extensive research and produced by MS4 permittees, Regional Water Boards, academia and other stakeholders, recommended the establishment of a water quality design storm for water quality protection on a watershed basis.

[5] E.g., Central Coast Water Board Resolution R3-2013-0032 (post-construction storm water management requirements) allows municipal storm water permittees to use Watershed Plans to justify alternative compliance for site-based runoff retention and peak management requirements.

The Stormwater Management Planning Act implemented through Water Code section 10563 substantively focuses on diverting runoff from existing storm drains, channels, or conveyance structures to sites (particularly publicly owned sites) that can clean, store,[6] infiltrate and/or use the runoff. As required in recently adopted Regional Water Board MS4 permits, watershed management planning must include an analysis that demonstrates a reasonable assurance that proposed storm water management plan elements will successfully achieve required water quality outcomes when implemented. Stakeholders, the State and Regional Water Boards, and U.S. Environmental Protection Agency staff are working collaboratively to conduct appropriate assurance analyses, and compile findings, conclusions, and recommendations in publicly available guidance manuals.

Section III: Applicability of Guidelines per Water Code section 10563

The development of a storm water resource plan and compliance with this part in accordance with Section 10565 shall be required to receive grants for storm water and dry weather runoff capture projects from a bond act approved by the voters after January 1, 2014. (Wat. Code, § 10563 (c)(1).)

These Guidelines [and the associated Water Code provisions] do not apply to:

a) Funds provided for the purpose of developing a [Storm Water Resource Plan; or]

b) A grant for a disadvantaged community as defined in Section 79505.5, with a population of 20,000 or less, and that is not a co-permittee for [an MS4] National Pollutant Discharge Elimination System (NPDES) permit issued to a municipality with a population greater than 20,000. (Wat. Code, § 10563(c) et seq.)

Implementation of Plans prepared per these Guidelines shall not interfere with or prevent the exercise of authority by a public agency to carry out its programs, projects, or responsibilities…[nor shall these Guidelines] affect requirements imposed under any other law. (Wat. Code, § 10563(a) & (b).)

Section IV: Water Code Requirements for Storm Water Resource Plans

To be deemed consistent with requirements in section 10560 et seq. of the Water Code, Plans should be developed and implemented consistent with the guidance provided in Sections V through VI of these Guidelines. If certain guidance is not relevant on a watershed-specific and/or site-specific basis, the Plan should clearly state the rationale for such determination. Storm Water Resource Plans must address all mandatory elements in these Guidelines to be deemed consistent with Water Code section 10560 et seq. See Appendix A: Checklist and Self-Certification of Compliance with Water Code requirements and State Water Board guidance for Storm Water Resource Plans.

[6] Certain control measures implemented or implied by MS4 permittees for urban runoff management may create a habitat for vectors (e.g., mosquitos and rodents) if not properly designed or maintained. Close collaboration and cooperative efforts among permittees, local vector control agencies, Water Board staff, and Department of Public Health staff are necessary to minimize potential nuisances and public health impacts resulting from vector breeding.

Section V: Standard Provisions

Each Storm Water Resource Plan should address or provide formal reference addressing the following provisions.

A. CALIFORNIA ENVIRONMENTAL QUALITY ACT COMPLIANCE

Implementation of activities and individual projects per the Storm Water Resource Plan must be in compliance with the California Environmental Quality Act. (Public Resources Code § 21000 et seq.)

B. CONSISTENCY WITH WATER QUALITY CONTROL PLANS, APPLICABLE WATER QUALITY CONTROL POLICIES, AND WATER RIGHTS

The Storm Water Resource Plan must be consistent with, and assist in compliance with, applicable federal and state regulations and policies, and permits implementing federal and state regulations and policies, including, but not limited to:

- Clean Water Act and the Safe Drinking Water Act;
- Water rights permits/licenses;
- State Water Board plans and policies; and
- State and Regional Water Board water quality control plans and policies, including total maximum daily loads adopted by the Regional Water Board. (Wat. Code, § 10562, subd. (b)(5).)

See Appendix B for web links to the State Water Board plans and policies and the Regional Water Board Basin Plans.

C. SUBMISSION TO ENTITIES OVERSEEING INTEGRATED REGIONAL WATER MANAGEMENT PLANS AND OTHER LOCAL PLANS

Upon development, [a Storm Water Resource Plan must] be submitted to any applicable integrated regional water management group. Upon receipt, the Integrated Regional Water Management group shall incorporate the [Storm Water Resource Plan] into its integrated regional water management plan. (Wat. Code, § 10562, subd. (b)(7).)

The Plan should identify: (1) the existing integrated regional water management (IRWM) group to which the Plan will be submitted, and (2) other local plans that may affect or be affected by the Plan (e.g., local watershed plans, groundwater management plans, salt and nitrate management plans), as applicable.

Storm water management on a watershed basis provides for a combination of storm water management objectives and multiple benefits throughout the watershed or sub-watershed. Therefore, the Plan should discuss how the various storm water management objectives within the watershed will protect or improve water quality, water supply reliability, and/or achieve other objectives. The Plan should include a discussion of the added benefits to integration of multiple storm water management strategies, as compared to stand-alone projects.

The Plan must discuss how its objectives and projects fit into the broader water management goals of the applicable IRWM plan. For the purposes of receiving project implementation funding, submittal of a Storm Water Resource Plan to the applicable IRWM group (for further incorporation into an existing IRWM plan) fulfills the public agency's requirement for "incorporation." However, the State Water Board recognizes that further collaboration and coordination with other agencies within the IRWM group is essential for long-term incorporation.

D. CONSISTENCY WITH APPLICABLE PERMITS

All Storm Water Resource Plans must be implemented in accordance with applicable National Pollutant Discharge Elimination System (NPDES) permits, waste discharge requirements, Areas of Special Biological Significance Compliance Plans (State Water Board Resolution 2012-0012), and/or conditional waivers issued by the State and/or Regional Water Boards. (Wat. Code, § 10562, subds. (b)(5) & (6).)

E. CONSISTENCY WITH CALIFORNIA HELATH AND SAFETY CODE – PEST AND MOSQUITO ABATEMENT

For the prevention of public health threats and diseases caused by vectors, the Mosquito Abatement and Vector Control District Law requires property owners, including municipalities, to prevent public nuisances caused by property or activity that has been artificially altered from its natural condition so that it does not:

- Support the development, attraction, or harborage of vectors such as mosquitoes and rats; or
- Facilitate the introduction or spread of vectors.

Storm water management plans and systems should be vetted through local mosquito and vector control districts and maps and maintenance plans provided for comment. (Division 3, Chapter 1 of the Health and Safety Code beginning with Article 2000.)

F. MODIFICATION OF A RIVER OR STREAM CHANNEL

Projects within the Plan that include substantial change or use of any material from a river, stream, or lake should avoid and minimize erosion, sediment transport, and hydromodification, and fully mitigate environmental impacts resulting from the project, as required by Clean Water Act sections 401 and 404.

G. MONITORING

To assess the effectiveness of Plan implementation on a watershed basis, Storm Water Resource Plans should include a monitoring component to collect statistically meaningful data. Monitoring requirements associated with applicable MS4 permit(s) and/or funding contracts should be included in the Plan. For individual projects within a watershed that may impact or have a potential to impact water quality, a monitoring component that ensures the integration of existing local, regional, or statewide monitoring efforts should be included.[7] Watershed-wide and individual project data should be stored in centralized local, regional, or statewide water quality data collection systems.

[7] See "Urban Stormwater Best Management Practice Performance Monitoring" developed by USEPA at http://water.epa.gov/scitech/wastetech/guide/stormwater/upload/2006_10_31_guide_stormwater_monttoc.pdf

Section VI: Storm Water Resource Plan Guidance

A. DESCRIPTION OF WATERSHED AND SUB-WATERSHEDS

The [State Water Board] shall establish guidance…[to define]…the appropriate geographic scale of watersheds for storm water resource planning. (Wat. Code, § 10565, subd. (c).) The following constitutes such guidance.

A watershed is defined as the region draining into a river, river system, or other body of water above a particular point. The United States Geological Survey (USGS) designates watershed hydrologic units at six levels (see **Table 1**).

Table 1. USGS Watersheds

Watershed Level	Square miles (average)	Acres (average)
Region	177,560	113,638,400
Subregion	16,800	10,752,000
Basin	10,596	6,781,440
Subbasin	700	448,000
Watershed	227	40,000-250,000
Subwatershed	40	10,000-40,000

CalWater[8] (CalWater version 2.2.1) delineates California watershed boundaries at several smaller scales in between the "Watershed" and "Subwatershed" levels delineated by the USGS. The CalWater hierarchy of watershed designations consists of the following six levels of increasing specificity: Hydrologic Region, Hydrologic Unit, Hydrologic Area, Hydrologic Sub-Area, Super Planning Watershed, and Planning Watershed (see **Table 2** below).

Table 2. CalWater Watersheds

Watershed Level	Square miles (average)	Acres (average)
Hydrologic Region	12,735	8,150,000
Hydrologic Unit	672	430,000
Hydrologic Area	244	156,000
Hydrologic Sub-Area	195	125,000
Super Planning Watershed	78	50,000
Planning Watershed	5-16	3,000-10,000

In general, the boundary of each watershed area identified in a Storm Water Resource Plan should not be based on political boundaries, county lines, property boundaries, vegetation-type edges, highways, fences, federal reserves, or any other non-watershed boundary. However, as necessary, political boundaries may be used to describe smaller watersheds, flat areas that encompass multiple small watersheds, or watersheds without distinct boundaries within the identified storm water management area. The applicable watersheds and sub-watersheds should not be split or divided.

[8] CalWater version 2.2.1 also cross-references watershed codes implemented by the California Department of Water Resources, the California State Water Resources Control Board and Regional Water Quality Control Boards, as well as Hydrologic Unit Codes published by USGS for California and the nation. Standardized watershed delineations, codes, and names from both state and federal systems are used primarily to map, analyze, and document water resources and water quality information and regulations.

In general, entities preparing a Storm Water Resource Plan should use the CalWater watershed designations, the USGS Hydrologic Unit designations, or an equivalent system such as defined by an applicable Integrated Regional Watershed Management (IRWM) Group, to determine and identify their watershed scale and boundaries, with the following caveats:

1. The scale of the watershed selected should allow for quantitative analyses of storm water and dry weather runoff patterns;

2. The watershed should be the largest practicable to allow for comprehensive and integrated storm water management, and if practical, across multiple jurisdictional boundaries;

3. Plans should include multiple projects within the watershed to achieve watershed-based storm water management objectives, and should not be developed on a scale for the sole purpose of funding a single project;

4. In general,[9] watersheds smaller than the CalWater "Planning Watershed" size should not be used (smaller than 5 square miles in size) unless to address watershed-specific conditions or regulatory requirements; and

5. Plans based on the IRWM group watershed boundary are preferred.

Each Storm Water Resource Plan should include a description and boundary map of each watershed and sub-watershed applicable to the Plan. The Plan should specifically provide the following:

i. An explanation of why the watershed(s) and sub-watershed(s) are appropriate for storm water management with a multiple-benefit watershed approach;

ii. A description of the internal boundaries within the watershed (boundaries of municipalities; service areas of individual water, wastewater, and land use agencies, including those not involved in the Plan; groundwater basin boundaries, etc.; preferably provided in a geographic information system (GIS) file);

iii. A description of the water quality priorities within the watershed based on, at a minimum, applicable TMDLs and consideration of water body-pollutant combinations listed on the State's Clean Water Act (CWA) Section 303(d) list of water quality limited segments (i.e., impaired waters list);

iv. The general quality and identification of surface and ground water resources within the watershed (preferably provided in a GIS file);

v. A description of the local entity or entities that provide potable water supplies, and the estimated volume of potable water provided by the water suppliers;

[9] Entities working in watersheds smaller than 5 square miles should not be precluded from funding due to the limited size of the watershed if they can demonstrate: (1) they have unique water quality challenges; (2) they are hydrologically independent from the larger surrounding watersheds; and (3) they have met all of the other requirements of the Storm Water Resource Plan Guidelines.

vi. A description of native habitats, creeks, lakes, rivers, parks, and other natural or open space within the sub-watershed boundaries; and

vii. An identification (quantitative, if possible) of the natural watershed processes that occur within the sub-watershed and a description of how those natural watershed processes have been disrupted within the sub-watershed (e.g., high levels of imperviousness convert the watershed processes of infiltration and interflow to surface runoff increasing runoff volumes; development commonly covers natural surfaces and often introduces non-native vegetation, preventing the natural supply of sediment from reaching receiving waters).

B. ORGANIZATION, COORDINATION, AND COLLABORATION

The [State Water Board] shall establish guidance… [in]… identifying types of local agencies and nongovernmental organizations that need to be consulted in developing a [Storm Water Resource Plan]. (Wat. Code, § 10565, subd. (a).) The following constitutes such guidance.

Many local agencies, especially water supply agencies, can directly benefit from projects that use storm water and dry weather runoff as a resource; these beneficiaries have the potential to be important partners and/or serve crucial inter-agency coordination roles. Local municipalities, school districts, universities, conservancies, and other public agencies that have public lands and easements for multiple benefit projects are also potentially valuable partners. Consistent with the requirement to prioritize use of lands or easements in public ownership for storm water and dry weather runoff projects (Wat. Code, § 10562, subd. (b)(8)), state, regional, and local government agencies, public and private utilities, and nongovernmental organizations[10] should collaborate to address local, regional, and watershed-wide obstacles by working together to maximize environmental outcomes that result from joint government/organizational efforts.

Nongovernmental organizations and state conservancies can provide essential leadership, innovation, and expertise in planning and conducting project design; assistance in developing effective collaborative approaches and engaging communities; and in-kind support and private funding. The State Water Board encourages these collaborative efforts to build strong working partnerships between public agencies, nongovernmental organizations, and the communities served.

In addition to collaboration with public agencies, utilities, conservancies, and nongovernmental organizations, entities developing Storm Water Resource Plans shall provide opportunities for community participation in Plan development and implementation. (Wat. Code, § 10562, subd. (b)(4).) Accordingly, the following coordination and collaboration components should be addressed in a Storm Water Resource Plan:

i. Description of existing regional water management group(s) implementing an existing Integrated Regional Water Management Plan (IRWMP);

ii. Identification of and coordination with agencies and organizations (including, but not limited to public agencies, nonprofit organizations, and privately owned water utilities) that need to participate and implement their own authorities and

[10] Including environmental justice groups.

mandates in order to address the storm water and dry weather runoff management objectives of the Plan for the targeted watershed;

iii. Identification of nonprofit organizations working on storm water and dry weather resource planning or management in the watershed;

iv. Identification and discussion of public engagement efforts and community participation in Plan development;

v. Identification of required decisions that must be made by local, state or federal regulatory agencies for Plan implementation and coordinated watershed-based or regional monitoring and visualization;

vi. Planning and coordination of existing local governmental agencies, including where necessary new or altered governance structures to support collaboration among two or more lead local agencies responsible for Plan implementation;

vii. Description of the relationship of the Plan to other existing planning documents, ordinances, and programs established by local agencies; and

viii. Explanation of why individual agency participation in various isolated efforts is appropriate (if applicable).

C. QUANTITATIVE METHODS FOR IDENTIFICATION AND PRIORITIZATION OF STORM WATER AND DRY WEATHER RUNOFF CAPTURE PROJECTS

The [State Water Board] shall establish guidance…[to define]…appropriate quantitative methods for identifying and prioritizing opportunities for storm water and dry weather runoff capture projects. (Wat. Code, § 10565, subd. (b).) The following constitutes such guidance.

1. Identification of Projects Using Quantitative Measures

To be consistent with Water Code requirements, Plans shall include a metrics-based and integrated evaluation and analysis of multiple benefits to maximize water supply, water quality, flood management, environmental, and other community benefits within the watershed. (Wat. Code, § 10562, subd.(b)(2).) **Table 3** below lists and defines appropriate metrics for each benefit type. Other metrics and methodologies for integrated evaluation and analysis of multiple benefits may be considered, as appropriate.

TABLE 3. BENEFIT METRICS

Benefit	Example	Metric Unit(s)
Water Quality *while contributing to compliance with applicable permit and/or TMDL requirements*	Increased filtration and/or treatment of runoff Nonpoint source pollution control Reestablished natural water drainage and treatment	**Pollutant Load Reduction** pounds (lbs)/day kilograms (kg)/day milligram/Liter microgram /Liter most probable number of bacteria or indicator organisms (mpn)/mL **Volume Treated** million gallons per day (mgd) acre-feet per year (afy)
Water Supply *through groundwater management and/or runoff capture and use*[11]	Water supply reliability Water conservation Conjunctive use	**Volume Captured** *in terms of augmentation/replacement of water supply, or reduced dependence on imported water* million gallons per day (mgd) acre-feet per year (afy) **Cost** dollars per volume per year (of augmented water supply)
Flood Management	Decreased flood risk by reducing runoff rate and/or volume Reduced sanitary sewer overflows	**Rate, Volume, and/or Size** cubic feet per second (cfs) acre-feet (af) cubic feet (cf) acres or linear feet
Environmental	Environmental and habitat protection and improvement, including: - wetland enhancement/creation; - riparian enhancement; and/or - instream flow improvement	**Size and/or Rate** acres cubic feet per second (cfs) carbon sequestration (megagrams of carbon per area)

[11] Groundwater management and/or runoff capture and use also includes "on-farm" flood flow capture and recharge projects located on suitable agricultural lands.

TABLE 3. BENEFIT METRICS

Benefit	Example	Metric Unit(s)
Environmental *(continued)*	Increased urban green space	**Other**[12] area units of landscape and buffer measure of improved hydrology number of biotic structure number of physical structures reduced temperature (degrees)
	Reduced energy use, greenhouse gas emissions, or provides a carbon sink	
	Reestablishment of the natural hydrograph	
	Water temperature improvements	
Community	Enhanced and/or created recreational and public use areas	**Size** size of population served number of people number of jobs acres
	Community involvement	
	Employment opportunities provided	

2. Integrated Metrics-Based Analysis

The Storm Water Resource Plan should include an integrated watershed metrics-based analysis demonstrating that the proposed storm water and dry weather runoff capture projects and programs within the watershed will collectively address the Plan's storm water management objectives and produce the proposed multiple benefits identified per the guidance in Section VI.D. The following guidance provides the minimum level of information to be included in an integrated metrics-based analysis for different types of projects within the watershed.

a. Water Quality Projects Analysis

The Storm Water Resource Plan should include a watershed-based analysis of how existing and proposed projects/programs comply with or are consistent with Total Maximum Daily Loads, applicable NPDES permit and/or waste discharge requirements. The analysis for water quality projects should simulate the proposed watershed-based outcomes using modeling, calculations, pollutant mass balances, water volume balances and/or other methods of analysis that provide the following, as applicable:

[12] California Wetlands Monitoring Workgroup (CWMW). 2013. California Rapid Assessment Method (CRAM) for Wetlands, Version 6.1 pp. 67:

- **Landscape and buffer** metrics includes aquatic area abundance (for bar-built estuaries this includes stream corridor continuity, aquatic area in adjacent landscape, and marine connectivity) and buffer (percent of area with buffer, average buffer width, and buffer condition).
- **Hydrology** metrics includes water source, hydroperiod or channel stability, and hydrologic connectivity.
- **Biotic structure** metrics includes plant community (number of plant layers present or endemic species richness (vernal pools only), number of co-dominant species, and percent invasion), vertical biotic structure, horizontal interspersion, and native plant species richness.
- **Physical structure** metrics includes structural patch richness and topographic complexity.

i. Estimates of expected watershed-wide pollutant load reductions expressed as concentration-based or mass-based in consideration of critical conditions; and

ii. Estimates of the difference between the current and future pollutant discharge/loading in the receiving water/watershed once the Plan is implemented.

Estimated pollutant reductions should generally be expressed on a pollutant-by-pollutant basis and should be consistent with the relevant averaging period(s)/duration (including the selected critical condition), if any, in the applicable Total Maximum Daily Loads, NPDES permit and/or waste discharge requirements. Pollutant reductions may also be estimated using relationships between volume reduction and pollutant reduction, or by identifying a limiting pollutant that if addressed will ensure that all other pollutants are sufficiently reduced.

In addition to the above, to the extent possible, the narrative should describe in a quantitative manner using the metrics in **Table 3** (or other more appropriate metrics) how the project and programs in the watershed will contribute to the preservation, restoration, or enhancement of the following watershed processes, as applicable:

i. **Overland Flow**: Precipitation reaching the ground surface that does not immediately infiltrate must run over the land surface (thus, "overland" flow). Most un-compacted vegetated soils have infiltration capacities of one to several inches per hour at the ground surface, which exceeds the rainfall intensity of even unusually intense storms. In contrast, pavement and hard surfaces reduce the effective infiltration capacity of the ground surface to zero, ensuring overland flow regardless of the meteorological attributes of a storm.

ii. **Groundwater Recharge and Infiltration**: Groundwater recharge and infiltration are closely-linked hydrologic processes that are dominant across much of California's intact landscapes. Groundwater recharge and infiltration can be thought of as the inverse of overland flow - precipitation that reaches the ground surface and does not immediately run off has most likely infiltrated. Thus, on virtually any geologic material on all but the steepest slopes (or bare rock), infiltration of rainfall into the soil is inferred to be widespread, if not ubiquitous. With urbanization, changes to the process of infiltration are also quite simple to characterize: some (typically large) fraction of that once-infiltrating water is now converted to overland flow.

iii. **Interflow:** Interflow takes place following storm events as shallow subsurface flow (usually within three to six feet of the surface) occurring in a more permeable soil layer above a less permeable substrate. In the storm response of a stream, interflow provides a transition between the rapid response from surface runoff and much slower stream discharge from deeper groundwater. In some geologic settings, the distinction between "interflow" and "deep groundwater" is artificial and largely meaningless; in others, however, there is a strong physical discrimination between "shallow" and "deep" groundwater movement.

Urban development reduces infiltration and thus interflow, as well as reducing the footprint of the area supporting interflow volume.

iv. **Evapotranspiration:** In undisturbed humid-region watersheds, the process of returning water to the atmosphere by direct evaporation from soil and vegetation surfaces, and by the active transpiration by plants, can account for nearly one-half of the total annual water balance; in more arid regions, this fraction can be even higher. Land development covers soils with impervious surfaces and usually results in the compaction of soils when grading occurs. Native plants are often replaced with turf, which typically has lower rates of evapotranspiration unless irrigated throughout the summer months.

v. **Delivery of Sediment to Receiving Waters:** Sediment delivery into the channel network is a critical process for the maintenance of various habitat features in fluvial systems (although excessive sediment loading from watershed disturbance can instead be a significant source of degradation, and excessive fine sediment particles in substrate composition can inhibit salmonid spawning). Quantifying this rate can be difficult; however, the overriding influence of slope gradient is widely documented. Maintenance of sediment delivery is essential to the health of certain receiving-water types (as is organic matter delivery). Development and non-native vegetation may also prevent the natural supply of sediment from reaching the stream.

vi. **Delivery of Organic Matter to Receiving Waters:** The delivery of organic matter is critical to receiving water health as it forms the basis for the aquatic food web. Delivery of organic matter follows similar pathways as inorganic matter (e.g., sediment). However, the dominant amount and timing of delivery is often associated with the presence, width, and composition of the vegetative riparian zone.

vii. **Chemical and Biological Transformation:** Chemical and biological transformation encompasses the suite of watershed processes that alter the chemical composition of water as it passes through the soil column on its path to, and after entry into, a receiving water. The conversion of subsurface flow to overland flow in a developed landscape eliminates much of the opportunity for attenuation and transformations within the soil column, and this is commonly expressed as degraded water quality. The dependency of these processes on watershed conditions is complex in detail, but in general a greater residence time of storm water in the soil should be correlated with greater activity for this group of processes.

b. Storm Water Capture and Use Projects Analysis

The Plan should include an analysis of how collectively the projects and programs in the watershed will capture and use the proposed amount of storm water and dry weather runoff. Projects included in the Plan may be individual projects or “project types,” that will result in the Plan’s proposed watershed outcomes, as demonstrated through a quantitative metric-based analysis in the Plan (**Figure 1**).

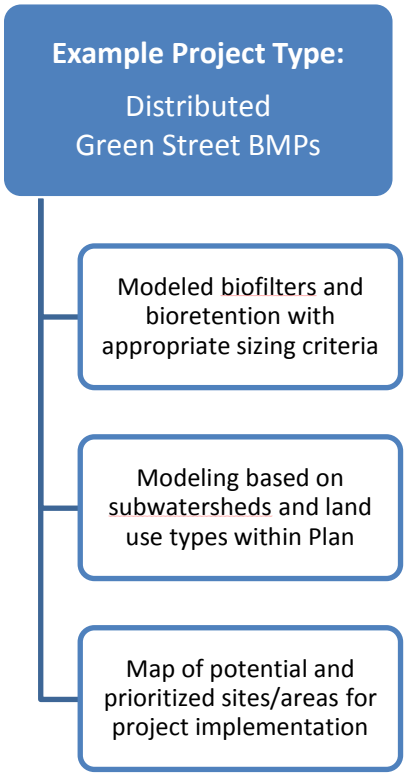

Figure 1

The analysis for storm water capture and use projects should simulate the proposed watershed-based outcomes using modeling, calculations, water balances and/or other methods of analysis that provide the following, as applicable:

i. A demonstration that, where feasible, individual projects[13] (within the project areas' watershed) capture dry weather runoff and, at minimum, the volume from an 85th-percentile 24-hour storm event, based on available watershed-specific rainfall data for beneficial use and proposed multiple benefits.

   The volumetric capture threshold feasibly achievable may vary based on watershed characteristics and other water quality considerations; in such a case, the Plan must include discussion of the crucial multiple benefits resulting from the capture and use projects that do not meet the 85th percentile, 24-hour storm threshold.

ii. A current assessment of storm water capture opportunities (preferably provided in a geographical information system file). The assessment should include:

   a. Watershed map;
   b. All waterbodies (natural and manmade) within the watershed;

[13] See definition of "project."

c. List of known and suspected storm water and non-storm water pollutant sources in each storm water management area addressed by the Plan;
d. Major existing storm water outfalls, major existing structural controls of storm and non-storm water (including, but not limited to, storm water pump stations, low-flow diversions, urban runoff treatment facilities, low impact developments, detention basins used for storm water treatment, and other catch basin inserts/screens) that discharge to receiving waters; and
e. Opportunity sites and/or drainage areas, and the corresponding volume of storm water and dry weather runoff that can be captured at the sites or within the drainage areas.

c. Water Supply and Flood Control Projects Analysis

The Plan should include an analysis of how the projects and programs in the watershed will collectively result in the proposed water supply augmentation and flood management objectives. The analysis for water supply and flood control projects should simulate the proposed watershed-based outcomes using modeling, calculations, water balances and/or other methods of analysis that provide the following, as applicable:

i. Estimated volume of storm water and/or dry weather runoff capture, as percentage of total volume of storm water and dry weather runoff;

   a. Estimated volume of storm water and/or dry weather runoff infiltration into groundwater basin/aquifer; and/or
   b. Estimated volume of storm water and/or dry weather runoff onsite storage and use.

ii. Estimate of volume of potable water offset as a result of storm water and dry weather runoff capture.

d. Environmental and Community Benefits Analysis

In addition to tangible benefits such as water quality, water supply, and flood control, the Plan should include a narrative analysis of how the projects and programs within the watershed will collectively benefit the environment and community. As applicable, the narrative analysis should describe in a quantitative manner using the metrics in **Table 3** and narratively for intangible benefits how proposed projects and programs within the watershed will collectively contribute to the following elements:

i. Water quality, environmental, and habitat protection, such as wetland enhancement and/or creation, and stream/riparian enhancement and/or in-stream flow augmentation;

ii. Increased urban green space and connectivity;

iii. Enhancement and/or creation of recreational and public use areas; and

iv. Reduced energy use reducing greenhouse gas emissions, reduced urban heat island effects (for example, as a result from increased tree canopy), improving air quality, and/or providing a carbon sink.

3. Information and Data Management

The Storm Water Resource Plan should include a discussion addressing data collection and management including, but not limited to the following:

a. Mechanisms by which data will be managed and stored;
b. How data will be accessed by stakeholders and the public;
c. How existing water quality and water quantity monitoring will be assessed;
d. Frequency at which data will be updated; and
e. How data gaps (for which additional monitoring is needed) will be identified.

All monitoring results conducted in the watershed should be provided (preferably in a GIS file) to the appropriate local, regional and/or state data collection systems applicable to corresponding individual-project funding and regulatory requirements. If the Plan includes a surface water or groundwater quality monitoring component, include a discussion of the integration of ambient data into the State Water Board's California Environmental Data Exchange Network, Surface Water Ambient Monitoring Program (SWAMP), and Groundwater Ambient Monitoring and Assessment Program. Appendix B provides a listing of web links for accessing information on the State Water Board's statewide data management strategies.

If the Storm Water Resource Plan consists of, or incorporates existing plans that include storm water monitoring and reporting, the Plan should not duplicate monitoring/reporting efforts. In this case, this section of the Plan should include a narrative summary of the existing monitoring efforts and/or requirements of other incorporated plans and the associated reporting mechanism(s). The narrative summary must also include detailed reference to other plans, including document title, general page locations of monitoring and reporting requirements, and internet address where document is located.

D. IDENTIFICATION AND PRIORITIZATION OF MULTIPLE BENEFIT PROJECTS

[A Storm Water Resource Plan] shall use measurable factors to identify, quantify, and prioritize potential storm water and dry weather runoff capture projects. (Wat. Code, § 10562, subd. (e).) In accordance with Water Code section 10562, subd. (d), a Storm Water Resource Plan shall identify in the Plan all of the following:

(1) Opportunities to augment local water supply through groundwater recharge or storage for beneficial use of storm water and dry weather runoff.

(2) Opportunities for source control of pollutants due to storm water and dry weather runoff, onsite and local infiltration, and use of storm water and dry weather runoff.

(3) Projects to reestablish natural water drainage treatment and infiltration systems, or mimic natural system functions to the maximum extent feasible.

(4) Opportunities to develop, restore, or enhance habitat and open space through storm water and dry weather runoff management, including wetlands, [streams,] riverside habitats, parkways, and parks.

(5) Opportunities to use existing publicly owned lands and easements, including, but not limited to, parks, public open space, community gardens, farm and agricultural preserves, school sites, and government office buildings and complexes, to capture, clean, store, and use storm water and dry weather runoff either onsite or offsite.

(6) Design criteria and best management practices to prevent storm water and dry weather runoff pollution and increase effective storm water and dry weather runoff management for new and upgraded infrastructure and residential, commercial, industrial, and public development. These design criteria and best management practices shall accomplish all of the following:

(A) Reduce effective impermeability within a watershed by creating permeable surfaces, retention basins, cisterns, and other storage for beneficial use.
(B) Increase water storage for beneficial use through a variety of onsite storage techniques.
(C) Increase groundwater supplies through infiltration, where appropriate and feasible.
(D) Support low-impact development for new and upgraded infrastructure and development using low-impact techniques.

(7) Activities generating or contributing to the pollution of storm water or dry weather runoff, or that impair the effective beneficial use of storm water or dry weather runoff.

1. Guidance for Prioritizing Storm Water and Dry Weather Runoff Capture Projects within a Watershed

The intention of the Water Code requirements is to encourage storm water and dry weather runoff projects that provide multiple public water quality and supply benefits, and have been identified, prioritized, and selected based on a metrics-driven analysis. Therefore, the Plan should prioritize individual projects and programs for implementation based on an integration of quantitative factors to assure the greatest water quality, water supply, conservation, and community needs are addressed. Accordingly, Plans should prioritize individual projects or programs according to the following elements:

a. Projects or programs supported by entities that have created permanent, local, or regional funding (i.e., entities who have established a new, multi-year local or regional source of funding dedicated to storm water and/or dry weather runoff capture projects, and who provide funds for both capital and operations and maintenance).

b. Projects or programs that use a metric-driven approach and an appropriately detailed geospatial analysis of multiple benefits to maximize water supply, water quality, flood management, environmental, and community benefits within the watershed.

c. Projects located on lands in public ownership.

d. Projects that augment local water supplies such as:
    1. Projects that use captured storm water and dry weather runoff to recharge groundwater; and
    2. Projects that store and use captured storm water and dry weather runoff for irrigation or other permitted uses.

e. Projects and programs that preserve, restore, or enhance watershed processes that yield a broad suite of water quality benefits and support beneficial uses.

f. Projects and programs that create or restore habitat, open space, parks, recreation, or green open space in disadvantaged communities with a high deficit of tree canopy, parks and open space.

2. Multiple Benefits

The Storm Water Management Plan should include a high-level general discussion of the overall benefits and impacts of Plan implementation. Each project and program implemented in accordance with the Plan should at minimum, address: (1) at least two or more **Main Benefits** listed in **Table 4** within the watershed or sub-watershed, and (2) as many as feasible **Additional Benefits** for the same project/program.

TABLE 4. STORM WATER MANAGEMENT BENEFITS		
Benefit Category	**Main Benefit**	**Additional Benefit**
Water Quality *while contributing to compliance with applicable permit and/or TMDL requirements*	Increased filtration and/or treatment of runoff	Nonpoint source pollution control
		Reestablished natural water drainage and treatment
Water Supply *through groundwater management and/or runoff capture and use*	Water supply reliability	Water conservation
	Conjunctive use	
Flood Management	Decreased flood risk by reducing runoff rate and/or volume	Reduced sanitary sewer overflows
Environmental	Environmental and habitat protection and improvement, including; - wetland enhancement/creation; - riparian enhancement; and/or - instream flow improvement	Reduced energy use, greenhouse gas emissions, or provides a carbon sink
		Reestablishment of the natural hydrograph
	Increased urban green space	Water temperature improvements
Community	Employment opportunities provided	Community involvement
	Public education	Enhance and/or create recreational and public use areas

E. IMPLEMENTATION STRATEGY AND SCHEDULE

1. Resources for Plan Implementation

A Storm Water Resource Plan should identify the resources that the participating entities are committing for implementation of the Plan. The Plan should include the following items to ensure its effective implementation. (Wat. Code, § 10562, subd. (d)(8).):

a. Projection of additional funding needs and sources for administration and implementation needs, above and beyond the needs of the existing storm water management plans and/or integrated regional water management plans; and

b. Schedule for arranging and securing Plan implementation financing, including identification of phased Plan implementation.

2. Plan Implementation

An entity developing a storm water resource plan shall identify in the plan: *[p]rojects and programs to ensure the effective implementation of the [Storm Water Resource Plan]…to achieve multiple benefits. These projects and programs shall include the development of appropriate decision support tools and the data necessary to use the decision support tools. The Plan shall identify …[o]rdinances or other mechanisms necessary to ensure the effective implementation of the [Storm Water Resource Plan].* (Wat. Code, § 10562, subds. (d)(8) & (9).)

The Storm Water Resource Plan should identify the following implementation and scheduling components:

a. Timeline for submitting the Storm Water Resource Plan into an existing Integrated Regional Water Management Plan (IRWMP), and/or other existing watershed water resource management plans;

b. Specific actions, projects, and studies, ongoing or planned, by which the Plan will be implemented;

c. All entities responsible for project implementation, with clearly identified linkages or interdependence between projects;

d. Description of the community participation strategy for Plan implementation;

e. A procedure to track the status of each element of the Plan, such as existing infrastructure, feasibility studies, pilot or demonstration projects, design efforts;

f. Timelines for all active or planned project components and identification of the institutional structure that will ensure Plan implementation;

g. A procedure for ongoing review, updates, and adaptive management of the Plan (see below); and

h. A general strategy and potential timeline for obtaining necessary federal, state, and local permits.

3. Adaptive Management – Maintaining a Living Document

The Plan should be structured as a living document and implemented as an ongoing, adaptive program that allows agencies and non-agency partners to identify, plan, and implement current and future projects. The Plan should contain clear procedures for updating and adding future projects to the Plan.

Furthermore, as Plan programs or projects are implemented and information is gathered over time, the Plan should be modified to reflect the most current understanding of the watershed and present a sound approach to addressing changing conditions. Ongoing adaptations to the Plan may include:

a. Re-characterization of water quality priorities;
b. A source assessment re-evaluation;
c. An effectiveness assessment of watershed-based projects; and/or
d. An updated metrics-based, quantitative analysis.

4. Implementation Performance Measures

The Storm Water Resource Plan should explain how the identified projects and programs within the watershed will achieve the multiple-benefit goals and assure that each implemented project is consistent with the Plan's objectives and goals. The Plan should include a discussion of existing and necessary data, the technical analysis, and the performance measures corresponding to the following elements:

a. Evaluation of the expected and actual outcomes of the Plan (i.e., water quality, water supply augmentation, other benefits);

b. Quantification of the storm water management objectives, multiple benefits, and environmental outcomes;

c. The monitoring and information-management systems that will be used to gather performance data;

d. Mechanisms to adapt project operations and Plan implementation based on performance data collected; and

e. Mechanisms to share performance data with stakeholders.

See sections VI.C.1 and VI.C.2 for guidance on quantification of implementation performance measures.

F. EDUCATION, OUTREACH AND PUBLIC PARTICIPATION

A stormwater resource plan shall…[p]rovide for community participation in plan development and implementation. (Wat. Code, § 10562, subd. (b)(4).)

To maximize community-based benefits, key stakeholders and the public should be involved in all appropriate implementation steps of the Storm Water Resource Plan. Public education and opportunities for public participation in actions, decisions, and projects implemented through watershed-based storm water management should be

provided. The Plan should include or provide for public education and public participation goals addressing the following elements:

i. Public education and public participation opportunities to engage the public when considering major technical and policy issues related to the development and implementation of the Plan;
ii. Mechanisms, processes, and milestones that have been or will be used to facilitate public participation and communication during development and implementation of the Plan;
iii. Mechanisms to engage communities in project design and implementation;
iv. Identification of specific audiences including local ratepayers, developers, locally regulated commercial and industrial stakeholders, nongovernmental organizations, nonprofit organizations, and the general public;
v. Strategies to engage disadvantaged and climate vulnerable communities within the Plan boundaries and ongoing tracking of their involvement in the planning process;
vi. Efforts to identify and address environmental injustice within the watershed; and
vii. A schedule for initial public engagement and education.