SAFE CLEAN WATER PROGRAM

SCIENTIFIC STUDY PROGRAM
FISCAL YEAR 2027-2028

Removal of CECs in Infiltration BMPs

UPPER LA RIVER WATERSHED AREA

PROJECT LEAD:

Geosyntec Consultants
Brandon Steets, P.E.

PRESENTATION DATE:
NOVEMBER 4, 2026



Scientific Study Overview

Evaluate the effectiveness of using amendments in infiltration BMPs to remove emerging contaminants and protect groundwater in LA County.

Nexus

Connection to Stormwater/Urban Runoff capture or pollution reduction

The findings from this study will allow stormwater managers in LA County to implement infiltration BMPs, including through the SCWP, that **better protect groundwater from emerging contaminants** that pose a risk to human health. By protecting groundwater from these contaminants, this could significantly impact the quality and supply of drinking water in LA County.

This proposed study builds on knowledge gained from recent research by UCLA and Geosyntec to **identify a novel and cost-efficient retrofit approach to enhance infiltration BMPs** to meet drinking water thresholds for emerging contaminants.

STUDY LEAD

Geosyntec Consultants

WATERSHED AREA(S)

Central Santa Monica Bay, South Santa Monica Bay, Upper Los Angeles River, Lower Los Angeles River

TOTAL FUNDING REQUESTED

$1,600,000

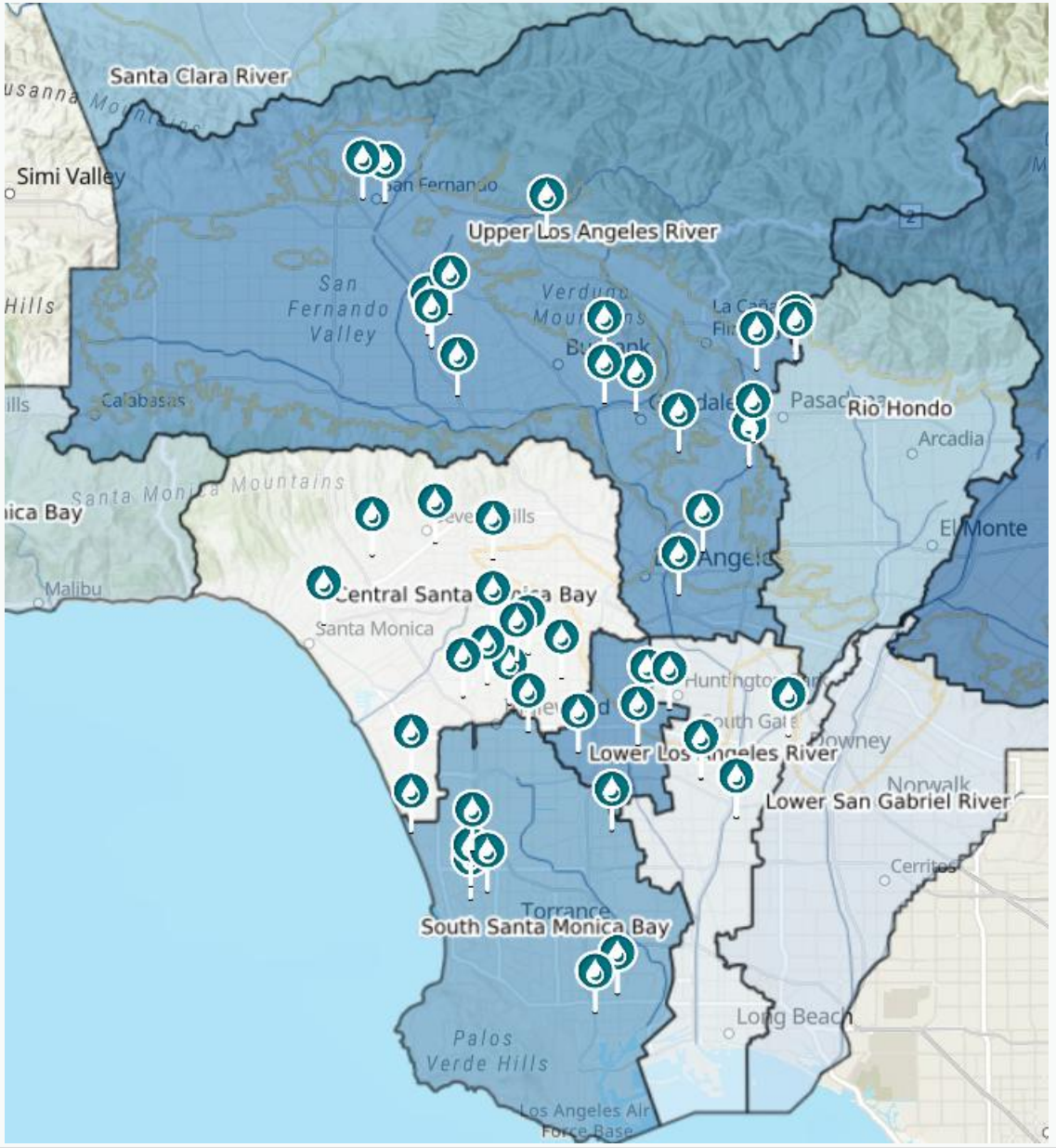
Funding Phase(s)/FY(s): FY27-28 – FY29-30

Study Location

Watershed Areas:

- Central Santa Monica Bay
- South Santa Monica Bay
- Upper Los Angeles River
- Lower Los Angeles River

Map at right shows funded SCWP infrastructure projects focused on infiltration (bioinfiltration, infiltration wells, and infiltration facilities), ~50 projects worth over $300M.



Problem Statement, Study Questions & Objectives

Problem Statement

The knowledge gap this Study addresses

CECs in stormwater, such as PFAS and 6PPDq, may be transported through infiltration BMPs and pose a risk to groundwater used as a drinking-water source in LA County.

Study Questions

What this Study aims to answer

1. What are the concentrations of emerging contaminants in stormwater runoff entering BMPs and then infiltrating to groundwater in LA County?
2. Where concentrations are above existing regulatory limits or emerging risk-based thresholds, can removal using solid or liquid amendments be used to reduce concentrations below these thresholds?
3. What is the expected long-term performance of these amendments?
4. What are the implementation and maintenance and reapplication costs for these amendments?

Objectives

How Study Questions investigate the Problem

1. Determine concentrations of CECs entering stormwater BMPs and infiltrating to groundwater.
2. Field test simple, low-cost BMP amendments including biochar, cationic resin, and/or polyDDA.
3. Quantify CEC concentrations in infiltration water following BMP amendment.
4. Provide guidance for reducing the risk of CECs to groundwater for infiltration BMPs in LA County.

Prior Similar Studies

Have any been done before? How this differs?

- SWRCB Drywell Guidance
- SWRCB Stormwater CEC Database
- SERDP Removal of Organic Contaminants from Stormwater Runoff
- SERDP Enhanced PFAS Removal
- SCWP Regional CECs and Pollutant EMCs in Stormwater Assessment

Study Methodology

Data Collection

How and under what conditions data is gathered

The study will collect data from **multiple infiltration BMP types**, watershed settings, and storm events to characterize CEC occurrence, transport, treatment, and groundwater recharge under representative conditions. Monitoring will include **influent and infiltrating water quality**, vadose-zone conditions, hydrology, BMP performance, seasonal variability, maintenance conditions, and post-wildfire effects where applicable. The study will include evaluation of contaminant removal, longevity of treatment effectiveness based on mass and volumes treated, and effects of competing chemicals (e.g., DOC, ions) to inform final implementation guidance.

Data Validation

QA/QC and comparison to benchmarks

The study will follow a comprehensive **Quality Assurance Project Plan (QAPP) to ensure the accuracy, consistency, completeness, and reliability** of all data collected. Standardized sampling, analytical methods, and **rigorous QA/QC** will ensure reliable and comparable data, supporting defensible conclusions applicable across SCWP-funded projects.

Baseline Conditions

Existing conditions used for comparison

Selected infiltration BMPs will be sampled to establish **baseline runoff and infiltration conditions across multiple storms, seasons, land uses, and BMP types**, providing a reference for evaluating CEC treatment and amendment performance.

Documentation

How records ensure reproducibility

Task-specific deliverables will provide **frequent communication** of project progress and results to the WASC and stakeholders, with laboratory data incorporated into relevant deliverables and Geosyntec data-management policies followed throughout the study.

Expected Outcomes & Alignment

Expected Outcomes

Anticipated results, use cases, and target audience

The following outcomes are expected from this study:

- **A robust dataset that** 1) identifies high-risk CECs in stormwater for infiltration BMPs, 2) evaluates the effectiveness of low-cost amendments to reduce high risk CECs, and 3) demonstrates CEC removal to below risk-based thresholds for groundwater
- **A practical guidance document** targeting stormwater managers and practitioners in LA County to implement efficient actions to control CECs at risk of impacting groundwater through infiltration BMPs, including long-term performance and costs for implementation and maintenance
- **Clear communication** of study results and recommendations to LA County stormwater agencies, practitioners, regulators, researchers, and the public through publications, webinars, conference presentations, and online summaries and fact sheets

Alignment

Fit with Watershed Plans or WASC SIP priorities

The proposed study directly supports the needs, strategies, and opportunities identified in the Watershed Plans by addressing a key knowledge gap associated with infiltration-based BMPs, which are a priority strategy for improving water quality and increasing local water supply through groundwater recharge. By evaluating CECs in infiltrating stormwater and demonstrating practical retrofit approaches using amendments, **this study will help protect groundwater resources, improve the long-term performance of infiltration BMPs, support drought resilience and water quality goals, and provide actionable guidance** for municipalities and watershed managers implementing SCWP-funded stormwater capture projects throughout Los Angeles County.

Summary of Benefits

Describe how the study is expected to support, inform, or enable measurable benefits in:

- Water Quality

  The study will **quantify CEC concentrations and removal efficiencies** in infiltration BMPs and determine whether low-cost amendments can reduce contaminants below groundwater risk-based thresholds. The results will **support improved BMP design and retrofits** that reduce pollutant loading to groundwater while maintaining stormwater infiltration and recharge benefits.

- Water Supply

  The study will enable **safer and more reliable stormwater infiltration** and groundwater recharge by identifying and **reducing CECs that could threaten groundwater quality**, the study will reduce uncertainty around infiltration BMPs and **support expanded use of captured stormwater** as a local water supply.

- Other Co-benefits

  These include **improved climate resilience and groundwater protection**, more effective use of existing and future SCWP infrastructure, and reduced long-term BMP treatment and maintenance costs through identification of effective low-cost amendments. The study will also provide transferable design and implementation guidance that can **accelerate adoption of enhanced infiltration BMPs** across Los Angeles County.

Study Team & Dissemination

Study Team

Lead entity, partners, relevant expertise

The Geosyntec team developed **Statewide guidance for drywells** (SWRCB, 2020), including pretreatment guidance, and recently supported the SWRCB by developing a database on CECs in stormwater and **evaluate their potential risk to stormwater infiltration**. In both efforts, PFAS were identified as a priority risk to groundwater used for drinking. The Geosyntec team has also worked for the Department of Defense in collaboration with researchers, including Dr. Sanjay Mohanty at UCLA, to evaluate the **removal of CECs, including PFAS**, in laboratory media column tests **with biochar and polyDDA amendments**.

Regulations

If applicable — relevant regulatory requirements

No analytical results gathered in this project will be used to determine regulatory compliance. While State drinking water limits and **emerging risk-based thresholds for human health** will be used to compare CEC concentrations and identify risks broadly in watershed areas, **specific locations will not be identified in this project**.

Engagement & Dissemination

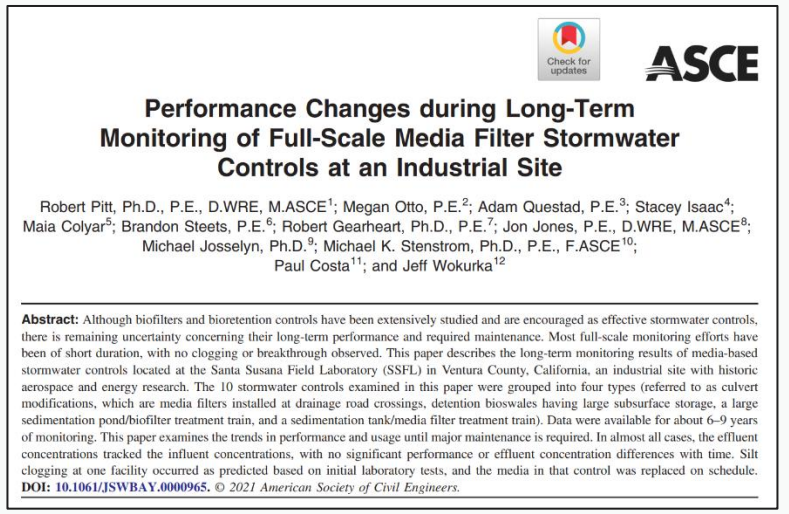
How results will be shared, incl. SCW Program website

The proposed study will actively engage municipalities, watershed coordinators, BMP owners and operators, regulatory stakeholders, and other SCWP project proponents throughout study planning, site selection, monitoring, and interpretation of results to ensure the study addresses practical stormwater management needs and supports future project implementation. Community engagement will include **presentations** at Watershed Area Steering Committee (WASC) meetings, **stakeholder workshops**, and **public outreach events** to communicate study objectives, progress, and findings. Study results, datasets, **technical memoranda**, and final recommendations will be made publicly available through the SCWP Reporting Repository, **project fact sheets, webinars, conference presentations, and outreach materials** designed for both technical and non-technical audiences.

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Study Team Qualifications & Benefits

- Qualifications:
  - Statewide leadership developing CA Drywell Guidance and Stormwater CEC database for SWRCB,
  - ~10 yrs of research on PFAS in stormwater for SERDP, including PFAS treatment design guidance,
  - 15+ yrs of testing and optimizing media filter performance for a wide range of constituents at Santa Susana Field Lab under LA RWQCB oversight,
  - BMP performance experts for EPA/WRF/ASCE on the International BMP Database (bmpdatabase.org), and
  - Development of BMP effectiveness guidance on 6PPDq for Navy (NESDI program).
- Benefits:
  - Experienced team that can deliver desired outcomes for the ULAR Watershed Area,
  - Credibility with regulators and other outside audiences, and
  - Confidence in high-quality work that truly builds on the state-of-the-science rather than recreating it (i.e., no wasted/unnecessary effort).



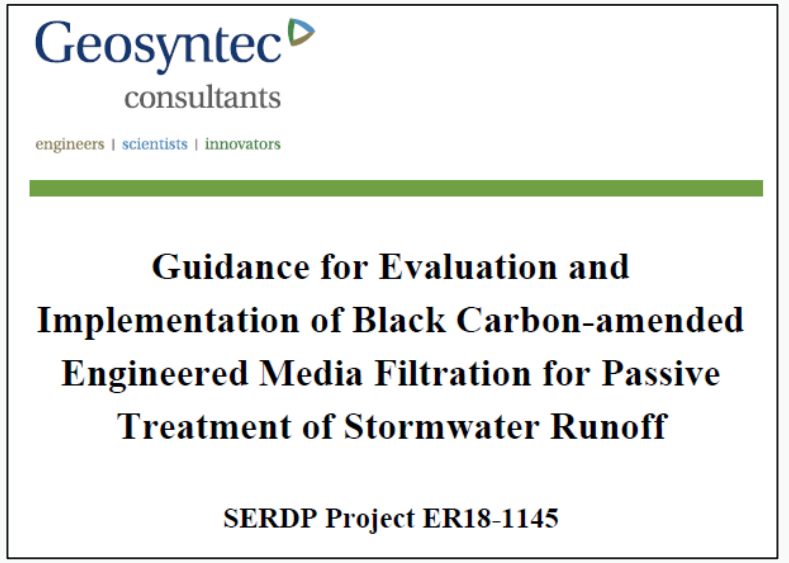
Check for updates

ASCE

Performance Changes during Long-Term Monitoring of Full-Scale Media Filter Stormwater Controls at an Industrial Site

Robert Pitt, Ph.D., P.E., D.WRE, M.ASCE[1]; Megan Otto, P.E.[2]; Adam Questad, P.E.[3]; Stacey Isaac[4]; Maia Colyar[5]; Brandon Steets, P.E.[6]; Robert Gearheart, Ph.D., P.E.[7]; Jon Jones, P.E., D.WRE, M.ASCE[8]; Michael Josselyn, Ph.D.[9]; Michael K. Stenstrom, Ph.D., P.E., F.ASCE[10]; Paul Costa[11]; and Jeff Wokurka[12]

Abstract: Although biofilters and bioretention controls have been extensively studied and are encouraged as effective stormwater controls, there is remaining uncertainty concerning their long-term performance and required maintenance. Most full-scale monitoring efforts have been of short duration, with no clogging or breakthrough observed. This paper describes the long-term monitoring results of media-based stormwater controls located at the Santa Susana Field Laboratory (SSFL) in Ventura County, California, an industrial site with historic aerospace and energy research. The 10 stormwater controls examined in this paper were grouped into four types (referred to as culvert modifications, which are media filters installed at drainage road crossings, detention bioswales having large subsurface storage, a large sedimentation pond/biofilter treatment train, and a sedimentation tank/media filter treatment train). Data were available for about 6–9 years of monitoring. This paper examines the trends in performance and usage until major maintenance is required. In almost all cases, the effluent concentrations tracked the influent concentrations, with no significant performance or effluent concentration differences with time. Silt clogging at one facility occurred as predicted based on initial laboratory tests, and the media in that control was replaced on schedule.
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Guidance for Evaluation and Implementation of Black Carbon-amended Engineered Media Filtration for Passive Treatment of Stormwater Runoff

SERDP Project ER18-1145

Cost & Schedule

TASK	DESCRIPTION	COST	COMPLETION DATE
Task 1	Monitoring Plan & BMP Selection	$160,000	12/31/2027
Task 2	Baseline BMP Monitoring	$260,000	3/31/2028
Task 3	BMP Modification	$420,000	9/30/2028
Task 4	BMP Performance Monitoring	$420,000	3/31/2029
Task 5	Reporting & Technology Transfer	$200,000	12/31/2029
Task 6	Project Management & Meetings	$160,000	12/31/2029
TOTAL COST		**$1,600,000**	

Cost Share

Total Cost Share: $0 **Leveraged Funding %:** 0%

Funding Request by Watershed Area

WASC	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
CSMB	$155,000	$180,000	$65,000	$0	$0	$400,000
LLAR	$155,000	$180,000	$65,000	$0	$0	$400,000
SSMB	$155,000	$180,000	$65,000	$0	$0	$400,000
ULAR	$155,000	$180,000	$65,000	$0	$0	$400,000
TOTAL	$620,000	$720,000	$260,000	$0	$0	$1,600,000

Years correspond to your requested Fiscal Years (e.g. FY27-28). Include only WASCs where funding is requested.

Watershed Planning Alignment

This study will directly support the following strategies:

1.1 Improve Water Quality: Generates performance data to help identify high-performing infiltration BMP amendments for reducing CECs and protecting groundwater.

2.1 Increase Drought Preparedness: Supports integration of water-quality protection with stormwater capture and groundwater recharge, helping maximize infiltration as a local water-supply strategy.

4.2 Deliver Multi-Benefit Projects: Advances infiltration BMP approaches that simultaneously provide pollutant removal, stormwater capture, and groundwater recharge.

5.2 Invest in Research & Development: Develops and disseminates scientifically defensible performance data and practical guidance for enhanced infiltration BMPs.

8.4 Integrate Monitoring into O&M: Evaluates BMP performance under different operating, maintenance, seasonal, and hydrologic conditions to inform future O&M practices.

9.1 Prioritize Meaningful Engagement: Engages WASCs, municipalities, BMP owners/operators, and other stakeholders throughout study planning, implementation, and dissemination of results.

SCW PROGRAM-WIDE STRATEGIES	
IMPROVE WATER QUALITY Goal A	
1.1	Prioritize high performance Projects and Programs in areas with the highest pollutant loads
INCREASE DROUGHT PREPAREDNESS Goal B	
2.1	Link MS4 compliance and water supply planning to maximize stormwater capture for water quality and water supply*
IMPROVE PUBLIC HEALTH Goal C	
3.1	Evaluate open space and large lot potential, particularly on school campuses*
3.2	Create, enhance, and restore park and green space, especially in high-need communities
3.3	Help communities most affected by extreme heat mitigate and adapt to the effects of climate change
DELIVER MULTI-BENEFITS WITH NATURE-BASED SOLUTIONS & DIVERSE PROJECTS Goal E, F,G	
4.1	Acknowledge, where feasible, other capital improvement programs that can contribute to regional outcomes*
4.2	Deliver nature-based, multi-benefit Projects and Programs that improve water quality while addressing community priorities and concerns
LEVERAGE FUNDING & INVEST IN RESEARCH & DEVELOPMENT Goal D, H, I	
5.1	Bolster SCW Program and regional coordination to support identification and communication of alternative funding sources and opportunities
5.2	Bolster the Scientific Study Program through enhanced review, coordination, and dissemination of results
EQUITABLY DISTRIBUTE BENEFITS Goal J, K	
6.1	Consider historic land use disparities and environmental justice metrics across the SCW Program area*
6.2	Advance equity and prioritize new investments particularly in communities not currently served by a SCW Program Project or Program
PROMOTE GREEN JOBS AND CAREER PATHWAYS Goal M	
7.1	Prioritize smaller Projects for which construction and maintenance jobs are more likely to come from a local labor force
7.2	Invest in research and Programs that promote permanent career pathways
7.3	Coordinate job placement and partner with workforce training and pre-apprenticeship programs
ENSURE ONGOING OPERATIONS & MAINTENANCE FOR PROJECTS Goal N	
8.1	Maintain a skilled, local workforce to ensure quality construction and comprehensive operations & maintenance (O&M)
8.2	Ensure sufficient resources are set aside for Project O&M and monitoring
8.3	Promote wildfire resilience through fire-resilient O&M protocols for Projects
8.4	Integrate post-construction monitoring data into O&M plans
PRIORITIZE MEANINGFUL ENGAGEMENT	
9.1	Promote meaningful and sustained outreach and engagement through regional coordination and expertise
9.2	Ensure sufficient resources are set aside for Project O&M and monitoring
9.3	Promote fire-adapted communities through enhanced education and outreach

*SCW Program-wide Priority Strategy based on WASC engagement
Note: While some strategies may not explicitly reference water quality, in accordance with the SCW Program Implementation Ordinance, all SCW Program Projects and Programs are required to include a Water Quality Benefit.

Thank you

QUESTIONS?

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