Interim MOU-Based Regional Collaborative Program Summary Report

Prepared for

San Mateo Countywide Water Pollution Prevention Program
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ACRONYMS AND ABBREVIATIONS

C/CAG	City/County Association of Governments of San Mateo County
Centralized Program	Centralized Regional Collaborative Program
County	San Mateo County
GSI	Green stormwater infrastructure
Interim Program	Interim Memorandum of Understanding-Based Regional Collaborative Program
LID	Low impact development
MOU	Memorandum of Understanding
MRP	Municipal Regional Stormwater Permit
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and maintenance
PCBs	Polychlorinated Biphenyls
RAA	Reasonable Assurance Analysis
Report	Interim Program Report
SMCWPPP	San Mateo Countywide Water Pollution Prevention Program
TMDL	Total Maximum Daily Load
Water Board	San Francisco Bay Regional Water Quality Control Board

EXECUTIVE SUMMARY

Introduction and Background

The City/County Association of Governments of San Mateo County (C/CAG) is developing a Regional Collaborative Program approach to advance regional-scale stormwater management within San Mateo County (County). The intent of the Regional Collaborative Program is to provide a cost-effective mechanism to meet local stormwater quality requirements while delivering multiple benefits, including sustainable stormwater management and climate resilience.

In 2022, C/CAG finalized a White Paper summarizing methods for advancing regional-scale stormwater management that demonstrated that significant water quality compliance cost savings could be achieved through this approach. The Technical Advisory Committee established for that project identified a Regional Collaboration Program framework option that includes both a near-term Memorandum of Understanding (MOU)-based approach and a longer-term centralized approach.

Interim Program and Components

The Interim MOU-Based Regional Collaborative Program (Interim Program), described in this Interim Program Report (Report), is intended to enable jurisdictions within the County to participate in cost-sharing or other transactions to fund the implementation and maintenance of regional stormwater management projects that meet San Francisco Bay Regional Water Quality Control Board (Water Board) Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit (MRP or MRP 3.0; Order R2-2022-0018) requirements.

Interim Program components described in this report include Interim Program Administrator roles, units of exchange, eligible participants, and eligible boundaries. The Interim Program Administrator is proposed to be C/CAG. The proposed unit of exchange for the Interim Program is Greened Acres. These units were selected because the MRP is the most pressing compliance need for the Interim Program. These units of exchange are generated through Regional Collaborative Projects.

Eligible participants are those entities that may participate in either the generation or purchase of units of exchange through the Interim Program. Eligible sellers are expected to include the jurisdictions and/or agencies in the County paying for and/or overseeing the construction of Regional Collaborative Projects included in the Interim Program and/or paying for operations and maintenance (O&M) for these projects. Eligible buyers would include San Mateo Countywide Water Pollution Prevention Program permittees only for the Interim Program.

Exchange boundaries are the geographic boundaries within which the buyer and seller must be located. For the Interim Program, the exchange boundaries will be limited by the overall County boundary and are expected to be dependent on the location of the Interim Program Regional Collaborative Projects.

Financial Considerations and Interim Program Operations

The cost basis for the Greened Acres units of exchange that are sold or cost-shared through the Interim Program is anticipated to be project-specific. The cost basis for Greened Acres generated by a specific Regional Collaborative Project will be calculated based on the associated design, construction, administrative, and/or O&M costs. The resulting unit of exchange cost basis would be multiplied by the total number of units of exchange purchased or cost shared to obtain the total cost of a specific exchange.

Buyers participating in the Interim Program may purchase or cost-share units of exchange through various methods. It is anticipated that the buyer and seller would mutually determine the financial transaction and cost-sharing option(s), as well as whether the payment is one-time or recurring. These financial methods could include signing an MOU that defines the total units of exchange purchased and the total cost of the units of exchange; and/or pooling funds through an established fiduciary body, such as the San Mateo County Flood and Sea Level Rise Resiliency District (OneShoreline).

Several Interim Program components must be tracked in a Regional Collaborative Program Tracking Tool. Proper tracking assures buyers and sellers that agreements will be followed and compliance can be achieved through exchanges. A new program such as the proposed Interim Program also requires robust adaptive management processes to evolve the Interim Program as needed to continue to deliver the Regional Collaborative Program objectives.

Case Study

The Orange Memorial Park project has been identified as a Case Study for the Interim Program. The project provides trash capture, peak flow diversion (i.e., flood control), and LID/GSI treatment, for a portion of Colma Creek flow. Operations and maintenance of the project is an ongoing cost that could be used to develop a cost basis for the units of exchange generated by the project. As of the date of this Interim Program Report, long-term buyers have not been identified for the Orange Memorial Park project Greened Acre units of exchange. In the short term (for two years beginning in 2023 and ending in 2025), OneShoreline will use Colma Creek Flood Zone property tax funds to cover the direct costs to maintain the Orange Memorial Park project.

Next Steps

Implementation of the Interim Program is expected to require several additional steps, including completion of Case Study exchanges, documentation of lessons learned, and completion of legal review. The findings from these activities will be incorporated into a Regional Collaborative Program Operational Document, which will also describe the transition from the Interim Program to a Centralized Regional Collaborative Program. It is anticipated that the transition from an Interim Program to a larger Centralized Regional Collaborative will be a longer process. Program Administrators will solicit and incorporate input from many interested entities during this transition process to evolve the Regional Collaborative Program over time.

1 INTRODUCTION

The City/County Association of Governments of San Mateo County (C/CAG) is developing a Regional Collaborative Program approach to advance regional-scale stormwater management within San Mateo County (County). The intent of the Regional Collaborative Program is to provide a cost-effective mechanism to meet local stormwater quality requirements while delivering multiple benefits, including sustainable stormwater management and climate resilience.

The Regional Collaborative Program is being developed in at least two phases. The first phase is being developed as an Interim Memorandum of Understanding (MOU)-Based Regional Collaborative Program (Interim Program), which is described in this report. The second phase entails a proposed expansion to a Centralized Regional Collaborative Program (Centralized Program). An optional third phase could entail a transition to a true Market-Based Regional Collaborative Program (Market-Based Program).

This Interim Program Report (Report) describes the proposed structure and components for the Interim Program. The Interim Program will allow jurisdictions within the County to participate in cost-sharing or other transactions to fund the implementation and maintenance of regional stormwater management projects. This Report includes the following sections:

- Section 2 summarizes the background and drivers for the Regional Collaborative Program.
- Section 3 describes the proposed structure and components of the Interim Program.
- Section 4 discusses financial considerations for the Interim Program.
- Section 5 describes key operations for the Interim Program.
- Section 6 discusses the proposed Interim Program Case Study.
- Section 7 proposes a legal review process for the Interim Program.
- Section 8 lists the next steps for the Regional Collaborative Program.

2 BACKGROUND

In 2022, C/CAG finalized a White Paper summarizing methods for advancing regional-scale stormwater management within the County to cost-effectively meet San Francisco Bay Regional Water Quality Control Board (Water Board) Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit (MRP or MRP 3.0; Order R2-2022-0018) requirements[1] (C/CAG, 2022). The White Paper compiled the following studies:

- Drivers, Objectives, Business Case, and Regional Collaborative Program Framework development (Geosyntec, 2021).

[1] Available at C/CAGs website: https://www.flowstobay.org/regional-collaborative.

- Identification, prioritization, analysis, and concepts of regional stormwater capture project opportunities (Craftwater, 2022).
- Assessing the Feasibility of Stormwater Credit Trading in the County (Corona Environmental and American Rivers, 2021).
- Funding and Financing Countywide Green Stormwater Infrastructure Investments (WaterNow, 2021).

This work built on the *Stormwater Resource Plan for San Mateo County* (SRP), which C/CAG completed in 2017 (San Mateo Countywide Water Pollution Prevention Program [SMCWPPP], 2017), and the *PCBs and Mercury Total Maximum Daily Load (TMDL) Control Measure Implementation Plan and Reasonable Assurance Analysis (RAA) for San Mateo County,* completed in 2020 (TMDL Control Measure Plan; SMCWPPP, 2020b and 2020c). These reports found that more drainage areas could be treated with a collaborative, regional-scale stormwater management approach as compared with more localized efforts. Regional-scale stormwater management is defined to include large-scale regional stormwater capture projects, programmatic implementation of parcel-based stormwater capture projects, including countywide initiatives such as rain barrel/cistern/rain garden rebate and incentive programs, and green streets.

Several drivers for the Regional Collaborative Program were identified through the C/CAG advancing regional-scale stormwater management work. They include (1) limited resources; (2) existing stormwater infrastructure deficiencies; (3) water quality regulations and protection; (4) climate resiliency; (5) beneficial use of stormwater; and (6) equity and community engagement. A Business Case demonstrated that significant cost savings could be achieved by regional-scale stormwater management, specifically when implemented for compliance with water quality regulatory requirements. The Technical Advisory Committee established for the C/CAG Advancing Regional-Scale Stormwater Management project identified a Regional Collaborative Program Framework option that includes both a near-term MOU approach and a longer-term centralized and/or market-based approach as the preferred Regional Collaborative Program. A countywide Regional Collaborative Program framework was summarized in the White Paper.

2.1 Regional Collaborative Program Regulatory and Financial Drivers

The primary regulatory driver for the Interim Program is MRP Provision C.3.j, which requires the implementation of green stormwater infrastructure (GSI) retrofit projects. County jurisdictions must treat runoff from 43.31 impervious acres countywide with Provision C.3.c/C.3.d compliant facilities (i.e., GSI), and each permittee must implement GSI project(s) treating at least 0.2 impervious acres within its own jurisdiction or contribute substantially to a GSI project outside of its jurisdiction and within the County. In addition, Provision C.3.b requires new and redevelopment projects that create and/or replace amounts of impervious surface above specified thresholds (Regulated Projects) to implement low impact development (LID) management practices, including stormwater treatment through GSI. Provision C.3.e allows for alternative or in-lieu compliance for Regulated Projects, providing that a net environmental benefit is achieved.

In addition to the main Provision C.3 driver requiring GSI retrofits, the MRP also includes requirements for trash management (through Provision C.10) and implements TMDLs for impaired water bodies in the MRP area (through Provisions C.11, C.12, C.14, and C.18). Additionally, C/CAG's TMDL Control Measure Plan presented scenarios where County municipalities would collectively need to invest between $760 million and $1.14 billion in capital improvement funds (on top of storm drain infrastructure investments) over several decades to meet San Francisco Bay PCBs and mercury TMDL goals (SMCWPPP, 2020b). Provision C.12 of MRP 3.0 also requires permittees countywide over the permit term to address (with 70% efficiency) PCBs in 445 acres of old industrial land area or other areas with moderate to high PCBs levels or to reduce PCBs loads from such areas by 81 grams per year.

To comply with the requirements of the MRP, the County and permittees are implementing regional stormwater capture projects within the County which are currently in varying stages of planning, design, and construction. So far, several of these projects have received grant funding for capital costs, including design and construction. However, ongoing operations and maintenance (O&M) have not been funded for any of the regional projects moving forward in the County. Cities that have constructed regional projects are interested in sharing ongoing maintenance costs among other County permittees.

3 INTERIM MOU-BASED REGIONAL COLLABORATIVE PROGRAM

3.1 Overview

The Regional Collaborative Program is intended to enable County jurisdictions to participate in cost-sharing or other transactions to fund the implementation and maintenance of regional stormwater management projects that meet MRP requirements. A flow chart of how the Interim Program and the Centralized Program would operate is shown in Figure 1. The components shown in the flow chart are defined as follows:

- Capital Program Investment (i.e., Funding and Financing) – These mechanisms provide initial capital for planning, designing, and constructing Regional Collaborative Projects. Currently, C/CAG and entities within the County have applied for and received state and federal grant funds to invest in multiple regional stormwater capture projects.
- Regional Collaborative Projects – These consist of regional and distributed stormwater capture projects comprising the Regional Collaborative Program infrastructure.
- Units of Exchange – Also referred to as credits, these are the units generated by Regional Collaborative Projects that Interim Program participants would purchase or cost-share to meet their MRP compliance requirements (see Section 3.3 for more details).
- MOU Participants – The eligible participants, likely municipalities, who would choose to participate in the Interim Program (see Section 3.4 for more details).
- The Regional Collaborative Capital and Administrative Fund – This fund, once established, would pool capital funds from MOU cost-sharing agreements. There may be multiple project-specific funds established and maintained by individual Regional Collaborative Project owners for the Interim Program. When the Centralized Program is

established, this fund would become centralized. This would fund the administration of the Interim Program, reimburse capital expenses, and fund capital investments in Regional Collaborative Projects and/or payments for capital financing.

- The Regional Collaborative O&M Fund – This fund, once established, would pool O&M payments (ideally ongoing) from MOU participants to fund ongoing O&M of the Regional Collaborative Projects. Similar to the Capital and Administrative Fund, there may be multiple project-specific O&M funds established and maintained by individual Regional Collaborative Project owners for the Interim Program. When the Centralized Program is established, this fund will become centralized.

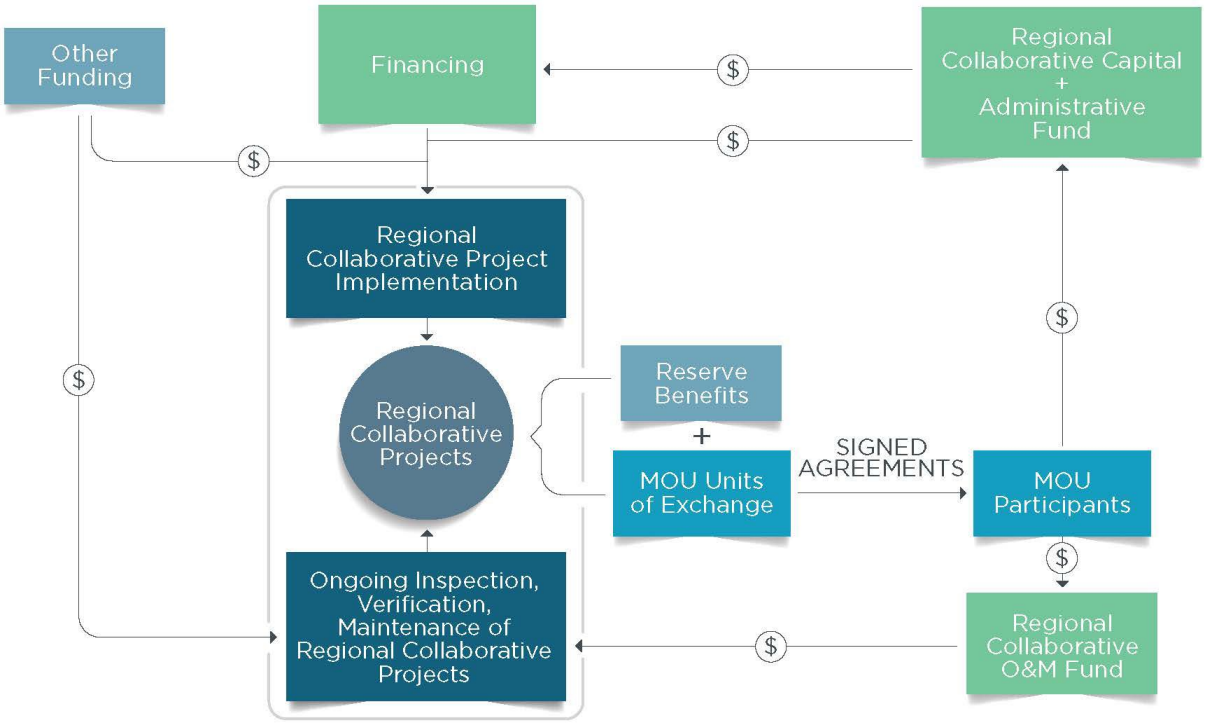

Figure 1: Interim MOU-Based Regional Collaborative Program Flow Chart

The proposed Interim Program Administrator, units of exchange (and associated Regional Collaborative Projects), eligible participants, and exchange boundaries are described in the following sections. Financial considerations (including cost-sharing mechanisms) and the tracking tool for the Interim Program are described in Chapters 4 and 5, respectively.

3.2 Interim Program Administrator

The Interim Program Administrator is proposed to be C/CAG, given its role in supporting local, countywide, and regional efforts to cost-effectively comply with MRP requirements and its related countywide GSI planning efforts. It is assumed that administration of the Interim Program would require partnership and collaboration with C/CAG's member agencies and

OneShoreline, as agencies with jurisdiction over storm drain systems and flood control conveyances in the County, as well as other potential regional partners, e.g., Caltrans.

C/CAG, in its role as Interim Program Administrator, would manage the following aspects of the Interim Program:

1. Gathering and preparing reporting information for the Interim Program, including internal reporting to County-based agencies, and documenting how many units of exchange have been created and how the units of exchange have been reserved, allocated, and paid for. Reporting tasks would also entail synthesizing Interim Program information as required for the countywide MRP Annual Report.
2. Managing the Regional Collaborative Program tracking tool, which would track Regional Collaborative Projects, units of exchange, exchanges, and payments.
3. Hosting informational and/or training webinars on how to implement the Interim Program.
4. Developing an Operational Document, which would describe roles, responsibilities, components, and functions of the Interim Program and the transition to a Centralized Program, and updating the Operational Document through adaptive management processes.

In addition to the primary Interim Program Administrator responsibilities above, C/CAG would likely facilitate, manage, and track exchange agreements that occur through the Interim Program and have an ongoing regional role of planning Regional Collaborative Projects and assisting with implementation. OneShoreline would also be expected to have a regional role relating to planning and implementing Regional Collaborative Projects. C/CAG would assist in identifying a group or committee that could provide oversight of the Interim Program Administrator and the overall Interim Program. It is expected that this group would define what oversight might entail.

Other entities would also take on administrative activities for the Interim Program. Regional Collaborative Project owners would be expected to be substantially involved in the development of agreements, financial transactions and fund management, and project and exchange documentation and tracking. Buyers would also be expected to be engaged in developing terms of agreements.

As currently planned, C/CAG would not initially be directly involved in financial transactions or managing funds through its role as the Interim Program Administrator. When a centralized Regional Collaborative Capital and Administrative Fund and/or O&M Fund is established (anticipated to be a step in establishing the Phase 2 Centralized Program), C/CAG as well as other potential funding partners/administrators may play a direct role in managing such transactions and financial accounts.

3.3 Units of Exchange

3.3.1 Definition and Needs for Units of Exchange

The Interim Program units of exchange are the metrics generated by Regional Collaborative Projects that MOU participants would purchase or cost-share. For the Interim Program, units of exchange must be defined as a common measurement unit of equivalent water quality benefit, which reflects both the regulatory stormwater quality requirement and the measurable or

estimated outcome of a stormwater control measure. In the case of the Interim Program, the units of exchange must comply with the MRP requirements, specifically the definitions of LID/GSI facilities that meet C.3.b, C.3.c, C.3.d, and C.3.j requirements. The units of exchange are also expected to provide benefits for MRP Provisions C.10, C.11, and C.12. The units of exchange must be consistently measurable in how they are calculated.

Units of exchange are generated by the stormwater control measures implemented as part of a stormwater treatment exchange program. In the case of the Interim Program, the units of exchange are generated from Regional Collaborative Projects. In some cases, a portion of the units of exchange generated by a Regional Collaborative Project are not saleable or available for exchange or trade. These "Reserve" units of exchange that cannot be exchanged may need to be reserved for use by the entity that funded the capital construction of the Regional Collaborative Project or reserved for another environmental benefit, such as the net environmental benefit requirement of MRP Provision C.3.e. Together, these are called "Reserve Benefits" (as shown in Figure 1).

3.3.2 Interim Program Units of Exchange

The proposed unit of exchange for the Interim Program is Greened Acres, or acres treated by MRP-compliant[2] LID/GSI stormwater treatment. These units were selected because the MRP is the most pressing compliance need for the Interim Program. A definition of Regional Collaborative Program Greened Acres units of exchange was developed and described in a memorandum prepared by Paradigm (2023; see Appendix A). Per the memorandum, the proposed framework for quantifying Greened Acres generated through Regional Collaborative Projects is as follows:

- A non-Regulated Regional Collaborative Project with full LID treatment sized for 80% annual runoff volume capture will be credited Greened Acres equal to the equivalent impervious acres in the project's drainage area.
- A non-Regulated Project with full LID treatment that is sized for less than 80% annual runoff volume capture will be credited Greened Acres proportional to its estimated annual volume capture relative to 80% annual runoff volume capture and the directly connected impervious acres in the project's drainage area.
- A non-Regulated Project with partial LID treatment (e.g., with a combination of mechanisms for capturing, treating, and/or releasing stormwater runoff to the receiving water) will be credited Greened Acres proportional to its estimated runoff volume treated with LID.

Based on this framework, the Greened Acre calculation would be applied as follows:

[2] Stormwater treatment compliant with MRP Provisions C.3.c and C.3.d.

$$Greened\ Acres = \frac{Vol_{capture}}{80\% \times Vol_{runoff}} \times Directly\ Connected\ Impervious\ Acres$$

Where:

$$Vol_{capture} = the\ annual\ average\ volume\ captured\ and\ treated\ by\ the\ project$$

$$Vol_{runoff} = the\ annual\ average\ runoff\ volume\ for\ the\ drainage\ area$$

This approach for quantifying Greened Acres has been presented to Water Board staff but not yet accepted. Additional discussions will take place during fiscal year (FY) 23-24.

3.3.3 Regional Collaborative Projects Generating Units of Exchange

The Regional Collaborative Projects in the Interim Program are proposed to include the constructed regional stormwater capture facility in Orange Memorial Park, located in South San Francisco, and potentially, other planned regional projects currently under development in the County. The Regional Collaborative Projects identified for the Interim Program will be confirmed in the Operational Document and the Regional Collaborative Program Tracking Tool (see Section 5).

The allowable facility types for the Interim Program include those that are compliant with MRP Provision C.3.c LID/GSI requirements. These currently include the following facility types:

- Infiltration Systems, including infiltration trenches, infiltration basins, subsurface infiltration systems (i.e., gallery or vault), and pervious pavement.
- Capture and Use Systems, including parcel-based rainwater harvesting and regional stormwater capture and use.
- Bioretention Systems with Biotreatment Soil Media[3], including lined bioretention or flow-through planters, unlined bioretention, tree wells, and suspended pavement systems.

The treatment systems listed above must also meet the specific design and sizing requirements included in the SMCWPPP C.3 Regulated Projects Guide (SMCWPPP, 2020a) to be considered LID/GSI.

An Alternative Treatment Systems Workgroup was established in late 2022 at the San Francisco Bay regional level and met through mid-2023. The Workgroup discussed allowable facility types to meet MRP LID/GSI requirements and potential changes to the MRP to expand the allowable facility types. In July 2023, the Water Board issued a Tentative Order for an MRP Amendment which would add a subprovision allowing additional facility types with expanded options for stormwater control measures; however, as written, the new subprovision would also require substantial additional studies that would likely dissuade project sponsors from pursuing these alternative facility types at this time, and it could not be applied to regional projects. SMCWPPP submitted comments on the Tentative Order of the MRP Amendment requesting more flexibility in the treatment options for regional projects to comply with C.3.e and C.3.j via a proposed Alternative Treatment Systems Equivalency Approach demonstrating commensurate

[3] Biotreatment soil media (BSM) must have a 5 inch/hour loading rate to meet MRP C.3.c requirements.

benefit for water quality, urban greening, and hydrology for site-constrained projects where infiltration may be restricted due to underlying soils (see Appendix B); however, that proposal was not included in the MRP Amendment. Discussions with Regional Water Board staff and other permittees and countywide program representatives on the applicability of alternative treatment systems for regional projects are expected to continue during the coming year.

Regional Collaborative Projects included in the Interim Program would need to complete a certification process, likely conducted by the jurisdiction in which they are located, to confirm that the regional project meets requirements and is eligible to generate units of exchange. This process is anticipated to be similar to the existing process for design review and inspection of installed treatment facilities. Additionally, ongoing verification of the Regional Collaborative Projects would be needed to confirm that the projects are functioning as designed and properly maintained and, therefore, generating the units of exchange on an ongoing basis.

3.4 Eligible Participants

Eligible participants are those entities that may participate in either the generation or purchase of units of exchange through the Interim Program.

Eligible sellers are expected to include the jurisdictions and/or agencies in the County where the facility is located and the jurisdictions/agencies paying for and/or overseeing the construction of Regional Collaborative Projects included in the Interim Program and/or paying for operations and maintenance for these projects.

Eligible buyers for the Interim Program would include SMCWPPP permittees only. SMCWPPPP Permittees may purchase units of exchange for retrofit compliance purposes (i.e., MRP Provision C.3.j) or, potentially, for alternative compliance for Regulated Projects (i.e., MRP Provision C.3.e) where that permittee is the owner.

Other partners may also be involved in the Interim Program through funding Regional Collaborative Projects. These partners might not act as direct buyers or sellers through the Interim Program but instead be designated as reserve benefit partners. Reserve benefit partners would be entitled to a portion of the units of exchange (i.e., the reserve benefits) generated by the Regional Collaborative Project they fund. These entitled reserve benefits would not be available for purchase by other buyers.

3.5 Exchange Boundaries

Exchange boundaries are the geographic boundaries within which the buyer and seller must be located. Exchanges may not occur with an entity located outside of the designated exchange boundaries. The Interim Program exchange boundaries would be San Francisco Bay-draining watersheds and Pacific Ocean-draining watersheds for MRP Provision C.3.e (Alternative Compliance)[4], and countywide for MRP Provision C.3.j. From the regulatory perspective, the MRP requires that offsite projects implemented for alternative compliance (i.e., through Provision C.3.e) be located "within the same watershed" as the Regulated Project. Watersheds

[4] This means that cross-receiving water body exchanges would not be allowed for Provision C.3.e (Alternative Compliance) exchanges.

for this requirement are interpreted as the San Mateo County area draining to San Francisco Bay and the County area draining to the Pacific Ocean. The exchange boundaries for units of exchange purchased for alternative compliance could be as large as these areas. Units of exchange purchased to meet C.3.j retrofit requirements do not have a watershed-based requirement, and therefore the exchange boundary could be as large as the County.

The exchange boundaries for individual stormwater capture projects generating units of exchange could be limited by the seller. For example, these could be limited to a stream-based watershed (e.g., the Colma Creek watershed for the Orange Memorial Park site) and/or the drainage area tributary to a Regional Collaborative Project, at the discretion of the project owner[5]. The exchange boundaries for specific Regional Collaborative Projects are expected to be established when entered into the Regional Collaborative Program Tracking Tool.

4 FINANCIAL CONSIDERATIONS

4.1 Cost Basis for Units of Exchange

The cost basis for the Greened Acres units of exchange that are sold or cost-shared through the Interim Program is anticipated to be project-specific. The cost basis for Greened Acres generated by a specific Regional Collaborative Project will be calculated based on the associated design, construction, administrative, and/or O&M costs. An example cost basis calculation would sum the design, construction costs to install the project, and the jurisdiction's administrative and O&M costs for a specified time, for example, thirty years. This total dollar amount would be divided by the total number of saleable Greened Acre units of exchange (i.e., subtracting any generated units of exchange that must be reserved for the capital funder, owner, or environmental benefit purposes). The resulting unit of exchange cost basis would be multiplied by the total number of units of exchange purchased or cost shared to obtain the total cost of a specific exchange.

Depending on the source of capital funds for the Regional Collaborative Project, the proportion of design, construction, administrative, or operations and maintenance costs considered in the cost basis calculation may change. For example, if a jurisdiction's Regional Collaborative Project design and construction was funded by an external agency or grant, those external funds may not be included in the unit of exchange cost-basis as this investment would not need to be recouped by the jurisdiction (e.g., this could be important for a nexus requirement). In this case, the unit of exchange cost-basis would likely consist of O&M and administrative costs. Another consideration is whether the payment should consist of a one-time upfront payment or a recurring payment. For example, while the Interim Program may include O&M costs in the cost basis calculation for units of exchange, this is an ongoing cost that could be paid through an upfront payment (scaled to cover a specific time period, such as the thirty-year example provided previously) or through ongoing recurring payments. Similarly, if administrative costs are expected to change over time, administrative costs may not be included in the unit of exchange

[5] Limiting project-specific exchange boundaries is left to the discretion of the project owner for the Interim Program; however, many sellers may wish to select the largest exchange boundary possible to expand the potential pool of buyers for units of exchange.

cost basis calculation and instead applied as a small percentage surcharge on the total purchase and/or on recurring payments.

Costs, payment methods, and whether the payment is one-time or recurring would be established in project-specific exchange agreements. The terms of the agreement would be determined by the parties to the exchange agreement. As the MRP and its compliance requirements could change under future reissuances, the agreements would need to be developed to be flexible enough to be altered as needed or at a specified frequency in response to MRP changes.

A cost-basis example for the City of South San Francisco Orange Memorial Park project is discussed in the Case Study (see Section 6).

4.2 Financial Transaction and/or Cost-Sharing Options

Buyers participating in the Interim Program may purchase or cost-share units of exchange through various methods. It is anticipated that the buyer and seller would mutually determine the financial transaction and cost-sharing option(s), as well as whether the payment is one-time or recurring. These financial methods could include:

- Enter into an MOU that defines the total units of exchange purchased and the total cost of the units of exchange. This would be coupled with a receipt of proof of payment to allow the buyer to take credit for the units of exchange for their compliance purposes. The MOU would also define the payment schedule, including whether the units of exchange were purchased through a one-time payment or are paid for on a recurring basis.
- Pool funds through an established fiduciary body, such as the San Mateo County Flood and Sea Level Rise Resiliency District (OneShoreline) or C/CAG. An example might entail OneShoreline, C/CAG, and/or its member agencies in a Regional Collaborative Project drainage area contributing to a project's capital and/or O&M costs with oversight by relevant entity or entities (e.g., the Colma Creek Citizens Advisory Committee and OneShoreline Board of Directors for a project being funded by OneShoreline Flood Zone revenue or other operational funds; or C/CAG's Stormwater Committee and Board of Directors for a project funded via a portion of the countywide stormwater program fund as agreed upon by the member agencies). For this mechanism, the fiduciary body may obtain funds from buyers to pay for or recover costs for all or a portion of capital and/or O&M costs and would establish the required financial transaction procedures and funds. Involved parties have had initial discussions to use this pooled fund approach for the Orange Memorial Park Project, which is discussed more in the Case Study (Section 6).

During the Interim Program period, it is recommended that C/CAG manage and track the associated units of exchange for record-keeping and reporting purposes (also see Section 5.2). As the Regional Collaborative Program transitions to the Centralized Program, future program developments are likely to include establishing a dedicated centralized Regional Collaborative Capital and Adminstrative and/or O&M Fund, which could be managed C/CAG, OneShoreline or a combination of participating agencies.

5 INTERIM PROGRAM OPERATIONS

5.1 Reporting and Tracking

Several Interim Program components must be tracked in the Regional Collaborative Program Tracking Tool. Proper tracking assures buyers and sellers that agreements will be followed and compliance can be achieved through exchanges. The Regional Collaborative Program Tracking Tool would need to track the following components:

- Seller and buyer information.
- Regional Collaborative Project data, including the total units of exchange generated by the projects and the number of saleable units of exchange. This may also include certification information that documents that the project meets Interim Program requirements to generate units of exchange.
- Exchange details, including the date of exchange, total units of exchange purchased, total purchase cost, relevant agreements and their start/end dates, and financial mechanisms.
- A ledger that uses the Regional Collaborative Project data and exchange details to track how many units of exchange are remaining and available for purchase.
- Regional Collaborative Project ongoing inspection and maintenance data, including dates of inspections, maintenance dates, maintenance activities, and other project verification data.

C/CAG has an existing GI Tracking Tool that is expected to be adapted for this purpose in the coming years. The GI Tracking Tool currently tracks the locations and attributes of San Mateo County permittee GSI facilities. The GI Tracking Tool would be updated to allow for the functionality needed for the Interim Program and Phase 2 Centralized Program.

In addition to ongoing, updated tracking of Interim Program-related data, the Regional Collaborative Program Tracking Tool must have the ability to output information needed for reporting. This could include information such as the total number of units of exchange generated or contributed, the units of exchange purchased and/or claimed, the total cost of exchanges, and information regarding certification or ongoing verification of facilities.

5.2 Operational Document

An Operational Document is a helpful tool for describing the Interim Program standard operating procedures, roles, responsibilities, components, and functions. The Operational Document would evolve from this Report, and additional operations-specific details would be added as decisions are made by the Interim Program Administrator and participants regarding units of exchange calculations, financial transactions, agreements, and other logistical actions to implement the Interim Program. The Operational Document would also describe the transition to the Centralized Program and the associated operational changes needed. The Operational Document would be updated regularly through adaptive management processes.

5.3 Adaptive Management

A new program such as the Regional Collaborative Program requires adaptive management, especially if it is intended to be operational for several years or decades. Assumptions made in the development of the framework and descriptions of the Interim Program and subsequent Centralized Program components may turn out to be different from observations when the Program is implemented. To address this, robust adaptive management processes must be in place to evolve the Interim Program and subsequent Centralized Program as needed to continue to deliver the Regional Collaborative Program objectives. There are two major components of adaptive management: (1) conducting ongoing evaluations of the Regional Collaborative Program, and (2) adjusting Regional Collaborative Program operations to address issues discovered through Program evaluations.

Ongoing evaluations should focus on the measurable outcomes of the Regional Collaborative Program. Evaluations could also examine the Regional Collaborative Program's Tracking Tool and administrative needs to assess whether additional improvements in functionality, programmatic, or accounting methodology are needed. The measurable outcomes of the Interim Program include but are not limited to: the number of units of exchange available, the volume of cost-sharing or other exchange transactions that fund the implementation and maintenance of Regional Collaborative Projects, and the relative contributions towards MRP compliance achieved. If components, processes, or other Interim Program features are unintentionally restricting the ability of potential buyers or sellers to participate in exchanges, these features should be adjusted to better enable these transactions. While administrative burden could affect the exchange volume, this could also be separately assessed as part of ongoing adaptive management evaluations.

Evaluations of the Regional Collaborative Program should occur regularly (for example, annually) and be formally documented. Findings and potential solutions to address substantial challenges should be approved by the Program Administrator and the committee providing administrative oversight. Remedial actions should be documented in the Program Operational Document, and structural changes to the Tracking Tool, agreement template, or other Program components would then be made.

In addition to adapting the Interim Program as needed while it is being implemented, adaptive management processes will assist in evolving the Interim Program into the Centralized Program over time. This Regional Collaborative Program evolution could include multiple changes, including but not limited to the following:

- Expanding the role of Interim Program Administrator to a centralized entity that is managing more components of the Regional Collaborative Program, including:
    - The Regional Collaborative Capital and Administrative Fund and Regional Collaborative O&M Fund or equivalents;
    - Individual exchanges and financial transactions, including a standardized set of forms and/or agreements;
    - Certification and verification of Regional Collaborative Projects;

    - Planning and implementation for additional Regional Collaborative Projects;
    - Adjusting or updating the units of exchange definitions; and
    - Cost setting and unit of exchange cost adjustments.
- Expanding the list of eligible entities that can participate, potentially including:
    - Private developers and other Regulated Project owner entity buyers within San Mateo County;
    - Permittee buyers covered under permits other than the MRP, including Phase II permittees, Caltrans, and potentially facilities covered under individual NPDES permits, within San Mateo County; or
    - Other permittee buyers outside of San Mateo County (if expanded beyond San Mateo County; this would likely occur after a designated Centralized Program establishment period).
- Expanding the saleable metrics (i.e., units of exchange) generated through an expanded list of Regional Collaborative Project types:
    - Additional LID/GSI project types (for Greened Acres), including green streets, frontage improvements, programmatic measures such as rain barrel rebates, etc.;
    - Trash capture facilities (for trash management units of exchange);
    - Water diversion and recharge (for water supply units of exchange);
    - Detention or hydromodification practices (for flood control/quantity-based units of exchange); and/or
    - Park, restoration, habitat, coastal, and/or other non-LID/GSI nature-based solutions (for park space, biodiversity, and/or climate resilience units of exchange).

Expansion of the Interim Program should first involve a demand study to identify the potential volume of units of exchange needed for interested buyers. Expansion of the Regional Collaborative Program that is not targeted to known interested parties could make the Regional Collaborative Program overly costly and complicated while being underutilized. Additional details on the Centralized Regional Collaborative Program would be developed through outreach and research and documented in a Regional Collaborative Program Framework Report, which could be developed at a later date.

An optional third phase would include the development of a Market-Based Regional Collaborative Program, which would enable private sellers to construct Regional Collaborative Projects, potentially set prices, and sell units of exchange through a market-enabled Regional Collaborative Program Tracking Tool. Administrators may explore the transition of the Centralized Program to a “true” Market-Based Regional Collaborative Program after the Centralized Program is established.

6 CASE STUDY

The Orange Memorial Park project located in South San Francisco has been identified as a Case Study for the Interim Program. The current status of Greened Acre units of exchange and cost-sharing is provided in this section and next steps are summarized in Section 8.

6.1 Units of Exchange

The Orange Memorial Park project provides trash capture, peak flow diversion (i.e., flood control), and LID/GSI treatment, for a portion of Colma Creek flow draining to the project. Diversion and treatment of Colma Creek flow is expected to provide compliance towards MRP Provision C.3.j targets as well as other MRP compliance and community benefits. The calculated Greened Acres units of exchange generated from the project have been discussed with Water Board (see section 3.3.1); however, final approval of these units of exchange is still needed. Following approval of the number of Greened Acre units of exchange generated by the project, these units can be cost-shared with or sold to interested buyers.

The project captures and treats a portion of the flow generated from a drainage area that includes the Colma Creek Flood Zone (approximately 80% of the total drainage area) and San Mateo County (approximately 20% of the total drainage area).

6.2 Cost Basis for Units of Exchange

The capital costs for the Orange Memorial Park project were fully funded by Caltrans. Caltrans also took compliance credit for a portion of the trash management benefits provided through the project. Operations and maintenance of the project is an ongoing cost that could be used to develop a cost basis for the generated units of exchange. A summary of operations and maintenance costs, provided by South San Francisco (2023) is provided in the image below.

OMP Maintenance Costs for 23-24

DESCRIPTION	FREQUENCY	COST
Training	2 events	$ 7,467
Clean Diversion Channel & Trash Rack	once per month	$ 121,356
Clean Grit Chamber	once per year	$ 29,840
Inspect & Maintain Storage/Conveyance System	once per week	$ 34,917
Inspect & Maintain Water Reuse System	once per month	$ 18,746
Environmental Compliance Testing	twice per year	$ 34,172
Regulatory Compliance Reporting	once per year	$ 25,000
City Oversight and Administration (10% of total)	--	$ 27,150
TOTAL		$ 298,648

The costs represented above are estimated annual costs and would be expected to increase over time. The environmental compliance testing and regulatory compliance reporting costs (6th and 7th items) are not expected to be needed long-term. The annual price of an Orange Memorial

Park Greened Acre unit of exchange could be calculated as the annual project maintenance cost divided by the total number of Greened Acres generated and available for sale.

6.3 Financial Transactions or Cost Sharing

The primary Orange Memorial Park project beneficiaries include the entities whose runoff is being diverted into and treated by the project for water quality, peak flow control, reduced channel maintenance needs, and community co-benefits. Additionally, the City of South San Francisco receives water conservation benefits and associated savings from offsetting a portion of its landscape irrigation and other potable water demand (e.g., street sweeping, urban tree watering) via the estimated 15 million gallons/year stored and treated for non-potable uses. For MRP compliance purposes, these beneficiaries could share the costs of project maintenance commensurate with the benefits received by acting as "buyers" of Orange Memorial Park Greened Acre units of exchange. For example, the Colma Creek Flood Zone, which is managed by OneShoreline, could fund Orange Memorial Park Greened Acre units of exchange proportionately equivalent to the portion of the project drainage area and associated Greened Acre volumes managed by the Flood Zone.

It is expected that other C/CAG member agencies may also want to purchase the Greened Acre units of exchange generated by the Orange Memorial Park project to fulfill MRP Provision C.3.j retrofit requirements during the current permit term. This could occur through a bulk purchase of Greened Acre units of exchange by C/CAG on behalf of C/CAG's member agencies, or it could occur through individual member agency purchases and cost-sharing arrangements with South San Francisco. South San Francisco may also want to retain some Greened Acres units in exchange for alternative compliance for City-owned Regulated Projects.

As of the date of this Interim Program Report, long-term buyers have not been identified for the Orange Memorial Park project Greened Acre units of exchange. In the short term (for two years beginning in 2023 and ending in 2025), OneShoreline has committed to use Colma Creek Flood Zone property tax funds to cover all direct costs to maintain the Orange Memorial Park project via an existing Maintenance Agreement between OneShoreline and South San Francisco to pay for Colma Creek Channel maintenance and related costs in the Flood Zone area. After 2025, other Interim Program buyers or cost apportionments may be needed to pay for the project maintenance.

The direct costs covered through the OneShoreline two-year funding term include: (1) training; (2) clean diversion channel & trash rack; (3) clean grit chamber; (4) inspect and maintain storage/conveyance system; and (5) inspect and maintain water reuse system. The estimated total cost in FY23-24 of these tasks is $212,326. Via the Maintenance Agreement between OneShoreline and South San Francisco, South San Francisco will document the actual costs for Orange Memorial Park project maintenance to submit for reimbursement to OneShoreline on an annual basis for the next two years. This agreement would not cover the costs associated with Environmental Compliance Testing, Regulatory Compliance Reporting, or City Oversight and Administration.

7 LEGAL REVIEW PROCESS

The proposed process for legal review of the Interim Program will include a review of this Report by C/CAG Legal Counsel. C/CAG Counsel will be asked to focus their review on identifying any fatal flaws in the Interim Program as it is described in the Final Report, as well as provide general comments relating to the legality and/or legal complexity of implementing the Interim Program. Any findings or suggested edits to this Report from legal reviewers will be addressed in the Regional Collaborative Program Operational Document.

It is also expected that legal counsel and/or other decision-makers for the participants that purchase or cost-share Orange Memorial Park units of exchange would be engaged in legal review, likely through the Stormwater Committee Ad-hoc Workgroup Advancing Regional Projects. The review by the Case Study participants would include assessing and editing agreements and input regarding the required approvals needed within their jurisdiction to carry out an exchange.

It is not expected that Water Board staff would be consulted about the structure and administration of the Interim Program; however, Water Board staff is likely to continue to be consulted about the definition of units of exchange. The purpose of these discussions will be to align units of exchange with desired permit compliance standards.

8 NEXT STEPS

The development of the Interim Program will be an iterative process, and the transition from an Interim Program to a larger Centralized Program will likely be a longer process that will evolve the Regional Collaborative Program over time. Implementation of the Interim Program and Centralized Program are expected to require the following steps:

Table 1: Next Steps for Interim Program and Market-Based Program

Next Step	Action	Who
Complete Interim Program Case Study	Establish Units of Exchange for Orange Memorial Park (continue discussions with Water Board staff during FY 23-24).	C/CAG, Water Board, South San Francisco, OneShoreline
	Establish Cost of Orange Memorial Park Units of Exchange.	South San Francisco, OneShoreline
	Identify "Seller" and draft Agreement for Sale of Units.	South San Francisco, OneShoreline, C/CAG
	Identify Buyers.	South San Francisco, OneShoreline, C/CAG
	Complete pilot exchanges, including agreements and financial transactions.	South San Francisco, OneShoreline, Buyers
	Track completed exchanges and units of exchange sold.	South San Francisco, OneShoreline, C/CAG
Further Review and Development of Interim Program	Complete Legal Review of Interim Program - Document Feedback from C/CAG Legal Reviewers and identify needed updates to Interim Program.	C/CAG
	Describe Lessons Learned from Case Study and associated updates to Interim Program.	C/CAG

Next Step	Action	Who
Centralized Program Transition	Determine whether additional Regional Collaborative Projects would be exchanged through Interim Program or Market-Based Program and evaluate options for establishing Regional Collaborative Capital & Administrative Fund and/or O&M Fund.	C/CAG, OneShoreline, WARP
	Draft Operational Document incorporating Interim Program Case Study Lessons Learned, Legal Review, and transition to Centralized Program.	C/CAG
	Implement operations outlined in Interim Program Operational Document, including but not limited to tracking, reporting processes, or standardizing agreements.	C/CAG
Centralized Program Development	Identify deadlines and responsible parties for the Centralized Program Development Steps listed below (this can be formalized into a "Centralized Program Roadmap"). Identify required reviewers and program approvals (e.g., Resolutions by C/CAG Board, City Councils, etc.).	C/CAG, OneShoreline, WARP
	Identify Program Administrator and convene the committee providing oversight of the Program Administrator. These entities would be managing completion of the remaining identified steps.	C/CAG, OneShoreline, WARP
	Establish and develop a tracking system to track Projects, units generated, units exchanged, buyers, and ongoing Project O&M.	TBD
	Identify and document eligible participants for the Centralized Program, including unit generators/sellers and buyers (may be iterative with the step below).	TBD
	Expand on demand projections conducted for the Advancing Regional Projects effort for eligible participants and document. Examine potential demand for other units of exchange.	TBD
	Define and document the units of exchange to be included in the Program and develop baselines, calculations, control measures, timeframes, and certification and verification requirements.	TBD
	Using demand projections as a basis, establish and document Program exchange boundaries and other geographic limits.	TBD
	Develop template agreements for participation in the Program.	TBD
	Establish long-term financial processes (could include building from Interim Program Regional Collaborative Capital & Administrative and/or O&M Fund if developed), including the entities collecting payments and funds established for these payments. Identify whether O&M payments will be upfront or ongoing, and if ongoing, the mechanism to charge these payments.	TBD
	Conduct cost studies to set amounts and frequency for units of exchange and O&M payments for the Market-Based Program.	TBD
	Implement additional Regional Collaborative Projects to generate units of exchange available for purchase through the Program.	TBD

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APPENDIX A

Demonstration of the calculation of "Greened Acres" from volume capture for non-Regulated, regional-scale stormwater capture projects (Paradigm, 2023)

To:	Reid Bogert, San Mateo Countywide Water Pollution Prevention Program (SMCWPPP)
From:	Stephen Carter and Chris Carandang, Paradigm Environmental; Jill Bicknell and Jon Konnan, EOA
Date:	3/9/2023
Subject:	Demonstration of the calculation of "Greened Acres" from volume captured for non-Regulated, regional-scale stormwater capture projects

The San Francisco Bay Regional Water Quality Control Board (Water Board) adopted the third issuance of the Municipal Regional Stormwater Permit (MRP 3.0) in May 2022, with an effective date of July 1, 2022. The City/County Association of Governments (C/CAG) of San Mateo County and its 22 member agencies are planning for implementation of new Green Infrastructure (GI) requirements, including implementation of GI associated with non-Regulated Projects (typically retrofit green streets or regional-scale stormwater capture and treatment projects) to meet specified numeric targets by the end of the permit term, pursuant to Provision C.3. Implementation will be credited in terms of impervious acres treated by such projects. From here on in this memorandum, the term "Greened Acres" is used to refer to the acres of impervious area from which runoff is captured and treated using Low Impact Development (LID) or other treatment systems[1], to the standards defined in Provision C.3. LID treatment measures including harvesting and reuse, infiltration, evapotranspiration, and biotreatment.

Provision C.3 regulates new and redevelopment projects that meet certain criteria (i.e., public and private developments that exceed thresholds for creating or replacing impervious area, with specific exceptions). However, non-Regulated Projects may also be implemented by municipal Permittees to meet countywide stormwater pollutant reduction and GI retrofit goals in Provision C.3. Regional-scale stormwater capture retrofit projects (regional projects) are strategically located and designed to treat large areas and capture or treat as much stormwater as possible within limited footprints. These types of projects are typically "offline", meaning they receive stormwater via diversion from a channel or storm drain. As a result, it is more challenging to apply the sizing criteria that govern Regulated Projects. Additionally, regional projects may utilize alternative stormwater capture and treatment technologies, such as mechanical and chemical (high flow-rate media) filtration for all or part of the runoff captured. Though these technologies are not traditionally considered LID practices, they can provide substantial water quality benefits.

Thus, there is a need for a consistent and technically sound calculation to demonstrate how regional projects contribute towards GI implementation in terms of Greened Acres. There are several regional-scale multi-benefit stormwater capture projects being advanced in San Mateo County, one of which has already been constructed. As detailed in prior reports developed by C/CAG and the Countywide Stormwater Program, including the Reasonable Assurance for Green Infrastructure (SMCWPPP 2020b) and more recently the Regional Collaborative Program Framework White Paper (SMCWPP 2022), regional projects provide significant cost-savings towards achieving water quality and other social and environmental benefits related to stormwater management. Yet, while some regional

[1] Current MRP 3.0 language only allows impervious acres whose runoff is treated with LID treatment to count toward the required numeric GI targets. However, a work group of MRP Permittee, countywide stormwater program, and Water Board staff has been formed to discuss the role and benefits of alternative treatment systems that could result in more flexibility for treatment options in the future, possibly via formal amendment of MRP 3.0 by the Water Board during the permit term.

projects may provide full LID treatment as currently defined in the MRP (i.e., through infiltration and/or harvesting and use), others may not, or may provide LID treatment for only a portion of the overall volume managed by a facility.

The purpose of this memo is to propose an approach that links the quantification of Greened Acres to the stormwater capture metrics of regional-scale non-Regulated Projects that are already constructed or may be implemented in future years by the Permittees to meet the current GI retrofit goals in Provision C.3, countywide stormwater pollutant reduction goals (e.g., trash removal per Provision C.10 and PCBs load reductions per Provision C.12), and/or provide other benefits such as flood and climate resilience. This analysis will enable Permittees to take credit for the benefits of regional stormwater projects that may be designed to full or partial LID standards and provide substantial and measurable water quality benefits, especially compared to small scale distributed GI.

To support the implementation of GI Plans and realize these water quality benefits, C/CAG and municipalities have developed multiple regional stormwater capture project concepts and designs, and the City of South San Francisco has just completed the construction of the first regional project in the Bay Area at Orange Memorial Park. For the current analysis, the Orange Memorial Park Project was evaluated to provide a demonstration of a potential Greened Acres calculation methodology. The following provides a summary of the sections within this memo that outline the approach:

- **Section 1 Methodology:** Summarizes the proposed methodology for calculating stormwater capture for a regional project in a way that is translatable to the LID standards in Provision C.3 and, thus counts as Greened Acres for tracking GI implementation.
- **Section 2 Modeling Analysis:** Describes the modeling analysis conducted to estimate stormwater capture for a regional project in San Mateo County, which serves as the basis for the demonstration of Greened Acres calculation in Section 3.
- **Section 3 Example Greened Acres Calculation:** Demonstrates an example calculation of Greened Acres for the regional project modeled in Section 2 by applying the proposed methodology in Section 1.
- **Section 4 Conclusions and Next Steps:** Summarizes results and discusses potential next steps for promoting the crediting of Greened Acres for non-Regulated projects.

1 METHODOLOGY

Provision C.3.d, which governs the numerical sizing criteria for stormwater treatment systems of Regulated Projects (as defined in Provision C.3.b), provides multiple options for sizing stormwater treatment systems of Regulated Projects according to whether the primary mode of action is dependent on volume capacity, flow capacity, or a combination of both. However, the criterion that provides the most overlap across LID type and, therefore, provides the most flexibility in translating a stormwater capture performance metric to Greened Acres, is *80% annual runoff volume capture* (Provisions C.3.d.i.(1)(b) and C.3.d.i.(3)). This is also the most commonly used design criteria in San Mateo County and among other MRP permittees and programs for regional projects. For this reason, it is proposed as the metric for translating volumes captured/treated to Greened Acres for regional projects. The following represents the proposed approach for calculating Greened Acres for regional projects based on volume capture:

- A regional project with full LID treatment that is sized for capture of 80% of the annual runoff volume from the entire drainage area will be credited Greened Acres equal to the directly connected impervious area[2] in the project's drainage area. This is a 1:1 translation of impervious coverage to Greened Acres because it meets the LID treatment standards and numerical sizing criteria defined in Provision C.3.c and d, respectively.
- A regional project with full LID treatment that is sized for capture of less than 80% of the annual runoff volume from the drainage area (i.e., an offline system receiving runoff via diversion from a channel or storm drain) will be credited Greened Acres proportional to its estimated annual volume capture in relation to 80% annual runoff volume capture and the directly connected impervious acres in the project's drainage area. For example, a project whose drainage area includes 100 acres of impervious area but only achieves 60% volume capture (75% of the sizing criteria) will be credited for 75 Greened Acres. This is not a 1:1 translation of impervious coverage to Greened Acres because only part of the selected sizing criteria is met; thus, a proportional credit based on the volume capture is provided.
- A regional project with partial LID treatment (e.g., uses a combination of mechanisms for capturing, treating, and/or releasing stormwater runoff to the receiving water) may include a multiplication factor to determine the equivalent Greened Acres treated with LID. Consider the example above, but instead of 60% volume capture with full LID treatment, the project treats 40% of the annual volume with LID and 20% with non-LID (60% total volume capture). Under this configuration, the project is credited for 50 Greened Acres – 2/3 of the 75 Greened Acres that would have been credited if it was a fully LID-treated project. This is also not a 1:1 translation of impervious coverage to Greened Acres because only part of the sizing and treatment criteria is met; thus, a proportional credit is provided.

Using the logic outlined above, a broadly applicable equation for Greened Acres can be applied for regional projects:

$$Greened\ Acres = \frac{Vol_{capture}}{80\% \times Vol_{runoff}} \times Directly\ Connected\ Impervious\ Acres$$

$Vol_{capture} = the\ annual\ average\ volume\ captured\ and\ treated\ by\ the\ project$
$Vol_{runoff} = the\ annual\ average\ runoff\ volume\ for\ the\ drainage\ area$

For consistent and transparent use of the Greened Acres equation above, the following methodology has been developed.

1. Delineate the drainage area for the project using the best-available elevation datasets.
2. Perform a reasonable estimation of the impervious area within the project drainage area using the best-available land cover datasets. Apply documented land use-based procedures to calculate the directly connected and disconnected impervious area within the drainage area.
3. Determine if a project captures all or a portion of the flow associated with the drainage area and the method and rate of diversion.
4. Determine if a project features LID (e.g., reuse, infiltration) or non-LID (e.g., treat-and-release) treatment mechanisms. If a project features a combination of mechanisms, configure a long-term continuous simulation to account for the amount of runoff diverted from the

[2] Directly connected impervious area is the impervious area in a watershed where runoff is conveyed directly to a storm drain or waterway, as opposed to disconnected impervious area where stormwater runs off into pervious area.

drainage area and the proportion of annual runoff treated by each mechanism, in preparation for step 5. If applicable, document the extent to which each mechanism meets the LID treatment standard.

5. Calculate the average annual runoff volume for the drainage area and the average annual volume captured by the project through long-term continuous simulation, using local rainfall data or other acceptable method specified in Provision C.3.
6. Use simulation results to calculate Greened Acres that should be credited to a project.

As a demonstration of the proposed methodology, these steps were completed for a large-scale regional retrofit project with both LID and non-LID components in San Mateo County as described in Section 2 (steps 1 through 5) and Section 3 (step 6).

2 MODELING ANALYSIS

C/CAG conducted a Reasonable Assurance Analysis (RAA) to demonstrate that San Mateo County municipalities can meet the pollutant load reduction requirements of the MRP. As part of the RAA, a watershed and GI performance modeling system was developed that simulates existing PCB and mercury loads from San Mateo County watersheds and sets goals for the amount of GI needed to meet the water quality requirements (SMCWPPP 2020a and 2020b). The model synthesized physical watershed characteristics (land use, land cover, slope, soils) and local historical rainfall data to simulate stormwater flows and pollutant loads by calibrating to observed streamflow and sampling data. Modeled flows and pollutant loads were then used to optimize cost-effective GI implementation scenarios. For this analysis, the RAA model was used to simulate the annual average stormwater capture for the Orange Memorial Park Stormwater Capture Project – which was then used to estimate the number of Greened Acres that can be credited to the project using the proposed methodology.

The first two steps of the proposed methodology (drainage area delineation and impervious area estimate) were determined from previous planning and design efforts. Section 2.1 describes the key assumptions used in the model. Section 2.2 describes the model output that is used in the Greened Acres calculation.

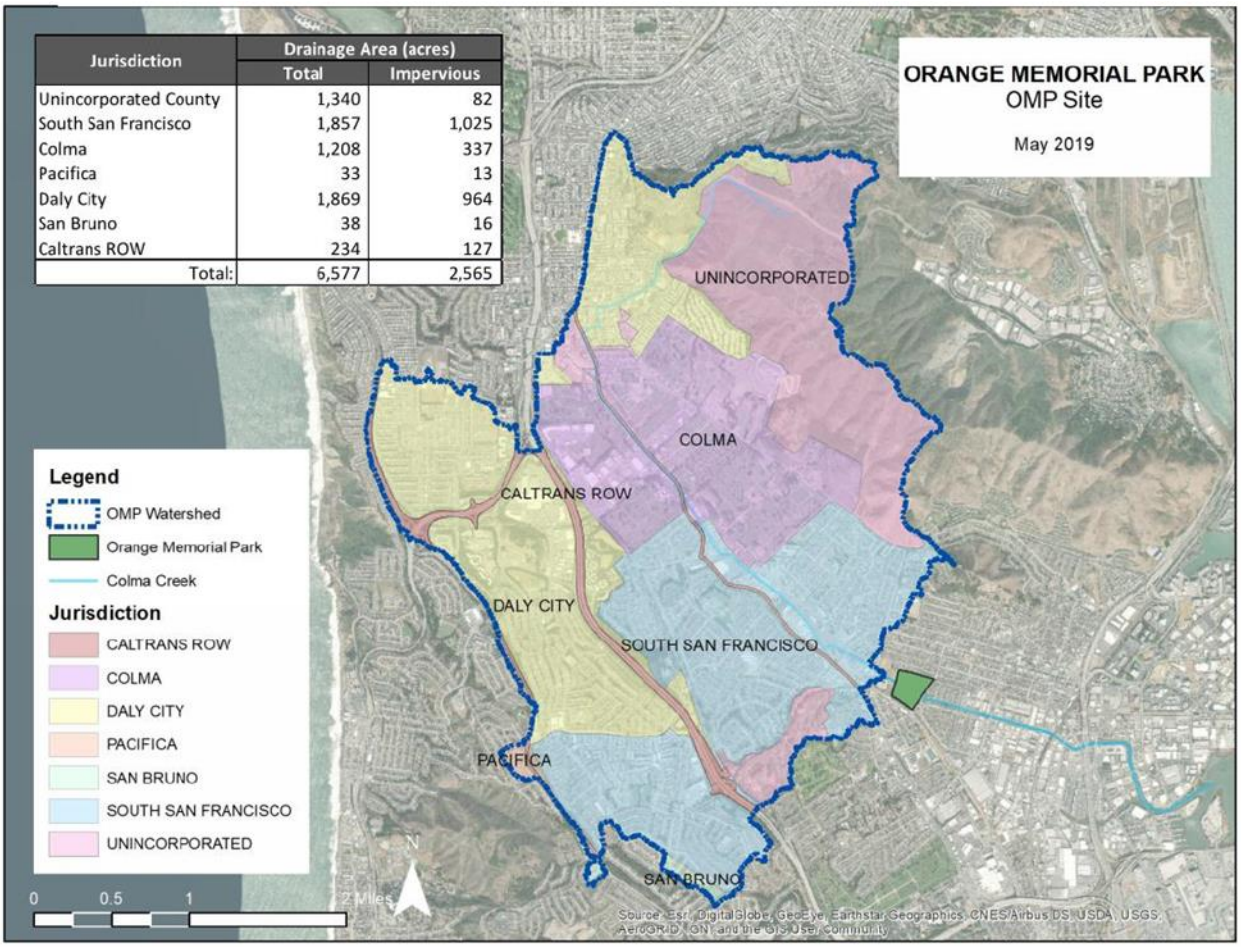
2.1 Key Model Parameters

The RAA modeling system was used to simulate the physical processes within the stormwater treatment systems of three regional projects in San Mateo County. The model utilizes key assumptions related to the dimensions of the structures and their design flow and treatment rates to estimate stormwater capture and treatment effectiveness over an average year (Water Year 2002) that is representative of historical hourly rainfall data (this is the same simulation period used in the RAA). This simulation allows for the estimation of annual average volume capture of the projects, which is then used to determine the proportion of the MRP numeric sizing criteria that is achieved. The Orange Memorial Park Project features a combination of treatment mechanisms, which allow for a thorough examination of the proposed Greened Acres calculation for a range of project types that are likely to be implemented in the future.

The Orange Memorial Park Project is located along the Colma Creek flood control channel within the southern half of Orange Memorial Park, a 28-acre public park the City of South San Francisco, California. The San Mateo County Stormwater Resource Plan (SRP) identified the Project as a high-priority regional project that can capture water from a large multi-jurisdictional 6,577-acre drainage area, including six municipalities and Caltrans (Figure 2-1). The Project design and construction were funded by Caltrans and construction was completed in May 2022. The Project supports the Park's Master Plan by co-locating stormwater capture, storage, and treatment facilities in Orange Memorial

Park with other planned and future capital improvement projects in the Park, while also providing several additional community benefits. Key elements of the project design include:

- A 20 cfs diversion structure from the channel for stormwater capture;
- A grit chamber and trash screening facility (non-LID), which provides trash and sediment (PCBs) removal;
- A subsurface cistern with approximately 0.7 acre-feet of storage for offset of potable water use equal to 15 million gallons between the months of April to November (LID);
- A subsurface infiltration gallery with approximately 4.3 acre-feet of storage (LID);
- A field-verified design infiltration rate of 0.5 inches per hour; and
- A water quality polishing and disinfection facility designed for water reuse in the park, street sweeping, and street tree watering.



Jurisdiction	Drainage Area (acres)	
	Total	Impervious
Unincorporated County	1,340	82
South San Francisco	1,857	1,025
Colma	1,208	337
Pacifica	33	13
Daly City	1,869	964
San Bruno	38	16
Caltrans ROW	234	127
Total:	6,577	2,565

Figure 2-1. Drainage area, jurisdictions, and footprint for the Orange Memorial Park Project.

Table 2-1 summarizes the key model input parameters for the Orange Memorial Park Project.

Table 2-1. BMP specifications for the Orange Memorial Park Project. Blue columns are used directly in the Greened Acres calculation

Drainage Area (ac)	Directly Connected Impervious Area (ac)	Disconnected Impervious Area (ac)	Total Impervious Area (ac)	Diversion Rate (cfs)	Treatment Mechanism	Storage Capacity (ac-ft)
6,577	1,945	620	2,565	20	Trash Screen and Grit Chamber *(Non-LID)*	-
					Infiltration *(LID)*	4.3
					Reuse *(LID)*	0.7

2.2 Model Output

Table 2-2 summarizes the key model outputs for the Orange Memorial Park Project. To properly apply the proposed methodology, the model must be able to track the following output:

- **Annual average stormwater runoff volume (runoff) for the drainage area.** 80% of this value is the numeric sizing criteria from C.3.
- **Annual volume diverted/treated by the project.**
- **Annual volume treated by each treatment mechanism**. It is essential to track volumes associated with each treatment mechanism if both LID and non-LID components are used. These types of mechanisms may be credited differently for calculation of Greened Acres.

These results will be used in the Greened Acres calculation detailed in the following section.

Table 2-2. Modeled annual average stormwater volume estimates for the Orange Memorial Park Project

Runoff (ac-ft/yr)	Treated[1] (ac-ft/yr)	*Treatment Non-LID* (ac-ft/yr)	Infiltrated *LID* (ac-ft/yr)	Reused *LID* (ac-ft/yr)
5,650	1,721	1,398	276	47

[1] Includes infiltrated, reused, and non-LID treated stormwater.

3 EXAMPLE GREENED ACRES CALCULATION

The methodology proposed in Section 1 and the model output presented in Section 2 are used to demonstrate the calculation of Greened Acres. The Orange Memorial Park Project features various treatment mechanisms; therefore, it is a good candidate for demonstrating the range of regional project configurations that Permittees may seek to claim credit for under MRP 3.0 using the proposed calculation.

The Orange Memorial Park Project features a grit chamber with trash screens, infiltration, and reuse treatment mechanisms. Because the grit chamber is not considered LID as defined by the MRP, this

non-LID treated portion of the annual stormwater volume capture is omitted from the Greened Acres calculation. Using the estimated annual volume associated with each LID treatment mechanism and 80% of the annual average runoff volume (the numerical sizing criteria if the project were to meet C.3 standards), the project is estimated to receive credit for 139 Greened Acres, approximately 7% of the connected impervious area within its drainage area (1,945 acres). Figure 3-1 shows a conceptual diagram of how annual volumes are tracked for a project with multiple treatment mechanisms like Orange Memorial Park. The calculation is demonstrated below:

$$Greened\ Acres_{infil} = \frac{276\ acft}{(80\%\ \times 5{,}650\ acft)} \times 1{,}945\ acres = 119\ acres$$

$$Greened\ Acres_{reuse} = \frac{47\ acft}{(80\%\ \times 5{,}650\ acft)} \times 1{,}945\ acres = 20\ acres$$

$$Greened\ Acres_{total} = Greened\ Acres_{infil} + Greened\ Acres_{reuse}$$

$$= 119 + 20\ acres$$

$$= 139\ acres$$

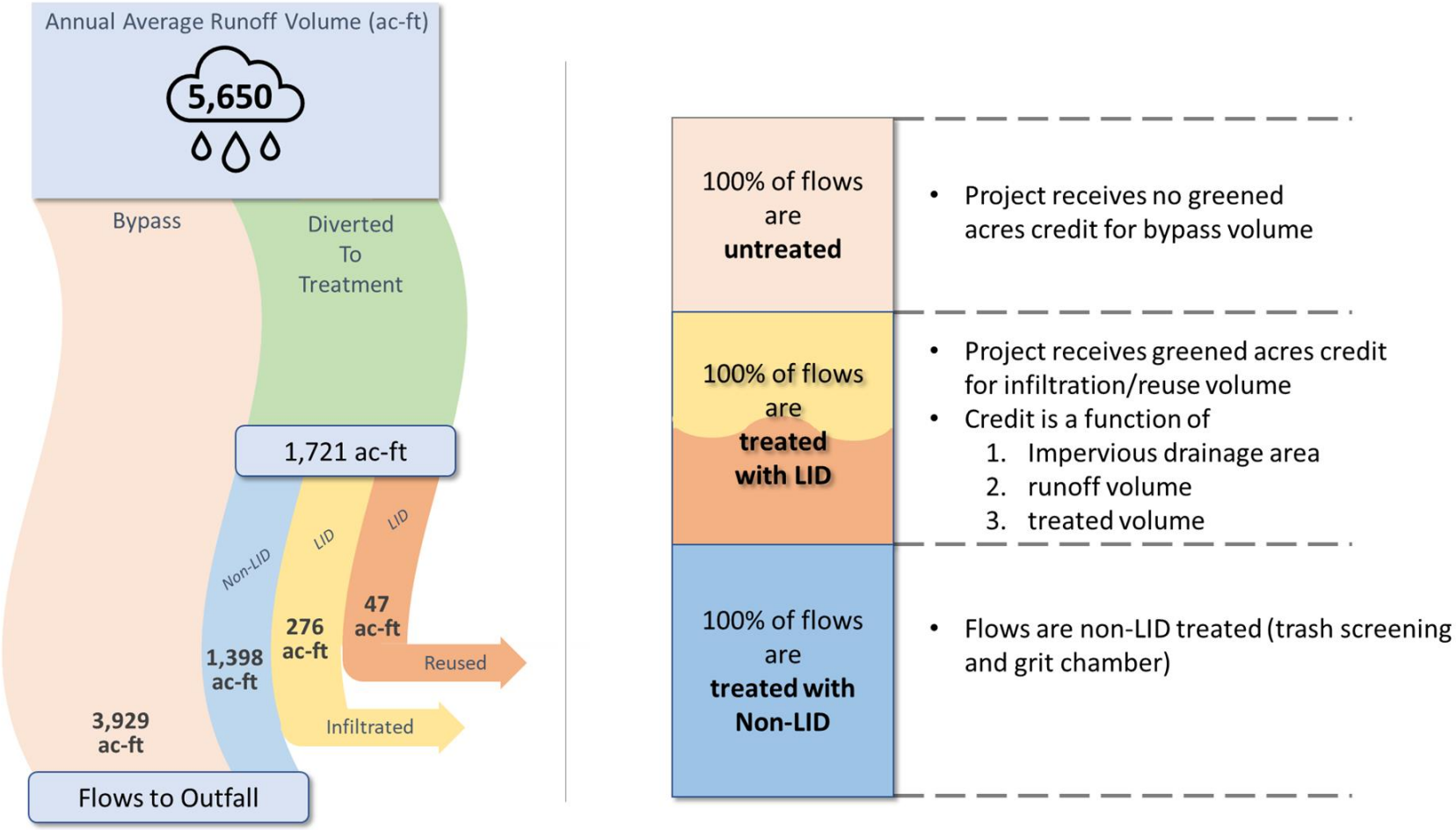


Figure 3-1. Conceptual diagram depicting the tracking of annual volumes of the Orange Memorial Park Project for the Greened Acres calculation.

4 CONCLUSIONS & NEXT STEPS

As stated above, the primary goal of this memorandum is to support the current GI retrofit implementation requirements under Provision C.3 for existing and future regional-scale stormwater projects that provide full or partial treatment through LID practices consistent with Provision C.3.c and Provision C.3.d. The GI retrofit requirements are set for each Permittee based on population in the 2019 Census Survey (see MRP 3.0 Attachment H, Table H-1). Each Permittee must implement non-Regulated Projects, or Regulated Projects sized beyond the minimum requirements in Provision C.3, that treat 3 impervious acres (Greened Acres) for every 50,000 population, by June 30, 2027. Permittees are allowed to meet the implementation requirements countywide (the San Mateo countywide numeric GI implementation requirement is 43.31 acres). However, if requirements are met on a countywide basis, Provision C.3 requires every jurisdiction to treat a minimum of 0.2 acres of impervious areas within its boundaries or by contributing substantially to a project outside of its jurisdiction (e.g., via contribution to a regional project). If the countywide requirement is not met, each Permittee is responsible for meeting their individual requirement.

There is no specification in the MRP about how credit towards these implementation targets can be given for regional projects that: 1) cannot be sized using a standard Provision C.3.d sizing approach; or 2) that utilize non-LID stormwater treatment systems[3].

This memorandum addresses the first need for a methodology to demonstrate how regional projects meet the C.3.d sizing criteria. To address the second need, Provision C.3.c.i.(2)(c)(ii).a states:

> *The Permittees may convene a workgroup with the Water Board to discuss and investigate the pollutant removal effectiveness and hydrologic equivalency of – and suggested criteria for – high flow-rate media treatment systems in combination with retention/detention measures…*

The demonstration of Greened Acres calculations in this memorandum will support additional discussions at the broader MRP regional level via the Alternative Treatment Systems Workgroup with Water Board staff and other program and permittee representatives about the potential for partial credit; for example, towards GI retrofit targets for alternative treatment technologies that can show equivalence with the benefits of LID measures. Pending the outcomes of the Workgroup on the topic of alternative treatment options and MRP compliance, a Permit amendment may be issued that could provide more flexibility in the types of treatment systems and project configurations that would be eligible to receive Greened Acres credit. In addition to stormwater treatment meeting Provision C.3.d and LID criteria, Greened Acres could potentially be linked to other water quality benefits and control measure implementation metrics and targets associated with regional-scale stormwater projects, such as climate resiliency goals or trash load reduction and demonstration of full trash capture equivalency. The methods described within this memorandum will be useful in future dialogues on this topic. It should be noted that the methods may ultimately need revision consistent with any permit amendments.

Using the demonstrated methodology, the Orange Memorial Park Project would be credited 139 Greened Acres, which would more than satisfy the numeric implementation requirements for San Mateo County over the next permit term. Additionally, Greened Acres may continue to be used as a measure of implementation in future permit terms, and more regional projects will likely need to be

[3] C/CAG's Countywide Stormwater Program commented specifically on this issue during the comment period of the reissued permit, requesting increased flexibility for regional-scale multi-benefit stormwater projects in some situations for receiving credit towards GI implementation.

implemented by Permittees to meet future GI implementation as well as climate resilience goals. Thus, the need for a reliable and technically sound calculation of Greened Acres will continue to grow as these types of projects become more widespread.

5 REFERENCES

SFBRWQCB (San Francisco Bay Regional Water Quality Control Board). 2022. *Municipal Regional Stormwater NPDES Permit, No. R2-2022-0018, NPDES Permit No. CAS612008*. Public Release Date: May 11, 2022.

SMCWPPP (San Mateo Countywide Water Pollution Prevention Program). 2020a. San Mateo County-Wide Reasonable Assurance Analysis Addressing PCBs and Mercury: Phase I Baseline Modeling Report. Prepared by Paradigm Environmental and Larry Walker Associates.

SMCWPPP (San Mateo Countywide Water Pollution Prevention Program). 2020b. San Mateo County-Wide Reasonable Assurance Analysis Addressing PCBs and Mercury: Phase II Green Infrastructure Modeling Report. Prepared by Paradigm Environmental and Larry Walker Associates.

SMCWPPP (San Mateo Countywide Water Pollution Prevention Program). 2022. Advancing Regional-Scale Stormwater Management in San Mateo County: Regional Collaborative Program Framework White Paper. Prepared by Geosyntec Consultants and Kieser & Associates.

APPENDIX B

MRP 3.0 Provision C.3 Alternative Treatment Systems Workgroup Comments – Considerations for LID/GSI Equivalency Approach (Geosyntec, 2023)

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Memorandum

Date:	February 20, 2023
To:	Reid Bogert, C/CAG
Copies to:	Jill Bicknell and Jon Konnan, EOA
From:	Kelly Havens, Senior Engineer; Lisa Austin, Senior Principal; and Aaron Poresky, Principal
Subject:	MRP 3.0 Provision C.3 Alternative Treatment Systems Workgroup Comments – Considerations for LID/GSI Equivalency Approach Geosyntec Project Number: CWR0769

1. PURPOSE

The City/County Association of Governments of San Mateo County (C/CAG) is participating in an Alternative Treatment Systems Workgroup convened following the adoption of the San Francisco Bay Regional Water Quality Control Board (Water Board) Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit (MRP or MRP 3.0; Order R2-2022-0018).

Water Board staff and Bay Area Municipal Stormwater Collaborative (BAMSC) members are leading the Alternative Treatment Systems Workgroup and have requested comments from participants regarding an option for a low impact development (LID)/green stormwater infrastructure (GSI) facility equivalency analysis to allow for a broader suite of compliant stormwater treatment facilities.

This memorandum provides considerations for an equivalency approach for MRP-compliant LID/GSI that could be presented to the Water Board as a recommendation from the Alternative Treatment Systems Workgroup for a potential MRP amendment.

2. SUMMARY OF MRP AND ALTERNATIVE TREATMENT WORKGROUP

The MRP requires permittees to require "Regulated Projects," as defined by Provision C.3.b, and impervious surface retrofit projects required by Provision C.3.j to implement LID stormwater treatment measures to treat runoff from the project drainage area. LID treatment measures are defined in MRP Provision C.3.c.i.(2)(c) as follows:

> *"[LID treatment measures]…treat 100 percent of the amount of runoff identified in Provision C.3.d for the Regulated Project's or Provision C.3.j project's drainage area with LID treatment measures onsite or with LID treatment measures at a joint stormwater treatment facility.*
>
> *(i) LID treatment measures are harvesting and use, infiltration, evapotranspiration, and biotreatment.*
>
> *(ii) Biotreatment (or bioretention) systems shall be designed to have a surface area no smaller than what is required to accommodate a 5 inches/hour stormwater runoff surface loading rate, infiltrate runoff through biotreatment soil media at a minimum of 5 inches per hour and maximize infiltration to the native soil during the life of the Regulated Project. The soil media for biotreatment (or bioretention) systems shall be designed to sustain healthy, vigorous plant growth and maximize stormwater runoff retention and pollutant removal. Permittees shall ensure that Regulated Projects use biotreatment soil media that meet the minimum specifications set forth in the Revised Model Biotreatment Soil Media Specifications submitted by BASMAA on behalf of the Permittees on February 5, 2016, and approved on April 18, 2016….*
>
> *(iii) Green roofs may be considered biotreatment systems that treat roof runoff only if they meet certain minimum specifications."*

MRP 3.0 Provision C.3.c.i.(2)(c)(iii) allows for the Alternative Treatment Systems Workgroup:

> *"a. The Permittees may convene a workgroup with Water Board staff to discuss and investigate the pollutant removal effectiveness and hydrologic equivalency of – and suggested criteria for – high flow-rate media treatment systems in combination with retention/detention measures, such as silva cells and structural soils, as compared to conventional bioretention. The workgroup should consider issues including: the MEP standard in relation to the use of such systems; the pollutant removal benefits and hydrologic criteria associated with the Permit's LID design approach and which are included in other MS4 permits, such as the Western Washington Phase II Municipal Stormwater Permit (NPDES Permit No. WAR045717) and the Los Angeles Regional MS4 Permit (NPDES Permit No. CAS004004); and additional issues, such as the feasibility of obtaining high flow rate media at construction and, as needed, for the life of a project."*

The Alternative Treatment Systems Workgroup was first convened in September 2022 and has met five times. The Workgroup intends to develop alternative treatment system language that could be included in an MRP 3.0 permit amendment later this year. The Alternative Treatment Systems Workgroup has also established a list of facilities that are considered LID/GSI in accordance with the MRP definition provided above (provided as Attachment A).

During the meeting held on February 2, 2023, Water Board staff presented an option for alternative treatment systems that would include equivalency analysis. This option included the following components:

1. Geographic area restrictions based on hydrologic benefit
2. Applied only to on-site facilities currently considered non-LID per the MRP
3. Technical infeasibility demonstration and/or equivalency analysis
4. Modeling of water quality benefits
5. Equivalency of urban greening benefits
6. Executive Officer (EO) approval

At the end of the meeting, Water Board staff requested comments in response to this option.

This memorandum presents considerations for an LID/GSI equivalency approach that is consistent with the language and the intent of the MRP. As described below, the proposed approach would be expanded upon in a regional guidance document to be developed following approval of the alternative treatment system permit amendment.

3. PROPOSED EQUIVALENCY APPROACH

3.1 LID/GSI Equivalency Approach Overview

The LID/GSI equivalency approach should focus on providing MRP equivalency for three key benefits of LID/GSI:

- Water Quality
- Urban Greening
- Hydrology

These benefits are provided when the definition of LID/GSI in MRP Provision C.3.c.i.(2)(c) is met. Equivalency with these three benefits may require an alternative treatment system to be paired with other stormwater storage or greening components. For the sake of this memorandum, this combination of treatment system(s) and other greening strategies is termed an "alternative treatment system solution".

The following sections discuss equivalency for these three key benefits.

3.1.1 Water Quality Equivalency

Water quality equivalency would be based on the pollutant removal performance of an alternative treatment system solution as compared to an MRP-compliant LID/GSI facility. There

are standardized processes for demonstrating water quality performance that have been developed by other organizations. One such process is the Washington State Department of Ecology Emerging Stormwater Treatment Technologies (TAPE) program, which is currently recommended in countywide program C.3 guidance for selection of non-LID high-flow-rate media systems (where allowed). It is recommended that the treatment component of any alternative treatment system solution demonstrate approval through this program or similar, to provide evidence of water quality equivalency to MRP-compliant LID/GSI.

Note that in the case of some pollutants (especially nutrients, but sometimes metals and TSS), it is common for MRP-compliant LID/GSI to provide lower performance than would be needed to meet the respective TAPE standards. Therefore, using TAPE as a standard for acceptance of the water quality equivalency of an alternative treatment system solution would be conservative.

3.1.2 Urban Greening Equivalency

The urban greening benefits provided by LID/GSI facilities are especially valuable in dense urban environments. As some treatment systems may have limited or no greening included within the facility footprint, often by necessity due to space constraints, urban greening should be provided in addition to the treatment facility as part of the alternative treatment system solution.

It is suggested that the total footprint of urban greening provided by an alternative treatment system solution be equivalent to the LID/GSI facility footprint required by the MRP. The MRP includes a required surface area for biotreatment facilities, defined as "what is required to accommodate a 5 inches/hour stormwater runoff surface loading rate". It is suggested that a total square footage of healthy vegetation or tree canopy equivalent to this surface area be considered equivalent urban greening to MRP-compliant LID/GSI.

3.1.3 Hydrologic Equivalency

As listed in Attachment A, MRP-compliant facility types include infiltration, capture and use, and bioretention (i.e., biotreatment in Provision C.3.c.i.(2)(c)). Infiltration and capture and use facilities provide retention of captured stormwater and provide substantial hydrologic benefits. In the majority of the Bay Area, facilities that comply solely via retention are not typically technically or economically feasible. This section, therefore, focuses on hydrologic equivalency with bioretention facilities compliant with the MRP.

MRP Provision C.3.c.i.(2)(c) requires that bioretention facilities be designed to:

- Treat 100 percent of the amount of runoff identified in Provision C.3.d for the Regulated Project's or Provision C.3.j project's drainage area;
- Have a surface area no smaller than what is required to accommodate a 5 inches/hour stormwater runoff surface loading rate;
- Infiltrate runoff through biotreatment soil media at a minimum of 5 inches per hour; and

- Maximize infiltration to the native soil during the life of the Regulated Project.

These requirements govern the hydrologic performance of an MRP-compliant bioretention facility.

As hydrologic benefit is reliant on the amount of retention that could be provided by a facility, it is suggested that a potential equivalency approach be dependent on the underlying soil condition and infiltration feasibility:

- **Option 1: Soils do not allow appreciable infiltration or systems must be lined due to infiltration hazards.** In locations where underlying soils do not allow infiltration, the hydrologic benefits of MRP-compliant bioretention are limited. This is because bioretention soil media permeability is highly variable and typically filters and discharges well above the 5 inches/hour minimum surface loading rate required by the MRP. The minor hydrologic benefits of MRP-compliant lined bioretention can be offset using the site design measures required under MRP Provision C.3.c and other measures to meet the urban greening equivalency approach presented in Section 3.1.2. A separate system of tanks or other storage and flow controls to precisely match flow control performance would have very limited benefit and pose an elevated burden for O&M while increasing the greenhouse gas footprint of a typical site.
- **Option 2: Soils allow some infiltration.** Where some infiltration can occur, increased hydrologic benefit is provided by MRP-compliant unlined bioretention. For these locations, it is suggested that hydrologic equivalency be provided through detention volume included in the alternative treatment system solution that provides equivalent storage, flow control, and/or retention to an MRP-compliant bioretention facility. These potential hydrologic equivalency parameters are described further below:
    - **Equivalent total storage** to a bioretention facility that: (1) treats 100 percent of the amount of runoff identified in Provision C.3.d for the project's drainage area, and (2) has a surface area no smaller than what is required to accommodate a 5 inches/hour stormwater runoff surface loading rate;
    - **Equivalent flow control** by matching the discharge rate of standard unlined bioretention for the volumetric hydraulic design basis, requiring sufficient storage and (potentially) an orifice design to provide this; and
    - **Equivalent retention**, based on the retention that would have been provided through standard unlined bioretention at that location, and could be provided in the alternative treatment system solution through infiltration, evapotranspiration, or capture and use, either on-site or off-site.

As discussed in Section 4, more detailed regional standardized guidance should be developed to describe the suggested hydrologic equivalency demonstration.

3.2 Remove other Restrictions where Equivalency is Demonstrated

If equivalency with the MRP standards is provided by matching the three benefits introduced above, other restrictions or processes should not be required. The restrictions introduced by Water Board staff that should not be required for the equivalency demonstration include:

- **Geographic limitations for where the equivalency approach may be applied**. If flow control equivalency to MRP 3.0 Provision C.3.c.i.(2)(c) is provided, geographic restrictions based on flow control benefits should not be required. In this case, the alternative treatment system solution is discharging stormwater at a rate equivalent to or lower than that expected by MRP-compliant LID/GSI. Note that where hydromodification/flow duration control standards apply, these would still need to be met via a separate demonstration that is beyond the scope of this discussion.
- **Demonstration of technical infeasibility of LID**. A demonstration that it is technically infeasible to treat 100% of the C.3.d design volume/flow onsite and/or offsite (per C.3.e.i) using LID/GSI as defined by MRP 3.0 Provision C.3.c.i.(2)(c) should not be required. If an alternative treatment system solution has functionally equivalent performance to a facility designed per the MRP Provision C.3.c definition of LID/GSI (as demonstrated through the benefits introduced in this memo), it should be allowed to be implemented wherever the MRP allows or requires C.3.c compliant treatment.
- **Limitation to on-site non-LID only**. MRP Provision C.3.j retrofit projects and regional facilities implemented for MRP Provision C.3.e.i or MRP Provision C.3.j should be allowed to demonstrate equivalency to C.3.c and be considered compliant.

4. SUGGESTED PROCESS

A regional Guidance Document should be developed that provides clear quantitative methods and tools to demonstrate the equivalency of an alternative treatment system solution to MRP C.3.c compliant facilities. A simple checklist-type form could be developed to allow for easy confirmation that the methods were appropriately used when demonstrating equivalency. The regional Guidance Document and accompanying checklist process would be approved by the Water Board EO, which would preclude the need for Water Board EO approval of every proposed alternative treatment system solution.

Permittees could choose to allow alternative treatment system solutions that demonstrate MRP LID/GSI equivalency in their jurisdiction or would have the discretion to disallow these approaches or impose additional limitations. Permittees would be tasked with confirming that any applications for equivalent alternative treatment system solutions appropriately follow the Guidance Document and demonstrate that they are equivalent. Records supporting these approvals would be maintained for potential audits, as with any other documents associated with Regulated Projects.

Attachment A: Summary of Stormwater Treatment System Characteristics
Shared by the MRP 3.0 Alternative Treatment Systems Workgroup

Treatment System Name	Description	Components	Treatment Mechanism(s)	LID per MRP3?	Benefits				
					Pollutant Removal	Peak flow reduction	Volume reduction	Water supply/ use offset	Urban greening/ cooling
Infiltration Systems									
Infiltration trench	Long narrow trench filled with permeable material (e.g., gravel), designed to store runoff and infiltrate through the bottom and sides into the subsurface soil.	Gravel-filled trench; raised underdrain (optional).	Infiltration	✓	✓	✓	✓		
Subsurface infiltration system (gallery or vault)	Underground vaults or pipes that store and infiltrate stormwater.	Large-diameter perforated pipes (metal or plastic), or concrete arches, concrete vaults, plastic chambers or crates with open bottoms.	Infiltration	✓	✓	✓	✓	✓	
Infiltration basin	Water impoundment over permeable soils that stores and infiltrates stormwater.	Vegetated depression or basin designed to store runoff on the surface and infiltrate it gradually into the ground; inflow and outflow structures; overflow spillway.	Infiltration	✓	✓	✓	✓	✓	
Pervious pavement	Paving or pavement systems properly designed to store and infiltrate rainfall at a rate equal to immediately surrounding unpaved, landscaped areas, or store and infiltrate a specified runoff volume.	Load-bearing, durable surface constructed over a subbase/base structure typically consisting of compacted, open-graded aggregate, raised underdrain (optional). Top layer may consist of pervious concrete, porous asphalt, concrete pavers with aggregate in openings, permeable pavers, or grid pavements.	Infiltration	✓	✓	✓	✓		
Capture and Use Systems									
Rainwater harvesting (parcel-based)	Rainwater collected from impervious surfaces stored for later use (e.g., irrigation or non-potable indoor use).	Collection system (rain barrels, above-ground or below-ground cisterns, pipes, or proprietary storage systems); debris filters; overflow; distribution system.	Infiltration (irrigation); POTW (toilet flushing)	✓	✓	✓	✓	✓	
Stormwater capture and use (regional; vault-based)	Capturing and storing of stormwater for potable uses, such as aquifer recharge, as well as a wide range of non-potable uses.	Collection system (above-ground or below-ground tanks, open storage reservoirs, or proprietary storage systems); diversion or inlet structure; pretreatment; infiltration and/or other treatment prior to use.	Infiltration (irrigation); POTW (toilet flushing)	✓	✓	✓	✓	✓	
Bioretention Systems with Biotreatment Soil Media (5 in/hr surface loading rate)									
Bioretention (lined) or flow-through planter	System designed to detain stormwater runoff, filter stormwater runoff through biotreatment soil media and plant roots, and release treated stormwater runoff to the storm drain system. May be surrounded with concrete or other structural planter box walls and/or waterproof membranes.	Ponding area, mulch, vegetation, biotreatment soil media (per BASMAA spec), aggregate layer, underdrain, inlets and overflow structure.	Filtration/adsorption/uptake via BSM and plants	✓	✓	✓			
Bioretention (unlined)	System designed to detain stormwater runoff, filter stormwater runoff through biotreatment soil media and plant roots, and either infiltrate stormwater runoff to underlying soils, as allowed by site conditions, or release treated stormwater runoff to the storm drain system, or both.	Ponding area, mulch, vegetation, biotreatment soil media (per BASMAA spec), aggregate layer, raised underdrain (required f(required for installations in slow-draining native soils), inlets and overflow structure.	Filtration/adsorption/uptake via BSM and plants; infiltration	✓	✓	✓	✓		
Tree wells (LID)	System consisting of a tree in a bioretention area typically with a small surface area.	Excavated pit or vault filled with biotreatment soil media; tree(s) and other vegetation; aggregate layer; underdrain (required for installations in slow-draining native soils).	Filtration/adsorption/uptake via BSM and plants; infiltration	✓	✓	✓	✓		

Attachment A: Summary of Stormwater Treatment System Characteristics
Shared by the MRP 3.0 Alternative Treatment Systems Workgroup

Treatment System Name	Description	Components	Treatment Mechanism(s)	LID per MRP3?	Benefits				
					Pollutant Removal	Peak flow reduction	Volume reduction	Water supply/ use offset	Urban greening/ cooling
Suspended pavement systems (e.g., Silva Cells) with trees	Underground system of structural modules that provide rootable soil volume for tree root growth under pavement areas adjacent to the tree planting area.	Structural cells (e.g., Silva Cells), ponding area and/or flow distribution piping, tree(s), biotreatment soil media, aggregate layer, raised underdrain (required for installations in slow-draining native soils), inlet and outlet structures.	Filtration/adsorption/uptake via BSM and plants; infiltration	✓	✓	✓	✓		
High Flow Rate Media Systems									
Media filter	System that captures and directs runoff through a filter bed or cartridges filled with an absorptive media designed to remove pollutants.	Vault filled with high flow rate media such as sand, compost, or proprietary media (layered or in cartridges), underdrain and/or inlet and outlet structures.	Filtration		✓				
Media filter with vegetation (includes tree well filters and high flow rate biofiltration)	System that captures and directs runoff through a filter bed or cartridges filled with an absorptive media designed to remove pollutants, and incorporates vegetation for additional pollutant removal benefits.	Vault filled with high flow rate media such as sand, compost, or proprietary media, mulch, vegetation, and underdrain.	Filtration; some plant uptake		✓				
Other									
Extended detention basin	Constructed basin with drainage outlets that are designed to detain runoff from a water quality design storm for some minimum time (e.g., 48 hours).	Sedimentation forebay, properly designed excavation providing required temporary storage of stormwater runoff, inlet and outlet structures, emergency spillway.	Detention/sedimentation		<✓	✓			
Vegetated swale	Open, shallow, sloped channels with vegetation covering side slopes and bottom that collect and convey runoff to downstream discharge points.	Permeable soil, vegetation, outlet structure, underdrain (if required).	Some filtration, sedimentation, and infiltration		<✓				
Hydrodynamic separator	Mechanical system designed as flow-through structure that uses swirl concentration and continuous deflective separation to screen, separate and trap trash, debris, sediment, and hydrocarbons from stormwater runoff.	Inlet, separation chamber,screening, sump storage, baffle wall, diversion weir, outlet pipe.	Screening, separation/trapping, sedimentation		<✓				
Baffle box	Proprietary system that captures trash and sediment by directing stormwater through screens and over a series of baffles causing sediments to settle in the chambers below.	Splitter screen, turbulence deflectors, sediment chambers, flow control weir, oil skimmer and hydrocarbon boom (optional).	Screening/gravity separation, sedimentation		<✓				
Constructed wetlands	Engineered, shallow-water ecosystems designed to treat stormwater runoff (does not include natural wetlands)	Wet pond with different depth zones, sediment forebay, overflow/emergency spillway, wetland vegetation	Settling, sorption, filtration, microbial degradation, plant uptake if sufficient vegetation		✓	✓			