

Baseline Trash Load and Short-Term Trash Load Reduction Plan

Submitted by:

City of Sunnyvale

Environmental Services Department

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In compliance with Provisions C.10.a(i) and C.10.a(ii) of Order R2-2009-0074

FEBRUARY 1, 2012

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**BASELINE TRASH LOAD
AND
SHORT-TERM TRASH LOAD REDUCTION PLAN**

CERTIFICATION STATEMENT

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature by Duly Authorized Representative:



1-24-12

John Stufflebean
Director of Environmental Services

Date

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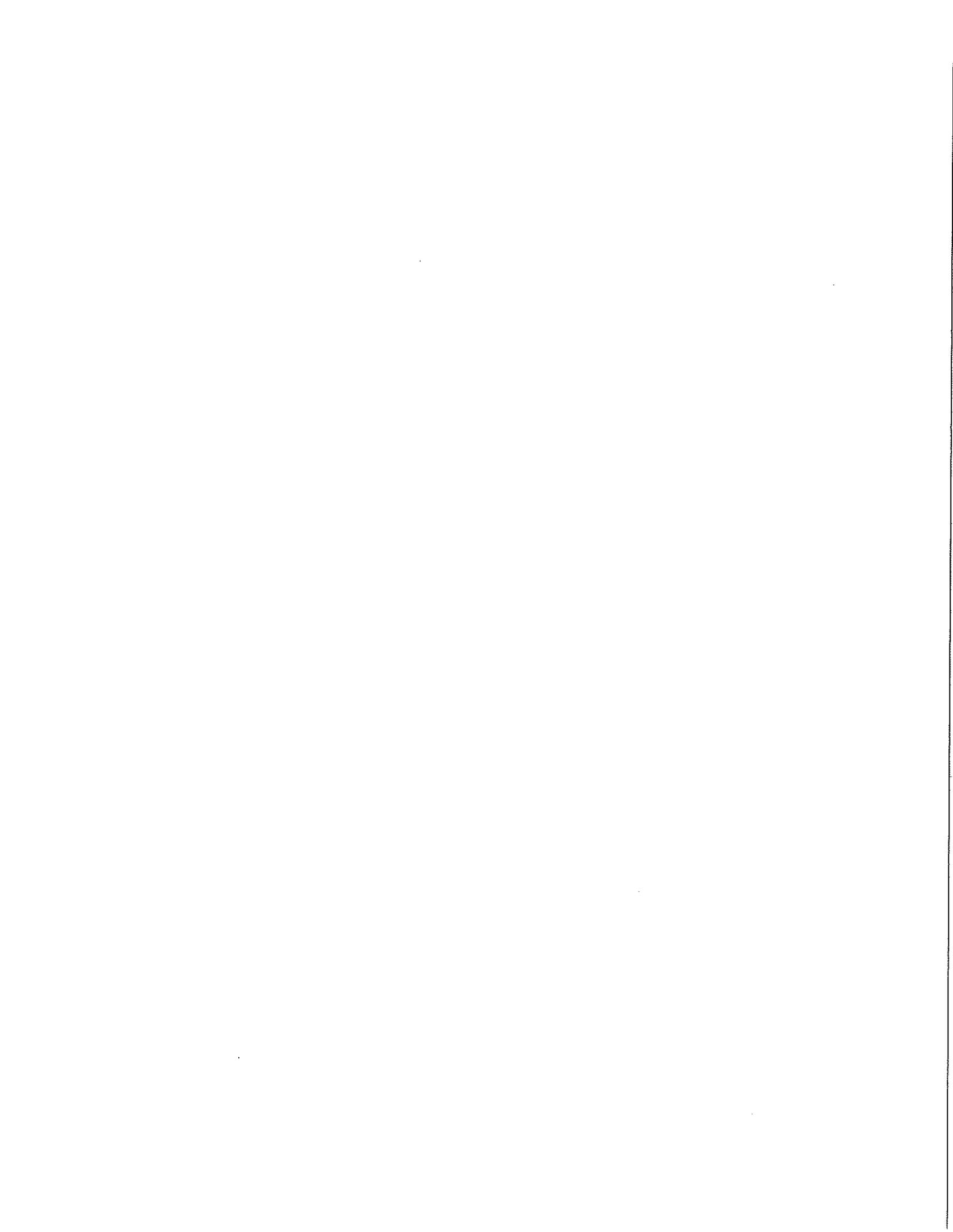
Figure 2-1: Estimated trash baseline loading rates for geographical areas in the City of Sunnyvale.

ABBREVIATIONS

BASMAA	Bay Area Stormwater Management Agencies Association
BID	Business Improvement District
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CASQA	California Stormwater Quality Association
CDS	Continuous Deflection Separator
CEQA	California Environmental Quality Act
CY	Cubic Yards
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
GIS	Geographic Information System
MRP	Municipal Regional Stormwater NPDES Permit
MS4	Municipal Separate Storm Sewer System
NGO	Non-Governmental Organization
NPDES	National Pollutant Discharge Elimination System
Q	Flow
SFRWQCB	San Francisco Regional Water Quality Control Board
SWRCB	State Water Resource Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
Water Board	San Francisco Regional Water Quality Control Board
WDR	Waste Discharge Requirements

PREFACE

This Baseline Trash Load and Short-Term Trash Load Reduction Plan (Plan) is submitted in compliance with provision C.10.a(i) and C.10.a(ii) of the Municipal Regional Stormwater NPDES Permit (MRP) for Phase I communities in the San Francisco Bay (Order R2-2009-0074). This Plan was developed using a regionally consistent format developed by the Bay Area Stormwater Management Agencies Association (BASMAA). Based on new information that becomes available during the implementation of this Short-Term Plan (e.g., experience with implementation, revisions to baseline loading estimates or quantification formulas altering load reduction credits), the City of Sunnyvale may choose to amend or revise this Plan. If revisions or amendments are necessary, a revised Short-Term Plan will be submitted to the Water Board via the City of Sunnyvale's annual reporting process.



1.0 INTRODUCTION

The Municipal Regional Stormwater NPDES Permit for Phase I communities in the San Francisco Bay (Order R2-2009-0074), also known as the Municipal Regional Permit (MRP), became effective on December 1, 2009. The MRP applies to 76 large, medium and small municipalities (cities, towns and counties) and flood control agencies in the San Francisco Bay Region, collectively referred to as Permittees. Provision C.10 of the MRP (Trash Load Reduction) requires Permittees to reduce trash from their Municipal Separate Storm Sewer Systems (MS4s) by 40 percent before July 1, 2014.

Required submittals to the San Francisco Bay Regional Water Quality Control Board (Water Board) by February 1, 2012 under MRP provision C.10.a (Short-Term Trash Loading Reduction Plan) include:

1. (a) Baseline trash load estimate, and (b) description of the methodology used to determine the load level.
2. A description of the Trash Load Reduction Tracking Method that will be used to account for trash load reduction actions and to demonstrate progress and attainment of trash load reduction levels.
3. A Short-Term Trash Loading Reduction Plan that describes control measures and best management practices that will be implemented to attain a 40 percent trash load reduction from its MS4 by July 1, 2014;

This Short-Term Trash Load Reduction Plan (Short-Term Plan) is submitted by the City of Sunnyvale in compliance with the portions of MRP provision C.10.a.i listed as 1a and 3 above. In compliance with 1b, BASMAA submitted a progress report on behalf of Permittees that briefly describes the methodologies used to develop trash baseline loads (BASMAA 2011a). These methods are more fully described in BASMAA (2011b, 2012a). Lastly, the *Trash Load Reduction Tracking Method Technical Report* (BASMAA 2012b) was submitted by BASMAA on behalf of Permittees in compliance with submittal 2 described above. The Baseline Loading Rates and Tracking Method projects are briefly described below.

Baseline Trash Loading Rates Project

Through approval of a BASMAA regional project, Permittees agreed to work collaboratively to develop a regionally consistent method to establish baseline trash loads from their MS4s. The project, also known as the *BASMAA Baseline Trash Loading Rates Project* assists Permittees in establishing a baseline to demonstrate progress towards MRP trash load reduction goals (i.e., 40 percent). The intent of the project was to provide a scientifically-sound method for developing (default) baseline trash generation rates that can be adjusted, based on Permittee/site specific conditions and used to develop baseline loading rates and loads. Baseline loads form the reference point for comparing trash load reductions achieved through control measure implementation.

Baseline trash loading rates are quantified on a volume per unit area basis and based on factors that significantly affect trash generation (e.g., land use, population density, and economic profile). The method used to establish baseline trash loads for each Permittee builds off "lessons learned" from previous trash loading studies conducted in urban areas (Allison and Chiew 1995; Allison et al. 1998; Armitage et al. 1998; Armitage and Rooseboom 2000; Lippner et al. 2001; Armitage 2003; Kim et al. 2004; County of Los Angeles 2002, 2004a, 2004b; Armitage 2007). The method is based on a conceptual model developed as an outgrowth of these studies (BASMAA 2011b). Baseline trash loading rates were developed through the quantification and characterization of trash captured in Water Board recognized

full-capture treatment devices installed in the San Francisco Bay Area. Methods used to develop trash baseline loading rates are more fully described in BASMAA (2011b, 2011c, and 2012a).

Trash Load Reduction Tracking Method Summary

The trash load reduction tracking method, described in the *Trash Load Reduction Tracking Method Technical Report*, assists Permittees in demonstrating progress towards reaching trash load reduction goals defined in the MRP (e.g., 40 percent). The tracking method is based on information gained through an extensive literature review and Permittee experiences in implementing stormwater control measures in the San Francisco Bay Area. The literature review was conducted to evaluate quantification methods used by other agencies to assess control measure effectiveness or progress towards quantitative goals. Results are documented in the *Trash Load Reduction Tracking Method: Technical Memorandum # 1 – Literature Review* (BASMAA 2011d).

Methods attributable to specific trash control measures fall into two categories: 1) trash load reduction quantification formulas; and 2) load reduction credits (BASMAA 2012b). Quantification formulas were developed for those trash control measures that were deemed feasible and practical to quantify load reductions at this time. Load reduction credits were developed for all other control measures included in the methodology development. Both categories of methods assume that as new or enhanced trash control measures are implemented by Permittees, a commensurate trash load reduction will occur. Progress towards load reduction goals will be demonstrated through comparisons to established trash baseline load estimates developed through the *BASMAA Baseline Trash Loading Rates Project*.

Short-Term Trash Load Reduction Plan

The purpose of this Short-Term Plan is to describe the current level of implementation of control measures and best management practices, and identify the type and extent to which new or enhanced control measures and best management practices will be implemented to attain a 40 percent trash load reduction from their MS4 by July 1, 2014. The Short-Term Plan was developed using a template created by BASMAA through a regional project. New and enhanced trash control measures (i.e., Best Management Practices) that Permittees may implement to demonstrate trash load reduction goals are included in Table 1.1. This list was developed collaboratively through the BASMAA Trash Committee, which included participation from Permittee, stormwater program, Water Board and non-governmental organization (NGO) staff. The list of control measures is based on: 1) the potential for Permittees to implement; 2) the availability of information required to populate formulas and develop credits; and 3) the expected benefit of implementation. Load reductions associated with each control measure are demonstrated either through a quantification formula (QF) or credits (CR) described in the *Trash Load Reduction Tracking Method Technical Report* (BASMAA 2012b).

In efforts to reduce trash discharged from MS4s, Permittees may choose to implement control measures that are not included in Table 1.1 as described more fully in BASMAA (2012b). If a Permittee chooses to do so, methods specific to calculating trash load reductions for that control measure would need to be developed. Additionally, at that point, consideration should be given to updating this Short-Term Plan.

Additionally, based on new information that becomes available during the implementation of this Short-Term Plan (e.g., experience with implementation, revisions to baseline loading estimates or quantification formulas altering load reduction credits), the City of Sunnyvale may amend or revise this

Plan. If revisions or amendments are necessary, a revised Short-Term Plan will be submitted to the Water Board via the City of Sunnyvale’s annual reporting process.

Table 1-1 Trash control measures for which load reduction quantification credits or formulas were developed to track progress towards trash load reduction goals.

Load Reduction Credits
Single-use Carryout Plastic Bag Ordinances
Polystyrene Foam Food Service Ware Policies and Ordinances
Public Education and Outreach Programs
Activities to Reduce Trash from Uncovered Loads
Anti-Littering and Illegal Dumping Enforcement Activities
Improved Trash Bin/Container Management Activities
Single-Use Food and Beverage Ware Ordinances
Quantification Formulas
On-land Trash Pickup (Volunteer and/or Municipal)
Enhanced Street Sweeping
Partial-Capture Treatment Devices
Enhanced Storm Drain Inlet Maintenance
Full-Capture Treatment Devices
Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal)

This Short-Term Plan is organized into the following sections:

- Introduction;
- Trash Baseline Load Estimate;
- Load Reduction Calculation Process;
- Planned Implementation of New or Enhanced Control Measures;
- Implementation Schedule; and
- References

2.0 BASELINE TRASH LOADING ESTIMATE

Note: Tables and information presented in this section are subject to change based on the results of a third monitoring event of the BASMAA Baseline Trash Loading Rates Project. Therefore, this section of the Short-Term Plan may be updated with revised trash generation rates, baseline loading rates, and baseline loads.

This section provides the estimated annual trash baseline load from the City of Sunnyvale's Municipal Separate Storm Sewer System (MS4). In compliance with Provision C.10.a.ii of the MRP, the City of Sunnyvale worked collaboratively with other MRP Permittees through BASMAA to develop data and the process necessary to establish baseline trash loading estimate from our MS4. The collaborative project was managed through the BASMAA Trash Committee and included a series of steps described in BASMAA (2012) and listed below. The approach was intended to be cost-effective and consistent, and still provide an adequate level of confidence in trash loads from MS4s, while acknowledging that uncertainty in trash loads still exists. The approach entailed the following steps:

1. Conduct literature review;
2. Develop conceptual model;
3. Develop and implement sampling and analysis plan;
4. Test conceptual model;
5. Develop and apply default trash **generation rates** to Permittee effective loading areas;
6. Adjust default trash generation rates based on baseline levels of control measure implementation by the Permittee to develop trash **baseline loading rates**; and,
7. Calculate Permittee-specific annual trash **baseline load**.

Through the collaborative BASMAA project, default baseline trash generation rates (volume per area) were developed for a finite set of categories, based on factors that significantly affect trash loads (e.g., land use). These trash generation rates were then applied to effective loading areas in applicable jurisdictional areas within the City of Sunnyvale. Trash generation rates were then adjusted based on baseline street sweeping, storm drain inlet maintenance, and stormwater pump station maintenance conducted in each applicable area. The sum of the trash loads (i.e., rate multiplied by area) from each effective loading area represents the City of Sunnyvale's baseline trash load from its MS4. A full description of the methods by which trash baseline loads were developed is included in BASMAA (2012a) and is summarized below.

Permittee Characteristics

Sunnyvale's history has always been based on its economy. Initially the area's open spaces and fertile soils were ideal for fruit orchards that supported the first residents. With the arrival of the railroads in 1864, the economic base of the community began to expand as canneries were built near the rail lines to process the fruit from surrounding orchards. In 1906, the Hendy Iron Works was relocated from San Francisco to Sunnyvale, continuing the area's industrial development. The City was incorporated in 1912.

By 1940, the City's population had grown to about 4,400 and the Hendy Iron Works was taken over by Westinghouse to support the war effort. After World War II, the defense related industries capitalized on the presence of the Moffett Naval Air Station, with Lockheed Missiles and Space Company moving to

Sunnyvale in 1956, and soon becoming the City's largest employer. The 1950s and 1960s became the period of largest growth for the community, resulting in a population of 96,000 by 1970.

Sunnyvale is the second largest city in Santa Clara County and the fifth largest in the San Francisco Bay area with a current residential population of 141,099. The City has a workforce of approximately 118,450 and a daytime population of 230,000. According to the 2010 Census, the City has a population density of 6,173.9 people per square mile, and average household size of 2.56. Of the residents who call the City of Sunnyvale home, 22.4% are under the age of 18, 6.7% are between 18 and 24, 36.3% are between 25 and 44, 23.4% are between 45 and 64, and 11.2% are 65 and older. The median household income was \$88,364 in 2009¹.

Approximately 55.5% of residents have a Bachelor Degree or higher. The largest employers in Sunnyvale are Lockheed Martin Space Systems; Northrup Grumman Marine; Yahoo, Inc. (Headquarters); Network Appliance, Inc (Headquarters); Palm, Inc. (Headquarters); and Juniper Networks (Headquarters). There are 52 shopping centers/complexes and about 315 restaurants. The City maintains 20 public parks, two golf courses, and 51 tennis courts. There are 26 public and private schools (elementary, middle, and high schools) and approximately 132 multi-purpose sports fields. The City sponsors annual events such as the Art and Wine Festival, Summer Music Series, Hands on the Arts, Downtown Association Holiday Tree Lighting, and the State of the City Address.

Default Trash Generation Rates (Regional Approach)

A set of default trash generation rates was developed via the BASMAA regional collaborative project (BASMAA 2012a). Default generation rates were developed based on a comparison between trash characterization monitoring results, land uses, economic profiles, and other factors that were believed to affect trash generation. Three trash characterization monitoring events were scheduled via the *Trash Generation Rates Project*. Due to the compliance timeline in the MRP, only two of three trash characterization monitoring events were used to develop trash generation rates described in BASMAA (2012a) and presented in this section. Following the completion of the third characterization event (Winter 2011/12), this section of the Short-Term Plan may be updated to reflect the most up-to-date trash generation and loading rates available. Trash generation rates based on the results of two of the three characterization events are shown in Table 2-1 for each trash loading category.

¹ Business and Economic Fact Sheet for Sunnyvale CA, November 2011. Available at <http://sunnyvale.ca.gov/Portals/0/Sunnyvale/OCM/ED-GeneralFiles/Business%20Economic%20Fact%20Sheet%2011-29-11%20update.pdf>

Table 2-1: Regional Default Annual Trash Generation Rates by Land Use Category.

Land Use Category	Generation Rates (Gallons/Acre)
Retail and Wholesale	29.99
High Density Residential	17.04
K-12 Schools	13.14
Commercial and Services/ Heavy, Light and Other Industrial	7.08
Urban Parks	2.14
Low Density Residential	1.25
Rural Residential	0.17

Jurisdictional and Effective Loading Areas

Default trash baseline generation rates presented in Table 2-1 were applied to effective loading areas with **jurisdictional areas** within the City of Sunnyvale. The City of Sunnyvale’s jurisdictional areas includes all urban land areas within the City of Sunnyvale boundaries that are subject to the requirements in the MRP. Land use areas identified by a combination of the ABAG 2005 land use dataset and Permittee knowledge that were not included within the City’s jurisdictional areas include:

- Federal and State of California Facilities and Roads (e.g., interstates, State highways, military bases, prisons);
- Roads Owned and Maintained by the County of Santa Clara;
- Colleges and Universities (private or public);
- Non-urban Land Uses (e.g., agriculture, forest, rangeland, open space, wetlands, water);
- Communication or Power Facilities (e.g., PG & E substations);
- Water and Wastewater Treatment Facilities; and
- Other Transportation Facilities (e.g., airports, railroads, and maritime shipping ports).

Once the City of Sunnyvale’s jurisdictional area was delineated, an effective trash loading area was developed by creating a 200-foot buffer on each side of the streets within the City’s jurisdictional area. The purpose of the effective loading area is to eliminate land areas not directly contributing trash to the City’s MS4 (e.g., large backyards and rooftops). Both the jurisdictional and the effective loading areas for the City of Sunnyvale are presented in Table 2-2.

Table 2-2: Jurisdictional areas and effective loading areas in the City of Sunnyvale by land use classes identified by ABAG (2005).

Land Use Category	Jurisdictional Area (Acres)	Effective Loading Area (Acres)	% of Effective Loading Area
High Density Residential	2,772	2,584	28%
Low Density Residential	3,847	3,802	41%
Rural Residential	5	4	0%
Commercial and Services/ Heavy, Light and Other Industrial	3,962	1,906	21%
Retail and Wholesale	711	563	6%
K-12 Schools	442	239	3%
Urban Parks	366	157	2%
TOTAL	11,105	9,254	100%

Permittee-Specific Baseline Trash Loading Rates

Regional default trash generation rates developed through the BASMAA regional collaborative project were applied to effective loading areas within the City of Sunnyvale based on identified land uses. These generation rates were then adjusted based on the calculated effectiveness of baseline street sweeping, storm drain inlet maintenance and pump station maintenance implemented by the City. These adjustments were conducted in GIS due to the site specificity of baseline generation rates and baseline control measure implementation. The following sections describe the baseline level of implementation for these three control measures. A summary of trash baseline generation and loading rates for the City of Sunnyvale are provided in Table 2-3 and areas associated with these rates are illustrated in Figure 2-1.

Baseline Street Sweeping

A "baseline" street sweeping program is defined as the sweeping frequency and parking enforcement implemented by the City prior to effective date of the MRP. Baseline street sweeping differs from "enhanced" street sweeping, which includes increased parking enforcement and/or sweeping conducted at a frequency greater than baseline ceiling (i.e., once per week for retail land uses and twice per month for all other land uses). The baseline ceiling was created so as not penalize implementers of enhanced street sweeping programs prior to the effective date of the MRP. For those Permittees that sweep less frequent than the baseline ceiling, their current sweeping frequency serves as their baseline.

The City of Sunnyvale's baseline street sweeping program includes sweeping industrial, commercial, retail and residential areas twice per month, with downtown areas swept once per week. Parking enforcement equivalent occurs on all arterial roads within the City, and posting of parking enforcement signs is limited to the downtown area in the City. The estimated trash load reduced via baseline street sweeping is presented in Table 2-3.

The City of Sunnyvale's baseline street sweeping program goes beyond the regionally defined street sweeping criterion. The current street sweeping program includes sweeping nearly all streets every

other week and the downtown area three times per week. Parking enforcement signs for street sweeping are not posted within the City, but parking enforcement equivalent exists on most arterial roads. The estimated trash load reduced via baseline street sweeping is presented in Table 2-3.

Baseline Storm Drain Inlet Maintenance

Within the City of Sunnyvale, storm drain inlets were cleaned at a baseline level of one time per year prior to the effective date of the MRP. Based on this baseline frequency and the effectiveness rating developed in BASMAA (2012b), the baseline storm drain maintenance program in the City of Sunnyvale has an annual effectiveness rating of 5%. The estimated trash load reduced via baseline storm drain inlet maintenance is presented in Table 2-3.

Baseline Stormwater Pump Station Maintenance

The City of Sunnyvale owns and maintains two stormwater pump stations. Both pump stations have trash racks that capture trash and allow for removal during maintenance. The estimated volume of trash removed annually from each pump station prior to the effective date of the MRP is considered the baseline level of implementation. To determine the baseline volume of trash removed from pump stations, an effectiveness rating of 25% removal of the baseline trash load attributable to the area draining to the pump station is assumed. This effectiveness rating is based on methods developed in BASMAA (2012b). The estimated trash load reduced via baseline pump station maintenance is presented in Table 2-3.

Baseline Trash Loading Estimate

The estimated baseline trash load from the City of Sunnyvale was calculated as the sum of the loads from the City’s effective loading area, adjusted for baseline implementation of street sweeping, storm drain inlet maintenance, and pump station maintenance. The preliminary annual trash baseline load for the City of Sunnyvale is presented in Table 2-3. Preliminary baseline trash loading rates are presented in Figure 2-1 to provide a geographical illustration of areas with estimated low, moderate, high and very high trash loading rates.

Table 2-3: Preliminary annual trash baseline load for the City of Sunnyvale.

Category	Annual Load (gallons)
Preliminary Generation Trash Load	83,678
Load Removed via Baseline Street Sweeping	36,643
Load Removed via Baseline Storm Drain Inlet Maintenance	2,352
Load Removed via Baseline Stormwater Pump Station Maintenance	897
Preliminary Trash Baseline Load	43,786

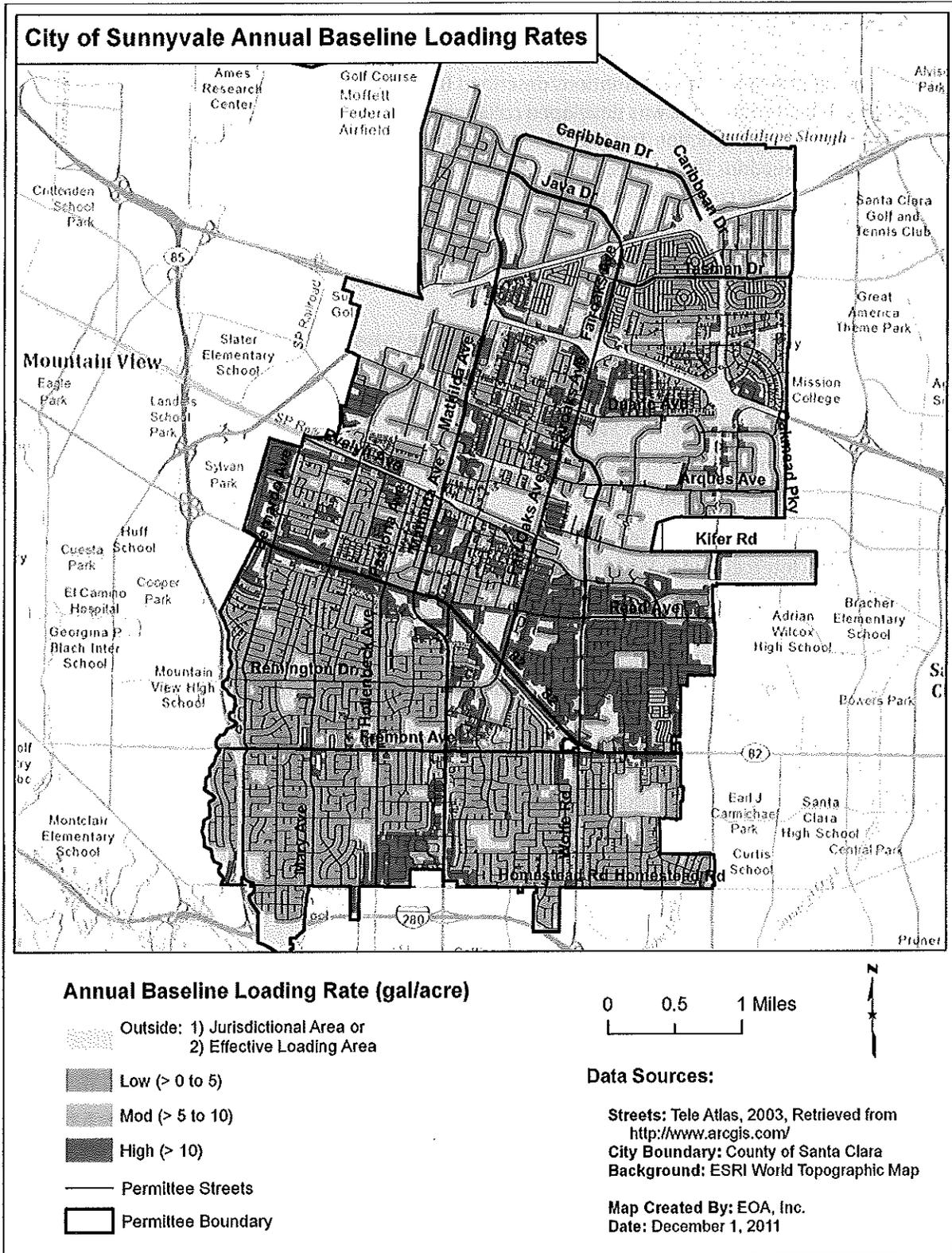


Figure 2-1: Estimated trash baseline loading rates for geographical areas in the City of Sunnyvale.

3.0 LOAD REDUCTION CALCULATION PROCESS

Using the guiding principles and assumptions described BASMAA (2011e), a stepwise process for calculating trash load reductions was developed collaboratively through BASMAA. This process is fully described in Trash Load Reduction Tracking Method Technical Report (BASMAA 2011e) and is briefly summarized in this section. The process takes into account at what point in the trash generation and transport process a trash control measure: 1) prevents trash generation, 2) intercepts trash in the environment prior to reaching a water body, or 3) removes trash that has reached a water body. In doing so, it minimizes over estimating trash load reductions associated with specific control measures that overlap.

To demonstrate trash load reductions, baseline trash loading rates will be adjusted using the following process:

- Step #1:** Existing Enhanced Street Sweeping
- Step #2:** Trash Generation Reduction
- Step #3:** On-land Interception
- Step #4:** Trash Interception in the Stormwater Conveyance System
- Step #5:** Trash Interception in Waterways
- Step #6:** Comparison to Baseline Trash Load

Reductions calculated in Steps 2 and 5 are assumed to be implemented at a constant rate on an “area-wide” basis. For example, if a new region-wide public education strategy is implemented within the San Francisco Bay area, all Permittees can apply load reduction credits associated with this control measure. In contrast, Steps 1, 3 and 4 are “area-specific” reductions that only apply to specific areas within a Permittee’s jurisdiction. Area-specific control measures include full-capture treatment devices and enhanced street sweeping. Area-specific reductions may require the use of a Geographic Information System (GIS) to calculate.

Reductions are generally applied in the sequence as presented in Figure 2-1 and described below, although some reductions may be applied “in-parallel” and calculated during the same sub-step in the process.

Step #1: Existing Enhanced Street Sweeping

Trash load reductions due to existing enhanced street sweeping implemented prior to the effective date of the MRP and conducted at levels above baseline levels are not incorporated into each Permittee’s trash baseline load. Therefore, load reductions associated with existing enhanced control measures are accounted for first in the trash load reduction calculation process. Existing enhanced street sweeping includes street sweeping conducted at a frequency greater than **1x/week** for streets within retail land use areas or greater than **2x/month** for streets in all other land use areas. The result of adjustments made to trash baseline loads due to the implementation of existing enhanced street sweeping is a set of **current baseline loading rates** and a **current baseline load**.

Step #2: Trash Generation Reduction Control Measures

Trash generation reduction control measures prevent or greatly reduce the likelihood of trash from being deposited onto the urban landscape. They include the following area-wide control measures:

- CR-1: Single-Use Carryout Plastic Bag Ordinances
- CR-2: Polystyrene Foam Food Service Ware Ordinances
- CR-3: Public Education and Outreach Programs
- CR-4: Reduction of Trash from Uncovered Loads
- CR-5: Anti-Littering and Illegal Dumping Enforcement
- CR-6: Improved Trash Bin/Container Management
- CR-7: Single-Use Food and Beverage Ware Ordinances

Load reductions associated with trash generation reduction control measures are applied on an area-wide basis.² Therefore, reductions in current baseline loading rates are adjusted uniformly based on the implementation of the control measure and the associated credit attributed.

Baseline loading rate adjustments for all generation reduction controls measures implemented may be applied in-parallel, but should be applied prior to calculating on-land interception measures discussed in Step #3. The result of adjustments to trash baseline loading rates due to the implementation of these enhanced control measures will be a set of **street loading rates**. The **street load** is the volume of trash estimated to enter the environment and available for transport to the MS4 if not intercepted via on-land control measures described in Step #3.

Step #3: On-land Interception Control Measures

Once trash enters the environment, it may be intercepted and removed through the following control measures prior to reaching the stormwater conveyance system:

- QF-1: On-land Trash Cleanups (Volunteer and/or Municipal) (Area-wide)
- QF-2: Enhanced Street Sweeping (Area-specific)

Since on-land trash cleanups can affect the amount of trash available to street sweepers, load reductions associated with their implementation will be quantified first, followed by street sweeping enhancements. On-land trash cleanups will be applied as an area-wide reduction and all effective loading rates will be adjusted equally. Enhanced street sweeping, however, is an area-specific control measure and only those effective loading rates associated with areas receiving enhancements will be adjusted. Due to the spatial nature of enhanced street sweeping, GIS may be needed to conduct this step.

The result of adjustments to effective loading rates due to the implementation of these enhanced control measures will be a set of **conveyance system loading rates**. The **conveyance load** is the volume of trash estimated to enter the stormwater conveyance system (e.g., storm drains).

² The only exception to this statement are load reductions associated with the establishment of Business Improvement Districts (BIDs) or equivalent, which are specific to geographic areas and considered "area-specific".

Step #4: Control Measures that Intercept Trash in the MS4

Control measures that intercept trash in the stormwater conveyance system are area-specific. Therefore, they only apply to land areas and associated trash loads reduced. Conveyance system loading rates developed as a result of Step #3 should be adjusted in-parallel for the following control measures:

- QF-3a: Partial-capture Treatment Device: Curb Inlet Screens (Area-specific)
- QF-3b: Partial-capture Treatment Device: Stormwater Pump Station Trash Racks Enhancements (Area-specific)
- QF-4: Enhanced Storm Drain Inlet Maintenance (Area-specific)
- QF-5: Full-Capture Treatment Devices (Area-specific)

Load reductions for these control measures are calculated in-parallel because they are applied to independent geographical areas. Reductions from all control measures described in this step are area-specific and may require the use of GIS to calculate a set of **waterway loading rates**. Once waterway loading rates have been determined, a **waterway load** will be developed and used as a starting point for calculating load reductions associated with trash interception in waterways discussed in Step #5.

Step #5: Control Measures that Intercept Trash in Waterways

The load of trash that passes through the stormwater conveyance system without being intercepted may still be removed through interception in waterways. There are two control measures associated with interception in waterways:

- QF-3c: Partial-capture Treatment Device: Litter Booms/Curtains (Area-wide)
- QF-7: Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal) (Area-wide)

As these control measures are implemented, load reduction estimates can be calculated in-parallel for these two measures.

Step #6: Comparison to Baseline Trash Load

Applying the five steps described in the processes above will provide an estimated trash load (volume) remaining after trash control measures are implemented. As depicted in the following equation, the relative percent difference between the baseline load and the load remaining after control measures are implemented is the percent reduction that will be used to assess progress towards MRP trash load reduction goals.

$$\frac{\text{Baseline Load} - \text{Remaining Load}}{\text{Baseline Load}} \cdot 100 = \% \text{ Reduction}$$

4.0 ENHANCED TRASH CONTROL MEASURES

This section describes the new or enhanced trash control measures planned for implementation by the City of Sunnyvale. The enhanced control measures described are designed to reach a 40% reduction by July 1, 2014. New and enhanced control measures that will be implemented by the City of Sunnyvale include those listed in Table 4.1.

Table 4-1. Trash control measures that are planned for implementation by the City of Sunnyvale to reach the 40% trash load reduction.

Control Measure
Single-use Carryout Plastic Bag Ordinance
Polystyrene Foam Food Service Ware Policies
Public Education and Outreach Programs
Activities to Reduce Trash from Uncovered Loads
Improved Trash Bin/Container Management
On-land Trash Pickup (Volunteer and/or Municipal)
Full-Capture Treatment Devices
Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal)

CR-1: Single-use Carryout Plastic Bag Ordinance

Single-use plastic carryout bags have been found to contribute substantially to the litter stream and to have adverse effects on marine wildlife (United Nations 2009, CIWMB 2007, County of Los Angeles 2007). The prevalence of litter from plastic bags in the urban environment also compromises the efficiency of systems designed to channel stormwater runoff. Furthermore, plastic bag litter leads to increased clean-up costs for the Permittees and other public agencies.

Based on recent experiences of municipalities throughout the State, the process Permittees must go through to enact a single-use carryout plastic bag ordinance is difficult due to intense scrutiny and opposition from not only public interest groups and lobbyists, but also merchants and community members. In most cases, most opposition groups are pressing for the development of Environmental Impact Reports (EIRs) in accordance with the California Environmental Quality Act (CEQA).

Baseline Level of Implementation

Prior to adoption of the MRP, some Permittees within the Bay Area have enacted ordinances on Single-use Carryout Plastic Bags. To avoid penalizing these early implementers, an ordinance implemented by a Permittee prior to the effective date of the MRP will be credited equally to a control measure implemented after the effective date. Therefore, the baseline level of implementation is not applicable for this control measure.

Enhanced Level of Implementation

The Sunnyvale City Council adopted an ordinance prohibiting the distribution of single-use carryout plastic bags on December 13, 2011 (SMC 5.38 - Plastic Carryout Bags). Based on the language in SMC 5.38, the City believes that it meets the criteria set out for Tier 3³ of the Load Reduction Tracking Method Technical Report for enhanced control measures to reduce single-use plastic bag usage. Additionally, the City believe that due to its ordinance requiring that a fee be issued for the distribution of paper bags, the City meets the criteria for additional load reduction credits described in the Load Reduction Tracking Method Technical Report. The City will also initiate a public outreach campaign to promote the use of reusable bags and to help ensure the successful reduction in bag usage as identified in the ordinance.

The SMC 5.38 includes the following criteria and elements:

- It applies to the following retail establishments on June 20, 2012:
 - Full-line self service retail store with gross annual sales of two million dollars or more that sells a line of dry grocery, canned goods or non-food items and some perishable items;
 - Store of at least 10,000 square feet of retail space that sells any perishable or non-perishable goods, including but not limited to: clothing, food, or personable items and generates sales or use tax; or

³ Tier 3 criteria = Adoption of a local ordinance or implementation of a statewide or countywide action that prohibits all retail establishments (with the exception of restaurants) from distributing single-use carryout plastic bags within their jurisdictional boundaries.

- Drug store, pharmacy, supermarket, grocery store, convenience food store, food mart or other entity engaged in the retail sale of a limited line of goods that includes milk, bread, soda, and snack foods, including those stores with a Type 20 or 21 license issued by the Department of Alcoholic Beverage Control.
- It applies to the additional following retail establishments on March 20, 2013:
 - Store of less than 10,000 square feet of retail space that sells any perishable or non-perishable goods including, but not limited to, clothing, food, or personal items, and generates sales or use tax pursuant to the Bradley-Burns Uniform Local Sales and Use Tax Law.
- None of these retail establishments shall provide any customer a plastic carry-out bag for groceries at the point of sale. The ordinance does not apply to plastic produce bags or product bags.
- Store shall make only recyclable paper bags or reusable bags available for the purpose of carrying away goods or other materials from the point of sale. Stores that provide customers with a recyclable paper carry-out bag must charge the customer \$0.10 per bag, with stores indicating on the customer receipt the number of bags provided and total amount charged. After January 1, 2014, the charge to customers will go up to \$0.25 per bag. Stores may not reimburse customers for any portion of the cost of a bag.

Stores are required to report on a quarterly basis to the Environmental Services Department Director on the number of bags sold, the amount of monies collected, and any efforts the store has taken to promote the use of reusable bags by customers. If reports are not received, then enforcement measures as outlined in SMC 5.38.080 (Enforcement and violation penalty) will be implemented and the store will be subject to fines as described in that chapter. The Director of the Environmental Services Department or his/her delegated staff is responsible for enforcing the requirements of SMC 5.38. This includes investigating violations, issuing fines, and entering any store during business hours. Written warning notices will be issued for violations of the ordinance, with penalties payable by the operator of the store to the Solid Waste Management Fund, to assist the Department with the costs of implementing and enforcing the requirements of the chapter.

Stores must provide at the point of sale, free of charge either reusable bags or paper carryout bags or both (at the store's option) to any customer participating in the California Special Supplemental Food Program for Women, Infants, and Children, pursuant to specific chapters within the Health and Safety Code.

The ordinance does not apply to charitable organizations that reuse and recycle donated goods or materials and receive more than fifty percent of revenues from the handling and sale of those donated goods or materials.

The City has previously initiated public outreach and educational efforts to encourage the use of reusable bags by residents through its website and other printed media. Enhancements and additional outreach efforts to educate the public, with a focus on making behavioral changes will be implemented to reduce the number of single-use bags used within the City. This may involve working directly with retail establishments to provide low-cost reusable bags, assisting with signage to remind patrons to bring their own bags, and the use of free or low-cost media options to promote reusable bag usage.

Reduction from Implementing Control Measure

The City of Sunnyvale will receive a 12% reduction credit for implementing specific enhanced control measures described in Enhanced Level of Implementation section above. The 12% reduction credit will be applied to the City of Sunnyvale's baseline trash load. This percent reduction credit is consistent with methods presented in the BASMAA (2012b). A summary of all load reductions anticipated through the implementation of this plan are included in Section 5.0.

CR-2: Polystyrene Foam Food Service Ware Policy

Polystyrene foam is used as food ware in the food service industry. According to the USEPA, floatable debris in waterways, such as products made of polystyrene, is persistent in the environment and has physical properties that can have serious impacts on human health, wildlife, the aquatic environment and the economy (USEPA 2002). Due to its properties, polystyrene foam used as food ware is typically not recycled. Since 1990, over 100 government agencies within the United States, including over twenty within the Bay Area, have enacted full or partial bans on polystyrene foam food service ware.

Baseline Level of Implementation

Prior to adoption of the MRP, over twenty agencies within the Bay Area enacted full or partial bans on polystyrene foam food service ware. To avoid penalizing these early implementers, an applicable control measure implemented by a Permittee prior to the effective date of the MRP will be credited equally to a control measure implemented after the effective date. Therefore, the baseline level of implementation is not applicable for this control measure.

Enhanced Level of Implementation

The City of Sunnyvale plans to revise the City's current Environmental Procurement Policy (EPP), which requires staff to consider the long-term environmental impacts of purchasing any materials, products, or services, to specifically require the use of non-Expanded Polystyrene (EPS) alternatives for cups and food service items. This will prohibit the purchase and use of EPS food service ware at City-sponsored events and on City-owned property. City Solid Waste Division staff review applications for City event permits and include requirements to follow the City's EPP Policy. Enforcement of the policy is done by the Solid Waste Division. Outreach to the public about alternatives will be done by Environmental Services Department staff.

The EPP may include language such as:

- The purchase, use and distribution of expandable polystyrene (Styrofoam) products by any City staff, attendee, vendor, caterer, supplier, of any City-sponsored or employee events or on City-owned property is prohibited;
- Alternative food service ware that is reusable, biodegradable, compostable, or recyclable should be used instead;
- Exemptions could be granted in the following circumstances: Health and/or safety operational issues are demonstrated;
- Emergency circumstances when alternatives do not exist.

The City Policy is planned to become effective by December 1, 2013 or earlier, pending approvals of the City Manager and Executive Leadership Team (ELT), using the approval process outlined in the City's Policy Manual. The percent trash reduction from MS4s as a result of implementing an EPS food service ware prohibition policy will be reported in the Annual Report submitted each September. The implementation of this policy will meet the requirements of Tier 1a of the *Load Reduction Tracking Method Technical Report*.

The Sunnyvale City Council will be ranking study issues for 2012 and included on their list is a citywide ban on EPS. Based on the results of that study session, Council will direct staff as to the next steps to take, which may include development of an ordinance to ban the use of EPS for food service ware used by businesses within the City.

The change in the City's Policy Manual to include the prohibition of food vendors from distributing polystyrene foam food ware at City-sponsored events or on City-owned property will be developed in 2012, after the Study Issue on a citywide ban on EPS is complete. If this city policy is not adopted by the ELT and City Manager per the criteria for adoption set in the City's Policy Manual, an alternative element will be identified for this plan equal to the 2% reduction in trash loading rate that is proposed for this plan element.

Percent Reduction from Enhancements

The City of Sunnyvale will receive a 2% reduction credit for implementing specific enhanced control measures described in *Enhanced Level of Implementation* section above. The 2% reduction credit will be applied to the City of Sunnyvale's baseline trash load. This percent reduction credit is consistent with methods presented in the BASMAA (2012b). A summary of all load reductions anticipated through the implementation of this plan are included in Section 5.0.

CR-3: Public Education and Outreach Programs

Permittees in the San Francisco Bay Area have implemented public education and outreach programs to inform residents about stormwater issues relating to pollutants of concern, watershed awareness and pollution prevention. Public education and outreach efforts include developing and distributing brochures and other print media; posting messages on websites and social networking media (Facebook, Twitter etc.), attending community outreach events, and conducting media advertising. In recent years, some municipal agencies have implemented anti-litter campaigns to increase public awareness about the impacts of litter on their communities and water quality; and to encourage the public to stop littering.

Baseline Level of Implementation

The City of Sunnyvale implemented the following public education and outreach control measures prior to the effective date of the MRP. Since FY 05-06, the City's Environmental Outreach program has included litter prevention messages as part of its local advertising efforts (e.g., bus-back ads, theater ads, City Quarterly Reports, utility bill inserts, etc.) as well as including litter prevention as part of the school outreach program messages (see City of Sunnyvale Stormwater Annual Reports FY 05-06 through FY 09-10 for details on the City's Environmental Outreach program). Beginning after MRP adoption, the current level of outreach efforts and messages on litter prevention were increased in early 2010 and will continue on through the MRP term. The early implementation of these messages and control measures should not be considered baseline as they were implemented prior to MRP adoption and will continue to be implemented through the term of the MRP, with additional enhancements.

Enhanced Level of Implementation

The City of Sunnyvale has implemented the following public education and outreach control measures prior to July 1, 2014 and will continue implementation to that date:

Litter Reduction Advertising Campaigns

BASMAA Youth Outreach Campaign (Regional)

Through participation and funding of the regional **BASMAA Youth Outreach Campaign** the City of Sunnyvale will implement an outreach campaign designed to reduce littering from the target audience in the Bay Area. The Youth Outreach Campaign was launched in September 2011 (post-MRP effective date) and aims to increase the awareness of Bay Area Youth (ages 16-24) on litter and stormwater pollution issues, and eventually change their littering behaviors. Combining the ideas of Community Based Social Marketing with traditional advertising, the Youth Campaign aims to engage youth to enable the peer-to-peer distribution of Campaign messages. The Campaign will at least run from FY 11-12 through FY 13-14. A brief description of the Campaign activities is provided below:

- **Raising Awareness:** The Campaign will begin by raising awareness of the target audience on litter and stormwater pollution issues. Partnerships with youth commissions, high schools, and other youth focused organizations will be developed to reach the target audience. Messages targeted to youth will be created and distributed via paid advertising, email marketing, Campaign website and social networking sites (e.g., Facebook and twitter).

- Engage the Youth - The advertisements will encourage the audience to participate in the Youth Campaign by joining a Facebook page, entering a contest, taking an online quiz, etc., and providing their contact information. At the beginning of FY 12-13, a video contest will be launched to get Bay Area youth further involved in the Campaign. An online voting system will be used to select the winning entry. Media advertising will be conducted to promote the winning entry.
- Change Behaviors: To move the audience along the behavior change continuum, the Campaign will use electronic platforms such as email marketing and social networking sites to encourage participants to engage in increasingly more difficult behavior changes, such as participating in a clean-up, organizing a clean-up, etc.
- Maintain Engagement: The Campaign will continue to interact with the target audience through email marketing and social media websites.

The Youth Campaign will include a pre and post campaign survey to evaluate the effectiveness of outreach. The pre-campaign survey will be conducted in FY 11-12 and the post campaign survey in FY 13-14. Other evaluation mechanisms, such as website hits, number of youth engaged in the Campaign's social networking website, etc., will also be used to evaluate its effectiveness in increasing awareness and changing behavior.

Watershed Watch Campaign (Countywide)

In addition to the BASMAA Campaign, the City of Sunnyvale will continue to implement the countywide **Watershed Watch Campaign** through active participation and funding of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP). This Campaign conducts media advertising that includes anti-litter messages. Anti-litter advertisements for television, print, transit, and radio have been developed and are used each year and will continue in the future. A telephone survey is conducted every five years to measure the effectiveness of outreach and increase in awareness about litter and stormwater related messaging.

Advertising Campaign (Local)

The City of Sunnyvale will continue its own local advertising campaigns and efforts to reduce litter with messages such as "Protect our Waterways – Please Don't Litter" and "If it Flows Down the Street, It Ends Up in the Creek", which are part of the Utility Bill inserts, Bus-Back advertising, and local Theater screen advertising. Examples of advertising used by the City each year are included in the C.7 section of the Sunnyvale Annual Stormwater Permit Report.

Outreach to School-age Children or Youth

ZunZun (Countywide)

Through participation and funding of the SCVURPPP countywide **ZunZun Program**, the City of Sunnyvale plans to continue to implement litter reduction outreach to elementary school-age children. Up to 50 ZunZun assemblies at elementary schools are conducted in the Santa Clara Valley each year. These bilingual musical assemblies educate elementary school students and their teachers on watersheds and urban runoff pollution prevention, including litter. ZunZun performances use physical comedy, audience participation, and musical instruments to educate teachers and children. Handouts, including teacher and student activity sheets, are distributed following the assembly.

The SCVURPPP Schools and Youth Education and Outreach Work Group provide a list of schools for ZunZun to contact. In addition to schools with high Hispanic populations, the list includes schools with high Asian/Pacific Islander populations.

ZunZun assemblies are evaluated using postage-paid evaluation cards that are distributed to all teachers present at the performances. Teachers mail the completed evaluation cards to SCVURPPP, and results are compiled by SCVURPPP staff. Based on the teacher feedback, changes are made to future assemblies and/or handouts.

Outreach to School-age Children or Youth (Local)

The City plans to continue to implement Sunnyvale's school and youth outreach program where Sunnyvale staff schedule and provide stormwater pollution prevention presentations in kindergarten and 5th grade classrooms. The presentations include litter pollution prevention as an important element of the lesson. In FY 09-10, 893 students in these grades were reached and in FY 10-11, through 64 classroom presentations, 1256 students received the messages. The activities include the use of the **Enviroscape Model** (with litter as one of the pollutants of concern and samples of water taken from the area around the Pacific "garbage patch" are shown and discussed) or a hands-on activity called "Who Dirtied the Bay" is provided. Detailed information on the Sunnyvale school outreach programs is available in the C.7 section of the Stormwater Permit Annual Report. Teachers are provided with presentation evaluation forms and information that is returned on the effectiveness of the presentations is tabulated and reported annually.

Media Relations

Through participation and funding of the **BASMAA Regional Media Relations Project**, the City of Sunnyvale plans to continue to implement a media relations project partially designed to reduce littering from target audiences in the Bay Area. The goal of the BASMAA Media Relations Project is to generate media coverage that encourages individuals to adopt behavior changes to prevent water pollution, including littering. At least two press releases or PSAs focus on litter issues each year (e.g., creek clean-up activities, preventing litter by using reusable containers, etc.).

The City also makes extensive use of free media to focus on litter reduction and clean-up activities for local participation. City Environmental Outreach prepares messages for the Sunnyvale Quarterly (sent to all residents and businesses either electronically or by hard copy), electronic message boards in the Library and Public Safety and on the City's website. Public Service Announcements for local litter clean up events were picked up by KLIV and KRTY with information on the events and how to participate. The Sunnyvale Community/Neighborhood Association E-news, the Community Cable TV, KSUN, the City's online Community Calendar, Yahoo Groups and Yahoo Upcoming Events Calendar, Mercury News upcoming events calendar, and the City's Twitter account are all used to promote upcoming litter cleanup activities and events.

Community Outreach Events

City Environmental Outreach staff reaches the community as a whole through a number of annual events such as the State of the City and, presentations through the speaker's bureau to community service groups, neighborhood groups, and business groups. In FY 10-11, the City staff attended twelve community events and made presentations about litter issues and litter pollution prevention. Staff will be implementing additional effectiveness measurements.

Example of measurements include things like documenting additional requests for information, setting up local litter prevention actions (e.g., clean ups), or to take action requesting a “give-away”, such as a reusable bag.

The City also participates in three regional litter clean up events and promotes participation in them through paid-local newspaper advertising, flyers/posters, and free electronic media. In addition, in FY 11-12 the City began making presentations to and working with local faith-based groups, schools, clubs, and neighborhood associations to provide information on how they can reduce litter by encouraging groups to hold neighborhood litter clean up events. Staff will be able to evaluate the effectiveness of these outreach presentations by the number of groups who actually schedule a local litter pick-up event, where the City provides bags, gloves, and a location to properly dispose of the litter, and tracks the quantity of litter collected.

Percent Reduction from Enhancements

The City of Sunnyvale will receive a total of 8% reduction credit for implementing specific enhanced control measures described in Enhanced Level of Implementation section above. This percent reduction is comprised of the following credits, consistent with the *Load Reduction Tracking Method*:

- Litter Reduction Advertising Campaigns – 3%
- Outreach to School-age Children or Youth – 2%
- Media Relations – 1%
- Community Outreach Events - 2%

These 8 % reduction credits will be applied to the City of Sunnyvale’s baseline trash load. This percent reduction credit is consistent with methods presented in the BASMAA (2011e). A summary of all load reductions anticipated through the implementation of this plan are included in Section 5.0.

CR-4: Reduction of Trash from Uncovered Loads

Although it is currently illegal to operate a vehicle that is improperly covered and which its' contents escapes⁴, vehicles remain an important trash source to MS4s and local waterways. Specifically, vehicles that do not secure or cover their loads when transporting trash and debris have a high risk of contributing trash to MS4s. Land areas that generate trash from vehicles include roads, highways (on/off ramps, shoulders or median strips) and parking lots. To help address the dispersion of trash from unsecured or uncovered vehicles destined for landfills and transfer stations, Permittees may require municipally-contracted trash haulers to cover or secure loads or work with municipal or private landfill and transfer station operators to educate waste haulers on securing loads and/or to enhance enforcement of existing regulations.

Baseline Level of Implementation

The baseline trash load described in Section 2.0 assumes that prior to adoption of the MRP the City of Sunnyvale has not adopted control measures to reduce trash from vehicles with uncovered loads. Therefore, implementation of any of the control measures described in this section is considered to be enhanced implementation.

Enhanced Level of Implementation

The City of Sunnyvale revised SMC 8.16 (Solid Waste Management and Recycling) of the Sunnyvale Municipal Code to implement the following enhanced control measures, effective December 1, 2011. SMC 8.16.190 *Vehicles, conveyances, and containers - Applicable Regulations* has been amended to include that:

(a) All vehicles, conveyances, or containers used for hauling solid waste within the city shall be of such construction as to comply with all laws, rules, and regulations of the state of California pertaining thereto, and shall be of a types and construction to prevent leakage, spillage, or overflow. This ordinance is intended to implement the requirements of Vehicle Code section 23114 or its successor statute.

and

(b) Any operator of an open bed truck hauling waste and recyclables for disposal at the SMaRT Station will be subject to a fee for which the operator will receive a tarp to be used for covering debris and solid waste.

The fee as established by resolution of the city council for the truck tarp is currently set at \$15.00.

Based on this enhanced level of implementation, the City goes beyond the requirement for Municipal Trash Haulers to cover loads with the adoption of the ordinance revisions and an increased awareness with enforcement by requiring payment of a fee for a tarp, if a load is uncovered.

⁴ In accordance with the California Vehicle Code Sections 23114 and 23115, it is against the law to operate a vehicle on the highway which is improperly covered, constructed, or loaded so that any part of its contents or loads spills, drops, leaks, blows, or otherwise escapes from the vehicle. Exempted materials include hay and straw, clear water and feathers from live birds. Additionally, any vehicle transporting garbage, trash, or rubbish, used cans or bottles, waste papers, waste cardboard, etc. must have the load covered to prevent any part of the load from spilling on the highway (CVC 2011). Significant fines are possible for non-compliance.

City Patrol Officers write citations under the California Vehicle Code Section 23114 and 23115 for uncovered loads when they are observed, but active enforcement does not occur due to the lower priority of this issue when compared to crime suppression, traffic safety, and general calls for service. However, through a contract basis, Environmental Services Department may provide funding to Public Safety so that Officers could be assigned on overtime to monitor traffic coming to the SMaRT Station and issue citations for uncovered loads. This active enforcement would be considered implementation of an enhanced enforcement program for vehicles with uncovered loads and would receive the maximum percent reduction credit for this activity. The active enforcement with overtime contract pay for Public Safety Officers is planned for FY 12-13.

In addition, the City has prescriptive language in municipal contracts for debris/garbage haulers that work within the city. Per requirements of the contract (5.12 and 5.14), haulers are required to have collection vehicles to have water-tight bodies and that the contractor places tarps over all open debris boxes during transport to the disposal site.

Percent Reduction from Enhancements

These 5% reduction credit will be applied to the City of Sunnyvale's baseline trash. This percent reduction credit is consistent with methods presented in the BASMAA (2011e). A summary of all load reductions anticipated through the implementation of this plan are included in Section 5.0.

CR-6: Improved Trash Bin/Container Management

Receptacles used to place/store trash or recyclables prior to collection by a public agency or private waste hauler reduce the potential for littering and trash loading to stormwater conveyance systems and receiving waters (City of Los Angeles 2004). For the purposes of assigning trash load reduction credits, receptacles fall into the following two categories:

- **Private Trash/Recycling Bins:** A receptacle for placing trash or recyclables generated from a household, business, or other location that is serviced by a trash hauler. Bins are specifically-designed, heavy-duty plastic wheeled containers with hinged lids; or large multi-yard metal or plastic containers rectangular in shape.
- **Public Area Trash Containers:** A receptacle for placing incidental trash generated in public spaces that provides people with a convenient and appropriate place to dispose of trash. The design and size of public area trash containers vary widely, depending on their setting and use.

The effectiveness of bins/containers and bins in reducing trash in the environment is likely dependent upon: the location and density of the receptacles, size of the bin/container in relationship to the size needed to service users, frequency of maintenance, and the ability of the bin/container to capture and contain the trash deposited.

Baseline Level of Implementation

The baseline trash load described in Section 2.0, assumes that the City of Sunnyvale has not implemented enhanced trash bin/container management practices prior to effective date of the MRP.

The Sunnyvale Municipal Code, SMC 8.16.040 and 050 establish the requirements for solid waste containers, maintenance, and their removal. As part of the Franchise Hauler contract for the City, Solid Waste Division staff perform annual "ride-alongs" with the collection vehicle drivers and identify waste containers that are either improperly sized or their frequency of collection is insufficient, causing potential releases of solid waste on a property. Standard operating procedures have been developed for staff who perform these inspections with the hauler drivers and subsequent notification or enforcement that may be required if a problem is observed.

Enhanced Level of Implementation

The City of Sunnyvale has implemented or will implement the following improved trash bin/container management practices to ensure adequate private trash service prior to July 1, 2014:

Solid Waste Division staff will continue to enforce the requirements of SMC 8.15.040 and .050 to ensure that businesses and households have sufficient trash collection frequencies and that the trash bins/containers are of an adequate size to hold the quantity of trash generated to prevent unintended releases of trash. The City will continue to include language in its contract with its Franchise Waste Hauler to allow City staff to go out with drivers on their routes and identify problematic properties. The contract also includes requirements for ensuring container lids are

properly closed after emptying and for cleaning up litter in the vicinity of any solid waste storage bins.

Solid Waste Program staff will continue with follow up and enforcement with property owners where bin sizing, placement, collection frequency and failures to comply with municipal code are noted.

The City has one Business Improvement District BID in the downtown Murphy Street historical area. The Public Works Department currently provides street sweeping in the Murphy Avenue core area bounded by Frances Street, Evelyn Avenue, Sunnyvale Avenue, and Washington Avenue. Sweeping and litter pick up services are provided three times per week, and a street cleaning unit for sidewalks is also used weekly. Adjacent city-owned parking lots in this area are part of a special Parking District, and are swept three times per week as well. An area specific credit of 50% for this area is being sought for these streets and parking lot areas. The establishment of additional BIDs is not being considered at this time.

Percent Reduction from Enhancements

These 3.1% reduction credit will be applied to the City of Sunnyvale's baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Sunnyvale. This percent reduction credit is consistent with methods presented in the BASMAA (2011e). A summary of all load reductions anticipated through the implementation of this plan are included in Section 5.0.

QF-1: On-Land Trash Cleanups (Volunteers & Municipal)

On-land cleanups conducted by Permittees and volunteers have been successful in removing trash from identified trash hot spots and engaging local citizenry in improving their communities. Permittees have several programs in place to address on-land trash. Municipal efforts relate to ongoing beautification of impacted areas and coordination of cleanup events. Volunteer on-land cleanups involve the meeting of individuals, creek and watershed groups, civic organizations, businesses, and others at designated or adopted on-land sites to remove trash. On-land trash cleanups are conducted as single-day events or throughout the year.

Baseline Level of Implementation

The City of Sunnyvale implemented minimal on-land cleanup activities prior to the effective date of the MRP. These cleanup events are considered baseline because they were accounted for in the preliminary trash generation rates established through the BASMAA *Baseline Trash Generation Rates Project*. New or enhanced actions that began or are planned to begin after the effective date of the MRP are described under the next section.

Enhanced Level of Implementation

Prior to July 1, 2014, the City of Sunnyvale will be conducting or coordinating the following on-land trash cleanups listed below. These on-land cleanups will be conducted or coordinated each year and the volume of trash removed will be tracked to demonstrate trash loads reduced.

- The City of Sunnyvale plans to support and organize the “Keep America Beautiful” litter clean up event in the spring (March/April) time frame each year. The number of clean up sites/central collection spots may vary from year to year, depending on staffing availability, but it is our intent to maintain up to four neighborhood check-in spots for the event that will clean up an area approximately one square mile around each of the check-in sites.
- The City also plans to sponsor at least one additional volunteer event each year, similar to what was done in FY 11-12 by supporting the “Knock out Litter” event held by local faith-based groups and a youth boxing club. Through the two annual volunteer events, coordinated by City staff, the expected waste load reduction will be 12 cubic yards or 324 cubic feet per year (2,083 gallons).

Percent Reduction from Enhancements

The total estimated annual volume of trash that will be reduced beginning July 1, 2014 as a result of implementing on-land trash cleanups is 2,083 gallons. This volume is equal to approximately a 4.7 percent reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Sunnyvale. Both values provided within this section are included in Trash Load Reduction Summary Table included in Section 5.

QF-2: Enhanced Street Sweeping

Street sweeping is conducted by most, if not all, Bay Area municipalities to remove trash and debris that collect in the gutters at the edge of streets. Parked cars and large storms that produce significant runoff can impact the effectiveness of street sweepers. However, increasing parking enforcement or more frequent street sweeping (as compared to the frequency of storm events) may increase the trash load reduced to MS4s. Permittees who choose to enhance street sweeping may do so to demonstrate trash load reductions to their MS4s and progress towards trash load reduction goals required by the MRP.

Baseline Level of Implementation

The baseline trash load described in Section 2.0 incorporates the trash load reductions due to baseline street sweeping. The City of Sunnyvale's baseline street sweeping program includes sweeping at a frequency of two times per month on average in retail areas and two times per month on average in all other areas. Sweeping in the downtown Murphy Street Business Improvement District (BID) retail area occurs three times per week.

Parking is prohibited along the major arterial roadways (e.g., Mathilda Avenue, Sunnyvale-Saratoga Road, and significant portions of El Camino Real). A list of all streets with parking prohibitions is available upon request and has been utilized to calculate the baseline trash load reduction via street sweeping actions. The downtown business district has parking enforcement between 2 AM and 7 AM, to allow for sweeping of streets and city parking lots. These parking prohibitions allow sweepers access to the curb.

Enhanced Level of Implementation

Due to the existing enhanced street sweeping that City of Sunnyvale conducts in the Murphy Street Business Improvement District (BID), which is above the baseline street sweeping frequency ceiling of 1x/week for streets within retail land use areas or greater than 2x/month for streets in all other land use areas, the City removes an estimated 745 gallons of trash annually.

At this time, the City of Sunnyvale is not considering implementation of additional enhanced street sweeping by increasing sweeping frequency or including additional parking enforcement for additional areas of Sunnyvale.

Percent Reduction from Enhancements

The total estimated annual volume of trash that is reduced as a result of implementing existing enhanced street sweeping is 745 gallons. This volume is equal to approximately a 1.7 percent reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Sunnyvale. Values provided within this section are included in Trash Load Reduction Summary Table included in Section 5.

QF-5: Full-Capture Treatment Devices

As defined by the Municipal Regional Stormwater Permit (MRP), a full-capture system or device is any single device or series of devices that traps all particles retained by a 5 mm mesh screen and has a design treatment capacity of not less than the peak flow rate (Q) resulting from a one-year, one-hour, storm in the sub-drainage area. A list of the full-capture systems and devices recognized by the San Francisco Bay Regional Water Quality Control Board (Water Board) is included in *Trash Load Reduction Tracking Method Report (BASMAA 2012b)*. Trash loads reduced via publically or privately owned and operated devices within a Permittee's jurisdictional area that have been recognized by the Water Board as full-capture may be used to demonstrate attainment of trash load reduction goals.

Baseline Level of Implementation

Prior to adoption of the MRP, some Permittees installed and maintained full capture devices. To avoid penalizing these early implementers, an applicable control measure implemented within a Permittee's jurisdictional area prior to the effective date of the MRP will be credited equally to a control measure implemented after the effective date. Therefore, the baseline level of implementation is no trash full-capture devices have been installed.

Enhanced Level of Implementation

A total of 77 trash full-capture treatment devices (Storm Tek, AS-2 inlet screens) were installed in the City of Sunnyvale as of August 18, 2011. In addition, the City has approved installation of 11 large full-trash capture devices (e.g., vortex-separator and continuous deflection-type devices) that treat stormwater from parking lots of new and redevelopment projects starting in 2003. City staff inspects these units on a regular basis for compliance with their stormwater management plans. Of the 11, six have been constructed. Additional private units will be added upon their completion and inspection by staff. A list of these full-capture devices is included in Table QF-6-1. All devices listed within this table are enhanced trash control measures. Table QF-6-1 also includes the area treated and the calculated trash load reduced from each full-capture treatment device. These calculations are consistent with the approach described in the *Trash Load Reduction Tracking Method Report (BASMAA 2012b)*.

Percent Reduction from Enhancements

The total estimated annual volume of trash that will be reduced by July 1, 2014 as a result of installing and implementing maintenance of full-capture devices is 1527 gallons. This volume is equal to approximately a 3.5 percent reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Sunnyvale. Both values provided within this section are included in Trash Load Reduction Summary Table included in Section 5.

Table QF-6-1. Trash full-capture treatment devices within the jurisdictional boundaries of the City of Sunnyvale that are planned for installation by July 1, 2014.

Device ID	Public or Private	Device Name	Location (Cross Streets)	Installation Date/Anticipated Installation Date	Total Area Treated (acres)	Trash Load Reduced
S075-315	Public	AS-ST 3-G Inlet Screen	N. Stelling and Homestead Road SW corner	8/18/2011	0.85	
S086-312	Public	AS-ST 3-G Inlet Screen	Near 1565 Hollenbeck Ave	8/17/2011	3.10	
S162-309	Public	AS-ST 3-G Inlet Screen	Fremont and Bernardo intersection SE corner	8/16/2011	2.40	
S162-307	Public	AS-ST 3-G Inlet Screen	Near 1000-1096 Fremont Ave, east of Bernardo Ave	8/16/2011	1.57	
S163-307	Public	AS-ST 3-G Inlet Screen	Fremont Ave, 2 lots west of Wright Ave intersection	8/16/2011	2.44	
S163-309	Public	AS-ST 3-G Inlet Screen	Fremont & Wright, SW corner	8/16/2011	1.32	
S163-310	Public	AS-ST 3-G Inlet Screen	Fremont & Wright SE corner	8/16/2011	0.61	
S164-301	Public	AS-ST 3-G Inlet Screen	Fremont & Mary SW corner	8/16/2011	0.97	
S164-302	Public	AS-ST 3-G Inlet Screen	Fremont & Mary SE corner	8/16/2011	0.63	
S165-301	Public	AS-ST 3-G Inlet Screen	Fremont (westbound) near Fremont Terrace W. intersection	8/17/2011	0.63	
S165-306	Public	AS-ST 3-G Inlet Screen	East of Fremont Ave & Warner Ave intersection	8/16/2011	1.61	
S165-314	Public	AS-ST 3-G Inlet Screen	Fremont & Nelson, SW corner	8/17/2011	3.27	
S166-323	Public	AS-ST 3-G Inlet Screen	Fremont & Hollenbeck, SW corner	8/16/2011	2.09	
S166-324	Public	AS-ST 3-G Inlet Screen	Fremont & Hollenbeck, SE corner	8/16/2011	0.80	
S166-325	Public	AS-ST 3-G Inlet Screen	Fremont & Oxbow Ct, SW corner	8/16/2011	0.90	

Baseline Trash Load and Short-Term Trash Load Reduction Plan

Device ID	Public or Private	Device Name	Location (Cross Streets)	Installation Date/Anticipated Installation Date	Total Area Treated (acres)	Trash Load Reduced
S166-326	Public	AS-ST 3-G Inlet Screen	Fremont & Oxbow Ct, SE corner	8/16/2011	0.50	
S166 - no number	Public	AS-ST 3-G Inlet Screen	Fremont Ave. westbound lane, opposite Cordilleras Ave	8/17/2011	0.91	
S167-306	Public	AS-ST 3-G Inlet Screen	Fremont & Los Arboles intersection, SW corner	8/16/2011	8.47	
S167-310	Public	AS-ST 3-G Inlet Screen	Fremont & Sydney Dr., SW corner	8/16/2011	2.60	
S168-304	Public	AS-ST 3-G Inlet Screen	SE Corner Sydney & Fremont	8/16/2011	0.38	
S168-303	Public	AS-ST 3-G Inlet Screen	526 W. Fremont Ave, in front of Post Office	8/16/2011	0.98	
S168-306	Public	AS-ST 3-G Inlet Screen	Near 168 E. Fremont Ave (gas station)	8/17/2011	1.80	
S168-301	Public	AS-ST 3-G Inlet Screen	NW corner Fremont & SV Saratoga	8/17/2011	1.55	
S168-305	Public	AS-ST 3-G Inlet Screen	1323 Sunnysvale Saratoga Rd (Dairy Belle)	8/17/2011	1.39	
S168-307	Public	AS-ST 3-G Inlet Screen	Near 115A E. Fremont Ave & intersection SV-Saratoga Rd	8/17/2011	0.72	
S172-332	Public	AS-ST 3-G Inlet Screen	Fremont Ave, Eastbound lane 2 lots west of Wolfe	8/17/2011	1.43	
S172-327	Public	AS-ST 3-G Inlet Screen	Fremont & Wolfe intersection, SW corner	8/17/2011	2.52	
S172-328	Public	AS-ST 3-G Inlet Screen	Wolfe Road, Near 1313 S. Wolfe - (Wendy's)	8/17/2011	4.03	
S172-345	Public	AS-ST 3-G Inlet Screen	Fremont & Wolfe intersection NW corner	8/17/2011	1.35	
S208-304	Public	AS-ST 3-G Inlet Screen	NW corner Remington & SV Saratoga	8/17/2011	1.85	
S208-305	Public	AS-ST 3-G Inlet Screen	SW corner Remington & SV Saratoga	8/17/2011	1.82	
S208-306-	Public	AS-ST 3-G Inlet Screen	SE corner Remington & SV Saratoga	8/17/2011	1.08	

Device ID	Public or Private	Device Name	Location (Cross Streets)	Installation Date/Anticipated Installation Date	Total Area Treated (acres)	Trash Load Reduced
S233-318	Public	AS-ST 3-G Inlet Screen	Northbound lanes SV Saratoga, 200 Yd S of Cumulus Ave	8/17/2011	0.82	
S233 -no number	Public	AS-ST 3-G Inlet Screen	Southbound lanes SV Saratoga, 200 Y N of Remington Ave int.	8/17/2011	1.03	
S248-302	Public	AS-ST 3-G Inlet Screen	Mathilda & SV Saratoga intersection	8/17/2011	0.89	
S248-312	Public	AS-ST 3-G Inlet Screen	SV Saratoga & Crawford Dr., NW corner	8/17/2011	0.68	
S248-313	Public	AS-ST 3-G Inlet Screen	SV Saratoga & Crawford Dr., SW corner	8/17/2011	5.38	
S273-no # B	Public	AS-ST 3-G Inlet Screen	SV Saratoga (south lane) near Fall River	8/17/2011	0.43	
S273-no # A	Public	AS-ST 3-G Inlet Screen	SV Saratoga South lane, S of PG&E Tower	8/17/2011	0.46	
S273-304	Public	AS-ST 3-G Inlet Screen	Mathilda Ave Northbound, N of Fall River Terrace	8/17/2011	1.11	
S274-301	Public	AS-ST 3-G Inlet Screen	Mathilda Southbound lane, near 585 Amherst	8/18/2011	1.64	
S274-302	Public	AS-ST 3-G Inlet Screen	Mathilda Northbound, S. of 988 Mathilda (Cherry Orchard)	8/18/2011	0.98	
S287-312	Public	AS-ST 3-G Inlet Screen	Mathilda & El Camino intersection, SW corner	8/18/2011	1.50	
S287-307	Public	AS-ST 3-G Inlet Screen	Mathilda & El Camino intersection NW corner	8/18/2011	0.78	
S314-304	Public	AS-ST 3-G Inlet Screen	Mathilda & W. Olive intersection SW corner	8/18/2011	1.49	
S314-303	Public	AS-ST 3-G Inlet Screen	Mathilda & W. Olive, NW corner	8/18/2011	0.26	
S314-305	Public	AS-ST 3-G Inlet Screen	Mathilda & E. Olive SE corner	8/18/2011	2.71	
S314-309	Public	AS-ST 3-G Inlet Screen	Mathilda & All America Way, NW corner	8/18/2011	0.42	
S327-305	Public	AS-ST 3-G Inlet Screen	Mathilda & Iova, SW corner	8/18/2011	1.08	

Baseline Trash Load and Short-Term Trash Load Reduction Plan

Device ID	Public or Private	Device Name	Location (Cross Streets)	Installation Date/Anticipated Installation Date	Total Area Treated (acres)	Trash Load Reduced
S327-308	Public	AS-ST 3-G Inlet Screen	Mathilda & Iowa, NW corner	8/18/2011	0.53	
S327-307	Public	AS-ST 3-G Inlet Screen	Mathilda & Iowa, NE corner	8/18/2011	0.28	
S327-306	Public	AS-ST 3-G Inlet Screen	Mathilda & Iowa, SE corner	8/18/2011	1.72	
S327-309	Public	AS-ST 3-G Inlet Screen	Mathilda & McKinley SW Corner	8/18/2011	2.32	
S327-311	Public	AS-ST 3-G Inlet Screen	Mathilda & McKinley NW corner	8/18/2011	0.33	
S327-310	Public	AS-ST 3-G Inlet Screen	Mathilda & McKinley SE corner	8/18/2011	1.10	
S353-306	Public	AS-ST 3-G Inlet Screen	Mathilda & Washington SW corner	8/18/2011	2.31	
S353-312	Public	AS-ST 3-G Inlet Screen	Mathilda & Washington SE corner	8/18/2011	1.12	
S353-334	Public	AS-ST 3-G Inlet Screen	Washington eastbound lane, west of Frances int.	8/18/2011	0.17	
S353-335	Public	AS-ST 3-G Inlet Screen	Washington Eastbound lane at Frances Ave int.(Macys)	8/18/2011	0.54	
S353-no#	Public	AS-ST 3-G Inlet Screen	Washington & Town Center Alley, west side.	8/18/2011	0.24	
S353-349	Public	AS-ST 3-G Inlet Screen	Frances & Evelyn, SE corner	8/18/2011	2.41	
S432-304	Public	AS-ST 3-G Inlet Screen	W. Maude Ave & San Angelo inters. , SE corner (7-11 store)	8/18/2011	1.42	
S448 - 304	Public	AS-ST 3-G Inlet Screen	Maude eastbound, near 678 W. Maude (Bakery)	8/18/2011	1.41	
S193-320	Public	AS-ST 3-G Inlet Screen	Svale-Saratoga & Westside Dr intersection - Westside inlet	1/10/2008	1.65	
S193-321	Public	AS-ST 3-G Inlet Screen	Svale-Saratoga & Westside Dr. intersection - SV-Saratoga inlet	1/10/2008	1.64	
S398-301	Public	AS-ST 3-G Inlet Screen	155 Acalanes Ave, across from Coronado Intersection	1/10/2008	2.11	

Device ID	Public or Private	Device Name	Location (Cross Streets)	Installation Date/Anticipated Installation Date	Total Area Treated (acres)	Trash Load Reduced
S432-320	Public	AS-ST 3-G Inlet Screen	240 W. Maude (in front of liquor store)	1/10/2008	2.02	
S432-321	Public	AS-ST 3-G Inlet Screen	340 W. Maude - (in front of KFC)	1/10/2008	1.98	
S452-307	Public	AS-ST 3-G Inlet Screen	Intersection of Caliente Ave & Bernal Ave, SW corner	1/10/2008	2.10	
S470-301	Public	AS-ST 3-G Inlet Screen	785 Morse - in front of Columbia Neighborhood Cent.	9/22/2008	2.12	
S470-303b	Public	AS-ST 3-G Inlet Screen	-825 Morse Ave - in front of Columbia Middle School	1/10/2008	2.17	
S489-311	Public	AS-ST 3-G Inlet Screen	Near 828 W. Awhanee	1/10/2008	1.32	
S629-313	Public	AS-ST 3-G Inlet Screen	Intersection of Caribbean Dr & Geneva Ave, SW corner	1/10/2008	1.72	
S653-304	Public	AS-ST 3-G Inlet Screen	Intersection of Caribbean Dr. & Borregas Ave, NW corner	1/10/2008	1.67	
S75-313	Public	AS-ST 3-G Inlet Screen	Intersection of Homestead Rd & Hollenbeck Ave, NW corner	9/22/2008	1.31	
S75-314	Public	AS-ST 3-G Inlet Screen	Intersection of Homestead Rd & N. Stelling Ave, SE corner	1/10/2008	1.19	
(Mathilda overpass project CDS)	Public	Cortech Unit	400-438 W. Evelyn Ave	6/1/2012	(10.24 acres for entire project	
(Mathilda overpass project CDS)	Public	Cortech Unit	400-470 W. California Ave	6/1/2012	(10.24 acres for entire project	
Subtotal for all 77 small units, based on BASMAA Load Calculator Tool						903

Baseline Trash Load and Short-Term Trash Load Reduction Plan

Device ID	Public or Private	Device Name	Location (Cross Streets)	Installation Date/Anticipated Installation Date	Total Area Treated (acres)	Trash Load Reduced (Gallons)
	Private - retail	Contech unit - hydrodynamic separator	398 W. El Camino Real, and Mathilda Ave Cherry Glenn Plaza intersection	2009	0.77	
	Private - residential	CDS units	707 S. Mathilda - Classics at Las Palmas (residential)	2009	2.4	
	Private - retail	CDS units	811 E. Arques Ave, (Lowes)	2008	15.07	
	Private - commercial	CDS units	111 Java Drive (Java Metro Center)	2009	12.7	
	Private - retail	CDS Units	782 E. El Camino Real (Walgreens & Panda Express)	2009	2.28	
	Private - retail	CDS Units	2502 Towncenter Lane - Towncenter mixed use project	2010	35.5	
	Private		⁵ More to be added			
Subtotal for 6 large units, based on BASMAA Load Calculator tool						624
Combined total for all Trash Full-Capture Devices						1527

⁵ Additional private units will be added, once installations are complete and inspections have been done by Sunnyvale staff.

QF-6: Creek/Channel/Shoreline Cleanups

Creek/channel/shoreline cleanups have been successful in removing large amounts of trash from San Francisco Bay Area creeks and waterways; and increasing citizen's awareness of trash issues within their communities. Creek/channel/shoreline cleanups are conducted as single-day events or throughout the year by volunteers and municipal agencies. Since volunteers and municipal agencies have the common goal of clean creeks and waterways, their efforts sometimes overlap. This is apparent with some municipal agencies using volunteers to help assess and clean designated trash hot spots during single-day volunteer events.

Baseline Level of Implementation

Trash reduced via creek/channel/shoreline cleanups was not accounted for in the City of Sunnyvale's baseline trash load described in Section 2.0. Therefore, implementation of any of the control measures described in this section is considered to be an enhancement and can be used to demonstrate progress towards load reduction goals.

Enhanced Level of Implementation

Prior to July 1, 2014, the City of Sunnyvale will conduct MRP-required⁶ and the following non-MRP required creek/channel/shoreline cleanups⁷ listed below. Both types of cleanups will be conducted each year and the volume of trash removed will be tracked to demonstrate trash loads reduced.

Single Day Efforts:

- National River Clean Up Day (third Saturday in May)
- Coastal Clean Up Day (third Saturday in September)

The City has sponsored cleanup sites for these events since 2008, and will continue to do so in the future. Based on previous collection efforts, we estimate that approximately 1,400 gallons of debris will be collected annually via these two events.

Permittee-Led Clean Up Activities:

City staff has performed the five trash hot spot clean up actions required in accordance with provision C.10.b since May 2010 (post-MRP effective date). The hot spot clean ups will continue to occur through the course of this permit. New locations may need to be identified if the quantity of debris collected continues to be reduced at some locations. Based on previously collected data, we have estimated that less than 175 gallons of trash will be collected from the five hot spots.

Additionally, City staff, in cooperation with volunteers conducted a homeless/litter clean up in April 2011 along a portion of the Sunnyvale East Channel, near the John W. Christian Green Belt area. The City intends to continue performing this type of clean up, on an as-needed basis in the future. Due to the uncertainty of this type of clean up being needed on an annual basis, we

⁶ Creek/channel/shoreline cleanups conducted in accordance with Permit Provision C.10.b.

⁷ All other creek/channel/shoreline cleanups conducted by a municipality that are not required by Provision C.10.b.

have not included that as an item for a percent reduction here. However, we will track the quantity of debris collected, if an event occurs, and will include that information in our annual report.

Percent Reduction from Enhancements

The total estimated annual volume of trash that will be reduced by July 1, 2014 as a result of implementing creek/channel/shoreline cleanups is approximately 1,575 gallons. This volume is equal to approximately a 3.6 percent reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Sunnyvale. Both values provided within this section are included in Trash Load Reduction Summary Table included in Section 5.

5.0 SUMMARY OF TRASH CONTROL MEASURE ENHANCEMENTS

The City of Sunnyvale is committed to reducing the potential for trash impacts in local water bodies in the San Francisco Bay Area. The planned enhanced trash control measures described in Section 3.0 are also listed in Table 5-1. The enhancements are intended to comply with the 40% trash load reduction goal in MRP provision C.10.

- The City is implementing a Single Use Carryout Plastic Bag Ordinance, which was approved by Council on December 6, 2011, with an effective date of June 20, 2012. The City will apply the maximum 12% reduction credit for this action to help meet the trash load reduction goal.
- Council will be considering a citywide Polystyrene Foam Food Service Ware prohibition in a study session to be scheduled for 2012. The results of that session will determine if the City will seek to develop an ordinance to institute a citywide prohibition for its use by businesses. In the interim, City staff will pursue the adoption of a revision of city policy, under the current Environmentally Preferable Purchasing Policy to prohibit the purchase or use of expanded polystyrene (EPS) products for use at city-sponsored events or on city-owned property. Pending approval by the City Manager and Executive Leadership Team, it is anticipated that this will become effective by December 1, 2013. In the event the policy is not approved, an alternative element will be identified for this plan that will equal the 2% reduction in trash loading rate that is proposed for prohibitions at events and City-owned property.
- The City will continue to implement and enhance its public education and outreach program, especially to school-age children. Our currently implement program is very robust and has included a litter prevention element in outreach messages for the past several years. The City will apply the maximum 8% reduction credit allowed for enhanced control measures.
- An uncovered load ordinance became effective on December 1, 2011. The City has had prescriptive language regarding contract haulers bringing debris to the SMaRT Station since September 30, 2010 Environmental Services Division will work with Public Safety to allow for an enhanced enforcement program for uncovered loads. This would allow the City to apply the maximum 5% reduction credit for implementing this action.
- City staff will continue to enforce the requirements of SMC 8.15.040 and .050 to ensure that businesses and households have sufficient trash collection frequencies and that the trash bins/containers are of an adequate size to hold the quantity of trash generated to prevent unintended releases of trash. City staff will continue with follow up and enforcement with property owners where bin sizing, placement, collection frequency and failures to comply with municipal code are noted. Additionally, the City will continue to support the Business Improvement District BID in the downtown Murphy Street historical area, where sweeping and litter pick up services are provided three times per week, and a street cleaning unit for sidewalks is also used weekly. The City will receive a 3.1% reduction credit for implementing these actions.

- City staff will continue to organize and sponsor land-based trash clean ups such as the Great American Litter Pick Up and local faith-based or community group clean ups such as the “Knock Out Litter” event held in October 2011. The estimated annual reduction for these types of events will be approximately 4.7% of the baseline trash load. Quantities of debris collected at these events will be tracked to demonstrate the reduction.
- The City has installed 77 small full-trash capture devices and two large devices (Contech-type units) since 2008. The estimated trash load reduction from all small devices is 2.1%. Only a few of the privately installed full-trash capture devices have been included in the percent reduction calculated for full-trash capture devices. The estimated load reduction from these large devices is 1.4%. This will provide the City a 3.5 % reduction in litter from the MS4. More treated areas may be added as private projects are completed and inspections by City staff are done.
- The City will continue to sponsor at least two single-day, creek/channel or shoreline clean up events each year. In addition, City staff will continue with the 5 trash hot-spot clean ups annually. Based on the average quantity of debris collected through these efforts in the past, the City estimates that a 3.6% reduction in the trash load can be reached. The volume of debris collected at these events will continue to be tracked and reported on annually, to demonstrate the reduction.

Based on calculations presented in Table 5.1, the City estimates that a 43.2% reduction from the baseline load estimate can be achieved, if all elements of this plan are implemented.

Table 5-1. Planned enhanced trash control measure implementation within the jurisdictional boundaries of the City of Sunnyvale and associated trash loads reduced. (Baseline load 43,318 gallons)

Trash Control Measure	Summary Description of Control Measure	% Reduction (Credits)	Trash Load Reduced	Cumulative % Reduction (Compared to Baseline)
Existing Enhanced Street Sweeping	Sweeping frequency of 3x per week in Murphy St. Business Improvement District	NA	745	1.7
Single-use Carryout Plastic Bag Ordinance (CR-1)	Tier 3- Prohibit distribution at retail establishments with the exception of restaurants	12.0%	5,165	13.5
Polystyrene Foam Food Service Ware Ban (CR-2)	Tier 1- Prohibit Distribution at City-sponsored events or City-owned Property	2.0%	861	15.5
Public Education and Outreach Programs (CR-3)	<ul style="list-style-type: none"> Advertising campaigns Outreach to schools & youth Media Relations – use of free media Community outreach events 	8.0%	3,443	23.3
Activities to Reduce Trash from Uncovered Loads (CR-4)	<ul style="list-style-type: none"> Prescriptive language in municipal contracts for trash/debris haulers Enhanced enforcement program for vehicles with uncovered loads 	5.0%	2,152	28.2
Improved Trash Bin/Container Management (Municipally or Privately-Controlled) (CR-6)	Ensuring Adequate private trash service: Tier 2 – Development of an ordinance and identification and enforcement of inadequate trash service for private trash/recycling containers	3.1%	1,347	31.3
Enhanced On-land Trash Cleanups (Volunteer and/or Municipal) (QF-1)	GALP and additional volunteer clean ups ~ 12 cu yard/year	NA	2,083	36.1
Full-capture Treatment Devices (QF-5)	<ul style="list-style-type: none"> 77 City owned small devices, Mathilda Overpass - 2 large devices (under construction) 6 Privately owned/maintained large devices at retail businesses and high density residential properties. 	NA	1,527	39.6
Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal) (QF-6)	<ul style="list-style-type: none"> National River Clean Up Day Coastal Clean Up Day Trash hot spot cleanups 	NA	1,575	43.2

Annual Reporting and Progress Towards Trash Load Reduction Goal(s)

Consistent with MRP Provision C.10.d (i), the City of Sunnyvale intends to report on progress towards MRP trash load reduction goals on an annual basis beginning with the Fiscal Year 2011-2012 Annual Report. Annual reports will include:

1. A brief summary of all enhanced trash load reduction control measures implemented to-date;
2. The dominant types of trash likely removed via these control measures;
3. Total trash loads removed (credits and quantifications) via each control measure implementation; and
4. A summary and quantification of progress towards trash load reduction goals.

Similar to other MRP provision, annual reporting formats will be consistent region-wide. Annual reports are intended to provide a summary of control measure implementation and demonstrate progress toward MRP trash reduction goals. For more detailed information on specific control measures, the City of Sunnyvale will retain supporting documentation on trash load reduction control measure implementation. These records should have a level of specificity consistent with the trash load reduction tracking methods described in the *BASMAA Trash Load Reduction Tracking Method Technical Report (BASMAA 2011e)*.

Considerations of Uncertainties

Baseline trash loading and load reduction estimates are based on the best available information at the time this Short-Term Plan was developed. As with any stormwater loading and reduction estimate, a number of assumptions were used during calculations and therefore uncertainty is inherent in the baseline trash load estimate presented in Section 2.0 and the load reduction estimate presented in this section. For these reasons, the baseline loading estimates presented in this plan should be considered first-order estimates. During the implementation of this Short-Term Plan and subsequent plans, additional information may become available to allow the calculation of a more robust baseline load.

6.0 IMPLEMENTATION SCHEDULE

Implementation of enhanced trash control measures by the City of Sunnyvale is currently planned to occur in a timeframe consistent with MRP requirements. A preliminary implementation schedule for all planned enhancements is described in Table 6-1. This schedule provides a timeframe for reducing trash discharged from the City of Sunnyvale's MS4 by 40%.

Based on new information that becomes available during the implementation of this Short-Term Plan (e.g., experience with implementation, revisions to baseline loading estimates or quantification formulas altering load reduction credits), the City of Sunnyvale may choose to amend or revise this Plan and/or the associated implementation schedule. If revisions or amendments occur, a revised Short-Term Plan and implementation schedule will be submitted to the Water Board via the annual reporting process.

Table 6-1. Preliminary implementation schedule for enhanced trash control measures in the City of Sunnyvale.

Trash Control Measure	Beginning Date of Implementation
Single-use Carryout Plastic Bag Ordinance (CR-1)	June 20, 2012
Polystyrene Foam Food Service Ware Ban (CR-2)	December 1, 2013
Public Education and Outreach Programs (CR-3)	December 1, 2009
Activities to Reduce Trash from Uncovered Loads (CR-4)	December 1, 2011
Improved Trash Bin/Container Management (Municipally or Privately-Controlled) (CR-6)	December 1, 2012
On-land Trash Cleanups (Volunteer and/or Municipal) (QF-1)	March, 2008
Full-capture Treatment Devices (QF-5)	Small Units: <ul style="list-style-type: none"> • January 2008 - City began installation • August 2011 - City began installation Large units: Installations began in 2004
Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal) (QF-6)	May 2008

7.0 REFERENCES

- Allison R.A. and F.H.S. Chiew 1995. Monitoring stormwater pollution from various land uses in an urban catchment. Proceedings from the 2nd International Symposium on Urban Stormwater Management, Melbourne, 551-516.
- Allison, R.A., T.A. Walker, F.H.S. Chiew, I.C. O'Neill and T.A. McMahon 1998. From Roads to rivers: Gross pollutant removal from urban waterways. Report 98/6. Cooperative Research Centre for Catchment Hydrology. Victoria, Australia. May 1998.
- Armitage, N. 2001. The removal of Urban Litter from Stormwater Drainage Systems. Ch. 19 in Stormwater Collection Systems Design Handbook. L. W. Mays, Ed., McGraw-Hill Companies, Inc. ISBN 0-07-135471-9, New York, USA, 2001, 35 pp.
- Armitage, N. 2003. The removal of urban solid waste from stormwater drains. Prepared for the International Workshop on Global Developments in Urban Drainage Management, Indian Institute of Technology, Bombay, Mumbai India. 5-7 February 2003.
- Armitage, N. 2007. The reduction of urban litter in the stormwater drains of South Africa. Urban Water Journal Vol. 4, No. 3: 151-172. September 2007.
- Armitage N., A. Rooseboom, C. Nel, and P. Townshend 1998. "The removal of Urban Litter from Stormwater Conduits and Streams. *Water Research Commission (South Africa) Report No. TT 95/98*, Pretoria.
- Armitage, N. and A. Rooseboom 2000. The removal of urban litter from stormwater conduits and streams: Paper 1 – The quantities involved and catchment litter management options. *Water S.A. Vol. 26. No. 2: 181-187.*
- BASMAA (Bay Area Stormwater Management Agencies Association). 2011a. Progress Report on Methods to Estimate Baseline Trash Loads from Bay Area Municipal Stormwater Systems and Track Loads Reduced. February 2011.
- BASMAA (Bay Area Stormwater Management Agencies Association). 2011b. Method to Estimate Baseline Trash Loads from Bay Area Municipal Stormwater Systems: Technical Memorandum #1. Prepared by EOA, Inc. April 2011.
- BASMAA (Bay Area Stormwater Management Agencies Association). 2011c. Sampling and Analysis Plan. Prepared by EOA, Inc. April 2011.
- BASMAA (Bay Area Stormwater Management Agencies Association). 2011d. Trash Load Reduction Tracking Method: Technical Memorandum #1 – Literature Review. Prepared by EOA, Inc. May 2011.
- BASMAA (Bay Area Stormwater Management Agencies Association). 2012a. Trash Baseline Generation Rates: Technical Report. Prepared by EOA, Inc. February 1.
- BASMAA (Bay Area Stormwater Management Agencies Association). 2012b. Trash Load Reduction Tracking Method: Technical Report. Prepared by EOA, Inc. February 1.
- County of Los Angeles. 2002. Los Angeles County Litter Monitoring Plan for the Los Angeles River and Ballona Creek Trash Total Maximum Daily Load. May 30, 2002.
- County of Los Angeles. 2004a. Trash Baseline Monitoring Results Los Angeles River and Ballona Creek Watershed. Los Angeles County Department of Public Works. February 17, 2004.

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County of Los Angeles 2004b. Trash Baseline Monitoring for Los Angeles River and Ballona Creek Watersheds. Los Angeles County Department of Public Works. May 6, 2004.

County of Los Angeles, Department of Public Works, Environmental Programs Division. 2007. *An Overview of Carryout Bags in Los Angeles County: A Staff Report to the Los Angeles County Board of Supervisors*. Alhambra, CA. http://dpw.lacounty.gov/epd/PlasticBags/PDF/PlasticBagReport_08-2007.pdf. August 2007.

Kim, L.H, M. Kayhanian, M.K. Stenstrom 2004. Event mean concentration and loading of litter from highways during storms. *Science of the Total Environment* Vol 330: 101-113.

