Trash Long-Term Reduction Plan and Progress Assessment Strategy

February 1, 2014

Del Valle Regional Park

Submitted by:

City of Livermore

Water Resources Division

101 W. Jack London Blvd.

Livermore, CA 94551

LIVERMORE
CALIFORNIA

In compliance with Provisions C.10.c of Order R2-2009-0074

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City of Livermore
LONG-TERM TRASH LOAD REDUCTION PLAN AND ASSESSMENT STRATEGY

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:

Darren Greenwood
Assistant Public Works Director

February 1, 2014

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ABBREVIATIONS

AACSP	Adopt-A-Creek Spot Program
ACCWP	Alameda County Clean Water Program
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
LARPD	Livermore Area Recreation and Park District
LVJUSD	Livermore Valley Joint Unified School District
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
Zone 7	Zone 7 Water Agency

PREFACE

This Long-Term Trash Load Reduction Plan and Assessment Strategy (Long-Term Plan) is submitted in compliance with provision C.10.c of the Municipal Regional Stormwater NPDES Permit (MRP) for Phase I communities in the San Francisco Bay (Order R2-2009-0074). The Long-Term Plan was developed using a regionally consistent outline and guidance developed by the Bay Area Stormwater Management Agencies Association (BASMAA) and reviewed by San Francisco Bay Regional Water Quality Control Board staff. The Long-Term Plan is consistent with the Long-Term Trash Load Reduction Framework developed in collaboration with Water Board staff. Its content is based on the City of Livermore's current understanding of trash problems within its jurisdiction and the effectiveness of control measures designed to reduce trash impacts associated with Municipal Separate Storm Sewer (MS4) discharges. This Long-Term Plan is intended to be iterative and may be modified in the future based on information gained through the implementation of trash control measures. The City of Livermore therefore reserves the right to revise or amend this Long-Term Plan at its discretion. If the City makes significant revisions or amendments, a revised Long-Term Plan will be submitted to the Water Board through the City's annual reporting process.

1.0 Introduction

1.1 Purpose of Long-Term Trash Reduction Plan

The Municipal Regional Stormwater National Pollutant Discharge Elimination System (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.c of the MRP requires Permittees to submit a *Long-Term Trash Load Reduction Plan* (Long-Term Plan) by February 1, 2014. Long-Term Plans must describe control measures that are currently being implemented, including the level of implementation, and additional control measures that will be implemented and/or increased level of implementation designed to attain a 70% trash load reduction by July 1, 2017, and 100% (i.e., "No Visual Impact") by July 1, 2022.

This Long-Term Plan is submitted by the City of Livermore in compliance with MRP provision C.10.c. Consistent with provision C.10 requirements, the goal of the Long-Term Plan is to solve trash problems in receiving waters by reducing the impacts associated with trash in discharges from the City of Livermore's municipal separate storm sewer system (MS4) that are regulated by NPDES Permit requirements. The Long-Term Plan includes:

1. Descriptions of the current level of implementation of trash control measures, and the type and extent to which new or enhanced control measures will be implemented to achieve a target of 100% (i.e. full) trash reduction from MS4s by July 1, 2022, with an interim milestone of 70% reduction by July 1, 2017;
2. A description of the *Trash Assessment Strategy* that will be used to assess progress towards trash reduction targets achieved as a result of control measure implementation; and,
3. Time schedules for implementing control measures and the assessment strategy.

The Long-Term Plan was developed using a regionally consistent outline and guidance developed by the Bay Area Stormwater Management Agencies Association (BASMAA) and reviewed by the San Francisco Bay Regional Water Quality Control Board (Water Board) staff. The Long-Term Plan is consistent with the Long-Term Trash Load Reduction Framework (see section 1.2.1) developed in collaboration with Water Board staff. Its content is based on the City of Livermore's current understanding of trash problems within its jurisdiction and the effectiveness of control measures designed to reduce trash impacts associated with Municipal Separate Storm Sewer (MS4) discharges. The Long-Term Plan builds upon trash control measures implemented by the City prior to the adoption of the MRP and during the implementation of the Short-Term Trash Load Reduction Plan submitted to the Water Board on February 1, 2012.

1.2 Background

1.2.1 Long-Term Trash Load Reduction Plan Framework

A workgroup of MRP Permittee representatives and Water Board staff met between October 2012 and March 2013 to better define the process for developing and implementing Long-Term Plans, methods for assessing progress toward reduction goals, and tracking and reporting requirements associated with provision C.10. Through these discussions, an eight-step framework for developing and implementing Long-Term Plans was created by the workgroup (Figure 1).

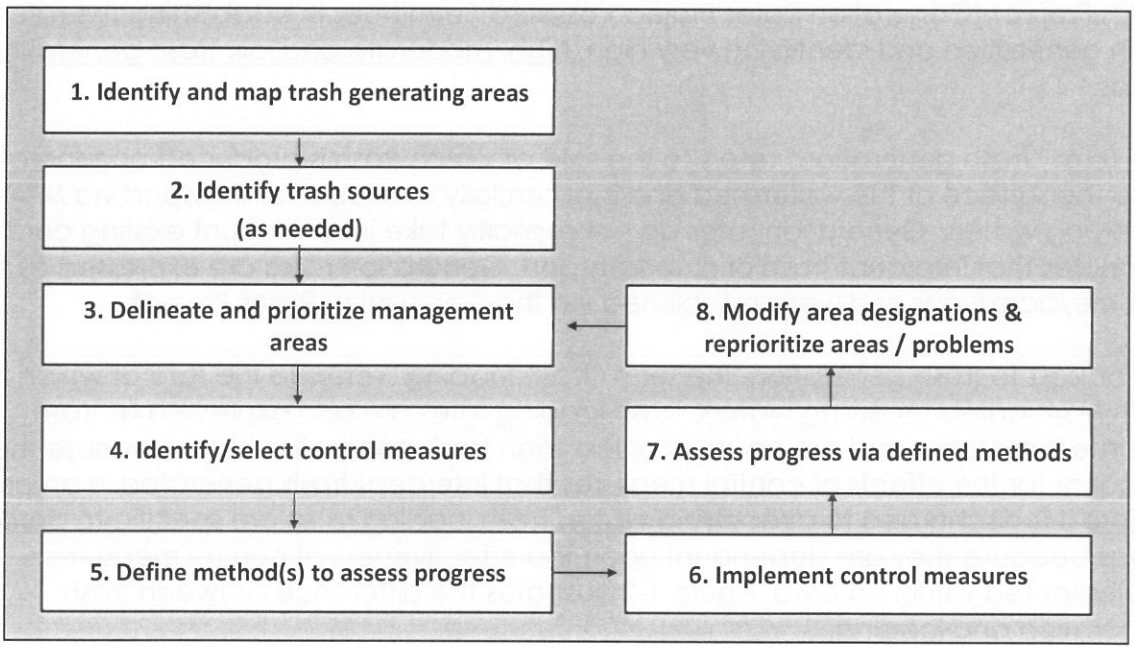


Figure 1-1. Eight-step framework for developing, implementing and refining Long-Term Trash Reduction Plans.

The workgroup agreed that as the first step in the framework, Permittees would identify very high, high, moderate, and low trash generating areas in their jurisdictional areas. Trash generation rates developed through the *BASMAA Baseline Trash Generation Rates Project* (as discussed below) were used as a starting point for differentiating and delineating land areas with varying levels of trash generation. Permittees would then use local knowledge and field and/or desktop assessments to confirm or refine the level of trash generation for specific areas within their jurisdiction. Each Permittee would then develop a map depicting trash generation categories within their jurisdiction.

As a next step, Permittees would then delineate and prioritize Trash Management Areas (TMAs) where specific control measures exist or are planned for implementation. TMAs delineated by Permittees are intended to serve as reporting units in the future. Reporting at the management area level provides the level of detail necessary to demonstrate implementation and progress towards trash reduction targets.

Once control measures are selected and implemented, Permittees will evaluate progress toward trash reduction targets using outcome-based assessment methods. As the results of the progress assessments are available, Permittees may choose to reprioritize trash management areas and associated control measures designed to improve trash reduction within their jurisdictions.

1.2.2 BASMAA Generation Rates Project

Through approval of a BASMAA regional project in 2010, Permittees agreed to work collaboratively to develop a regionally consistent method to establish trash generation rates within their jurisdictions. The project, also known as the *BASMAA Trash Generation Rates Project* (Generation Rates Project) assisted Permittees in establishing the rates of trash generation and identifying very high, high, moderate and low trash generating areas.

The term "trash generation" refers to the rate at which trash is produced or generated onto the surface of the watershed and is potentially available for transport via MS4s to receiving waters. Generation rates do not explicitly take into account existing control measures that intercept trash prior to transport. Generation rates are expressed as trash volume/acre/year and were established via the Generation Rates Project.

In contrast to trash generation, the term "trash loading" refers to the rate at which trash from MS4s enters receiving waters. Trash loading rates are also expressed as trash volume/acre/year and are equal to or less than trash generation rates because they account for the effects of control measures that intercept trash generated in an area before it is discharged to a receiving water. Trash loading rates are specific to particular areas because they are dependent upon the effectiveness of control measures implemented within an area. Figure 1-2 illustrates the difference between trash generation and loading.

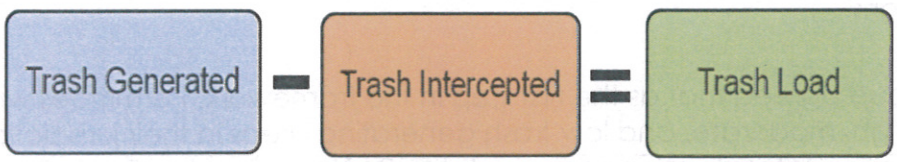


Figure 1-2. Conceptual model of trash generation, interception and load.

Trash generation rates were estimated based on factors that significantly affect trash generation (i.e., land use and income). The method used to the establish trash generation rates 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).

Trash generation 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. Trash generation rates estimated from this study are listed for each land use type in Table 1-1. Methods used to develop trash generation rates are more fully described in BASMAA (2011b, 2011c, and 2012).

Table 1-1. San Francisco Bay Area trash generation rates by land use (gallons/acre/year).

Land Use	Low[b]	Best[b]	High[b]
Commercial & Services	0.7	**6.2**	17.3
Industrial	2.8	**8.4**	17.8
Residential[a]	0.3 - 30.2	**0.5 - 87.1**	1.0 - 257.0
Retail[a]	0.7 - 109.7	**1.8 - 150.0**	4.6 - 389.1
K-12 Schools	3	**6.2**	11.5
Urban Parks	0.5	**5.0**	11.4

[a] For residential and retail land uses, trash generation rates are provided as a range that takes into account the correlation between rates and household median income.

[b] For residential and retail land uses: Low = 5% confidence interval; Best = best fit regression line between generation rates and household median income; and, High = 95% confidence interval. For all other land use categories: High = 90th percentile; Best = mean generation rate; and, Low = 10th percentile.

1.3 Organization of Long-Term Plan

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

1.0 Introduction;
2.0 Scope of the Trash Problem;
3.0 Trash Management Areas and Control Measures;
4.0 Progress Assessment Strategies; and
5.0 References

Section 2.0 is intended to provide a description of the extent and magnitude of the trash problem in the City of Livermore. Control measures that will be implemented by City of Livermore as a result of this Long-Term Plan are described in section 3.0. Section 4.0 describes the methods that will be used to assess progress toward trash reduction targets.

2.0 Scope of the Trash Problem

2.1 Permittee Characteristics

Incorporated in 1876, the City of Livermore is located in Alameda County, and has a jurisdictional area of 10,487 acres. According to the 2010 Census, it has a population of 80,968, with a population density of 3,216.5 people per square mile and average household size of 2.76. Of the 80,968 residents who call City of Livermore home, 25.5% are under the age of 18, 7.6% are between 18 and 24, 27.8% are between 25 and 44, 28.8% are between 45 and 64, and 10.3% are 65 or older. The median household income was $93,988 in 2010[1]. Demographically, the City of Livermore's population is 74.6% White, 2.1% Black or African American, 0.6% American Indian and Alaska Native, 8.4% Asian, 0.3% Pacific Inslander, 8.6% Other, and 5.4% two or more races according to 2010 Census Data. Top employers in the City of Livermore include Valley Care Health System Lifestyle RX Fitness Center, Livermore Valley Joint Unified School District and Comcast. The City of Livermore is also home to Lawrence Livermore National Laboratory, Sandia National Laboratories, I-Gate and several wineries.

Land uses within City of Livermore depicted in ABAG (2005) are provided in 2-1. The City of Livermore is primarily comprised of six land uses. These include Commercial and Services, Industrial, Residential, Retail, K-12 Schools and Urban Parks.

Table 2-1. Percentages of the City of Livermore's jurisdictional area[2] within land use classes identified by ABAG (2005)

Land Use Category	Jurisdictional Area (Acres)	% of Jurisdictional Area
Commercial and Services	648.4	4.3%
Industrial	1,533.7	10.1%
Residential	6,938.6	45.6%
Retail	443.2	2.9%
K-12 Schools	300.6	2.0%
Urban Parks	401.1	2.6%

[1] The median household income for the City of Livermore from the 2010 Census is currently unavailable.

[2] A Permittee's jurisdictional area is defined as the urban land area within a Permittee's boundary that is not subject to stormwater NPDES Permit requirements for traditional and non-traditional small MS4s (i.e. Phase II MS4s) or the California Department of Transportation, or owned and maintained by the State of California, the U.S. federal government or other municipal agency or special district (e.g., flood control district).

2.2 Trash Generating Areas

2.2.1 Generation Categories and Designation of Areas

The process and methods used to identify the level of trash generation within the City of Livermore are described in this section and illustrated in Figure 2-1.

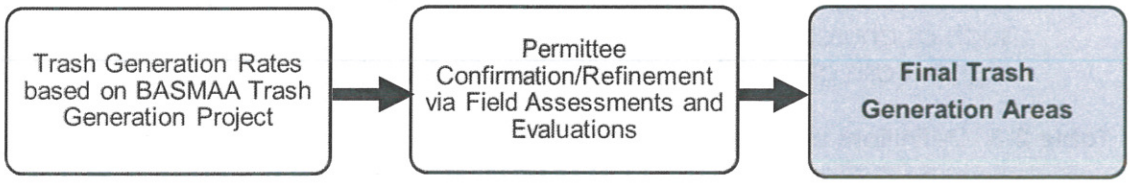


Figure 2-1. Development of Trash Generation Areas

As a first step, trash generation rates developed through *the BASMAA Trash Generation Rates Project* were applied to parcels within the City of Livermore based on current land uses and 2010 household median incomes. A Draft Trash Generation Map was created as a result of this application. The draft map served as a starting point for the City of Livermore to identify trash-generating levels. Levels of trash generation are depicted on the map using four trash generation rate (gallons/acre/year) categories that are symbolized by four different colors illustrated in Table .

Table 2-2. Trash generation categories and associated generation rates (gallons/acre/year).

Category	Very High	High	Moderate	Low
Generation Rate (gallons/acre/year)	> 50	10-50	5-10	< 5

The City of Livermore then reviewed and refined the draft trash generation map to ensure that trash generation categories were correctly assigned to parcels or groups of parcels. City of Livermore staff refined maps using the following process:

1. Based upon our knowledge of trash generation and problem areas within the City, staff identified areas on the draft map that potentially had incorrect trash generation category designations.
2. Trash generation category designations initially assigned to areas identified in step #1 were then assessed and confirmed/refined by the City using the methods listed below.

a. On-Land Visual Assessments

To assist Permittees with developing their trash generation maps, BASMAA developed a *Draft On-land Visual Trash Assessment Protocol (Draft Protocol)*. The Draft Protocol entails walking a street segment and visually observing the level of trash present on the roadway, curb and gutter, sidewalk, and other areas adjacent to the street that could potentially contribute trash to the MS4. Based on the level of trash observed, each segment (i.e., assessment area) was placed into one of four on-land assessment condition categories that are summarized in Table 2-3. The City of Livermore assessed a total of 52 areas to assist in conducting/refining trash generating area designations using the Draft Protocol. Through these assessments, staff determined that some commercial and retail land uses such as churches, community centers and day care centers were assigned higher trash generation rates than actually exist.

Table 2-3. Definitions of on-land trash assessment condition categories.

On-land Assessment Condition Category	Summary Definition
A (Low)	Effectively no trash is observed in the assessment area.
B (Moderate)	Predominantly free of trash except for a few pieces that are easily observed.
C (High)	Trash is widely/evenly distributed and/or small accumulations are visible on the street, sidewalks, or inlets.
D (Very High)	Trash is continuously seen throughout the assessment area, with large piles and a strong impression of lack of concern for litter in the area.

b. Querying Municipal Staff

Commercial and Services, Industrial, Residential and Retail areas were reviewed and approved by City of Livermore Planning, Engineering, Streets, Solid Waste and Recycling, Collections and Source Control staff. K-12 Schools and Urban Parks were reviewed and approved by City of Livermore Landscape staff, Livermore Area Recreation and Park District (LARPD), and Livermore Valley Joint Unified School District (LVJUSD) staff.

c. Viewing Areas via Google Maps – Street View

Trash generation designation areas were defined by land use and parcel address using the City of Livermore's GIS Database with Google Maps-Street View prior to performing On-land Visual Assessments.

3. Based on assessments conducted to confirm/refine trash generation category designations, the City created a final trash generation map that depicts the most current understanding of trash generation within the City of Livermore. The City documented this process by tracking the information collected through the assessments and subsequent refinements to the Draft Trash Generation Map. The City of Livermore's Final Trash Generation Map is included as Figure 2-2.

2.2.2 Summary of Trash Generating Areas and Sources

Summary statistics for land use and trash generation categories generated through the mapping and assessment process are presented in Table 2-4.

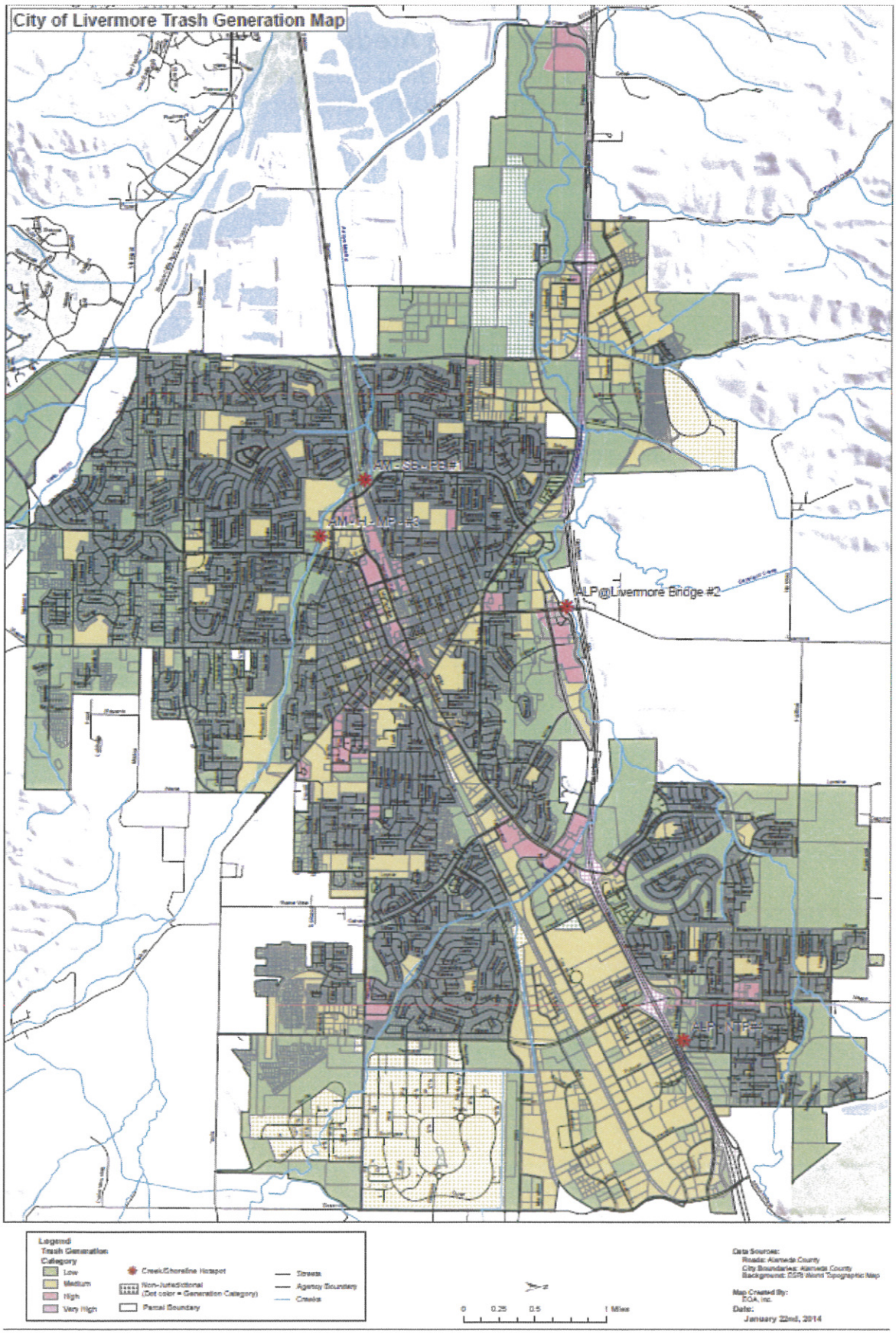
Table 2-4. Percentage of jurisdictional area within the City of Livermore assigned to each trash generation category.

Trash Generation Category	Jurisdictional Area (Acres)	Commercial and Services	Industrial	Residential	Retail	K-12 Schools	Urban Parks	Other
Very High	0.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
High	534.5	0.0%	0.0%	25.2%	74.8%	0.0%	0.0%	0.0%
Medium	3,324.2	18.2%	45.9%	13.8%	1.2%	9.0%	11.9%	0.0%
Low	11,354.8	0.4%	0.1%	55.8%	0.0%	0.0%	0.1%	43.6%

Table 2-4. Acres of jurisdictional area within the City of Livermore assigned to each trash generation category.

Trash Generation Category	Commercial and Services	Industrial	Residential	Retail	K-12 Schools	Urban Parks	Other
Very High	0.0	0.0	0.0	0.0	0.0	0.0	0.0
High	0.0	0.0	134.91	399.55	0.0	0.0	0.0
Medium	605.45	1526.73	459.10	39.12	298.78	395.25	0.0
Low	42.95	6.93	6344.32	4.48	1.86	5.84	4,948.42

Figure 2-2. Final Trash Generation Map for the City of Livermore.



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3.0 Trash management areas and control measures

This section describes the control measures that the City of Livermore has or plans to implement to solve trash problems and achieve a target of 100% (i.e. full) trash reduction from their MS4 by July 1, 2022. The selection of control measures described in this section is based on the City of Livermore's current understanding of trash problems within its jurisdiction and the effectiveness of control measures designed to reduce trash impacts associated with MS4 discharges. Information on the effectiveness of some trash control measures is currently lacking and therefore in the absence of this information, the City based its selection of control measures on existing effectiveness information, their experience in implementing trash controls and knowledge of trash problems, and costs of implementation. As knowledge is gained through the implementation of these control measures, the City may choose to refine their trash control strategy described in this section. If significant revisions or amendments are made, a revised Long-Term Plan will be submitted to the Water Board through the City of Livermore's annual reporting process.

3.1 Management Area Delineation and Prioritization

Consistent with the long-term plan framework, the City of Livermore's delineated and prioritized trash management areas (TMAs) based on the geographical distribution of trash generating areas, types of trash sources, and current or planned control measure locations. TMAs are intended to form the management units by which trash control measure implementation can be tracked and assessed for progress towards trash reduction targets. Once delineated, TMAs were also prioritized for control measure implementation. The City of Livermore's primary management areas were selected based on the spatial distribution of trash generating areas and the location of specific existing or planned management actions within the City's jurisdiction. City staff used the following process to designate the City's seventeen Primary TMAs:

1. Identify and prioritize high, medium and low trash generating retail, commercial and industrial areas with existing, full-capture treatment devices (Primary TMAs 1, 2 and 3).

2. Identify high trash generating retail area (and detention basin) with planned, enhanced street sweeping and on-land trash clean-up activities (Primary TMA 5).

3. Identify and prioritize high, medium and low trash generating industrial, commercial, retail, residential and downtown areas with planned, full-capture treatment devices (Primary TMAs 4, 6, 7, 8, 9 and 10).

4. Identify and prioritize high, medium and low trash generating commercial, industrial and retail areas with improved trash bin/container management and planned, enhanced anti-littering and illegal dumping enforcement activities (Primary TMA 11, 12, 13 and 14).

5. Identify medium trash generating urban parks and K-12 schools with LARPD and LVJUSD existing and planned activities (Primary TMAs 15 and 16).

6. Identify low trash generating residential and other areas with existing street sweeping and storm drain inlet maintenance (Primary TMA 17).

City staff designated the Secondary TMAs within Primary TMAs 1 to 7 and 9 to 16 by specific land use type using the first letter of each land use. Secondary TMA designations include the following letter: C (Commercial), R (Retail), I (Industrial), P (Park) and S (School). Primary TMAs 8 and 17 were not assigned a Secondary TMA designation since TMA 8 comprises the high and medium trash generating downtown area, and Primary TMA 17 primarily includes low trash generating residential and other areas.

During this process, City of Livermore Water Resources Division staff used the City of Livermore's GIS Database with Google Maps-Street View and On-Land Visual Assessment to confirm land use. In addition, Water Resources Division staff received TMA information and feedback from knowledgeable City of Livermore Planning, Engineering, Streets, Landscape, Collections, Solid Waste and Recycling, and Neighborhood Preservation staff, as well as, LARPD and LVJUSD staff.

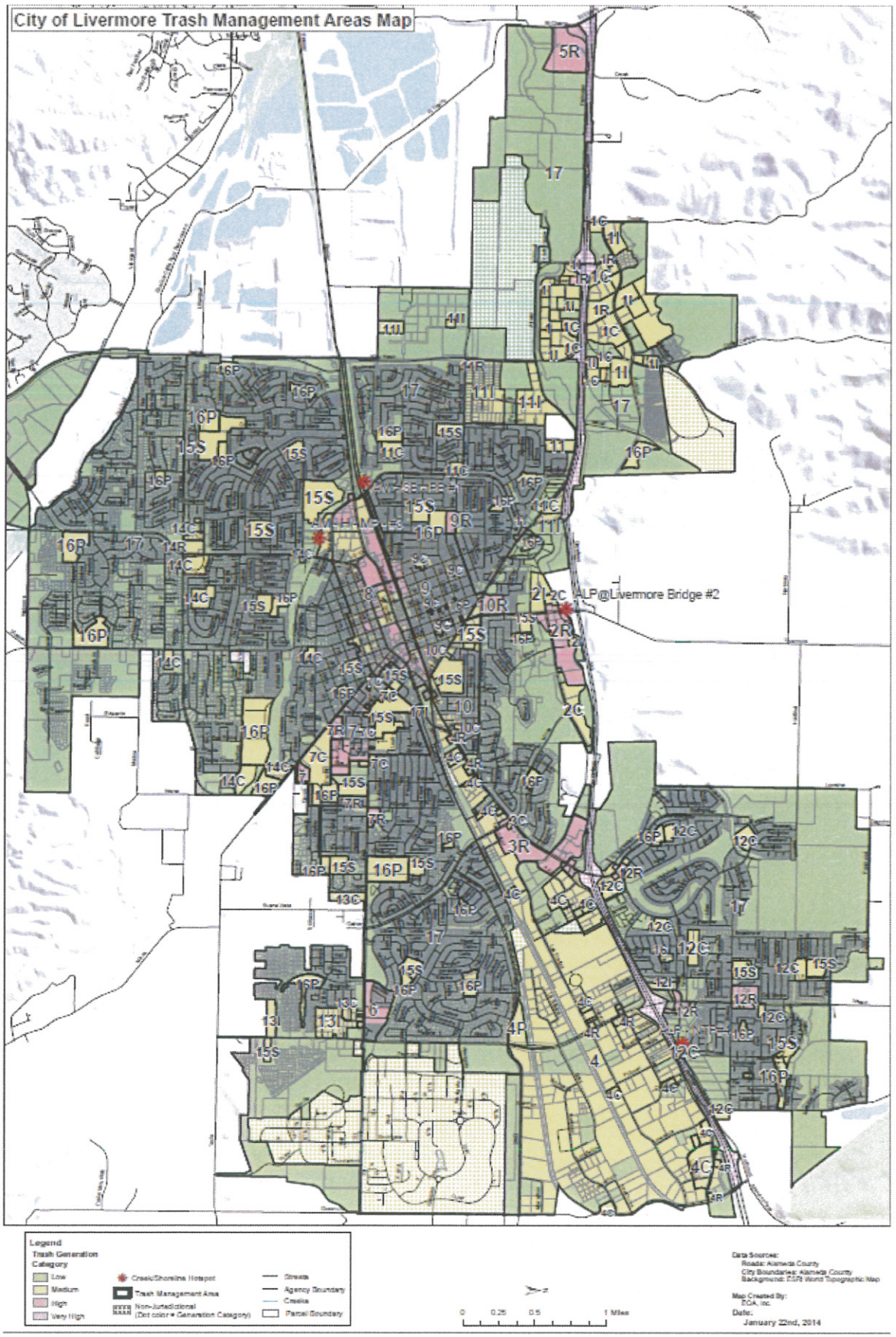
A map depicting the City's TMAs is included as 3-1. All jurisdictional areas within the city are included within a TMA. The amount of jurisdictional land area and associated trash condition categories for each TMA are included in Table 3-1.

Table 3-1. Jurisdictional area and percentage of each Trash Management Area (TMA) comprised of trash generation categories

TMA	Jurisdictional Area (Acres)	Trash Generation Rate			
		Very High	High	Medium	Low
1	10.6	0.0%	0.0%	90.9%	9.1%
1C	178.7	0.0%	0.0%	100.0%	0.0%
1I	115.8	0.0%	0.0%	100.0%	0.0%
1R	23.4	0.0%	13.3%	86.7%	0.0%
2	0.0	0.0%	100.0%	0.0%	0.0%
2C	28.5	0.0%	0.0%	100.0%	0.0%
2I	21.0	0.0%	0.0%	100.0%	0.0%
2R	55.5	0.0%	99.9%	0.0%	0.1%
3C	1.3	0.0%	0.0%	100.0%	0.0%
3R	77.7	0.0%	100.0%	0.0%	0.0%
4	1,438.3	0.0%	0.0%	83.5%	16.5%
4C	73.1	0.0%	0.0%	100.0%	0.0%
4P	17.7	0.0%	0.0%	100.0%	0.0%
4R	11.4	0.0%	29.0%	71.0%	0.0%
5R	50.5	0.0%	100.0%	0.0%	0.0%

6	40.9	0.0%	100.0%	0.0%	0.0%
7	145.4	0.0%	56.7%	42.6%	0.8%
7C	66.7	0.0%	0.0%	100.0%	0.0%
7CD	0.1	0.0%	0.0%	100.0%	0.0%
7I	1.8	0.0%	0.0%	100.0%	0.0%
7R	25.6	0.0%	98.1%	1.9%	0.0%
8	299.6	0.0%	42.1%	53.0%	4.9%
9	246.1	0.0%	5.2%	93.4%	1.4%
9C	7.4	0.0%	0.0%	100.0%	0.0%
9R	0.8	0.0%	0.0%	100.0%	0.0%
10	101.9	0.0%	0.0%	99.6%	0.4%
10C	4.5	0.0%	0.0%	100.0%	0.0%
10I	0.8	0.0%	0.0%	100.0%	0.0%
10R	13.4	0.0%	100.0%	0.0%	0.0%
11	14.2	0.0%	13.6%	86.1%	0.3%
11C	26.3	0.0%	0.0%	100.0%	0.0%
11I	133.4	0.0%	0.0%	99.8%	0.2%
11R	10.3	0.0%	100.0%	0.0%	0.0%
12C	72.6	0.0%	0.0%	100.0%	0.0%
12I	8.5	0.0%	0.0%	100.0%	0.0%
12R	31.5	0.0%	100.0%	0.0%	0.0%
13	0.2	0.0%	0.0%	0.0%	100.0%
13C	4.9	0.0%	0.0%	100.0%	0.0%
13I	45.3	0.0%	0.0%	100.0%	0.0%
14C	71.6	0.0%	0.0%	100.0%	0.0%
14R	8.8	0.0%	0.0%	100.0%	0.0%
15	0.4	0.0%	0.0%	100.0%	0.0%
15S	286.8	0.0%	0.0%	100.0%	0.0%
16	3.5	0.0%	0.0%	100.0%	0.0%
16P	340.6	0.0%	0.0%	100.0%	0.0%
17	11,096.1	0.0%	0.0%	0.0%	100.0%

Figure 3-1. Trash Management Area Map for the City of Livermore.



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3.2 Current and Planned Trash Control Measures

The City of Livermore has historically addressed trash through street sweeping and storm drain inlet inspection and maintenance. The City's street sweeping schedule has been in effect for many years prior to the MRP adoption and continues to be implemented as our main, year round trash removal effort. The City sweeping schedule consists of sweeping all large residential and commercial areas, and schools once a month; and all large retail and industrial areas, and Downtown once a week and once every two weeks during leaf season. Other maintenance operations that remove trash are on-land clean-up activities organized by City staff and the Livermore Adopt-A-Creek Spot Program, City staff removal of illegally dumped materials referred by City staff, businesses and residents, annual cleaning of 5,325 storm drain inlets, and local enforcement by City staff for uncovered loads, illegal dumping and littering.

Since the adoption of the MRP, the City purchased and installed one-hundred and seventy-four (174) connector pipe screen capture devices using monies from the Federal American Recovery and Reinvestment Act of 2009 as part of the Bay-Area Wide Trash Capture Demonstration project. These trash capture devices located in TMAs 1, 2 and 3 satisfy the City's requirement to treat 30% of Livermore's commercial land area, as specified by the MRP provision C/10.a.iii. The trash capture devices treat a total area of 451.65 acres of land, which is approximately 36.6% of Livermore's very high and high trash generating areas.

The City is planning to purchase approximately three-hundred and thirty-one (331) small devices and three (3) large devices. The planned trash capture devices will treat approximately a total area of 1,155.91 acres of land, which is approximately 41.6% of Livermore's very high, high and medium trash generating areas. The City has hired Schaaf & Wheeler to draft a full trash capture device plan to determine optimum trash capture device locations and device types in order to meet the 70% and 100% reduction goals as specified by the MRP provision C/10. Locations will be recommended based on trash generation rates of drainage areas (already determined by the City) and system hydraulics (to be analyzed by Schaaf & Wheeler). Additionally, Schaaf & Wheeler will determine the City's gain towards meeting the 70% and 100% trash reduction goals if the City requires private property owners in new and existing high and medium trash generating retail, commercial and industrial areas to install full trash capture devices on their properties' storm drain systems. A copy of Schaaf & Wheeler's final trash capture device plan will be included in this Long-term Trash Plan. The Long-term Plan will be reviewed at the end of every fiscal year and updated as needed. Please refer to Figure 3-2 for the location and area treated by all the City's existing and planned trash capture devices as of December 2013.

Furthermore, since the adoption of the MRP, the City has instituted an annual clean-up of its four required trash hot spots along creeks pursuant to the MRP Provision C.10.b.i. In 2010 and 2011, City staff cleaned all four spots annually, and in 2012 and 2013, volunteers and adoptees cleaned all four spots at least once per the MRP Provision. Please refer to Figure 3-2 for locations of City's trash hot spots. The City's current trash

hot spots will be evaluated and moved if the trash problem is significantly reduced or if another trash hot spot within the City is found to require additional clean-up. Hot spot evaluations and location changes will be included in this Long-term Trash Plan and in future annual stormwater reports. Trash items collected during these clean-up are characterized and counted each year as an attempt to link the trash to its source. The City will continue this effort during the trash hot spot evaluation process each year. For more information on the City's trash hot spot clean-ups please refer to Section 3.2.4.

In an effort to reduce trash at its source, the City adopted a polystyrene ban in 2011 and a single-use plastic ban in 2013. The plastic bag ban is enforced by StopWaste (the Alameda County Waste Management Authority) while the polystyrene ban is enforced by City staff. In addition to the County's assessments of the bans mentioned in Section 3.1, the City will continue to use its own resources to inspect businesses and take appropriate enforcement action against the illegal distribution of banned items. In conjunction with the Alameda County Clean Water Program's project to assess the effectiveness of full capture devices described in Section 4, local assessment from hot spot cleaning, cleaning trash devices, street assessments and an analysis of enforcement actions, the City will show a trend of trash reduction from these bans. For more information about the product bans please refer to Section 3.2.3.

The above mentioned trash reduction activities will continue to serve as the City's main trash reduction efforts and will be enhanced as these actions are evaluated (please refer to 3.2.3 for a description of planned enhancements). In addition, the City will add new trash reduction activities that are TMA-specific and jurisdiction-wide as described in the following sections.

3.2.1 Trash Management Area #1

Near intersection of N. Canyons Parkway and Constitution Drive.

TMA #1 is priority 1, and includes low and medium trash generating residential/other areas (10.6 acres), medium and high trash generating industrial (115.8 acres) and commercial (178.7 acres) areas, and medium and high trash generating retail areas (23.4 acres). The trash sources in this area include moving vehicles, parked cars,

uncovered loads, pedestrians, nearby retail, commercial, industrial and residential areas, and nearby bus stops.

Prior to the adoption of the MRP, the general approach to addressing TMA #1 includes the following control measures:

- Street Sweeping – Existing schedule is 1x/week and 2x/week during leaf season
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.
  - Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –
  - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
  - Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
  - Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.

Since the adoption of the MRP, the City of Livermore purchased 67 Connector Pipe Trash Screen Devices that treat 139.49 acres, which are regularly maintained twice a year with vactor truck and shovel. The estimated percentage of material in catch basin removed, and estimated percentage of types of material are categorized by type using Attachment G. The only device that had any maintenance performance issues was TCD85 located in front of 2850 Constitution Drive, and it collapsed.

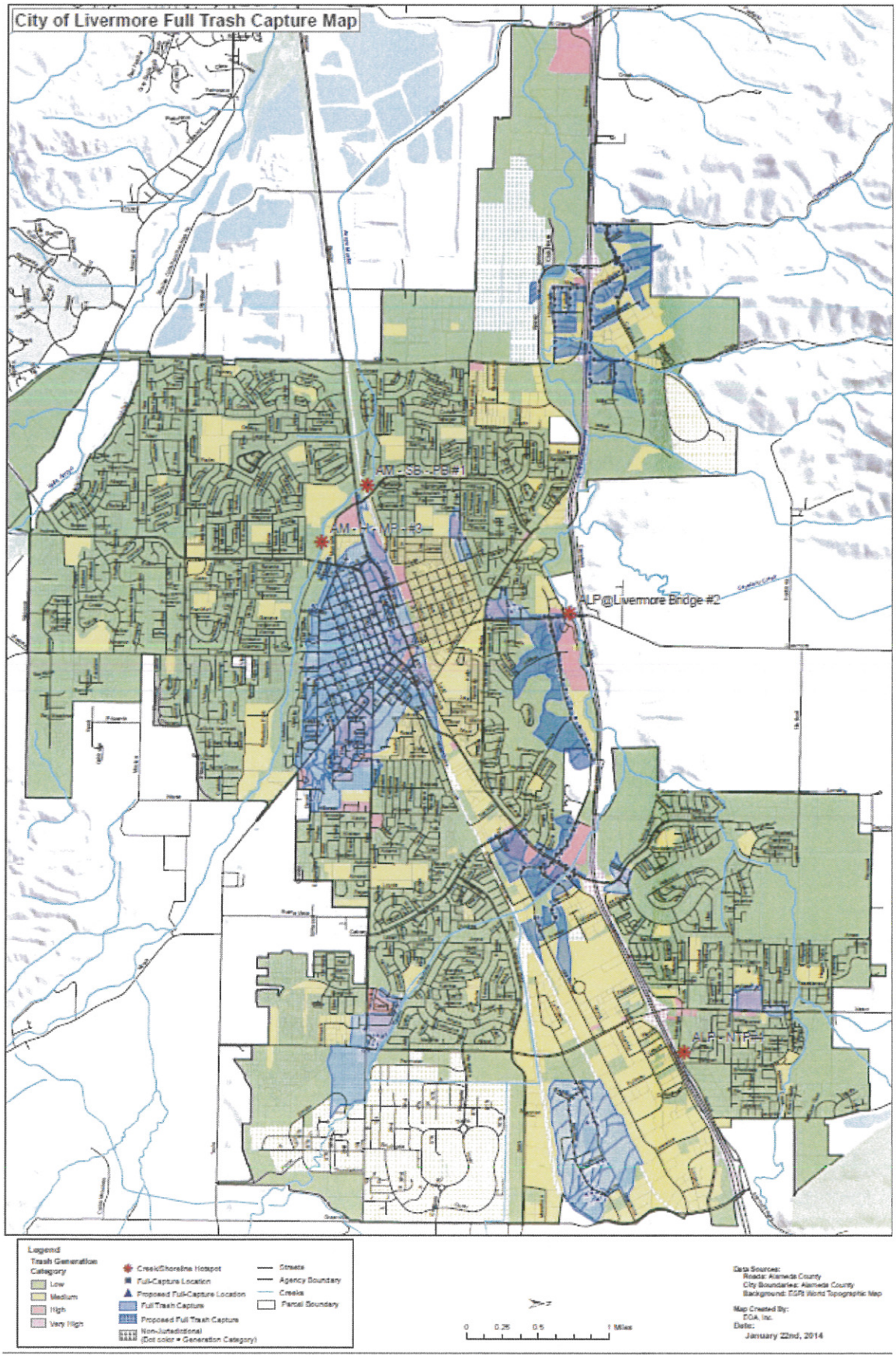
In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Anti-littering and Illegal Dumping Enforcement Activity –
  - Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.

- Planned City staff's participation in the Highway Patrol Litter Enforcement Committee to ensure clover leafs off of Interstate Highway 580 in Livermore are cleaned and litter bugs are cited during quarterly Enforcement Days.
- Planned City staff enforcement of high trash generating TMA #1R areas without existing full trash capture device. Enforcement includes inspection of areas' waste storage area, parking lot and any partial trash capture device (i.e., CD unit, vortex unit, large interceptor) located on private property. Partial trash capture devices shall be maintained by the property manager/owner twice a year.

- Activities to Reduce Uncovered Loads – Planned City staff's participation in the Highway Patrol Litter Enforcement Committee to ensure uncovered loads on Interstate Highway 580 are cited during quarterly Enforcement Days.

Figure 3-2. Trash Full Capture Device Map for the City of Livermore.



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3.2.2 Trash Management Area #2

Near intersection of Las Positas Road and N. Livermore Avenue.

TMA #2 is priority 2, and includes low trash generating residential/other areas (0.0 acres), medium trash generating industrial (21.0 acres) and commercial areas (28.5 acres), and high trash generating retail areas (55.5 acres). The trash sources in this area include moving vehicles, parked cars, uncovered loads, pedestrians, transients, nearby retail and commercial areas, and nearby bus stops.

Prior to the adoption of the MRP, the general approach to addressing TMA #2 includes the following control measures:

- Street Sweeping – Existing schedule is 1x/week and 2x/week during leaf season
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.
  - Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –
  - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
  - Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
  - Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.

Since the adoption of the MRP, the City of Livermore purchased 22 Connector Pipe Trash Screen Devices that treat 18.42 acres, which are regularly maintained twice a year with vactor truck and shovel. The estimated percentage of material in catch basin removed, and estimated percentage of types of material are categorized by type using Attachment G. The only two devices that had any maintenance performance issues were damaged (TCD19) and had a missing hatch (TCD32). TCD19 is located in front of 2900 Las Positas Road and TCD32 is located in front of 3400 Las Positas Road.

In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Anti-littering and Illegal Dumping Enforcement Activity –
  - Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.
  - Planned City staff's participation in the Highway Patrol Litter Enforcement Committee to ensure clover leafs off of Interstate Highway 580 in Livermore are cleaned and litter bugs are cited during quarterly Enforcement Days.
  - Planned City staff enforcement of high trash generating TMA #2R areas without existing full trash capture device. Enforcement includes inspection of areas' waste storage area, parking lot and any partial trash capture device (i.e., CD unit, vortex unit, large interceptor) located on private property. Partial trash capture devices shall be maintained by property manager/owner twice a year.
- Activities to Reduce Uncovered Loads – Planned City staff's participation in the Highway Patrol Litter Enforcement Committee to ensure uncovered loads on Interstate Highway 580 are cited during quarterly Enforcement Days.

3.2.3 Trash Management Area #3

Near intersection of Las Positas Road and First Street.

TMA #3 is priority 3, and includes medium trash generating commercial areas (1.3 acres), and high trash generating retail areas (77.7 acres). The trash sources in this area include moving vehicles, parked cars, uncovered loads, pedestrians, transients, nearby retail and commercial areas, nearby train station, and nearby bus stops.

Prior to the adoption of the MRP, the general approach to addressing TMA #3 includes the following control measures:

- Street Sweeping – Existing schedule is 1x/week and 2x/week during leaf season
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.
  - Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –
  - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
  - Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.

Since the adoption of the MRP, the City of Livermore purchased 20 Connector Pipe Trash Screen Devices that treat 38.05 acres, which are regularly maintained twice a year with vactor truck and shovel. The estimated percentage of material in catch basin

removed, and estimated percentage of types of material are categorized by type using Attachment G. TCD19, located in front of 4747 Arroyo Vista, is the only device that had any maintenance performance issues since it was installed backwards by West Coast Storm, Inc.

In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Anti-littering and Illegal Dumping Enforcement Activity –
  - Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.
  - Planned City staff's participation in the Highway Patrol Litter Enforcement Committee to ensure clover leafs off of Interstate Highway 580 in Livermore are cleaned and litter bugs are cited during quarterly Enforcement Days.
  - Planned City staff enforcement of high trash generating TMA #3R areas without existing full trash capture device. Enforcement includes inspection of areas' waste storage area, parking lot and any partial trash capture device (i.e., CD unit, vortex unit, large interceptor) located on private property. Partial trash capture devices shall be maintained twice a year by the property manager/owner.
- Activities to Reduce Uncovered Loads – The planned City staff's participation in the Highway Patrol Litter Enforcement Committee to ensure uncovered loads on Interstate Highway 580 are cited during quarterly Enforcement Days.

3.2.4 Trash Management Area #4

Near intersection of Las Positas Road and Vasco Road.

TMA #4 is priority 4, and includes low and medium trash generating residential areas (1,438.3 acres), medium trash generating commercial areas (73.1 acres), medium and high trash generating retail areas (11.4 acres), and low trash generating park areas (17.7 acres). (Park areas will be moved into TMA #16 with the next Long-term Trash Plan update.) The trash sources in this area include moving vehicles, parked cars, uncovered loads, pedestrians, nearby retail, commercial, residential and park areas, and nearby bus stops.

Prior to the adoption of the MRP, the general approach to addressing TMA #4 includes the following control measures:

- Street Sweeping – Existing schedule is 1x/week and 2x/week during leaf season
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.
  - Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –
  - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
  - Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
  - Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.

Since the adoption of the MRP, the City of Livermore purchased 13 Connector Pipe Trash Screen Devices that treat 54.54 acres, which are regularly maintained twice a year with vactor truck and shovel. The estimated percentage of material in catch basin removed, and estimated percentage of types of material are categorized by type using Attachment G. These devices haven't had any maintenance performance issues to date according to City staff.

In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Anti-littering and Illegal Dumping Enforcement Activity –
  - Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of

the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.
    - Planned City staff's participation in the Highway Patrol Litter Enforcement Committee to ensure clover leafs off of Interstate Highway 580 in Livermore are cleaned and litter bugs are cited during quarterly Enforcement Days.
    - Planned City staff enforcement of high trash generating TMA #4R areas without existing full trash capture device. Enforcement includes inspection of areas' waste storage area, parking lot and any partial trash capture device (i.e., CD unit, vortex unit, large interceptor) on private property. Partial trash capture devices shall be maintained by the property manager/owner twice a year.
- Activities to Reduce Uncovered Loads – Planned City staff's participation in the Highway Patrol Litter Enforcement Committee to ensure uncovered loads on Interstate Highway 580 are cited during quarterly Enforcement Days
- Full Trash Capture – Planned installation of 67 Connector Pipe Trash Screen Devices that will treat 258.34 acres, and receive regularly scheduled maintenance with vactor truck and shovel twice a year.

3.2.5 Trash Management Area #5

Near intersection of W. Jack London Boulevard and El Charro Road.

TMA #5 is priority 5, and includes 50.5 acres of high trash generating retail area known as Livermore Premium Outlets Shopping Center. The trash sources in this area include moving vehicles, parked cars, uncovered loads, pedestrians and nearby bus stop.

Prior to the adoption of the MRP, the general approach to addressing TMA #5 includes the following control measures:

- Street Sweeping – Existing schedule is 1x/week and 2x/week during leaf season
- Inlet Inspection and Cleaning – Existing schedule is 1x/year

- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.
  - Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –
  - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
  - Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.

In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Street Sweeping – Planned schedule is 2x/week
- Anti-littering and Illegal Dumping Enforcement Activity –
  - Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.
  - Planned City staff's participation in the Highway Patrol Litter Enforcement Committee to ensure clover leafs off of Interstate Highway 580 in Livermore are cleaned and litter bugs are cited during quarterly Enforcement Days.
  - Planned City staff enforcement of high trash generating TMA #5R areas without existing full trash capture device. Enforcement includes inspection of areas' waste storage area, parking lot and any partial trash capture device (i.e., CD unit, vortex unit, large interceptor) on private property. Partial trash capture devices shall be maintained by property manager/owner twice a year.
- Activities to Reduce Uncovered Loads – Planned Highway Patrol Litter Enforcement Committee participation to ensure uncovered loads on Interstate Highway 580 are cited during quarterly Enforcement Days.
- On-land Trash Clean-up (of detention basin) – Planned schedule is 2x/week by City staff/contractor

3.2.6 Trash Management Area #6

Near intersection of East Avenue and Charlotte Way.

TMA #6 is priority 6, and includes 40.9 acres of high trash generating multi-family residential areas. The trash sources in this area include moving vehicles, parked cars, uncovered loads, pedestrians, and nearby bus stops.

Prior to the adoption of the MRP, the general approach to addressing TMA #6 includes the following control measures:

- Street Sweeping – Existing schedule is 1x/month
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.
  - Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –
  - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
  - Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.

In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Anti-littering and Illegal Dumping Enforcement Activity – Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.
- Full Trash Capture – Planned installation of 26 Connector Pipe Trash Screen Devices that will treat 25.68 acres and receive regularly scheduled maintenance twice a year. The estimated percentage of material in device removed and estimated percentage of types of material will be categorized using Attachment G.
- Multi-Family Dwelling Pilot – This area includes one of the three apartment and condominium complexes discussed in 3.2.15. Depending on the success of the Pilot, outreach will be disseminated to surrounding complexes.

3.2.7 Trash Management Area #7

Near intersection of S. Livermore Avenue and Pacific Avenue.

TMA #7 is priority 7, and includes 239.6 acres of low, medium and high trash generating residential/other areas (145.4 acres), medium and high trash generating retail areas (25.6 acres), and medium trash generating commercial (66.7 acres), industrial (1.8 acres) and CD (0.1 acres) areas. The trash sources in this area include moving vehicles, parked cars, uncovered loads, pedestrians, nearby residential, commercial, industrial and CD areas, and nearby bus stops.

Prior to the adoption of the MRP, the general approach to addressing TMA #7 includes the following control measures:

- Street Sweeping – Existing schedule is 1x/month
- Inlet Inspection and Cleaning – Existing schedule is 1x/year

- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.
  - Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –
  - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
  - Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
  - Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.

In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Anti-littering and Illegal Dumping Enforcement Activity –
  - Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.
  - Planned City staff enforcement of high trash generating TMA #7R areas without existing full trash capture device. Enforcement includes inspection of areas' waste storage area, parking lot and any partial trash capture device (i.e., CD unit, vortex unit, large interceptor). Partial trash capture devices shall be maintained twice a year.
- Full Trash Capture – Planned installation of 32 Connector Pipe Trash Screen Devices that will treat 147.88 acres and receive regularly scheduled maintenance twice a year. The estimated percentage of material in device removed and estimated percentage of types of material will be categorized using Attachment G.

3.2.8 Trash Management Area #8

Near intersection of First Street and Holmes Street.

TMA # 8 is priority 8, and includes the downtown area comprised of 299.6 acres of low, low, medium and high trash generating residential/other, commercial and retail areas. The trash sources in this area include moving vehicles, parked cars, uncovered loads, pedestrians, transients, nearby retail, commercial and residential areas, nearby train station, and nearby bus stops.

Prior to the adoption of the MRP, the general approach to addressing TMA #8 includes the following control measures:

- Street Sweeping – Existing schedule is 1x/week and 2x/week during leaf season
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.
  - Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –
  - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
  - Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
  - Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.

In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Anti-littering and Illegal Dumping Enforcement Activity –
  - Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.
  - Planned City staff enforcement of high trash generating TMA #8R areas without existing full trash capture device. Enforcement includes inspection of areas' waste storage area, parking lot and any partial trash capture device (i.e., CD unit, vortex unit, large interceptor) on private property. Partial trash capture devices shall be maintained twice a year by property manager/owner.
- Full Trash Capture – Planned installation of 85 Connector Pipe Trash Screens that will treat 232 acres and receive regularly scheduled maintenance twice a year. Specific device type and maintenance activity will be determined as part of the full trash capture device plan mentioned previously. The estimated percentage of material in device removed and estimated percentage of types of material will be categorized using Attachment G.
- Multi-Family Dwelling Pilot – This area includes two of the three apartment and condominium complexes discussed in 3.2.15. Depending on the success of the Pilot, outreach will be disseminated to surrounding complexes.

3.2.9 Trash Management Area #9

Near intersection of Portola Avenue and N. Murrieta Boulevard.

TMA #9 is priority 9, and includes 254.3 acres of low, medium and high trash generating residential/other areas (246.1 acres), and medium commercial (7.4 acres) and retail (0.8 acres) areas. The trash sources in this area include moving vehicles, parked cars, uncovered loads, pedestrians, nearby retail, commercial and residential areas, and nearby bus stops.

Prior to the adoption of the MRP, the general approach to addressing TMA #9 includes the following control measures:

- Street Sweeping – Existing schedule is 1x/month
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Partial Trash Capture - Existing two stormwater lift stations with trash racks located on N. P Street and N. Livermore Avenue cleaned 2x/year
- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.
  - Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –
  - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
  - Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
  - Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.

In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Anti-littering and Illegal Dumping Enforcement Activity –
  - Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.
  - Planned City staff enforcement of high trash generating TMA#9R areas without existing full trash capture device. Enforcement includes inspection of areas' waste storage area, parking lot and any partial trash capture device (i.e., CD unit, vortex unit, large interceptor) on private property. Partial trash

capture devices shall be maintained by property manager/owner twice a year.

- Full Trash Capture – Planned installation of 1 large full capture device that will treat 3.66 acres and receive regularly scheduled maintenance twice a year. The estimated percentage of material in device removed and estimated percentage of types of material will be categorized using Attachment G.

3.2.10 Trash Management Area #10

Near intersection of Junction Avenue and Chestnut Street.

TMA #10 is priority 10, and includes 120.6 acres of low and medium trash generating residential/other areas (101.9 acres), medium trash generating commercial (4.5 acres) and industrial (0.8 acres) areas, and high trash generating retail areas (13.4 acres). The trash sources in this area include moving vehicles, parked cars, uncovered loads, pedestrians, nearby retail, commercial, industrial and residential areas, and nearby bus stops.

Prior to the adoption of the MRP, the general approach to addressing TMA #10 includes the following control measures:

- Street Sweeping – Existing schedule is 1x/month
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.
  - Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –

- Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
- Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
- Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.

In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Anti-littering and Illegal Dumping Enforcement Activity – Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.
- Full Trash Capture – Planned installation of 4 Connector Pipe Trash Screen Devices that will treat 12.99 acres and receive regularly scheduled maintenance twice a year. The estimated percentage of material in device removed and estimated percentage of types of material will be categorized using Attachment G.

3.2.11 Trash Management Area #11

Near intersection of Kitty Hawk Road and Rickenbacker Circle.

TMA #11 is priority 11, and includes 184.2 acres of low, medium and high trash generating residential/other areas (14.2 acres), medium trash generating industrial (133.4 acres) and commercial (26.3) areas, and high trash generating retail areas (10.3

acres). The trash sources in this area include moving vehicles, parked cars, uncovered loads, pedestrians, nearby retail, industrial, commercial, and residential areas, and nearby bus stops.

Prior to the adoption of the MRP, the general approach to addressing TMA #11 includes the following control measures:

- Street Sweeping – Existing schedule is 1x/month
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.
  - Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –
  - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
  - Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
  - Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.

In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Anti-littering and Illegal Dumping Enforcement Activity – Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.
- Full Trash Capture – Planned installation of 3 Connector Pipe Trash Screen Devices that will treat 6.79 acres and receive regularly scheduled maintenance twice a year. The estimated percentage of material in device removed and estimated percentage of types of material will be categorized using Attachment G.

3.2.12 Trash Management Area #12

Near intersection of N. Vasco Road and Scenic Avenue.

TMA #12 is priority 12, and includes 112.6 acres of medium trash generating commercial (72.6 acres) and industrial (8.5 acres) areas, and high trash generating retail (31.5 acres) areas. The trash sources in this area include moving vehicles, parked cars, uncovered loads, pedestrians, nearby retail, commercial and industrial areas, and nearby bus stops.

Prior to the adoption of the MRP, the general approach to addressing TMA #12 includes the following control measures:

- Street Sweeping – Existing schedule is 1x/month
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.
  - Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –
  - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
  - Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.

In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Anti-littering and Illegal Dumping Enforcement Activity – Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.
- Full Trash Capture – Planned installation of 8 Connector Pipe Trash Screen Devices that will treat 27.68 acres and receive regularly scheduled maintenance twice a year. The estimated percentage of material in device removed and estimated percentage of types of material will be categorized using Attachment G.

3.2.13 Trash Management Area #13

Near intersection of East Avenue and Research Drive.

TMA #13 is priority 13, and includes 50.4 acres of low trash generating residential/other area (0.2 acres), and medium trash generating industrial (45.3 acres) and commercial (4.9 acres) areas. The trash sources in this area include moving vehicles, parked cars, uncovered loads, pedestrians, nearby industrial, commercial and residential areas, and nearby bus stops.

Prior to the adoption of the MRP, the general approach to addressing TMA #13 includes the following control measures:

- Street Sweeping – Existing schedule is 1x/month
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.

  - Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –
  - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
  - Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
  - Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.

In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Anti-littering and Illegal Dumping Enforcement Activity – Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.
- Full Trash Capture – Planned installation of 3 Connector Pipe Trash Screen Devices that will treat 9.04 acres and receive regularly scheduled maintenance twice a year. The estimated percentage of material in device removed and estimated percentage of types of material will be categorized using Attachment G.

3.2.14 Trash Management Area #14

Near intersection of Concannon Boulevard and Holmes Street.

TMA #14 is priority 14, and includes 80.4 acres of medium trash generating commercial (71.6 acres) and retail (8.8 acres) areas. The trash sources in this area include moving vehicles, parked cars, uncovered loads, pedestrians and nearby commercial and retail businesses and bus stops.

Prior to the adoption of the MRP, the general approach to addressing TMA #14 includes the following control measures:

- Street Sweeping – Existing schedule is 1x/month
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.
  - Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –
  - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
  - Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.

In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Anti-littering and Illegal Dumping Enforcement Activity – Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.
- Full Trash Capture – Planned installation of 1 large trash capture device that will treat 5.57 acres and receive regularly scheduled maintenance twice a year. Specific device type and maintenance activity will be determined as part of the full trash capture device plan mentioned previously. The estimated percentage of material in device removed and estimated percentage of types of material will be categorized using Attachment G.

3.2.15 Trash Management Area #15

In front of Livermore High School.

TMA #15 is priority 15, and includes medium trash generating residential/other areas (0.4 acres) and school areas (286.8 acres). School areas include: 24 public schools (13 elementary schools, 4 middle schools and 7 high schools), 8 private schools (1 Kindergarten through third grade school, 3 Kindergarten through eighth grade schools, 1 Kindergarten through twelfth grade school, and 3 first through twelfth grade schools), and 2 charter schools (1 Kindergarten through eighth grade school and 1 high school). Public schools are owned and maintained by LVJUSD. The trash sources in these areas include moving vehicles, parked cars, uncovered loads, pedestrians and nearby residential areas, and bus stops.

Prior to the adoption of the MRP, the general approach to addressing TMA #15 includes the following control measures:

- Street Sweeping – Existing schedule is 1x/month

- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.
  - Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –
  - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
  - Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
  - On-land Clean-ups – LVJUSD existing schedule at school trash hot spots at least 1x/year. Existing schedule at schools near/in Adopt-A-Creek Spots at least 1x/year.

In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Anti-littering and Illegal Dumping Enforcement Activity – Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.
- Full Trash Capture – Planned installation of 4 Connector Pipe Trash Screen Devices that will treat 36.03 acres and receive regularly scheduled maintenance twice a year. The estimated percentage of material in device removed and estimated percentage of types of material will be categorized using Attachment G.

3.2.16 Trash Management Area #16

In front of Sycamore Grove Park Parking Lot.

TMA #16 is priority 16, and includes low trash generating residential/other areas (3.5 acres), and medium trash generating urban park areas (340 acres). This TMA is mostly owned and maintained by LARPD. LARPD provides 29 neighborhood parks ranging from two to 12 acres in size; three community parks with such amenities as an equestrian center and rodeo grounds, new synthetic turf sports fields; four open space parks totaling 1,360 acres; and 10 special-use parks. The trash sources in these areas include moving vehicles, parked cars, uncovered loads, pedestrians and nearby residential areas, and bus stops.

Prior to the adoption of the MRP, the general approach to addressing TMA #16 includes the following control measures:

- Street Sweeping – LARPD existing schedule is more than 1x/month
- Inlet Inspection and Cleaning – LARPD existing schedule is 1x/year
- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.
  - Existing City staff and LARPD enforcement of City of Livermore Municipal Code and LARPD uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –
  - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
  - Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.

- On-land Clean-ups – LARPD existing schedule at park trash hot spots at least 1x/year. Existing schedule at parks near/in Adopt-A-Creek Spots at least 1x/year.

In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Anti-littering and Illegal Dumping Enforcement Activity – Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.
- Full Trash Capture – Planned installation of 1 trash capture device that will treat 12.66 acres and receive regularly scheduled maintenance twice a year. The estimated percentage of material in device removed and estimated percentage of types of material will be categorized using Attachment G.

3.2.17 Trash Management Area #17

Near intersection of Isabel Avenue and Concannon Boulevard.

TMA #17 is priority 17, and includes 11,096.1 acres of low trash generating single-family residential and other (e.g., urban open and agricultural) areas. The trash sources in this area include moving vehicles, parked cars, uncovered loads, pedestrians and nearby residential areas and bus stops.

Prior to the adoption of the MRP, the general approach to addressing TMA #17 includes the following control measures:

- Street Sweeping – Existing schedule is 1x/month
- Inlet Inspection and Cleaning – Existing schedule is 1x/year

- Anti-littering and Illegal Dumping Enforcement Activities –
  - Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures.
  - Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping, littering and enforcement and recovery of abating litter nuisance prohibitions. Enforcement methods include administrative citation and fines.
- Trash Bin/Container Management –
  - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers.
  - Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
  - Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.

Since the adoption of the MRP, the City of Livermore purchased 52 Connector Pipe Trash Screen Devices that treat 194.11 acres, which are regularly maintained twice a year with vactor truck and shovel. The estimated percentage of material in catch basin removed, and estimated percentage of types of material are categorized by type using Attachment G. These devices haven't had any maintenance performance issues to date according to City staff. Connector Pipe Trash Screen Devices are typically not installed in low trash generating areas, however, this TMA #17 is located in the same catchment areas as many of the high and medium trash generating areas.

In addition to the existing control measures listed above, the following control measures are planned for future implementation between July 2014 and July 2022:

- Anti-littering and Illegal Dumping Enforcement Activity - Planned City staff promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Violators in question receive a letter providing the time/location of the violation and what was observed, clean-up cost information, and a warning stating that a citation would be issued for a second violation.
- Full Trash Capture – Planned installation of 99 Connector Pipe Trash Screen Devices that will treat 377.58 acres, and receive regularly scheduled maintenance with vactor truck and shovel twice a year.

3.2.15 Jurisdiction-wide Control Measures

Polystyrene Foam Food Service Ware Ordinance

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.

Action Initiated after the MRP effective date and implemented prior to July 1, 2014:
As of July 1, 2011, the City of Livermore's Ordinance banning Styrofoam® 'to-go' containers (expanded polystyrene disposable foodservice ware) for foodservice businesses officially took effect. By switching to recyclable and compostable take-out alternatives, Livermore's businesses will be reducing both litter and water pollution.

A copy of the Ordinance is available on City of Livermore's website:
http://www.cityoflivermore.net/civicax/filebank/documents/6622/

Trash Receptacle Management

The City of Livermore will be evaluating the types of public trash receptacles used throughout the City. The enclosed top receptacles are more difficult for people to pick through so, less trash is ending up on the streets. The City will be evaluating trash bin locations and replacing receptacles that are found to be trash sources. Overflowing trash in receptacles that are heavily used, particularly those receptacles adjacent to bus stations and multi-use trails will be emptied more often or replaced with larger receptacles to accommodate trash volume. City staff will work closely with its Solid Waste and Recycling staff, as well as Livermore Amador Valley Transit Authority and LARPD, to determine the best solution for each trash receptacle on a case-by-case basis.

Anti-Litter Outreach Using Trash Receptacles

The City of Livermore will work with the ACCWP PIP and Trash subcommittee to develop outreach material to post on trash receptacles strategically throughout the City to encourage pedestrians to deposit their trash in the receptacles and improve water quality. This localized outreach campaign will focus on areas where littering is more prevalent. Future design, implementation and assessment of this outreach campaign will be described in the ACCWP and the City's Fiscal Year 13-14 Annual Report.

Cigarette Butts

It has been widely recognized that cigarette butts are one of the most predominant items of trash found on streets today. Many cleanup and outreach efforts have been conducted in the San Francisco Bay Area to address cigarette butts including specific trash receptacles and outreach to collect the butts. Livermore Municipal Code *Chapter 8.10 Smoking Pollution Control* prohibits smoking in all enclosed public places within the city, including bus stops and apartment/condominium complexes.

During 2014, City staff will analyze the current and historic effort to enforce this ordinance and determine if enhanced enforcement could influence the amount of cigarette butts that are littered. In addition to enforcement of the City's ordinance, outreach materials will be designed and distributed to remind citizens of the ordinance and "Litter-Bug Hotline", and discourage littering. The City will also design local trash pickup campaigns in conjunction with AACSP adoptees, volunteers, school groups and apartment and complex residents to increase awareness of the high volume of cigarette butts that are picked up as an enhancement to on-land cleanup efforts.

Public and School Education and Outreach Program

Prior to the MRP, the City of Livermore Water Resources Division (WRD) disseminated general anti-litter information at public events and school presentations as part of its stormwater pollution prevention message until May 2011. In addition, the WRD included general anti-litter information on its web page, in its monthly, sewer bill, and in the City's quarterly, residential newsletter.

After the MRP became effective, the City of Livermore Water Resources and Engineering Divisions developed the Livermore Adopt-A-Creek Spot Program (AACSP) with LARPD, LVJUSD, Zone 7 Water Agency (Zone 7), Alameda County Resource Conservation District and Friends of the Arroyos from May 2011 to September 2012. The AACSP's mission is to promote healthy local creeks through active community participation and education using the following goals and objectives:

- Reduce Litter
- Minimize urban run-off pollution to storm drains and creeks
- Improve and protect water quality and aquatic habitat
- Support and promote community stewardship
- Provide local watershed beautification opportunities
- Inform the community of creek restoration opportunities
- Provide local watershed educational opportunities
- Help create and maintain a healthy, Tri-Valley watershed

The following AACSP elements were developed to help the Program meet its goals and objectives: creek spot adoption, creek clean-up event and creek spot outreach. These elements are described in more detail below.

Creek Spot Adoption

AACSP participants may make a commitment to regularly clean and beautify one of the nine creek spots on City of Livermore, Zone 7, LARPD and LVJUSD properties along the Arroyo Mocho, Arroyo Las Positas, Altamont Creek and Arroyo Seco. Beautifying a spot might include: regularly picking up trash and other debris, removing weeds and other unwanted vegetation, painting over graffiti, marking storm drains, and photography and/or sketch mapping spots for changes at least once a year. Partnering agencies provide the following supplies and services:

- Supplies: clean-up kits, graffiti removal kits, storm drain marking kits, and gardening tools for enhancement/restoration projects
- Services: guidance with clean-up planning, trash and recyclables disposal, technical assistance for enhancement/restoration projects, and educational presentations and activities

Incentives to joining the AACSP include signs at adopted creek/arroyo spots, website recognition and personal satisfaction.

Currently, all nine Adopt-A-Creek Spots are adopted. Four of these Spots include the City's Trash Hot Spots.

Creek Clean-up Events

The AACSP kicked-off the Program at an annual, creek spot clean-up event called Tri-Valley Creeks to Bay Day at six creek spots on September 15, 2012. As part of Coastal Clean-up Day, 192 volunteers collected, categorized and counted 1,037 pounds of trash and 288 pounds of recyclables. The purpose of this annual event is to get the Adopt-A-Creek Spots adopted, provide adoptees clean-up assistance, provide non-adoptees an opportunity to beautify a section of creek, and provide adoptees and non-adoptees alike local watershed and anti-littering messaging.

On September 14, 2013, the AACSP hosted its second Tri-Valley Creeks to Bay Day where 154 clean-up volunteers removed 1,736.5 gallons of trash and 235.6 gallons of recyclables from eight creek spots.

Creek Spot Outreach

The AACSP developed the City of Livermore's anti-litter message which specifically defined the City's trash problem, explained how long litter lasts, provided 12 easy ways to prevent litter, and described the City of Livermore and AACSP's efforts to keep litter out of waterways. Beginning September 2012, the City's anti-litter message was presented in a City and AACSP display at public events (i.e., Tri-Valley Creeks to Bay Day) and school presentations (i.e., LVJUSD Science Odyssey), in a City and AACSP Power Point presentation at group meetings (i.e., California Water Environment Association's Pretreatment, Pollution Prevention and Stormwater (P3S) Meeting) and conferences, (i.e., Alameda County Watershed Annual Conference), and on the City of Livermore Water Resources Division web page (http://www.cityoflivermore.net/citygov/pw/wrd/pollution/keeping_litter_out_of_water

ways/default.asp) and AACSP's website (www.trivalleycreeks.org). The general anti-litter outreach message is still provided in the WRD monthly, sewer bill once a year.

Also, the AACSP developed the Program's Creek Assessment Activity Form (Attachment A) and Creek Assessment Activity Pre and Post-test (Attachment B) for middle and high school students. The Creek Assessment Activity helps science students assess creek health by measuring the pollution vulnerability, and the physical, biological and chemical properties of the Adopt-A-Creek Spots. The Creek Assessment Pre and Post-test helps science teachers evaluate middle and high school students' knowledge of the City of Livermore's anti-litter message, etc. The Creek Assessment and Pre and Post-test meet California Department of Education's Common Core State Standards for grades 6 through 12.

On Tri-Valley Creeks to Bay Day 2012 and 2013, approximately 30 Christian Middle School and Livermore High and Granada High School students, assessed creek health at three of six to eight Adopt-A-Creek Spots. These assessment results are posted on the World Water Monitoring Day website (http://monitorwater.org/outpost/map.aspx). In 2013, approximately ten Granada High School students took the Creek Assessment Pre and Post-test before and after their Creek Assessment Activity. These test results will be provided in the City of Livermore's FY 2013-14 Stormwater Report.

A Tri-Valley Creeks to Bay Day Volunteer Survey (Attachment C) was developed to help measure participants' knowledge of City of Livermore's anti-litter message. In 2013, approximately ten volunteers participated in the survey posted on Survey Monkey's website. These survey results will be provided in the City of Livermore's FY 2013-14 Stormwater Report.

Pending AACSP partnership support and funding, the following actions will be implemented between July 2014 and July 2022:

- New Adopt-A-Creek Spots will be identified and included in the AACSP
- AACSP's map (Attachment D) and website will be updated with existing and new Spot information
- AACSP's website will be translated into Spanish
- Creek Assessment Activity, and Pre and Post-test will be provided to middle and high school teachers not participating in the AACSP
- Revise Tri-Valley Creeks to Bay Day Survey to be more litter specific

Alameda County Waste Management Authority Single-Use Bag Ban Ordinance
Single-Use plastic bags were a significant component of the litter found in storm drains and water bodies throughout Alameda County. To address this issue, the Alameda County Waste Management Authority has adopted a single-use bag ban. As of January 1, 2013, all grocery stores, supermarkets, mini-marts, convenience stores, liquor stores, pharmacies, drug stores or other entities that sell milk, bread, soda and snack foods (all four items) and/or alcohol (Type 20 or21 license) in Alameda County must comply with the Single-Use Bag Ban Ordinance.

Single-Use Bag Requirement: Affected stores may no longer provide customers with single-use bags at checkout.

Bag Sales Requirements:

- Affected stores that distribute recycled paper or reusable bags must charge 10 cents or more per bag. These bags must meet the specifications in the Ordinance.
- Retailer retains all proceeds from the sale of recycled paper bags and reusable bags without any restrictions on their use

A copy of the Ordinance is available on the Alameda County Waste Management Authority's website: http://reusablebagsac.org/ordinancetext.html

The City of Livermore is a member of ACCWP. The jurisdiction-wide control measures described below will be conducted through participation in ACCWP.

Multi-Family Dwelling Litter Outreach

Multi-family dwellings (i.e., apartment buildings and condominium complexes) are often areas of high trash generation. ACCWP is working with the City of Livermore to develop a litter reduction pilot targeting multi-family complexes known to be sites with significant litter issues. The pilot includes the following apartment building and condominium complexes: Livermore Garden Apartments (5720 East Avenue), La Castilleja (975 Murrieta Boulevard), and Castilleja Del Arroyo (1001 and 1009 Murrieta Boulevard).

- December 2013: Pre-campaign Measurement – ACCWP and the City took baseline measurements of all three sites. Methods of measurement included taking photos of on-site litter, as well as collecting, characterizing and counting the litter using the Ocean Conservancy's Volunteer Trash Data Form. (Adopt A Creek Spot volunteers use this Data Form to characterize and count the trash collected from the Trash Hot Spot located behind the condominium complexes on Coastal Clean-up Day.) Areas measured included landscaped and other common areas, the sidewalk, gutter and streets located in front of the sites. All three property managers/volunteers collected one week's worth of on-site litter.

- November – December 2013: Research – All three property managers were interviewed by City staff using twenty-five questions developed by the ACCWP. The interview results helped define the target audience(s) (i.e., age groups, income level, ethnic groups, etc.) and determine outreach tactics (i.e., face-to-face, signage, printed materials, etc.) This information will also assist the City and ACCWP in developing appropriate messaging.

- November 2013 – January 2014: Plan – One of the three sites was chosen as the "Control" site. In addition, outreach strategies and tactics were selected for the "Active" sites.

- February 2014: Concept/Design/Content Production – Selected outreach tactics will be designed and produced for the Active sites.

- February 2014: Multi-cultural Advising, Translation – Consultant will advise on outreach tactics and messaging, and will provide translation as needed.

- March 2014 – May 16, 2014: Outreach – Outreach tactics will be rolled out at Active sites.

- May 17, 2014 – May 31, 2014: Post-campaign Measurement — City staff and ACCWP will duplicate the pre-campaign measurement methodologies at all three sites, including the Control. All three property managers/volunteers will collect one week's worth of on-site litter. On-site and off-site litter will be characterized and counted by City staff using the Ocean Conservancy's Volunteer Trash Data Form. All three property managers will be interviewed by City staff to help determine residents' attitudes/change in behavior, etc.

- June 1, 2014 – June 30, 2014: Reporting – Final Pilot Report will be presented to ACCWP member agencies.

Depending on the success of the pilot, it may be replicated at other multi-family complexes throughout the County.

The Public Information and Participation Subcommittee of ACCWP also is in the process of identifying other litter-related areas and activities that affect jurisdictions throughout the County, and will implement pilot projects to address the high priority issues over the next several years. One issue being considered is cigarette butt litter.

Litter Outreach to K-12 Schools

K-12 schools are often high litter generation areas. ACCWP has developed a request for proposal for a four-year litter reduction education/outreach grant directed at K-12 schools throughout Alameda County. ACCWP intends to fund multiple projects, each focused on a specific age group. Proposals for $10,000 or more per project and school year will be considered, for a total of up to $125,000 per school year, for up to four years. Eligible organizations include for-profit and non-profit groups, as well as government agencies. The goals of the project are to clearly reduce the amount of litter at the participating schools and incorporate institutional changes at the schools so that litter will continue to be reduced in the future. Implementation is scheduled to begin in the 2014/15 school year. The request for proposal will include a requirement to evaluate the level of litter reduction achieved. A description of the successful proposals will be included in the ACCWP Fiscal Year 2013/14 Annual Report.

"Be the Street" Youth Anti-Litter Advertising Campaign

Intentional litter by youth has been found to be a significant contributor to litter problems. To address this issue, ACCWP has participated in the development and implementation of the Be the Street campaign. Be the Street is a Bay Area wide outreach effort that takes a Community Based Social Marketing approach to encourage youth to keep their community clean (http://www.bethestreet.org/). The intent of the campaign is to make "no-littering" the norm among the target audience (youth between the ages of 14 and 24). The campaign is a three-year effort that began in fiscal year 2011-12 and will run through 2013-14. ACCWP has been participating in

and providing financial support to the Be the Street campaign since its inception. The campaign will be evaluated in the spring of 2014. Depending upon the results of the evaluation, ACCWP may continue to participate in this or similar efforts in future years.

As part of efforts to support the Be The Street anti-litter youth campaign, Clean Water Program member agencies purchased additional mass media distribution of a video contest entry, entitled "Pick Up Trash." CWP edited the spot to include a Be The Street Watermarked logo, and to add the website url at the end of the spot. The video was distributed at movie theaters and through an online ad campaign as follows:

Video Ad Run Summary

Regional Movie Theater Ad Buy: $19,028

- 637,000 projected impressions
- 9 Theaters in Alameda County, 132 screens
- 4-week run: 07/05/13-08/01/13

Individual Theater Ad Buy: $4,208

- Approximately 150,000 projected impressions
- 3 Theaters in Livermore and Castro Valley (areas not covered in the Regional Buy)
- Ad runs run from 4 weeks to 28 weeks

Online Video Ad Campaign: $4,000

- Google Display Network and YouTube Pre-Roll
- Estimated impressions: 300,000
- Estimated views: 24,000
- Estimated Click-throughs 1,500 to the Be The Street webpage

Community Stewardship Grants

Through its Community Stewardship Grants program ACCWP provides up to $20,000 per year to individuals and community groups to implement stormwater and watershed enhancement and education projects. The grants range from $1,000 to $5,000. Starting in fiscal year 2014/15 ACCWP will specifically encourage and support litter reduction grant applications. The projects of the Fiscal Year 2014/15 grant recipients will be described in the ACCWP Fiscal Year 2013/14 Annual Report.

Anti-Litter Outreach to Residents

Through its Public Information and Participation program ACCWP encourages residents to adopt less polluting behaviors. One targeted behavior is littering, both intentional and unintentional. ACCWP uses a variety of mechanisms to influence residents including public service announcements, online and movie theater advertising, and participating in outreach events. The ACCWP Public Information and Participation Subcommittee is in the process of developing a three-year budget/strategic plan for fiscal years 2014/15 through 2016/17. One of the strategic objectives of the plan will be to reduce litter. This plan will be described in the ACCWP Fiscal Year 2013/14 Annual Report.

3.2.16 Creek and Shoreline Hot Spot Cleanups

The City of Livermore has four Trash Hot Spots located in the following areas:

1. *Arroyo Mocho-Stanley Bridge-Pedestrian Bridge (AM-SB-PB #1)*
2. *Arroyo Las Positas@Livermore Avenue Bridge (ALP@Livermore Bridge #2)*
3. *Arroyo Mocho-Holmes-Mocho Park (AM-H-MP #3)*
4. *Arroyo Las Positas-Northfront Trailhead Park (ALP-NTP #4)*

The City's Trash Hot Spots are identified in the City of Livermore trash maps, and are described in more detail below.

1. Arroyo Mocho-Stanley Bridge-Pedestrian Bridge: AM-SB-PB #1

The section extends from Stanley Boulevard about 500 feet downstream to the chain-link-fenced flood control bypass diversion downstream. The City of Livermore and the Union Pacific Railroad own this property. This section is located in Primary Trash Management Area 12.

Arroyo Mocho looking upstream towards the railroad and Stanley Boulevard bridges.

This 54-inch storm drain outfall located below Stanley adjacent to the Mocho Trail was built in 1955 and collects urban runoff (and street trash) from as far away as the 1st street Downtown Flag Pole.

This section of the Arroyo Mocho collects a large amount of trash from litter along the trail and from the upstream 1st Street, 4th Street and Murrieta Boulevard storm drains. Upstream street storm drains collect trash from nearby retail and commercial businesses and moving vehicles. The dominant types of trash include paper and plastic bags, plastic and glass beverage bottles, beverage cans, caps/lids, clothing/shoes, cups/plates/forks/knives/spoons/napkins, food wrappers/containers, straws/stirrers,

paper, cigarette filters and lighters, tobacco packaging/wrappers, batteries and building materials.

City staff cleaned this section of the Arroyo Mocho on September 23, 2010 and September 21, 2011, and removed 1.25 cubic yards and 2.5 cubic yards, respectively. Volunteers cleaned this section on Tri-Valley Creeks to Bay Day on September 15, 2013, and removed 0.77 cubic yards. Adopt-A-Creek Spot Adoptee, Phil Hann, cleaned this section weekly from September 22, 2013 to December 30, 2013, and removed 1.6 cubic yards. Phil and volunteers cleaned this section on January 4, 2014 and January 11, 2014, and removed 1.82 cubic yards. Phil continues to remove approximately 0.02 cubic yards a week in between larger clean-up events.

2. *Arroyo Las Positas@Livermore Avenue Bridge (ALP@Livermore Bridge #2)*

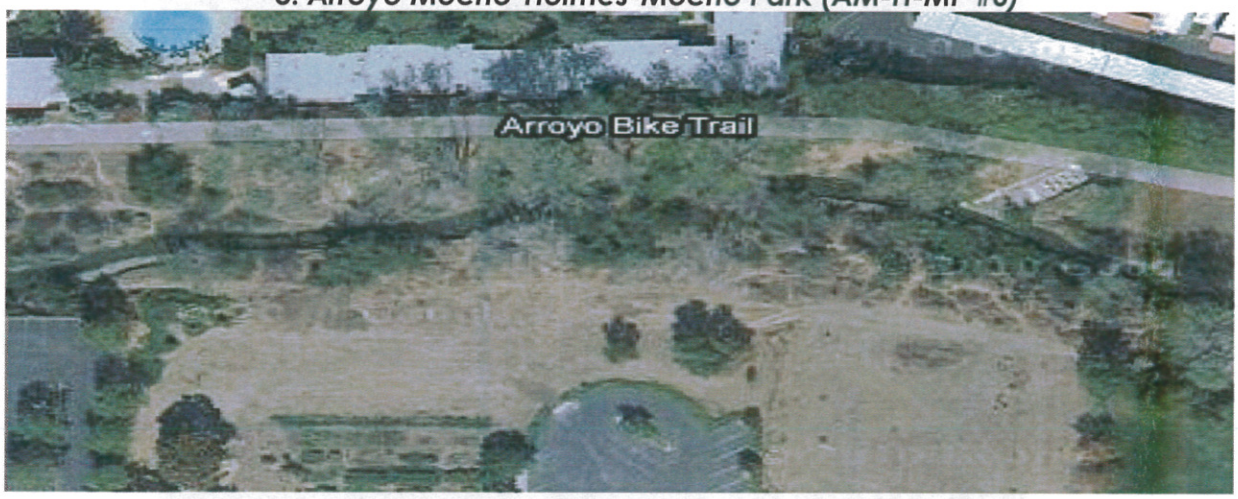
The section of the Arroyo Las Positas extends 300 feet upstream from the North Livermore Avenue Bridge across the Arroyo Las Positas. This is the site of the historic USGS stream flow monitoring station. The property is owned by Caltrans. The year-round stream flow originates from rising groundwater in the Springtown area. The watershed extends from Tesla Pass to Brushy Peak and includes the Lawrence Livermore and Sandia National Labs and all of Springtown. This section is located in Primary Trash Management Area 2.

View of Arroyo Las Positas with North Livermore Avenue Bridge, trash and stream monitoring station.

Trash in the arroyo comes from occasional homeless camps, nearby retail and commercial businesses located on Las Positas Road, windblown trash from moving vehicles on Interstate Highway 580 and N. Livermore Avenue, and urban storm drain runoff upstream from this site. The dominant types of trash include paper and plastic bags, plastic and glass beverage bottles, beverage cans, caps/lids, clothing/shoes, cups/plates/forks/knives/spoons/napkins, food wrappers/containers, straws/stirrers, paper, plastic sheeting/tarps, cigarette filters and lighters, tobacco packaging/wrappers, batteries, light bulbs/tubes, oil/lube bottles, building materials, car parts, tires and toys.

City staff cleaned this section on September 24, 2010 and September 22, 2011, and removed 3.25 cubic yards and 0.25 cubic yards, respectively. Adopt-A-Creek Spot Adoptee, Las Positas College Spanish Club, cleaned this section on Make a Difference Day on October 27, 2012 and removed 1.49 cubic yards; and cleaned this section on Tri-Valley Creeks to Bay Day on September 14, 2013 and removed 2.78 cubic yards. Las Positas Spanish Club will continue to clean this section at least twice a year.

3. *Arroyo Mocho-Holmes-Mocho Park (AM-H-MP #3)*



This section of the Arroyo is adjacent to the popular and well-used Arroyo Mocho Trail. This creek spot extends from just above the Holmes Street Bridge downstream 400 feet to the 4th street storm drain outfall. The trail and arroyo are owned by the City of Livermore. The LARPD owned Mocho Park is located adjacent and south of the creek opposite from the trail. This section is located in Primary Trash Management Area 8 but receives trash from Primary Trash Management Area 7 as well.

Arroyo Mocho looking upstream to the Holmes Street Bridge.

Mocho Trail and 4th Street Storm Drain outfall looking upstream from about 400 feet below Holmes Street.

This section of the Arroyo Mocho collects a large amount of trash from litter along the trail and nearby apartment and condominium complexes, occasional homeless encampments, and windblown trash from moving vehicles on Holmes Street and Mocho Park. The dominant types of trash include paper and plastic bags, plastic and glass beverage bottles, beverage cans, caps/lids, clothing/shoes, cups/plates/forks/knives/spoons/napkins, food wrappers/containers, straws/stirrers, paper, plastic sheeting/tarps, cigarette filters and lighters, tobacco packaging/wrappers, batteries, building materials, car parts and toys.

City staff cleaned this section on September 24, 2010 and September 22, 2011, and removed 0.25 cubic yards and 0.25 cubic yards, respectively. Volunteers cleaned this section on Tri-Valley Creeks to Bay Day on September 15, 2012, and removed 1.57 cubic yards. Livermore First Presbyterian volunteers cleaned this section on September 30, 2012 and removed 1.63 cubic yards. Kaiser Permanente volunteers cleaned this section on Martin Luther King Day on January 12, 2013, and removed 4.36 cubic yards. Adopt-A-Creek Spot Adoptee, Cub Scout Pack 942, cleaned this section on Tri-Valley Creeks to Bay Day on September 14, 2013, and removed 3.76 cubic yards. City staff cleaned this section on December 16, 2013 as part of the Multi-Family Dwelling Litter Outreach Pre-Campaign Measurement, and removed 0.71 cubic yards. Cub Scout Pack 942 will continue to clean this section at least twice a year.

4. *Arroyo Las Positas-Northfront Trailhead Park (ALP-NTP #4)*

On the northeast side of Livermore, the Arroyo Las Positas travels along much of the I-580 corridor as it heads through the valley. Adjacent to Northfront Trailhead Park, this arroyo is perpendicular to Northfront Road. A public-use asphalt trail runs next to the arroyo, adjoining nearby neighborhoods to the Northfront Road area. This section is located in Primary Trash Management Area 8 but receives trash from Primary Trash Management Area 7 as well.

Arroyo Las Positas adjoining nearby neighborhoods.

The Arroyo Las Positas is a main stream through the north side of town. In the Northfront Road area, trash is generated by Northfront Trailhead Park use, Interstate Highway 580 and Northfront Road traffic, and adjoining neighborhoods. The dominant types of trash include paper and plastic bags, plastic and glass beverage bottles, beverage cans, caps/lids, clothing/shoes, cups/plates/forks/knives/spoons/napkins, food wrappers/containers, straws/stirrers, paper, plastic sheeting/tarps, cigarette filters, building materials, car parts and foam packaging materials.

City staff cleaned this section on September 23, 2010 and September 22, 2011, and removed 0.25 cubic yards and 1.5 cubic yards, respectively. Volunteers cleaned this section on Tri-Valley Creeks to Bay Day on September 15, 2012, and removed 0.31 cubic yards. Girl Scout volunteers cleaned this section on May 1, 2013 and removed 0.15 cubic yards. Volunteers cleaned this section on Tri-Valley Creeks to Bay Day on September 14, 2013, and removed 0.4 cubic yards. New Adopt-A-Creek Spot Adoptee, Jared Dalusong and Saundra Lorimand, will clean this section at least twice a year.

Bridge over the Arroyo Las Positas.

3.2.17 Summary of Trash Control Measures

Trash Management Area 1: Kitty Hawk Rd/N Canyons Prkway/Portola Ave/Airway Blvd (mostly industrial and commercial)

- Street Sweeping – Existing schedule is 1x/week and 2x/week during leaf season
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis. Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.
- Full Trash Capture – Existing 67 Connector Pipe Screen Trash Device maintenance 2x/year; install more as needed or switch from small devices to large devices
- Anti-littering and Illegal Dumping Enforcement Activities – Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Planned City staff enforcement of high trash generating retail areas without existing full trash capture device. Planned Highway Patrol Litter Enforcement Committee participation to ensure clover leafs off of Interstate Highway 580 in Livermore are cleaned and litter bugs are cited during quarterly Enforcement Days.
- Activities to Reduce Uncovered Loads – Planned Highway Patrol Litter Enforcement Committee participation to ensure uncovered loads on Interstate Highway 580 are cited during quarterly Enforcement Days
- Jurisdictional Measures

Trash Management Area 2: N Livermore Ave/Las Positas Rd (mostly retail and commercial)

- Street Sweeping – Existing schedule is 1x/week and 2x/week during leaf season
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis. Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.

- Full Trash Capture – Existing 22 Connector Pipe Screen Trash Device maintenance 2x/year; install more as needed or switch from small devices to large devices
- Anti-littering and Illegal Dumping Enforcement Activities – Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Planned City staff enforcement of high trash generating retail areas without existing full trash capture device. Planned Highway Patrol Litter Enforcement Committee participation to ensure clover leafs off of Interstate Highway 580 in Livermore are cleaned and litter bugs are cited during quarterly Enforcement Days.
- Activities to Reduce Uncovered Loads – Planned Highway Patrol Litter Enforcement Committee participation to ensure uncovered loads on Interstate Highway 580 are cited during quarterly Enforcement Days
- Jurisdictional Measures

Trash Management Area 3: 1st St/Las Positas Rd (mostly retail)

- Street Sweeping – Existing schedule is 1x/week and 2x/week during leaf season
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
- Full Trash Capture – Existing 20 Connector Pipe Screen Trash Device maintenance 2x/year; install more as needed or switch from small devices to large devices
- Anti-littering and Illegal Dumping Enforcement Activities – Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Planned City staff enforcement of high trash generating retail areas without existing full trash capture device. Planned Highway Patrol Litter Enforcement Committee participation to ensure clover leafs off of Interstate Highway 580 in Livermore are cleaned and litter bugs are cited during quarterly Enforcement Days.
- Activities to Reduce Uncovered Loads – Planned Highway Patrol Litter Enforcement Committee participation to ensure uncovered loads on Interstate Highway 580 are cited during quarterly Enforcement Days

- Jurisdictional Measures

Trash Management Area 4: S Vasco Rd/Southfront Rd/Las Positas Rd/Brisa St/National Dr (mostly industrial)

- Street Sweeping – Existing schedule is 1x/week and 2x/week during leaf season
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis. Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.
- Full Trash Capture – Existing 13 Connector Pipe Screen Trash Device maintenance 2x/year. Planned 67 Connector Pipe Trash Screen Device installation and maintenance 2x/year; install more as needed or switch from small devices to large devices.
- Anti-littering and Illegal Dumping Enforcement Activities – Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Planned City staff enforcement of high trash generating retail areas without existing full trash capture device. Planned Highway Patrol Litter Enforcement Committee participation to ensure clover leafs off of Interstate Highway 580 in Livermore are cleaned and litter bugs are cited during quarterly Enforcement Days.
- Activities to Reduce Uncovered Loads – Planned Highway Patrol Litter Enforcement Committee participation to ensure uncovered loads on Interstate Highway 580 are cited during quarterly Enforcement Days
- Jurisdictional Measures

Trash Management Area 5: Livermore Premium Outlets shopping center

- Street Sweeping – Existing schedule is 1x/week and 2x/week during leaf season. Planned schedule is 2x/week.
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
- On-land Trash Clean-up (of Detention Basin) – Planned schedule is 2x/week by City staff/contractor

- Anti-littering and Illegal Dumping Enforcement Activities – Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Planned City staff enforcement of high trash generating retail areas without existing full trash capture device. Planned Highway Patrol Litter Enforcement Committee participation to ensure clover leafs off of Interstate Highway 580 in Livermore are cleaned and litter bugs are cited during quarterly Enforcement Days.
- Activities to Reduce Uncovered Loads – Planned Highway Patrol Litter Enforcement Committee participation to ensure uncovered loads on Interstate Highway 580 are cited during quarterly Enforcement Days
- Jurisdictional Measures

Trash Management Area 6: S Vasco Rd/E Ave (mostly multi-family residential)

- Street Sweeping – Existing schedule is 1x/week and 2x/week during leaf season
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
- Full Trash Capture – Planned 26 Connector Pipe Screen Trash Device installation and maintenance 2x/year; install more as needed or switch from small devices to large devices
- Anti-littering and Illegal Dumping Enforcement Activities – Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping.
- Jurisdictional Measures

Trash Management Area 7: 4th St/Maderia Wy/Pacific Ave/East Ave (mostly commercial)

- Street Sweeping – Existing schedule is 1x/month
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or

add a container if container is overflowing on a case-by-case basis. Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.

- Full Trash Capture – Planned 32 Connector Pipe Trash Screen Device installation and maintenance 2x/year; install more as needed or switch from small devices to large devices
- Anti-littering and Illegal Dumping Enforcement Activities – Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Planned City staff enforcement of high trash generating retail areas without existing full trash capture device.
- Jurisdictional Measures

Trash Management Area 8: Downtown

- Street Sweeping – Existing schedule is 1x/week and 2x/week during leaf season
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis. Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.
- Full Trash Capture – Planned 85 Connector Pipe Trash Screen Device installation and device maintenance 2x/year; install more as needed or switch from small devices to large devices
- Anti-littering and Illegal Dumping Enforcement Activities – Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Planned City staff enforcement of high trash generating retail areas without existing full trash capture device.
- Jurisdictional Measures

Trash Management Area 9: Portola Ave/Rincon Ave/Railroad/Junction Ave (mostly residential)

- Street Sweeping – Existing schedule is 1x/month

- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis. Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.
- Full Trash Capture – Planned 1 large full capture device installation and device maintenance 2x/year; install more as needed or switch from large devices to small devices
- Partial Trash Capture – Existing two stormwater lift stations with trash racks less than 5mm mesh screens maintained 2x/year
- Anti-littering and Illegal Dumping Enforcement Activities – Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping. Planned City staff enforcement of high trash generating retail areas without existing full trash capture device.
- Jurisdictional Measures

Trash Management Area 10: Portola Ave/Junction Ave/Gardella Plz/1st St (mostly residential)

- Street Sweeping – Existing schedule is 1x/month
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis. Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.
- Full Trash Capture – Planned 4 Connector Pipe Trash Screen Device installation and maintenance 2x/year; install more as needed or switch from small devices to large devices
- Anti-littering and Illegal Dumping Enforcement Activities – Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping.
- Jurisdictional Measures

Trash Management Area 11: Isabel Ave/El Rancho Dr/Rincon Ave/E Airway Blvd (mostly industrial and commercial)

- Street Sweeping – Existing schedule is 1x/month
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis. Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.
- Full Trash Capture – Planned 3 Connector Pipe Trash Screen Device installation and device maintenance 2x/year; install more as needed or switch from small devices to large devices
- Anti-littering and Illegal Dumping Enforcement Activities – Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping.
- Jurisdictional Measures

Trash Management Area 12: Springtown Blvd/Bluebell Dr/N Vasco Rd/Northfront Rd (mostly commercial)

- Street Sweeping – Existing schedule is 1x/month
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis. Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.
- Full Trash Capture – Planned 8 Connector Pipe Trash Screen Device installation and device maintenance 2x/year; install more as needed or switch from small devices to large devices
- Anti-littering and Illegal Dumping Enforcement Activities – Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping.
- Jurisdictional Measures

Trash Management Area 13: S Vasco Rd/East Ave (mostly industrial and commercial)

- Street Sweeping – Existing schedule is 1x/month
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis. Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.
- Full Trash Capture – Planned 3 Connector Pipe Trash Screen Device installation and device maintenance 2x/year; install more as needed or switch from small devices to large devices
- Anti-littering and Illegal Dumping Enforcement Activities – Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping.
- Jurisdictional Measures

Trash Management Area 14: Isabel Ave/Wetmore Rd/Concannon Blvd/S Livermore Ave/5th St/Murrieta Blvd/E Stanley Blvd (mostly commercial)

- Street Sweeping – Existing schedule is 1x/month
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
- Full Trash Capture – Planned 1 large full trash capture device maintenance 2x/year; install more as needed or switch from large devices to small devices
- Anti-littering and Illegal Dumping Enforcement Activities – Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping.
- Jurisdictional Measures

Trash Management Area 15: Schools

- Street Sweeping – Existing schedule is 1x/month

- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
- Full Trash Capture – Planned 4 Connector Pipe Trash Screen Device installation and device maintenance 2x/year; install more as needed
- Anti-littering and Illegal Dumping Enforcement Activities – Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping.
- Jurisdictional Measures

Trash Management Area 16: Parks

- Street Sweeping – LARPD existing schedule is more than 1x/month
- Inlet Inspection and Cleaning – LARPD existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or add a container if container is overflowing on a case-by-case basis.
- Full Trash Capture – Planned 1 large full capture device installation and device maintenance 2x/year; install more as needed
- Anti-littering and Illegal Dumping Enforcement Activities – Existing LARPD staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing LARPD staff enforcement of uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping.
- On-land Clean-ups – LARPD existing schedule at park trash hot spots at least 1x/year. Existing schedule at parks near/in Adopt-A-Creek Spots at least 1x/year.
- Jurisdictional Measures

Trash Management Area 17: Low Trash Generation Areas (single-family residential and other)

- Street Sweeping – Existing schedule is 1x/month
- Inlet Inspection and Cleaning – Existing schedule is 1x/year
- Trash Bin/Container Management - Existing waste hauler franchise agreement requires drivers to clean up any litter resulting from emptying containers. Existing waste hauler franchise agreement requires the hauler to increase the size and/or

add a container if container is overflowing on a case-by-case basis. Existing waste hauler franchise agreement entitles single-family residents three on-call pick-ups 1x/year to help prevent illegal dumping.

- Full Trash Capture – Existing 52 Connector Pipe Trash Screen Device maintenance 2x/year. Planned 99 Connector Pipe Trash Screen Device installation and device maintenance 2x/year; install more as needed.
- Anti-littering and Illegal Dumping Enforcement Activities – Existing City staff enforcement of waste hauler franchise agreement litter abatement procedures. Existing City staff enforcement of City of Livermore Municipal Code uncovered load, illegal dumping and littering prohibitions. Planned promotion of City of Livermore Police Department's "Litter-Bug Hotline" where individuals can report incidents of littering and illegal dumping.
- Jurisdictional Measures

3.3 Control Measure Implementation Schedule

The City of Livermore's detailed time schedule to implement all control measures for trash reduction in Table 3-4 below:

Table 3-2. City of Livermore completed and planned trash control measure implementation schedule.

Trash Management Area and Control Measures	Pre-MRP	Short-Term					Long-Term							
		FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014[a]	FY 2014-2015	FY 2015-2016	FY 2016-2017[b]	FY 2017-2018	FY 2018-2019	FY 2019-2020	FY 2020-2021	FY 2021-2022[c]
TMA #1														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full Trash Capture						X	X	X	X	X	X	X	X	X
Activities to Reduced Uncovered Loads							X	X	X	X	X	X	X	X
Anti-littering and Dumping Enforcement Activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMA #2														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full Trash Capture							X	X	X	X	X	X	X	X
Activities to Reduced Uncovered Loads							X	X	X	X	X	X	X	X
Anti-littering and Dumping Enforcement Activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMA #3														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full Trash Capture														
Activities to Reduced Uncovered Loads							X	X	X	X	X	X	X	X

Trash Management Area and Control Measures	Pre-MRP	Short-Term					Long-Term							
		FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014[a]	FY 2014-2015	FY 2015-2016	FY 2016-2017[b]	FY 2017-2018	FY 2018-2019	FY 2019-2020	FY 2020-2021	FY 2021-2022[c]
Anti-littering and Dumping Enforcement Activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMA #4														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full Trash Capture									X	X	X	X	X	X
Activities to Reduced Uncovered Loads							X	X	X	X	X	X	X	X
Anti-littering and Dumping Enforcement Activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMA #5														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
On-land Trash Clean-up							X	X	X	X	X	X	X	X
Activities to Reduced Uncovered Loads							X	X	X	X	X	X	X	X
Anti-littering and Dumping Enforcement Activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMA #6														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Trash Management Area and Control Measures	Pre-MRP	Short-Term					Long-Term							
		FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014[a]	FY 2014-2015	FY 2015-2016	FY 2016-2017[b]	FY 2017-2018	FY 2018-2019	FY 2019-2020	FY 2020-2021	FY 2021-2022[c]
Full Trash Capture									X	X	X	X	X	X
Anti-littering and Dumping Enforcement Activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMA #7														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full Trash Capture									X	X	X	X	X	X
Anti-littering and Dumping Enforcement Activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMA #8														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full Trash Capture									X	X	X	X	X	X
Anti-littering and Dumping Enforcement Activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMA #9														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full Trash Capture									X	X	X	X	X	X

Trash Management Area and Control Measures	Pre-MRP	Short-Term					Long-Term							
		FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014[a]	FY 2014-2015	FY 2015-2016	FY 2016-2017[b]	FY 2017-2018	FY 2018-2019	FY 2019-2020	FY 2020-2021	FY 2021-2022[c]
Partial Trash Capture	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Anti-littering and Dumping Enforcement Activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMA #10														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full Trash Capture									X	X	X	X	X	X
Anti-littering and Dumping Enforcement Activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMA #11														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full Trash Capture									X	X	X	X	X	X
Anti-littering and Dumping Enforcement Activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMA #12														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full Trash Capture									X	X	X	X	X	X

Trash Management Area and Control Measures	Pre-MRP	Short-Term					Long-Term							
		FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014[a]	FY 2014-2015	FY 2015-2016	FY 2016-2017[b]	FY 2017-2018	FY 2018-2019	FY 2019-2020	FY 2020-2021	FY 2021-2022[c]
Anti-littering and Dumping Enforcement Activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMA #13														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full Trash Capture									X	X	X	X	X	X
Anti-littering and Dumping Enforcement Activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMA #14														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full Trash Capture									X	X	X	X	X	X
Anti-littering and Dumping Enforcement Activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMA #15														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full Trash Capture									X	X	X	X	X	X
On-land Clean-ups														

Trash Management Area and Control Measures	Pre-MRP	Short-Term					Long-Term							
		FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014[a]	FY 2014-2015	FY 2015-2016	FY 2016-2017[b]	FY 2017-2018	FY 2018-2019	FY 2019-2020	FY 2020-2021	FY 2021-2022[c]
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMA #16														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full Trash Capture									X	X	X	X	X	X
Anti-littering and Dumping Enforcement Activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X
On-land Clean-ups	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMA #17														
Street Sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inlet Inspection and Cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Full Trash Capture									X	X	X	X	X	X
Anti-littering and Dumping Enforcement Activities	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash Bin/Container Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdictional Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jurisdiction-wide Control Measures														
Single-Use Bag Ban					X	X	X	X	X	X	X	X	X	X
K-12 School Outreach						X	X	X	X	Activities to be determined				
Be the Street campaign				X	X	X	Activities to be determined							
Multi-Family Dwelling Outreach						X	Activities to be determined							
Community Stewardship Grants (litter)							X	Activities to be determined						

Trash Management Area and Control Measures	Pre-MRP	Short-Term					Long-Term							
		FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014[a]	FY 2014-2015	FY 2015-2016	FY 2016-2017[b]	FY 2017-2018	FY 2018-2019	FY 2019-2020	FY 2020-2021	FY 2021-2022[c]
Litter related outreach to residents	X	X	X	X	X	X	X	X	Activities to be determined					
Creek and Shoreline Hot Spot Cleanups														
Annual Cleanups	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Assessment of Clean-ups	X	X	X	X	X	X	X	X	X	X	X	X	X	X

[a] July 1, 2014 - 40% trash reduction target
[b] July 1, 2017 - 70% trash reduction target
[c] July 1, 2022 - 100% trash reduction target

4.0 Progress Assessment strategy

Provision C.10.a.ii of the MRP requires Permittees to develop and implement a 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 targets. Early into the MRP, Permittees decided to work collaboratively to develop a trash load reduction tracking method through the Bay Area Stormwater Management Agencies Association (BASMAA). Permittees, Water Board staff and other stakeholders assisted in developing Version 1.0 of the tracking method. On behalf of all MRP Permittees, the Bay Area Stormwater Management Agencies Association (BASMAA) submitted Version 1.0 to the Water Board on February 1, 2012.

The Trash Assessment Strategy (Strategy) described in this section is intended to serve as Version 2.0 of the trash tracking method and replace version 1.0 previously submitted to the Water Board. The Strategy is specific to Permittees participating in the Alameda Countywide Clean Water Program (ACCWP), including the City of Livermore. The City intends to implement the Strategy in phases and at multiple geographical scales (i.e., jurisdiction-wide and trash management area) in collaboration with ACCWP. Pilot implementation is scheduled for the near-term and as assessment methods are tested and refined, the Strategy will be adapted into a longer-term approach. The Strategy selected by the City is described in the following sections.

4.1 ACCWP Pilot Assessment Strategy

The following ACCWP Pilot Trash Assessment Strategy (ACCWP Pilot Strategy) was developed by ACCWP on behalf of the City and other Permittees in Alameda County. The ACCWP Pilot Strategy will be implemented at a pilot scale on a countywide basis and includes measurements and observations in the City of Livermore.

4.1.1 Management Questions

The ACCWP Pilot Strategy is intended to answer the following management questions over time as trash control measures outlined in section 3.0 are implemented and refined:

- Are specific control measures effective?
- Is the amount of trash in and along local waterways declining?
- Are control measures being implemented appropriately?

The ACCWP Pilot Strategy, including indicators and methods, is summarized in this section. These indicators are intended to detect progress towards trash load reduction targets and solving trash problems.

4.1.2 Indicators of Progress and Success

To track progress, both outcome and output indicators will be assessed. Outcome-based indicators are those that measure the result of litter reduction efforts. This type of

indicator could include measurements of litter in and around the storm drain system or local water bodies. Output-based indicators are those that assess the implementation of control measures. This type of indicator could include assessing the maintenance of trash capture devices or compliance with product bans. Indicators that ACCWP Permittees will use to answer the management questions include:

Outcome-Based Indicators:

- 1-A Amount of single-use plastic bags entering storm drains
- 1-B Amount of polystyrene food ware entering storm drains
- 1-C Amount of litter removed from Trash Hot Spots and other creek/shoreline cleanup events
- 1-D Amount of litter at schools participating in the litter outreach program
- 1-E Amount of litter at multi-family dwellings participating in the targeted outreach program
- 1-F Self-reported litter related attitude and behavior of residents

Output-Based Indicators:

- 2-A Full capture device operation and maintenance
- 2-B Compliance with the Single-Use Bag Ban
- 2-C Implementation of an effective street sweeping program
- 2-D Commercial Trash Container Management
- 2-E Residential Trash Container Management

In selecting the indicators above, the City of Livermore in collaboration with ACCWP and other ACCWP Permittees recognize that no one environmental indicator will provide the information necessary to effectively determine progress made in reducing trash discharged from MS4s and improvements in the level of trash in receiving waters. Multiple indicators were therefore selected.

As described in Section 2.2, trash is transported to receiving waters from pathways other than MS4s, which may confound our ability to observe MS4-associated reductions in creeks and shorelines. Evaluations of data on the amount of trash in receiving waters that are conducted over time through the Pilot Assessment Strategy will assist the City in further determinations of the important sources and pathways causing problems in local creeks, rivers and shorelines.

4.1.3 Pilot Assessment Methods

This section briefly summarizes the preliminary assessment methods that the City of Livermore will implement through the ACCWP Pilot Strategy to generate indicator information described in the previous section. Additional information on each method can be found in the ACCWP Pilot Trash Assessment Strategy submitted to the Water Board by ACCWP on behalf of the City.

OUTCOME-BASED INDICATORS

1-A Amount of Single-Use Plastic Bags Entering Storm Drains

ACCWP participated in the development of the BASMAA baseline trash generation rate study. A total of 47-drop inlet full trash capture devices located throughout Alameda County were included in the study. The study included an assessment of the volume and number of single-use plastic bags found in these 47 inlets as well as over 100 other inlets from throughout the Bay Area. Since the conclusion of the study, the Alameda County Waste Management Authority has adopted a single-use bag ban. As of January 1, 2013, all grocery stores, supermarkets, mini-marts, convenience stores, liquor stores, pharmacies, drug stores or other entities that sell milk, bread, soda and snack foods (all four items) and/or alcohol (Type 20 or21 license) in Alameda County must comply with the Single-Use Bag Ban Ordinance.

ACCWP will conduct a follow-up study to assess the number and volume of single-use plastic bags in storm drain inlets throughout the County following the implementation of the bag ban. The study will consist of re-sampling most or all devices sampled during the previous study and comparing the number of single-use bags found before versus after the implementation of the bag ban. ACCWP will also sample up to 50 additional full trash capture inlet devices from high and medium trash generating areas throughout the County and compare the number of single-use bags found in all of the sampled inlets in Alameda County after the adoption of the bag ban versus the number of bags found in inlets throughout the Bay Area during the baseline trash generation rate study. ACCWP is planning to assess the level of single-use and other trash in all of the approximately 100 inlets again after several years to assess the overall decline in trash over time. A detailed study design is included in the ACCWP Pilot Assessment Strategy to be submitted separately.

1-B Amount of Polystyrene Food Ware Entering the Storm Drain System

As noted above, ACCWP participated in the development of the BASMAA baseline trash generation rate study. A total of 47 drop inlet full trash capture devices located throughout Alameda County were included in the study. The study included an assessment of the volume and number of expanded polystyrene (EPS) food ware items found in these 47 inlets as well as over 100 other inlets from throughout the Bay Area. A majority of the fourteen cities within Alameda County have adopted expanded polystyrene food ware bans. San Leandro and Pleasanton adopted their expanded polystyrene bans after the completion of the BASMAA baseline trash generation rate study.

ACCWP will conduct a follow-up study to assess the effectiveness of the EPS food ware bans at reducing the amount of EPS entering the storm drain system. As San Leandro and Pleasanton have adopted their ban since the completion of the baseline study, the follow-up study will compare the volume and number of EPS food ware items in the full trash capture devices in those two cities before and after the implementation of the bans. ACCWP will also sample a total of up to 100 full trash capture inlet devices from throughout the County and compare the number and volume of EPS food ware items

in areas with versus without EPS bans. A detailed study design is included in the ACCWP Pilot Assessment Strategy to be submitted separately.

1-C Amount of Litter Removed from Trash Hot Spots and Other Creek/Shoreline Cleanup Events

ACCWP member agencies collect trash annual from a total of 47 Hot Spots as well as numerous additional creek and shoreline cleanup events. Each member agency will gather data from these events that will allow for long term tracking of trends. The data to be collected include the volume and or weight of trash removed, the number of people and or the total number of person hours for each event, the length of creek or shoreline cleaned, and the dominant types of trash at each location. ACCWP will compile the data from these events and track the long-term trends in trash along these water bodies throughout the County. Member agencies will also track trends at their specific cleanup locations.

1-D Amount of Litter at Schools Participating in the Litter Outreach Program

ACCWP has developed a request for proposal for a four-year litter reduction education/outreach grant directed at K-12 schools throughout Alameda County. ACCWP intends to award a total of up to $125,000 per year to the successful applicant(s). The goals of the project are to clearly reduce the amount of litter at the participating schools and incorporate institutional changes at the schools so that litter will continue to be reduced in the future. Implementation is scheduled to begin in the 2014/15 school year. The request for proposal will include a requirement to evaluate the level of litter reduction achieved. A copy of the request for proposals is included in the ACCWP Pilot Assessment Strategy. A description of the assessment mechanism(s) of the successful proposal(s) will be included in the ACCWP Fiscal Year 2013/14 Annual Report.

1-E Amount of Litter at Multi-Family Dwellings Participating in the Targeted Outreach Program

Multi-family dwellings (i.e., apartment buildings and condominium complexes) are often areas of high trash generation. ACCWP is working with the City of Livermore to develop a litter reduction pilot targeting multi-family complexes known to be sites with significant litter issues. The pilot includes the following apartment building and condominium complexes: Livermore Garden Apartments (5720 East Avenue), La Castilleja (975 Murrieta Boulevard), and Castilleja Del Arroyo (1001 and 1009 Murrieta Boulevard). The planned assessment mechanisms include:

- December 2013: Pre-campaign Measurement – ACCWP and the City staff took baseline measurements of all three sites on December 12th, December 16th and December 26th. Most of the on-site litter collected, characterized and counted included some of the Coastal Commission's "most likely to find items". These items include: cigarette butts, food (i.e., candy, chip) wrappers, and loose paper pieces (i.e., napkins, receipts, tissues junk mail and newspaper).

- December 2013: Property Manager Interviews – All three property managers were interviewed by City staff using twenty-five questions developed by the ACCWP on December 12th, 13th and 27th. The interview results helped define

the ACCWP and City's target audiences. These audiences include: low and medium income, school-aged children and adults, and Hispanic and Caucasian ethnic groups. Also, the interview results helped determine that in-person conversation and written notices posted to residents' front doors were the most effective outreach tactics used by property managers.

- January 2014: Plan – ACCWP and City staff will be testing the merits of a more traditional multi-touch campaign versus a norming-only campaign. Both will be measured against a "control". Active and Control Sites with assigned outreach tactics are listed below:

  Active Sites:

  Castilleja Del Arroyo Condominiums
  1001 & 1009 Murrieta Boulevard
  Multi-touch Campaign:
  - Content in HOA Newsletter (tentatively an ad box &/or resident Q&A)
  - Litter Signage
  - Notice on Bulletin Board &/or on Unit Doors

  La Castilleja Condominiums
  975 Murrieta Boulevard
  Norming Campaign:
  -Volunteer will clean up every day instead of once-twice/week.

  Control Site:

  Livermore Garden Apartments
  5720 East Avenue
  No Campaign

- May 17, 2014 – May 31, 2014: Post-campaign Measurement — City staff and ACCWP will duplicate the pre-campaign measurement methodologies at all three sites, including the Control. All three property managers/volunteers will collect one week's worth of on-site litter. On-site and off-site litter will be characterized and counted by City staff using the Ocean Conservancy's Volunteer Trash Data Form. All three property managers will be interviewed by City staff to help determine residents' attitudes/change in behavior, etc.

- June 1, 2014 – June 30, 2014: Reporting – Final Pilot Report will be presented to ACCWP member agencies.

1-F Self-Reported Litter Related Attitude and Behavior of Residents

Through its Public Information and Participation program ACCWP encourages residents to adopt less polluting behaviors. One targeted behavior is littering. ACCWP uses a variety of mechanisms to influence residents including public service announcements, online and movie theater advertising, outreach to K-12 schools, and participating in outreach events. ACCWP conducts telephone surveys of residents every several years

to gauge Alameda County residents' awareness and attitude regarding stormwater related issues. These surveys include questions regarding respondents' reported behavior and attitudes regarding litter and littering. Future surveys will continue to track the long-term trends in residents' awareness and attitudes regarding litter and littering.

OUTPUT-BASED INDICATORS

2-A Full capture device operation and maintenance

Consistent with the MRP, adequate inspection and maintenance of trash full capture devices is required to maintain full capture designation by the Water Board. The City of Livermore is currently developing an operation and maintenance verification program (Trash O&M Verification Program), via ACCWP, to ensure that devices are inspected and maintained at a level that maintains this designation. The ACCWP Trash O&M Verification Program will be modeled on the current O&M verification program for stormwater treatment controls implemented consistent with the Permit new and redevelopment requirements.

2-B Compliance with the Single-Use Bag Ban

The Alameda County Waste Management Authority is taking the lead on inspection and enforcement of the Single-Use Bag Ban. ACCWP will coordinate with the Waste Management Authority and report on the results of their inspection and enforcement program.

2-C Implementation of an effective street sweeping program

Street sweeping can be very effective in reducing the amount of trash entering the storm drain system. However, its effectiveness is dependent upon the frequency of sweeping and the ability of the sweeper to sweep along the edge of the curb. Parked cars can significantly reduce the effectiveness of a street sweeping program. The City of Livermore will coordinate with ACCWP to develop and implement an assessment of its street sweeping program.

2-D Commercial Trash Container Management

Improper trash container management at commercial facilities can be a significant source of trash to the storm drain system. The City of Livermore *will coordinate with ACCWP to develop and implement an assessment of its commercial trash container management program.*

2-E Residential Trash Container Management

Fugitive trash from residential trash collection can be a significant source of trash to the storm drain system. The City of Livermore will coordinate with ACCWP to develop and implement an assessment of its residential trash collection program.

4.2 BASMAA "Tracking California's Trash" Project

The ACCWP Pilot Assessment Strategy described in the previous section recognizes that outcome-based trash assessment methods needed to assess progress toward trash reduction targets are not well established. In an effort to address these information gaps associated with trash assessment methods, the Bay Area Stormwater Management Agencies Association (BASMAA), in collaboration with ACCWP, the 5 Gyres Institute, San Francisco Estuary Partnership, the City of Los Angeles, and other stormwater programs in the Bay Area, developed the *Tracking California's Trash* Project. The State Water Resources Control Board (SWRCB) who recognized the need for standardized trash assessment methods that are robust and cost-effective funds the Project through a Proposition 84 grant awarded to BASMAA.

The Project is intended to assist BASMAA member agencies in testing trash assessment and monitoring methods needed to evaluate trash levels in receiving waters, establish control measures that have an equivalent performance to trash full capture devices, and assess progress in trash reduction over time. The following sections provide brief descriptions of tasks that BASMAA will conduct via the three-year Project. Full descriptions of project scopes, deliverables, and outcomes will be developed as part of the task-specific Sampling and Analysis Plans required by the SWRCB during the beginning of the Project. The Project is currently underway and will continue through 2016.

4.2.1 Testing of Trash Monitoring Methods

BASMAA and the 5 Gyres Institute will evaluate the following two types of assessment methods as part of the Project:

- **Trash Flux Monitoring –** Trash flux monitoring is intended quantify the amount of trash flowing in receiving waters under varying hydrological conditions. Flux monitoring will be tested in up to four receiving water bodies in San Francisco Bay and/or the Los Angeles areas. Methods selected for evaluation and monitoring will be based on a literature review conducted during this task and through input from technical advisors and stakeholders. Monitoring is scheduled to begin in 2014 and will be completed in 2016.
- **On-land Visual Assessments –** As part of the Project, BASMAA will also conduct an evaluation of on-land visual assessment methods that are included in the ACCWP Pilot Assessment Strategy. The methods are designed to determine the level of trash on streets and public right-of-ways that may be transported to receiving waters via MS4s. BASMAA plans to conduct fieldwork associated with the evaluation of on-land visual assessment at a number of sites throughout the region. To the extent practical, sites where the on-land methods evaluations take place will be coordinated with trash flux monitoring in receiving waters. On-land assessments will occur in areas that drain to trash full capture devices, and all sites will be assessed during wet and dry weather seasons in order to evaluate on-land methods during varying hydrologic conditions. Monitoring is scheduled to begin in 2014 and will be completed in 2016.

4.2.2 Full Capture Equivalent Studies

Through the implementation of BASMAA's *Tracking California's Trash* grant-funded project, a small set of "Full Capture Equivalent" projects will also be conducted in an attempt to demonstrate that specific combinations of control measures will reduce trash to a level equivalent to full capture devices. Initial BMP combinations include high-frequency street sweeping, and enhanced street sweeping with auto-retractable curb inlet screens. Other combinations will also be considered. Studies are scheduled to begin in 2014 and will be completed in 2016.

4.3 Additional Progress Assessments

In fiscal year 2017-18, the City of Livermore will continue to evaluate the effectiveness of the City's Expanded Polystyrene Ban using ACCWP's assessment methodology for its full trash capture inlet devices included in BASMAA's baseline trash generation rate study.

The City of Livermore will continue to evaluate the City's Trash Hot Spot Clean-up progress from fiscal year 2018-19 to fiscal year 2021-22 using the Hot Spot Data Tracking Field Form (Attachment E) developed by the ACCWP Trash Subcommittee.

In fiscal year 2017-2018, the City of Livermore will continue to evaluate the effectiveness of the City's Multi-family Dwelling Litter Outreach Program using ACCWP's planned assessment mechanisms outlined in 4.1.3 Pilot Assessment Methods.

From fiscal year 2014-15 to fiscal year 2021-22, the City of Livermore will perform street assessments using the On-land Visual Assessment Form (Attachment F) in the City's Primary Trash Management Areas with high generating retail areas without existing full-trash capture devices. These assessments will be performed on an annual basis on a day before the next scheduled street sweeping event to assess City staff's enforcement efforts of these areas. City staff will customize the Form by July 2014 and revise as necessary. Completed assessment forms will be filed in a binder and made available for review upon request. In addition, the City will continue to track trash in the trash full capture devices and during street sweeping activities to determine the success of these measures. City staff will assess each full capture device for performance and cost using the Trash Full Capture Device Assessment Form (Attachment G) to observe every device during its maintenance event twice a year. City staff will customize the Form by July 2014 and revise as necessary.

4.4 Long-Term Assessment Strategy

The City of Livermore is committed to implementing standardized assessment methods post-FY 2016/17 based on the lessons learned from pilot assessments. Assessment activities described in the previous sections will evaluate the utility of different assessment methods to demonstrate progress towards trash reduction targets and provide recommended approaches for long-term implementation. Lessons learned will be submitted to the Water Board with the FY 2015-2016 Annual Report and a revised Strategy will be developed and submitted, if necessary. The revised Strategy will include

assessment methods that will be used to demonstrate progress during the remaining term of trash reduction requirements.

4.5 Implementation Schedule

The implementation schedule for the ACCWP Pilot Implementation Strategy, BASMAA's Tracking California's Trash project, and the Long-Term Assessment Strategy are included in Table 4-1. Load reduction reporting milestones are also denoted in the table. The schedule is consistent with the need for near-term pilot assessment results to demonstrate progress toward short-term targets, while acknowledging the need for testing and evaluation of assessment methods and protocols prior to long-term implementation.

Table 4-1. **City of Livermore planned trash progress assessment implementation schedule.**

Trash Assessment Programs and Methods	Prior to FY 2013-14	Fiscal Year								
		2013-14[a]	2014-15	2015-16	2016-17[b]	2017-18	2018-19	2019-20	2020-21	2021-22[c]
Pilot Trash Assessment Strategy (ACCWP)										
Single-Use Plastic Bag Assessment	X	X				X				
Expanded Polystyrene Assessment	X	X								
Trash Hot Spot Cleanup Assessment	X	X	X	X	X	X				
K-12 School Litter Reduction Outreach Program						X				
Multi-Family Dwelling Litter Outreach Program	X	X								
Residents' Self-Reported Litter-Related Behavior	X					X				
Full Capture Operation and Maintenance Verification			X	X	X					
Single-Use Bag Ban Compliance		X	X	X	X					
Street Sweeping Effectiveness Evaluation			X	X	X					
Commercial Trash Container Management Assessment			X	X	X					
Residential Trash Container Management Assessment			X	X	X					
Tracking California's Trash Project (BASMAA)										
Testing of Trash Monitoring Methods										
Trash Flux Monitoring Protocol Testing			X	X	X					
On-land Visual Assessment Evaluations			X	X	X					
Full Capture Equivalent Studies			X	X	X					
Additional Assessments (City of Livermore)										
Expanded Polystyrene Assessment					X					X
Trash Hot Spot Cleanup Assessment	X	X	X	X	X	X	X	X	X	X
Multi-Family Dwelling Litter Outreach Program Assessment	X	X			X					X
Trash Full Capture Device Assessment	X	X	X	X	X	X	X	X	X	X
Street Assessment			X	X	X	X	X	X	X	X
Long-Term Trash Assessment Strategy (ACCWP)						X	X	X	X	X

[a] July 1, 2014 - 40% trash reduction target
[b] July 1, 2017 - 70% trash reduction target
[c] July 1, 2022 - 100% trash reduction target

5.0 REFERENCES

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ATTACHMENT A. AACSP CREEK ASSESSMENT ACTIVITY FORM

Name(s)_____ Location _____ Date_____

Stream Water Quality Evaluation Sheet

	Measurement	Data	POOR Stream Quality (1)	ADEQUATE Stream Quality (2)	GOOD Stream Quality (3)	EXCELLENT Stream Quality (4)	Score
Physical Properties	**Temperature:** Affects the amount of oxygen that can be dissolved in water, rate of photosynthesis of plants, metabolic rates of animals, and the sensitivity of organisms to toxic wastes, parasites, and diseases.		Above 21°C	18 - 21°C	14 - 17°C	Below 14°C	
	Turbidity (clarity): Turbidity is a measure of cloudiness in water. The more turbid the water, the muddier it looks. Suspended solids in turbid water can clog fish gills, reduce growth rates, decrease resistance to disease, and prevent egg development.		Above 100 JTU	40 - 100 JTU	1 - 39 JTU	0 JTU	
	Total Dissolved Solids: Dissolved solids may include salts, minerals from local geology, and runoff from fertilizers.		Above 530 ppm	271 - 530 ppm	80 - 270 ppm	Below 80 ppm	
Chemical Properties	**pH:** This is a measure of acidity and alkalinity in a solution. Most organisms have adapted to life in water of a specific pH and may die if it changes even slightly.		Below 6.0 or Above 8.0	6.0 - 6.3 or 7.6 - 8.0	6.4 - 6.7 or 7.3 - 7.5	6.8 - 7.2	
	Dissolved Oxygen: Fish, invertebrates, plants, and aerobic bacteria all require oxygen for respiration. Depletions in dissolved oxygen can cause major shifts in the kinds of aquatic organisms found in water bodies.		0 - 1 ppm	2 - 4 ppm	5 - 6 ppm	Above 6 ppm	
Pollution Vulnerability	**Runoff Pollution:** Non-point source pollution comes from diffuse (dispersed) sources such as runoff from chemically fertilized agriculture, and suburban runoff, automotive exhaust, and litter.		All surfaces bordering stream are paved and all land nearby stream is used for agriculture and/or houses.	Moderate amount of paved surface nearby stream with moderate amount of agriculture and/or houses nearby.	Little paved surface nearby stream with little agriculture and/or houses nearby.	No paved surfaces or storm drains nearby stream and no agriculture or houses nearby.	
Biological Properties	**Macroinvertebrates** (water bugs): These are biotic indicators that represent the health of a creek over weeks or months as they spend part or all of their life cycle in the creek.		ONLY pollution tolerant species.	No indicator species.	Indicator species found; less than 10 invertebrate species total.	Indicator species found; 10 or more species of invertebrates found.	
	Riparian Zone: This is the area along the stream banks typically populated with plants that provide crucial habitat for many species.		No plants along stream banks and no trees covering stream.	1 - 10m width of plants on stream banks and 1-33% of stream covered /shaded by trees.	10 - 20m width of plants along stream bank and 34 - 66% of stream covered/ shaded by trees.	More than 20m width of plants along stream bank and more than 66% of stream covered/ shaded by trees	
Use the total score to rate the overall quality of the stream. To do this find which range your total score falls in and circle that box.			Overall POOR Stream Quality: Total Score = 0 - 8	Overall ADEQUATE Stream Quality: Total Score = 9 - 16	Overall GOOD Stream Quality: Total Score = 17 - 24	Overall EXCELLENT Stream Quality: Total Score = 25 - 32	TOTAL SCORE=

Describe at least one way to increase the quality of this stream.

ATTACHMENT B. AACSP CREEK ASSESSMENT ACTIVITY PRE AND POST-TEST

Name: _____ **School:** _____ **Date:** _____

PRE-Test

Multiple Choice

Identify the choice that best completes the statement or answers the question.

____ 1. Which statement best defines turbidity?
   a. Turbidity is a measure of water clarity.
   b. Turbidity measures how acidic or basic a solution is.
   c. Turbidity is the area along the side of the creek typically populated with vegetation.
   d. Turbidity represents the total amount of dissolved solids (salt) in creek water.

____ 2. Most fresh water creeks have a pH range of
   a. 2 - 4
   b. 4 - 6
   c. 6 - 8
   d. 8 - 10

____ 3. Analyze the data in the table to determine a relationship between temperature and dissolved oxygen in water.

Water Temperature (°C)	Dissolved Oxygen (mg/L)
0	14.6
5	12.8
10	11.3
15	10.2
20	9.2
25	8.6
100	0

   a. As water temperature decreases the amount of dissolved oxygen decreases.
   b. As water temperature increases the amount of dissolved oxygen increases.
   c. As water temperature decreases the amount of dissolved oxygen increases.
   d. There is no relationship between water temperature and dissolved oxygen.

Short Answer

4. Name three bodies of water in the Livermore Valley.

_____

_____

_____

5. Water (and garbage!) are flowing downstream from your current location. What is the final destination of the water in your creek?

_____

6. Compare and contrast information presented about sites 1, 2, and 3 to determine which site represents the healthiest creek ecosystem. Justify your answer with at least two facts.

Parameter	Site #1	Site #2	Site #3
Dissolved Oxygen	1ppm	8ppm	2ppm
pH	4.6	7.3	9.6
Turbidity	150 JTU	15 JTU	55 JTU
Temperature	18 °C	12 °C	20 °C
Riparian Zone	There is no riparian zone at this site. The area has been developed and cement boarders the creek on both sides.	There is 30 meters of vegetation on both creek banks. Large trees shade most of the creek water.	There is 5 meters of vegetation on both creek banks. Little to none of the creek is shaded by vegetation.
Pollution	Paved surface surrounds the creek. This increases urban runoff. Also, there are two storm drains located upstream.	Unpaved surface surrounds the creek. This decreases urban runoff. Also, there are no storm drains or point source pollution sites located upstream.	Moderate paved surface Surrounds the creek. This decreases urban runoff. Also, there is one point source pollution source (factory waste water) located upstream.

_____

_____

_____

_____

_____

_____

Name: _____ School: _____ Date: _____

POST-Test

Multiple Choice

Identify the choice that best completes the statement or answers the question.

____ 1. Which statement best defines turbidity?
   a. Turbidity is a measure of water clarity.
   b. Turbidity measures how acidic or basic a solution is.
   c. Turbidity is the area along the side of the creek typically populated with vegetation.
   d. Turbidity represents the total amount of dissolved solids (salt) in creek water.

____ 2. Most fresh water creeks have a pH range of
   a. 2 - 4
   b. 4 - 6
   c. 6 - 8
   d. 8 - 10

____ 3. Analyze the data in the table to determine a relationship between temperature and dissolved oxygen in water.

Water Temperature (°C)	Dissolved Oxygen (mg/L)
0	14.6
5	12.8
10	11.3
15	10.2
20	9.2
25	8.6
100	0

   a. As water temperature decreases the amount of dissolved oxygen decreases.
   b. As water temperature increases the amount of dissolved oxygen increases.
   c. As water temperature decreases the amount of dissolved oxygen increases.
   d. There is no relationship between water temperature and dissolved oxygen.

Short Answer

4. Name three bodies of water in the Livermore Valley.

_____

_____

_____

5. Water (and garbage!) are flowing downstream from your current location. What is the final destination of the water in your creek?

_____

6. Compare and contrast information presented about sites 1, 2, and 3 to determine which site represents the healthiest creek ecosystem. Justify your answer with at least two facts.

Parameter	Site #1	Site #2	Site #3
Dissolved Oxygen	1ppm	8ppm	2ppm
pH	4.6	7.3	9.6
Turbidity	150 JTU	15 JTU	55 JTU
Temperature	18 °C	12 °C	20 °C
Riparian Zone	There is no riparian zone at this site. The area has been developed and cement boarders the creek on both sides.	There is 30 meters of vegetation on both creek banks. Large trees shade most of the creek water.	There is 5 meters of vegetation on both creek banks. Little to none of the creek is shaded by vegetation.
Pollution	Paved surface surrounds the creek. This increases urban runoff. Also, there are two storm drains located upstream.	Unpaved surface surrounds the creek. This decreases urban runoff. Also, there are no storm drains or point source pollution sites located upstream.	Moderate paved surface Surrounds the creek. This decreases urban runoff. Also, there is one point source pollution source (factory waste water) located upstream.

_____

_____

_____

_____

_____

_____

ATTACHMENT C. TRI-VALLEY CREEKS TO BAY DAY SURVEY

Tri-Valley Creeks to Bay Clean-up Survey

1. In which city do you live?

Livermore	Pleasanton
Dublin	Other (specify):

2. How did you hear about the Tri-Valley Creeks to Bay Clean-up?

TV	Livermore Sanitation Newsletter
Newspaper Ad	City Manager Newsletter
Radio	City Sewer Bill Message
Internet Search	City Employee Email
Poster or Flyer	LARPD Valley Wilds Newsletter
Word of Mouth	LVJUSD (on-line) Newsletter
Other (Specify):	Friends of the Arroyos (on-line Newsletter
	Tri-Valley Conservancy (on-line) Newsletter
	Lawrence Livermore National Laboratory NewsOnline

3. Do you feel creek pollution is a significant problem in the Tri-Valley?

No	Yes

4. Did you participate in the Tri-Valley Creeks to Bay Clean-up last year?

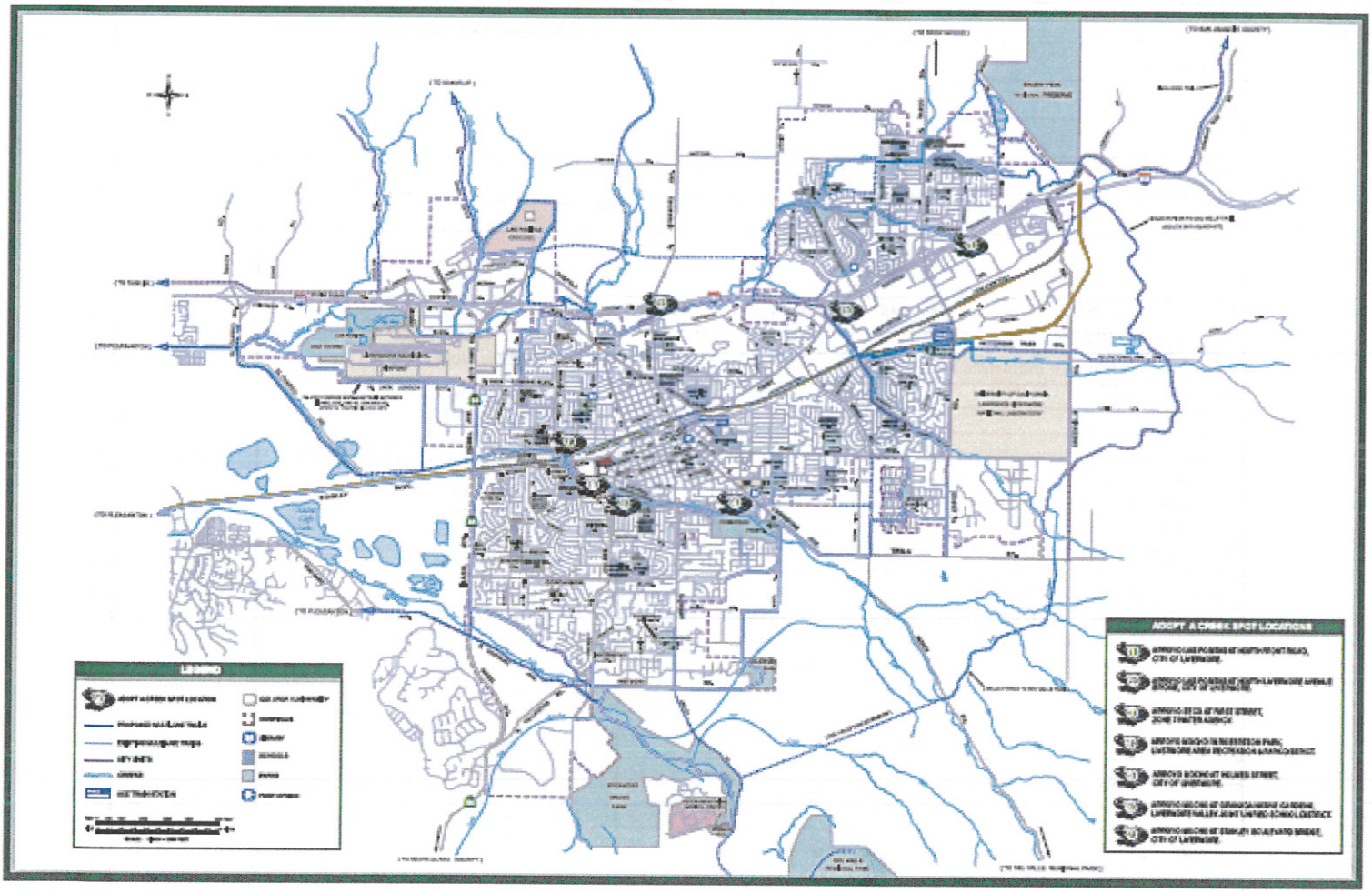
5. What did you like best about the Tri-Valley Creeks to Bay Clean-up?

6. How could we make the Tri-Valley Creeks to Bay Clean-up better next year?

7. Are you participating in the Tri-Valley Creeks to Bay Clean-up next year?

8. Are you interested in adopting a site through the Adopt a Creek Spot Program?

ATTACHMENT D. ADOPT-A-CREEK SPOT PROGRAM MAP



ATTACHMENT E. HOT SPOT DATA TRACKING FIELD FORM

Date: _____ **Participants/Affiliation:**

Location: _____

Time: _____

Number of Participants	Person Hours	Trash Collected*		Recyclables Collected*		Length of Creek/Shoreline Cleaned*	
		Amount	Unit	Amount	Unit	Amount	Unit

* Describe in comments below how volume or weight and length cleaned were estimated.

Odd-Sized Trash Items
(in addition to bagged materials above)

Amount	Item

Estimated volume (cubic yards) of odd-sized trash items:

Dominant Types of Trash:

Check applicable items below:

- ☐ Beverage Cans
- ☐ Biodegradable/Paper items
- ☐ Bottle Caps/Lids
- ☐ C&D Wastes
- ☐ Cigar Tips
- ☐ Cigarette Filters
- ☐ Fishing Line
- ☐ Floatable Foam
- ☐ Glass bottles
- ☐ Pieces of hard plastic
- ☐ Plastic Bags
- ☐ Plastic Bottles
- ☐ Plastic Sheeting/Film
- ☐ Plastic Wrappers
- ☐ Straws/Stirrers
- ☐ Styrofoam
- ☐ Textiles
- ☐ Other:
- ☐ Other:
- ☐ Other:

Comments: _____

Material Sources:

- ☐ Illegal Dumping
- ☐ Littering
- ☐ Storm flow/Tidal Deposition (transportable, persistant, buoyant)
- ☐ Other:

Useful Clean Up Tools:

- Clipboard & Pen
- Scissors or pocket knife
- Dust Pan & Brush
- Fishing net (scooping out trash during high tide)
- Gloves (disposable and thick gloves)
- Grabbers
- Hammer
- 5-gallon bucket(s)
- Trash Bags (dark, heavy duty for trash & clear for recyclables)
- Rakes (fan-shaped, shrub and/or heavy duty garden rake)
- Shovel (flat and pointed)
- Sharps container
- Sieve

ATTACHMENT F. ON-LAND VISUAL TRASH ASSESSMENT FORM

On-land Visual Assessment Data Collection Form – Version 1.0

Agency: _____ Date: _____

Team Members: _____ Contact E-mail: _____

Note: Fill out a separate Data Collection Form for each assessment area

I. Assessment Area	
MAP ID	Assessment Area: Delineate the assessment area on the associated map, create a map ID, and mark the ID on the map and place in the box provided to the left. Below, describe the location and boundaries of the assessment area. Include the street segment name, length of the street based on cross streets, and land area description (if applicable).

II. Condition Category Assignment

Trash Condition Category

Conduct the assessment in accordance with the Visual On-land Assessment Protocol for Stormwater (Refer to Definitions on Back). Check one of the below categories based on the assessment.

❑ Low (A) ❑ Medium (B) ❑ High (C) ❑ Very High (D)

❑Low/Medium (A/B) ❑ Medium/High (B/C) ❑ High/Very High (C/D)

Photograph Documentation

Check the box below to indicate that photographs were taken and are maintained by your agency.

Photographs: ❑ Number of photographs taken: _____

Trash Condition Category	Definition
A	Effectively no trash is observed in the assessment area. There may be some small pieces in the area, but they are not obvious at first glance and one individual could easily clean up all trash observed in a very short timeframe.
B	Predominantly free of trash except for a few pieces that are easily observed in the assessment area. The trash could be collected by one or two individuals in a short period of time.
C	Trash is widely/evenly distributed and/or small accumulations are visible on the street, sidewalks, or inlets. It would take a more organized effort to remove all trash from the area.
D	Trash is continuously seen throughout the assessment area, with large piles and a strong impression of lack of concern for litter in the area. There is often significant litter along gutters. It would take a large number of people during an organized effort to remove all trash from the area.

F:\SCD\SC05.12 - Trash\Visual Assessments\Visual On-land Assessment Data Collection Form 5_2_13.doc 5/2/13

III. Preliminary Source Identification (Optional)

Stormwater trash sources identified within the assessment area during assessments (CHECK ALL SOURCES THAT APPLY).

Vehicles

- ❑ Moving Vehicles
- ❑ Parked Cars
- ❑ Uncovered Loads
- ❑ Other _____

Inadequate Waste Container Management

- ❑ Overflowing or uncovered receptacles/dumpsters
- ❑ Dispersal of household trash and recyclables before, during and after collection
- ❑ Other _____

Pedestrian Litter

- ❑ Restaurants
- ❑ Convenience Stores
- ❑ Liquor Stores
- ❑ Bus Stops
- ❑ Special Events
- ❑ Other _____

Illegal Dumping

- ❑ Illegal dumping on-land
- ❑ Homeless encampments
- ❑ Other _____

IV. Comments and Additional Information about the Assessment Area and Sources

F:\SC05\SC05.12 - Trash\Visual Assessments\Visual On-land Assessment Data Collection Form 5_2_13.doc

5/2/13

ATTACHMENT G. TRASH FULL CAPTURE DEVICE ASSESSMENT FORM

Trash Capture Device Maintenance Report — Small Devices

BAY AREA-WIDE TRASH CAPTURE DEMONSTRATION PROJECT

Use the municipal staff DATA login for your city/county to enter maintenance data at www.bayareatrashtracker.org

Address or intersection: _____

OPTIONAL SFEP Device ID: _____ Municipal Device ID _____

Purchase Order No.: _____ Item Line No. (from Purchase Order): _____

MAINTENANCE

Date of maintenance event: _____

Reason for inspection/maintenance (check all that apply):

- ☐ Regular scheduled maintenance
- ☐ Repair (describe): _____
- ☐ Response to complaint (describe): _____

Is device functioning properly?

- ☐ Yes ☐ No (explain): _____
- ☐ Clogged
- ☐ Needs repair/adjustment (explain): _____
- ☐ Evidence of bypass

Condition of device

- ☐ Intact, not damaged
- ☐ Damaged or broken part (describe): _____
- ☐ Missing/vandalized

Estimated percentage of catch basin full: _____% full

Maintenance effort:

How many staff participated in this maintenance event?: _____

Equipment used for trash removal:

☐ Manual/shovels/clamshell ☐ Vactor truck ☐ Other (describe): _____

Maintenance time spent at site (excluding travel, prep, cleanup, disposal):

☐ 15 min or less ☐ 15-30 min ☐ 30 min-1 hr ☐ 1-1.5 hrs ☐ 1.5-2 hrs ☐ >2 hours (please indicate): _____

OPTIONAL

☐ Photos from this maintenance event to be uploaded to the TrashTracker website

Materials removed (estimated percentage/volume in cubic feet if available; use other units if necessary):

- ☐ Plastic _____% _____ cubic ft.
- ☐ Paper _____% _____ cubic ft.
- ☐ Sediment _____% _____ cubic ft.
- ☐ Metal _____% _____ cubic ft.
- ☐ Leaves/vegetation _____% _____ cubic ft.
- ☐ Glass _____% _____ cubic ft.
- ☐ Other _____? _____% _____ cubic ft.

Thank You!

San Francisco Estuary Partnership, www.sfestuary.org
Janet Cox: (510) 622-2334 jwcox@waterboards.ca.gov
Jesse Mills: (510) 622-2466 jemills@waterboards.ca.gov