

Trash Long-Term Reduction Plan and Progress Assessment Strategy

February 1, 2014

Submitted by:
City of Piedmont
Public Works Department
120 Vista Avenue
Piedmont, CA 94611

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

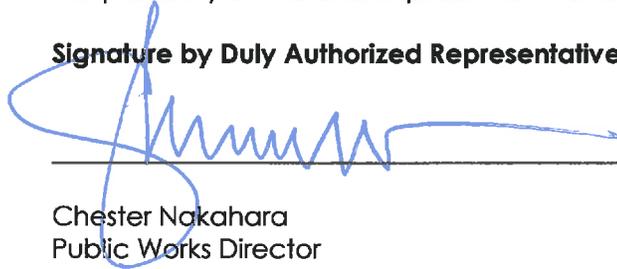
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**City of Piedmont
LONG-TERM TRASH LOAD REDUCTION PLAN AND
ASSESSMENT STRATEGY**

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:



Chester Nakahara
Public Works Director

February 1, 2014

TABLE OF CONTENTS

CERTIFICATION STATEMENT	III
TABLE OF CONTENTS.....	IV
LIST OF TABLES	IV
LIST FIGURES.....	V
LIST APPENDICES	V
ABBREVIATIONS.....	VI
PREFACE	1
1.0 INTRODUCTION	2
1.1 PURPOSE OF LONG-TERM TRASH REDUCTION PLAN	2
1.2 BACKGROUND.....	3
1.2.1 Long-Term Trash Load Reduction Plan Framework.....	3
1.2.2 BASMAA Generation Rates Project.....	4
1.3 ORGANIZATION OF LONG-TERM PLAN.....	5
2.0 SCOPE OF THE TRASH PROBLEM	6
2.1 PERMITTEE CHARACTERISTICS	6
2.2 TRASH SOURCES AND PATHWAYS	7
2.3 TRASH GENERATING AREAS	8
2.3.1 Generation Categories and Designation of Areas.....	8
2.3.2 Summary of Trash Generating Areas and Sources	10
3.0 TRASH MANAGEMENT AREAS AND CONTROL MEASURES	13
3.1 MANAGEMENT AREA DELINEATION AND PRIORITIZATION	13
3.2 CURRENT AND PLANNED TRASH CONTROL MEASURES	16
3.2.1 Trash Management Area #1.....	16
3.2.4 Jurisdiction-wide Control Measures	19
3.2.5 Creek and Shoreline Hot Spot Cleanups.....	21
3.2.6 Summary of Trash Control Measures.....	21
3.3 CONTROL MEASURE IMPLEMENTATION SCHEDULE	21
4.0 PROGRESS ASSESSMENT STRATEGY	25
4.1 ACCWP PILOT ASSESSMENT STRATEGY.....	25
4.1.1 Management Questions.....	25
4.1.2 Indicators of Progress and Success.....	25
4.1.3 Pilot Assessment Methods.....	26
4.2 BASMAA "TRACKING CALIFORNIA'S TRASH" PROJECT	28
4.2.1 Testing of Trash Monitoring Methods.....	28
4.2.2 Full Capture Equivalent Studies	29
4.3 ADDITIONAL PROGRESS ASSESSMENTS	29
4.4 LONG-TERM ASSESSMENT STRATEGY	29
4.5 IMPLEMENTATION SCHEDULE.....	30
5.0 REFERENCES	32

LIST OF TABLES

TABLE 1-1. SAN FRANCISCO BAY AREA TRASH GENERATION RATES BY LAND USE (GALLONS/ACRE/YEAR).

TABLE 2-1. PERCENTAGES OF THE CITY OF PIEDMONT'S JURISDICTIONAL AREA WITHIN LAND USE CLASSES IDENTIFIED BY ABAG (2005)

TABLE 2-2. TRASH GENERATION CATEGORIES AND ASSOCIATED GENERATION RATES (GALLONS/ACRE/YEAR).

TABLE 2-3. DEFINITIONS OF ON-LAND TRASH ASSESSMENT CONDITION CATEGORIES.

TABLE 2-4. PERCENTAGE OF JURISDICTIONAL AREA WITHIN THE CITY/COUNTY OF [INSERT MUNICIPALITY NAME] ASSIGNED TO EACH TRASH GENERATION CATEGORY.

TABLE 3-1. JURISDICTIONAL AREA AND PERCENTAGE OF EACH TRASH MANAGEMENT AREA (TMA) COMPRISED OF TRASH GENERATION CATEGORIES

TABLE 3-2. CITY OF PIEDMONT'S TRASH CONTROL MEASURE IMPLEMENTATION SCHEDULE.

TABLE 4-1. CITY OF PIEDMONT'S TRASH PROGRESS ASSESSMENT IMPLEMENTATION SCHEDULE.

LIST FIGURES

FIGURE 1-1. EIGHT-STEP FRAMEWORK FOR DEVELOPING, IMPLEMENTING AND REFINING LONG-TERM TRASH REDUCTION PLANS.

FIGURE 1-2. CONCEPTUAL MODEL OF TRASH GENERATION, INTERCEPTION AND LOAD.

FIGURE 2-1. TRASH SOURCES CATEGORIES AND TRANSPORT PATHWAYS TO URBAN CREEKS.

FIGURE 2-2. DEVELOPMENT OF TRASH GENERATION AREAS

FIGURE 2-3. FINAL TRASH GENERATION MAP FOR THE CITY OF PIEDMONT

FIGURE 3-1. TRASH MANAGEMENT AREA MAP FOR THE CITY OF PIEDMONT.

FIGURE 3-2. TRASH FULL CAPTURE DEVICE MAP FOR THE CITY OF PIEDMONT.

LIST APPENDICES

ABBREVIATIONS

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

PREFACE

This 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 Piedmont'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 Piedmont therefore reserves the right to revise or amend this Long-Term Plan at its discretion. If significant revisions or amendments are made by the City of Piedmont, a revised Long-Term Plan will be submitted to the Water Board through the City of Piedmont'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 Piedmont 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 Piedmont'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 Piedmont'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 of Piedmont 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, which included

the 40% trash activities for the City of Piedmont from February 1, 2012 to July 1, 2014. The City of Piedmont is 90% residential and there is no real trash problem that currently exists in town. The opportunities for more trash pick is minimal to none. The City has one of the best maintained street and park systems in the East Bay. Piedmont residents expect and get a “Nordstrom” level and service. The City of Piedmont can not increase it's long term trash pick up because there are limited opportunities for trash pick up. Quite simply if there is not any trash to pick up so how can you increase our trash loads?

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).

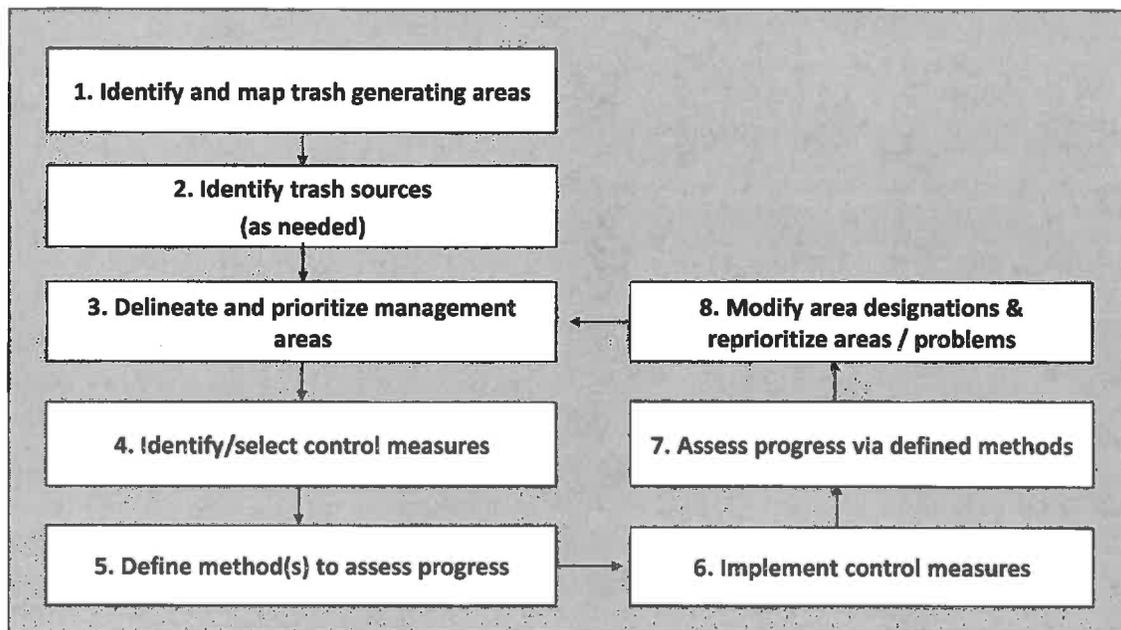


Figure 1-1. Eight-step framework for developing, implementing and refining Long-Term Trash Reduction Plans.

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 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	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 Piedmont. Control measures that will be implemented by City of Piedmont 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 1907, the City of Piedmont is located in Alameda County, and has a jurisdictional area of 1.7 square miles or 1088 acres. According to the 2010 Census, it has a population of 11,100, with a population density of 6,529 people per square mile and average household size of 2.92. Of the 11,100 residents who call City of Piedmont home, 31% are under the age of 18, 10% are between 18 and 24, 11% are between 25 and 44, 34% are between 45 and 64, and 14% are 65 or older. The median household income was \$161,000 in 2010. The City of Piedmont is home to mainly single Family Homes 70.0%, multi-family 3.0%, commercial 0.6%, 7.0% Parks and Open Spaces, .08% Religious and 20.0% streets. There are no industrial areas in Piedmont. There are 1,660 jobs in Piedmont with the majority employed by the School District and the City of Piedmont.

The City of Piedmont has a very high standard regarding the care and maintenance of it's facilities. The City has only two small commercial zones: the Civic Center commercial area and the Grand Avenue commercial zone. Both areas are very modest in size and there is really only one area in town, the Civic Center are next to Piedmont High School where there is a small amount of trash generated. The Piedmont High students can go off campus for lunch and usually use Piedmont Park and the civic center as their outdoor lunch room. City staff in conjunction with the school staff and volunteer groups pick up trash in these area three times per day when school is in session. This city currently does an outstanding job with trash pick up at all of it's facilities and streetscapes. There is no real trash problem that currently exists in town. The opportunities for more trash pick is minimal to none. The City has one of the best maintained street and park systems in the East Bay. Piedmont residents expect and get a "Nordstrom" level and service. The City of Piedmont can not increase it's long term trash pick up because there are limited opportunities for trash pick up. Quite simply if there is not any trash to pick up how can you increase your trash loads?

The City also does an outstanding job of street sweeping. Street sweepings really is year round and staff is on a constant on-call to respond to service requests. The City has over 150 trash cans located throughout the city's open spaces and civic areas. Last year we also installed recycling centers at all of our major parks, sports fields and civic center areas. The school district has also set up recycling stations at all of their elementary, middle and high school facilities.

Land uses within City of Piedmont depicted in ABAG (2005) are provided in Table 2. The City of Piedmont is primary comprised of four land uses. These include 90% residential, 7% parks and schools and 3% retail/commercial. There are no industrial sites in Piedmont.

Table 2-1. Percentages of the *City of Piedmont's* jurisdictional area¹ within land use classes identified by ABAG (2005)

Land Use Category	Jurisdictional Area (Acres)	% of Jurisdictional Area
Commercial and Services	13.5	1.2%
Industrial	0.0	0.0%
Residential	958.5	88.2%
Retail	2.5	0.2%
K-12 Schools	32.3	3.0%
Urban Parks	61.7	5.7%
Other	17.9	1.6%

2.2 Trash Generating Areas

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

As a first step, trash generation rates developed through the BASMAA Trash Generation Rates Project were applied to parcels within the City of Piedmont based on current land uses and 2010 household median incomes

Trash in San Francisco Bay Area creeks and shorelines originates from a variety of sources and is transported to receiving waters by a number of pathways (Figure). Of the four source categories, pedestrian litter includes trash sources from high traffic areas near businesses and schools, transitional areas where food/drinks are not permitted (e.g. bus stops), and from public or private special events with high volumes of people. Trash from vehicles occurs due to littering from automobiles and uncovered loads. Inadequate waste container management includes sources such as overflowing or uncovered containers and dumpsters as well as the dispersion of household and business-related trash and recycling materials before, during, and after collection. On-land illegal dumping of trash is the final source category.

Trash is transported to receiving waters through three main pathways: 1) Stormwater Conveyances; 2) Wind; and, 3) Direct Dumping. Stormwater or urban runoff conveyance systems (e.g., MS4s) consist of curbs/gutters, and pipes and channels that discharge to urban creeks and the San Francisco Bay shorelines. Wind can also blow trash directly into creeks or the Bay. Lastly, trash in receiving waters can also originate from direct dumping into urban creeks and shorelines.

¹ 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).

This Long-term Plan and associated trash control measures described in Section 3.0 are focused on reducing trash from one of the transport pathways illustrated in Figure 2.1. **stormwater conveyances**. Specifically, the Long-term Plan is focused on reducing the impacts of discharges from MS4s to San Francisco Area receiving waters and the protection of associated beneficial uses.

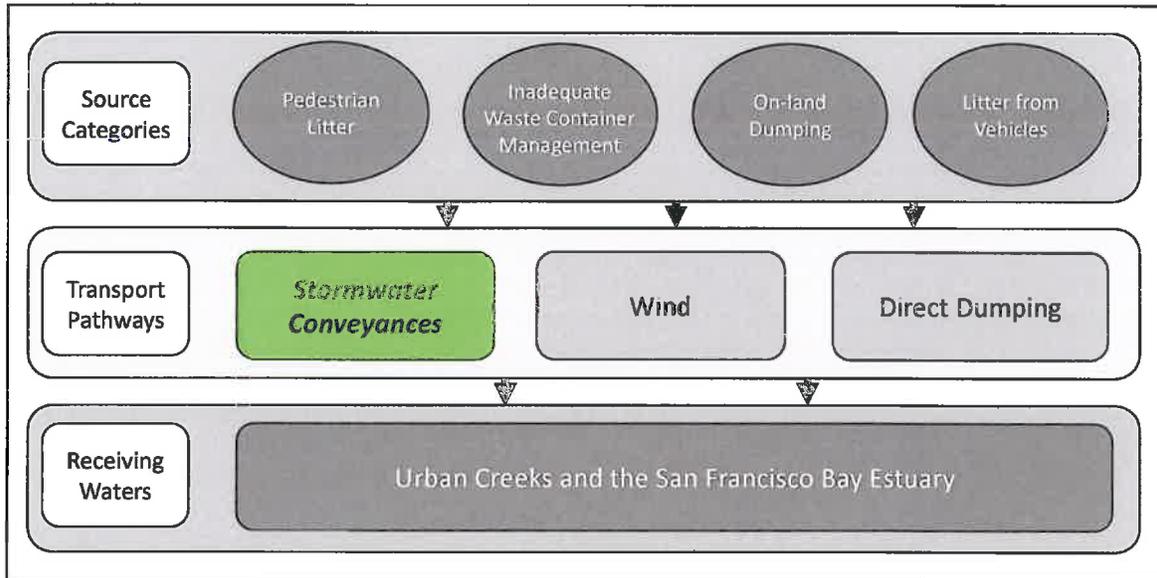


Figure 2-1. Trash sources categories and transport pathways to urban creeks.

2.3 Trash Generating Areas

2.3.1. Generation Categories and Designation of Areas

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

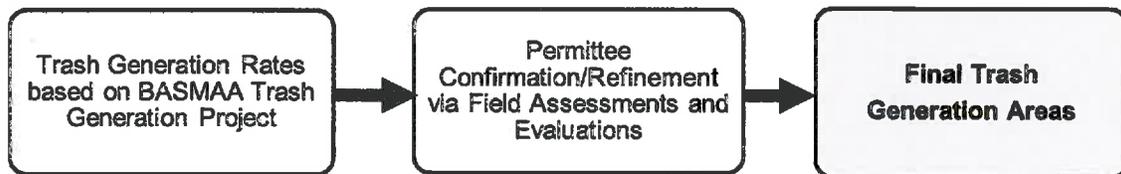


Figure 2-2. Development of Trash Generation Areas

As a first step, trash generation rates developed through the *BASMAA Trash Generation Rates Project* were applied to parcels within the City of Piedmont 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 Piedmont 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 Piedmont 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 Piedmont staff refined maps using the following process:

1. Based upon our knowledge of trash generation and problem areas within the City of Piedmont, 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 of Piedmont 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. Using the Draft Protocol the City of Piedmont assessed a total of two areas to assist in conducting/refining trash generating area designations.

The City has two areas that are of some minor concerns for trash generation. They are Bushy Dell Creek and the Civic Center Area. They are assessed and cleaned three times a day during weekday periods.

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 or Members of the Public

The City of Piedmont staff daily visually assesses the hot spots area in Piedmont Park and the Civic Center Area. Trash is picked up by City staff, contract staff and Republic Services. At the end of each day almost all of the trash is picked up in these areas of concern. Public Volunteer groups (Boy Scouts, Brownies, Garden Clubs) are encouraged to schedule trash clean up days along Bushy Dell Creek

c. Reviewing Municipal Operations Data

The street maintenance division provided data related to existing street sweeping practices, inlet cleaning (vactoring) and on-land cleanup efforts. Also maintenance schedules were prepared for the newly installed full capture devices installed in the civic center area.

d. Viewing Areas via Goggle Maps – Street View

Because of the limited areas of concerns (Civic center and Bushy Dell Creek) the Google maps were not needed and they are not applicable for Piedmont.

- Based on assessments conducted to confirm/refine trash generation category designations, the City of Piedmont created a final trash generation map that depicts the most current understanding of trash generation within the City of Piedmont. The City of Piedmont documented this process by tracking the information collected through the assessments and subsequent refinements to the Draft Trash Generation Map. The City of Piedmont's Final Trash Generation Map is included as Attachment 1.

2.3.2 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 . Please refer to Attachment 1 for Piedmont's final trash generation map.

Table 2-4. Percentage of jurisdictional area within the City of Piedmont 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	0.9	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Medium	108.9	12.4%	0.0%	0.0%	1.3%	29.7%	56.6%	0.0%
Low	976.6	0.0%	0.0%	98.2%	0.0%	0.0%	0.0%	1.8%

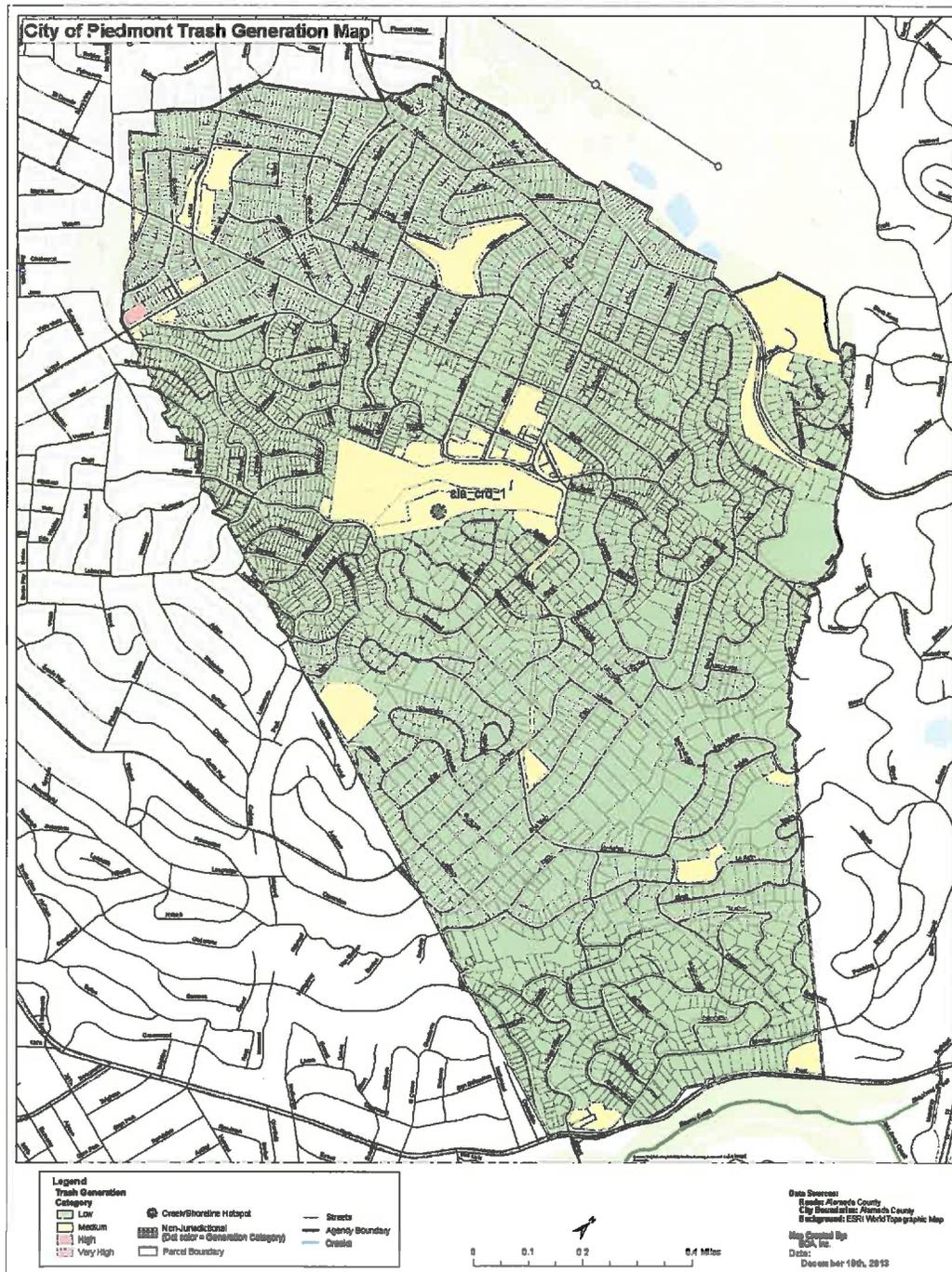


Figure 2-3. Final Trash Generation Map for the City of Piedmont

3.0 Trash management areas and control measures

This section describes the control measures that the City of Piedmont 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 Piedmont'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 of Piedmont 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 of Piedmont 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 Piedmont's annual reporting process.

3.1 Management Area Delineation and Prioritization

The City of Piedmont has only one (TMA) that needs to be addressed, that is Piedmont Park and Civic Center which are located directly adjacent to each other. Consistent with the long-term plan framework, the City of Piedmont 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 Piedmont'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 City's jurisdiction. City staff used the following procedure to designate TMAs:

The City of Piedmont is 90% residential and there is only one TMA that is of any concern. A visual on-land assessment and local institutional knowledge were used to create the one Piedmont TMA. This is Piedmont's trash hot spot and where the majority of the full capture devices were installed.

A map depicting the City of Piedmont's one TMA is included as Attachment 2. 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 .

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	15.9	0.0%	5.8%	94.2%	0.0%
2	100.8	0.0%	0.0%	93.2%	6.8%
3	11.0	0.0%	0.0%	0.0%	100.0%
4	958.7	0.0%	0.0%	0.0%	100.0%

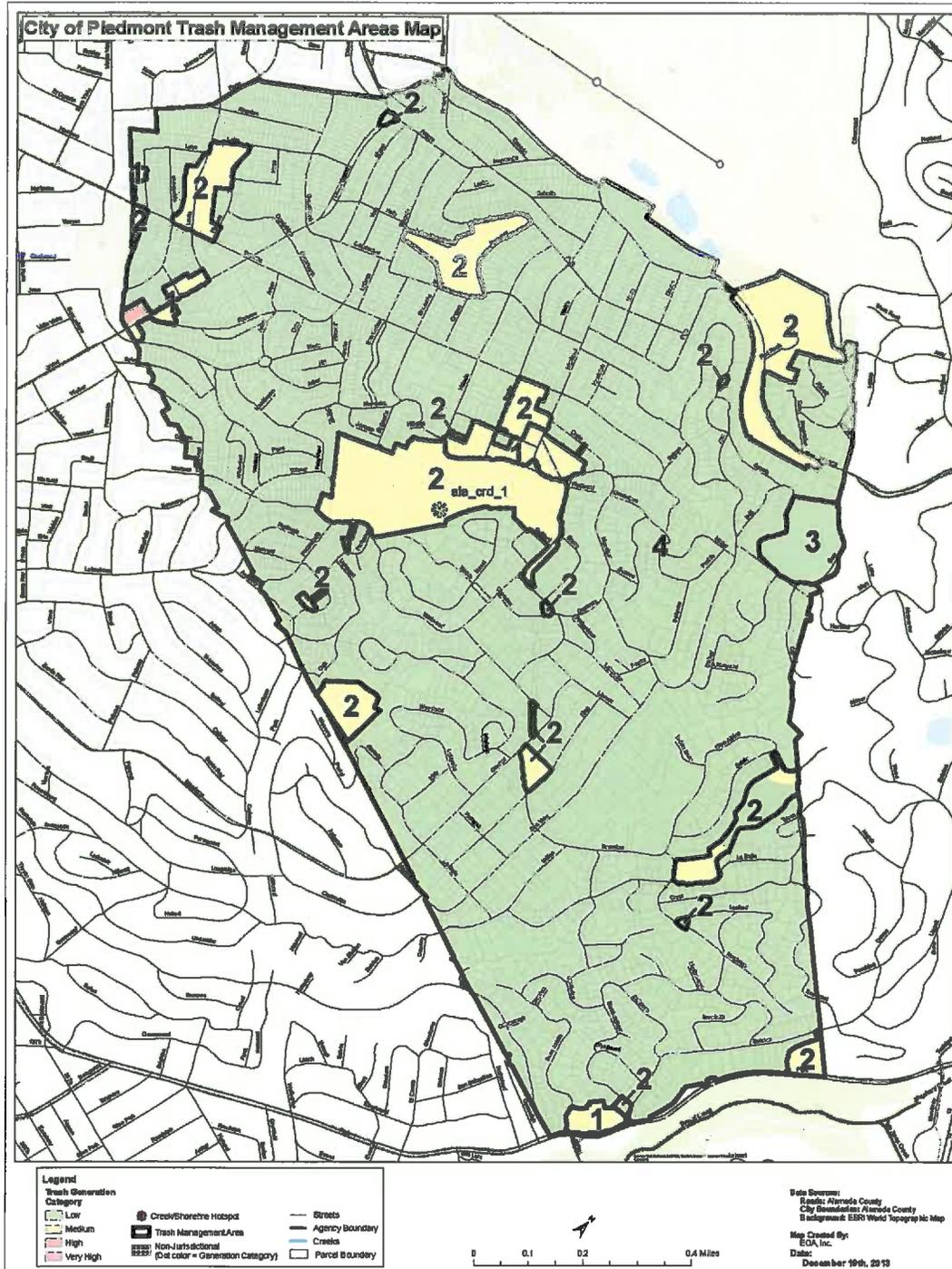


Figure 3-1. Trash Management Area Map for the City of Piedmont.

3.2 Current and Planned Trash Control Measures

Control Measures

3.2.1. Trash Management Area #1

Piedmont Park, Civic Center and Piedmont High/Middle School.

Trash generated each week day by the Piedmont High School and Middle Schools students.

They have off-campus privileges at lunch time where some trash is generated each week day

- The City of Piedmont has addressed trash through our on-going maintenance operations and manual clean-up activities. At the City's one hot spot location, maintenance crews pick up trash three times per day to coincide with the Piedmont's high and middle school schedules. Piedmont does not allow trash to stay more than a day at any location. This is accomplished through institutional knowledge and residents that demand pristine parks, open spaces and civic center areas.
- The City of Piedmont has an aggressive street tree sweeping program that operates all year. There are set sweeping schedules and sweeping will occur on as needed basis. Piedmont residents know their street will be swept with just a phone call to Public Works Department.
- The city operates three street tree sweepers which is extraordinary for a city our size and population.
- The City of Piedmont has installed twelve trash capture devices mostly around the Civic Center area and Piedmont Park.
- The City of Piedmont has also placed new recycling centers at all of their major parks, ball fields and civic center locations. The City of Piedmont has approximately 150 trash cans located throughout the City. The trash is picked up weekly/daily by city park staff, our landscape contractor, Cleary Brothers and by our trash collector.
- The City of Piedmont also has a yearly storm drain maintenance which takes place in the Fall/Winter months. Every storm drain inlet is vactor'd yearly and on a as needed basis by a contracted company. Because we vactor so frequently we have not had a problem with our full capture trash devices overflowing.
- City Staff has coordinated with school officials to create student lunch monitors that help control student littering. Staff each season work with the scouts and other civic groups to do on-land and creek clean-ups when needed.
- The City of Piedmont has a very active police department with constant surveillance by police officers in cars, volunteer rangers and most recently through the use of cameras. Because of the heightened security, the Piedmont close knit neighborhoods self police their streets and very little goes on without the police or public work's involvement. Therefore the City does not have a problem with illegal dumping, homeless encampments and other activities that could lead to water pollution.

- Because of the very few commercial establishments in town the City has only a handful of trash containers and each of these are enclosed with an aesthetically pleasing enclosure and are well maintained and managed.
- All of these action have been implemented over the last three years. **There is no need to increase the frequency or the quality of service because there are no more trash problems that need correcting at this time or that the City's sees in the foreseeable future.**
- There are no existing or new trash problems that need to be addressed at this time in the City of Piedmont. With a work force that includes City Staff, Contract Landscape Maintenance Companies and Republic services the City has the trash management issues firmly under control. The City is fortunate to have a stable tax base, supportive City Council and citizens that allocate the needed funding and staff to stay on top of these trash issues. The City of Piedmont does not face the same trash issues of larger cities like Oakland, Berkeley and Fremont.

The City of Piedmont each year during the Fall and Winter months contracts out to a private vectoring company cleaning of all of the catch basins in town especially those located in high traffic areas.

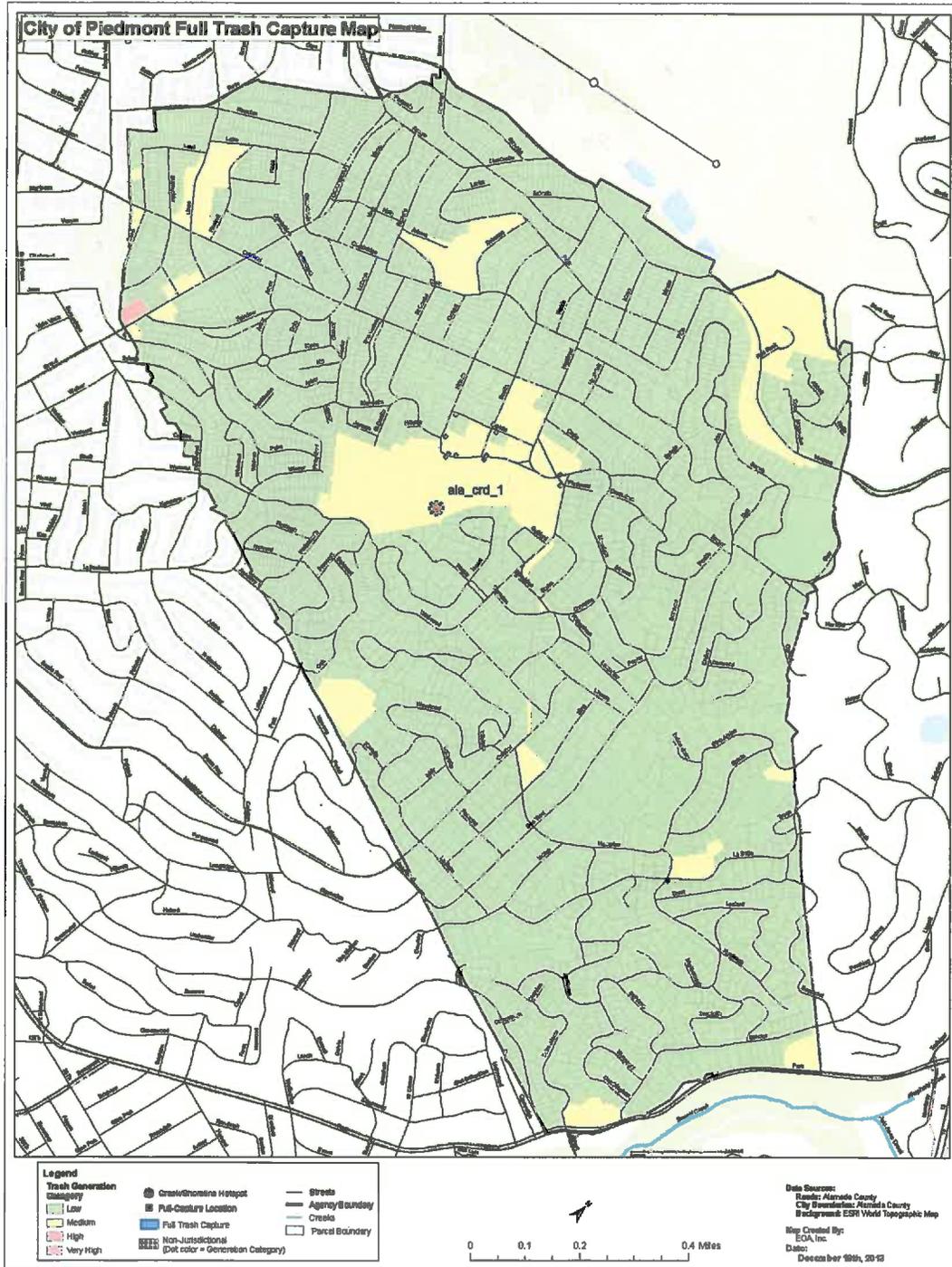


Figure 3-2. Trash Full Capture Device Map for the City of Piedmont

3.2.4. Jurisdiction-wide Control Measures

The City of Piedmont does not plan to add any new trash control measures because no new measures are needed at this time. The City already has the following effective programs in place:

- An aggressive trash receptacle management, especially at our one 'hot spot' location
- Superlative street sweeping program
- Public Support from Piedmont Schools and Private Organizations
- Stable and sufficient Budget
- Supportive City Council and Commissions
- Aggressive surveillance system through the police department and new surveillance cameras
- An highly educated and affluent citizenry
- Active Local Volunteer Groups (Scouts, (8) Garden Clubs, Piedmont Beautification Foundation etc.. Public Events that educate and support clean water ideals. The City of Piedmont provides outreach and education through the following programs: Arbor/Earth Day Celebration, the Annual Harvest Festival and the annual July 4th Celebration. These event are attended by hundreds of Piedmont residents. These control measures are considered baseline because they were not related to trash reduction specifically. The City also works with many local clubs (eight Garden Clubs), the Piedmont Beautification Foundation and the Boy and Girls scouts. We schedule several creek clean up days when they are required, The city has a motto that trash in parks and open spaces invite more trash. We attempt to clean up any trash the day that it occurs.
- The City has also run anti litter campaigns on our local TV Channel, KCOM. We use the local station and the City's web site to bring home the Clean Water message to Piedmont residents and children
- Passed the Plastic Bag Ban Ordinance by City Council (No need for polystyrene, No restaurants in town).
- The City of Piedmont is a member of ACCWP. The jurisdiction-wide control measures described below will be conducted through participation in ACCWP
 - **Enhanced Level of Implementation Bay Area Wide**
 - Through the participation and funding of the regional BASMAA Youth Outreach Program Campaign, on the behalf of the City of Piedmont, will implement an outreach campaign designed to reduce littering from the target audience in the Bay Area. The Youth Outreach Campaign was launched in September 2011 (post MRP effective date) and aims to increase the awareness of Bay Area Youths (ages 16-24) on litter and storm water pollution issues, and eventually change their littering habits. Combining the ideas of the Community Based Social Marketing with traditional advertising. The youth Campaign aims to youth to enable peer-to-peer distribution of Campaign messages. This Campaign will at least run from FY11-12 through FY13-14. A brief description of the Campaign is provided below:
 - **Raising Awareness:** The Campaign will begin by raising awareness of the target audience on litter and storm water pollution issues. Partnerships with youth commissions, high schools and other youth focused organizations will be developed to reach the target audience. Messages targeted to youth will be created and distributed via paid advertising, e-mail marketing Campaign website and social networking (e.g.. Facebook and twitter).
 - **Engage the Youth:** The advertisements will encourage the audience to participate in a Facebook page, entering a contest, taking an online quiz, etc.. and providing their contact information. At the beginning of FY 12-13, A video contest will be launched to get Bay Area youths further involved in the Campaign. An on-line voting system will be

used to select the winning entry. Media advertising will be conducted to promote the entry.

- **Change Behaviors:** To move the audience along the behavior continuum, the Campaign will use electronic platforms such as email marketing and social networking sites to encourage participants to engage in increasingly more difficult behavior changes, such as participating in a clean-up, organizing a clean-up etc.,
- **Maintain Engagement:** The Campaign will continue to interact with the target audience through email and social media websites.

The Youth Campaign will include a pre and post campaign survey to evaluate the effectiveness of the outreach. The precampaign survey will be conducted in FY 11-12 and the post campaign survey in FY13-14. Other evaluation mechanisms such as websites hits, number of youths engaged in the Campaign's social networking websites etc.. will also be used to evaluate its effectiveness and changing behavior.

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 award a total of up to \$125,000 per year to up to 4 successful applicants. 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.

Multi-Family Dwelling Litter Outreach (The City of Piedmont very limited number of low density multi-family dwellings)

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 pilot litter reduction outreach program targeting multi-family dwellings. Three facilities and one control site will be participating in the pilot program. The pilot program will be implemented over the next several months and will include developing outreach materials for non-English speaking communities. Depending on its success, the program may be implemented at other multi-family dwellings 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.

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.

3.2.5 Creek and Shoreline Hot Spot Cleanups

The City of Piedmont has two hot spot areas: Bushy Dell Creek and the Piedmont Civic Center area. The hot spots are adjacent to each other and are directly connected to Piedmont high and Middle Schools. These hot spot area are cleaned up to three times daily by City Crews, Contract Landscape Contractors and Republic Services. The daily amount of trash will vary greatly but on average two 20 gallon trash cans are filled weekly.

We have also installed litter/recycling stations at all of our major parks and ball fields. The city has over one hundred and thirty trash stations in our public open spaces. The litter is picked up by city staff, contract landscape maintenance companies and Republic Services. Because of all of these efforts on a daily basis, Piedmont Parks and open spaces are virtually trash free.

3.2.6 Summary of Trash Control Measures

As previously stated, the City of Piedmont has a very high standard regarding the care and maintenance of its facilities. The City has only two small commercial zones: the Civic Center commercial area and the Grand Avenue commercial zone. Both areas are very modest in size and there is really only one area in town, the Civic Center are next to Piedmont High School where there is a small amount of trash generated. The Piedmont High students can go off campus for lunch and usually use Piedmont Park and the civic center as their outdoor lunch room. City staff in conjunction with the school staff and volunteer groups pick up trash in these area three times per day when

school is in session. This city currently does an outstanding job with trash pick up at all of it's facilities and streetscapes. There is no real trash problem that currently exists in town. The opportunities for more trash pick is minimal to none. The City has one of the best maintained street and park systems in the East Bay. Piedmont residents expect and get a "Nordstrom" level and service. The City of Piedmont can not increase it's long term trash pick up because there are limited opportunities for trash pick up. Quite simply if there is not any trash to pick up how can you increase your trash loads?

3.3 Control Measure Implementation Schedule

The City of Piedmont needs no new trash implementation program in the future because presently effectively all the trash that is generated in the City is being removed within a short period of time.

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

Trash Management Area and Control Measures	Pre-MRP	Short-Term						Long		
		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
TMA #1				X	X	X	X	X		
Control Measure #1				X	X	X	X	X		
Control Measure #2										
Jurisdiction-wide Control Measures										
Control Measure #1										
Single-Use Bag Ban										
K-12 School Outreach										
Be the Street campaign				X	X	X	X	X	X	X
Multi-Family Dwelling Outreach										
Community Stewardship Grants (litter)										
Litter related outreach to residents	X	X	X	X	X	X	X	X	X	X
Creek and Shoreline Hot Spot Cleanups										
Control Measure #1										
Control Measure #2										

^aJuly 1, 2014 - 40% trash reduction target

^bJuly 1, 2017 - 70% trash reduction target

^cJuly 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 Piedmont. 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 of Piedmont 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 Piedmont. 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.

4.1.1 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 product bans
- 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 Piedmont 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.

4.1.2 Pilot Assessment Methods

This section briefly summarizes the preliminary assessment methods that the City of Piedmont 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 of Piedmont.

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 or 21 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 will be included in the ACCWP Pilot Assessment Strategy to be submitted separately.

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

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

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 Piedmont 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 product bans

2-C Implementation of an effective street sweeping program

2-D Commercial Trash Container Management

2-E Residential Trash Container Management

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 Project is funded through a Proposition 84 grant awarded to BASMAA by the State Water Resources Control Board (SWRCB) who recognized the need for standardized trash assessment methods that are robust and cost-effective.

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 field work 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

None

4.4 Long-Term Assessment Strategy

The City of Piedmont is committed to implementing standardized assessment methods post-2016 based on the lessons learned from pilot assessments and studies that will occur between 2014 and 2016. 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 agreed upon assessment methods that will be used to demonstrate progress during the remaining term of trash reduction

requirements. Reporting using the new/revised methods will begin with the FY 2016-17 Annual Report.

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 Piedmont 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)										
On-land Visual Assessments										
Initial (Baseline) Assessments	X									
Pilot Progress Assessments		X	X	X	X					
Full Capture Operation and Maintenance Verification			X	X	X					
Control Measure Effectiveness Evaluations	X	X	X	X	X					
Receiving Water Condition Assessments	X	X	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					
Long-Term Trash Assessment Strategy (ACCWP)										
						X	X	X	X	X

^aJuly 1, 2014 - 40% trash reduction target
^bJuly 1, 2017 - 70% trash reduction target
^cJuly 1, 2022 - 100% trash reduction target

NOTE:

As stated previously the City of Piedmont cannot increase trash pick up. There is no need for a future management schedule when all of the trash is currently being picked up.

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