Humboldt BAYKEEPER
Klamath RIVERKEEPER
Yuba River WATERKEEPER
Russian RIVERKEEPER
Monterey COASTKEEPER
Santa Barbara CHANNELKEEPER
Ventura COASTKEEPER
Los Angeles WATERKEEPER
Orange County COASTKEEPER
Inland Empire WATERKEEPER
San Diego COASTKEEPER

To: Jonathan Bishop, Deputy Director, State Water Resources Control Board

From: Sean Bothwell, Policy Director, California Coastkeeper Alliance

CC: Gayleen Perreira, Sr. WRCE (Municipal Storm Water Unit), State Water Resources Control Board
Greg Gearheart, Deputy Director (OIMA), State Water Resources Control Board
Cris Carrigan, Director of the Office of Enforcement, State Water Resources Control Board
Sarah Wheeler, Project Scientist, California Ocean Science Trust
Holly Wyer, Program Manager, Ocean Protection Council
Stephen Weisberg, Executive Director, Southern California Coastal Water Research Project

Date: May 24, 2017

RE: Recommendations for Trash Amendments Compliance Monitoring

I. EXECUTIVE SUMMARY

This memo provides California Coastkeeper Alliance's recommendations for the Trash Amendments compliance monitoring. MS4 permittees will need two monitoring programs to demonstrate compliance with the Trash Amendments: Compliance monitoring of the Amendments' provisions and in-stream monitoring to demonstrate water quality objective compliance.

- Compliance Monitoring of the Trash Amendments' Provisions – Despite its enforcement deficiencies as detailed below, the Visual Assessment Method may be acceptable to determine compliance with the Trash Amendments' provisions if it is accompanied by strict liability.

- Instream Monitoring to Demonstrate Compliance with the Water Quality Objective – CCKA supports the State Water Board's partnership with the Ocean Protection Council and Ocean Science Trust to develop a statewide protocol for instream monitoring. We strongly advise all parties to incorporate the recommended monitoring protocol set forth below and derived from the City of San Jose Trash Monitoring Plan (See Attachment 1) into any statewide instream monitoring protocol.

II. TRASH AMENDMENTS' PROVISIONS COMPLIANCE DETERMINATION

a. The Visual Assessment Method must include strict liability.

The Clean Water Act requires every NPDES permittee to monitor its discharges into the navigable waters of the United States in a manner sufficient to determine whether it is in compliance with the relevant

NPDES permit.[1] "[E]ach NPDES permit shall include conditions meeting the following . . . monitoring requirements . . . to assure compliance with permit limitations."[2] That is, an NPDES permit is unlawful if a permittee is not required to effectively monitor its permit compliance.[3] The Trash Amendments, which will be incorporated into NPDES permits, states that compliance monitoring must be able to "demonstrate…compliance with full capture system equivalency."[4]

The Visual Assessment Method – as originally proposed by the San Francisco Regional Water Board – is unenforceable on its own and is not sufficient to determine whether a Permittee is in compliance with the relevant NPDES permit. Trash accumulating upstream of an MS4 may help indicate the quantity of trash entering the MS4 and ultimately discharges into the waterway. However, it is likely that the Water Boards' enforcement staff will be unable to prove causation between trash generated on the street and sidewalks result in the actual discharged of trash into a waterway.

To ensure the Visual Assessment Method is enforceable and complies with the Clean Water Act, a Permittee must assume strict liability for visual assessments that show non-compliance with the requirements of the Trash Amendments. If a Permittee self-selects the Visual Assessment Method for monitoring Track 2 compliance – and the Permittee's own visual assessments demonstrate the Permittee is out of compliance – then the Permittee should be deemed out of compliance without the State or Regional Water Board proving causation and/or the actual discharge of trash into a waterway.

b. The State Water Board should provide a recommended protocol for the Visual Assessment Method to ensure precise compliance analysis and uniformity between regions.

As qualitative visual trash assessments usually lacks the precision of chemical stormwater analysis, assessors need to pay careful attention to quality control. Procedures should be in place to ensure assessments are replicable. As these assessments are subjective, multiple trained staff should be conducting each assessment, as well as validation exercises between assessment teams conducted several times per year. Visual assessment programs with high levels of variability must require a higher sampling frequency.

Data generated through compliance monitoring must yield data that is actionable from an enforcement perspective. Visual assessments should be conducted in a fashion that allows the Permittee to assess management actions on trash generation rates as well as introduction of trash into the MS4 stormwater system. If a visual assessment of trash on streets is used for compliance monitoring, data generated must be able to be used as a proxy for the quantity of trash that moved through the MS4 stormwater system and show equivalency to the effectiveness of full capture systems.

If visual assessment methods produce data categories (such as the Low-Very High categories of the OVTA method), categories should be sufficiently narrow to allow for enforceable action based on results. Categories should be correlated to the quantities of trash contributions to the MS4. Categories should be sufficiently narrow to allow for the comparison of performance results to full capture systems. Categories should be based on magnitude of departure from full capture system performance.

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[1] 33 U.S.C. § 1342(a)(2); 40 C.F.R. § 122.44(i)(1).
[2] *Id.*
[3] See 40 C.F.R. § 122.26(d)(2)(i)(F) ("Permit applications for discharges from large and medium municipal storm sewers . . . shall include ...monitoring procedures necessary to determine compliance and noncompliance with permit conditions . . . .").
[4] State Water Resources Control Board, FINAL AMENDMENT TO WATER QUALITY CONTROL PLAN FOR OCEAN WATERS OF CALIFORNIA TO CONTROL TRASH, D-8 (April 7, 2015).

There should be an adequate number of sampling sites to characterize compliance with Track 1 performance goals. GIS maps of the drainage basins covered by management actions should be produced and high priority areas should be categorized by track 2 management type. Ideally assessments should be conducted in each drainage basin. If that is not possible, a representative number of sites must be chosen to allow for comparisons based on management actions and land use types. Data must be able to be used to determine effectiveness of each action in each mix of land use areas. Permittees should be able to show compliance in all types of management actions. Site selection should be based on probability-based stratified-random design. This will allow for analysis for compliance of the whole MS4 system in priority areas.

Visual trash assessments should be conducted at a frequency that is high enough to determine compliance with the trash amendment. Annual sampling frequency should be determined by using power analysis conducted at each site. In the absence of sufficient data to conduct the power analysis on individual sites, studies or a literature review should be conducted to determine minimum sampling frequencies. For example, BASMA 2016[5] identified 6 sampling events are needed to identify a 0.5 change in grade levels with a 90% confidence level.

The timing of assessments should be carefully considered. Assessments should be conducted either immediately before rain events, or at times that are most representative of the effectiveness of management actions.

III. INSTREAM MONITORING TO DEMONSTRATE WATER QUALITY OBJECTIVE COMPLIANCE

We strongly support the State Water Board's efforts to partner with the Ocean Protection Council and the Ocean Science Trust to contract SCCWRP to provide recommendations on a statewide instream monitoring protocol. We would highly recommend that any statewide instream monitoring protocol be based on the City of San Jose Trash Monitoring Plan[6]. This monitoring program yields more actionable data than the 2007 SWAMP protocols.

The San Jose Trash Monitoring Plan is designed to answer 6 questions:

1. Have trash control actions effectively prevented trash within San Jose's jurisdiction from discharging into receiving waters?
2. Is trash present in receiving waters, including transport from one receiving water to another at levels that may cause adverse water quality impacts?
3. What proportions of trash found in these receiving waters are from MS4 pathways and non-MS4 pathways?
4. What is the characterization of trash types in these receiving waters?
5. Has the amount of trash discharged from San Jose MS4 decreased from the previous year and over time? If so, by how much? If not, why?
6. Has the amount of trash Hot Spots decreased from the previous year?

[5] Bay Area Stormwater Management Agencies Association. *Evaluation of the on-land Visual Assessment Protocol as a method to establish baseline levels of Trash and Detect Improvements in Stormwater* Quality, 2016
[6] City of San Jose, Trash Receiving Waters Monitoring Plan, 2016.

The program collects data on:

1. Weight and volume of trash removed;
2. Types of trash removed; and
3. Estimated proportion of trash from MS4 and non MS4 systems.

In general, the San Jose monitoring program collects both quantitative and qualitative data from assessments. They identify the usefulness of qualitative assessments to "detect relatively substantial changes in the levels of trash observed over a defined time period". Quantitative assessments are more suitable for assessment of management actions.

Monitoring is conducted in three steps:

1. Defining Assessment Areas
    a. San Jose Trash monitoring program monitors 300 ft. stream reaches. Width of the channel is defined by the high-water line, usually the bankfull width.

2. Conducting Qualitative Assessments
    a. Sites are scored on visual assessments of trash impacts.
    b. Sites are given a 0-20 score based on levels of visual trash impacts.
    c. Trash is characterized by estimates of potential trash pathways into the receiving water.
        i. Percent of trash from four different sources (stormwater, Homeless Encampment, Illegal Dumping/Litter, Wind) is identified.

3. Conducting Quantitative Assessments
    a. All trash from the assessment area is collected and categorized based on type, size and condition, and location.
    b. Trash sorted into categories based on stormwater vs non stormwater transport pathways.
        i. Stormwater Trash is identified by being "Small, persistent, transportable, able to fit into storm drain inlets" and one of the following:
            1. Old, worn, water damaged;
            2. Integrated with vegetation or debris;
            3. Well distributed and mixed with debris,
    c. Volume and weight of each trash transport pathways is obtained.
    d. Trash from each transport pathway is then characterized by type.
        i. Volume of trash is estimated from each of eight categories:
            1. Plastic recyclable beverage containers;
            2. Glass recyclable beverage containers;
            3. Single-use plastic carryout grocery bags;
            4. Expanded Polystyrene Disposable Food and Beverage Ware;
            5. Rigid Plastic Disposable Food and Beverage Ware;
            6. Cigarette Butts;
            7. Other Plastic;
            8. All other Trash.
    e. Sites are scored based on visual identifications of trash quantity.

This is a robust process that we would like to see used as a model for statewide receiving water monitoring. The important characteristics that should be included in a statewide model are:

1. Assessment locations are relatively long, 300ft. It is the experience of California Waterkeeper organizations that there is considerable spatial variability in trash distribution. By assessing relatively long stream reaches, more of that variability is captured.
2. Assessments contain both Qualitative and Quantitative Assessments. Qualitative assessments are able to quickly measure general levels of trash in receiving waters, whereas quantitative measures are able to assess the effectiveness of specific management actions (bag bans, recycling bins, street sweeping, etc).
3. The criteria used in the identification of transport pathways is clear, unambiguous, and replicable.
4. Both total volume and weight of trash is collected. Together these two measurements provide a clear picture of the extent of trash in the receiving waters. Counts of trash types do not provide a clear picture, as plastic debris is easily broken down into smaller and smaller parts.
5. Debris volume is categorized by type. As weights and volumes vary dramatically be debris types, categorization of types allows for like to like comparisons across a region. Additionally, type comparisons allow managers and regulators to assess the effectiveness of specific management actions.

Additionally, site selection should be based on probability-based stratified-random design. This will reduce bias in the site selection as well as providing the data needed to assess total stream miles affected by trash. Sites should be assessed at least twice annually, once in the dry season and once in the wet season. Trash in the MS4 mobilized in the rainy season. Having dry season and rain season data allows for a more complete picture of MS4 transport mechanisms.

IV. Conclusion

Monitoring for trash is not easy. There is no easy way to conduct compliance monitoring for Track 2—the reason CCKA strongly supported Track 1 and its associated incentives. Regardless, monitoring must be done to demonstrate compliance with the Trash Amendments' provisions and its water quality objective. But most importantly, any recommended monitoring scheme must be enforceable.

The State Water Board, along with its partners at the Ocean Protection Council and the Ocean Science Trust, should recommend a statewide monitoring protocol that includes:

- Compliance monitoring using the Visual Assessment Method accompanied by strict liability; and

- In-stream monitoring that largely mirrors the City of San Jose Trash Monitoring Plan.

ATTACHMENT ONE

CITY OF SAN JOSE TRASH MONITORING PLAN

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

TRASH RECEIVING WATERS MONITORING PLAN

Submitted in Compliance with the Consent Decree (Civil Case No.: 15-CV-00642-BLF) entered into by and between the San Francisco Baykeeper and the City of San Jose

December 2, 2016

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1.0 INTRODUCTION

1.1. Purpose and Objectives

This Trash Receiving Water Monitoring Program Plan (Trash Monitoring Plan) is submitted by the City of San José (City) in compliance with the Consent Decree entered into by and between San Francisco Baykeeper (Baykeeper) and the City.[1] The Consent Decree describes actions that the City has agreed to implement (without admission of any alleged violation or other wrongdoing) to resolve complaints filed by Baykeeper and to avoid costly litigation.

Provision V of the Consent Decree requires the City to address five components of a Trash Reduction Program, including:

A. Trash Reduction Requirements
B. Compliance with the MS4 Permit
C. Receiving Water Monitoring Program
D. Full Capture Systems
E. Trash Hot Spots
F. Trash Program Reporting and Action Plan

Provision V.C requires the City to develop a Trash Receiving Waters Monitoring Program that is designed to answer the following questions:

1. Have trash control actions effectively prevented trash within San José's jurisdiction from discharging into receiving water(s)?
2. Is trash present in receiving water(s), including transport from one receiving water to another, e.g., from a creek to a San Francisco Bay segment, at levels that may cause adverse water quality impacts?
3. What proportions of trash found in these receiving waters are from MS4 pathways and non-MS4 pathways?
4. What is the characterization of trash types in these receiving waters?
5. Has the amount of trash discharged from the San José MS4 decreased from the previous year and over time? If so, by how much? If not, why?
6. Has the amount of trash at the Trash Hot Spots decreased from the previous year?

To address these questions, the City is required to collect and record the following data at six Trash Hot Spot locations one time each year:

- Weight and volume of trash removed;
- Types of trash removed (characterization); and
- Estimate proportion of trash from municipal separate storm sewer system (MS4) and non-MS4 sources.

The City contracted with EOA, Inc. (EOA) to provide technical support/assistance on the development of a Trash Monitoring Plan that addresses the requirements that are described in Provision V.C of the Consent Decree.

The City is also addressing trash monitoring activities in compliance with Provision C.10 of the Municipal Regional Stormwater Permit for Bay Area Phase 1 Permittees (a.k.a. MRP). Provision C.10.b.v. of the MRP requires Permittees to develop a Trash Monitoring Program Plan by July 1, 2017 and begin implementing

[1] Consent Decree became effective on August 11, 2016.

the plan in fall 2017. Permittees (including the City) have joined together through the Bay Area Stormwater Management Agencies Association (BASMAA) to develop a Trash Monitoring Program Plan to satisfy the MRP requirement, which will allow for regional consistency in the implementation of trash monitoring methodologies. The MRP-required Monitoring Program Plan is required to address similar study questions as those presented in the Consent Decree.

1.2 Project Organization

The Trash Monitoring Plan will be implemented by the City and/or its' contractors or partners that will be under the oversight of the City's Project Manager. Roles for key project staff are presented in Table 1.

Table 1. San Jose Trash Monitoring Plan Roles and Responsibilities.

Role	Name (Affiliation)	Contact Information
Project Manager	Jennifer Seguin (City of San Jose)	Jennifer.seguin@sanjoseca.gov
Responsible for oversight of managerial-level activities, including budgeting and reporting.		
Monitoring Project Manager	Brad Hunt (City of San Jose)	Brad.hunt@sanjoseca.gov
Responsible for day-to-day operations associated with implementation of the Trash Monitoring Plan. Responsible for planning and organizing staff and support for monitoring events.		
Quality Assurance Officer	TBD	TBD
Provides independent oversight and review of the quality of the data being generated.		

2.0 MONITORING DESIGN

2.1 Monitoring Locations

The Consent Decree identifies six existing Trash Hot Spot locations in receiving waters for trash monitoring. These sites are a subset of the 32 Trash Hot Spots where the City removes trash each year to meet MRP requirements. Three of the Consent Decree-identified locations are located on Coyote Creek, two are on Guadalupe River, and one is on Los Gatos Creek. Trash removal, and for some locations trash characterization has been conducted by the City on an annual basis at a majority of these sites since 2012. Based on data collected by the City in previous years, these six sites generally represent locations where the most trash is collected via hot spot cleanups. Site information is provided in Table 2 and the locations of the sites are illustrated in Figure 1.

Table 2. Receiving Water Monitoring Locations at Designated Trash Hot Spots. Coordinates are provided for the lower end of the monitoring location; assessment area is 300 feet in length.

Site ID	Watershed	Coordinates (Lower End)		Location
		Latitude	Longitude	
SJC02	Coyote Creek	37.35947	-121.87377	Watson Park, Upstream edge of Highway 101 Bridge
SJC08	Coyote Creek	37.34543	-121.87428	Roosevelt Park; Approximately 300 feet downstream W Santa Clara Street Bridge
SJC25a	Coyote Creek	37.29603	-121.82105	Approximately 150 feet upstream the centerline of Singleton Road crossing
SJC23	Los Gatos Creek	37.33304	-121.89902	Downstream W. Santa Clara Street Bridge at SAP Center
SJC27	Guadalupe River	37.32569	-121.89077	Between Woz Way Bridge and onramp to Highway 87
SJC31	Guadalupe River	37.30962	-121.88550	Upstream and downstream of W. Alma Ave Bridge

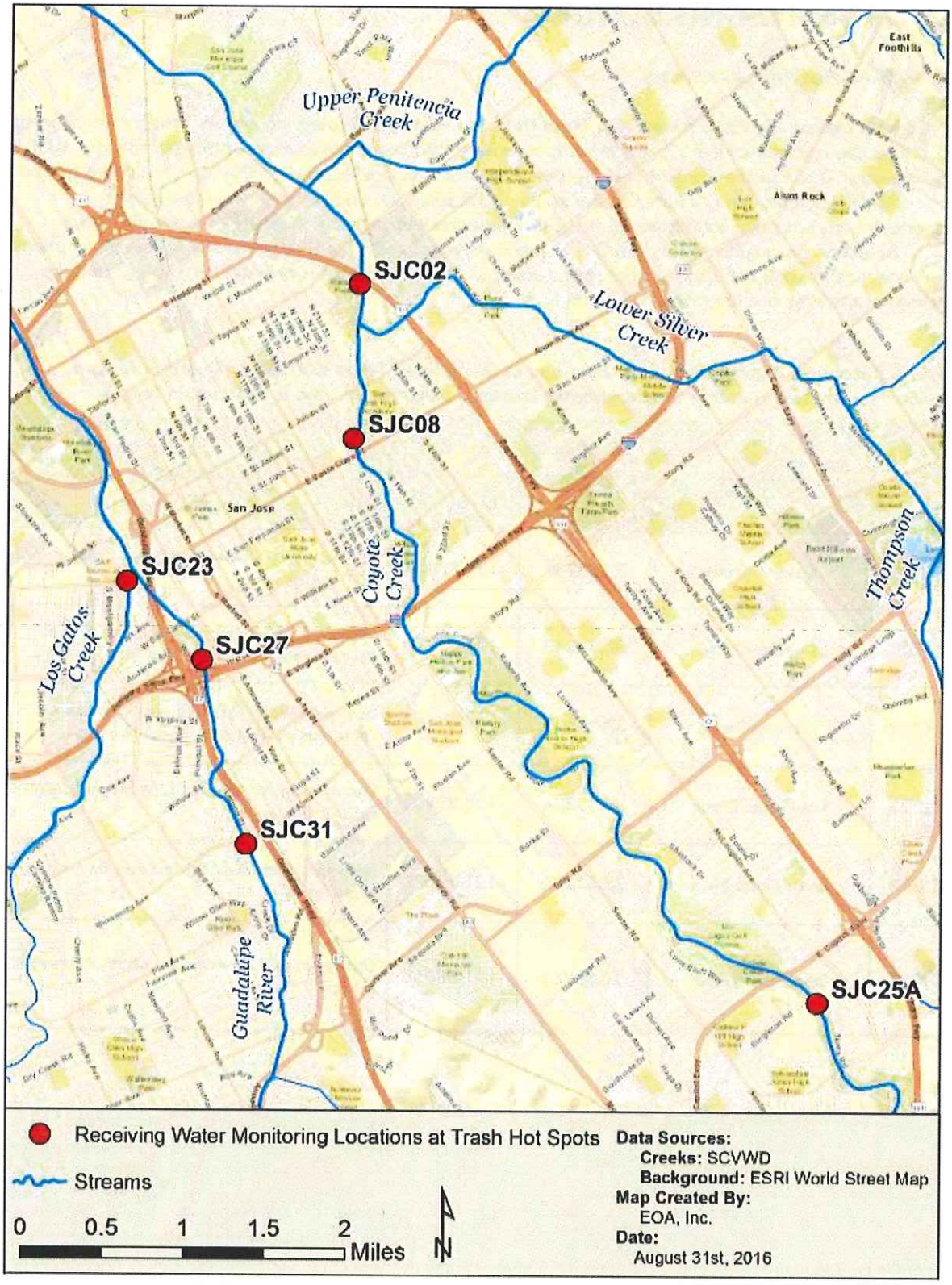

Figure1. City of San Jose Trash Receiving Water Monitoring Locations.

2.2 Monitoring Frequency

In accordance with the Consent Decree, qualitative and quantitative trash assessments will be conducted once annually during the dry season (May 1 – September 30) beginning in 2017. The City may conduct additional qualitative trash assessments an additional 1-2 times each year, as resources allow, to evaluate seasonal changes in trash condition.

2.3 Monitoring Methods

The City will conduct trash assessments at the six sampling locations following the Standard Operating Procedures (SOP) provided in Appendix A. The SOP is briefly summarized in the sections below and should be directly consulted prior to conducting trash assessments. The SOP builds upon previous protocols developed and implemented to assess trash conditions in receiving waters (SFBRWQCB 2007) and the levels of trash on streets and sidewalks (EOA 2015) that can be transported to receiving waters via stormwater. The protocol includes qualitative and quantitative methods for measuring trash accumulation in a geographically defined assessment area in creeks and rivers.

In general, the qualitative method provides a cost-effective approach to evaluate changes in trash conditions at receiving water locations at higher frequencies over time (e.g., confirming effectiveness of cleanup actions, evaluating seasonal and yearly changes). Additionally, the qualitative method is best used when attempting to detect relatively substantial changes in the levels of trash observed over a defined time period.

The quantitative assessment method is more suitable for use at assessment sites that will be the focus of specific management actions, situations that require more refined estimates of trash volumes (e.g., requirements to detect volume and proportion of stormwater related trash over time), or projects that have the goal of detecting small changes in the levels of trash observed in receiving waters over a relatively short timeframe.

Within the defined assessment area, the measurement of trash on stream banks will be used as a surrogate in cases where direct measurements or observations of trash in receiving waters are not feasible.

The City of San Jose will implement all three steps of the assessment protocol for this project, including:

- **Step 1:** Defining the boundaries of **Assessment Area**, which forms the extent of where the protocol is conducted; and
- **Step 2:** Conducting a **Qualitative Assessment** of trash levels and estimating the relative contributions of trash pathways; and
- **Step 3:** Conducting a **Quantitative Assessment** of trash volumes and types, by a) collecting and removing trash from the assessment area, b) calculating the total volume of trash associated with stormwater and non-stormwater pathways; and c) sorting and characterizing trash items.

2.3.1 Definition of Assessment Areas

The Consent Decree requires trash assessment areas to be 300 feet in length. Prior to assessments, the City will conduct field reconnaissance at each site to measure and document the 300 foot reach, including GPS coordinates and easily identified landmarks at upstream and downstream ends of the reach. During field visit, the high water line (e.g., bankfull width) will be identified to assist in the delineation of the assessment area along each bank. Accumulation of debris and trash in vegetation are good indicators of the annual high water extent along the upper banks. When outside the bankfull width, areas of debris accumulation or trash in vegetation that are indicative of the high water line will be included in the

assessment area. The width of assessment area will be measured at the upstream, middle and downstream sections of the assessment area. The average width can then be used to estimate total trash assessment area. The area can be used to compare trash conditions across sites (i.e., trash volume per unit area). Methods for identifying high water line and defining assessment boundary are described in the Trash Assessment SOP (Appendix A).

2.3.2 Trash Assessment Planning

The City's Project Manager will schedule trash assessment dates and locations with contracted parties that will be performing the cleanup (e.g., San José Conservation Corps) and will haul the trash to the landfill (e.g., the Environmental Services Department's Integrated Waste Management (IWM) division). All necessary materials and supplies identified in the Trash Monitoring SOP should be assembled prior to conducting fieldwork. Additionally, the Monitoring Program Manager (and preferably all field staff) should review the Trash Monitoring SOP prior to conducting fieldwork.

2.3.3 Health and Safety

Health and safety issues that field crew members should be aware of are identified in the Trash Monitoring SOP (Appendix A). Information, such as potential presence of homeless encampments and sensitive wildlife species, should be gathered by the Monitoring Project Manager several days prior to field visits in an attempt to better understand potential health and safety concerns that the crews may encounter. Based on this information, the Monitoring Project Manager will brief the field crew regarding health and safety issues prior to conducting trash assessments. Briefings could take place at tailgate meetings immediately prior to conducting the assessments.

2.3.4 Photo Documentation

Photo documentation of trash conditions will be conducted using the Santa Clara Valley Urban Runoff Pollution Program's Photo Documentation Procedures (Appendix B). Each hot spot location is evenly divided into three (3) segments of100 feet length by placing easily removable markers (e.g., surveyor's flags) along the creek bank. Label the segments A to C, beginning at the furthest downstream end of the hot spot area. Digital photographs are used to show trash condition before and after cleanup at the same spot within each segment of your hot spot. Photographs maybe taken anywhere within the segment, but should illustrate the extent and magnitude of trash within the segment. Photographs should be digital and the image numbers recorded on the qualitative assessment field form. Additional photographs taken by field crews should also be documented.

2.3.5 Trash Assessments

The **Qualitative Assessment** is a visual survey technique that documents the levels of trash within the creek/river channel and the relative contribution of trash from different transport pathways (i.e., MS4, non-MS4). Once crew members have walked the entire assessment area, they will assign a qualitative assessment score using condition category descriptions provided in the Trash Monitoring Plan SOP (Appendix A). The field crew will also estimate the types of trash transport pathways that are contributing to the trash observed in the assessment area, as well as the relative proportion of trash that each pathway has contributed to the assessment area.

The next step in the trash assessment is to conduct a **Quantitative Assessment** by collecting all trash from the assessment area. Photo documentation of trash conditions is necessary prior to when quantitative assessment is conducted (see previous section). Trash outside of the defined assessment area should not be quantified as part of this protocol. If trash from adjacent land use is collected as a cleanup measure, it should be labeled and placed separately from the trash collected within the assessment area. Trash within the assessment area should be collected by pathway, beginning with stormwater pathway. Identification

of trash items associated with stormwater pathway are based on three characteristics: type of trash, size and condition, and location within the assessment area. These trash items are removed and placed (un-compacted) temporarily into buckets (for volume estimates), and eventually into garbage bags for weight estimates. The bags are tied shut, labeled and placed into storage for eventual trash characterization.

Once all stormwater associated trash is collected, the process is repeated for all other applicable pathways (i.e., illegal dumping/littering, homeless encampments, and wind). Materials that are too large to be placed in buckets or bags should be stacked together (by pathway) and the volume should be estimated visually. Estimates of large items (e.g., construction materials or appliances) should be made in cubic feet or cubic yards and recorded on the Quantitative Assessment Data Collection Form. All trash associated with non-stormwater pathways will not be characterized and will be set aside for disposal.

The Monitoring Project Manager or field crew supervisor should check both Qualitative and Quantitative Data Collection Forms to make sure they are complete and accurately filled out, prior to leaving the site.

2.3.6 Trash Characterization

Trash characterization will occur at the assessment location following trash removal. Trash items should be separated from debris (e.g., leaves, conifer needles, dirt, sand) and sorted into the eight major categories described in the Trash Characterization Form (Appendix A). Trash in each category should be placed into separate buckets that represent each category. If an observed trash item is not on the list, use best professional judgment in determining the appropriate trash category. Measure and record the volume for each of the trash categories using methods described in Appendix A.

2.4 Data Management

All trash assessment data will be reviewed for legibility and errors as soon as possible after monitoring events. Trash assessment data will be entered into an electronic database. Photographs are transferred into computer folders and renamed using convention explained in the SCVURPPP *Photograph Documentation Protocol for Creek and Shoreline Trash Hot Spots*. Photographs will be organized into directory folders by year, then by Assessment Area ID, and then by "before" and "after" clean up.

3.0 QUALITY ASSURANCE AND QUALITY CONTROL

This section of the Trash Monitoring Plan describes specific quality assurance (QA) procedures and quality control (QC) activities that will be implemented to ensure the validity and quality of the data collected.

Data Quality Objectives (DQOs) are established to ensure that data collected are sufficient and of adequate quality for the intended use. DQOs include both quantitative and qualitative assessment of the acceptability of data. The qualitative goals include representativeness and comparability, and the quantitative goals include completeness and precision. Measurement Quality Objectives (MQOs) are the acceptance thresholds or goals for the data.

The following DQOs and MQOs are established for this project:

- The representativeness of data is the ability of the sampling locations and the sampling procedures to adequately represent the true condition of the sample sites. Representativeness of the sampling event is ensured by sampling within the target location and specified timeframe. The MQOs for sampling event representativeness are measured by proximity to the station location. Corrective action for this MQO is to flag samples that are collected outside of the defined assessment area.

- Comparability is the degree to which data can be compared directly to other relevant studies. The MQOs will rely on training and oversight of field crews to follow field sampling protocols to ensure comparability with other studies that utilize similar protocols.

- Completeness is defined as the percentage of valid data collected and analyzed compared to the total expected to being obtained under normal operating conditions. The objective is to conduct trash assessments for the entire assessment area at each site. An overall completeness of greater than 90% of assessment area is considered acceptable for the Trash Monitoring Plan.

- Precision is used to measure the degree of mutual agreement among individual measurements of the same property under prescribed similar conditions. Overall precision usually refers to the degree of agreement for the entire sampling, operational, and analysis system. For this project, precision will be measured by re-analyzing trash volume measurements at 10% of all sampled locations. Original and re-analyzed samples will be measured by different field staff using the same protocols.

4.0 PROJECT SCHEDULE

This section addresses the sampling and reporting schedules associated with implementation of the Trash Monitoring Plan. The schedule presented is consistent with the schedule presented in the Consent Decree.

4.1 Assessment Schedule

The Consent Decree requires that trash assessments are conducted at six trash hot spot locations during the dry season (May 1 – September 30) beginning in 2017. Assessments will continue one time each year. Additional qualitative assessments may be conducted by the City 1-2 times each year at each site, depending on the availability of resources.

4.2 Reporting Schedule

The Consent Decree requires that all monitoring results and analyses are included in the City's Annual Report submitted in compliance with the MRP. The City's Annual Report is submitted by September 30th of each year. The Annual Reports will contain an analysis of data collected during the previous dry season with respect to answering the management questions listed in Section 1.0.

5.0 REFERENCES

EOA. (2015). Visual On-land Trash Assessment Protocol for Stormwater. Prepared by Eisenberg, Olivieri and Associates. April 2015.

SFRWQCB (2007). A Rapid Trash Assessment Method Applied to Waters of the San Francisco Bay Region: Trash Measurement in Streams. Prepared by San Francisco Bay Regional Water Quality Control Board. April 2007.

Appendix A

Standard Operating Procedures for Monitoring Trash in Receiving Waters

CITY OF SAN JOSE
STANDARD OPERATING PROCEDURE FOR
MONITORING TRASH IN RECEIVING WATERS
VERSION 1.0

The following Standard Operating Procedure (SOP) describes the City of San Jose's protocol for monitoring trash conditions in receiving waters. The protocol includes a qualitative and quantitative method for measuring trash accumulation in a geographically defined assessment area in creeks and rivers within the City of San Jose. This SOP builds upon previous protocols developed and implemented to assess trash conditions in receiving waters[2] and the levels of trash on streets and sidewalks[3] that can be transported to receiving waters via stormwater.

Qualitative Assessment: The qualitative method is based on a visual survey technique that documents the levels of trash within the creek/river channel and the relative contribution of trash from different transport pathways. The qualitative method may be applied to an assessment area that is either defined prior to implementing the protocol, or as part of a longitudinal survey (i.e., continuous stream walk). In general, the qualitative method provides a cost-effective approach to evaluate changes in trash conditions in receiving waters at numerous assessment areas at higher frequencies over time (e.g., evaluating seasonal and yearly changes). Additionally, the qualitative method is best used when attempting to detect relatively substantial changes in the levels of trash observed over a defined time period.

Quantitative Assessment: The quantitative method includes the measurement of trash collected from a specific assessment area, and includes an optional trash characterization step to provide additional information on relevant trash sources and potential control measures to reduce trash impacts to receiving waters. The quantitative assessment method is more suitable for use at assessment sites that will be the focus of specific management actions; situations that require more refined estimates of trash volumes; or projects that have the goal of detecting relatively small changes in the levels of trash observed in receiving waters over a relatively short timeframe.

There are three major steps included in this SOP:

- **Step 1:** Defining the boundaries of **Assessment Area,** which forms the extent of where the protocol is conducted;
- **Step 2:** Conducting a **Qualitative Assessment** of trash levels and estimating the relative contributions of trash pathways; and
- **Step 3:** Conducting a **Quantitative Assessment** of trash volumes and types, by a) collecting and removing trash from the assessment area, b) calculating the total volume of trash associated with stormwater and non-stormwater pathways; and c) sorting and characterizing trash items.

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[2] SFRWQCB (2007). A Rapid Trash Assessment Method Applied to Waters of the San Francisco Bay Region: Trash Measurement in Streams. Prepared by San Francisco Bay Regional Water Quality Control Board. April 2007.
[3] EOA. (2015). Visual On-land Trash Assessment Protocol for Stormwater. Prepared by Eisenberg, Olivieri and Associates. April 2015.

When both qualitative and quantitative assessments are planned at a site, they should be performed in the order presented above. If only qualitative assessments are planned, only steps 1 and 2 should be conducted.

DEFINE AND MAP THE ASSESSMENT AREA

Prior to conducting trash assessments, the geographical extent of the receiving water area that the protocol will be applied should be well defined. Documenting the boundaries of the assessment area will allow the user of the protocol to provide a more accurate comparison of assessment results over time. Both the length and the width of the assessment area should be established and well documented, preferably on maps.

I. Length of Assessment Area

The length, or longitudinal distance between the most upstream and downstream ends of the assessment area, can be established one of two ways:

i. *Repeat Assessments of Specific Areas* – In cases where repeat visits to a specific assessment area are planned, the user should establish the length of the assessment area prior to beginning the assessment, and when in the field, measure the length using a tape measure. Upstream and downstream extents are most easily established using identifiable and stable landmarks (e.g., road crossing or outfall) and should be documented to allow for future identification.

ii. *Continuous Stream Surveys/Walks* –Longitudinal continuous stream surveys/walks may be used when assessment of trash conditions for an extended length of stream reach is desired. This approach may provide additional information on the longitudinal patterns of trash deposition and/or pathways affecting specific reaches of creek/channel. The user may establish the assessment area length based on changes in trash conditions observed during field surveys (i.e., a new assessment area is established if trash conditions change significantly while surveying).

Using either method, the agreed upon length of the assessment area should be mapped, and recorded with the geographic coordinates of the most upstream and downstream extent.

II. Width of Assessment Area

The width of the assessment area, or upper lateral boundary, should be defined by the high water line along the stream/channel bank. The high water line is typically defined (for the purpose of this protocol) as the bankfull channel width, which is the wetted channel during normal annual peak flows. Bankfull widths can be identified in the field using physical habitat indicators such as debris piles, changes in bank slope, channel scour lines, and patterns of riparian vegetation. To the extent possible, sources of trash outside of the assessment area boundary that may contribute trash to the assessment area should be documented. These source areas may extend to the top of a levee or to flood plain terraces for channels with extensive floodplain areas. An example sketch of a channel cross-section showing the lateral boundaries of an assessment area based on bankfull channel widths is provided in Figure 1.

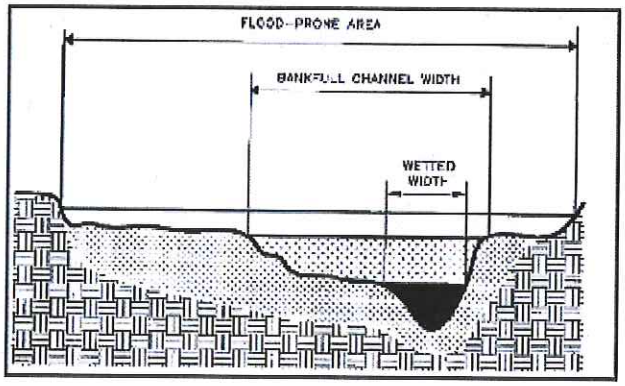

Figure 1. Example cross-section of stream channel with delineation of bankfull width.

PROJECT PLANNING

I. Field Mobilization

One or two days prior to trash assessment, crew members should complete/assemble The following materials and supplies for the field:

- Paperwork (Trash Monitoring Plan SOP, datasheets, maps, permits, gate keys)
- Super-heavy duty plastic trash bags and twist ties
- Five-gallon buckets
- Labels and marker to write on labels
- Gloves
- Scale (for weighing trash bags)
- Container for hazardous waste items
- Rubber boots or chest/hip waders for each person
- Cell phone
- GPS (could be cell phone)
- Camera
- Ruler and/or yardstick
- Measuring tape
- First aid kit

Project manager should schedule the trash assessment dates and locations with contracted parties that will be performing the clean-up (e.g., San José Conservation Corps) and will haul the trash to the landfill (e.g., the Environmental Services Department's Integrated Waste Management (IWM) Division).

II. Health and Safety

Prior to conducting trash assessments, the City of San José Monitoring Project Manager should debrief the contractor crews regarding health and safety issues. Some information, such as potential presence of homeless encampments and sensitive wildlife species should be gathered several days prior to field visits. The field crew should

conduct a tailgate meeting immediately prior to conducting the assessments. Health and safety issues include, but are not limited to:

- General safety and awareness of surroundings – deep water, steep banks, poison oak, blackberry bushes.
- Avoidance of deep spots in the channel and show caution for submerged objects while walking through the channel.
- Need to wear gloves to protect hands when collecting trash
- Homeless encampments – Do not approach or interact with people living in camp. Do not remove items from an active camp.
- Hazardous materials – Do not remove any of the following hazardous items: sharps (syringes, razors, knives) or batteries, propane tanks etc. These items should be properly disposed of by identified San Jose staff or contractors who are trained and prepared for handling hazardous waste.
- Fecal material – Do not touch or remove any trash contaminated with feces. This material should be properly disposed of by identified San José staff or contractors who are trained and prepared for handling biowaste.
- Need to avoid disturbing wildlife, including nesting birds and wood rats.

QUALITATIVE ASSESSMENT

This section describes procedures for conducting the qualitative trash assessment portion of the SOP. The data collection form for qualitative assessments is provided in Attachment 1.

I. Assessment Area Information

On the field form complete all information associated with the location and boundaries of the assessment area (See Step #1 above). This includes the receiving water body name, associated jurisdiction(s), length of the assessment area, GPS (lat/long) coordinates for the upper and lower (longitudinal) boundary of the area, and applicable land uses adjacent to the area.

II. Trash Condition

The qualitative assessment is based on the "trash condition score" in the assessment area.[4] The trash condition score is defined as the level of trash that is visible to field crewmembers in the assessment area. The condition score is based on a "first impression" of the amount of trash observed. Level of trash condition is divided into four condition categories that include narrative description of trash levels that are associated with a scoring range (0 – 20): Very High (0-5), High (6-10), Moderate (11-15) and Low (16-20). The scoring ranges for the four condition categories are shown in Table 1. Example photographs for each condition category are provided in Attachment 1.

Effort should be made to physically walk on both banks and within the channel (where feasible) to observe trash throughout the assessment area. Trash that is visible outside of the assessment area should not be included be included in the trash condition score, but should be indicated in the comments section. To the extent possible, assessment

[4] The trash condition score in this SOP is based on the "Level of Trash" parameter in the Rapid Trash Assessment (RTA) protocol (Version 8.0) developed by the San Francisco Bay Regional Water Quality Control Board (SFWQCB 2007).

areas should not be selected in locations that prevent field crew access to assessment area (e.g., private lands with no access permission, steep banks, and dense vegetation).

Crew members may individually choose a trash condition category initially, but must **collectively agree on the appropriate trash condition category** to assign the area. For scenarios where direct measurements of observations are not feasible, measurements of trash on banks or shorelines will be used as a surrogate measure.

Table 1. Trash condition categories and scoring system for qualitative assessments of receiving waters.

Qualitative Assessment	Condition Category			
	Low	**Moderate**	**High**	**Very High**
Description	• Effectively no or very little trash. • On first glance, little or no trash is visible. • Little or no trash is evident when streambed and stream banks are closely examined for litter and debris. • One individual could easily clean up all trash observed in a very short timeframe.	• Predominantly free of trash except for a few littered areas. • On first glance, trash is evident in low levels. • After close inspection, small levels of trash are evident in stream bank and/or streambed. • Trash could be cleaned up by one or two individuals in a short period of time.	• Predominantly littered except for a few clean areas. • Trash is evident upon first glance in moderate levels along streambed and banks. • Evidence of site being used by people: scattered cans, bottles, food wrappers, plastic bags etc. • It would take a more organized effort to remove all trash from the area.	• Trash is continuously seen throughout the assessment area. • Trash distracts the eye on first glance. • Substantial levels of litter and debris in streambed and banks. • Evidence of site being used frequently by people (e.g., many cans, bottles, food wrappers, plastic bags, clothing; piles of garbage and debris). • It would take a large number of people during an organized effort to remove all trash from the area.
Site Score	**20 19 18 17 16**	**15 14 13 12 11**	**10 9 8 7 6**	**5 4 3 2 1 0**

The qualitative trash condition score should apply to the entire assessment area. When conducting qualitative assessments during continuous stream survey/walks, GPS coordinates should be recorded each time trash conditions change. A tally sheet showing score and GPS locations can be documented in the field. Alternatively, survey applications on mobile devices (e.g., ArcGIS Survey 123) can be used to document condition scores, coordinates, photos and pathways observed during the survey. Using either method, condition scores and assessment areas can be tabulated, summarized and mapped in the office following field assessments.

III. Trash Pathway

The qualitative trash assessment should include an estimate of the types of trash transport pathway contributing to the trash observed in the assessment area. Additionally, crewmembers should estimate the relative proportion of trash that each

pathway has contributed to the assessment area. Transport pathways that should be documented include:

1. Illegal Dumping
2. Homeless Encampments
3. Wind/Litter
4. Stormwater (MS4)

Observations of pathways should be recorded on the Qualitative Trash Assessment Data Collection Form (Attachment 1).

IV. Photo Documentation

Photo documentation of trash conditions will be conducted using the Santa Clara Valley Urban Runoff Pollution Program's Photo Documentation Procedures (Appendix B). Each hot spot location is evenly divided into three (3) segments of100 feet length by placing easily removable markers (e.g., surveyor's flags) along the creek bank. Label the segments A to C, beginning at the furthest downstream end of the hot spot area. Digital photographs are used to show trash condition before and after cleanup at the same spot within each segment of your hot spot. Photographs maybe taken anywhere within the segment, but should illustrate the extent and magnitude of trash within the segment. Photographs should be digital and the image numbers recorded on the qualitative assessment field form. Additional photographs taken by field crews should also be documented. Note: if planning to conduct a quantitative assessment, record photographs (before and after cleanup) on the Quantitative Assessment Data Collection Form (Attachment 2).

QUANTITATIVE ASSESSMENT

The quantitative assessment portion of the protocol has two components: 1) an estimate of trash volume and weight; and 2) trash characterization. The selection of one or both options will depend on the monitoring objectives. Trash items that are not visible or cannot be safely accessed by field crews during the assessment will not be collected, characterized or weighed. Non-visible trash may include items on the bottom of the wetted channel or buried under dirt and debris on banks or within dry channel bed. Inaccessible trash may include items trapped in tree branches, dense vegetation (e.g., blackberry bushes) or on steep banks that cannot be safely accessed. The location and estimated amounts of inaccessible trash, and reasons for in-accessibility of trash, will be described in the comments section of Qualitative Assessment Data Collection Form.

I. Estimate Trash Volume

After completing a qualitative assessment, the first step to conducting a quantitative assessment is to collect all trash from the assessment area. Trash outside of the defined assessment area should not be collected or quantified as part of this protocol. Trash within the assessment area should be collected by pathway in the following order:

1. *Stormwater Pathway* - In an effort to quantify the portion of the trash present in the assessment area that is associated with different transport pathways, trash items associated with the stormwater pathway should be collected first. Identification of trash items associated with stormwater should be based on three categories: 1) type of trash, 2) trash characteristics, and 3) location within assessment area (see Table

2). Furthermore, trash characteristics are determined using four additional categories A) small, persistent and transportable, B) old, worn and water damaged, C) integrated with vegetation/debris; and D) Well distributed/mixed. Trash is sorted under "Stormwater Pathway" when category "A" is met AND at least one of the remaining categories B, C, or D is also met. All trash meeting the characteristics to have originated from stormwater conveyances (e.g., outfalls) should be categorized as stormwater even if it also meets the characteristics or location criteria for a different pathway.[5]

Use 5-gallon buckets (with handles) to collect trash associated with the stormwater pathway. The outside of buckets should be marked. Once the bucket is full (i.e., level with the top of the bucket) empty into a super-heavy duty plastic garbage bag (e.g., 30 gallons). For partially filled buckets, estimate volume using 0.25 gallon increments. Trash that is placed in bags should be un-compacted. Garbage bags should not be filled with more than 40 to 50 pounds of material. If material contains sharp or large objects, "double bag" the material, as necessary. Use multiple garbage bags per assessment site, if needed. Total number buckets and volume of collected trash is recorded on the Quantitative Assessment Data Collection Form (Attachment 2).

If characterization of stormwater trash is desired (see below), twist the super-heavy duty plastic garbage bag(s) closed when finished filling with material. All bags should be labeled with the assessment site ID, assessment date, and trash pathway. Use duct tape around the twisted end of the super-heavy duty plastic garbage bag(s). Ensure that garbage bag(s) are securely closed. Label the duct tape with pre-assigned Assessment Area #, date of cleanout (i.e., MMDDYY) and total number of bags using a permanent marker (e.g., *COY001-050315 - 1 of 2*). All filled garbage bags trash should then be transported out of the channel and to the characterization site location. If characterization is planned at a later date, then all filled garbage bags should be stored in a secure location until characterization can occur. Characterization should occur within five (5) business days of the cleanout.

[5] It is assumed, however, that the characteristics of stormwater associated trash items will be very similar to those of trash items that originated from the general accumulation of trash in the channel from upstream sources and as a result this categorization may result in an over-estimate of the proportion of trash associated with stormwater.

Table 2. Trash items typically associated with stormwater and other transport pathways.

Trash Pathway	Example Trash Items	Trash Characteristics	Potential Location in Assessment Area
Stormwater			
	- Polystyrene food ware - Cigarette butts & wrappers - Food wrappers - Fast food items - Plastic bottles/cups - Plastic straws/caps - Carryout plastic grocery bags - Rubber balls/tape - Paper fragments - Fabric and cloth - Metal cans/debris - Glass bottles/pieces - Food containers	A. Small, persistent, transportable, able to fit into storm drain inlets B. Old, worn, water damaged C. Integrated with vegetation, debris D. Well distributed and mixed with debris	- Wetted channel - Banks below high water line - Directly below or downstream of outfalls
Other Pathways			
Homeless Encampments	- Fast food items - Bagged trash - Large items - Fabric and cloth - Cardboard/paper - Metal cans/debris - Glass Bottles/pieces - Food Containers	- Items too large to fit through San José storm drains and system pipe lines - Dense, multiple piles near current or abandoned camping site - No sign of water damage	- Adjacent to camps or trails - Banks, above and below high water mark - Under bridges
Illegal Dumping	- Fast food items - Bags of trash - Yard waste - Construction debris - Fabric and cloth - Paint spray cans - Furniture/Appliances	- Items too large to fit through San José storm drains and system pipe lines - Recent - Large piles, adjacent to roads -	- Directly upstream or downstream of bridges - Near roadways, bike or foot paths
Wind/Litter	- Paper - Carryout plastic grocery bags - Styrofoam - Fast food items	- Light weight - Recent - Distributed evenly, recent/not worn (litter)	- Adjacent to freeways and road crossings

2. <u>*Other Pathways*</u> - Once all stormwater associated trash is collected, repeat the process for all other applicable pathways (i.e., illegal dumping, homeless encampments, and wind/litter) to the extent that trash volume and weight measurements are desired. Materials that are too large to be placed in buckets or bags should be stacked together (by pathway) and the volume should be estimated visually. Estimates of large items (e.g., construction materials or appliances) should be made in cubic feet or cubic yards and recorded on the Quantitative Assessment Data Collection Form (Attachment 2).

II. Estimate Trash Weight

Trash bags containing all trash items collected from each pathway will be weighed using a mobile scale that is brought to the assessment location. Weights will be recorded on the Quantitative Assessment Data Collection Form.

III. *Trash Characterization*

Trash characterization should occur at a location that is protected from the wind and provides adequate space to work. Trash items should be separated from debris (e.g., leaves, conifer needles, dirt and sand) and sorted into the eight major categories described in the Trash Characterization Data Collection Form (Attachment 3). Trash in each category should be placed into separate buckets or piles that represent each trash category. If an observed trash item is not on the list, use best professional judgment in determining which category the item may be categorized.

With the exception of plastic and glass recyclable beverage container (CRV-labeled) and single-use plastic bags (see below), measure the total volume of each trash category using buckets and containers of known volume. When buckets and containers are not completely filled, use a ruler or yard stick to estimate total volume. For example, if a 2-gallon bucket is determined to be one-third full when measuring with a ruler, the estimation of the total volume of trash within the bucket would be 0.33 X 2 gallons = 0.666 gallons. When measuring total volume of trash, ensure that it is un-compacted. Use the *Trash Characterization Data Collection Form* to record the total volume of each trash category.

The total volume of plastic and glass recyclable beverage containers (CRV-labeled) is determined by the size of each container. Sum the total volume of each container type. For example, if two 20-ounce plastic containers are present, record 40 ounces on the *Trash Characterization Data Collection Form*. Single-use plastic bags are tallied and multiplied by standard size of 12 ounces and the total volume is recorded.

ATTACHMENT 1

QUALITATIVE TRASH ASSESSMENT DATA COLLECTION FORM

Trash Assessment – Qualitative Data Collection Form (Version 1.0)

Date: _____ **Crew Members:** _____

I. Assessment Area Information

Assessment Area ID# _____

Location of Assessment Area: _____

Receiving Waterbody: _____ Jurisdiction(s): _____

Assessment Area Length (feet) _____ SCVWD Station ID _____

GPS Coordinates: Upstream End _____ Downstream End _____

Land Uses Adjacent to Assessment Area (**Check all that apply**): ☐ Residential (Single-family) ☐ Residential (Multi-family) ☐ Commercial ☐ Urban Park ☐ Freeway ☐ Industrial ☐ Public ☐ Open Space ☐ Mixed-use ☐ Other Developed

II. Trash Condition

Qualitative Assessment	Condition Category			
	Low	**Moderate**	**High**	**Very High**
Description	Effectively no or very little trash. On first glance, little or no trash is visible. Little or no trash is evident when streambed and stream banks are closely examined for litter and debris. One individual could easily clean up all trash observed in a very short timeframe.	Predominantly free of trash except for a few littered areas. On first glance, trash is evident in low levels. After close inspection, small levels of trash are evident in stream bank and/or streambed. Trash could be cleaned up by one or two individuals in a short period of time.	Predominantly littered except for a few clean areas. Trash is evident upon first glance in moderate levels along streambed and banks. Evidence of site being used by people: scattered cans, bottles, food wrappers, plastic bags etc. It would take a more organized effort to remove all trash from the area.	Trash is continuously seen throughout the assessment area. Trash distracts the eye on first glance. Substantial levels of litter and debris in streambed and banks. Evidence of site being used frequently by people (e.g., many cans, bottles, food wrappers, plastic bags, clothing; piles of garbage and debris). It would take a large number of people during an organized effort to remove all trash from the area.
Site Score	**20 19 18 17 16**	**15 14 13 12 11**	**10 9 8 7 6**	**5 4 3 2 1 0**

III. Trash Pathways

Potential trash pathways/sources and percent contribution to assessment areas (**Check all that apply**):

Trash Pathway	% Contribution to Trash Observed in Assessment Area				
	Not Observed	**< 25%**	**25-50%**	**50-75%**	**>75%**
Stormwater					
Homeless Encampment					
Illegal Dumping/Litter					
Wind					

IV. Photo Documentation

Creek Location: ❑ Segment A ❑ Segment B ❑ Segment C

Additional Photographs (Optional):

❑ Yes ❑ No

	Additional photographs may be taken to illustrate the amount of trash collected during a cleanup.

V. Comments

Comments:

EXAMPLE TRASH CONDITION CATEGORY PHOTOGRAPHS

LOW TRASH LEVEL CONDITION

Effectively no or very little trash. On first glance, little or no trash is visible. Little or no trash is evident when streambed and stream banks are closely examined for litter and debris. One individual could easily clean up all trash observed in a very short timeframe.

EXAMPLE TRASH CONDITION CATEGORY PHOTOGRAPHS

EXAMPLE TRASH CONDITION CATEGORY PHOTOGRAPHS

MODERATE TRASH LEVEL CONDITION

Predominantly free of trash except for a few littered areas. On first glance, trash is evident in low levels. After close inspection, small levels of trash are evident in stream bank and/or streambed. Trash could be cleaned up by one or two individuals in a short period of time.

EXAMPLE TRASH CONDITION CATEGORY PHOTOGRAPHS

EXAMPLE TRASH CONDITION CATEGORY PHOTOGRAPHS

HIGH TRASH LEVEL CONDITION

Predominantly littered except for a few clean areas. Trash is evident upon first glance in moderate levels along streambed and banks. Evidence of site being used by people: scattered cans, bottles, food wrappers, plastic bags etc. It would take a more organized effort to remove all trash from the area.

EXAMPLE TRASH CONDITION CATEGORY PHOTOGRAPHS

EXAMPLE TRASH CONDITION CATEGORY PHOTOGRAPHS

VERY HIGH TRASH LEVEL CONDITION

Trash is continuously seen throughout the assessment area. Trash distracts the eye on first glance. Substantial levels of litter and debris in streambed and banks. Evidence of site being used frequently by people (e.g., many cans, bottles, food wrappers, plastic bags, clothing; piles of garbage and debris). It would take a large number of people during an organized effort to remove all trash from the area.

EXAMPLE TRASH CONDITION CATEGORY PHOTOGRAPHS

ATTACHMENT 2

QUANTITATIVE TRASH ASSESSMENT
DATA COLLECTION FORM

Date: _____ **Crew Members:** _____

I. Assessment Area Information

Assessment Area ID# _____

Site Location: _____

II. Trash Removal and Estimated Volume and Weight

Record total volume of trash associated with each trash pathway that was collected in the assessment area:

Trash Pathway	Volume (Un-compacted)					Weight (lbs)	Types of Trash Observed
	Total # Buckets	Bucket Size (gal)	Bag Size (gal)	Large (Unbagged) Items	Unit (circle)		
Stormwater							
Homeless Encampment					ft^3 yd^3		
Illegal Dumping/Litter					ft^3 yd^3		
Wind					ft^3 yd^3		

III. Photo Documentation

Creek Location (After Cleanup):

- ❑ Segment A
- ❑ Segment B
- ❑ Segment C

Additional Photographs (Optional):

❑ Yes ❑ No

Additional photographs may be taken to illustrate the amount of trash collected during a cleanup.

IV. Comments

Comments: _____

ATTACHMENT 3

TRASH CHARACTERIZATION
DATA COLLECTION FORM

Stormwater Trash Characterization - Data Form (Version 1.0)

Date: _____ **Crew Members:** _____

I. Site Information

Assessment Area ID# _____ Location: _____

II. Trash Characterization Data Collection Form

	Trash Category/Type	Examples of Items Included in Category	Volume (gallons)
1	Recyclable Beverage Containers (CRV labeled)	Plastic Bottles	
2	Recyclable Beverage Containers (CRV labeled)	Glass Bottles	
3	Single-use Plastic Carryout Grocery Bags	Plastic Bags with handles	
4	Expanded Polystyrene (Foam) Disposable Food and Beverage Ware	Polystyrene Foam Food Containers ("Clamshells")	
		Polystyrene Foam Beverage Containers (e.g., cups)	
		Polystyrene Foam Bowls	
		Polystyrene Foam Plates	
		Polystyrene Condiment Containers	
		Polystyrene Foam Trays	
5	Rigid Plastic Disposable Food and Beverage Ware (includes Non-EPS plastic, fiber-based, and compostable plastic)	Food Containers ("Clamshells")	
		Beverage Containers (e.g., cups)	
		Bowls	
		Plates	
		Condiment Containers	
		Food Trays	
6	Cigarette Butts	Cellulose cigarette butts	
7	Other Plastic	Plastic Bags (Produce, Meat, Newspapers, Other)	
		Pre-packaged Food- Polystyrene Foam Containers (Eggs Cartons, Ramen Bowls, Meat Trays)	
		Cigarette packaging	
		Mylar (Non-recyclable) Film Food Wrappers (e.g., chip bags, candy bar wrappers)	
		Disposable Plastic Utensils (food related)	
		Styrofoam Packaging (non-food related)	
		Styrofoam Pieces	
		Plastic Band, 6-pack ring	
		Plastic Pieces	
		All Other Plastic Products	
8	All Other Trash	Paper Napkin	
		Hybrid Materials (e.g., plastic-coated paper wrappers)	
		Receipt, Bus/Train Card	
		Newspaper, Magazine, Flyer	
		Cardboard	
		Lottery/Scratcher Card	
		Other Paper Products	
		Glass Bottle (non-CRV labeled)	
		Glass Jar or Container	
		Glass Pieces	
		Other Glass	
		Aluminum/Steel Can	
		Bottle Cap	
		Pipe, Rebar	
		Wire	
		Machine part	
		Nail, Bolt, Screw	
		Other Metal	
		Rubber	
		Foam	
		Toy, Balloon	
		Golf Ball	
		Tennis Ball	
		Synthetic Fabric	
		Natural Fabric (cotton, wool)	
		Wood Debris	
		Other Wood	
		Other Miscellaneous	

III. Comments

Comments:

Appendix B

SCVURPPP Photograph Documentation Protocol for Creek and Shoreline Trash Hot Spots

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Photograph Documentation Protocol for Creek and Shoreline Trash Hot Spots

Goal: To effectively illustrate the magnitude and extent of trash in a creek or shoreline directly before and after a trash hot spot cleanup event.

Applicable MRP Provision: Consistent with Provision C.10.c(i) in the Municipal Regional Permit (MRP 2.0): *"A trash hot spot shall be at least 100 yards (300 feet) of creek length or 200 yards (600 feet) of shoreline length. Documentation shall include the trash condition before and after clean up of the entire hot spot using photo documentation with a minimum of one photo per 100 feet of hot spot length."*

Photograph Documentation Protocol:

1) Establish Photo Documentation Segments:

- Creek Hot Spots: Evenly divide your 300 ft creek hot spot into three (3) segments of 100 ft length by placing easily removable markers (e.g., surveyor's flags) along the creek bank. Label the segments A to C, beginning at the furthest downstream. If a creek hot spot is greater than 300 ft, continue to segment the hot spot until you reach the most upstream point your hot spot.
- Shoreline Hot Spots: Evenly divide your 600 ft shoreline hot spot into six (6) segments of 100 ft length by placing easily removable markers (e.g., surveyor's flags) along the shoreline. Label the segments A to F, beginning at the first segment with the water on your right.

2) Photograph Trash Conditions within Segments

- Required: Digital photographs are used to show trash condition before and after cleanup at the same spot within each segment of your hot spot. Within each segment, a minimum of one photograph must be taken before the cleanup and one photograph after the cleanup - for a total of 3 before and 3 after photographs for 300 ft creek hot spots and 6 before and 6 after photographs for shoreline hot spots. Photographs maybe taken anywhere within the segment, but should illustrate the extent and magnitude of trash within the segment.
- Optional: Additional photographs may be taken within the hot spot. Although optional, it is highly recommended that an additional photograph be taken to illustrate the volume of trash collected during the cleanup.

3) Label Photographs/Files

- Label Electronic (Photographs) Files – After downloading photographs from your digital camera, rename each photograph/file with the following information: a) cleanup date; b) hot spot ID (will be provided to you by Program staff); c) segment ID (A to C for 300 ft creek hot spots and A to F for shoreline hot spots); d) photograph number (i.e., number assigned to a photograph taken before or after trash cleanup; and e) before (1) or after (2) cleanup. For optional photographs, include "OPT" in the label description. Electronic photograph files should be renamed using the following formats: