June 7, 2012

To: Municipal Regional Stormwater NPDES Permit (Order R2-2009-0074) Permittees

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From: Bruce H. Wolfe
Executive Officer

Subject: **Water Board Staff Review of Trash Plans and Reports**

We have reviewed the Baseline Trash Load Generation Rates Report (Baseline Load Report) and the Trash Load Reduction Tracking Method Plan (Tracking Method) submitted by the Bay Area Stormwater Management Agencies Association (BASMAA) on February 1, 2012, and the associated individual Short-Term Trash Generation Reduction Plans submitted by the Permittees (Permittee Plans). We find that the Baseline Report, the Tracking Method, and the Permittee Plans all have significant deficiencies, and, as such, they do not comply with the requirements of the Municipal Regional Stormwater NPDES Permit (Permit). Most importantly, implementation of the Permittee Plans will not attain the 40 percent trash load reduction level by July 2014.

We acknowledge the baseline trash load estimates are preliminary and that revised estimates will be submitted along with the Permittees' Annual Reports on September 15, 2012, based on additional data and analysis. However, we are concerned that trash loads from high trash load drainage areas are and will continue to be underestimated with the

proposed load generation model. We are further concerned that shortcomings in the modeling approach and load estimates result in substantial inadequacies in the Permittee Plans.

The primary compliance deficiency in the Tracking Method and the Permittee Plans is the reliance on actions that are not new or enhanced. In addition, there is an over reliance on formulas and fixed-credit amounts for trash reduction actions when actual trash volume collected can be directly measured. In some cases, formulas may be justified to reduce assessment efforts, but these formulas must be calibrated and regularly verified with local measurements. In addition, most of the proposed quantification formulas and credits are too general, lack adequate justification, or lack followup verification, and many of the formulas and credits are applied on too large a scale to account for actions and to provide measurable success, particularly in high trash load drainage areas. There is also inadequate discussion of accounting, monitoring, and reporting in the Tracking Method and the Permittee Plans.

We discuss our specific issues and concerns with the Baseline Load Report and the Tracking Method and general issues and concerns with the Permittee Reports in the following sections of this comment letter. We also provide some directions and options to address deficiencies in the reports and plans and commit to work with BASMAA and the Permittees in addressing the deficiencies. In response to this letter, by July 6, 2012, please submit a time schedule for actions that you will take to resolve the deficiencies. This should include immediate improvements that will be provided with Annual Reports by September 15, 2012, and, subsequently, appropriate revisions to the reports and plans by February 1, 2013. More time may be provided with justification, but all issues must be resolved no later than February 1, 2014, when submittals of Long-Term Trash Load Reduction Plans are due. We prefer to avoid enforcement actions but will consider such options if necessary.

## Baseline Trash Load Generation Rates Report

We recognize that it is not feasible to directly measure trash loads from all discharge locations, so estimates of trash loads must be based on model predictions using data from locations representative of various types of drainage areas of storm drain systems. However, the very limited dataset and simple model used result in significant uncertainty in what are likely underestimated loads. The model is based on simplifying assumptions that have not been validated, and much more data are needed to generate independent data sets to calibrate and verify model predictions.

A model that better accounts for drainage area characteristics and more local calibration data may be required if either the data used to attempt to calibrate the model are too variable, or if there are additional parameters that are not adequately described by the simple modeling approach. Alternatively, the simple model may be adequate for low trash load drainage areas, but it would then need to be augmented with empirical models that account for high trash load drainage areas. The later would be consistent with the inevitable need to identify high load drainages where significant load reduction actions are needed and resulting reductions can be tracked.

The following is a list of our issues and concerns with the model and preliminary load estimates and needed improvements:

- Predicted trash loads were based on the Permittees' jurisdictional areas that excluded various land areas that are claimed to be outside a Permittee's legal jurisdiction, such as State and federal facilities and roads, other transportation facilities, public and private colleges and universities, and infrastructure facilities. However, the Permit does not allow these unilaterally-determined exclusions, and, in reality, the claimed exclusions are not all outside of the Permittees' legal jurisdictions (e.g., private colleges). The Permitees are responsible for discharges from their storm drain systems regardless of the sources of trash. We acknowledge there are constraints and limitations on the Permitees' ability to control trash loadings from some of these areas that may be significant sources of trash in the Permittees storm drain systems, but these areas cannot be excluded from the baseline trash load estimates. Rather, they should be accounted for in trash load reduction plans that may include requesting actions by the Water Board or other authorities.
- A questionable over-simplification in the modeling approach is the arbitrary use of a 200-foot "effective loading area" band on either side of a street as the assumed contributing area for each catchment. Trash contributing areas that are beyond 200 feet of either side of a street's center line are ignored, such as shopping mall parking. This results in underestimates of trash loads by not including significant trash contributing land uses that are beyond the 200-foot zone. Realistic estimates of trash loads will require more specific delineations of loading areas.
- The limited data used to estimate baseline trash loads included the amount of trash captured in inlet trash capture devices assuming the device captured 100 percent of the trash from its effective loading area. However, this is only the case if maintenance had occurred frequently enough to avoid full or overflowing trash capture devices, as this condition leads to significant loss of trash through the overflow path. Trash can also bypass the device if large surface area trash, like plastic bags, paper or leaves, clog the entire screen and lead to overflow even though the trash retention reservoir of the device is not full. The adequacy of maintenance and clogging/overflow must be accounted for in trash capture device data used.
- The baseline trash load estimates are based on data from relatively few inlets and storm events. Meanwhile, there is a very large dataset from the Los Angeles area of 12,500 data points from 550 inlet inserts over 20 storms and three dry weather clean outs that should be used in some manner.
- Some varied land-use categories were collapsed into a single category to generate trash load estimates due to limited local data from the limited number of installed full trash capture devices. However, there is significant variability in these lumped land-use datasets, which results in significant uncertainties in the model-predicted loads. Some of the categorical trash generation rates vary by four orders of magnitude, yet average values that are not representative of these highly variable datasets were used in the modeled estimates. Alternatives, such as the upper confidence level of the mean or median of the data, would result in significantly higher baseline load estimates. Obviously, these would

be overestimates of loads from some drainage areas, but we are more interested in the high load generation areas.

- The extreme variability in trash load generation data needs to be accounted for with a combination of more data and further delineation of drainage areas and factors that affect variability. Community-specific calibration and verification of model predictions may be necessary, particularly in high trash load drainage areas.
- A significant shortcoming in predicted baseline trash loads is how they are modified to account for existing Permittee-specific storm drain inlet maintenance, pump station maintenance, and street sweeping. We understand the intent is to account for these existing actions in the estimate of the baseline trash loads; however, the approach used most likely significantly overcompensates for these existing actions. All three of these "adjustments" need further vetting and verification with actual Permittee data. The storm drain inlet cleaning adjustment is not large, but should still be calibrated and verified by local data. The pump station trash capture volume should be directly measured, rather than based on a fixed 25 percent of the catchment baseline generation rate. The street sweeping adjustments are particularly problematic, since street sweeping variability likely affects the aforementioned variability in trash load generation data and the likely underestimate of baseline trash loads.

  The street sweeping adjustments are also overestimated based on published street sweeper effectiveness data. Roger James, a commenter on the Baseline Load Report, contacted the author of the published paper that contains the street sweeping effectiveness curve used to account for the adjustments and found out the curve is an upper bound prediction of "best case" street sweeping. In addition, the origin of the increased sweeping efficiency curve for sweeping to the curb is apparently a local Palo Alto study, which could also be verified with more local calibration data. The Permittees have years of street sweeping data that should be used to justify and verify street sweeper adjustments.

## Trash Load Reduction Tracking Method Plan (Tracking Method)

The Tracking Method is supposed to provide a means to account for trash load reduction actions and a means to demonstrate progress towards attainment of trash load reduction levels. The Tracking Method as proposed provides these means in a manner that has significant shortcomings. We support the proposed hierarchy of accounting for actions from trash generation reduction, to on-land interception, to trash interception in the stormwater conveyance system, to trash interception in waterways. However, the current application of this framework is much too general and lacks adequate quantification.

There is inadequate discussion of accounting, monitoring, and reporting. We support a standard tracking method, but the method must specify appropriate qualifying, siting, and level of implementation criteria and conditions for each trash reduction measure. The method must also specify what must be tracked and documented to account for adequate implementation of the measure to qualify for a projected (credit) or measured trash load reduction benefit. There also must be quantification of the trash loads avoided or reduced by

all measures. We acknowledge it is not possible to a priori quantify the trash load reduction benefit of some actions, so a level of estimated benefit (credit) has to be assumed. However, most of the proposed credits are far too high and out of proportion for actions that are unlikely to impact the trash loading in a significant manner. There must be justification for the proposed credits and representative and strategic monitoring to subsequently quantify the trash load reduction benefit per unit of defined action that accounts for the spatial and temporal scope and degree of implementation of the unit of action. There also needs to be drainage-area scales of accounting, tracking, and monitoring of implementation measures with an emphasis on high trash load areas.

We acknowledge load reduction quantification is constrained by the current lack of available data, but there is no commitment or plan to generate quantification data for many of the actions. We also agree that there is a need for a combination of quantification formulas and credits in addition to direct quantification of specific action load reductions. However, most of the proposed quantification formulas and credits are too general, lack adequate justification, or lack followup verification. We recognize the desire to make the Tracking Method simple and to minimize the tracking burden on the Permittees, but many of the formulas and credits are applied on too large a scale, e.g., area-wide rather than area-specific, to account for actions and to provide measurable success. Even load reduction actions that have area-wide applicability, such as single-use bag ordinances, need to be tracked or verified on an area-specific basis, particularly in high trash load drainage areas.

The Tracking Method contains the appropriate guiding principle that control measures that were implemented prior to the Permit's effective date are considered baseline. The only exceptions provided are for difficult to implement, expensive, and relatively recent actions, specifically implementation of full-trash capture devices that were installed pre-Permit and enforcement of single-use bag and foodware bans that were adopted pre-Permit. These actions can count towards trash load reduction goals. However, many of the other accounted actions are not new or enhanced, such that the Tracking Method is too vague, inconsistent, or too liberal in defining baseline or new actions.

Many categories of actions include proposed credit for actions that were in place before the Permit's effective date, and include statements asserting, so as to avoid penalizing early implementers, control measures implemented prior to the Permit's adoption will be credited equally to new or enhanced control measures to demonstrate progress towards trash load reduction goals. As such, the Tracking Method as proposed would allow some Permittees to reach the 40 percent trash reduction from baseline level on paper with few or no new actions. This is clearly not intended or allowed by the Permit. The Permit's intent is for non-early implementers to catch up, rather than to provide a grace period to early implementers.

Another shortcoming of the Tracking Method is how it accounts for existing enhanced street sweeping. We understand the intent is to adjust the estimates of baseline trash loads to account for existing enhanced street sweeping. However, the proposed adjustments for existing enhanced street sweeping have the same shortcomings as the proposed adjustments for existing baseline street sweeping that we discuss in the Baseline Load

Report comments, and the proposed adjustments overcompensate for existing enhanced street sweeping. The existing enhanced street sweeping adjustments need improved justification and verification with local data.

In the following section, we provide comments on specific control measures and the associated fact sheets.

### *CR-1 Single-use Carryout Plastic Bag Ordinances*

The proposed load reduction credits are within a reasonable range given the amount of plastic bags found in trash loads and the difficulty of adoption and implementation of a strong set of restrictions on the use of single use bags, particularly plastic bags. However, verification and reporting of implementation and enforcement is missing. The effectiveness of ordinances depends on followup inspection and enforcement. Therefore, acceptance of any proposed credit is contingent on the specifics of actual verification and reporting by a Permittee.

### *CR-2 Polystyrene Foam Food Service Ware Ordinances*

The proposed load reduction credits are in a reasonable range given the amount of plastic foodware found in trash loads and the difficulty of adoption and implementation of a strong set of restrictions on the use of polystyrene foam food ware. However, verification and reporting of implementation and enforcement is missing. The effectiveness of ordinances depends on followup inspection and enforcement. Therefore, acceptance of any proposed credit is contingent on the specifics of actual verification and reporting by a Permittee.

### *CR-3 Public Education and Outreach Programs*

We support and encourage public education and outreach efforts to reduce trash, but we do not accept the proposed public education and outreach program credits. The proposed credits that would allow the Permitees to claim trash reduction credits totaling eight percent are grossly inflated and most likely would be misapplied and claimed without merit, as illustrated in most of the Permittee Plans. Any proposed credit must have a basis for the projected benefit, and the associated program must be specific to trash reduction and must be documented, along with the specifics of the accounting and reporting needed to claim and verify a proposed credit. Verification must include some form of survey or other means to demonstrate the benefit of the education or outreach effort.

We specifically disagree with the notion called out in this section that the Permittees can claim credit for past education and outreach measures that are still ongoing. We are not aware of any such ongoing measures specific to trash that merit any consideration of credit towards reduction of baseline trash loads. One education and outreach measure that we can credit at this time is the “Be the Street” campaign, but the associated credit should reflect the behavioral change goal of the project and how it will be measured.

### *CR-4 Activities to Reduce Trash from Uncovered Loads*

Uncovered loads on trucks transporting trash and debris is undoubtedly a problem of some magnitude, particularly on faster arterial roads and highways where the vehicle speed makes

dispersal of the trash out of the vehicle more likely. However, there is no basis for assuming up to five percent of trash area-wide comes from uncovered loads, and there is no justification for the proposed four percent area-wide credit for implementation of an enhanced enforcement program. Any load reduction or reduction credit must be justified and verified and only applied on an area-specific basis. Also, any allowed credit requires documentation of a Permitee's new or enhanced program, along with specifics on the accounting and reporting needed to claim and verify a proposed credit.

A related action that has not been accounted for but merits consideration is abatement and cleanup of fugitive trash from trash collection activities, a common source of trash and litter to the street scape. With the premium on speed of operation, there is nearly always litter on the street after the collection of trash and recyclables, regardless of the fact that both trash containers and trash collection trucks are covered. The process of emptying the containers into the truck, particularly on windy days, generates loose trash on the street that the collection crews, with few exceptions, ignore. An effective program to abate this source, in a verifiable and reportable manner, would be suitable for credit.

### *CR-5 Anti-Littering and Illegal Dumping Enforcement Activities*

Only load reduction from new or enhanced measures can be claimed, and load reductions should be quantified rather than based on credits. Most Permittees have had some effort of this type in effect, and in many cases have had significant anti-littering and illegal dumping abatement and enforcement activities in place for decades. We acknowledge illegal dumping can be a significant source of trash in specific areas. However, rather than tiered area-wide credits as proposed without justification, any load reduction or reduction credit must be justified and verified and only applied on an area-specific basis. The Permittees presumably already maintain records of illegal dumping abatement and cleanup efforts; these records should provide a basis for direct accounting and reporting of area-specific loads reduced from new or enhanced actions.

### *CR-6 Improved Trash Bin/Container Management Activities*

Only load reduction from new or enhanced measures can be claimed and can only be claimed on an area-specific rather than area-wide basis. The fact sheet acknowledges that the effectiveness of containers and bins in reducing trash is likely dependent on site-specific factors. Area-specific load reduction credits must be justified and verified, and implementation requires documentation of a Permitee's new or enhanced program, along with the specifics of the accounting and reporting needed to claim and verify a proposed credit. We support and encourage implementation of a strategic plan for public area trash containers, but any reduction credit must be area-specific and based on the design of the strategic plan, rather than an arbitrary three percent area-wide reduction credit.

Business Improvement Districts with trash reduction control measures show promise, and have the potential to eliminate or substantially reduce trash loading by more than 50 percent from these areas. We support the incentive provided by the proposed 50 percent load reduction credit, and we will continue to work with the Permittees to find cost-effective means of accounting for actual trash load reductions that do not create a disincentive to implement this measure.

In addition, this Improved Trash Bin/Container Management Activities category should be expanded to incorporate trash and debris abatement that occurs at industrial and commercial sites as a result of a Permittee's business inspection program or via verification of those sites implementation of the State's General Stormwater Permit for Industrial Activities. Trash transfer stations, plastic pre-production pellet using facilities, recyclers dealing in beverage containers, auto shredders and other metal and material recyclers may all be candidates for targeted inspection and enforcement of adequate control of all trash and debris as a discharge. Also, control of trash from private property, particularly shopping malls, retail districts and commercial properties should be leveraged through city staff inspection. The Permittees have existing ordinances that require these properties to be maintained litter and trash free.

### *CR-7 Single-use Food and Beverage Ware Ordinances*

As noted in the fact sheet, single-use food and beverage ware have been found to contribute substantially to the litter stream, and we support incentive-based load reduction credits. However, the large credits proposed, which could total up to 24 percent, need to be justified.

### *QF-1 On-land Trash Cleanups (Volunteer and/or Municipal)*

We support the proposed loads reduced formula and associated assumptions and the assertion that only new or enhanced efforts apply to baseline load reductions. We also acknowledge the need for and intent by BASMAA to develop a standardized means of accounting for trash removed by volunteers via on-land cleanups.

### *QF-2 Enhanced Street Sweeping*

Enhanced street sweeping must be new street sweeping begun after the Permit's effective date. We do not have enough information to understand the full basis of the sweeper curves and proposed formulas; regardless, these would need considerable local calibration by the Permittees to be acceptable. The Permittees have years of street sweeping data. In addition, any trash load reduction claims from enhanced street sweeping using a modeled approach must include documentation of enhancements and operations and verification of load reductions. Preferably, trash load reduction claims should be based on actual additional trash volume collected by enhanced street sweeping. This will also have the effect of encouraging the most effective operation of the street sweeping equipment.

### *QF-3 Partial-Capture Treatment Devices*

Tracking and accounting of loads reduced from curb inlet screens and stormwater pump station trash screens must be device-specific and directly measured. We do not accept the alternative approach proposed, without further justification and verification, that would allow the Permittees to use an average inlet drainage area in the determination of conveyance load. We also question the validity of the assumed average 84 percent effectiveness rating of curb inlet screens. In our experience, these devices often stick open or are propped open by trash items.

We also question the validity of the proposed default effectiveness rating of 25 percent for pump station trash racks. We agree that trash removed by trash booms and curtains must

be directly quantified. However, only trash loads that are prevented from entering receiving waters can be counted as applied as load reductions. Trash that is retained in and removed from receiving waters cannot be directly credited as a load reduction. However, we recognize the use of trash booms and curtains within receiving waters serves to prevent further conveyance of trash in a receiving water and to other receiving waters and provides a means of cleanup of trash that has been discharged. We will work with the Permittees to determine how to appropriately account for trash booms and curtains.

### *QF-5 Full-Capture Treatment Devices*

There must be some direct measurement of trash reductions associated with full-trash capture devices. We do not accept the proposed loads-reduced formula, which relies on estimated loading rates and allows the use of Permittee or regional average drainage areas, to estimate trash load reductions without improved justification, documentation of device operation and maintenance, and ongoing verification of trash load reductions in at least strategic locations. The flaws in this modeled approach, particularly use of non-representative conveyance loading rates and regional-average device drainage area or the proposed Permittee-average device drainage area, in conjunction with over compensating for implementation of trash generation activities (e.g., outreach and education and street sweeping) are illustrated in many of the Permittee Plans, which project fictitiously low trash load reductions from the required mandatory minimum full-trash capture devices they plan to implement.

The Fact Sheet incorrectly refers to a list of full-capture devices recognized by the Water Board. Water Board staff, not the Water Board itself, has acknowledged the list with the conditional statement that the devices have potential benefits if properly designed, operated, and maintained to provide full trash capture, but that potential must be demonstrated. If devices are allowed to fill up or clog with trash, they will cease to function as capture devices. Tracking of full-capture treatment devices must include documentation of inspections, maintenance actions, and trash removed.

### *QF-6 Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal)*

The 40 percent trash load reduction requirement applies to trash loading to receiving waters. Consequently, trash removed from receiving waters, either collected in booms or as creek hot spot or shoreline cleanups, do not count as trash load reduction actions. These are cleanup actions rather than abatement actions and serve as mitigation for the adverse consequences of trash discharges. Once trash is in creeks and channels and on shorelines, it has already impacted the beneficial uses of waters of the State.

While it is very useful to remove this trash and reduce its impacts, this trash removal cannot be credited the same as on-land or storm drain system trash abatement measures. We will work with the Permittees to determine appropriate credit for these actions. These cleanups can serve as a short-term offset of discharged trash. They also provide a means of determining the types and potential sources of trash and to track reduction of trash from on-land and storm drain abatement measures. Also, we expect the amount of trash collected in these cleanups should decrease over time.

## Short Term Trash Loading Reduction Plans

We have general comments and issues and concerns with most or all of the Permittee Plans, but are not commenting on specific Plans at this time. The primary deficiency in the Plans is their over-reliance on actions that are not new or enhanced. All of the Plans have shortcomings associated with our comments and discussion of issues and concerns with the Baseline Report and Tracking Method that they are based on. An illustration of these shortcomings is the very small calculated load reductions (less than two percent for some Permittees) for implementation of mandatory minimum full trash capture devices.

The Plans do not adequately describe, as required by the Permit, control measures and best management practices, including any trash reduction ordinances, that are currently being implemented and their current level of implementation and additional control measures and best management practices that will be implemented, and/or an increased level of implementation to meet the 40 percent trash load reduction level. Description of current actions needs to be sufficient to account for their ongoing implementation, and new or enhanced actions are in addition to these baseline actions. Description of new or enhanced actions needs to be sufficient to verify and track them and to account for their effectiveness and load reduction. The Plans overly rely on generalized trash load reduction credits and formulas and do not adequately account for community and drainage-area characteristics. A preferred approach would be drainage-area specific trash load reduction plans with emphasis on high trash load generation areas.

An adequate description of new or enhanced actions must include a schedule of implementation, but the implementation schedules provided in the Plans are too general to be of any value. Some just use terms like “Ongoing” or “Pre-MRP”, which reflect the over-reliance on actions that are not new or enhanced. Others just provide an implementation start date, which for some Permittees is just stated as “Post-MRP”.

A consequence of the deficient description of actions in the Plans is that each Permittee’s annual report must provide a detailed description of actions to demonstrate compliance with Permit requirements. The Permit reporting requirement that allows for providing just a summary of actions was based on an expectation that the Permittees would provide adequate details in the Plans.