

# Attachment 1

## Department of Resources Recycling & Recovery (CalRecycle)

### SCOPE OF WORK

#### *Evaluation of Water Quality Impacts of Tire-Derived Aggregate Use in Storm Water Management Applications*

## I. INTRODUCTION/OBJECTIVES

The objectives of this project are as follows:

- Determine the suitability of Tire Derived Aggregate (TDA) as a media in storm water treatment and retention basins.
- Determine the magnitude, duration, and impact of metal oxidation and subsequent leaching into the water from the metal in TDA used as media in storm water treatment and retention basins.

## II. WORK TO BE PERFORMED

Work to be performed under this contract involves the evaluation of the suitability of using TDA as a media in storm water treatment and retention basins, the preparation of a report on the findings of each evaluation, and, if required, presentation(s) of the findings. Where warranted, the information obtained will help promote the use of TDA in storm water treatment applications currently under-utilized in California, such as highway and urban parking area storm water treatment systems. The first primary task will evaluate performance of TDA as a media in a storm water treatment application. The second primary task will determine the rate, duration, and impact of oxidized metals leaching from TDA used as media in a storm water treatment basin.

## III. TASKS IDENTIFIED

### **Task 1 – Work Plan:**

Contractor shall develop a Work Plan which will include sufficient detail for all design, construction, sampling, data collection, data analysis, and reporting required for the tasks below. The Work Plan shall be approved in writing by the Contract Manager prior to commencing work on the tasks below.

### **Task 2 - Impact of Metal Leachate from TDA in Storm Water Treatment Systems:**

#### **Task 2a – Design and construct bench scale test**

Previous research has shown that TDA exposed to water leaches various metals resulting from the oxidation of the steel cording and bead in the tire material. The primary metals

noted and observed are iron, manganese, and zinc. The Contractor shall determine the rate and duration of the oxidation under conditions similar to that found in a storm water treatment basin using a number of bench scale, TDA-filled vessels (provided by Contractor). In the laboratory setting, the Contractor shall use water along with typical storm water constituent loadings to replicate the constituents and concentrations found in the field. The Contractor shall dose the bench scale, TDA-filled vessels with water at various rates to understand the relationship between dosing and leachate rate and duration.

Any variation from the Work Plan must be preapproved in writing by the Contract Manager. After construction, the Contractor cannot begin the data collection program (described in Task 3b) until the Contract Manager provides written approval that the constructed project meets the requirements of the Work Plan.

#### **Task 2b – Data collection**

Contractor shall collect data on the concentration of metals from the bench scale, TDA-filled vessels as detailed in the Work Plan. Data shall be collected for a period of 12 months.

#### **Task 2c – Data analysis**

Contractor shall analyze all data and prepare a summary report that includes the data, analysis of the data, and resulting findings. Contractor shall include this information in the draft Final report.

### **Task 3 - TDA Storm Water Treatment and Retention Basin:**

#### **Task 3a - Design and construction of storm water treatment basins using TDA media**

Contractor shall design and construct a treatment and retention basin that receives storm water from a paved surface subject to frequent vehicle use. The paved surface will be a roadway or parking lot. The Contractor may partner with an agency such as Caltrans, a county, or city on an existing project. In that case, the Contractor will coordinate with the partnering agency and the Contract Manager on the construction of the retention basin. The basin design must be similar to those used by Caltrans to treat highway runoff or basins in common use to treat parking lot runoff.

Construction cannot begin until the Contract Manager provides written approval of the siting and design of the treatment and retention basin. After construction, Contractor cannot begin the sampling program (described in Task 2b) until the Contract Manager provides written approval that the constructed basin meets the requirements of the Work Plan.

#### **Task 3b -Sampling**

Contractor shall sampling the influent and effluent from the treatment and retention basin and tested for various constituents as specified in the Work Plan. The sampling shall be conducted for a period of 12 months.

**Task 3c – Data analysis**

Contractor shall analyze all data and prepare a summary report that includes the data, the analysis of the data, and the resulting findings. Contractor shall include these results in the draft final report.

**Task 4– Preparation of final report and Presentation of findings**

Contractor shall submit the draft report to the Contract Manager for review and approval. The Contract Manager will provide written approval or requests for changes or revisions to the Contractor. Contractor shall incorporate any changes or revisions required by the Contract Manager and submit a final report.

If requested by the Contract Manager, the Contractor shall prepare a draft presentation of its findings for each project and submit the draft to the CalRecycle Contract Manager for review and approval. As required by the CalRecycle Contract Manager, the contractor shall make the presentation(s).

**IV. CONTRACT/TASK TIME FRAME**

The tasks are not sequential and will overlap in time. The draft Final report will be received as specified in the Project Work Plan and no later than 2/15/2016. The term of the contract will be approximately 24 months with all project deliverables completed by March 15, 2016. Final reports are required to follow the CalRecycle format for publication.

<b>Task #</b>	<b>Due Dates*</b>
<b>1. Work Plan</b>	<b>April 1, 2014</b>
<b>2. Impact of Metal Leachate from TDA in Storm Water Treatment Systems</b>	
2a. Design and construction of bench scale test environment	June 1, 2014
2b. Data Collection	June 1, 2015
2c. Data analysis	September 1, 2015
<b>3. TDA Storm Water Treatment and Retention Basin</b>	
3a. Design and construction of storm water treatment basins using TDA media	September 1, 2014
3b. Sampling	September 1, 2015
3c. Data analysis	December 1, 2015
<b>4. Preparation of Final Report and Presentation of findings</b>	<b>February 1, 2016</b>

\* Assumes contract fully executed by March 1, 2014

The following provisions will be included in the Terms and Conditions or Special Terms and Conditions of the Contract:

## **V. COPYRIGHT PROVISION**

The contractor shall establish for CalRecycle good title in all copyrightable and trademarkable materials developed as a result of this Scope of Work. Such title shall include exclusive copyrights and trademarks in the name of the State of California, Department of Resources Recycling & Recovery (CalRecycle).

## **VI. CALIFORNIA WASTE TIRES**

Unless otherwise provided for in this Scope of Work, in the event the contractor and/or subcontractor(s) purchase waste tires or waste-tire derived products for the performance of this Scope of Work, only California waste tires and California waste tire-derived products shall be used. As a condition of payment under the agreement, the contractor shall be required to provide documentation substantiating the source of the tire materials used during the performance of this Scope of Work to the contract manager.

## **VII. WASTE REDUCTION AND RECYCLED-CONTENT PRODUCT PROCUREMENT**

In the performance of this Agreement, Contractor shall use recycled content, used or reusable products, and practice other waste reduction measures where feasible and appropriate.

Recycled Content Products: All products purchased and charged/billed to CalRecycle to fulfill the requirements of this contract shall be Recycled Content Products (RCPs), or used (reused, remanufactured, refurbished) products. All RCPs purchased or charged/billed to CalRecycle to fulfill the requirements of the contract shall have both the total recycled-content (TRC) and the postconsumer content (PC) clearly identified on the products. Specific requirements for the aforementioned purchases and identification are discussed in the Terms and Conditions of the Contractual Agreement under Recycled-Content Product Purchasing and Certification.

The Contractor should, at a minimum, ensure that the following issues are addressed, as applicable to the services provided:

## **VIII. WRITTEN DOCUMENT PROVISION**

All documents and/or reports drafted for publication by or for CalRecycle in accordance with this contract shall adhere to CalRecycle's *Guidelines For Preparing Reports (available upon request)* and shall be reviewed by CalRecycle's Contract Manager in consultation with one of CalRecycle editors.

In addition, these documents and/or reports shall be printed double-sided on one hundred percent (100%) recycled-content paper. Specific pages containing full-color photographs

or other ink-intensive graphics may be printed on photographic paper. The paper should identify the postconsumer recycled content of the paper (i.e., “printed on 100% postconsumer paper”). When applicable, the contractor shall provide the contract manager with an electronic copy of the document and/or report.

To the greatest extent possible, soy ink instead of petroleum-based inks should be used to print all documents