

RESEARCH PROBLEM STATEMENT #DC-504

I – Problem Title

Guidance and Specifications for the use of Compost and Mulch for Erosion Control and Stormwater Treatment (LAP-01)

II – Research Problem Statement

Should Caltrans apply compost and/or mulch to the roadside or disturbed soil areas to improve stormwater quality within California's diverse highway environment and how will these temporary/permanent erosion control techniques affect vegetation establishment, water quality and slope stability? This research will include a literature search, and review existing guidance and specifications from sources including, but not limited to, other Departments of Transportation on appropriate use of compost and/or mulch as best management practices (BMPs). This study will define different California derived recycled mulch and compost blends; when, where and how these blends are most appropriate to use based on actual water quality analyses; lab testing and field demonstrations. The guidance will establish parameters for applications based on performance criteria such as: soil type, climate, slope length and steepness, aspect, and location. The research will address how compost and/or mulch 1) will mulch affect water quality and erosion 2) can be used in place of structural BMPs or permanent vegetation and 3) it will affect the establishment of permanent vegetation cover especially in higher elevations where vegetation cover sometimes is difficult to achieve.

III – Objective

This research will provide clear guidance and specifications for the use of compost, mulch or a blend to control erosion and improve stormwater quality. Application rates, quality and size of material, pollutant removal, efficiency over time, vegetation establishment, short-term liabilities, and required maintenance shall be reviewed and included in this study. The results of this research will improve project delivery by assuring environmental obligations are successfully met, and decreasing long-term life cycle costs.

IV – Background

Caltrans is required to remove pollutants from stormwater through the installation of best management practices (BMPs).

Using vegetation to control erosion and filter pollutants has been a cost effective practice along much of California's roadways. In higher elevation areas, vegetation establishment is not as successful using with methods that are effective in other areas of the State. Presently, few strategies exist that will assure adequate vegetation establishment in areas such as the Tahoe Basin, where Caltrans faces increased scrutiny from State and Local agencies to provide water quality protection. The Federal Endangered Species Act, the Federal Clean Water Act and other Federal, State and Local regulations regulate erosion and the resulting sediment. Caltrans Statewide National Pollution Discharge Elimination System (NPDES) Storm Water Permit specifically addresses erosion and sediment control, along with other pollutants found in stormwater runoff from roadways.

Economical and effective methods of controlling erosion and promoting vegetation growth are necessary for the Department to carry out its mission.

V – Statement of Urgency and Benefits

Erosion control and stormwater quality research is necessary for the Department to meet its obligations under the Endangered Species Act and the Clean Water Act. This project will assist the Department in complying with requirements of the NPDES Storm Water Permit. This research will provide Caltrans personnel with tools to better meet these obligations.

VI – Related Research

Several research studies have been completed on the use of composted mulch for erosion control. A nationwide literature search is recommended as a part of this study

VII – Deployment Potential

Guidance and specifications developed as part of this research can be implemented in ongoing and future projects that include erosion control and stormwater treatment BMPs.