State of California
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 05-74

December 8, 2005

Agenda Item No.: 05-12-2

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code sections 39700 through 39705;

WHEREAS, a research proposal, number 2603-250, entitled "Light Duty Gasoline PM: Characterization of High Emitters and Valuation of Repairs for Emission Reduction", has been submitted by the University of California, Riverside;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 2603-250 entitled "Light Duty Gasoline PM: Characterization of High Emitters and Valuation of Repairs for Emission Reduction", submitted by University of California, Riverside, for a total amount not to exceed $249,827.

NOW, THEREFORE BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 2603-250 entitled "Light Duty Gasoline PM: Characterization of High Emitters and Valuation of Repairs for Emission Reduction", submitted by University of California, Riverside, for a total amount not to exceed $249,827.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein, and as described in Attachment A, in an amount not to exceed $249,827.

I hereby certify that the above is a true
and correct copy of Resolution 05-74, as
adopted by the Air Resources Board.

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Lori Andreoni, Clerk of the Board

## ATTACHMENT A

## "Light Duty Gasoline PM: Characterization of High Emitters and Valuation of Repairs for Emission Reduction"

### Background
Light-duty gasoline vehicles (LDGV) are currently estimated to emit a large portion of the total particulate matter (PM) emissions attributable to mobile sources. The emissions may be comparable to PM emissions from diesel vehicles. More stringent diesel vehicle PM regulations will take effect in 2007 and, along with existing diesel retrofit strategies, will result in significantly lower PM emissions from diesel engines. With this reduction in the diesel PM emission burden, it is anticipated that PM emissions from LDGVs, particularly high PM emitters, may contribute disproportionately to the total on-road PM inventory.

### Objective
The work proposed in this study will evaluate new means to identify high PM emitters on the highway and at inspection/maintenance (I/M) locations, evaluate the potential costs and benefits of repair and other emission reduction strategies, and try to characterize the importance of high PM emitters to the inventory.

### Methods
The contractors will evaluate the reliability and accuracy of remote sensing device (RSD) methods for characterizing LDGV PM emissions by performing a pilot study. They will use suitable RSD and/or visual surveys to characterize PM emissions from a large sample of in-use LDGVs in California and procure chassis dynamometer emissions test for a fleet of in-use LDGVs to determine their mass emissions. The contractors will also perform engine repairs on selected high PM emitters and conduct after-repairs emissions tests to determine the effectiveness of the engine repairs.

### Expected Results
This program is expected to improve the ability of the ARB to identify high PM emitters and to provide the data on frequency, emission levels, repair effectiveness and repair costs to guide development of PM control strategies.

### Significance to the Board
The results of the program should provide the ARB with tools to identify high-PM emitters and to pursue cost-effective emission reduction strategies. The tools will also provide a means to estimate the frequency of occurrence of high PM emitters and potentially estimate the contribution of high emitters to the PM inventory.

### Contractor:
University of California, Riverside

### Contract Period:
18 months

**Co-Principal Investigators (PIs):**
John Collins, Ph.D. and Thomas Durbin, Ph.D.

**Contract Amount:**
$249,827

**Basis for Indirect Cost Rate:**
The State and the UC system have agreed to a ten percent indirect cost rate.

**Past Experience with this Principal Investigators:**
ARB staff have extensive prior experience with both PIs. This experience has been positive.

**Prior Research Division Funding to UCR:**

| Year | 2005 | 2004 | 2003 |
|---|---|---|---|
| Funding | $0 | $1,717,466 | $1,036,130 |

# B U D G E T  S U M M A R Y

University of California, Riverside

"Light Duty Gasoline PM: Characterization of High Emitters and Valuation of Repairs for Emission Reduction"

| | | | |
|---|---|---|---|
| **DIRECT COSTS AND BENEFITS** | | | |
| 1. | Labor and Employee Fringe Benefits | $ 100,023 | |
| 2. | Subcontractors | $ 0 | |
| 3. | Equipment | $ 0 | |
| 4. | Travel and Subsistence | $ 4,708 | |
| 5. | Electronic Data Processing | $ 0 | |
| 6. | Reproduction/Publication | $ 0 | |
| 7. | Mail and Phone | $ 0 | |
| 8. | Supplies | $ 10,500 | |
| 9. | Analyses | $ 64,344[1] | |
| 10. | Miscellaneous | $ 51,414[2] | |
| | Total Direct Costs | | $ 230,989 |
| **INDIRECT COSTS** | | | |
| 1. | Overhead | $ 18,838 | |
| 2. | General and Administrative Expenses | $ 0 | |
| 3. | Other Indirect Costs | $ 0 | |
| 4. | Fee or Profit | $ 0 | |
| | Total Indirect Costs | | $ 18,838 |
| **TOTAL PROJECT COSTS** | | | **$ 249,827** |

[1] Costs are for 42 experimental analyses, including smog checks, unified cycle (criteria gases, PM, EC, OC, MOUDI), and speciation media.

[2] Costs include: Vehicle recruitment and repairs, Graduate Student Fees, and Facilities Fee. Because CE-CERT is a permanent off-campus facility, federal regulations requires the accounting for facilities rental as a direct cost. Facilities rental is charged based on 20.9% of Modified Total Direct Costs (MTDC).