

State of California  
AIR RESOURCES BOARD

Resolution 04-13

March 25, 2004

Agenda Item No.: 04-3-2

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 2549-236, entitled "Evaluation of the Heavy-Duty Diesel Engine Not-To-Exceed Regulation," 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 2549-236 entitled "Evaluation of the Heavy-Duty Diesel Engine Not-To-Exceed Regulation," submitted by University of California, Riverside, for a total amount not to exceed \$400,000.

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 2549-236 entitled "Evaluation of the Heavy-Duty Diesel Engine Not-To-Exceed Regulation," submitted by University of California, Riverside, for a total amount not to exceed \$400,000.

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 \$400,000.

I hereby certify that the above is a true  
And correct copy of Resolution 04-13, as  
Adopted by the Air Resources Board.

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Lori Andreoni, Clerk of the Board

## **ATTACHMENT A**

### **“Evaluation of the Heavy-Duty Diesel Engine Not-To-Exceed Regulation”**

#### **Background**

Heavy-duty diesel engines/vehicles (HDDEs/HDDVs) are substantial contributors to the motor vehicle emissions inventory for NO<sub>x</sub> and particulate matter (PM). In the 1990s it was found that seven of the largest HDDE manufacturers violated certification regulations by defeating emissions controls during in-use highway driving. As a consequence of these violations, the USEPA and ARB negotiated the Consent Decree (CD) and Settlement Agreement (SA), respectively, with these HDDE manufacturers. The CD and SA stipulate the implementation of in-use Not-To-Exceed (NTE) requirements. The NTE requirements call for the HDDE manufacturers to perform in-use emissions measurements and report results to the USEPA and ARB. The CD and SA NTE requirements have been carried over into the upcoming 2007 HDDE emissions standards, and the ARB has also adopted NTE requirements for 2005-06. The NTE requirements are expected to result in compliant in-use HDDEs, but this has not been independently verified.

#### **Objective**

The ultimate objective of this project is to evaluate the in-use NTE regulation for HDDEs, both in terms of issues related to the actual implementation of the NTE regulation, as well as in terms of the regulation's effectiveness in reducing in-use emissions from HDDEs. A supporting objective is to evaluate and compare different commercially available on-vehicle ("on-board") emissions measurement systems that could be used to satisfy the ultimate objective of this project, and/or that could be used for emissions inventory development purposes.

#### **Methods**

The objectives of this project would be accomplished by conducting laboratory evaluations of candidate on-vehicle ("on-board") emissions measurement systems, followed by actual over-the-road emissions testing using suitable on-board systems identified during the on-board systems evaluation portion of the project.

#### **Expected Results**

The results from this project will provide ARB staff with data to determine the effectiveness of the NTE regulation in ensuring that emissions from heavy-duty diesel engines are controlled to their certification levels.

#### **Significance to the Board**

Heavy-duty diesel engines are substantial contributors to the NO<sub>x</sub> and PM emissions inventories, and ensuring effective control of in-use NO<sub>x</sub> and PM emissions from heavy-duty diesel engines is critical to the ARB's plans for attainment of ambient air quality standards.

**Contractor:**  
University of California, Riverside

**Contract Period:**  
20 months

**Principal Investigator (PI):**  
Dr. J. Wayne Miller

**Contract Amount:**  
\$400,000

**Cofunding:**  
\$16,000 (US EPA for Task 2)

**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 Investigator:**  
Dr. Miller has previously performed successful contracts with the ARB, and is currently involved in ongoing research involving heavy-duty diesel vehicle emissions.

**Prior Research Division Funding to the University of California, Riverside:**

Year	2003	2002	2001
Funding	\$336,131	\$0	\$268,633

# BUDGET SUMMARY

University of California, Riverside

Evaluation of the Heavy-Duty Diesel Engine Not-To-Exceed Regulation

## **DIRECT COSTS AND BENEFITS**

1.	Labor and Employee Fringe Benefits	\$ 155,232	
2.	Subcontractors	\$ 50,000	
3.	Equipment	\$ 0	
4.	Travel and Subsistence	\$ 3,915	
5.	Electronic Data Processing	\$ 238	
6.	Reproduction/Publication	\$ 0	
7.	Mail and Phone	\$ 0	
8.	Supplies	\$ 4,000	
9.	Analyses (emissions testing)	\$ 82,000 <sup>1</sup>	
10.	Miscellaneous	<u>\$ 77,577<sup>2</sup></u>	
	Total Direct Costs		\$372,962

## **INDIRECT COSTS**

1.	Overhead	\$ 27,038	
2.	General and Administrative Expenses	\$ 0	
3.	Other Indirect Costs	\$ 0	
4.	Fee or Profit	<u>\$ 0</u>	
	Total Indirect Costs		<u>\$27,038</u>

## **TOTAL PROJECT COSTS**

**\$400,000**

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<sup>1</sup> Analyses from mobile emissions laboratory

Prep/ Tech days	\$17,000
Test days	60,000
Truck Rental	<u>5,000</u>
	82,000

<sup>2</sup> Off-Campus Facilities Rental \$56,510  
Graduate Student Fees & Insurance 21,067  
\$77,577

## SUBCONTRACTORS' BUDGET SUMMARY

West Virginia University

WVU will act as a consultant to the project and will advise UCR and project sponsors regarding project planning and problem resolution.

### **DIRECT COSTS AND BENEFITS**

1.	Labor and Employee Fringe Benefits	\$	36,702
2.	Subcontractors	\$	0
3.	Equipment	\$	0
4.	Travel and Subsistence	\$	0
5.	Electronic Data Processing	\$	2,500
6.	Reproduction/Publication	\$	0
7.	Mail and Phone	\$	100
8.	Supplies	\$	100
9.	Analyses	\$	280
10.	Miscellaneous	\$	<u>0</u>
Total Direct Costs			\$39,682

### **INDIRECT COSTS**

1.	Overhead	\$	0
2.	General and Administrative Expenses	\$	10,318
3.	Other Indirect Costs	\$	0
4.	Fee or Profit	\$	<u>0</u>
Total Indirect Costs			<u>\$10,318</u>

<b><u>TOTAL PROJECT COSTS</u></b>	<b><u>\$50,000</u></b>
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