State of California
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 08-20

February 28, 2008

Agenda Item No.: 08-2-2

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 2650-259, entitled "Expansion of the NYSERDA Evaluation of On-Board Real-Time Particulate Emissions Measurement Technologies Program," has been submitted by the Southern Research Institute;

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

WHEREAS, the New York State Energy Research and Development Authority is cosponsoring this project for a total amount of $400,000; and

WHEREAS, the Air Resources Board will fund this proposal for a total amount $102,722; and

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

> Proposal Number 2650-259, entitled "Expansion of the NYSERDA Evaluation of On-Board Real-Time Particulate Emissions Measurement Technologies Program," has been submitted by the Southern Research Institute, for a total amount not to exceed $102,722.

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 2650-259, entitled "Expansion of the NYSERDA Evaluation of On-Board Real-Time Particulate Emissions Measurement Technologies Program," has been submitted by the Southern Research Institute, for a total amount not to exceed $102,722.

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 $102,722.

I hereby certify that the above is a true and correct copy of Resolution 08-20, as adopted by the Air Resources Board.

Lori Andreoni

Lori Andreoni, Clerk of the Board

ATTACHMENT A

"Expansion of the NYSERDA Evaluation of On-Board Real-Time Particulate Emissions Measurement Technologies Program"

Background

Over the past decade, instruments have been developed that are capable of measuring particulate matter (PM) emissions in real-time (i.e., on a second-by-second basis) using a variety of measurement metrics such as PM mass, particle number concentration, particle surface area, and particle length, and using a variety of techniques such as laser light scattering, photoacoustic, laser induced incandescence, and oscillating inertial microbalance. Some of these instruments are intended for laboratory environments, while others are "portable emissions measurement systems" (PEMS) that are intended to be placed on-board the source being emissions tested (e.g., a car, truck, or bulldozer).

The Air Resources Board (ARB) staff have used, and are planning to use PEMS to collect both gaseous and PM emissions from sources such as cars, trucks, locomotives, and off-road equipment. However, recent experience has revealed that these instruments, when used in a "side-by-side" manner tend to produce emissions results that can vary by more than an order of magnitude (CRC project E-69, "The Kansas City Light-duty gasoline vehicle PM study").

Hence, there is a need for an evaluation of these real-time PM measurement instruments. The New York State Energy Research and Development Authority (NYSERDA) released a solicitation in late 2006 (Program Opportunity Notice 1072) to have a contractor perform an evaluation of a variety of real-time PM instruments. The Southern Research Institute (SRI) was selected to perform this evaluation in a project funded at $400,000. ARB staff learned about this project when contacted by staff from SRI, and subsequently determined that ARB could benefit from leveraging state dollars by adding funding to the NYSERDA project to increase the project scope to include additional emissions sources (i.e., engines burning gasoline and E85).

Objective

The objective of this project is to perform an evaluation of real-time PM measurement instruments under controlled laboratory conditions using a variety of different fuels.

Methods

The PM instruments will be evaluated under laboratory test conditions using engine and/or vehicle dynamometers to place a load on the engine. Emissions will be collected using a Code of Federal Regulations compliant dilution sampling system. The test cycles will include three repetitions of each of four steady state test cycles, plus three repetitions of a to-be-determined transient test cycle. The additional engine-fuel types will complement the existing program, and for consistency, will utilize the same test cycles and protocols as the original NYSERDA project.

Expected Results

The results from this project are expected to aid ARB staff both in the selection as well as the utilization of these real-time PM measurement systems.

Significance to the Board
PM emissions have been shown to be harmful to public health, and ARB has been working to accurately quantify these emissions. The current PM measurement reference method relies on integrated filter based measurements which cannot characterize the dynamic behavior of PM emissions generation. Real-time PM emissions measurements will not only aid ARB in understanding PM emissions generation, but will also aid ARB staff in the development of PM emissions inventories.

Contractor:
Southern Research Institute

Contract Period:
18 months

Principal Investigator (PI):
Tim Hansen

Contract Amount:
The ARB-funded contract amount is $102,722.

Cofunding:
The New York State Energy Research and Development Authority is contributing $400,000 to the cost of this study.

Basis for Indirect Cost Rate:
The indirect cost rates have been approved by the Federal government.

Past Experience with this Principal Investigator:
The PI for this project, Mr. Tim Hansen has ten years of experience with environmental projects, including most recently, the ongoing "Clean Diesel Technology Field Demonstration Program" for the NYSERDA (about a $1 million program).

Prior Research Division Funding to Southern Research Institute:

Year	2007	2006	2005
Funding	$0	$0	$0

BUDGET SUMMARY

Contractor: Southern Research Institute

"Expansion of the NYSERDA Evaluation of On-Board Real-Time Particulate Emissions Measurement Technologies Program"

DIRECT COSTS AND BENEFITS				
1.	Labor and Employee Fringe Benefits	$	30,879	
2.	Subcontractors	$	0	
3.	Equipment	$	0	
4.	Travel and Subsistence	$	22,540[1]	
5.	Electronic Data Processing	$	0	
6.	Reproduction/Publication	$	0	
7.	Mail and Phone	$	0	
8.	Supplies	$	4,327	
9.	Analyses	$	0	
10.	Miscellaneous	$	0	
	Total Direct Costs			$57,746
INDIRECT COSTS				
1.	Overhead	$	44,976	
2.	General and Administrative Expenses	$	0	
3.	Other Indirect Costs	$	0	
4.	Fee or Profit	$	0	
	Total Indirect Costs			$44,976
TOTAL PROJECT COSTS				**$102,722**

[1] The travel and subsistence charges are to cover the cost of travel and per diem for the contractor, and to partially cover the cost of travel and per diem for the PM instrument providers (travel for both entities is to the emissions test facility). Other than travel expenses, all other costs are being borne by the instrument providers (i.e., loan and shipping of instruments, calibrations, staff time to operate the instruments, and labor require to post-process and perform quality assurance/quality control of their emissions data).