State of California
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 09-16

February 26, 2009

Agenda Item No.: 09-2-2

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 2672-263, entitled "Characterization of Ambient Aerosol Sources and Processes during CalNex 2010 with Aerosol Mass Spectrometry," has been submitted by the University of Colorado, Boulder;

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 2672-263 entitled "Characterization of Ambient Aerosol Sources and Processes during CalNex 2010 with Aerosol Mass Spectrometry," submitted by the University of Colorado, Boulder, for a total amount not to exceed $285,000.

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 2672-263 entitled "Characterization of Ambient Aerosol Sources and Processes during CalNex 2010 with Aerosol Mass Spectrometry," submitted by the University of Colorado, Boulder, for a total amount not to exceed $285,000.

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 $285,000.

I hereby certify that the above is a true and correct copy of Resolution 09-16, as adopted by the Air Resources Board.

Monica Vejar

Monica Vejar, Clerk of the Board

ATTACHMENT A

"Characterization of Ambient Aerosol Sources and Processes during CalNex 2010 with Aerosol Mass Spectrometry"

Background

Despite improvements in emission control technologies, fine particles remain a serious pollution problem in urban areas of California. Both the South Coast Air Basin and the Central Valley frequently exceed California health-based particle concentration standards. Aerosols significantly impact other areas as well, such as climate, visibility, and deposition of toxics and nutrients to the ground. A recent study in the eastern South Coast Air Basin – 2005 Study of Organic Aerosols at Riverside (SOAR) - was organized by Professor Jimenez and indicated that secondary organic aerosol (SOA) is the dominant component of organic aerosol (OA). In this work, five independent estimates of SOA for PM2.5 during the summer gave similar values: SOA comprises approximately 70 percent of the organic aerosol during the summer (in the absence of a "photochemical episode"). Organic aerosol comprised approximately 40 percent of the total PM2.5. Aerosol Mass Spectrometer (AMS) measurements near downtown Los Angeles show that this high level of SOA is not limited to the eastern side of the air basin, but is likely to extend to the western side as well.

Objective

The primary objective of the proposed research is to improve the characterization of the sources and processing of organic aerosols in the South Coast Air Basin of California. This will be achieved through the deployment of a high-resolution AMS and auxiliary instrumentation at a ground-based supersite in the Los Angeles area during the CalNex 2010 field study and the subsequent data analysis.

Methods

A high-resolution, time-of-flight AMS instrument will be deployed at a supersite located near downtown Los Angeles. Analysis of the data sets will be carried out using positive matrix factorization and other statistical methods. These techniques will allow identification of different components of SOA (primary and different aged secondary organic aerosol fractions).

Expected Results

In conjunction with other gas- and particle-phase measurements from National Oceanic and Atmospheric Administration and other research groups and newly developed mass spectrometric techniques, this research will identify both primary and secondary components of organic aerosol, characterize the sources and chemical properties of these components, and test state-of-the-science SOA models.

Significance to the Board

The project will provide critically needed information on organic aerosols in the South Coast Air Basin: unique, high-resolution AMS data sets and comprehensive primary/secondary aerosol mass analyses. This information will facilitate effective policy decisions and implementation regarding both climate change and air quality.

Contractor:
University of Colorado, Boulder

Contract Period:
36 months

Principal Investigator (PI):
Professor Jose-Luis Jimenez

Contract Amount:
$285,000

Basis for Indirect Cost Rate:
The State and the University of Colorado, Boulder have agreed to a ten percent indirect cost rate.

Past Experience with this Principal Investigator:
Although the State does not have direct previous experience with Professor Jose Jimenez, he is widely recognized as one of the premiere aerosol scientists in the world and as a leader in Aerosol Mass Spectrometer analysis. Staff is confident that his group's work will provide new and important information about primary and secondary aerosol sources and processing, which is critically needed for the development of optimal climate change and air pollution mitigation strategies.

Prior Research Division Funding to University of Colorado, Boulder:

Year	2008	2007	2006
Funding	$0	$0	$0

BUDGET SUMMARY

Contractor: University of Colorado at Boulder

Characterization of Ambient Aerosol Sources and Processes during CalNex 2010 with Aerosol Mass Spectrometry

DIRECT COSTS AND BENEFITS			
1.	Labor and Employee Fringe Benefits	$ 160,130	
2.	Subcontractors	$ 30,000	
3.	Equipment	$ 0	
4.	Travel and Subsistence	$ 21,507	
5.	Electronic Data Processing	$ 525	
6.	Reproduction/Publication	$ 160	
7.	Mail and Phone	$ 350	
8.	Supplies	$ 12,300	
9.	Analyses	$ 0	
10.	Miscellaneous	$ 37,391[1]	
	Total Direct Costs		$262,363
INDIRECT COSTS			
1.	Overhead	$ 0	
2.	General and Administrative Expenses	$ 22,637	
3.	Other Indirect Costs	$ 0	
4.	Fee or Profit	$ 0	
	Total Indirect Costs	$ 22,637	
TOTAL PROJECT COSTS			**$285,000**

[1] Funds are requested for tuition remission for the two graduate students (3 semesters for C. Robinson and 4 semesters for A. Ortega), and for shipping to and from the field study (estimated from previous experience during the SOAR campaigns).

Attachment 1

SUBCONTRACTORS' BUDGET SUMMARY

Subcontractor: Pennsylvania State University

Description of subcontractor's responsibility: Professor William Brune and a research assistant from Pennsylvania State University will test and calibrate a Potential Aerosol Mass (PAM) chamber, help the PI (Professor Jose Jimenez) and coworkers couple the chamber to the Aerosol Mass Spectrometer, and collaborate in the data collection and analysis.

DIRECT COSTS AND BENEFITS			
1.	Labor and Employee Fringe Benefits	$ 13,619	
2.	Subcontractors	$ 0	
3.	Equipment	$ 0	
4.	Travel and Subsistence	$ 2,000	
5.	Electronic Data Processing	$ 0	
6.	Reproduction/Publication	$ 0	
7.	Mail and Phone	$ 0	
8.	Supplies	$ 12,563[1]	
9.	Analyses	$ 0	
10.	Miscellaneous	$ 0	
	Total Direct Costs		$28,182
INDIRECT COSTS			
1.	Overhead	$ 1,818	
2.	General and Administrative Expenses	$ 0	
3.	Other Indirect Costs	$ 0	
4.	Fee or Profit	$ 0	
	Total Indirect Costs	$ 1,818	
TOTAL PROJECT COSTS			**$30,000**

[1] Cost includes $10,000 for materials to be fabricated to build a chamber