

State of California  
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 09-59

December 9, 2009

Agenda Item No.: 09-10-1

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 2680-265, entitled "Hourly In-situ Quantitation of Organic Aerosol Marker Compounds during CalNex 2010," has been submitted by the University of California, Berkeley;

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 2680-265 entitled "Hourly In-situ Quantitation of Organic Aerosol Marker Compounds during CalNex 2010," submitted by the University of California, Berkeley, for a total amount not to exceed \$249,999.

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 2680-265 entitled "Hourly In-situ Quantitation of Organic Aerosol Marker Compounds during CalNex 2010," submitted by the University of California, Berkeley, for a total amount not to exceed \$249,999.

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 \$249,999.

I hereby certify that the above is a true and correct copy of Resolution 09-59, as adopted by the Air Resources Board.

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Lori Andreoni, Clerk of the Board

## ATTACHMENT A

### “Hourly In-situ Quantitation of Organic Aerosol Marker Compounds during CalNex 2010”

#### **Background**

Mass concentrations of particulate matter in the southern San Joaquin Valley routinely exceed ambient air quality standards established to protect public health. Organics comprise a significant but variable fraction (20-80 percent) of the particulate matter. This research will provide detailed hourly measurements of over 100 organic particulate species and use factor (and/or positive matrix factorization) analysis to characterize the contribution of various types of emission sources to the organic species in particulate matter.

#### **Objective**

The objective of this project is to identify the types of emissions contributing to the observed organic particulate matter in the southern San Joaquin Valley.

#### **Methods**

The investigators will make measurements that characterize many of the organic compounds in fine particulate matter, relate that information to measurements of gaseous volatile organic compounds in the air and to the mixture of organic species associated with various types of emission sources, and then conduct statistical analyses that can ascribe the mix of source types contributing to the observed composition of organic particulate matter in the air.

#### **Expected Results**

The investigators will provide uniquely detailed organic particulate matter data (hourly data for over 100 organic species for up to 6 weeks) at the CalNex super-site in the southern San Joaquin Valley during the CalNex field study (May-June 2010). These and additional collocated CalNex measurements (e.g., volatile organic compounds (VOC)) will be validated and subjected to factor analysis to identify the contribution of various emission sources (direct emissions and secondary formation from atmospheric gases).

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

The results will help ARB design efficient control strategies to reduce ambient PM in the southern San Joaquin Valley and thus improve the health and welfare of residents. The results will provide new insights into the chemical reactions occurring in the atmosphere and also into improving the chemistry modules of aerosol models.

#### **Contractor:**

University of California, Berkeley (UCB)

#### **Contract Period:**

24 months

**Principal Investigator (PI):**

Professor Allen Goldstein

**Contract Amount:**

\$249,999

**Cofunding:**

The proposed project is an ARB contribution to CalNex 2010, which is a collaborative study with the National Oceanic and Atmospheric Administration (NOAA) to address scientific questions which bear upon the ability to formulate policy related to mitigation of air pollution and climate change. NOAA is contributing resources and direct funding to CalNex conservatively estimated at \$15,000,000. The NOAA contributions include a dedicated research vessel and multiple research aircraft, ground support, planning, and direct funding of contracted measurements.

**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:**

Professor Goldstein is a well-known and respected research expert on anthropogenic and biogenic sources of VOCs. He is one of the premier experts on atmospheric chemistry in forests. He has conducted past research and staff have been pleased with Professor Goldstein's planning, execution, and reporting of results from his research projects. Two previous contracts with ARB that have direct pertinence to this project are 98-328 (Blodgett Forest VOCs) and 03-324 (TAG in SOAR).

**Prior Research Division Funding to UCB:**

<b>Year</b>	<b>2008</b>	<b>2007</b>	<b>2006</b>
<b>Funding</b>	\$1,135,500	\$1,372,484	\$1,607,398

**B U D G E T   S U M M A R Y**

Contractor: University of California (Berkeley)

Hourly In-Situ Quantitation of Organic Aerosol Market Compounds During CalNEX 2010

**DIRECT COSTS AND BENEFITS**

1.	Labor and Employee Fringe Benefits	\$	91,452
2.	Subcontractors	\$	94,845
3.	Equipment	\$	0
4.	Travel and Subsistence	\$	8,000
5.	Electronic Data Processing	\$	0
6.	Reproduction/Publication	\$	2,000
7.	Mail and Phone	\$	0
8.	Supplies	\$	13,736
9.	Analyses	\$	0
10.	Miscellaneous	\$	<u>25,947<sup>1</sup></u>
	Total Direct Costs		\$235,980

**INDIRECT COSTS**

1.	Overhead	\$	14,019
2.	General and Administrative Expenses	\$	0
3.	Other Indirect Costs	\$	0
4.	Fee or Profit	\$	<u>0</u>
	Total Indirect Costs		<u>\$14,019</u>

**TOTAL PROJECT COSTS** **\$249,999**

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<sup>1</sup> Miscellaneous line item represents remission of the tuition (in-state) and student fees for the two years that the Graduate Student Researcher will be working on this project.

**Attachment 1****SUBCONTRACTORS' BUDGET SUMMARY**

Subcontractor: Aerosol Dynamics, Inc.

Description of subcontractor's responsibility: Aerosol Dynamics, Inc. (ADI) staff will prepare, set-up, operate, maintain, trouble-shoot, and remove the TAG instrument from the monitoring site in the southern San Joaquin Valley during the CalNex field study. ADI will QA/QC the data. ADI will also participate in the integration and analysis of data sets and the presentation of results.

**DIRECT COSTS AND BENEFITS**

1.	Labor and Employee Fringe Benefits	\$	49,936
2.	Subcontractors	\$	0
3.	Equipment	\$	0
4.	Travel and Subsistence	\$	3,106
5.	Electronic Data Processing	\$	0
6.	Reproduction/Publication	\$	0
7.	Mail and Phone	\$	0
8.	Supplies	\$	6,848
9.	Analyses	\$	0
10.	Miscellaneous	\$	<u>0</u>
	Total Direct Costs		\$59,890

**INDIRECT COSTS**

1.	Overhead	\$	34,955 <sup>1</sup>
2.	General and Administrative Expenses	\$	0
3.	Other Indirect Costs	\$	0
4.	Fee or Profit	\$	<u>0</u>
	Total Indirect Costs		<u>\$34,955</u>

**TOTAL PROJECT COSTS** **\$94,845**

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<sup>1</sup> Overhead rate is only 70% of labor (line item #1 under Direct Costs). This is different from the standard methodology of applying the overhead rate to Total Direct Costs minus Equipment. This modified methodology results in savings to the ARB of about \$7,000 compared to the standard methodology.