State of California
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 08-21

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 2654-259, entitled "ARCTAS-California 2008: An Airborne Mission to investigate California Air Quality," has been submitted by the University of California, Irvine;

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

WHEREAS, the National Atmospheric and Space Administration is providing cost sharing through contribution of in-kind resources including research aircraft, instruments, personnel, and data management services; and

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

> Proposal Number 2654-259 entitled "ARCTAS-California 2008: An Airborne Mission to investigate California Air Quality," submitted by the University of California, Irvine, 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 2654-259 entitled "ARCTAS-California 2008: An Airborne Mission to investigate California Air Quality," submitted by the University of California, Irvine, 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 08-21, as adopted by the Air Resources Board.

Lori Andreoni

Lori Andreoni, Clerk of the Board

ATTACHMENT A

"ARCTAS-California 2008: An Airborne Mission to investigate California Air Quality"

Background

The understanding of emission sources, atmospheric transport, and chemical transformations is foundational to evaluating the effectiveness of plans for reducing emissions of those pollutants directly harmful to human health and those greenhouse gas (GHG) species which can cause harm through climate change. Therefore, it is important to obtain complementary suites of measurements for multiple pollutants including precursor emissions and intermediate and final reaction products at locations both offshore and over land. Most aircraft platforms available to past air quality studies have been limited by available power or payload to carrying relatively few types of instruments and have had relatively restricted geographic range. To obtain a more extensive suite of measurements than previously possible, this study would take advantage of a cost sharing from the National Atmospheric and Space Administration (NASA) in the form of their contribution of two advanced research aircraft. The contribution from NASA is made possible and the cost to the Air Resources Board (ARB) is low because these aircraft are already being prepared and funded for sophisticated instrumentation by multiple principal investigators in preparation for studies of the transport and transformation of pollutants in the arctic in 2008. The NASA aircraft with all research personnel and infrastructure can be made available for one week during summer 2008 for use on California specific missions.

Objective

The proposed airborne observations are expected to provide improved information on emissions and radiative forcing from GHGs and aerosols important to climate change and human health. The characterization will address emissions, atmospheric chemical processes, off-shore and aloft boundary conditions, and ocean-land interactions for an extensive list of gases and aerosols important to climate change and protection of human health.

Methods

The research aircraft are equipped with state-of-the-science instruments for in-situ measurements of concentrations and meteorological variables and collection of whole air samples for subsequent laboratory analysis.

Expected Results

The contractor will collect air samples aboard the NASA DC-8 research aircraft and will analyze those samples in the laboratory to quantify more than 60 trace gases in each. The subcontractor will make advanced measurements detailing nitrogen containing species important to climate change and ozone and aerosol formation.

Significance to the Board

The observations to be collected with the proposed efforts are foundational for improvement and validation of emission inventories for a long list of greenhouse gas species and precursor species which lead to formation of ozone and aerosols. The experiments are also expected to provide new information on natural and anthropogenic

emissions of sulfur containing compounds off the coast of California. In addition, details of mercury chemistry and atmospheric processing will be considered. In addition, the suite of measurements will provide observational constraints for models of the chemical processing and fate of atmospheric mercury.

Contractor:
University of California, Irvine (UCI)

Contract Period:
24 months

Principal Investigator (PI):
Professor Donald Blake

Contract Amount:
$400,000

Cofunding:
As a cost sharing, NASA as a project collaborator will fly two highly instrumented aircraft for missions designed specifically to address research questions of interest to the ARB. As a cost sharing, ARB will fund two PI's, Professor Donald Blake of UCI and Ronald Cohen of the University of California, Berkeley for their operations on the NASA aircraft. The NASA aircraft have range, speed, and instrument payloads sufficient to provide detailed information both over land and well offshore.

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:
The PI, Professor Donald Blake of UCI, has provided good service to ARB on past contracts. He is currently providing sample collection and laboratory analysis to quantify concentrations of hydrocarbon species and green house gas species collected as part of an ARB special study at Mount Wilson.

Prior Research Division Funding to the University of California, Irvine:

Year	2007	2006	2005
Funding	$456,616	$368,534	$542,644

BUDGET SUMMARY

Contractor: University of California, Irvine

ARCTAS-California 2008: An Airborne Mission to Investigate California Air Quality

DIRECT COSTS AND BENEFITS			
1.	Labor and Employee Fringe Benefits	$ 159,490	
2.	Subcontractors (UC, Berkeley)	$ 190,000	
3.	Equipment	$ 0	
4.	Travel and Subsistence	$ 0	
5.	Electronic Data Processing	$ 0	
6.	Reproduction/Publication	$ 0	
7.	Mail and Phone	$ 0	
8.	Supplies	$ 32,068	
9.	Analyses	$ 0	
10.	Miscellaneous	$ 0	
	Total Direct Costs		$381,558
INDIRECT COSTS			
1.	Overhead (10% of 184,415)	$ 18,442	
2.	General and Administrative Expenses	$ 0	
3.	Other Indirect Costs	$ 0	
4.	Fee or Profit	$ 0	
	Total Indirect Costs		$18,442
TOTAL PROJECT COSTS			**$400,000**

Attachment 1

SUBCONTRACTORS' BUDGET SUMMARY

Subcontractor: University of California, Berkeley

Description of subcontractor's responsibility: UCB will integrate instrumentation aboard the NASA DC-8 for in-situ measurement of NO_2, total peroxynitrates, total alkyl and multifunctional nitrates and HNO3 and assess for correlated sources of VOC and NO_X, sources of NO_X alone and the effects of NO_X on a) HO_X radicals, b) inorganic and organic aerosol production and c) production of ozone.

DIRECT COSTS AND BENEFITS			
1.	Labor and Employee Fringe Benefits	$ 142,286	
2.	Subcontractors	$ 0	
3.	Equipment	$ 0	
4.	Travel and Subsistence	$ 0	
5.	Electronic Data Processing	$ 0	
6.	Reproduction/Publication	$ 0	
7.	Mail and Phone	$ 0	
8.	Supplies	$ 12,595[1]	
9.	Analyses	$ 0	
10.	Miscellaneous	$ 19,631[2]	
	Total Direct Costs		$174,512
INDIRECT COSTS			
1.	Overhead	$ 15,488	
2.	General and Administrative Expenses	$ 0	
3.	Other Indirect Costs	$ 0	
4.	Fee or Profit	$ 0	
	Total Indirect Costs		$15,488
TOTAL PROJECT COSTS			**$190,000**

[1] Electronic parts and vacuum equipment. Costs are based on average expenditures in recent projects of similar scope and are adjusted for inflation.
[2] Tuition for two graduate student assistants for four semesters total.