State of California
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 10-5

February 25, 2010

Agenda Item No.: 10-2-1

WHEREAS, the Air Resources Board (ARB or 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 2697-266, entitled "Mobile Platform III: Characterizing Spatially Inhomogeneous Non-Criteria Pollutants in the Los Angeles Air Basin," has been submitted by the University of California, Los Angeles;

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

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

> Proposal Number 2697-266 entitled "Mobile Platform III: Characterizing Spatially Inhomogeneous Non-Criteria Pollutants in the Los Angeles Air Basin," submitted for a total amount not to exceed $290,000.

NOW, THEREFORE, BE IT RESOLVED that ARB, pursuant to the authority granted by Health and Safety Code section 39703, hereby accepts the recommendation of RSC and approves the following:

> Proposal Number 2697-266 entitled "Mobile Platform III: Characterizing Spatially Inhomogeneous Non-Criteria Pollutants in the Los Angeles Air Basin," submitted for a total amount not to exceed $290,000.

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 $290,000.

I hereby certify that the above is a true and correct copy of Resolution 10-5, as adopted by the Air Resources Board.

Sandra Bannerman, Clerk of the Board

ATTACHMENT A

Mobile Platform III: Characterizing Spatially Inhomogeneous Non-Criteria Pollutants in the Los Angeles Air Basin

Background

Highly localized vehicle emission impacts due to sharp concentration gradients near roadways have been of growing concern in recent years and have important exposure and health implications for those spending time in close proximity to major roadways. In a preceding study by the current investigators (Hu et al., 2009), a wide impact area of elevated pollutant concentrations on the downwind (up to ~2000 m) and upwind (up to ~600 m) sides of a freeway was measured during the pre-sunrise (PSR) hours. This impact area was much larger than earlier measurements during daytime particularly on the downwind side, where pollutant concentrations dropped slowly, remaining at about 40 percent of their freeway edge values 1200 m downwind. The measurements were made during meteorological conditions typical of the PSR period, characterized by weak winds and a radiation inversion. The results suggested broad areas of elevated pollutants around major roadways may be common in the early morning hours; however, this hypothesis needs to be tested. There are also concerns regarding the proximity of roadways with high traffic densities to primarily minority and low-income neighborhoods. Although Southern California has met Federal Air Quality Standards for carbon monoxide and nitrogen oxide on a regional basis, concentrations of these pollutants are more elevated along heavily traveled roadways. In addition, a recent California Department of Health Services study found that non-white children were three to four times more likely to live in areas with high traffic density compared to white children.

Objective

The objective of this study is to generalize previous PSR results to several locations in Southern California, and to characterize air pollution and exposure in low-income and/or minority neighborhoods that are adversely impacted by sources (e.g. freeways, busy arterial roads).

Methods

Researchers at University of California, Los Angeles (UCLA) propose to use the mobile platform, developed by Air Resources Board (ARB), to measure ultrafine particles (UFP), particulate matter (PM) 2.5 mass, black carbon, oxides of nitrogen (NO, NO_2, NO_X), carbon dioxide (CO_2), carbon monoxide (CO), and particle-bound polyaromatic hydrocarbons (PAHs) in different locations in the South Coast Basin. These locations include the area near the Ports of Los Angeles and Long Beach, downtown Los Angeles/Boyle Heights, and another location on the east side of the basin. The bulk of the sampling consists of 6-9 measurement days per sampling route in both winter and summer seasons. Sampling will occur on three different routes in various locations in the South Coast Basin during the PSR period, in the morning after sunrise, and in the afternoon. Routes driven during the PSR period will mainly focus on the near-roadway environment. Morning (post-sunrise) and afternoon routes in the Boyle

Heights/Downtown Los Angeles, and Ports areas will also include measurements near housing communities located in low-income/minority neighborhoods.

Expected Results
The results of this study will contribute to our understanding of near-road exposures during the PSR period as well as our understanding of air quality in/at low-income communities/housing complexes. In addition, this study will begin to evaluate the effect of various emission control strategies (implemented by ARB and the Ports of Los Angeles and Long Beach), on exposures in freeway-adjacent residential neighborhoods.

Significance to the Board
Elevated levels of pollutants near busy roadways have important exposure implications, particularly in the early morning hours before sunrise, when people are most likely to be home. During this time period, elevated pollution levels have been observed up to a mile and a half downwind of a busy freeway and over a quarter mile upwind of the freeway. The findings of this study will determine the overall importance of the PSR exposures and attempt to elucidate vehicle-related exposures in low-income and/or minority neighborhoods.

Contractor:
University of California, Los Angeles

Contract Period:
30 months

Principal Investigators (PI):
Suzanne E. Paulson, Ph.D.
(Co-PI) Arthur M. Winer, Ph.D.

Contract Amount:
$290,000

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

Past Experience with this Principal Investigator:
Professor Paulson has nearly a decade of research experience in atmospheric science and has recently published two important manuscripts using data gathered from ARB's mobile platform to characterize exposures during PSR hours and near a small municipal airport. She has also successfully led previous ARB-funded studies.

Professor Winer has four decades of research experience in the field of air pollution. He has successfully completed numerous projects and contracts with ARB and has been involved with mobile platform measurements and analysis for at least five years.

Prior Research Division Funding to University of California, Los Angeles:

Year	2008	2007	2006
Funding	$386,076	$616,171	$348,990

BUDGET SUMMARY

Contractor: University of California, Los Angeles

Mobile Platform III: Characterizing Spatially Inhomogeneous Non-Criteria Pollutants in the Los Angeles Air Basin

DIRECT COSTS AND BENEFITS				
1.	Labor and Employee Fringe Benefits	$	245,948	
2.	Subcontractors	$	0	
3.	Equipment	$	0	
4.	Travel and Subsistence	$	5,000	
5.	Electronic Data Processing	$	0	
6.	Reproduction/Publication	$	1,200	
7.	Mail and Phone	$	0	
8.	Supplies	$	2,303	
9.	Analyses	$	0	
10.	Miscellaneous	$	11,811[1]	
	Total Direct Costs			$266,262
INDIRECT COSTS				
1.	Overhead	$	23,738	
2.	General and Administrative Expenses	$	0	
3.	Other Indirect Costs	$	0	
4.	Fee or Profit	$	0	
	Total Indirect Costs			$23,738
TOTAL PROJECT COSTS				**$290,000**

[1] Equipment maintenance for mobile platform.