

State of California  
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 05-44

September 15, 2005

Agenda Item No.: 05-8-2

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 2589-249, entitled "Environmental Justice Saturation Monitoring of Selected Pollutants in Wilmington", has been submitted by Desert Research Institute;

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

WHEREAS, the California Energy Commission has agreed to cosponsor this proposal for a total amount of \$150,000; and

WHEREAS, the South Coast Air Quality Management District has agreed to cosponsor this proposal for a total amount of \$100,000; and

WHEREAS, the Air Resources Board will fund this proposal for a total amount not to exceed \$225,451; and

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

Proposal Number 2589-249 entitled "Environmental Justice Saturation Monitoring of Selected Pollutants in Wilmington", submitted by Desert Research Institute, for a total amount not to exceed \$475,451.

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 2589-249 entitled "Environmental Justice Saturation Monitoring of Selected Pollutants in Wilmington", submitted by the Desert Research Institute, for a total amount not to exceed \$475,451.

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 \$475,451.

I hereby certify that the above is a true and correct copy of Resolution 05-44, as adopted by the Air Resources Board.

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Lori Andreoni, Clerk of the Board

## **ATTACHMENT A**

### **“Environmental Justice Saturation Monitoring of Selected Pollutants in Wilmington”**

#### **Background**

Air quality data are essential to characterize a community's exposure to air pollutants; however, air quality data (criteria pollutants and air toxics) collected at any environmental justice (EJ) community are very limited, typically at relatively few (one to five) locations due to the cost of traditional monitoring technologies. In order to address these issues, an EJ project entitled “Air Pollution and Environmental Justice: Integrating Indicators of Cumulative Impact and Socioeconomic Vulnerability into Regulatory Decision-making” (Pastor et al.) was recently developed and funded by the Air Resources Board (ARB) and the California Energy Commission (CEC). The project is intended to develop a framework that takes into account cumulative exposure, a more comprehensive model of vulnerability at the community level including environmental, demographic, and socioeconomic status (SES) factors, and a screening tool for regulators and others to identify areas in need of special policy attention and community outreach. A wide range of databases (e.g., air quality data and census data) from federal, state, and air district sources, as well as local case studies will be integrated for this project.

Wilmington, near Los Angeles, is located in one of the largest industrial and commercial areas of Southern California and the potential for disproportional health impacts to the community has drawn considerable interest from policy makers and community advocates. It has several large refineries, the intermodal container transfer facility and the associated Alameda corridor, and is located just north of the Ports of Los Angeles and Long Beach, and is surrounded by some of the most heavily traveled freeways in the Los Angeles metropolitan area. Wilmington was selected for this saturation project because of its proximity to many stationary, area, and mobile sources, abundance of the existing data, and ongoing and planned research efforts in this area. To complement the Pastor et al. project, additional air quality of finer spatial resolution that captures real exposure in the community and are compatible with SES data are needed.

#### **Objectives**

There are four objectives in this project, including: 1) complementing the Pastor et al. project and providing an air quality data set that is of comparable spatial resolution as socioeconomic status (SES) data for EJ analysis, 2) collecting spatially resolved data in order to identify hot spots of selected pollutants, their magnitude and spatial extent, and relative importance compared to a regional background, 3) collecting data of sufficient spatial and temporal resolution to allow comparison with fine-scale modeling results, and 4) demonstrating the use of low-cost monitoring technologies such as passive monitors.

## **Methods**

The study will be conducted in three phases. In the initial phase, we will evaluate the precision, accuracy, sampling rates and validity of passive sampling methods in the laboratory using a flow through chamber with known pollutant concentrations. In phase 2, all sampling methods that are proposed for the saturation monitoring program will be tested in Wilmington prior to initiation of the full field study. Measurements will likely include passive monitors for O<sub>3</sub>, NO, NO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub>, BTEX (benzene, toluene, ethylbenzene, xylenes), formaldehyde, and acrolein, odor-causing sulfides, and low-volume aerosol sampler for fine particulate matter mass and light absorption. Phase 3, saturation monitoring, will be conducted over a period of one year starting in the summer of 2006 and will consist of a two tiered approach. Tier 1 will consist of four consecutive weeks of monitoring during each quarter of the year at up to twenty sites to establish seasonal average variations in neighborhood-scale exposures among the various census tracts in Wilmington and at various mobile and stationary source hot spots. Tier 1 will consist of one-week integrated passive and low-volume aerosol samples. Tier 2 measurements will supplement the Tier 1 saturation monitoring program with daily sampling for PM and BTEX and continuous CO, VOC and PM<sub>2.5</sub> mass measurements at selected hotspot locations during two-week sampling periods in both summer and fall/winter. This proposed saturation monitoring program will be coordinated with complementary studies by other investigators of the pollutant gradients in the areas using a mobile monitoring platform and a second study of exposures to ultrafine particles.

## **Expected Results**

This project is intended to complement the Pastor et al. project that was recently developed and funded by the California Air Resources Board and the California Energy Commission. This includes collection of extensive spatial and temporal data to identify hotspots of selected pollutants in Wilmington and determine the concentration gradient in areas primarily impacted by stationary as well as mobile and area sources. The data set collected from this project will be combined with SES data for EJ analysis and allow comparisons with existing emission inventory and dispersion modeling results. The outcome of this project is expected to improve our understanding of actual exposure level at an EJ community and the methodology developed from this project is expected to be applicable to other EJ communities.

## **Significance to the Board**

The results of this project will provide the ARB, other regulatory agencies, and researchers with improved and more up-to-date database for assessing exposure levels in EJ communities and lead to more scientifically sound control plans and strategies.

## **Contractor:**

Desert Research Institute

## **Contract Period:**

36 months

**Principal Investigators (PIs):**

Eric M. Fujita, D. Env., Principal Investigator

Barbara Zielinska, Ph.D., Co-Principal Investigator

**Contract Amount:**

\$475,451

**Cofunding:**

The California Energy Commission and the South Coast Air Quality Management District are contributing \$150,000 and \$100,000, respectively, to the cost of this study.

**Basis for Indirect Cost Rate:**

The State and the Desert Research Institute have agreed to a sixty-nine percent indirect cost rate because of the cost share factor.

**Past Experience with this Principal Investigator:**

Both Principal Investigators are well qualified for conducting this field study. Dr. Eric Fujita is a Research Professor at the DRI and has over 24 years of experience in managing and conducting air quality studies. He is the principal author of the field study plans for the 2000 Central California Ozone Study and 1997 Southern California Ozone Study (SCOS97-NARSTO). His research interests include chemical characterization of emission sources, reconciliation of emission inventory estimates for VOC and PM with ambient measurements, and measurement and characterization of exposure to toxic air contaminants. He has conducting similar studies in Houston and Mexicali, Mexico. Dr. Fujita also coordinated laboratory comparisons of VOC measurements during the SCOS97-NARTSO, COAST and NARSTO-Northeast ozone studies. Dr. Barbara Zielinska is also a Research Professor and the Director of the Organic Analytical Laboratory at DRI and has over twenty years of experience in the collection and analysis of trace atmospheric organic compounds. Her current primary areas of interest include collection and analysis of trace atmospheric organic species present in both the gas and particle phases and development of analytical methods for identifying biologically active compounds in primary and secondary particulate organic matter.

**Prior Research Division Funding to DRI:**

Year	2005	2004	2003
Funding	\$0	\$0	\$0

# BUDGET SUMMARY

Desert Research Institute

“Environmental Justice Saturation Monitoring of Selected Pollutants in Wilmington”

## **DIRECT COSTS AND BENEFITS**

1.	Labor and Employee Fringe Benefits	\$	139,860
2.	Subcontractors	\$	0
3.	Equipment	\$	41,705 <sup>1</sup>
4.	Travel and Subsistence	\$	34,930
5.	Electronic Data Processing	\$	0
6.	Reproduction/Publication	\$	0
7.	Mail and Phone	\$	0
8.	Supplies	\$	18,008
9.	Analyses	\$	148,767 <sup>2</sup>
10.	Miscellaneous	\$	<u>0</u>
	Total Direct Costs		\$383,270

## **INDIRECT COSTS**

1.	Overhead	\$	235,680
2.	General and Administrative Expenses	\$	0
3.	Other Indirect Costs	\$	0
4.	Fee or Profit	\$	0
5.	Less Cost Share	\$	<u>(143,499)</u>
	Total Indirect Costs		<u>\$92,181</u>

## **TOTAL PROJECT COSTS**

**\$475,451**

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<sup>1</sup> Aerosol Sampling Network      \$22,425  
CO/CO2 Monitor                    5,990  
ppbRAE PID Monitor                13,290

<sup>2</sup> The major component of this project is extensive data collections and analyses.