State of California
AIR RESOURCES BOARD

Resolution 81-48

July 29,1981

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, an unsolicited research Proposal Number 1035-83a entitled "Assessment of Gaseous and Particulate Dry Acid Deposition in California," has been submitted by the Air and Industrial Hygiene Laboratory, California Department of Health Services, to the Air Resources Board; and

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

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

> Proposal Number 1035-83a entitled, "Assessment of Gaseous and Particulate Dry Acid Deposition in California," submitted by the Air and Industrial Hygiene Laboratory, California Department of Health Services for a total amount not to exceed $155,254,

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 1035-83a entitled, "Assessment of Gaseous and Particulate Dry Acid Deposition in California," submitted by the Air and Industrial Hygiene Laboratory, California Department of Health Services for a total amount not to exceed $155,254.

BE IT FURTHER RESOLVED, that the Executive Officer shall initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed, in an amount not to exceed $155,254.

I certify that the above is a true and correct copy of Resolution 81-48 as passed by the Air Resources Board.

Sally Rump

Sally Rump
BOARD SECRETARY

State of California
AIR RESOURCES BOARD

ITEM NO.: 81-14-3b.1
DATE: July 29,1981

ITEM: Research Proposal No. 1035-83a entitled "Assessment of Gaseous and Particulate Dry Acid Deposition in California."

RECOMMENDATION: Adopt Resolution 81-48 approving Proposal No.1035-83a for funding in an amount not to exceed $155,254.

SUMMARY: The importance of dry deposition processes in the overall phenomenon of acid deposition has only recently been recognized. Specifically, a recent model of the South Coast Air Basin showed that dry deposition accounted for approximately 30 percent of the emitted acid precursors, which is about fifteen times the wet deposition value. It is also thought that the potential for environmental insult is greater for dry deposition owing to an undiluted and highly localized acidic dose to the receptor surface.

Although dry deposition samples are being collected on a routine basis by the national monitoring network, the data collected thus far are not well understood. In fact, there is no currently existing methodology that is widely accepted as adequate for quantifying dry acid deposition.

The objective of this two-year, two-phase project are to: 1) assess the magnitude of gaseous and particulate dry acid deposition at various California sites and compare these values to wet deposition values which have been documented in earlier studies; 2) provide reference dry deposition values for comparision with future data in order to establish trend information; 3) develop measurement techniques; and 4) investigate acidic particle size distributions and deposition on test surfaces.

In Phase I of the study, acid gases SO_2 and NO_2 will be measured at various sampling sites. Ambient concentrations of these acids and their precursors will be used, together with known deposition velocity values, to estimate deposition rates. The technique, known as the concentration method, will be compared

with the gradient method, which will be developed during Phase II of the study.

In the gradient method, acid precursor samples will be obtained at several levels above the ground, and deposition rates be calculated based on the vertical concentration gradient. Particle deposition will also be studied on various types of surfaces, and size distribution of acidic aerosol particles will be obtained using a newly developed acid particle filter sampler.

This study will provide valuable information on the relative contribution of dry deposition to the overall phenomenon of acid deposition in California. In addition, the proposed study would increase our understanding of the chemistry and formation of atmospheric acidity. This is expected to be critical to the Board in developing strategies to ensure acceptable levels of atmospheric acidity are not exceeded.

State of California

AIR RESOURCES BOARD

Resolution 81-49

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 Section 39700 through 39705;

WHEREAS, an unsolicited research Proposal Number 1038-83 entitled " Health Effects from the Inhalation of Oxidant Air Pollutants as Related to the Immune System" has been submitted by the University of California at Davis to the Air Resources Board; and

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

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

> Proposal Number 1038-83 entitled "Health Effects from the Inhalation of Oxidant Air Pollutants as Related to the Immune System" submitted by the University of California at Davis for an amount not to exceed $100,372;

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 1038-83 entitled "Health Effects from the Inhalation of Oxidant Air Pollutants as Related to the Immune System" submitted by the University of California at Davis for an amount not to exceed $100,372.

BE IT FURTHER RESOLVED, that the Executive Officer shall initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed, in an amount not to exceed $100,372.

I certify that the above is a true and correct copy of Resolution 81-49 as passed by the Air Resouces Board.

Sally Rump

Sally Rump
BOARD SECRETARY

State of California
AIR RESOURCES BOARD

ITEM NO: 81-14-3b.2
DATE: July 29,1981

ITEM: Research Proposal Number 1038-83 entitled "Health Effects from the Inhalation of Oxidant Air Pollutants as Related to the Immune System".

RECOMMENDATION: Adopt Resolution No. 81-49 approving Research Proposal No. 1038-83 for funding in an amount not to exceed $100,372

SUMMARY: This proposal is submitted to extend research efforts by the proponents. The previously reported work was done under ARB sponsorship. Findings of this earlier work indicate that ozone at concentrations as low as 0.16 ppm (the lowest value tested), administered over a two-week period, produced responses closely related to asthma in the mice under study. This response was due to an ozone-induced increase in sensitivity to a common allergen. This increased sensitivity was associated with increased numbers of immunologically active cells in the airway membranes of such animals. The earlier studies also demonstrated an unexpected finding in terms of viral infectivity. Two weeks of ozone exposure at 0.64 or 0.40 ppm inhibited respiratory viral infection in the mice studied.

Ozone-Lung Sensitization Experiments

The work to be performed in these experiments is related to the asthma initiation process and would be done primarily with the mouse model. Mice do not exhibit an obvious asthma-like reaction to inhaled allergens. However, much of what is known about the human immune system has been inferred from experimental work with mice. The end points to be assessed in the mice are analogous to asthma, in that similar immune system components and agents are actively involved. Ozone at 0.10 ppm would be employed in this study as well as one other level, depending on the initial study results.

While inhaled allergens do not provoke a direct asthmatic response in mice, guinea pigs do respond somewhat as human asthmatics respond, mainly with marked constriction of pulmonary smooth muscle. The investigators would attempt to demonstrate that the protocols employed to produce effects in mice would produce an asthma-like constriction of airways of the guinea pigs. The exposure and sensitization protocol employed in the first two studies on mice would be employed in these experiments.

Ozone at 0.2 ppm would be used for the first of two studies. The ozone level for the second study would be derived from the results of the initial effort. End points to be assayed for the guinea pigs would include observation of airway constriction following allergen inhalation, tissue alteration, and possible cellular changes.

Ozone-Viral Infectivity Experiments

The previous findings of ozone inhibition of the viral infection process by the investigator were totally unexpected. While they have postulated explanations for their observations further investigation was deemed necessary by them to allow for a fuller understanding of this phenomenon. The work proposed would be directed at investigating the nature of interaction between 0.16 ppm ozone given before and after viral infection initiation. The lower ozone level may well produce findings different from the previous work. The infectivity study would employ 250 mice. They would be split into control and exposed groups. The exposed animals would be exposed to 14 days of ozone. At the end of this period the differential mortality rates will be analyzed and a visual number survey, as well as interferon and antibody levels, and location studies will be undertaken.

State of California

AIR RESOURCES BOARD

Resolution 81-50

WHEREAS, an unsolicited proposal to augment Contract Number A0-100-32, entitled, "Rebuild California Air Resources Board Field Fumigation Facility and Maintain for Experimental Use" has been submitted by the University of California, Riverside to the Air Resources Board; and

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

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

> An Augmentation to Contract Number A0-100-32 entitled "Rebuild California Air Resources Board Field Fumigation Facility and Maintain for Experimental Use" for an amount not to exceed $9,168,

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:

> An Augmentation to Contract Number A0-100-32 entitled "Rebuild California Air Resources Board Field Fumigation Facility and Maintain for Experimental Use" for an amount not to exceed $9,168.

BE IT FURTHER RESOLVED, that the Executive Officer shall initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed, in an amount not to exceed $9,168.

I certify that the above is a true and correct copy of Resolution 81-50 as passed by the Air Resources Board.

Sally Rump

Sally Rump
BOARD SECRETARY

State of California
AIR RESOURCES BOARD

ITEM NO: 81-14-3b.3
DATE: July 29, 1981

ITEM: Proposal to augment Contract Number AO-100-32 entitled "Rebuild California Air Resources Board Field Fumigation Facility and Maintain for Experimental Use", University of California, Riverside, Dr. Ray Thompson.

RECOMMENDATION: Adopt Resolution No. 81-50 approving Proposed Augmentation of Contract AO-100-32 for an amount not to exceed $9,168.

SUMMARY: This proposal is a request for augmentation of an ongoing effort to rebuild, improve and refurbish 20 plant fumigation chambers located at University of California, Riverside. After the original contract was signed, a decision was made by staff and the contractor to rebuild the chambers on a larger site on the west campus. Chamber design was also changed to increase useable experimental area, improve temperature control and allow for quick disassembly in case of severe weather. The original chamber facility relied on ambient oxidants for fumigations. The new facility will have the added flexibility of controlling ozone concentration through an ozonizer. These improvements require (1) repair of an existing OREC ozonizer, (2) additional charcoal filters, and (3) Teflon sampling tubing.