State of California
AIR RESOURCES BOARD

LIDAR Profiling of Ozone in the San Joaquin Valley

Resolution 15-34

July 23, 2015

Agenda Item No.: 15-6-2

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 2798-283, titled "LIDAR Profiling of Ozone in the San Joaquin Valley," has been submitted by the National Oceanic and Atmospheric Administration, for a total amount not to exceed $101,281;

WHEREAS, the Research Division staff has reviewed Proposal Number 2798-283 and finds that in accordance with Health and Safety Code section 39701, research is needed to provide key data to begin to look into any contribution of baseline ozone aloft to surface ozone exceedances in the San Joaquin Valley; and

WHEREAS, in accordance with Health and Safety Code section 39705, the Research Screening Committee has reviewed and recommends funding the Research Proposal.

NOW, THEREFORE BE IT RESOLVED that the Air Resources Board, pursuant to the authority granted by Health and Safety Code section 39700 through 39705, hereby accepts the recommendations of the Research Screening Committee and staff and approves the Research Proposal.

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 Proposal as further described in Attachment A, in an amount not to exceed $101,281.

I hereby certify that the above is a true and correct copy of Resolution 15-34 as adopted by the Air Resources Board.

/s/
Tracy Jensen, Clerk of the Board

ATTACHMENT A

"LIDAR Profiling of Ozone in the San Joaquin Valley"

Background

Because health effects research has consistently led to lower ambient air quality standards for ozone, the Board needs to continue to reduce ozone precursor emissions in California. The San Joaquin Valley (SJV) is classified as an extreme ozone nonattainment area for the 8-hour ozone NAAQS. To attain the NAAQS, it is important to better understand how the various sources of ozone contribute to the high ozone concentrations. Some recent episodic field studies and modeling work suggest that baseline ozone over California may be increasing and it may contribute to ozone exceedances in the SJV under certain meteorological conditions. Increasing out-of-state contributions are making attainment of the more stringent ozone standards increasingly difficult. However, at present, there remains a great deal of uncertainty about the contributions of stratospheric and transported ozone to surface concentrations in the SJV. Intermittent measurements by ozonesondes or aircraft do not provide the temporal coverage needed to evaluate how well models (such as WRF-Chem) can estimate the contribution of background ozone to surface concentrations in the SJV during these transport regimes. This project will use surface based ozone LIDAR to provide quasi-continuous ozone profiles up to 2 – 3 km above ground level in the SJV for 6 weeks during the spring and summer (ozone season) of 2016. The data will help us to better characterize the ozone vertical profile and its temporal variation in the SJV, and understand the vertical mixing of ozone aloft down to the surface. It will provide key data to begin to look into any contribution of baseline ozone aloft to surface ozone exceedances in the SJV.

Objective

The primary objective of the study is to investigate the variability of ozone in the lowest 2 km above a fixed location in the San Joaquin Valley during the late spring (May-June) and summer (July-August) of 2016. This will be accomplished by using the mobile National Oceanic and Atmospheric Administration's (NOAA) Earth Systems Research Laboratory (ESRL) TOPAZ ozone LIDAR, which will be operated continuously (weather permitting) for periods of 4 to 8 hours on a daily basis, and for longer periods on an infrequent basis to collect vertical profiles of ozone concentrations. The data will help us to better characterize the vertical structure and mixing of ozone in the SJV.

Methods

A truck-mounted TOPAZ (Tunable Optical Profiler for Aerosols and Ozone) differential absorption LIDAR (DIAL) system will be deployed and operated by NOAA research team in the SJV. The LIDAR will be operated quasi-continuously for periods of 4-8 hours each day to collect ozone profiles up to 2 – 3 km above ground level for 6 weeks during the 2016 ozone season. The ozone profiles will be analyzed routinely and posted daily to a web site for access by ARB staff. At the end of the study, the profile data will be fully screened and validated for quality assurance and quality control, and then submitted to ARB.

Expected Results
It is anticipated that this project will provide the ARB with 6 weeks of ozone vertical profile data to better quantify the ozone vertical structure and its temporal variation in the SJV, and understand the vertical mixing of ozone aloft down to the surface during ozone exceedances.

Significance to the Board
The ozone LIDAR measurements in the San Joaquin Valley will provide key data to begin to look into any contribution of baseline ozone aloft to surface ozone exceedances in the SJV.

Contractor:
National Oceanic and Atmospheric Administration

Contract Period:
24 months

Principal Investigator (PI):
Andrew O. Langford, Ph.D.

Contract Amount:
$101,281

Basis for Indirect Cost Rate:
The State and the National Oceanic and Atmospheric Administration have agreed to a ten percent indirect cost rate.

Past Experience with this Principal Investigator:
The principal investigators have extensive experience with atmospheric remote sensing measurements and in determining different source contributions to ambient ozone. Both PIs have participated in numerous atmospheric chemistry field studies. They recently performed very similar ground based ozone LIDAR measurements in the Las Vegas Ozone Study.

Prior Research Division Funding to the National Oceanic and Atmospheric Administration:

Year	2014	2013	2012
Funding	$ 0	$ 0	$ 0

BUDGET SUMMARY

National Oceanic and Atmospheric Administration

LIDAR Profiling of Ozone in the San Joaquin Valley

DIRECT COSTS AND BENEFITS					
1.	Labor and Employee Fringe Benefits	$	50,235		
2.	Subcontractors	$	0		
3.	Equipment	$	0		
4.	Travel and Subsistence	$	26,688		
5.	Electronic Data Processing	$	0		
6.	Reproduction/Publication	$	0		
7.	Mail and Phone	$	0		
8.	Supplies	$	16,000		
9.	Analyses	$	0		
10.	Miscellaneous	$	2,000		
	Total Direct Costs			$	94,923
INDIRECT COSTS					
1.	Overhead	$	6,358		
2.	General and Administrative Expenses	$	0		
3.	Other Indirect Costs	$	0		
4.	Fee or Profit	$	0		
	Total Indirect Costs			$	6,358
TOTAL PROJECT COSTS				**$**	**101,281**