BOARD MEETING DATE: November 5, 2021 AGENDA NO. 10

PROPOSAL: Appropriate Funds for U.S. EPA Science to Achieve Results and NASA Citizen Science Grant Projects, Issue Purchase Orders for Air Monitoring Equipment

SYNOPSIS: In October 2016, the Board recognized revenue from U.S. EPA through its Science to Achieve Results (STAR) research grant project to engage, educate and empower California communities on the use and applications of "low-cost" air monitoring sensors. In October 2018, the Board recognized revenue from NASA for a three-year project to collect and use real-time sensor data to improve PM estimates from satellites. In July 2021, NASA granted a no-cost extension to complete the data analysis and reporting for the project. These actions are to appropriate funds up to $77,110 for the STAR grant project, and issue purchase orders for air quality sensors and monitoring systems. These actions are also to appropriate funds for the NASA Citizen Science grant award of up to $46,424.

COMMITTEE: Administrative, October 8, 2021; Recommended for Approval

RECOMMENDED ACTIONS:

1. Appropriate up to $22,011 for the U.S. EPA Science to Achieve Results (STAR) grant project in the Services & Supplies Major Object in Science & Technology Advancement's FY 2021-22 Budget (Org 43) to purchase air quality sensors;
2. Appropriate up to $55,099 for the U.S. EPA STAR grant project in the Capital Outlays Major Object of Science & Technology Advancement's FY 2021-22 Budget (Org 43) to purchase air monitoring systems;
3. Authorize the Procurement Manager, in accordance with South Coast AQMD Procurement Policy and Procedure, to issue sole source purchase orders with:
    a. PurpleAir, Inc. for up to 100 PurpleAir PA-II air quality sensors not to exceed $22,011, as listed in Table 1; and
    b. Aeroqual, Ltd. for up to two Aeroqual AQM 65 air monitoring systems not to exceed $55,099 as listed in Table 1.

4. Appropriate up to $46,424 for the NASA Citizen Science grant project into Science & Technology Advancement's Budget (Org 43) for FYs 2021-22 and/or 2022-23 as set forth in Table 2.

Wayne Nastri
Executive Officer

MMM:JCL:AP:VP:OP:ld

Background

Science to Achieve Results (STAR) Grant Project

On June 9, 2014, U.S. EPA, as part of its STAR project, solicited applications for research grants empowering communities and individuals to take action on avoiding air pollution exposure, using low-cost portable air pollution sensors. South Coast AQMD's proposal to provide California communities with the knowledge necessary to appropriately select, use and maintain sensors and interpret sensor data was awarded one of these grants. On October 7, 2016, the Board recognized and appropriated $749,820 from U.S. EPA for this grant. As part of this project, air quality sensors were deployed for PM2.5 measurements in 14 California communities, and calibration procedures were developed to improve the quality of the collected sensor data. Open-source tools were also developed to support data access, data analysis and data visualization of air quality information by communities and citizen scientists. On May 7, 2021 (Agenda No. 5; Recommended Action 6.) the Board authorized the execution of a sole source contract to enhance the capabilities of open-source tools to support data access, data analysis and data visualization of air quality. Due to unexpected circumstances in which the contractor downsized their operations, this contract could not be executed and $77,110 in grant funds will be used to purchase air quality sensors and monitoring systems instead. U.S. EPA has approved the reallocation of funds for the purchase of up to 100 PurpleAir PA-II air quality sensors and up to two Aeroqual AQM 65 air monitoring systems to maintain, sustain and calibrate the existing sensor network developed as part of the STAR grant project.

NASA Citizen Science Grant Project

In 2016, staff collaborated with the Research Triangle Institute (RTI) and NASA's Goddard Space Flight Center (GSFC) to apply for a competitive "Research Opportunities in Earth and Space Science (ROSES) 2016: Citizen Science for Earth Systems Program" research grant. The proposal was selected and South Coast AQMD was awarded $75,884 for a small-scale prototype phase deployment of low-cost PM sensors in the Basin. Upon successful completion of the prototype phase, in July 2018 this project was selected for a three-year implementation phase award. For the implementation phase, South Coast AQMD was awarded up to $452,776 to implement a spatially dense network of low-cost PM2.5 sensors to be operated by citizen scientists within the Basin, and to assist with implementation of similar networks in Raleigh,

North Carolina and New Delhi, India. The Board has previously recognized revenue for this grant. In July 2021, a one-year no-cost extension was granted by NASA to utilize the remaining grant funding to complete the sensor deployment and associated data analysis that were delayed due to COVID-19 health and safety restrictions.

Proposal

STAR Grant Project

This action is to appropriate up to $22,011 to the Services & Supplies Major Object in Science & Technology Advancement's FY 2021-22 Budget (Org 43) to purchase air quality sensors. This action is also to appropriate up to $55,099 in the Capital Outlays Major Object of Science & Technology Advancement's FY 2021-22 Budget (Org 43) to purchase air monitoring systems.

Proposed Purchases Through Sole Source

This action is to purchase the air quality sensors described below and listed in Table 1.

PurpleAir Air Quality Sensors

As a part of the STAR grant project, approximately 300 sensors have been deployed in California communities since 2017 to address air quality concerns and better understand personal exposure to air pollutants. Staff is proposing to purchase up to 100 PurpleAir PA-II air quality sensors to help maintain and sustain the existing network developed as part of the STAR grant project. The cost of the PurpleAir PA-II sensors shall not exceed $22,011.

Aeroqual Air Monitoring Systems

Two Aeroqual AQM 65 air monitoring systems will be used for co-located continuous measurements of common air pollutants at selected locations to improve the sensor calibration methodology developed as part of the STAR grant project, and to evaluate the overall performance of existing community sensor networks. The cost for two Aeroqual monitoring systems shall not exceed $55,099.

NASA Citizen Science Grant Project

This action is to appropriate remaining grant funds of up to $46,424 for the NASA Citizen Science grant project into Science & Technology Advancement's Budget (Org 43) for FYs 2021-22 and/or 2022-23 as set forth in Table 2. As a part of this project, nearly 150 sensors have been deployed by citizen-scientists in the Basin. Staff will continue working with the citizen scientists to maintain this network and will assist project collaborators from RTI and GCFS with similar sensor deployments in Raleigh, North Carolina and New Delhi, India. Staff will also conduct data analysis and contribute to publications and a final report for the project.

Sole Source Justification

Sole Source Justification Section VIII.B.3 of the Procurement Policy and Procedure identifies four major provisions under which a sole source award funded, in whole or in part with Federal funds, may be justified. Specifically, the requests below for sole

source award are made under provision B.3.a.: the items are only available from a single source.

PurpleAir PA-II Sensor

PurpleAir, Inc. is the only manufacturer of the PA-II outdoor air quality sensor that has the unique and necessary experience and capabilities to provide accurate PM measurements via a low-cost PM sensor and display the PM measurements on a public facing web-based platform with mapping capabilities. South Coast AQMD has already deployed about 300 sensor devices in California as part of the STAR grant project. The replacement of aging sensors within this network with devices of the same make and model will guarantee the compatibility of PM2.5 data by STAR grant communities and will enable them to continue to provide community members with locally relevant air quality information.

Aeroqual AQM 65 Air Monitoring System

Aeroqual, Ltd. is the only manufacturer of a fully integrated air monitoring station that delivers reliable measurements of up to 20 different gaseous and particulate pollutants and environmental parameters simultaneously and is designed to be calibrated using standard calibration equipment. This ensures that measurements will be robust and traceable back to reference standards. South Coast AQMD in collaboration with Aeroqual, Ltd. is developing remote Moment Matching (MOMA) calibration techniques to calibrate sensor networks based on regulatory monitoring data from existing stations. These Aeroqual systems will be used to verify and improve the performance of the MOMA techniques by quantifying the measurement error of existing sensor networks.

Benefits to South Coast AQMD

The results of the STAR and the NASA Citizen Science grant projects will allow South Coast AQMD and other policymakers to better understand air quality issues at the community level and to incorporate sensors and satellite data into the decision-making process. Sensor deployments will also allow South Coast AQMD to interact with communities and inform them on the appropriate use and operation of sensor devices for measuring local air quality.

Resource Impacts

Remaining funding for the implementation phase of the NASA Citizen Science grant project will support the activities to meet the objectives of the project. Funding from U.S. EPA will support the STAR grant project implementation.

Attachments

Table 1 - Proposed Sole Source Expenditures for U.S. EPA STAR Grant Project for FY 2021-22

Table 2 - Proposed Expenditures for NASA Citizen Science Grant Project for FYs 2021-22 and/or 2022-23

Table 1

Proposed Sole Source Expenditures for U.S. EPA STAR Grant Project
FY 2021-22*

Description	Qty	Account Code	Program Code	Estimated Total Cost
PurpleAir PA-II sensor	Up to 100	68300	43246	$22,011
Total Appropriations for Services and Supplies Major Object				**$22,011**
Aeroqual AQM 65 Air Monitoring System	Up to 2	77202	43246	$55,099
Total Appropriations for Capital Outlays Major Object				**$55,099**
Total				**$77,110**

*This supersedes FY 2020-21 Capital Outlay Appropriations presented to the Board on May 7, 2021, Agenda 5, Recommended Action 6.

Table 2

Proposed Expenditures for NASA Citizen Science Grant Project
FYs 2021-22 and/or 2022-23

Description	Account Number	Program Code	Estimated Total Cost
Professional & Specialized Services (Data Management & Analysis)+	67450	43467	$12,000
Mileage and Travel	67800	43467	6,000
Communications+	67900	43467	12,600
Small Tools+	68300	43467	10,824
Other (meeting supplies, publications, etc.)	69700	43467	5,000
Total Appropriations Services & Supplies and/or Capital Outlays Major Object			**$46,424**

+During the procurement process, these items may be categorized as Capital Outlays or Services and Supplies, depending on whether the item is purchased or contracted as a service.