

BOARD MEETING DATE: October 5, 2018

AGENDA NO. 9

**PROPOSAL:** Recognize Revenue and Appropriate Funds for U.S. EPA PAMS and NASA Citizen Science Programs, Transfer Funds for AQ-SPEC, Issue Solicitations and Purchase Orders and/or Contracts for Services, Air Monitoring and Analysis Equipment and One Vehicle

**SYNOPSIS:** SCAQMD will receive U.S. EPA Section 105 Grant funds in the amount of \$794,261 for the FY 2018 (26th Year) PAMS Program, with a similar amount estimated for the FY 2019 (27th Year) PAMS Program. SCAQMD will also receive grant funds up to \$452,776 from NASA (National Aeronautics and Space Administration) through its Research Opportunities in Earth and Space Sciences Citizen Science Program. In addition, staff is collaborating on test methods and development of a standard for low-cost indoor air quality sensors, which requires various equipment for testing and analysis. These actions are to: 1) recognize revenue and appropriate funds when they become available in Science & Technology Advancement's FYs 2018-19 and/or 2019-20 Budgets for the PAMS Program and FYs 2018-19, 2019-20 and 2020-21 for the NASA Citizen Science Program; 2) transfer funds between Major Objects in support of AQ-SPEC; and 3) issue solicitations and purchase orders and/or contracts for services, air monitoring and laboratory equipment and one vehicle.

**COMMITTEE:** Administrative, September 14, 2018; Recommended for Approval

**RECOMMENDED ACTIONS:**

1. Recognize revenue, upon receipt, and appropriate funds in the amount of \$402,573 (\$391,688 was previously included in Salaries & Employee Benefits within the FY 2017-18 Budget) for the U.S. EPA Section 105 Grant for the 26th Year PAMS Program into Science & Technology Advancement's (Org 47) FY 2018-19 Budget, Services and Supplies and Capital Outlays Major Objects, as set forth in Table 1.
2. Recognize revenue, upon receipt of award notification, and appropriate funds in the amount of up to \$460,909 (\$333,352 was previously included in Salaries & Employee Benefits within the FY 2018-19 Budget) for the U.S. EPA Section 105

Grant for the 27th Year PAMS Program (award estimated at \$794,261) into Science & Technology Advancement's (Org 47) FYs 2018-19 and/or 2019-20 Budgets, Services and Supplies and Capital Outlays Major Objects, as set forth in Table 2.

3. Recognize revenue, upon receipt, and appropriate funds up to \$168,030 on an as-needed basis for the NASA Citizen Science Grant into Science & Technology Advancement's Budgets (Org 43) for FYs 2018-19, 2019-20 and 2020-21 as set forth in Table 3 (\$284,746 has been or will be included in Salaries & Employee Benefits and Indirect Costs in the appropriate FY budget).
4. Transfer \$21,225 into Science & Technology Advancement's FY 2018-19 AQ-SPEC Budget (Org 43) from the Services and Supplies Major Object to the Capital Outlays Major Object, Capital Outlays Account.
5. Issue solicitations (RFP and/or RFQ) and authorize the Executive Officer or Procurement Manager, in accordance with SCAQMD's Procurement Policy and Procedure, to solicit bids for services and equipment listed in Table 4 and described in this letter.
6. Authorize the Executive Officer or Procurement Manager, in accordance with SCAQMD's Procurement Policy and Procedure, to issue purchase orders and/or execute contracts for the following:
  - a. Up to two Direct (True) NO2 CAPS monitors based on the results of an RFQ in an amount not to exceed \$40,000 as listed in Table 4 and described in this letter;
  - b. Up to four NO/NOx monitors based on the results of an RFQ in an amount not to exceed \$50,000 as listed in Table 4 and described in this letter; and
  - c. Technical support for the Upper Air Meteorological Network based on the results of an RFP in an amount not to exceed \$100,000 as listed in Table 4 and described in this letter.
7. Authorize the Procurement Manager, in accordance with SCAQMD's Procurement Policy and Procedure, to issue sole source, prior bid, last price, or cooperative purchasing purchase orders for the following (as listed in Table 5 and described in this letter):
  - a. One carbon dioxide analyzer from Thermo Fisher Scientific Inc. in an amount not to exceed \$10,555;
  - b. One neutralizer from TSI Inc. in an amount not to exceed \$10,670;
  - c. Up to four Teledyne API Model T701H Zero (Pure) Air Generators from Teledyne API at a cost not to exceed \$32,000; and
  - d. One Low Emission Vehicle (truck or van) at a cost not to exceed \$50,000.

Wayne Nastri  
Executive Officer

MMM:JCL:AP:VP:RMB:KRD:OP:ld

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## **Background**

### **PAMS Program**

In February 1993, the U.S. EPA promulgated the PAMS regulations for areas classified as serious, severe or extreme nonattainment. These regulations require SCAQMD to conduct monitoring for ozone precursors with enhanced monitoring equipment at multiple sites. The PAMS Program also funds the meteorological upper air stations located at LAX and Ontario airports, along with Irvine and Moreno Valley. Since the onset of the PAMS Program, the U.S. EPA has annually allocated Section 105 Grant funds in support of this requirement.

### **NASA Citizen Science Grant**

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 SCAQMD was awarded \$75,884 for a small-scale prototype phase deployment of low-cost PM sensors in the South Coast Air Basin (Basin). Upon successful completion of the prototype phase, this project was selected for a three-year implementation phase award. For the implementation phase, SCAQMD will receive grant funds up to \$452,776 for FYs 2018-19 through 2020-21 to implement a spatially dense network of low-cost PM2.5 sensors to be operated by citizen scientists.

### **AQ-SPEC Program**

With the advent of low-cost gaseous and particulate sensors, it has been possible to develop energy efficient ventilation techniques for maintaining acceptable indoor air quality (IAQ) conditions inside buildings and residential homes. However, research has shown that the accuracy of sensors being offered for this purpose varies widely. Thus, there is a need to create a standardized test method for determining the accuracy of low-cost IAQ sensors so builders and designers can adequately select such sensors to optimize the performance of "smart ventilation" systems.

DOE's Office of Energy Efficiency and Renewable Energy awarded a competitive research grant to Newport Partners, LLC, under its "Building America Industry Partnerships for High Performance Housing Innovation" funding opportunity. Newport Partners will develop laboratory test methods for performance verification of low-cost indoor air quality sensors and assist in developing an American Society for Testing and Materials (ASTM) standard based on those test methods.

## **Proposal**

### **26th Year PAMS Program Funds**

The U.S. EPA Section 105 Grant for the 26th Year PAMS Program will be funded at \$794,261. This action is to recognize revenue, upon receipt, and appropriate a portion of the funds in the amount of \$402,573 (\$391,688 was previously included in Salaries

and Employee Benefits within the FY 2017-18 Budget) in Science & Technology Advancement's FY 2018-19 Budget, Services and Supplies and Capital Outlays Major Objects, as set forth in Table 1. The U.S. EPA concurs with staff's proposed allocation.

#### 27th Year PAMS Program Funds

The estimated U.S. EPA Section 105 Grant for the 27th Year PAMS Program funding is up to \$794,261 based on the 26th Year PAMS Program funding levels. This action is to recognize revenue, upon receipt, and appropriate a portion of the estimated funds in the amount of \$460,909 (the remainder \$333,352 was previously included in Salaries and Employee Benefits within the FY 2018-19 Budget) in Science & Technology Advancement's FYs 2018-19 and/or 2019-20 Budget, Services and Supplies and Capital Outlays Major Objects, as set forth in Table 2. The U.S. EPA concurs with staff's proposed allocation.

#### NASA Citizen Science Grant

The objective of this project is to relate aerosol characteristics observed from satellites to PM concentrations measured at ground level by undertaking the following:

- 1) Collecting real-time surface PM data by deploying dense networks of low-cost PM sensors to be operated by citizen-scientists in three geographical regions representing a wide range of PM loadings and chemical composition: the Basin, Raleigh, NC, and Delhi, India;
- 2) Utilizing the collected surface PM<sub>2.5</sub> datasets to interpret, validate and improve the current surface PM estimates derived from satellite data; and
- 3) Developing resources for citizen-scientists to use air quality sensors and satellite data to enable them to produce quality data for widespread use and empower citizen-scientists to take steps to reduce air pollution and avoid exposure.

For this purpose, SCAQMD will collaborate with researchers from RTI and GSFC to deploy a dense network of 300 sensors, using citizen scientists to host and maintain the sensors, and the resulting data will be used to improve the interpretation of PM<sub>2.5</sub> measurements from satellites.

#### Transfer AQ-SPEC Funds

SCAQMD is partnering with Newport Partners, the Home Ventilating Institute, and Texas A&M's Riverside Energy Efficiency Laboratory to develop and publish an ASTM consensus test standard for performance verification of low-cost IAQ sensors measuring PM<sub>2.5</sub> and CO<sub>2</sub>. The elements of a successful standardized test method will include:

- a) Convening a work group of industry-leading stakeholders including laboratories, manufacturers and industry groups;
- b) Transitioning current SCAQMD's test methods applicable to outdoor air quality sensors to a consensus test standard focused on indoor air quality applications;
- c) Incorporating adequate stringency into test methods to ensure repeatability and reliability, while minimizing testing costs for sensor manufacturers;

- d) Verifying test standard suitability through lab testing; and
- e) Communicating with ASTM staff and relevant subcommittees and committees to ensure publication of the standard.

For this purpose, staff will provide access to its existing low-cost sensor test methods, consulting with respect to the development of a new test standard focused on indoor sensor performance and conducting lab testing on low-cost indoor sensors to identify good performing sensors for indoor applications in the ventilation system of buildings and residential homes.

This action is to transfer \$21,225 in Science & Technology Advancement's FY 2018-19 AQ-SPEC Budget (Org 43) from the Services and Supplies Major Object to the Capital Outlays Major Object to facilitate purchase of a carbon dioxide analyzer and a neutralizer.

#### Proposed Purchase Orders and/or Contracts through Solicitations

This action is to issue solicitations to solicit bids for services and equipment listed in Table 4 and, based on solicitation results, issue or execute purchase orders or contracts, as follows:

##### *Direct (True) NO<sub>2</sub> CAPS Monitors*

Changes to the PAMS requirements include monitoring for NO and NO<sub>y</sub> (total oxides of nitrogen) in addition to direct nitrogen dioxide (NO<sub>2</sub>), where the latter must be taken with extremely sensitive, fast and accurate NO<sub>2</sub> measurements. The estimated cost for two direct NO<sub>2</sub> monitors is \$40,000. Quotes for this RFQ will be solicited through a competitive formal bid, in accordance with SCAQMD's Procurement Policy and Procedure.

##### *NO/NO<sub>x</sub> Monitors*

PAMS requirements include monitoring for NO/NO<sub>x</sub> as a means of determining nitrogen dioxide (NO<sub>2</sub>). The estimated cost of four NO/NO<sub>x</sub> monitors is \$50,000. Quotes for this RFQ will be solicited through a competitive formal bid, in accordance with SCAQMD's Procurement Policy and Procedure.

##### *Technical Support for Upper Air Meteorological Network*

As part of the U.S. EPA PAMS Program, comprehensive measurements of meteorological parameters have been collected in the Basin since 1994, using a network of radar wind and temperature profilers, acoustic wind profilers and tower-mounted meteorological sensors. Data from the upper air measurement stations is routinely used for air quality forecasting and event analyses and has been invaluable for regional modeling efforts. SCAQMD utilizes consultants to provide operational support due to the limited availability of staff resources to operate and maintain this network. The cost of these technical support services will not exceed \$100,000. Proposals for this RFP

will be solicited through a competitive formal bid, in accordance with SCAQMD's Procurement Policy and Procedure

Proposed Purchases through Sole Source, Prior Bid, Last Price, and Cooperative Purchasing Purchase Orders

This action is to purchase the following equipment and one vehicle as listed in Table 5 using the procurement method noted.

*Carbon Dioxide Analyzer*

The test standard development for IAQ sensors shall include a CO<sub>2</sub> analyzer to be used as a reference monitor to conduct gas concentration measurements in the laboratory evaluations. One CO<sub>2</sub> reference monitor, using non-dispersive infrared (NDIR) technology that is relatively inexpensive and is also used by the National Oceanic and Atmospheric Administration to measure global ambient CO<sub>2</sub> concentration with very high accuracy and an uncertainty of less than five percent, will be purchased through a sole source purchase order from Thermo Fisher Scientific Inc. The estimated cost of the carbon dioxide analyzer is \$10,555.

*Neutralizer*

The test standard for IAQ sensors measuring PM<sub>2.5</sub> will be developed using aerosol atmospheres with particles dispersed by nebulization, combustion or powder dispersion that are usually electrostatically charged. Normally, a high level of electrical charge is undesirable. It increases losses of ultrafine particles to the walls of transport and sampling systems or it can affect filter-efficiency measurements. To ensure that chamber particle reference instruments operating on the electrostatic principle work properly, PM<sub>2.5</sub> particles entering these instruments must be neutralized. Aerosol neutralizers minimize particle losses and coagulation caused by electrostatic charges. Therefore, one aerosol neutralizer will be purchased through a sole source purchase order from TSI Inc. The estimated cost of the aerosol neutralizer is \$10,670.

*Zero Air Generators*

Zero air generators are necessary to deliver contaminant-free air required for the operation of air monitoring equipment in support of PAMS measurement and audit requirements. An RFQ was previously released for zero air generators and Teledyne API was selected. The vendor has agreed to honor the same price as the prior bid. The cost for up to four zero air generators is approximately \$32,000. The U.S. EPA concurs with staff's proposed purchase.

*Low Emission Vehicle (Truck or Van)*

With an aging fleet of calibration and repair vehicles, staff has identified the need to replace older high-mileage vehicles with new low emission vehicles. Calibration and repair vehicles are essential for staff to perform routine and non-routine calibration and maintenance and repair of air monitoring equipment for air monitoring stations



supporting the PAMS Program. Low emission vehicles are available from vendors through cooperative purchasing under the State of California, Department of General Services, Procurement Division, and Alternative Fueled Vehicles Contract 1-18-23-23A through H. One low emission truck and/or van will be selected from the vendor on the list with the most competitive price for these types of vehicles. The cost of one low emission truck and/or van is approximately \$50,000.

### **Outreach**

In accordance with SCAQMD's Procurement Policy and Procedure, a public notice advertising the RFQ/RFP and inviting bids will be published in the Los Angeles Times, the Orange County Register, the San Bernardino Sun, and Riverside County's Press Enterprise newspapers to leverage the most cost-effective method of outreach to the South Coast Basin.

Additionally, potential bidders may be notified utilizing SCAQMD's own electronic listing of certified minority vendors. Notice of the RFQ/RFP will be emailed to the Black and Latino Legislative Caucuses and various minority chambers of commerce and business associations, and placed on the Internet at SCAQMD's website (<http://www.aqmd.gov>) where it can be viewed by making the selection "Grants & Bids."

### **Sole Source Justification**

Section VIII.B.2 of the SCAQMD Procurement Policy and Procedure identifies four major provisions under which a sole source award may be justified. Requests for sole source purchases from Thermo Fisher Scientific Inc. and TSI Inc. is made under Section VIII.B.2.c(3): The project involves the use of proprietary technology. Thermo Fisher Scientific Inc. is the only manufacturer of a carbon dioxide analyzer that is portable, rugged and with an uncertainty of less than five percent. TSI Inc. is the only manufacturer of an aerosol neutralizer that is designed to fit into TSI Series Electrostatic Classifies Model 3080, currently used in the AQ-SPEC Program.

### **Prior Bid, Last Price**

In addition, Section IV.B.5 of the SCAQMD Procurement Policy and Procedure allows for awards based on prior bid, last price if the conditions of the previous purchase are similar. The Board previously released RFQ #Q2017-05 for competitive bids on zero (pure) air generators and Teledyne API was the selected vendor for the zero air generators. Teledyne has agreed to honor the same price as the last bid for these items.

**Cooperative Purchasing**

Under Section IV.A.5 of the SCAQMD Procurement Policy and Procedure, the Procurement Manager shall pursue cooperative purchasing opportunities whenever possible. Low emission vehicles are available from vendors under the State of California, Department of General Services, Procurement Division, Vehicles Contract 1-18-23-23 A through H.

**Benefits to SCAQMD**

The results of the implementation phase of the NASA Citizen Science project will allow SCAQMD and other policymakers to better understand air quality issues at the community level and to incorporate satellite data into the decision-making process. This sensor deployment will also allow SCAQMD to better interact with citizen-scientists and inform them on the appropriate use and operation of sensor devices for measuring PM.

**Resource Impacts**

As outlined in Tables 1-2 and 4-5, the U.S. EPA Section 105 Grant funding will support the operation of the PAMS Program and fund Capital Outlays, Services and Supplies, and Salaries and Employee Benefits to meet necessary objectives of the Program.

There is sufficient funding available in Science & Technology Advancement's FY 2018-19 Budget for the purchase of the AQ-SPEC air monitoring equipment shown in Table 5.

NASA has authorized funding of up to \$452,776 for the implementation phase of the Citizen Science Grant, which will support the activities to meet the objectives of the project (see Table 3).



**Table 1**  
**Proposed 26th Year PAMS Expenditures for FY 2018-19**

<b>Account Description</b>	<b>Account Number</b>	<b>Program Code</b>	<b>Estimated Expenditure</b>
<b>Services &amp; Supplies Major Object:</b>			
Rents & Leases Equipment	67300	47530	\$500
Rents & Leases Structure	67350	47530	8,000
Professional and Specialized Services: Technical Support – Upper Air Network	67450	47530	60,000
Professional and Specialized Services: Data Management and Analysis	67450	47530	18,100
Professional and Specialized Services: Relocate, Calibrate & Certify PAMS Auto-GC	67450	47530	22,000
Temp Agency Services	67460	47530	5,000
Demurrage Expenses	67550	47530	10,000
Maintenance of Equipment	67600	47530	70,000
Building Maintenance	67650	47530	9,000
Travel	67800	47530	5,000
Communications	67900	47530	1,973
Laboratory Supplies	68050	47530	40,000
Office Expense	68100	47530	5,000
Small Tools	68300	47530	20,000
Training	69500	47530	6,000
<b>Total Services &amp; Supplies Major Object:</b>			<b>\$280,573</b>
<b>Capital Outlays Major Object:</b>			
Zero (Pure) Air Generator (Up to 4)	77000	47530	\$32,000
Direct (True) NO2 CAPS Monitors (Up to 2)	77000	47530	40,000
NO/NOx Monitors (Up to 4)	77000	47530	50,000
<b>Total Capital Outlays Major Object:</b>			<b>\$122,000</b>
<b>FY 2018-19 Appropriations</b>			<b>\$402,573</b>

\*\$391,688 was previously recognized in Salaries & Employee Benefits within the FY 2018-19 Budget.

**Table 2**  
**Proposed 27th Year PAMS Expenditures for FYs 2018-19 and/or 2019-20**

<b>Account Description</b>	<b>Account Number</b>	<b>Program Code</b>	<b>Estimated Expenditure</b>
<b>Services &amp; Supplies Major Object:</b>			
Rents & Leases Equipment	67300	47530	\$500
Rents & Leases Structure	67350	47530	37,000
Professional and Specialized Services: Technical Support – Upper Air Network	67450	47530	40,000
Professional and Specialized Services: Data Management and Analysis	67450	47530	19,000
Professional and Specialized Services: Station Upgrades	67450	47530	80,000
Temp Agency Services	67460	47530	5,000
Demurrage Expenses	67550	47530	15,000
Maintenance of Equipment	67600	47530	70,000
Building Maintenance	67650	47530	33,336
Travel	67800	47530	5,000
Communications	67900	47530	3,000
Laboratory Supplies	68050	47530	50,000
Postage	68060	47530	1,073
Office Expense	68100	47530	13,000
Small Tools	68300	47530	27,000
Training	69500	47530	12,000
<b>Total Services &amp; Supplies Major Object:</b>			<b>\$410,909</b>
<b>Capital Outlays Major Object:</b>			
Low Emission Vehicle (1)	77000	47530	\$50,000
<b>Total Capital Outlays Major Object:</b>			<b>\$50,000</b>
<b>Estimated Salaries and Benefits*</b>			<b>\$333,352</b>
<b>FY 2018-19/2019-20 Estimated Appropriations</b>			<b>\$794,261</b>

\*\$333,352 was previously recognized in Salaries & Employee Benefits within the FY 2018-19 Budget; funds not expended in FY 2018-19 will be appropriated into FY 2019-20.

**Table 3**  
**Proposed Expenditures for NASA Citizen Science Project**  
**for FYs 2018-19 through 2020-21**

Description	Account Number	Program Code	Estimated total cost
Professional & Specialized Services (Data Mgmt & Analysis)*	67450	43467	\$12,000
Mileage and Travel	67800	43467	33,030
Communications*	67900	43467	12,000
Laboratory Supplies	68050	43467	2,000
Office Expenses*	68100	43467	6,000
Small Tools*	68300	43467	90,000
Other (meeting supplies and publications)	69700	43467	13,000
<b>Total Appropriations Services &amp; Supplies and/or Capital Outlays Major Object</b>			<b>\$168,030</b>
Estimated Salaries and Benefits & Indirect Costs		44467	284,746
<b>Total Grant Award</b>			<b>\$452,776</b>

\*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.

**Table 4**  
**Proposed Purchase Orders and/or Contracts through Solicitations**

Description	Qty	Funding Source	Estimated Cost
Direct (True) NO2 CAPS Monitors	Up to 2	PAMS 26th Year	\$40,000
NO/NOx Monitors	Up to 4	PAMS 26th Year	\$50,000
Upper Air Technical Support Contract	1	PAMS 26th/27th Year*	\$100,000
<b>Total</b>			<b>Not to Exceed \$ 190,000</b>

\* \$40,000 of this contract is contingent upon receipt of PAMS 27th Year funding.

**Table 5**  
**Proposed Purchases through Sole Source, Prior Bid, Last Price and Cooperative Purchasing Purchase Orders**

Description	Qty	Funding Source	Estimated Cost
Thermo 410iQ Carbon Dioxide Analyzer	1	AQ-SPEC FY 2018-19	\$10,555
TSI 3012A Neutralizer	1	AQ-SPEC FY 2018-19	\$10,670
Teledyne API Model T701H Zero (Pure) Air Generators	Up to 4	PAMS 26th Year	\$32,000
Low Emission Vehicle	1	PAMS 27th Year	\$50,000
<b>Total</b>			<b>Not to Exceed \$103,225</b>