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Board Agenda Item

TO: Air Pollution Control District Board

FROM: Aeron Arlin Genet, Air Pollution Control Officer

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SUBJECT: Air Quality Sensors Study in New Cuyama

RECOMMENDATION:

Receive and file information on an air quality sensors study the District is conducting with Sonoma Technology, Inc. at Cuyama Valley High School.

DISCUSSION:

Until recently, air quality monitoring has only been performed by air quality regulatory agencies and/or regulated entities using expensive and sophisticated monitoring devices subject to strict siting and quality assurance requirements. Low-cost portable air quality sensors (\$100-\$2500) are now commercially available in a wide variety of designs and capabilities that offer new opportunities for community involvement in data collection, particularly in the realm of understanding personal exposure to a given pollutant. This emerging technology is quickly evolving and provides the potential to gather air quality data in situations or locations where it is currently cost-prohibitive. Individuals and organizations have started to use these sensors to learn more about air quality in their backyards and neighborhoods.

There are a number of technical and practical challenges associated with this emerging area of monitoring, including development of portable sensors that produce high quality data, evaluation of sensor variability, integration of data from multiple sensors of different quality obtained through multiple sources (e.g., government and citizen), and visualization and use of sensor data by the public and by agencies responsible for protecting human health. The U.S. Environmental Protection Agency (EPA) and several air districts, including the South Coast Air Quality Management District (SCAQMD), are currently evaluating the performance of sensors to be able to assist communities in their understanding and use of sensor technology.

The District is interested in the potential for these air quality sensors to provide educational opportunities and information on localized air quality issues. In particular, in Santa Barbara County, high winds can often result in localized short-term higher levels of particulate matter (PM), but the locations affected can vary widely, since conditions differ so much around the county. Schools may need to make decisions about whether to hold events outdoors when PM levels are high, and it is difficult to tell which schools are most affected by a wind event. While portable low-cost sensors that detect PM are being evaluated in the laboratory, and in urban settings, not much is known about their performance in rural settings, or in connection with high wind and dust events.

The District has contracted with Sonoma Technology, Inc. (STI) to perform a study of portable air sensors at a cost of \$99,968 (approved by your Board in the FY 2015-2016 budget). STI was selected for its technical expertise, experience evaluating air sensor technology, work on air sensors education as part of its program “Kids Making Sense,” and ability to co-locate and evaluate data from expensive federal-equivalent method monitoring equipment against the sensor data. STI has worked with EPA for more than a decade on its AirNow program, and an STI consultant is a co-author of EPA’s *Air Sensors Guidebook*. STI’s air quality experts also work with a number of California air districts, including SCAQMD and the Bay Area Air Quality Management District.

The New Cuyama location was selected for this study to help improve our understanding of localized air quality issues associated with potential high wind and dust events in the area. The District is also appreciative of the support of the Cuyama Joint Unified School District Superintendent and High School science teacher in working on this project.

The goals of the study are to:

- Gain information on how two different types of low-cost portable air sensors (the Alphasense and the AirBeam) that detect PM levels perform in a rural setting;
- Evaluate data gathered from these sensors against co-located BAM 1020 (federal equivalent method PM monitoring equipment), the District’s EBAM (portable non-federal equivalent method, but considered higher-level PM monitoring equipment), a GRIMM particle sizer, and equipment measuring wind speed and direction;
- Engage Cuyama Valley High School students in understanding the workings of this new technology and the data provided; and
- Provide a strong technical foundation for more educational and information-gathering efforts the District could undertake with schools around the county in the future, as well as for efforts to obtain funding for additional activities in this area.

Equipment was installed onsite on April 5, and the study will run for approximately three months. Data are being evaluated on an ongoing basis, and a full report will be prepared at the close of the study period.

Staff’s presentation to your Board will include more information on emerging sensor technology as well as details on the study and the sampling equipment.
of funds.