

BOARD MEETING DATE: September 6, 2019

AGENDA NO. 6

PROPOSAL: Amend Contract to Implement Advanced Building Energy Management Projects

SYNOPSIS: In October 2017, the Board approved a contract with Willdan Energy Solutions to implement pre-commercial efficiency projects for the South Coast AQMD building. These projects are being funded through a \$3,994,265 CEC award to Willdan Energy Solutions, and \$2,293,645 from South Coast AQMD. Additional funds are needed for new and contingency costs for the replacement of the building chillers and laboratory fume hood retrofits. In addition to providing much needed building upgrades, these projects will increase the efficiency of the building by over 20 percent, and provide a case study and showcase for new building infrastructure technologies. This action is to amend a contract with Willdan Energy Solutions to implement pre-commercial efficiency projects for the South Coast AQMD building in an amount not to exceed \$665,000 from the Infrastructure Improvement Fund (02).

COMMITTEE: Administrative, July 19, 2019; Recommended for Approval

RECOMMENDED ACTION:

Authorize the Executive Officer to amend a contract with Willdan Energy Solutions to implement pre-commercial efficiency projects for the South Coast AQMD building in an amount not to exceed \$665,000 from the Infrastructure Improvement Fund (02).

Wayne Natri
Executive Officer

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Background

The South Coast AQMD building was opened in 1991. At the time of construction, the building incorporated many advanced energy features that were then available. Many of the building's mechanical control systems such as the chilling system, cooling towers, and exhaust fume hood controls in the laboratory are significantly past their typical 20-year useful lifespan.

In 2017, Willdan Energy Solutions (Willdan) was awarded CEC funding in the amount of \$3,994,265 to use South Coast AQMD's building as a demonstration site for an Electric Program Investment Charge (EPIC) grant, to demonstrate a greater than 20 percent energy efficiency improvement using pre-commercial technology on existing buildings. In October 2017, the Board authorized the South Coast AQMD to enter into a contract with Willdan for implementation of the project and to provide matching funds in the amount of \$2,293,645.

The pre-commercial technologies that Willdan will implement at the building include: (1) replacing the building chillers and cooling towers with high-efficiency low global warming potential refrigerant units; (2) demonstrating LED fixtures with innovative controls that adjust color, temperature, and intensity with daylight; (3) adding direct current (DC) LED lighting for the laboratory from a renewable DC source; (4) using advanced zone-level building management system controls; (5) replacing the laboratory's constant flow fume hood exhaust systems with an advanced variable flow laboratory exhaust system; (6) development of a demand response platform; and (7) demonstration of an off-grid outdoor LED lighting system.

Energy savings achieved through the implementation of these projects will improve the efficiency of the building by over 20 percent and are anticipated to result in yearly energy cost savings of over \$200,000. On a broader scale, the increased efficiency and demand response capabilities from the new technologies being implemented will demonstrate a way to reduce power plant emissions which improves air quality. Additionally, the use of the new refrigerant in the chiller system will showcase a refrigerant gas that does not result in stratospheric ozone depletion and is not a potent greenhouse gas.

Two of the main projects are the central plant upgrade of the building chillers and cooling towers, and the retrofit of the laboratory's fume hood exhaust system. Based on the engineering and planning to date, additional costs have been incurred to address unforeseen expenses and to maximize efficiency and longevity. Some of these costs are being covered with CEC grant funding by reducing the scope of other components of the project, including the DC LED laboratory lighting component of the project. However, additional cost share from South Coast AQMD will be needed for the central plant upgrade and the laboratory retrofit for the projects to be successful.

Proposal

To maximize the efficiency and functionality of the new systems, new elements have been added to the scope of the project. For the central plant, a new water treatment system is being proposed to prevent corrosion. For similar purposes, the cooling towers will be fully fitted in stainless steel and the piping materials along with the interior of the chillers will be upgraded materials or epoxy treated to minimize corrosive

conditions. These measures will prolong the lifespan of the new system and reduce the need for future repairs.

The request for additional funding in the Willdan contract includes an additional cost to retrofit the laboratory fume hood controls and fume hood exhaust from constant flow to variable flow. During the engineering phase of this project, it was found that the existing fume hood exhaust acid scrubber unit is heavily corroded from use of acids required for sample extractions of toxic metals. The replacement of the fume hood exhaust acid scrubber unit was not originally anticipated and not included in the initial budget.

Funding is also being requested due to unanticipated construction labor and materials cost increases since 2016, when the CEC grant application was originally submitted by SCAQMD and Willdan. Specifically, labor costs have gone up by about 3-4% a year, and steel prices are higher today than they were in 2016. Other unforeseen costs resulted from structural changes required to better accommodate the existing building.

Contingency funds are also being requested to prepare for future unforeseen circumstances that may potentially occur due to the age of the building, including replacing additional corroded piping in the central cooling plant, needing additional structural design and changes as a result of unknowns discovered during demolition, or needing to repair/replace additional support equipment.

A summary of the additional funding being requested is provided in the table below:

Table 1. Additional Funding Being Requested

Requested Funding	Amount	Description
Central plant	\$350,000	Additional corrosion prevention equipment and processes, such as replacing the water treatment system and upgrading the cooling towers; upgraded sensors to optimize monitoring and controls; general increase in costs of construction labor and materials
Laboratory fume hoods	\$65,000	Replacement of existing heavily corroded fume hood exhaust acid scrubber unit
Contingency funds, to be added only as necessary	\$250,000	For unanticipated costs during demolition and installation
Total	\$665,000	

The upgrade of the building chillers and cooling towers and the retrofit of the laboratory's fume hoods are scheduled to be completed by January 2020. Once implemented, these projects will provide much needed replacements to the building's aging mechanical infrastructure, greatly improve energy efficiency, provide the building with demand response capability, and demonstrate the latest technologies.

Resource Impacts

The CEC EPIC research grant is providing \$3,994,265 to install pre-commercial, efficient technologies at the South Coast AQMD building. This proposal to add up to \$665,000 to the implementation contract with Willdan would bring South Coast AQMD's cost-share for these projects to the not to exceed amount of \$2,958,645. Amendments to add up to \$665,000 of funding to the contract will be on an as-needed basis from the Infrastructure Improvement Fund (02). There is sufficient funding available in the Infrastructure Improvement Fund (02) for this proposal.

Energy savings achieved through the implementation of these projects is anticipated to result in yearly energy cost savings of over \$200,000. The sustainability of these savings will be ensured initially through a year-long monitoring and evaluation requirement of the EPIC research grant award and later maintained through the new building energy management system. In addition, cost containment for these projects results from a requirement of the CEC grant prohibiting Willdan from taking a profit in this process, and a limitation for subcontractors of a 10% profit margin on their work.

As mentioned above, some CEC grant funds designated for DC LED lighting in the laboratory were re-allocated to the Central Plant and the laboratory fume hoods projects. A request to restore such funding for the DC LED lighting component using other sources will be brought to the Board at a future date.