ACTION ITEM

Approval of Contract with the US Geological Survey to Fund *Operation Baseline 2.0* Studies

Summary: The Executive Officer requests authority to enter into a contract with the US Geological Survey (USGS), up to $943,645, for two science investigations related to the upgrade of the Sacramento Regional County Sanitation District's wastewater treatment plant.

Requested Action

Authorize the Executive Officer to enter into a new contract with the US Geological Survey (USGS), up to $943,645, to continue to study nutrients and the food web, and to use the latest data collected for the development of a linked model suitable for management purposes, related to the upgrade of the Sacramento Regional County Sanitation District's wastewater treatment plant.

The Executive Officer has dedicated authority, up to $500,000, to enter into contract agreements on the Council's behalf. This proposed contract requires Council authorization because the total contract exceeds that amount.

Background: *Operation Baseline*

The largest inland discharger west of the Mississippi, the Sacramento Regional County Sanitation District's (Regional San) wastewater treatment plant processes about 130 million gallons of wastewater daily, enough water to fill approximately 200 Olympic-sized swimming pools each day. Treated wastewater flowing into the Sacramento River is thought to negatively affect the Delta food web and in turn, the endangered Delta Smelt and other native fishes. As a result, Regional San must adhere to more stringent nutrient limits for its effluent by May 2021, as required by the Central Valley Regional Water Quality Control Board. In response, Regional San is undertaking a $1.7 billion dollar infrastructure improvement project called EchoWater (https://www.regionalsan.com/echowater-project). The project will eliminate nearly all ammonia and most nitrate from the treated water flowing into the Sacramento River. This major shift in nutrients may have large consequences for the aquatic food web and invasive aquatic plants in the Sacramento-San Joaquin Bay-Delta. The Delta Stewardship Council (Council) saw a unique opportunity to learn from this large-scale management change and in 2017, invested over $1.2 million in multiple projects to develop tools and to collect additional data beyond current monitoring requirements to understand the project's impact. Given the emphasis on understanding baseline conditions before the upgrade, the Council's initiative is referred to as "*Operation Baseline*."

The contracts awarded in 2017 have already enabled major advancements in the way we study nutrients, food webs, and sediment in the dynamic Delta (see **Attachment 1** for more information). One of the projects produced a conceptual framework that organizes ideas about how the reduced nutrients in the Delta might cause changes in

the occurrence of harmful algal blooms, excessive growth of invasive aquatic vegetation, and the amount and quality of phytoplankton. Conceptual frameworks are useful analytical tools that can be used to understand the big picture and identify knowledge gaps. Another project tested a new type of sensor that can measure the phytoplankton community quickly and at the same time nutrients are measured. This work was identified as a high priority science action by the Delta science community in the 2017-2021 Science Action Agenda. While these studies were specific to the wastewater treatment plant upgrade, they are also responsive to the Delta Nutrient Research Plan called for in Delta Plan Recommendation WQ R08-02. It is also important to note that all the related *Operation Baseline* studies are responsive to multiple recommendations from the 2018 Delta Independent Science Board's Water Quality Review.

> For Example; Recommendation 1 "A more comprehensive view of the multiple elements that comprise water quality in the Delta is needed among stakeholders. Improved development and use of numerical and conceptual models of water quality in the Delta could help the community move towards this goal"

Operation Baseline 2.0 Selection Process

In 2019 the Delta Science Program initiated phase two of *Operation Baseline* to continue to fill knowledge gaps and use technologies developed in the first phase by coordinating a request for directed action proposals. This is the last chance to collect data before the nutrient regime in the Delta undergoes drastic and permanent changes.

The Delta Science Program continued work to address high-priority data and knowledge gaps through collaborative meetings and by using the new conceptual framework that identified the information needed to answer important questions. Through a targeted funding process, twelve concept proposals from Delta researchers were received, with eight of those being requested to be developed into full, detailed proposals. The proposals underwent a robust review process that included academic reviewers (subject matter experts from across the world), agency reviewers, and internal reviewers from Council staff. All reviewers were selected based on their area of expertise and ability to provide an unbiased review. Through this process, four proposals were eligible for funding. The State Water Contractors will fund one of those proposals as a result of a successful collaborative science funding partnership. The three proposals that the Delta Lead Scientist has recommended for funding are described below. The proposed contract for USGS exceeds the delegated authority of the Executive Officer, the other two contracts are described as supplemental information.

Contracts Overview

1. US Geological Survey (USGS): $943,645

Over the next two years, USGS investigators will measure small floating algae that are the base of the aquatic food web in the Estuary (phytoplankton), using a combination of fixed location and boat-based measurements. The sensor that rapidly measures the types of phytoplankton was tested through the Council's investment in 2017 during the first phase of *Operation Baseline*. The boat-based instrument platforms are a new way to capture changes in nutrients and phytoplankton that we

know occur between fixed monitoring locations, which helps to better understand dynamics in both nutrients and phytoplankton across a large region, and over a short time scale. This work will occur before and after the expected change in nutrients in order to capture the effect of the upgrade.

In a partnership with the Virginia Institute of Marine Sciences (VIMS) and the Department of Water Resources, USGS will also advance a model that links water movement, nutrients, phytoplankton, and aquatic vegetation. The model will focus on the data-rich Cache Slough Complex, which is an area of interest for wetland restoration and native fish habitat, with profound implications for the overall health of the Delta ecosystem. A workshop will engage Delta scientists and managers to ensure that the model will produce useful information. For example, the linked model will use enormous amounts of recent data (including the boat-based measurements discussed above) to improve our understanding and management of expected changes in the coverage of invasive aquatic vegetation resulting from the wastewater treatment plant upgrade.

2. Virginia Institute of Marine Sciences (VIMS): $155,520

In conjunction with USGS, staff from VIMS will oversee and perform modeling of the interactions between water, water quality, phytoplankton, and invasive aquatic vegetation. VIMS will also participate in key workshops and venues with Delta scientists and managers.

3. BSA Environmental Services: $200,000

This contract will enable existing monitoring programs and special studies across the Delta that collect samples of phytoplankton to expand the identification of the smallest phytoplankton that are smaller than two micrometers – less than half the size of a human red blood cell. These tiny organisms have not been routinely measured in existing monitoring efforts but may have a substantial role in the overall phytoplankton community. This research would address this important gap in current knowledge.

Fiscal Information

Approval of this contract will allocate up to $943,645 to USGS for completing new *Operation Baseline 2.0* studies including studying nutrients, food web, and modeling efforts.

Leveraged funds from other institutions include: $313,497 USGS match; $145,000 DWR match; $25,000 VIMS match; and multi-agency in-kind contributions of over $1,000,000 (includes time, travel, and equipment for multiple staff to conduct routine monitoring throughout the Delta).

List of Attachments

Attachment 1: Delta Science Program *Operation Baseline* Fact Sheet

Contact

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