



CITY OF SANTA BARBARA

COUNCIL AGENDA REPORT

AGENDA DATE: April 28, 2015

TO: Mayor and Councilmembers

FROM: Water Resources Division, Public Works Department

SUBJECT: Amendment To Joint Funding Agreement With United States Geological Survey For Groundwater Modeling

RECOMMENDATION:

That Council authorize the Public Works Director to execute an Amendment to the Joint Funding Agreement with the United States Geological Survey for groundwater modeling services, increasing the City's portion of the cost by \$30,000, for a total City project cost of \$406,925.

DISCUSSION:

Groundwater is an important part of the City's water supply, particularly during critical drought periods when normal surface water supplies are limited. Groundwater is also the City's only truly local potable water supply that is currently operational and available in the event that deliveries from the Santa Ynez River are disrupted. The City's groundwater basins are relatively small compared to other local agencies and must be managed carefully to optimize their role in our water supply.

The City boundaries overlies Storage Units I and III of the Santa Barbara groundwater basin, as well as portions of the Foothill Basin. The City currently owns and operates water supply production wells in both of these primary groundwater basins, and has an extensive network of groundwater monitoring wells for water levels and water quality.

The City has a long-standing partnership with United States Geological Survey (USGS) on efforts to better understand the basin through data collection, monitoring, and modeling studies. Over the years, USGS has written the definitive reports describing the geology and capacity of the City's groundwater basins and has developed and maintained groundwater models of each basin.

In 2009, the City and USGS entered into a Joint Funding Agreement for a Cooperative Water Resources Program to update and enhance groundwater models, evaluate the

sustainable yield of the City's groundwater resources, and develop decision rules for use in managing supplies from groundwater. The work effort included updating and calibrating the existing MODFLOW-2000 groundwater flow model to SEAWAT-2000, which models seawater intrusion. The result is a more sophisticated model of the quantity of groundwater flow, as well as the quality, in terms of salt content and extent of intrusion. This SEAWAT model will allow the City to estimate the location of the saltwater/freshwater interface and the rate at which it can be expected to move inland toward City wells, if increased pumping were to continue in response to drought.

Intrusion of seawater into Storage Unit No. 1 (in the downtown area) is of particular concern during periods of increased pumping. Groundwater pumping lowers groundwater levels, which allows seawater intrusion to occur. Groundwater levels recover relatively quickly after pumping is reduced, but the seawater interface is much slower to return to its prior location. Tracking this interface is important in terms of estimating the amount of pumping that can be done before the salt content in a given well renders it unusable for potable supply for a substantial period of time.

The phases of the current Cooperative Water Resources Program consist of:

1. Quantifying the present sustainable yield of the groundwater basins;
2. Evaluating the future sustainable yield of the basins, given historical weather variability as well as potential climate change effects;
3. Developing decision rules for evaluating the current status of the basis at any given time; and
4. Documenting the result of the work in one or more reports.

USGS has finished calibrating the updated model and has worked with City staff to define model scenarios that will produce results that help define the sustainable yield under a variety of possible climate, water level, and water quality scenarios. The scenarios include:

- **Scenario 1: Start with full basin, simulate 10-year normal hydrology:** "How much can we pump as a base yield in normal conditions?"
- **Scenario 2: Start with full basin, simulate 10-year drought hydrology:** "How much can we pump in drought conditions?"
- **Scenario 3: Start with low basin, simulate 10-year normal hydrology:** "How long until basin recovers after drought is over?"

- **Scenario 4: Varied starting point (including current condition), simulate 10-year drought hydrology:** Generates results that can be used to develop decision rules.
- **Scenario 5: Start with current basin conditions; simulate varied 2-year hydrology:** Generates a range of results based on varied hydrology.

Scenarios 2 and 3, and some variations of Scenario 4, are outside of the original scope of the agreement. Therefore, staff recommends an amendment to the Joint Funding Agreement to include these scenarios to better understand the estimated sustainable yield of the basin. The additional cost to include these scenarios will be shared between USGS and the City; the City's portion of the additional cost is \$30,000.

Remaining work for the total project is expected to be complete by September 2015.

BUDGET/FINANCIAL INFORMATION:

The total project amount with the proposed amendment would be \$586,055, which is shared between USGS and the City. The City's portion of the total project cost would be \$406,925; which is a \$30,000 increase to incorporate the additional modeling scenarios. There are sufficient funds available in the Fiscal Year 2015 Water Fund Operating Budget to cover the additional budget of \$30,000.

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APPROVED BY: City Administrator's Office