



BOARD ACTION

TO: Governing Board (Engineering and Operations Committee)

FROM: Carlos Quintero, General Manager
Roberto Yano, Assistant General Manager
Erick Del Bosque, Director of Engineering and Operations
Paul Oberbauer, Engineering Manager

DATE: July 28, 2023

SUBJECT: Consideration of U.S. Geological Survey Proposal for Seawater Intrusion and Land Subsidence Investigations

SUMMARY

Since 2001, Sweetwater Authority (Authority) has collaborated with the United States Geological Survey (USGS) on groundwater investigations in the San Diego Formation (SDF). This groundwater formation underlies the Authority's service area and is part of the greater Coastal Plain of San Diego basin. As part of this effort, the USGS installed several multiple-depth monitoring wells throughout coastal San Diego, with eight located within the Authority's service area. These wells have informed the expansion and ongoing operation of the Reynolds Groundwater Desalination Plant and its eleven brackish groundwater production wells that pump water from the SDF. Five of these wells were added as part of the expansion.

Prior to this expansion, the Authority operated and continues to operate three freshwater production wells at the National City Wells facility and six brackish production wells that supply the Reynolds Desalination Plant. The freshwater production wells at the National City Wells Facility also pump water from the SDF. The locations of the USGS multiple-depth wells, locations of the eleven brackish and three freshwater production wells, in addition to other monitoring wells owned by the Authority, are shown in figures included in Attachment 1.

To ensure the long-term sustainability of the groundwater resources, the Authority has been monitoring seawater intrusion since the construction of the USGS multiple-depth wells. It has also monitored land subsidence since 2017. These monitoring efforts should be performed intermittently, preferably every two to three years for seawater intrusion and at least once every five years for land subsidence, based on recommendations from the Authority's Preliminary Groundwater Sustainability Plan.

Memo to: Governing Board (Engineering and Operations Committee)
Subject: Consideration of U.S. Geological Survey Proposal for Seawater Intrusion and
Land Subsidence Investigations

July 28, 2023

Page 2 of 4

Seawater Intrusion into the San Diego Formation

The deepest of the USGS monitoring wells reaches 2,658 feet below ground surface, which is used to measure electromagnetic conductance, among other purposes. The electromagnetic conductance data and groundwater sampling from other monitoring wells are used to assess levels of seawater intrusion into the SDF. This is of particular interest to the Authority because the moderately brackish to fresh quality of the water produced from the SDF and National City wells is critical to the continued sustainable operation of the Reynolds Desalination Plant and the National City Wells Facility.

Beginning in 2017 and continuing in 2019, USGS measured seawater intrusion at the five well sites nearest the coast and detected modest seawater intrusion into the SDF.

Land Deformation from Groundwater Extraction

Pumpage from groundwater production wells is known to contribute to deformation of the ground surface that can manifest as land subsidence. As part of the monitoring efforts in 2017 and 2019, USGS measured land subsidence using satellite Interferometric Synthetic Aperture Radar (InSAR) data and land-based surveying. The 2017 and 2019 data analyses detected land subsidence to a maximum of approximately 2.4 inches in the service area.

USGS Proposed Scope of Work

As a continuation of the prior efforts in 2017 and 2019 described above, staff proposes to again collect electromagnetic geophysical logs at the five USGS monitoring wells nearest the coast to compare against prior data sets and ascertain any progression of seawater intrusion since 2019. Staff also proposes to continue past InSAR data analysis with the latest InSAR data set to characterize any land deformation that has occurred since 2019 and to observe how it has progressed.

To move forward with the scope of work identified above, staff requested a proposal from USGS, and this proposal is included for the Board's consideration as Attachment 2. To supplement its data gathering and analysis activities, the USGS also proposes to collect 27 water quality samples that would be taken from these five monitoring well sites at various depths to further characterize water quality in the SDF. The USGS also proposes to present the results to the Authority in committees and/or Board meetings, and to provide as-needed technical support to staff in its management and planning of future development of the Authority's groundwater resources in the SDF.

Memo to: Governing Board (Engineering and Operations Committee)
Subject: Consideration of U.S. Geological Survey Proposal for Seawater Intrusion and
Land Subsidence Investigations

July 28, 2023

Page 3 of 4

PAST BOARD ACTIONS

June 8, 2022	The Board approved the FY 2022-23 Strategic Plan Work Plan as presented.
	The Board adopted Resolution 22-04, adopting the FY 2022-23 Budget.
July 22, 2015	The Board awarded contracts for the expansion of the Reynolds Desalination Facility with five additional production wells in the SDF
June 30, 2015	The Board adopted the Budget for FY 2015-16, establishing the Groundwater Management Plan project.

FISCAL IMPACT

The overall cost of the USGS scope of work is \$342,000. USGS will contribute \$60,000 towards the effort, with the remaining \$282,000 to be funded by the Authority.

The FY 2023-24 Budget includes \$300,000 for this proposed work under account no. 10-40-400-5114. Past seawater intrusion and land subsidence investigations from 2017 and 2019 were expended from both the San Diego Formation Aquifer Study (account no. 20054016) and the Groundwater Sustainability Plan (account no. 20164003).

POLICY / STRATEGIC PLAN

Strategic Plan Goal 7: Environmental Stewardship – Provide core services while maintaining a balanced approach to human and environmental needs.

- Objective ES5: Increase knowledge of groundwater basin to ensure sustainable management of groundwater resources and comply with potential future legal requirements for the Coastal Plain of San Diego Groundwater Basin, pertaining to the Sustainable Groundwater Management Act
 - Task 001.01: Conduct groundwater studies by the U.S. Geological Survey to further understand the San Diego Formation and support development of the GSP

ALTERNATIVES

1. Authorize the General Manager to execute an agreement with the United States Geological Survey to perform an investigation of seawater intrusion and land deformation in accordance with their proposal dated May 23, 2023, for a total cost of

Memo to: Governing Board (Engineering and Operations Committee)
Subject: Consideration of U.S. Geological Survey Proposal for Seawater Intrusion and
Land Subsidence Investigations

July 28, 2023

Page 4 of 4

\$342,000, of which the Authority would fund a not-to-exceed amount of \$282,000,
with remaining funds to be contributed by the United States Geological Survey.

2. Other direction as determined by the Governing Board.

RECOMMENDATION

Staff recommends that the Governing Board authorize the General Manager to execute an agreement with the United States Geological Survey to perform an investigation of seawater intrusion and land deformation in accordance with their proposal dated May 23, 2023, for a total cost of \$342,000, of which the Authority would fund a not-to-exceed amount of \$282,000, with remaining funds to be contributed by the United States Geological Survey.

ATTACHMENTS

1. Well Locations
2. USGS Proposal dated May 23, 2023
3. Staff Presentation