



Office of the City Manager

October 18, 2019

To: Honorable Mayor and Members of the City Council
From: Dee Williams-Ridley, City Manager *DR*
Re: Aquatic Park Lagoon: water quality and infrastructure update

This memo provides an update on water quality in the Aquatic Park lagoon. It covers water quality & testing, the investigation into sources of increased bacteria, and tide tube infrastructure.

- **Water quality testing:** Since concerns about water quality, higher water levels, and increased turbidity were first reported, we increased the frequency and scope of testing.
- **Bacteria Source Investigation:** Staff have begun the process of assessing potential sources of contamination into the Aquatic Park lagoon.
- **Infrastructure:** We have continued to move the city forward through the complex, multi-jurisdictional permit process required to assess, maintain, clean and potentially repair the tide tubes. Addressing this has been a priority for staff, and \$350,000 in Measure T1 funding was approved by City Council to pay for a first phase of work.

Water Quality Testing

Ensuring that we have accurate data that reflects best practices has been a top priority so that we can identify and execute appropriate next steps. The City has historically done monthly water testing of water in the Aquatic Park lagoon from late spring to early fall for three bacteria: E. coli, fecal coliforms and total coliforms. When concerns first arose in July, the test showed normal levels of bacteria.

As a result of these concerns, we increased our monthly tests to weekly tests starting August 20, when the results showed that bacteria levels were running within past normal levels. On August 27, however, we saw a rise in E. coli levels. Even though it was a single test, we posted nearly two dozen signs at the Aquatic Park lagoon cautioning the public to minimize contact with water. The September 3 sample showed

that E. coli levels had subsided, but we kept the public warning signs up because conditions vary and we wanted to get more data with lower E. Coli levels before removing the warnings.

In mid-September staff included testing for enterococci bacteria, an additional indicator bacteria present in human waste, which is consistent with the State's water quality monitoring criteria for water beaches along the Bay.

The testing received on September 20 showed high levels of enterococci and E. coli, and they were at levels that our Environmental Health professionals determined to be unsafe for water contact. Weekly test results since September 20 continue to show high levels of E-coli, fecal coliform, total coliform and enterococci. Based on these consistently high levels, we are working on investigating why this is happening so that we can improve the lagoon water quality.

Investigating potential bacteria sources

The City is looking into potential sources for the elevated bacteria levels, increased water level, reports of continual incoming water, and elevated turbidity.

City staff have contracted with Wood Environment and Infrastructure Solutions, a specialized consulting firm, to investigate the potential sources of the contamination so that the city can determine appropriate remedies.

City staff have also been working with regulatory agencies and conferring with agencies that manage similar water bodies so we can better understand the dynamics at play in the Aquatic Park lagoon.

The potential locations where contaminants could be coming from that staff and the contractor are investigating include:

1. Concealed Locations/Dead End Streets and Illicit Discharges. We are monitoring areas that are not heavily trafficked such as streets that dead-end at the railroad tracks.
2. Improper Building Connections. We are testing buildings in the area to verify that their sanitary sewer connections were properly made.
3. Storm Drains Entering Aquatic Park and the Lagoon. We are conducting dye tests of storm drains to identify pathways that allow urban runoff to reach the park and lagoon. Results so far have not revealed any new entry points that were not previously known.

4. Sanitary Sewers. We have been examining sanitary sewers for faults that could lead to leakage.

The work of the contractor is expected to be completed in the coming weeks.

Tide Tube Infrastructure

Five tide tubes are located on the west side of Aquatic Park, approximately opposite where Parker Street dead-ends at the railroad tracks (see attachment). These tubes are significantly clogged with marine growth and sediment. They may also be damaged. The underperformance of these tubes has two potentially major impacts:

1. Poor exchange of water with the Bay, resulting in higher concentrations of stormwater runoff and other inflows; and
2. Increased flooding during storms as it takes more time for the elevated water levels after rains to slowly drain to the Bay.

We will continue to work on assessing the tide tubes' integrity and functionality and removing accumulated sediment and debris. This type of work requires extensive permitting. CalTrans, the Regional Water Quality Board, the Bay Conservation Development Commission, the California Department of Fish and Wildlife and the U.S. Army Corps of Engineers all must give the City maintenance permits in order to clean out the tide tubes before we can determine the extent of work needed.

In the first phase of staff work, the City contracted with an engineering firm to implement the project. The contractor is working on a Biological Resources Study and wetland delineation study, both of which are required for permit applications. We are also doing a limited camera inspection, submitting maintenance permit applications to the above listed entities and developing bid documents for initial clean out of the tide tubes. In November, we expect to conclude the first phase by submitting the required permit applications to the five regulatory bodies.

In the second phase, this is the timeline for work:

- 2020, June through August: bid and award of contract to clean out and inspect tide tubes.
- 2020, September – November: tubes cleared out and inspected.
- 2020, December: determine necessary actions for rehabilitation of tide tubes

At present, it is not possible to know the extent of the damage of the tide tube openings and lengths. At a minimum, staff anticipate a cost of at least \$1.5M to repair the tide tube openings, but the cost could be much more if additional damage is found.

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For more information on past studies of Aquatic Park please see the City's Aquatic Park Improvement Program web page:

[https://www.cityofberkeley.info/Parks_Rec_Waterfront/Trees_Parks/Aquatic_Park_Improvement_Program_\(APIP\).aspx](https://www.cityofberkeley.info/Parks_Rec_Waterfront/Trees_Parks/Aquatic_Park_Improvement_Program_(APIP).aspx).

Attachment:

Map of Aquatic Park storm drain pipe network

cc: Dee Williams-Ridley, City Manager
David White, Deputy City Manager
Scott Ferris, Director, Parks, Recreation & Waterfront
Phil Harrington, Director, Public Works
Kelly Wallace, Interim Director, Health, Housing & Community Services
Matthai Chakko, Assistant to the City Manager
Jenny Wong, City Auditor
Mark Numainville, City Clerk

Attachment – Map of Aquatic Park storm drain pipe network



ATKINS **FIGURE 4.3-5** Aquatic Park Storm Drain Pipe Network Source: APP Figure 31, March 2011

100022704 Berkeley Aquatic Park Improvement Program