

DATE: November 13, 2024

TO: Parks and Recreation Commission

FROM: Salman Husaini, Associate Engineer
Tina Tseng, Principal Civil Engineer
Lisa Au, Assistant Public Works Director

VIA: Edward Arango, Acting Public Works Director

SUBJECT: Recycled Water Reservoir Siting Study—Site Options, Project 23-40

PURPOSE

Review and comment on the Charleston Park site for a new recycled water reservoir in the North Bayshore as a part of Recycled Water System Expansion, Phase I, Project 23-40.

BACKGROUND

Recycled water is an integral component of the City of Mountain View (City)'s water supply portfolio. The City receives recycled water from the City of Palo Alto's Regional Water Quality Control Plant (RWQCP), which treats the City's wastewater. The wastewater undergoes different treatment depending on whether it will be discharged to the San Francisco Bay or undergo further advanced treatment as recycled water, commonly used for landscape irrigation, toilet flushing, and cooling towers.

The current agreement with the RWQCP allows the City to receive a maximum peak-flow rate of 3 million gallons per day (MGD) of recycled water through 2060. The City's historical recycled water use typically remains under 0.5 MGD serving approximately 4% of the City's water needs. However, with the current and projected impacts of climate change, constraints from imported supplies through the City's water wholesalers (i.e., San Francisco Public Utilities Commission and Santa Clara Valley Water District), recycled water remains a droughtproof water source crucial for meeting the needs of the City's residents and businesses.

To prepare the City for future water demands and improve the resilience of its water supplies, the City completed the 2022 Recycled Water Feasibility Study Update ([Update](#)) report. Findings of the Update were presented to the City Council on March 22, 2022. Recycled water is currently served to over 60 customers in the North Bayshore Precise Plan Area (North Bayshore). The Update concluded that the guaranteed 3 MGD recycled water from the RWQCP only meets

existing maximum-day demand, but not peak-hour demand. The Update also proposed system expansion alternatives to serve additional customers within North Bayshore, NASA, and potential future customers in the East Whisman Precise Plan Area (East Whisman). Based on the findings, Council directed staff to proceed with full build-out of the recycled system in the North Bayshore and to evaluate a future expansion to East Whisman via Middlefield Road. Figure 1 highlights these expansion alternatives from the Update.

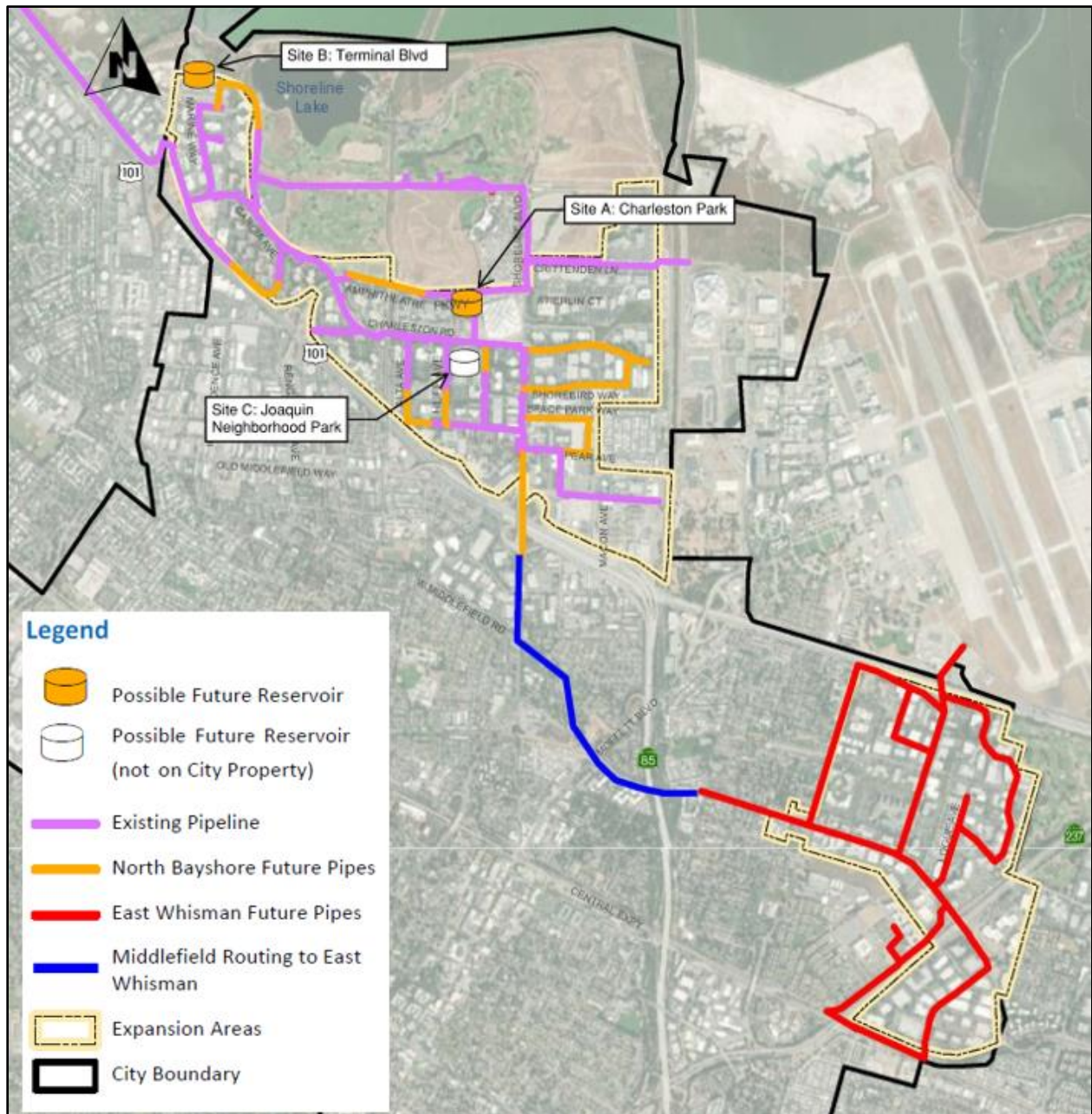


Figure 1: Recycled Water Expansion Alternatives and Potential Recycled Water Reservoir Locations

As the City currently lacks recycled water storage, the Update emphasized the need for a reservoir to meet future maximum-day and peak-hour demands. Introducing a reservoir and pump station to the City's recycled water system will provide storage capability and improve reliability, operational flexibility, and system pressure regulation. Currently, the City's recycled water system relies heavily on the operational schedule of the RWQCP and is required to suspend service to customers during any planned or unplanned plant shutdowns. A recycled water reservoir will greatly reduce the City's dependence on the RWQCP and enable consistent, uninterrupted recycled water service. The Update proposed various locations in the North Bayshore Area to construct a recycled water storage reservoir. In approving the Update, the City Council also directed staff to conduct a recycled water storage reservoir siting study (Study) to consider and evaluate these locations.

Subsequently, in March 2023, the City Council authorized the City Manager to execute an agreement with Wood Rodgers to prepare the Study and recommend a suitable location for the reservoir. The three potential reservoir locations identified (also shown in Figure 1) are on current and potential future City property and City right-of-way. The locations include an area in north Charleston Park, Terminal Boulevard, and a future neighborhood park proposed to be dedicated as a part of Google's North Bayshore Master Plan.

ANALYSIS

The Study to identify a feasible location for the recycled water reservoir initially included three alternatives at each site, including buried, semiburied, and above-grade options. A pump station is required at the reservoir to boost water pressure to deliver water to customers. The pump equipment can be housed either in a building above grade or buried below grade, but the electrical equipment is required to be above-grade to avoid the risk of potential flood damage. The size of the proposed pump station building at each location will be approximately 51'x28' and house three pumps with a capacity of 1,500 gallons per minute each. The layout, spacing, and sizing of the pump station and pumps will be refined in the design phase of the project.

Each site alternative is evaluated based on the following criteria:

- Land Acquisition/Easements;
- Permitting/Stakeholder Coordination;
- Constructability;
- Construction Schedule;
- Off-Site Utility Improvements;
- Environmental Impacts;
- Operation and Maintenance;
- Community Impact;
- Capital Costs; and
- Operations and Maintenance Costs.

Certain alternatives were excluded from the assessment due to excessive spatial requirements or unacceptable levels of encroachment within the public right-of-way. Aboveground options were evaluated initially due to unknown underground conditions. However, soil borings were conducted, and the geotechnical analyses concluded that underground or semiburied options at any of the three sites are viable from a constructability standpoint. Therefore, the aboveground options were excluded from further consideration because staff determined that these alternatives would be too visually obstructive and would compromise the intended use of each site.

The three sites are described in the figures and discussion below:

Site A—Charleston Park

Charleston Park is approximately seven acres, with two acres on land under a long-term ground lease to Google, which was required to be an extension of the park as part of the project approval of 1600 Amphitheatre Parkway in 1995 (Figure 2). The park includes open lawn space, a waterfall fountain, trees and landscaping, concrete walkways and stairs, restroom facility, and a bus transit center. The park topography is gently sloped, ranging from approximately 12' to 21' in elevation. North of the park is a closed landfill (Vista Slope) with an earthen cap that is considered a burrowing owl habitat. Adjacent to the landfill to the east resides the Shoreline Amphitheatre, which hosts large events and concerts throughout the year. The park and surrounding area are heavily trafficked by pedestrians and bicyclists.

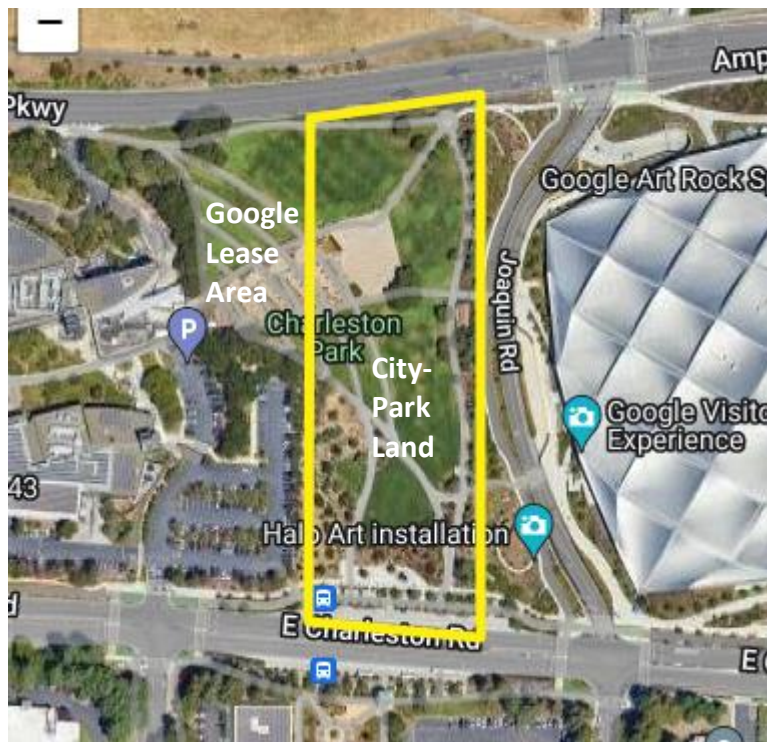


Figure 2: Charleston Park Location

Site A is located on the northwest side of the park, south of Amphitheatre Parkway and west of Joaquin Road. The area under evaluation is between Googleplex headquarters and the recently constructed Google Gradient Canopy for either a buried or semiburied reservoir option where the waterfall fountain feature is currently located. Due to frequent breakdowns and ongoing maintenance challenges associated with the existing waterfall fountain, staff is reevaluating its use and incorporating a new buried or semiburied recycled water reservoir as part of replacing the fountain with landscaping and park features.

This decorative waterfall fountain, installed over 30 years ago by Silicon Graphics when the area was originally developed, has become increasingly costly to maintain. Annual expenses for specialized fountain vendors exceed \$10,000 for regular cleaning, maintenance, and general repairs. Additionally, the fountain's aging equipment necessitates ongoing replacements and more extensive repairs, with the most recent repair estimated at over \$27,000. Beyond the financial costs, staff spends significant time during the fall and winter cleaning goose debris from the fountain and surrounding areas. The open water attracts geese, creating unsightly conditions along the public walkway and within the fountain itself. Furthermore, in light of recent water shortages and droughts, maintaining such a large and aging fountain no longer aligns with the City's environmental and sustainability initiatives.

Staff is considering installing the reservoir at this location because it would preserve park use without interfering with any recreation activities and will provide an opportunity to redesign and update the park. A buried reservoir option would be located underneath the existing waterfall fountain area with improvements to ensure park users can enjoy the space above it as they would any other park area. A semiburied option would be situated in the hillside further west within the existing fountain's footprint, with a portion of the reservoir exposed while allowing the integration of other park features, such as landscaping, hilly areas, pathways, and park benches. Site A is sloped and will most likely straddle the City park land and area leased to Google. Therefore, use of this area would require Google's concurrence. Google representatives have indicated a willingness to collaborate with the City if the City selects Site A for the reservoir.

The pump station building could be designed to match the aesthetics of the existing park restroom building or be based on community feedback. Currently, a pump station building is proposed to be located near the existing park restroom. This site was selected to allow for vehicle access for pump station maintenance. As shown, this site will impact three Heritage deodar cedar trees and will require mitigation; however, the proposed location is tentative and further design work and discussions with Google would be required to confirm the optimal location for the pump station.

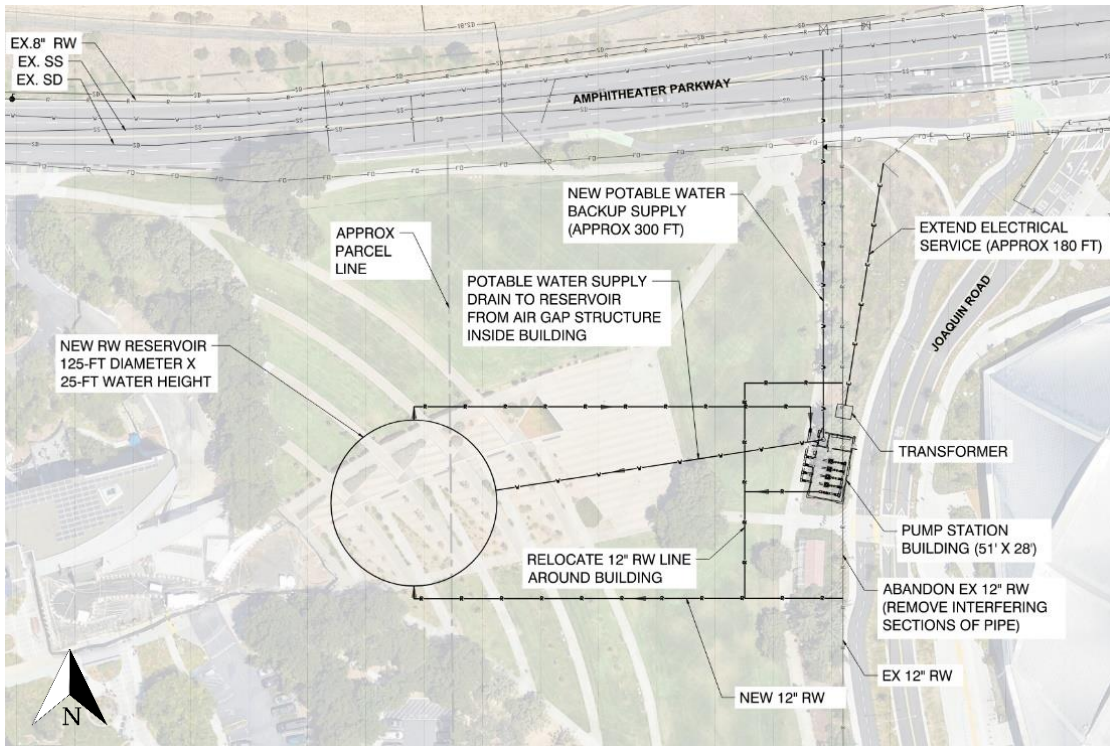


Figure 3: Semiburied Option at Charleston Park

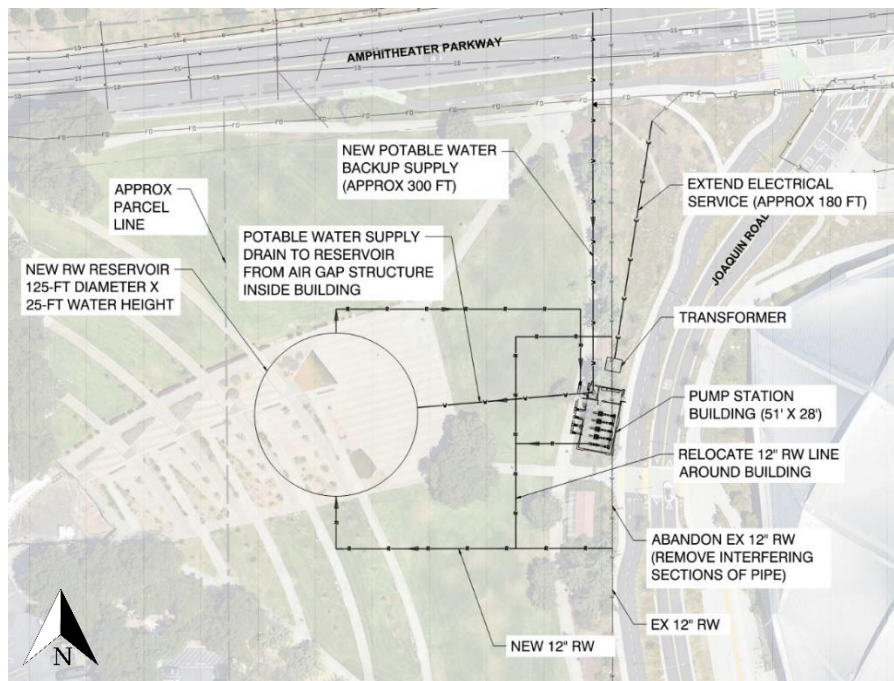


Figure 4: Buried Option at Charleston Park

Site B—Terminal Boulevard

Site B is located at the terminus of Terminal Boulevard, west of Shoreline Lake, east of San Antonio Road, and south of Casey Forebay. The businesses in the area are predominantly technology-based and are located on the south side of the roadway with paved driveway access, parking lots, utilities, and landscaping. The north side of Terminal Boulevard includes public access to the Palo Alto Baylands Nature Preserve Trail, including parking stalls. The topography is relatively flat at an elevation of approximately 5', and the proposed site is approximately 25' east of the Coast-Casey Drainage Canal.

The above-grade and semiburied options are not feasible due to the need to remove a significant portion of parking in the public right-of-way and block access to nearby trails. Additionally, these options would create challenges for through traffic on the street, including egress from Shoreline Amphitheatre events and access for City maintenance vehicles. While a buried reservoir (approximate width of 60' and length of 900') is the only viable option for Site B, it is not recommended. This option would occupy nearly all underground space under the roadway and present significant challenges, including utility conflicts, potential hazardous materials, and corrosive soils. These factors could result in increased costs, extended construction timelines, and potential disruptions to essential services and access.

Currently, there is no indication that this alternative will impact any existing trees; however, further design work would be required to confirm this preliminary finding.

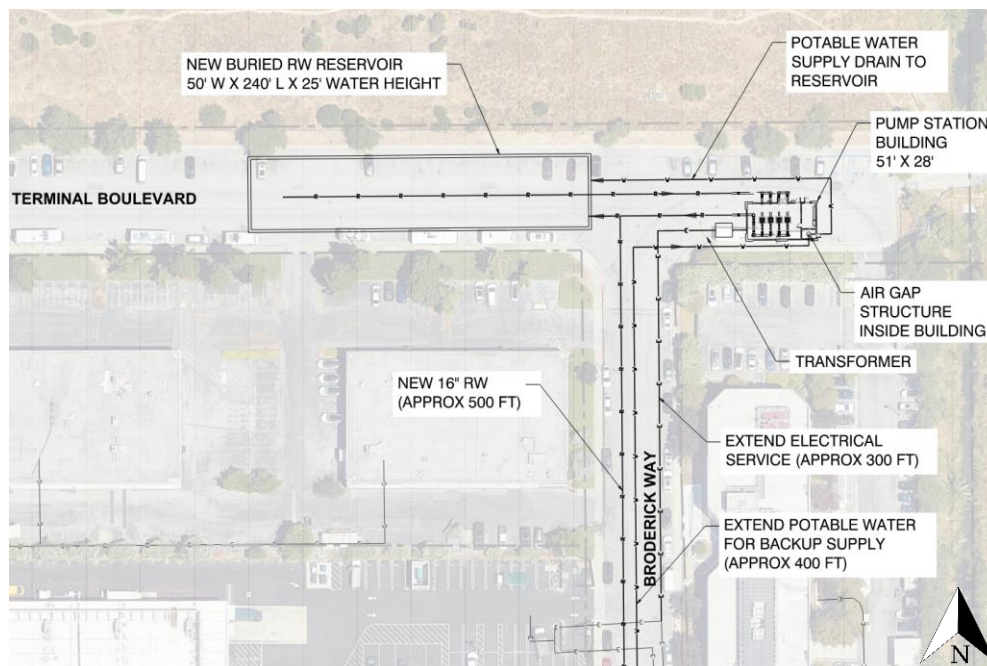


Figure 5: Buried Option at Terminal Boulevard

Site C—Joaquin Neighborhood

Site C is located in the future Joaquin Neighborhood park to be dedicated to the City as part of the Google North Bayshore Master Plan conditions of approval. The future park, currently referred to as Joaquin Commons, will cover an area of approximately 323'x344' (2.55 acres) on the northeast corner of Joaquin Road and future Monarch Street. The existing topography is relatively flat at an elevation of approximately 14'. Currently, the size and location of Joaquin Commons are conceptual, and there are plans to integrate the existing Green Loop bike path through the park. The most viable option for this site is a buried or semiburied reservoir as an above-grade reservoir would reduce the available future park area.

A buried reservoir is anticipated to be underneath the grass for park users to enjoy the space above it as they would any other park area. A semiburied option would have a portion of the reservoir exposed while allowing the integration of other park features, such as landscaping, hilly areas, pathways, and park benches.

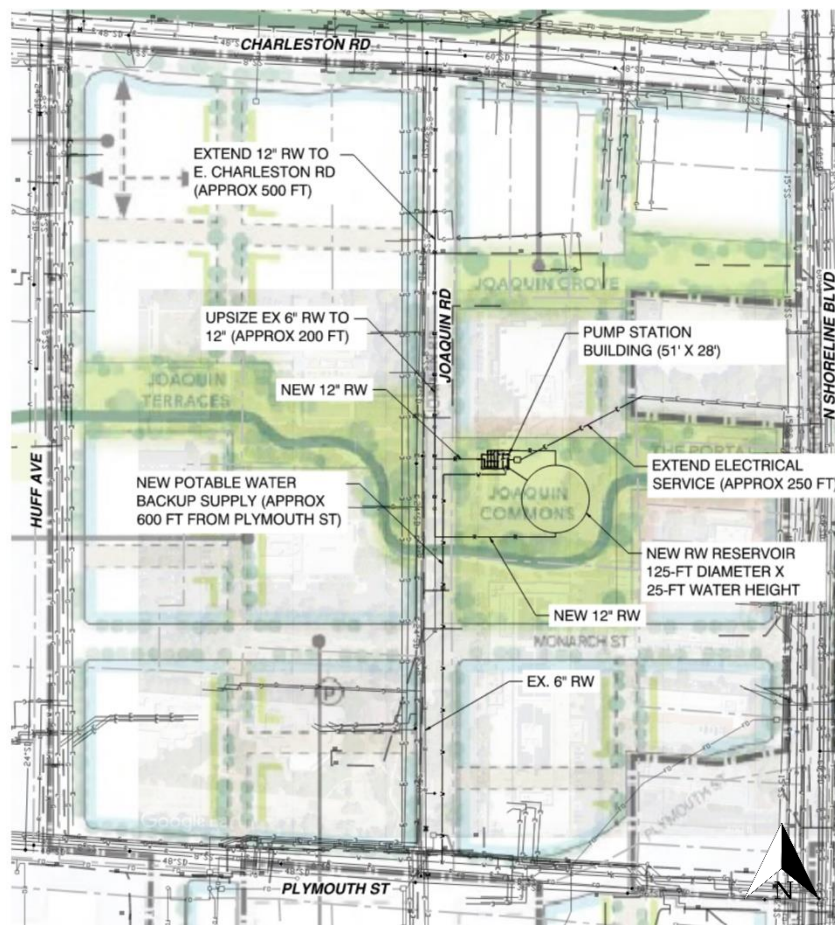


Figure 6: Buried/Semiburied Option at the Future Joaquin Neighborhood Park

The park layout is conceptual, and any tree impacts are unknown at this stage. A major challenge with this location is that it may be 15 to 30 years before the land could be available. The Google North Bayshore Master Plan is planned to take up to 30 years to complete, and the Joaquin area is one of the latter phases for the Master Plan.

PRELIMINARY RESULTS

The Study is currently ongoing, but the preliminary results indicate that a fully buried reservoir at Charleston Park ranks as the highest-scored option based on the aforementioned criteria and as outlined in Table 1. Renderings of the two reservoir options at Charleston Park are shown in Attachment 1. As mentioned earlier in this memorandum, certain alternatives were excluded from the analysis due to infeasibility. As a result, Site Options A3 (Site A, aboveground), B2 (Site B, semiburied), B3 (Site B, aboveground), and C3 (Site C aboveground) were not scored as an option for the final reservoir and pump station.

Table 1: Site Ranking

| Criteria | Priority Weighting (%) | Rank (1-5)** | | | | | | Weighted Rank | | | | | |
|-------------------------------------|------------------------|------------------------------|----|----|----|----|------|---------------|------------|------------|------------|------------|--|
| | | A1 | A2 | B1 | C1 | C2 | | A1 | A2 | B1 | C1 | C2 | |
| Land Acquisition/Easements | 5 | 5 | 5 | 4 | 1 | 1 | | 0.25 | 0.25 | 0.2 | 0.05 | 0.05 | |
| Permitting/Stakeholder Coordination | 5 | 2 | 2 | 2 | 3 | 3 | | 0.1 | 0.1 | 0.1 | 0.15 | 0.15 | |
| Constructability | 20 | 2 | 3 | 1 | 3 | 4 | | 0.4 | 0.6 | 0.2 | 0.6 | 0.8 | |
| Construction Schedule | 5 | 2 | 2 | 3 | 1 | 1 | | 0.1 | 0.1 | 0.15 | 0.05 | 0.05 | |
| Off-Site Improvements/Utilities | 10 | 4 | 4 | 1 | 2 | 2 | | 0.4 | 0.4 | 0.1 | 0.2 | 0.2 | |
| Environmental Impacts | 5 | 3 | 3 | 1 | 3 | 3 | 0.15 | 0.15 | | 0.05 | 0.15 | 0.15 | |
| Operation and Maintenance | 10 | 3 | 3 | 2 | 3 | 3 | | 0.3 | 0.3 | 0.2 | 0.3 | 0.3 | |
| Community Impact | 20 | 5 | 3 | 2 | 4 | 3 | | 1.0 | 0.6 | 0.4 | 0.8 | 0.6 | |
| Capital Costs | 10 | 2 | 3 | 1 | 2 | 3 | 0.2 | 0.3 | 0.1 | 0.2 | 0.3 | | |
| O&M Costs | 10 | 4 | 4 | 3 | 4 | 4 | | 0.4 | 0.4 | 0.3 | 0.4 | 0.4 | |
| Total: | 100 | Total Weighted Score: | | | | | | 3.3 | 3.2 | 1.8 | 2.9 | 3.0 | |

- A1 Fully buried reservoir at Site A—Charleston Park
- A2 Semiburied reservoir at Site A—Charleston Park
- ~~A3 Aboveground reservoir at Site A—Terminal Boulevard~~
- B1 Fully buried reservoir at Site B—Terminal Boulevard
- ~~B2 Semiburied reservoir at Site B—Terminal Boulevard~~
- ~~B3 Aboveground reservoir at Site B—Terminal Boulevard~~
- C1 Fully buried reservoir at Site C—Joaquin Park
- C2 Semiburied reservoir at Site C—Joaquin Park
- ~~C3 Aboveground reservoir at Site C—Joaquin Park~~

** Scores for each category range from 1 to 5, with higher scores indicating a more favorable assessment.

In summary, the buried and semiburied options at Charleston Park (Site A) ranked the highest based on the evaluation criteria and present an opportunity to redesign and update the park. Terminal Boulevard (Site B) ranked the lowest due to challenges in maintaining access for Shoreline Amphitheatre and public trail, significant utility conflicts, extremely corrosive soils, and the potential discovery of hazardous materials during construction. The future Joaquin Park (Site C) is not recommended because of the uncertainty of when the land may become available with a likely delay of 15 to 30 years for providing the much-needed storage for one of the City's water supplies.

Staff requests the PRC to review and comment on these preliminary findings for the Recycled Water Reservoir Siting Study—Site Options.

NEXT STEPS

Upon completion of the draft Study, staff will present a recommendation for the location of the Recycled Water Reservoir to the City Council for consideration and approval. Assuming the reservoir will be located within Charleston Park, staff will bring the project back to the PRC for further input during project design.

Staff expects to present the Study to the Council in Q4 2024, begin design in Q1 2025, and complete final design by Q4 2026, followed by construction.

PUBLIC NOTICING

In addition to the standard agenda posting, notices were mailed to property owners and residents within 750' of the proposed project sites.

SH-TT-LA/AF/1/CSD
955-11-13-24M

Attachment: 1. Recycled Water Reservoir and Pump Station Renderings at Charleston Park

cc: PWD, CSD