CASE STUDY 3 OF 6: GOOGLE'S BAY VIEW CAMPUS IN SANTA CLARA COUNTY

Water-Wise Development on a Corporate Campus

SERIES OVERVIEW

In 2022, California is in the midst of a severe drought — just a few years after the worst drought in a millennium ended in 2017. This pattern of accelerating and deepening droughts is consistent with climate change models for the state, which forecast longer, more severe and more frequent droughts punctuated by heavy rain and flooding. Unlike past droughts, these events are not periods to survive until "normalcy" returns. Instead, they are a sign that the climate is changing — and that the state must fundamentally change how it uses water.

These six case studies — a follow-up to SPUR and Pacific Institute's report *Water for a Growing Bay Area* — highlight leaders who are pioneering more sustainable approaches to water in Northern California. We highlight public water agencies, private corporations, nonprofit affordable housing developers and local land use authorities who are using water more efficiently, protecting groundwater supplies, reusing stormwater and recycling water.

Water sustains life, and its status — whether it is plentiful or scarce, clean or polluted, fresh or salty — shapes the well-being of all living creatures. These six case studies illustrate strategies for California to meet the challenge of a changing climate and emerge with a healthy environment and flourishing communities.

Key Takeaways

- Corporations account for a large share of urban water use, and the scale of their developments allows for innovative water efficiency and reuse solutions.
- Onsite water reuse coupled with water efficiency make the Google Bay View campus an example of net-positive water development, in which the building will be able to generate more non-potable water than it uses.
- One of the biggest barriers to creating more net-positive developments is the difficulty of obtaining permits for onsite water reuse.

Businesses and other non-residential spaces account for nearly 40% of the Bay Area's water use, and the business community can play a role in demonstrating leading-edge practices for water-efficient buildings. One model is Google's Bay View project, a 1.1 million square foot development under construction in the city of Mountain View that serves as an example of how buildings can use leading-edge technologies to meet non-potable water demands with rainwater and onsite reuse.

Cities need to address the challenge of how to grow without endlessly increasing water demand. A common strategy is using water offsets, in which the demand for water from new development is offset by efficiencies elsewhere in the system (see Case Study 5).

Water-Wise Development on a Corporate Campus

A newer approach, pursued by Google at its Bay View campus, is for new developments to use a combination of efficiency, onsite reuse and stormwater capture to attain "net-positive water," meaning the building generates more non-potable water than it uses.

Google's Bay View campus in Mountain View will use advanced technologies to reduce its demand for water and meet much of that demand with reuse.
Rendering courtesy Google

The Bay View campus will be able to reduce its water demand by using a relatively new approach to heating and cooling buildings known as energy piles, largely eliminating the need to run cooling towers. Since cooling towers make up a significant portion of the water consumption in conventional commercial buildings, this translates into water savings. The use of energy piles will result in a 60% reduction in energy and a 90% reduction in water (five million gallons per year) for yearly cooling needs.

Having greatly decreased water demand, the project's designers then turned their focus to meeting as much of that demand as possible from onsite water sources. In California, code requires using municipally supplied potable water for all potable uses; however, they found opportunities to meet all non-potable water needs with onsite systems. Potable uses are those where people would reasonably be expected to drink the water — namely the water from faucets, showerheads and bathtub faucets. Non-potable water uses include irrigation, cooling tower operation, toilet and urinal flushing and clothes washing. As part of the Bay View project's water system, rainwater will be stored in ponds to meet non-potable demands while creating habitat for native plant and animal species.

FIGURE 1

Bay View Campus Water System

The Bay View campus will use municipal potable, rainwater, stormwater and onsite wastewater treatment as supplies. Municipal potable water will be used for purposes requiring drinking-quality water. Rain/stormwater and onsite reuse are predicted to be sufficient to meet all non-potable demands, but infrastructure is in place to allow municipal water to make up any shortfall in non-potable water as required.

Source: Sherwood Design Engineers and Google

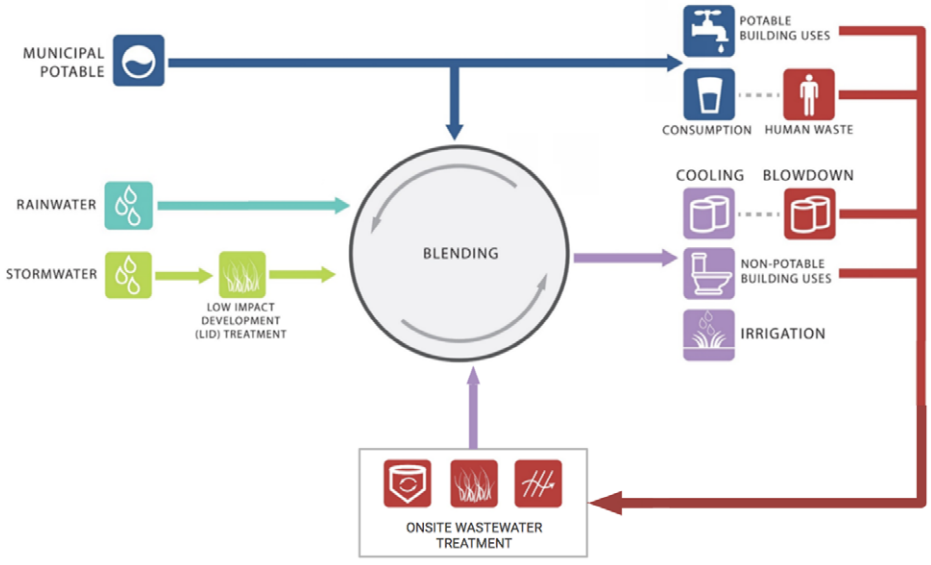
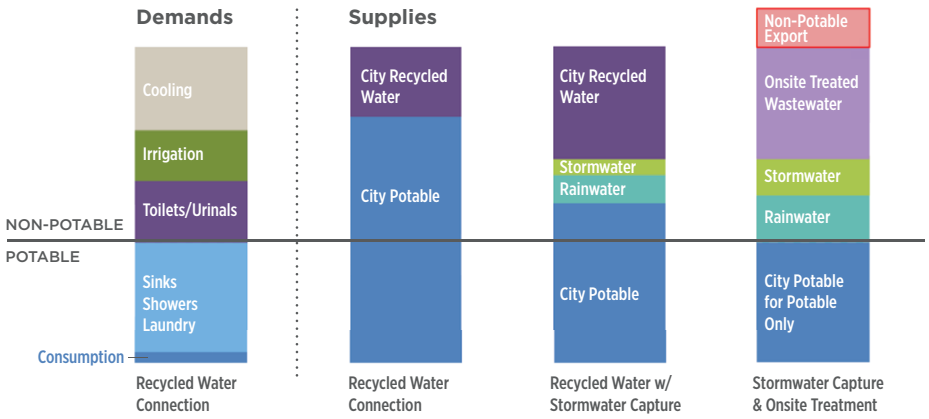


FIGURE 2

Water Supply Will Exceed Demand at Bay View Campus

The "Demands" bar at left shows the split between uses that must be met with potable water and those that can be met with non-potable water. The three supply bars show alternative supply scenarios. The first supply bar shows the portfolio if Bay View had sourced water exclusively from the city, in which case municipal recycled water can only meet a minority of non-potable demands. The second supply bar shows the portfolio if Bay View had used city water plus rain/stormwater capture. In this case, non-potable water meets a majority of non-potable demands. The third supply bar shows the supply portfolio as implemented, with supplies from city potable water, rain/stormwater and onsite wastewater treatment. This scenario generates a surplus of non-potable water beyond what is required at the site.

Source: Sherwood Design Engineers and Google



The net impact of demand reduction, rainwater capture and wastewater treatment means the Bay View development will generate more non-potable water than it needs and will only use municipal potable water for potable purposes. Reducing demand for municipal potable water potentially means reduced demand for water from rivers, streams and groundwater. Infrastructure was designed to enable export of surplus non-potable water to other parcels, should Mountain View allow that at some future date.

There are several major challenges for other property owners looking to embrace the goal of being net-positive for non-potable water use. First, the Bay View campus employs relatively new technologies that are largely unfamiliar to local designers and contractors — the nearest building with a similar energy pile system is the Seattle Federal Building. Second, implementing these systems requires substantial capital. A third hurdle is the permitting burden. For the Bay View project, Google had to obtain permits from many local, regional and state entities. Smaller companies would have difficulty mustering the resources to engage in such a long and complex permitting process. The Bay View project and other pilots can instill confidence that onsite wastewater reuse can be done safely. A key piece of recently passed state legislation, 2018 Senate Bill 966, creates a framework for local governments to evaluate and permit onsite non-potable reuse systems. These standards will be published by the end of 2022 and are expected to be based on a risk-reduction framework created by a National Blue Ribbon Committee. Permitting onsite wastewater treatment systems will be a new undertaking for many local governments, many of whom are wary of taking on the risk of permitting a new type of water treatment system. Successful pilot projects can allay concerns that onsite water reuse poses a health and safety hazard.

Onsite reuse systems like those being implemented at Bay View have the potential to be a key piece of the puzzle in building a water-resilient future for our region. However, while there is widespread agreement that water reuse is a key part of future water supplies, there is active debate about the best strategy for reuse. Reuse can happen at small scales and be managed by

private property owners, as in the case of the Bay View campus, or it can be managed in a centralized fashion by municipal agencies. The sooner the Bay Area can study these systems and proactively address challenges, the sooner we can usher in a new era of water-wise development.

Strategies to Increase Commercial Water Use Efficiency and Reuse

Take a systems approach to onsite water management.
Coupling advanced technology to reduce water demand with strategies to capture and use water onsite will vastly decrease the amount of potable water the Bay View campus needs from the municipal water supplier. More widespread use of technologies such as geo-energy piles in place of cooling towers, rainwater capture and onsite reuse could improve the drought resilience of a property and its community by reducing demand on the municipal system and diversifying supplies.

Provide financial and technical support for local governments to permit onsite reuse.
By 2023, California cities and counties will be responsible for permitting onsite reuse systems. The state will need to provide technical and financial assistance to prepare local jurisdictions for the permitting of onsite reuse systems. Permitting is an unfunded mandate, which makes it difficult for local governments to effectively implement it. Funding from proposed resilience bonds and federal infrastructure spending could support local governments to develop streamlined permitting processes for onsite reuse and other priorities for water use.

Who has authority: State Water Resources Control Board to provide technical support, State Water Board and Department of Water Resources to direct grant money for reuse to supporting local permitting authorities

Read all the case studies at spur.org/watershedmoments

Acknowledgments

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