CHAPTER 2

Description of Project

The Underground Flow Equalization System Project would equalize wet weather flows by temporarily holding excess flows upstream of the WWTP and reduce storage requirements at the WWTP during wet weather events. The Project would be located in the southeast corner of the San Mateo County Event Center (Event Center) parking lot along Saratoga Drive, approximately 800 feet southeast from the Event Center buildings. Single- and multi-family residences are situated east and south of the Project site across Saratoga Drive and 28th Avenue, and the Bay Meadows Community Park is adjacent to the south side of the Project site. The Nueva School Bay Meadows Campus is located approximately 1,000 feet southwest of the Project site. The location of the holding structure was situated in an area that would optimize reduction of SSOs in a portion of the collection system where bottlenecking frequently occurs.

The Project consists of a concrete holding structure, pump station, diversion sewers and force main, and an odor control equipment room (see **Figure 2-1** showing the layout of proposed facilities). These facilities would be located underground. Access hatches, an emergency backup generator, and an electrical building and vents for treated air would be located at ground level.

2.1 Underground Wastewater Temporary Holding Structure

The holding structure would have a storage volume of approximately 5.3 million gallons (MG). During storm events, diversion sewers would route wet weather flows from the existing sewers to the holding structure via two new diversion sewer pipelines. The holding structure would store excess flows up to 24 hours after the storm event subsides (see **Figure 2-2**). An effluent pump station would pump the stored water back into the collection system via an 18-inch-diameter pressure pipeline (force main) when the downstream collection system has available capacity (see **Figure 2-3**). The holding structure would also be used by the City to temporarily divert and hold dry weather flows during routine operations and maintenance activities.

The holding structure would be approximately 200 feet long by 150 feet wide and consist of a reinforced concrete tank buried approximately 3 to 6 feet below ground surface (bgs). The structure would include parallel self-cleaning flushing channels that flow into an effluent channel and then into the influent/ effluent sump in the bottom of the pump station. Up to nine 2,000-gallon buckets would be installed to clean the structure. The buckets would fill with clean water and then tip over, forming a flushing wave across the bottom of the structure. A typical storm would require the use of three tipping buckets. The tipping buckets would use clean water via a connection to the City's water system, or recycled water, if available in the future.

Minor appurtenances, access manholes or hatches, and vents for treated air would all be at or above the ground surface. It is anticipated that manholes and removable concrete slabs for access to the tipping buckets could cover approximately 2,800 square feet, and hatches to the effluent pumps and odor control equipment would total about 1,800 square feet, for a total of approximately 3,600 square feet of at-grade or aboveground appurtenances. The electrical equipment and generator would be located above ground in a dedicated electrical building approximately 600 square feet in size. The perimeter of the Project site along Saratoga Drive and adjacent to Bay Meadows Park would have a wall or fence and landscaping outside of the wall or fence to provide screening for the site.

2.2 Effluent Pump Station

The Project includes a new effluent pump station to pump diluted wastewater back into the S. Delaware Street sewer once downstream capacity is available. The effluent pump station would also be used to dispose of the flush water expended during the cleaning cycle. The effluent pump station would consist of two submersible solids-handling pumps, each sized to deliver approximately 2,100 gallons per minute (gpm) and would discharge into two 12-inch pipes that would converge into a 16-inch discharge header. The valves and header would be housed in a combined mechanical and odor control access vault below ground, also allowing access for maintenance. The discharge header would connect to the 18-inch force main pipe that would extend from the holding structure to the nearest manhole along S. Delaware Street.

The Project would also include a new 175-kilowatt (kW) emergency diesel generator to allow processes to continue during periods of power outages. Operation of the diesel generators would be limited to 50 hours per year for testing.

2.3 Diversion Sewers and Force Main

Diversion sewers are needed to convey the diluted wastewater from two locations to the holding structure and would consist of two new diversion sewer pipelines totaling approximately 3,430 feet. The branch 1 diversion sewer pipeline consists of approximately 2,200 feet of 36-inch-diameter pipe. The diversion structure would be located within S. Delaware Street, approximately 50 feet south of the Saratoga Drive and S. Delaware Street intersection. From this diversion point, the pipeline would slope in an easterly direction along Saratoga Drive to the holding structure.

The branch 2 diversion sewer pipeline consists of approximately 1,230 feet of 36-inch-diameter pipe. The diversion structure would be located in S. Delaware Street south of the intersection with 25th Avenue and convey flow from the diversion structure north in S. Delaware Street and discharge to the branch 1 sewer at the Saratoga Drive and S. Delaware Street intersection.

An existing sanitary sewer gravity pipe would be used to convey the diluted wastewater back to the S. Delaware Street sewer. The existing pipe will be converted into a force main using Cured-In-Place (Plastic) Pipe (CIPP) technology. Short sections of new force main pipe would be constructed to tie the existing gravity pipe into the holding structure and the existing sewer main in S. Delaware Street.

2.4 Odor Control

The holding structure would include an odor control system to provide adequate capture and treatment of foul air associated with operation. The system would consist of foul air fans that draw air from each of the chambers and media vessels containing granular activated carbon for adsorption of odorous compounds. In addition, the odor control system would include fiberglass-reinforced plastic ductwork for transmission of air, control dampers, and a controls system for operation and monitoring. Treated air would be discharged through an inconspicuous 10-foot-tall stack at grade or other architectural feature (see **Figure 2-4** showing an example of a carbon scrubber on a similar facility).

In addition to odor control, the holding structure would be operated in such a way to reduce the generation of odors. Within 24 hours of a wet weather event, the structure would be pumped out and flushed, reducing the time that stored waters can become anoxic, which would help prevent the generation of noxious odors such as hydrogen sulfide (see **Figure 2-5**). Even during times when the structure is empty and idle, there is still a risk of untreated air escaping. To prevent such an occurrence, the odor control system would continue to operate during dry weather at a reduced capacity to maintain a constant negative pressure within the tank.

2.5 Maintenance

The City would conduct routine checking and periodic maintenance of the holding structure and diversion sewers. The structure would be cleaned automatically with the tipping buckets after every storm that results in an overflow. Modeling projections estimated that the holding structure could be used up to 15 times per year, depending on weather conditions, and up to five times per year to accommodate maintenance on other collection system projects. Inspection of the interior of the structure from the surface following each event would occur to verify the tipping buckets are functioning properly and solids have been flushed from the interior. The structure interior may require additional cleaning to remove grease and other debris from the interior walls with high-pressure hoses, depending on frequency of use.

The effluent pump station would be inspected and tested after each event to ensure dewatering and cleaning was properly completed. Replacement parts such as cables or gaskets are expected to be needed approximately every 5 years, with pump replacement expected approximately every 25 years.

Diversion sewers between the diversion structures and holding structure would be cleaned semiannually and would be inspected every 5 years using closed-circuit television. Cleaning and inspection of the diversion structures are expected to occur semiannually.

Additionally, odor control facilities would be inspected weekly during the rainy season. Spent carbon media used in odor control devices can either be regenerated in place or replaced. It is expected that the carbon media would be replaced approximately every 5 years, or as needed based on media testing.

2.6 Project Construction

It is expected that Project construction would begin in 2020. The holding structure and diversion pipelines would be constructed simultaneously over an approximate 25-month period.

2.6.1 Underground Wastewater Temporary Holding Structure

Prior to construction, existing structures and pavement would be demolished or relocated. Up to 3 acres is expected for construction of the Project, including approximately 1 acre for the holding structure and up to 2 acres for equipment staging, soil stockpiling, and general construction activities. **Figure 2-6** provides a conceptual layout of construction disturbance areas.

2.6.1.1 Shoring Installation and Dewatering

Shoring would need to be installed around the perimeter of the area requiring excavation to support the excavation of the holding structure. Shoring would consist of sheet piles, soldier pile shoring installed with pile drivers, or secant pile shoring installed with a crane and an auger. Tiebacks may be required to support the shoring system and would be contained within the footprint of the final facility's permanent easement.

Prior to the start of excavation, up to 15 dewatering wells would be installed approximately 50 feet apart around the holding structure to reduce groundwater intrusion during excavation. The wells would lower the groundwater as the excavation proceeds. Monitoring wells would also be installed to monitor groundwater levels surrounding the Project site during dewatering. Once the bottom of the excavation is reached, a concrete pad would be poured to limit groundwater inflow from the bottom of the excavation for the holding structure. The purpose of the concrete pad would be to block the temporary flow of groundwater, although the pad would be left in place as the base for the construction of the concrete structure. Dewatering water would be disposed of in accordance with state and federal requirements.

2.6.2 Diversion Sewers and Force Main

It is expected that the diversion sewer pipeline would be installed via traditional open cut methods. Construction would require an approximate 10-foot buffer on either side of the trench. Trench dewatering is likely due to the depth of the sewer and the height of the groundwater table in the area. Depending on the soil and amount of water, the contractor may drill well points, which are shallow wells spaced along the pipeline to lower the groundwater level to just below the trench bottom, or pump groundwater directly out of the construction trench.

The force main will be an existing pipeline that will be rehabilitated in place using CIPP technology and will be completed using trenchless technology.

2.6.3 Construction Traffic

Construction traffic would access the holding structure site via Saratoga Drive from S. Delaware Street and/or Hillsdale Boulevard. Truck traffic exiting the site would use Saratoga Drive to Hillsdale Boulevard to access U.S. Route 101 (US 101). Construction vehicles would enter and exit the holding basin site via a newly constructed access drive on Saratoga Drive. Once construction is complete, the access drive would be the primary entry point for periodic City maintenance vehicles. Construction workers would park in a temporary construction easement area at the Event Center. Average daily construction activities would require 20 to 30 workers onsite and two to three major pieces of equipment (crane, excavators, pile installation equipment, or concrete pumpers).

Activities requiring maximum workers and truck traffic would include site excavation, backfill, and concrete pours. The maximum construction traffic on any given day could be up to 30 onsite workers (equivalent to 60 vehicle trips), plus approximately 100 truck trips for the delivery of concrete or hauling away excavated material, for a maximum daily total of 160 truck trips.
Diversion sewer pipeline and effluent force main construction would likely require a crew of about eight workers and up to approximately 30 truck trips per day hauling away excavated material and importing gravel for the pipeline bedding and backfill. Given that pipeline construction and holding structure construction could take place simultaneously, it is expected that as many as 206 vehicle trips could occur cumulatively each day during construction.

2.6.4 Disposal of Excavated Material

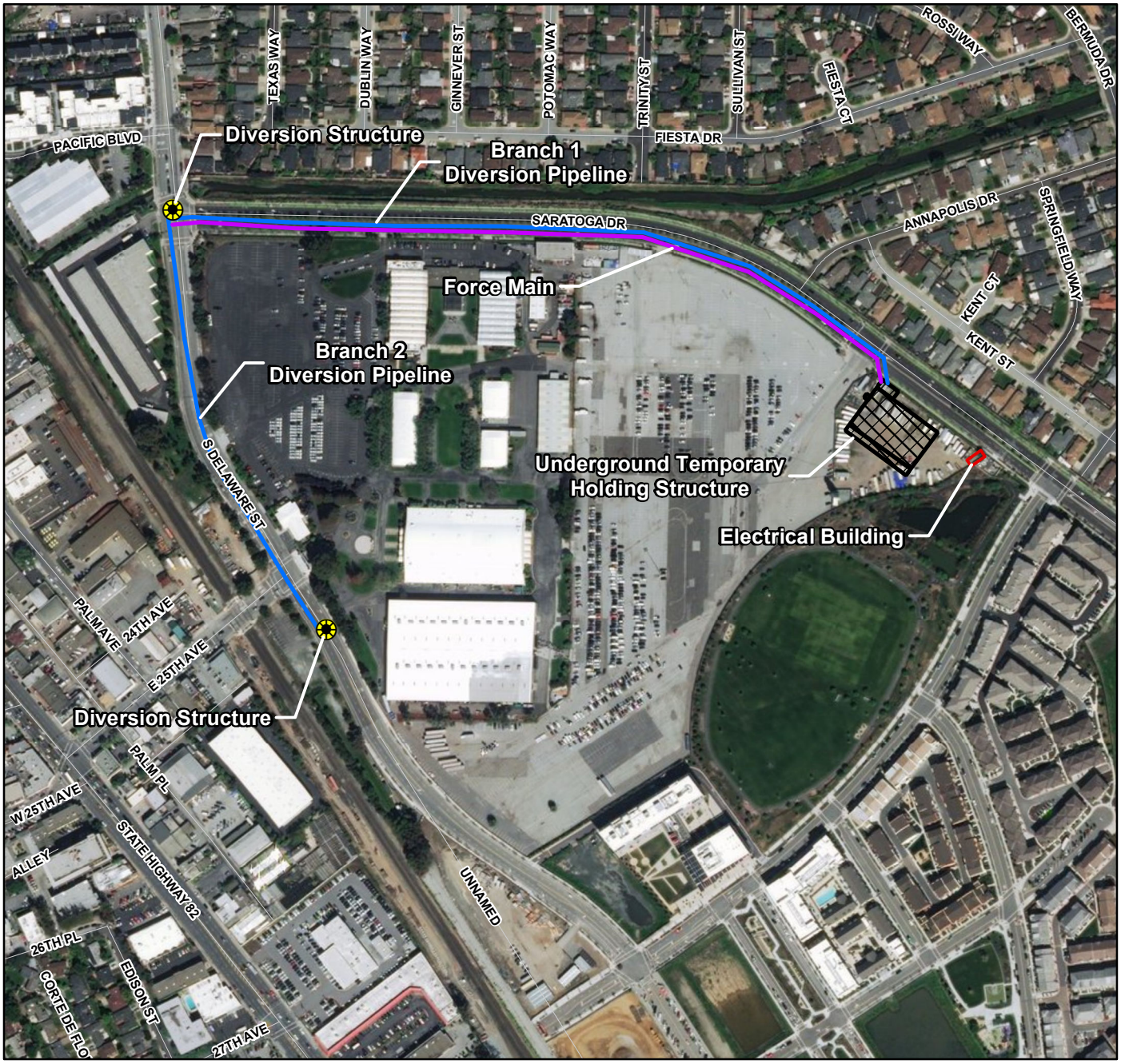
Construction of the Project would require removal of approximately 75,000 cubic yards of soil. Contaminated soil would be disposed of in accordance with state and federal regulations. Up to 60 percent of the construction debris would be reused, in accordance with the City's municipal code. Remaining construction waste would be disposed of at an appropriate licensed facility.

2.6.5 Site Restoration

All areas disturbed by construction activities would be restored in compliance with applicable codes, ordinances, and plans. When feasible, existing walkways, landscape materials, and landscape irrigation systems would be preserved and protected during construction. New groundcovers, shrubs, trees, and irrigation systems would be provided, as necessary. Existing parking areas and sidewalks that were disturbed or removed to accommodate construction would be restored or replaced as necessary.

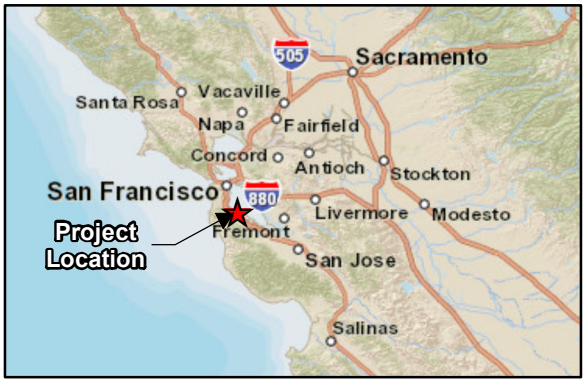
2.6.6 Construction Schedule

Construction is expected to begin in 2020 and last up to 25 months. It is assumed that all work would be conducted Monday through Friday, within a normal 8-hour shift between 7 a.m. and 7 p.m., and no construction activities would occur during the evening or weekends without prior approval by the City. A general construction schedule is provided in **Figure 2-7**.



Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, NRCAN, METI, iPC, TomTom
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

VICINITY MAP



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Feet

FIGURE 2-1
Underground Flow Equalization System
Underground Flow Equalization System, Environmental Impact Report
City of San Mateo Clean Water Program

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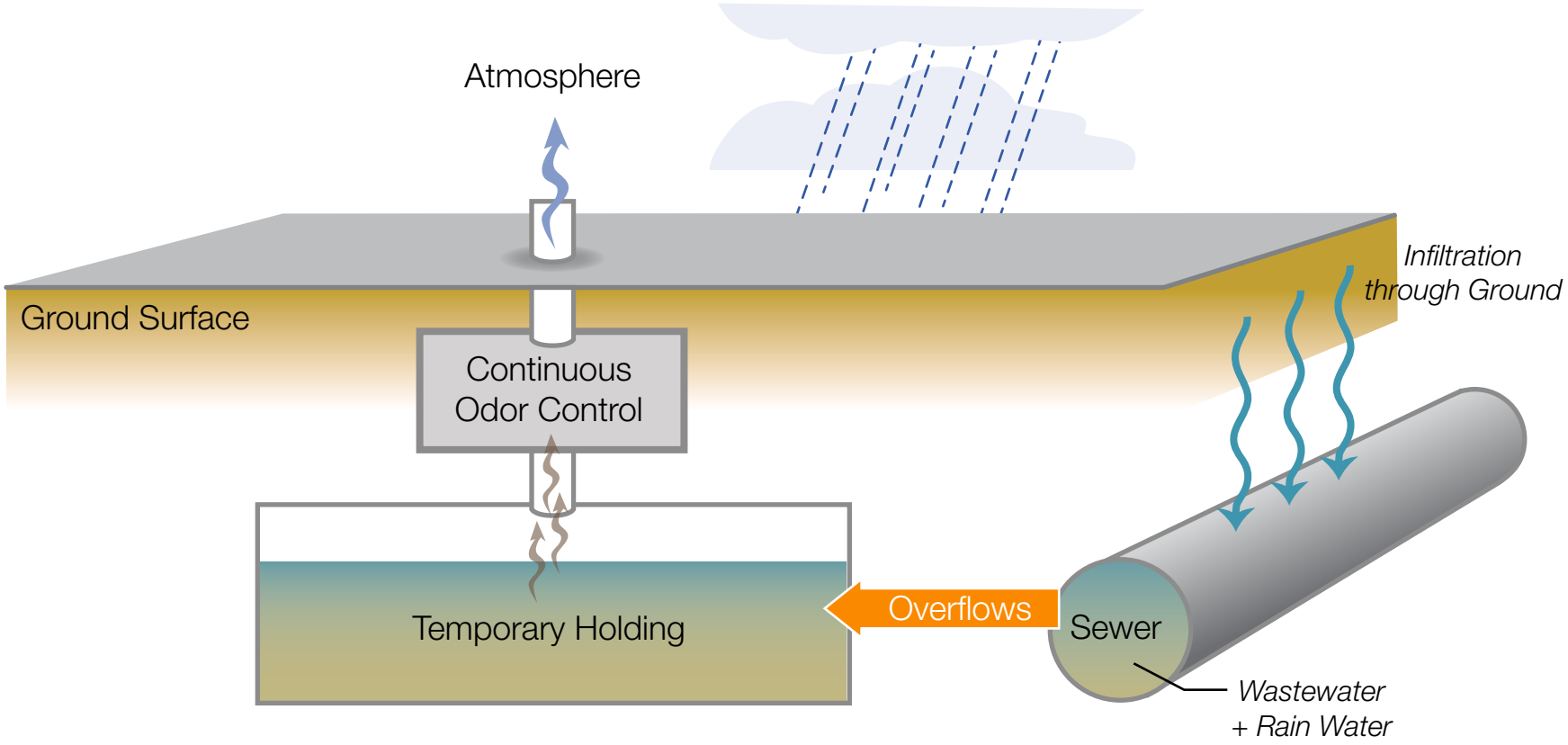
PROTECTING THE BAY FOR A SUSTAINABLE FUTURE



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PROTECTING THE BAY FOR A SUSTAINABLE FUTURE

Figure 2-2
Wet Weather Operations
Underground Flow Equalization System,
Environmental Impact Report
City of San Mateo Clean Water Program

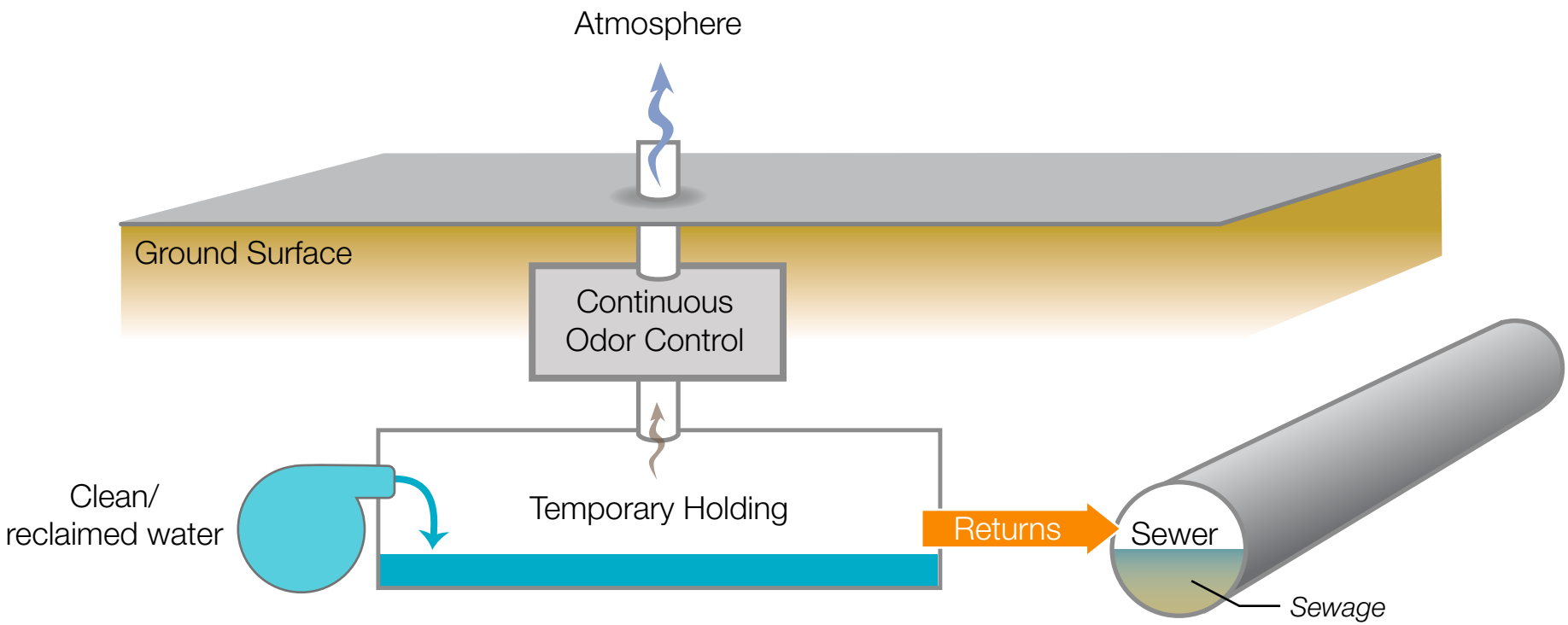

Figure 2-3
Post-Operations Self-Cleaning Mechanism
Underground Flow Equalization System, Environmental Impact Report
City of San Mateo Clean Water Program

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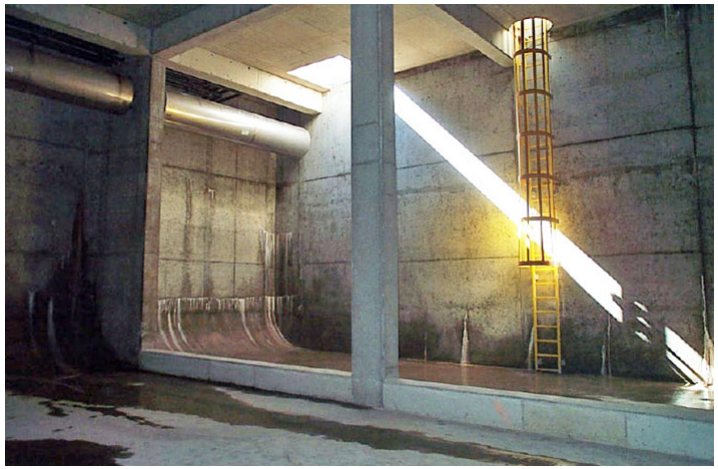
Carbon Odor Scrubber

Example of ground-level air-tight vault access hatch

Tipping buckets flush solids and debris from holding structure to pumping system for removal

Holding structure captures solids and debris for treatment and disposal at the treatment plant



Interior holding structure after cleaning

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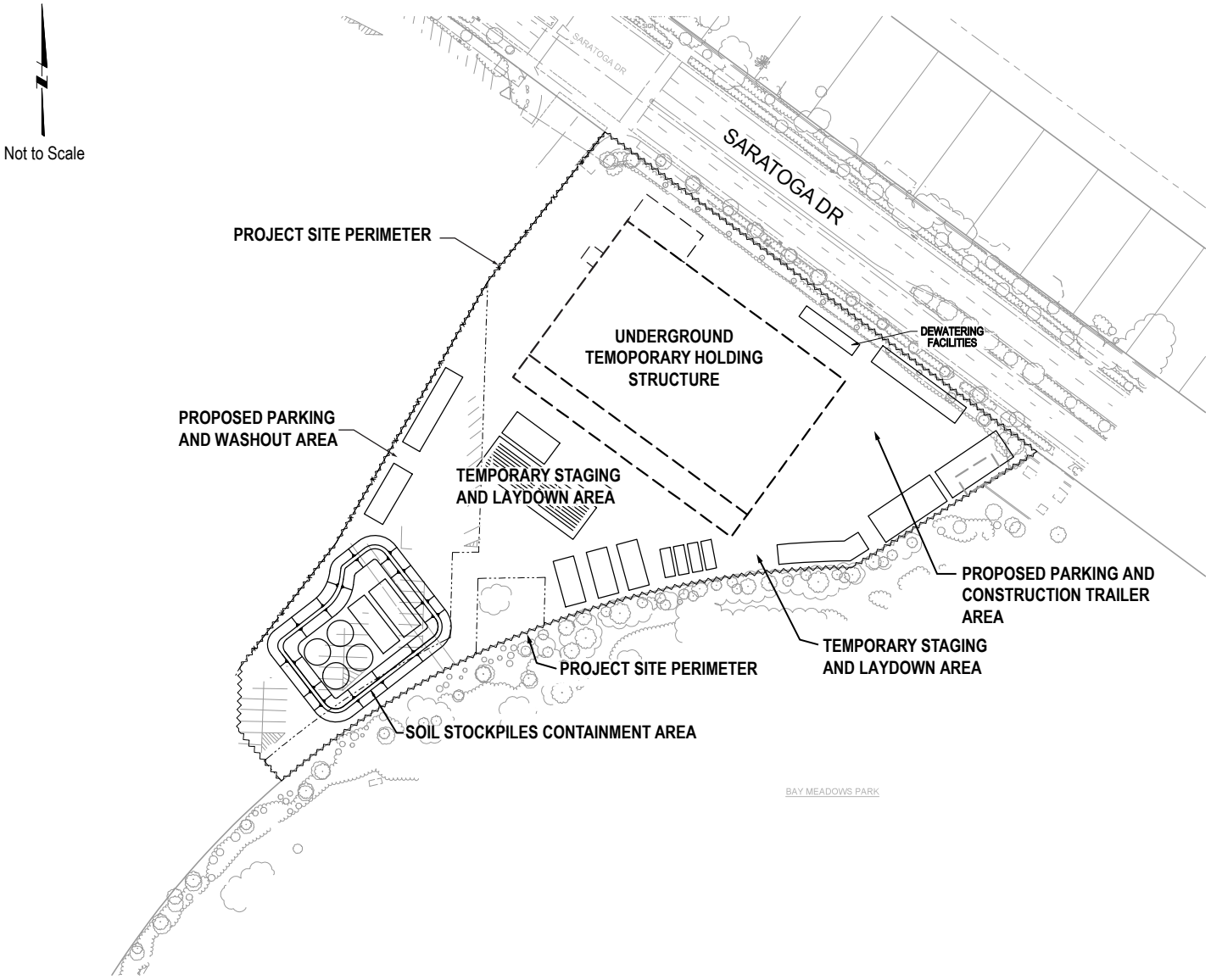
Figure 2-5
Self-Cleaning Process
Underground Flow Equalization System, Environmental Impact Report
City of San Mateo Clean Water Program



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Source: Stantec, 2018. Civil Construction Staging and Easement Plan 60% Design. August 10.

Figure 2-6
Conceptual Construction Layout
Underground Flow Equalization System, Environmental Impact Report
City of San Mateo Clean Water Program

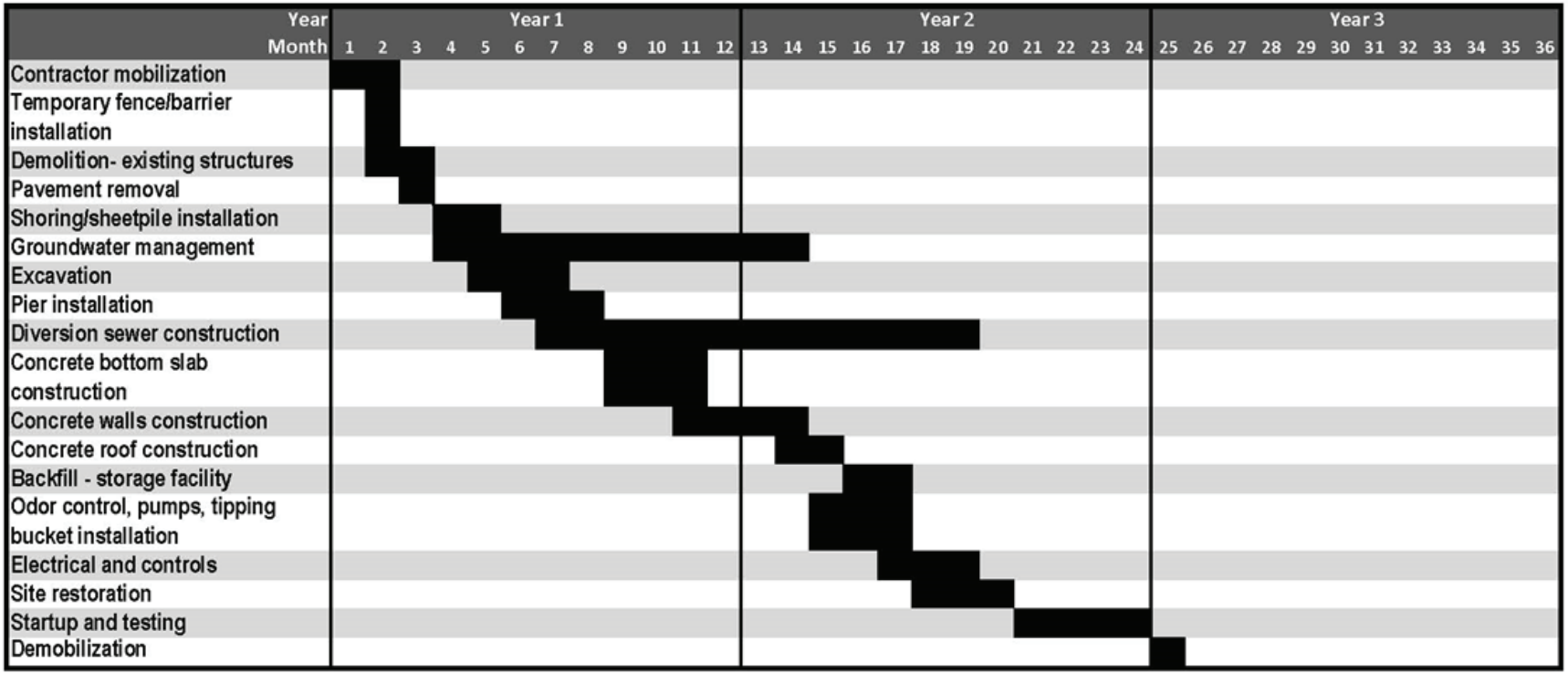

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FIGURE 2-7
Construction Schedule
Underground Flow Equalization System, Environmental Impact Report
City of San Mateo Clean Water Program