FREYER & LAURETA, INC. CIVIL ENGINEERS • SURVEYORS • CONSTRUCTION MANAGERS

# MEMORANDUM

FINAL – November 1, 2022

**To:** Patrick Heisinger, Interim City Manager (City of East Palo Alto)

**From:** Jeffrey J. Tarantino, P.E., QSD, Vice President (Freyer & Laureta, Inc.)


**Copy:** Humza Javed, Public Works Director (City of East Palo Alto)

**RE:** **Sanitary Sewer Capital Improvement and Operation Plan Development**
East Palo Alto, California

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Freyer & Laureta, Inc. (F&L) is pleased to present this memorandum to the City of East Palo Alto (City) with the proposed Sanitary Sewer Capital Improvement and Operation Plan (Plan) to support the City's *Application for a Change of Organization, Reorganization, or Outside Service Agreement* (Application) to the San Mateo Local Agency Formation Commission (LAFCo). The purpose of F&L's engineering evaluation was to:

- Identify potential capital improvements to improve the overall reliability and resiliency of the existing sanitary sewer collection system.
- Identify potential capacity improvements required to provide service for future development as approved by the City.
- Develop an annual operation and maintenance budget for the sanitary sewer collection system including the expenses associated with wastewater treatment at the Palo Alto Regional Water Quality Control Plant (PARWQCP).
- Develop potential annual sanitary sewer service charge to support ongoing operation of the sanitary sewer collection system.
- Develop connection fee for new developments to receive sanitary sewer service.

We have presented below the results of our engineering evaluation with the proposed Five-Year Capital Improvement and Operations Plan Cash Flow included at the end of this memorandum.

## 1 Technical Reference Information

To support our evaluation, F&L reviewed the following publicly available technical information:

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1. *Draft Final Report, San Mateo LAFCO Municipal Service Review Updates: City of East Palo Alto, East Palo Alto Sanitary District, West Bay Sanitary District,* prepared by Berkson Associates dated June 6, 2022.
2. *East Palo Alto Sanitary District Master Plan Update,* prepared by Freyer & Laureta, Inc. dated March 2015.
3. *Addendum to the March 2015 East Palo Alto Sanitary District Master Plan Update,* prepared by Freyer & Laureta, Inc. dated April 28, 2021.
4. *East Palo Alto Sanitary District, 2019 Sewer Rate Study,* prepared by Bartle Wells Associates dated April 17, 2019.
5. *East Palo Alto Sanitary District Standard Specifications for Design and Construction of Sanitary Sewer Collection and Conveyance Facilities,* approved June 6, 2002.
6. *East Palo Alto Sanitary District Regular Board Meeting Agenda Item 13 Addendum No. One to the Second Restated and Amended Agreement between the City of Palo Alto and the East Palo Alto Sanitary District for Wastewater Treatment and District Outfall* from August 18, 2022 Regular Board Meeting.
7. *RWQCB Capital Program Presentation to the City of Palo Alto Finance Committee,* presented on November 17, 2020.
8. *City of Palo Alto 2021 Wastewater COS report,* prepared by Raftelis dated January 11, 2021.
9. *West Bay Sanitary District Wastewater Collection System Master Plan*, prepared by West Yost Associates dated July 2011.
10. *West Bay Sanitary District Budget, Fiscal Year 2022-2023,* approved June 8, 2022.
11. *Technical Memorandum RE: CCTV Survey Evaluation and Pipeline Replacement Priorities Areas 1, 3, and 4,* prepared by Sierra West Consultants, Inc. dated September 29, 2022.

F&L utilized information from the above referenced documents to develop the key technical assumptions that serve as the basis for the proposed capital improvement and operations plan. We have included additional references to select documents from the above list in this memorandum including within the supporting tables.

# 2 Existing Sanitary Sewer Collection System

The purpose of this section is to describe briefly the existing sanitary sewer collection system that is operated by the East Palo Alto Sanitary District (EPASD) and identify potential deficiencies that may need to be corrected to allow the sanitary sewer collection system to continue to provide adequate level of service (LOS) for the existing customers.

## 2.1 Existing System Information

EPASD currently provides wastewater collection service to portions of the communities of Menlo Park and East Palo Alto, located in San Mateo County in the San Francisco Bay Area. EPASD operates and maintains the collection system in accordance with the requirements of the State Water Resources Control Board, as administered through the Statewide SSO Waste

Discharge Requirements and RWQCB Sewer System Management Plan guidelines. The District's service area is primarily residential with several commercial and industrial parcels. EPASD's service area encompasses nearly 1.84 square miles. EPASD's collection system is a gravity system with approximately 70 percent of the existing pipelines being six-inch (6-in) diameter. The larger collector lines range between 8-in diameter and 24-in diameter including a siphon beneath the San Francisquito Creek.

All sanitary sewer flows are conveyed to the PARWQCP where flows are treated and discharged to the San Francisco Bay. According to the existing agreement[1] between City of Palo Alto (Palo Alto) and EPASD, EPASD has flow capacity rights to convey up to 3.06 million gallons per day (MGD) on an annual average flow (AAF) basis[2] to the PARWQCP, which is equivalent to 7.64-percent of the total capacity. The agreement further indicates that Palo Alto will make available 2.9 MGD average dry weather flow (ADWF) capacity for EPASD's utilization.

## 2.2 Existing System Condition Review

F&L reviewed the publicly available information listed in Section 1 to determine what deficiencies, if any, within the existing collection and conveyance system have been identified by EPASD. According to the *East Palo Alto Sanitary District Master Plan Update dated March 2015* (2015 Master Plan), EPASD identified portions of the existing collection system that were at risk of sanitary sewer overflows (SSOs) during peak wet weather flow (PWWF). The PWWF flow was determined based on a 10-year, 24 hour design storm. The 2015 Master Plan included flow monitoring data that was utilized to develop the design PWWF for purposes of evaluating the capacity of the existing collection system.

The 2015 Master Plan also identified a series of capital improvements necessary to reduce the potential risk of SSOs during PWWF. F&L understands that the 2015 Master Plan suggested capital improvements resulted in providing additional capacity to convey PWWF but that the collection system would still operate under surcharge condition meaning that some portions of the collection and conveyance system would operate with pipes under pressure flow condition. The 2015 Master Plan only identified improvements within the collection system and did not note any identified deficiencies for the trunk sewer that conveys flows from the collection system on the west side of San Francisquito Creek to the PARWQCP.

F&L also reviewed the *Addendum to the March 2015 East Palo Alto Sanitary District Master Plan Update dated April 28, 2021* (2021 Master Plan), which identified a different set of recommended capital improvements to reduce the risk of SSOs during PWWF. The 2021 Master Plan acknowledged the different operation criteria that was used to perform the existing collection system capacity assessment and indicated that the proposed capital improvements resulted in providing sufficient capacity to allow the collection system and conveyance system to flow with some pipes flowing full but not under pressure flow conditions. The 2021 Master Plan capital improvements included those improvements identified in the 2015 Master Plan plus additional collection system improvements and a new

[1] Refer to Item 13 from the August 18, 2022 EPASD Regular Board Meeting for a copy of the referenced agreement.
[2] AAF is calculated by dividing the total flow measured at the EPASD connection point to the PAWRCP and dividing by total number of days during the reporting period.

parallel trunk sewer between the downstream end of the dual siphons and the discharge point to the PARWQCP.

Finally, F&L reviewed the summary of the closed circuit television (CCTV) inspection program currently being performed by EPASD presented in the Technical Memorandum RE: CCTV Survey Evaluation and Pipeline Replacement Priorities Areas 1, 3, and 4 (CCTV TM). F&L understands from the CCTV TM that EPASD has completed assessment of approximately 22.2 miles of the 29.8 miles of the existing collection and conveyance system. The existing condition grade for all pipes inspected was prepared using the industry standard Pipeline Assessment and Certification Program (PACP) established by the National Association of Sewer Service Companies (NASSCO). The CCTV TM identified over 27,500 linear feet (approximately 5.2 miles) of existing pipes that are considered priority for repair and/or replacement. F&L understands from review of the CCTV TM that the remaining 90,000 linear feet (approximately 17 miles) are considered to be secondary priority that should also be replaced or repaired as funding is available.

## 2.3 Existing System Capacity Assessment and Suggested Improvements

F&L considered the recommended improvements from both the 2015 Master Plan and the 2021 Master Plan when evaluating the existing capacity of the sanitary sewer collection and conveyance system. In reviewing both documents, F&L notes that the existing sanitary sewer collection system is:

- A relative flat system with pipe slopes generally less than two-percent due to the existing, flat topography of the service area.
- All flows from the collection system are conveyed to a single point at the end of O'Connor Street where flows are conveyed across San Francisquito Creek through twin, siphon pipes to the trunk sewer to convey flows to the PARWQCP.

Because of the average slope throughout the collection system is relatively flat and the use of a siphon to convey flows across San Francisquito Creek, there is limited opportunity to improve the overall conveyance strategy to reduce the length of the system that either flows full or under surcharged conditions without introducing a pump station. As reported monthly during EPASD Regular Board Meetings, the EPASD has not recently reported any SSOs. The 2015 Master Plan also indicates that the highest risk for SSOs to occur is during PWWF conditions and that the improvements suggested in the 2015 Master Plan will result in reducing the risk of SSOs but still allow the collection system to operate under surcharge conditions only during PWWF. The 2015 Master Plan indicates that with the recommended improvements in place that the overall hydraulic grade line (HGL) of the collection system is lowered to an elevation that, even under pressure flow conditions, the HGL is at least four-feet lower than the rim elevation of any sanitary sewer manhole.

F&L developed a suggested list of capital improvements that match the improvements identified in the 2015 Master Plan. Although we concur that performing the improvements suggested in the 2021 Master Plan would provide additional contingency capacity when compared to the 2015 Master Plan, the PWWF design condition is the peak design event that will only occur for a short duration as described in the 2015 Master Plan. The improvements identified in the 2015 Master Plan do allow for some portions of the collection and conveyance system to flow under surcharge conditions (e.g., pressure flow) but the predicated HGL is at least four-feet lower than the sanitary sewer manhole rim elevations.

Table 1 lists the pipe segments and Figure 1[3] highlights the same pipe segments that are required to be upgraded to reduce the risk of SSOs during PWWF conditions. Table 2 presents the Conceptual Opinion of Probable Project Cost to implement the improvements listed in Table 1 and highlighted on Figure 1.

### 2.4 Existing System Condition Assessment and Suggested Improvements

The CCTV TM presented condition assessments for over 22 miles of the existing collection system based NASSCO PACP guidelines. F&L reviewed the location of high priority pipeline segments recommended for repair or replacement in the CCTV TM[4] to determine if there is any overlap between the F&L suggested capacity related improvements presented in Figure 1.

Figure 2 presents the high priority segments from the CCTV TM and highlights the overlap between the F&L suggested PWWF capacity related improvements and the high priority condition related improvements identified in the CCTV TM. F&L does note that although a significant portion of the condition related improvements identified in the CCTV TM will also be corrected through implementation of the F&L suggested PWWF capacity improvements that any annual operating and capital improvement budget should also include budget for addressing the remaining high priority repair and replacement projects within Areas 1, 2, and 4 plus the secondary priority pipeline segments presented in the CCTV TM.

## 3 Proposed Development Impacts

### 3.1 Additional Development Flows

F&L reviewed the 2021 Master Plan, which presents the anticipated additional flows from new development that may occur based on the City's Vista 2035 General Plan. The 2021 Master Plan indicates that the potential total additional ADWF is 1.08 MGD[5]. No changes to the methodology presented in the 2021 Master Plan to estimate the potential maximum additional flows from proposed development during ADWF are suggested.

### 3.2 Development Capacity Improvements

F&L reviewed the 2021 Master Plan that presented a methodology for identifying development impacts to the existing collection system[6]. In summary, the 2021 Master Plan compared the depth over diameter (d/D) of pipes within the existing collection system during Peak Dry Weather Flow (PDWF) conditions to the predicated d/D during PDWF with the additional flows from the new development. EPASD then determined the required capital improvements required to restore the d/D of the collection system once the developments are completed to match the existing d/D of the current collection system.

Generally, F&L concurs that impacts from planned developments should be identified using PDWF conditions. However, we suggest a different methodology to determine development

[3] The figures included as attachments to this memorandum were developed utilizing publicly available portable document format (PDF) maps of the EPASD collection system.

[4] Figure 5 from the CCTV TM highlights the high priority segments within Areas 1, 2, and 4.

[5] See Section 3.2 from the 2021 Master Plan for the methodology used to estimate the additional future flows from planned development.

[6] See Section 3.3 from the 2021 Master Plan for the methodology used to determine impacts from planned development.

related deficiencies than what was presented in the 2021 Master Plan. Referring to the West Bay Sanitary District (WBSD) 2011 Master Plan, capacity deficiencies were determined if:

- Pipes with diameter of 10-inches or smaller have a d/D over 0.67.
- Pipes with diameter of 12-inches or large have a d/D over 0.80.

Applying the WBSD capacity deficiency criteria and reviewing the d/D information published in the 2021 Master Plan[7], F&L identify those portions of the collection system that are predicted to have d/D greater than the criteria listed in the bullets above during PDWF conditions. F&L only identified those pipe segments that were not included in Table 1 to be replaced due to existing condition capacity deficiencies during PWWF for inclusion in the summary of anticipated development related deficiencies.

Table 3 lists those pipe segments that are required to be replaced including the proposed replacement pipe diameter and Figure 3 highlights those same segments. The OPPC for the proposed improvements is presented in Table 4.

### 3.3 Anticipated Developments (Five Years)

The City provided a list of those developments where an applicant has identified may be completed within the next five fiscal years. Table 5 lists each of the developments including the anticipated number of residential units or square feet of commercial, industrial, or office space. Identifying the potential new development that is anticipated to come online in the next five fiscal years is important to determine the additional flow that may be added to the sanitary sewer collection system and will inform the potential capital improvements timeline.

Table 6 calculates the Equivalent Dwelling Units (EDUs) that are associated with each the anticipated developments listed in Table 5. EPASD's *Standard Specifications for Design and Construction of Sanitary Sewer Collection and Conveyance Facilities* includes a methodology for calculating EDUs based on the type of development. EDUs are utilized by EPASD to calculate both the Annual Service Charges and Connection Fees.

## 4 Proposed Capital Improvement Plan

F&L developed a capital improvement plan that includes both the existing system capacity deficiencies and the development related deficiencies as shown on Figure 4. Based on review of the EPASD CCTV TM, there are some additional pipe segments from the Priority 1 list that are in addition to the suggested capital improvement plan. Figure 5 overlays the pipeline segments identified in the capital improvement plan and highlights the remaining EPASD CCTV TM Priority 1 segments that should be replaced. F&L notes that we have not specifically highlighted a specific timeline for replacement of the remaining Priority 1 noted on Figure 5 but we have included an annual budget in the evaluation of annual sewer service charge presented in Section 6 for repairing and replacing the remaining high priority and secondary priority segments. The actual scope for the annual repair and replacement program will need to be evaluated each year to determine the total length of pipelines that will be replaced including coordination any other capital improvement projects that may be implemented by the City.

[7] Refer to Table 11 from the 2021 Master Plan for the predicted d/D following completion of anticipated development.

Figure 6 includes a suggested timeline to address the existing system capacity deficiencies. The suggested timeline is intended to allow the existing system capacity deficiencies to be built over 15 years, which will allow for grant and low interest loan funding sources to be secured to fund the necessary improvements. The actual timeline to implement the capacity assurance improvements may need to be adjusted based on proposed development approval, permitting, and construction process.

Because the development related deficiencies will be implemented based on actual development approvals and construction, F&L has not identified a specific timeline to implement the development related deficiency improvements. Figure 7 does present the anticipated developments over the next five years listed in Table 5 with the development related deficiency improvement to allow the City to begin understanding where improvements may be required prior to issuing final Certificates of Occupancies for any of the identified developments. The ultimate timeline to construct the capital improvements required to address development related deficiencies will be determined once the proposed development has paid its connection fees and provided a firm timeline for occupancy.

# 5 Proposed Operating and Maintenance Plan

F&L understands that the City would contract with a public or private entity to operate the collection system. The collection system would continue to be operated in accordance with Statewide SSO Waste Discharge Requirements and RWQCB Sewer System Management Plan guidelines. To develop an estimated annual operating and maintenance budget, F&L reviewed the published Fiscal Year 2022/2023 budget from WBSD. Table 7 presents our methodology for developing a budget for operating expenses for labor and other overhead costs applying a ratio calculated by dividing the total miles of pipes within the EPASD collection system by the total miles of pipe within the WBSD collection system.

In addition to the labor costs for operating the collection system, EPASD contributes the operating and capital costs for the PARWQCP as outlined in the existing agreement. In reviewing the *East Palo Alto Sanitary District, 2019 Sewer Rate Study (Rate Study)*, F&L identified that the study include a summary of anticipated treatment operation, capital, and debt service costs[8]. The costs listed in the Rate Study were consistent with information that F&L found from a November 17, 2020 presentation to the City of Palo Alto Finance Committee.

We have summarized the anticipated costs for PARWQCP treatment and capital improvements in Table 8.

# 6 Annual Sewer Charge

F&L reviewed existing information from the EPASD web site and identified that the current Annual Sewer Charge (ASC) is $600 per EDU[9]. The current ASC is consistent with the suggested ASC from the Rate Study for Fiscal Year 2019/20 but EPASD has not implemented the recommend 4-percent annual increase that was included in the Rate

[8] See Table 3 from the referenced 2019 Sewer Rate Study.
[9] https://www.epasd.com/residents/forms-permits

Study[10]. If EPASD had implemented the recommended 4-percent annual increase from its own Rate Study, the current ASC would be $690 per EDU.

F&L calculated a potential ASC based on the current estimated operating and capital costs that would be required to fund all expenses for one fiscal year with only partial contribution from the EPASD reserves. Table 9 provides a potential ASC that is more than the current EPASD published ASC but we do not recommend that the larger ASC be implemented in the near term. We have presented the calculated ASC to confirm what the EPASD Rate Study indicates is a necessary annual rate increase to account for the projected annual increase in operating costs that will continue to be experienced in future years. Without implementing a regular annual ASC increase , there will be a shortfall between revenues and expenses that will need to be funded from current reserves.

For purposes of developing the Plan, we suggest that the ASC be established at $690 per EDU for Fiscal Year 2022/23 to match the original recommendations of the EPASD's Rate Study and then be increased by 5-percent per year based on the current economic conditions as well as the additional annual capital needs to address the extensive condition deficiencies identified in EPASD's CCTV TM. However, F&L does anticipate that at some point in the future the ASC will be required to be raised to a level similar to what is presented in Table 9 to ensure that there is adequate revenue to provide safe and reliable sanitary sewer service to all current and future customers while not diverting funds from reserves that can otherwise fund critical capital improvement projects.

# 7 Connection Fee

EPASD's published connection fee[11] is $6,060 although F&L could not find a study that outlined the methodology used to determine the connection fee. F&L did develop a potential connection fee that considers:

- 50-percent of capacity assurance improvements identified in Table 2 will be a benefit to new development because implementing the recommend projects provides a more reliable and resilient system for existing customers but also creates additional capacity for the benefit of new development.
- 100-percent of development related capacity deficiencies identified in Table 4.
- Buy-in cost of $5 million per 1.0 MGD of treatment capacity to reflect developers payback of existing PAWRQCP capacity that is available for new development.
- Application review fee.

Table 10 presents the calculation methodology to develop a potential Connection Fee, which is $6,100. Because the potential Connection Fee presented in Table 10 is similar to the current publish EPASD connection fee, we suggest that the connection fee be kept at $6,060 for the first year and then increased by 5-percent per year similar to the ASC. However, a regular review of the connection fee should be completed to ensure that connection fee reflects actual costs incurred to accommodate City approved development.

[10] Table 4 from the Rate Study presents the recommended ASC beginning with Fiscal Year 2019/20 and includes a project annual cash flow through Fiscal Year 2028/29 based on a 5% annual rate increase.
[11] https://www.epasd.com/residents/forms-permits

# 8 Annual Budget Cash Flow

As a final step in developing the Plan, F&L evaluated the year over year cash flow for operations and improvements of the sanitary sewer collection system. Table 11 presents F&L's cash flow project for five fiscal years beginning with Fiscal Year 2022/23. The cash flow analysis includes the following key items:

- The ASC is initial set at $690 per EDU consistent with the recommendations included in EPASD's Rate Study but a 5-percent annual escalation is applied to reflect current economic conditions and the anticipated annual repair and replacement program to address the deficiencies identified in the EPASD CCTV TM.
- The connection fee is set at $6,060 per EDU similar to the current EPASD connection fee and an annual 5-percent escalation is applied similar to the ASC.
- The total number of anticipated new EDUs for each fiscal year is provided based on the information presented in Table 6.
- The total number of connected EDUs is also provided including accounting for new EDUs that are projected to be added during each fiscal year.
- The beginning reserve fund balance is assumed to be $17.38 million. The most recent publicly available audit for EPASD is dated June 30, 2020 and indicates a net position of $25.03 million. In addition, the EPASD FY 22/23 includes a $15 million transfer from reserves to the Construction Replacement Fund and indicates a reserve fund balance of $17.38 million.
- Revenues include the ASC, connection fees, property taxes presented in the EPASD Rate Study, ERAF Rebate/Former RDAF presented in the EPASD Rate Study, and interest earned on reserve funds.
- Expenses including labor and other operating expenses for the collection system, Sewer Rehab Improvements to fund annual point repair projects, Capacity Assurance Improvements to fund the improvements identified in Table 2, PAWRQCP annual treatment costs, EPASD share of existing PARWQCP debt service, EPASD share of project PARWQCP debt service, and EPASD 2011 SRF Loan debt service presented in the EPASD Rate Study.

For each fiscal year, the project expenses are projected revenues are calculated and presented. If expenses in a given fiscal year are greater than the project revenues, the Reserve Funds are used to balance the expenses and revenues.

By utilizing portions of the existing Reserve Funds each fiscal year, the existing customers' contributions to the reserves over the prior years is utilized to fund the existing customers' 50-percent share of the Capacity Assurance Improvements identified in Table 2. The primary purpose of holding collected ASC and connection fees over several years is to allow an agency to develop sufficient funds to implement capital improvement projects. Therefore, beginning to draw from reserves to fund the existing customers' portion of the recommended annual capital improvement program and capacity assurance capital improvement program is for the benefit of the existing customers.

At the end of the five year evaluation period, the projected Reserve Fund balance is greater than the annual operating and debt service costs. Because EPASD receives its revenue payments twice per year as part of the property tax collection, sufficient reserves to fund at

least six months of operation is suggested. The cash flow evaluation presented in Table 11 maintains a minimum of 12-months of Reserve Funds for each given fiscal year.

The cash flow review above will be impacted by the actual beginning balance of EPASD Reserve Funds. If additional information on the actual Reserve Fund balance becomes available, the cash flow analysis will be updated.

**List of Tables**



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**Table 1**

**2015 Master Plan Capital Improvements Under Existing PWWF (1)**

Sanitary Sewer Capital Improvement and Operation Plan Development

East Palo Alto, California

| Segment | Length (Feet) | Existing Diameter (Inches) | Existing d/D | Proposed Diameter (Inches) | Proposed d/D |
|---|---|---|---|---|---|
| C5-C4 | 328 | 6 | 1 | 8 | 0.51 |
| C4-C3 | 436 | 6 | 1 | 8 | 0.48 |
| C3-C2 | 398 | 6 | 1 | 8 | 0.51 |
| C2-C1 | 205 | 6 | 1 | 8 | 0.78 |
| D24-D23 | 350 | 8 | 1 | 12 | 0.55 |
| D23-D22 | 74 | 8 | 1 | 12 | 0.58 |
| D22-D21 | 149 | 8 | 1 | 12 | 0.58 |
| D21-D19 | 391 | 8 | 1 | 12 | 0.55 |
| D19-D10 | 49 | 10 | 0.54 | 12 | 0.36 |
| D10-D3 | 490 | 10 | 1 | 12 | 0.6 |
| A14-A13 | 289 | 6 | 1 | 8 | 0.6 |
| A13-A12 | 412 | 6 | 1 | 8 | 0.6 |
| A12-A11 | 486 | 6 | 1 | 8 | 0.6 |
| A11-A10 | 418 | 6 | 1 | 8 | 0.6 |
| A20-A19 | 340 | 6 | 1 | 8 | 0.6 |
| A19-A18 | 214 | 6 | 1 | 8 | 0.6 |
| A18-A16 | 442 | 6 | 1 | 8 | 0.6 |
| M4-M3 | 358 | 8 | 1 | 12 | 0.6 |
| M3-M2 | 380 | 8 | 1 | 12 | 0.6 |
| M2-M43 | 48 | 8 | 1 | 12 | 0.6 |
| E1-H9 | 270 | 12 | 1 | 18 | 0.53 |
| H9-H73 | 247 | 12 | 1 | 18 | 0.49 |
| H73-H74 | 101 | 12 | 1 | 18 | 0.49 |
| H74-H8 | 113 | 12 | 1 | 18 | 0.49 |
| H8-H7 | 234 | 12 | 1 | 18 | 0.59 |
| H7-H75 | 90 | 12 | 1 | 18 | 0.51 |
| H75-H6 | 260 | 12 | 1 | 18 | 0.49 |
| H6-H5 | 9 | 12 | 1 | 18 | 0.4 |
| H5-H4 | 260 | 15 | 1 | 18 | 0.64 |
| H4-H3 | 8 | 15 | 1 | 18 | 0.56 |
| H14-H13 | 447 | 8 | 1 | 12 | 0.38 |
| H13-H12 | 108 | 8 | 1 | 12 | 0.38 |
| H12-H11 | 334 | 8 | 1 | 12 | 0.42 |
| H11-H64 | 199 | 8 | 1 | 12 | 0.44 |
| H64-H71 | 161 | 8 | 1 | 12 | 0.52 |
| H71-H3 | 35 | 8 | 1 | 12 | 0.46 |
| H3-H2 | 31 | 15 | 1 | 24 | 0.6 |
| H2-I11 | 37 | 15 | 0.53 | 24 | 0.24 |
| I11-I10 | 380 | 15 | 1 | 24 | 0.39 |
| I10-I9 | 222 | 15 | 1 | 24 | 0.36 |

**Table 1**

**2015 Master Plan Capital Improvements Under Existing PWWF (1)**

Sanitary Sewer Capital Improvement and Operation Plan Development

East Palo Alto, California

| Segment | Length (Feet) | Existing Diameter (Inches) | Existing d/D | Proposed Diameter (Inches) | Proposed d/D |
|---|---|---|---|---|---|
| I9-I8 | 155 | 15 | 1 | 24 | 0.47 |
| I8-I7 | 239 | 15 | 0.77 | 24 | 0.32 |
| I7-I6 | 259 | 15 | 1 | 24 | 0.34 |
| I6-I5 | 411 | 18 | 1 | 24 | 0.57 |
| I5-I31 | 135 | 18 | 1 | 24 | 0.57 |
| I31-I4 | 322 | 18 | 1 | 24 | 0.57 |
| I4-I3 | 243 | 18 | 1 | 24 | 0.57 |
| A29-T29 | 346 | 18 | 0.45 | 24 | 0.3 |
| T29-T28 | 234 | 18 | 0.43 | 24 | 0.28 |
| T28-T27 | 163 | 18 | 1 | 24 | 0.54 |
| T27-T26 | 356 | 18 | 0.57 | 24 | 0.37 |
| T26-T25 | 306 | 18 | 0.52 | 24 | 0.34 |
| T25-T24 | 283 | 18 | 1 | 24 | 0.6 |
| T24-T23 | 317 | 18 | 0.53 | 24 | 0.34 |
| T23-T22 | 447 | 18 | 0.6 | 24 | 0.38 |
| T20-T19 | 332 | 18 | 0.43 | 24 | 0.29 |
| T19-T18 | 500 | 21 | 1 | 24 | 0.67 |
| T18-T17 | 541 | 21 | 1 | 24 | 0.67 |
| T17-T34 | 396 | 21 | 1 | 24 | 0.67 |
| A23-A24 | 251 | 6 | 1 | 8 | 0.6 |
| A24-A25 | 254 | 6 | 1 | 8 | 0.6 |
| A25-A26 | 235 | 6 | 1 | 8 | 0.6 |
| A26-A27 | 311 | 6 | 1 | 8 | 0.6 |

**Notes**

(1) Capital Improvements are from Table 8.1 Upsize Recommendations in the EPASD 2015 Master Plan. Sections of pipe that have already been replaced have been excluded from this table.

**Abbreviations**

d/D: depth over diameter

PWWF: Peak Wet Weather Flow

**Table 2**

**Conceptual OPPC Eliminating Deficiencies Under Existing PWWF (1)**

Sanitary Sewer Capital Improvement and Operation Plan Development

East Palo Alto, California

| Item No. | Description | Units | Quantity (2) | Unit Price | Budget |
|---|---|---|---|---|---|
| **Conceptual Opinion of Probable Construction Cost** | | | | | |
| 1 | Mobilization | ls | 1 | $ 50,000 | $ 50,000 |
| 2 | Traffic Control | ls | 1 | $ 20,000 | $ 20,000 |
| 3 | Sheeting, Shoring, and Bracing | ls | 1 | $ 20,000 | $ 20,000 |
| 4 | 8-inch DR 17 HDPE Pipe | lf | 5,020 | $ 200 | $ 1,004,000 |
| 5 | 12-inch DR 17 HDPE Pipe | lf | 3,570 | $ 300 | $ 1,071,000 |
| 6 | 18-inch DR 17 HDPE Pipe | lf | 1,590 | $ 550 | $ 874,500 |
| 7 | 24-inch DR 17 HDPE Pipe | lf | 6,660 | $ 800 | $ 5,328,000 |
| 8 | Manholes | ea | 64 | $ 10,000 | $ 640,000 |
| 9 | 30% Contingency | % | 30% | $ 9,007,500 | $ 2,702,250 |
| **Subtotal - Conceptual Opinion of Probable Construction Cost (3)** | | | | | **$ 11,710,000** |
| **Engineering and Administration Cost** | | | | | |
| 10 | Design | % | 10% | $ 11,710,000 | $ 1,171,000 |
| 11 | Environmental/Permitting | % | 10% | $ 11,710,000 | $ 1,171,000 |
| 12 | Construction Management/Inspection | % | 15% | $ 11,710,000 | $ 1,757,000 |
| 13 | District Administration | % | 5% | $ 11,710,000 | $ 586,000 |
| **Subtotal - Engineering and Administration Cost (3)** | | | | | **$ 4,685,000** |
| **Total Conceptual Opinion of Probable Project Cost (3)** | | | | | **$ 16,395,000** |

**Notes**

(1) See Table 1 and Figure 1 for limits of improvements.

(2) Quantities rounded to nearest 10 feet.

(3) Costs rounded to nearest $1,000.

**Abbreviations**

DR: dimension ration

HDPE: high density polyethylene

OPPC: opinion of probable project cost

**Table 3**

**Additional 2021 Master Plan Addendum Capital Improvements from Future Developments Under Predicted PDWF as Compared to 2015 Master Plan Capital Improvements Under Existing PWWF (1)**

Sanitary Sewer Capital Improvement and Operation Plan Development

East Palo Alto, California

| Segment | Length (Feet) | Existing Diameter (Inches) | Existing d/D | Predicted d/D | Proposed Diameter (Inches) | Proposed d/D |
|---|---|---|---|---|---|---|
| B7-B6 | 380 | 12 | 1 | 1 | 15 | 0.46 |
| B3-B2 | 239 | 12 | 0.7 | 1 | 15 | 0.5 |
| B2-A1 | 181 | 12 | 0.52 | 0.62 | 15 | 0.38 |
| A1-A2 | 80 | 12 | 0.66 | 0.82 | 15 | 0.46 |
| A2-A5 | 244 | 12 | 0.66 | 1 | 15 | 0.46 |
| A5-A8 | 124 | 15 | 0.67 | 1 | 18 | 0.49 |
| A8-A9 | 61 | 15 | 0.32 | 0.37 | 18 | 0.25 |
| A9-A10 | 181 | 15 | 0.7 | 1 | 18 | 0.53 |
| A10-A15 | 300 | 15 | 0.43 | 0.51 | 18 | 0.35 |
| A15-A16 | 435 | 15 | 0.69 | 1 | 18 | 0.52 |
| D5-D4 | 70 | 8 | 0.78 | 0.84 | 10 | 0.46 |
| D4-D3 | 296 | 8 | 0.78 | 0.84 | 10 | 0.46 |
| D3-D2 | 363 | 12 | 0.8 | 1 | 15 | 0.51 |
| D2-D1 | 53 | 12 | 1 | 1 | 15 | 0.67 |
| D1-E4 | 354 | 12 | 0.66 | 0.82 | 15 | 0.46 |
| E4-E3 | 357 | 12 | 0.58 | 0.7 | 15 | 0.42 |
| E3-E2 | 280 | 12 | 0.74 | 1 | 15 | 0.5 |
| E2-E1 | 283 | 12 | 0.66 | 1 | 15 | 0.5 |
| H36-H35 | 474 | 6 | 0.32 | 1 | 6 | 0.45 |
| H17-H57 | 397 | 8 | 0.33 | 0.75 | 12 | 0.34 |
| M38-M39 | 158 | 8 | 0.36 | 0.84 | 12 | 0.36 |
| M39-M43 | 241 | 8 | 0.36 | 0.84 | 12 | 0.36 |
| M43-M42 | 104 | 8 | 0.45 | 1 | 12 | 0.44 |
| M42-M41 | 37 | 8 | 0.27 | 1 | 12 | 0.28 |
| M41-M13 | 111 | 8 | 0.36 | 0.84 | 12 | 0.36 |
| M13-M12 | 276 | 8 | 0.36 | 0.84 | 12 | 0.36 |
| M12-M40 | 337 | 8 | 0.36 | 0.84 | 12 | 0.36 |
| M40-M5 | 263 | 8 | 0.36 | 0.84 | 12 | 0.36 |
| M5-M4 | 373 | 8 | 0.78 | 1 | 12 | 0.52 |
| M4-M31 | 143 | 8 | 0.66 | 1 | 12 | 0.48 |
| M31-M3 | 357 | 10 | 0.6 | 1 | 12 | 0.54 |
| I15-I14 | 386 | 12 | 0.76 | 1 | 15 | 0.62 |
| I14-I13 | 444 | 12 | 0.56 | 1 | 15 | 0.48 |
| I13-I12 | 320 | 12 | 0.58 | 1 | 15 | 0.48 |
| I12-I6 | 339 | 12 | 0.58 | 1 | 15 | 0.46 |
| O7-O6 | 427 | 8 | 0.69 | 0.81 | 8 | 0.66 |
| L53-L52 | 218 | 6 | 0.8 | 0.8 | 6 | 0.64 |

**Table 3**

**Additional 2021 Master Plan Addendum Capital Improvements from Future Developments Under Predicted PDWF as Compared to 2015 Master Plan Capital Improvements Under Existing PWWF (1)**

Sanitary Sewer Capital Improvement and Operation Plan Development

East Palo Alto, California

| Segment | Length (Feet) | Existing Diameter (Inches) | Existing d/D | Predicted d/D | Proposed Diameter (Inches) | Proposed d/D |
|---|---|---|---|---|---|---|
| L52-L50 | 224 | 6 | 1 | 1 | 8 | 0.57 |
| L50-L49 | 224 | 8 | 0.57 | 0.57 | 10 | 0.36 |
| L49-L48 | 233 | 8 | 1 | 1 | 10 | 0.5 |
| L3-L2 | 83 | 10 | 1 | 1 | 12 | 0.58 |
| L2-L1 | 179 | 10 | 0.77 | 0.77 | 12 | 0.48 |
| L1-L21 | 223 | 10 | 1 | 1 | 14 | 0.55 |
| L21-K28 | 68 | 10 | 1 | 1 | 14 | 0.6 |
| K28-K4 | 242 | 10 | 1 | 1 | 15 | 0.64 |
| K4-K3 | 238 | 12 | 1 | 1 | 15 | 0.51 |
| K3-K2 | 190 | 12 | 1 | 1 | 15 | 0.58 |
| D35-D34 | 178 | 6 | 1 | 1 | 8 | 0.54 |
| N21-N14 | 196 | 10 | 0.58 | 0.74 | 10 | 0.624 |
| N14-N2 | 88 | 10 | 0.6 | 0.77 | 10 | 0.624 |
| E8-E7 | 355 | 8 | 0.48 | 1 | 12 | 0.38 |
| E7-E6 | 311 | 8 | 0.42 | 1 | 12 | 0.36 |

**Notes**

(1) Capital Improvements are from Table 11 of the 2021 Master Plan Addendum that have been excluded from the 2015 Master Plan Capital Improvements. The improvements listed are required due to future development.

**Abbreviations**

d/D: depth over diameter

PDWF: Peak Dry Weather Flow

PWWF: Peak Wet Weather Flow

**Table 4**

**Conceptual OPPC Eliminating Deficiencies Under Future Development (1)**

Sanitary Sewer Capital Improvement and Operation Plan Development

East Palo Alto, California

| Item No. | Description | Units | Quantity (2) | Unit Price | Budget |
|---|---|---|---|---|---|
| **Conceptual Opinion of Probable Construction Cost** | | | | | |
| 1 | Mobilization | ls | 1 | $ 50,000 | $ 50,000 |
| 2 | Traffic Control | ls | 1 | $ 20,000 | $ 20,000 |
| 3 | Sheeting, Shoring, and Bracing | ls | 1 | $ 20,000 | $ 20,000 |
| 4 | 6-inch DR 17 HDPE Pipe | lf | 690 | $ 150 | $ 103,500 |
| 5 | 8-inch DR 17 HDPE Pipe | lf | 830 | $ 200 | $ 166,000 |
| 6 | 10-inch DR 17 HDPE Pipe | lf | 1,110 | $ 250 | $ 277,500 |
| 7 | 12-inch DR 17 HDPE Pipe | lf | 3,730 | $ 300 | $ 1,119,000 |
| 8 | 14-inch DR 17 HDPE Pipe | lf | 290 | $ 350 | $ 101,500 |
| 9 | 15-inch DR 17 HDPE Pipe | lf | 5,690 | $ 400 | $ 2,276,000 |
| 10 | 18-inch DR 17 HDPE Pipe | lf | 1,100 | $ 550 | $ 605,000 |
| 11 | Manholes | ea | 52 | $ 10,000 | $ 520,000 |
| 12 | 30% Contingency | % | 30% | $ 5,258,500 | $ 1,577,550 |
| **Subtotal - Conceptual Opinion of Probable Construction Cost (3)** | | | | | **$ 6,836,000** |
| **Engineering and Administration Cost** | | | | | |
| 13 | Design | % | 10% | $ 6,836,000 | $ 684,000 |
| 14 | Environmental/Permitting | % | 10% | $ 6,836,000 | $ 684,000 |
| 15 | Construction Management/Inspection | % | 15% | $ 6,836,000 | $ 1,025,000 |
| 16 | District Administration | % | 5% | $ 6,836,000 | $ 342,000 |
| **Subtotal - Engineering and Administration Cost (3)** | | | | | **$ 2,735,000** |
| **Total Conceptual Opinion of Probable Project Cost (3)** | | | | | **$ 9,571,000** |

**Notes**

(1) See Table 3 and Figure 2 for limits of improvements.

(2) Quantities rounded to nearest 10 feet.

(3) Costs rounded to nearest $1,000.

**Abbreviations**

DR: dimension ration

HDPE: high density polyethylene

OPPC: opinion of probable project cost

**Table 5**
**Proposed Developments: Anticipated Completion Prior to FY 2027/2028 (1) (2)**
Sanitary Sewer Capital Improvement and Operation Plan Development
East Palo Alto, California

| Land-Use Category | Type | FY 2023/2024 | | FY 2024/2025 | | | | | | | | FY 2025/2026 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Clarum | | Sobrato Phase II (3) | | JobTrain | | 965 Weeks | | Woodland Park | | University Circle Phase II | | 1675 Bay (4 Corners) (4) | |
| | | Added | Removed | Added | Removed | Added | Removed | Added | Removed | Added | Removed | Added | Removed | Added | Removed |
| Residential (Units) | Single-Residential | | 1 | | | | | | | | | | | | |
| | Multiple-Residential | 33 | | | | | | 136 | | 605 | 161 | | | 180 | |
| Commercial - Office (sf) | Office | | | 203,967 | | 110,000 | | | | | | 180,000 | | | |
| Commercial - Non-Office (sf) | Restaurant | | | | | | | | | | | | | 20,000 | |
| | Hotel/Motel | | | | | | | | | | | | | | |
| | Commercial | 2,500 | | 8,690 | 12,000 | | | | | | | | | 20,000 | |
| | Medical | | | | | | | | | | | | | | |
| | School | | | | | | | | | | | | | | |
| | Church | | | | | | | | | | | | | | |
| | Recreational | | | | | | | | | | | | | | |
| | Retirement | | | | | | | | | | | | | | |
| Industrial (sf) | Industrial | | | | | | | | | | | | | 500,000 | |

**Notes**
(1) Proposed developments anticipated to be completed within the next five fiscal years based on information provided by the individual developers to the City of East Palo Alto and is subject to change.
(2) See Figure 5 for locations of proposed developments.
(3) Sobrato Phase II demolishes 12,000 sf of office and retail, but does not specify the split. The demolished area was counted as Commercial since the unit flows in gpd/sf from the EPASD Standard Specs used is the same for both.
(4) For 1675 Bay (4 Corners), 40,000 sf of "Community/Retail/Restaurant" was split evenly between the Restaurant and Commercial categories since the breakdown was not specified.

**Abbreviations**
FY: fiscal year
sf: square feet

**Table 6**
**Equivalent Dwelling Units Over the Next Five Fiscal Years (1)**
Sanitary Sewer Capital Improvement and Operation Plan Development
East Palo Alto, California

| Land-Use Category | Type | Flow, 2022-23 (hcf) (2) | EDU, 2022-23 (2) (3) (4) | EDU, 2023-24 (4) | EDU, 2024-25 (4) | EDU, 2025-26 (4) | EDU, 2026-27 (4) |
|---|---|---|---|---|---|---|---|
| Residential (5) | Single-Residential | -- | 3,371 | 3,370 | 3,370 | 3,370 | 3,370 |
| | Multiple-Residential | -- | 368 | 401 | 981 | 1,161 | 1,161 |
| Commercial - Office (6) | Office | 4,662 | 40 | 40 | 171 | 246 | 246 |
| Commercial - Non-Office (6) | Restaurant | 6,468 | 55 | 55 | 55 | 139 | 139 |
| | Hotel/Motel | 15,716 | 134 | 134 | 134 | 134 | 134 |
| | Commercial | 23,376 | 200 | 201 | 199 | 208 | 208 |
| | Medical | 1,296 | 11 | 11 | 11 | 11 | 11 |
| | School | 21,188 | 181 | 181 | 181 | 181 | 181 |
| | Church | 5,551 | 47 | 47 | 47 | 47 | 47 |
| | Recreational | 890 | 8 | 8 | 8 | 8 | 8 |
| | Retirement | 372 | 3 | 3 | 3 | 3 | 3 |
| Industrial (6) | Industrial | 2,976 | 25 | 25 | 25 | 234 | 234 |
| **Total (7) (8)** | **--** | **--** | **4,443** | **4,476** | **5,186** | **5,741** | **5,741** |

**Notes**

(1) The increase in Equivalent Dwelling Units (EDU) per year are based on the major proposed developments and their anticipated completion fiscal year.

(2) Number of residential units and flows for all other land uses for fiscal year 2022-23 are assumed to be the same as reported the EPASD "Sewer Service Charges Fiscal Year 2020-2021" report dated July 2020. The referenced report listed that there were a total of 38 customers "manually billed" but no flow or EDU information was provided for the 38 manually billed customers to allow inclusion in the development of projected EDUs.

(3) For non-residential land uses, the total number of equivalent EDUs is calculated by multiplying the flows in HCF by 748 gallons per hcf and then dividing by 240 gallons per EDU.

(4) Numbers of EDU are rounded to the nearest whole number.

(5) Both Single-Residential and Multiple-Residential are assumed to be one EDU per unit.

(6) The EDU calculations for Commercial and Industrial land-use categories use the commercial and industrial unit flows found in EPASD's Standard Specs B1.03-3 and B1.03-4.

(7) The EDU calculations use a rate of 240 gallons per day (gpd) per EDU.

(8) The calculated infiltration rate in EPASD's Standard Specs Section B1.03-5 was ignored since infiltration and inflow will be corrected as part of the PWWF improvements presented in Table 1 and improvements will utilized HDPE that will have fused pipe, which has a considerably lower infiltration rate.

**Abbreviations**

EDU: equivalent dwelling unit
EPASD: East Palo Alto Sanitary District
hcf: hundreds of cubic feet
HDPE: high density polyethylene
PWWF: peak wet weather flow

**References**

1. Sewer Service Charges, Fiscal Year 2020-2021 prepared by EPASD dated July 2020 can be downloaded from the link below: https://www.epasd.com/home/showpublisheddocument/3882/637304927865700000

**Table 7**
**Estimated Annual Operating & Maintenance Expenses**
Sanitary Sewer Capital Improvement and Operation Plan Development
East Palo Alto, California

| | WBSD (1) | 2022/23 | 2023/24 | 2024/25 | 2025/26 | 2026/27 |
|---|---|---|---|---|---|---|
| Cost Escalation | - | - | 3.0% | 3.0% | 3.0% | 3.0% |
| Ratio of EPASD Pipe Mileage to WBSD (2) | - | 15.0% | - | - | - | - |
| **Proposed Operating & Maintenance Expenses (3)** | | | | | | |
| Salaries, Wages, & Benefits | $ 6,200,000 | $ 930,000 | $ 958,000 | $ 987,000 | $ 1,017,000 | $ 1,048,000 |
| Other Operating Expenses | $ 9,100,000 | $ 1,365,000 | $ 1,406,000 | $ 1,448,000 | $ 1,491,000 | $ 1,536,000 |
| **Total Operating & Maintenance Expenses** | | $ 2,295,000 | $ 2,364,000 | $ 2,435,000 | $ 2,508,000 | $ 2,584,000 |

**Notes**

(1) To develop estimated annual operation and maintenance expenses excluding fees paid to City of Palo Alto, the WBSD Fiscal Year 2022/2023 budget dated June 2022 was used as the basis for costs. See Page 8 of the referenced WBSD budget document for the source of expenses presented above.
(2) WBSD collection system includes over 200 miles of gravity pipes and the EPASD collection system includes over 30 miles of gravity pipes.
(3) The estimated Fiscal Year 2022/2023 operating and maintenance expense for the EPASD collection system is calculated by multiplying the Ratio of EPASD Pipe Mileage by the WBSD expenses. All costs rounded to nearest $1,000.
(4) An annual cost escalation is applied in each subsequent fiscal year following Fiscal Year 2022/23.

**Abbreviations**

EPASD: East Palo Alto Sanitary District
WBSD: West Bay Sanitary District

**References**

1. Budget for Fiscal Year 2022/2023 prepared by WBSD dated June 8, 2022 can be accessed from the following link:
https://westbaysanitary.org/wp-content/uploads/2022/08/2022-23_Budget_Report_Approved-6-8-22.pdf

**Table 8**
**PARWQCP Treatment Expenses Calculation (1)**
Sanitary Sewer Capital Improvement and Operation Plan Development
East Palo Alto, California

| | 2022/23 | 2023/24 | 2024/25 | 2025/26 | 2026/27 |
|---|---|---|---|---|---|
| EPASD Share of PARWQCP (2) | 7.64% | 7.64% | 7.64% | 7.64% | 7.64% |
| **PARWQCP CAPITAL IMPROVEMENTS (3)** | | | | | |
| Existing Debt Service | $ 203,000 | $ 203,000 | $ 128,000 | $ 128,000 | $ 128,000 |
| Planned Debt Serve | $ 272,000 | $ 272,000 | $ 432,000 | $ 517,000 | $ 517,000 |
| **Total EPASD Share of Capital Improvements** | **$ 475,000** | **$ 475,000** | **$ 560,000** | **$ 645,000** | **$ 645,000** |
| **PARWQCP OPERATING EXPENSES (3)** | | | | | |
| Treatment O&M | $ 2,201,000 | $ 2,270,000 | $ 2,344,000 | $ 2,412,000 | $ 2,470,000 |
| Minor CIP Fund | $ 234,000 | $ 240,000 | $ 247,000 | $ 253,000 | $ 26,000 |
| **Total EPASD Share of Operating Expenses** | **$ 2,435,000** | **$ 2,510,000** | **$ 2,591,000** | **$ 2,665,000** | **$ 2,496,000** |
| **Total EPASD Share of Treatment Expenses** | **$ 2,910,000** | **$ 2,985,000** | **$ 3,151,000** | **$ 3,310,000** | **$ 3,141,000** |

**Notes**

(1) EPASD does not currently utilize its full 7.64% allocation of treatment capacity and therefore the annual PARWQCB operating costs do not reflect EPASD's full utilization of its capacity. As more EPASD EDUs are connected to the system, the annual rate adjustment is calculated by the proportionate increase in Total EPASD Connected EDUs to reflect the anticipated increase operating expenses.

(2) EPASD share of operating and capital expenses is from the PARWQCP Capital Program Finance Committee Meeting presentation dated 11/17/20, on page 10.

(3) All costs from Table 3 of the EPASD 2019 Sewer Capacity Rate Study dated April 17, 2019.

**Abbreviations**

EPASD: East Palo Alto Sanitary District
PARWQCP: Palo Alto Regional Water Quality Control Plant
EDUs: Equivalent Dwelling Units

**References**

1. PARWQCB Capital Program Finance Committee Meeting presentation can be accessed from the following link:
https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/reports/city-manager-reports-cmrs/year-archive/2020-2/11172020-item-2-presentation.pdf?t=74441.91
2. EPASD 2019 Sewer Rate Study dated April 17, 2019 can be accessed from the following link:
https://www.epasd.com/home/showpublisheddocument/3588/637116752736400000

**Table 9**
**Projected Annual Sewer Charge to Balance Annual Costs**
Sanitary Sewer Capital Improvement and Operation Plan Development
East Palo Alto, California

| | | Annual Sewer Charge |
|---|---|---|
| Total EDUs, Current (1) | | 4,443 |
| **VARIABLE CHARGES** | | |
| **Operating & Maintenance** | | |
| Total Operating & Maintenance (2) | $ | 2,295,000 |
| **Treatment** | | |
| PARWQCP Capital Improvements (3) | $ | 475,000 |
| PARWQCP Operating Expenses (3) | $ | 2,435,000 |
| **Total Variable Charges** | **$** | **5,205,000** |
| **FIXED CHARGES** | | |
| **Capital & Other Non-Operating** | | |
| City Sewer Rehab Improvements (4) | $ | - |
| City Capacity Assurance Improvements (5) | $ | - |
| **Total Fixed Charges** | **$** | **-** |
| **Total Annual Sewer Costs** | **$** | **5,205,000** |
| **Total Annual Sewer Service Cost per EDU (6)** | **$** | **1,171** |

**Notes**
(1) See Table 6 for annual Total EDU calculations.
(2) Total Operating & Maintenance Expenses presented in Table 7.
(3) Total PARWQCB Capital Improvements and Operating Expenses presented in Table 8.
(4) Contribution to annual sanitary sewer rehabilitation program to replace aging infrastructure that is not included Capacity Assurance Improvements or Development Impact Improvements.
(5) Capacity Assurance Improvements assumes that the total costs presented in Table 2 are funded 50/50 between existing Reserves to reflect the existing customers share of the capacity improvements. The existing customers have been contributing to funding the existing reserve and therefore no additional contribution is required for the next five fiscal years. The remaining 50% of t would be recovered through Connection Fees.
(6) Total Annual Sewer Service Cost per EDU is calculated by the sum of Total Annual Sewer Costs divided by Total EDUs, Current.

**Abbreviations**
EDUs: Equivalent Dwelling Units
EPASD: East Palo Alto Sanitary District
PARWQCP: Palo Alto Regional Water Quality Control Plant
SRF: Clean Water State Revolving Fund

**Table 10**
**Connection Fee Calculations**
Sanitary Sewer Capital Improvement and Operation Plan Development
East Palo Alto, California

| | | |
|---|---|---|
| **AT FULL BUILDOUT** | | |
| Projected Total ADWF Increase (gpd) (1) | | 1,080,000 |
| Projected Total EDU Increase (2) | | 4500 |
| Development Share of Cost of Capacity Assurance | $ | 8,197,500 |
| Total Cost of Improvements Due to Development (4) | $ | 9,571,000 |
| Total Cost of Treatment (5) | $ | 5,000,000 |
| **Capacity and Improvement Fee (6)** | **$** | **5,100** |
| **Application Review Fee (7)** | **$** | **1,000** |
| **Connection Fee (8)** | **$** | **6,100** |

**Notes**

(1) Projected Total ADWF Increase is from the EPASD 2021 Master Plan and LAFCo MSR Report.

(2) Projected Total EDU Increase was calculated using a rate of 240 gpd/EDU.

(3) The Development Share of the Cost of the Capacity Assurance is 50% of the costs presented in Table 2. The Capacity Assurance project reduce the potential for sanitary sewer overflows during peak wet weather flows that is a current system deficiency. However, implementing the Capacity Assurance project results in adding additional capacity for both average dry weather flow and peak dry weather flow that is a benefit to new development.

(4) See Table 4 for cost of improvements due to development.

(5) Total Cost of Treatment is based on EPASD reported cost of $5 million per 1.0 MGD of treatment capacity. It should be noted that EPASD current 7.96% ownership of the PARWQCP is equivalent to ADWF capacity of 2.9 MGD. The total project ADWF at full buildout is 2.2 MGD based on 240 gpd/EDU and 8,943 EDUs. Therefore, the Total Cost of Treatment presented above is for new development to buy-in to the available treatment capacity.

(6) Capacity and Improvement fee is calculated by dividing the total cost of improvements and treatment by the projected Total EDU increase and rounding to nearest $100.

(7) Application fee is for technical review of applications to verify that the proposed development complies with applicable components for standards and regulations.

(8) Connection Fee is determined by adding the Capacity and Improvements Fee with the Application Review Fee.

**Abbreviations**

ADWF: Average Dry Weather Flow
EDUs: Equivalent Dwelling Units
gpd: gallons per day

**Table 11**
**Wastewater Enterprise Fund Cash Flow Projections**
Sanitary Sewer Capital Improvement and Operation Plan Development
East Palo Alto, California

| | 2022/23 | 2023/24 | 2024/25 | 2025/26 | 2026/27 |
|---|---|---|---|---|---|
| Overall Rate Adjustment | 0% | 5% | 5% | 5% | 5% |
| Annual Sewer Charge (per EDU) (1) | $690 | $725 | $761 | $799 | $839 |
| Connection Fee (per EDU) (2) | $6,060 | $6,363 | $6,681 | $7,015 | $7,366 |
| Total New EDUs (3) | - | 33 | 709 | 555 | - |
| Total EDUs (3) | 4,443 | 4,476 | 5,186 | 5,741 | 5,741 |
| Interest Earnings Rate | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% |
| **Beginning Reserve Funds** | **$17,380,000** | **$14,569,886** | **$12,004,834** | **$13,344,539** | **$14,269,654** |
| **REVENUES** | | | | | |
| Sewer Service Charges (4) | $3,065,986 | $3,243,224 | $3,945,075 | $4,585,641 | $4,814,923 |
| Connection Fees (5) | $0 | $210,244 | $4,739,878 | $3,893,440 | $0 |
| Property Taxes (6) | $521,000 | $536,630 | $552,729 | $569,311 | $586,390 |
| ERAF Rebate/Former RDAF (6) | $300,000 | $300,000 | $300,000 | $300,000 | $300,000 |
| Investment Earnings (7) | $86,900 | $72,849 | $60,024 | $66,723 | $71,348 |
| **Total Revenues** | **$3,973,886** | **$4,362,948** | **$9,597,705** | **$9,415,114** | **$5,772,661** |
| **EXPENSES** | | | | | |
| **Operating & Maintenance** | | | | | |
| Salaries & Benefits (8) | $930,000 | $958,000 | $987,000 | $1,017,000 | $1,048,000 |
| General Liability & Workers Comp Alloc (8) | $1,365,000 | $1,406,000 | $1,448,000 | $1,491,000 | $1,536,000 |
| PARWQCP Wastewater Treatment (6) | $2,435,000 | $2,510,000 | $2,591,000 | $2,665,000 | $2,496,000 |
| **Subtotal** | **$4,730,000** | **$4,874,000** | **$5,026,000** | **$5,173,000** | **$5,080,000** |
| **Capital & Other Non-Operating** | | | | | |
| Sewer Rehab Improvements (9) | $1,500,000 | $1,500,000 | $1,500,000 | $1,500,000 | $1,500,000 |
| Capacity Assurance Improvements (10) | $0 | $0 | $1,093,000 | $1,093,000 | $1,093,000 |
| **Subtotal** | **$1,500,000** | **$1,500,000** | **$2,593,000** | **$2,593,000** | **$2,593,000** |
| **Debt Service** | | | | | |
| EPASD 2011 SRF Loan (6) | $79,000 | $79,000 | $79,000 | $79,000 | $79,000 |
| Share of Existing PARWQCP Debt (6) | $203,000 | $203,000 | $128,000 | $128,000 | $128,000 |
| Share of Projected PARWQCP Debt (6) | $272,000 | $272,000 | $432,000 | $517,000 | $517,000 |
| **Subtotal** | **$554,000** | **$554,000** | **$639,000** | **$724,000** | **$724,000** |
| **Total Expenses** | **$6,784,000** | **$6,928,000** | **$8,258,000** | **$8,490,000** | **$8,397,000** |
| **Revenues Less Expenses** | **($2,810,114)** | **($2,565,052)** | **$1,339,705** | **$925,114** | **($2,624,339)** |
| **Ending Reserve Fund** | **$14,569,886** | **$12,004,834** | **$13,344,539** | **$14,269,654** | **$11,645,315** |

**Notes are on Page 2 of 2.**

**Notes**

(1) Proposed Annual Sewer Charge is shown as the proposed rate from Table 4 of the East Palo Alto Sanitary District 2019 Sewer Rate Study prepared by Bartle Wells Associates dated April 17, 2019.
(2) Proposed Connection Fee matches EPASD current connection fee published on the EPASD web site under Forms & Permits.
(3) See Table 6 for the current number of EDUs and estimate for annual increase in EDUs.
(4) Sewer Service Charges is calculated by multiplying Total EDUs by Annual Sewer Service Charge.
(5) Connection Fees is calculated by multiplying Total New EDUs by Connection Fee.
(6) Source of revenues and expenses is Table 4 of the East Palo Alto Sanitary District 2019 Sewer Rate Study prepared by Bartle Wells Associates dated April 17, 2019.
(7) Investment income is interest income on Beginning Fund Reserve.
(8) Operating & Maintenance Expenses are presented in Table 7.
(9) The City Sewer Rehab Improvement is an ongoing annual program to replace pipes that are found to be damaged or at the end of service life but not included Capacity Assurance Improvements or Developer Impact Capacity Improvements
(10) Capacity Assurance Improvements is an annual expenditure to implement the improvements identified in Table 2 over a 15 year period. The design and construction will be completed in phases beginning in Fiscal Year 2024/25 once new development begins to come on line.

**Abbreviations**

EDUs: Equivalent Dwelling Units
EPASD: East Palo Alto Sanitary District
PARWQCP: Palo Alto Regional Water Quality Control Plant

**References**

1. East Palo Alto Sanitary District 2019 Sewer Rate Study prepared by Bartle Wells Associates dated April 17, 2019 can be accessed from the following link:
https://www.epasd.com/home/showpublisheddocument/3588/637116752736400000
2. EPASD current fees including connection fees can be accessed from the following link:
https://www.epasd.com/residents/forms-permits

# EPASD SANITARY SEWER SERVICE AREA
# EPASD MASTER PLAN UPDATE
# EAST PALO ALTO, CA

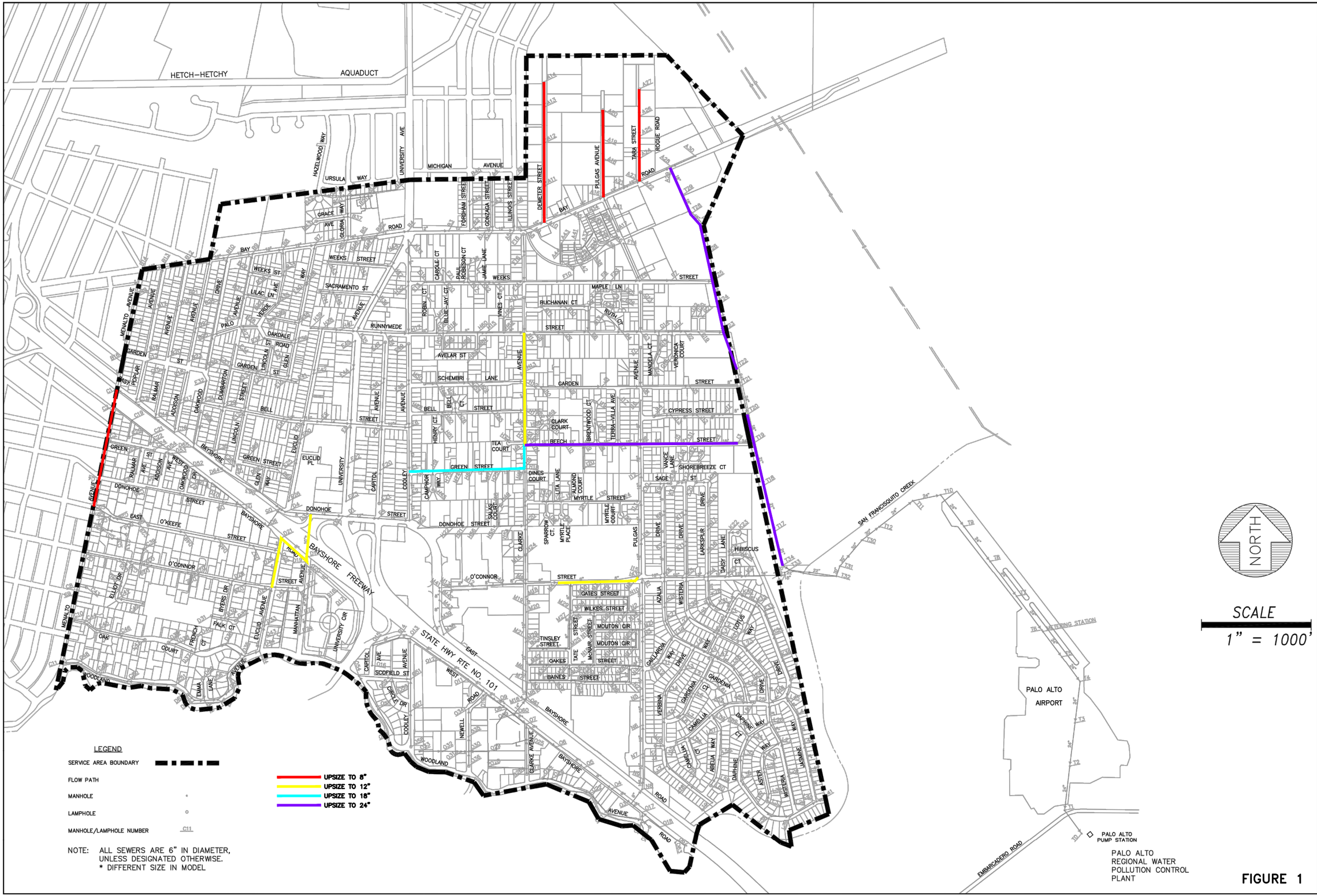


**FIGURE 1**


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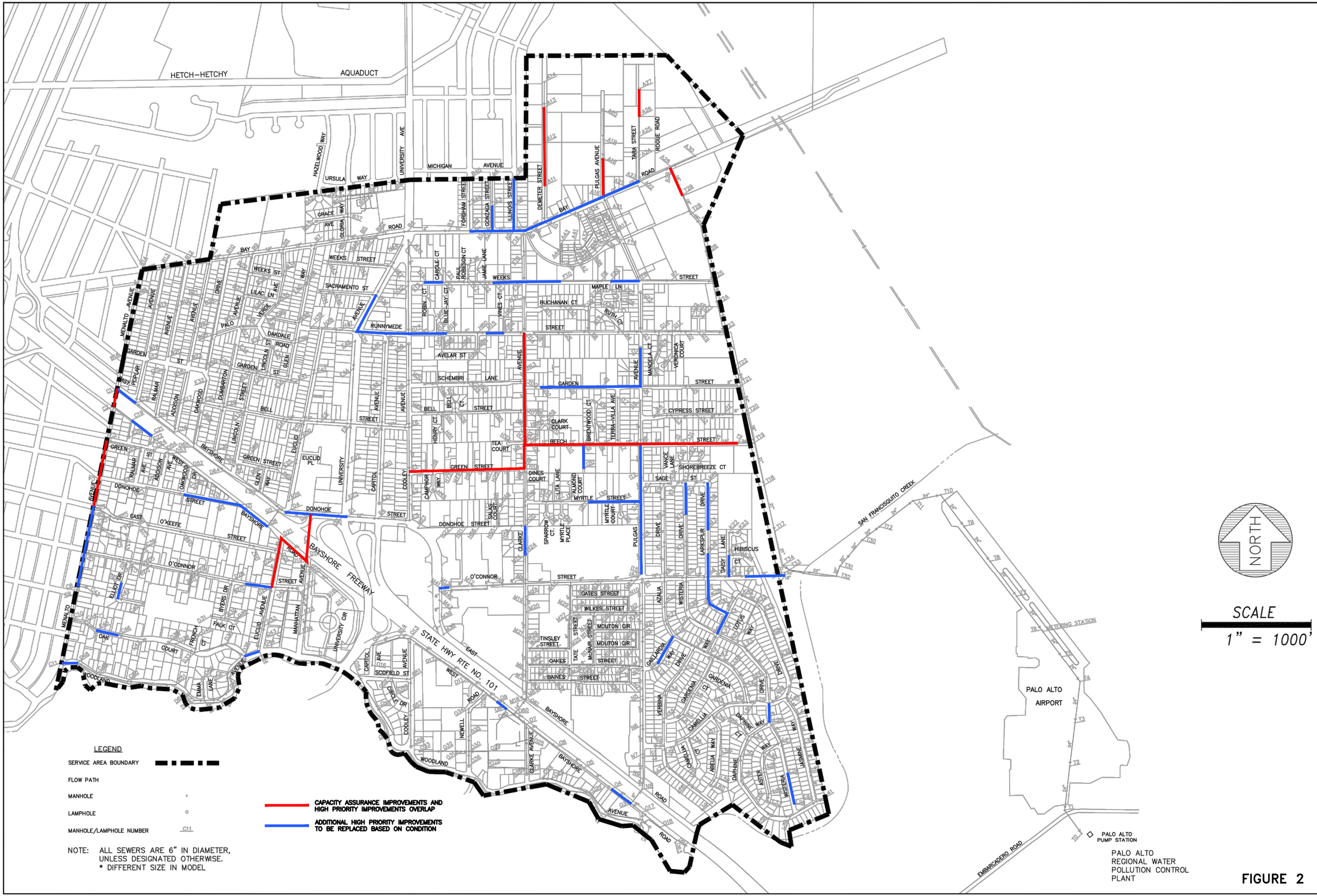
| | |
|---|---|
| DATE: | 10/1/2020 |
| SCALE: | 1" = 1000' |
| DESIGNED: | RAM |
| DRAWN: | RAM |
| CHECKED: | JF |
| PROJ. ENGR: | JJT |

FIGURE 1

JOB NO. 2052

# EPASD SANITARY SEWER SERVICE AREA
# EPASD MASTER PLAN UPDATE
# EAST PALO ALTO, CA




LEGEND

- SERVICE AREA BOUNDARY
- FLOW PATH
- MANHOLE
- LAMPHOLE
- MANHOLE/LAMPHOLE NUMBER C11

NOTE: ALL SEWERS ARE 6" IN DIAMETER, UNLESS DESIGNATED OTHERWISE.
* DIFFERENT SIZE IN MODEL

- CAPACITY ASSURANCE IMPROVEMENTS AND HIGH PRIORITY IMPROVEMENTS OVERLAP
- ADDITIONAL HIGH PRIORITY IMPROVEMENTS TO BE REPLACED BASED ON CONDITION

**FIGURE 2**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# EPASD MASTER PLAN UPDATE
# EAST PALO ALTO, CA

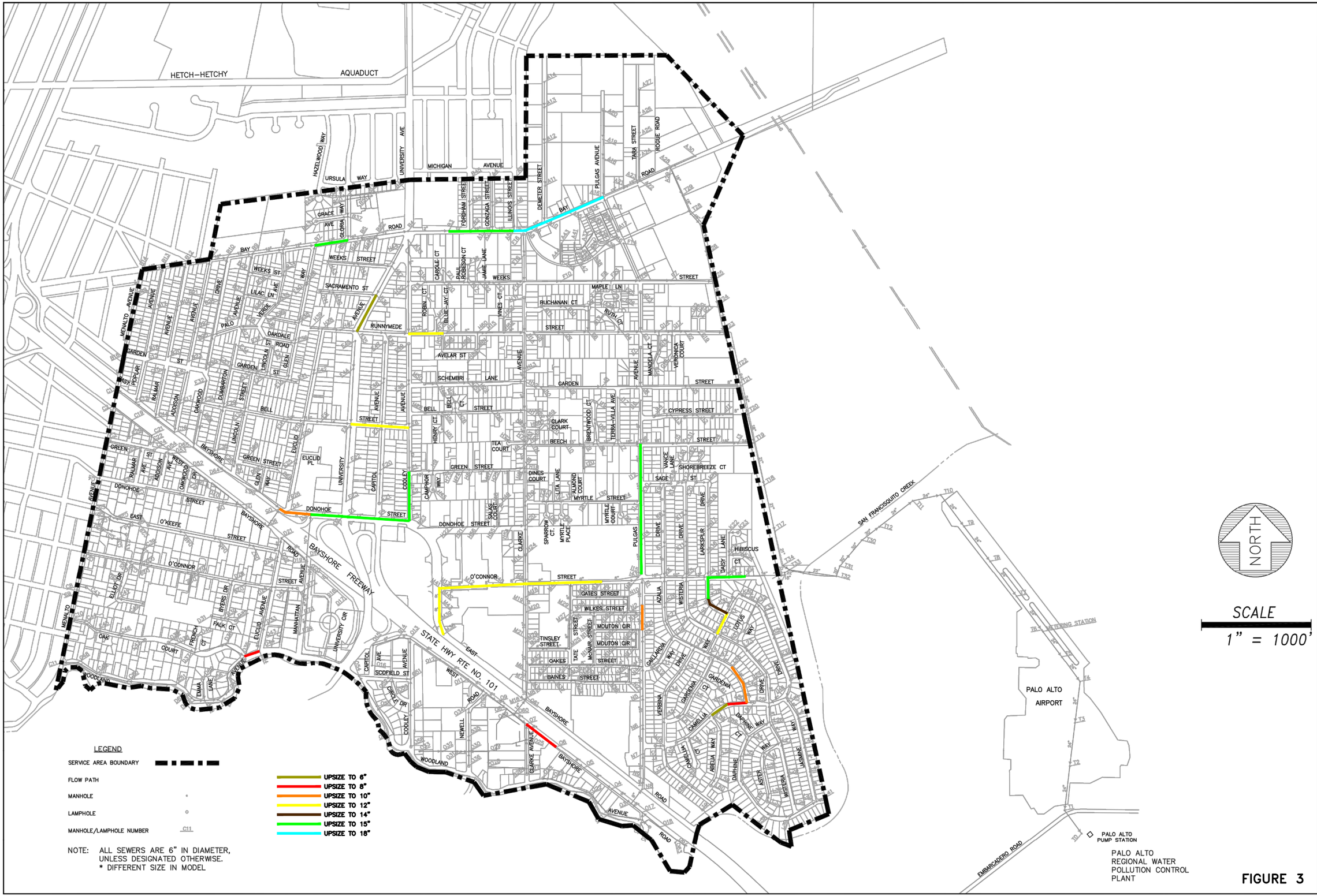


**FIGURE 3**


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FIGURE
1

JOB NO.
2052

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# EPASD MASTER PLAN UPDATE
# EAST PALO ALTO, CA

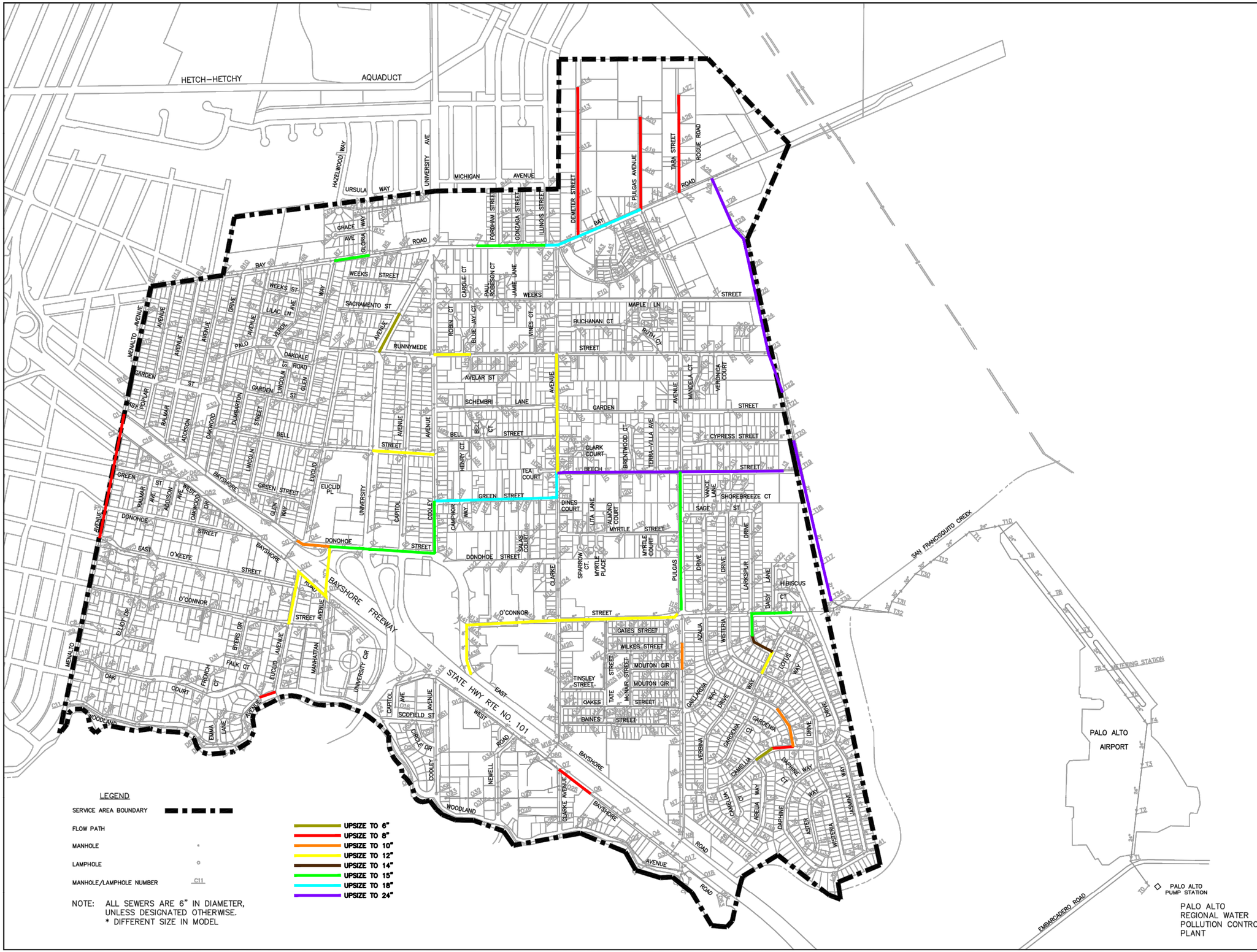


**FIGURE 4**


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FIGURE 1

JOB NO. 2052

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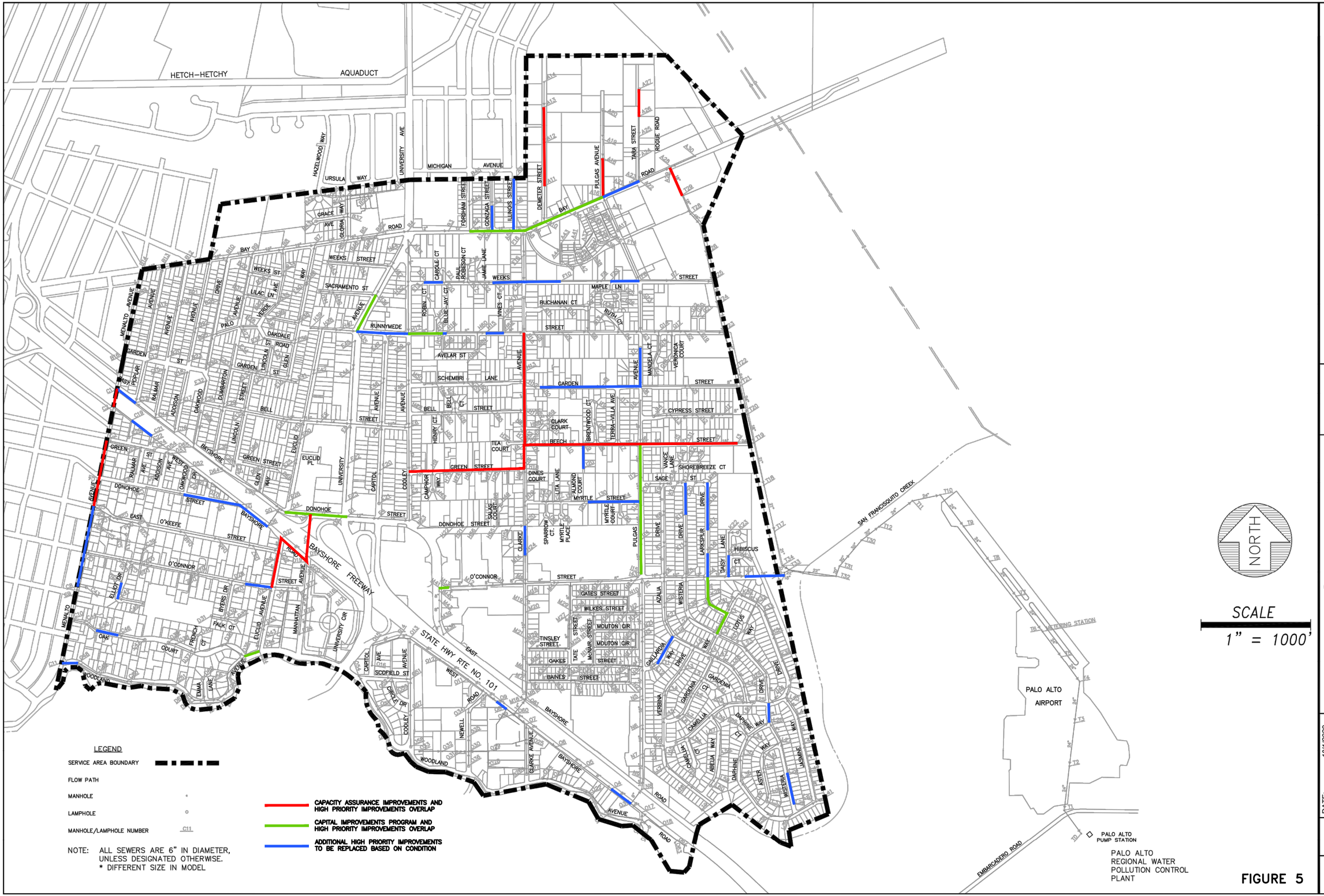
# EAST PALO ALTO, CA




LEGEND

- SERVICE AREA BOUNDARY
- FLOW PATH
- MANHOLE
- LAMPHOLE
- MANHOLE/LAMPHOLE NUMBER C11

NOTE: ALL SEWERS ARE 6" IN DIAMETER, UNLESS DESIGNATED OTHERWISE.
* DIFFERENT SIZE IN MODEL

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- CAPITAL IMPROVEMENTS PROGRAM AND HIGH PRIORITY IMPROVEMENTS OVERLAP
- ADDITIONAL HIGH PRIORITY IMPROVEMENTS TO BE REPLACED BASED ON CONDITION

NORTH

SCALE
1" = 1000'

**FIGURE 5**


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FIGURE
1

JOB NO.
2052

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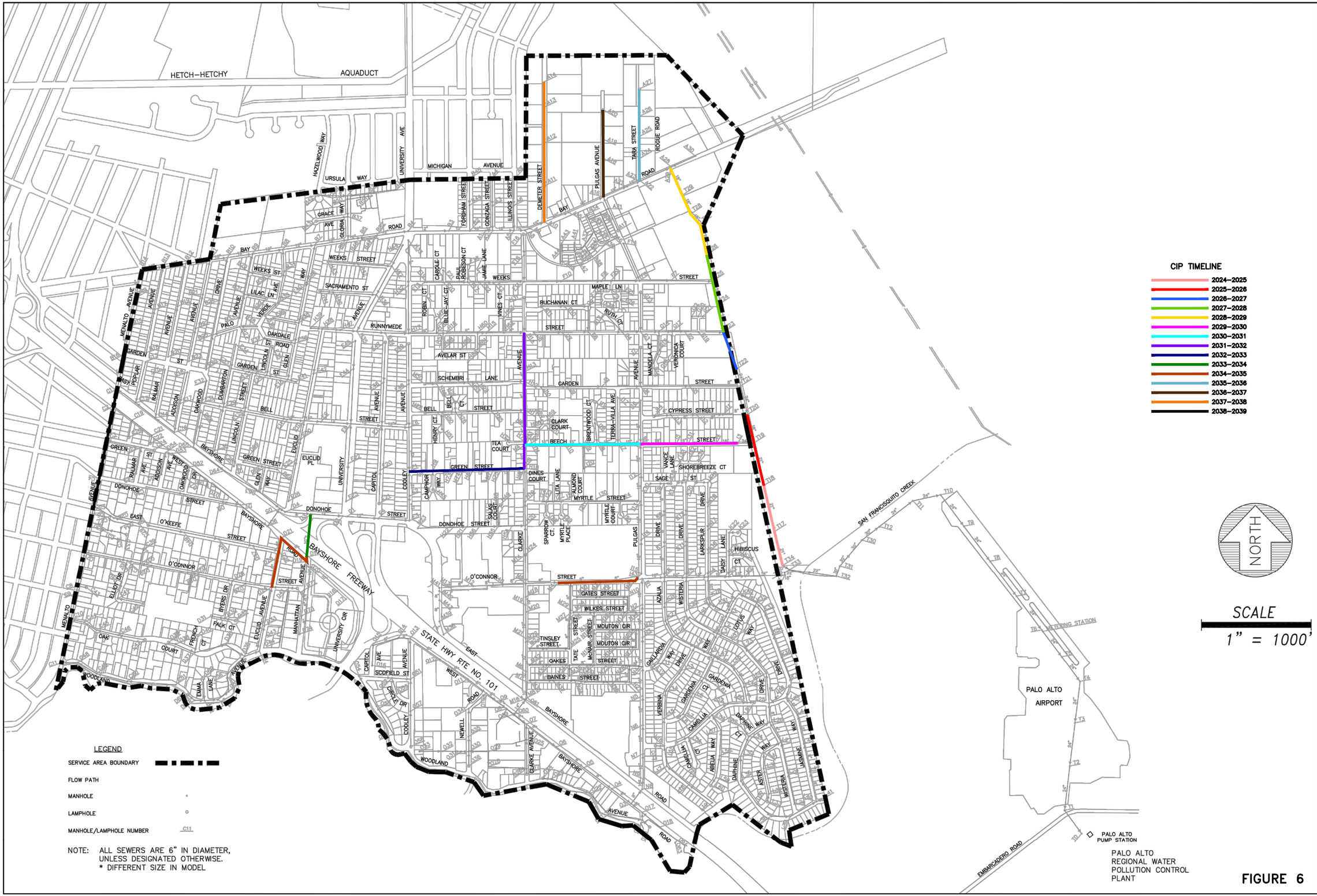
# EPASD MASTER PLAN UPDATE
# EAST PALO ALTO, CA




## CIP TIMELINE

- 2024–2025
- 2025–2026
- 2026–2027
- 2027–2028
- 2028–2029
- 2029–2030
- 2030–2031
- 2031–2032
- 2032–2033
- 2033–2034
- 2034–2035
- 2035–2036
- 2036–2037
- 2037–2038
- 2038–2039

NORTH

SCALE
1" = 1000'

LEGEND

- SERVICE AREA BOUNDARY
- FLOW PATH
- MANHOLE
- LAMPHOLE
- MANHOLE/LAMPHOLE NUMBER C11

NOTE: ALL SEWERS ARE 6" IN DIAMETER, UNLESS DESIGNATED OTHERWISE.
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**FIGURE 6**


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FIGURE
1

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2052

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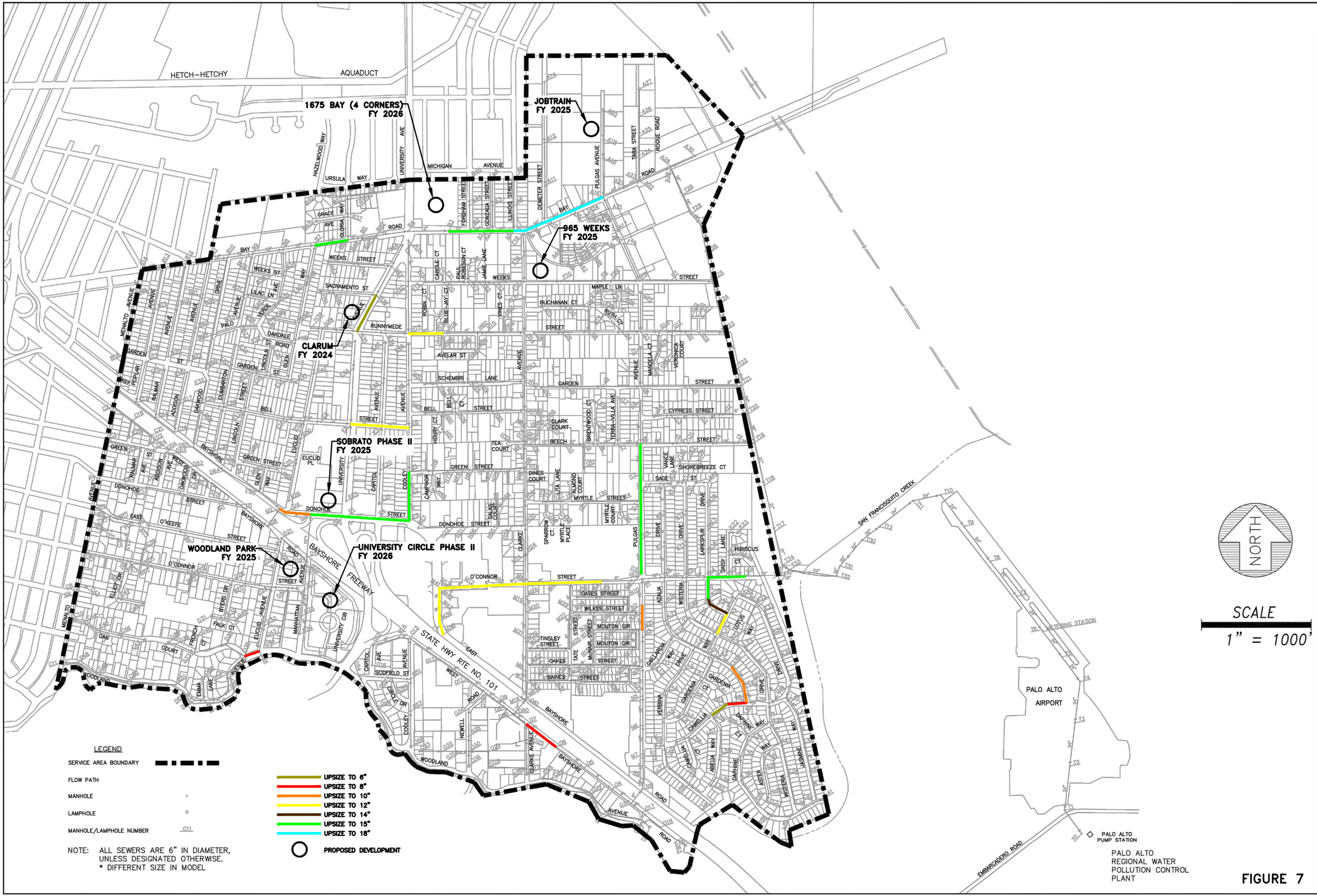


FIGURE 7


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FIGURE 1

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