Received 1/14/2021

EAST PALO ALTO SANITARY DISTRICT

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Akin Okupe, M.B.A, P.E., General Manager

March 10, 2020

Kevin J. Ashe
Holland & Knight
50 California Street, Suite 2800
San Francisco, CA 94111

Re: Capacity Charges for University Plaza Phase II and 1200 Weeks Street Projects

Dear Kevin,

Pursuant to your letter dated January 14, 2020, please find below responses paragraph by paragraph. The paragraph annotation of your letter is attached for reference.

Paragraph 2

The District does not currently levy fees for growth of capital facilities. The District's capacity charges for wastewater are comprised of two components: a buy-in to the wastewater distribution system, which represents the proportional share of the cost of wastewater infrastructure that has already been built, and a buy-in to the cost of capacity rights in the wastewater treatment plant necessary to serve each new or expanded connection. Neither of these components is designed to recover the cost of building new infrastructure or expanding the wastewater system. Rather, the fees are designed using an average buy-in approach designed to recover proportionate costs of assets that were oversized to accommodate growth.

The buy-in component for existing infrastructure was calculated by identifying the total linear feet of pipelines of varying diameters, estimating a price for construction and engineering, adding an estimate for other District assets such as administrative buildings, vehicles and equipment, and reducing the total price to account for any infrastructure that may be at the end of its useful life. (*See* Capacity Charge Study, pp. 5-6). The Capacity Charge Study then estimates a unit cost for capacity in the Palo Alto Regional Water Quality Control Plant. Finally, the Study estimates the District's share of plant costs, and allocates those costs based on strength and flow characteristics of

wastewater. (Capacity Charge Study, pp. 8-9), These numbers, when taken together, result in a capacity charge of $6,060 per equivalent dwelling unit, or EDU. EDUs are assigned based on the type of use, with residential connections receiving 1 EDU per unit, and non-residential receiving EDUs based on a formula taking into account projected flow and strength/quality of such flow of wastewater discharge.

Since the District cannot predict the sequence of development and financial cash flow of capacity charges from such developments, no expansion component was added to the charge. Unless the costs of system upgrades are borne by new development, existing rate payers will have to prefund growth projects, thereby subsidizing the cost of capacity for new development. Pursuant to the findings of the hydraulic impact assessment,, the proposed development will require upgrade to the existing capacity in the collection system . Such capacity is neither accounted for in the projections used in the Study, or the total cost recovery estimated to be necessary (since, as mentioned above, the cost recovery identified is simply for buy-in and not expansion).

As such, the cost to upgrade the present sewer infrastructures as necesary to support the project and as indicated in the memoranda are not fees. These costs were identified because the District's capacity fee structure is not designed to accommodate growth and does not pay for growth, and the present budget does not make provision to fund growth. In addition, the District is not asking the developer to pay these costs, we are proposing that the developer upgrade the existing collection system in accordance with the findings and pay the capacity charges. The District will then reimburse the developer after taking the salvage value of the existing pipe and the opportunity cost of capital into consideration. The District will also reimburse developer from future developers required to pay their proportional share of these upgrades.

Paragraph 3

Please see above. The Capacity Charge Study does not account for expansion of the system, and the costs recovered pursuant to the capacity charges adopted based on that Study are designed to buy-in to existing infrastructure. There is currently no capacity in the system to accommodate the proposed projects, nor will the capacity charges recover the costs to accommodate these projects.

Paragraph 5

Again, the cost presented in the memoranda prepared by Freyer & Lauretta Engineering Inc are not a capacity charges, they are the cost of upgrading the system to accommodate these projects.

Paragraph 7 (1)

Capacity charges are designed based on quality and quantity of projected wastewater discharge, measured in flow (gallons per day), biological oxygen demand (BOD) (pounds/day) and suspended solids (SS) (pounds per day). The reduction in office

space does not affect the sewerage discharge unless there is corresponding reduction the variables described in the preceding sentence.

Paragraph 7 (2)

The peak demand used in the hydraulic modeling is based on actual time of use.

We cannot use an arbitrary peaking factor. We must use the peaking factor provided in the Sanitary Sewer Flow Monitoring Study dated June 2012 prepared by V and A Inc. We can calculate the actual flow rate due to the 10 year storm event and add the peak dry weather flow inclusive of your project, the sum will be used to run the model. This will avoid the peaking factor effect on your discharge.

Paragraph 7 (3)

Under existing serviceability state condition considering peak dry weather flow and a 10 years storm, there is no free board. The Hydraulic Grade Line rises above the manhole.

Paragraph 7 (4)

Our District Technical Specification does not allow the Hydraulic Grade Line to rise above the pipe under peak wet weather condition as this will lead to a sanitary sewer overflow which could be a threat to public health

Paragraph 7 (5)

The capital projects identified in the Master Plan for growth were not included in the calculation presented by Bartle Wells. As described above, the Capacity Charge Study identified the ultimate capacity charge using a look-back at existing infrastructure, such as existing pipeline (with cost reduced to account for age of facilities), as well as a buy-in to the capacity in the regional treatment plant. Capital projects necessary to serve the development were not included as a part of the Capacity Charge Study, and therefore there is no double-counting.

Paragraph 7 (6)

The developer will be reimbursed after considering the salvage value of the existing pipes and the lost opportunity cost of capital due to early replacement of the existing pipes.

Paragraph 7 (7)

There is no funding for growth.

Paragraph 9 to 18

All these sections in your memorandum discussed the methodology of calculating the capacity charge, I agree with this methodology based on accurate predicted discharge into our collection system. The consultant is working on the impact of the predicted flow into the collection system. The issue we are trying to address is that this methodology accounts for a share of existing infrastructure, but the existing system cannot accommodate this development. Thus, we are proposing that the developers upgrade the existing infrastructure and pay the capacity charges. The developers will be reimbursed after taking into consideration the salvage value of the existing pipe and the lost opportunity cost of capital.

Paragraph 22

We have decided not to use a peaking factor by using an alternative method which includes the sum of the peak dry weather discharge and the 10 year discharge storm from the monitoring study.

Paragraph 23

The District has decided to revisit the methodology in order to ensure that your projected discharge is not amplified by the peaking factor by using the following procedures.

a.) Calculate the peak dry weather flow inclusive of these projects
b.) Calculate the 10 year storm flow in the pipe

c.) Run the static model with the sum of (a) and (b) above. This will ensure that the sewage discharge is not amplified by the peaking factor.

Paragraph 24

The criteria used to perform the hydraulic model indicated in the master plan differ from that used in the evaluation of the hydraulic impact of these projects, the master plan does not take actual time of use of office building into consideration, Please note that the master plan analysis does not include the University Plaza Phase II and the Primary School Project.

Paragraph 25

The estimated cost in the amount of $6,130,000.00 is not covered by existing capacity fees. Existing capacity fees cover the cost of existing infrastructure; the development project requires an upgrade to the system to accommodate the University Plaza Phase II project. There is no provision in the budget to fund this upgrade at the moment. As previously mentioned, we anticipate the developer to upgrade the existing pipes and pay capacity charges. We will reimburse the developer after considering the salvage value of the existing pipe and the lost opportunity cost of capital if the District has to reimburse the developer now versus replacing the pipes at the end of their useful life.

The District will also reimburse the developer from future developers required to pay their proportional share of these upgrades.

Paragraph 27

2. This has been previously addressed in response to Paragraph 23 above

3. This had been previously addressed in response to Paragraph 23 above

4. We will present the peak flow hydraulic grade line in updated memorandum.

5. The improvements were not included in the Capacity Charge Study, and the Master Plan did not identify a source of funding.

6. There is no funding in place.

Paragraph 28

As previously described, the system does not have capacity to accommodate the proposed development without expansion. The Capacity Charge Study is designed to recover new connections' share of capacity in the existing system, and not for expansion that is needed to accommodate this project.

Paragraph 29

I am open to discussing how we move forward in a meeting.

Paragraph 30 to 40

Previously addressed.

Paragraph 43

The discharge used was provided to the consultant, currently, we have revised the methodology by assuming a discharge per head of 20 gallons per day. This value has been multiplied by the population to arrive at the total discharge per day.

Paragraph 44

Please see response to Paragraph 43 above

Paragraph 45

The Master Plan is a conceptual document, not an implementing one. Additional steps are necessary to implement the Master Plan, including establishing a funding source for projects identified therein as well as preparation of a specific plan. No such funding source exists at this time.

Paragraph 46

The existing Capacity Charge Study does not take expansion into consideration. The cost to expand the system to accommodate this project is not included in the Capacity Charge Study, and there is no funding in place for the infrastructure necessary to accommodate this project. If included, the recovered funds would not cover the cost of upgrading the system to accommodate this development, this would shift the capacity costs for the project onto existing rate payers, which would be inequitable.

Paragraph 47

We will evaluate your recommendation and update the technical memorandum accordingly.

Attached with is a summary from the master plan update prepared by Kennedy Jenks Consultant dated September 2002, it confirms that there is no capacity in the system without an upgrade.

Also attached with is a summary from master plan update prepared by Freyer & Lauretta Inc., dated October 2014, it also confirms that an upgrade to the existing system would be necessary for additional flow.

Way Forward

There are two options available to resolve the issues and move the projects forward as follows:

Option 1

The developer can wait until the District is ready to replace the old pipes at the end of their useful life and just pay capacity charges to connect to the system

Option 2

The developer can replace the pipes now and pay capacity charges with a reimbursement from the District after considering the salvage value of the existing pipes, the opportunity cost of capital lost due to early replacement of the pipes. Some of

the reimbursement will also come from future development in accordance with their proportional share of the benefits of these upgrades. Credit will be given to the developer to ensure that the developer is only being charged a proportional share of the pipe replacement.

Iam open to a meeting to discuss how we move your projects forward.

Thank you for your anticipated action.

Sincerely,

Akin Okupe, General Manager

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Kevin J. Ashe
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January 14, 2020

Via Electronic Mail

Akin Okupe
General Manager
East Palo Alto Sanitary District
901 Weeks Street
East Palo Alto, CA 94303

Re: Capacity Charges for University Plaza Phase II and 1200 Weeks Street Projects

Mr. Okupe,

P1 On behalf of our client, the Sobrato Organization ("Sobrato"), developer of the University Plaza Phase II project, and Sheppard Mullin's client, The Primary School ("TPS"), developer of the 1200 Weeks Street (each a "Project", collectively, the "Projects"), enclosed please find the technical analyses you requested on November 26, 2019.

P2 As discussed at the Engineering Committee Meeting at the East Palo Alto Sanitary District's ("District") office on December 10, 2019, Sobrato and TPS continue to disagree with your position that the District's sanitary sewer system lacks sufficient capacity to connect to and serve the Projects. Additionally, we strongly oppose the District's attempts to levy $6.13 million and $4.08 million dollars in "probable project costs" against the Projects, respectively (as mentioned in the draft Freyer & Lauretta memoranda, dated October 28 and 29, 2019). While state law permits the District to levy reasonable connection fees and capacity charges of a "proportional benefit" to projects (Gov. Code § 66013), nothing in state law or the District's own regulations permit it to levy disproportional "probable project costs" against individual projects for District-wide improvements.

P3 The attached independent, technical memoranda prepared by Kennedy Jenks and BKF Engineers note that "capacity charges" levied against the Projects should be calculated pursuant to the methodology set forth in the December 2018 Bartle Wells Report (*i.e.*, the Equivalent Dwelling Unit calculation for non-residential connections), which the District's Board adopted on January 10, 2019 in Resolution No. 1238. **Pursuant to this methodology, the appropriate capacity**

charges levied against the Projects are as follows: $224,410 for UPP2, and $228,494 for 1200 Weeks Street.

P4 We look forward to discussing this matter with you further to reach a mutually agreeable solution. If we cannot come to an agreeable solution, Sobrato and TPS are fully prepared to seek relief from the District's Board pursuant to Section 205 of the District's Code, and beyond, if necessary. Please be advised that we have not discussed this matter with the District's legal counsel, but recommend that you engage counsel prior to further discussions on this subject.

Regards,

Tamsen Plume	Kevin J. Ashe	Jennifer Renk
Holland & Knight, LLP	Holland & Knight, LLP	Shepperd Mullin Richter & Hampton, LLP

cc:
Tim Steele, The Sobrato Organization
Robert Tersini, The Sobrato Organization
Tom Morse, BKF Engineers
Jennifer Von der Ahe, The Primary School
Jennifer Renk, Sheppard Mullin Richter & Hampton, LLP
Ashley Stanley, BKF Engineers
Patrick Bosch, BKF Engineers
John Rayner, Kennedy Jenks
Kamal Fallaha, City of East Palo Alto
Rafael Alvarado, City Attorney, City of East Palo Alto
Carlos Castellanos, MidPen Housing Corp.

Enclosures:

- BKF Engineers, Technical Memorandum re University Plaza Phase 2 – Sanitary Sewer Capacity Fee Calculation, dated January 13, 2020
- Kennedy Jenks, Technical Memorandum re Review of Freyer & Laureta October 29, 2019 Draft Memorandum re University Plaza Phase II Development
- BKF Engineers, Technical Memorandum re The Primary School – Sanitary Sewer Capacity Fee Calculation, dated January 13, 2020
- Kennedy Jenks, Technical Memorandum re Review of Freyer & Laureta October 28, 2019 Draft Memorandum re 1200 Weeks Street Development

BKF Engineers
Technical Memorandum re University Plaza Phase 2 – Sanitary Sewer Capacity Fee Calculation, dated January 13, 2020

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January 13, 2020
BKF Job No.: C20160076

Mr. Akin Okupe, General Manager
East Palo Alto Sanitary District
901 Weeks Street
East Palo Alto, CA 94303

Transmitted Via Email: aokupe@epasd.com

Subject: University Plaza, Phase 2, East Palo Alto, CA
Sewer System Hydraulic Modeling
October 29, 2019 Freyer & Laureta Memorandum

Dear Mr. Okupe:

P5 Thank you for forwarding the sanitary sewer analysis memorandum titled, "East Palo Alto Sanitary District – University Phase II Development," prepared by Freyer & Laureta, Inc dated October 29, 2019 and the Wastewater Capacity Charge Update prepared by Bartle Wells Associates, dated December 2018 (Bartle Wells Report).

P6 During our December 10, 2019 meeting with the District, you noted that the Bartle Wells Report establishes "capacity fees" for new projects served by the District. The Bartle Wells Report establishes a methodology to "Equitably [recover] costs based on the new or increased capacity needs of each new development or redevelopment project." Implementing this methodology and fee structure to address system capacity is more appropriate than one off analyses for individual projects, as was done in the Freyer & Laureta memorandum. In light of this, we have included as Attachment A a sanitary sewer capacity fee calculation memorandum for the University Plaza Phase 2 project based on the Equivalent Dwelling Unit (EDU) methodology identified in the Bartle Wells Report.

P7 While we believe that the capacity fee discussed above should be the only capacity fee applicable to new development served by the District, we have reviewed the Freyer & Laureta memorandum and have several questions and concerns outlined below.

P7 (1) 1. The project as approved by the East Palo Alto City Council has been reduced to include 203,967 square feet of office space and 8,690 square feet of community flex space.

P7 (2) 2. The calculation of peak hour demand is not industry standard and does not match the methodology used in the March 2015 East Palo Alto Sanitary District Master Plan Update prepared by Freyer & Laureta, Inc. Dividing the average day flow by the assumed operational hours is unnecessary and provides an overly conservative peaking factor.

While one might consider this methodology for a single building or small campus it is not appropriate for a city wide sanitary sewer system where system peaks and time of use are already included as part of the flow monitoring complete to develop Master Plan Update. To apply this methodology universally would require a continuous simulation model instead of the static, peak flow model used.

An additional peaking factor of 5.8 was used in the model. This is the single highest peak factor identified in the Master Plan Update. Portions of the system that serve the proposed project site have smaller peaking factors. As identified in the Master Plan Update, this peaking factor is for Peak Wet Weather Flow that includes the system diurnal peak and significant system rain water dependent inflow and infiltration. Since this new project will not contribute additional rain water dependent inflow and infiltration, the peaking factor should be reduced.

This overly conservative methodology may unduly show impact to district wide facilities, hampering future development in the City of East Palo Alto. Based on analysis of nodes E2, I3 and T13 in the 2015 Master Plan update the maximum ADWF to PDWF peak is 1.7 at node E2. The remainder of the peaking factor is wet weather inflow and infiltration that is and existing condition and not increased by the proposed project.

P7 (3) 3. The Memorandum states, "...the model does indicate there is a potential for SSOs as a result of the peak flows from the development." However, Figure 2 – Peak flow Hydraulic Grade Line shows available freeboard between the system hydraulic grade and existing ground even using the overly conservative peaking factors.

P7 (4) 4. The peak flow hydraulic grade line for the existing condition is not presented and there is no discussion of the existing surcharge condition during peak wet weather events. Please note that it is common practice to allow some surcharge of a sanitary sewer system during peak wet weather events in existing pipes as new projects are added to the system and future capital improvement upgrades are scheduled.

P7 (5) 5. While this memorandum identifies that significant system improvements are required, these improvements are substantially the same improvements identified in the Master Plan Update and used as the basis for the Bartle Wells Report (e.g.: increasing the size of the 15" sewer main on Beech street and Green Street). This "double counting" of improvements is further evidence that only the capacity charges recommended in the Bartle Wells Report should apply to the project.

P7 (6) 6. Numerous system improvements identified in this memorandum are also identified in the Freyer & Laureta, Inc. memorandum prepared for the Primary School, 1200 Weeks Street development, dated October 28, 2019. The section of sewer main between T19 and T16 is included in both summaries of "probable projects costs" with no discussion of fair share costs.

P7 (7)

7. The Master Plan Update recommends a Capital Improvement Program. What is the status of the recommended Capital Improvement Program? Has timing been confirmed and funding identified?

P8

Please let us know if a meeting would be helpful to discuss these comments. We look forward to working with your team to refine the modeling and better understand the project and cumulative impacts. Please contact me at 650.482.6419 if you have any questions regarding these comments.

Sincerely,
BKF Engineers

Thomas R. Morse

Thomas R. Morse, PE, LEED® AP
Vice President

Attachment:

- Attachment A: University Plaza Phase 2 – Sanitary Sewer Capacity Fee Calculation

cc:
Kamal Fallaha, City of East Palo Alto
Tim Steele, The Sobrato Organization
Robert Tersini, The Sobrato Organization
Tamsen Plume, Holland & Knight, LLP
Kevin Ashe, Holland & Knight, LLP
John Rayner, Kennedy Jenks
Sachi Itagaki, Kennedy Jenks
Jennifer Von der Ahe, The Primary School
Jennifer Renk, Sheppard Mullin Richter & Hampton, LLP
Carlos Castellanos, MidPen Housing Corp.
Ashley Stanley, BKF Engineers
Cole Gaumnitz, BKF Engineers

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ATTACHMENT A

MEMORANDUM

Date: January 13, 2020 **BKF Job Number: 20160076**

Deliver To: Akin Okupe, General Manager, East Palo Alto Sanitary District
Joan Sykes-Miessi, Vice President, Board of Directors
Dennis Scherzer, Director, Board of Directors

From: Thomas Morse

Subject: University Plaza Phase 2 – Sanitary Sewer Capacity Fee Calculation

Purpose

P9 The purpose of this memorandum is to provide a summary of East Palo Alto Sanitary District (District) sanitary sewer capacity fee calculations associated with the University Plaza Phase 2 (UPP2) development.

Background

P10 The UPP2 development encompasses approximately 2.60 acres in East Palo Alto, situated north of Donohoe Street, between University Avenue, the existing Chevron Gas Station, and the Ravenswood School District Bus Yard. Donohoe Street has an existing 12-inch sanitary sewer main that flows east toward University Avenue.

The site is currently occupied by paved and unpaved parking areas and existing buildings including a pharmacy and a Stanford Law Clinic totaling 11,495 square feet. The proposed development includes two buildings: a 6-story parking garage with 8,690 square feet of Community Flex Space and a 7-story office building with 203,967 square feet of office space as approved by the East Palo Alto City Council December 17, 2019.

Methodology

P11 The sanitary sewer capacity fee is based on the Equivalent Dwelling Unit (EDU) methodology and adopted per EDU capacity fee identified in the December 2018 Wastewater Capacity Charge Update Study prepared by Bartle Wells Associates.[1] The EDU methodology for non-residential connections is:

EDU Formulas for Non-Residential Connections[2]
Number of EDUs = 0.871 * Flow/240 gpd + 0.060 * BOD/200 mg/l + 0.067 * SS/200 mg/l

[1] East Palo Alto Sanitary District *Wastewater Capacity Charge Update* (Dec. 2018) at 10.

[2] As of the date of this memorandum, it is remains unclear whether the District Board has adopted the capacity fee structure recommend by Bartle Wells Associates. On December 18, 2019, the Sobrato Organization (through counsel) submitted a public records act request for confirmation that the District has adopted this capacity fee methodology. This memorandum assumes that the District has adopted the capacity fee methodology proposed in the Bartle Wells Associated December 2018 report.

Under this methodology, the first step is to calculate the average day dry weather flow based on the unit demands provided to the District in the original BKF Sewer Demand Memorandum dated July 30 2018 and used in the Freyer and Laureta October 29, 2019 East Palo Alto sanitary District – University Phase II Development Memorandum. EDUs are then calculated based on typical residential household average day dry weather demand of 240 gallons per day (gpd) per EDU. The capacity fee per EDU is then applied to develop the project specific capacity fee. A credit is applied for existing retail and medical office uses on the site and for the total of deposits already provided to the District.

Existing Sanitary Sewer Demand Calculations

P12 The Average Dry Weather Flow (ADWF) for the existing sewer demand is calculated by taking the area of the existing building area and multiplying by a demand factor of 0.09 gpd per square foot (gpd/sf).

P13 Existing sanitary sewer demand is estimated to be approximately 1,035 gpd ADWF. This equates to 4.31 EDUs.

Proposed Sanitary Sewer Demand Calculation

P14 The ADWF sanitary sewer demand for the UPP2 buildings is calculated by taking the proposed building areas and multiplying by the appropriate demand factors. This includes 203,967 square feet of office space at a demand factor of 0.05 gpd/sf and 8,690 square feet of Community Flex Space at a demand factor of 0.09 gpd/sf.

P15 The proposed project sanitary sewer demand is estimated to be 10,980 gpd ADWF. This equates to 45.75 EDUs.

Project Sanitary Sewer Fee Calculation

P16 The proposed UPP2 project sanitary sewer capacity fee calculation is included as Table A included as an attachment to this memorandum.

P17 As outlined in the 2018 Bartle Wells Associated Wastewater Capacity Charge Update the identified capacity fee is $6,060 per EDU to, "Equitably [recover] costs based on the new or increased capacity needs of each new development or redevelopment project."

P18 **Based on this per EDU fee and the EDUs identified and allocated credits, the project sanitary sewer capacity fee is $224,410.**

ATTACHMENTS:

- Table A – University Plaza Phase 2 Project Sanitary Sewer Capacity Fee Calculations

TABLE A: UNIVERSITY PLAZA PHASE 2 PROJECT
SANITARY SEWER CAPACITY FEE

Proposed Use	Square Footage (SF)[1]	Demand Factor (gpd/SF)[2]	Average Dry Weather Flow (GPD)	EDU[3]	$/EDU[4]	Capacity Fee	Comment
PROPOSED PROJECT							
Office	203,967	0.05	10,198	42.49	$ 6,050	$ 257,084	
Community Flex Space	8,690	0.09	782	3.26	$ 6,050	$ 19,716	
Subtotal			**10,980**	**45.75**		**$ 276,800**	
EXISTING USES AND DEPOSIT CREDITS							
Office	-7,129	0.09	-642	-2.67	$ 6,050	$ (16,174)	Older Buildings, no water-saving fixtures
Medical Office	-4,366	0.09	-393	-1.64	$ 6,050	$ (9,906)	Older Buildings, no water-saving fixtures
Deposits						$ (26,310)	$15,000 + $11,310
Subtotal			**-1,035**	**-4.31**		**$ (52,390)**	
TOTAL			**12,015**	**41.44**		**$ 224,410**	

Table Notes:

1. Proposed building floor area based on project entitlements. Existing floor area based on actual building size and uses

2. Unit demands for proposed office use based on the East Palo Alto Sanitary District - University Phase II Development Memorandum dated October 29, 2019 Prepared by Freyer and Laureta for the East Palo Alto Sanitary District and Item 2 of the August 6, 2019 letter from the East Palo Alto Sanitary District regarding University Plaza Phase 2, East Palo Alto - Sewer System Hydraulic Modeling.

3. Capacity fee calculation is based on the Equivalent Dwelling Unit (EDU) methodology. Based on the East Palo Alto Sanitary District Wastewater Capacity Charge Updated dated December 2018 and prepared by Bartle Wells Associates 1 EDU = 240 gallons per day.

4. Based on the East Palo Alto Sanitary District Wastewater Capacity Charge Updated dated December 2018 and prepared by Bartle Wells Associates the capacity fee for 1 EDU = $6060.

Kennedy Jenks
Technical Memorandum re Review of Freyer & Laureta October 29, 2019 Draft Memorandum re University Plaza Phase II Development, dated January 13, 2020

Kennedy Jenks

13 January 2020

Technical Memorandum

To: Tim Steele

From: John H. Rayner PE

Subject: Review of F&L Oct 29 Draft Memorandum re University Phase II Development
KJ 1964020.00

Background

P19 The subject memo was written by Freyer & Laureta, engineers for East Palo Alto Sanitary District, to estimate the sewage generated by the proposed University Plaza Phase II Development, to be constructed on a 2.60 acre parcel in East Palo Alto, and estimate its impact on the District's collection system. The Development is proposed to have 231,883 square feet of office space. Using a sewage generation rate of 0.05 gallons per day (GPD) per square foot, the Development's average daily sewage flow is estimated to be 11,594 GPD. Based on the measured peak flow during wet weather at site E2, a sewer manhole downstream of the Development, a peaking factor of 5.8 is estimated for the Development.

P20 At its meeting on December 17, 2019, the EPA City Council approved the Development with its office space reduced to 212,657 square feet.

P21 The F&L memo then inserts the flow estimates for the Development into its hydraulic model of the EPASD collection system. The model results are shown graphically as hydraulic profiles on Figures 1,2 and 3 in the memo. Figure 1 shows average flow conditions. The hydraulic grade line shows the depth of sewage in sewers along the flow path, from the Development to the siphon under San Fransquito Creek. There are no problems shown under average flow conditions. Figure 2 shows the same sewers under peak flow conditions. The hydraulic grade line is now shown above the top of sewers, indicating that the sewers are flowing full and under low pressure because the level of sewage inside manholes has risen above the top of the sewers (the sewers are flowing surcharged). However, the hydraulic grade line is below the ground surface indicating there are no sanitary sewage overflows. Figure 3 shows what the hydraulic grade line would be if the first 4599' of 12" and 15"" sewers would be replaced with 20" sewers and the next 2,820' of 18" and 21" sewers would be replaced with 28" sewers. The cost of replacing these sewers is estimated to be $6,130,600 in the F&L memo.

Review

P22 The sewage generation from the University Plaza Phase II Development needs to be analyzed at 212,657 square feet of office space, approved by the City Council, instead of the initially proposed 231,883 square feet of office space.

P23 The use of a 5.8 peaking factor used in the F&L memo for the Development was calculated by dividing meter readings during peak wet weather flow (PWWF) by the average dry weather flow (ADWF) from a metering station downstream of the Development. The flows were measured as part of a 2011/2012 flow monitoring program cited in the F&L memo. The District's sewage flows increase significantly during wet weather as rainwater enters the sewers directly through inflow and indirectly from increased groundwater infiltration. Neither of these sources of additional sewage flow during wet weather are significant factors in new office building projects so the 5.8 peaking factor used for estimating the Development's impact on the collection system should be significantly lower (probably closer to 3.0). A higher peaking factor may be appropriate to use in analyzing the capacity of onsite sewers and those serving just the Development and a small local area but not for analyzing the overall collection system. In analyzing the hydraulics of collection systems, its standard practice to reduce peaking factors as the collection system receives additional flow from more sources.

P24 With only one exception, the sewer size increases proposed in the F&L memo are greater than those shown in the EPASD 2015 Master Plan by F&L. The proposed sewer size increases in the Master Plan are those required to increase sewer capacity to "... handle future flows". Unlike the F&L memo, the Master Plan does not show that sewers on Donohoe Street and Cooley Avenue need to be increased in size. The Master Plan (MP) does show that the other sewers listed in the F&L memo, from Green Street to the Trunkline manhole T16, will eventually need to be increased in size, however, the sizes differ from those in the F&L memo (Green and Clarke Streets:18" in MP and 20" in F&L memo; Beech Street to Pulgas Avenue: 24" in MP and 20" in F&L memo; Beech Street to Trunkline manhole T16: 24" in MP and 28" in F&L memo). The 2016 Sewer Trunkline Realignment project replaced the18" sewer on Beech Street between manhole I3 and T20 with a new 24" sewer. It's also noted that 1,522' of 21" sewers listed in the F&L memo as needing to be replaced with 28" sewers by the University Plaza Phase II Development, are the same sewers listed as needing to be replaced in the October 28th F&L Draft Memorandum for the Primary School project.

P25 The estimated sewer replacement cost of $6,130,600 in the F&L memo, is represented as a capacity fee for the Development which would far exceed the reasonable cost of providing service for just the Development. According to the California Government Code, a capacity fee must be proportional to the benefit of the property being served and the California Health and Safety Code states that special districts can only charge a property for its proportional share of the line. The sewer size increases proposed in both the F&L memo and the Master Plan are intended to convey flow from future buildout and are not solely necessary to convey sewage from just the Development. The capacity fee charged by EPASD needs to be consistent with these requirements.

P26 Once we have all the files required for the hydraulic model, we will run the model to evaluate the impact of the University Plaza Phase II Development on the District's collection system and to estimate its proportionate share of any upgrade costs.

BKF Engineers
Technical Memorandum re The Primary School – Sanitary Sewer Capacity Fee Calculation, dated January 13, 2020

January 13, 2020
BKF Job No.: C20150053

Mr. Akin Okupe, General Manager
East Palo Alto Sanitary District
901 Weeks Street
East Palo Alto, CA 94303

Transmitted Via Email: aokupe@epasd.com

Subject: The Primary School, East Palo Alto, CA
Sewer System Hydraulic Modeling
October 29, 2019 Freyer & Laureta Memorandum

Dear Mr. Okupe:

P27 Thank you for forwarding the sanitary sewer analysis memorandum titled, "East Palo Alto Sanitary District – 1200 Weeks Street Development," prepared by Freyer & Laureta, Inc and dated October 28, 2019. We have reviewed the memorandum and have several questions and comments outlined below.

P27 (1) 1. The project as approved by the East Palo Alto City Council includes maximum occupancies of 511 students and 70 staff.

P27 (2) 2. The calculation of peak hour demand is not industry standard and does not match the methodology used in the March 2015 East Palo Alto Sanitary District Master Plan Update prepared by Freyer & Laureta, Inc. Dividing the average day flow by the assumed operational hours is unnecessary and provides an overly conservative peaking factor. While one might consider this methodology for a single building or small campus it is not appropriate for a city wide sanitary sewer system where system peaks and time of use are already included as part of the flow monitoring complete to develop Master Plan Update. To apply this methodology universally would require a continuous simulation model instead of the static, peak flow model used.

An additional peaking factor of 3.88 was used in the model. As identified in the Master Plan Update, this peaking factor is for Peak Wet Weather Flow that includes the system diurnal peak and significant system rain water dependent inflow and infiltration. Since this new project will not contribute additional rain water dependent inflow and infiltration, the peaking factor should be reduced.

This overly conservative methodology may unduly show impact to district wide facilities, hampering future development in the City of East Palo Alto.

P27 (3) 3. The Memorandum makes reference to predicted SSO's, however, Figure 2 – Peak flow Hydraulic Grade Line shows available freeboard between the system hydraulic grade and existing ground even using the overly conservative peaking factors.

P27 (4) 4. The peak flow hydraulic grade line for the existing condition is not presented and there is not discussion of the existing surcharge condition during peak wet weather events.

P27 (5) 5. While this memorandum identifies that significant system improvements are required, these improvements are substantially the same improvements identified in the Master Plan Update.

P27 (6) 6. The Master Plan Update recommends a Capital Improvement Program. What is the status of the recommended Capital Improvement Program? Has timing been confirmed and funding identified?

P28 During our December 10, 2019 District meeting, you referenced the December 2018 Wastewater Capacity Charge Update prepared by Bartle Wells Associates. We understand that this document identifies a methodology to, "Equitably [recover] costs based on the new or increased capacity needs of each new development or redevelopment project." Implementing this methodology and fee structure to address system capacity is more appropriate than one off analysis of individual project. A sanitary sewer fee capacity calculation based on the Equivalent Dwelling Unit fees identified in the Wastewater Capacity Charge Update will be submitted separately.

P29 Please let us know if a meeting would be helpful to discuss these comments. We look forward to working your team to refine the modeling and better understand the project and cumulative impacts. Please contact me at 650.482.6458 if you have any questions regarding these comments.

Sincerely,
BKF Engineers

Ashley A. Stanley, PE, PLS, LEED® AP
Associate

cc:
Kamal Fallaha, City of East Palo Alto
Jennifer Von der Ahe, The Primary School
Jennifer Renk, Sheppard Mullin Richter & Hampton LLP
Courtney Garcia, The Primary School
Time Steele, The Sobrato Organization
Robert Tersini, The Sobrato Organzation
Tamsen Plume, Holland & Knight, LLP
Kevin Ashe, Holland & Knight, LLP
John Rayner, Kennedy Jenks
Sachi Itagaki, Kennedy Jenks
Carlos Castellanos, MidPen Housing Corp.
Ashley Stanley, BKF Engineers
Cole Gaumnitz, BKF Engineers

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ATTACHMENT A

MEMORANDUM

Date: January 13, 2020 **BKF Job Number: 20150053**

Deliver To: Akin Okupe, General Manager, East Palo Alto Sanitary District
Joan Sykes-Miessi, Vice President, Board of Directors
Dennis Scherzer, Director, Board of Directors

From: Ashley Stanley

Subject: The Primary School – Sanitary Sewer Capacity Fee Calculation

Purpose

P30 The purpose of this memorandum is to provide a summary of East Palo Alto Sanitary District (District) sanitary sewer capacity fee calculations associated with the Weeks Primary School (WPS) development.

Background

P31 The Primary School development encompasses approximately 2.60 acres in East Palo Alto, situated with Weeks Street to the north and Runnymede Street to the South. Weeks Street has an existing 6-inch sanitary sewer main that flows east toward a trunk line flowing south parallel to the Bay Trail.

P32 The site is currently undeveloped. The proposed development includes two buildings: a 2-story main school building with 61,000 SF of classroom, associated office, and community meeting space, and a one-story gymnasium with 11,000 SF of athletic, associated space, and a laundry room.

Methodology

P33 The sanitary sewer capacity fee is based on the Equivalent Dwelling Unit (EDU) methodology and adopted per EDU capacity fee identified in the December 2018 Wastewater Capacity Charge Update Study prepared by Bartle Wells Associates. The first step is to calculate the average daily and peak flows based on the unit demands presented in the Kennedy Jenks Technical Memorandum, dated January 2020. These unit demands are based on anticipated occupancy and characteristic wastewater generation rates found in the 2010 California Plumbing Code.

P34 Equivalent dwelling units are then calculated based on typical residential household average day dry weather demand of 240 gallons per day (gpd) per EDU. The capacity fee per EDU is then applied to develop the project specific capacity fee. A credit is applied for any existing uses on the site and for the total of deposits already provided to the District.

Existing Sanitary Sewer Demand Calculations

P35 The Average Dry Weather Flow (ADWF) for the existing sewer demand is calculated by taking the area of the existing building area and multiplying by a demand factor of 0.09 gpd per square foot (gpd/sf).

P36 As the site is currently undeveloped, there is no existing demand.

Proposed Sanitary Sewer Demand Calculation

P37 The average daily sanitary sewer demand for the Primary School buildings is calculated by taking the proposed occupancy of the school and gymnasium and multiplying by the appropriate demand factors. This includes 511 students at 15gpd/person and 70 staff at 20gpd/person.

P38 The proposed project sanitary sewer demand is estimated to be 9,065 gpd. This equates to 37.77 EDUs.

Project Sanitary Sewer Fee Calculation

P39 The proposed Primary School project sanitary sewer capacity fee calculation is included as Attachment A to this memorandum.

P40 As outlined in the 2018 Bartle Wells Associated Wastewater Capacity Charge Update the identified capacity fee is $6,060 per EDU to, "Equitable [recover] costs based on the new or increased capacity needs of each new development or redevelopment project." Based on this per EDU fee and the EDUs identified, the project sanitary sewer capacity fee is $228,494.

ATTACHMENTS:

- Attachment A – The Primary School Project Sanitary Sewer Capacity Fee Calculations

PRIMARY SCHOOL PROJECT
SANITARY SEWER CAPACITY FEE

Proposed Use	Occupancy (Persons)[1]	Wastewater flow (GPD)[2]	Average Flow (GPD)	EDU[3]	$/EDU[4]	Capacity Fee	Comment
PROPOSED PROJECT							
Students	511	15	7,665	31.94	$6,060	$193,222	
Staff	70	20	1,400	5.83	$6,060	$35,272	
Subtotal			**9,065**	**37.77**		**$ 228,494**	
EXISTING USES AND DEPOSITS CREDITS							
No Existing Uses	-	-	-	-	-	-	
Deposits	-	-	-	-	-	-	
Subtotal			-	-		-	
TOTAL			**9,065**	**37.77**		**$ 228,494**	

Table Notes:

1. Proposed building occupancy based on project entitlements.

2. Wastewater demands for proposed use based on the 2010 California Plumbing Code, cited in Technical Memorandum created by Kennedy Jenks

3. Capacity fee calculation is based on the Equivalent Dwelling Unit (EDU) methodology. Based on the East Palo Alto Sanitary District Wastewater Capacity Charge Updated dated December 2018 and prepared by Bartle Wells Associates 1 EDU = 240 gallons per day.

4. Based on the East Palo Alto Sanitary District Wastewater Capacity Charge Updated dated December 2018 and prepared by Bartle Wells Associates the capacity fee for 1 EDU = $6060.

Kennedy Jenks
Technical Memorandum re Review of Freyer & Laureta October 28, 2019 Draft Memorandum re 1200 Weeks Street Development, dated January 13, 2020

Kennedy Jenks

13 January 2020

Technical Memorandum

To: Jennifer Von der Ahe

From: John H. Rayner PE

Subject: Review of F&L Oct 28 Draft Memorandum re 1200 Weeks Street Development
KJ 1964020.00

Background

P41 The subject memo was written by Freyer & Laureta, engineers for East Palo Alto Sanitary District, to estimate the sewage generated by the proposed Primary School, to be constructed at 1200 Weeks Street in East Palo Alto. The memo estimates the school's average daily and peak sewage flows and its impact on the District's collection system. The memo estimates the total occupancy of the school as 224 people and uses a waste fixture unit count of 350 to estimate an average daily sewage flow of 49,755 gallons per day (GPD) and a peak instantaneous flow of 193,080 GPD.

P42 The memo then inserts the flow estimates for the Primary School into a hydraulic model of the EPASD collection system. The model results are shown graphically as hydraulic profiles on Figures 1,2 and 3 in the memo. Figure 1 shows average flow conditions. The hydraulic grade line shows the depth of sewage in sewers along the flow path, from the Primary School to the siphon under San Fransquito Creek. There are no problems shown under average flow conditions. Figure 2 shows the same sewers under peak flow conditions. The hydraulic grade line is now shown slightly above the top of sewers, indicating that the sewers are flowing full and under low pressure because the level of sewage inside manholes has risen above the top of the sewers (the sewers are flowing surcharged) but the hydraulic grade line is still well below the ground surface indicating there are no sanitary sewage overflows. Figure 3 shows what the hydraulic grade line would be if the first 477' of 6" sewer, near the school, would be replaced with a 10" sewer and the next 3,434' of 18" and 24" sewers would be replaced with 28" sewers. The cost of replacing these sewers is estimated to be $4,086,600 in the F&L memo.

Review

P43 The method used in the F&L memo for estimating average daily flow was to use 95% of the water supply requirements found in the plumbing code for the 350 waste fixture units at the school. Waste fixture units are used to ensure that water supply pipelines are sized properly. The plumbing code does <u>not</u> use waste fixture units to estimate sewage generation. Instead the

2010 California Plumbing Code uses the enclosed Table K-3 to estimate sewage generation for a variety of building uses. Sewage generation estimates for elementary students are listed in the Code as 15 GPD/student and 20 GPD/person for staff.

P44 We reviewed with the occupancy of the school with the architect who confirmed that the planning documents and conditions of approval from the City of East Palo Alto list occupancy as 511 students plus 70 staff. This is significantly greater than the total occupancy of 224 estimated in F&L's memo. Applying the higher occupancy to the sewage generation rates in the 2010 California Plumbing Code yields an average sewage generation rate of 9,065 GPD. Allowing for part-time staff, parents' meetings, occasional use of the gym by others and other miscellaneous uses, the estimated sewage generation for the Primary School should not exceed 10,000 GPD. This is about 20% of F&L's estimate, using waste fixture units, of 49,755 GPD.

P45 Except for the Weeks Street sewer between manholes F7 and T25, the sewer size increases proposed in the F&L memo are greater than those shown in the EPASD 2015 Master Plan by F&L. The proposed sewer size increases in the Master Plan are those required to increase sewer capacity to "... handle future flows". The Master Plan shows that the 3,434' of Trunkline between manholes T25 and T16 needs to be replaced with 24" sewers, instead of 28" sewers as in the F&L memo. The 2016 Sewer Trunkline Realignment project recently replaced about 600' of this same section of Trunkline with new 24" sewer, not 28" sewer. It's also noted that 1522' of 21" sewers listed in the F&L memo as needing to be replaced with 28" sewers by the Primary School project, are the same sewers listed as needing to be replaced in the October 29th F&L Draft Memorandum for the University Plaza Phase II Development.

P46 The estimated sewer replacement cost of $4,086,600 in the F&L memo, is represented as a capacity fee for the Primary School which would far exceed the reasonable cost of providing service for just the School. According to the California Government Code, a capacity fee must be proportional to the benefit of the property being served and the California Health and Safety Code states that special districts can only charge a property for its proportional share of the line. The sewer size increases proposed in both the F&L memo and the Master Plan are intended to convey flow from future buildout and are not solely necessary to convey sewage from just the Primary School. The capacity fee charged by EPASD needs to be consistent with these requirements.

P47 Based on our analysis, the hydraulic model of the EPASD collection system should be reanalyzed using the lower average daily flow of 10,000 GPD for the Primary School. Once we have all the files required for the hydraulic model, we will use the lower sewage generation rate

for the Primary School to reevaluate its impact on the District's collection system and to estimate its proportionate share of any upgrade costs.

Enclosure: 2010 California Plumbing Code, pages 464 & 465

APPENDIX K
PRIVATE SEWAGE DISPOSAL SYSTEMS

K 1.0 Private Sewage Disposal – General.

A. Where permitted by Section 713.0, the building sewer shall be permitted to be connected to a private sewage disposal system complying with the provisions of this appendix. The type of system shall be determined on the basis of location, soil porosity, and groundwater level, and shall be designed to receive all sewage from the property. The system, except as otherwise approved, shall consist of a septic tank with effluent discharging into a subsurface disposal field, into one (1) or more seepage pits, or into a combination of subsurface disposal field and seepage pits. The Authority Having Jurisdiction shall be permitted to grant exceptions to the provisions of this appendix for permitted structures that have been destroyed due to fire or natural disaster and that cannot be reconstructed in compliance with these provisions provided that such exceptions are the minimum necessary.

B. Where the quantity or quality of the sewage is such that the above system cannot be expected to function satisfactorily for commercial, agricultural, and industrial plumbing systems; for installations where appreciable amounts of industrial or indigestible wastes are produced; for occupancies producing abnormal quantities of sewage or liquid waste; or when grease interceptors are required by other parts of this code, the method of sewage treatment and disposal shall be first approved by the Authority Having Jurisdiction, Special sewage disposal systems for minor, limited, or temporary uses shall be first approved by the Authority Having Jurisdiction.

C. Disposal systems shall be designed to utilize the most porous or absorptive portions of the soil formation. Where the groundwater level extends to within twelve (12) feet (3,658 mm) or less of the ground surface or where the upper soil is porous and the underlying stratum is rock or impervious soil, a septic tank and disposal field system shall be installed.

D. Disposal systems shall be located outside of flood hazard areas.
Exception: Where suitable sites outside of flood hazard areas are not available, disposal systems shall be permitted to be located in flood hazard areas on sites where the effects of inundation under conditions of the design flood are minimized.

E. All private sewage disposal systems shall be so designed that additional seepage pits or subsurface drain fields, equivalent to not less than one-hundred (100) percent of the required original system, shall be permitted to be installed where the original system cannot absorb all the sewage. No division of the lot or erection of structures on the lot shall be made if such division or structure impairs the usefulness of the one-hundred (100) percent expansion area.

F. No property shall be improved in excess of its capacity to properly absorb sewage effluent by the means provided in this code.
Exception: The Authority Having Jurisdiction shall be permitted to, at its discretion, approve an alternate system.

G. No private sewage disposal system, or part thereof, shall be located in any lot other than the lot that is the site of the building or structure served by such private sewage disposal system, nor shall any private sewage disposal system or part thereof be located at any point having less than the minimum distances indicated in Table K-1.
Nothing contained in this code shall be construed to prohibit the use of all or part of an abutting lot to provide additional space for a private sewage disposal system or part thereof when proper cause, transfer of ownership, or change of boundary not in violation of other requirements has been first established to the satisfaction of the Authority Having Jurisdiction. The instrument recording such action shall constitute an agreement with the Authority Having Jurisdiction, which shall clearly state and show that the areas so joined or used shall be maintained as a unit during the time they are so used. Such agreement shall be recorded in the office of the County Recorder as part of the conditions of ownership of said properties and shall be binding on all heirs, successors, and assigns to such properties. A copy of the instrument recording such proceedings shall be filed with the Authority Having Jurisdiction.

H. When there is insufficient lot area or improper soil conditions for adequate sewage disposal for the building or land use proposed, and the Authority Having Jurisdiction so finds, no building permit shall be issued and no private sewage disposal shall be permitted. Where space or soil conditions are critical, no building permit shall be issued until engineering data and test reports satisfactory to the Authority Having Jurisdiction have been submitted and approved.

I. Nothing contained in this appendix shall be construed to prevent the Authority Having Jurisdiction from requiring compliance with additional requirements than those contained herein, where such additional requirements are essential to maintain a safe and sanitary condition.

J. Alternate systems shall be permitted to be used only by special permission of the Authority Having Jurisdiction after being satisfied of their adequacy. This authorization is based on extensive field and test data from conditions similar to those at the proposed site, or require such additional data as necessary to provide assurance that the alternate system will produce continuous and long-range results at the proposed site, not less than equivalent to systems which are specifically authorized.

If demonstration systems are to be considered for installation, conditions for installation, maintenance, and monitoring at each such site shall first be established by the Authority Having Jurisdiction.

Approved aerobic systems shall be permitted to be substituted for conventional septic tanks provided the Authority Having Jurisdiction is satisfied that such systems will produce results not less than equivalent to septic tanks, whether their aeration systems are operating or not.

K 2.0 Capacity of Septic Tanks.

The liquid capacity of all septic tanks shall conform to Tables K-2 and K-3 as determined by the number of bedrooms or apartment units in dwelling occupancies and the estimated waste/sewage design flow rate or the number of plumbing fixture units as determined from Table 7-3 of this Code, whichever is greater in other building occupancies. The capacity of any one (1) septic tank and its drainage system shall be limited by the soil structure classification, as specified in Table K-4.

K 3.0 Area of Disposal Fields and Seepage Pits.

The minimum effective absorption area in disposal fields in square feet (m^2), and in seepage pits in square feet (m^2) of sidewall, shall be predicated on the required septic tank capacity in gallons (liters) and/or estimated waste/sewage flow rate, whichever is greater, and shall conform to Table K-4 as determined for the type of soil found in the excavation, and shall be as follows:

1. When disposal fields are installed, a minimum of one-hundred and fifty (150) square feet (14 m^2) of trench bottom shall be provided for each system exclusive of any hard pan, rock, clay, or other impervious formations. Sidewall area in excess of the required twelve (12) inches (305 mm) and a maximum of thirty-six (36) inches (914 mm) below the leach line shall be permitted to be added to the trench bottom area when computing absorption areas.
2. Where leaching beds are permitted in lieu of trenches, the area of each such bed shall be not less than fifty (50) percent greater than the tabular requirements for trenches. Perimeter sidewall area in excess of the required twelve (12) inches (305 mm) and a maximum of thirty-six (36) inches (914 mm) below the leach line shall be permitted to be added to the trench bottom area when computing absorption areas.
3. No excavation for a leach line or leach bed shall be located within five (5) feet (1,524 mm) of the water table nor to a depth where sewage may contaminate the underground water stratum that is usable for domestic purposes.

   Exception: In areas where the records or data indicate that the groundwaters are grossly degraded, the five (5) foot (1,524 mm) separation requirement shall be permitted to be reduced by the Authority Having Jurisdiction. The applicant shall supply evidence of groundwater depth to the satisfaction of the Authority Having Jurisdiction.
4. The minimum effective absorption area in any seepage pit shall be calculated as the excavated sidewall area below the inlet exclusive of any hardpan, rock, clay, or other impervious formations. The minimum required area of porous formation shall be provided in one (1) or more seepage pits. No excavation shall extend within ten (10) feet (3,048 mm) of the water table not to a depth where sewage contaminate underground water stratum that is usable for domestic purposes.

   Exception: In areas where the records or data indicate that the groundwaters are grossly degraded, the ten (10) foot (3,048 mm) separation requirement shall be permitted to be reduced by the Authority Having Jurisdiction.

   The applicant shall supply evidence of groundwater depth to the satisfaction of the Authority Having Jurisdiction.
5. Leaching chambers shall be sized on the bottom absorption area (nominal unit width) in square feet. The required area shall be calculated using Table K-4 with a 0.70 multiplier.

K 4.0 Percolation Test.

A. Wherever practicable, disposal field and seepage pit sizes shall be computed from Table K-4. Seepage pit sizes shall be computed by percolation tests, unless use of Table K-4 is approved by the Authority Having Jurisdiction.
B. In order to determine the absorption qualities of seepage pits and of questionable soils other than those listed in Table K-4, the proposed site shall be subjected to percolation tests acceptable to the Authority Having Jurisdiction.
C. When a percolation test is required, no private disposal system shall be permitted to serve a building if that test shows the absorption capacity of the soil is less than 0.83 gallons per square foot (33.8 L/m^2) or more than 5.12 gallons per square foot (208 L/m^2) of leaching area per 24 hours. If the percolation tests shows an absorption rate greater than 5.12 gallons per square foot (208 L/m^2) per 24 hours, a private disposal system shall be permitted if the site does not overlie groundwaters protected for drinking water supplies, a minimum thickness of two (2) feet (610 mm) of the native soil below the entire proposed system is replaced by loamy sand, and the system design is based on percolation tests made in the loamy sand.

K 5.0 Septic Tank Construction.

A. Plans for all septic tanks shall be submitted to the Authority Having Jurisdiction for approval. Such plans shall show all dimensions, reinforcing, structural calculations, and such other pertinent data as required.
B. Septic tank design shall be such as to produce a clarified effluent consistent with accepted standards and shall provide adequate space for sludge and scum accumulations.
C. Septic tanks shall be constructed of solid durable materials not subject to excessive corrosion or decay and shall be watertight.

EXECUTIVE SUMMARY

This Master Plan Update project was undertaken by the East Palo Alto Sanitary District (District) to assess the impact that future development within the City of East Palo Alto (City) will have on the District's collection system.

System Characteristics

The District is responsible for the operation and maintenance of the sanitary sewer collection system that serves most of East Palo Alto and a portion of Menlo Park, as shown in Figure 1. The District's collection system is a gravity system. Approximately 70% of the pipelines are 6" in diameter. The larger collector lines range between 8" and 21". The trunk line running from the District to the Palo Alto Regional Water Quality Control Plant (RWQCP) is 24" in diameter and contains a siphon beneath San Fransquito Creek. The District has an agreement with the RWQCP, which entitles the District to 7.17% of the dry weather capacity of the RWQCP, approximately 2.7 MGD.

Anticipated Development

The City is anticipating significant redevelopment within the city. Zoning changes are listed in the East Palo Alto 1999 General Plan, and major areas of redevelopment are described in August 2000 Preliminary Draft of the East Palo Alto Revitalization Plan. Other specific development plans have been submitted to the District for review, and some are currently under construction. The major areas within the District identified for redevelopment include:

1. University Circle
2. Ravenswood 101 (Gateway 101)
3. Ravenswood Villages (University Square)
4. Ravenswood Business Park
5. University Avenue Corridor
6. Four Corners/Bay Road
7. Weeks Neighborhood

Mathematical Model

A mathematical model of the District's collection system was developed using the computer software program called HYDRA to assess the impact of this development. HYDRA uses Manning's equation to calculate the flow, capacity, and the hydraulic profile for modeled pipelines. District pipelines that are within or downstream of redevelopment areas were included in the model. A manhole survey of the District using GPS was performed to provide the structural input for the model. Both wet and dry weather flow monitoring were conducted in 2000-2001 to generate data used to calibrate the model.

District Flows

Present flows and flows from two future buildout scenarios were modeled. One future scenario uses flows based on the zoning and density requirements that are described in the August 1999 General Plan. The second future scenario incorporates the planned revitalization of four areas within the City as described in the August 2000 Preliminary Draft of the East Palo Alto Revitalization Plan. The Revitalization Plan proposes development that exceeds the limits set forth in the General Plan, therefore could result in even more wastewater flow than what would

result in development per the General Plan. Total District flows for each development scenario are summarized in Table ES-1.

Table ES-1. Estimated District Flows

Model Scenario	Estimated District Flow
Present	
2001 ADWF	1.7 MGD
2001 PDWF	3.5 MGD
2001 PWWF	5.0 MGD
Future General Plan	
Future ADWF	3.3 MGD
Future PDWF	6.4 MGD
Future PWWF	7.8 MGD
Future Revitalization	
Revitalization ADWF	4.3 MGD
Revitalization PDWF	8.5 MGD
Revitalization PWWF	9.9 MGD

ADWF – Average Dry Weather Flow
MGD – Million Gallons per Day
PDWF – Peak Dry Weather Flow
PWWF – Peak Wet Weather Flow

Model Results

For each development scenario, three flow scenarios were run: average dry weather flow, peak dry weather flow, and peak wet weather flow. The system capacity was evaluated on its ability to accommodate peak wet weather flows. The following is a summary of the results of the modeling:

1. Under the present (2001) flow scenarios, the capacity of the existing pipelines is adequate to handle the peak wet weather flows.

2. A large portion of the collection system is at capacity now, and future buildout flows will overwhelm many of the larger mains in existing system. Over half of the pipelines included in the model were listed as overcapacity during peak wet weather flow scenarios, as shown in Figure 11 – Overcapacity Pipelines at General Plan Buildout and Figure 12 – Overcapacity Pipelines at Revitalization Plan Buildout.

3. The predicted average dry weather flow for both future buildout scenarios exceeds the 2.7 MGD capacity allotment from the RWQCP.

4. Existing pipelines and manholes have settled over time, and some of the pipelines have flat or reverse slopes.

5. The slopes of the District's pipelines are relatively flat, and often less than 0.001. As a result, calculated velocities at average dry weather flow for both the present and future scenarios were often less than 2.0 feet per second (fps). The calculated velocities indicate that the District may have a problem with blockages in the collection system due to the settling out of solids in the flow. In fact, EPASD maintenance crews are required to frequently flush sewer pipelines throughout the District to prevent blockages.

6. The siphon under San Fransquito Creek causes surcharging in the pipeline in O'Connor Street directly upstream of the siphon (manholes T15 to T14) during both present and future peak flows. EPASD maintenance crews have verified the occurrence of surcharging in this pipeline. Additionally, grease gets trapped in the pipelines just upstream of the siphon requiring frequent routine maintenance.

Recommended Improvement Projects

Improvement projects were developed to accommodate future flows for the two future development scenarios. Base projects consisting of pipeline replacement in the same alignment were developed for overcapacity pipelines. Where applicable, alternatives to the base project were developed taking into account potential pipeline realignment, flow diversion out of the District, and the addition of a pump station. The base projects and alternative projects were compared to identify the most effective plan for upgrading the current collection system to meet future flow demands. The alternative comparison is presented in Table ES-2.

Estimated improvement project costs are anticipated to be $10 million to $12 million. Table ES-3 includes a list of the specific recommended improvement projects needed to accommodate peak wet weather flows at full buildout of the General Plan. Table ES-4 includes a list of the specific projects needed to accommodate the peak wet weather flows at full buildout of the Revitalization Plan. These recommended improvement projects are shown in Figures 17 and 18 for each development scenario, respectively.

Project Priorities

The recommended improvements were developed to accommodate future peak wet weather flows for the full buildout development scenarios. It is likely that development will be phased over the next 10 years or more. Therefore, not all of the recommended improvement projects will need to be constructed immediately. The improvement projects were prioritized based on expected development phasing. Projects included in Priority 1 will be required to accommodate the planned development at University Circle and along University Avenue. Priority 1 projects include pipelines located in the following streets:

- Donohoe St. between Euclid Ave. and Cooley Ave.
- Cooley Ave. between Donohoe St. and Green St.
- Green St. between Cooley Ave. and Clarke Ave.
- Clarke Ave. between Green St. and Beech St.
- Beech St. from Clarke Ave. to the eastern end Beech St.

In addition, further study of the alternatives for trunkline improvements from the siphon to the RWQCP is a Priority 1 project.

Priority 2 projects will be required to accommodate future flows from some of the Revitalization Areas, to address the portion of the main located in contaminated soil, and well as to accommodate the development from Ravenswood Villages and the redevelopment south of Highway 101. Priority 2 projects include pipelines located in the following streets:

- Trunkline construction from the siphon to the RWQCP

- Reroute trunkline (MH A29 to T21) outside area of contamination
- O'Connor Street east of Pulgas Ave.
- Pulgas Ave. between East Bayshore Rd. and O'Connor St.
- Trunkline between MH T23 and Siphon

Improvement projects not included in either priority 1 or 2 should be constructed as necessary to accommodate flows from future development.

Summary of Recommendations

1. Develop a preliminary plan for accommodating increased flows and revise the District's connection fees accordingly.

2. Closely monitor future development and implement recommended improvements as they become necessary.

3. Initiate discussions with the RWQCP for additional capacity.

4. Study alternatives for increasing the capacity of the trunkline from the siphon to the RWQCP. A recommended alternative was not selected because the following issues require further investigation before an improvement project can be selected:
   - Condition of existing siphon and trunkline.
   - Environmental compliance: construction in environmentally sensitive areas will trigger an Initial Study and maybe an EIR.
   - Easement conditions.

   Because of its length and location, any improvements to the trunkline will be very costly.

5. The total flow from the District is currently reported by the RWQCP. The method used to calculate the District flow is unclear. It may be calculated as the difference between the total flow to the RWQCP and sum of the metered flow from the RWQCP's other customers or measured by the Parshall flume currently installed between manholes M5 and M6. It is recommended that the District install and maintain a trunkline flow meter that can be used to track future District flows.

6. Reduce inflow and infiltration into the system. I/I reduction will be achieved to some extent by replacing existing pipelines. However, the majority of the I/I is from service laterals. It is recommended that the District require that service laterals be replaced when the pipeline to which they connect is replaced.

Chapter 7 Result Summary

Chapter 7.1 - Observations

The following is a summary of general observations about the results of the model:

1. Under the present flow scenarios, the capacity of the existing pipelines is adequate to handle current peak wet weather flows.

2. A large portion of the collection system, including the trunkline to the RWQCP, is at capacity now, and future buildout flows will overwhelm many of the mains in the existing system. Many of the pipelines included in the model were listed as overcapacity during peak wet weather flow scenarios. The dry weather flow capacity of the RWQCP is 38 MGD. The District has an agreement with the RWQCP, which entitles the District to 7.63% of the dry weather capacity of the RWQCP, approximately 2.9 MGD. The predicted average dry weather flow for both future buildout scenarios exceeds the capacity allotment from the RWQCP.

3. Some pipes may be relatively flat due to settlement

4. The slopes of the District's pipelines are relatively flat. As a result, calculated velocities at average dry weather flow for both the present and future scenarios were often low. The ideal minimum velocity of sewage flows in a gravity pipeline is 2.0 fps to prevent settling of the solids out of the flow. The calculated velocities indicate that the District may have a problem with blockages in the collection system due to the settling out of solids in the flow. In fact, EPASD maintenance crews are required to frequently clean sewer pipelines throughout the District to prevent blockages.

5. The siphon under San Francisquito Creek causes surcharging during both present and future peak flows. EPASD maintenance crews have verified the occurrence of surcharging in this pipeline. Additionally, grease gets trapped in the pipelines just upstream of the siphon requiring frequent routine maintenance.