Vallecitos Water District Water and Wastewater Capital Facility Fees

Final Draft Report

EXECUTIVE SUMMARY

Vallecitos Water District (District) last updated their Water and Wastewater Capital Facility Fees in November 2011 based on their then newly adopted 2008 Master Plan. The 2011 Capital Facility Fee Nexus Study was prepared by Atkins. A copy of this original Study is included in Appendix A to this report for reference purposes. That Study also prepared a Wastewater Density Impact Fee to address changes in General Plan land use designations within the County and the City of San Marcos (densification) that were not included in the wastewater portion of the 2008 Master Plan. The primary driver of this was due to additional treatment capacity needed by the District to accommodate new sewer connections beyond what the 2008 Master Plan anticipated.

In October 2018 the District completed a new Water, Wastewater, and Recycled Water Master Plan which provides the basis for updating their Water and Wastewater Capital Facility Fees. The 2018 Master Plan was adopted by the District's Board on May 1. 2019. The new Master Plan includes the latest land use revisions from the County and City of San Marcos for both water and wastewater future needs.

The purpose of this report is to provide a technical explanation of the District's update to its Water and Wastewater Capital Facility Fees based on this recently adopted 2018 Master Plan. The list of capital improvement projects included in the 2018 Master Plan, which forms the basis of the fees, is unchanged, but includes updated timing and costs between the 2008 and 2018 Master Plans. The only addition to the capital Improvement projects included in the fee are projects recently identified by Encina, which is the regional wastewater treatment facility serving North San Diego County and of which the District is a member. With the updated wastewater land use designations, the need for the Wastewater Density Impact Fee discussed in the 2011 Capital Facility Fee Nexus Study has been eliminated. The economic model uses the same fee calculation methodology as contained in the 2011 Capital Facility Fee Nexus Study, which is the incremental or growth methodology as discussed later in this report.

Water and wastewater Capital Facility Fees are one-time fees levied to recover the costs of facilities needed to provide utility service to new connections to the District's water and wastewater systems. These charges are typically collected at the time of development but may also be recovered for expansion of service to existing connections, such as when an existing customer requires a larger water meter or there is an expansion of existing users. Revenues generated through Capital Facility Fees are used to directly offset system expansion costs and repay costs incurred to finance system expansions or improvements. Table 1 summarizes the current Water and Wastewater Capital Facility Fees currently charged to new development and the proposed 2019 updated fees.

	Current 2019 Fee	Updated 2019 Fee
Water Capital Facility Fee	$7,756	$7,896
Wastewater Capital Facility Fee	$9,963	$12,986
TOTAL CAP FEES	$17,719	$20,882

CAPITAL FACILITY FEE BACKGROUND

In conformance with California law, a local agency may require new developments to mitigate their impacts and construct or pay their fair share of the capital facilities needed to provide service which includes District Capital Improvement Projects (CIP) identified in the Master Plan. Capital Facility Fees are calculated based on the proportionate share of the estimated present value of construction costs for future capital facilities included in the 2018 Master Plan and the present value of financing costs for these facilities based on reasonable financing assumptions that are associated with serving new development. In other words, all components of the Capital Facility Fees are brought to 2019 dollars.

Revenues generated through Capital Facility Fees are used to directly offset expansion CIP costs and to repay cost incurred to finance system expansions that benefits new development, in accordance with the proportionate share for new development. The District bases its Capital Facility Fees on the growth or incremental methodology. The growth methodology is a common approach for establishing capital facility fees. The approach is based on the cost of future capital facilities required to reasonably accommodate planned growth plus the cost to finance these facilities. This cost is allocated to the new growth that is to be served by the facilities based on projected equivalent dwelling units (EDUs). Under this approach, new customers and existing customers with increased demands pay for the incremental investment necessary for system expansion.

The basic equation for the growth methodology is:

$$\frac{\text{Growth CIP Asset Values} + \text{Financing Costs}}{\text{Projected Growth in Equivalent Dwelling Units}}$$

CAPITAL FACILITY FEE CALCULATION

The District is essentially using an updated economic model created by staff to determine their Capital Facility Fees. This economic model is based on the one prepared by Atkins during the 2008 Master Plan cycle with some changes. These changes update current interest rates for debt financing and timing on the District's capital facility needs to serve expansion. The list of Capital projects included in the 2018 Master Plan, which forms the basis of the fee, is unchanged, but includes updated timing and costs between the 2008 and 2018 Master Plans. The only addition to the capital projects included in the fee are two (2) projects recently identified for the Encina Water Pollution Control Facility, which is the regional wastewater treatment facility serving North San Diego County and of which the District is a

member. The economic model uses the same fee calculation methodology as contained in the 2011 Nexus Study completed by Atkins, which is the incremental or growth methodology as discussed earlier.

The Water and Wastewater Capital Facility Fees each have four major components as shown in Table 2 for water and Table 3 for wastewater. These components are the capital facilities identified as expansion related projects in the Master Plan (CIP), the financing costs of these future facilities with an adjustment to bring the financing costs to present value, the remaining portion of existing debt used to fund expansion CIP, and an adjustment for the capital expansion fund shortfall.

Certain growth assets are being developed not only to serve new development, but also to provide capacity for existing development where there is currently a system deficiency. Only the expansion portion of CIP projects identified in the 2018 Master Plan that will serve new development were included in the Capital Facility Fee determination. In addition, CIPs that would be development-specific and therefore would not provide a regional benefit will be constructed by individual developers. These development-specific projects were removed from the Capital Facility Fee determination process as well.

Table 2: Water Capital Facility Fee Calculation

Water Capital Facility Fee Calculation			
	Growth Shortfall	Capital / Debt	TOTAL
CIP		$ 21,239,747	$ 21,239,747
Financing costs		22,721,194	22,721,194
PV discount		(13,131,953)	(13,131,953)
Existing Growth Debt		29,059,565	29,059,565
Existing Growth Shortfall	9,161,412		9,161,412
Ttl Revenue Requiremt (PV)	$ 9,161,412	$ 59,888,552	$ 69,049,964
EDUs	8,400	8,800	
Water Capacity Fee	**$ 1,091**	**$ 6,806**	**$ 7,896**

Table 3: Wastewater Capital Facility Fee Calculation

Wastewater Capital Facility Fee Calculation			
	Pipeline/ EWA	Treatmt/ Outfall	Total
CIP	$ 16,887,713	$ 31,832,821	$ 48,720,534
Financing costs	15,548,030	30,106,460	45,654,489
PV discount	(9,439,696)	(18,563,208)	(28,002,905)
Existing Growth Debt	35,886,965	-	35,886,965
Existing Growth Shortfall	6,820,636	-	6,820,636
Ttl Revenue Requiremt (PV)	$ 65,703,646	$ 43,376,073	$ 109,079,719
EDUs	8,400	8,400	
Wastewater Capacity Fee	**$ 7,822**	**$ 5,164**	**$ 12,986**

The four components are defined as follows:

1. *Capital Improvement Plan (CIP)*

Water Expansion CIP

The 2018 Master Plan identified a total water CIP of $112,100,000 divided into water storage, pipeline, and pumping projects in five timing phases. Phase I includes the capital facilities needed from 2015 to 2020 and then each successive phase includes CIP projects in five year increments after that as shown in Table 4 for water and Table 5 for wastewater. On a project by project basis the District separated the expansion contribution from the replacement contribution for each project for a total of $21,239,747 in expansion contribution for the projects as shown in Table 4. Please note that only Phase 1 to 4 of water expansion projects were included in the water Capital Facility Fee. Phase 5 projects are less certain, and timing of those projects are more subjective.

The following is a listing of the water CIP projects that are included in the Water Capital Facility Fee determination. This listing describes the allocation of the expansion-only portion of the CIP project if an existing facility is being replaced and upsized for expansion at the same time, and/or if the CIP project is addressing an existing capacity deficiency. As stated above, Phase 5 water CIP projects have been excluded from the Water Capital Facility Fee calculation.

CIP R-1 – Meadowlark Tank #3

The District's in-zone water supply and storage criteria, as discussed in Chapter 3 of its 2018 Master Plan, requires that each primary zone contain a minimum 4.5 times the zone's average daily demand (ADD) in operational and emergency storage, plus a fire storage (typically 0.30 MG). The existing ADD of the Meadowlark primary zone is 1.20 MG per Chapter 5 of the 2018 Master Plan, which leads to a storage requirement of 5.69 MG (1.20 MG * 4.5 + 0.30 MG). However, only 4.00 MG of storage currently exists in the zone (Meadowlark Tank #1 has a capacity of 1.30 MG and Meadowlark Tank #2 has a capacity of 2.70 MG), meaning that a storage deficit of 1.69 MG (5.69 MG – 4.00 MG) exists.

The Meadowlark Tank #3 will add 2.47 MG of storage to the Meadowlark primary zone. This will be a Phase 1 project. 1.69 MG of the 2.47 MG of additional storage provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 0.78 MG (2.47 MG – 1.69 MG) will be available for future expansion, which represents 32% (0.78 MG / 2.47 MG * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for the Meadowlark Tank #3 at $3,400,000. With 32% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Water Capital Facility Fee determination is $1,088,000 ($3,400,000 * 32%).

CIP R-3 – Coronado Hills Tank #2

The District's in-zone water supply and storage criteria, as discussed in Chapter 3 of its 2018 Master Plan, requires that each primary zone contain a minimum 4.5 times the zone's average daily demand (ADD) in operational and emergency storage, plus a fire storage (typically 0.30 MG). The existing

ADD of the Coronado Hills primary zone is 0.25 MG per Chapter 5 of the 2018 Master Plan, which leads to a storage requirement of 1.42 MG (0.25 MG * 4.5 + 0.30 MG). 2.60 MG of storage currently exists in the zone (Coronado Hills Tank #1 has a capacity of 2.60 MG).

The Coronado Hills Tank #2 will add another 2.60 MG of storage to the Coronado Hills primary zone. This will be a Phase 2 project. A capacity deficit does not currently exist in this primary zone since the Coronado Hills Tank #1 capacity of 2.60 MG exceeds the storage requirement of 1.42 MG. Therefore, the entire 2.60 MG capacity of the Coronado Hills Tank #2 will be available for future expansion.

The 2018 Master Plan estimated the total cost for the Coronado Hills Tank #2 at $3,600,000. With 100% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Water Capital Facility Fee determination is $3,600,000.

CIP R-4 – Deer Springs Tank #2

The District's in-zone water supply and storage criteria, as discussed in Chapter 3 of its 2018 Master Plan, requires that each primary zone contain a minimum 4.5 times the zone's average daily demand (ADD) in operational and emergency storage, plus a fire storage (typically 0.30 MG). The existing ADD of the Deer Springs and Wulff primary zones, which the project would serve, is 0.31 MG per Chapter 5 of the 2018 Master Plan. This leads to a storage requirement of 1.98 MG (0.31 MG * 4.5 + 2 * 0.30 MG). However, only 0.92 MG of storage currently exists in the combined Deer Springs and Wulff pressure zones (Deer Springs Tank #1 has a capacity of 0.57 MG and Wulff Tank #2 has a capacity of 0.35 MG), meaning that a storage deficit of 1.06 MG (1.98 MG – 0.92 MG) exists.

The Deer Springs Tank #2 will add 1.00 MG of storage to the Deer Springs primary zone. This will be a Phase 2 project. The project will also demolish the existing 0.57 MG Deer Springs Tank #1. Therefore, only 0.43 MG (1.00 MG – 0.57 MG) of net additional storage is being added. And since the existing storage deficit of 1.06 MG is greater than the net additional storage of 0.43 MG that the project will provide, 100% of the additional storage provided by this project will be allocated to mitigate the existing capacity deficit, and 0% will be available for future expansion.

The 2018 Master Plan estimated the total cost for the Deer Springs Tank #2 at $1,400,000. With 0% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Water Capital Facility Fee determination is $0.

CIP R-5 – Coggan Tank #2

The District's in-zone water supply and storage criteria, as discussed in Chapter 3 of its 2018 Master Plan, requires that each primary zone contain a minimum 4.5 times the zone's average daily demand (ADD) in operational and emergency storage, plus a fire storage (typically 0.30 MG). The existing ADD of the Coggan primary zone is 0.22 MG per Chapter 5 of the 2018 Master Plan, which leads to a storage requirement of 1.31 MG (0.22 MG * 4.5 + 0.30 MG). However, only 1.30 MG of storage currently exists in the zone (Coggan Tank #1 has a capacity of 1.30 MG), meaning that a storage deficit of 0.01 MG (1.31 MG – 1.30 MG) exists.

The Coggan Tank #2 will add 6.00 MG of storage to the Coggan primary zone. This will be a Phase 3 project. The project will also demolish the existing 1.30 MG Coggan Tank #1. Therefore, only 4.70

MG (6.00 MG – 1.30 MG) of net additional storage is being added. 0.01 MG of the 4.70 MG of additional storage provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 4.69 MG (4.70 MG – 0.01 MG) will be available for future expansion, which represents 78% (4.69 MG / 6.00 MG * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for the Coggan Tank #2 at $8,300,000. With 78% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Water Capital Facility Fee determination is $6,488,000 ($8,300,000 * 78%).

CIP PS-4 – Mountain Belle Pump Station

The District's pump station criteria, as discussed in Chapter 3 of its 2018 Master plan, requires that the pumping systems for primary zones be sized to serve the maximum day demand (MDD) of the pressure zones as well as a 150-gpm fire storage replenishment. Furthermore, this volume must be delivered within 16 hours of each day in order to avoid San Diego Gas & Electric on-peak electrical rates. From Chapter 5 of the 2018 Master Plan, the combined existing ADD of the 1330 North Twin Oaks, the 1059 and the 900 Tres Amigos pressure zones that this project would serve is 0.47 MGD, or 329 gpm. Using the peaking curve from Chapter 3 of the 2018 Master Plan, a peaking factor of 2.70 would generate an MDD of 890 gpm (329 gpm * 2.70) for the pressure zones served by the project. Therefore, the pumping systems would be required to provide 1,040 gpm (890 gpm MDD + 150 gpm fire replenishment) over a 24-hour period, or 1,560 gpm (24 hours / 16 hours * 1,040 gpm) over a 16-hour period in order to avoid on-peak electricity rates.

The Mountain Belle Pump Station will add 3,000 gpm of pumping capacity to the existing 2,000-gpm North Twin Oaks Pump Station that currently serves the 1330 North Twin Oaks, the 1059 and the 900 Tres Amigos pressure zones. This will be a Phase 2 project. A capacity deficit does not currently exist in these pressure zones since the North Twin Oaks Pump Station's capacity exceeds the pumping requirements. Therefore, the entire 3,000 gpm capacity of the Mountain Belle Pump Station will be available for future expansion.

The 2018 Master Plan estimated the total cost for the Mountain Belle Pump Station at $3,300,000. With 100% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Water Capital Facility Fee determination is $3,300,000.

CIP PS-8 – Schoolhouse Pump Station Expansion

The District's pump station criteria, as discussed in Chapter 3 of its 2018 Master plan, requires that the pumping systems for primary zones be sized to serve the maximum day demand (MDD) of the pressure zones as well as a 150-gpm fire storage replenishment. Furthermore, this volume must be delivered within 16 hours of each day in order to avoid San Diego Gas & Electric on-peak electrical rates. From Chapter 5 of the 2018 Master Plan, the existing ADD of the 1115 Schoolhouse primary zone that this project would serve is 0.60 MGD, or 419 gpm. Using the peaking curve from Chapter 3 of the 2018 Master Plan, a peaking factor of 2.65 would generate an MDD of 1,111 gpm (419 gpm * 2.65) for the 1115 Schoolhouse primary zone.

As stated in Chapter 5 of the 2018 Master Plan, the Schoolhouse Pump Station also serves the Double Peak Pump Station and its firm capacity of 1,050 gpm. Therefore, the pumping systems would be required to provide 1,261 gpm (1,111 gpm MDD of the Schoolhouse primary zone + 150

gpm fire replenishment) as well as the 1,050 gpm firm capacity of the Double Peak Pump Station over a 24-hour period, or 2,941 gpm (24 hours / 16 hours * 1,261 gpm + 1,050 gpm firm capacity of the Double Peak Pump Station) over a 16-hour period in order to avoid on-peak electricity rates.

The Schoolhouse Pump Station currently has 2,100 gpm of pumping capacity, meaning that a capacity deficit of 841 gpm (2,941 gpm – 2,100 gpm) exists. The proposed expansion project will replace the existing pumps and increase the capacity of the pump station by 1,050 gpm to a total of 3,150 gpm. This will be a Phase 2 project. 841 gpm of the 1,050 of additional capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 209 gpm (1,050 gpm – 841 gpm) will be available for future expansion, which represents 7% (209 gpm / 3,150 gpm * 100%) of the project's total capacity.

The 2018 Master Plan estimated the total cost for the Schoolhouse Pump Station Expansion at $500,000. With 7% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Water Capital Facility Fee determination is $33,000.

CIP P-30 – Pipeline Connecting the Mountain Belle Pump Station to the 1330 North Twin Oaks Zone

This pipeline project is designed to connect the proposed Mountain Belle Pump Station to the 1330 North Twin Oaks pressure zone. This will be a Phase 2 project. The project is a new pipeline and does not replace or upsize any pipeline infrastructure that currently exists in the 1330 North Twin Oaks pressure zone. Furthermore, there are no existing pipeline deficiencies shown in the District's WaterGEMS hydraulic model that this project would remedy. Therefore, the entire capacity of the pipeline will be allocated for future expansion.

The 2018 Master Plan estimated the total cost for the pipeline connecting the Mountain Belle Pump Station to the 1330 North Twin Oaks Zone at $700,000. With 100% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Water Capital Facility Fee determination is $700,000.

CIP P-101 – Schoolhouse Road Pipeline from the Schoolhouse Pump Station to San Elijo Road

The District's potable water main criteria, as discussed in Chapter 3 of its 2018 Master Plan, requires that District pipelines not exceed a velocity of 7 feet per second. Being the outlet pipeline from the Schoolhouse Pump Station, the existing 16-inch diameter Schoolhouse Road pipeline has a maximum flowrate equal to the firm capacity of the pump station. According to Chapter 5 of the 2018 Master Plan, the Schoolhouse Pump Station has a firm capacity of 2,100 gpm, or 4.68 cubic feet per second (cfs). To determine the capacity of the existing 16-inch Schoolhouse Road pipeline, the following formula is utilized for pressure pipe flow:

$Q = V * A$, where

Q = flowrate through the pipeline (cubic feet per second)

V = flow velocity through the pipeline (feet per second)

A = the cross-sectional area of the pipeline (square feet), where the area is defined as $A = \pi d^2 / 4$ where d = pipeline diameter (feet)

Utilizing the equation above, the capacity of the existing 16-inch Schoolhouse Road pipeline is 9.73 cfs (7 feet per second * (π / 4 * (1.33 feet)^2)). Therefore, the existing pipeline has sufficient capacity to handle current flows from the Schoolhouse Pump Station.

This pipeline project will replace approximately 600 feet of existing 16-inch diameter outlet pipeline with new 20-inch diameter pipe from the Schoolhouse Pump Station to San Elijo Road. This will be a Phase 2 project. Utilizing the equation above, the capacity of the proposed 20-inch Schoolhouse Road pipeline is 15.27 cfs (7 feet per second * (π / 4 * (1.67 feet)^2)). 9.73 cfs of the 15.27 cfs capacity provided by this project currently exists and therefore will be allocated to existing development. The remaining 5.54 cfs (15.27 cfs – 9.73 cfs) will be available for future expansion, which represents 36% (5.54 cfs / 15.27 cfs * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for the Schoolhouse Road pipeline at $300,000. With 36% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Water Capital Facility Fee determination is $108,000.

CIP P-400 – El Norte Parkway Pipeline from Rees Road to Woodland Parkway

This pipeline project is designed to connect existing infrastructure in Rees Road and in Woodland Parkway in order to improve the system's ability to serve demands from the District's connection to the San Diego County Water Authority's first aqueduct. This will be a Phase 2 project. The project is a new pipeline and does not replace or upsize any pipeline infrastructure that currently exists in the 920 pressure zone. Furthermore, there are no existing pipeline deficiencies shown in the District's WaterGEMS hydraulic model that this project would remedy. Therefore, the entire capacity of the pipeline will be allocated for future expansion.

The 2018 Master Plan estimated the total cost for the El Norte Parkway pipeline at $4,100,000. With 100% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Water Capital Facility Fee determination is $4,100,000.

Table 4 below shows the breakdown of these water CIP projects by phase and the total expansion cost component that is used for the "CIP" row in Table 2 above. Note that the 2015 cost contributions from each CIP project above have been brought to 2019 levels.

Table 4: Water CIP Expansion-Only Costs per Phase

Master Plan Water Expansion CIP (2019 ENR) Phases 1-4					
Phase	Year	Storage	Pipeline	Pumping	Total
1	2015-2020	1,190,135	-	-	1,190,135
2	2021-2025	3,937,946	5,368,733	3,645,881	12,952,560
3	2026-2030	7,097,053	-	-	7,097,053
4	2031-2035	-	-	-	-
5	2036-	-	-	-	-
		12,225,134	5,368,733	3,645,881	$ 21,239,747

Wastewater Expansion CIP

The 2018 Master Plan identified a total wastewater CIP of $140,800,000 divided into wastewater treatment, land outfall, and pipeline/pumping projects in five timing phases. Table 5 summarizes the expansion portion of the wastewater CIP from the Master Plan in the same Phases as the water CIP, as well as the Encina Water Pollution Control Facility CIP. On a project by project basis the District separated the expansion contribution from the replacement contribution for each project for a total of $48,720,534 in expansion contribution for the projects. Similar to the water CIP, Phases 1-4 of the wastewater CIP expansion costs are used for calculation of the fee. A full list of the Master Plan and the Encina CIP projects are included as Attachment A to this report. Each list summarizes the allocation of the expansion portion of the CIP if a project is a combined project where an existing facility is being replaced and upsized for expansion at the same time.

The following is a listing of the wastewater CIP projects that are included in the Wastewater Capital Facility Fee determination. This listing describes the allocation of the expansion portion of the CIP project if an existing facility is being replaced and upsized for expansion at the same time, and/or if the CIP project is addressing an existing capacity deficiency. As stated above, Phase 5 wastewater CIP projects have been excluded from the Wastewater Capital Facility Fee calculation.

CIP SB-1 – Montiel Lift Station Replacement

The District's lift station criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that each lift station pump be sized so that each is capable of handling peak wet weather wastewater flows for the sewershed that it serves. From Chapter 7 of the 2018 Master Plan, the existing peak wet weather flow for the Montiel sewershed that this project would serve is 103 gpm.

The Montiel Lift Station pumps currently have 100 gpm of pumping capacity each, meaning that a capacity deficit of 3 gpm (103 gpm – 100 gpm) exists. The proposed project will replace the existing pumps and double the capacity of the pumps to 200 gpm. This will be a Phase 1 project. 103 gpm of the 200 gpm of capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 97 gpm (200 gpm – 103 gpm) will be available for future expansion, which represents 49% (97 gpm / 200 gpm * 100%) of the project's total capacity.

The 2018 Master Plan estimated the total cost for the Montiel Lift Station Replacement at $1,500,000. With 49% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $728,000.

CIP SP-5 – Rock Springs Road Pipeline Replacement

The District's wastewater gravity main criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines 12 inches in diameter and smaller not exceed a flow depth to pipe diameter ratio of 0.50, and that District pipelines larger than 12 inches in diameter not exceed a flow depth to pipe diameter ratio of 0.75. According to the District's SewerGEMS hydraulic model, a portion of sewer pipeline in Rock Springs Road and an adjacent greenbelt area from Lancer Park Avenue to Bennett Avenue has an existing peak wet weather flow of 396 gpm. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = K` * d^{8/3} * (S_f)^{1/2} / n$, where

> $K`$ = hydraulic coefficient of 0.2316 for a flow depth to pipe diameter ratio of 0.50, and 0.4223 for a flow depth to pipe diameter ratio of 0.75

> d = pipeline diameter (feet)

> S_f = the pipeline slope, which is 0.62%, or 0.0062 for the project limits

> n = Manning's friction coefficient, assumed to be 0.013

Utilizing the equation above, the maximum allowable flowrate in the existing 8-inch Rock Springs Road pipeline is 0.48 cubic feet per second, or 215 gpm (0.2316 * (0.67 feet)$^{8/3}$ * (0.0062)$^{1/2}$ / 0.013). Therefore, there is a capacity deficiency (396 gpm actual flow vs. 215 gpm design capacity) in the existing 8-inch pipe.

This pipeline project will upsize approximately 2,600 feet of existing 8-inch diameter pipeline to 12-inch and 15-inch diameter pipe in Rock Springs Road and an adjacent greenbelt area from Lancer Park Avenue to Bennett Avenue. The upsized pipeline will have a capacity of 1.41 cubic feet per second, or 633 gpm (0.2316 * (1.00 feet)$^{8/3}$ * (0.0062)$^{1/2}$ / 0.013). This will be a Phase 1 project. 396 gpm of the 633 gpm of capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 237 gpm (633 gpm – 396 gpm) will be available for future expansion, which represents 37% (237 gpm / 633 gpm * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP SP-5 at $3,500,000. With 37% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $1,311,000 ($3,500,000 * 37%).

CIP SP-6 – Old Questhaven Road Pipeline Replacement

The District's wastewater gravity main criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines 12 inches in diameter and smaller not exceed a flow depth to pipe diameter ratio of 0.50, and that District pipelines larger than 12 inches in diameter not exceed a flow depth to pipe diameter ratio of 0.75. According to the District's SewerGEMS hydraulic model, a portion of sewer pipeline in the Old Questhaven Road right-of-way adjacent to San Elijo Road just east of Rancho Santa Fe Road has an existing peak wet weather flow of 896 gpm. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = K` * d^{8/3} * (S_f)^{1/2} / n$, where

> $K`$ = hydraulic coefficient of 0.4223 for a flow depth to pipe diameter ratio of 0.75

> d = pipeline diameter (feet)

> S_f = the pipeline slope, which is 0.47%, or 0.0047 for the project

> n = Manning's friction coefficient, assumed to be 0.013

Utilizing the equation above, the maximum allowable flowrate in the existing 21-inch Old Questhaven Road pipeline is 9.91 cubic feet per second, or 4,447 gpm (0.4223 * (1.75 feet)$^{8/3}$ *

$(0.0047)^{1/2}$ / 0.013). Therefore, there is sufficient capacity (896 gpm actual flow vs. 4,447 gpm design capacity) in the 21-inch pipe to serve existing demands.

This pipeline project will upsize approximately 2,100 feet of existing 21-inch diameter pipeline to 36-inch diameter pipe in Old Questhaven Road right-of-way adjacent to San Elijo Road. The upsized pipeline will have a capacity of 41.7 cubic feet per second, or 18,718 gpm $(0.4223 * (3.00 \text{ feet})^{8/3} * (0.0047)^{1/2}$ / 0.013). This will be a Phase 2 project. 4,447 gpm of the 18,718 gpm capacity provided by this project currently exists and therefore will be allocated to existing development. The remaining 14,271 gpm (18,718 gpm – 4,447 gpm) will be available for future expansion, which represents 76% (14,271 gpm / 18,718 gpm * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP SP-6 at $1,800,000. With 76% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $1,372,000 ($1,800,000 * 76%).

CIP SP-9 – Nordahl Shopping Center Pipeline Replacement

The District's wastewater gravity main criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines 12 inches in diameter and smaller not exceed a flow depth to pipe diameter ratio of 0.50, and that District pipelines larger than 12 inches in diameter not exceed a flow depth to pipe diameter ratio of 0.75. According to the District's SewerGEMS hydraulic model, the gravity sewer pipeline running through the Nordahl Shopping Center has an existing peak wet weather flow of 330 gpm. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = K` * d^{8/3} * (S_f)^{1/2} / n$, where

> $K`$ = hydraulic coefficient of 0.2316 for a flow depth to pipe diameter ratio of 0.50, and 0.4223 for a flow depth to pipe diameter ratio of 0.75
>
> d = pipeline diameter (feet)
>
> S_f = the pipeline slope, which is 0.42%, or 0.0042 for the project limits
>
> n = Manning's friction coefficient, assumed to be 0.013

Utilizing the equation above, the maximum allowable flowrate in the existing 8-inch Nordahl Shopping Center pipeline is 0.39 cubic feet per second, or 176 gpm $(0.2316 * (0.67 \text{ feet})^{8/3} * (0.0042)^{1/2}$ / 0.013). Therefore, there is a capacity deficiency (330 gpm actual flow vs. 176 gpm design capacity) in the existing 8-inch pipe.

This pipeline project will upsize approximately 3,800 feet of existing 8-inch diameter pipeline to 12-inch and 15-inch diameter pipe in the Nordahl Shopping Center. The upsized pipeline will have a capacity of 1.16 cubic feet per second, or 519 gpm $(0.2316 * (1.00 \text{ feet})^{8/3} * (0.0042)^{1/2}$ / 0.013). This will be a Phase 2 project. 330 gpm of the 519 gpm of capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 189 gpm (519 gpm – 330 gpm) will be available for future expansion, which represents 36% (189 gpm / 330 gpm * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP SP-9 at $2,100,000. With 36% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $763,000 ($2,100,000 * 36%).

CIP SP-10 – Diamond Siphon Replacement

The District's wastewater siphon criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines not exceed a velocity of 5 feet per second. According to the District's SewerGEMS hydraulic model, the Diamond Siphon has an existing peak wet weather flow of 1,271 gpm. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = V * A$, where

Q = flowrate through the pipeline (cubic feet per second)

V = flow velocity through the pipeline (feet per second)

A = the cross-sectional area of the pipeline (square feet), where the area is defined as $A = \pi d^2 / 4$ where d = pipeline diameter (feet)

Utilizing the equation above, the capacity of the existing 10-inch Diamond Siphon is 2.73 cubic feet per second, or 1,224 gpm (5 feet per second * (π / 4 * (0.83 feet)^2)). Therefore, there is a capacity deficiency (1,271 gpm actual flow vs. 1,224 gpm design capacity) in the existing 10-inch pipe.

This pipeline project will replace approximately 200 feet of existing 10-inch diameter siphon pipeline with new 15-inch diameter siphon pipe from the Diamond Environmental Services parking lot south to Mission Road. This will be a Phase 1 project. Utilizing the equation above, the capacity of the proposed 15-inch siphon pipe is 6.14 cubic feet per second, or 2,754 gpm (5 feet per second * (π / 4 * (1.25 feet)^2)). 1,271 gpm of the 2,754 gpm capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 1,483 gpm (2,754 gpm – 1,271 gpm) will be available for future expansion, which represents 54% (1,483 gpm / 2,754 gpm * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP SP-10 at $800,000. With 54% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $431,000 ($800,000 * 54%).

CIP SP-11 – San Marcos Interceptor Phase 2 Replacement

The District's wastewater gravity main criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines 12 inches in diameter and smaller not exceed a flow depth to pipe diameter ratio of 0.50, and that District pipelines larger than 12 inches in diameter not exceed a flow depth to pipe diameter ratio of 0.75. According to the District's SewerGEMS hydraulic model, the west San Marcos Interceptor has an existing peak wet weather flow of 7,514 gpm. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = K` * d^{8/3} * (S_f)^{1/2} / n$, where

K` = hydraulic coefficient of 0.4223 for a flow depth to pipe diameter ratio of 0.75

d = pipeline diameter (feet)

S_f = the pipeline slope, which is 0.40%, or 0.0040 for the project limits

n = Manning's friction coefficient, assumed to be 0.013

Utilizing the equation above, the maximum allowable flowrate in the existing 21-inch west San Marcos Interceptor pipeline is 9.14 cubic feet per second, or 4,100 gpm (0.4223 * (1.75 feet)$^{8/3}$ * (0.0040)$^{1/2}$ / 0.013). Therefore, there is a capacity deficiency (7,514 gpm actual flow vs. 4,100 gpm design capacity) in the existing 21-inch pipe.

This pipeline project will upsize approximately 1,900 feet of existing 21-inch diameter pipeline to 42-inch diameter pipe along San Marcos Creek from Via Vera Cruz to McMahr Road. The upsized pipeline will have a capacity of 58.02 cubic feet per second, or 26,038 gpm (0.4223 * (3.50 feet)$^{8/3}$ * (0.0040)$^{1/2}$ / 0.013). This will be a Phase 1 project. 7,514 gpm of the 26,038 gpm of capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 18,524 gpm (26,038 gpm – 7,514 gpm) will be available for future expansion, which represents 71% (18,524 gpm / 26,038 gpm * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP SP-11 at $5,800,000. With 71% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $4,126,000 ($5,800,000 * 71%).

CIP SP-12 – San Marcos Interceptor Phase 3 Replacement

The District's wastewater gravity main criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines 12 inches in diameter and smaller not exceed a flow depth to pipe diameter ratio of 0.50, and that District pipelines larger than 12 inches in diameter not exceed a flow depth to pipe diameter ratio of 0.75. According to the District's SewerGEMS hydraulic model, the west San Marcos Interceptor has an existing peak wet weather flow of 7,514 gpm. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = K$` $* d^{8/3} * (S_f)^{1/2} / n$, where

K` = hydraulic coefficient of 0.4223 for a flow depth to pipe diameter ratio of 0.75

d = pipeline diameter (feet)

S_f = the pipeline slope, which is 0.40%, or 0.0040 for the project limits

n = Manning's friction coefficient, assumed to be 0.013

Utilizing the equation above, the maximum allowable flowrate in the existing 21-inch west San Marcos Interceptor pipeline is 9.14 cubic feet per second, or 4,100 gpm (0.4223 * (1.75 feet)$^{8/3}$ * (0.0040)$^{1/2}$ / 0.013). Therefore, there is a capacity deficiency (7,514 gpm actual flow vs. 4,100 gpm design capacity) in the existing 21-inch pipe.

This pipeline project will upsize approximately 1,800 feet of existing 21-inch diameter pipeline to 42-inch diameter pipe in McMahr Road north to San Marcos Boulevard, and then west to the existing 42-inch diameter pipeline at Pacific Street. The upsized pipeline will have a capacity of 58.02 cubic feet per second, or 26,038 gpm (0.4223 * (3.50 feet)$^{8/3}$ * (0.0040)$^{1/2}$ / 0.013). This will be a Phase 1 project. 7,514 gpm of the 26,038 gpm of capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 18,524 gpm (26,038 gpm – 7,514 gpm) will be available for future expansion, which represents 71% (18,524 gpm / 26,038 gpm * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP SP-12 at $5,500,000. With 71% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $3,913,000 ($5,500,000 * 71%).

CIP SP-15 – San Pablo Walkway Pipeline Replacement

The District's wastewater gravity main criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines 12 inches in diameter and smaller not exceed a flow depth to pipe diameter ratio of 0.50, and that District pipelines larger than 12 inches in diameter not exceed a flow depth to pipe diameter ratio of 0.75. According to the District's SewerGEMS hydraulic model, the San Pablo Walkway pipeline has an existing peak wet weather flow of 95 gpm. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = K` * d^{8/3} * (S_f)^{1/2} / n$, where

   $K`$ = hydraulic coefficient of 0.2316 for a flow depth to pipe diameter ratio of 0.50

   d = pipeline diameter (feet)

   S_f = the pipeline slope, which is 0.41%, or 0.0041 for the project

   n = Manning's friction coefficient, assumed to be 0.013

Utilizing the equation above, the maximum allowable flowrate in the existing 8-inch San Pablo Walkway pipeline is 0.39 cubic feet per second, or 176 gpm (0.2316 * (0.67 feet)$^{8/3}$ * (0.0041)$^{1/2}$ / 0.013). Therefore, there is sufficient capacity (95 gpm actual flow vs. 176 gpm design capacity) in the 8-inch pipe to serve existing demands.

This pipeline project will upsize approximately 1,800 feet of existing 8-inch diameter pipeline to 12-inch diameter pipe in the San Pablo Walkway from an alleyway south of La Loma Drive to La Habra Drive. The upsized pipeline will have a capacity of 1.14 cubic feet per second, or 514 gpm (0.2316 * (1.00 feet)$^{8/3}$ * (0.0041)$^{1/2}$ / 0.013). This will be a Phase 3 project. 176 gpm of the 514 gpm capacity provided by this project currently exists and therefore will be allocated to existing development. The remaining 338 gpm (514 gpm – 176 gpm) will be available for future expansion, which represents 66% (338 gpm / 514 gpm * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP SP-15 at $1,700,000. With 66% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $1,118,000 ($1,700,000 * 66%).

CIP SP-20 – Discovery Street East Pipeline Replacement

The District's wastewater gravity main criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines 12 inches in diameter and smaller not exceed a flow depth to pipe diameter ratio of 0.50, and that District pipelines larger than 12 inches in diameter not exceed a flow depth to pipe diameter ratio of 0.75. According to the District's SewerGEMS hydraulic model, the Discovery Street East pipeline has an existing peak wet weather flow of 118 gpm. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = K` * d^{8/3} * (S_f)^{1/2} / n$, where

K` = hydraulic coefficient of 0.2316 for a flow depth to pipe diameter ratio of 0.50

d = pipeline diameter (feet)

S_f = the pipeline slope, which is 0.42%, or 0.0042 for the project

n = Manning's friction coefficient, assumed to be 0.013

Utilizing the equation above, the maximum allowable flowrate in the existing 8-inch Discovery Street East pipeline is 0.39 cubic feet per second, or 175 gpm (0.2316 * (0.67 feet)$^{8/3}$ * (0.0042)$^{1/2}$ / 0.013). Therefore, there is sufficient capacity (118 gpm actual flow vs. 175 gpm design capacity) in the 8-inch pipe to serve existing demands.

This pipeline project will upsize approximately 2,100 feet of existing 8-inch diameter pipeline to 12-inch diameter pipe in Discovery Street from La Sombra Drive to McMahr Road. The upsized pipeline will have a capacity of 1.15 cubic feet per second, or 517 gpm (0.2316 * (1.00 feet)$^{8/3}$ * (0.0042)$^{1/2}$ / 0.013). This will be a Phase 3 project. 175 gpm of the 517 gpm capacity provided by this project currently exists and therefore will be allocated to existing development. The remaining 342 gpm (517 gpm – 175 gpm) will be available for future expansion, which represents 66% (342 gpm / 517 gpm * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP SP-20 at $700,000. With 66% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $463,000 ($700,000 * 66%).

CIP SP-21 – Rock Springs Road West Pipeline Replacement

The District's wastewater gravity main criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines 12 inches in diameter and smaller not exceed a flow depth to pipe diameter ratio of 0.50, and that District pipelines larger than 12 inches in diameter not exceed a flow depth to pipe diameter ratio of 0.75. According to the District's SewerGEMS hydraulic model, the Rock Springs Road West pipeline has an existing peak wet weather flow of 582 gpm. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = K` * d^{8/3} * (S_f)^{1/2} / n$, where

K` = hydraulic coefficient of 0.2316 for a flow depth to pipe diameter ratio of 0.50, and 0.4223 for a flow depth to pipe diameter ratio of 0.75

d = pipeline diameter (feet)

S_f = the pipeline slope, which is 0.41%, or 0.0041 for the project

n = Manning's friction coefficient, assumed to be 0.013

Utilizing the equation above, the maximum allowable flowrate in the existing 12-inch west San Marcos Interceptor pipeline is 1.14 cubic feet per second, or 511 gpm (0.2316 * (1.00 feet)$^{8/3}$ * (0.0041)$^{1/2}$ / 0.013). Therefore, there is a capacity deficiency (582 gpm actual flow vs. 511 gpm design capacity) in the existing 12-inch pipe.

This pipeline project will upsize approximately 1,300 feet of existing 12-inch diameter pipeline to 15-inch diameter pipe in Rock Springs Road from Woodland Parkway to Lancer Park Avenue. The upsized pipeline will have a capacity of 3.77 cubic feet per second, or 1,690 gpm (0.4223 * (1.25 feet)$^{8/3}$ * (0.0041)$^{1/2}$ / 0.013). This will be a Phase 4 project. 582 gpm of the 1,690 gpm of capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 1,108 gpm (1,690 gpm – 582 gpm) will be available for future expansion, which represents 66% (1,108 gpm / 1,690 gpm * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP SP-21 at $500,000. With 66% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $328,000 ($500,000 * 66%).

CIP SP-22 – Rock Springs Road East Pipeline Replacement

The District's wastewater gravity main criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines 12 inches in diameter and smaller not exceed a flow depth to pipe diameter ratio of 0.50, and that District pipelines larger than 12 inches in diameter not exceed a flow depth to pipe diameter ratio of 0.75. According to the District's SewerGEMS hydraulic model, the Rock Springs Road East pipeline has an existing peak wet weather flow of 308 gpm. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = K` * d^{8/3} * (S_f)^{1/2} / n$, where

K` = hydraulic coefficient of 0.2316 for a flow depth to pipe diameter ratio of 0.50

d = pipeline diameter (feet)

S_f = the pipeline slope, which is 0.38%, or 0.0038 for the project

n = Manning's friction coefficient, assumed to be 0.013

Utilizing the equation above, the maximum allowable flowrate in the existing 8-inch west San Marcos Interceptor pipeline is 0.37 cubic feet per second, or 168 gpm (0.2316 * (0.67 feet)$^{8/3}$ * (0.0038)$^{1/2}$ / 0.013). Therefore, there is a capacity deficiency (308 gpm actual flow vs. 168 gpm design capacity) in the existing 8-inch pipe.

This pipeline project will upsize approximately 800 feet of existing 8-inch diameter pipeline to 12-inch diameter pipe in Rock Springs Road from Bennett Avenue to Rock Springs Hollow. The upsized pipeline will have a capacity of 1.10 cubic feet per second, or 495 gpm ($0.2316 * (1.00 \text{ feet})^{8/3} * (0.0038)^{1/2} / 0.013$). This will be a Phase 4 project. 308 gpm of the 495 gpm of capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 187 gpm (495 gpm – 308 gpm) will be available for future expansion, which represents 38% (187 gpm / 495 gpm * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP SP-22 at $200,000. With 38% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $76,000 ($200,000 * 38%).

CIP SP-25 – San Marcos Interceptor East Pipeline Replacement

The District's wastewater gravity main criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines 12 inches in diameter and smaller not exceed a flow depth to pipe diameter ratio of 0.50, and that District pipelines larger than 12 inches in diameter not exceed a flow depth to pipe diameter ratio of 0.75. According to the District's SewerGEMS hydraulic model, the east San Marcos Interceptor pipeline has an existing peak wet weather flow of 2,961 gpm. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = K` * d^{8/3} * (S_f)^{1/2} / n$, where

   $K`$ = hydraulic coefficient of 0.4223 for a flow depth to pipe diameter ratio of 0.75

   d = pipeline diameter (feet)

   S_f = the pipeline slope, which is 0.50%, or 0.0050 for the project

   n = Manning's friction coefficient, assumed to be 0.013

Utilizing the equation above, the maximum allowable flowrate in the existing 18-inch east San Marcos Interceptor pipeline is 6.75 cubic feet per second, or 3,030 gpm ($0.4223 * (1.50 \text{ feet})^{8/3} * (0.0050)^{1/2} / 0.013$). Therefore, there is sufficient capacity (2,961 gpm actual flow vs. 3,030 gpm design capacity) in the 8-inch pipe to serve existing demands.

This pipeline project will upsize approximately 800 feet of existing 18-inch diameter pipeline to 24-inch diameter pipe in the east San Marcos Interceptor within the Twin Oaks Valley Park residential community. The upsized pipeline will have a capacity of 14.54 cubic feet per second, or 6,525 gpm ($0.4223 * (2.00 \text{ feet})^{8/3} * (0.0050)^{1/2} / 0.013$). This will be a Phase 3 project. 3,030 gpm of the 6,525 gpm capacity provided by this project currently exists and therefore will be allocated to existing development. The remaining 3,495 gpm (6,525 gpm – 3,030 gpm) will be available for future expansion, which represents 54% (3,495 gpm / 6,525 gpm * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP SP-25 at $800,000. With 54% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $429,000 ($800,000 * 54%).

CIP SP-28 – Linda Vista / Rancho Santa Fe Intersection Pipeline Replacement

The District's wastewater gravity main criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines 12 inches in diameter and smaller not exceed a flow depth to pipe diameter ratio of 0.50, and that District pipelines larger than 12 inches in diameter not exceed a flow depth to pipe diameter ratio of 0.75. According to the District's SewerGEMS hydraulic model, the Rancho Santa Fe Road pipeline south of Linda Vista Drive has an existing peak wet weather flow of 273 gpm. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = K^` * d^{8/3} * (S_f)^{1/2} / n$, where

$K^`$ = hydraulic coefficient of 0.2316 for a flow depth to pipe diameter ratio of 0.50

d = pipeline diameter (feet)

S_f = the pipeline slope, which is 0.68%, or 0.0068 for the project

n = Manning's friction coefficient, assumed to be 0.013

Utilizing the equation above, the maximum allowable flowrate in the existing 8-inch west Rancho Santa Fe pipeline is 0.50 cubic feet per second, or 224 gpm (0.2316 * (0.67 feet)$^{8/3}$ * (0.0068)$^{1/2}$ / 0.013). Therefore, there is a capacity deficiency (273 gpm actual flow vs. 224 gpm design capacity) in the existing 8-inch pipe.

This pipeline project will upsize approximately 2,000 feet of existing 8-inch diameter pipeline to 12-inch diameter pipe in Rancho Santa Fe Road south from the intersection with Linda Vista Drive. The upsized pipeline will have a capacity of 1.47 cubic feet per second, or 660 gpm (0.2316 * (1.00 feet)$^{8/3}$ * (0.0068)$^{1/2}$ / 0.013). This will be a Phase 4 project. 273 gpm of the 660 gpm of capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 387 gpm (660 gpm – 273 gpm) will be available for future expansion, which represents 59% (387 gpm / 660 gpm * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP SP-28 at $1,200,000. With 59% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $704,000 ($1,200,000 * 59%).

CIP SP-33 – San Marcos Boulevard West Pipeline Replacement

The District's wastewater gravity main criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines 12 inches in diameter and smaller not exceed a flow depth to pipe diameter ratio of 0.50, and that District pipelines larger than 12 inches in diameter not exceed a flow depth to pipe diameter ratio of 0.75. According to the District's SewerGEMS hydraulic model, the west San Marcos Boulevard pipeline has an existing peak wet weather flow of 367 gpm. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = K^` * d^{8/3} * (S_f)^{1/2} / n$, where

$K^`$ = hydraulic coefficient of 0.2316 for a flow depth to pipe diameter ratio of 0.50

d = pipeline diameter (feet)

S_f = the pipeline slope, which is 0.43%, or 0.0043 for the project

n = Manning's friction coefficient, assumed to be 0.013

Utilizing the equation above, the maximum allowable flowrate in the existing 8-inch west San Marcos Boulevard pipeline is 0.40 cubic feet per second, or 178 gpm (0.2316 * (0.67 feet)$^{8/3}$ * (0.0043)$^{1/2}$ / 0.013). Therefore, there is a capacity deficiency (367 gpm actual flow vs. 178 gpm design capacity) in the existing 8-inch pipe.

This pipeline project will upsize approximately 6,600 feet of existing 8-inch diameter pipeline to 12-inch diameter pipe in San Marcos Boulevard from Pacific Street to Knoll Road. The upsized pipeline will have a capacity of 1.17 cubic feet per second, or 523 gpm (0.2316 * (1.00 feet)$^{8/3}$ * (0.0043)$^{1/2}$ / 0.013). This will be a Phase 2 project. 367 gpm of the 523 gpm of capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 156 gpm (523 gpm – 367 gpm) will be available for future expansion, which represents 30% (156 gpm / 523 gpm * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP SP-33 at $4,100,000. With 30% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $1,226,000 ($4,100,000 * 30%).

CIP SP-34 – San Marcos Creek North of Mission Road Pipeline Replacement

The District's wastewater gravity main criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines 12 inches in diameter and smaller not exceed a flow depth to pipe diameter ratio of 0.50, and that District pipelines larger than 12 inches in diameter not exceed a flow depth to pipe diameter ratio of 0.75. According to the District's SewerGEMS hydraulic model, the San Marcos Creek pipeline has an existing peak wet weather flow of 2,088 gpm. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = K` * d^{8/3} * (S_f)^{1/2} / n$, where

$K`$ = hydraulic coefficient of 0.4223 for a flow depth to pipe diameter ratio of 0.75

d = pipeline diameter (feet)

S_f = the pipeline slope, which is 0.39%, or 0.0039 for the project

n = Manning's friction coefficient, assumed to be 0.013

Utilizing the equation above, the maximum allowable flowrate in the existing 18-inch San Marcos Creek pipeline is 5.96 cubic feet per second, or 2,675 gpm (0.4223 * (1.50 feet)$^{8/3}$ * (0.0039)$^{1/2}$ / 0.013). Therefore, there is sufficient capacity (2,088 gpm actual flow vs. 2,675 gpm design capacity) in the 18-inch pipe to serve existing demands.

This pipeline project will upsize approximately 1,000 feet of existing 18-inch diameter pipeline to 24-inch diameter pipe along San Marcos Creek between N. Twin Oak Valley Road and Woodward Street north of Mission Road. The upsized pipeline will have a capacity of 12.84 cubic feet per second, or 5,760 gpm (0.4223 * (2.00 feet)$^{8/3}$ * (0.0039)$^{1/2}$ / 0.013). This will be a Phase 4 project. 2,675 gpm of

the 5,760 gpm capacity provided by this project currently exists and therefore will be allocated to existing development. The remaining 3,085 gpm (5,760 gpm – 2,675 gpm) will be available for future expansion, which represents 54% (3,085 gpm / 5,760 gpm * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP SP-34 at $1,300,000. With 54% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $696,000 ($1,300,000 * 54%).

CIP SP-35 – Mission Road & Mulberry Road Pipeline Replacement

The District's wastewater gravity main criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines 12 inches in diameter and smaller not exceed a flow depth to pipe diameter ratio of 0.50, and that District pipelines larger than 12 inches in diameter not exceed a flow depth to pipe diameter ratio of 0.75. According to the District's SewerGEMS hydraulic model, the Mission Road and Mulberry Road pipeline has an existing peak wet weather flow of 381 gpm. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = K` * d^{8/3} * (S_f)^{1/2} / n$, where

$K`$ = hydraulic coefficient of 0.2316 for a flow depth to pipe diameter ratio of 0.50

d = pipeline diameter (feet)

S_f = the pipeline slope, which is 0.81%, or 0.0081 for the project

n = Manning's friction coefficient, assumed to be 0.013

Utilizing the equation above, the maximum allowable flowrate in the existing 8-inch Mission Road and Mulberry Road pipeline is 0.54 cubic feet per second, or 245 gpm (0.2316 * (0.67 feet)$^{8/3}$ * (0.0081)$^{1/2}$ / 0.013). Therefore, there is a capacity deficiency (381 gpm actual flow vs. 245 gpm design capacity) in the existing 8-inch pipe.

This pipeline project will upsize approximately 3,600 feet of existing 8-inch diameter pipeline to 12-inch diameter pipe in Mission Road from 300 feet west of Falcon Place to Mulberry Road, then north in Mulberry Road to Borden Road. The upsized pipeline will have a capacity of 1.61 cubic feet per second, or 721 gpm (0.2316 * (1.00 feet)$^{8/3}$ * (0.0081)$^{1/2}$ / 0.013). This will be a Phase 3 project. 381 gpm of the 721 gpm of capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 340 gpm (721 gpm – 381 gpm) will be available for future expansion, which represents 47% (340 gpm / 721 gpm * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP SP-35 at $1,700,000. With 47% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $802,000 ($1,700,000 * 47%).

CIP SP-36 – Richland Road Pipeline Replacement

The District's wastewater gravity main criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines 12 inches in diameter and smaller not exceed a flow depth to pipe diameter ratio of 0.50, and that District pipelines larger than 12 inches in diameter not exceed a

flow depth to pipe diameter ratio of 0.75. According to the District's SewerGEMS hydraulic model, the Richland Road pipeline has an existing peak wet weather flow of 1,268 gpm. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = K` * d^{8/3} * (S_f)^{1/2} / n$, where

   $K`$ = hydraulic coefficient of 0.4223 for a flow depth to pipe diameter ratio of 0.75

   d = pipeline diameter (feet)

   S_f = the pipeline slope, which is 0.69%, or 0.0069 for the project

   n = Manning's friction coefficient, assumed to be 0.013

Utilizing the equation above, the maximum allowable flowrate in the existing 15-inch Richland Road pipeline is 4.88 cubic feet per second, or 2,188 gpm (0.4223 * (1.25 feet)$^{8/3}$ * (0.0069)$^{1/2}$ / 0.013). Therefore, there is sufficient capacity (1,268 gpm actual flow vs. 2,188 gpm design capacity) in the 15-inch pipe to serve existing demands.

This pipeline project will upsize approximately 2,000 feet of existing 15-inch diameter pipeline to 18-inch diameter pipe in Richland Road from Mission Road to Rock Springs Road. The upsized pipeline will have a capacity of 7.93 cubic feet per second, or 3,558 gpm (0.4223 * (1.50 feet)$^{8/3}$ * (0.0069)$^{1/2}$ / 0.013). This will be a Phase 4 project. 2,188 gpm of the 3,558 gpm capacity provided by this project currently exists and therefore will be allocated to existing development. The remaining 1,370 gpm (3,558 gpm – 2,188 gpm) will be available for future expansion, which represents 39% (1,370 gpm / 3,558 gpm * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP SP-36 at $1,000,000. With 39% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $390,000 ($1,000,000 * 39%).

CIP LO-A1 – Land Outfall Gravity Section A

The District's wastewater gravity main criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines larger than 12 inches in diameter not exceed a flow depth to pipe diameter ratio of 0.75. According to Chapter 7 of the District's 2018 Master Plan, Gravity Section A of the Land Outfall has experienced an existing peak wet weather flow of 13.92 MGD, which occurred during the December 22, 2010 storm event. To determine the adherence of this pipeline to the District's wastewater gravity main criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = K` * d^{8/3} * (S_f)^{1/2} / n$, where

   $K`$ = hydraulic coefficient of 0.4223 for a flow depth to pipe diameter ratio of 0.75

   d = pipeline diameter (feet)

   S_f = the pipeline slope, which is 0.22%, or 0.0022 for the project

   n = Manning's friction coefficient, assumed to be 0.013

Utilizing the equation above, the maximum allowable flowrate in the existing 30-inch portion of Gravity Section A is 17.41 cubic feet per second, or 11.25 MGD (0.4223 * (2.50 feet)$^{8/3}$ * (0.0022)$^{1/2}$ / 0.013). Therefore, there is a capacity deficiency (13.92 MGD actual flow vs. 11.25 MGD gpm design capacity) in the existing 30-inch pipe.

This pipeline project will upsize approximately 1,500 feet of existing 30-inch diameter pipeline to 42-inch diameter pipe in a District easement just south of San Marcos Boulevard in the vicinity of Acacia Drive. The upsized pipeline will have a capacity of 42.71 cubic feet per second, or 27.60 MGD (0.4223 * (3.50 feet)$^{8/3}$ * (0.0022)$^{1/2}$ / 0.013). This will be a Phase 2 project. 13.92 MGD of the 27.60 MGD of capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 13.68 MGD (27.60 MGD – 13.92 MGD gpm) will be available for future expansion, which represents 50% (13.68 MGD / 27.60 MGD * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP LO-A1 at $2,300,000. With 50% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $1,140,000 ($2,300,000 * 50%).

CIP LO-A2 – Land Outfall Siphon Section A

The District's wastewater siphon criteria, as discussed in Chapter 6 of its 2018 Master Plan, requires that District pipelines not exceed a velocity of 5 feet per second. According to Chapter 7 of the District's 2018 Master Plan, Siphon Section A of the Land Outfall has experienced an existing peak wet weather flow of 13.92 MGD, which occurred during the December 22, 2010 storm event. To determine the adherence of this pipeline to the District's wastewater siphon criteria, the following formula is utilized to calculate maximum allowable flowrate through the pipe:

$Q = V * A$, where

Q = flowrate through the pipeline (cubic feet per second)

V = flow velocity through the pipeline (feet per second)

A = the cross-sectional area of the pipeline (square feet), where the area is defined as $A = \pi d^2 / 4$ where d = pipeline diameter (feet)

Utilizing the equation above, the capacity of the existing 24-inch Siphon Section A is 15.71 cubic feet per second, or 10.15 MGD (5 feet per second * (π / 4 * (2.00 feet)^2)). Therefore, there is a capacity deficiency of 3.77 MDG (13.92 MGD actual flow - 10.15 MGD design capacity) in the existing 24-inch pipe.

This pipeline project will construct a 30-inch-diameter parallel siphon approximately 18,200 feet in length within or in the vicinity of San Marcos Boulevard, Palomar Airport Road and Poinsettia Lane from Acacia Drive to El Camino Real. This will be a Phase 3 project. Utilizing the equation above, the capacity of the proposed 30-inch parallel siphon pipe is 24.54 cubic feet per second, or 15.86 MGD (5 feet per second * (π / 4 * (2.50 feet)^2)). 3.77 MGD of the 15.86 MGD in additional capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 12.09 MGD (15.86 MGD – 3.77 MGD) will be available for future expansion, which represents 76% (12.09 MGD / 15.86 MGD * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP LO-A2 at $21,000,000. With 76% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $16,011,000 ($21,000,000 * 76%).

CIP LO-B – Land Outfall Gravity Section B

Gravity Section B of the Land Outfall is an existing 1,500-foot-long, 30-inch diameter pipe jointly owned by the District, the City of Carlsbad and the Buena Sanitation District. The existing peak wet weather flow within Gravity Section B of the Land Outfall is 22.67 MGD. This is derived by summing the capacity that the City of Carlsbad owns within this portion of the Land Outfall (5.00 MGD), the capacity that the Buena Sanitation District owns within this portion of the Land Outfall (3.75 MGD), and the District's peak wet weather flow of 13.92 MGD, which occurred during the December 22, 2010 storm event as discussed in Chapter 7 of the District's 2018 Master Plan.

According to the Encinas Canyon Multi-Agency Relief Sewer Implementation Plan (December 2011), the existing capacity of Gravity Section B of the Land Outfall is 22.35 MGD. Therefore, there is a capacity deficiency (22.67 MGD actual flow vs. 22.35 MGD gpm design capacity) in the existing 30-inch pipe.

This pipeline project will upsize 1,500 feet of existing 30-inch diameter pipeline to 36-inch diameter pipe in a District easement just south of Las Palmas Drive west of El Camino Real in the City of Carlsbad. The upsized pipeline will have a capacity of 32.16 MGD, according to the Encinas Canyon Multi-Agency Relief Sewer Implementation Plan. This will be a Phase 3 project. 22.67 MGD of the 32.16 MGD of capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 9.49 MGD (32.16 MGD – 22.67 MGD gpm) will be available for future expansion, which represents 30% (9.49 MGD / 32.16 MGD * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP LO-B at $2,000,000. With 30% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $590,000 ($2,000,000 * 30%).

CIP LO-D1a – Land Outfall Gravity Section D1a

Gravity Section D1a of the Land Outfall consists of 1,200 feet of 30-inch diameter gravity sewer sections jointly owned by the District, the City of Carlsbad and the Buena Sanitation District. The existing peak wet weather flow within Gravity Section D of the Land Outfall is 22.67 MGD. This is derived by summing the capacity that the City of Carlsbad owns within this portion of the Land Outfall (5.00 MGD), the capacity that the Buena Sanitation District owns within this portion of the Land Outfall (3.75 MGD), and the District's peak wet weather flow of 13.92 MGD, which occurred during the December 22, 2010 storm event as discussed in Chapter 7 of the District's 2018 Master Plan.

According to the Encinas Canyon Multi-Agency Relief Sewer Implementation Plan (December 2011), the existing capacity of Gravity Section D1a of the Land Outfall is 22.52 MGD. Therefore, there is a capacity deficiency (22.67 MGD actual flow vs. 22.52 MGD gpm design capacity) in the existing 30-inch pipe.

This pipeline project will upsize 1,200 feet of existing 30-inch diameter pipeline to 36-inch diameter pipe in Palomar Airport Road and a District easement just south of Palomar Airport Road in the City of Carlsbad. The upsized pipeline will have a capacity of 32.40 MGD, according to the Encinas Canyon Multi-Agency Relief Sewer Implementation Plan. This will be a Phase 1 project. 22.67 MGD of the 32.40 MGD of capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 9.73 MGD (32.40 MGD – 22.67 MGD gpm) will be available for future expansion, which represents 30% (9.73 MGD / 32.40 MGD * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP LO-D1a at $1,600,000. With 30% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $480,000 ($1,600,000 * 30%).

CIP LO-D1b – Land Outfall Gravity Section D1b

Gravity Section D1b of the Land Outfall consists of 5,400 feet of 30-inch and 36-inch diameter gravity sewer sections jointly owned by the District, the City of Carlsbad and the Buena Sanitation District. The existing peak wet weather flow within Gravity Section D of the Land Outfall is 22.67 MGD. This is derived by summing the capacity that the City of Carlsbad owns within this portion of the Land Outfall (5.00 MGD), the capacity that the Buena Sanitation District owns within this portion of the Land Outfall (3.75 MGD), and the District's peak wet weather flow of 13.92 MGD, which occurred during the December 22, 2010 storm event as discussed in Chapter 7 of the District's 2018 Master Plan.

According to the Encinas Canyon Multi-Agency Relief Sewer Implementation Plan (December 2011), the existing capacity of Gravity Section D1b of the Land Outfall is 24.32 MGD. Therefore, there is sufficient capacity (22.67 MGD actual flow vs. 24.32 MGD gpm design capacity) in the existing 30-inch and 36-inch pipe.

This pipeline project will upsize 5,400 feet of existing 30-inch and 36-inch diameter pipeline to 42-inch diameter pipe in Palomar Airport Road and a District easement just south of Palomar Airport Road in the City of Carlsbad. The upsized pipeline will have a capacity of 32.46 MGD, according to the Encinas Canyon Multi-Agency Relief Sewer Implementation Plan. This will be a Phase 1 project. 24.32 MGD of the 32.46 MGD of capacity provided by this project currently exists and therefore will be allocated to existing development. The remaining 8.14 MGD (32.46 MGD – 24.32 MGD gpm) will be available for future expansion, which represents 25% (8.14 MGD / 32.46 MGD * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP LO-D1b at $8,300,000. With 25% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $2,081,000 ($8,300,000 * 25%).

CIP LO-D1c – Land Outfall Gravity Section D1c

Gravity Section D1c of the Land Outfall consists of 1,300 feet of 39-inch diameter gravity sewer sections jointly owned by the District, the City of Carlsbad and the Buena Sanitation District. The existing peak wet weather flow within Gravity Section D of the Land Outfall is 22.67 MGD. This is derived by summing the capacity that the City of Carlsbad owns within this portion of the Land Outfall (5.00 MGD), the capacity that the Buena Sanitation District owns within this portion of the

Land Outfall (3.75 MGD), and the District's peak wet weather flow of 13.92 MGD, which occurred during the December 22, 2010 storm event as discussed in Chapter 7 of the District's 2018 Master Plan.

According to the Encinas Canyon Multi-Agency Relief Sewer Implementation Plan (December 2011), the existing capacity of Gravity Section D1c of the Land Outfall is 21.99 MGD. Therefore, there is a capacity deficiency (22.67 MGD actual flow vs. 21.99 MGD gpm design capacity) in the existing 39-inch pipe.

This pipeline project will upsize 1,300 feet of existing 39-inch diameter pipeline to 48-inch diameter pipe in a District easement just south of Palomar Airport Road east of Interstate 5 in the City of Carlsbad. The upsized pipeline will have a capacity of 33.85 MGD, according to the Encinas Canyon Multi-Agency Relief Sewer Implementation Plan. This will be a Phase 1 project. 22.67 MGD of the 33.85 MGD of capacity provided by this project will be allocated to mitigate the existing capacity deficit. The remaining 11.18 MGD (33.85 MGD – 22.67 MGD gpm) will be available for future expansion, which represents 33% (11.18 MGD / 33.85 MGD * 100%) of the project's capacity.

The 2018 Master Plan estimated the total cost for CIP LO-D1c at $2,300,000. With 33% of this project's capacity allocated to expansion, the project's 2015 cost contribution to the Wastewater Capital Facility Fee determination is $760,000 ($2,300,000 * 33%).

Encina Water Pollution Control Facility – Waste Gas Flare

The Encina Wastewater Authority's (EWA) Comprehensive Asset Management Plan (E-CAMP), released in June 2019, identified the need for a new waste gas flare system. This will be a Phase 1 project based on EWA's schedule. The District's calculated contribution toward this facility is $182,290, which is allocated 100% to expansion. The new facility expands the capacity of the waste gas flare system as part of the solids treatment process. The new facility does not replace an existing system. It was identified as part of the EWA Phase 5 expansion but was not built with the original expansion. Now with increased demands on the solid system is realized, the need for the expansion has become necessary.

Encina Water Pollution Control Facility – Additional Solids Improvements New Heat Dryer

The Encina Wastewater Authority's Comprehensive Asset Management Plan (E-CAMP), released in June 2019, identified the need for additional solids treatment improvements at the Encina Water Pollution Control Facility. This will be a Phase 1 project based on EWA's schedule. The District's calculated contribution toward this facility is $4,419,157, which is allocated 100% to expansion. The new facility expands the capacity of the solids Heat Dryer as part of the solid's treatment process. The new facility does not replace an existing system. It was identified as part of the EWA Phase 5 expansion but was not built with the original expansion. Now with increased demands on the solid system is realized, the need for the expansion has become necessary.

Table 5 below shows the breakdown of these wastewater CIP projects by phase and the total expansion cost component that is used for the "CIP" row in Table 3 above. Note that the 2015 cost contributions from each CIP project above have been brought to 2019 levels.

Table 5: Wastewater CIP Expansion-Only Costs per Phase

Master Plan Wastewater Expansion CIP (2019 ENR) Phases 1-4						
Phase	Year	Pipeline / LS	Interceptor	Outfall	Treatment	EWA	Total
1	2015-2020	2,701,868	8,793,651	3,632,755	-	5,033,403	20,161,677
2	2021-2025	3,676,510	-	1,247,016	-	-	4,923,526
3	2026-2030	3,075,973	-	18,159,399	-	-	21,235,372
4	2031-2035	2,399,959	-	-	-	-	2,399,959
5	2036-	-	-	-	-	-	-
		11,854,310	8,793,651	23,039,170	-	5,033,403	$ 48,720,534

2. Financing Costs and Present Value Discount

The District's Master Plan breaks down the CIP into phases for implementation as shown in Tables 4 and 5. This implementation plan is utilized in the rate model to calculate the Capital Facility Fees. The District's policy in the past has always been that expansion capital facilities are to be 100% debt financed because expansion facilities have to be put in place prior to the first user connecting to them or paying any fees. The Capital Facility Fee revenue collected from new development is then used to repay the annual debt service. Thus this cost of capital must be included in valuing the expansion assets. The calculation of future debt service contained in the model is based on the following assumptions:

- Interest on Phase 1 debt will be 4.5%. For Phase 2 to 5, interest rate is 6.5%.
- The cost of issuance for each bond issue is 2% of the total principal amount.
- The term of each one of the debt issues will be 25 years.
- Inflation over the time period for calculating the present value of each year's payment of principal and interest will be 2% annually.

Using this approach to financing expansion related CIP provides for the adjusted equation for the District's Capital Facility Fees where all CIP and financing costs are in 2019 dollars:

$$\frac{\text{Present Value of Growth Asset + Present Value of Debt Repayment}}{\text{Projected Growth in Equivalent Dwelling Units}}$$

3. Existing Debt

The District has issued debt in the past to install major capital facilities to support new development. The major facilities that have been debt financed and still have capacity for new development include the 40-million-gallon Twin Oaks Reservoir, Encina Phase 5 Expansion, and the Meadowlark Reclamation Plant Expansion. Debt proceeds were used only to fund the expansion portion of these projects. Any portion of the project costs related to replacement were funded by water and sewer rates. The present value of existing debt service for capital expansion projects is currently $29 million for water and $36 million for wastewater.

4. Capital Facility Fund Shortfall

As stated above in Item 3, the District has substantial outstanding debt for existing capital facilities. This debt has always been included in the Capital Facility Fee calculation and the annual required debt service is paid from reserves in the Capital Expansion Fund into which all fee revenues are deposited. During the recent recession, projected new development on which the debt repayment schedule was based was unexpectedly delayed for several years. This resulted in lower than anticipated revenues. The debt service payments and the capital expansion cost to support projected development exceeded the Capital Facility Fee revenues resulting in a negative balance in the expansion fund. The expansion fund is restricted and tracked separately from other funds. Accordingly, the negative balance can only be funded through capacity fees or through the issuance of debt. The capital expansion costs resulted in facilities that still have capacity for new development and, as a result, the funding to replenish the reserve in the amount of the negative balance is included in the calculation of the Capital Facility Fee.

Equivalent Dwelling Units (EDUs)

The number of equivalent dwelling units utilized in the water and wastewater Capital Facility Fees determination is based on the demand projections from the 2018 Master Plan. Only Phase 1 through 4 water expansion projects were included in the water Capital Facility Fee calculation. Similarly, only Phase 1 through 4 water demand projections were included in the water Capital Facility Fee calculation. This timeframe includes demands from 2014 to 2035, as described in Chapter 5 of the 2018 Master Plan. As shown in Table 6 below, the District projects a water demand increase of 4.4 MGD (19.2 MGD – 14.8 MGD) within the timeframe.

Table 6: Water Demand Projections by Phase

Year	Projected Average Daily Demand (MGD)
2014[1]	**14.8**
2020	17.0
2025	18.6
2030	19.0
2035	**19.2**

District Ordinance 175 establishes the water EDU as 500 gallons per day. Therefore, the District projects a water demand increase of 8,800 EDUs (4.4 MGD / 500 gpd per EDU) that Phase 1 through 4 expansion projects will address.

Only Phase 1 through 4 wastewater expansion projects were included in the wastewater Capital Facility Fee calculation. Similarly, only Phase 1 through 4 wastewater demand projections were included in the

wastewater Capital Facility Fee calculation. This timeframe includes demands from 2014 to 2035, as described in Chapter 7 of the 2018 Master Plan.

As shown in Table 7 below, the District projects a wastewater demand increase of 2.1 MGD (9.6 MGD – 7.5 MGD) within the timeframe between 2014 and 2035.

Table 7: Wastewater Flow Projections by Phase

Year	Projected Annual Average Flows (MGD)
2014	**7.5**
2020	8.7
2025	9.5
2030	9.6
2035	**9.6**

District Ordinance 176 establishes the wastewater EDU as 250 gallons per day. Therefore, the District projects a wastewater demand increase of 8,400 EDUs (2.1 MGD / 250 gpd per EDU) that Phase 1 through 4 expansion projects will address.

CONCLUSIONS AND RECOMMENDATIONS

After following the procedures outlined in this report we have reached the following conclusions:

1. The economic model is well constructed, easy to follow/audit, and provides excellent summary tables that can be easily included in reports and presentations. We found no errors in calculation of the Fees in the model.
2. The Master Plan was reviewed to determine which water and wastewater expansion facilities should be included in the Capital Facility Fee calculation. The Master Plan clearly identifies the required capital facilities for the five phases and forms the required basis for the update of the District's Capital Facility Fees. Documentation from the Encina Wastewater Authority was reviewed for the waste gas flare and solids handling projects to be included in the Capital Facility Fee. Section 1 of this study describes the Capital Improvement Program projects that are a part of the proposed Capital Facility Fees, and how the expansion-only portion of each project's cost is derived.
3. The Engineering News Record calculations to bring Master Plan costs to January values were verified for accuracy.
4. The EDUs used in the Capital Facility Fee calculations were discussed and verified to be consistent with the Master Plan.
5. The components in the Capital Facility Fee calculations follow the industry guidelines that provide that these fees can recover cost for facilities in existence at the time a charge is imposed or charges for new facilities to be constructed in the future that will provide benefit to the property being charged and can include the costs of financing these facilities.

6. The District has reviewed multiple options for the interest rate to be used for debt issued for Phases 2 to 5. Originally the model was set to 8% for these phases due to concerns about increased inflation. The District has explored with their financial consultant whether this number is appropriate for future debt service interest rate and recommended a lesser rate of 4.5% for phase 1 projects and 6.5% for future debt issuance from phase 2-5 within the model. The District will want to revisit these interest rates as part of the next update to the Master Plan and/or associated Capital Facility Fee calculations to insure that they are recovering their cost of capital.
7. The District is estimated at 65% water and 60% wastewater buildout. Although the District has primarily used the incremental methodology to calculate their Capital Facility Fees, with a buy-in component relating only to the shortfall and existing debt, the District may wish to explore alternative fee calculation methodologies when the next Master Plan and Fee update is performed.