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# **Marina Coast Water District**

## **Water, Wastewater and Recycled Water Capacity Fee Study**

**Draft Final Report**  
**July 15, 2020**



**BARTLE WELLS ASSOCIATES**  
INDEPENDENT PUBLIC FINANCE ADVISORS



**BARTLE WELLS ASSOCIATES**  
INDEPENDENT PUBLIC FINANCE ADVISORS

1889 Alcatraz Avenue  
Berkeley, CA 94703  
T: 510-653-3399  
www.bartlewells.com

July 15, 2020

Mike Wegley  
District Engineer  
11 Reservation Road  
Marina, CA 93933

RE: Revised Draft Water, Wastewater and Recycled Water Capacity Fee Study

Bartle Wells Associates (BWA) is pleased to submit the attached *Water, Wastewater and Recycled Water Capacity Fee Study* to the Marina Coast Water District (District). Our study was developed in conjunction with the 2020 Master Plan provided by Akel Engineering which was adopted by the District Board on May 18, 2020. The report develops updated water, wastewater and recycled water capacity fees that are designed to equitably recover the costs of infrastructure and assets benefiting new development.

The results of our study are a product of extensive review from Staff, consultants, and community stakeholders. Over the past year and a half, BWA made numerous presentations to community stakeholders and the Fort Ord Reuse Authority (FORA) and incorporated feedback received by those groups. Our study also incorporates feedback from independent review provided by the Bay Area Building Industry Association and Lechowicz & Tseng Municipal Consultants.

A summary of proposed fees is shown below. The proposed fee calculation includes total fixed assets divided among all projected users in the intermediate-term (2040) plus expansion-related capital projects divided by future users in the intermediate-term.

Central Marina	Current	Proposed	Ord Community	Current	Proposed
Water \$/EDU	\$4,526	\$6,332	Water \$/EDU	\$8,010	\$11,699
Sewer \$/EDU	\$2,333	\$2,081	Sewer \$/EDU	\$3,322	\$3,012
<b>Total</b>	<b>\$6,859</b>	<b>\$8,413</b>	<b>Total</b>	<b>\$11,332</b>	<b>\$14,712</b>

We have enjoyed working with the District, FORA, and stakeholders on this assignment and appreciate the input and assistance received throughout the project. Please contact us anytime if you have questions about this report or related impact fee issues.

BARTLE WELLS ASSOCIATES

Douglas Dove, PE, CIPFA  
Principal/President

Abigail Seaman  
Consultant

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## **SUPPORTING DOCUMENTS**

Bartle Wells Associates – Capacity Fee Study Supporting Tables

Appendix A. MCWD Asset Listing

1. Water Assets
2. Sewer Assets
3. Asset Exclusions

Appendix B. Capital Improvement Plans

1. CIP Costs
2. Recycled Water CIP Adjustments

Appendix C. MCWD Water Use Factors (2021 Update)

# 1 Introduction, Background, and Government Code

## 1.1 Background

The Marina Coast Water District (District) retained AKEL Engineering to update its water, sewer and recycled water master plans. As subconsultants to AKEL, Bartle Wells Associates (BWA) has been retained to update the District's water, wastewater and recycled water capacity fees based on the new master plans. The current set of capacity fees were adopted in 2013 and have not been increased.

The District operates public water and sewer utilities that provide service to approximately 38,000 residents and associated public and commercial activities within the District's service area. The Water utility includes both potable and recycled water services. Customers are located in two service areas, Central Marina (Marina) and the Ord Community (Ord). District operations are further split between water and sewer, resulting in four cost centers, Marina Water, Marina Sewer, Ord Water and Ord Sewer. The cost centers are maintained as separate enterprises and have distinct user rates and capacity fees. This report documents the methodology and assumptions used to develop updated capacity fees for the four enterprises.

## 1.2 Government Code

Capacity fees are governed by California Government Code Section 66000 et. seq. This section of the Code was initially established by Assembly Bill 1600 (AB 1600) and is commonly referred to as the Mitigation Fee Act. Pursuant to the Code, a capacity fee is not a tax or special assessment but is instead a fee levied to defray the cost of public facilities needed to serve a new development.

Section 66013 of the Code specifically governs water and wastewater capacity fees. This section of the Code defines a “capacity charge” to mean “a charge for public facilities in existence at the time a charge is imposed or charges for new public facilities to be acquired or constructed in the future that are of proportional benefit to the person or property being charged.” The Code distinguishes “capacity charges” from “connection fees” which are defined as fees for the physical facilities necessary to make a water or wastewater connection, such as costs related to installation of meters and pipelines from a new building to a water or wastewater main.

According to the Section 66013, a water or wastewater capacity fee “shall not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed” unless approved by a two-thirds vote of the electorate. As such, the capacity fees calculated in this report represent the maximum fees that the District can levy. Section 66013 does not detail any specific methodology for calculating capacity fees.

Section 66016 of the Code identifies the procedural requirements for adopting or increasing water and wastewater capacity fees and Section 66022 summarizes the general process by which the fees can be legally challenged.

## 2 Capacity Fee Methodology

### 2.1 Current Capacity Fees

The District's current capacity fees were last evaluated by Carollo Engineers in a September 2013 report which calculated fees using a combined buy-in and future cost approach. Current fees are shown in Table 1.

**Table 1: Current Capacity Fees**

<b>Central Marina</b>	<b>\$/EDU</b>	<b>Ord Community</b>	<b>\$/EDU</b>
Water	\$4,526	Water	\$8,010
Sewer	\$2,333	Sewer	\$3,322
<b>Total Marina</b>	<b>\$6,859</b>	<b>Total Ord</b>	<b>\$11,332</b>

#### 2.1.1 Current EDU Calculation Methodology

The District's current capacity fees are charged based on an Equivalent Dwelling Unit (EDU) Evaluation of each customer.

Water EDUs are assigned based on water use factors contained in the District's Appendix C document. One EDU is equivalent to 0.33 Acre Foot (AF) of water use per year.

Wastewater EDUs are currently assigned as follows: Each residential connection including single family, multiple dwelling, condominium, trailer spaces and mobile homes is equal to one EDU. Non-residential wastewater EDUs are calculated based on plumbing fixture units at a current conversion rate of 20 fixture units per EDU. For each hotel/motel unit, a minimum of one EDU per room is applied. Each non-residential connection is a minimum of one EDU.

## 2.2 Facility Cost Valuation

The District does not have a complete historical fixed assets record with purchase date and cost for each existing asset so a standard “Replacement Cost New Less Depreciation” analysis was not possible. For purposes of this study, asset values for Central Marina water and wastewater systems were estimated using detailed asset inventories, replacement costs, and depreciation developed by AKEL engineering. Ord Community assets were estimated using the sum of capital investments made by the District since taking over the systems in 2001. The value of Ord assets donated by the Army were excluded from the analysis. The asset values were further adjusted to exclude assets funded by grants, developer contributions, and depreciation based on the current age and estimated condition of facilities. The detailed replacement cost calculations are shown in the supporting tables attached to this report.

## 2.3 Capacity Fee Calculation Overview

While the current fee calculation methodology is a widely used and generally appropriate way to recover the future share of the District’s utility system assets and development costs, BWA proposes that the District adopt a more comprehensive cost recovery approach as summarized below.

### **Current Methodology: Average Cost Approach**

$$\frac{\textit{Existing Asset Value} + \textit{Total CIP}}{\textit{Total Units}}$$

### **Proposed Methodology: Hybrid Buy-In + Marginal Future Cost Approach**

$$\frac{\textit{Existing Asset Value}}{\textit{Total Units}} + \frac{\textit{Future User Share of CIP}}{\textit{Future Units}}$$



### 2.3.1 Current Methodology: Average Cost Approach

The current capacity fees were calculated with an *average cost approach* fees using the District's existing system, future projects and buildout projections. Under this approach, new connections pay an average cost of the total value of the existing system escalated to current dollars and the total Capital Improvement Plan. The fees are calculated based on the total cost of facilities plus total CIP divided by the total capacity the District is projected to serve through build-out. This is a widely used approach for calculating capacity fees but in some cases may not comprehensively recover the future share of growth-related CIP from future users. BWA estimates that by using the average cost methodology that the District will experience a \$24.6 million shortfall in CIP funding from developer fees (see Supplementary Tables). Therefore, BWA recommends that the District use a revised methodology that incorporates both buy-in and marginal cost components for calculating capacity fees in the future, as summarized in Section 2.3.2.

### 2.3.2 Proposed Methodology: Hybrid Buy-In + Marginal Future Cost Approach

Under the proposed approach, new connections buy in to the District's current system based on an average share of the total existing system, or the replacement value of each enterprise's assets less estimated depreciation. New connections also pay for the future cost of expansion by adding the present value of future CIP to the fee basis. The fees are calculated based on the total cost of facilities divided by the total capacity the District is projected to serve through the intermediate-term (2040) plus future CIP divided by future capacity in the intermediate-term. This fee would comprehensively recover the development share of existing facilities and CIP benefiting future users.

## 3 Capacity Fee Calculation

### 3.1 System Buy-In Component – Existing Assets

The updated capacity fees are designed to recover the cost of facilities that benefit new growth including a share of existing water, wastewater and recycled water system facilities and assets as well as the cost of system upgrades and expansions needed to serve growth through the Intermediate Term horizon (approximately 2040). Since a detailed listing of assets and purchase dates was not available at the time of this study, BWA worked closely with District Staff and Akel Engineers to estimate the value of existing assets using the following information:

#### 1. Asset Listings and Replacement Value Estimates –

Central Marina - AKEL Engineering 2020 Master Plans

Water asset categories include pipelines, wells, pressure reducing valves, storage tanks and booster stations. Sewer asset categories include mains and lift stations. BWA only included pipelines and mains with diameters measuring 8” and larger, assuming all smaller pipelines are assets in-tract. Land, office buildings, and other assets were not included in the valuation.

Ord Community – The Ord Community’s water and wastewater systems were inherited from the Fort Ord military base and officially transferred to the District in 2001. Asset book value was estimated using the last 20 years of District capital spending listed in the Comprehensive Annual Financial Report (CAFR). Asset book values were escalated to current dollars using the 20-city Engineering News Record Construction Cost Index (ENR CCI).

#### 2. Asset Adjustments – District-provided data

BWA adjusted the asset replacement value by subtracting the value of assets contributed by outside sources and assets being replaced in the intermediate-term Master Plan CIPs.

- The District received a 2003 grant to fund pressure reducing valves and a 2008 grant to fund wells and to mitigate seawater intrusion. BWA subtracted a total of \$3.3 million of grant funding adjustments from the water asset valuation in the Ord Community.
- The District received \$11.1 million in developer-contributed water assets and \$8.9 in developer-contributed sewer assets which were subtracted from the asset valuation in the Ord community.

- The District’s 2020 Master Plan CIPs include replacement of existing water and wastewater pipelines. The estimated value of these pipelines was subtracted from the Marina replacement value.
- Assets donated by the army or funded by grants were removed from the Ord asset book value.

**3. Depreciation** – Estimation based on current age and condition of facilities.

Since detailed information on asset purchase values and dates were not available, the depreciation factor was conservatively set based on the age and condition of the existing facilities as follows:

- Central Marina’s water and wastewater infrastructure was mostly constructed around 1975. While improvements, replacements, and additional assets have been incorporated since that time, and Akel Engineers and District Staff estimate that the system is between 30% and 50% depreciated, BWA has conservatively estimated the system to be 50% depreciated. Akel Engineering has conducted a detailed survey of existing infrastructure and can confirm that the depreciation factors applied reflect the approximate age and condition of facilities.
- Ord Community assets were depreciated based on an estimated 75-year useful life. Depreciation was escalated to current dollars using the 20-city Engineering News Record Construction Cost Index (ENR CCI).

A summary of the asset valuation is provided in Table 2. Detailed calculations are provided in the supporting tables following this report. Detailed source information is provided in Appendix A.

**Table 2: Valuation Summary – Existing Assets**

	<b>Marina Water</b>	<b>Ord Water</b>	<b>Marina Sewer</b>	<b>Ord Sewer</b>
Estimated Asset Value <sup>1</sup>	\$41,782,100	31,688,633	\$45,207,600	\$16,413,178
Less Asset Adjustments	(4,834,600)	(15,056,647)	(5,589,800)	(10,723,180)
Less Estimated Depreciation	(18,473,750)	(2,773,020)	(19,808,900)	(1,091,957)
Cost Escalation to 2020 Current Value		5,753,155		2,431,657
<b>System Estimated Net Asset Value</b>	<b>\$18,473,750</b>	<b>19,612,121</b>	<b>\$19,808,900</b>	<b>7,029,698</b>

1 - 2020 replacement value of Master Plan asset listings for Marina  
20-year book value of capital spending for Ord

### 3.2 Future Cost Component – Capital Improvement Projects

1. **Capital Improvement Project Costs** - The District’s 2020 Water, Recycled Water, and Sewer Master Plans outline the capital improvements needed for each utility to reach intermediate-term buildout in 2040. These projects include upgrades, expansions, regular maintenance, and new facilities. The Master Plan divides project costs into two benefit groups: current customers and future customers. The present value of capital improvements benefiting future customers is included in the capacity fee calculation. The water capacity fee calculation includes both water and recycled water categories. Master plan projects attributable to a single development were excluded from the capacity fee calculation. Details are provided in Appendix B.

The District’s intermediate-term capital improvement project costs are summarized in Table 3.

**Table 3: Intermediate-Term Capital Improvement Plan Summary**

	<b>Marina Current Users</b>	<b>Marina Future Users</b>	<b>Ord Current Users</b>	<b>Ord Future Users</b>
Water	\$17,759,900	\$24,462,300	\$11,182,300	\$40,752,500
Recycled Water	\$7,546,000	\$5,418,723	\$7,854,000	\$39,980,141
Sewer	\$5,599,107	\$3,081,295	\$14,537,762	\$21,203,210
<b>Total CIP</b>	<b>\$30,905,007</b>	<b>\$32,962,318</b>	<b>\$33,574,062</b>	<b>\$101,935,851</b>

2. **Capital Improvement Plan Adjustments** – Adjustments were made to each cost center to accurately reflect projects funded by all new development.

Water and Sewer – The future user portion of financing costs were added to the CIP value to account for bond financing for the first five years of the water and sewer capital improvement plans. Financing costs were allocated based on each service area’s share of future user water and sewer project costs.

Recycled Water – expected grants and FORA Capital Contributions have been subtracted from the future share of project costs, while the future user portion of financing costs on three proposed loans have been added to the future project cost. Capital contributions are attributable to Ord only. Grants and future financing adjustments were allocated to Marina and Ord according to each service area’s share of future user recycled water project costs.

The adjusted future portion of capital improvement costs is calculated in Table 4 to be used in the capacity fee calculation.

**Table 4: Adjusted Capital Improvement Plan Summary**

	<b>Marina Current Users</b>	<b>Marina Future Users</b>	<b>Ord Current Users</b>	<b>Ord Future Users</b>
<b>Total CIP Costs</b>				
Water	\$17,759,900	\$24,462,300	\$11,182,300	\$40,752,500
Recycled Water	\$7,546,000	\$5,418,723	\$7,854,000	\$39,980,141
Sewer	\$5,599,107	\$3,081,295	\$14,537,762	\$21,203,210
<b>Total CIP</b>	<b>\$30,905,007</b>	<b>\$32,962,318</b>	<b>\$33,574,062</b>	<b>\$101,935,851</b>
<b>Adjustments</b>				
Water (Bond financing)	\$0	\$2,263,100	\$0	\$6,118,500
Recycled Water (SRF loans, grants, capital contributions)	\$0	\$348,836	\$0	(\$1,726,234)
Sewer (Bond financing)	\$0	\$244,700	\$0	\$695,300
<b>Adjusted Total CIP</b>				
Water	\$17,759,900	<b>\$26,725,400</b>	\$11,182,300	<b>\$46,871,000</b>
Recycled Water	\$7,546,000	<b>\$5,767,559</b>	\$7,854,000	<b>\$38,253,907</b>
Sewer	\$5,599,107	<b>\$3,325,995</b>	\$14,537,762	<b>\$21,898,510</b>

### 3.3 Proposed Updates to Water Demand Factors

#### 3.3.1 Estimated Water Demand per EDU

Marina Coast WD currently defines a water equivalent dwelling unit as the amount a typical residential dwelling would use in a year, or 0.33 AF per year. For non-residential development, the District utilizes “Appendix C, Assigned Water Use Factors for Determining Water Capacity Charges” to estimate the annual water use for various types of customers.

The District recently reviewed and updated its water use factors based on 250 gallons per day, or 0.28 AF/yr/EDU. This value aligns with the system wide average day use determined by Akel Engineering in the 2020 Water Master Plan. Updated water use factors are provided in Appendix C.

#### 3.3.2 Estimated Sewer Flow per EDU

Table 5 summarizes the sewer flow per person in the District between 2010 and 2016. The sewer flow trend is downward during this period and the average daily sewer flow per person is 63 gallons. The District estimates a typical household population of 2.8 persons. Thus, the typical sewer flow from a single-family home is estimated at 174 gallons per day. BWA recommends that the District establish 174 gallons per day as the sewer flow for one EDU.

**Table 5: Estimated Sewer Flow per EDU**

<b>Year</b>	<b>Population</b>	<b>Sewer Flow (gpdc)</b>
2010	30,840	68
2011	31,141	67
2012	31,445	64
2013	31,752	64
2014	32,062	61
2015	32,375	56
2016	33,346	<u>58</u>
<b>Average</b>		<b>62</b>
Population per Household (1 EDU)		2.8
<b>Sewer Flow per EDU</b>		<b>174</b>

Source: AKEL Engineers

### 3.4 Current and Projected EDUs

The District is expecting significant growth to intermediate-term buildout in 2040 per the projections in the latest Sewer Master Plan. BWA evaluated several methodologies for customer growth and concluded that the most reasonable methodology to apply is the projected change in average day demand from 2020 to intermediate-term buildout.

Table 6 shows current and projected customers in EDUs. Water EDUs were calculated using AKEL Engineering and District updated estimates of average day demand at 250 gpd (or 0.28AF/yr/EDU) and average day demand growth from present day to intermediate-term growth in 2040. Wastewater EDUs were calculated using 174 gpd (or 0.195 AFY/EDU) and average day demand growth from present day to intermediate-term growth in 2040.

**Table 6: Current and Projected EDUs**

	<b>Marina Water</b>	<b>Ord Water</b>	<b>Marina Sewer</b>	<b>Ord Sewer</b>
Average Day Demand per EDU (gpd)	250	250	174	174
Current Demand - 2020 (mgd)	1.98	1.26	1.10	0.90
<b>Current EDUs</b>	<b>7,920</b>	<b>5,040</b>	<b>6,322</b>	<b>5,172</b>
Intermediate Term Demand -2040 (mgd)	3.59	3.34	2.21	2.42
<b>Intermediate Term EDUs</b>	<b>14,360</b>	<b>13,360</b>	<b>12,701</b>	<b>13,908</b>
<b>Future Growth EDUs to Intermediate Term</b>	<b>6,440</b>	<b>8,320</b>	<b>6,379</b>	<b>8,736</b>

### 3.5 Proposed Capacity Fee Calculation

Table 7 shows the detailed calculation of the District’s updated capacity fees using the Hybrid Buy-In + Marginal Future Cost methodology described in Section 2.3.2 and updated information described above in Section 3. Recycled Water CIP costs are included in the water capacity fee net of adjustments described in Section 3.2.

**Table 7: Proposed Capacity Fee Calculation - Hybrid Buy-In + Marginal Future Cost**

	<b>Marina Water</b>	<b>Ord Water</b>	<b>Marina Sewer</b>	<b>Ord Sewer</b>
Estimated Asset Replacement Value	\$18,473,750	\$19,612,121	\$19,808,900	\$7,029,698
Total System EDUs to Intermediate Term	14,360	13,360	12,701	13,908
<b>Buy-In Capacity Fee Component \$/EDU</b>	<b>\$1,286</b>	<b>\$1,468</b>	<b>\$1,560</b>	<b>\$505</b>
Water CIP (incl. adjustments)	\$26,725,400	\$46,871,000	-	-
Recycled Water CIP (incl. adjustments)	\$5,767,559	\$38,253,907	-	-
<u>Sewer CIP (incl. adjustments)</u>	-	-	<u>\$3,325,995</u>	<u>\$21,898,510</u>
Value of Future CIP to Intermediate Term	\$32,492,959	\$85,124,907	\$3,325,995	\$21,898,510
Future Growth EDUs to Intermediate Term	6,440	8,320	6,379	8,736
<b>Marginal Future Cost Component \$/EDU</b>	<b>\$5,045</b>	<b>\$10,231</b>	<b>\$521</b>	<b>\$2,507</b>
<b>Proposed Capacity Charge \$/EDU</b>	<b>\$6,332</b>	<b>\$11,699</b>	<b>\$2,081</b>	<b>\$3,012</b>
Current Capacity Charge	\$4,526	\$8,010	\$2,333	\$3,322
Difference	\$1,806	\$3,689	(\$252)	(\$310)



### 3.6 Estimated Sewer Plumbing Fixture Units per EDU

Many agencies, including the District, assign non-residential sewer EDUs based on the count of plumbing fixture units in a new building. Plumbing fixtures are defined in Chapter 7 of the California Plumbing Code (CPC) and various plumbing units are assigned fixture unit counts based on the relative flow associated with that unit. For example, a clothes washer is assigned 3 fixture units and a kitchen sink is assigned 2 fixture units. The District currently equates one EDU with 20 fixture units. As shown in Table 8, a typical single-family home with two bathrooms is currently rated at 19 DFUs based on Table 702.1 of the 2016 CPC. BWA recommends that the District update its fixture unit allocation per EDU to 19 fixture units.

**Table 8: Estimated Plumbing Fixture Units per EDU**

Fixture Type	Quantity	DFU <sup>1</sup>	Total DFU
Bathtub (with or without shower)	1	2	2
Clothes Washer	1	3	3
Dishwasher	1	2	2
Lavatory Sink	2	1	2
Shower (single)	1	2	2
Kitchen Sink	1	2	2
Toilet (1.28 gal per flush)	2	3	6
<b>Fixture Units in a Typical Single-Family Residence</b>			<b>19</b>

1. DFU = Drainage Fixture Units as defined in Chapter 7 of California Plumbing Code

### 3.7 Accessory Dwelling Units

Recently enacted state law, Government Code Section 65852.2 (SB 1069) effective January 1, 2018, requires that the capacity fees charged to ADUs must proportionately account for impact on services based on the ADU's size or number of plumbing fixtures. Table 9 summarizes an example calculation for a hypothetical ADU containing a kitchen sink, bathroom (lavatory) sink, 1.28 gpf toilet and a shower. The ADU in this example would have a rating of 8 fixture units.

**Table 9: Estimated ADU Fixture Units**

Fixture Type	Quantity	DFU <sup>1</sup>	Total DFU
Bathtub (with or without shower)	0	2	0
Clothes Washer	0	3	0
Dishwasher	0	2	0
Lavatory Sink	1	1	1
Shower (single)	1	2	2
Kitchen Sink	1	2	2
Toilet (1.28 gal per flush)	1	3	3
<b>Fixture Units in Example ADU</b>			<b>8</b>

1. DFU = Drainage Fixture Units as defined in Chapter 7 of California Plumbing Code

### 3.8 Multi-Family Residential Sewer Users

Multi-family units, including apartments, condominiums, trailer spaces and mobile homes are currently assigned one EDU for the purposes of calculating capacity fees. Recent trends in water and sewer demand show that multi-family units typically have lower demand than a single-family residence, typically due to a reduced number of residents per multi-family dwelling or reduced number of plumbing fixtures. In the 2017 Wastewater Rate Study, Carollo Engineers reported reduced flow for multi-family customers and recommended that the District adopt a use factor of 0.8 for multi-family residences. BWA recommends that the District adopt a use factor of 0.8 for all multi-family residences (multiple dwelling, condominium, trailer space, or mobile home) for the purposes of calculating capacity fees. A factor of 0.8 is common among California water and wastewater agencies and reflects recent trends in demand for multi-family residences.

### 3.9 Summary of Proposed Changes to Capacity Fee Structure

BWA proposes revisions to the sewer EDU calculations as follows:

- Each nineteen (19) fixture units are equivalent to one (1) equivalent dwelling unit (EDU).
- Each Single-Family Residential connection is one (1) EDU
- Each Multi Family Residential Connection (multiple dwelling, condominium, trailer space or mobile home) is 0.8 EDU
- Each nonresidential connection is a minimum of one (1) EDU.
- Hotels are considered non-residential units
- Updated Sewer Flow per EDU = 62gpd \* 2.8 persons/household = 174gpd/EDU

Water use factors have also been updated to reflect these changes and can be found attached to this report.

## 4 Conclusion and Recommendations

### 4.1 Summary of Proposed Fees

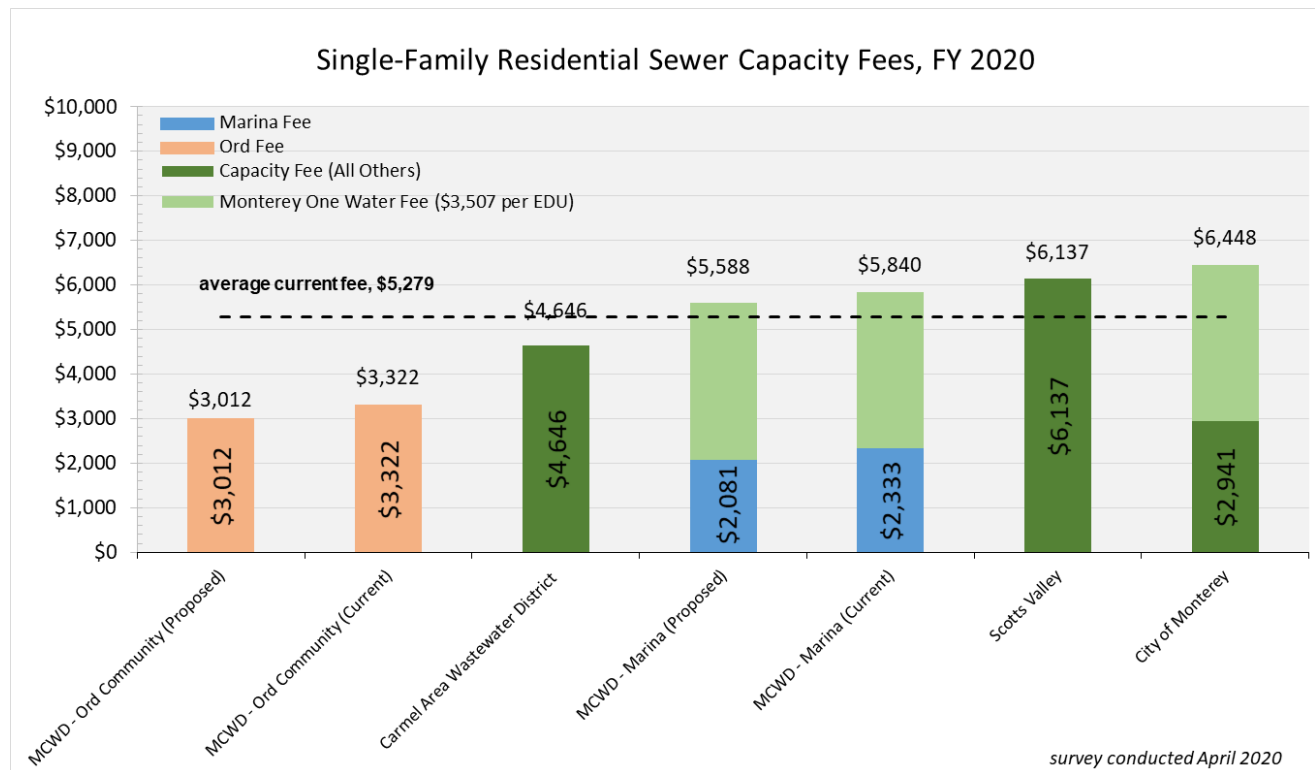
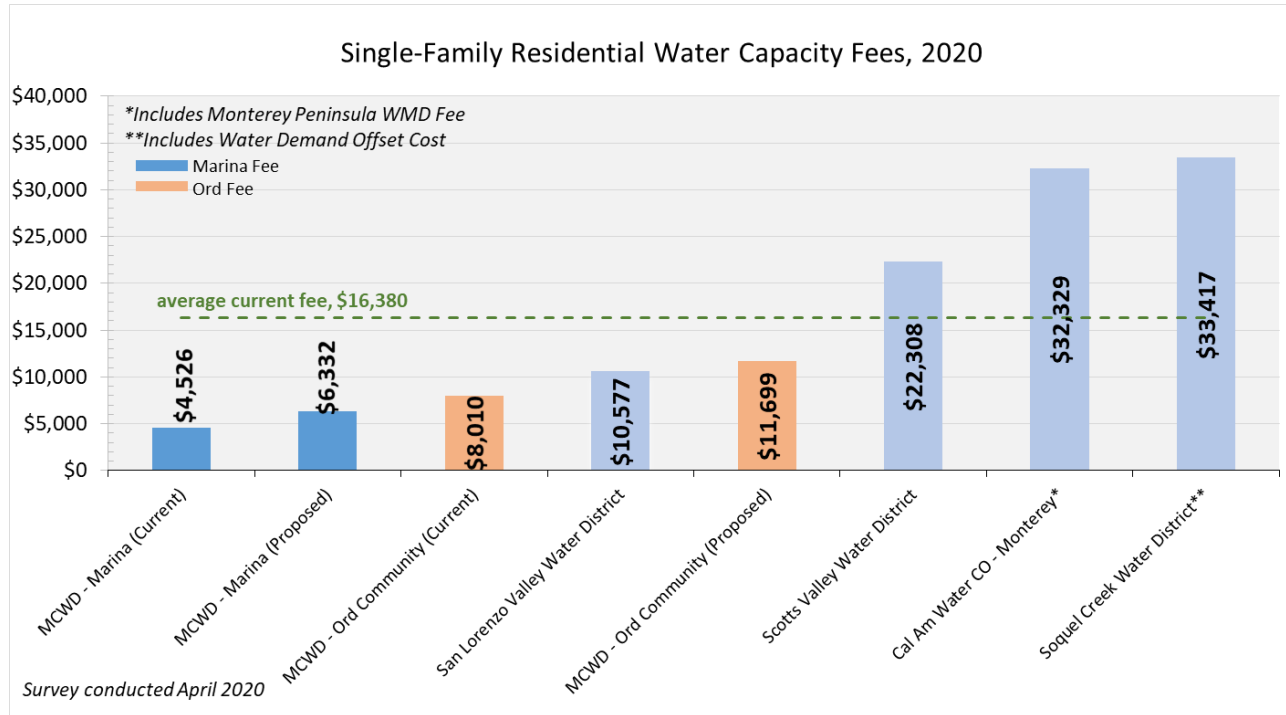
Table 10 provides a summary of findings per the methodology and District information detailed in this report. BWA has calculated fees on a \$/EDU basis using the proposed methodology described in Section 2.3.2 and calculated in Table 7.

**Table 10: Proposed Capacity Fee Summary**

<b>Central Marina</b>	<b>\$/EDU</b>	<b>Ord Community</b>	<b>\$/EDU</b>
Water	\$6,332	Water	\$11,699
Sewer	\$2,081	Sewer	\$3,012
<b>Total Marina</b>	<b>\$8,413</b>	<b>Total Ord</b>	<b>\$14,712</b>

## 4.2 Capacity Fee Survey of Surrounding Agencies

BWA conducted a capacity fee survey of surrounding water and wastewater agencies to compare with the District's proposed fees. The results are shown below.



### 4.3 Conclusion

BWA finds that the proposed fees follow generally accepted fee design criteria and adhere to the substantive requirements of government code. BWA recommends that the District adopt the fees enclosed in this report by following the procedure to increase capacity fees as follows:

1. Create a nexus study to determine equitable capacity fees (Done by BWA)
2. Set notice the date of a public hearing as required in Government Code
3. Send notice of hearing to developers if specifically requested in writing
4. Hold public hearing and adopt new capacity fees via Resolution
5. Fees may become effective not less than 30 days after adoption

### 4.4 Future Fee Adjustments

In future years, BWA recommends that the District update its capacity fees annually by adjusting the fees by the change in the Engineering News-Record Construction Cost Index (20-Cities Average) to account for future construction cost inflation. Additionally, the District should review and consider updating its capacity fees when substantial revisions are made to anticipated capital improvement costs or to substantial changes in projected demand. In general, BWA recommends that capacity fees be independently reviewed and/or updated approximately once every five years.

# Marina Coast WD



## Water, Wastewater & Recycled Water Capacity Fee Supporting Tables

**7/15/2020**



BARTLE WELLS ASSOCIATES

Independent Public Finance Advisors

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**Table S-1**  
**Marina Coast WD**  
**Current Capacity Fees**

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<u>2020 Capacity Fees</u>	<u>Central Marina</u> <sup>1</sup>	<u>Ord Community</u> <sup>1</sup>
Water Capacity Fee (per EDU)	\$4,526	\$8,010
Sewer Capacity Fee (per EDU)	\$2,333	\$3,322

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EDU = Equivalent Dwelling Unit

1 - Last updated 2013, does not include regional wastewater fees

**Current Residential Water Capacity Fees**

*Each residential connection (single-family, multiple dwelling, condominium, trailer space, or mobile home) is one (1) EDU which is equivalent to 0.33 acre foot water use per year*

**Current Non Residential Water Capacity Fees**

Each EDU is equivalent to 0.33 acre foot water use per year.

Refer to MCWD "Appendix C" for assigned water use factors

**Current Non Residential Sewer Capacity Fees**

Each twenty (20) fixture units are equivalent to one (1) EDU.

Each hotel/motel unit assigned a minimum of one (1) EDU per room.

Each nonresidential connection is a minimum of one (1) EDU.

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**Table S-2A**  
**Marina Coast WD**  
**Asset Valuation - Existing Central Marina Water and Sewer System Assets**

<b>Water System Estimated Asset Value</b>	
	<b>Marina Water</b>
<b>Asset Listing - Replacement Value<sup>1</sup></b>	
Water Pipelines (8" and larger) <sup>2</sup>	\$25,089,000
Wells	11,310,000
Pressure Reducing Valves	91,300
Storage Tanks	4,660,000
Booster Stations	631,800
<b>Total Asset Replacement Value</b>	<b>\$41,782,100</b>
Less Developer Contributed Assets	\$0
Less Pipelines Being Replaced in CIP	(4,834,600)
Less Grant Funding	
<b>Adjusted Asset Replacement Value</b>	<b>\$36,947,500</b>
<i>Estimated % Depreciation<sup>3</sup></i>	<i>50%</i>
Less Estimated Depreciation	(18,473,750)
<b>Water System Estimated Net Asset Value</b>	<b>\$18,473,750</b>

<b>Sewer System Estimated Asset Value</b>	
	<b>Marina Sewer</b>
<b>Asset Listing - Replacement Value<sup>1</sup></b>	
Sewer Pipelines (8" and larger) <sup>2</sup>	\$41,736,700
Sewer Lift Stations	3,470,900
<b>Total Asset Replacement Value</b>	<b>\$45,207,600</b>
Less Developer Contributed Assets	\$0
Less Pipelines Being Replaced in CIP	(5,589,800)
<b>Adjusted Asset Replacement Value</b>	<b>\$39,617,800</b>
<i>Estimated % Depreciation<sup>3</sup></i>	<i>50%</i>
Less Estimated Depreciation	(19,808,900)
<b>Sewer System Estimated Net Asset Value</b>	<b>\$19,808,900</b>

1 - Source: Akel Engineering. Detail provided in Appendix A

2- Excludes pipes smaller than 8" diameter considered to be in-tract facilities

3 - Estimated based on current age and condition of facilities

**Table S-2B**

**Marina Coast WD**

**Asset Valuation - Existing Ord Water System Assets (Excludes Value of Assets Inherited from US ARMY)**

FY	ORD Water Assets	FY Change	Asset Exclusions	Net Investment	Estimated Depreciation	Net Book Value	20 Cities ENRCCI	Current Value ENR 20 Cities 11,439
2000	-	-			-	-	6,221	-
2001	-	-			-	-	6,343	-
2002	2,347,058	2,347,058	(1,600,000)	747,058	179,294	567,764	6,538	993,370
2003	3,600,215	1,253,157	(959,029)	294,128	66,669	227,459	6,694	388,692
2004	5,307,211	1,706,996		1,706,996	364,159	1,342,837	7,115	2,158,919
2005	6,039,222	732,011		732,011	146,402	585,609	7,446	899,648
2006	7,338,495	1,299,273		1,299,273	242,531	1,056,742	7,751	1,559,550
2007	10,591,407	3,252,912		3,252,912	563,838	2,689,074	7,966	3,861,451
2008	14,306,495	3,715,088	(2,330,000)	1,385,088	221,614	1,163,474	8,310	1,601,562
2009	20,559,012	6,252,517		6,252,517	917,036	5,335,481	8,570	7,121,653
2010	21,625,196	1,066,184		1,066,184	142,158	924,026	8,799	1,201,265
2011	21,625,196	-		-	-	-	9,070	-
2012	21,625,196	-		-	-	-	9,308	-
2013	20,628,323	(996,873)		(996,873)	(93,041)	(903,832)	9,547	(1,082,951)
2014	20,628,323	-		-	-	-	9,806	-
2015	20,628,323	-		-	-	-	10,035	-
2016	20,889,771	261,448		261,448	13,944	247,504	10,338	273,863
2017	20,889,771	-		-	-	-	10,737	-
2018	20,889,771	-		-	-	-	11,062	-
2019	31,688,633	10,798,862	(10,167,618)	631,244	8,417	622,827	11,218	635,097
		31,688,633	(15,056,647)	16,631,986	2,773,020	13,858,966		<b>19,612,121</b>

Exclusions:

- (1,600,000) Army Conveyed Assets (2002)
- (2,330,000) Prop 50 Grant - Well 34 & Watkins Gate (2008)
- (959,029) Prop 13 Grant - PRV Replacement (2003)
- (10,167,618) Developer Contributed Assets (booked 2019)  
75 year assumed useful life



Table S-2C

Marina Coast WD

Asset Valuation - Existing Ord Sewer Collection System Assets (Excludes Value of Assets Inherited from US ARMY)

FY	ORD Sewer Assets	FY Change	Exclusions	Net Investment	Estimated Depreciation <sup>1</sup>	Net Book Value	20 Cities ENRCCI	Current Value ENR 20 Cities 11,439
2000	-	-			-	-	6,221	-
2001	-	-			-	-	6,343	-
2002	1,680,178	1,680,178	(1,278,000)	402,178	96,523	305,655	6,538	534,780
2003	1,845,480	165,302		165,302	37,468	127,834	6,694	218,448
2004	4,569,439	2,723,959		2,723,959	581,111	2,142,848	7,115	3,445,121
2005	5,009,041	439,602		439,602	87,920	351,682	7,446	540,275
2006	5,834,811	825,770		825,770	154,144	671,626	7,751	991,192
2007	8,050,944	2,216,133		2,216,133	384,130	1,832,003	7,966	2,630,716
2008	6,341,021	(1,709,923)		(1,709,923)	(273,588)	(1,436,335)	8,310	(1,977,165)
2009	6,833,253	492,232		492,232	72,194	420,038	8,570	560,655
2010	6,842,305	9,052		9,052	1,207	7,845	8,799	10,199
2011	6,842,305	-		-	-	-	9,070	-
2012	6,842,305	-		-	-	-	9,308	-
2013	6,206,947	(635,358)		(635,358)	(59,300)	(576,058)	9,547	(690,220)
2014	6,206,947	-		-	-	-	9,806	-
2015	6,206,947	-		-	-	-	10,035	-
2016	6,206,947	-		-	-	-	10,338	-
2017	6,206,947	-		-	-	-	10,737	-
2018	6,206,947	-		-	-	-	11,062	-
2019	16,413,178	10,206,231	(9,445,180)	761,051	10,147	750,904	11,218	765,697
Totals		16,413,178	(10,723,180)	5,689,998	1,091,957	4,598,041		<b>\$7,029,698</b>

Exclusions:

- (1,278,000) Army Conveyed Assets (2002)
- (9,445,180) Developer Contributed Assets (booked 2019)  
75 year assumed useful life

**Table S-3**  
**Marina Coast WD**  
**Intermediate Term Capital Improvement Plan Summary**

<b>Water System Capital Improvement Plan - 2020 Water Master Plan (See Appendix B)</b>			
<b>Marina Water</b>	<b>Current Users<sup>1</sup></b>	<b>Future Users</b>	<b>Total</b>
Pipeline Improvements	\$1,541,000	\$3,973,000	\$5,514,000
Valve Improvements	\$137,000	\$0	\$137,000
<b>Total Marina Specific Improvements</b>	<b>\$1,678,000</b>	<b>\$3,973,000</b>	<b>\$5,651,000</b>
Marina's Share of Combined Improvements	\$14,403,900	\$16,516,300	\$30,920,200
<b>Total Marina Water CIP</b>	<b>\$17,759,900</b>	<b>\$24,462,300</b>	<b>\$42,222,200</b>
Adjustment - Future Interest Costs	\$0	\$2,263,100	\$2,263,100
<b>Total Marina Water CIP - Adjusted</b>	<b>\$17,759,900</b>	<b>\$26,725,400</b>	<b>\$44,485,300</b>
<b>Ord Water</b>			
Pipeline Improvements	\$2,807,500	\$26,997,500	\$29,805,000
Tank Improvements	\$1,419,400	\$3,469,600	\$4,889,000
Pump Station Improvements	\$834,600	\$449,400	\$1,284,000
Valve Improvements	\$27,400	\$109,600	\$137,000
<b>Total Ord Specific Improvements</b>	<b>\$5,088,900</b>	<b>\$31,026,100</b>	<b>\$36,115,000</b>
Ord's Share of Combined Improvements	\$5,231,400	\$9,167,400	\$14,398,800
<b>Total Ord Water CIP</b>	<b>\$11,182,300</b>	<b>\$40,752,500</b>	<b>\$51,934,800</b>
Adjustment - Future Interest Costs	\$0	\$6,118,500	\$6,118,500
<b>Total Ord Water CIP - Adjusted</b>	<b>\$11,182,300</b>	<b>\$46,871,000</b>	<b>\$58,053,300</b>
<b>Recycled Water System Capital Improvement Plan 2020 Water Master Plan (See Appendix B)</b>			
<b>Marina Recycled</b>	<b>Current Users<sup>1</sup></b>	<b>Future Users</b>	<b>Total</b>
Distribution Facilities	\$0	\$1,589,780	\$1,589,780
Transmission Facilities	\$0	\$525,661	\$525,661
Other Treatment Improvements	\$0	\$1,049,282	\$1,049,282
Water Augmentation Project	\$7,546,000	\$2,254,000	\$9,800,000
<b>Total Marina Recycled Water CIP</b>	<b>\$7,546,000</b>	<b>\$5,418,723</b>	<b>\$12,964,723</b>
Adjustment - Grants	\$0	(\$870,666)	(\$870,666)
Adjustment - FORA Capital Contributions	\$0	\$0	\$0
Adjustment - Future Interest Costs	\$0	\$1,219,502	\$1,219,502
<b>Total Ord Recycled Adjustments</b>	<b>\$0</b>	<b>\$348,836</b>	<b>\$348,836</b>
<b>Total Marina Recycled Water CIP - Adjusted</b>	<b>\$7,546,000</b>	<b>\$5,767,559</b>	<b>\$13,313,559</b>
<b>Ord Recycled</b>			
Distribution Facilities	\$0	\$7,710,220	\$7,710,220
Transmission Facilities	\$0	\$9,987,556	\$9,987,556
Other Treatment Improvements	\$0	\$19,936,365	\$19,936,365
Water Augmentation Project	\$7,854,000	\$2,346,000	\$10,200,000
<b>Total Ord Recycled Water CIP</b>	<b>\$7,854,000</b>	<b>\$39,980,141</b>	<b>\$47,834,141</b>
Adjustment - Grants	\$0	(\$6,423,903)	(\$6,423,903)
Adjustment - FORA Capital Contributions	\$0	(\$4,300,000)	(\$4,300,000)
Adjustment - Future Interest Costs	\$0	\$8,997,669	\$8,997,669
<b>Total Ord Recycled Adjustments</b>	<b>\$0</b>	<b>(\$1,726,234)</b>	<b>(\$1,726,234)</b>
<b>Total Ord Recycled Water CIP - Adjusted</b>	<b>\$7,854,000</b>	<b>\$38,253,907</b>	<b>\$46,107,907</b>
<b>Sewer System Capital Improvement Plan- 2020 Water Master Plan (See Appendix B)</b>			
<b>Marina Sewer</b>	<b>Current Users<sup>1</sup></b>	<b>Future Users</b>	<b>Total</b>
Gravity Main Improvements	\$1,621,505	\$3,081,295	\$4,702,800
Lift Station Improvements	\$2,494,976	\$0	\$2,494,976
Condition Assessment Improvements	\$46,200	\$0	\$46,200
Misc Improvements	\$1,436,426	\$0	\$1,436,426
<b>Total Marina Sewer CIP</b>	<b>\$5,599,107</b>	<b>\$3,081,295</b>	<b>\$8,680,402</b>
Adjustments - Future Interest Costs	\$0	\$244,700	\$244,700
<b>Total Marina Sewer CIP - Adjusted</b>	<b>\$5,599,107</b>	<b>\$3,325,995</b>	<b>\$8,925,102</b>
<b>Ord Sewer</b>			
Gravity Main Improvements	\$1,141,372	\$3,025,868	\$4,167,240
Force Main Improvements	\$667,033	\$903,167	\$1,570,200
Lift Station Improvements	\$3,703,525	\$1,290,794	\$4,994,319
Condition Assessment Improvements	\$1,133,100	\$0	\$1,133,100
Misc Improvements	\$7,892,732	\$15,983,381	\$23,876,113
<b>Total Ord Sewer CIP</b>	<b>\$14,537,762</b>	<b>\$21,203,210</b>	<b>\$35,740,972</b>
Adjustments - Future Interest Costs	\$0	\$695,300	\$695,300
<b>Total Ord Sewer CIP - Adjusted</b>	<b>\$14,537,762</b>	<b>\$21,898,510</b>	<b>\$36,436,272</b>

1 - Costs allocated to current users are excluded from capacity fee calculation

2 - Recycled Water CIP projects included in water capacity fee

Detail provided in Appendix B

**Table S-4**  
**Marina Coast WD**  
**Master Plan - Water Demand and Wastewater Flow Projection**

**Average Day Use - Water**

Development Horizon	Marina Water (mgd)	Ord Water (mgd)	Total (mgd)
Existing (2020)	1.98	1.26	3.24
Intermediate Term (2020-2040)	3.59	3.34	6.93
Buildout (to 2050)	3.59	5.93	9.52
<b>% Growth to Intermediate Term</b>	<b>81%</b>	<b>165%</b>	<b>114%</b>
<b>% Growth to Buildout</b>	<b>81%</b>	<b>371%</b>	<b>194%</b>

System Wide Average Day Use  
 Estimated EDUs @ 250 gpd  
 0.28 AFY/EDU

Development Horizon	Marina Water (EDU)	Ord Water (EDU)	Total (EDU)
Existing (2020)	7,920	5,040	12,960
Intermediate Term (2020-2040)	14,360	13,360	27,720
Buildout (to 2050)	14,360	23,720	38,080
<b>% Growth to Intermediate Term</b>	<b>81%</b>	<b>165%</b>	<b>114%</b>
<b>% Growth to Buildout</b>	<b>81%</b>	<b>371%</b>	<b>194%</b>

**Average Day Demands - Sewer**

Development Horizon	Marina Sewer (mgd)	Ord Sewer (mgd)	Total (mgd)
Existing (2020)	1.10	0.90	2.00
Intermediate Term (2020-2040)	2.21	2.42	4.63
Buildout (to 2050)	2.21	4.3	6.51
<b>% Growth to Intermediate Term</b>	<b>101%</b>	<b>169%</b>	<b>132%</b>
<b>% Growth to Buildout</b>	<b>101%</b>	<b>378%</b>	<b>226%</b>

System Wide Average Day Sewer Demands  
 Estimated EDUs @ 174 gpd  
 0.195 AFY/EDU

Development Horizon	Marina Sewer (EDU)	Ord Sewer (EDU)	Total (EDU)
Existing (2020)	6,322	5,172	11,494
Intermediate Term (2020-2040)	12,701	13,908	26,609
Buildout (to 2050)	12,701	24,713	37,414
<b>% Growth to Intermediate Term</b>	<b>101%</b>	<b>169%</b>	<b>132%</b>
<b>% Growth to Buildout</b>	<b>101%</b>	<b>378%</b>	<b>226%</b>

Source: Akel Engineering flow & use estimates, MCWD use factors, updated MCWD Appendix C

**Table S-5  
Marina Coast WD  
EDU Growth Projection Summary**

<b>Current FY 2020 EDUs</b>	<b>Units</b>	<b>% Growth to Intermediate Term<sup>1</sup></b>	<b>EDU Growth to Intermediate Term<sup>1</sup></b>	<b>Est. Total EDUs at Intermediate Term</b>
<u>Central Marina</u>				
7,920	<i>Water EDUs</i>	81%	6,440	<b>14,360</b>
6,322	<i>Wastewater EDUs</i>	101%	6,379	<b>12,701</b>
<u>Ord Community</u>				
5,040	<i>Water EDUs</i>	165%	8,320	<b>13,360</b>
5,172	<i>Wastewater EDUs</i>	169%	8,736	<b>13,908</b>
<u>Total System</u>				
12,960	<i>Water EDUs</i>	114%	14,760	<b>27,720</b>
11,494	<i>Wastewater EDUs</i>	132%	15,115	<b>26,609</b>

1 - Source: Table S-4

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**Table S-6**  
**Marina Coast WD**  
**Capacity Fee Methodologies Overview**

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**Current Methodology: Average Cost**

$$\frac{\textit{Existing Asset Value} + \textit{Total CIP}}{\textit{Total Units}}$$

**Proposed Methodology: Hybrid Buy-In + Marginal Future Cost**

$$\frac{\textit{Existing Asset Value}}{\textit{Total Units}} + \frac{\textit{Future User Share of CIP}}{\textit{Future Units}}$$

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**Table S-7**

**Marina Coast WD**

**Capacity Charge Calculations - Hybrid Buy-In + Marginal Future Cost Methodology (to Intermediate Term Horizon)**

	Marina Water		Ord Water		Marina Sewer		Ord Sewer	
<b>Buy-In Component</b>								
Estimated Asset Replacement Value (see table S-2A-C)	\$	18,473,750	\$	19,612,121	\$	19,808,900	\$	7,029,698
Total System EDUs to Intermediate Term		14,360		13,360		12,701		13,908
<b>Buy In Capacity Fee Component \$/EDU</b>	<b>\$</b>	<b>1,286</b>	<b>\$</b>	<b>1,468</b>	<b>\$</b>	<b>1,560</b>	<b>\$</b>	<b>505</b>
<b>Marginal Future CIP Cost Component</b>								
Value of Future CIP to Intermediate Term								
Water CIP (incl. adjustments - see table S-3)	\$	26,725,400	\$	46,871,000				
Recycled Water CIP (incl. adjustments - see table S-3)	\$	5,767,559	\$	38,253,907				
<u>Sewer CIP (incl. adjustments - see table S-3)</u>	\$	-	\$	-	\$	3,325,995	\$	21,898,510
Total Value of Future CIP to Intermediate Term	\$	32,492,959	\$	85,124,907	\$	3,325,995	\$	21,898,510
Number of Future EDUs to Intermediate Term		6,440		8,320		6,379		8,736
Water Component \$/EDU	\$	4,150	\$	5,634	\$	-	\$	-
Recycled Water Component \$/EDU	\$	896	\$	4,598	\$	-	\$	-
Sewer Component \$/EDU	\$	-	\$	-	\$	521	\$	2,507
<b>Marginal Future CIP Cost Component \$/EDU</b>	<b>\$</b>	<b>5,045</b>	<b>\$</b>	<b>10,231</b>	<b>\$</b>	<b>521</b>	<b>\$</b>	<b>2,507</b>
<b>Proposed Capacity Charge \$/EDU<sup>1</sup></b>	<b>\$</b>	<b>6,332</b>	<b>\$</b>	<b>11,699</b>	<b>\$</b>	<b>2,081</b>	<b>\$</b>	<b>3,012</b>
Current Capacity Charge	\$	4,526	\$	8,010	\$	2,333	\$	3,322
Difference		\$1,806		\$3,689		(\$252)		(\$310)

1 - Water capacity fee includes Water and Recycled Water CIP

Table S-7A

## Marina Coast WD

## Example Capacity Charge Calculation - Average Cost Methodology (to Intermediate Term Horizon)

	Marina Water	Ord Water	Marina Sewer	Ord Sewer
<b>Buy-In Component</b>				
Estimated Asset Replacement Value	\$ 18,473,750	\$ 19,612,121	\$ 19,808,900	\$ 7,029,698
Total System EDUs to Intermediate Term	14,360	13,360	12,701	13,908
<b>Buy In Capacity Fee Component \$/EDU</b>	<b>\$ 1,286</b>	<b>\$ 1,468</b>	<b>\$ 1,560</b>	<b>\$ 505</b>
<b>CIP Cost Component (Includes Total CIP)</b>				
Value of Total CIP to Intermediate Term				
Water CIP (incl. adjustments - see table S-3)	\$ 44,485,300	\$ 58,053,300		
Recycled Water CIP (incl. adjustments - see table S-3)	\$ 13,313,559	\$ 46,107,907		
<u>Sewer CIP (incl. adjustments - see table S-3)</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 8,925,102</u>	<u>\$ 36,436,272</u>
Total Value of CIP to Intermediate Term	\$ 57,798,859	\$ 104,161,207	\$ 8,925,102	\$ 36,436,272
Total System EDUs to Intermediate Term	14,360	13,360	12,701	13,908
Water Component \$/EDU	\$ 3,098	\$ 4,345	\$ -	\$ -
Recycled Water Component \$/EDU	\$ 927	\$ 3,451	\$ -	\$ -
Sewer Component \$/EDU	\$ -	\$ -	\$ 703	\$ 2,620
<b>Total CIP Cost Component \$/EDU</b>	<b>\$ 4,025</b>	<b>\$ 7,796</b>	<b>\$ 703</b>	<b>\$ 2,620</b>
<b>Average Cost Capacity Charge \$/EDU<sup>1</sup></b>	<b>\$ 5,311</b>	<b>\$ 9,264</b>	<b>\$ 2,262</b>	<b>\$ 3,125</b>
Future EDUs	6,440	8,320	6,379	8,736
Total CIP Cost Component \$/EDU	\$ 4,025	\$ 7,796	\$ 703	\$ 2,620
Calculated Capacity Fee Revenue for Future CIP	\$ 25,920,937	\$ 64,866,859	\$ 4,482,744	\$ 22,885,592
Future CIP - Development Share	\$ 32,492,959	\$ 85,124,907	\$ 3,325,995	\$ 21,898,510
Difference	\$ (6,572,023)	\$ (20,258,047)	\$ 1,156,749	\$ 987,082
<b>Total Development Shortfall</b>	<b>\$ (24,686,239)</b>			

1 - Water capacity fee includes Water and Recycled Water CIP

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**Table S-8**  
**Marina Coast WD**  
**Estimated Sewer Flow Per EDU**

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Estimated population per household: **2.8** people.

<b>Year</b>	<b>Population</b>	<b>Sewer Flow (gpcd)</b>
2010	30,840	68
2011	31,141	67
2012	31,445	64
2013	31,752	64
2014	32,062	61
2015	32,375	56
2016	33,346	<u>58</u>
Average		62
<b>Sewer Flow per EDU</b>		<b>174</b>

ADWF sewer flow per day per person, the average from 2010 to 2016 is 63 gpcd.

The sewer flow trend is downward from approximately 68 gpcd in 2010 to 58 gpcd in 2016.

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Source: AKEL Engineering

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**Table S-9**  
**Marina Coast WD**  
**Calculation of Typical Single Family Residence (2 bathroom) Fixture Units**

<b>Fixture Type</b>	<b>Quantity</b>	<b>DFU (1)</b>	<b>Total DFU</b>
Bathtub(with or without shower)	1	2	2
Clothes Washer	1	3	3
Dishwasher	1	2	2
Lavatory Sink	2	1	2
Shower (single)	1	2	2
Kitchen Sink	1	2	2
Toilet (1.28 gal per flush)	2	3	6
<b>Fixture Units in a Typical Single Family Residence</b>			<b>19</b>

1. DFU=Drainage Fixture Units as defined in Chapter 7 of California Plumbing Code

**Table S-10**  
**Marina Coast WD**  
**Example Calculation of ADU (1 bathroom) Fixture Units**

<b>Fixture Type</b>	<b>Quantity</b>	<b>DFU (1)</b>	<b>Total DFU</b>
Bathtub(with or without shower)	0	2	0
Clothes Washer	0	3	0
Dishwasher	0	2	0
Lavatory Sink	1	1	1
Shower (single)	1	2	2
Kitchen Sink	1	2	2
Toilet (1.28 gal per flush)	1	3	3
<b>Fixture Units in Example ADU</b>			<b>8</b>

1. DFU=Drainage Fixture Units as defined in Chapter 7 of the California Plumbing Code

**Table S-11**  
**Marina Coast WD**  
**Summary of Proposed Capacity Fees**

Central Marina			
<u>Residential Capacity Fees</u>	<u>Current</u>	<u>Proposed</u>	<u>\$ Increase (Decrease)</u>
Water Capacity Fee - \$/EDU	\$4,526	\$6,332	\$1,806
Sewer Capacity Fee - \$/EDU	<u>\$2,333</u>	<u>\$2,081</u>	( <u>\$252</u> )
<b>Total Capacity Fee</b>	<b>\$6,859</b>	<b>\$8,413</b>	<b>\$1,554</b>

Ord Community			
<u>Residential Capacity Fees</u>	<u>Current</u>	<u>Proposed</u>	<u>\$ Increase (Decrease)</u>
Water Capacity Fee - \$/EDU	\$8,010	\$11,699	\$3,689
Sewer Capacity Fee - \$/EDU	<u>\$3,322</u>	<u>\$3,012</u>	( <u>\$310</u> )
<b>Total Capacity Fee</b>	<b>\$11,332</b>	<b>\$14,712</b>	<b>\$3,380</b>

EDU = Equivalent Dwelling Unit

**Residential and Non-Residential Water Capacity Fees**

Each EDU is equivalent to 0.28 Acre foot water use per year.  
 Refer to MCWD "Appendix C" for assigned water use factors

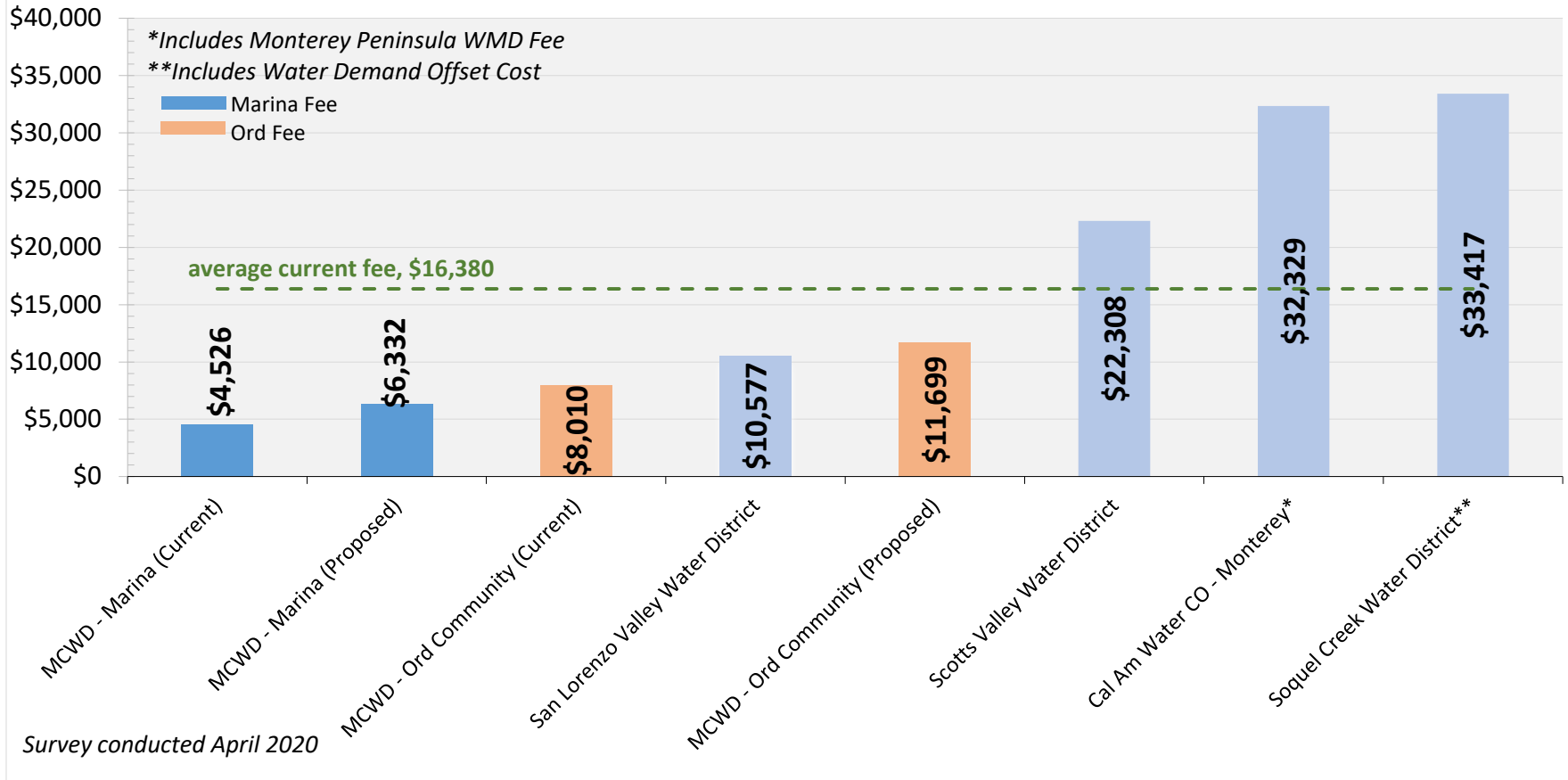
**Residential Sewer Capacity Fees**

Each Single-Family Residential connection is one (1) EDU  
 Each Multi-Family Residential connection (multiple dwelling, condominium, trailer space or mobile home) is 0.8 EDU

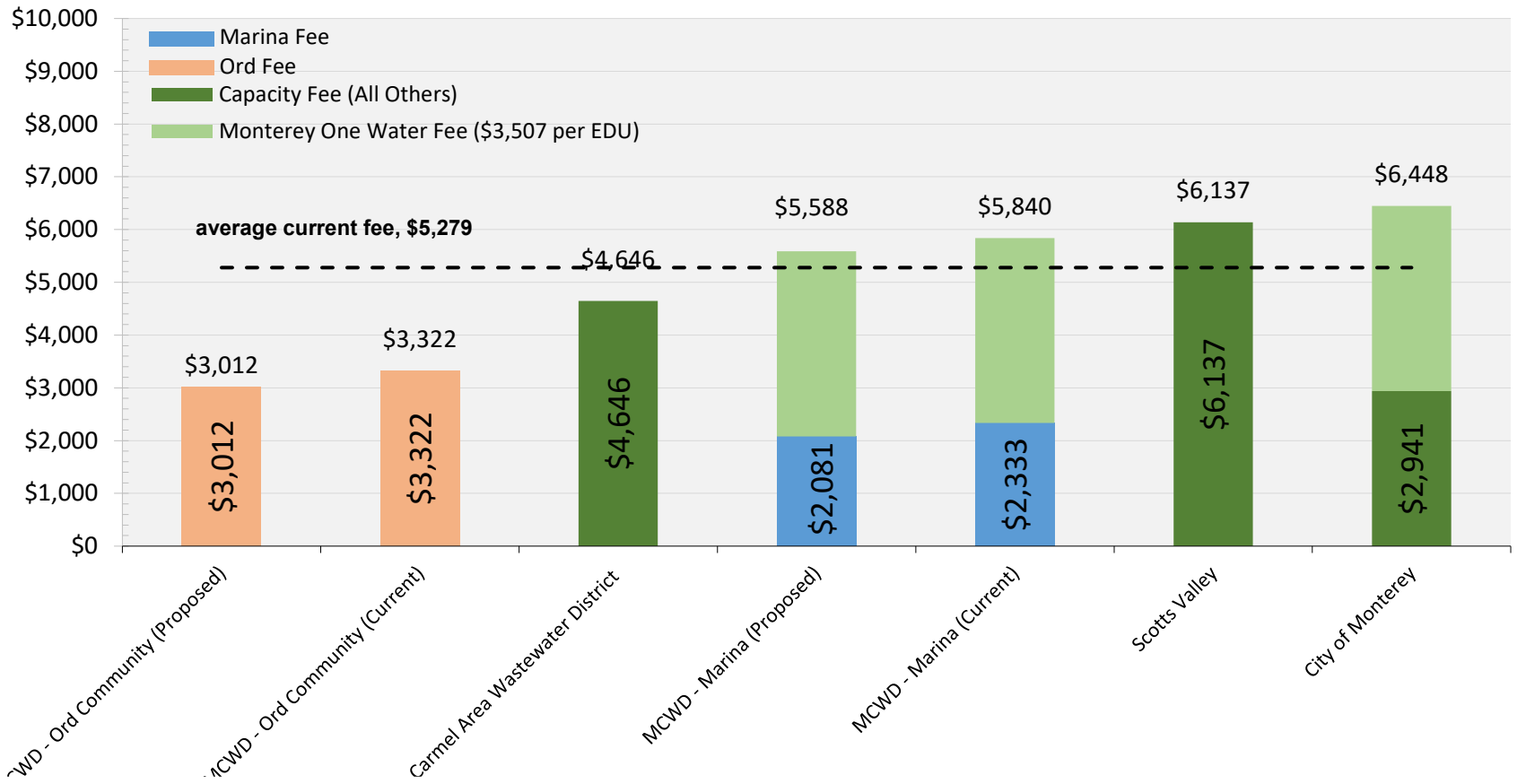
**Non Residential Sewer Capacity Fees**

Each nineteen (19) fixture units are equivalent to one (1) equivalent dwelling unit (EDU).  
 Each nonresidential connection is a minimum of one (1) EDU.  
 Hotels are considered non-residential units

## Single-Family Residential Water Capacity Fees, 2020



## Single-Family Residential Sewer Capacity Fees, FY 2020



## **Appendix A: Asset Listing**

1. Water Assets
2. Sewer Assets
3. Asset Exclusions

## **Appendix A1: Asset Listing - Water Asset Detail**

Excerpts from MCWD 2020 Water Master Plan, Akel Engineering

## Table 1 Unit Costs

### Water Master Plan Marina Coast Water District

PRELIMINARY

Pipelines	
Pipe Size (in)	Cost <sup>1,2</sup> (\$/lineal foot)
12	\$213
16	\$256
18	\$276
20	\$316
24	\$346
30	\$383
36	\$451
Pump Stations	
Estimated Pumping Station Unit Cost (\$/gpm), where Q is equal to the total station capacity in gpm	
Construct New Pump Station	Unit Cost (\$/gpm) = $191.99 \times e^{-0.0001 \times Q}$
Upgrade Existing Pump Station	Unit Cost (\$/gpm) = $160.97 \times e^{-0.00008 \times Q}$
Pressure Reducing Valves	
	Cost (\$)
PRV	\$73,000
Storage Reservoirs <sup>3</sup>	
≤1.0 MG	\$2.92
1.1 MG-3.0 MG	\$2.33
3.1 MG - 5.0 MG	\$1.68
> 5 MG	\$1.25
Groundwater Wells	
Replace Pump	\$55,000
1,500 gpm Capacity	\$3,016,000

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Notes:

2/7/2019

1. Construction costs estimated using June 2018 ENR CCI of 11,089
2. Construction costs are based on Bid Tabs Results received from District staff on October 18, 2018.
3. Tank costs were adjusted to reflect recent construction for a 1.5 MG tank, as provided by District staff on 2/7/2019.



**Table 2 Existing Pipe Replacement Cost**  
 Water Master Plan  
 Marina Coast Water District

PRELIMINARY

Pipe Diameter	Total Length by Diameter		Unit Cost <sup>1,2</sup> (\$/LF)	Infrastructure Costs (\$)	Baseline	Estimated	Capital Improvement
	(ft)	(miles)			Construction Costs (\$)	Construction Costs (\$)	Cost <sup>3</sup> (\$)
<b>Ord Community</b>							
3	65	0.01	142	9,230	9,300	9,300	11,700
4	6,679	1.26	142	948,418	948,500	948,500	1,185,700
6	134,805	25.53	142	19,142,310	19,142,400	19,142,400	23,928,000
8	244,671	46.34	142	34,743,282	34,743,300	34,743,300	43,429,200
10	26,294	4.98	178	4,667,185	4,667,200	4,667,200	5,834,000
12	112,313	21.27	213	23,922,669	23,922,700	23,922,700	29,903,400
14	4,483	0.85	235	1,051,264	1,051,300	1,051,300	1,314,200
16	30,400	5.76	256	7,782,400	7,782,400	7,782,400	9,728,000
18	21,931	4.15	276	6,052,956	6,053,000	6,053,000	7,566,300
20	5,556	1.05	316	1,755,696	1,755,700	1,755,700	2,194,700
24	39,999	7.58	346	13,839,654	13,839,700	13,839,700	17,299,700
30	11,180	2.12	383	4,281,940	4,282,000	4,282,000	5,352,500
<b>Central Marina</b>							
4	1,920	0.4	142	272,640	272,700	272,700	340,900
6	92,363	17.5	142	13,115,546	13,115,600	13,115,600	16,394,500
8	91,442	17.3	142	12,984,764	12,984,800	12,984,800	16,231,000
10	4,264	0.8	178	756,860	756,900	756,900	946,200
12	20,536	3.9	213	4,374,168	4,374,200	4,374,200	5,467,800
16	249	0.05	256	63,744	63,800	63,800	79,800
18	1,609	0.3	276	444,084	444,100	444,100	555,200
20	4,581	0.9	316	1,447,596	1,447,600	1,447,600	1,809,500
<b>Total Cost</b>							
	Subtotal - Ord Community			118,197,004	118,197,100	118,197,100	147,746,400
	Subtotal - Central Marina			33,459,402	33,459,500	33,459,500	41,824,400
	Total Cost			151,656,406	151,656,500	151,656,500	189,570,700

Notes:

1. Unit costs for pipelines less than 12" based on cost per inch-diameter of 12" pipeline
2. Pipelines smaller than 8" assumed to be replaced with 8".
3. 25% contingency assumed for replacement costs in estimated asset value calculation

4/14/2020

**Table 3 Existing Wells Replacement Cost**  
 Water Master Plan  
 Marina Coast Water District

PRELIMINARY

Supply Well	Location	Design Capacity		Infrastructure Costs <sup>1,2</sup>	Baseline Construction Costs	Estimated Construction Costs	Capital Improvement Cost <sup>3</sup>
		Rated (gpm)	(mgd)				
<b>Central Marina</b>							
<b>Well 10</b>	Bayer Avenue and Ridgeview	1,350	1.94	3,016,000	3,016,000	3,016,000	3,770,000
<b>Well 11</b>	Reservation Rd & Salinas Ave	2,000	2.88	3,016,000	3,016,000	3,016,000	3,770,000
<b>Well 12 (Inactive)</b>	Top of Beach Rd	1,900	2.74	3,016,000	3,016,000	3,016,000	3,770,000
<b>Ord Community</b>							
<b>Well 29</b>	Old County Rd	1,500	2.16	3,016,000	3,016,000	3,016,000	3,770,000
<b>Well 30</b>	Reservation Rd	1,500	2.16	3,016,000	3,016,000	3,016,000	3,770,000
<b>Well 31</b>	Reservation Rd	2,400	3.46	3,016,000	3,016,000	3,016,000	3,770,000
<b>Well 34</b>	Reservation Rd	2,000	2.88	3,016,000	3,016,000	3,016,000	3,770,000
<b>Well 35</b>	Watkins Gate & Reservation Rd	2,000	2.88	3,016,000	3,016,000	3,016,000	3,770,000
<b>Total Cost</b>							
		Subtotal - Central Marina		9,048,000	9,048,000	9,048,000	11,310,000
		Subtotal - Ord Community		15,080,000	15,080,000	15,080,000	18,850,000
		Total Cost		24,128,000	24,128,000	24,128,000	<b>30,160,000</b>

Notes:

4/14/2020

1. Unless noted otherwise well improvement consists of pump replacement only.
2. Well 12 currently inactive due to quality issues and is not currently planned for reinstatement. Unit cost shown assumes new well construction
3. 25% contingency assumed for replacement costs in estimated asset value calculation

**Table 4 Existing Pressure Reducing Valves Replacement Cost**

Water Master Plan  
Marina Coast Water District

PRELIMINARY

Location	PRV ID	Unit Cost (\$)	Infrastructure Costs (\$)	Baseline Construction Costs (\$)	Estimated Construction Costs (\$)	Capital Improvement Cost <sup>1</sup> (\$)
<b>Central Marina</b>						
Carmel Ave at Crumpton Ln	PRV-2	73,000	73,000	73,000	73,000	91,300
<b>Ord Community</b>						
Sand Tank	Bermad Valve	73,000	73,000	73,000	73,000	91,300
12th St near DX Dr	PRV-24	73,000	73,000	73,000	73,000	91,300
8th St at 2nd Ave	PRV-28	73,000	73,000	73,000	73,000	91,300
Monterey Rd at Normandy Rd	PRV-20	73,000	73,000	73,000	73,000	91,300
8-inch pipeline s/o Sand Tank	PRV-50	73,000	73,000	73,000	73,000	91,300
Old County Rd near Well 29	PRV-25	73,000	73,000	73,000	73,000	91,300
Gigling Rd at 6th Division Cir	PRV-26	73,000	73,000	73,000	73,000	91,300
Abrams Dr at Bunker Hill Dr	PRV-10	73,000	73,000	73,000	73,000	91,300
Inter-Garrison Rd near Spotsylvania Ct	PRV-11	73,000	73,000	73,000	73,000	91,300
Inter-Garrison Rd at Abrams Dr	PRV-12	73,000	73,000	73,000	73,000	91,300
Inter-Garrison Rd at Schoonover Dr	PRV-13	73,000	73,000	73,000	73,000	91,300
Inter-Garrison Rd. to East Garrison	PRV-EG	73,000	73,000	73,000	73,000	91,300
Kiska Rd at Buna Rd	PRV-17	73,000	73,000	73,000	73,000	91,300
Peninsula Point Dr at Bay Crest Cir	PRV-18	73,000	73,000	73,000	73,000	91,300
Coe Ave to Upper Seaside Highlands	PRV-19	73,000	73,000	73,000	73,000	91,300
General Jim Moore Blvd at Normandy Dr	PRV-27	73,000	73,000	73,000	73,000	91,300
Coe Ave to Sunbay Apartments	PRV-SUNBAY	73,000	73,000	73,000	73,000	91,300
<b>Total Cost</b>						
	Subtotal - Central Marina		73,000	73,000	73,000	91,300
	Subtotal - Ord Community		1,241,000	1,241,000	1,241,000	1,552,100
	Total Cost		1,314,000	1,314,000	1,314,000	<b>1,643,400</b>

4/14/2020

1. 25% contingency assumed for replacement costs in estimated asset value calculation

**Table 5 Existing Storage Reservoirs Replacement Cost**

Water Master Plan  
Marina Coast Water District

PRELIMINARY

Pressure Zone	Tank Name	Location	Volume (MG)	Infrastructure Costs (\$)	Baseline Construction Costs (\$)	Estimated Construction Costs (\$)	Capital Improvement Cost <sup>2</sup> (\$)
<b>Central Marina</b>							
A	Reservoir 2	Crescent Ave, Marina	2.00	4,660,000	4,660,000	4,660,000	4,660,000
<b>Ord Community</b>							
A	Intermediate	Above Schoonover Park	0.17	493,480	493,500	493,500	493,500
A <sup>1</sup>	Sand Tank	California Ave	1.00	2,920,000	2,920,000	2,920,000	2,920,000
B	B1	6th & Durham	2.00	4,660,000	4,660,000	4,660,000	4,660,000
C	C1	7th and Giggling	2.00	4,660,000	4,660,000	4,660,000	4,660,000
C	C2 (old F)	Off Watkins Gate Rd.	2.00	4,660,000	4,660,000	4,660,000	4,660,000
D	D1	Above Fitch Park	2.00	4,660,000	4,660,000	4,660,000	4,660,000
D	Huffman	BLM- Huffman Ranch	0.06	175,200	175,200	175,200	175,200
E	Hydropneumatic	Above Fitch Park	0.01	29,200	29,200	29,200	29,200
<b>Total Cost</b>							
		Subtotal - Central Marina		4,660,000	4,660,000	4,660,000	4,660,000
		Subtotal - Ord Community		22,257,880	22,257,900	22,257,900	22,257,900
		<b>Total Cost</b>		<b>26,917,880</b>	<b>26,917,900</b>	<b>26,917,900</b>	<b>26,917,900</b>

4/14/2020

Notes:

1. Tank planned for imminent demolition
2. 25% contingency assumed for replacement costs in estimated asset value calculation

**Table 6 Existing Booster Stations Replacement Cost**

Water Master Plan  
Marina Coast Water District

Name	Location	System	Design Capacity <sup>1</sup>		Unit Cost (\$/gpm)	Infrastructure Costs (\$)	Baseline Construction Costs (\$)	Estimated Construction Costs (\$)	Capital Improvement Cost <sup>2</sup> (\$)
			Rated						
			(gpm)	gpm					
<b>Central Marina</b>									
A-Booster	Reservoir 2	Marina	3 x 1,500 gpm	4,500	112	505,372	505,400	505,400	631,800
<b>Ord Community</b>									
B-Booster	Sand Tank	Ord	3 x 2,800 gpm	8,400	82	690,523	690,600	690,600	863,300
C-Booster	Sand Tank	Ord	1 x 2,000 gpm 4 x 1,800 gpm	9,200	77	709,401	709,500	709,500	886,900
D-Booster	Intersection of Giggling Road and Parker Flats	Ord	1 x 4,800 gpm 1 x 2,000 gpm	6,800	93	635,328	635,400	635,400	794,300
E-Booster	D1 Tank	Ord	3 x 120 gpm 2 x 2,150 gpm	4,660	111	516,685	516,700	516,700	645,900
F-Booster (Inactive) <sup>1</sup>	Intermediate Tank	Ord	2 x 1,500 gpm	3,000	127	379,870	379,900	379,900	474,900
<b>Total Cost</b>									
Subtotal - Central Marina						505,372	505,400	505,400	631,800
Subtotal - Ord Community						2,931,808	2,932,100	2,932,100	3,665,300
Total Cost						3,437,180	3,437,500	3,437,500	<b>4,297,100</b>

Notes:

1. Booster station currently inactive and not currently planned for reinstatement.
2. 25% contingency assumed for replacement costs in estimated asset value calculation

## **Appendix A2: Asset Listing - Sewer Asset Detail**

Excerpts from MCWD 2020 Sewer Master Plan, Akel Engineering

## Table 1 Unit Costs

### Sewer Master Plan Marina Coast Water District

PRELIMINARY

Pipelines <sup>1,2</sup>	
Pipe Size	Cost
(in)	(\$/lineal foot)
8	218
10	243
12	279
15	303
18	327
21	352
24	400
27	450
30	500
36	600

Lift Station <sup>2,3</sup>
Estimated Lift Station Project Cost = $9,045*Q^2 + 293951*Q + 342,261$ , where Q is in mgd

**AKEL**  
ENGINEERING GROUP, INC.

2/7/2019

Notes :

1. Construction costs are based on Bid Tabs Results received from District staff on October 18, 2018.
2. Construction costs estimated using June 2018 ENR CCI of 11,089.
3. Lift Station costs based on Akel Engineering Group experience on similar projects.

**Table 2 Existing Pipe Replacement Cost**  
Sewer Master Plan  
Marina Coast Water District

Pipe Diameter	Total Length by Diameter		System	Unit Cost (\$/LF)	Infrastructure Costs (\$)	Baseline Construction Costs (\$)	Estimated Construction Costs (\$)	Capital Improvement Cost <sup>3</sup> (\$)
	(ft)	(miles)						
<b>Central Marina</b>								
<b>Gravity Mains</b>								
6	17,961	3.4	Marina	135	2,416,322	2,416,400	2,416,400	3,020,500
8	116,156	22.0	Marina	218	25,354,159	25,354,200	25,354,200	31,692,800
10	10,614	2.0	Marina	243	2,574,211	2,574,300	2,574,300	3,217,900
12	7,499	1.42	Marina	279	2,091,540	2,091,600	2,091,600	2,614,500
15	3,487	0.7	Marina	303	1,057,127	1,057,200	1,057,200	1,321,500
18	2,052	0.4	Marina	327	671,856	671,900	671,900	839,900
21	1,420	0.3	Marina	352	499,369	499,400	499,400	624,300
24	234	0.04	Marina	400	93,641	93,700	93,700	117,200
30	205	0.04	Marina	500	102,545	102,600	102,600	128,300
72	440	0.1	Marina	1,200	528,000	528,000	528,000	660,000
<b>Force Mains</b>								
6	1,201	0.2	Marina	165	198,327	198,400	198,400	248,000
8	2,240	0.4	Marina	186	416,140	416,200	416,200	520,300
<b>Ord Community</b>								
<b>Gravity Mains</b>								
3	200	0.04	Ord	218	43,600	43,600	43,600	54,500
4	1,127	0.21	Ord	218	245,686	245,700	245,700	307,200
5	402	0.08	Ord	218	87,636	87,700	87,700	109,700
6	97,344	18.44	Ord	218	21,220,992	21,221,000	21,221,000	26,526,300
8	150,587	28.52	Ord	218	32,869,647	32,869,700	32,869,700	41,087,200
10	32,401	6.14	Ord	243	7,858,207	7,858,300	7,858,300	9,822,900
12	23,796	4.51	Ord	279	6,636,924	6,637,000	6,637,000	8,296,300
15	21,371	4.05	Ord	303	6,478,880	6,478,900	6,478,900	8,098,700
18	13,022	2.47	Ord	327	4,263,601	4,263,700	4,263,700	5,329,700
24	5,422	1.03	Ord	400	2,169,744	2,169,800	2,169,800	2,712,300
27	2,237	0.42	Ord	450	1,007,088	1,007,100	1,007,100	1,258,900
30	3,358	0.64	Ord	500	1,679,731	1,679,800	1,679,800	2,099,800
<b>Force Mains</b>								
4	967	0.18	Ord	165	159,555	159,600	159,600	199,500
6	7,526	1.43	Ord	165	1,242,805	1,242,900	1,242,900	1,553,700
8	4,400	0.83	Ord	186	817,417	817,500	817,500	1,021,900
10	18,887	3.58	Ord	214	4,043,999	4,044,000	4,044,000	5,055,000
<b>Total Cost</b>								
Subtotal - Central Marina					36,003,236	36,003,900	36,003,900	45,005,200
Subtotal - Ord Community					90,825,512	90,826,300	90,826,300	113,533,600
Total Cost					<b>126,828,748</b>	<b>126,830,200</b>	<b>126,830,200</b>	<b>158,538,800</b>

Notes:

4/14/2020

1. Unit costs for gravity pipelines less than 8" based on cost per inch-diameter of 8" pipeline
2. Pipelines smaller than 8" assumed to be replaced with 8".
3. 25% contingency assumed for replacement costs in estimated asset value calculation



**Table 3 Existing Lift Station Replacement Cost**  
 Sewer Master Plan  
 Marina Coast Water District

Lift Station Name	Location	System	Quantity	Capacity		Infrastructure Costs (S)	Baseline Construction Costs (S)	Estimated Construction Costs (S)	Capital Improvement Cost <sup>1</sup> (S)	
				(mgd)	(gpm)					
<b>Central Marina</b>										
Dunes	Dunes Drive	Marina	2	2 @ 1.00	2 @ 700	965,623	965,700	965,700	1,207,200	
San Pablo	San Pablo Ct	Marina	2	2 @ 0.29	2 @ 200	515,587	515,600	515,600	644,500	
Cosky	Cosky Drive	Marina	2	2 @ 0.31	2 @ 216	527,764	527,800	527,800	659,800	
Crescent	Crescent Street	Marina	2	2 @ 0.14	2 @ 100	425,176	425,200	425,200	531,500	
<b>Ord Community</b>										
Fritzsche Field	Fritzsche Field North	Ord	2	2 @ 0.23	2 @ 160	479,227	479,300	479,300	599,200	
Promontory	8th Street	Ord	2	2 @ 0.13	2 @ 93	419,206	419,300	419,300	524,200	
Carmel	Carmel Avenue	Ord	2	2 @ 0.37	2 @ 254	564,471	564,500	564,500	705,700	
East Garrison	Reservation Rd	Ord	2	2 @ 0.53	2 @ 370	663,630	663,700	663,700	829,700	
Ord Village	End of Beach Range Road	Ord	4	3 @ 1.38 Sump @ 0.07	3 @ 960 Sump @ 50	1,738,594	1,738,600	1,738,600	2,173,300	
Wittmeyer	North of Wittmeyer Court	Ord	2	2 @ 0.2	2 @ 140	461,145	461,200	461,200	576,500	
Booker	End of Booker Street	Ord	3	2 @ 1.09 Sump @ 0.07	2 @ 760 Sump @ 50	1,048,631	1,048,700	1,048,700	1,310,900	
Clark	Brostrum Drive at Clark Court	Ord	2	2 @ 0.37	2 @ 260	564,471	564,500	564,500	705,700	
Neeson	Neeson Road/ Marina Airport	Ord	1	0.29	200	428,163	428,200	428,200	535,300	
Landrum	Landrum Court	Ord	2	2 @ 0.50	2 @ 350	644,897	644,900	644,900	806,200	
Imjin	Imjin at Abrams	Ord	2	2 @ 1.00	2 @ 700	965,623	965,700	965,700	1,207,200	
Schoonover	Schoonover at Warrelman	Ord	2	2 @ 0.68	2 @ 470	758,274	758,300	758,300	947,900	
Hatten	Hatten Road	Ord	2	2 @ 0.06	2 @ 40	377,622	377,700	377,700	472,200	
Gigling	Okinawa and Noumea Road	Ord	4	3 @ 1.26 Sump @ 0.07	3 @ 874 Sump @ 50	1,606,656	1,606,700	1,606,700	2,008,400	
Reservation	Reservation Road 1,125 ft nw/o Imjin	Ord	2	2 @ 1.02	2 @ 710	978,828	978,900	978,900	1,223,700	
Hodges	Hodges Court	Ord	2	2 @ 0.14	2 @ 95	425,176	425,200	425,200	531,500	
<b>Total Cost</b>										
						Subtotal - Central Marina	2,776,410	2,776,600	2,776,600	3,470,900
						Subtotal - Ord Community	12,809,137	12,810,000	12,810,000	16,013,400
						<b>Total Cost</b>	<b>15,585,547</b>	<b>15,586,600</b>	<b>15,586,600</b>	<b>19,484,300</b>

1. 25% contingency assumed for replacement costs in estimated asset value calculation

## **Appendix A3: Asset Listing - Exclusions**

Data provided by Marina Coast Water District

Appendix A: Asset Listing - Exclusions  
 Developer Contributed Assets - Ord Community  
 As of June 30, 2019

Asset	Estimated Date Of Service	Amount	Resolution No.	Resolution Date	Bill Of Sale Execution Date	LIFE (YEARS)	Description
<b>Ord Community - Water System Facilities</b>							
WATER SYSTEM FACILITIES - 20,505 LF 8" & 12" MAIN/591 16" & 20" MAINS/28 LF 6" & 8" FIRE LINES/36 HYDRANTS/298 LF LATERALS/APPURTANCES	08/31/12	\$1,801,870	2012-59	09/11/12	10/02/12	80	EAST GARRISON
WATER SYSTEM FACILITIES - 3,334 LF 8" MAIN/773 12" MAIN/9 HYDRANTS/95 LATERALS/1 2" IRRIGATION LINE	07/21/17	\$565,620	2017-54	08/21/17	TO BE EXECUTED	80	DUNES RESIDENTIAL PHASE 1C2 - SHEA HOMES
WATER SYSTEM FACILITIES - 470 LF 16" MAIN/14350 LF 8" MAIN/6 HYDRANTS/APPURTANCES	07/22/15	\$418,434	2015-42	08/03/15	01/21/16	80	PROMONTORY
WATER SYSTEM FACILITIES - 660 LF 12" MAIN/1,500 LF 8" MAIN/245 LF 6" MAIN/6 HYDRANTS	06/10/14	\$284,975	2014-28	07/07/14	12/01/14	80	UNIVERSITY VILLAGE APARTMENTS
WATER SYSTEM FACILITIES - 800 LF 8" PVC MAIN/LATERALS/VALVLES/HYDRANTS/PRV	03/23/11	\$103,000	2011-66	09/13/11	09/14/11	80	CHOMP MARINA CAMPUS
WATER SYSTEM FACILITIES - EAST GARRISON PHASE 2	01/20/16	\$1,808,090	2016-05	02/01/16	02/17/16	80	EAST GARRISON PHASE 2
WATER SYSTEM FACILITIES - EAST GARRISON PHASE 3	09/07/18	\$962,680	2018-53	09/17/18	TO BE EXECUTED	80	EAST GARRISON PHASE 3
WATER SYSTEM FACILITIES - PIPES/HYDRANTS/BLOW OFFS/MAINS/VALVES/APPURTANCES	06/21/05	\$994,037	2006-30	04/26/06	07/11/06	80	SEASIDE HIGHLANDS
WATER SYSTEM FACILITIES -1,649 LF 8" MAIN/730 LF 12" MAIN/9 HYDRANTS/1 4" VAULT SERVICE LINE/1 4" SERVICE LINE/2 2" IRRIGATION LINES/APPURTANCES	08/01/07	\$233,226	2016-17	03/21/16	04/13/16	80	DUNES RESIDENTIAL PHASE 1C1 - MCP
WATER SYSTEM FACILITIES -2,800 LF 8" PVC MAIN/12 8" VALVES/3 BLOW OFF VALVES/1 PRV/1 ARV/8 FIRE HYDRANTS WITH VALVES	08/01/07	\$893,813	2016-04	01/11/16	02/17/16	80	DUNES ON MONTEREY BAY PHASE 1A
WATER SYSTEM FACILITIES -2,800 LF 8" PVC MAIN/12 8" VALVES/3 BLOW OFF VALVES/1 PRV/1 ARV/8 FIRE HYDRANTS WITH VALVES	08/01/07	\$105,478	2017-24	04/17/17	04/28/17	80	DUNES ON MONTEREY BAY PHASE 1A - TARGET
WATER SYSTEM FACILITIES -2,800 LF 8" PVC MAIN/12 8" VALVES/3 BLOW OFF VALVES/1 PRV/1 ARV/8 FIRE HYDRANTS WITH VALVES	10/10/08	\$367,770	2008-45	10/14/08	01/21/16	80	SEASIDE RESORT ESTATES PHASE 1A
WATER SYSTEM FACILITIES -3,776 LF 8" MAIN/12 HYDRANTS/LATERALS/APPURTANCES	01/31/16	\$629,516	2016-17	03/21/16	04/13/16	80	DUNES RESIDENTIAL PHASE 1C1 - SHEA HOMES
WATER SYSTEM FACILITIES -PIPELINES/VALVES/FIRE HYDRANTS/APPURTANCES	08/21/07	\$696,425	2007-73	10/10/07	12/18/07	80	MARINA HEIGHTS PHASE 2
RECYCLED WATER FACILITIES - 1,252 8" MAIN/3 2" SERVICE LINES/APPURTANCES	07/21/17	\$97,560	2017-54	08/21/17	TO BE EXECUTED	80	DUNES RESIDENTIAL PHASE 1C2 - SHEA HOMES
RECYCLED WATER FACILITIES - 400 LF 4" RECLAIMED WATER MAIN/APPURTANCES	07/22/15	\$21,500	2015-42	08/03/15	01/21/16	80	PROMONTORY
RECYCLED WATER FACILITIES - 560 LF 4" RECLAIMED WATER MAIN	06/10/14	\$13,320	2014-28	07/07/14	12/01/14	100	UNIVERSITY VILLAGE APARTMENTS
RECYCLED WATER FACILITIES - 6,580 LF PIPE/2 8" BACKFLOW DEVICES/20 IRRIGATION LATERALS	08/31/12	\$386,380	2012-59	09/11/12	10/02/12	80	EAST GARRISON
RECYCLED WATER FACILITIES - EAST GARRISON PHASE 2	01/20/16	\$113,821	2016-05	02/01/16	02/17/16	80	EAST GARRISON PHASE 2
RECYCLED WATER FACILITIES - EAST GARRISON PHASE 3	09/07/18	\$39,232	2018-53	09/17/18	TO BE EXECUTED	80	EAST GARRISON PHASE 3
RECYCLED WATER FACILITIES - IRRIGATION WATER PIPES/MAINS/VALVES/APPURTANCES	06/21/05	\$145,070	2006-30	04/26/06	07/11/06	80	SEASIDE HIGHLANDS
RECYCLED WATER FACILITIES - 171 LF 4" LATERALS/VALVES	03/23/11	\$22,000	2011-66	09/13/11	09/14/11	80	CHOMP MARINA CAMPUS
RECYCLED WATER FACILITIES - 2,508 LF 4" LATERAL/5 4" VALVES/1 ARV/1 RP BFP	08/01/07	\$236,187	2016-04	01/11/16	02/17/16	80	DUNES ON MONTEREY BAY PHASE 1A
RECYCLED WATER FACILITIES - 2,508 LF 4" LATERAL/5 4" VALVES/1 ARV/1 RP BFP	10/10/08	\$136,302	2008-45	10/14/08	01/21/16	80	SEASIDE RESORT ESTATES PHASE 1A
RECYCLED WATER FACILITIES - 558 LF 4" MAIN/2 2" IRRIGATION LINES/APPURTANCES	08/01/07	\$20,624	2016-17	03/21/16	04/13/16	80	DUNES RESIDENTIAL PHASE 1C1 - MCP
RECYCLED WATER FACILITIES - LATERAL/ VALVES/APPURTANCES	08/21/07	\$24,000	2007-73	10/10/07	12/18/07	80	MARINA HEIGHTS PHASE 2
<b>Water System Facility Total</b>		<b>\$11,120,930</b>					
<b>Ord Community - Sewer System Facilities</b>							
SEWER SYSTEM FACILITIES - 1,164 LF 8" MAIN/279 15" MAIN/11 MANHOLES/APPURTANCES	08/01/07	\$140,187	2016-17	03/21/16	04/13/16	80	DUNES RESIDENTIAL PHASE 1C1 - MCP
SEWER SYSTEM FACILITIES - 1,164 LF 8" MAIN/279 15" MAIN/11 MANHOLES/APPURTANCES	01/31/16	\$546,393	2016-17	03/21/16	04/13/16	60	DUNES RESIDENTIAL PHASE 1C1 - SHEA HOMES
SEWER SYSTEM FACILITIES - 18,705 LF SEWER MAINS/102 MANHOLES/415 LF LATERALS	08/31/12	\$1,631,830	2012-59	09/11/12	10/02/12	60	EAST GARRISON
SEWER SYSTEM FACILITIES - 2,448 LF 8" PVC MAIN/19 MANHOLES/1 CLEAN OUT	08/01/07	\$1,991,000	2016-04	01/11/16	02/17/16	60	DUNES ON MONTEREY BAY PHASE 1A
SEWER SYSTEM FACILITIES - 2,448 LF 8" PVC MAIN/19 MANHOLES/1 CLEAN OUT	08/01/07	\$151,344	2017-24	04/17/17	04/28/17	60	DUNES ON MONTEREY BAY PHASE 1A - TARGET
SEWER SYSTEM FACILITIES - 2,448 LF 8" PVC MAIN/19 MANHOLES/1 CLEAN OUT	10/10/08	\$699,738	2008-45	10/14/08	01/21/16	60	SEASIDE RESORT ESTATES PHASE 1A
SEWER SYSTEM FACILITIES - 2,655 LF 8" MAIN/437 15" MAIN/20 MANHOLES/71 LATERALS/APPURTANCES	07/21/17	\$356,740	2017-54	08/21/17	TO BE EXECUTED	60	DUNES RESIDENTIAL PHASE 1C2 - SHEA HOMES
SEWER SYSTEM FACILITIES - 340 LF 8" PVC MAIN/210 LF 6" PVC MAIN/MANHOLES/LATERALS	03/23/11	\$52,000	2011-66	09/13/11	09/14/11	60	CHOMP MARINA CAMPUS
SEWER SYSTEM FACILITIES - 425 LF 8" MAIN/500 LF LATERALS/4 MANHOLES	06/10/14	\$82,040	2014-28	07/07/14	12/01/14	60	UNIVERSITY VILLAGE APARTMENTS
SEWER SYSTEM FACILITIES - 680 LF 8" MAIN/800 LF SMALLER FORCE MAIN/SEWER PUMP STATION/5 MANHOLES	07/22/15	\$591,441	2015-42	08/03/15	01/21/16	50	PROMONTORY
SEWER SYSTEM FACILITIES - EAST GARRISON PHASE 2	01/20/16	\$724,727	2016-05	02/01/16	02/17/16	60	EAST GARRISON PHASE 2
SEWER SYSTEM FACILITIES - EAST GARRISON PHASE 3	09/07/18	\$427,964	2018-53	09/17/18	TO BE EXECUTED	60	EAST GARRISON PHASE 3
SEWER SYSTEM FACILITIES - MAINS/MANHOLES/LATERALS/APPURTANCES	08/21/07	\$813,650	2007-73	10/10/07	12/18/07	60	MARINA HEIGHTS PHASE 2
SEWER SYSTEM FACILITIES - PIPES/MAINS/MANHOLES/APPURTANCES	06/21/05	\$761,431	2006-30	04/26/06	07/11/06	60	SEASIDE HIGHLANDS
<b>Sewer System Facility Total</b>		<b>\$8,970,485</b>					
<b>Developer Contributed Asset Total</b>		<b>\$20,091,415</b>					

**Appendix A: Asset Listing - Cenral Marina Water and Sewer Exclusions**

<b>Description</b>	<b>Reason for Exclusion</b>	<b>Length (LF)</b>	<b>Cost (\$/LF)<sup>1</sup></b>	<b>Replacement Value</b>
<b>Central Marina Water</b>				
Well 12	Inactive			\$3,770,000
Pipelines (by length)				
8"	Replaced in CIP	1,725	\$178	\$306,200
12"	Replaced in CIP	613	\$266	\$163,200
16"	Replaced in CIP	1,860	\$320	\$595,200
<b>Marina Water Total</b>				<b>\$4,834,600</b>
<b>Central Marina Sewer</b>				
Dunes Lift Station	Replaced in CIP			\$1,207,200
Crescent Lift Station	Replaced in CIP			\$531,500
Pipelines (by length)				
8"	Replaced in CIP	203	\$272	\$55,300
<b>Marina Sewer Total</b>				<b>\$1,794,000</b>

1 - Includes 25% contingency

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**Appendix A: Asset Listing Exclusions**  
**Grant Funding for Existing Assets**

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<b>Asset Category</b>	<b>Grant Amount</b>	<b>Description</b>	<b>Year Issued</b>
<b>Ord Community</b>			
Gate and Pressure Reducing Valves	\$959,029	Prop 13	2003
Well 34 / Seawater Intrusion	\$2,330,000	Prop 50	2008
<b>Total Grant Funding</b>	<b>\$3,289,029</b>		

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**Appendix B: Recycled Water CIP Adjustments**

	<b>Total</b>	<b>Marina Future</b>	<b>Ord Future</b>
Total CIP Cost - Developer Share	\$45,398,864	\$5,418,723	\$39,980,141
% Share		12%	88%
Grants	(\$7,294,569)	(\$870,666)	(\$6,423,903)
FORA Capital Contribution	(\$4,300,000)		(\$4,300,000)
Future Interest Costs <sup>1</sup>	\$10,217,171	\$1,219,502	\$8,997,669
<b>Total Recycled Water Adjustments</b>	<b>-\$1,377,398</b>	<b>\$348,836</b>	<b>-\$1,726,234</b>

1 - 3 loans to fund RW projects net of Capital Contributions and Grants, 30 year terms:

\$17.6m @ 1.8% interest Year 1, \$11.5m @ 1.8% interest Year 6, \$4.5m @ 1.8% interest Year 12

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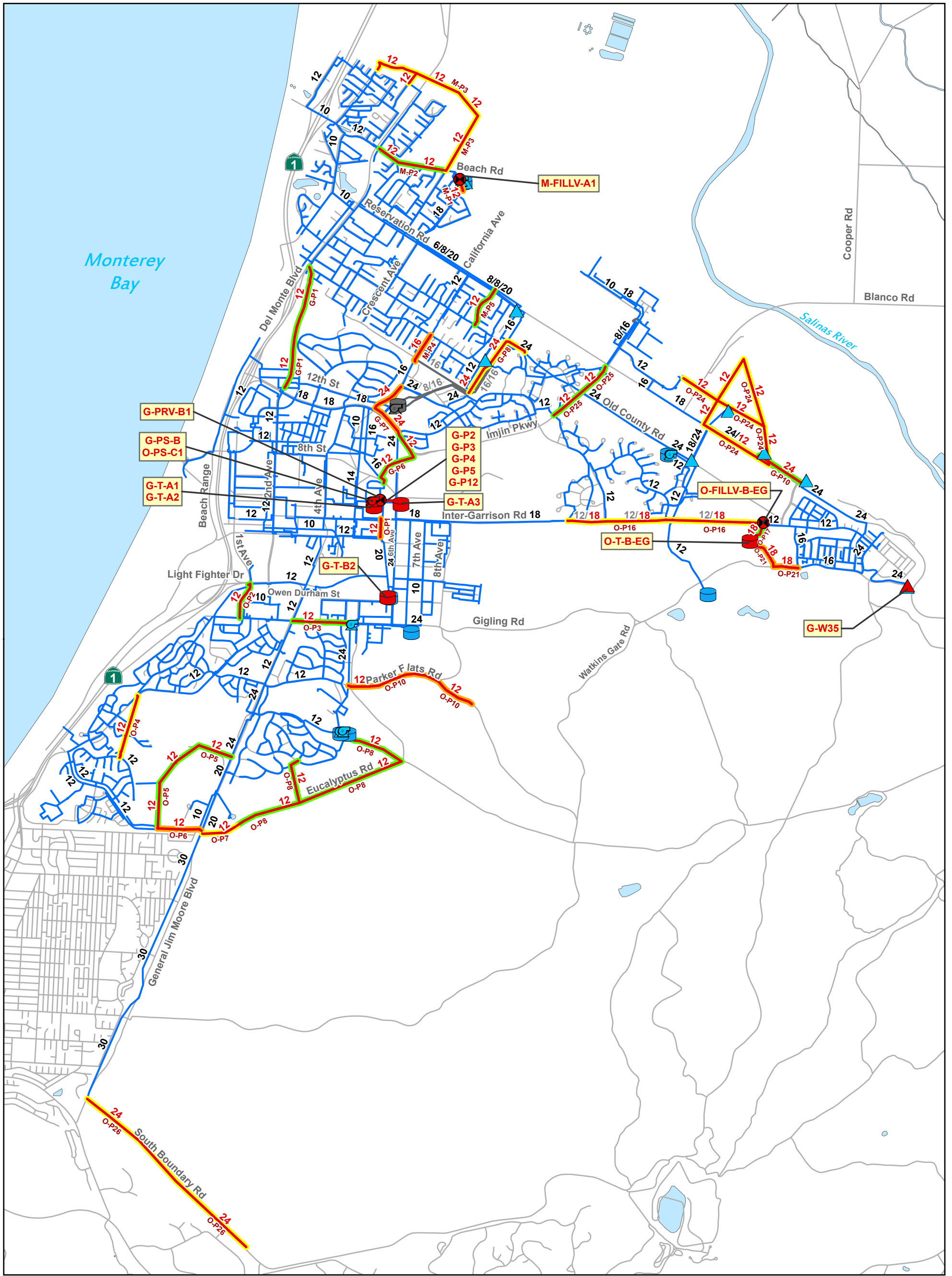
## **Appendix B: Capital Improvement Plan**

1. Costs
2. Exclusions

## **Appendix B1: Capital Improvement Plan - Costs**

Excerpts from MCWD 2020 Master Plans, Akel Engineering





**Legend**

- Future Improvements**
- Tanks
  - Wells
  - Boosters
  - Valves
  - Pipes

- Future to be Abandoned**
- Tank
  - Booster
  - Pipes

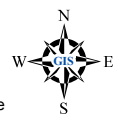
- Existing Modeled System**
- Tanks
  - Wells
  - Boosters
  - Pipes

**PRELIMINARY**

- Streets
- Rivers/Streams
- Waterbodies

Note: Existing PRVs not shown.

**Figure 8.2**  
**Intermediate-Term**  
**Improvements**  
 Water Master Plan  
 Marina Coast Water District



**Table 8.3 Intermediate-Term Capital Improvement Program**

Water Master Plan  
Marina Coast Water District

PRELIMINARY

Improv. No.	Improv. Type	Pressure Zone	Alignment	Limits	Improvement Details				Infrastructure Costs		Baseline Construction Cost (\$)	Estimated Construction Cost <sup>1</sup> (\$)	Capital Improvement Cost <sup>2,3,4</sup> (\$)	Construction Trigger	Suggested Cost Allocation		Cost Sharing	
									Unit Cost (\$/unit)	Infr. Cost (\$)					Existing Users	Future Users	Existing Users (\$)	Future Users (\$)
<b>Central Marina Water System</b>																		
<b>Pipeline Improvements</b>																		
					Existing Diameter (in)	New/Parallel/Replace	Diameter (in)	Length (ft)										
M-P1	Reliability	Zone A	ROW	From existing Reservoir 2 Site to Crescent Ave	-	New	12	425	213	90,525	91,000	136,000	170,000	Operational Improvement	100%	0%	170,000	0
M-P2	Reliability	Zone A	Beach Rd	From De Forest Rd to Del Monte Blvd	8	Parallel	12	2,725	213	580,425	581,000	863,000	1,079,000	Operational Improvement	100%	0%	1,079,000	0
M-P3	Development	Zone A	Armstrong Ranch	Future Armstrong Ranch Development	-	New	12	7,575	213	1,613,475	1,614,000	2,397,000	2,997,000	With Development	0%	100%	0	2,997,000
M-P4	Capacity	Zone A	California Ave	From approximately 500' n/o 3rd Ave to Reindollar Ave	12	Replace	16	1,225	256	313,600	314,000	467,000	584,000	Prior to Sank Tank Demolition	50%	50%	292,000	292,000
M-P5	Development	Zone B	Lynscott Dr	From Carmel Ave to Reservation Rd	8	Replace	12	1,725	213	367,425	368,000	547,000	684,000	With Development	0%	100%	0	684,000
<b>Subtotal - City of Marina Pipeline Improvements</b>									<b>2,965,450</b>	<b>2,968,000</b>	<b>4,410,000</b>	<b>5,514,000</b>				<b>1,541,000</b>	<b>3,973,000</b>	
<b>Valve Improvements</b>																		
					New/Replace	Size (in)												
M-FILLV-A1	Operational	Zone A	Existing Reservoir 2 Site		New	8				73,000	73,000	109,000	137,000	With M-P1	100%	0%	137,000	0
<b>Subtotal - City of Marina Valve Improvements</b>									<b>73,000</b>	<b>73,000</b>	<b>109,000</b>	<b>137,000</b>				<b>137,000</b>	<b>0</b>	
<b>Total Central Marina Improvement Costs</b>																		
																	<b>1,541,000</b>	<b>3,973,000</b>
																	<b>137,000</b>	<b>0</b>
<b>Total - Central Marina Improvements</b>									<b>3,038,450</b>	<b>3,041,000</b>	<b>4,519,000</b>	<b>5,651,000</b>				<b>1,678,000</b>	<b>3,973,000</b>	
<b>Ord Community Water System</b>																		
<b>Pipeline Improvements</b>																		
					Existing Diameter (in)	New/Parallel/Replace	Diameter (in)	Length (ft)										
O-P1	Fire Flow	Zone C	5th St	From 3rd Rd to 1st St	8	Replace	12	750	213	159,750	160,000	238,000	298,000	Existing Deficiency	100%	0%	298,000	0
O-P2	Reliability	Zone B	First Ave	From Lightfighter Dr to Gigling Ave	-	New	12	1,500	213	319,500	320,000	476,000	595,000	Operational Improvement	50%	50%	297,500	297,500
O-P3	Condition	Zone C	Gigling Rd	From General Jim Moore Blvd to Zone D Pump Station	12	Replace	12	2,300	213	489,900	490,000	728,000	910,000	Existing Deficiency	100%	0%	910,000	0
O-P4	Fire Flow	Zone B	Existing ROW	From Monterey Rd to Leinbach Ave	8	Replace	12	2,425	213	516,525	517,000	768,000	960,000	Existing Deficiency	100%	0%	960,000	0
O-P5	Development	Zone D	McClure Rd and ROW	From the intersection of General Jim Moore Blvd and McClure Rd to Coe Ave	-	New	12	5,325	213	1,134,225	1,135,000	1,686,000	2,108,000	With Development	0%	100%	0	2,108,000
O-P6	Capacity	Zone D	Coe Ave	From General Jim Moore Blvd to approx. 1,700' w/o General Jim Moore Blvd	8	Replace	12	1,725	213	367,425	368,000	547,000	684,000	With Development	50%	50%	342,000	342,000
O-P7	Development	Zone D	Eucalyptus Rd	From General Jim Moore Blvd to approx. 1,500' e/o General Jim More Blvd	-	New	12	1,350	213	287,550	288,000	428,000	535,000	With Development	0%	100%	0	535,000
O-P8	Development	Zone E	Eucalyptus Rd and Future ROW	Future Commercial Development, along and n/o Eucalyptus Rd	-	New	12	10,900	213	2,321,700	2,322,000	3,449,000	4,312,000	With Development	0%	100%	0	4,312,000
O-P10	Development	Zone D	Parker Flats Cutoff Rd and Eucalyptus Rd	From Normandy Rd to Future ROW	-	New	12	5,130	213	1,092,690	1,093,000	1,624,000	2,030,000	With Development	0%	100%	0	2,030,000
O-P16	Development	Zone C	Inter-Garrison Rd, Future ROW	From approx. 1,400' w/o Abrams Dr to future Reservoir B-EG Fill Valve (O-FILLV-B-EG)	12	Replace	18	7,500	276	2,070,000	2,070,000	3,074,000	3,843,000	With Development	0%	100%	0	3,843,000
O-P17	Development	Zone C	Future ROW	From Inter-Garrison Rd to future Reservoir B-EG (O-T-G-EG)	-	New	18	1,100	276	303,600	304,000	452,000	565,000	With Development	0%	100%	0	565,000
O-P21	Development	Zone B-EG	Watkins Gate Rd	From future B-EG reservoir (O-T-B-EG) to Watkins Gate Rd	-	New	18	2,375	276	655,500	656,000	975,000	1,219,000	With Development	0%	100%	0	1,219,000

**Table 8.3 Intermediate-Term Capital Improvement Program**

Water Master Plan  
Marina Coast Water District

PRELIMINARY

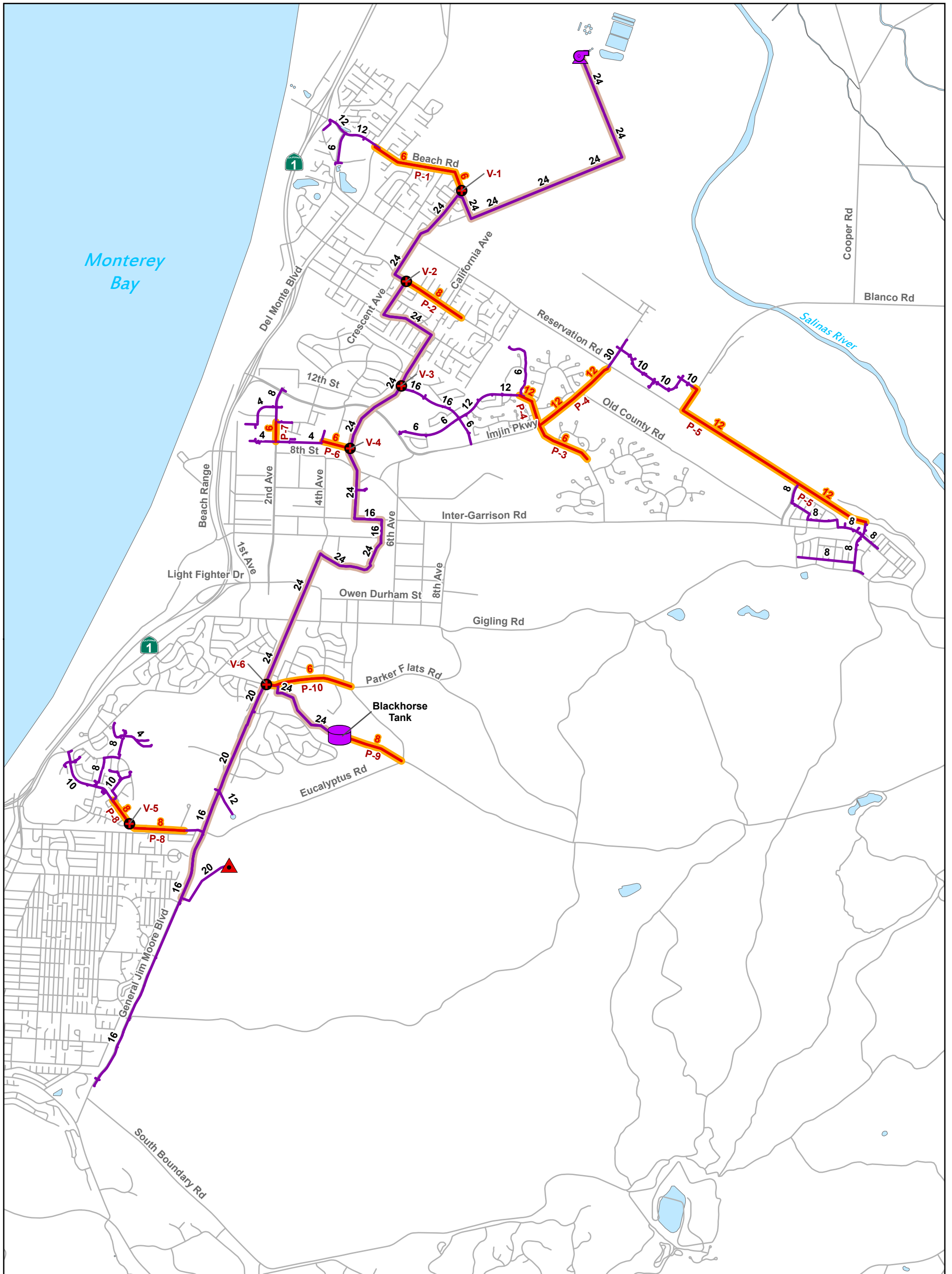
Improv. No.	Improv. Type	Pressure Zone	Alignment	Limits	Improvement Details				Infrastructure Costs		Baseline Construction Cost (\$)	Estimated Construction Cost <sup>1</sup> (\$)	Capital Improvement Cost <sup>2,3,4</sup> (\$)	Construction Trigger	Suggested Cost Allocation		Cost Sharing	
									Unit Cost (\$/unit)	Infr. Cost (\$)					Existing Users	Future Users	Existing Users (\$)	Future Users (\$)
O-P24	Capacity	Zone B	Planned Mixed Use Development	N/o Reservation Rd and e/o Blanco Rd	-	New	12	13,525	213	2,880,825	2,881,000	4,279,000	5,349,000	With Development	0%	100%	0	5,349,000
O-P25	Reliability	Zone B	Imjin Rd, Neeson Rd	From Reservation Rd to approx. 700' ne/o Abrams Dr	-	New	12	2,725	213	580,425	581,000	863,000	1,079,000	With Development	0%	100%	0	1,079,000
O-P26	Development	Zone D	South Boundary Rd	From General Jim Blvd to approx. 8,300' se/o South Boundary Rd	-	New	24	8,275	346	2,863,150	2,864,000	4,254,000	5,318,000	With Development	0%	100%	0	5,318,000
<b>Subtotal - Fort Ord Pipeline Improvements</b>									<b>16,042,765</b>	<b>16,049,000</b>	<b>23,841,000</b>	<b>29,805,000</b>				<b>2,807,500</b>	<b>26,997,500</b>	
<b>Tank Improvements</b>					<b>New/Replace</b>	<b>Capacity (MG)</b>												
O-T-B-EG	New Capacity	Zone B-EG	Existing Travel Camp tank site, s/o Inter-Garrison Rd approximately 1,700' w/o Camp St		New	0.80			2.92	2,336,000	2,336,000	3,469,000	4,337,000	Operational Improvement	20%	80%	867,400	3,469,600
O-T-SAND	Condition	Zone A	Existing Sand Tank Facility						-	-	-	-	552,000	After G-T-A1 Construction	100%	0%	552,000	0
<b>Subtotal - Fort Ord Tank Improvements</b>									<b>2,336,000</b>	<b>2,336,000</b>	<b>3,469,000</b>	<b>4,889,000</b>				<b>1,419,400</b>	<b>3,469,600</b>	
<b>Pump Station Improvements</b>					<b>New/Upgrade/Replace</b>	<b>Total Capacity (gpm)</b>												
O-PS-C1	New Capacity	Zone C	Planned A1/A2 tank site, nw/o the intersection of Inter-Garrison Rd and 6th Avenue		New	8,000			86	690,117	691,000	1,027,000	1,284,000	With G-T-A1	65%	35%	834,600	449,400
<b>Subtotal - Fort Ord Pump Station Improvements</b>									<b>690,117</b>	<b>691,000</b>	<b>1,027,000</b>	<b>1,284,000</b>				<b>834,600</b>	<b>449,400</b>	
<b>Valve Improvements</b>					<b>New/Replace</b>	<b>Size (in)</b>												
O-FILLV-B-EG	Supply Capacity	Zone B-EG	Inter-Garrison Road		New	8				73,000	73,000	109,000	137,000	With O-T-B-EG	20%	80%	27,400	109,600
<b>Subtotal - Fort Ord Valve Improvements</b>									<b>73,000</b>	<b>73,000</b>	<b>109,000</b>	<b>137,000</b>				<b>27,400</b>	<b>109,600</b>	
<b>Total Ord Community Improvement Costs</b>																		
<b>Pipeline Improvements</b>									<b>16,042,765</b>	<b>16,049,000</b>	<b>23,841,000</b>	<b>29,805,000</b>				<b>2,807,500</b>	<b>26,997,500</b>	
<b>Tank Improvements</b>									<b>2,336,000</b>	<b>2,336,000</b>	<b>3,469,000</b>	<b>4,889,000</b>				<b>1,419,400</b>	<b>3,469,600</b>	
<b>Pump Station Improvements</b>									<b>690,117</b>	<b>691,000</b>	<b>1,027,000</b>	<b>1,284,000</b>				<b>834,600</b>	<b>449,400</b>	
<b>Valve Improvements</b>									<b>73,000</b>	<b>73,000</b>	<b>109,000</b>	<b>137,000</b>				<b>27,400</b>	<b>109,600</b>	
<b>Total - Fort Ord Improvements</b>									<b>19,141,882</b>	<b>19,149,000</b>	<b>28,446,000</b>	<b>36,115,000</b>				<b>5,088,900</b>	<b>31,026,100</b>	

**Table 8.3 Intermediate-Term Capital Improvement Program**

Water Master Plan  
Marina Coast Water District

PRELIMINARY

Improv. No.	Improv. Type	Pressure Zone	Alignment	Limits	Improvement Details				Infrastructure Costs		Baseline Construction Cost (\$)	Estimated Construction Cost <sup>1</sup> (\$)	Capital Improvement Cost <sup>2,3,4</sup> (\$)	Construction Trigger	Suggested Cost Allocation		Cost Sharing	
									Unit Cost (\$/unit)	Infr. Cost (\$)					Existing Users	Future Users	Existing Users (\$)	Future Users (\$)
<b>Combined Water System (General)</b>																		
<b>Pipeline Improvements</b>																		
					Existing Diameter (in)	New/Parallel/Replace	Diameter (in)	Length (ft)										
G-P1	Reliability	Zone A	Future 2nd Ave Extension	From Imjin Rd to Reindollar Ave	-	New	12	4,775	213	1,017,075	1,018,000	1,512,000	1,890,000	With Development	100%	0%	1,890,000	0
G-P2	Capacity	Zone B	Planned Zone A Tank Site	From future PS-B to existing Zone B transmission main.	-	New	16	425	256	108,800	109,000	162,000	203,000	With G-PS-B	46%	54%	93,380	109,620
G-P3	Capacity	Zone C	Planned Zone A Tank Site	From future PS-C to existing Zone C transmission main.	-	New	18	925	276	255,300	256,000	381,000	477,000	With O-PS-C	65%	35%	310,050	166,950
G-P4	Capacity	Zone A	Planned Zone A Tank Site	From future Zone A tanks to future Zone A (existing Zone C) transmission main.	-	New	24	850	346	294,100	295,000	439,000	549,000	With G-T-A1	100%	0%	549,000	0
G-P5	Capacity	Zone A	Planned Zone A Tank Site	From future Zone A tanks to future Zone B and C Pump Station Building	-	New	20, 30	275	316, 383	89,850	90,000	134,000	168,000	With G-T-A2	39%	61%	65,520	102,480
G-P6	Reliability	Zone B	Imjin Road and Imjim Parkway	From the 8th St Cut-off to Abrams Dr	-	New	12	2,950	213	628,350	629,000	935,000	1,169,000	With G-T-A2	100%	0%	1,169,000	0
G-P7	Capacity	Zone A	Imjin Parkway	From Abrams Dr to Marina Heights Dr	-	New	24	2,550	346	882,300	883,000	1,312,000	1,640,000	With G-T-A1	0%	100%	0	1,640,000
G-P8	Capacity	Zone A	Marina Heights Development	From California Dr to approximately 600' n/o MacArthur Dr	-	New	24	3,300	346	1,141,800	1,142,000	1,696,000	2,120,000	With G-T-A1	0%	100%	0	2,120,000
G-P10	Capacity	Zone A	Reservation Rd	From existing Well 34 discharge to existing Well 31 discharge	16	Replace	24	2,000	346	692,000	692,000	1,028,000	1,285,000	With G-W35	0%	100%	0	1,285,000
G-P12	Capacity	Zone A	ROW, 3rd Ave	From future T-A3 to 6th Ave	-	New	20	300	316	94,800	95,000	142,000	178,000	With G-T-A3	0%	100%	0	178,000
									<b>Subtotal - Combined Pipeline Improvements</b>		<b>5,204,375</b>	<b>5,209,000</b>	<b>7,741,000</b>	<b>9,679,000</b>			<b>4,076,950</b>	<b>5,602,050</b>
<b>Tank Improvements</b>																		
					New/Replace	Capacity (MG)												
G-T-A1	Capacity	Zone A	Nw/o the intersection of Inter-Garrison Rd and 6th Avenue		Replace	1.60			2.33	3,728,000	3,728,000	5,537,000	7,475,000	Existing Deficiency	100%	0%	7,475,000	0
G-T-A2	Capacity	Zone A	Nw/o the intersection of Inter-Garrison Rd and 6th Avenue		Replace	1.60			2.33	3,728,000	3,728,000	5,537,000	7,475,000	Existing + Future Improvement	39%	61%	2,915,250	4,559,750
G-T-A3	Capacity	Zone A	Approx. 500' ne/o the intersection of 6th Ave and Intergarrison Rd		New	1.50			2.33	3,495,000	3,495,000	5,191,000	7,008,000	Approx. 2,600 EDUs	0%	100%	0	7,008,000
G-T-B2	Capacity	Zone B	Existing B1 Tank site		New	2.20			2.33	5,126,000	5,126,000	7,613,000	9,517,000	Existing + Future Improvement	18%	82%	1,713,060	7,803,940
									<b>Subtotal - Combined Tank Improvements</b>		<b>16,077,000</b>	<b>16,077,000</b>	<b>23,878,000</b>	<b>31,475,000</b>			<b>12,103,310</b>	<b>19,371,690</b>
<b>Pump Station Improvements</b>																		
					New/Upgrade/Replace	Total Capacity (gpm)												
G-PS-B	Capacity	Zone B	Planned A1/A2 tank site, nw/o the intersection of Inter-Garrison Rd and 6th Avenue		New	5,400			112	604,148	605,000	899,000	1,124,000	Prior to PS-B Demolition	46%	54%	517,040	606,960
									<b>Subtotal - Combined Pump Station Improvements</b>		<b>604,148</b>	<b>605,000</b>	<b>899,000</b>	<b>1,124,000</b>			<b>517,040</b>	<b>606,960</b>
<b>Supply Improvements</b>																		
					New/Replace	Total Capacity (gpm)												
G-W35	Capacity	Zone A	Existing Well 35 site		Replace Pump				55,000	55,000	55,000	82,000	103,000	With G-W1	0%	100%	0	103,000
G-W1	Quality	Zone A	Existing Well 30, 31, 34, 35		Wellhead Treatment				-	-	-	-	2,801,000	Operational Improvement	100%	0%	2,801,000	0
									<b>Subtotal - Combined Supply Improvements</b>		<b>55,000</b>	<b>55,000</b>	<b>82,000</b>	<b>2,904,000</b>			<b>2,801,000</b>	<b>103,000</b>



**Legend**

- |                                       |                            |                                |                |
|---------------------------------------|----------------------------|--------------------------------|----------------|
| Planned Groundwater Recharge Location | <b>Future Improvements</b> | <b>Existing Modeled System</b> | Streets        |
| Valves                                | Distribution Pipelines     | Tank                           | Rivers/Streams |
|                                       |                            | AWTF Pump Station              | Waterbodies    |
|                                       |                            | Pipes                          |                |
|                                       |                            | PWM Transmission Main          |                |

**PRELIMINARY**

**Figure 8.1**  
**Capital Improvement Program**  
 Recycled Water Master Plan  
 Marina Coast Water District



**Table 8.2 Capital Improvement Program**  
 Recycled Water Master Plan  
 Marina Coast Water District

PRELIMINARY

Improv. No.	Improv. Type	Alignment	Limits	Improvement Details				Infrastructure Costs		Baseline Construction Cost (\$)	Estimated Construction Cost <sup>1</sup> (\$)	Capital Improvement Cost <sup>2</sup> (\$)	Suggested Cost Allocation				Cost Sharing	
								Unit Cost (\$/unit)	Infr. Cost (\$)				Existing Users	Future Users	Central Marina	Fort Ord Community	Central Marina	Fort Ord Community
<b>Distribution Facilities<sup>3</sup></b>																		
<b>Distribution Pipeline Improvements<sup>4</sup></b>				Existing Diameter (in)	New/Parallel/Replace	Diameter (in)	Length (ft)											
P-1	Pipeline	Beach Rd	From Del Monte to Crescent Ave	-	New	6	4,000	107	428,000	428,000	635,580	732,428	0%	100%	100%	0%	732,428	0
P-2	Pipeline	Carmel Ave	From Vaughn Ave to Crumpton Ln	-	New	8	2,500	142	355,000	355,000	527,175	607,505	0%	100%	100%	0%	607,505	0
P-3	Pipeline	Abrams Dr	From Imjin Rd to Bunker Hill Dr	-	New	6	2,300	107	246,100	246,100	365,459	421,146	0%	100%	0%	100%	0	421,146
P-4	Pipeline	Abrams Rd, Imjin Rd	From MacArthur Dr to Reservation Rd	-	New	12	4,875	213	1,038,375	1,038,375	1,541,987	1,776,952	0%	100%	0%	100%	0	1,776,952
P-5	Pipeline	Reservation Road	From Blanco Rd to East Garrison	-	New	12	9,100	213	1,938,300	1,938,300	2,878,376	3,316,976	0%	100%	0%	100%	0	3,316,976
P-6	Pipeline	9th St	From Sea Glass Ave to 5th Ave	-	New	6	1,050	107	112,350	112,350	166,840	192,262	0%	100%	0%	100%	0	192,262
P-7	Pipeline	2nd Ave	From 10th St to 9th St	-	New	6	750	107	80,250	80,250	119,171	137,330	0%	100%	0%	100%	0	137,330
P-8	Pipeline	Coe Ave	From Pacific Crest Dr to Paralta Ave	-	New	8	1,500	142	213,000	213,000	316,305	364,503	0%	100%	0%	100%	0	364,503
P-9	Pipeline	Normandy Rd	From Blackhorse Reservoir to Eucalyptus Rd	-	New	8	2,350	142	333,700	333,700	495,545	571,055	0%	100%	0%	100%	0	571,055
P-10	Pipeline	Normandy Rd	From General Jim Moore Blvd to Parker Flats Rd	-	New	6	2,350	107	251,450	251,450	373,403	430,302	0%	100%	0%	100%	0	430,302
<b>Subtotal - Distribution System Improvements</b>									<b>4,996,525</b>	<b>4,996,525</b>	<b>7,419,840</b>	<b>8,550,459</b>					<b>1,339,933</b>	<b>7,210,526</b>
<b>Pressure Reducing Valve Improvements</b>				New/Replace	Size (in)													
PRV-1	PRV	Intersection of Beach Rd and Crescent Ave		New	4				73,000	73,000	108,405	124,924	0%	100%	100%	0%	124,924	0
PRV-2	PRV	Intersection of Carmel Ave and Vaughn Ave		New	4				73,000	73,000	108,405	124,924	0%	100%	100%	0%	124,924	0
PRV-3	PRV	California Ave s/o 3rd Ave		New	6				73,000	73,000	108,405	124,924	0%	100%	0%	100%	0	124,924
PRV-4	PRV	Intersection of 9th St and 5th Ave		New	4				73,000	73,000	108,405	124,924	0%	100%	0%	100%	0	124,924
PRV-5	PRV	Intersection of Coe Ave and Buttercup Blvd		New	4				73,000	73,000	108,405	124,924	0%	100%	0%	100%	0	124,924
PRV-6	PRV	Intersection of General Jim Moore Blvd and Normandy Rd		New	4				73,000	73,000	108,405	124,924	0%	100%	0%	100%	0	124,924
<b>Subtotal - Pressure Reducing Valve Improvements</b>									<b>438,000</b>	<b>438,000</b>	<b>650,430</b>	<b>749,541</b>					<b>249,847</b>	<b>499,694</b>
<b>Subtotal - Distribution Facilities</b>									<b>5,434,525</b>	<b>5,434,525</b>	<b>8,070,270</b>	<b>9,300,000</b>					<b>1,589,780</b>	<b>7,710,220</b>

**Table 8.2 Capital Improvement Program**  
 Recycled Water Master Plan  
 Marina Coast Water District

PRELIMINARY

Improv. No.	Improv. Type	Alignment	Limits	Improvement Details		Infrastructure Costs		Baseline Construction Cost (\$)	Estimated Construction Cost <sup>1</sup> (\$)	Capital Improvement Cost <sup>2</sup> (\$)	Suggested Cost Allocation				Cost Sharing		
						Unit Cost (\$/unit)	Infr. Cost (\$)				Existing Users	Future Users	Central Marina	Fort Ord Community	Central Marina	Fort Ord Community	
<b>Transmission Facilities<sup>5,6</sup></b>				<b>New/Replace</b>	<b>Pipe Length (ft)</b>												
<b>TM-1</b>	Pipeline	Various	From AWTF Pump Station to Blackhorse Reservoir	New 24" Pipeline		-	-	-	-	-							
<b>Blackhorse Tank</b>	Tank	Existing Water System Tank D-1 Site		New 2.0 MG Storage Tank	-	-	-	-	-	-							
<b>Subtotal - Transmission Facilities</b>						-	-	-	-	<b>10,513,217</b>	0%	100%	5%	95%	<b>525,661</b>	<b>9,987,556</b>	
<b>Other Treatment Improvements<sup>5,7</sup></b>																	
<b>TRT-1</b>	Various	Advanced Water Treatment				-	-	-	-	20,235,647	0%	100%	5%	95%	1,011,782	19,223,865	
<b>TRT-2</b>	Various	On Site Conversions								750,000	0%	100%	5%	95%	37,500	712,500	
<b>Subtotal - Other Treatment Improvements</b>						-	-	-	-	<b>20,985,647</b>					<b>1,049,282</b>	<b>19,936,365</b>	
<b>Water Augmentation Project<sup>5,7</sup></b>																	
<b>WAP-1</b>	Various	Advanced Water Treatment				-	-	-	-	12,973,333	77%	23%	49%	51%	6,356,933	6,616,400	
<b>WAP-2</b>	Various	Distribution Facilities								1,000,000	77%	23%	49%	51%	490,000	510,000	
<b>WAP-3</b>	Wells	Monitoring Wells								500,000	77%	23%	49%	51%	245,000	255,000	
<b>WAP-4</b>	Wells	Injection Well Facilities				-	-	-	-	5,526,667	77%	23%	49%	51%	2,708,067	2,818,600	
<b>Subtotal - Water Augmentation Project</b>						-	-	-	-	<b>20,000,000</b>					<b>9,800,000</b>	<b>10,200,000</b>	
<b>Total Costs</b>																	
				<b>Distribution Facilities</b>		<b>5,434,525</b>		<b>5,434,525</b>		<b>8,070,270</b>					<b>1,589,780</b>	<b>7,710,220</b>	
				<b>Transmission Facilities</b>		-		-		<b>10,513,217</b>					<b>525,661</b>	<b>9,987,556</b>	
				<b>Other Treatment Improvements</b>		-		-		<b>20,985,647</b>					<b>1,049,282</b>	<b>19,936,365</b>	
				<b>Water Augmentation Project</b>		-		-		<b>20,000,000</b>					<b>9,800,000</b>	<b>10,200,000</b>	
<b>Total - Recycled Water System Improvements</b>						<b>5,434,525</b>		<b>5,434,525</b>		<b>8,070,270</b>					<b>12,964,724</b>	<b>47,834,141</b>	



3/16/2020

- Notes:
1. Estimated Construction costs include 48.5 percent of baseline construction costs to account for unforeseen events and unknown field conditions, and for Contractor's overhead and profit, general conditions, and sales tax, consistent with 2007 Water Master Plan.
  2. Capital Improvement Costs also include an additional 25 percent of the estimated construction costs to account for administration, construction management, and legal costs.
  3. MCWD staff provided updated capital improvement costs for the distribution facilities, which were \$787,837 lower than predicted using the unit costs and associated contingencies. Thus, the \$787,837 reduction in cost was evenly distributed amongst the distribution facility improvements.
  4. Distribution pipeline improvements consist of improvements necessary to connect existing distribution infrastructure to planned transmission pipeline. This does not include cost for improvements necessary to connect potential users directly to the planned transmission pipeline.
  5. Improvement cost based on information received from District staff June 19, 2019.
  6. Suggested cost center cost allocation based on estimated recycled water demands within each cost center.
  7. Suggested cost center cost allocation based on intermediate-term water demands documented in the in-progress Water Master Plan, which includes the buildout of Central Marina and intermediate-term development limits of the Fort Ord Community.

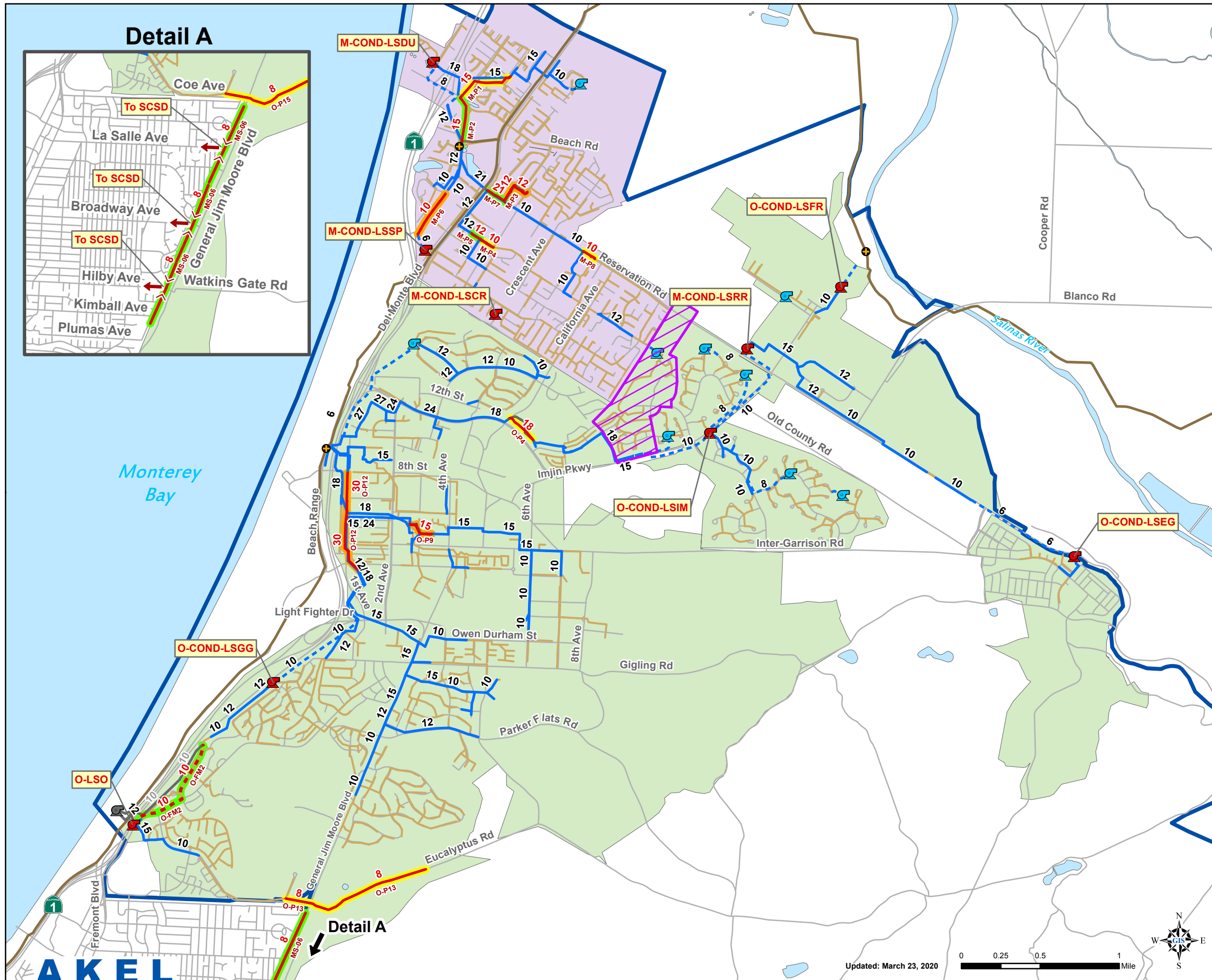
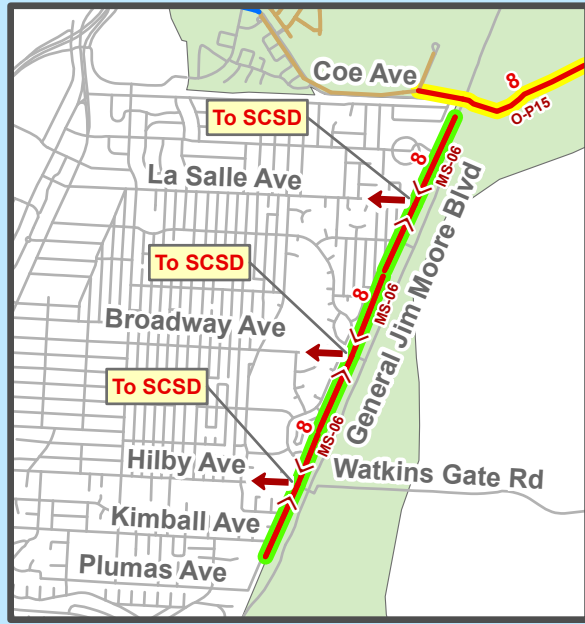
**Appendix B - Recycled Water Capital Improvement Plan Detail**

Analysis using Table 8.2 - Recycled Water Master Plan, AKEL Engineering

	Cost Total	% Allocation				Cost Allocation			
		% Current Users	% Future Users	Central Marina	Fort Ord	Current Marina	Future Marina	Current Ord	Future Ord
<b>Distribution Improvements</b>									
<b>Distribution Pipeline Improvements</b>									
P-1	\$732,428	0%	100%	100%	0%	\$0	\$732,428	\$0	\$0
P-2	607,505	0%	100%	100%	0%	0	607,505	0	0
P-3	421,146	0%	100%	0%	100%	0	0	0	421,146
P-4	1,776,952	0%	100%	0%	100%	0	0	0	1,776,952
P-5	3,316,976	0%	100%	0%	100%	0	0	0	3,316,976
P-6	192,262	0%	100%	0%	100%	0	0	0	192,262
P-7	137,330	0%	100%	0%	100%	0	0	0	137,330
P-8	364,503	0%	100%	0%	100%	0	0	0	364,503
P-9	571,055	0%	100%	0%	100%	0	0	0	571,055
P-10	430,302	0%	100%	0%	100%	0	0	0	430,302
<b>Total Distribution Pipeline</b>	<b>\$8,550,459</b>					<b>\$0</b>	<b>\$1,339,933</b>	<b>\$0</b>	<b>\$7,210,526</b>
<b>Pressure Reducing Valve Improvements</b>									
PRV-1	\$124,924	0%	100%	100%	0%	\$0	\$124,924	\$0	\$0
PRV-2	124,924	0%	100%	100%	0%	0	124,924	0	0
PRV-3	124,924	0%	100%	0%	100%	0	0	0	124,924
PRV-4	124,924	0%	100%	0%	100%	0	0	0	124,924
PRV-5	124,924	0%	100%	0%	100%	0	0	0	124,924
PRV-6	124,924	0%	100%	0%	100%	0	0	0	124,924
<b>Total Pressure Reducing Valves</b>	<b>\$749,541</b>					<b>\$0</b>	<b>\$249,847</b>	<b>\$0</b>	<b>\$499,694</b>
<b>Total Distribution Facilities</b>						<b>\$0</b>	<b>\$1,589,780</b>	<b>\$0</b>	<b>\$7,710,220</b>
<b>Transmission Facilities</b>									
TM-1	-						-		-
Blackhorse Tank	-						-		-
<b>Total Transmission Facilities</b>	<b>\$10,513,217</b>	0%	100%	5%	95%	<b>\$0</b>	<b>\$525,661</b>	<b>\$0</b>	<b>\$9,987,556</b>
<b>Other Treatment Improvements</b>									
TRT-1	\$20,235,647	0%	100%	5%	95%	0	1,011,782	0	19,223,865
TRT-2	750,000	0%	100%	5%	95%	0	37,500	0	712,500
<b>Total Other Treatment Improvements</b>	<b>\$20,985,647</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$0</b>	<b>\$1,049,282</b>	<b>\$0</b>	<b>\$19,936,365</b>
<b>Water Augmentation Project</b>									
WAP-1	\$12,973,333	77%	23%	49%	51%	4,894,839	1,462,095	5,094,628	1,521,772
WAP-2	1,000,000	77%	23%	49%	51%	377,300	112,700	392,700	117,300
WAP-3	500,000	77%	23%	49%	51%	188,650	56,350	196,350	58,650
WAP-4	5,526,667	77%	23%	49%	51%	2,085,211	622,855	2,170,322	648,278
<b>Total Water Augmentation Project</b>	<b>\$20,000,000</b>					<b>\$7,546,000</b>	<b>\$2,254,000</b>	<b>\$7,854,000</b>	<b>\$2,346,000</b>
<b>Total Recycled Water CIP</b>	<b>\$60,798,864</b>					<b>\$7,546,000</b>	<b>\$5,418,723</b>	<b>\$7,854,000</b>	<b>\$39,980,141</b>



### Detail A



### Legend

#### Future Improvements

- Lift Stations
- Gravity Mains
- Force Mains
- Abandoned Lift Stations
- Abandoned Pipes

#### Existing Modeled System

- Lift Stations
- Outfalls
- Gravity Mains by Size
  - 8" and Smaller
  - 10" and Larger
  - Force Mains
- Monterey One Water Interceptor

#### Planning Boundary

- Planning Boundary
- Cost Centers
  - Central Marina
  - Ord Community
  - Ord Community Service Area
  - Tributary to Central Marina Outfall
- Streets
- Waterbodies
- Rivers/Streams

**PRELIMINARY**

**Figure 8.2**  
**Intermediate-Term**  
**Improvements**  
 Sewer Master Plan  
 Marina Coast Water District



**Table 8.4 Intermediate-Term Capital Improvement Program**  
Sewer Master Plan  
Marina Coast Water District

PRELIMINARY

Improv. No.	Type of Improvement	Alignment	Limits	Improvement Details				Infrastructure Costs		Baseline Construction Costs	Estimated Construction Cost <sup>1</sup>	Capital Improvement Cost <sup>2,3</sup>	Construction Trigger	Suggested Cost Allocation		Cost Allocation	
								Unit Cost	Infr. Cost					Existing Users	Future Users	Existing Users	Future Users
								(\$)	(\$)	(\$)	(\$)	(\$)	(%)	(%)	(\$)	(\$)	
<b>Central Marina Sewer System</b>																	
<b>Gravity Main Improvements</b>																	
				Existing Diameter	New/Parallel/Replace	Diameter	Length										
				(in)		(in)	(ft)										
M-P1	Gravity Main	ROW, Cove Way, Cardoza Ave	From Abdy Way to Reservation Rd	-	New	15	1,975	303	598,745	598,800	889,300	1,111,700	With Marina Station Development	1%	99%	7,108	1,104,592
M-P2	Gravity Main	Reservation Rd	From Cardoza Ave to 150' s/o Seaside Cir	-	New	15	1,725	303	522,955	523,000	776,700	970,900	With Marina Station Development	1%	99%	6,207	964,693
M-P3	Gravity Main	Eucalyptus St, Peninsula Dr, Vista del Camino	From Viking Ln to Reservation Rd	8	Replace	12	1,350	279	376,527	376,600	559,300	699,200	Existing & Future Improvement	85%	15%	592,371	106,829
M-P4	Gravity Main	Carmel Ave	From Seacrest Ave to Sunset Ave	8	Replace	10	575	243	139,455	139,500	207,200	259,000	Existing Deficiency	100%	0%	259,000	0
M-P5	Gravity Main	Carmel Ave	From Sunset Ave to Casa de Bolea	8	Replace	12	350	279	97,618	97,700	145,100	181,400	Existing Deficiency	100%	0%	181,400	0
M-P6	Gravity Main	Lake Dr	From HWY 1 to Messinger Dr	6, 8	Replace	10	1,675	243	406,237	406,300	603,400	754,300	Approx. 600 EDUs	46%	54%	348,198	406,102
M-P7	Gravity Main	Reservation Rd	From Vista Del Camino to Del Monte Blvd	12, 18	Replace	21	750	352	263,751	263,800	391,800	489,800	Approx. 2,950 EDUs	41%	59%	202,766	287,034
M-P8	Gravity Main	Reservation Rd	From 200' w/o Crestview Ct to 800' w/o Crestview Ct	8	Replace	10	525	243	127,328	127,400	189,200	236,500	Approx. 200 EDUs	10%	90%	24,456	212,044
<b>Subtotal - City of Marina Pipeline Improvements</b>								<b>2,532,617</b>	<b>2,533,100</b>	<b>3,762,000</b>	<b>4,702,800</b>			<b>1,621,505</b>	<b>3,081,295</b>		
<b>Lift Station Improvements</b>																	
				Existing Capacity	Improvement Type	Recommended Capacity											
				(gpm)		(gpm)											
M-LSD	Lift Station Replacement	Dunes Lift Station		2 x 700	Capacity Upgrade	3 x 450		1,127,627	1,127,700	1,674,700	2,093,400	Existing Deficiency	100%	0%	2,093,400	0	
M-LSCR	Lift Station Replacement	Crescent Lift Station		2 x 100	Station Replacement	2 x 100		-	-	-	401,576	Condition Improvement	100%	0%	401,576	0	
<b>Subtotal - City of Marina Lift Station Improvements</b>								<b>1,127,627</b>	<b>1,127,700</b>	<b>1,674,700</b>	<b>2,494,976</b>			<b>2,494,976</b>	<b>0</b>		
<b>Condition Assessment Improvements<sup>4</sup></b>																	
				Improvement Type													
M-COND-LSSP	Condition	San Pablo Lift Station		Condition Improvements				24,600	24,600	36,800	46,200	Condition Improvement	100%	0%	46,200	0	
<b>Subtotal - Central Marina Condition Assessment Improvements</b>								<b>24,600</b>	<b>24,600</b>	<b>36,800</b>	<b>46,200</b>			<b>46,200</b>	<b>0</b>		
<b>Miscellaneous Improvements</b>																	
				Improvement Type													
MS-M1	WWTP	Located at the Marina WWTP		Demolition				-	-	-	883,265	Planned System Improvement	100%	0%	883,265	0	
MS-M2	Gravity Main	Del Monte Boulevard	Del Monte Blvd/ Reservation Rd	Replace				-	-	-	553,161	As Funding is Available	100%	0%	553,161	0	
<b>Subtotal - Central Marina Miscellaneous Improvements</b>											<b>1,436,426</b>			<b>1,436,426</b>	<b>0</b>		
<b>Total Central Marina Improvement Costs</b>																	
								<b>Gravity Main Improvements</b>	<b>2,532,617</b>	<b>2,533,100</b>	<b>3,762,000</b>	<b>4,702,800</b>			<b>1,621,505</b>	<b>3,081,295</b>	
								<b>Lift Station Improvements</b>	<b>1,127,627</b>	<b>1,127,700</b>	<b>1,674,700</b>	<b>2,494,976</b>			<b>2,494,976</b>	<b>0</b>	
								<b>Condition Assessment Improvements</b>	<b>24,600</b>	<b>24,600</b>	<b>36,800</b>	<b>46,200</b>			<b>46,200</b>	<b>0</b>	
								<b>Miscellaneous Improvements</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,436,426</b>			<b>1,436,426</b>	<b>0</b>	
<b>Total - Central Marina Improvements</b>								<b>3,684,844</b>	<b>3,685,400</b>	<b>5,473,500</b>	<b>8,680,402</b>			<b>5,599,107</b>	<b>3,081,295</b>		

**Table 8.4 Intermediate-Term Capital Improvement Program**  
Sewer Master Plan  
Marina Coast Water District

PRELIMINARY

Improv. No.	Type of Improvement	Alignment	Limits	Improvement Details				Infrastructure Costs		Baseline Construction Costs	Estimated Construction Cost <sup>1</sup>	Capital Improvement Cost <sup>2,3</sup>	Construction Trigger	Suggested Cost Allocation		Cost Allocation	
								Unit Cost	Infr. Cost					Existing Users	Future Users	Existing Users	Future Users
								(\$)	(\$)	(\$)	(\$)	(\$)	(%)	(%)	(\$)	(\$)	
<b>Ord Community Sewer System</b>																	
<b>Gravity Main Improvements</b>																	
				Existing Diameter	New/Parallel/Replace	Diameter	Length										
				(in)		(in)	(ft)										
O-P4	Gravity Main	ROW e/o Imjin Pkwy	From California Ave to 475' n/o Abrams Dr	18	Replace	18	1,100	327	360,157	360,200	534,900	668,700	With Sea Haven Development	53%	47%	356,905	311,795
O-P9	Gravity Main	ROW n/o Inter-Garrison Rd	Jogging from 4th Ave to 1,300' w/o 4th Ave	10	Replace	15	1,675	303	507,797	507,800	754,100	942,700	Existing Deficiency	40%	60%	376,128	566,572
O-P12	Gravity Main	1st Ave	From 1st St to 8th St	12,18,30	Replace	30	3,100	-	-	-	-	408,340	Condition Improvement	100%	0%	408,340	0
O-P13	Gravity Main	Eucalyptus Rd	From approximately 4,000' e/o General Jim Moore Blvd to approximately 800' w/o General Jim Moore Blvd	-	New	8	5,300	218	1,156,867	1,156,900	1,718,000	2,147,500	With Seaside East Development	0%	100%	0	2,147,500
<b>Subtotal - Ord Community Pipeline Improvements</b>									<b>2,024,820</b>	<b>2,024,900</b>	<b>3,007,000</b>	<b>4,167,240</b>				<b>1,141,372</b>	<b>3,025,868</b>
<b>Force Main Improvements</b>																	
				Existing Diameter	New/Parallel/Replace	Diameter	Length										
				(in)		(in)	(ft)										
O-FM2	Force Main	Monterey Rd, existing ROW	From relocated Ord Village LS to existing gravity main n/o Corregidor Rd	10	Replace	10	3,950	214	845,756	845,800	1,256,100	1,570,200	With O-LSO	42%	58%	667,033	903,167
<b>Subtotal - Ord Community Force Main Improvements</b>									<b>845,756</b>	<b>845,800</b>	<b>1,256,100</b>	<b>1,570,200</b>				<b>667,033</b>	<b>903,167</b>
<b>Lift Station Improvements</b>																	
				Existing Capacity	Improvement Type	Recommended Capacity											
				(gpm)		(gpm)											
O-LSG	Lift Station/ Force Main	Gigling Lift Station	Gigling LS and FM Improvements	-		-	-	-	-	-	-	2,021,079	With O-COND-LSGG	100%	0%	2,021,079	0
O-LSO	Lift Station Rehabilitation			-		-	-	-	-	-	-	2,247,000	Planned System Improvement	43%	57%	956,206	1,290,794
O-LSB	Lift Station Demolition and Replacement		Booker, Hatten, Neeson LS improvements	-		-	-	-	-	-	-	726,240	Planned System Improvement	100%	0%	726,240	0
<b>Subtotal - Ord Community Lift Station Improvements</b>									<b>0</b>	<b>0</b>	<b>0</b>	<b>4,994,319</b>				<b>3,703,525</b>	<b>1,290,794</b>
<b>Condition Assessment Improvements<sup>4</sup></b>																	
				Improvement Type													
O-COND-LSGG	Condition	Gigling Lift Station			Condition Improvements			444,300	444,300	660,200	825,600		With O-LSG	100%	0%	825,600	0
O-COND-LSIM	Condition	Imjin Lift Station			Condition Improvements			29,000	29,000	43,400	54,400		Condition Improvement	100%	0%	54,400	0
O-COND-LSFR	Condition	Fritzche Lift Station			Condition Improvements			63,200	63,200	94,100	117,700		Condition Improvement	100%	0%	117,700	0
O-COND-LSEG	Condition	East Garrison Lift Station			Condition Improvements			32,300	32,300	48,300	60,700		Condition Improvement	100%	0%	60,700	0
O-COND-LSRR	Condition	Reservation Road Lift Station			Condition Improvements			39,900	39,900	59,600	74,700		Condition Improvement	100%	0%	74,700	0
<b>Subtotal - Ord Community Condition Assessment Improvements</b>									<b>608,700</b>	<b>608,700</b>	<b>905,600</b>	<b>1,133,100</b>				<b>1,133,100</b>	<b>0</b>
<b>Miscellaneous Improvements</b>																	
MS-O1	Service		Del Rey Oaks Collection System Planning								61,200		With Development	0%	100%	0	61,200
MS-O2	Gravity Main		SCSD Sewer Improvements - Del Rey Oaks								2,039,964		With Development	0%	100%	0	2,039,964
MS-O3	Service		Monterey One Water Buy-In								11,040,808		-	50%	50%	5,520,404	5,520,404
MS-O4	Gravity Main		Inter-Garrison/ 8th Avenue Sewer Connection								1,035,000		With Development	0%	100%	0	1,035,000
MS-O5	WWTP		Demolish Ord Main Garrison WWTP								1,623,648		Planned System Improvement	100%	0%	1,623,648	0
MS-O6	Gravity Main		Seaside East Side Developments Parcels (future growth)								6,480,709		With Development	0%	100%	0	6,480,709
MS-O7	Lift Station		Miscellaneous Lift Station Improvements								1,497,360		Planned System Improvement	50%	50%	748,680	748,680

**Table 8.4 Intermediate-Term Capital Improvement Program**  
 Sewer Master Plan  
 Marina Coast Water District

PRELIMINARY

Improv. No.	Type of Improvement	Alignment	Limits	Improvement Details	Infrastructure Costs		Baseline Construction Costs	Estimated Construction Cost <sup>1</sup>	Capital Improvement Cost <sup>2,3</sup>	Construction Trigger	Suggested Cost Allocation		Cost Allocation	
					Unit Cost	Infr. Cost					Existing Users	Future Users	Existing Users	Future Users
					(\$)	(\$)					(%)	(%)	(\$)	(\$)
MS-08	Lift Station/ Gravity Main			Cypress Knolls Sewer Pipeline and Lift Station Improvement Project					97,424	Planned System Improvement	0%	100%	0	97,424
<b>Subtotal - Ord Community Miscellaneous Improvements</b>					<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>23,876,113</b>				<b>7,892,732</b>	<b>15,983,381</b>
<b>Total Ord Community Improvement Costs</b>														
				Gravity Main Improvements	2,024,820		2,024,900	3,007,000	4,167,240				1,141,372	3,025,868
				Force Main Improvements	845,756		845,800	1,256,100	1,570,200				667,033	903,167
				Lift Station Improvements	0		0	0	4,994,319				3,703,525	1,290,794
				Condition Assessment Improvements	608,700		608,700	905,600	1,133,100				1,133,100	0
				Miscellaneous Improvements	0		0	0	23,876,113				7,892,732	15,983,381
				<b>Total Ord Community Community Improvements</b>	<b>3,479,277</b>		<b>3,479,400</b>	<b>5,168,700</b>	<b>35,740,972</b>				<b>14,537,762</b>	<b>21,203,210</b>
<b>General Miscellaneous Sewer System Improvements</b>														
G-1	Odor Control Project	Various Locations		Odor Control Project					100,000	Planned System Improvement	100%	0%	100,000	0
G-2	Other	Corporation Yard Demolition and Rehab							116,300	As Funding is Available	100%	0%	116,300	0
<b>Subtotal - General Sewer System Improvements</b>									<b>216,300</b>				<b>216,300</b>	<b>0</b>
<b>Total Sewer System Improvement Costs</b>														
				Gravity Main Improvements	4,557,438		4,558,000	6,769,000	8,870,040				2,762,877	6,107,163
				Force Main Improvements	845,756		845,800	1,256,100	1,570,200				667,033	903,167
				Lift Station Improvements	1,127,627		1,127,700	1,674,700	7,489,295				6,198,501	1,290,794
				Condition Assessment Improvements	633,300		633,300	942,400	1,179,300				1,179,300	0
				Miscellaneous Improvements	0		0	0	25,528,839				9,545,458	15,983,381
				<b>Total Improvement Cost</b>	<b>7,164,120</b>		<b>7,164,800</b>	<b>10,642,200</b>	<b>44,637,674</b>				<b>20,353,170</b>	<b>24,284,504</b>



3/16/2020

- Notes :
1. Estimated Construction costs include 48.5 percent of baseline construction costs to account for unforeseen events and unknown field conditions, and for Contractor's overhead and profit, general conditions, and sales tax, consistent with 2007 Water Master plan.
  2. Capital Improvement Costs also include an additional 25 percent of the estimated construction costs to account for administration, construction management, and legal costs.
  3. Costs for improvements shown with only Capital Improvement Cost are based on information provided by District staff.
  4. Costs associated with condition assessment improvements are included for planning purposes and are to be implemented at the discretion of District staff or may be superceded by other planned lift station improvements.

## **Appendix B2: Capital Improvement Plan - Adjustments**

Data provided by Marina Coast Water District

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**Appendix B: Recycled Water CIP Adjustments**

	<b>Total</b>	<b>Marina Future</b>	<b>Ord Future</b>
Total CIP Cost - Developer Share	\$45,398,864	\$5,418,723	\$39,980,141
% Share		12%	88%
Grants	(\$7,294,569)	(\$870,666)	(\$6,423,903)
FORA Capital Contribution	(\$4,300,000)		(\$4,300,000)
Future Interest Costs <sup>1</sup>	\$10,217,171	\$1,219,502	\$8,997,669
<b>Total Recycled Water Adjustments</b>	<b>-\$1,377,398</b>	<b>\$348,836</b>	<b>-\$1,726,234</b>

1 - 3 loans to fund RW projects net of Capital Contributions and Grants, 30 year terms:

\$17.6m @ 1.8% interest Year 1, \$11.5m @ 1.8% interest Year 6, \$4.5m @ 1.8% interest Year 12

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**Table 8.4 Intermediate-Term General System Improvement Cost Responsibility**

Water Master Plan

Marina Coast Water District

PRELIMINARY

Improv. No.	CIP Cost <sup>1</sup>	Suggested Cost Allocation		Cost Responsibility <sup>2</sup>				
		Existing	Future	Central Marina		Ord Community		Total
				Existing	Future	Existing	Future	
<b>Pipeline Improvements</b>								
G-P1	\$1,890,000	100%	0%	97%	0%	3%	0%	100%
G-P2	\$203,000	46%	54%	9%	5%	37%	49%	100%
G-P3	\$477,000	65%	35%	13%	3%	52%	32%	100%
G-P4	\$549,000	100%	0%	97%	0%	3%	0%	100%
G-P5	\$168,000	39%	61%	38%	57%	1%	4%	100%
G-P6	\$1,169,000	100%	0%	20%	0%	80%	0%	100%
G-P7	\$1,640,000	0%	100%	0%	93%	0%	7%	100%
G-P8	\$2,120,000	0%	100%	0%	93%	0%	7%	100%
G-P10	\$1,285,000	0%	100%	0%	93%	0%	7%	100%
G-P12	\$178,000	0%	100%	0%	93%	0%	7%	100%
<b>Tank Improvements</b>								
G-T-A1	\$7,475,000	100%	0%	97%	0%	3%	0%	100%
G-T-A2	\$7,475,000	39%	61%	38%	57%	1%	4%	100%
G-T-A3	\$7,008,000	0%	100%	0%	93%	0%	7%	100%
G-T-B2	\$9,517,000	18%	82%	4%	7%	14%	75%	100%
<b>Pump Station Improvements</b>								
G-PS-B	\$1,124,000	46%	54%	9%	5%	37%	49%	100%
<b>Valve Improvements</b>								
G-PRV-B1	\$137,000	75%	25%	73%	23%	2%	2%	100%
<b>Miscellaneous Improvements<sup>3</sup></b>								
G-WD1	\$465,000	100%	0%	37%	0%	63%	0%	100%
<b>Supply Improvements<sup>3</sup></b>								
G-W35	\$103,000	0%	100%	0%	37%	0%	63%	100%
G-W1	\$2,801,000	100%	0%	37%	0%	63%	0%	100%



3/16/2020

Notes:

1. CIP Cost includes master planning contingencies of 48.5% (Construction) and 25% (Capital Improvement)
2. Unless noted otherwise, cost responsibility for Central Marina and Ord Community cost centers based on existing and future demands within the pressure zone served by each improvement.
3. Cost responsibility for Central Marina and Ord Community cost centers based on 5-year Improvement data received from District staff December 18, 2017.



## Table 8.5 Intermediate-Term General System Improvement Cost Responsibility

Sewer Master Plan

Marina Coast Water District

PRELIMINARY

Improv. No.	CIP Cost	Suggested Cost Allocation		Cost Responsibility				
				Central Marina		Ord Community		Total
		Existing	Future	Existing	Future	Existing	Future	
<b>Miscellaneous Improvements<sup>1</sup></b>								
G-1	\$100,000	100%	0%	45%	0%	55%	0%	100%
G-2	\$116,300	100%	0%	40%	0%	60%	0%	100%



5/28/2019

Notes:

1. CIP cost and cost responsibility for Central Marina and Ord Community cost centers based on 5-year Improvement data received from District staff December 18, 2017.

**Appendix B: Adjustments - Estimated Future Water and Sewer CIP Financing Costs**  
**Includes All Multi-Developer Future Capital Improvement Projects (Source MCWD 2020-21 5-yr CIP dated 6/8/2020)**

		19/20	20/21	21/22	22/23	23/24	24/25	Out Years	Total
<b>Marina Water</b>									
MW-W4	CA Ave Pipeline	0	0	0	0	0	584,000	0	584,000
	Subtotal	0	0	0	0	0	584,000	0	584,000
<b>Marina Sewer</b>									
MS-0205 (S6)	Reservation Rd 200' W VCCourt	0	0	0	0	375,000	0	0	375,000
MS-0137 (S5)	Reservation Rd Via Del Camino	0	0	0	0	0	489,800	0	489,800
MS-2	Peninsula Dr & Vista Del Camino	0	0	0	0	0	0	699,200	699,200
MS-4	Lake dr Pipeline Improvements	0	0	0	0	0	0	754,300	754,300
	Subtotal	0	0	0	0	375,000	489,800	1,453,500	2,318,300
<b>Ord Water</b>									
OW-0206	Inter-Garrison Rd Up-Sizing	772,400	0	0	0	0	0	0	772,400
OW-0202 (W18)	South Boundary Rd Pipeline	40,000	2,660,000	0	0	0	0	0	2,700,000
OW-11	Seaside Resort Pipeline - Coe Ave	0	0	0	0	0	0	684,000	684,000
OW-12	Seaside East Pipeline - Zone D	0	0	0	0	0	0	535,000	535,000
OW-14	Parker Flats Cutoff Rd Pipeline	0	0	0	0	0	0	2,030,000	2,030,000
OW-0171 (W13)	Eucalyptus Rd Pipeline	0	0	0	0	0	0	4,312,000	4,312,000
	Subtotal	812,400	2,660,000	0	0	0	0	7,561,000	11,033,400
<b>Ord Sewer</b>									
OS-0205 (S19)	Imjin LS & Force Main Phase 1	125,000	1,161,370	0	0	0	0	0	1,286,370
OS-0148 (S7)	Sea Haven Sewer Pipeline	0	0	0	0	0	668,700	0	668,700
OS-0202 (MS-02)	Sewer Improvements-DRO	0	0	0	0	0	502,454	1,537,510	2,039,964
OS-0210 (S9)	1st Ave Sewer Pipeline Replacement	0	0	0	0	0	0	408,340	408,340
OS-0214 (MS-04)	InterGarrison/8th Ave SS	0	0	0	0	0	0	1,035,000	1,035,000
OS-0216 (MS-03)	MOW Capacity Buy-In Beyond 2.2 MGD	0	0	0	0	0	0	11,040,808	11,040,808
	Subtotal	125,000	1,161,370	0	0	0	1,171,154	14,021,658	16,479,182
<b>General Water (29% Marina, 71% Ord)</b>									
GW-0112 (W21)	A1 & A2 Tanks & B/C Booster Station	364,720	6,695,000	6,590,000	0	0	0	0	13,649,720
GW-0305 (W23)	CA Ave & Imjin Pkwy Pipeline	0	2,400,000	0	0	0	0	0	2,400,000
GW-0123 (W27)	B2" Zone Tank @ CSUMB	0	140,000	1,275,000	8,102,000	0	0	0	9,517,000
GW-0210 (W26)	Reservoir A3 (1.6 MG)	0	0	0	0	0	0	7,186,000	7,186,000
GW-28	Well 35 Pump Replacement	0	0	0	0	0	0	103,000	103,000
GW-29	Wellhead Treatment	0	0	0	0	0	0	2,081,000	2,081,000
	Subtotal	364,720	9,235,000	7,865,000	8,102,000	0	0	9,370,000	34,936,720
	Marina Water Share	105,800	2,678,200	2,280,900	2,349,600	0	0	2,717,300	10,131,600
	Ord Water Share	258,920	6,556,800	5,584,100	5,752,400	0	0	6,652,700	24,805,120
<b>Total</b>									
	Total Marina Water	105,800	2,678,200	2,280,900	2,349,600	0	584,000	2,717,300	10,715,600
	Total Marina Sewer	0	0	0	0	375,000	489,800	1,453,500	2,318,300
	Total Ord Water	1,071,320	9,216,800	5,584,100	5,752,400	0	0	14,213,700	35,838,520
	Total Ord Sewer	125,000	1,161,370	0	0	0	1,171,154	14,021,658	16,479,182
	<b>Total All</b>	<b>1,302,120</b>	<b>13,056,370</b>	<b>7,865,000</b>	<b>8,102,000</b>	<b>375,000</b>	<b>2,244,954</b>	<b>32,406,158</b>	<b>65,351,602</b>
<b>Total Through 24/25: 32,945,444</b>									

**CIP Financing Cost (Based on Financing CIP Projects Through 2024/25)**

Financing \$32.945M 20yrs @2.5%	\$2,113,355.64	per year	2.50%
Total Payments	\$42,267,112.75	20yrs	20
Total Interest Cost	\$9,321,668.75		

**CIP Interest Cost Allocation (Based on Value of CIP Projects Through 2024/25)**

24.3% Total Marina Water	\$2,263,116.18
2.6% Total Marina Sewer	\$244,688.74
65.6% Total Ord Water	\$6,118,525.66
7.5% Total Ord Sewer	\$695,338.17

## **Appendix C: FY 2021 Proposed Water Use Factors**

Proposed Marina Coast Water District Water Use Factors for  
Determining Capacity Charges

Type of Use	Basis	Existing Assigned Water Use Rate By Acre-Ft	Proposed Assigned Water Use Rate By Acre-Ft
<u>Residential</u>			
Multi Family - Apartment	DU	x 0.33	0.21
Apartment (senior complex)	DU	x	0.12
Group Housing (boarding, dormitory, convalescent)	Occupant	x	0.062
Condominium/Townhouse	DU	x 0.33	0.24
Mobile Home	DU	x 0.33	0.21
Multi-Family - Duplex to Fourplex	DU	x 0.33	0.24
Single Family 0<lot<0.08 acres (13 or more units per acre)	DU	x 0.33	0.25
Single Family 0.08<=lot<0.22 acres (5-12 Units/Acre)	DU	x 0.33	0.28
Single Family 0.22<=lot<0.67 (2- 4 Units/acre)	DU	x 0.33	0.52
Single Family (lot>= 0.67 acres)	acres	x	0.89
Accessory Dwelling Unit < 640 sq. ft.	DU	x	0.17
Accessory Dwelling Unit 641 to 800 sq. ft.	DU	x	0.21
Accessory Dwelling Unit 841-1200 sq. ft.	DU	x	0.25
<u>Non-Residential</u>			
Auto Sales/Repair Shops (Gross Floor Area)	sq. ft.	x 0.00007	0.00006
Bank	sq. ft.	x	0.00030
Bakery	sq. ft.	x	0.00027
Bar (w/o restaurant)	sq. ft.	x 0.024/seat	0.00023
Beauty shop/barber shop	stations	x 0.059	0.050
Car Wash w/ recycle	sq. ft.	x *	*
Child Care	sq. ft.	x 0.0072	0.0061
Dry Cleaners (onsite cleaning)	sq. ft.	x 0.00040	0.00040
Gas Station (w/o minimart or restaurant)	pumps	x 0.1051	0.1051
Gym, Health Club (w/o aquatics)	sq. ft.	x	0.000117
Hotel/Motel/Bed & Breakfast (Guest room portion only)	units	x 0.170	0.110
Laundromat (self-serve)	washers	x 0.202	0.202
Laundry - Commercial	sq. ft.	x 0.1735	*
Office - General (nonmedical, includes chiropractor)	sq. ft.	x 0.00012	0.000102
Office - Government, Education	sq. ft.	x	0.000092
Office - Dental	sq. ft.	x 0.00029	
Office - Medical, Dental	sq. ft.	x 0.00018	0.000162
Manufacturing (other than food, beverage, chemical)	sq. ft.	x	0.056
Manufacturing (food, beverage, chemical)	sq. ft.	x	*
Meeting Halls, Churches, School Room	sq. ft.	x 0.0001	0.000092
Nursing Home (care portion only)	bed	x 0.142/room	0.12
Laboratory	sq. ft.	x	0.000082
Laboratory - Photographic	sq. ft.	x 0.003	0.003
Landscape (non-turf)	acres	x 2.1	2.1
Landscape (turf)	acres	x 2.5	2.5
Plant Nursery	sq. ft.	x 0.00009	0.00009

Proposed Marina Coast Water District Water Use Factors for  
Determining Capacity Charges

Type of Use	Basis	Existing Assigned Water Use Rate By Acre-Ft	Proposed Assigned Water Use Rate By Acre-Ft
Public Restroom	toilets	x 0.0676	0.058
Restaurant (incl. fast food, deli, sandwich shop)	seats	x 0.029	
Restaurant (full service - 3 meals, dish washing)	sq. ft.	x	0.00125
Restaurant (Fast-food/casual with onsite prep)	sq. ft.	x	0.00051
Restaurant (take out w/ minimal onsite prep)	sq. ft.	x 0.0027	0.00027
Store - General Retail (Department Store)	sq. ft.	x 0.00005	0.00005
Store - Grocery and Markets	sq. ft.	x 0.00039	0.00033
Swimming Pool (per 100 sq. ft. pool area)		x 0.020	0.02
Theater	seats	x 0.0014	0.0012
Veterinary	sq. ft.	x 0.00026	0.00022
Warehouse, Distribution, Self Storage	sq. ft.	x 0.00001	0.00001

Water use factors were updated based on a survey of similar coastal California water agencies and a 2011 study by A&N Technical Services for Monterey Peninsula Water Management District (MPWMD) The other coastal water agencies included Soquel Creek Water District (near Santa Cruz), the City of Santa Barbara, and Cal-American Water District – Monterey. Landscape factors continue to be calculated based on evapotranspiration (ET) factors.