MARINA COAST WATER DISTRICT

11 RESERVATION ROAD, MARINA, CA 93933-2099
Home Page: www.mcwd.org
TEL: (831) 384-6131 FAX: (831) 883-5995

Agenda
Special Board Meeting, Board of Directors
Marina Coast Water District
and
Regular Board Meeting, Board of Directors
Marina Coast Water District Groundwater Sustainability Agency
Via Zoom Teleconference

Tuesday, November 29, 2022, 6:30 p.m. PST

Due to Governor Newsom's Executive Order N-29-20 and recommendations on protocols to contain the spread of COVID-19, staff and Board members will be attending the November 29, 2022 meeting remotely from various locations*. There will be NO physical location of the meeting. The public is strongly encouraged to use the Zoom app for best reception.*
***There may be limited opportunity to provide verbal comments during the meeting. Persons who are participating via telephone will need to press *9 to be acknowledged for comments. Members of the public participating by Zoom will be placed on mute during the proceedings and will be acknowledged only when public comment is allowed, after requesting and receiving recognition from the Board President. Public comment can also be submitted in writing to Paula Riso at priso@mcwd.org by 9:00 am on Tuesday, November 29, 2022; such comments will be distributed to the MCWD Board before the meeting*.**

This meeting may be accessed remotely using the following Zoom link:
https://us02web.zoom.us/j/85125091262?pwd=bXlEaFlXcEpXTi93TUF3aGl1MkhlUT09
Passcode: 169894

To participate via phone: 1-669-900-9128; Meeting ID: 851 2509 1262; Passcode: 169894

Our Mission: *We provide our customers with high quality potable and recycled water, wastewater collection and conservation services that are safe, affordable, reliable and sustainable, through planning, management and the development of water resources in an environmentally sensitive manner.*

1. Call to Order

2. Roll Call

3. Pledge of Allegiance

* * * * *

4. Marina Coast Water District Groundwater Sustainability Agency Matters

This agenda is subject to revision and may be amended prior to the scheduled meeting. Pursuant to Government Code section 54954.2(a)(1), the agenda for each meeting of the Board shall be posted at the District offices at 11 Reservation Road, Marina. A complete Board packet containing all enclosures and staff materials will be available for public review on the District website, Monday, November 28, 2022. Information about items on this agenda or persons requesting disability related modifications and/or accommodations should contact the Board Clerk 48 hours prior to the meeting at: 831-883-5910

A. Action Item

1. Receive an "Indirect Potable Reuse Feasibility Study"; and, Adopt Resolution No. 2022-GSA03 Authorizing a Monterey Sub-basin Sustainable Groundwater Management Grant Program SGMA Implementation Grant Application

5. Return to Marina Coast Water District Matters

* * * * *

6. Public Comment on Closed Session Items *Anyone wishing to address the Board on matters appearing on Closed Session may do so at this time. Please limit your comment to four minutes. The public may comment on any other items listed on the agenda at the time they are considered by the Board.*

7. Closed Session

A. Pursuant to Government Code 54956.9
Conference with Legal Counsel – Existing Litigation
Appeal No. A-3-MRA-19-0034 by California-American Water Company to the California Coastal Commission over Denial by the City of Marina for a Coastal Development Permit for Construction of Slant Intake Wells for the Monterey Peninsula Water Supply Project

B. City of Marina vs. RMC Lonestar [CEMEX], California-America Water Company, Marina Coast WD, et al Defendants, Monterey County Superior Court Case No. 20CV001387 (Complaint for Breach of Contract, Declaratory Relief under the Agency Act, and Tortious Interference with Existing Contract)

C. Application of California-American Water Company to Obtain Approval of the Amended and Restate Water Purchase Agreement for the Pure Water Monterey Groundwater Replenishment Project, Update Supply and Demand Estimates for the Monterey Peninsula Water Supply Project, and Cost Recovery, before the California Public Utilities Commission, Application 21-11-024

D. Pursuant to Government Code section 54956.9(d)(4)
Conference with Legal Counsel – Initiation of Litigation
One Potential Case

8. Reportable Actions Taken During Closed Session *The Board will announce any reportable action taken during closed session and the vote or abstention on that action of every director present and may take additional action in open session as appropriate. Any closed session items not completed may be continued to after the end of all open session items.*

9. Director's Comments *Director reports on meetings with other agencies, organizations and individuals on behalf of the District and on official District matters.*

10. Adjournment *Set or Announce Next Meeting(s), date(s), time(s), and location(s):*

Regular Meeting: Tuesday, December 13, 2022, 6:30 p.m.

Marina Coast Water District
Groundwater Sustainability Agency
Agenda Transmittal

Agenda Item: 4-A1 **Meeting Date:** November 29, 2022

Prepared By: Patrick Breen **Approved By:** Remleh Scherzinger

Agenda Title: Receive an "Indirect Potable Reuse Feasibility Study"; and, Adopt Resolution No. 2022-GSA03 Authorizing a Monterey Sub-basin Sustainable Groundwater Management Grant Program SGMA Implementation Grant Application

Staff Recommendation: The Board of Directors receive an "Indirect Potable Reuse Feasibility Study"; and, adopt Resolution No. 2022-GSA03 authorizing a Monterey Sub-basin Sustainable Groundwater Management (SGM) Grant Program SGMA Implementation Grant application to the Department of Water Resources.

Background: *Strategic Element No. 2 Infrastructure – Our objective is to provide a high-quality water distribution system and an efficiently operating wastewater collection system to serve existing and future customers. Through the master planning process, our infrastructure strategy is to carefully maintain our existing systems and ensure future additions and replacements will meet District standards.*

Detailed Description: In January 2022 the District adopted a Groundwater Sustainability Plan (GSP) for the Monterey Subbasin and submitted it to the Department of Water Resources. The plan provides a path to achieve and document sustainable groundwater management within 20 years and preserves the long-term sustainability of the Monterey Subbasin now and into the future.

The Monterey Subbasin GSP was developed pursuant to the Sustainable Groundwater Management Act (SGMA) and submitted to the California Department of Water Resources (DWR) on January 31, 2022. Indirect Potable Reuse (IPR) was identified within the GSP as a preferred project to aid in achieving sustainable groundwater management within the Monterey Subbasin.

Marina Coast Water District (MCWD) has sponsored this indirect potable reuse feasibility study to explore and evaluate a preferred project for injection of advanced-treated recycled water into the Monterey Subbasin within MCWD's service area, for future extraction by MCWD's municipal production wells. The indirect potable reuse (IPR) is intended to both supplement MCWD's groundwater supplies, as well as aid in limiting ongoing groundwater level declines and protecting production wells from saltwater intrusion. This Study is partially funded by a grant through the California State Water Resources Control Board (SWRCB's) Water Recycling Funding Program (WRFP). The report has been prepared in accordance with the WRFP grant requirements.

The Indirect Potable Reuse feasibility study aims to identify a preferred project for injecting advanced treated recycled water into the Monterey Subbasin for future extraction by MCWD's municipal production wells. Injection of advanced treated recycled water and IPR is intended to utilize recycled water from Monterey One Water (M1W) to replenish groundwater and supplement MCWD's groundwater supplies within the Study Area.

To augment MCWD's existing supply portfolio and serve the redevelopment of the Fort Ord Community, MCWD participated in a joint, regional three-party planning process (TPP) with FORA and the Monterey Regional Water Pollution Control Agency ("MRWPCA"; now known as Monterey One Water [M1W]). This Three-Party Study was conducted for the purposes of water supply planning for the redevelopment of the former Fort Ord area. The TPP process identified and evaluated alternatives for additional water supply to support the redevelopment of the former Fort Ord at buildout, referred to as the "Additional Water Augmentation Component."

The Three-Party Study evaluated several water supply augmentation options, including: 1) groundwater augmentation through injection of advanced-treated recycled water, infiltration of Salinas River flood flows, and municipal stormwater; 2) local and participation in regional seawater desalination; 3) decentralized water recycling; and 4) water conservation.

After a series of consideration and evaluation among the three parties, the Three Parties selected injection of advanced treated water for IPR in the 180/400-Foot Aquifer and/or the Deep Aquifers as the recommended water supply augmentation alternative.

Based on the acceptance of the study staff is also requesting authorization to submit a Sustainable Groundwater management Grant Program SGMA Implementation grant application.

The proposed application includes projects and management actions associated with not only the Marina-Ord area of the Monterey Subbasin but also the Corral De Tierra areas of the Monterey Subbasin (MCWDGSA Manages the Marina Ord area and by agreement, the Salinas Valley Basin GSA (SVBGSA) manages the Corral De Tierra area).

The MCWDGSA will be the applicant for the grant and if the application is successful the SVBGSA would be a sub-grantee similar to how the Monterey Subbasin Planning grants were administered.

Below is a list of the Monterey Subbasin Plan components Staff is recommending for inclusion in the SGMA Implementation Grant Application:

Component 1: Grant Administration (MCWDGSA)

Component 2: Monterey Subbasin Data Expansion and SGMA Compliance (MCWDGSA & SVBGSA)

- Data expansion activities including installation of monitoring wells
- Aquifer testing
- Induction logging
- Establish Groundwater Dependent Ecosystem monitoring
- Update of the Subbasin Hydrogeologic Conceptual Model using collected data (including interpretation of Arial Electromagnetic Surveys)
- Update of the groundwater models including (1) updating the Monterey Subbasin Model and extending it for the 5-year GSP update, and (2) integrating the Monterey Subbasin Model into the Salinas Valley Integrated Hydrologic Model (SVIHM) and perform Monterey-Subbasin specific updates to the SVIHM.

Component 3: Indirect Potable Reuse in the Deep Aquifers of the Monterey Subbasin (MCWDGSA)

- Design and construction of an indirect potable reuse project for the injection of advanced treated recycled water in the Monterey Subbasin.

Component 4: Implement Deep Aquifers Management based on Deep Aquifers Study (MCWDGSA & SVBGSA)

- Participate in stakeholder engagement and develop potential management actions to implement recommendations of the Deep Aquifers Study

Component 5: Project update report – Data gathering for project assessment/feasibility (MCWDGSA & SVBGSA)

- Assess groundwater impacts of projects and management actions, including impacts on inter-subbasin flow, and in collaboration with partner agencies
- Update costs and benefits of projects according to activities completed to date, including grant components

Component 6: Corral Area Stakeholder Engagement (SVBGSA)

Component 7: Corral Area Projects and Management Actions (SVBGSA)

- Feasibility study, planning, and stakeholder engagement efforts for Corral Area projects and management actions

Environmental Review Compliance: None required.

Legal Counsel Review: None required.

Climate Adaptation: Diversification of the District's potable water sources will lessen the reliance on groundwater to prepare for more frequent and longer drought events.

Financial Impact: _____ Yes __X__ No **Funding Source/Recap:** None

Material Included for Information/Consideration: Resolution No. 2022-GSA03; and, "Indirect Potable Reuse Feasibility Study" dated October 2022.

Action Required: __X__Resolution _____Motion _____Review
(Roll call vote is required.)

Board Action

Motion By_____ Seconded By_____ No Action Taken_____

Ayes_____ Abstained_____

Noes_____ Absent_____

November 29, 2022

Resolution No. 2022 – GSA03
Resolution of the Board of Directors
Marina Coast Water District Groundwater Sustainability Agency
Authorizing a Monterey Sub-basin Sustainable Groundwater Management (SGM) Grant Program SGMA Implementation Grant Application

RESOLVED by the Board of Directors ("Directors") of the Marina Coast Water District Groundwater Sustainability Agency ("District"), at a special meeting duly called and held on November 29, 2022 via a video conference pursuant to Governor Newsom's Executive Order N-29-20, as follows:

WHEREAS, in the fall of 2014, the California legislature adopted, and the Governor signed into law, three bills (SB 1168, AB 1739, and SB 1319) collectively referred to as the "Sustainable Groundwater Management Act" ("SGMA"), that initially became effective on January 1, 2015, and that has been amended from time-to-time thereafter; and,

WHEREAS, the stated purpose of SGMA, as set forth in California Water Code section 10720.1, is to provide for the sustainable management of groundwater basins at a local level by providing local groundwater agencies with the authority, and technical and financial assistance necessary, to sustainably manage groundwater; and,

WHEREAS, SGMA requires the designation of Groundwater Sustainability Agencies ("GSAs") for the purpose of achieving groundwater sustainability through the adoption and implementation of regulatory programs known as Groundwater Sustainability Plans ("GSPs") or an alternative plan for all medium and high priority basins as designated by the California Department of Water Resources ("DWR"); and,

WHEREAS, SGMA requires GSAs to adopt GSPs for each basin/subbasin within the GSA's jurisdiction; and,

WHEREAS, GSPs for basins designated medium priority in DWR's Bulletin 118, and for those basins designated, are due to be filed with DWR no later than January 31, 2022; and,

WHEREAS, the Monterey Sub-basin of the Salinas Valley Groundwater Basin ("Sub basin") is designated medium priority; and,

WHEREAS, the Marina Coast Water District Groundwater Sustainability Agency (MCWDGSA) in coordination with the Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) developed a GSP for the Subbasin as required by SGMA; and,

WHEREAS, in January 2022, the District adopted a Groundwater Sustainability Plan (GSP) for the Monterey Subbasin and submitted it to the Department of Water Resources. The plan provides a path to achieve and document sustainable groundwater management within 20 years and preserves the long-term sustainability of the Monterey Subbasin now and into the future; and,

WHEREAS, the Monterey Subbasin GSP contained various projects and management actions to achieve sustainability including an Indirect Potable Reuse project, and,

WHEREAS, the California Department of Water Resources is accepting application for the "2021 Sustainable Groundwater Management (SGM) Grant program SGMA Implementation Grant pursuant to the California Drought, Water, Parks, Climate, Coastal Protection, and Outdoor Access for All Act of 2018 (Public Resources Code 80000, et seq.) and Budget Act of 2021 and 2022"; and,

WHEREAS, the MCWDGSA is responsible for implementing the Monterey Subbasin Groundwater Sustainability Plan for the Marina Ord Area and by agreement the SVBGSA is responsible for implementing the GSP in the Corral De Tierra portion of the Monterey Subbasin to achieve sustainability by 2042; and,

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of the Marina Coast Water District Groundwater Sustainability does hereby:

1. Authorize an application be made to the Department of Water Resources to obtain a grant under the 2021 Sustainable Groundwater Management (SGM) Grant Program SGMA Implementation Grant pursuant to the California Drought, Water, Parks, Climate, Coastal Protection, and Outdoor Access for All Act of 2018 (Pub. Resources Code, § 80000, et seq.) and the Budget Acts of 2021 and 2022. Be it further resolved that the MCWD GSA has the authority and shall enter into a funding agreement with the Department of Water Resources to receive a grant for: GSP Implementation Activities in the Monterey Subbasin.

2. Authorize and direct the General Manager of the MCWD GSA, to prepare the necessary data, conduct investigations, file such application, execute a funding agreement and any future amendments thereto, submit invoices, and submit any reporting requirements with the Department of Water Resources.

PASSED AND ADOPTED November 29, 2022, by the Board of Directors of the Marina Coast Water District by the following roll call vote:

Ayes: Directors_____

Noes: Directors_____

Absent: Directors_____

Abstained: Directors_____

_____
Jan Shriner, President

ATTEST:

_____
Remleh Scherzinger, Secretary

CERTIFICATE OF SECRETARY

The undersigned Secretary of the Board of the Marina Coast Water District hereby certifies that the foregoing is a full, true and correct copy of Resolution No. 2022-GSA03 adopted November 29, 2022.

_____

Remleh Scherzinger, Secretary

INDIRECT POTABLE REUSE FEASIBILITY STUDY

Marina Coast Water District

October 2022
EKI B60094.12

EKI ENVIRONMENT & WATER, INC.

www.ekiconsult.com
2001 Junipero Serra Blvd, Suite 300 • Daly City, CA 94014

INDIRECT POTABLE REUSE FEASIBILITY STUDY

Marina Coast Water District

October 2022

Prepared for:

Marina Coast Water District

Prepared by:

EKI Environment & Water, Inc.
2001 Junipero Serra Blvd., Suite 300
Daly City, California 94014
(650) 292-9100
www.ekiconsult.com
EKI B60094.12

Vera Nelson, P.E.

Tina Wang, P.E.

Groundwater Replenishment Reuse Feasibility Study

Marina Coast Water District

TABLE OF CONTENTS

TABLES (IN REPORT TEXT)

FIGURES (IN REPORT TEXT)

APPENDICES

ABBREVIATIONS AND ACRONYMS

AEM	Airborne Electromagnetic
AF	acre-feet
AFY	acre-feet per year
Army	United States Army Corps of Engineers
AWPF	Advanced Water Purification Facility
BMPs	best management practices
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CSIP	Castroville Seawater Intrusion Project
CSUMB	California State University Monterey Bay
CT	Carbon Tetrachloride
CWSRF	Clean Water State Revolving Fund
CY	calendar year
day/yr	day per year
DDW	Department of Drinking Water
DWR	Department of Water Resources
EIR	Environmental Impact Report
FO	Fort Ord
FORA	Fort Ord Reuse Authority
FO-SVA	Fort Ord-Salinas Valley Aquitard
ft	feet
ft bgs	feet below ground surface
ft/day	foot per day
ft^2/d	square feet per day
FY	fiscal year
gpm	gallons per minute
GRRP	Groundwater Replenishment Reuse Project
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HCF	hundred cubic feet
HP	horsepower
I-Bank	Economic Development Bank
in	inches
IPR	indirect potable reuse
IRWM	Integrated Regional Water Management
ISRF	Infrastructure State Revolving Fund
Kh	vertical hydraulic connectivity
kWh/yr	kilowatt-hours per year
LAFCO	Local Agency Formation Commission
M1W	Monterey One Water
Marina-Ord Area	Marina-Ord Management Area
MBGWFM	Monterey Subbasin Groundwater Flow Model

MCWD	Marina Coast Water District
MCWRA	Monterey County Water Resources Agency
MG	million gallons
mg/L	milligram per liter
mgd	million gallon per day
MOs	Measurable Objectives
MRWPCA	Monterey Regional Water Pollution Control Agency
MTs	minimum thresholds
M1W	Monterey One Water
N	nitrogen
NAVD 88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
O&M	operation and maintenance
PCE	perchloroethylene
PEST	Parameter Estimation and Uncertainty Analysis
PFAS	per-and poly-fluoroalkyl substances
PMA	project management action
PWM	Pure Water Monterey
RO	reverse osmosis
RTP	Regional Treatment Plant
RUWAP	Regional Urban Water Augmentation Program
RWQCB	Regional Water Quality Control Board
SGMA	Sustainable Groundwater Management Act
SMC	Sustainable Management Criteria
SMCs	Sustainable Management Criteria
SRF	State Revolving Fund
SVA	Salinas Valley Aquifer
SVBGSA	Salinas Valley Basin Groundwater Sustainability Agency
SVGB	Salinas Valley Groundwater Basin
SVRP	Salinas Valley Reclamation Plant
SWI	seawater intrusion
SWRCB	State Water Resources Control Board
TCE	trichloroethylene
TDS	total dissolved solids
TOC	total organic compounds
TPP	three-party planning
USBR	United States Bureau of Reclamation
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
VOCs	volatile organic compounds
WDR	Waste Discharge Requirements
WIFIA	Water Infrastructure Finance and Innovation Act

WRFP	Water Recycling Funding Program
WY	water year

1 INTRODUCTION

Marina Coast Water District (MCWD) has sponsored this indirect potable reuse feasibility study to explore and evaluate a preferred project for injection of advanced-treated recycled water into the Monterey Subbasin within MCWD's service area, for future extraction by MCWD's municipal production wells. The indirect potable reuse (IPR) is intended to both supplement MCWD's groundwater supplies, as well as aid in limiting ongoing groundwater level declines and protecting production wells from saltwater intrusion. This Study is partially funded by a grant through the California State Water Resources Control Board (SWRCB's) Water Recycling Funding Program (WRFP). This report has been prepared in accordance with the WRFP grant requirements.

1.1 Background

Marina Coast Water District (MCWD; or the District) is located within Monterey County adjacent to Monterey Bay at the northwest end of the Salinas Valley (See Figure 1-1). MCWD provides potable water and wastewater collection services to approximately 40,000 customers within MCWD's existing jurisdictional service area (Figure 1-2). MCWD's existing jurisdictional service area is 10.3 square miles and encompasses the City of Marina, the City of Seaside, and portions of the former Fort Ord Military Base. The former Fort Ord is located southeast of the City of Marina (Figure 1-2).

Prior to 1994 when Fort Ord closed, MCWD only served the City of Marina. After its closure, MCWD was selected to take over the water and wastewater systems within Fort Ord. Under a long-term water service agreement with the Fort Ord Reuse Authority (FORA), MCWD provides water service to all Federal activities within the former Fort Ord and will serve future developments within former Fort Ord. Until its termination in June 2020, FORA was overseeing the redevelopment of the former Fort Ord. In 2020 FORA allocated assets/liabilities and transitioned land use planning within former Fort Ord to each of the local jurisdictions, including the Cities of Marina and Seaside, the City of Monterey, and the County of Monterey. The governing document of Fort Ord's redevelopment, the Fort Ord Base Reuse Plan, was incorporated into each individual jurisdictional area's land use plans. These land use plans have been incorporated into MCWD's Urban Water Management Plan (UWMP) (Schaaf & Wheeler, 2021). Future redevelopment parcels identified in these land use plans that lie outside of MCWD's existing jurisdictional service area are considered part of the Fort Ord Community and will be served by MCWD in the future. The Study Area, as defined herein, includes the District's jurisdictional service area (Local Agency Formation Commission [LAFCO] Service Area), areas of planned future development within the former Fort Ord, and the remaining designated open space areas within former Fort Ord. The Study Area population is projected to be approximately 73,000 by 2040, primarily driven by development within the Ord Community and infill development in Central Marina.

To augment MCWD's existing supply portfolio and serve the redevelopment of the Fort Ord Community, MCWD participated in a joint, regional three-party planning process (TPP) with FORA and the Monterey Regional Water Pollution Control Agency ("MRWPCA"; now known as Monterey One Water [M1W]). This Three-Party Study was conducted for the purposes of water supply planning for the redevelopment of the former Fort Ord area. The TPP process identified and evaluated alternatives for additional water supply to support the redevelopment of the former Fort Ord at buildout, referred to as the "Additional Water Augmentation Component."

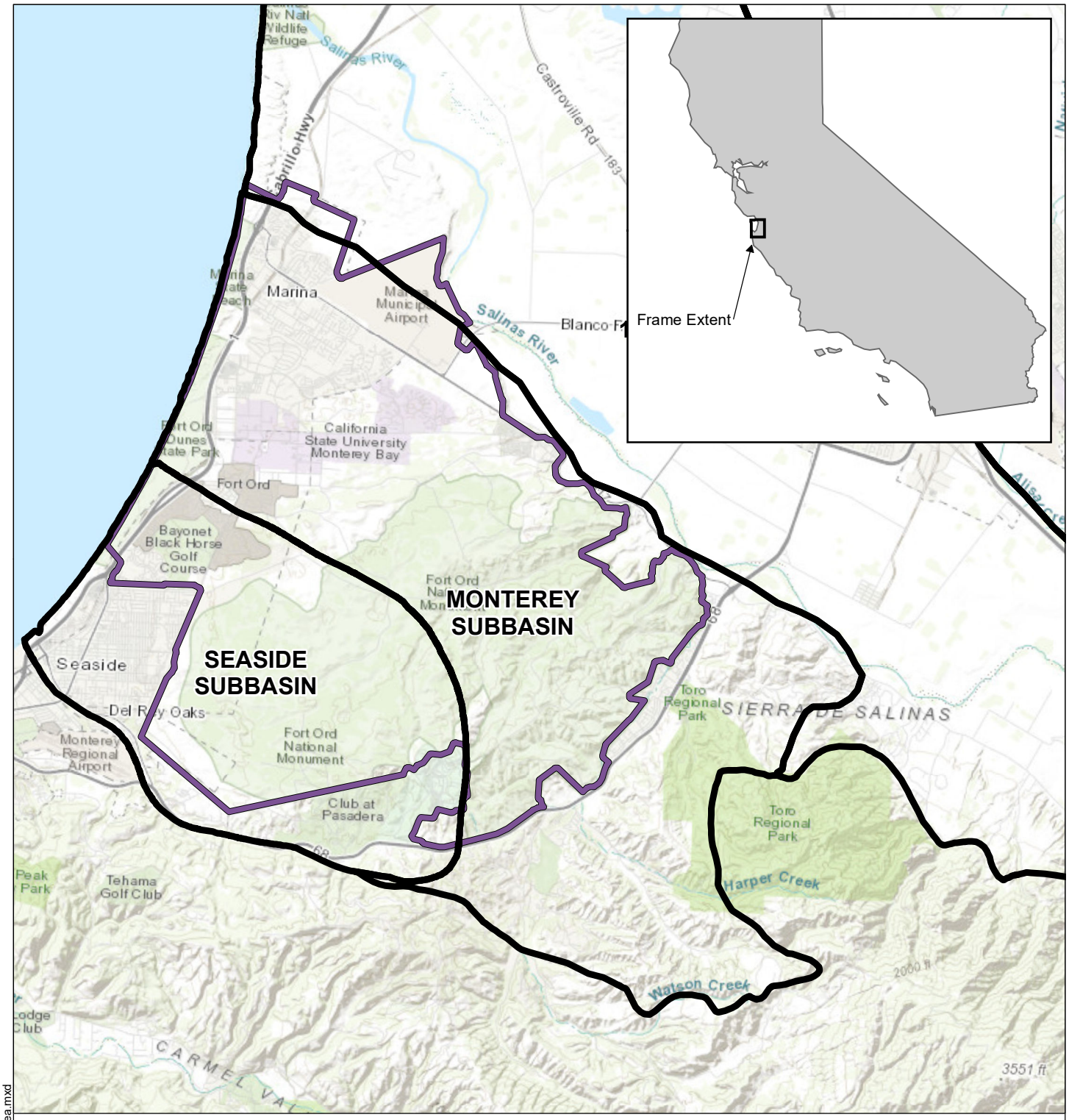
The Three-Party Study evaluated a number of water supply augmentation options, including (1) groundwater augmentation through injection of advanced-treated recycled water, infiltration of Salinas River flood flows, and municipal stormwater; (2) local and participation in regional seawater desalination; (3) decentralized water recycling; and (4) water conservation.

After a series of consideration and evaluation among the three parties, the Three Parties selected injection of advanced treated recycled water IPR in the 180/400-Foot Aquifer and/or the Deep Aquifers as the recommended water supply augmentation alternative.

1.2 Study Objectives

This indirect potable reuse feasibility study aims to identify a preferred project for injecting 827 acre-feet per year (AFY) advanced treated recycled water into the Monterey Subbasin for future extraction by MCWD's municipal production wells (see Figure 1-1). Injection of advanced treated recycled water and IPR is intended to utilize recycled water from M1W to replenish groundwater and supplement MCWD's groundwater supplies within the Study Area. The projected quantity of advanced-treated recycled water is based upon MCWDs existing recycled water right as further described in Section 3.2.3.2.

This study builds upon the recommended option selected by the Three-Party Study discussed in Section 1.1 above. It incorporates information developed as part of the Three-Party Study and information developed as part of the Monterey Subbasin Groundwater Sustainability Plan (GSP). The Monterey Subbasin GSP was developed pursuant to the Sustainable Groundwater Management Act (SGMA) and submitted to the California Department of Water Resources (DWR) on January 31st, 2022. The GSP assessed conditions in the Monterey Subbasin and provided a path to achieve and document sustainable groundwater management within 20 years following GSP adoption. IPR was identified within the GSP as a preferred project to aid in achieving sustainable groundwater management within the Monterey Subbasin.



Legend

- Groundwater Subbasins within Salinas Valley Basin
- Study Area Boundary

Abbreviations

DWR = California Department of Water Resources
MCWD = Marina Coast Water District

N

0 2 4

(Scale in Miles)

Sources

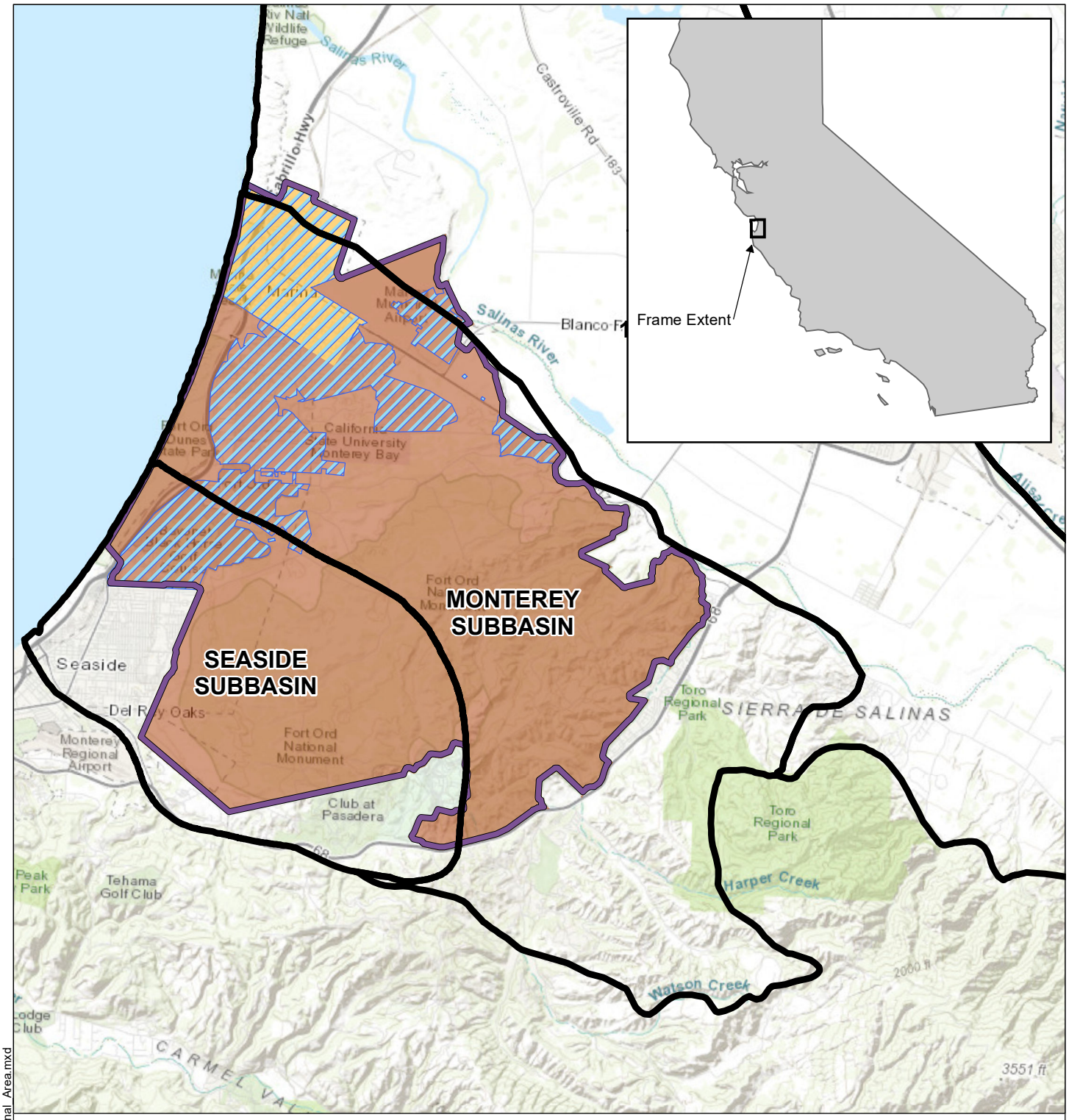
1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 6 October 2022.
2. DWR groundwater basins are based on the boundaries defined in California's Groundwater, Bulletin 118 - 2018 Update.
3. Study Area boundary provided by MCWD.

Study Area Boundary

Marina Coast Water District
Marina, CA
October 2022

Figure 1-1

Path: X:\B60094\Maps\2022\10\GRRP_Fig1-1_MCWD_Study Area.mxd



Legend

- Groundwater Subbasins within Salinas Valley Basin
- Study Area
- MCWD Jurisdictional Boundary
- Central Marina (City of Marina)
- Ord Community (Former Fort Ord)

Abbreviations

DWR = California Department of Water Resources
MCWD = Marina Coast Water District

N

0 2 4

(Scale in Miles)

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 10 October 2022.
2. DWR groundwater basins are based on the boundaries defined in California's Groundwater, Bulletin 118 - 2018 Update.
3. MCWD jurisdictional boundary, Central Marina, and Ord Community Areas were provided by MCWD.

MCWD Jurisdictional Boundary

Marina Coast Water District
Marina, CA
October 2022

Figure 1-2

Path: X:\B60094\Maps\2022\10\GRRP_Fig1-2_MCWD_Jurisdtional_Area.mxd

1.3 Study Organization

This Study is organized as follows:

- This section, Section 1, provides an introduction to the Study, including project background, study objections, and study organization;
- Section 2 describes the Study Area, including regional setting, geology, hydrogeology, and water quality;
- Section 3 describes the Study Area's characteristics and facilities related to water, wastewater, and recycled water, and outlines relevant permitting requirements;
- Section 4 describes the initial screening of project alternatives, introduces the numerical modeling conducted for the project alternatives, and the alternatives selected for detailed evaluation;
- Section 5 describes the detailed evaluation of the project alternatives, including an analysis of economic and energy impacts as well as non-quantified benefits and costs;
- Section 6 describes the recommended project based on the evaluation performed in Section 5, including an implementation plan;
- Section 7 describes a financing plan for the recommended project, including projections of costs and revenues; and
- Section 8 lists the references used in the preparation of this Study.

2 STUDY AREA

2.1 Regional Setting

2.1.1 Agency and Project Study Area Boundary

The Study Area includes the MCWD's jurisdictional service area (LAFCO Service Area), areas of planned future development within the former Fort Ord, and the remaining designated open space areas within the former Fort Ord, as shown on Figure 1-1. For water supply planning purposes and as referred to in MCWD's Urban Water Management Plan, the Study Area can also be divided into (1) the Marina service area, which is the portion of the City of Marina outside the former Fort Ord, and (2) the Ord Community service area within the former Army base. The Ord Community includes portions of the Cities of Marina, Seaside, Del Rey Oaks, and Monterey, as well as unincorporated portions of Monterey County (Schaaf & Wheeler, 2021). California State University and the University of California each have lands and facilities within the Ord Community. MCWD also has a 2.2 square mile sphere of influence immediately north of its service area.

2.1.2 Population

As of 2021, MCWD served approximately 36,600 residents, including approximately 14,300 residents in Central Marina and 22,300 residents in the Ord Community (Schaaf & Wheeler, 2021). The population is steadily increasing with the redevelopment[1] of the Fort Ord lands and infill development in Central Marina[2]. Table 2-1 summarizes population projections within the Study Area based on the 2020 Urban Water Management Plan (Schaaf & Wheeler, 2021). As shown in the table, the Study Area population is projected to rise to approximately 73,000 residents by 2040, doubling from current level.

Table 2-1. Projected Population in the Study Area

Year	2020	2025	2030	2035	2040
Central Marina (a)	14,297	19,520	21,647	23,279	24,881
Ord Community (b)	22,349	30,611	36,366	43,438	48,302
Population	**36,646**	**50,131**	**58,012**	**66,717**	**73,183**

Notes:
(a) Central Marina totals exclude the portion of the City of Marina within the Ord Community.
(b) Ord Community totals include the portion of the City of Marina within the former Fort Ord.

Sources:
(1) Population projection obtained from Table 3.3 of the 2020 UWMP (MCWD, 2021).

[1] The redevelopment of the Ord Community includes portions of the cities of Seaside, Del Rey Oaks, and Monterey, campuses for the University of California and California State University, and lands remaining under the jurisdiction of the County of Monterey within the boundaries of the former Fort Ord.

[2] One significant undeveloped area north of Central Marina, Armstrong Ranch, will be developed in the next twenty years. Other undeveloped areas in Central Marina will also be developed. See Section 2.1.3.2 and Figure 2-2 for details.

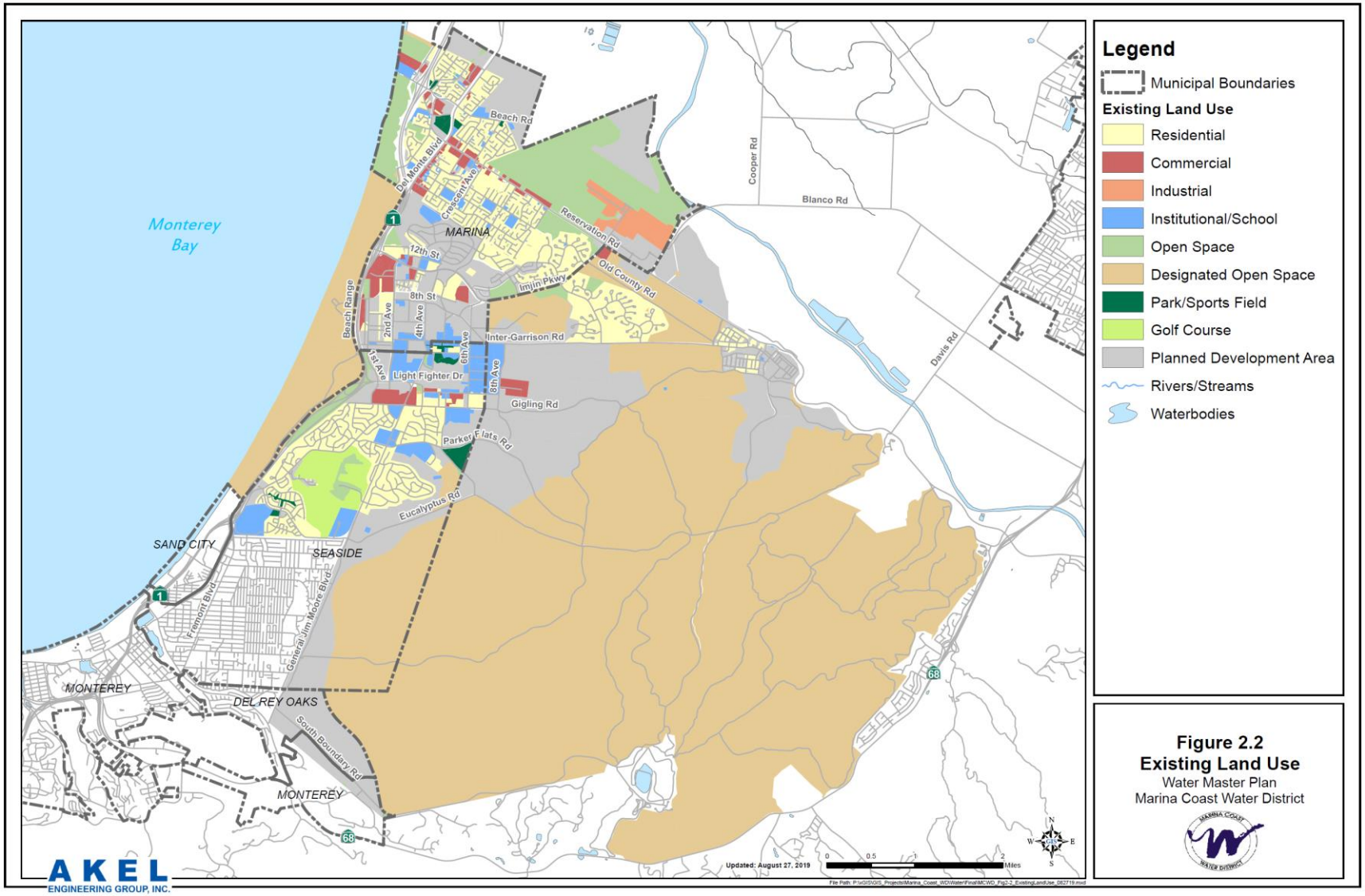
2.1.3 Land Use and Land Use Trends

2.1.3.1 Existing Land Use

Existing land use within the Study Area is identified on Figure 2-1. Based on MCWD's Water Master Plan, the Study Area contains roughly 4,800 acres of developed land. Land use within this developed area consists of approximately 54% residential land use, 24% commercial, institutional, and park land use, and 22% other land uses (i.e., golf course, airport runway, etc.). Planned future development areas within the Study Area include approximately 5,100 acres. The Study Area also contains approximately 18,000 acres of designated open space.

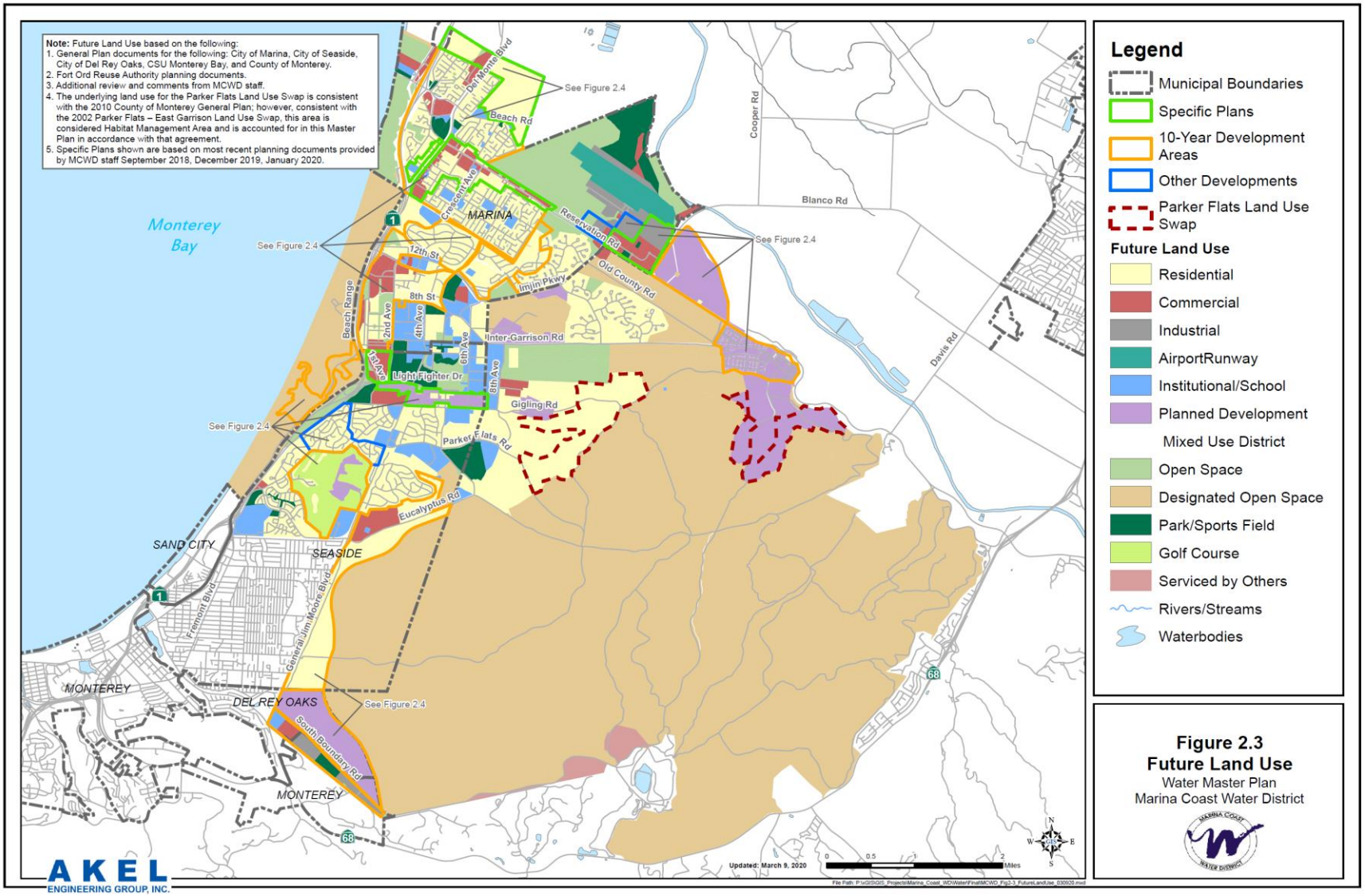
2.1.3.2 Land Use Trends and Future Land Use

As shown in Figure 2-2, anticipated future land use is based on General Plan documents, FORA Planning documents, specific plans, and other development agreements. For planning purposes, an intermediate-term development horizon has been created due to the unknown time-frame to reach the buildout of MCWD's service area. The areas of future growth planned for inclusion in the intermediate-term development horizon are shown graphically on Figure 2-3. Developments expected to occur within the intermediate-term development horizon include a combination of 12,500 residential units and the development of 600 acres of commercial and industrial areas (MCWD, 2020d). As such, MCWD is evaluating alternatives to supplement its current water supply portfolio to serve these future developments.



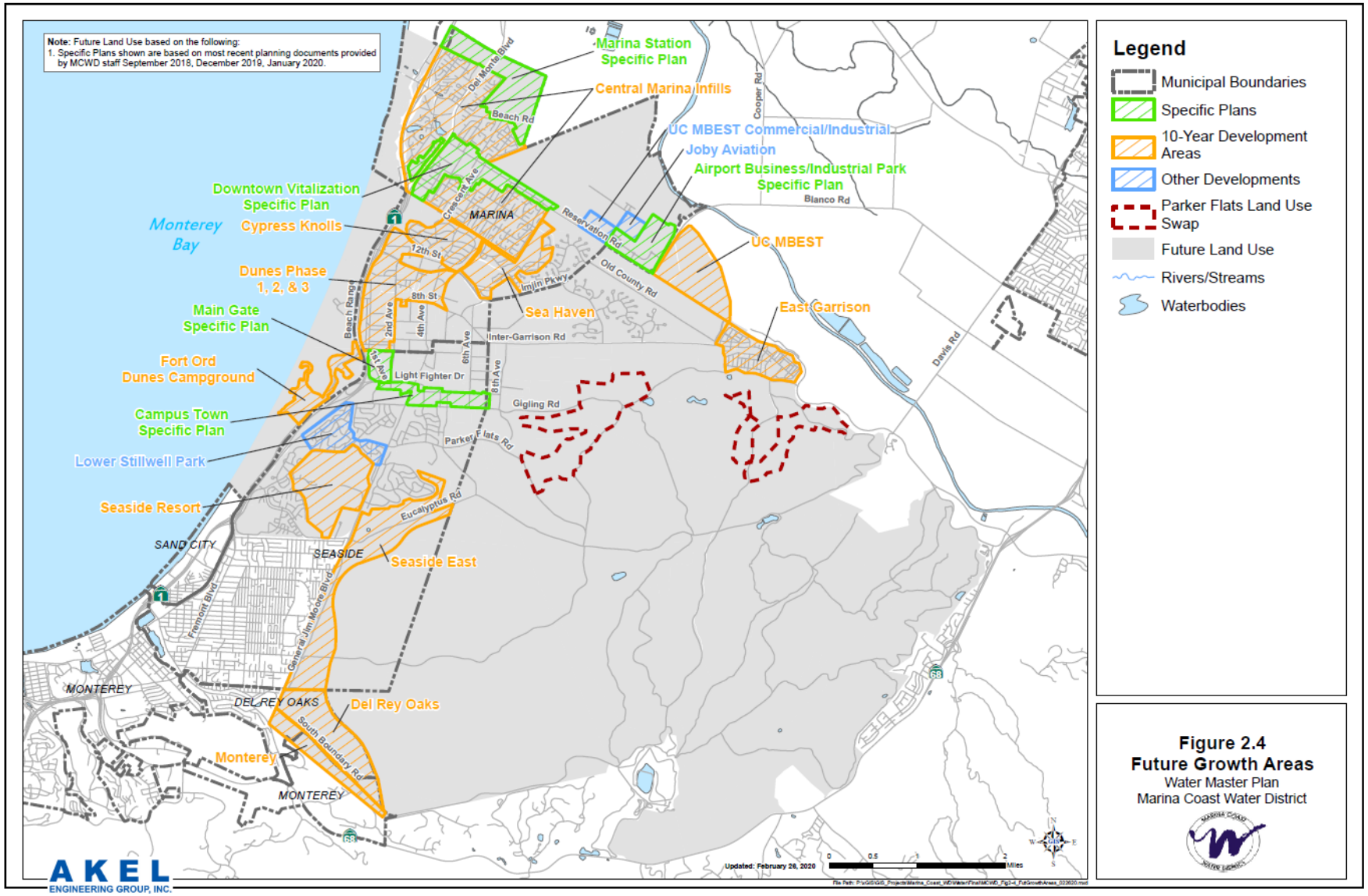
Note: Map adopted from Figure 2.2 from 2020 Water Master Plan (MCWD, 2020b).

Figure 2-1. Existing Land Use



Note: Map adopted from Figure 2.3 from 2020 Water Master Plan (MCWD, 2020b).

Figure 2-2. Future Land Use



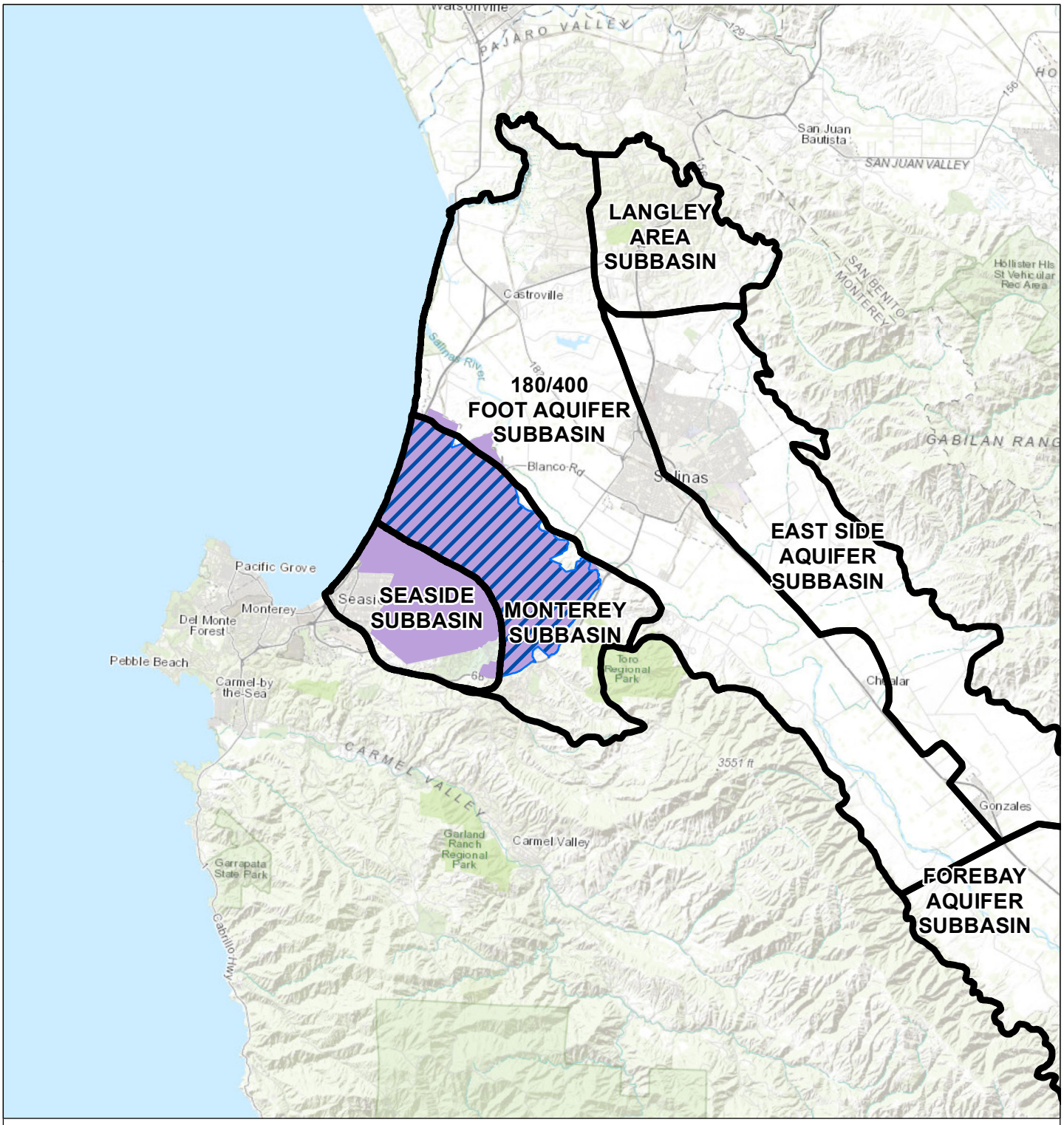
Note: Map adopted from Figure 2.4 from 2020 Water Master Plan (MCWD, 2020b).

Figure 2-3. Future Growth Areas

2.2 Hydrologic Setting

The Study Area overlies portions of the Monterey Subbasin, the 180/400-Foot Aquifer Subbasin, and the Seaside Subbasin. These subbasins are located in the Salinas Valley Basin. The descriptions of the hydrologic setting and Study Area characteristics provided herein focus on the Monterey Subbasin (Subbasin; California Department of Water Resources (DWR) Basin No. 3-004.10) and the Marina-Ord Management Area (Marina-Ord Area) as defined in the Monterey Subbasin Groundwater Sustainability Plan (GSP) (MCWD & SVBGSA, 2022a). The Marina-Ord Area encompasses the portion of the Study Area that is located within the Monterey Subbasin. It includes the area from which MCWD produces all of its groundwater and where the IPR project would be located.

The Monterey Subbasin is located at the northwestern end of the Salinas Valley Groundwater Basin, an approximately 90-mile-long alluvial basin underlying the elongated, intermountain valley of the Salinas River. The Monterey Subbasin includes the portions of the Monterey Bay coastal plain south of the approximate location of the Reliz Fault, as well as upland areas to the southeast of the coastal plain. The Monterey Subbasin is bordered by the 180/400-Foot Aquifer Subbasin to the northeast and the adjudicated Seaside Subbasin to the southwest (Figure 2-4). (MCWD & SVBGSA, 2022a).



Legend

- Groundwater Subbasins within Salinas Valley Basin
- Marina-Ord Management Area
- Study Area

Abbreviations

DWR = California Department of Water Resources
MCWD = Marina Coast Water District

N

0 5 10

(Scale in Miles)

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 6 October 2022.
2. DWR groundwater basins are based on the boundaries defined in California's Groundwater, Bulletin 118 - 2018 Update.
3. Study Area boundary provided by MCWD

Groundwater Basins

Marina Coast Water District
Marina, CA
October 2022
Figure 2-4

Path: X:\B60094\Maps\2022\10\GRRP_Fig2-4_GW Basins.mxd

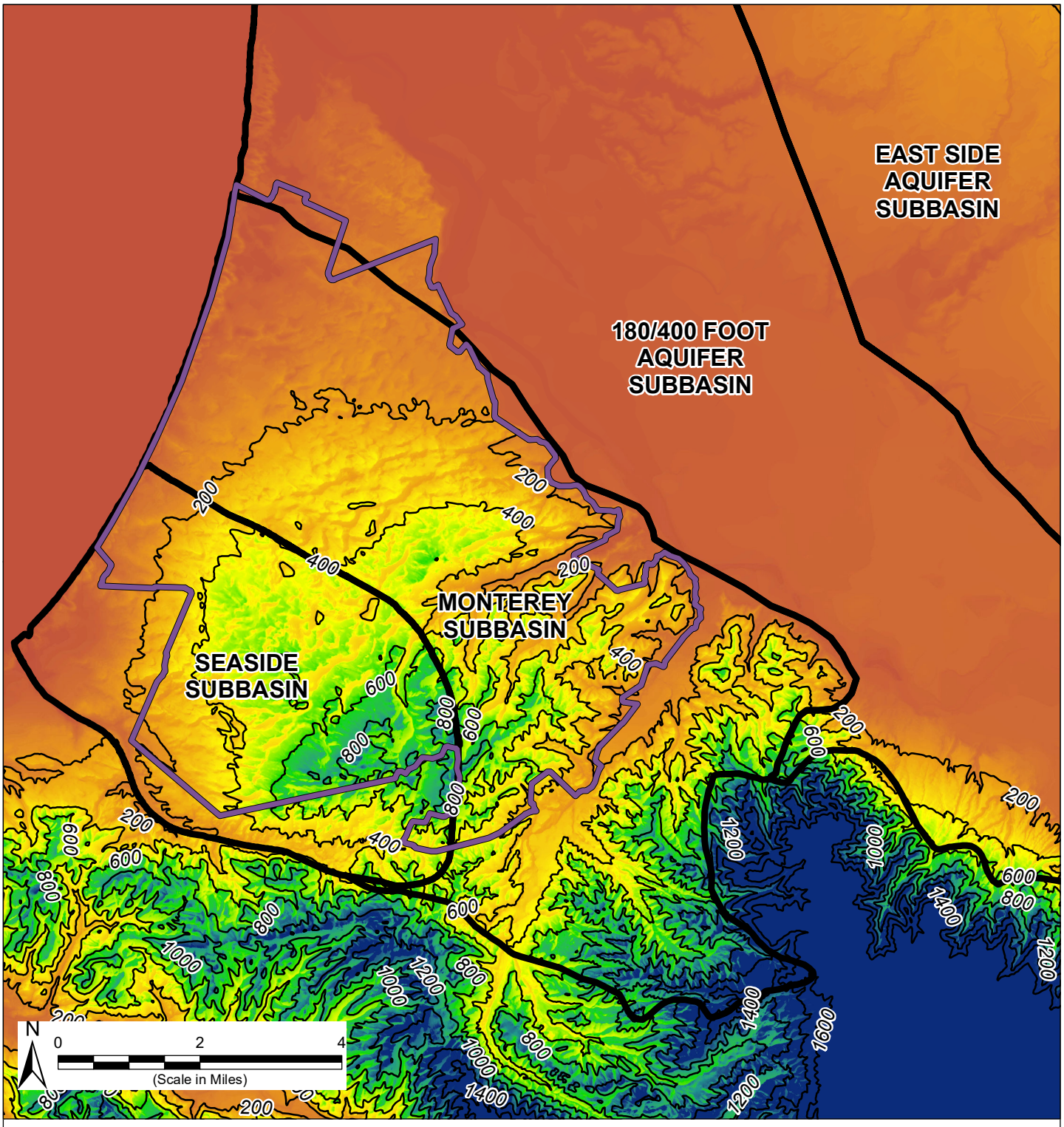
2.2.1 Geologic Setting

The Salinas Valley was formed through periods of structural deformation and periods of marine and terrestrial sedimentation in a tectonically active area on the eastern edge of the Pacific Plate. The water-bearing sediments of the Salinas Valley are over 2,000 feet thick in places and are composed of unconsolidated marine and alluvial sediments of Pliocene and younger age (Brown and Caldwell, 2015). Within the Monterey Subbasin, the water-bearing strata include river and sand dune deposits of the Holocene and Pleistocene ages, the Aromas Sand and Paso Robles Formation of the Plio-Pleistocene age, the Purisima Formation of the Pliocene age, and the Santa Margarita Formation of Miocene age (Greene, 1970; Harding ESE, 2001; Geosyntec, 2007).

2.2.2 Topography

Figure 2-5 shows the topography within the Study Area. Topography generally slopes down to the northwest towards Monterey Bay, ranging from sea level at the shoreline to 900 feet (ft) in the southern boundary of the Study Area.

In the coastal area, the topography is shaped by active coastal sand dunes, followed by coastal plain and older stabilized sand dunes. Coastal sand dunes are present along a narrow quarter-mile-wide stretch of land where the Study Area meets the bay. These coastal dunes rise to approximately 100 feet in elevation and grade eastward into a narrow coastal plain varying in width from one to two miles. Older sand dunes dominate the topography in the northwestern portion of the Monterey Subbasin and the majority of the Study Area (CH2M, 2004).



Legend

- Study Area
- Groundwater Subbasins within Salinas Valley Basin
- Elevation Contour (200-ft interval)

Land Surface Elevation (ft msl)

High : 1500
1200
900
600
300
Low : 0

Abbreviations

ft = feet
ft MSL = feet mean sea level
MCWD = Marina Coast Water District

Notes

1. All locations are approximate.

Sources

1. Surface elevation data obtained from USGS NED (https://viewer.nationalmap.gov/basic/).
2. Study Area boundary provided by MCWD.

Topography

Marina Coast Water District
Marina, CA
October 2022
Figure 2-5

Path: X:\B60094\Maps\2022\10\GRRP_Fig2-5_Topography.mxd

2.2.3 Hydrogeologic Setting

The Monterey Subbasin is hydrostratigraphically complex and represents a transition zone between the more defined, laterally continuous aquifer system along the central axis of the Salinas Valley and the less continuous aquifer systems towards the Sierra de Salinas.

Hydrostratigraphy in the vicinity of the City of Marina consists of a series of laterally continuous aquifers consistent with the aquifers that form the distinguishing features of the northern Salinas Valley: the confined aquifers known as the 180-Foot Aquifer and the 400-Foot Aquifer. Additionally, a deposit of permeable dune sands overlying the Salinas Valley Aquifer (SVA) forms a sometimes perched, shallow aquifer in this area. Towards the southeast, beyond Inter-Garrison Road, the typical aquifer sequence recognized in the Salinas Valley is not present (HLA, 1994). In these areas, the aquifers are described by their geologic names, such as the Aromas Sand, Paso Robles Formation, and Santa Margarita Formation (Geosyntec, 2007; Yates, 2005).

The following aquifers and aquitards are identified in the vicinity of the City of Marina in hydrostratigraphic order:

- Dune Sand Aquifer (known as the "A-Aquifer" at Fort Ord)
    - The Dune Sand Aquifer is composed of fine to medium, well-sorted dune sands of Holocene age with high infiltration potential (Ahtna Engineering, 2013). The groundwater in the Dune Sand Aquifer is unconfined and perched away from the coast, in areas where the Fort Ord-Salinas Valley Aquitard (FO-SVA) exists, and groundwater in the 180-Foot Aquifer has fallen below the bottom elevation of the FO-SVA. It is hydraulically connected to the underlying 180-Foot Aquifer in areas nearer to the coast.
- Fort Ord-Salinas Valley Aquitard
    - FO-SVA is composed of laterally extensive blue or yellow sandy clay layers with minor interbedded sand layers (Harding ESE, 2001; DWR, 2004). The FO-SVA thins towards the Monterey Subbasin/Seaside Subbasin boundary as well as toward the coast, where it appears to pinch out near Highway 1 (Harding ESE, 2001). The thinning and pinching out of the FO-SVA in these locations increases the vertical hydraulic connection between the Dune Sand Aquifer and the underlying 180-Foot Aquifer.
- 180-Foot Aquifer
    - The 180-Foot Aquifer consists of interconnected sand and gravel beds that are from 50 to 150 feet thick. The sand and gravel layers of this aquifer are interlayered with clay lenses (Ahtna Engineering, 2013). The 180-Foot Aquifer receives recharge from the overlying Dune Sand Aquifer as well as percolation through the FO-SVA and rainfall and surface water infiltration in areas where the FO-SVA does not exist.
    - Within this area, the 180-Foot Aquifer is further separated into an Upper 180-Foot Aquifer zone and a Lower 180-Foot Aquifer zone by an Intermediate 180-Foot Aquitard. Data collected within the former Fort Ord show that significant head differences exist between the upper and lower zones of the 180-Foot Aquifer.
- 180/400-Foot Aquitard
    - The base of the 180-Foot Aquifer is the 180/400-Foot Aquitard. This aquitard consists of interlayered clay and sand layers, including a marine blue clay layer (DWR, 2004). The 180/400-Foot aquitard varies in thickness and quality across the Subbasin, and "varies laterally throughout the Fort Ord area" (MACTEC, 2006). Therefore, areas of hydrologic connection between the 400-Foot and 180-Foot Aquifers exist, and Fort Ord is one of several locations where this aquitard is thin or discontinuous (Kennedy-Jenks, 2004).

- 400-Foot Aquifer
    - The Lower 180-Foot Aquifer zone and the 400-Foot Aquifer in the vicinity of the City of Marina are functionally the same due to the missing 180/400-Foot Aquitard in this area. The 400-Foot Aquifer is comprised of fine to medium-grained sand with varying degrees of interbedded clay lenses (Ahtna Engineering, 2013). Recharge to this aquifer likely occurs from both the overlying 180-Foot Aquifer and outcrops of the Aromas Sand and Paso Robles Formations in and near the western portion of the Subbasin.
- 400-Foot/Deep Aquitard
    - The base of the 400-Foot Aquifer is the 400-Foot/Deep Aquitard. In some areas of the Salinas Valley Basin, this aquitard can be several hundred feet thick (Kennedy-Jenks, 2004). However, boring logs in the Marina-Ord Area indicate that a series of aquitards underly the 400-Foot Aquifer and extend into the Deep Aquifers. The absence of seawater intrusion and disparate water levels between the 400 Foot Aquifer and the Deep Aquifers indicate that these clay layers form a significant barrier to vertical flow within the Study Area. There is no analysis available for the spatial occurrence or geologic composition of the 400-Foot/Deep Aquitard. It is likely comprised of Paso Robles Formation deposits.
- Deep Aquifers
    - The Deep Aquifers are also collectively referred to as the 900-Foot Aquifer or 900-Foot and 1500-Foot Aquifers in the northern Salinas Valley. The Deep Aquifers are up to 900 feet thick and have alternating sandy-gravel layers and clay layers which do not differentiate into distinct aquifer and aquitard units (DWR, 2004). Due to the geologic formations' depositional environments, the Deep Aquifers consist of alternating layers of sand and gravel mixtures with discontinuous clays rather than distinct, coherent aquifers and aquitards (Brown and Caldwell, 2015). The recharge mechanisms for the Deep Aquifers are not well known.

These aquifers are the principal aquifers within the Marina Ord Area in the Monterey Subbasin GSP.

2.2.3.1 Aquifer Transmissivity

Transmissivity is a measure of the aquifer's ability to transmit water and is determined by the thickness of water-bearing materials and their hydraulic conductivity. The hydraulic conductivity of water-bearing materials is mainly determined by sediment grain size (i.e., the fraction of sand and gravel), the size and shape of the pores between sediment grains, and the effectiveness of the interconnections between the pores. The limited study in the Study Area showed that the median transmissivity in the Dune Sand Aquifer is 1,300 square feet per day (ft^2/d), 12,700 ft^2/d in the 180-Foot Aquifer, 8,700 ft^2/d in the 400-Foot Aquifer, and 4,000 ft^2/day in the Deep Aquifers (HLA, 1994; HLA, 1999; MACTEC, 2006; USGS, 2002; and MCWD, 2019). Age dating of groundwater by the United States Geological Survey (USGS) indicates that groundwater in the Deep Aquifers near the Monterey Coast may be 25,000 to 30,000 years old (Hanson et al., 2002). An interval with dated marine water was found at approximately 1,000 feet below ground surface (ft bgs) in this area.

2.2.4 Groundwater Elevation and Groundwater Gradients

The groundwater elevations and groundwater gradients for the four principal aquifers are shown in Figure 2-6 and described below. Additional details can be found in the Monterey Subbasin GSP (MCWD & SVBGSA, 2022a) and the Water Year 2021 Annual Report (MCWD & SVBGSA, 2022b) for the Monterey Subbasin.

2.2.4.1 Dune Sand Aquifer

The groundwater levels in the Dune Sand Aquifer are generally higher inland (96 feet (ft) North American Vertical Datum of 1988 [NAVD 88] in fall 2020) and lower near the coast (8 ft NAVD 88) where a groundwater divide extends to the north. West of the groundwater divide, groundwater in the Dune Sand Aquifer flows westward toward the Pacific Ocean and recharges the 180-Foot Aquifer, where the SVA pinches out. Upon entering the 180-Foot Aquifer, groundwater abruptly reverses direction and flows eastward (i.e., inland). East of the groundwater divide, groundwater in the Dune Sand Aquifer flows to the northeast toward the 180/400-Foot Aquifer Subbasin and the Salinas River.

Groundwater elevations in the Dune Sand Aquifer have been stable for over three decades and do not show significant seasonal variations.

2.2.4.2 Upper 180-Foot Aquifer

Groundwater elevations in the upper 180-Foot Aquifer are highest at the coastline (7 ft NAVD 88 in fall 2020) and generally decrease inland to the east/northeast (-8 ft NAVD 88). Flow directions are generally to the northeast toward the 180/400-Foot Aquifer Subbasin. Groundwater elevations have been generally stable in the upper 180-Foot Aquifer for the past thirty years. Groundwater elevations are near sea level at the coastline and are below sea level further inland. This inland gradient allows high salinity water to flow into the Subbasin. However, inflow from the Dune Sand Aquifer protects the upper 180-Foot Aquifer from seawater intrusion.

Groundwater elevations have been generally stable in the upper 180-Foot Aquifer for over three decades and are generally higher in the spring and lower in the fall.

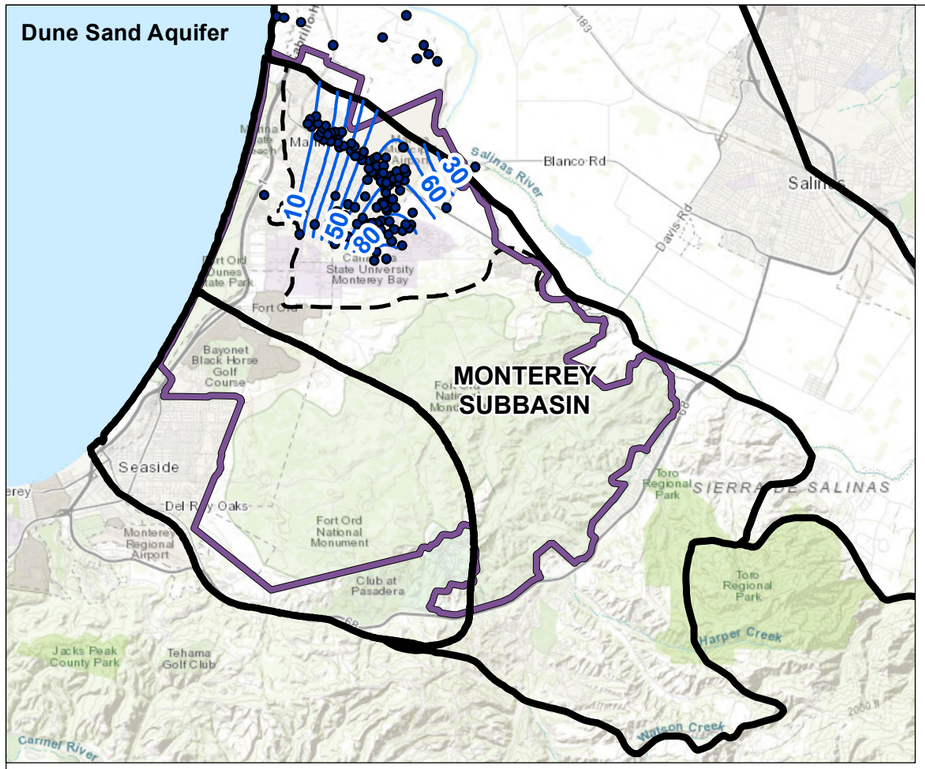
2.2.4.3 Lower 180-Foot, 400-Foot Aquifers

The Lower 180-Foot Aquifer zone and the 400-Foot Aquifer in the vicinity of the City of Marina are functionally the same and will be referred to as the Lower 180-Foot, 400-Foot Aquifers collectively. The groundwater elevations are highest in the southern portion of the Monterey Subbasin (4 ft NAVD 88) and generally decrease to the north and east (-10 ft NAVD 88). Flow directions are generally toward the northeast and the 180/400-Foot Aquifer Subbasin. A flow divide occurs along the Monterey-Seaside Subbasin boundary. A local groundwater depression exists just north of the Monterey-Seaside Subbasin boundary, where a potential connection between the 400-Foot Aquifer and the Deep Aquifers may be located. The inland gradient allows high salinity water to flow into the Subbasin, which has resulted in seawater intrusion in the northeastern portion of the Subbasin.

Groundwater elevations have been stable for the past thirty years in Lower 180-Foot, 400-Foot Aquifer wells in the northern portion of the Study Area. However, groundwater elevations have been declining consistently near the southern portion of the Study Area.

2.2.4.4 Deep Aquifers

Groundwater elevations in the Deep Aquifers are highest in the southeastern portion of the Marina-Ord Area and generally decrease toward the northwest. Flow directions are generally toward the north, suggesting some recharge occurs in mountain ranges south of the Subbasin. In Fall 2020, groundwater elevations ranged from 155 ft NAVD 88 near the southeastern Subbasin boundary to -61 ft NAVD 88 in the north near the Monterey-180/400-Foot Aquifer Subbasin boundary. Groundwater elevations have been decreasing in the Deep Aquifers since 2000.



Legend

- Fall 2020 Groundwater Contours
- GWE Measurement Locations
- Other Groundwater Subbasins within Salinas Valley Basin
- Study Area Boundary

Abbreviations

ft = foot
NAVD 88 = North American Vertical Datum of 1988

Notes

1. All locations are approximate.
2. Groundwater contours are in ft NAVD 88.
3. MPWMD#FO-10D and Sentinel MW#1 are screened in the Santa Margarita Aquifer, which is likely connected to the Deep Aquifers.

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 7 October 2022.
2. Groundwater contours are drawn using kriging method with groundwater elevation measurements collected during Fall 2020. Only static water levels are plotted.

N

0 2.5 5

(Scale in Miles)

Groundwater Level Contours in the Principal Aquifers - Fall 2020

Marina Coast Water District
Marina, CA
October 2022

Figure 2-6

Path: X:\B60094\Maps\2022\10\GRRP_Fig2-6_GroundwaterLevelContoursPrincipalAquifers_Fall2020.mxd

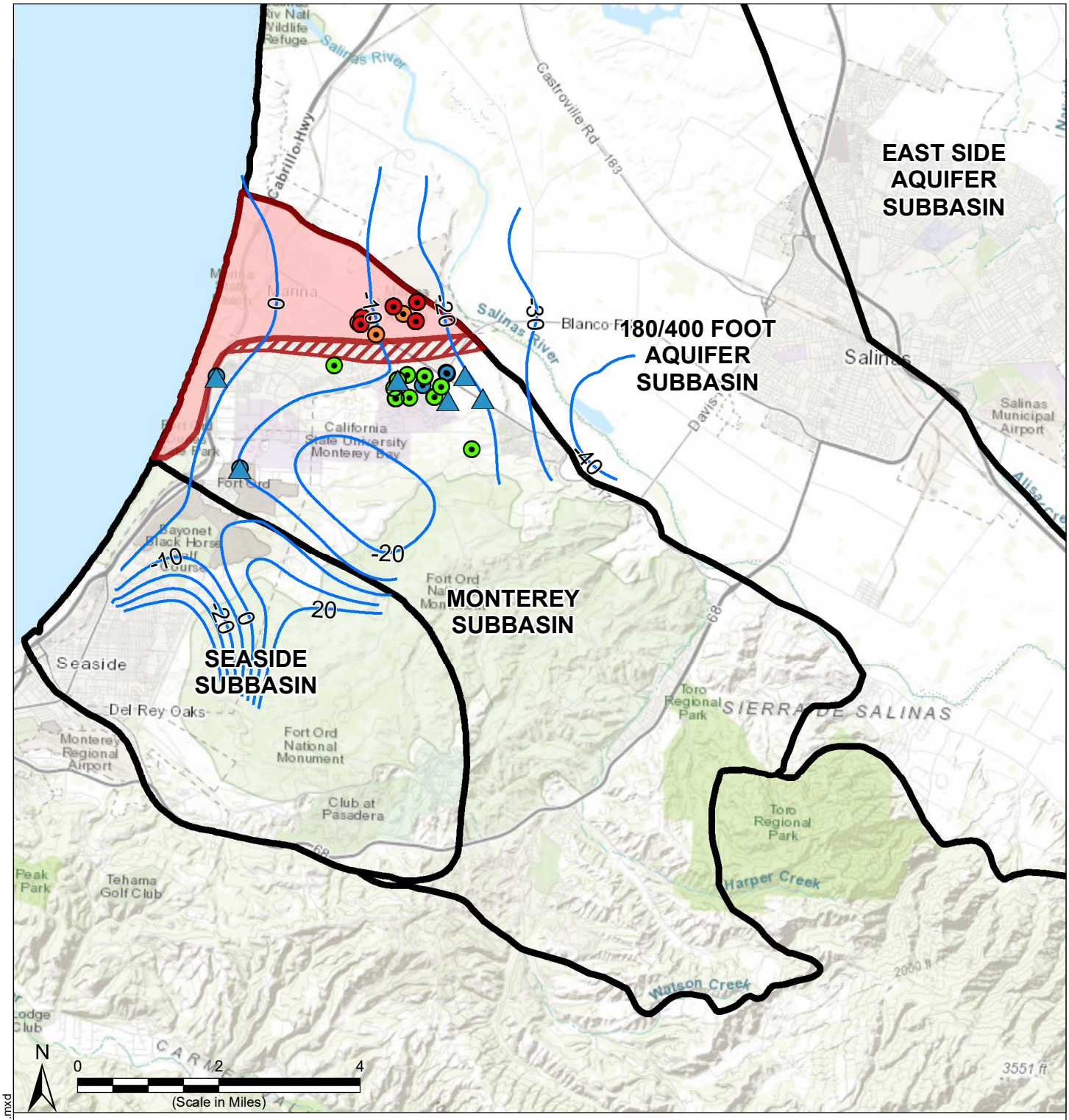
2.2.5 Groundwater Quality

Groundwater in the Study Area is generally considered of good quality with the exception of areas of legacy point-source contamination from former Fort Ord and seawater intruded areas within the 180- and 400- Foot Aquifers. The point source contamination is being addressed by the United States Army Corps of Engineers (Army) and includes contaminants such as volatile organic compounds (VOCs) and per- and poly-fluoroalkyl substances (PFAS). Seawater intrusion in the Monterey Subbasin and the adjacent 180/400 Foot Aquifer Subbasin is being addressed pursuant to SGMA. Sustainable management criteria have been identified in the Monterey GSP and 180/400 Foot Aquifer Subbasin GSP to limit further seawater intrusion within these subbasins.

2.2.5.1 Seawater Intrusion

Water quality data and Airborne Electromagnetic (AEM) Surveys indicate that seawater intrusion has occurred in the lower 180-Foot and 400-Foot Aquifers within the Study Area. Figure 2-7 shows the estimated extent of seawater intrusion within these aquifer zones within the Monterey Subbasin. The lateral extent of seawater intrusion has been relatively stable within the Monterey Subbasin over the past two decades, i.e., there has been no observed expansion of the location of the seawater intruded area (MCWD & SVBGSA, 2022). However, seawater intrusion has been expanding in the 180-Foot and 400-Foot Aquifers in the 180/400 Foot Aquifer Subbasin and will need to be actively addressed under SGMA. Ongoing monitoring of seawater intrusion within the Monterey Subbasin and the 180/400 Foot Aquifer Subbasin is being conducted pursuant to the GSPs for these subbasins, and projects and management actions are being identified to halt further seawater intrusion within the 180/400 Foot Aquifer Subbasin.

Groundwater elevations in the Deep Aquifers have been well below sea level in the Marina Ord Area and in the 180/400 Foot Aquifer Subbasin since the 1980s. Groundwater elevations in these aquifers are also well below groundwater elevations within the 400-Foot Aquifer which is seawater intruded within the northern portion of the Marina Ord Area. As such, the Deep Aquifers are at risk for seawater intrusion from vertical and/or lateral migration of seawater. However, there has not been any seawater intrusion observed in the Deep Aquifers to date. These data suggest that the clay layers that exist between the base of the 400-Foot Aquifer and the Deep Aquifers limit downward vertical flow into these aquifers. These clay layers are over 300 feet thick in the northern portion of the Study Area where the 400-Foot Aquifer is seawater intruded. The data also suggest that these aquifers could be isolated from the ocean or that submarine outcrops, if they exist, are located very far away from the coastline. Monitoring is being conducted as part of GSP implementation to assess the potential for both vertical and lateral migration of seawater into these aquifers. Sentinel wells have been placed near the ocean in the Monterey Subbasin to monitor for potential lateral migration of seawater from the submarine portions of these aquifers. Therefore, although the likelihood of seawater intrusion and/or potential timeframe for seawater intrusion into this aquifer is unknown, such monitoring should allow for early detection and assessment of the magnitude and rate of migration if it begins to occur. Modeling conducted as part of this feasibility study indicates that the rate of groundwater flow in these aquifers is very slow (i.e., on the order of 3 to 6 feet per day) therefore, such monitoring should provide years of warning prior to significant seawater intrusion into these Aquifers.



Legend

2017 Fall Groundwater Contours in the 400-Foot Aquifers

Estimated Seawater Intrusion in Monterey Subbasin (Note 3)

- Area of Known Seawater Intrusion
- Area of Potential Seawater Intrusion

Post 2015 Chloride Sampling Results (mg/L)

- 22 - 250

Post 2015 TDS Measurements

- ≤ 500 mg/L
- 500 - 1,000 mg/L
- 1,000 - 3,000 mg/L
- 3,000 - 10,000 mg/L
- >10,000 mg/L

Abbreviations

mg/L = miligram per liter

Notes

1. All locations are approximate.

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 7 October 2022
2. TDS and chloride measurements are obtained from various agencies.
3. Extent of seawater intrusion estimated for areas with TDS >1,000 mg/L based on AEM survey and groundwater monitoring data.

Seawater Intrusion Area

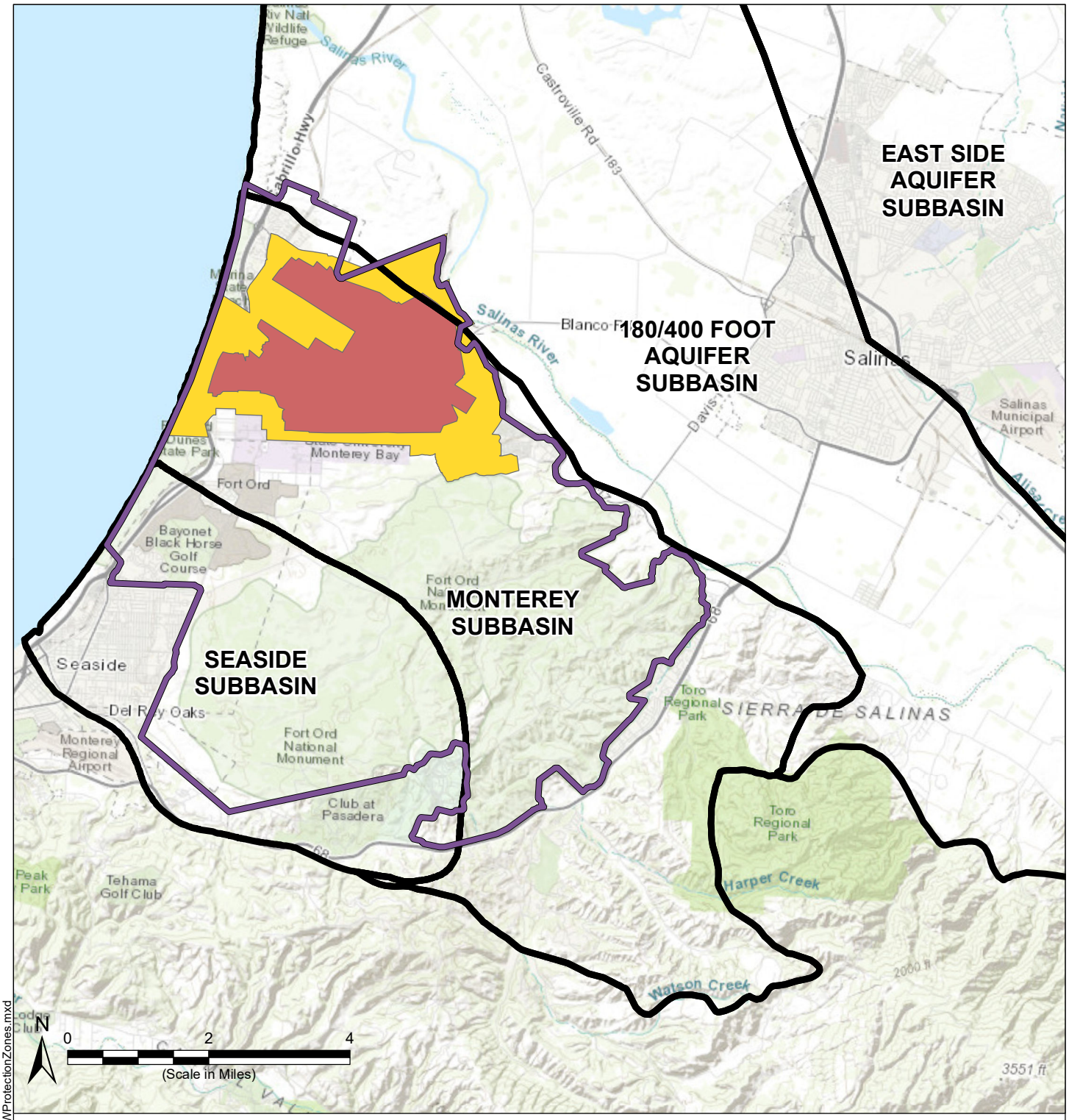
Marina Coast Water District
Marina, CA
October 2022

Figue 2-7

Path: X:\B60094\Maps\2022\10\GRRP_Fig2-7_SeawaterIntrusionArea.mxd

2.2.5.2 Fort Ord Impacts to Groundwater Quality

Legacy point-source groundwater contamination exists within the former Fort Ord. Groundwater contaminations generally consist of trichloroethylene (TCE), perchloroethylene (PCE), Carbon Tetrachloride (CT), and PFASs. The approximate extent of contamination plumes that have historically been identified in groundwater within former Fort Ord is delineated by the location of the Prohibition Zone (Figure 2-8). These contamination plumes are primarily located within the Dune Sand and 180-Foot Aquifers. No contamination has been detected in the 400-Foot Aquifer or the Deep Aquifers, separated from the Dune Sand Aquifer and 180-Foot Aquifer by significant aquitards in the Prohibition Zone. Three of MCWD's Deep Zone production wells (MCWD-10, MCWD-11, and MCWD-12) are located within the Prohibition Zone. Preliminary discussions with the Army indicate that the established Prohibition Zones and Consultation Zones do not apply to the construction of new wells within the Deep Aquifers since there is no known contamination from Fort Ord within the Deep Aquifers and significant aquitards exist between the Deep Aquifers and the Dune Sand and 180-Foot Aquifers where legacy contamination exists.



Legend

- Study
- Monterey Subbasin
- Other Groundwater Subbasins within Salinas Valley Basin

Fort Ord Special Groundwater Protection Zones

- Prohibition Zone
- Consultation Zone

Abbreviations

MCWD = Marina Coast Water District

Notes

1. All locations are approximate.
2. Monterey County Ordinance No. 04001 (Monterey County Code Title 15, Chapter 15.08.140) prohibits and/or regulates contruction of new water wells within the Fort Ord groundwater protection zones shown herein, which overlay or are adjacent to the contamination plumes on the former Fort Ord. Current groundwater protection zone are obtained from Source 2.

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 7 October 2022.
2. U.S. Department of the Army, 2017. Final 4th Five-Year Review Report for Fort Ord Superfund Site, Monterey County, California, prepared by the Fort Ord Base Realignment and Closure Office, dated September 2017.
3. Study Area boundary provided by MCWD.

Fort Ord Special Groundwater Protection (Contamination) Zones

Marina Coast Water District
Marina, CA
October 2022

Figure 2-8

Path: X:\B60094\Maps\2022\10\GRRP_Fig2-8_FortOrdSpecialGWProtectionZones.mxd

2.2.6 Water Budget Information

The groundwater budget for the Marina-Ord Area is estimated in the Monterey Subbasin GSP (MCWD & SVBGSA, 2022a). The Marina-Ord Area coincides with the portion of the Study Area that is located in the Monterey Subbasin and from which MCWD extracts all of its groundwater (Figure 2-4). The estimate groundwater budget for the Marina-Ord Area is based upon the 15-year hydrologic period from water year (WY) 2004 through 2018. Estimated inflows and outflows to the Marina-Ord Area during this period are as follows:

- Inflows:
  - Recharge (precipitation, evapotranspiration, etc.): 6,144 AFY
- Outflows:
  - Groundwater pumping: 4,346 AFY
  - Net Cross-boundary flows out of Marina-Ord Area into adjacent subbasins and Management areas: 3,431 AFY.

2.3 Beneficial Uses of Receiving Waters

The Study Area within the Monterey Subbasin primarily consists of coastal areas that drain toward Monterey Bay. Runoff in this area is minimal due to the high rate of surface water infiltration into the permeable dune sand. Consequently, well-developed natural drainages are absent throughout this area (Harding, 2004). Small intermittent creeks are found towards the southeastern boundary of the Study Area within the Fort Ord hills. Due to the minimal streamflow, there are no receiving waters within the Study Area.

3 WATER AND WASTEWATER CHARACTERISTICS AND FACILITIES

MCWD pumps groundwater to meet is potable water demand and is currently supplying approximately 600 AFY of recycled water to its irrigation customers. MCWD's potable water source and facilities are discussed in Section 3.1; MCWD's wastewater collection and recycled water systems are discussed in Section 3.2.

3.1 Potable Water Characteristics and Facilities

3.1.1 Entities

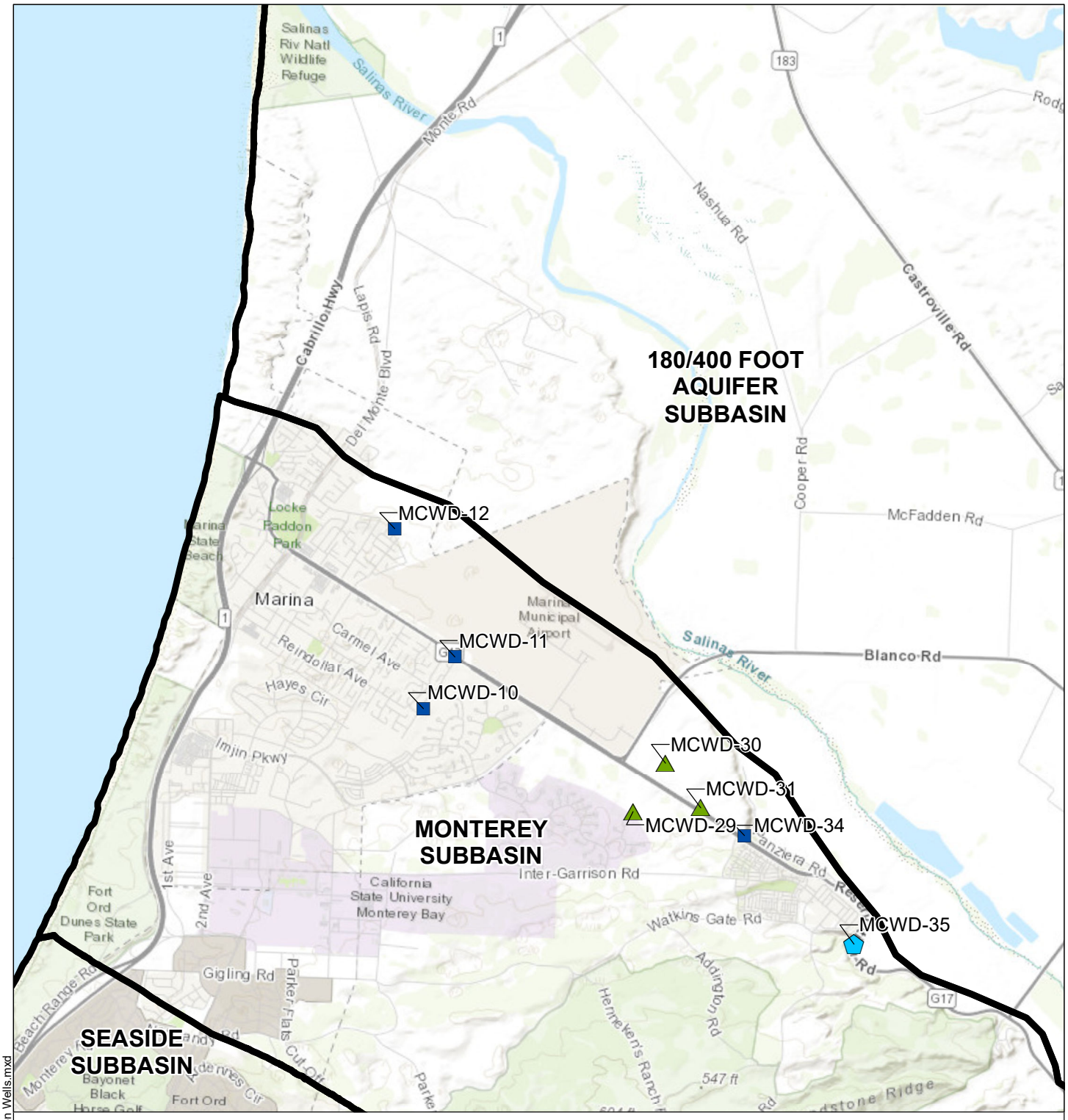
Marina Coast Water District (MCWD) is the sole water purveyor within the Study Area.

MCWD was formed in 1960 to provide potable water service to all residential, commercial, industrial, environmental, and fire protection uses in the unincorporated community of Marina. The original boundary was coincident with the Marina Fire District. In 1970, MCWD constructed a wastewater treatment plant and installed a wastewater collection system to serve the community. The City of Marina was incorporated in 1975, but MCWD remained separate. In 1991, MCWD constructed a pilot recycled water system, providing tertiary treated wastewater for irrigation of public streetscapes and parks near the wastewater plant. This system operated only until 1992 when the wastewater collection system was connected to the regional wastewater system operated by the Monterey Regional Water Pollution Control Agency (recently renamed Monterey One Water [M1W]). The Marina wastewater treatment plant was retired, and MCWD now provides wastewater collection services only, with treatment performed at the M1W regional plant. In 1994 when Fort Ord closed, MCWD was selected to take over the water and wastewater systems within Fort Ord. Under a long-term water service agreement with the United States Army Corps of Engineers (Army), MCWD provides water service to all Federal activities within the former Fort Ord and serves water and provides wastewater collection serves to the Fort Ord community. MCWD has two service areas, the Central Marina service area, which is the portion of the City of Marina outside the former Fort Ord, and the Ord Community service area within the former Army base. Further description of these service areas and existing and projected future land uses within the Study Area are presented in Section 2.1.1.

3.1.2 Potable Water Sources

MCWD currently pumps groundwater from the Marina-Ord Area of the Monterey Subbasin (Basin Number 3-004.10) as described in Section 2.2. The locations of MCWD's production wells[3] are shown on Figure 3-1. Groundwater extracted from these wells is disinfected before entering the distribution systems.

[3] Well MCWD-12 is currently inactive.



Legend

- Lower 180-Foot, 400-Foot Aquifer Production Wells
- 400-Foot/Deep Aquifers Production Wells
- Deep Aquifers Production Wells
- Groundwater Subbasins within Salinas Valley Basin

N

0 1 2

(Scale in Miles)

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 8 October 2022.

MCWD Production Wells

Marina Coast Water District
Marina, CA
October 2022

Figure 3-1

Path: X:\B60094\Maps\2022\10\GRRP_Fig3-1_MCWD Production Wells.mxd

3.1.3 Major Potable Water System Facilities

Major potable water facilities owned or operated by MCWD include the following (Figure 3-2):

- Seven active groundwater wells (additional details in Section 3.1.3.1).
- Seven ground-level storage tanks (totaling 9.2 million gallons in storage) (MCWD, 2020d).
- More than 162 miles of distribution mains whose pipe sizes range from 4 inches (in) to 30 in, and more than 100 miles of distribution mains are between 6 to 8 in (MCWD, 2020d).

3.1.3.1 MCWD Production Wells

As detailed in the 2020 UWMP (Schaaf & Wheeler, 2021), MCWD provides groundwater produced from seven wells. Two deep supply wells (MCWD-10 and MCWD-11) located in Central Marina[4], draw groundwater from the Deep Aquifers in the Monterey Subbasin where the water is then treated on-site for disinfection. The remaining five supply wells (MCWD-29, MCWD-30, MCWD-31, MCWD-34, and MCWD-35 [i.e., Watkins Gate Well]) located in the Ord Community, draw groundwater from the Lower 180-Foot, 400-Foot, and Deep Aquifers within the Monterey Subbasin[5]. Groundwater from these supply wells is disinfected at the Ord Community chlorination treatment facility. The production well capacities are shown in Table 3-1 below. The total capacities of the seven production wells are estimated at 14.9 million gallons per day (mgd). Prior to 2013 (or two years before well MCWD-35 was constructed), approximately half of the groundwater production occurred in the lower 180-Foot and 400-Foot Aquifers, and the remaining half occurred in the Deep Aquifers. Since 2013, the production in the lower 180-Foot and 400-Foot Aquifers decreased to 35% in 2021, while the production in the Deep Aquifers has been stable.

Table 3-1. MCWD Production Well Capacities

Supply Well	Location	Design Capacity				Additional Information				Pump Test Capacity[1]			
		Rated		HP	Pump Depth	Well Depth	Date Drilled	Date Rehabilitated	NaClO Dosing	Flow Rate		Total Dynamic Head	Test Year
		(gpm)	(mgd)	(HP)	(ft)	(ft)	(Year)	(Year)	(mg/L)	(gpm)	(mgd)	(ft)	
Fort Ord													
Well 29	Old County Rd	1,500	2.16	200		555	1985		0.8	1,500	2.16	252	2017
Well 30	Reservation Rd	1,500	2.16	150	410	550	1985	2016	0.8	1,528	2.20	277	2018
Well 31	Reservation Rd	2,400	3.46	250		490	1985		0.8	2,315	3.33	225	2017
Well 34	Reservation Rd	2,000	2.88	350	460	1110	2011		0.8	2,480	3.57	380	2017
Well 35	Watkins Gate & Reservation Rd	2,000	2.88	350	502	675	2011		0.8	2,494	3.59	374	2016
City of Marina													
Well 10	Bayer Avenue and Ridgeview	1,350	1.94	250	480	1550	1993	2007	1.5	1,458	2.10	434	2017
Well 11	Reservation Rd & Salinas Ave	2,000	2.88	300		1660	1986	2014	1.5	2,025	2.92	348	2017
Well 12 (Inactive)	Top of Beach Rd	1,900	2.74	300		1970	1989		8.5	2,022	2.91	430	2008
System Well Supply Capacity													
	Total Well Capacity	12,750	18.4							13,800	19.9		
	Firm Well Capacity (largest unit out of service)	10,350	14.9							11,306	16.3		

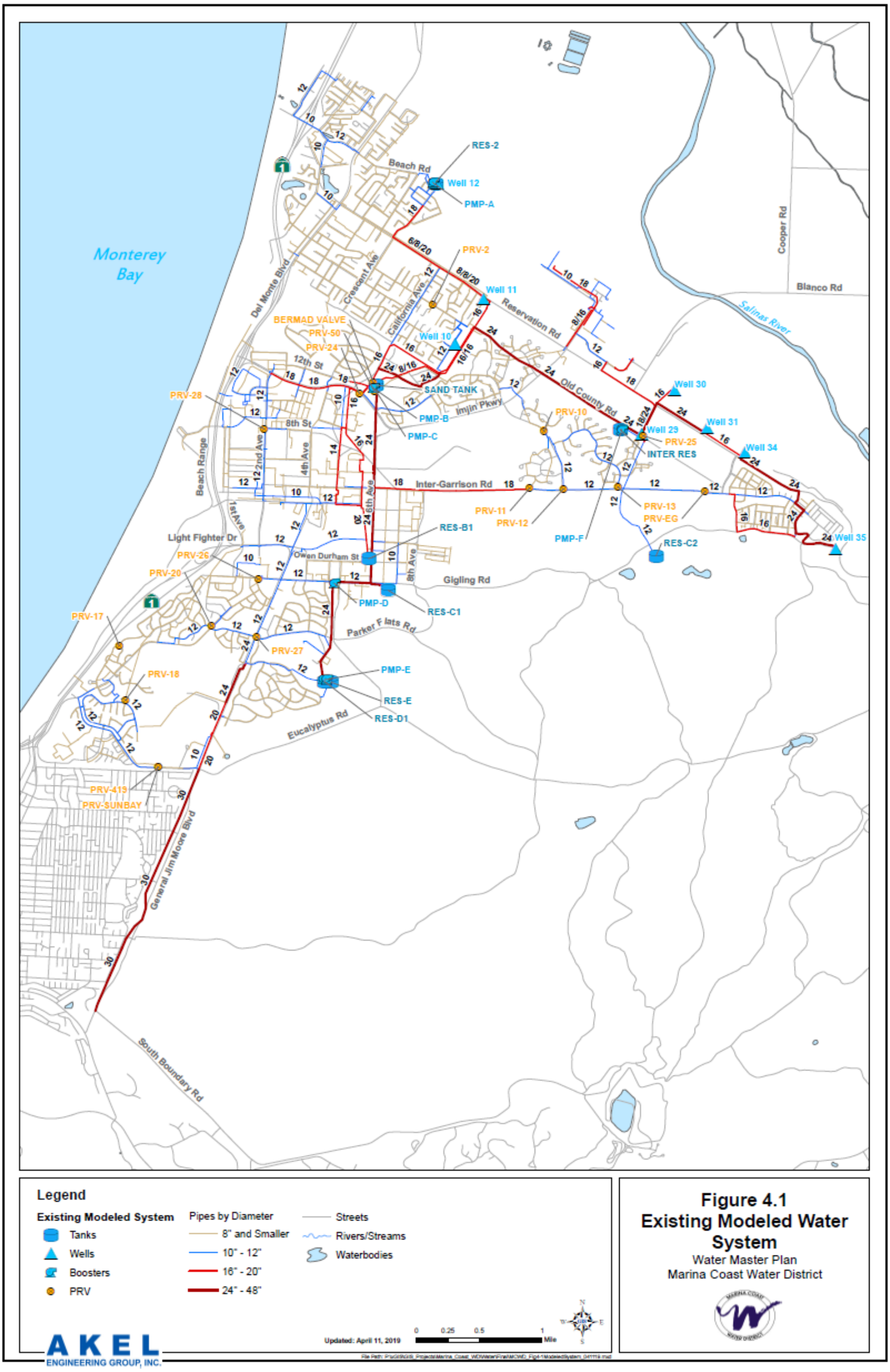
AKEL ENGINEERING GROUP, INC.

3/27/2019

Notes:
1. Source: Pump tests received from District staff

Note: The table is adopted from Table 4-1 of the 2020 Water Master Plan (MCWD, 2020d).

[4] Well MCWD-12 also located in Central Marina, but it is currently inactive.
[5] Wells MCWD-29, MCWD-30, and MCWD-31 screened the lower 180-Foot and 400-Foot Aquifers. Well MCWD-34 is screened in the Deep Aquifers and MCWD-35 is screened in the 400-Foot aquifer/Deep Aquifers.



Note: Figure adopted from Figure 4.1 of the Water Master Plan (MCWD, 2020b).

Figure 3-2. Major Water Facilities

3.1.4 Groundwater Management

As described in Section 2.2, MCWD's Service Area overlies portions of the Monterey Subbasin, the 180/400 Foot Aquifer Subbasin, and the Seaside Subbasin. However, MCWD withdraws all of its groundwater from the Monterey Subbasin. Groundwater management within the Monterey Subbasin is being conducted pursuant to SGMA. The Monterey Subbasin has been designated as a medium priory Subbasin. It is within the jurisdiction of the MCWD Groundwater Sustainability Agency (MCWD GSA) and the Salinas Valley Groundwater Sustainability agency (SVBGSA). The MCWD GSA is a single-agency GSA formed by MCWD. The SVBGSA is a Joint Powers Authority (JPA). The JPA membership comprises the County of Monterey, Monterey County Water Resources Agency (MCWRA), City of Salinas, City of Soledad, City of Gonzales, City of King, the Castroville Community Services District (CSD), and Monterey One Water (formerly the Monterey Regional Water Pollution Control Agency). The MCWD GSA and SVBGSA co-developed the Monterey Subbasin GSP, which was adopted by both GSAs and submitted to DWR on January 31st, 2022[6]. The GSP assesses conditions in the Monterey Subbasin and provides a path to achieve and document sustainable groundwater management within 20 years following GSP adoption.

Pursuant to a framework agreement between MCWD GSA and SVBGSA, the Monterey GSP establishes two Management Areas within the Subbasin. These Management Areas include the Marina-Ord Area and the Corral de Tierra Management Area (Corral de Tierra Area). The Marina-Ord Area coincides with the portion of the Study Area located within the Monterey Subbasin from which MCWD extracts groundwater and where the IPR project would be located. The Management Areas are developed to facilitate GSP implementation in these areas. Specifically, the establishment of the Marina-Ord Area allows MCWD GSA to plan, fund, and implement sustainable groundwater management for the redevelopment of the former Fort Ord within and outside of its current jurisdictional area within this management area. The Corral de Tierra Area, which is managed by SVBGSA, consists of the remainder of the Subbasin, which includes lands generally located south of State Route 68 and a few parcels along the northern subbasin boundary with the 180/400-Foot Aquifer Subbasin.

As described in Section 2.2.6, the Monterey Subbasin GSP also provides information on historical and projected water budgets within the Marina-Ord Area, which indicate that projects and/or management actions will likely be required to reach sustainability within the subbasin. The Monterey GSP also established Sustainable Management Criteria (SMCs) for the six sustainability indicators, including chronic lowering of groundwater levels, reduction of groundwater storage, and seawater intrusion. The primary goal of these SMCs is to stabilize groundwater elevations in the 400-Foot and Deep Aquifers and stop further seawater intrusion in the 180-Foot and 400-Foot Aquifers.

The 180/400-Foot Aquifer Subbasin has similar SGMA management goals, including halting seawater intrusion and stabilizing groundwater elevations in its aquifers. To stop seawater intrusion, it is anticipated that either (1) groundwater levels will be raised and a seaward gradient will be reestablished in the 180- and 400-Foot aquifers; and/or (2) an extraction or injection barrier will be implemented in these aquifer zones. Either management outcome is likely to affect the magnitude and direction of groundwater gradients in the 180-Foot and 400-Foot Aquifers within the Monterey Subbasin. As such, these management actions and projects must be considered in the evaluation and feasibility of groundwater recharge IPR alternatives within the 180- or 400-Foot Aquifers as they could affect the long-term performance of an IPR project within these aquifers. Further discussion regarding this issue is provided in Section 4.1.2.

[6] The GSP could be accessed via this link: https://www.mcwd.org/gsa_sustainability_plan.html#docs

The Monterey Subbasin GSP also concludes that groundwater levels in the Deep Aquifers are declining within Monterey Subbasin and 180/400 Foot Aquifer Subbasin. SMCs have been established within the Monterey Subbasin GSP to limit further groundwater level declines within the Deep Aquifers. The SVBGSA is also conducting a Deep Aquifers Study to further evaluate hydrogeologic properties and conditions of the Deep Aquifers in the northern Salinas Valley. The Study will recommend preliminary management and monitoring actions to address overdraft conditions and prevent seawater intrusion in the Deep Aquifers. It is anticipated that these actions will likely include management actions to decrease rates of groundwater extraction from the Deep Aquifers throughout the Salinas Valley. Such management actions could impact MCWD's ability to maintain and/or increase rates of extraction from the Deep Aquifer without groundwater augmentation. Although such management actions could impact hydraulic gradients within the Deep Aquifers, these changes would likely only flatten existing northwesterly gradients in the Monterey Subbasin, which are driven by high rates of agricultural pumping within the 180/400 Foot Aquifer Subbasin. As such, it is unlikely that management actions that result in proportionate decreases in groundwater extraction from the Deep Aquifer would dramatically change groundwater flow directions in these aquifers and impact the performance of an IPR project within the Deep Aquifers.

3.1.5 Water Use Trends and Future Demands

MCWD has two separate service areas: Central Marina, which encompasses the portion of the City of Marina outside the former Fort Ord, and the Ord Community. MCWD is the sole water supplier within these service areas. Water use in the MCWD service area has been generally stable between 2015 and 2020, fluctuating between 3,000 AFY and 3,400 AFY (Schaaf & Wheeler, 2021).

The UWMP projects that total water demand within the Study Area, including both potable and recycled water demand, will increase to approximately 9,600 AFY by 2040. The dramatic increase in demand is due to projected redevelopment within the Marina, and the redevelopment of former Fort Ord lands to civilian uses, as discussed in Section 2.1.3.2. A breakout of projected future water demands is summarized in Table 3-2 below.

Table 3-2. Projected Water Demand in 5-Year Increments

MCWD Area	Jurisdiction	2020	2025	2030	2035	2040
Ord	U.S. Army	409	461	471	471	471
	CSUMB	318	421	616	821	977
	Del Rey Oaks	0	31	224	238	238
	City of Monterey	0	0	130	130	130
	County of Monterey	227	436	436	522	522
	UCMBEST	1	116	335	377	408
	City of Seaside	339	839	1,032	1,435	1,698
	State Parks and Rec.	0	7	9	9	9
	Marina Ord Comm.	446	1,125	1,638	1,757	1,809
	Assumed Line Loss	190	348	348	348	348
Marina	Armstrong Ranch	0	550	680	680	680
	CEMEX	0	0	0	0	0
	Marina Central	1,438	1,656	1,874	2,081	2,284
Subtotal - Ord		*1,929*	*3,784*	*5,239*	*6,108*	*6,610*
Subtotal - Marina		*1,438*	*2,207*	*2,553*	*2,761*	*2,964*
Total		**3,367**	**5,991**	**7,792**	**8,869**	**9,574**

Sources:
(1) Demand projection is obtained from Table 4.5 of the 2020 UWMP (MCWD, 2021).

3.1.5.1 Water Cost Trend

Though the water demand is projected to increase dramatically, the cost of water production is expected to be generally stable (i.e., excluding inflation) if groundwater can meet all future potable demands. However, as discussed in Section 2.2.6, the Monterey Subbasin GSP indicates that projects and/or management actions will likely be required to maintain water levels above MTs consistently and to MOs within the Marina-Ord Area under projected future water demands. As such, the GSAs may need to implement groundwater pumping fees, quotas, or other measures that affect the supply or cost of potable water, such as the proposed IPR groundwater augmentation project.

3.1.5.2 Cost of Water Supplies

As stated in Section 3.1.2, groundwater is currently the sole potable water source for MCWD. The cost of the groundwater in fiscal year (FY) 2020 was projected to be about 10.96 million, which includes expenditures associated with administration, operation and maintenance (e.g., system maintenance, fuel, and chemicals), laboratory, conservation, engineering, and GSA implementation[7] (MCWD, 2018). As such, the baseline unit cost of groundwater is estimated to be $3,336/AF[8].

[7] GSA implementation costs include, but are not limited to, preparation, adoption, and amendment of a groundwater sustainability plan, and investigations, inspections, compliance assistance, enforcement, and program administration.
[8] MCWD's total water supply in calendar year (CY) 2020 was 3,285 AF (MCWD, 2021). Assuming the total supply in FY 2020 was similar to the supply in CY 2020, the unit cost of groundwater was estimated to be $3,336/AF.

3.1.5.3 Customer Fees and Charge

Starting in January 2023, MCWD's potable water rates for its customers will range from $3.80 per hundred cubic feet (HCF) to $5.89 per HCF with additional service fees[9].

3.1.6 Quality of Water Supplies

Despite known groundwater quality issues identified in Section 2.2.5, the groundwater that MCWD pumps is of good quality, and groundwater is the sole potable water supply for MCWD. As stated in MCWD's annual consumer confidence report, MCWD's water has always met all the California and Federal drinking water standards (MCWD, 2020b).

3.1.7 Future Water Supply Alternatives

As discussed in Section 1.1, MCWD was part of a Three-Party Study that identified and evaluated alternatives for additional water supplies to support the redevelopment of the former Fort Ord at buildout, referred to as the "Additional Water Augmentation Component." The Three-Party Study evaluated a number of water supply augmentation options, including (1) Groundwater augmentation through injection of advanced-treated recycled water, infiltration of Salinas River flood flows, and municipal stormwater; (2) Local and participation in regional seawater desalination; (3) Decentralized water recycling; and (4) Water conservation. The Three-Party Study recommended IPR as the most feasible alternative. It also evaluated several options for siting potential IPR Injection/extraction wells within the Study Area, further described in Section 4. IPR is also identified within the Monterey Subbasin GSP as a preferred project to aid in achieving sustainable groundwater management within the Subbasin. Other potential future water supply alternatives identified in Section 9 of the GSP primarily include participation in regional projects identified in the larger Salinas Valley Groundwater Basin including:

- Seasonal Releases from Reservoirs with aquifer storage and recovery;
- Regional Municipal Supply Project that desalinates the brackish water extracted from the proposed seawater intrusion barrier in the 180/400-Foot Aquifer Subbasin; and
- Muti-benefit Stream Channel Improvements that improves Salinas River recharge in the Salinas Valley.

In addition, the GSP identified continued water conservation and stormwater recharge management as preferred projects and management actions.

3.2 Wastewater and Recycled Water Facilities

3.2.1 Entities

MCWD is the entity that operates the two wastewater collection systems that serve the City of Marina and the Ord Community. The two collection systems connect to an interceptor pipeline that is operated by M1W. The interceptor pipeline conveys wastewater to the M1W Regional Treatment Plant (RTP) located north of Marina.

MCWD has senior rights to recycled water from the RTP through its agreement with M1W (Schaaf & Wheeler, 2021).

3.2.2 Major Wastewater Facilities

Major wastewater facilities serving MCWD customers include (Figure 3-3 and Figure 3-4):

[9] Additional fees could be found in MCWD's website: https://www.mcwd.org/docs/financials/22-23%20MCWD%20Rates,%20Fees,%20and%20Charges%20(Marina).pdf.

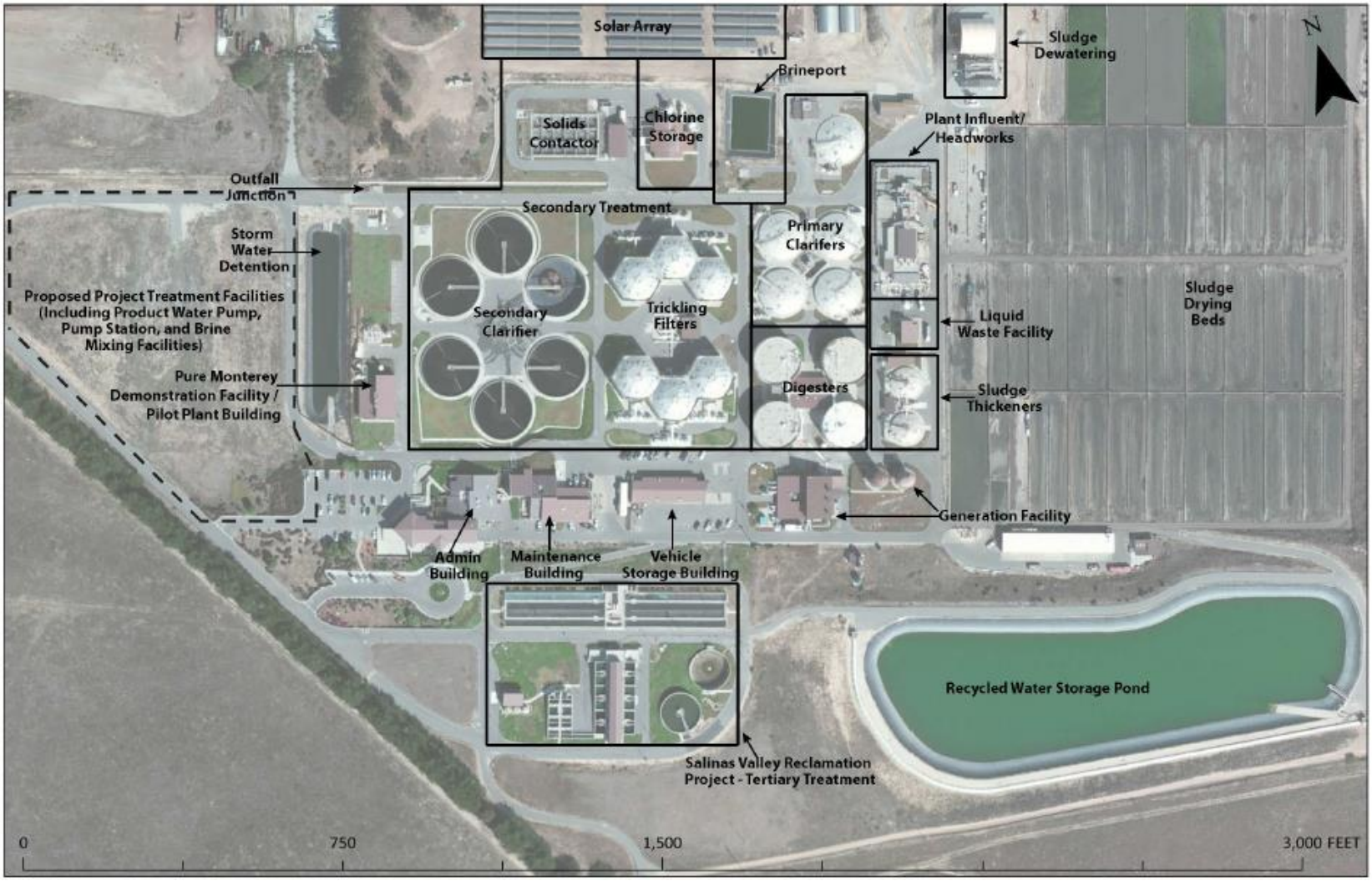
- Wastewater collection systems: MCWD operates two wastewater collection systems that serve the City of Marina and the Ord Community, which connect to an interceptor pipeline operated by M1W. The Central Marina collection system connects via a dedicated pump station, while the Ord Community connects via a gravity pipeline. The interceptor pipeline conveys wastewater to the MW1 RTP (Schaaf & Wheeler, 2021).

RTP: M1W operates the RTP, which treats wastewater collected from multiple communities in Monterey County to secondary standards. The facilities include screening, aerated grit removal, primary sedimentation, secondary treatment through biological trickling filters, bioflocculation for solids contact, and secondary clarification. Effluent is either discharged to an ocean outfall or is conveyed to either the Salinas Valley Reclamation Plant (SVRP) or to the Advanced Water Purification Facility (AWPF) for further treatment, as described below. The RTP also has solids handling facilities that anaerobically digest and dry the biosolids, which are hauled to the Monterey Regional Waste Management District's landfill located adjacent to the RTP. The RTP has a capacity of 29.6 mgd average dry weather flow (Trussell, et. al, 2019). In 2020, municipal wastewater flows to the RTP were 19,000 AF, with MCWD contributing 2,170 AF, or 11%.

- SVRP: M1W operates the SVRP, which is capable of producing an average of 29.6 mgd of tertiary-treated recycled water. Treatment facilities include coagulation, flocculation, filtration, and disinfection. The recycled water is delivered to the Castroville Seawater Intrusion Project and is temporarily stored in an 80 AF recycled water storage pond prior to being used for crop irrigation in the greater Castroville area.

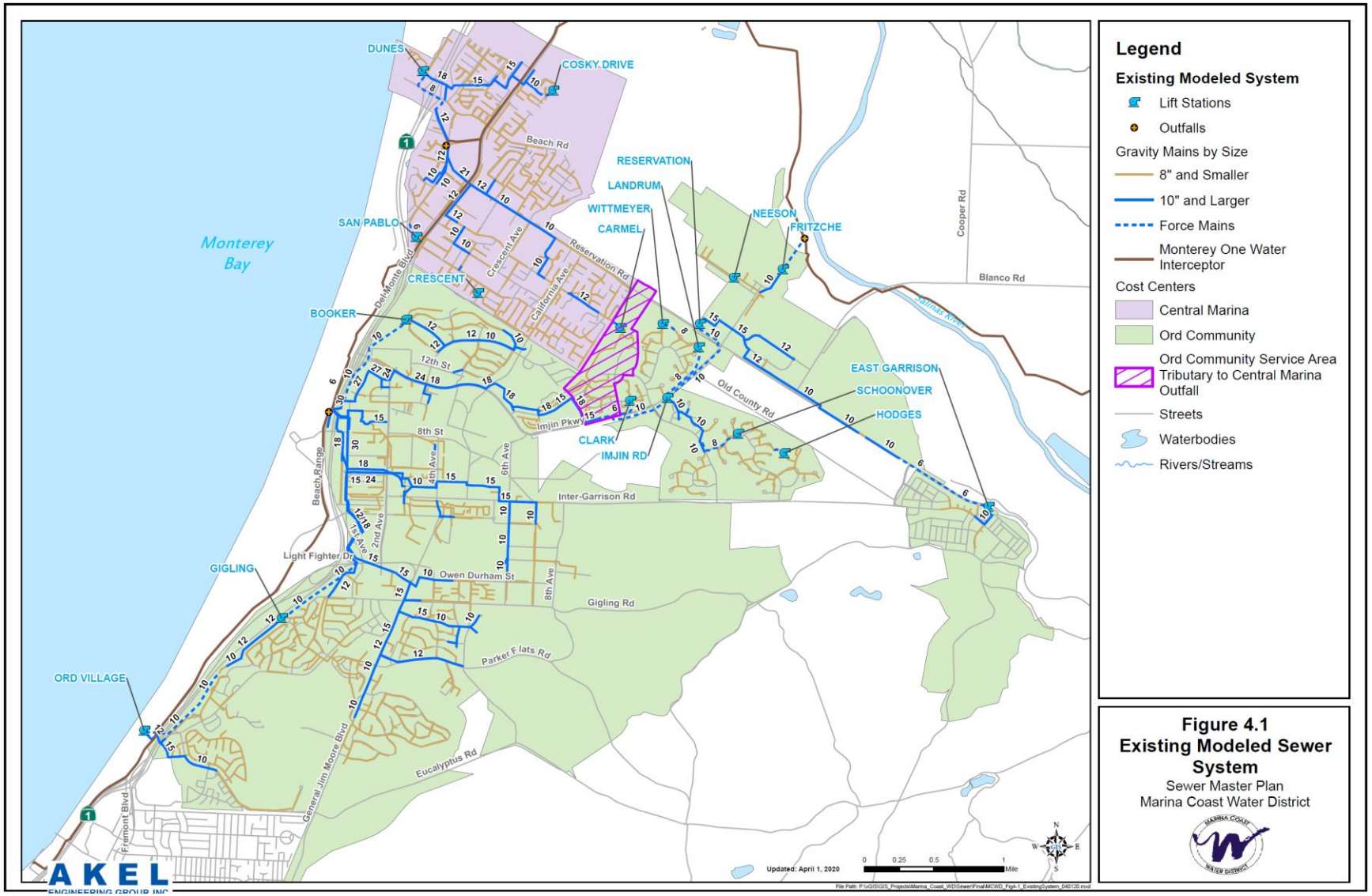
- AWPF: M1W operates the AWPF, which is capable of producing 5 mgd of recycled water advanced treatment standards. Treatment facilities include ozonation, membrane filtration, reverse osmosis (RO), advanced oxidation using ultraviolet light and hydrogen peroxide, and product water stabilization. The RO concentrate is mixed with hauled saline waste and secondary effluent from the RTP and discharged to an ocean outfall, while the effluent recycled water is used for urban landscape irrigation by MCWD via the Regional Urban Water Augmentation Program (RUWAP) and for groundwater injection and IPR in the Seaside Basin.

- Transmission facilities: Transmission facilities for the AWPF include the product water pump station and a 2.0 million gallons (MG) purified water reservoir operated by M1W, and a product water pipeline that is partially operated by M1W and is partially operated by MCWD. The product water pipeline, also identified as the "Existing Pure Water Monterey (PMW) Pipeline or transmission main," carries advanced-treated recycled water from the AWPF and ranges from 16 inches and 24 inches and diameter and was designed for a maximum daily flow of 5.0 mgd (see Figure 3-4).



Note: Figure adopted from M1W WDR (SWRCB, 2018). This Figure was dated 2018 and did not show the buildout aerial image of the AWPF. The AWPF is located on the right of this Figure, with a note stating "Proposed Project Treatment Facilities".

Figure 3-3. Existing Regional Treatment Plan Facilities



Note: Figure adopted from Figure 4.1 of the Sewer Master Plan (MCWD, 2020c).

Figure 3-4. Major Wastewater Facilities

3.2.3 Existing Recycling and Existing Rights to Treated Effluent

As discussed above, the treated secondary effluent from the regional RTP is either (1) discharged to the ocean pursuant to the National Pollutant Discharge Elimination System (NPDES) Permit (Order No. R3-2014-0013) (2) conveyed to the Salinas Valley Reclamation Plant (SVRP) for production of disinfected tertiary recycled water, or (3) to the AWPF for further treatment.

The SVRP currently produces about 14,000 AFY of tertiary-treated recycled water, meeting the standards of unrestricted reuse under Title 22 of the California Code of Regulations. The majority of the recycled water serves as a supplemental source to the Castroville Seawater Intrusion Project (CSIP) agricultural irrigation system. As agricultural demands are seasonal, this capacity cannot be fully utilized year-round.

Advanced-treated recycled water from the AWPF is currently delivered to the Pure Water Monterey Project in the Seaside Subbasin for injection of 3,500 AFY and provided to MCWD for landscape irrigation. MCWD has the right to utilize up 1,427 AFY of the advanced-treated recycled water from the AWPF. The sections below further describe existing recycling by MCWD and MCWD's existing rights to the treated effluent, including the rights to support MCWD's development of a potential IPR project.

3.2.3.1 Existing Recycling within the MCWD Service Area

The MCWD receives disinfected, advanced-treated recycled water from M1W's AWPF. MCWD began delivering recycled water in 2021 and currently has the capacity to deliver 600 AFY of advanced treated water for landscape irrigation. Initial users of this recycled water are located in both the City of Marina and the City of Seaside in the Monterey and Seaside Subbasins, including the Bayonet/Blackhorse Golf Course, California State University Monterey Bay (CSUMB), street medians, and common areas at residential developments.

MCWD's recycled water distribution system facilities are shown on Figure 3-5 below and include 80,000 feet of conveyance piping, a 2.0 MG tank (Blackhorse Reservoir), and 13 turnouts (i.e., recycled water supply access locations) (RWQCB, 2020). These facilities are currently utilized to serve MCWD's recycled customers for landscape irrigation. The pipe size ranges from 16 to 24 in (Trussell, et. al, 2019Trussell, et. al, 2019). MCWD's recycled distribution system has the capacity to carry as much as 1,427 AFY or more of advanced-treated recycled water from the AWPF to MCWD customers. It is anticipated that this advanced-treated recycled water distribution system (i.e., the existing Pure Water Monterey pipeline) would be used to supply the IPR project alternative if implemented (see Section 5 for details). If the IPR project is not implemented, it could also be used to provide additional advanced treated water for landscape irrigation to MCWD customers.

As shown in Table 3-3, the current projected cost of recycled water is approximately 4 million dollars, or $2,966/AF.[10]

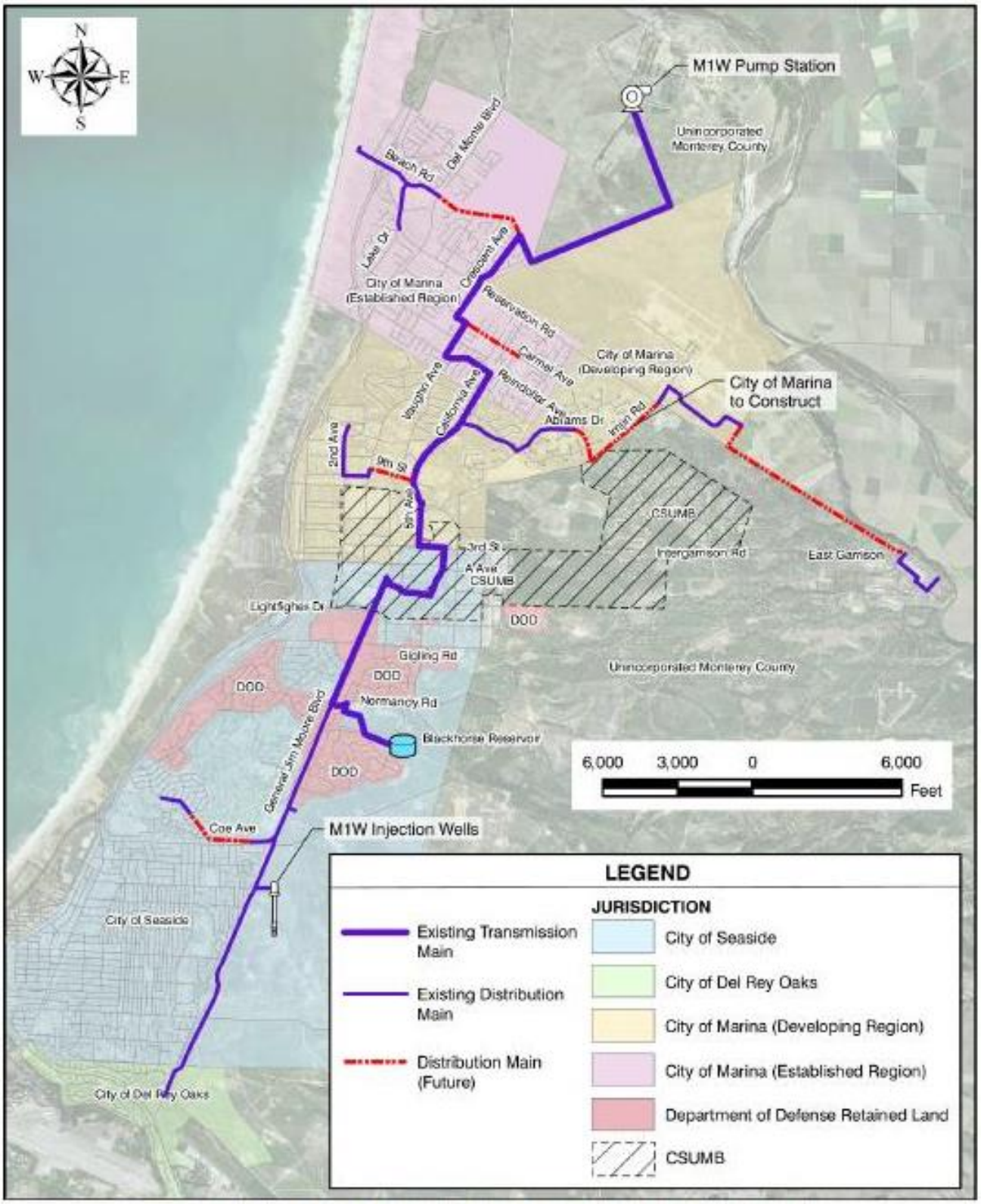
Table 3-3. Recycled Water Cost

Cost Category	Cost in FY 2022	Note
Treatment	$3,257,356	MCWD's share of the O&M cost for M1W, including power and chemical.
Transmission	$496,658	Debt service payments on three bond issues that financed the construction of pipelines and other assets for delivering recycled water; ongoing O&M costs associated with the system.
Distribution	$291,476	Cost to maintain the local distribution system, including debt service and O&M.
Administrative Overhead	$186,339	Engineering, laboratory, and finance department cost
Total	**$4,231,829**	The total recycled water cost is associated with a recycled water volume of 1,427 AF.

Abbreviations
AF = acre-feet
O&M = operation and maintenance

Notes:
(a) Cost by category was obtained from Source 1.

Sources:
(1) MCWD, 2022. Recycled Water Rate Study, prepared by Raftelis, dated 29 March 2022.



Note: Figure adopted from the Notice Of Applicability, Enrollment In General Waste Discharge Requirements Order No. WQ 2016-0068-DDW, Water Reclamation Requirements For Recycled Water Use And Transmittal of Monitoring And Reporting Program Order No. R3-2020-0069 (RWQCB, 2020).

Figure 3-5. Recycled Water Distribution System

3.2.3.2 MCWD's Rights to Treated Effluent

In 1989, MCWD entered into an annexation agreement with Monterey Regional Water Pollution Control Agency (MRWPCA; now M1W) for wastewater treatment. This agreement established MCWD's first right to receive tertiary treated wastewater from the SVRP. MCWD has the right to obtain treated wastewater from M1W's RTP equal in volume to that of the volume of MCWD wastewater treated by M1W and additional quantities not otherwise committed to other uses.

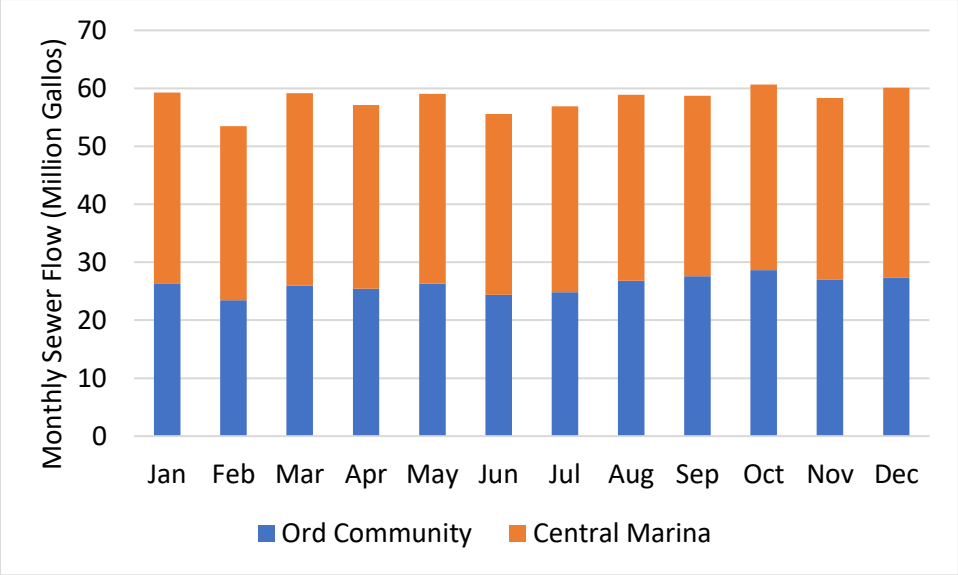
In 2005, the FORA and MCWD Boards of Directors both approved the Regional Urban Water Augmentation Project (RUWAP) Hybrid Alternative, which included recycled water and desalination supply components providing 1,200 AFY each. FORA and MCWD then agreed upon a modified RUWAP Hybrid Alternative that would provide recycled water to the former Fort Ord (via the M1W Pure Water Monterey Project). As discussed in Section 2.2.3, MCWD has the right to utilize up to and including a net 1,427 AFY of the AWPF treatment capacity to serve the Ord Community to implement the recycled water portion of the RUWAP. The wastewater stream for the MCWD portion of the project is MCWD's own municipal wastewater, which was originally slated for tertiary treatment, in addition to a 650 AFY contribution to RUWAP by (MCWRA through M1W from May through August.

On April 8, 2016, MCWD and M1W entered into the Pure Water Delivery and Supply Project Agreement, as amended by the 2017 First Amendment, wherein the Product Water Conveyance Facilities were designed, constructed, owned, and operated by MCWD with a capacity sufficient to convey a minimum of 5,127 AFY of advanced treated water, including the 3,700 AFY capacity for M1W and a total of 1,427 AFY capacity for MCWD. Both the 2016 Agreement and the 2017 Amendment are provided in Appendix A. The Product Water Conveyance Facilities include a regional advanced treated water transmission line through Marina, the Ord Community, and into the City of Seaside (i.e., referred to herein as the Pure Water Monterey [PWM] Pipeline) and allow delivery of advanced treated water from the AWPF for landscape irrigation within these communities and IPR in the Seaside Subbasin.

The regional transmission line was completed in 2019 and placed in operation in 2020 as part of the Pure Water Monterey Project. With the completion of the AWPF and the transmission line, MCWD recently completed its recycled water distribution system to allow delivery of its 600 AFY of advanced treated water for landscape irrigation in 2022. This study evaluates the injection and recovery of the remaining 827 AFY of advanced-treated water available to MCWD from the AWPF through an appropriately permitted IPR Project, also known as a Groundwater Replenishment Reuse Project (GRRP). The IPR project would provide seasonal storage and generate potable water that can meet a larger portion of MCWD's water demand beyond irrigation and non-potable needs.

3.2.4 Wastewater Flow

The wastewater flows collected for the Central Marina and Ord Community service areas are being treated in the RTP operated by M1W. As shown on Figure 3-6, the average monthly wastewater flow was approximately 58.1 million gallons and 1.91 mgd in 2021, and more than half of the flow was from the Central Marina area. The seasonal variations were not significant.



Note: the 2021 wastewater flow was provided by MCWD on 9 September 2022.

Figure 3-6. 2021 Monthly Wastewater Flow

3.2.5 Effluent Quality

The effluent at the RTP after secondary treatment (i.e., the wastewater effluent) meets the Water Recycling Criteria for oxidized wastewater, which is a prerequisite to producing disinfected tertiary recycled water for irrigation (Pure Water Monterey, 2019). The effluent is either discharged to the ocean pursuant to National Pollutant Discharge Elimination System (NPDES) Permit (Order No. R3-2014-0013) or used as influent for the co-located SVRP for the production of disinfected tertiary recycled water or to the AWPF for further treatment.

Disinfected, advanced-treated recycled water from M1W's AWPF is conveyed by MCWD for landscape irrigation and is also used for IPR at the Seaside Groundwater Basin. Water from M1W's AWPF would also be used as source water for the proposed IPR project identified here. This recycled water exceeds the tertiary effluent requirements. It meets the applicable standards of water quality in accordance with State of California law, including but not limited to the Title 22 Standards set forth by the California Department of Public Health as well as the turbidity requirements such that water quality does not exceed 0.2 NTU more than 5% of the time within 24 hours, and does not exceed 0.5 NTU at any time (MCWD, 2020a). Further description of the water quality characteristics of advanced-treated recycled water from the AWPF, as well as regulatory permitting requirements for subsurface application of recycled water that would have to be met as part of the IPR project, are described in Section 3.3 below.

3.3 Permitting Requirements

An overview of permitting requirements for an IPR project through groundwater recharge and replenishment is provided below.

3.3.1 State Water Resources Control Board Permitting

Regulations for the subsurface application of recycled water are included in Title 22 of the California Code of Regulations (CCR), Division 4, Chapter 3, Article 5.2. These regulations include minimum treatment requirements for full advanced treatment at the AWPF, as well as requirements to demonstrate adequate retention time within the aquifer. The State Water Resources Control Board (SWRCB), Division of Drinking Water (DDW) oversees permitting such a system.

Key regulatory considerations for the advanced treatment of wastewater, as well as the implementation of GRRP, are as follows:

- GRRPs must demonstrate log reduction of enteric viruses (12-log), Giardia cysts (10-log), and Cryptosporidium oocysts (10-log). The AWPF currently achieves 7-log enteric virus reduction, 10-log Giardia cyst reduction, and 10-log Cryptosporidium oocyst reduction, therefore, at least 5-log virus reduction is required during underground retention.
- Virus reduction during underground retention must be demonstrated by modeling, using either numerical modeling (which provides 0.5 log reduction credit per month of retention) or Darcy's Law modeling (which provides 0.25 log reduction credit per month of retention). Additionally, a tracer study must be initiated prior to the end of the third month of operation of the GRRP to confirm underground retention.
- A monitoring program is required to be implemented prior to GRRP operation, including sampling of each aquifer to be injected into over a one-year period. Additionally, at least two monitoring wells are required to be installed and sampled prior to GRRP operation.

This IPR project would be considered a separate GRRP from the M1W Pure Water Monterey project, even though it assumes the use of the same advanced-treated recycled water source from the AWPF. This GRRP would likely be a project between MCWD and M1W, with M1W overseeing the treatment of the advanced-treated recycled water to achieve at least a 10-log reduction of Giardia cysts, 10-log reduction of Cryptosporidium oocysts, and 7-log reduction of enteric viruses. The remaining 5-log reduction of enteric viruses (to achieve a total of 12-log reduction) is assumed to occur during underground retention and would be overseen by MCWD, along with the required groundwater monitoring program.

3.3.2 Regional Water Quality Control Board Permitting

The Regional Water Quality Control Board (RWQCB) is responsible for waste discharge requirements/water recycling requirements for wastewater treatment plants and thus oversees the general water quality effects of discharging treated wastewater into groundwater basins.

M1W has an existing Waste Discharge Requirements (WDR) permit for the Pure Water Monterey project (Order R3-2017-0003), which applies to both the advanced purification facility, as well as injection of the advanced-treated recycled water into the Seaside groundwater basin. In order for MCWD to inject the advanced-treated recycled water into the Monterey subbasin, the Pure Water Monterey WDR would either need to be modified to explicitly include this use, or a new WDR would need to be issued by the Central Coast RWQCB.

4 SCREENING AND DESCRIPTION OF PROJECT ALTERNATIVES

4.1 Initial Screening of Alternatives

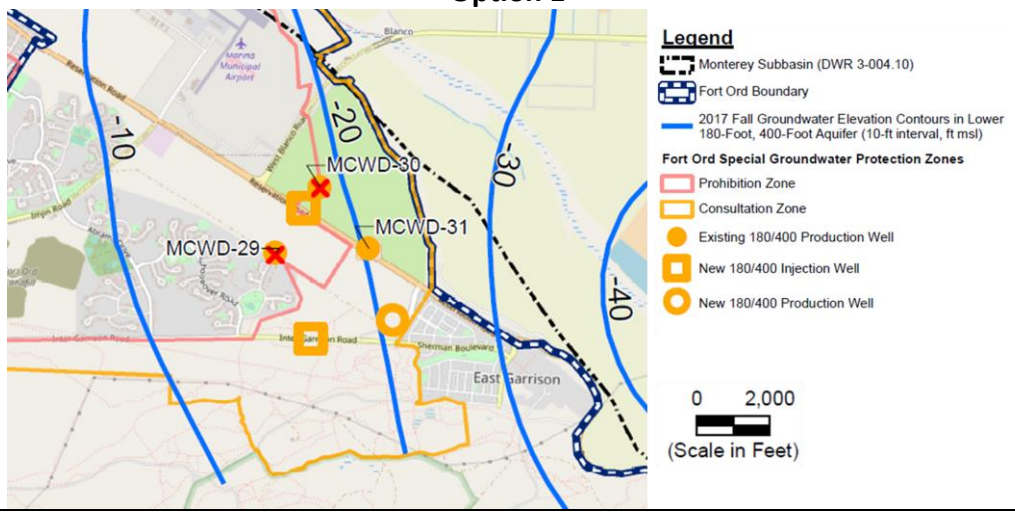
An initial screening of potential IPR alternatives was performed to narrow down the potential location and depth of IPR injection and extraction facilities. This initial screening is discussed in the section below and has been used to identify a focused set of alternatives for further detailed analysis in Section 5.

4.1.1 Project Options Considered

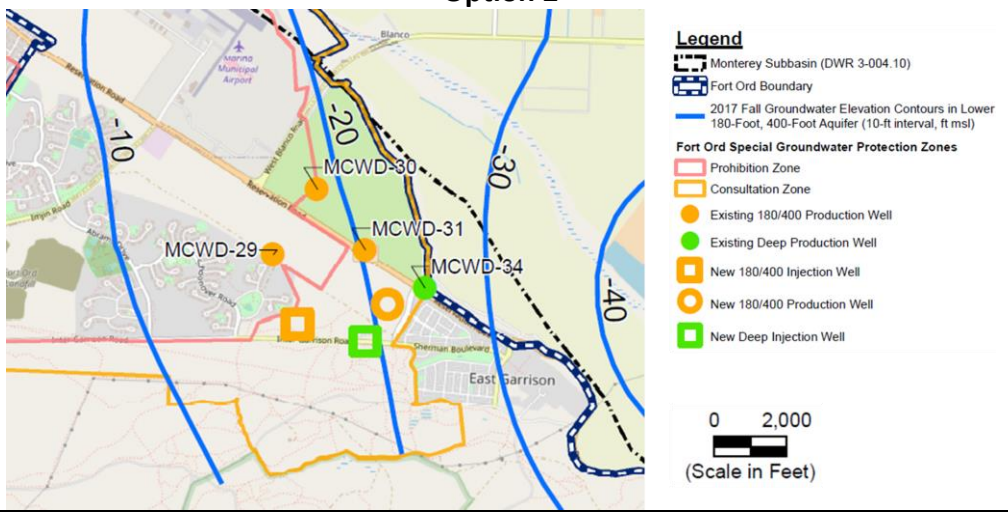
As discussed in Section 1.1, the Three-Party Study identified IPR as the recommended water supply augmentation option for the District. The Three-Party Study presented three potential options for siting an IPR injection/extraction alternative. These potential IPR injection/extraction alternatives are all located near existing MCWD production wells to maximize the use of existing infrastructure and minimize costs. The potential locations were developed based on the location of existing MCWD production wells, existing hydrogeology, water quality, and land use information. These IPR options, as well as a "no project" alternative, were considered for initial screening purposes. Further description of the "no project" alternative and the three IPR options are summarized below. The three IPR options are also illustrated on Figure 4-1.

- The No Project alternative assumes that a groundwater augmentation alternative is not implemented and that the additional 827 AFY of water generated by the IPR Project to meet future water demands would be met through increased groundwater extraction from existing MCWD groundwater production wells.
- Option 1 provides a potential approach for developing an IPR injection/extraction alternative within the 180/400-Foot Aquifer zone near the District's existing production wells near Reservation Road. The option will utilize the existing production well MCWD-31, one new production well, and injection wells located upgradient (i.e., southwest of these production wells).
- Option 2 is a hybrid alternative, which includes combined injection/extraction from both the 180/400-Foot Aquifer and Deep Aquifers near the District's Deep Aquifers production well MCWD-34. The option will utilize the existing production well MCWD-34, new 180/400-Foot Aquifer and Deep Aquifers production wells near MCWD-34, and new 180/400-Foot Aquifer and Deep Aquifers wells upgradient of production wells.
- Option 3 involves IPR injection/extraction near MCWD's Deep Aquifers production wells MCWD-10 and MCWD-11. The option will utilize existing Deep Aquifers wells MCWD-10 and MCWD-11, and two new Deep Aquifers injection wells located upgradient (i.e., south) of these production wells.

Option 1



Option 2



Option 3

Figure 4-1. Project Options Considered for Initial Screening

4.1.2 Qualitative Screening of Project Alternatives

The "no project" alternative and the three injection / extraction options "were qualitatively ranked against five screening criteria which were deemed important to MCWD. Factors considered under each screening criteria include:

- **Incremental capital and operation costs** in addition to the District's cost of producing and distributing groundwater, including (1) access to existing water and recycled water infrastructure such as pipeline, monitoring, and production wells as described in Sections 3.1.3 and 3.2.3; (2) construction of new infrastructure and modification of existing infrastructure such as monitoring and production wells;
- **Implementability**, particularly the ability to implement the project considering restrictions within Fort Ord Groundwater Protection Zones (see Section 2.2.5.2);
- **Environmental and groundwater management benefits**, such as the ability to improve groundwater conditions and achieve SGMA SMCs (see Section 3.1.4), including stabilizing groundwater elevations in the Deep Aquifers and protecting existing MCWD production wells from seawater intrusion;
- **Flexibility regarding future basin management**, with regards to changing groundwater conditions along the boundary between Monterey subbasin and the 180/400-Foot Aquifer Subbasin; and the potential for groundwater management actions and projects that will be required in the 180- and 400-Foot Aquifers to halt further seawater intrusion and stop declining groundwater levels in the Deep Aquifers (see Section 3.1.4) to impact the project; and
- **Technical feasibility**, including impacts on seawater intrusion, contaminant migration, data gaps, and uncertainty.

With the exception of the "no project" alternative, it is assumed that all IPR project alternatives provide similar water supply benefits to MCWD customers at 827 AFY.

4.1.3 Project Alternatives Selected for Further Evaluation

As shown in Table 4-1, Option 3 (i.e., IPR injection/extraction in the Deep Aquifers) is the only option with no "low score" that flags a critical disadvantage under the five screening criteria identified in Section 4.1.2 above. Therefore, several IPR injection/extraction alternatives within the Deep Aquifers have been identified based on hydrogeologic conditions, existing land uses, and water/wastewater facilities. These more detailed IPR injection/extraction alternatives in the Deep Aquifers have been selected for further detailed numerical modeling and engineering analysis. These alternatives are further discussed in Section 4.2, along with the "no project" alternative.

Table 4-1. Project Alternatives Evaluation

	Option	Incremental Capital and Operation Costs	Implementability	Environmental and Groundwater Management Benefits	Flexibility Regarding Future Management	Technical Feasibility
0	No project	**High Score** • No Incremental capital or operation cost in addition to MCWD's cost of producing and distributing groundwater	**Medium Score** • Increased groundwater production from MCWD's existing wells without any groundwater augmentation could cause groundwater levels to fall and/or seawater intrusion to advance, particularly if SMCs are not met in the adjacent 180/400 Foot Aquifer Subbasin (see Section 2.2.6). Such conditions could cause MTs to be exceeded within the Monterey Subbasin. Further, increased extraction from Deep Aquifers could be limited if pumping restrictions are imposed on the Deep Aquifers as part of future SGMA compliance actions in the Salinas Valley Groundwater Basin (SVGB)	**Low Score** • Would not protect existing 180/400-Foot Aquifer production wells from seawater intrusion • Would not increase groundwater elevations in the Deep Aquifers close to shoreline • Could further decrease groundwater elevations in the 400-Foot Aquifer or Deep Aquifers due to increased groundwater production from these aquifers • Could cause additional seawater intrusion in the 180-Foot and 400 Foot Aquifers due to increased groundwater production	**Low Score** • The ability to produce additional groundwater from MCWD's existing wells without causing undesirable results under SGMA depends on management and future conditions in the adjacent 180/400-Foot Aquifer Subbasin	**High Score** • No required action
1	IPR injection / extraction within the 180/400-Foot Aquifer	**Medium Score** • Higher capital cost due to distance from the existing PWM pipeline • Requires abandonment of MCWD Production Wells MCWD-29 and MCWD-30	**Low Score** • Requires permission from Army and County to install wells in Consultation Zone	**High Score** • Likely protects the 180-Foot and 400-Foot Aquifer production wells from seawater intrusion • Likely protects 180/400-Foot Aquifer wells from contaminant migration	**Low Score** • May require some loss of injected water to overall basin to protect wells against seawater intrusion • Higher risk of injected water to be lost to the adjacent 180/400-Foot Aquifer Subbasin • Would require significant modification if gradients change in 180/400-Foot Aquifers pursuant to SGMA	**Medium Score** • Requires modeling and long-term monitoring to assess impacts on contaminant migrations and seawater intrusion
2	Hybrid IPR Injection / extraction in the 180/400-Foot Aquifer and the Deep Aquifer	**Medium Score** • Higher capital cost due to distance from the existing PWM pipeline • Requires installation of monitoring wells and injection well into the Deep Aquifer • Allow existing MCWD 180/400-Foot-Aquifer production wells MCWD-29, MCWD-30, and MCWD-31 to remain, but injection/extraction rates would need to be coordinated between wells	**Medium Score** • New 180/400-Foot Aquifer extraction well could be placed outside of Prohibition and Consultation zones • Requires permission from Army and County to install 180/400-Foot Aquifer injection well in the Consultation Zone	**Low Score** • Would not protect existing 180/400-Foot Aquifer production wells from seawater intrusion • Would not increase groundwater elevations in Deep Aquifers close to shoreline	**Medium Score** • Higher risk of injected water to be lost to the adjacent 180/400-Foot Aquifer Subbasin • Injection into multiple aquifer zones provides greater flexibility if hydraulic gradients or conditions change in one zone • Injection and extraction wells unlikely to be impacted by seawater intrusion as wells are far inland	**Medium Score** • Requires modeling and long-term monitoring to assess impacts on contaminant migration and seawater intrusion front • Will likely require further characterization of gradients in Deep Aquifer

	Option	Incremental Capital and Operation Costs	Implementability	Environmental and Groundwater Management Benefits	Flexibility Regarding Future Management	Technical Feasibility
3	IPR injection / extraction in the Deep Aquifer	**Medium Score** • Lower capital cost due to proximity to the existing PWM pipeline • Requires installation of monitoring wells and injection well into the Deep Aquifer	**Medium Score** • No known seawater intrusion exists in the Deep Aquifer, however injection/extraction wells would be located approximately 2 miles from the coastline and in areas where seawater intrusion has occurred in the 400-Foot Aquifer. Data suggest that significant clay layers exist between the base of the 400-Foot Aquifer and the Deep Aquifers that limit downward vertical flow into these aquifers. The data also suggest that these aquifers could be isolated from the ocean or that submarine outcrops, if they exist, are located very far away from the coastline. Monitoring is being conducted as part of GSP implementation to assess the potential for both vertical and lateral migration of seawater into these aquifers (see Section 2.2.5.1) • SVGB-wide efforts are underway as part of GSP implementation to stop further groundwater level declines in the Deep Aquifers, which should aid in decreasing the risks of future seawater intrusion. • There is no known groundwater contamination within the Deep Aquifers, as such, Fort Ord Prohibition and Consultation Zones should not applicable to Deep Aquifers wells. However, coordination with the Army will be required for construction of the backflush basin which is located within the Prohibition Zone.	**High Score** • Would aid in stabilizing groundwater elevations in the Deep Aquifers near MCWD's main Deep Aquifer production wells (MCWD-10 and MCWD-11) • Would augment supplies in the Deep Aquifers, which may become subject to SVGB-wide groundwater use restrictions triggered by SMCs associated with on-going groundwater level declines in these aquifers. • Would aid in decreasing the risk of seawater intrusion into the Deep Aquifers, particularly if other SVGB-wide efforts are successful in decreasing extraction from the Deep Aquifers • Could aid in protecting the 400-Foot from seawater intrusion in the southern portion of the Marina Ord Area, as groundwater levels in this area are likely the result of groundwater level declines in the Deep Aquifers.	**Medium Score** • Not impacted by hydraulic gradients or anticipated changes in conditions within the 180- and 400-Foot Aquifers, which are likely to occur to address ongoing seawater intrusion within these aquifers in the 180/400 Foot Aquifer Subbasin.	**High Score** • Will require further characterization of gradients in Deep Aquifer

4.2 Description of Water Recycling Alternatives Developed for Further Evaluation

Option 3, which includes injection/extraction in the Deep Aquifers, was selected for further evaluation based on an initial screening of potential IPR alternatives identified in Section 4.1. Two potential injection/extraction alternatives within the Deep Aquifer were identified based on hydrogeologic conditions, land use, and the location of existing facilities. Both alternatives include injection sites upgradient of MCWD's Deep Aquifers production wells MCWD-10 and MCWD-11 on land parcels that are owned by the District. Further description of these two alternatives is provided in Sections 4.2.2 and 4.2.3 below. Numerical groundwater modeling (Section 4.3) was conducted for both of the identified injection/extraction alternatives to define and confirm the capture zone of the project extraction wells (i.e., MCWD-10 and MCWD-11) under potential IPR operations and verify that siting of these alternatives provide aquifer residence times that comply with minimum residence time requirements for GRRP set by the SWRCB (see Section 3.3.1). Further engineering evaluation of each alternative is provided in Section 5.

As required by the State Water Resources Control Board's guidelines for recycled water feasibility studies, the No Project Alternative is retained for further evaluation as a baseline case for comparison purposes. The No Project Alternative is identified as Alternative 1 and described in Section 4.2.1.

The following sections describe each alternative identified for further evaluation in detail.

4.2.1 No Project Alternative (Alternative 1)

Under the No Project Alternative:

- No groundwater augmentation alternative would be implemented, and the additional 827 AFY of water generated by the IPR Project to meet increased future water demands would be met through increased groundwater extraction from existing MCWD groundwater production wells.
- There would be no additional beneficial use of the recycled water produced by M1W aside from existing landscape irrigation

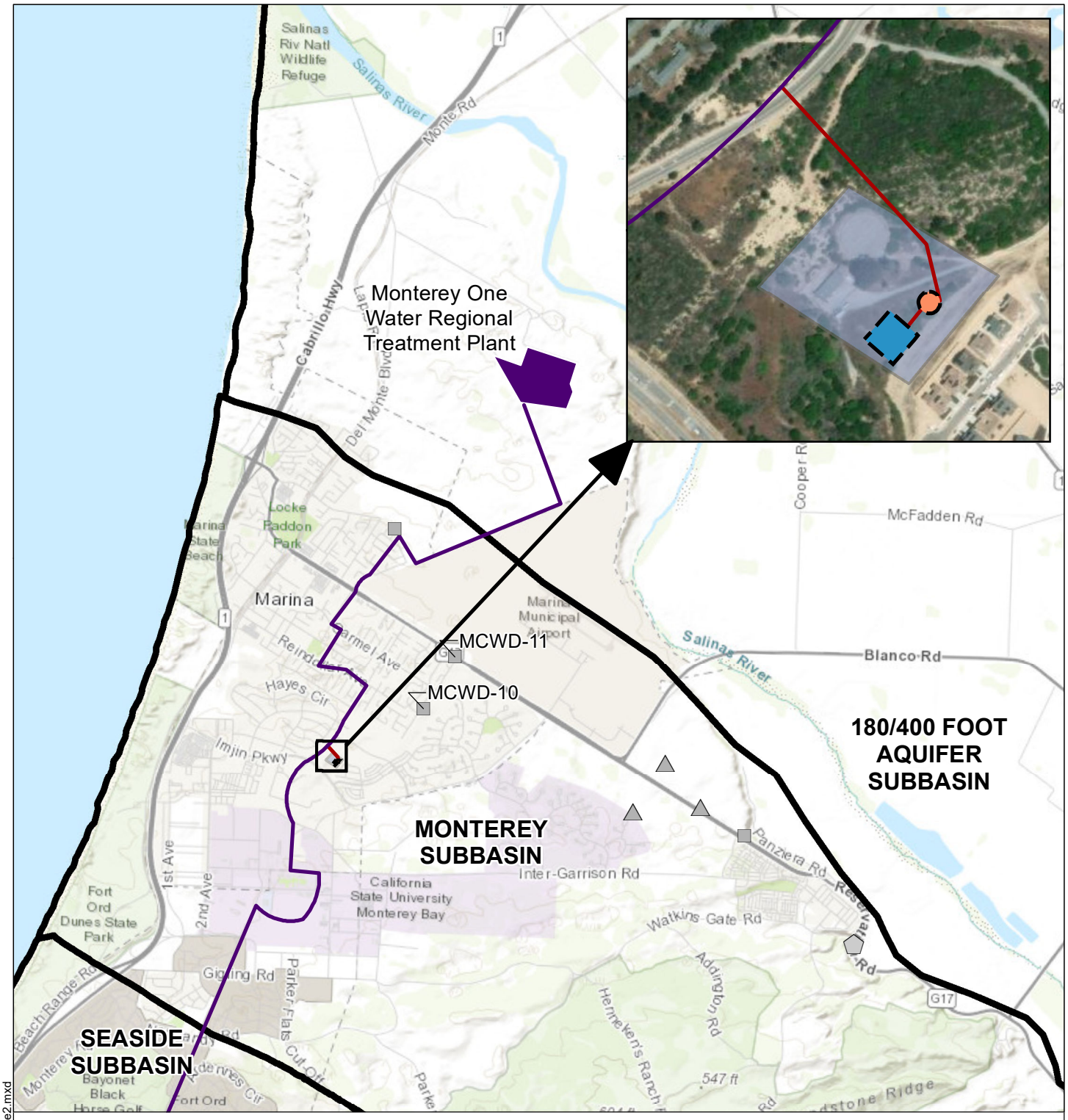
4.2.2 Groundwater Replenishment – California Avenue Alternative (Alternative 2)

Alternative 2 consists of injecting advanced-treated recycled water into the Deep Aquifers at a site located on California Avenue for later extraction at the existing MCWD Deep Aquifers wells MCWD-10 and MCWD-11. A description of the alternative is provided below.

4.2.2.1 Description of Alternative

The components of Alternative 2 are shown on Figure 4-2. As shown therein, the major facilities to be constructed would include the following:

- Approximately 400 linear feet of pipeline to convey advanced treated recycled water from the existing PWM Pipeline to the injection well;
- One injection well, approximately 1,300 feet deep and 18 inches in diameter, with a total injection capacity of 1,000 gallons per minute (gpm), at the locations shown on Figure 4-2, plus associated well pads, pedestals, site piping, hydropneumatic tank, and electrical, instrumentation, and controls work; and
- A backflush basin for percolating the water produced through periodic pumping of the injection wells, with approximate dimensions as described in Section 4.2.2.2.



Legend

- Existing Pure Water Monterey Pipeline
- Regional Treatment Plant
- Potential Pipeline Alignment
- Property Boundary
- Groundwater Subbasins within Salinas Valley Basin
- Potential Backflush Basin Location
- Potential Injection Well Location
- Lower 180-Foot, 400-Foot Aquifer Production Wells
- 400-Foot/Deep Aquifers Production Wells
- Deep Aquifers Production Wells

N

0 1 2

(Scale in Miles)

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 8 October 2022.

Major Components of Alternative 2

Marina Coast Water District
Marina, CA
October 2022

Figure 4-2

Path: X:\B60094\Maps\2022\10\GRRP_Fig4-2_CA Ave Alternative2.mxd

4.2.2.2 Storage and Backflush Basin Requirements

The proposed injection well location is located upstream of the existing Purified Water Reservoir for the M1W system, which currently provides some pressure control and flow equalization for the overall purified water system. However, because the injection flow rate is a relatively small fraction of the overall average daily recycled water flow available, it is assumed that the injection flow will be available with no additional product water storage being added upstream of the injection facilities.

As previously discussed, a backflush basin will be needed for percolating the water produced through periodic pumping of the injection wells. The approximate required size of the backflush basin is estimated to be approximately 8,000 square feet based on an assumed backflush rate of 2,000 gpm, an assumed backflush duration of 4 hours per week, and an assumed maximum water depth of 10 feet[11].

It should be noted that the backflush basin location is within the Ford Ord Special Groundwater Protection "Prohibition Zone," within which construction of new groundwater extraction wells and injection wells is prohibited without Army consent. The construction of recharge basins is not prohibited within the Prohibition Zone, however, construction of such a basin could potentially impact groundwater flow conditions in this portion of the Dune Sand Aquifer, where low levels of residual groundwater contamination still exist. Therefore, consultation and coordination with the Army will be required to confirm that the Army is amenable to the placement of a backflush basin at this location or alternatively, to aid in the development of an alternative solution for disposal of the backflush water discharge. One potential backup solution would be to add a liner to the backflush basin to store the water and connect the basin to the sanitary sewer, provided that there is sufficient capacity in the sanitary sewer. For the purposes of this study, it has been assumed that a backflush basin could be constructed in this area.

4.2.3 Groundwater Replenishment – Well 9 Site Alternative (Alternative 3)

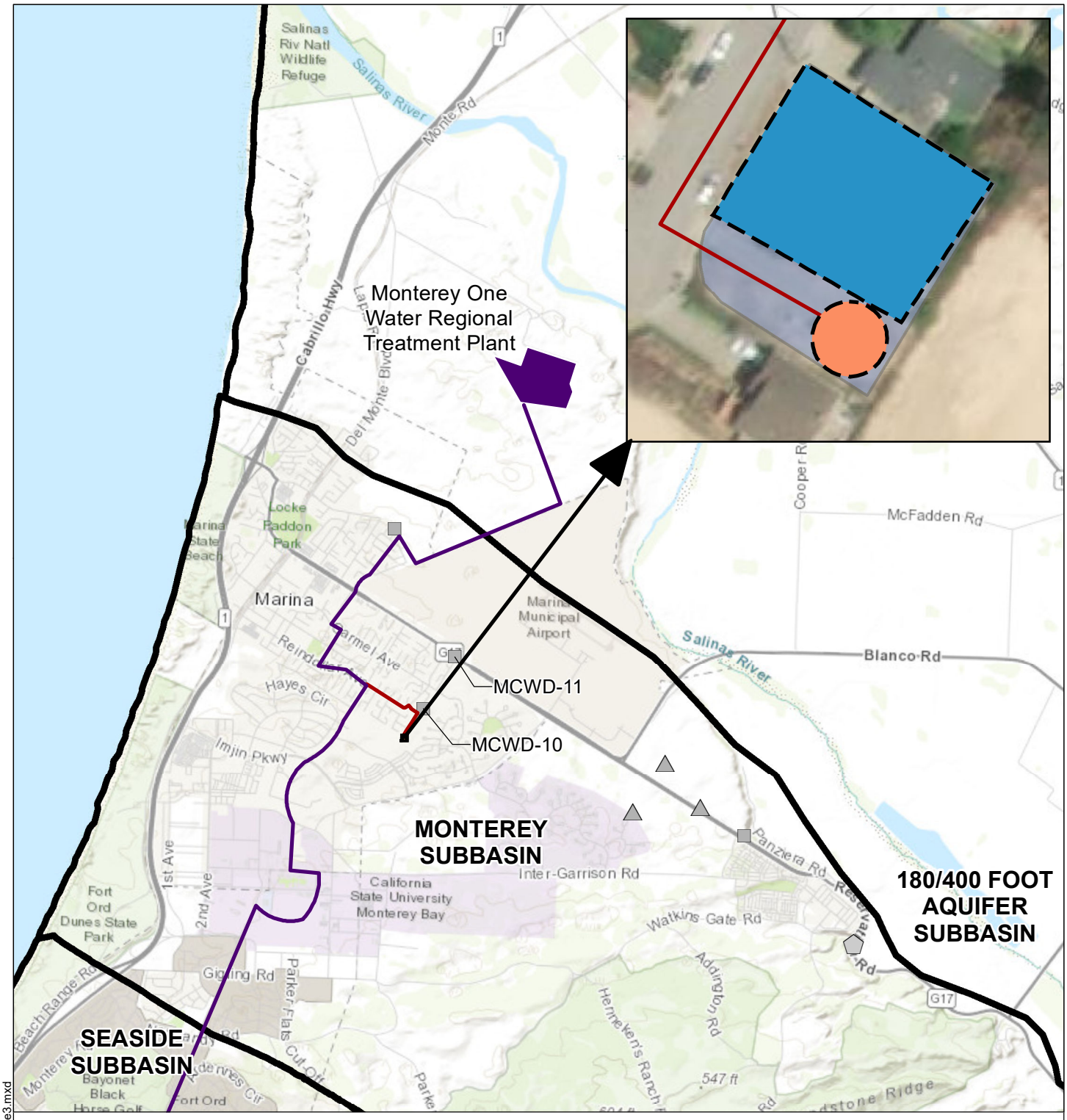
Alternative 3 consists of injecting advanced-treated recycled water into the Deep Aquifers at the District's Well 9 Site for later extraction at the existing MCWD Deep Aquifers wells MCWD-10 and MCWD-11. A description of the alternative is provided below.

4.2.3.1 Description of Alternative

The components of Alternative 3 are shown on Figure 4-3. As shown therein, the major facilities to be constructed would include the following:

- Approximately 3,500 linear feet of pipeline to convey advanced treated recycled water from the existing PWM pipeline to the injection well;
- One injection well, approximately 1,300 feet deep and 18 inches in diameter, with a total injection capacity of 1,000 gpm, at the locations shown on Figure 4-3 plus associated well pads, pedestals, site piping, hydropneumatic tank, and electrical, instrumentation, and controls work; and
- A backflush basin for percolating the water produced through periodic pumping of the injection wells, with approximate dimensions as described in Section 4.2.2.2.

[11] The calculation is as follows: 2,000 gpm x 240 minutes = 480,000 gallons per backflush = 77,061 cubic feet. Dividing the 77,061 cubic feet by 10 feet results in an area of 7,706 square feet which rounds to 8,000 square feet. Based on an assumed infiltration rate of 6 feet per day based on (Trussell, et. al, 2019), the 10 feet of water would percolate in less than two days.



Legend

- Potential Backflush Basin Location
- Potential Injection Well Location
- Existing Pure Water Monterey Pipeline
- Regional Treatment Plant
- Potential Pipeline
- Lower 180-Foot, 400-Foot Aquifer Production Wells
- 400-Foot/Deep Aquifers Production Wells
- Deep Aquifers Production Wells
- Property Boundary
- Groundwater Subbasins within Salinas Valley Basin

N

0 1 2

(Scale in Miles)

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 8 October 2022.

Major Components of Alternative 3

Marina Coast Water District
Marina, CA
October 2022

Figure 4-3

Path: X:\B60094\Maps\2022\10\GRRP_Fig4-4_CA Ave Alternative3.mxd

4.2.3.2 Storage and Backflush Basin Requirements

The Well 9 Site Alternative has similar storage and backflush basin requirements as described in Section 4.2.2.2.

4.3 Groundwater Modeling Development and Residence Time Analysis

For each alternative identified for detailed screening above, groundwater modeling analyses were performed to define and confirm the capture zone of the project extraction wells (i.e., MCWD-10 and MCWD-11) under potential IPR operations and verify that siting of these alternatives provide aquifer residence times that comply with minimum residence time requirements for GRRP set by the SWRCB (see Section 3.3.1).

4.3.1 Groundwater Flow Model Overview

The Monterey Subbasin Groundwater Flow Model (MBGWFM) was developed for the Monterey Subbasin to support the development of the Monterey Subbasin GSP (MCWD & SVBGSA, 2022a) in accordance with the requirements of SGMA. The MBGWFM is an approximation of the spatial extent and temporal variability of the groundwater system in the Monterey Subbasin and can be used to quantitatively evaluate local hydrogeologic conditions associated with water inflows, outflows, and associated connectivity between adjacent Seaside Subbasin, 180/400-Foot Aquifer Subbasins and the Pacific Ocean.

The MBGWFM utilizes the USGS computer code MODFLOW-NWT (Niswonger et al., 2011). As the Basin has variable degrees of confinement depending on aquifer formation and location, MODFLOW-NWT is an appropriate and effective computer code to solve the groundwater flow equation. The model covers the entire extent of the DWR-defined Monterey Subbasin boundary (DWR No.3-004.10) as well as areas on the periphery of the boundary. The MBGWFM is further discretized vertically into eight layers to represent unique Principal Aquifer or Aquitard units defined in the GSP and is consistent with previous hydrogeologic conceptualizations for the Subbasin. The MBGWFM includes both a historical simulation and multiple projected simulations. The historical simulation is discretized temporally into 240 monthly stress periods, representing a 20-year simulation period from DWR WY 1999 through WY 2018 to provide historical water budget and calibration. Several projected simulations were developed to predict aquifer response to various future supply and demand conditions and GSP implementation scenarios. Each projected simulation is discretized into 600 monthly stress periods, representing a 50-year projected water budget period from WY 2019 through WY 2068.

The MBGWFM was calibrated using the Model-Independent Parameter Estimation and Uncertainty Analysis (PEST) package to reasonably represent historically observed groundwater conditions in the Monterey Subbasin. In total, 65 unique parameters are specified within the MBGWFM, primarily related to aquifer properties (i.e., hydraulic conductivity and storage) defined within each model layer and for each specified boundary condition. PEST calibration is guided by professional user input, including specifying priors, bounds, and relationships between model parameters informed by existing available hydrogeologic data and information, and thus can be systematically applied to achieve an acceptable model error while keeping the parameter space constrained within reasonable limits. MBGWFM calibration statistics are summarized in Appendix 6B of the Monterey Subbasin GSP (MCWD & SVBGSA, 2022a).

Additional model information, including initial conditions, boundary conditions (e.g., no-flow, general-head, and river boundaries), aquifer properties, stresses (i.e., recharge and pumping), sensitivity analysis and other suggested future refinements can be found in Appendix 6B of the Monterey Subbasin GSP (MCWD & SVBGSA, 2022a).

4.3.2 Groundwater Replenishment Reuse Project (GRRP) Model Simulations

As part of this feasibility study, the MBGWFM model was refined in the vicinity of each GRRP alternative based on nearby aquifer pumping test data. The refined model was used to create several additional MBGWFM projected model scenarios to explicitly simulate each proposed GRRP alternative described in Section 4.2. The main objectives of simulating GRRP operations were to: (1) estimate the flow paths and travel velocities of recycled water particles injected at the proposed IPR injection well locations; (2) delineate the capture zones of proposed IPR extraction wells and other nearby production wells; and (3) estimate the aquifer residence times of injected recycled water molecules before recapture and evaluate whether or not either of the proposed GRRP alternatives are likely to comply with minimum residence time requirements for GRRP set by the SWRCB (see Section 3.3.1).

Simulating the GRRP alternatives was done in a multi-step process that included:

1) Refining local MBGWFM parameterization in the vicinity of the proposed GRRP alternatives based on nearby aquifer pumping test data (as necessary);
2) Developing projected MBGWFM scenarios for each GRRP alternative proposed in Section 4.3; and
3) Applying the USGS MODPATH software utility (Pollock, 2016) to simulate the flow paths of groundwater molecules originating at the GRRP injection well locations and estimate their residence times before recapture.

Each of these steps are further detailed below.

4.3.2.1 Model Refinements

As part of this exercise, aquifer transmissivity parameters were revisited in MBGWFM Layer 8 (i.e., the Deep Aquifers) to better encapsulate the range in plausible hydraulic conductivity distributions in the immediate vicinity of each GRRP site alternative and their associated impacts to groundwater flow paths and travel times near the GRRP. Specifically, local aquifer test data were analyzed to create three alternative distributions in horizontal hydraulic conductivity (Kh) that generally represented "low", "average", and "high" Kh scenarios as follows:

1) "Low" Kh – based off the original Kh distribution in the calibrated historical MBGWFM; corresponds to a Kh of approximately three to six feet per day (ft/d) in the vicinity of the GRRP;
2) "Average" Kh – based of the average Kh observed from nearby aquifer pumping test data in production wells MCWD-10, MCWD-11, and MCWD-12; corresponds to a Kh of approximately 18 – 25 ft/d in the vicinity of the GRRP.
3) "High" Kh – one order of magnitude higher than the original Kh distribution in the calibrated historical MBGWFM; corresponds to a Kh of approximately 30-60 feet/day (ft/d) in the vicinity of the GRRP

Each alternative Layer 8 Kh distribution described above still relied on the original coarse-grained texture model from the calibrated MBGWFM to inform the spatial variability in Kh within the aquifer (see Appendix 6B of the Monterey GSP for further details).

Each alternative set of Kh parameters was re-applied to the historical MBGWFM to ensure that the adjusted parameterization did not materially impact MBGWFM calibration at nearby wells to the GRRP site. In all cases, the scaled root-mean square error (RMSE) of Deep Aquifer (i.e., Layer 8) calibration wells in Marina-Ord Management Area did not increase by more than 1%, indicating the model was still performing within industry standards under each alternative Kh distribution.

4.3.2.2 GRRP Scenario Development

Several projected MBGWFM scenarios were developed to simulate IPR operations at each proposed GRRP alternative described in Section 4.2 under a range of assumptions regarding (1) hydraulic conductivity distributions and (2) municipal groundwater demands. GRRP operations were specifically simulated using the following assumptions:

1) Injection of 827 AFY, using a seasonal distribution in monthly injection volumes that aligns with the delivery schedule included in the 2016 Pure Water Delivery and Supply Project Agreement (see Section 3.2.3.2);
2) Injection using a single well entirely penetrating the Deep Aquifer (i.e., MBGWFM Layer 8); and
3) Injection located at either the California Avenue (Alternative 2) or Well 9 Site (Alternative 3).

GRRP operations were simulated from each GRRP Alternative under each of the three horizontal hydraulic conductivity (Kh) distributions described in Section 4.3.2.1 above and using one of the following assumptions for projected groundwater pumping demands at MCWD production wells:

1) Constant MCWD pumping rates based on "current" (i.e., WY 2018) conditions defined in the GSP, equivalent to ~2,700 AFY; or
2) 50-year projected MCWD pumping rates based on future demands outlined in the 2020 MCWD UWMP; i.e., increasing from ~2,700 AFY to ~8,800 AFY by 2040 (see Section 3.1.5).

Each GRRP model scenario employed the following additional assumptions used in the projected MBGWFM (see the Appendix 6B of the Monterey GSP for further details):

1) Initial head conditions based on final outputs from the calibrated historical MBGWFM (i.e., end of WY 2018);
2) 50-year projected hydrology with 2030 climate change conditions based on DWR's climate change factors dataset (DWR, 2020);
3) "Minimum Threshold" water level boundary conditions at the 180/400 Subbasin boundary; and
4) WY 2018 water level boundary conditions at the Seaside Subbasin boundary

Table 4-2 below summarizes the assumptions used for the GRRP model scenarios.

Table 4-2. Summary of Assumptions Employed in GRRP Model Scenarios

Categories	Scenarios
Initial Head	End of WY 2018, based on outputs from calibrated historical MBGWFM
Hydrology	50-year projected, with 2030 DWR climate change conditions
Boundary Conditions	"MT" water levels at 180/400 Subbasin boundary WY 2018 water levels at the Seaside Subbasin boundary
MCWD Pumping Demands	Option 1 – Current (i.e., WY 2018) pumping Option 2 – 50-year projected pumping (based off 2020 UWMP)
Aquifer Properties	Option 1 – "Low" Kh = 3-5 ft/day Option 2 – "Average" Kh = 18-25 ft/day Option 3 – "High" Kh = 30-60 ft/day
GRRP Injection Site Alternatives	Option 1 – California Avenue Alternative Option 2 – Well 9 Site Alternative
Abbreviations: ft/day = foot per day Kh = horizontal hydraulic connectivity	 MT = minimum threshold WY = Water Year

4.3.2.3 Flow Path Analysis

After running each GRRP model scenario described in Section 4.3.2.3, the MODPATH (Pollock 2016) software package was subsequently employed to estimate the flow paths and travel times of groundwater molecules originating at the two proposed GRRP site locations under the range of assumptions listed in Table 4-2 above. MODPATH is a software tool developed by the USGS designed to simulate the flow and travel time of groundwater molecules originating from specific locations of interest within the active model domain. This program can help determine whether or not recycled water molecules injected at the GRRP site locations are likely to travel within the capture zone of the proposed IPR extraction wells (i.e., MCWD-10 and MCWD-11) or other nearby production wells within the Subbasin, and if so, whether or not they will achieve the residence time requirements of a GRRP outlined by the SWRCB (see Section 3.3.1) before they are recovered for beneficial uses including human consumption.

For this task, MODPATH was used to complete a series of groundwater "particle tracking" runs for each of the GRRP projected scenarios listed in Section 4.3.2.3 above. MODPATH "particles" (i.e., simulated groundwater molecules) were inserted into the center of the Deep Aquifer (i.e., midpoint of Layer 8) in MBGWFM cells representing and immediately surrounding each proposed IPR injection well location (i.e., either California Avenue or Well 9 Site) and the model was subsequently run for each projected GRRP scenario. Particle tracking results then examined to determine if groundwater molecules originating at the proposed IPR injection well locations entered the capture zone of the proposed IPR extraction wells (i.e., MCWD-10 and MCWD-11) or any other production wells within the Monterey Subbasin, and if so, what their minimum residence times were before recapture. Effective porosity for the Deep Aquifer was set at 0.0925 for all particle tracking runs, based on the midpoint of the range of values (0.0625 to 0.12) reported for the Deep Aquifer from relevant literature (Geoscience, 2015; HydroFocus, 2016; and Todd, 2015).

4.3.3 Groundwater Modeling Results

4.3.3.1 California Avenue Alternative (Alternative 2)

Figure 4-4 presents a map of flow paths and travel times for MODPATH particles released at the California Avenue (Alternative 2) injection site under four GRRP model scenarios[12]:

Scenario A – "High" horizontal hydraulic conductivity (Kh) (i.e., ~30-60 ft/d), 2018 MCWD pumping rates (i.e., ~3,400 AFY)

Scenario B – "High" Kh, projected MCWD pumping rates (i.e., increasing to ~8,600 AFY by 2040);

Scenario C – "Average" Kh (i.e., ~18-25 ft/d), 2018 MCWD pumping rates

Scenario D – "Average" Kh, projected MCWD pumping rates

The particle positions represent the movement trajectory of recycled water molecules injected at the California Avenue injection well location and are color coded by the travel time to each incremental position shown on the map. As shown on Figure 4-4, groundwater molecules originating in the Deep Aquifer at the California Avenue site are likely to be captured by production wells MCWD-10 and/or MCWD-11 for all GRRP scenarios. For the "high" Kh scenarios (Scenarios A and B), a portion of particles released at the California Avenue site evade capture from MCWD-10 but are ultimately captured by MCWD-11. For the "average" Kh scenarios, particles released at the IPR injection site are either captured

[12] The "low" Kh model scenarios, which use the Deep Aquifer Kh distribution from the calibrated MBGWFM, are not included here as they will always result in longer minimum residence times than the "average" and "high" Kh scenarios. Thus, the results shown in Section 4.3.3 are conservative by nature.

by MCWD-10 or do not reach any production well before the MODPATH run is terminated at the end of the 50-year projected model simulation period.

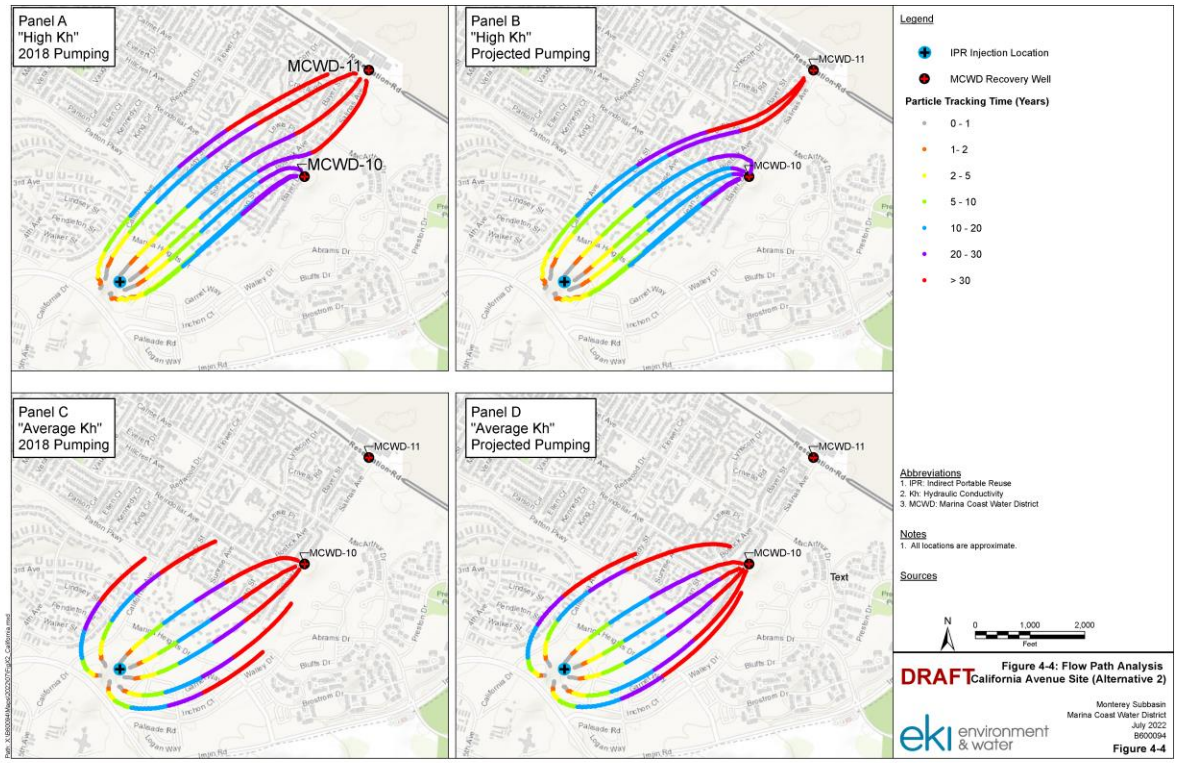


Figure 4-4. Flow Path Analysis – California Avenue Site (Alternative 2)

Table 4-3 summaries the minimum residence times of particles released at and immediately surrounding the California Avenue site under each scenario mentioned above. For all scenarios, the minimum residence time exceeds 21 years, which reliably satisfies the SWRCB's minimum residence criteria for the proposed GRRP (i.e., 10-months to achieve 5-log virus reduction when demonstrated using a numerical model; see Section 3.3.1 for further details). The shortest residence time from particles injected at the California Avenue site was calculated to be **256 months** under Scenario B ("high" Kh, projected MCWD pumping conditions).

Table 4-3. Residence Times of Particles Injected at California Avenue Site (Alternative 2)

Scenario	Kh Condition	MCWD Pumping Rates	Residence Time (months)
A	"High" (30-60 ft/d)	WY 2018	303
B	"High" (30-60 ft/d)	Projected	256
C	"Average" (18-25 ft/d)	WY 2018	500
D	"Average" (18-25 ft/d)	Projected	493
Abbreviations: ft/day = foot per day WY = Water Year		Kh = horizontal hydraulic connectivity	

4.3.3.2 Well 9 Site Alternative (Alternative 3)

Figure 4-5 presents a map of flow paths and travel times for MODPATH particles released at the Well 9 Site (Alternative 3) injection site under four GRRP model scenarios[13]:

Scenario A – "High" horizontal hydraulic conductivity (Kh) (i.e., ~30-60 ft/d), 2018 MCWD pumping rates (i.e., ~3,400 AFY)

Scenario B – "High" Kh, projected MCWD pumping rates (i.e., increasing to ~8,600 AFY by 2040);

Scenario C – "Average" Kh (i.e., ~18-25 ft/d), 2018 MCWD pumping rates

Scenario D – "Average" Kh, projected MCWD pumping rates

The particle positions represent the movement trajectory of recycled water molecules injected at the Well 9 Site injection well location and are color coded by the travel time to each incremental position shown on the map. As shown on Figure 4-5, groundwater molecules originating in the Deep Aquifer at the Well 9 Site are likely to be captured by production wells MCWD-10 and/or MCWD-11 for all GRRP scenarios. For the "high" Kh scenarios (Scenarios A and B), a portion of particles released at the IPR injection site evade capture from MCWD-10 but are ultimately captured by MCWD-11. For the "average" Kh scenarios, particles released at the Well 9 Site are either captured by MCWD-10 or do not reach any production well before the MODPATH run is terminated at the end of the 50-year projected model simulation period.

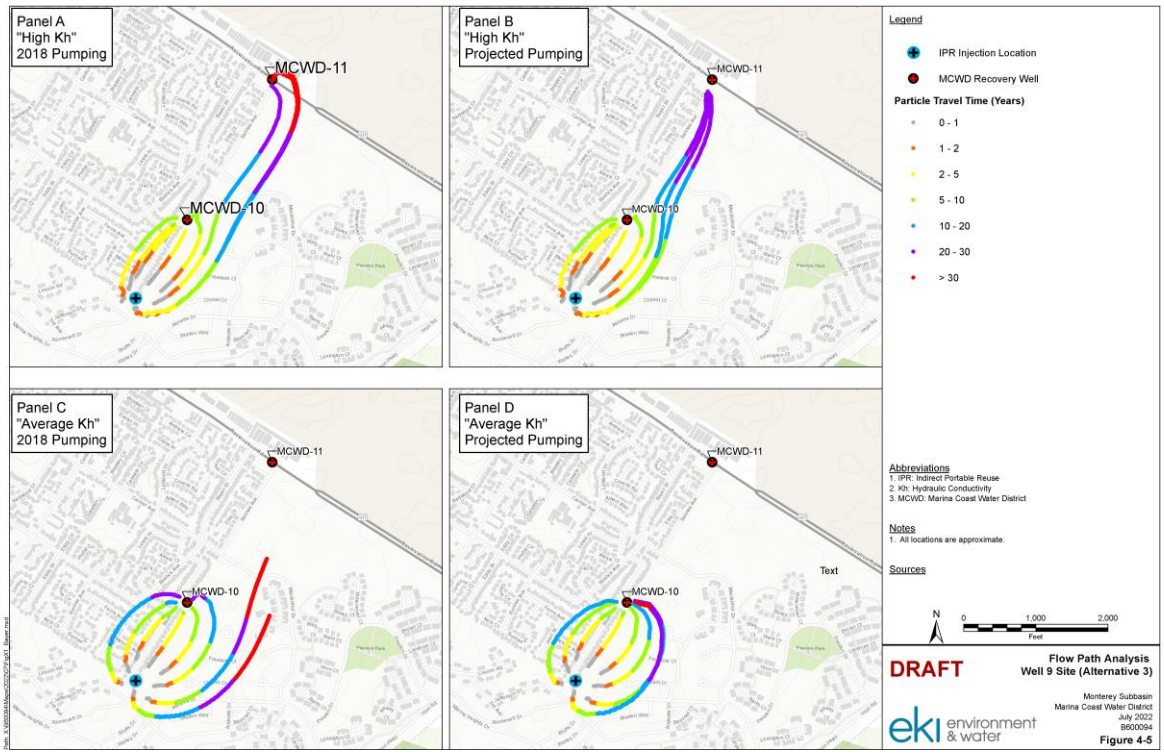


Figure 4-5. Flow Path Analysis – Well 9 Site (Alternative 3)

[13] The "low" Kh scenarios, which use the Deep Aquifer Kh distribution from the calibrated MBGWFM, are not included here as they will always result in longer minimum residence times than the "average" and "high" Kh scenarios. Thus, the results shown in Section 4.3.3 are conservative by nature.

Table 4-4 summaries the minimum residence times of particles released at and immediately surrounding the Well 9 site under each scenario mentioned above. For all scenarios, the minimum residence time exceeds three (3) years, which reliably satisfies the SWRCB's minimum residence criteria for the proposed GRRP (i.e., 10-months to achieve 5-log virus reduction when demonstrated using a numerical model; see Section 3.3.1 for further details). The shortest residence time from particles injected at the Well 9 Site was calculated to be **43 months** under Scenario A ("high" Kh, 2018 MCWD pumping conditions).

Table 4-4. Residence Times of Particles Injected at Well 9 Site (Alternative 3)

Scenario	Kh Condition	MCWD Pumping Rates	Residence Time (months)
A	"High" (30-60 ft/d)	WY 2018	43
B	"High" (30-60 ft/d)	Projected	45
C	"Average" (18-25 ft/d)	WY 2018	61
D	"Average" (18-25 ft/d)	Projected	63
Abbreviations: ft/day = foot per day WY = Water Year		Kh = horizontal hydraulic connectivity	

5 DETAILED EVALUATION OF RECYCLED WATER ALTERNATIVES

5.1 Evaluation Approach

An evaluation of beneficial users, water quality impacts, economics, and energy use associated with Alternatives 1, 2, and 3 is provided in Sections 5.2 through 5.4. Because all alternatives involve MCWD producing and distributing the water supply from its existing production wells, the identified costs and energy usage for each alternative only include the incremental cost and energy usage of groundwater replenishment. They do not include the District's baseline per unit costs or energy usage for groundwater extraction, treatment, and delivery, which would be equivalent for each of the identified alternatives. The District's baseline unit costs for groundwater extraction, treatment and delivery are presented in Section 3.1.5.2, and include expenditures associated administration, operation and maintenance (e.g., system maintenance, fuel, and chemicals), laboratory, conservation, engineering, and GSA implementation (MCWD, 2018). These baseline unit costs for supplying groundwater are estimated to be $3,336/AF. Similarly, the identified energy usage costs only reflect incremental energy usage for groundwater replenishment and do not include energy costs associated with groundwater extraction, treatment or delivery of groundwater to District customers.

The estimated incremental costs for each groundwater replenishment alternative are based on recent bids from similar projects, budget-level costs from equipment manufacturers, and experience with similar projects. Assumed unit costs are included in each alternative cost table, and additional assumptions are described below. Cost estimates assume appropriate redundancy for pumps and other critical equipment. All alternatives assume pipeline easements are generally within the public right-of-way; therefore, no land costs were included for pipelines. Capital costs[14] were annualized over a 30-year period assuming a 3% interest rate[15] and are presented along with operations and maintenance costs in 2022 dollars. All are Class 5 level estimates for conceptual or screening level project development (AACEI, 2019), which typically have an expected accuracy of +100% to -50%.

5.2 No Project Alternative (Alternative 1)

5.2.1 Users and Stakeholders

Under the No Project Alternative, no groundwater augmentation would be implemented, and increased groundwater extraction from existing MCWD groundwater production wells would be used to generate the additional 827 AFY of potable water to aid in meeting increased future water demands. In addition, MCWD's groundwater production from the Deep Aquifers would be at greater risk of reduction due to potential SVGB-wide groundwater use restrictions triggered under SGMA as a result of ongoing groundwater level declines in the aquifer.

Under the No Project Alternative, there would also not be any additional beneficial use by MCWD of the recycled water produced by M1W aside from existing landscape irrigation.

5.2.2 Permitting Requirements

The No Project Alternative would require no additional permitting.

[14] Capital costs include all costs for construction, engineering design, permitting, construction management, and project implementation (MCWD staff time for the project).
[15] Office of Management and Budget Circular A-94 lists a 30-year discount rate of 2.4%, which was rounded up to the nearest percent for purposes of this evaluation.

5.2.3 Water Quality Impacts

The potential impact to groundwater quality from the No Project Alternative is difficult to predict accurately. However, as discussed above, increased groundwater production from MCWD's existing wells without any groundwater augmentation could cause groundwater levels to fall and/or seawater intrusion to increase, particularly if SMCs are not met in the 180/400 Foot Aquifer Subbasin (see Section 2.2.6). Such conditions could cause MTs to be exceeded within the Monterey Subbasin and increase the risk of further seawater intrusion.

5.2.4 Incremental Cost Analysis

The unit cost for the production of an additional 827 AFY of groundwater under the No Project Alternative should be equivalent to baseline groundwater extraction, treatment and delivery costs outline in Section 3.1.5.2. Therefore, the incremental project cost for this alternative is estimated to be zero.

5.2.5 Incremental Energy Analysis

Similarly, the incremental energy cost of the No Project Alternative is estimated to be zero.

5.3 Groundwater Replenishment – California Avenue Alternative (Alternative 2)

5.3.1 Users and Stakeholders

As with the other IPR project alternatives, the primary project stakeholders would be MCWD and M1W. The ultimate users of the recycled water would be the customers of MCWD, located within the City of Marina and the former Fort Ord. These users and stakeholders would benefit from the IPR Project through the continued delivery of high quality water by MCWD. The IPR Project would also protect MCWD's groundwater production from the Deep Aquifer in the event that SVGB-wide groundwater use restrictions are triggered under SGMA as a result of on-going groundwater level declines in these aquifers.

Other stakeholders that would be involved in project planning including the Army, which is responsible for cleanup of the former Fort Ord. As part of the cleanup, the Army has worked with Monterey County to establish groundwater protection zones in the vicinity of the former Fort Ord that either prohibit well construction or require County permission to construct new wells. Preliminary discussions with the Army indicate that the established Prohibition Zones and Consultation Zones would not apply to wells constructed within the Deep Aquifers since there is no known contamination from Fort Ord within the Deep Aquifers. As noted in Section 4.2, the proposed backflush basin location is within the Ford Ord Special Groundwater Protection. The construction of recharge basins is not prohibited within Prohibition Zone; however, construction of a backflush basin could potentially impact local groundwater flow conditions in the Dune Sand Aquifer where low levels of residual groundwater contamination still exist. Therefore, consultation and coordination with the Army will be required to confirm that the Army is amenable to placement of a backflush basin at this location, or alternatively, to aid in the development an alternative solution for disposal of the backflush water discharge. One potential backup solution would be to add a liner to the backflush basin to store the water and connect the basin to the sanitary sewer, provided that there is sufficient capacity in the sanitary sewer. For the purposes of this study, it has been assumed that a backflush basin could be constructed in this area, but the costs described in Section 5.3.4 include a contingency to cover adding a liner and constructing a pipeline connecting the basin to the sanitary sewer.

In addition, there are numerous water supply projects currently in development to serve portions of the Monterey Peninsula, with various municipalities and agencies involved. Municipalities and agencies that will be engaged in the project planning process include California American Water, City of Seaside, City of Marina, California State University Monterey Bay, City of Castroville, City of Salina, and the SVBGSA.

5.3.2 Permitting Requirements

Regulations for subsurface application of recycled water are included in Title 22 of the CCR, Division 4, Chapter 3, Article 5.2. These regulations include minimum treatment requirements for full advanced treatment at the AWPF, as well as requirements to demonstrate adequate retention time within the aquifer. Department of Drinking Water (DDW) primarily oversees permitting of such a system; however, RWQCB is responsible for waste discharge requirements/water recycling requirements for wastewater treatment plants and thus oversees the general water quality effects of discharging treated wastewater into groundwater basins.

Detailed descriptions of all regulatory requirements for the advanced treatment of wastewater as well as implementation of a groundwater replenishment project is included in Section 2 of the Pure Water Monterey Final Engineering Report (Pure Water Monterey, 2019), and the key regulatory considerations are as follows:

- Groundwater replenishment projects must demonstrate adequate log reduction of enteric viruses (12-log), Giardia cysts (10-log), and Cryptosporidium oocysts (10-log). The Pure Water Monterey treatment facility currently achieves 7-log enteric virus reduction, 10-log Giardia cyst reduction, and 10-log Cryptosporidium oocyst reduction, therefore at least 5-log virus reduction is required during underground retention.
- Virus reduction during underground retention must be demonstrated by modeling, using either numerical modeling (which provides 0.5 log reduction credit per month of retention) or Darcy's Law modeling (which provides 0.25 log reduction credit per month of retention). Additionally, a tracer study must be initiated prior to the end of the third month of operation of the GRRP to confirm underground retention.
- A monitoring program is required to be implemented prior to groundwater replenishment project operation including sampling of each aquifer to be injected into over a one-year period. Additionally, at least two monitoring wells are required to be installed and sampled prior to groundwater replenishment project operation.

5.3.3 Water Quality Impacts

Implementation of this alternative will aid in mitigating the potential for seawater intrusion within the Deep Aquifers and near MCWD's production wells. Although there is currently no evidence of seawater intrusion within the Deep Aquifers, groundwater levels are well below sea level in the Deep Aquifers within the Study Area. This alternative will increase groundwater levels within the Deep Aquifers near the coast and near MCWD's existing Deep Aquifers production wells and, as such, decrease the risk of seawater intrusion into these aquifers from both the overlying 400-Foot Aquifer and the submarine portions of the Deep Aquifers. However, it should be recognized that implementation of this alternative will not, by itself, stop further declines in groundwater levels within the Deep Aquifers and the ongoing risk of seawater intrusion. Coordinated efforts across multiple subbasins within the Salinas Valley Groundwater Basin will be required to stop further decline in groundwater levels in the Deep Aquifers pursuant to SMCs. Such efforts have been initiated as part of the Deep Aquifers Study that is being conducted under GSP implementation.

Legacy point-source groundwater contamination at the former Fort Ord also exists in the vicinity of this Project location. This groundwater contamination is, however, limited to the Dune Sand Aquifer and the 180-Foot Aquifer. No contaminants have been detected in the Deep Aquifers, and very thick aquitards exist between the Deep Aquifers and these overlying Aquifers. As such, these legacy groundwater impacts are not expected to impact Injection/extraction within the Deep Aquifer; however, they will need to be considered in the construction of the backflush basin, as discussed in Section 4.2.2.2.

As discussed in Section 3.1.6, the water served by MCWD consistently meets all California and Federal drinking water standards. Given that advanced-treated recycled water is of very high quality, injection of this water should not negatively impact groundwater quality. MCWD's water supply is expected to continue to meet the California and Federal drinking water standards.

5.3.4 Incremental Cost Analysis

Conceptual incremental cost estimates for the Alternative, including capital costs and operation and maintenance (O&M) costs, are shown in Table 5-1, with detailed backup provided in Tables B-1 and B-2 in Appendix B.

Table 5-1. Incremental Cost Estimate Summary for Alternative 2

Item	Water Volume
Water Injection (AFY)	827
	Annual Cost (over 30 Years)
Capital Costs, Annualized ($/year)	$1,000,000
O&M Costs ($/year)[16]	$202,000
Total ($/year)	**$1,202,000**
Total ($/AF)	**$1,040**
Abbreviations: AFY = acre-feet per year	

All infrastructure is assumed to be located on District-owned land and no land purchasing or leasing costs are anticipated.

5.3.5 Incremental Energy Analysis

Table 5-2 below presents the estimated incremental energy usage for Alternative 2, with detailed backup calculations shown in Table B-5 in Appendix B.

Table 5-2. Incremental Energy Estimate Summary for Alternative 2

Item	Operating Pumps	Pump Size (HP)	Operating Time (day/yr)	Energy Use (kWh/yr)[17]
Injection Well Backwash Pump	1	400	8.7	62,000
			Total	**62,000**
Abbreviations: day/yr = day per year HP = horsepower		kWh/yr = kilowatt-hours per year		

[16] O&M cost estimates incorporate the fact that advanced treatment facilities will require additional labor to operate, resulting in additional labor costs.
[17] Energy use is based on a daily operating run time of 90%, and pumps operating at 90% efficiency.

5.3.6 Other Non-Quantified Benefits and Costs

The potential water quality benefits of this alternative are described in Section 5.3.3 above. An additional benefit is that M1W could potentially coordinate its planned expansion of the Pure Water Monterey project with this project to take advantage of economies of scale at the AWPF. Each project would have separate injection well sites, but the treatment of the recycled water would occur at a common facility and therefore be able to share planning and construction costs.

Additionally, using advanced treatment technology and implementing indirect potable reuse can allow for significant community education benefits through public tours of the treatment facility and injection facilities. This community education could aid in increasing public awareness of the benefits of recycled water use, which may be helpful during possible future expansion efforts.

5.4 Groundwater Replenishment – Well 9 Site Alternative (Alternative 3)

The users and stakeholders and permitting requirements for this alternative are equivalent to those identified for Alternative 2 in Sections 5.3.1 and 5.3.2.

5.4.1 Water Quality Impacts

The Groundwater Replenishment – Well 9 Site Alternative will have very similar water quality benefits to those associated with Alternative 2 outlined in Section 5.2.3.

However, because the proposed injection well in this alternative is located closer to MCWD's extraction wells than the injection well in Alternative 2, these water quality benefits are likely to be slightly greater as groundwater levels will be increased closer to MCWD's production wells. Further, less time will be required for injected water to reach MCWD's production wells, increasing the likelihood that injected groundwater will be fully captured by MCWD's production wells and utilized by the District. This benefit is particularly important if the direction of hydraulic gradients change within the Deep Aquifers due to reductions and/or modification of existing groundwater extraction patterns.

5.4.2 Incremental Cost Analysis

Conceptual cost estimates for Alternative 3, including capital costs and operation and maintenance (O&M) costs, are shown in Table 5-3, with detailed backup provided in Tables B-3 and B-4 in Appendix B.

Table 5-3. Cost Estimate Summary for Alternative 3

Item	Water Volume
Water Injection (AFY)	827
	Annual Cost (over 30 Years)
Capital Costs, Annualized ($/year)	$1,058,000
O&M Costs ($/year)[18]	$212,000
Total ($/year)	**$1,270,000**
Total ($/AFY injected)	**$1,090**
Abbreviations: AFY = acre-feet per year	

All infrastructure is assumed to be located on District-owned land, and no land purchasing or leasing costs are anticipated.

5.4.3 Incremental Energy Analysis

Table 5-4 below presents the estimated energy usage for Alternative 3, with detailed backup calculations presented in Table B-5 in Appendix B.

Table 5-4. Energy Estimate Summary for Alternative 3

Item	Operating Pumps	Pump Size (HP)	Operating Time (day/yr)	Energy Use (kWh/yr)[19]
Injection Well Backwash Pump	1	400	8.7	62,000
			Total	**62,000**
Abbreviations: day/yr = day per year HP = horsepower		kWh/yr = kilowatt-hours per year		

5.4.4 Other Non-Quantified Benefits and Costs

The potential water quality benefits of this alternative are described in Section 5.3.3 above. An additional benefit is that M1W could potentially coordinate their planned expansion of the Pure Water Monterey project with this project to take advantage of economies of scale for the treatment portion of the projects. Each project would have separate injection well sites, but the treatment of the recycled water would occur at a common facility and therefore be able to share planning and construction costs.

Additionally, using advanced treatment technology and implementing indirect potable reuse can allow for significant community education benefits through public tours of the treatment facility and injection facilities. This community education could help the public become used to the idea of future expansion on the use of recycled water.

[18] O&M cost estimates incorporate the fact that advanced treatment facilities will require additional labor to operate, resulting in additional labor costs.
[19] Energy use is based on a daily operating run time of 90%.

5.5 Overall Comparison of Alternatives

A summary of the incremental cost estimates and energy usage for each of the identified alternatives is presented in Table 5-5 below:

Table 5-5. Summary of Alternatives

Item	Alternative 1 (No Project)	Alternative 2 Groundwater Replenishment – California Avenue Alternative	Alternative 3 Groundwater Replenishment – Well 9 Site Alternative
Quantity of Water Replenished (AFY)	0 (a)	827	827
Annual Cost [(1)] ($/year)	0	$1,202,000	$1,270,000
Unit Cost ($/AF)	0	$1,040	$1,090
Energy Usage (kWh/yr)	0	62,000	62,000

Abbreviations:
AFY = acre-feet per year
kWh/yr = kilowatt-hours per year

Notes:
(a) Under the No Project Alternative, an additional 827 AFY is extracted from the groundwater basin, however, there is no groundwater replenished. The cost is assumed to be zero as this table only compares the incremental cost and energy use above what is needed for producing and distributing groundwater.
(b) Cost based on Class 5 level estimates for conceptual or screening level project development, which typically has an expected accuracy of +100 to -50%.

- Alternative 1, while it does not result in additional cost above producing and distributing groundwater, will increase groundwater extraction from the Monterey Subbasin without additional replenishment and will do nothing to limit water level declines in the Deep Aquifers or decrease the risk of seawater intrusion in the Subbasin. Consequently, Alternative 1 is not recommended.
- Alternatives 2 and 3 will both aid in meeting Subbasin SMCs which include limiting water level declines in the Deep Aquifers and decreasing the risk of seawater intrusion. They will also both protect MCWD's groundwater production from the Deep Aquifer in the event that SVGB-wide groundwater use restrictions are triggered under SGMA as a result of ongoing groundwater level declines in these aquifers. The Alternatives have similar costs, although Alternative 3 is slightly more expensive. However, as discussed in Section 5.4.3, because the proposed injection well is closer to MCWD's extraction wells in Alternative 3 than in Alternative 2, the overall benefit of this alternative is likely to be slightly greater than Alternative 2. Alternative 3 will increase groundwater levels closer to MCWD's production wells and further decrease the potential for downward vertical flow in the vicinity of these production wells. In addition, less time will be required for injected water to reach MCWD's production wells, increasing the likelihood that injected groundwater will be fully captured by MCWD's production wells and directly utilized by the District. The increased proximity of the injection wells to MCWD's extraction wells will also mitigate the effects of potential changes in the direction due to reductions and/or modification of existing groundwater extraction patterns.

Given that the incremental costs of Alternatives 2 and 3 are similar and the water quality benefits of Alternative 3 are significantly greater, Alternative 3 is the recommended alternative.

6 RECOMMENDED PROJECT

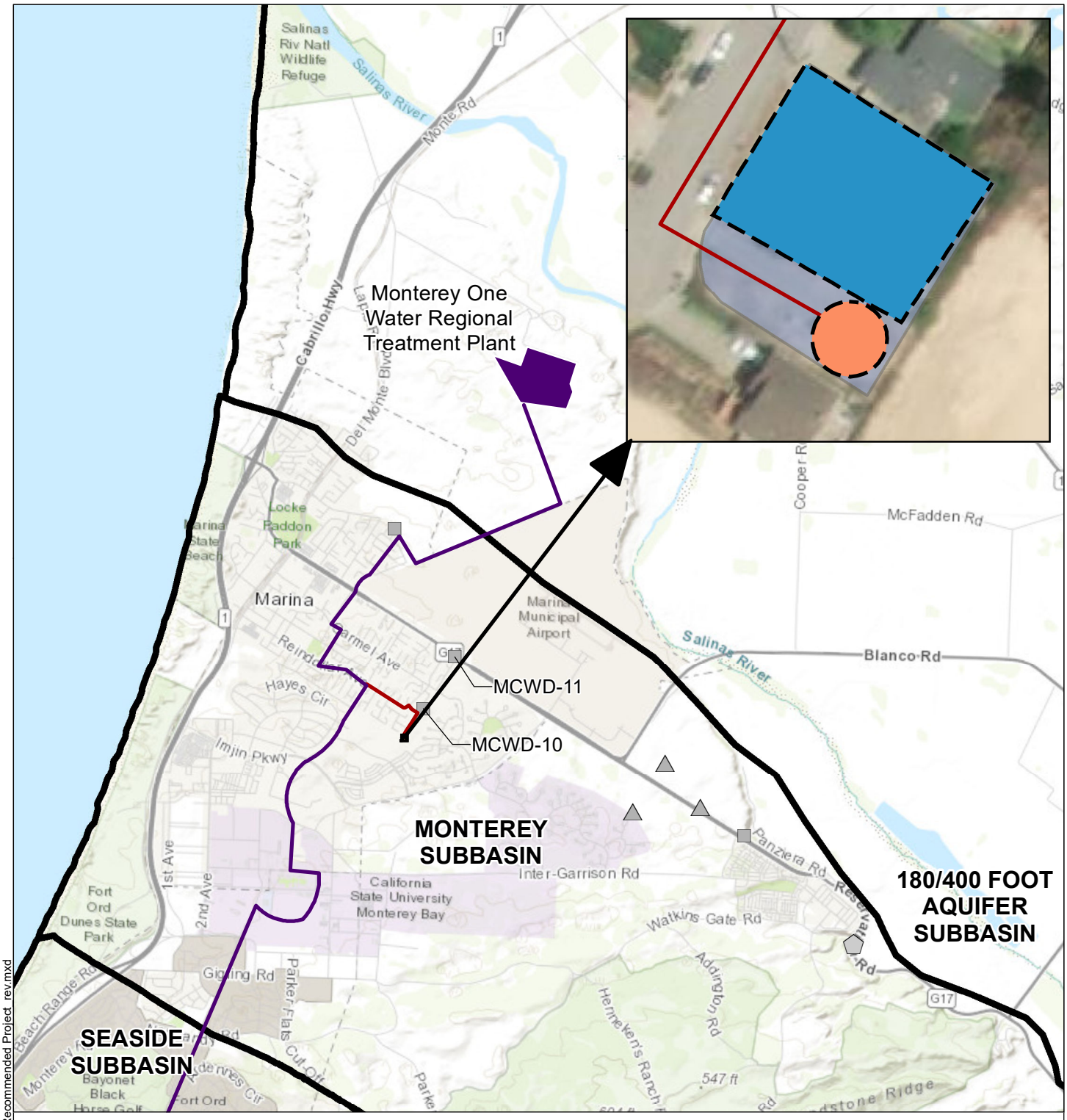
Based on the evaluation described in Section 5, Alternative 3 has been selected as the recommended recycled water project. As discussed in Section 5.5, this alternative is recommended because it has the highest benefit to basin users and water quality while having a reasonable incremental unit cost.

6.1 Proposed Facilities

The recommended alternative is presented conceptually on Figure 6-1. The facilities that will be required to support this project generally include the following:

- Approximately 3,500 linear feet of pipeline to convey advanced treated recycled water from the AWPF to the injection well;
- One injection well, approximately 1,300 feet deep and 18 inches in diameter, with a total injection capacity of 1,000 gpm, at the location shown on Figure 6-1 plus associated well pads, pedestals, site piping, hydropneumatic tank, and electrical, instrumentation, and controls work; and
- A backflush basin for percolating the water produced through periodic pumping of the injection wells.

Conceptual level sizing of the facilities was performed as part of the development of the cost estimates outlined in Section 5.3.4. The preliminary sizing of the facilities is based on the recycled water demands presented in Table 5-4. More refined estimates of facility sizing will be performed as part of the facilities planning effort discussed in Section 6.6.



Legend

- Potential Backflush Basin Location
- Potential Injection Well Location
- Existing Pure Water Monterey Pipeline
- Regional Treatment Plant
- Potential Pipeline
- Lower 180-Foot, 400-Foot Aquifer Production Wells
- 400-Foot/Deep Aquifers Production Wells
- Deep Aquifers Production Wells
- Property Boundary
- Groundwater Subbasins within Salinas Valley Basin

N

0 1 2

(Scale in Miles)

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 8 October 2022.

Components of Recommended Project

Marina Coast Water District
Marina, CA
October 2022
Figure 6-1

Path: X:\B60094\Maps\2022\10\GRRP_Fig6-1_Components of Recommended Project_rev.mxd

6.2 Cost Estimate

The estimated incremental capital and operational costs for the recommended project are provided in Table 5-4. These costs are based on the Engineering News-Record construction cost index for the San Francisco Bay Area, and annualized costs are based on the project's estimated useful life of 30 years. More refined cost estimates will be prepared as part of the facilities planning effort discussed in Section 6.6.

6.3 Facility and Supply Reliability

The existing wastewater treatment plant and the new advanced treatment facilities are expected to be a reliable source of recycled water due to the multiple redundancies built into their designs. The existing facilities include standby equipment, so any system downtimes are expected to be short in duration.

Because of the nature of indirect potable reuse and the fact that there will be at least ten years of travel between the time of recycled water injection and the time that the recycled water reaches water supply wells, temporary interruptions in the recycled water supply would not have any immediate or long-term adverse effect on the potable water supply.

6.4 Environmental Impacts and Requirements

6.4.1 Environmental Impacts

Potential environmental impacts of the recommended project include the following:

- Construction activities would generate dust and emissions, although air quality mitigation and dust abatement measures would be evaluated as part of the environmental analysis for the project. Further evaluation can be performed as part of the environmental analysis for this project to quantify the project's incremental effects.
- Potential biological resources (e.g., sensitive species) located near the proposed injection well facilities or the pipeline alignment could be affected by construction activities. If sensitive species are identified as part of the environmental analysis for the project, it is expected that mitigation measures can be developed to avoid or minimize construction impacts.
- Potential cultural resources located near the proposed injection well facilities could be affected by construction activities. Mitigation measures can be developed as part of the environmental analysis for the project to reduce potential impacts on cultural resources.
- Construction activities could cause soil erosion. However, best management practices (BMPs) can be implemented to mitigate soil erosion impacts.
- The injection of recycled water is expected to result in a net improvement in groundwater quality due to the injection of product water from the existing advanced treatment facilities that will be low in total dissolved solids (TDS). Monitoring requirements imposed by the GRRP and NPDES permitting will confirm that the project has no significant negative impacts on groundwater quality.
- Construction activities could cause temporary water quality effects due to the alteration of drainage patterns during construction. However, BMPs can be implemented to mitigate water quality effects.
- Construction activities would involve the use of construction equipment that would have the potential to generate excessive noise. Mitigation measures can be developed as part of the environmental analysis to reduce potential noise impacts.

- Construction activities in the public right-of-way would be expected to cause temporary traffic impacts. Construction activities on the Well 9 Site would be away from public streets and would not be expected to cause significant traffic impacts. Traffic control mitigation measures can be developed to reduce traffic impacts along the pipeline route.

No significant environmental impacts are anticipated related to aesthetics, land use, mineral resources, housing, public services, recreation, or historic properties.

6.4.2 Environmental Requirements

Prior to the construction of the recommended project, documentation will need to be prepared in accordance with the California Environmental Quality Act (CEQA). Based on the anticipated environmental impacts, it is expected that the CEQA documentation would likely include the preparation of an Environmental Impact Report (EIR).

Because it is expected that the project may use funding from the State Revolving Fund (SRF) program and/or from the Title XVI program under the United States Bureau of Reclamation (USBR), the environmental documentation should address the requirements of the National Environmental Policy Act (NEPA) in addition to the CEQA requirements. Additional environmental analysis requirements associated with NEPA (SWRCB, 2017) include:

- Preparation of a biological assessment report to meet the Endangered Species Act requirements;
- Preparation of a cultural resources report and associated documentation to meet the National Historic Preservation Act requirements;
- Preparation of a Clean Air Act report to document that the project's emissions are in general conformity with the Clean Air Act; and
- Any required documentation related to conformance of the project with federal laws and regulations such as the Environmental Justice Executive Order 12898, the Farmland Protection Policy Act, Floodplain Management Executive Order 11988, the Migratory Bird Treaty Act, and Protection of Wetlands Executive Order 11990.

6.5 Legal and Institutional Requirements

6.5.1 Permitting and Water Rights

As previously noted, the recommended project would require permitting under the GRRP program. In addition, the existing Pure Water Monterey WDR permit (Order R3-2017-003) would either need to be modified, or a new WDR would need to be obtained from the Central Coast RWQCB to allow injection of recycled water into the Monterey subbasin.

In addition to these permits required to operate the new facilities, construction permits will need to be obtained, including:

- Encroachment, grading, and building permits from the City of Marina to install the pipelines and facilities related to the injection well;
- A drilling permit from Monterey County to install the injection wells;
- A permit to construct from the Bay Area Air Quality Management District; and
- A stormwater permit for construction activities from the RWQCB.

California Water Code Section 1211 requires that before changing the point of discharge, place of use, or purposes of use of treated wastewater, the owner of the treatment plant must seek approval from the SWRCB Division of Water Rights. This process typically includes filing a Petition for Change for Owners of Wastewater Treatment Plants.

6.5.2 Interagency Coordination

To implement the recommended project, coordination would need to occur between MCWD and M1W, which operates the RTP and AWPF that will provide the product water for the project. It is assumed that no additional contractual arrangement would need to be established, as M1W currently has senior rights to recycled water from the RTP through a previous agreement with M1W. It is assumed that MCWD will solely be responsible for planning, designing, constructing, and operating the new facilities. However, if there will be any variation from that assumption, MCWD may wish to have a Memorandum of Understanding to establish and document:

- Ownership of the various components of the new pipeline and injection facilities;
- Operational responsibilities for the new pipeline and injection facilities;
- Description of recycled water delivery schedule and quantities;
- Payment responsibilities for any needed land acquisitions;
- Management and payment responsibilities for planning, design, construction, and operation of the new facilities.

6.6 Implementation Plan and Schedule

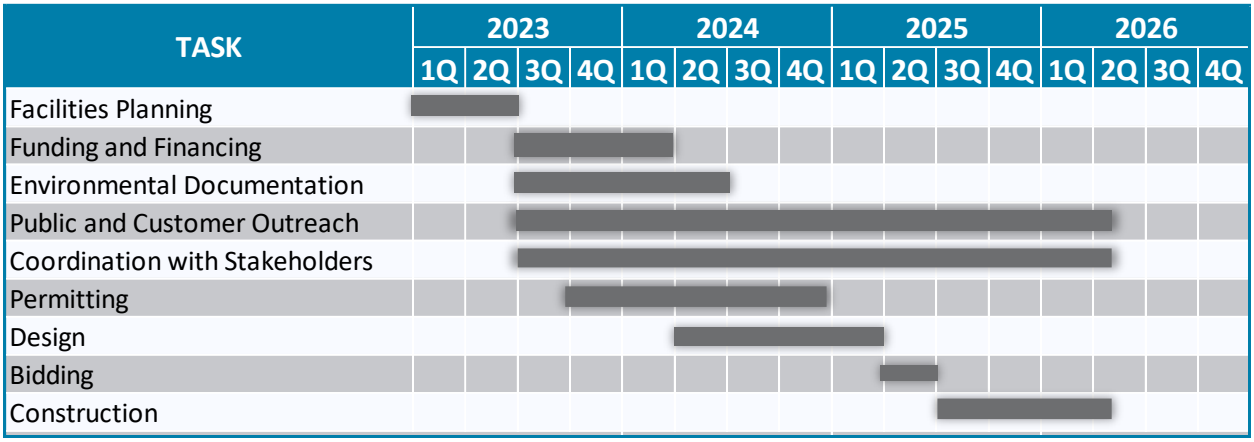
The implementation steps for the recommended project would generally include the following:

- Detailed Facilities Planning: A facilities plan (or plans) should be completed in order to refine the configuration and sizing of each component of the project. The evaluation will include additional hydraulic analysis to confirm feasible injection well flow rates. Facilities planning will also include the preliminary design of the facilities as needed for the environmental planning, including more detailed configuration, location, and sizing of each component of the project.
- Institutional Agreements and Petition for Change: Prior to obtaining funding, MCWD may wish to draft a Memorandum of Understanding defining roles and responsibilities related to the recycled water project as described in Section 6.5.2. Furthermore, a Petition for Change with the SWRCB will need to be filed as described in Section 6.5.1.
- Funding and Financing: Potential funding sources for the project are discussed in Section 8.1. The timing of the funding pursuits will depend on the funding cycles, which vary based on the program and economic conditions. Certain funding programs are dependent on environmental documentation being complete, which also impacts the timing of the funding pursuit.
- Environmental Documentation: As described in Section 7.4.2, CEQA and NEPA documentation will be prepared, likely consisting of an EIR supplemented by additional documentation prepared in accordance with NEPA.
- Public and Customer Outreach: An outreach effort, including public workshops, should be implemented in parallel with the environmental documentation preparation to educate the public about the recommended project.

- Coordination with the City of Marina: The facilities in the recommended project include the construction of injection wells and a backflush basin on properties owned by the City of Marina. Installing these wells will require either acquiring land, securing an easement, or obtaining access to a portion of the properties. Coordination with the City will be needed to site the new injection wells relative to the City's existing extraction wells. Finally, coordination with the City will be required in preparation for potential construction impacts.
- Permitting: Permits needed for the construction and operation of the recycled water facilities will need to be obtained, with major permits outlined in Section 6.5.1.
- Design and Construction: The final steps of the implementation will be the design and construction of the project components as outlined in the Facilities Plan.

A potential implementation schedule for the project is provided below on Figure 6-2.

Figure 6-2. Preliminary Implementation Schedule



6.7 Operation Plan

Responsibilities related to the operations of the new facilities will be determined after the facilities planning is performed when the exact equipment will be better defined. However, it is currently anticipated that the new injection wells and backflush basin, as well as the new pipeline to the injection wells, will all be operated and maintained by MCWD and that payment for operation and maintenance will likely be MCWD's sole responsibility. These responsibilities can be clarified in a Memorandum of Understanding as discussed in Section 6.5.2.

6.8 Research Needs

The recommended project uses proven technologies and conventional system components; therefore, there are no significant research needs associated with the project. If research needs are identified during the facilities planning stage, these needs will be described in the Facilities Plan discussed in Section 6.6.

7 FINANCING PLAN AND REVENUE PROGRAM

The funding of the capital costs associated with the recommended project is a major constraint in its implementation. Based on the anticipated project costs, it appears likely that outside funding will be needed for the project to be economically feasible for MCWD and its customers. Multiple outside funding sources are potentially available for recycled water projects, as described in the sections below.

7.1.1 Sources and Timing of Funds

Potential outside funding opportunities that may be available for this project include:

- Grant Funding:
  - SWRCB Water Recycling Funding Program: The SWRCB Water Recycling Funding Program provides grants to cover the design and construction of recycled water facilities. Based on the program guidelines, grant funds can cover 35% of eligible construction-phase costs, with eligible costs potentially including engineering and construction management costs. Guidelines for this program can be found at the following website:

    https://www.waterboards.ca.gov/water_issues/programs/grants_loans/water_recycling/docs/wrfp_guidelines.pdf

  - DWR Sustainable Groundwater Management Grant Program: The DWR Sustainable Groundwater Management Grant Program funds activities that promote the sustainable management of groundwater pursuant to SGMA. Implementation funding will be awarded to GSAs and water agencies within eligible high- and medium-priority groundwater basins, including critically overdrafted basins, to support implementation actions that align with the basin's adopted GSP. The recommended project was included as one of the preferred projects in the Monterey Subbasin GSP.

    DWR opened Round 2 of the Sustainable Groundwater Implementation Grant (Round 2 Implementation Grant) solicitation on 4 October 2022. MCWD is currently pursuing this grant for the Monterey Subbasin for the recommended project, along with other SGMA implementation efforts, with collaboration and support from the SVBGSA. The Round 2 Implementation Grant requires no cost share.

    https://water.ca.gov/work-with-us/grants-and-loans/sustainable-groundwater

  - USBR WaterSMART Title XVI Funding Program: The WaterSMART Title XVI Water Reclamation and Reuse Program is a grant program specifically for water reclamation and reuse projects. Grants can cover planning, design, and construction of water recycling projects up to 25% of the total project costs up to $20 million. Eligibility for the program is dependent on a USBR-approved Title XVI Recycled Water Feasibility Study, which means that this Study would have to be submitted to USBR for approval. (This Study has been prepared to comply with USBR's Title XVI study requirements.) Information regarding this program can be found at the following website:

    https://www.usbr.gov/watersmart/

  - Integrated Regional Water Management (IRWM) Program: The IRWM Program is administered by DWR and provides grants to fund integrated regional water resources projects. To be funded by this program, a project has to be included in an approved IRWM Plan by an IRWM region. This project falls within Monterey County and would therefore have to be included in the Greater Monterey County IRWM Plan to be funded. This project is not

currently included in the current IRWM Plan. Information regarding this program can be found at the following website:

https://water.ca.gov/Work-With-Us/Grants-And-Loans/IRWM-Grant-Programs/Proposition-1

- Loan Funding:
  - SWRCB Clean Water State Revolving Fund (CWSRF) Program: The CWSRF Program offers low-interest loans to eligible applicants for the construction of publicly-owned facilities, including water reclamation and distribution facilities. Typical interest rates have been around 1% to 1.5%, with terms of 20 or 30 years. The SWRCB offers partial principal forgiveness to selected applicants whose projects qualify as "Green Projects," including recycled water projects. Detailed information regarding this program can be found at the following website:

    https://www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/

  - Infrastructure State Revolving Fund (ISRF) Program: The ISRF Program provides low-interest loan financing to public agencies for a variety of infrastructure projects including wastewater treatment projects. Funding is available in amounts up to $25 million, with loan terms up to 30 years. The program is administered by the California Infrastructure and Economic Development Bank (I-Bank). Information regarding this program can be found at the following website:

    https://www.ibank.ca.gov/loans/infrastructure-loans/

  - Water Infrastructure Finance and Innovation Act (WIFIA) Program: The WIFIA is a federal loan program for eligible water and wastewater infrastructure projects, including water recycling projects. The program can fund design or construction expenses with a minimum project budget of $20 million. The loan's interest rate will be equal to or greater than the U.S. Treasury Rate of similar maturity, with a maximum term of 35 years. Information regarding this program can be found at the following website:

    https://www.epa.gov/wifia

Aside from State and Federal grant and loan programs, other available funding approaches include the following:

- Debt Financing: Options for debt financing include a variety of bonds, including revenue bonds, general obligation bonds, and assessment district bonds.
- Pay As You Go Financing: Collection of capital charges or assessments from customers.
- Utility Fees or Benefit Assessments: Monthly or bi-monthly fees imposed on each property benefiting from the recycled water.
- Development Charges or Connection Fees: One-time fees imposed on developers at the time of system connection.

The funding of the recommended project will likely include a combination of funding sources. In order of priority, grants will be secured where available, then low-interest loans will be pursued as feasible, and then debt financing will be obtained for project costs not covered by grants and low-interest loans. Loans would be repaid using water and wastewater revenues. Timing of the funding will depend on the individual grant and loan application cycles and their varying requirements for their application packages.

7.1.2 Pricing Policy or Rate Study

Project costs not covered by grants will be recovered from MCWD customers. Because IPR involves injecting recycled water into the ground and allowing it to be extracted by the production wells, the recycled water "customers" are the same group as the potable water customers. A future rate study will be performed to allocate costs appropriately to MCWD customers. Operational costs could be recovered from either the water system service charges or the wastewater system charges.

7.1.3 Projections of Annual Costs and Revenues

As discussed in Section 7.1.1, the project will likely be funded using a combination of sources, including grants, low-interest loans, and/or debt financing. Annual cost and revenue projections were prepared for four example scenarios:

1. Project capital costs funded entirely with a CWSRF loan;
2. 25% of the project capital costs funded with a federal or state grant, with the remainder financed with a CWSRF loan;
3. 50% of the project capital costs funded with a federal or state grant, with the remainder financed with a CWSRF loan; or
4. 100% of the project capital costs funded with a federal or state grant.

The cost and revenue projects are shown in Table 7-1. This Table includes the total capital and annual costs developed in Section 5.4.4.

Table 7-1. Summary of Potential Annual Costs for Recommended Project

Item	Scenario 1: Loan Financing Only	Scenario 2: 25% Grant, 75% Loan	Scenario 3: 50% Grant, 50% Loan	Scenario 4: 100% Grant
Total Capital Cost	$18,300,000	$18,300,000	$18,300,000	$18,300,000
Assumed Grant	$0	$4,575,000	$9,150,000	$18,300,000
Capital Cost for Loan Financing	$18,300,000	$13,725,000	$9,150,000	$0
Loan Annual Payment (Assuming 1.5% interest rate over 30 years)	$762,000	$571,000	$381,000	$0
Annual O&M Cost	$212,000	$212,000	$212,000	$212,000
Total Annual Cost Including Loan Payment	**$974,000**	**$783,000**	**$593,000**	**$212,000**
Abbreviations: O&M = operation and maintenance				

8 REFERENCES

AACEI, 2019. Recommended Practices and Standards, Association for the Advancement of Cost Engineering International, March 2019 Update.

Brown and Caldwell, 2015. State of the Salinas River Groundwater Basin, dated 16 January 2015.

CH2M, 2004. Hydrogeologic Assessment of the Seaside Groundwater Subbasin, dated January 2004.

DWR, 2004. Salinas Valley Groundwater Basin, 180/400 Foot Aquifer Subbasin. California's Groundwater Bulletin 118, last updated on 27 February 2024.

DWR, 2020. DWR climate change datasets, available online at https://data.cnra.ca.gov/dataset/sgma-climate-change-resources/resource/833a3998-809d-4585-b9e1-462704631934.

Geoscience, 2015, Monterey Peninsula Water Supply Project, Groundwater Modeling and Analysis, DRAFT, dated 7 April 2015.

Geosyntec Consultants, 2007. El Toro Groundwater Study, dated July 2007.

Hanson et al., 2002. Geohydrology of a Deep-Aquifer Monitoring-Well Site at Marina, Monterey County, California, dated January 2002.

HLA, 1994. Basewide Hydrogeologic Characterization, Fort Ord, California, U.S. Department of the Army, dated 10 June 1994.

HLA, 1999. Draft Final OU 2 Plume Delineation Investigation Report, dated 11 February 1999.

HydroFocus, 2016, North Marina Groundwater Model Review, Revision, and Implementation for Slant Well Pumping Scenarios, dated 23 November 2016.

Kennedy/Jenks Consultants, 2004. Hydrostratigraphic Analysis of the Northern Salinas Valley, dated May 14, 2004.

MACTEC Engineering and Consulting, 2006. Final Operable Unit Carbon Tetrachloride Plume Groundwater Remedial Investigation/Feasibility Study Former Fort Ord, California Volume 1 - Remedial Investigation, dated May 19, 2006.

MCWD, 2018. Cost Of Service and Rate Study, prepared by Carollo Engineers, dated January 2018.

MCWD, 2019. MCWD Production Well Pump Test Results, provided by MCWD Staff on September 18, 2019.MCWRA; LSCE, 2006. Monterey County Groundwater Management plan, dated May 2006.

MCWD, 2020a. Draft Recycled Water Master Plan, prepared by Akel Engineering Group, Inc., dated April 2020. Accessed online on 6 October 2022, via link: https://mcwd.org/docs/engr_files/Master_Plans/MCWD_RecycledWaterMP_FinalDraft_040720.pdf

MCWD, 2020b. MCWD Consumer Confidence Report, 2020. Accessed on 11 April 2022 via link: https://www.mcwd.org/docs/ccr/mcwd_ccr_2020_rev_English_Final.pdf

MCWD, 2020c . Sewer Master Plan, prepared by Akel Engineering Group, Inc., dated May 2020.

MCWD, 2020d. Water Master Plan, prepared by Akel Engineering Group, Inc., dated May 2020.

MCWD, 2021. Water Loss Audit Report in 2020, dated 27 September 2021, accessed online on 30 September 2022, via link: https://wuedata.water.ca.gov/awwa_plans.

MCWD, 2022. Recycled Water Rate Study, prepared by Raftelis, dated 29 March 2022.

MCWD & SVBGSA, 2022a. Groundwater Sustainability Plan, Monterey Subbasin, prepared by EKI Environment & Water and Montgomery & Associates, dated January 2022.

MCWD & SVBGSA, 2022b. WY 2021 Annual Report, Monterey Subbasin, prepared by EKI Environment & Water and Montgomery & Associates, dated April 2022.

MCWRA, 2017. Recommendations to Address the Expansion of Seawater Intrusion in the Salinas Valley Groundwater Basin, dated October 2017.

Niswonger, R. G., Panday, S., & Ibaraki, M. 2011. MODFLOW-NWT, a Newton formulation for MODFLOW-2005. US Geological Survey Techniques and Methods, 6(A37), 44.

Pollock, 2016. User guide for MODPATH Version 7—A particle-tracking model for MODFLOW. USGS, dated 2016.

Pure Water Monterey, 2019. Final Engineering Report, Monterey One Water Pure Water Monterey Groundwater Replenishment Project, revised in April 2019.

RWQCB, 2020. Marina Coast Water District, Marina, Monterey County - Notice of Applicability, Enrollment in General Waste Discharge Requirements Order No. WQ 2016-0068-DDW, Water Reclamation Requirements for Recycled Water Use and Transmittal of Monitoring and Reporting Program Order No. R3-2020-0069, Central Coast Regional Water Quality Control Board, Central Valley Region, 27 August 2020.

Schaaf & Wheeler, 2021. Marina Coast Water District 2021 Urban Water Management Plan, Schaaf & Wheeler Consulting Civil Engineers, May 2021.

SWRCB, 2018. Draft Order No. R3-2018-0017 NPDES No. CA0048551, Waste Discharge Requirements For the Monterey One Water Regional Wastewater Treatment Plant and Advanced Water Purification Facility Discharge to the Pacific Ocean, dated 6-7 December 2018. Accessed online via link: https://montereyonewater.org/DocumentCenter/View/322/NPDES-Order-No-2018-0017?bidId=.

Todd, 2015, Recharge Impacts Assessment Report, Pure Water Monterey Groundwater Replenishment Project, dated March 2015.

Trussell, et. al, 2019. Final Engineering Report, Monterey One Water Pure Water Monterey Groundwater Replenishment Project, Trussell Technologies, Inc., Nellor Environmental Associates, Inc., and Todd Groundwater, Revised April 2019.

U.S. Army Corps of Engineers, Sacramento District, 2019. Final Quality Assurance Project Plan, Superfund Response Actions, Former Fort Ord, California. Volume I – Groundwater. https://fortordcleanup.com/reference-documents/quality-assurance-project-plans-qapp/

USGS, 2002. User's Guide to SEAWAT: A Computer Program For Simulation of Three-Dimensional Variable-Density Ground-Water Flow. https://fl.water.usgs.gov/PDF_files/twri_6_A7_guo_langevin.pdf.

Yates, 2005. Seaside Groundwater Basin: Update on Water Resource Conditions, dated 14 April 2005.

Appendix A

Existing Relevant Agreements

Pure Water Delivery and Supply Project Agreement Between Monterey Regional Water Pollution Control Agency and Marina Coast Water District

Table of Contents

THIS **PURE WATER DELIVERY AND SUPPLY PROJECT** [hereinafter referred to as "Agreement"] is made this 8th day of April, 2016 ("Effective Date"), by and between Monterey Regional Water Pollution Control Agency ("PCA") and Marina Coast Water District ("MCWD"), hereinafter "Parties."

The PCA was formed as a California Joint Powers Agency by a Joint Exercise of Powers Agreement for the Monterey Regional Water Pollution Control Agency, effective June 29, 1979. The MCWD is a County Water District and political subdivision of the State of California, organized under Division 12, sections 30000 and following, of the California Water Code.

WITNESSETH

WHEREAS, the 1997 Fort Ord Base Reuse Plan (BRP) identifies the availability of water as a resource constraint and the BRP estimates that an additional 2,400 AFY of water is needed to augment the existing groundwater supply to achieve the permitted development level as reflected in the BRP (Volume 3, figure PFIP 2-7); and,

WHEREAS, the Fort Ord Reuse Authority ("FORA") transferred ownership of all of the then existing Fort Ord water and sewer facilities to the Marina Coast Water District ("MCWD") under the 1998 Water/Wastewater Facilities Agreement; title was transferred in 2001; and,

WHEREAS, under Section 3.2.2 of the 1998 Water/Wastewater Facilities Agreement, FORA has the responsibility to determine, in consultation with MCWD, what additional water and sewer facilities are necessary for MCWD's Ord Community service area in order to meet the BRP requirements, and that, once FORA determines that additional water supply and/or sewer conveyance capacity is needed, under Section 3.2.1, it is MCWD's responsibility to plan, design, and construct such additional water and sewer facilities. Section 7.1.2 requires FORA to insure that MCWD recovers all of its costs for the new facilities and their operation; and,

WHEREAS, in 2002, MCWD, in cooperation with FORA, initiated the Regional Urban Water Augmentation Project (RUWAP) to explore water supply alternatives to provide the additional 2,400 AFY of water supply needed under the BRP; and

WHEREAS, as a result of an extensive environmental review, FORA and MCWD agreed to adopt a modified Hybrid Alternative, which would provide 1,427 AFY of recycled water to the Ord Community without the need for seasonal storage, and this in turn resulted in the FORA Board adopting Resolution 07-10 (May 2007), which allocated that 1,427 AFY of RUWAP recycled water to its member agencies having land use jurisdiction; and

WHEREAS, in June 2009, PCA and MCWD entered into a 50-year RUWAP Memorandum of Understanding, in which, subject to certain conditions specified therein, (a) PCA committed 650 AFY of summer recycled water to MCWD for the Ord Community; (b) MCWD affirmed its separate commitment of 300 AFY of summer recycled water to the Ord Community; and (c) PCA and MCWD committed to supply 477 AFY of recycled water during other months to the Ord Community - for a total of 1,427 AFY; and

WHEREAS, MCWD has been and continues to work collaboratively with FORA and with the PCA to carry out MCWD's obligation to provide the 1,427 AFY of recycled water for the Ord Community; and

WHEREAS, on May 31, 2013, PCA commenced environmental review of its Pure Water Monterey Groundwater Replenishment Project ("Pure Water Monterey Project"). The Pure Water Monterey Project is a water supply project that would serve northern Monterey County by providing: (1) purified recycled water for recharge of a groundwater basin that serves as drinking water supply; and (2) recycled water to augment the existing Castroville Seawater Intrusion Project's agricultural irrigation supply. The Pure Water Monterey Project includes a pipeline to transport purified recycled water from a new Advanced Water Treatment Plant ("AWT") at PCA's Regional Treatment Plant to new Injection Well Facilities overlying the Seaside Groundwater Basin ("Product Water Conveyance Pipeline"). The Environmental Impact Report ("EIR") for the Pure Water Monterey Project evaluated two alternative alignments for the Product Water Conveyance Pipeline, a Coastal Alignment and an alignment that follows the right-of-way for the existing and future RUWAP pipeline ("RUWAP Alignment"). The Pure Water Monterey Project EIR identified the environmental effects of constructing the Product Water Conveyance Pipeline along the RUWAP Alignment, and operating the Product Water Conveyance Pipeline for the Pure Water Monterey Project; however the EIR recognized that shared use of a single Product Water Conveyance Pipeline for both the Pure Water Monterey Project and to supply recycled water to MCWD for the RUWAP would necessitate further review under the California Environmental Quality Act ("CEQA"). Shared use of a single Product Water Conveyance Pipeline would necessitate expansion of the Advanced Water Treatment Plant in order to purify the recycled water destined for the RUWAP because all water flowing in the shared pipeline must be purified; by contrast if water to serve the RUWAP were conveyed in its own separate pipeline only tertiary treatment would be needed; and

WHEREAS, on September 8, 2015, MWCD and PCA tentatively agreed to work together on the Pure Water Monterey Project; and

WHEREAS, on October 8, 2015, the PCA Board unanimously voted to certify the EIR for the Pure Water Monterey Project and to approve the Pure Water Monterey Project. The PCA Board selected the RUWAP Alignment for the Product Water Conveyance Pipeline.

WHEREAS, on October 9, 2015, the FORA Board unanimously voted to adopt a resolution to endorse the Pure Water Monterey Project as an acceptable option as the recycled component of the RUWAP and, as part of the Pure Water Monterey Project implementation, the FORA Board will review and consider project component costs and scheduling through annual consideration of the FORA CIP and Ord Community Budgets.

NOW, THEREFORE, for and in reliance of the foregoing, the Parties hereby agree as follows:

DEFINITIONS

For the purposes of this Agreement, the following definitions are provided:

A. The term "Annexation Agreements" refers to the Annexation Agreement between MCWD and PCA dated April 25, 1989, and the Annexation Agreement between MCWD and WRA dated March 26, 1996. The individual Annexation Agreements are referenced herein by their respective dates.

B. The term "AWT" or "AWT Facilities" or "Advanced Water Treatment Facilities" means the Advanced Water Treatment facilities as shown in Exhibit B at the PCA Regional Treatment Plant

for the Pure Water Monterey Project and includes the AWT-PCA, AWT Phase 1, and the AWT Phase 2. The AWT Facilities includes that segment of new pipeline shown on Exhibit B and located within the existing property lines of the Regional Treatment Plant property.

C. The term "AWT Capacity Entitlement" shall mean the entitlement to the plant treatment capacity of the AWT which a Party has the right to use under this Agreement.

D. The term "AWT-PCA" shall mean construction and operation of an advanced water treatment plant sized to produce 3,700 AFY of purified recycled water to deliver to the Seaside Groundwater Basin for the Pure Water Monterey Project as approved by the PCA Board in its Resolution Number 2015-24 on October 8, 2015 as part of the "Pure Water Monterey Project".

E. The term "AWT Phase 1" shall mean construction and operation of an expansion to the AWT-PCA to produce an additional 600 AFY of purified recycled water to deliver to the FORA land use jurisdiction members in addition to the 3,700 AFY of purified recycled water from the AWT-PCA to deliver to the Seaside Groundwater Basin, for a total production of purified recycled water of from the AWT Phase 1 of 4,300 AFY.

F. The term "AWT Phase 2" shall mean construction and operation of an expansion to the AWT-PCA to produce an additional 827 AFY for a total of 1,427 AFY of purified recycled water to deliver to the FORA land use jurisdiction members in addition to the 3,700 AFY of purified recycled water from the AWT-PCA to deliver to the Seaside Groundwater Basin, for a total production of purified recycled water from the AWT Phase 2 of 5,127 AFY.

G. The term "Drought Reserve" shall refer to storage of up to 1,000 acre-feet of water for potential use during a drought. During wet or normal water years, about 50% of the years, an additional 200 AFY may be conveyed through the Pipeline Facilities and injected in the winter months to develop the Drought Reserve, thereby increasing PCA's use of the Pipeline Facilities to 3,700 AFY.

H. The term "Existing Pipeline Facilities" shall be the existing recycled water pipeline (and appurtenances) constructed by MCWD and rights-of-ways, which will become part of the Product Water Conveyance Facilities as shown in Exhibit C.

I. The term "Injection Well Facilities" shall mean collectively the Injection Well Facilities, turnouts, diversions and lateral pipelines connected to and beyond the Product Water Conveyance Facilities as shown in Exhibit C.

J. The term "New Pipeline Facilities" shall mean the new recycled water pipeline sections (and appurtenances), booster plant, and rights-of-ways to convey purified recycled water as shown in Exhibit C which will become a part of the Product Water Conveyance Facilities. The beginning and ending points of the "New Pipeline Facilities" are shown in Exhibits A and C, respectively.

K. The term "Parties" or "Both Parties" shall mean MCWD and PCA and their respective Boards.

L. The term "Pipeline Facilities Entitlement" shall mean the entitlement to the capacity of the Pipeline Facilities which a Party has the right to use under this Agreement.

M. The term "Product Water Conveyance Facilities", "Pipeline Facilities", and "RUWAP Conveyance Facilities" shall mean collectively the New Pipeline Facilities and the Existing Pipeline Facilities as shown in Exhibits C.

N. The term "Pure Water Monterey Project" shall mean the full project that the PCA Board approved in its Resolution Number 2015-24 on October 8, 2015 including construction and operation of all source water facilities, Product Water Conveyance Facilities, AWT-PCA and other improvements to the Regional Treatment Plant, and Cal Am Distribution System Improvements described in such resolution and in the EIR for the Pure Water Monterey Project.

O. The term "Pure Water Delivery and Supply Project Facilities" or "Project Facilities" shall mean collectively the AWT and the Product Water Conveyance Pipeline Facilities, as generally shown in Exhibit A. The term "Project Facilities components" shall refer severally to the AWT Facilities and the Pipeline Facilities. The Pure Water Delivery and Supply Project Facilities, as defined by this Agreement is a subset of certain components of the Pure Water Monterey Project and RUWAP Recycled Water Project including expansion of the AWT to implement this Agreement.

P. The terms "reclaimed water", "reclaimed wastewater", and "recycled water" shall mean purified recycled water.

Q. The term "RUWAP Distribution Facilities" shall mean those facilities connected to the Product Water Conveyance Facilities, which will be used to distribute MCWD's recycled water to MCWD's customers. The RUWAP Distribution Facilities are not a Project Facilities component.

R. The term "RUWAP Recycled Project" shall mean the urban recycled water portion of the Regional Urban Water Augmentation Project (RUWAP) approved by the MCWD and FORA Boards. In 2002, MCWD, in cooperation with FORA, initiated the Regional Urban Water Augmentation Project (RUWAP) to explore water supply alternatives to provide an additional 2,400 AFY of water supply needed under the Base Reuse Plan. As a result of an extensive environmental review, FORA and MCWD agreed to adopt a modified Hybrid Alternative, which would provide 1,427 AFY of recycled water to the Ord Community without the need for seasonal storage, and this in turn resulted in the FORA Board adopting Resolution 07-10 (May 2007), which allocated that 1,427 AFY to its member agencies having land use jurisdiction. As a result of the Pure Water Monterey Project, the RUWAP Recycled Project includes MCWD's Pipeline Facilities Entitlement, the RUWAP Distribution Facilities, and MCWD's AWT Capacity Entitlement under this Agreement.

S. The term "Source Water Facilities" shall mean the diversion facilities as approved in the "Pure Water Monterey Project" by the PCA Board in its Resolution Number 2015-24 on October 8, 2015.

T. The term "summer months" shall mean the months of May, June, July, August, and September.

I. DESIGN, ENVIRONMENTAL, RIGHT-OF-WAY, AND CONSTRUCTION

1.01 California Environmental Quality Act Compliance and Other Conditions

(a) Conditions Precedent and Drop Dead Dates: Nothing in this Agreement, except Section 1.01 (b), shall be deemed to constitute a binding obligation on either Party unless and until all of the following have occurred first:

i. New Pipeline Facilities: MCWD must complete any necessary CEQA review for any change in the location of the New Pipeline Facilities as compared to the location of the

pipeline facilities as shown the EIR for the Pure Water Monterey Project by October 31, 2016. Further, upon completion of any such CEQA review, before this Agreement can take effect, MCWD and PCA must approve the change in location of the New Pipeline Facilities. In conducting the CEQA review, MCWD reserves all of its rights, powers and discretion with regard to any such change in location in pipeline facilities. This includes the authority to adopt mitigation measures and/or an alternative project design, configuration, capacity or location in order to reduce any identified significant environmental impacts; the authority to deny the change in location of pipeline facilities based on any significant environmental impact that cannot be mitigated (in which case this Agreement shall not take effect); and the authority to approve the change in location of pipeline facilities notwithstanding any significant environmental impact that cannot be mitigated, if MCWD determines that these impacts are outweighed by the project's social, economic or other benefits. PCA similarly reserves all of its rights, powers and discretion under CEQA with regard to any decision by PCA on whether and how to approve any change in location in pipeline facilities.

ii. AWT: PCA must complete any necessary CEQA review for AWT Phase 1 and AWT Phase 2 by October 31, 2016. In conducting the CEQA review, PCA reserves all of its rights, powers and discretion with regard to the expansion of the AWT. This includes the authority to adopt mitigation measures and/or an alternative project design, configuration, capacity or location in order to reduce any identified significant environmental impacts; the authority to deny the expansion of the AWT based on any significant environmental impact that cannot be mitigated (in which case this Agreement shall not take effect); and the authority to approve the expansion of the AWT notwithstanding any significant environmental impact that cannot be mitigated, if PCA determines that these impacts are outweighed by the project's social, economic or other benefits. MCWD similarly reserves all of its rights, powers and discretion under CEQA with regard to any decision by MCWD on whether and how to approve any expansion of the AWT.

iii. There must be no CEQA lawsuits challenging any of the Parties' approvals with respect to any change in the location of the New Pipeline Facilities or with respect to the AWT Phase 1 or AWT Phase 2; if any such lawsuits are filed, all such lawsuits must be favorably resolved to the satisfaction of both PCA and MCWD.

iv. All necessary regulatory approvals must be obtained for the Pure Water Monterey Project, AWT, and the New Pipeline Facilities including regulatory approvals required for any change in the location of the New Pipeline Facilities as compared to the location evaluated in the EIR for the Pure Water Monterey Project by October 31, 2016.

v. Funding must be secured by December 31, 2016 for the Pure Water Monterey Project and the RUWAP Distribution Facilities, including for any change in the location of the New Pipeline Facilities as compared to the location evaluated in the EIR for the Pure Water Monterey Project, for AWT Phase 1, and for the CEQA work for AWT Phase 2; provided, however, that this funding is not required for the completed design and construction of AWT Phase 2 for the provisions of this Agreement to take effect with regard to implementation of Phase 1.

vi. All source water must be approved for the Pure Water Monterey Project, except for Lake El Estero and Tembladero Slough by October 31, 2016.

vii. All approvals must be obtained from the California Public Utilities Commission for the

water purchase agreement under which Cal Am agrees to buy 3,500 acre-feet of water per year from the Pure Water Monterey Project by October 31, 2016.

(b) Key Dates and Conditions for Future Negotiations.

i. If the Division of Financial Services of the State Water Resource Control Board fails to approve PCA's SRF loan Initial Funding Agreement by October 31, 2016, then MCWD and PCA agree to negotiate in good faith alternatives for providing recycled water (tertiary or purified) for potential customers.

ii. If the Division of Financial Services of the State Water Resource Control Board approves PCA's initial funding agreement, then if the Division of Financial Services of the State Water Resource Control Board fails to approve MCWD's State Revolving Fund (SRF) loan Initial Funding Agreement and/or MCWD passes a Board resolution to discontinue work on the project by October 31, 2016, then MCWD shall transfer all work product (e.g. right-of-way, design, survey, environmental, bid documents, etc.) to PCA so PCA can continue progressing with the project. If the Division of Financial Services of the State Water Resource Control Board approves PCA's State Revolving Fund (SRF) Loan Final Funding Agreement but denies MCWD's State Revolving Fund (SRF) Loan Final Funding Agreement and MCWD does not identify alternate financing by December 31, 2016, MCWD shall transfer all work product to PCA for financing and constructing the New Pipeline Facilities.

a. PCA will pay MCWD for all project expenditures on any work products transferred (e.g. right-of-way, design, survey, environmental, and bid document development).

b. In the event that PCA assumes responsibility for the financing and construction of the product water conveyance facilities, MCWD would continue to maintain ownership of the Product Water Conveyance Facilities per 2.06 of this agreement, and would assume ownership upon satisfactory demonstration of no additional financial impact to PCA for providing the financing to construct the Product Water Conveyance Facilities.

iii. If the Division of Financial Services awards PCA an interest rate that is lower than the interest rate awarded to MCWD and MCWD does not receive grant or other funds that could be applied to the New Pipeline Facilities that would reduce PCA's share of the New Pipeline Facilities cost by approximately the same amount as the difference in cost from MCWD's higher interest rate, then MCWD and PCA agree to negotiate in good faith alternatives for financing and constructing the New Pipeline Facilities.

1.02 MCWD's Obligations.

MCWD will fulfill the following obligations relating to the New Pipeline Facilities:

(a) MCWD will be responsible for acquiring all rights-of-way needed for the New Pipeline Facilities.

(b) MCWD will conduct any necessary CEQA review for the New Pipeline Facilities.

(c) MCWD will complete the design and contract documents for the construction of the New Pipeline Facilities.

(d) MCWD will finance, construct, and install the New Pipeline Facilities in substantial conformity

with designs and plans approved by the Parties in writing. MCWD will put the New Pipeline Facilities out to bid and administer the construction contract.

1.03. PCA's Obligations.

PCA will fulfill the following obligations relating to the AWT Facilities:

(a) PCA will conduct any necessary CEQA review for the AWT including Phase 1 and Phase 2.

(b) PCA will finance, construct, and install the AWT Phase 1, in substantial conformity with designs and plans approved by the Parties in writing. PCA will put the AWT Phase 1 out to bid, and administer the construction contract(s).

(c) PCA will complete the design and contract documents for the AWT Phase 1.

(d) PCA will provide, and MCWD shall have, an AWT Capacity Entitlement of 600 AFY of purified recycled water from the AWT Phase 1 facilities.

(e) PCA will provide, and MCWD shall have, an AWT Capacity Entitlement of an additional 827 AFY of purified recycled water from the AWT Phase 2 for a total AWT Capacity Entitlement in the AWT facilities of 1,427 AFY.

(f) Up until MCWD exercises its option for the AWT Phase 2 facilities, MCWD shall have the continuing right to 827 AFY of tertiary water as set forth in the Annexation Agreements and the 2009 RUWAP MOU (1,427 AFY less the 600 AFY of recycled water provided in the AWT Phase 1 facility). It is not intended or implied that this water would be used in the same pipeline as the advanced treated water.

1.04. Change Orders.

(a) Change orders must be approved in writing.

(b) Any change order or related set of change orders that increases the Pure Water Delivery and Supply Project Facilities cost by $100,000 or more shall require the written consent of both parties within 30 days of presentation.

(c) Any change order or related set of change orders that increases the Pure Water Delivery and Supply Project Facilities cost by less than $100,000 or that lowers the Pure Water Delivery and Supply Project Facilities cost may be approved by the party designated herein to administer the contract, without the consent of the other party, except that a copy of any proposed or executed change order shall promptly be provided to the other party as soon as it is available. The contract administrator party shall not split up change order work so that approval of the combined change order work by the other party is not required.

(d) Each party's contract administrator shall be authorized to give consent to change orders for that party. Neither party's consent to a change order will be unreasonably withheld or delayed.

(e) This Change Orders section shall apply separately to the AWT and Product Water Conveyance Facilities. This section shall no longer apply to a component of the Pure Water Delivery and Supply Project Facilities on the date that the parties agree in writing that that such component has been completed and is ready to be used.

1.05. Project Schedule Cooperation between agencies.

(a) Subject to the terms and conditions of this Agreement, PCA and MCWD shall work cooperatively and with diligence to obtain all permits, approvals, and financing to construct the Pure Water Delivery and Supply Project Facilities.

(b) Both parties will develop an implementation schedule. Representatives of the parties will meet on a monthly basis, or more often if necessary, in order to ensure that the Pure Water Delivery and Supply Project Facilities are proceeding according to the schedule and in conformity with this contract and the approved plans and designs. Each party will make every reasonable effort to fulfill its obligations in a timely manner to meet the projects milestones and deadlines.

1.06. Right to inspect.

(a) Each party shall have the right to inspect the Pure Water Delivery and Supply Project Facilities, while under construction and at any time thereafter during the term of this contract, upon the giving of reasonable advance notice to the party administering the construction contract. Such inspections may take place at any time during the day or night; however, night time inspections will not take place without at least one week's notice, except in case of emergency or by agreement between the parties.

(b) Each party shall have the sole right to direct the construction work that such party is responsible to implement and the work of each party's own employees. Each party's right to inspect is for the purpose of observation only and not for the purpose of supervision of the work observed.

1.07. Ocean Outfall.

Nothing in this Agreement changes past agreements between the Parties to meet and confer in good faith to evaluate the environmental, technical, managerial, and financial feasibility of a project to use the Regional Treatment Plant outfall to transport and discharge brine byproduct from a future water desalination facility.

II. PURE WATER DELIVERY AND SUPPLY PROJECT FACILITIES DESCRIPTION, OWNERSHIP, OPERATIONS, AND MAINTENANCE

2.01. Location and Description of the Pure Water Delivery and Supply Project Facilities.

The Pure Water Delivery and Supply Project Facilities are shown generally in Exhibit A, attached hereto and made a part hereof and consist of the following sections:

- AWT (Exhibit B)
- New Pipeline Facilities (Exhibit C)
- Existing Pipeline Facilities (Exhibit C)

2.02. AWT Phase 1

The AWT Phase 1 shall be sized to produce a minimum of 600 AFY of purified recycled water with the ability to produce a maximum day demand of 1.37 MGD for MCWD and in addition to produce a minimum of 3,700 AFY of purified recycled water with the ability to produce a maximum day demand of 4.0 MGD for the Pure Water Monterey Project.

2.03. Product Water Conveyance Facilities

(a) The New and Existing Pipeline Facilities will have a minimum total conveyance capacity of

5,127 AFY.

(b) PCA is prohibited from providing water to any customer within any MCWD service area through the use of any Pure Water Monterey Project Facility, either directly or through a third party, unless approved and authorized in writing by the MCWD Board of Directors. PCA agrees that it shall not authorize any third party to use any Pure Water Monterey Project Facility to serve water to any customer within any MCWD service area unless approved and authorized in writing by the MCWD Board of Directors.

2.04. Reserved

2.05. Future Expansion of Facilities (AWT Phase 2)

(a) Subject to Section 1.01 (a) conditions, PCA will provide upon a written request from MCWD an additional AWT Capacity Entitlement for MCWD of up to and including 827 AFY of purified recycled water under AWT Phase 2 for a total AWT Capacity Entitlement of 1,427 AFY. PCA will not unreasonably delay implementing the request.

(b) PCA will reserve physical space at the plant site and facilities for expanding the AWT should subsection (a) be triggered from time to time in the future.

(c) Should MCWD request expanding the AWT beyond the AWT Phase 1 while there is sufficient time and funding capacity to include the further expansion in the Clean Water State Revolving Fund loan for the Pure Water Monterey Project, the costs for the AWT Phase 2 will be subject to the cost sharing section of this Agreement.

(d) Subject to Section 2.05(b) above, PCA may expand the AWT and may construct additional reclamation facilities, at its sole cost and expense and without receiving the consent of MCWD, unless the Product Water Conveyance Facilities are disrupted or delivery of AWT water to MCWD is affected, then consent is required by MCWD in writing. Any increases in capacity and any additional reclamation facilities so constructed shall be used at PCA's discretion.

2.06. Ownership, Operation, and Maintenance of the Pure Water Delivery and Supply Project Facilities

(a) PCA will own, operate, and maintain the AWT.

(b) MCWD will own, operate and maintain the Product Water Conveyance Facilities. In addition, MCWD shall own a Pipeline Facilities Capacity Entitlement equal to 27.833% of the capacity of the Product Water Conveyance Facilities with a maximum annual use of 1,427 AFY during the initial term and any extended term of this Agreement. If and when the AWT Phase 2 is commercially operational and as shown on the table accompanying Section 3.02(b), the Parties recognize and agree that, during the summer months, MCWD's use of the Pipeline Facilities' capacity may exceed 27.833% of the instantaneous capacity and that MCWD is hereby authorized to exceed 27.833% during the summer months.

(c) PCA shall own a Pipeline Facilities Capacity Entitlement equal to 72.167% of the capacity of the Product Water Conveyance Facilities with a maximum annual use of 3,700 AFY during initial term and any extended term of this Agreement. Parties recognize and agree that, during the months of November through February, PCA's use of the Pipeline Facilities' capacity may exceed 72.167% of the instantaneous capacity and that PCA is hereby authorized to exceed 72.167% during those specific months.

(d) For the term of this Agreement, PCA shall maintain the AWT in good condition and repair and MCWD shall maintain the Product Water Conveyance Facilities in good condition and repair.

(e) Both parties agree to coordinate operations and to share/integrate SCADA and other operational tools as necessary to facilitate efficient and effective operations of the Pure Water Delivery and Supply Project Facilities.

2.07. Decision-making authority.
In order to provide for the smooth and efficient operation of the Pure Water Delivery and Supply Project Facilities, MCWD and PCA will have the full authority to make and implement decisions with regard to activities and expenditures for the operations, and maintenance of their respective Project Facilities component without prior approval of the other party. All such activities shall be within the scope of services for operations and maintenance. All such expenditures shall be funded with the respective parties operational and maintenance budgets and/or the replacement reserves.

2.08. Outside Contracts.
When either Party deems it more appropriate for an outside contractor to make repairs or perform maintenance, bids may be solicited for contracts to perform this work.

2.09. Permits and approvals.
Each Party shall be responsible for obtaining and complying with all permits and approvals for the Project Facilities component that such Party owns that are necessary to perform its work under this Agreement.

2.10. Safety and loss prevention program.
MCWD and PCA will jointly develop, maintain, and implement a safety and loss prevention program for the Pure Water Delivery and Supply Project Facilities, and will provide appropriate training for its employees working on the facilities. This program will conform to all requirements set forth in CAL OSHA's Process Safety Management Program and US EPA's Risk Management Program, and will be revised and updated as new regulations are promulgated. All costs associated with the program will be included in the annual budget process.

2.11. Access to facilities.
Both MCWD and PCA personnel shall be provided access rights to all Pure Water Delivery and Supply Project Facilities with adequate notice and staff availability/chaperone.

2.12. Pure Water Coordinating Committee.
(a) Within sixty days of the Effective Date of this Agreement, the parties shall establish and maintain a Pure Water Coordinating Committee which membership shall consist of at least one representative from each Party. A representative from each Party shall be the person who will be or who is responsible for the daily operations of a Pure Water Delivery and Supply Project Facilities component. The committee shall have access to and shall share all pertinent information in order to discuss and make recommendations for sustaining or improving the operations (including water quality), maintenance, and capital replacement efforts of the project.

(b) Any financial changes approved by the Pure Water Coordinating Committee at a Committee meeting that require a budget modification will be submitted to both Boards of Directors for approval of the necessary budget modifications.

2.13. Unanticipated events/Emergency situations

(a) Non-emergency circumstances or events may arise which were not anticipated in either the scopes of services or the budgets for the Pure Water Delivery and Supply Project Facilities. In this case, plans for addressing such circumstances or events, including justification and estimated amount of expenditures, will be submitted to the Pure Water Coordinating Committee for its review and recommendations. Before proceeding with those plans, each party must first give its written approval to incur any additional costs associated therewith consistent with the procurement policy of each agency.

(b) If the event or circumstance constitutes an emergency situation which threatens health and safety, damage to property, or injury to persons, the Party having operational control of the affected Pure Water Delivery and Supply Project Facilities component will act as promptly and as efficiently as possible to mitigate the situation without waiting for approval by the Pure Water Coordinating Committee. The Pure Water Coordinating Committee will be advised as soon as possible thereafter of the mitigating actions taken and of any further action that may be necessary.

III. DELIVERY OF PURIFIED RECYCLED WATER

3.01. Existing Allocations

(a) Subject to the terms and conditions described in this Agreement, PCA agrees to treat and provide an annual amount of purified recycled water from PCA's and MCWD's entitlements to assure delivery of the agreed water commitments to the RUWAP Recycled Project approved by the FORA Board of Directors and allocated to FORA land use jurisdiction members. Up to 1,762 AFY of source water would be made available from PCA to provide a net 1,427 AFY of purified recycled water taking into account the assumption of a 19% loss resulting from the advanced water treatment processes with the following limitations unless the FORA Board of Directors agrees to an allocation of less than 1,427 AFY of net purified recycled water:

i. As stated in the 1996 Annexation Agreement, up to a maximum of 300 AFY of source water will be treated for MCWD's use between the months of April and September.

ii. As stated in the 2009 RUWAP MOU, up to a maximum of 650 AFY of source water will be made available from PCA entitlements between the months of May and August for recycled water use.

iii. As per the 2009 RUWAP MOU, Section 3.1, the Parties agreed to meet and confer in good faith to evaluate the environmental, technical, managerial, and financial feasibility of a groundwater recovery replenishment project to inject and store recycled water.

iv. As stated in Section IV 1(d) of the Amended and Restated Water Recycling Agreement between PCA and Monterey County Water Resources Agency which was approved in November 2015, PCA is allocated 650 AF of water by Water Resources Agency during the months of May through August.

(b) The parties agree to commit to a process to determine the amount of MCWD's Fort Ord Water Rights. The process shall include MCWD, PCA, FORA, U.S. Army, and MCWRA meeting and discussing the various agreements, obtaining legal opinions as necessary, and drafting documentation to clarify each agency's opinion, agreement, or disagreement and next steps on this issue by January 31, 2017.

3.02 Demand Schedule.

(a) According to Section 3.01 and subject to Section 2.03 of this Agreement, PCA will provide MCWD with purified recycled water according to the following typical nonbinding Schedule for AWT Phase 1 (~600 AFY of product water):

Approximate Demand Schedule (Phase 1):

	Demand (AF)			Needed
Month	Others	Golf Course	Total	Supply (AF)
January	7	16	23	28
February	5	11	16	19
March	8	19	27	33
April	16	40	56	70
May	26	62	88	108
June	26	63	89	110
July	27	65	92	113
August	22	54	76	94
September	20	49	69	85
October	12	29	41	51
November	5	12	17	21
December	2	5	7	9
Total	175	425	600	741

(b) According to Section 3.01 and subject to Section 2.03 of this Agreement, PCA will provide MCWD with purified recycled water according to the following typical nonbinding Schedule for AWT Phase 2 project (ultimate build out of the AWT to the amount approved by the FORA Board of Directors pursuant to Resolution No. 07-10):

Approximate Demand Schedule (Phase 2):

	Demand (AF)			Needed
Month	Others	Golf Course	Total	Supply (AF)
January	38	16	54	66
February	26	11	37	46
March	45	19	64	79
April	94	40	134	166
May	146	62	208	257
June	149	63	212	261
July	153	65	218	269
August	127	54	181	224
Septembe	116	49	165	203
October	68	29	97	120
Novembe	28	12	40	50
Decembe	12	5	17	21
Total	1002	425	1427	1762

3.03 Water Quality.

All water produced and delivered to MCWD shall meet all applicable standards of quality prescribed by the State of California (including, but not limited to, the regulations promulgated by

the State Health Department and set forth in the California Code of Regulations, Title 22), or by separate agreement of the parties, so that the water may be used for the purposes specified herein. The parties clarify their intent with regard to the required water quality and further agree that the AWT Facilities have been designed to produce purified recycled water for the injection and landscape irrigation and other authorized purposes. The Parties agree that the purified recycled water to be used for landscape irrigation and other authorized purposes shall be of the same water quality as the water used for injection.

3.04. Warranties.
PCA warrants that all water committed to MCWD pursuant to this Agreement shall be transferred to MCWD free and clear of all claims by any person or entity, except as otherwise specified.

3.05. Duty to monitor water quality; cessation in deliveries.
PCA will monitor the quality of water produced, in accordance with the Indirect Potable Reuse guidelines per the California Department of Drinking Water Title 22 Article 5.2 of the CCR.

3.06. Regulations to protect water quality.
PCA will, to the extent feasible, enact reasonable and appropriate regulations governing the kinds of wastes and other materials that may be discharged into the sewerage system, in order to protect the quality of water ultimately produced by the AWT.

3.07. Daily Operation.
The AWT will be in operation and will supply water to MCWD on a daily basis except for temporary periods of shut-down authorized by this Agreement or made necessary by circumstances beyond the control of PCA or MCWD.

3.08. Incidental Uses.
PCA may use such amounts of purified recycled water from the Pure Water Delivery and Supply Project Facilities as may be needed for the normal operation and maintenance of PCA's facilities, including, but not limited to, the backwash of injection wells.

3.09. Notice of temporary cessation of water deliveries.
PCA will give immediate notice to MCWD, by telephone and/or electronic communication to MCWD's General Manager, or to the person designated by the General Manager to receive such notices, with a prompt follow-up notice in writing, as soon as PCA becomes aware of the need to cease deliveries. In addition, whenever a cessation of deliveries occurs, PCA shall use every reasonable effort to restore service as soon as possible.

3.10. Interruptions of service.
(a) No work of construction, remodeling, renovation, replacement, repairs, addition, or expansion authorized under this Agreement and performed on the AWT or Injection Well Facilities shall, either before, during, or after such work, interfere with, interrupt, or reduce the delivery of advanced treated water to MCWD under this Agreement, except that minor interferences, interruptions, or reductions shall be allowed when necessary, unavoidable, or beyond the control of PCA.

(b) PCA shall schedule its planned maintenance activities on the AWT and the Injection Well Facilities to minimize interruption of distribution of purified recycled water. Unscheduled work to perform repairs or maintenance will be performed in the manner deemed by PCA to have the least impact on the supply of advanced treated water. In case of any interruption of service, PCA shall give notice in the same manner as required by this Agreement.

(c) MCWD shall schedule its planned capital replacement, maintenance activities, and lateral tie-in's to the Product Water Conveyance Facilities to minimize interruption of distribution of purified recycled water. Unscheduled work to perform repairs or maintenance will be performed in the manner deemed by MCWD to have the least impact on the distribution of purified recycled water. In case of any interruption of service on the Product Water Conveyance Facilities, MCWD shall give notice in the same manner as required by this Agreement.

IV. ESTIMATED COSTS, COST SHARING, FINANCING, AND BUDGETING

4.01. Estimated Costs of the Project

(a) The PCA submitted an SRF loan package in the amount of $113,000,000 of which $41,190,000 is for the Advanced Water Treatment Facilities. It is anticipated that project costs will be below this amount. MCWD submitted an SRF loan package in the amount of $35,000,000 which includes $22,600,000 for the RUWAP New Pipeline Facilities. It is also anticipated that project costs will be below this amount.

(b) The estimated construction costs and proportional share of the New Pipeline Facilities and AWT Phase 1 are presented below. The cost allocations for the Pipeline Facilities are based upon a MCWD maximum use of 1,427 AFY per year and a PCA maximum use of 3,700 AFY. If any maximum use amount is exceeded, then the Parties agree to recalculate the allocations for the Pipeline Facilities, to true up those capital costs back to the date of this Agreement, and to agree on a true up amount and payment schedule. The estimated annual debt service cost share is located in Exhibit E:

ESTIMATED CAPITAL COSTS	Total Amount	PCA Share	MCWD Share
New Pipeline Facilities	$ 22,600,000	$ 16,309,742 72.167%	$ 6,290,258 27.833%
AWT Phase 1	$ 41,184,636	$ 35,438,144 86.047%	$ 5,746,492 13.953%
Existing Pipeline Facilities	$ 1,389,000	$ 1,002,400 72.167%	$ 386,600 27.833%
TOTAL	$ 65,173,636	$ 52,185,008 80.071%	$ 12,988,628 19.929%

(c) Except for the $1,389,000 in Section 4.02 (a) (iii) for the Existing Pipeline Facilities, the Parties agree that all dollar amounts in this Agreement, including exhibits, are estimates and that this Agreement shall be amended from time to time to reflect the actual dollar amounts when known.

(d) Both Parties commit grant funds to the Project Facilities by the ratio of the costs of the Project Facilities to the total costs to each party for Project Facilities, Injection Facilities, RUWAP Distribution Facilities, and Source Water Facilities. Both Parties agrees to apply those grant funds towards the total capital costs of a Project Facilities component, to be allocated to each parties share of capital costs as defined in Section 4.02 (a). The following is an example:

PRODUCT CONVEYANCE FACILITIES AND RUWAP DISTRIBUTION FACILITIES

Total Project Cost	$35 Million
Transmission Line PCA 71% MCWD 29%	$23 Million $16.33 Million $ 6.67 Million
Distribution (ALL MCWD)	$12 Million
Capital Cost Split (Grant Distribution %)	PCA $16.33 Million (46.7%) MCWD $18.67 Million (53.3%)
Assume $17M in Grants	PCA $7,939,000 MCWD $9,061,000

AWT, DIVERSION, INJECTION FACILITIES

AWTF PCA 72.17% MCWD 27.83%	$40,000,000 $28,866,783 $11,133,216
Diversion PCA 100%	$947,765 + 5,649,339 ≈ $6,600,000
Injection PCA 100%	$10,668,000
Capital Distribution (Grant Distribution %)	
MCWD -AWTF	$11,133,216 (19.44%)
PCA AWTF+DIV+IND	$46,134,783 (80.56%)
TOTAL	$57,267,999
Assume $15M in Grants	PCA $12,084,000 MCWD $2,916,000

Total Project Costs	$92,267,999
Total Capital Cost Split PCA MCWD	 $62,464,783 $29,803,216
Total Assured Grants	$32,000,000
Grant Amounts PCA MCWD	 $20,023,000 $11,977,000

4.02. Cost Sharing: Capital and Replacement Costs

(a) Both parties will pay their share of all capital and replacement costs for the Project Facilities based on its percentage share of AWT Capacity Entitlement and/or Pipeline Facilities Capacity Entitlement as follows:

i. AWT Facilities: % of a party's AWT Capacity Entitlement in AFY to the total AWT Capacity Entitlement in AFY from both parties. For AWT Phase 1, PCA = 86.047% and MCWD = 13.953%. For AWT Phase 2, PCA = 72.167% and MCWD = 27.833%.

ii. New Pipeline Facilities: PCA = 72.167% and MCWD = 27.833%.

iii. Existing Pipeline Facilities: PCA = 72.167% and MCWD = 27.833%. The parties agree that the total value of MCWD's Existing Pipeline Facilities for purposes of this Agreement is $1,390,000. The parties agree that the annual payment to MCWD shall be equal to this total value amortized over a 30 year period.

4.03. Cost Sharing: Operations and Maintenance Costs

(a) Both parties will pay their share of all operations and maintenance costs for the Pure Water Delivery and Supply Project Facilities based on actual use of the facilities based on the following:

i. AWT Facilities: % of AFY produced vs total from both parties

ii. Product Water Conveyance Facilities: % AFY through pipeline vs total from both parties

iii. Operations and Maintenance costs include, but are not limited to, the following: Power, chemicals, a Party's own or contracted labor and services, parts, materials, supplies, insurance, engineering, financial, and legal services, and such other cost categories agreed to by the Parties.

4.04. Project Funding: Capital Costs

(a) PCA applied for a Clean Water SRF loan to pay for the entire capital costs of AWT which shall include all of the design, contract documents, rights-of-way acquisition, and all work to construct the AWT.

(b) MCWD applied for a Clean Water SRF loan to pay for the entire capital costs of the New Pipeline Facilities which shall include all of the design, contract document, rights-of-way acquisition, and CEQA work necessary, and all work to construct the New Pipeline Facilities.

4.05. Project Funding: Replacement and Renewal Reserves

(a) Each Agency shall establish a Replacement and Renewal Reserve Fund for the purpose of funding capital outlay projects on the Pure Water Delivery and Supply Project Facilities; assist in meeting any fiscal sustainability plan requirements for the Clean Water State Revolving Fund loans; and maintaining a proportional share of the State Revolving Fund loan's debt reserve requirement.

(b) Each agency shall allocate sufficient funds in their annual budget to contribute to each Replacement and Renewal Reserve Fund in accordance with the capital cost sharing section of this Agreement. PCA will retain the replacement funds for those facilities in which they own and operate. MCWD will retain the replacement funds for those facilities in which they own and operate. Unless otherwise stated in Clean Water State Revolving Fund agreements, the following depreciation schedule related to operational equipment shall be used as a basis to establish annual funding of replacement reserves:

Equipment Type	Useful Life (Years)
Replacement Electrical	30
Replacement Instrumentation	15
Replacement Pumps & Motors	20
Motorized sluice gates	30
Replacement Wells & Ozonators	20

(c) Two years prior to the completion of the thirty-year loan cycle, MCWD and PCA will develop a long-term Capital Improvement Plan, which includes establishing an appropriate level of Renewal and Replacement reserves. Any funds that are held in Reserves in excess of the Capital Improvement Plan will be refunded within ninety (90) days of the Plan's establishment.

4.06. Project Funding: Operations and Maintenance Costs

Each party shall place in their annual operating budget sufficient funds to pay for operations and maintenance according to the operations and maintenance cost sharing section of this Agreement.

Each party shall follow the recommended operation and maintenance schedules as suggested by the manufacturers throughout the initial term of this agreement.

4.07. Annual Budget Process.

Each year, in accordance with its normal budgeting schedule, both parties will adopt budgets sufficient to cover the capital, renewal, operation, and maintenance costs of their proportional share of the Pure Water Delivery and Supply Project Facilities.

4.08 Financial Obligations

Both Parties agree to pledge sufficient funds to meet their respective financial obligations under this Agreement by Board action.

V. PAYMENTS AND ACCOUNTING

5.01 Payment Schedule and Procedures.

(a) MCWD will make payments to PCA each year as follows:

i. Thirty (30) days before the date the PCA's annual payment on the Clean Water State Revolving Fund loan for the Pure Water Monterey Project is due, MCWD will pay an amount equal to MCWD's proportional share of capital costs (debt service) as provided in Exhibit E.

ii. By March 1 of each year, MCWD shall pay PCA the proportional share of the amortized replacement/renewal costs as identified in Exhibit E.

iii. On a monthly basis, PCA will bill MCWD for Operation and Maintenance costs on an acre foot rate basis and actual demand.

(a) PCA will make payments to MCWD each year as follows:

i. Thirty (30) days before the date the MCWD's annual payment on the Clean Water State Revolving Fund loan for the New Pipeline Facilities is due, PCA will pay an amount equal to PCA's proportional share of capital costs (debt service) as provided in Exhibit E.

ii. By March 1 of each year, PCA shall pay MCWD the proportional share of the amortized replacement/renewal costs of the New Pipeline Facilities as identified in Exhibit E.

iii. By June 30 of each year, PCA will pay an amount equal to PCA's proportional share of capital costs (debt service) for the construction of the Existing Pipeline Facilities funded by MCWD as provided in Exhibit E.

iv. By June 30 of each year, PCA will pay MCWD the proportional share of the amortized replacement/renewal costs of the Existing Pipeline Facilities as identified in Exhibit E.

v. On a monthly basis, MCWD will bill PCA for the Operation and Maintenance costs for the Product Water Conveyance Facilities on an acre foot rate basis and actual demand.

(b) At least thirty (30) days before capital or replacement payments are due, a request for payment shall be sent indicating the amount due, the date payment is due, and the nature of the payment.

(c) Payment requests for operation and maintenance costs will be billed monthly. The resulting payments will be due within thirty days of billing.

(d) Notwithstanding anything to the contrary contained herein, obligations to make payments shall be prioritized as follows, and the obligations in each category shall be subordinate to the obligations in each prior category, shall be on a parity with all other obligations in such category, and shall be senior to the obligations in each subsequent category:

i. Operation and maintenance

ii. Debt service on obligations incurred to finance the Pure Water Delivery and Supply Project Facilities and payments to any provider of credit enhancement for such obligations

iii. Replacement/renewal costs

(e) All requests for payment shall be promptly reviewed, approved for payment where such requests or portion thereof that are in conformity with this Agreement, and promptly submitted for payment. Disputed payment shall be resolved according to the Dispute Resolution Process in this Agreement.

5.02. Application of loan payments by PCA.

(a) All payments made by MCWD to PCA for the repayment of the Clean Water SRF loan shall be used for such repayment. Upon termination of any loan agreement, any unused funds retained by PCA shall be returned to MCWD within 60 days from the date of the approved PCA audit for the fiscal year in which the agreement was terminated.

(b) All payments made by PCA to MCWD for the repayment of the Clean Water SRF loan shall be used for such repayment. Upon termination of any loan agreement, any unused funds retained by MCWD shall be returned to PCA within 60 days from the date of the approved MCWD audit for the fiscal year in which the agreement was terminated.

5.03. Remedies for Delinquent Payments.

(a) If either party should fail to make any payment required under this Agreement for a period of ninety (90) days or more after the due date, then upon fifteen (15) days' written notice, the party that is owed may act to proportionally reduce the activities for which payment is due; provided that no such reduction shall take effect if Dispute Resolution has been invoked and the full amount of the payment has been paid under protest.

(b) In addition, if either party should fail to make any payment required under this Agreement for a period of ninety (90) days or more after the due date and Dispute Resolution has not been invoked, the party that is owed shall have the right to seek any appropriate judicial relief, at law

or in equity, for such default. Such relief may include, but need not be limited to, damages and injunctive relief.

5.04 Allocations: Operations and Maintenance Rates

(a) Operations and Maintenance Rates: Based on electronic timesheets and indirectly through each Agency's Cost Allocation Plan, all costs associated with the new AWT Facilities will be allocated directly to PCA's Pure Water Monterey Fund and all costs associated with the Product Water Conveyance Facilities will be allocated directly to MCWD's RUWAP Conveyance Facilities Fund. Indirect costs and direct costs will be used in the development of PCA's and MCWD's Operation and Maintenance Rates. Each Agency's Operation and Maintenance rate will be subject to review and/or development of a third party consultant of the respective Agency's selection. PCA's Operation and Maintenance component of the rate will be consistent with rates provided to entities who utilize Advanced Treated Water.

(b) PCA and MCWD retain the right to transition from any cost allocation plan identified in 5.04 of this Agreement to a cost allocation model that is compliant with the Office of Management and Budget (OMB) Circular A-87 – Cost Principles for State, Local, and Indian Tribe Governments or a subsequent revision. Any cost allocation subject to this provision shall be accompanied by a Certificate of Cost Allocation Plan and be in compliance with Title 2 CFR, Part 200. All indirect costs charged to the Pure Water Monterey Fund and the RUWAP Conveyance Facilities Fund will be applied consistently with the results of this plan to ensure equity between costs centers and conformance with OMB standards.

5.05. Accounting system.

Both parties will maintain an accounting system that is in conformity with generally accepted accounting principles (GAAP) and will allow for the segregation and tracking of all Replacement/Renewal reserves associated with the Project Facilities. Indirect costs shall not be applied to Replacement/Renewal Reserve contributions.

5.06. Financial reports.

Both parties will provide an annual report of the proportional share of reserve funds retained for the purpose of renewing the Pure Water Delivery and Supply Project Facilities. This report will be provided by September 30 of each year; and include deposits made to the Repair/Renewal Reserve, proportional interest earned, and the proportional share of any replacement/renewal costs.

5.07. Annual audit.

The accounting for the Pure Water Delivery and Supply Project Facilities will be subject to both parties Annual Audit. The Replacement/Renewal Reserve funds will be classified as Restricted on both parties Comprehensive Annual Financial Statement (CAFR). This Restricted classification will remain in effect through the term of this agreement, unless there are any new Governmental Accounting Standards Board (GASB) pronouncements or auditor comments that require a change in classification. A copy of each parties CAFR will be provided to the other by January following the close of the prior fiscal year.

5.08. Right to inspect and audit records.

Both parties shall have the right to inspect the other's records pertaining to debt service payments associated with the Pure Water Delivery and Supply Project Facilities and contributions for Renewal/Replacement Reserves, upon reasonable advance notice. Both parties shall also have the right to audit the other's records pertaining to the Project Facilities and contributions for Renewal/Replacement Reserves, or to have them audited by an auditor selected by the other party at that party's sole cost and expense. Such audit may be performed at any time during regular business

hours, upon the giving of reasonable advance notice.

5.09. Reimbursement for overcharge or undercharge.
If any there is audit shows that the incorrect application of replacement/renewal reserves, each agency will have 90 days to comply with the audit findings. If an undercharge or an overcharge has occurred in monthly demand billings, each agency will have 90 days to refund or pay the identified difference.

5.10. Claims for Stranded Costs
The parties agree to commit to a process to determine the amount of each parties' claims for stranded costs. The process shall include MCWD and PCA meeting and discussing the documentation to clarify each agency's opinion, agreement, or disagreement and next steps on this issue by March 31, 2017.

VI. INDEMNIFICATION.

6.01. Indemnification.
(a) PCA shall indemnify, defend, and hold harmless MCWD , its officers, agents, and employees, from and against any and all claims, liabilities, and losses whatsoever against MCWD (including damages to property and injuries to or death of persons, court costs, and reasonable attorneys' fees) occurring or resulting to any and all persons, firms or corporations furnishing or supplying work, services, materials, or supplies in connection with the performance of this Agreement, and from any and all claims, liabilities, and losses occurring or resulting to any person, firm, or corporation for damage, injury, or death arising out of or connected with the PCA's performance or non-performance of its obligations pursuant to this Agreement caused in whole or in part by any negligent act or omission or willful misconduct of PCA, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, except to the extent caused by the negligence or willful misconduct of MCWD.

(b) MCWD shall indemnify, defend, and hold harmless PCA, its officers, agents, and employees, from and against any and all claims, liabilities, and losses whatsoever against PCA (including damages to property and injuries to or death of persons, court costs, and reasonable attorneys' fees) occurring or resulting to any and all persons, firms or corporations furnishing or supplying work, services, materials, or supplies in connection with the performance of this Agreement, and from any and all claims, liabilities, and losses occurring or resulting to any person, firm, or corporation for damage, injury, or death arising out of or connected with the MCWD's performance or non-performance of its obligations pursuant to this Agreement caused in whole or in part by any negligent act or omission or willful misconduct of MCWD, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, except to the extent caused by the negligence or willful misconduct of PCA.

6.02. Procedure for Indemnification.
(a) If any legal or administrative proceedings are instituted, or any claim or demand is asserted, by any third party which may give rise to any damage, liability loss or cost or expense with respect to which either party has agreed to indemnify the other party in this contract, then the indemnified party shall give the indemnifying party written notice of the institution of such proceedings, or the assertion of such claim or demand, promptly after the indemnified party first becomes aware thereof. However, any failure by the indemnified party to give such notice on such prompt basis shall not affect any of its rights to indemnification hereunder unless such failure materially and

adversely affects the ability of the indemnifying party to defend such proceeding.

(b) The indemnifying party shall have the right, at its option and at its own expense, to utilize counsel of its choice in connection with such proceeding, claim or demand, subject to the approval of the indemnified party, which approval shall not be unreasonably withheld or delayed. The indemnifying party shall also have the right to defend against, negotiate with respect to, settle or otherwise deal with such proceeding, claim or demand. However, no settlement of such proceeding, claim or demand shall be made without the prior written consent of the indemnified party, which consent shall not be unreasonably withheld or delayed. The indemnified party may participate in any such proceeding with counsel of its choice at its own expense.

(c) In the event, or to the extent, the indemnifying party elects not to, or fails to, defend such proceeding, claim or demand and the indemnified party defends against, settles or otherwise deals with any such proceeding, claim or demand, any settlement thereof may be made without the consent of the indemnifying party if it is given written notice of the material terms and conditions of such settlement at least ten days before a binding agreement with respect to such settlement is executed. However, nothing herein is intended to bar either party from submitting any dispute arising from this section to Dispute Resolution.

(d) Each of the parties agrees to cooperate fully with each other in connection with the defense, negotiation or settlement or any such proceeding, claim or demand.

6.03. Payment of indemnified claims.
The indemnifying party shall forthwith pay all of the sums owing to or on behalf of the indemnified party, upon the happening of any of the following events:

(a) Upon the rendition of a final judgment or award with respect to any proceeding described in Section 6.02, above, by a court, arbitration board or administrative agency of competent jurisdiction and upon the expiration of the time in which an appeal therefrom may be made; or

(b) Upon the making of a settlement of such proceeding, claim or demand; or

(c) Upon the parties' making of a mutually binding agreement with respect to each separate matter indemnified thereunder.

6.04. Contribution in the event of shared liability.
In the event any proceeding, claim or demand described in Section 6.01 is brought, in which allegations of fault are made against both the parties, the extent of indemnification shall be determined in accordance with the agreement of the parties, or, if there is no agreement, then in accordance with the findings of the court as to the relative contribution by each of the parties to the damage suffered by the party seeking indemnity with respect to such proceedings. If the court fails to make any such findings, then the matter shall be submitted to Dispute Resolution.

6.05. Exclusion from O&M costs.
Amounts payable by either party as indemnification shall not be included in the operations and maintenance costs of the Project.

VII. INSURANCE

7.01. General insurance requirements.
Without limiting either parties duty to indemnify, both parties shall maintain in effect throughout the

term of this Agreement a policy or policies of insurance meeting the requirements hereinafter set forth. All such insurance required by this article shall meet the following requirements:

(a) Each policy shall be with a company authorized by law to transact insurance business in the State of California, and shall be written on an occurrence form unless such insurance is only available at a reasonable cost if written on a claims made form.

(b) Each policy shall provide that both parties shall be given notice in writing at least thirty days in advance of any change, cancellation or non-renewal thereof.

(c) Except with respect to workers compensation insurance, each policy shall provide an endorsement naming both parties and its officers, agents and employees as additional insureds, or additional insureds, as applicable, and shall further provide that such insurance is primary to any other insurance maintained by either party.

(d) Unless otherwise agreed by MCWD and PCA, if a party awards a contract for construction work for the Pure Water Delivery and Supply Project Facilities, that party shall require the general contractor to provide commercial general liability and motor vehicle liability insurance coverage at least equal to the coverages required under this Agreement and shall name both MCWD and PCA as an additional named insureds and shall further provide that such insurance is primary to any issuance maintained by MCWD or PCA.

7.02. Commercial general liability insurance.

(a) MCWD and PCA shall maintain (and be named insured under) commercial general liability insurance covering all operations under this Agreement, with such coverages as the parties may agree upon from time to time. Each party shall be named as an additional insured on the other party's commercial general liability coverage.

(b) Each party shall pay the annual cost of such insurance for the term of this Agreement. Such insurance costs shall be treated as an annual operation and maintenance cost for the AWT Facilities and the Product Water Conveyance Facilities. In addition, should this Agreement be terminated by the parties, the obligation to pay for such insurance regarding the Project shall be accordingly reduced.

7.03. Motor vehicle insurance.

Both parties shall maintain insurance covering all motor vehicles (including owned and non-owned) used in providing services under this Agreement, with a combined single limit of not less than $2,000,000.

7.04. Property insurance.

(a) PCA shall maintain insurance covering the AWT Facilities against loss or damage due to fire and other perils to the extent that such insurance is reasonably commercially available and within available funds for the Pure Water Monterey Project. MCWD shall maintain insurance covering the Product Water Conveyance Facilities against loss or damage due to fire and other perils to the extent that such insurance is reasonably commercially available and within available funds for the Project.

(b) Subject to Subsection (a) above, the amount of the insurance shall not be less than the then-current replacement cost of the applicable Pure Water Delivery and Supply Project Facilities, without depreciation. Insurance coverage for the Pure Water Delivery and Supply Project Facilities under this section shall be reviewed and approved by both parties, which shall not

unreasonably withhold or delay its approval. Both parties shall provide each other with a copy of the insurance policy and shall give the other party thirty (30) days' advance notice of any cancellation or proposed change in the insurance required by this section, and any such change shall be subject to review and approval by the other party.

7.05. Workers' compensation insurance.
Each party shall maintain a workers' compensation plan covering all of its employees as required by Labor Code Sec 3700, either (a) through workers' compensation insurance issued by an insurance company, with coverage meeting the statutory limits and with a minimum of $100,000 per accident for employer's liability, or (b) through a plan of self-insurance certified by the State Director of Industrial Relations, with equivalent coverage. If either party elects to be self-insured, the certificate of insurance otherwise required by this Agreement shall be replaced with a consent to self-insure issued by the State Director of Industrial Relations.

7.06. Certificate of insurance.
Each party shall file certificates of insurance with the other party, showing that it has in effect the insurance required by this contract. Each party shall file a new or amended certificate promptly after any change is made in any insurance policy which would alter the information on the certificate then on file.

7.07. Self-insurance up to and including the first $1 million of liability.
Each party may elect to be self-insured or to participate in the self-insurance pool for up to and including the first $1 million of liability under any insurance required to be provide by it under this Agreement, provided the other party first gives its written consent, which will not be unreasonably withheld or delayed. The parties shall enter into a separate written memorandum of understanding specifying the proportionate amount or share of such self-insurance costs to be allowed and allocated as annual operation and maintenance costs for the Pure Water Delivery and Supply Project Facilities.

7.08. Insurance costs.
Except as otherwise specifically provided for in this Agreement, the parties agree to determine as part of the annual budget process what annual insurance costs are to be allowed and allocated as annual operation and maintenance costs for the Pure Water Delivery and Supply Project Facilities.

7.09. Periodic increases in coverage requirements.
Not more frequently than every five (5) years, if in the opinion of an insurance broker or consultant retained jointly by the parties, the amount of any insurance coverage required by this Agreement is not adequate, the party responsible for providing that insurance coverage shall increase the amount of the insurance coverage as required by the insurance broker or consultant.

7.10. Duty to apply insurance proceeds.
If either party recovers any insurance proceeds on account of loss or damage to any Project Facilities component, such proceeds shall be applied to repair or replace the damaged portion of that Project Facilities component, and not otherwise. If either party is self-insured and any loss or damage occurs that would have been covered by insurance otherwise required to be maintained by such party under this Agreement, then such party shall provide the funds that would have been recovered had the party been insured and shall apply the funds to repair or replace the damaged portion of the Project Facilities component.

7.11. Losses Caused by Third Parties.
If any Project Facilities component is damaged or destroyed or any other personal injury, death, property damage or economic loss is incurred relating to any Project Facilities component

(collectively, "damage or loss") during the term of this Agreement, and excluding the amount of any such damage or loss covered in Section VI, Indemnification, then the responsible third party or parties shall be responsible for paying for any such damage or loss. If the funds or other consideration paid by either party pursuant to Section VI and by the third parties are insufficient to cover the total cost of the damage or loss, then the balance necessary to cover the total cost of the damage or loss shall be paid from the applicable reserve and, then to the extent the funds in the replacement reserve are inadequate, the balance will be allocated between the parties based upon the then Capital Cost allocation for the applicable Project Facilities component.

VIII. TERM OF AGREEMENT

8.01. Term of Agreement.
This Agreement shall become effective on the date hereinabove entered and terminate on December 31, 2055 unless extended in accordance with Section 8.02.

8.02. Automatic extension.
This Agreement shall be automatically renewed for an additional 10-year period (an "extended term") unless a party is in default under this Agreement or unless one party provides the other party with written notice to terminate this Agreement upon expiration of the initial term or of any extended term. Any such notice must be provided to the other party at least three (3) full years prior to the expiration of any extended term. Unless such notice is provided, the parties agree that there shall not be a limit on the number of extended terms.

8.03. Conditions of agreement during term.
All the terms of this Agreement shall remain in effect during any term, except as otherwise provided in this Agreement or as may be amended in writing which is signed by both parties.

8.04. Rights on Termination.
(a) Unless otherwise agreed upon in writing by the parties, upon any termination of this Agreement, MCWD shall have the continuing right to tertiary water as set forth in the Annexation Agreements and the 2009 RUWAP MOU. Except as provided in the Annexation Agreements and the 2009 RUWAP MOU, PCA shall provide facilities for treating the water beyond secondary treatment level at its sole cost and expense or through a cooperative agreement with MCWD or any other entity. Upon any termination of this Agreement, MCWD shall have the continuing right to receive the same quantity of tertiary treated water as MCWD was or would have been entitled to receive during any term of this Agreement so long as MCWD provides facilities at its sole cost and expense or through a cooperative agreement with PCA or any other entity for the delivery of such tertiary treated water and purified recycled water.

(b) MCWD's and PCA's respective rights to tertiary treated water in accordance with this Agreement shall also survive termination.

IX. DISPUTE RESOLUTION

9.01. Dispute resolution procedure.
If any dispute arises between the parties as to the proper interpretation or application of this Agreement and/or the proper operation of the facilities, the parties shall resolve the dispute in accordance with this Article.

9.02. Duty to meet and confer.

If any dispute under this Agreement arises, the parties shall first meet and confer, in an attempt to resolve the matter between themselves. Each party shall make all reasonable efforts to provide to the other party all the information that the party has in its possession that is relevant to the dispute, so that both parties will have ample information with which to reach a decision.

9.03. Mediation and Binding Arbitration.

(a) If the dispute is not resolved within sixty (60) days after the first meeting under Section 9.02, then either party may notify the other party that the notifying party elects to submit the dispute to mediation. If the other party agrees to submit the dispute to mediation, then the parties will jointly select a mediator. The terms of mediation shall be set by agreement of the parties and the mediator.

(b) If the dispute is not resolved by meeting and conferring, and mediation does not occur or is unsuccessful, the parties may agree to submit the matter to binding arbitration. In that event, the parties will jointly select a single arbitrator. If the parties are unable to agree on a single arbitrator, then the parties shall request the Presiding Judge of the Monterey County Superior Court to appoint an arbitrator who has proven experience in the subject matter of the dispute. Any person selected as an arbitrator shall be a qualified professional with expertise in the area that is the subject of the dispute, unless the parties otherwise agree. The cost of the arbitrator shall be shared equally between the parties. Unless otherwise agreed by the parties, the arbitration shall be conducted in accordance with the rules of the American Arbitration Association ("Rules"); provided that the arbitration does not have to be handled through the American Arbitration Association. . The parties agree that they will faithfully observe the Rules and will abide by and perform any award rendered by the arbitrator, and that a judgment of the court having jurisdiction may be entered on the award. Notwithstanding the Rules, discovery will be permitted and the provisions of the California Code of Civil Procedure Section 1283.05 are incorporated herein unless the parties agree otherwise. The parties hereby consent to the jurisdiction of the courts of Monterey County for the confirmation, correction or vacation of any arbitration award. The arbitrator may grant any remedy or relief deemed by the arbitrator just and equitable under the circumstances, whether or not such relief could be awarded in a court of law. The arbitrator will have no power to award punitive damages or other damages not measured by the party's actual damages against any party. This limitation of the arbitrator's powers under this Agreement shall not operate as an exclusion of the issue of punitive damages from this Agreement to arbitrate sufficient to vest jurisdiction in a court with respect to that issue. The arbitrator's award will be deemed final, conclusive and binding to the fullest extent allowed by California law, and may be entered as a final judgment in court.

X. GENERAL PROVISIONS

10.01. Compliance with laws.

Both parties will comply with all permit and licensing requirements applicable to the project, and will operate the project in accordance with all requirements of law and governmental regulations.

10.02. Attorney's fees.

If either party commences an action against the other party arising out of or in connection with this Agreement, the prevailing party shall be entitled to have and recover from the losing party reasonable attorneys' fees and costs.

10.03. Amendments.
No amendment or modification shall be made to this Agreement, except in writing, approved by the respective Boards and duly signed by both parties.

10.04. Contract administrators.
(a) MCWD hereby designates its General Manager as its contract administrator for this Agreement. All matters concerning this Agreement which are within the responsibility of MCWD shall be under the direction of or shall be submitted to the General Manager or such other MCWD employee in the MCWD as the General Manager may appoint. MCWD may, in its sole discretion, change its designation of the contract administrator and shall promptly give written notice to PCA of any such change.

(b) PCA hereby designates its General Manager as its contract administrator for this Agreement. All matters concerning this Agreement which are within the responsibility of PCA shall be under the direction of or shall be submitted to the General Manager or such other PCA employee in the PCA as the General Manager may appoint. PCA may, in its sole discretion, change its designation of the contract administrator and shall promptly give written notice to MCWD of any such change.

10.05. Assignment.
Any assignment of this Agreement shall be void without the written consent of the non-assigning party, except that PCA shall have the right to assign all of its rights and obligations under this Agreement to a local governmental agency created by PCA for the sole purpose of assuming and performing all rights and obligations of PCA under the Pure Water Monterey Project and except that MCWD shall have the right to assign all of its rights and obligations under this Agreement to a local governmental agency created by MCWD for the sole purpose of assuming and performing all rights and obligations of MCWD under this Agreement; provided that in either case the local governmental agency assignee shall have adequate financial assets to insure its performance of all assigned obligations.

10.06. No Modification of MCWD Contract Entitlement.
Nothing in this Agreement is intended to, nor shall it be interpreted to, expand, limit or otherwise modify MCWD's existing contractual rights, entitlements, and obligations pursuant to either of the Annexation Agreements or the 2009 RUWAP MOU.

10.07. Negotiated Agreement.
This Agreement has been arrived at through negotiation between the parties. Neither party is to be deemed the party which prepared this Agreement within the meaning of Civil Code Sec. 1654.

10.08. Time is of essence.
Time is of the essence of this Agreement.

10.09. Headings.
The article and paragraph headings are for convenience only and shall not be used to limit or interpret the terms of this Agreement.

10.10. Entire Agreement.
This written Agreement, together with all exhibits attached hereto and incorporated by reference, is the complete and exclusive statement of the mutual understanding of the parties, except to the extent that this Agreement expressly refers to or requires the preparation of additional agreements. Any such additional agreement shall be in writing.

10.11. Notices.

All notices and demands required under this Agreement shall be deemed given by one party when delivered personally to the principal office of the other party; when faxed to the other party, to the fax number provided by the receiving party; or five days after the document is placed in the US mail, certified mail and return receipt requested, addressed to the other party as follows:

To PCA:

General Manager
MRWPCA
5 Harris Court, Building D
Monterey, CA 93940
Fax: (831) 372-6178

To MCWD:

General Manager
MCWD
11 Reservation Road
Marina, CA 93933
Fax: (831) 883-5995

10.12. Execution of documents.

(a) The parties will execute all documents necessary to complete their performance under this Agreement.

10.13. Exhibits.

(a) The following exhibits are attached to this Agreement:

Exhibit A: Pure Water Delivery and Supply Facilities

Exhibit B: AWT Facilities

Exhibit C: Product Water Conveyance Facilities

Exhibit D: Reserved

Exhibit E: Summary of Estimated Costs- Phase 1 only

Exhibit F: Financial and Construction Responsibilities of the Project Components

Exhibit G: Important Project Agreement Dates

10.14. Severability.

If any one or more of the terms, provisions, covenants or conditions of this Agreement are to any extent declared invalid, unenforceable, void or voidable for any reason whatsoever by a court of competent jurisdiction, the finding or order or decree of which becomes final, the Parties agree to amend the terms in a reasonable manner to achieve the intention of the Parties without invalidity. If the terms cannot be amended thusly, the invalidity of one or several terms will not affect the validity of the Agreement as a whole, unless the invalid terms are of such essential importance to this Agreement that it can be reasonably assumed that the Parties would not have contracted this Agreement without the invalid terms. In such case, the Party affected may terminate this Agreement by written notice to the other Party without prejudice to the affected Party's rights in law or equity.

10.15. Waiver.

(a) No waiver of any right or obligation of any of the parties shall be effective unless in writing, specifying such waiver, executed by the party against whom such waiver is sought to be

enforced. A waiver by any of the parties of any of its rights under this Agreement on any occasion shall not be a bar to the exercise of the same right on any subsequent occasion or of any other right at any time.

10.16. Written Authorization.

(a) For any action by any party which requires written authorization from the other party, the written authorization shall be signed by authorizing party's General Manager, or the General Manager's written designee.

XII. EXECUTION

In witness whereof, the parties execute this Agreement as follows:

PCA

Dated: 4/8/2016

Board Chair, Board of Directors

MCWD

Dated: 4.7.16

President, Board of Directors

Approved as to form:

Dated: 4/8/2016

Counsel, PCA

Dated: April 7, 2016

Legal Counsel, MCWD

Exhibit A: Pure Water Delivery and Supply Facilities

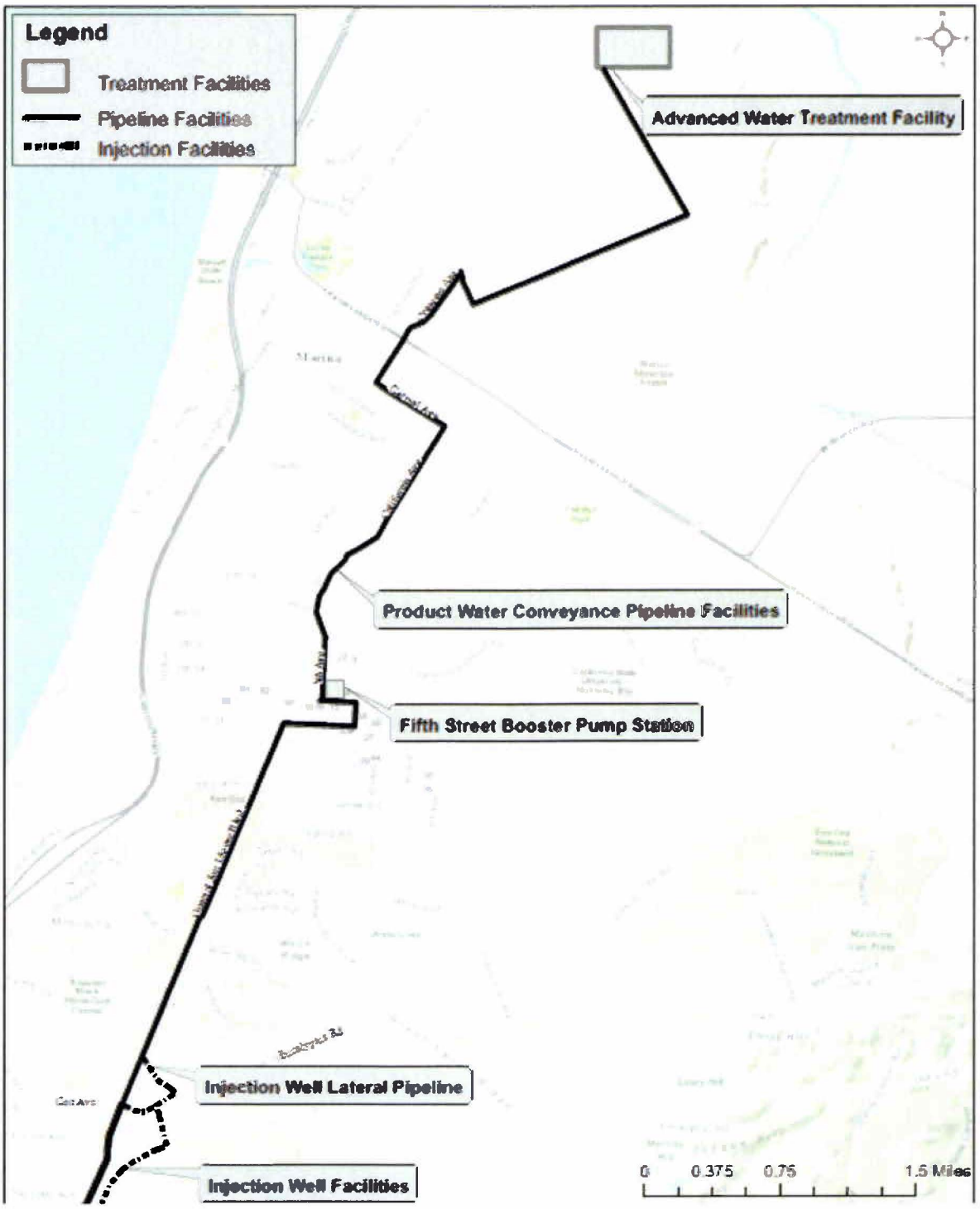
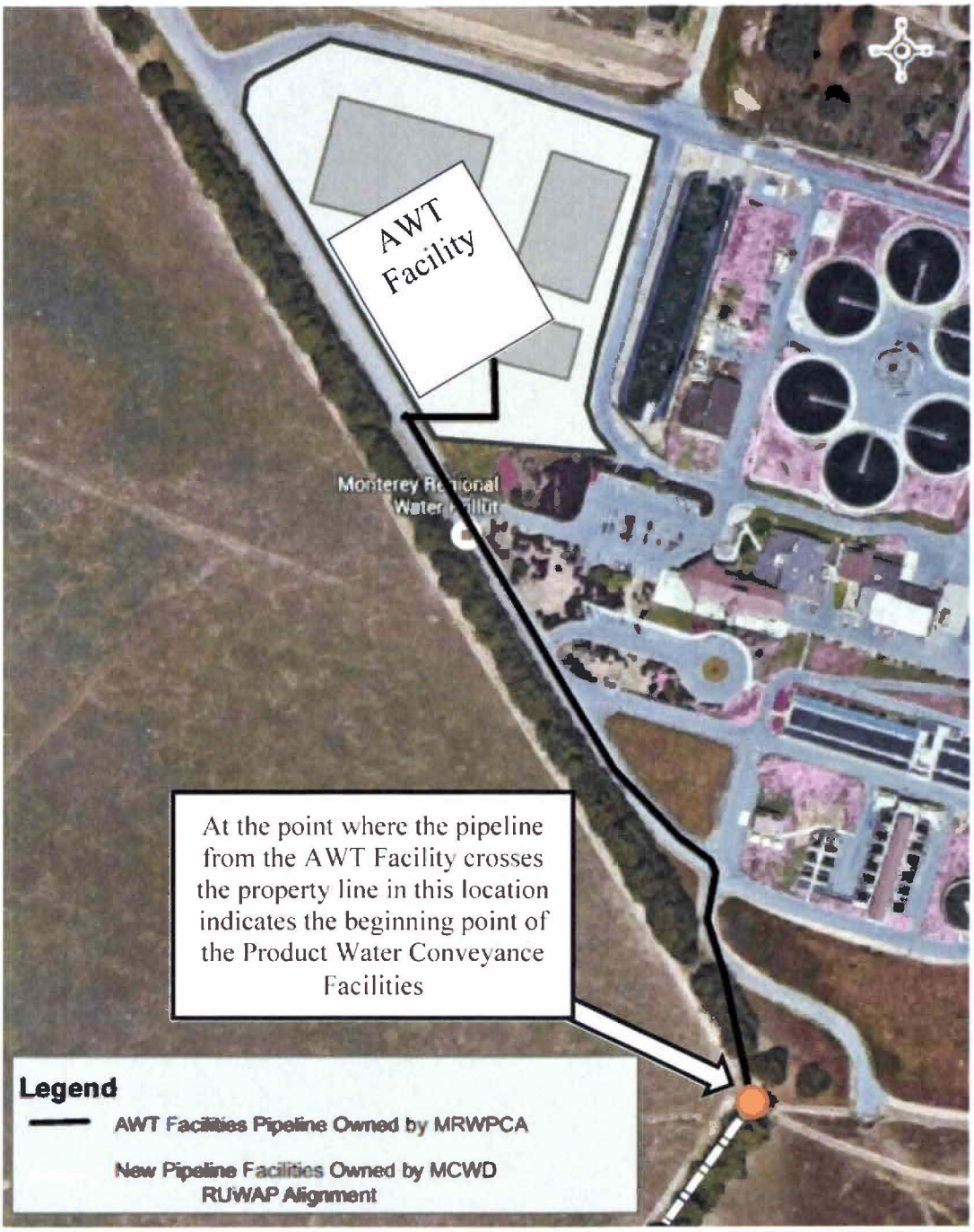


Exhibit B: AWT Facilities



● Beginning of Product Water Conveyance Facilities

Exhibit C (page 1 of 2): Product Water Conveyance Facilities

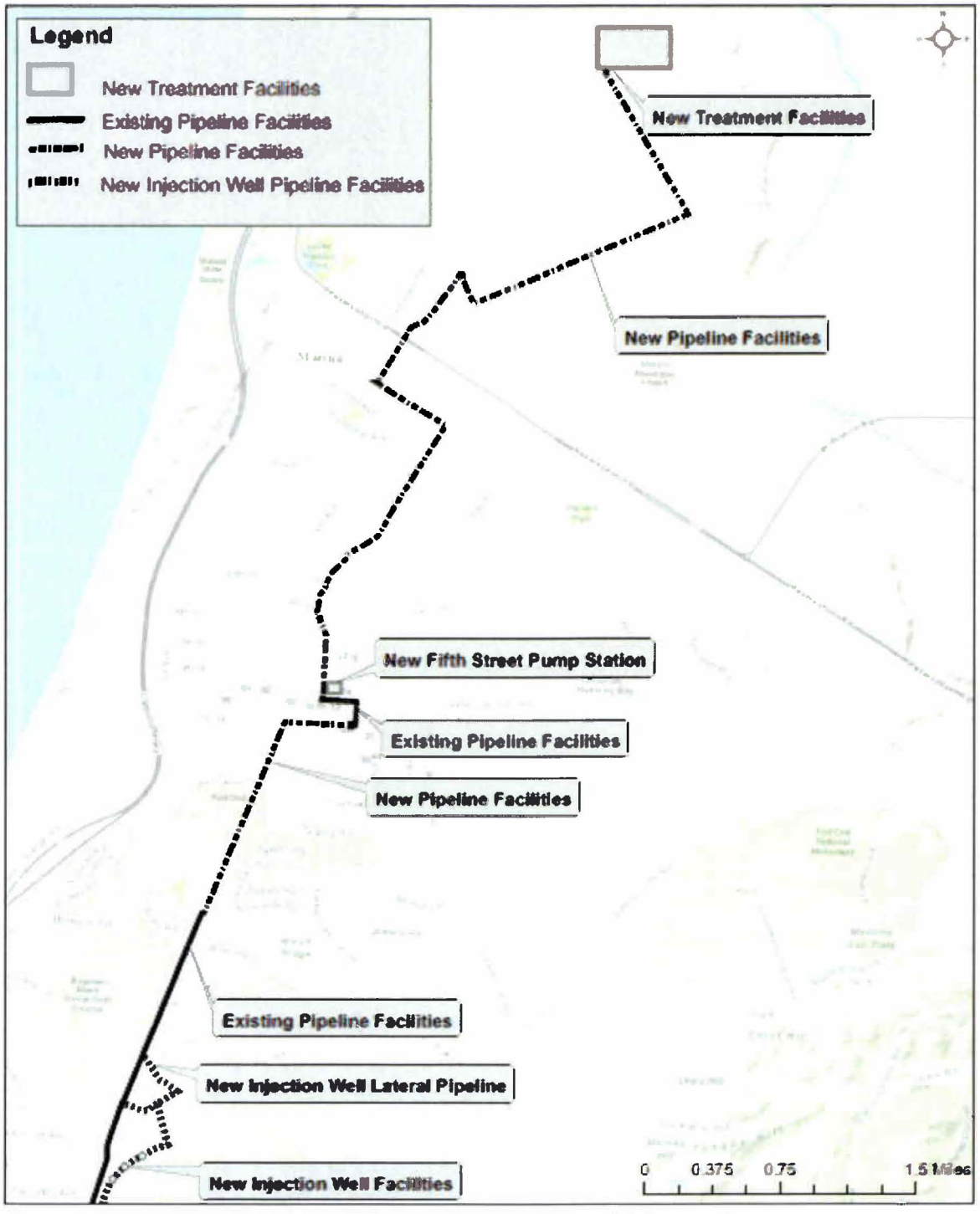
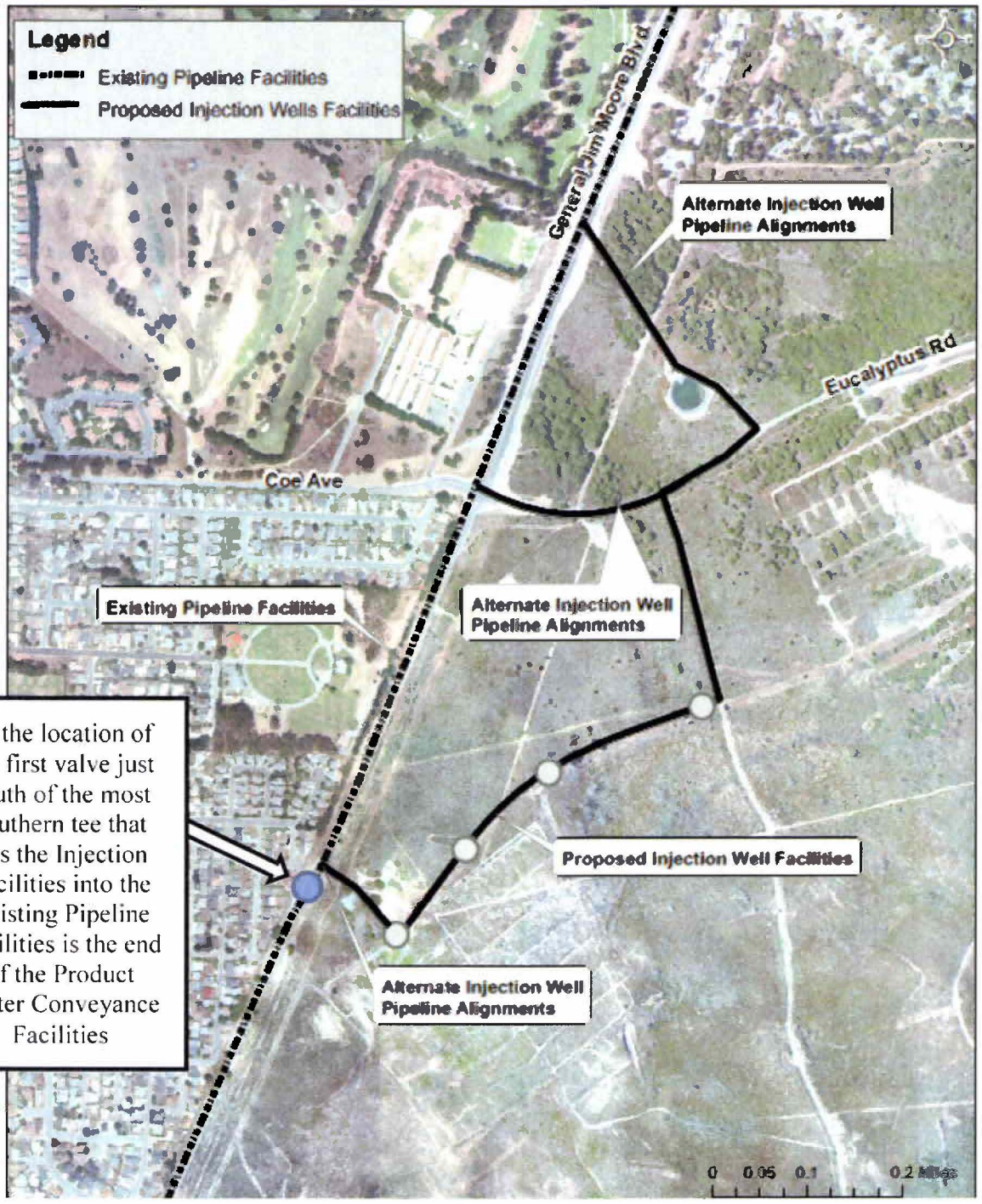


Exhibit C (page 2 of 2): Product Water Conveyance Facilities



● End of Product Water Conveyance Facilities

Exhibit D: Reserved

Exhibit E: Summary of Estimated Costs-Phase 1 Only

(Note: This table does not include potential grant funds or other capital contributions that may be received and applied to the project that would reduce the overall costs for PCA and/or MCWD).

Est. Capital Costs	PCA Share	MCWD Share	PCA Share	MCWD Share	Total Amount
New Pipeline Facilities	72.167%	27.833%	$16,309,742	$ 6,290,258	$ 22,600,000
AWT Phase 1	86.047%	13.953%	$35,438,144	$ 5,746,492	$ 41,184,636
Existing Pipeline Facilities	72.167%	27.833%	$ 1,002,400	$ 386,600	$ 1,389,000
TOTAL	80.938%	19.062%	$52,750,285	$12,423,351	$ 65,173,636

Est. Annual Debt Service Costs	PCA Share	MCWD Share	PCA Share	MCWD Share	Annual Amount
New Pipeline Facilities	72.167%	27.833%	$ 631,972	$ 243,736	$ 875,707
AWT Phase 1	86.047%	13.953%	$ 1,373,161	$ 222,666	$ 1,595,827
Existing Pipeline Facilities	72.167%	27.833%	$ 54,502	$ 21,020	$ 75,522
TOTAL	80.863%	19.137%	$ 2,059,635	$ 487,421	$ 2,547,056

Est. Annual OM Costs	PCA Share	MCWD Share	PCA Share	MCWD Share	Annual Amount
New Pipeline Facilities	86.047%	13.953%	$ 146,054	$ 23,684	$ 169,738
AWT Phase 1	86.047%	13.953%	$ 2,480,409	$ 402,212	$ 2,882,621
Existing Pipeline Facilities	86.047%	13.953%	$ 4,595	$ 745	$ 5,340
TOTAL	86.047%	13.953%	$ 2,631,058	$ 426,641	$ 3,057,699

Est. Annual Renewal Costs	PCA Share	MCWD Share	PCA Share	MCWD Share	Annual Amount
New Pipeline Facilities	72.167%	27.833%	$ 56,110	$ 21,640	$ 77,750
AWT Phase 1	86.047%	13.953%	$ 620,818	$ 100,669	$ 721,487
Existing Pipeline Facilities	72.167%	27.833%	$ 2,005	$ 773	$ 2,778
TOTAL	84.653%	15.347%	$ 678,933	$ 123,082	$ 802,015

Est Total Annual Costs			PCA Share	MCWD Share	Annual Amount
New Pipeline Facilities			$ 834,136	$ 289,059	$ 1,123,195
AWT Phase 1			$ 4,474,388	$ 725,547	$ 5,199,935
Existing Pipeline Facilities			$ 61,102	$ 22,538	$ 83,640
TOTAL			$ 5,369,626	$ 1,037,145	$ 6,406,770

Est. Total Demands and Cost/AF	PCA Share	MCWD Share	PCA Share	MCWD Share	Annual Amount
Phase 1 Demand	86.047%	13.953%	3,700	600	4,300
Total Cost/AF			$ 1,451	$ 1,729	$ 1,490

Note: New Pipeline Facilities includes the piping and pump station facilities.

Exhibit F: Financial and Construction Responsibilities of Project Components

Project Item	Who will perform the work and pay the initial invoices		How will costs be reconciled between MCWD and PCA
	MCWD	PCA	
New Pipeline Facilities CEQA	X		PCA to reimburse MCWD based on Capital Cost Share %
New Pipeline Facilities Design	X		PCA to reimburse MCWD based on Capital Cost Share %
New Pipeline Facilities Permits	X		PCA to reimburse MCWD based on Capital Cost Share %
New Pipeline Facilities Capital	X		PCA to reimburse MCWD based on Capital Cost Share %
New Pipeline Facilities O&M	X		PCA to reimburse MCWD based on OM Cost Share %
New Pipeline Facilities Renewal	X		PCA to reimburse MCWD based on Renewal Cost Share %
Existing Pipeline Facilities O&M	X		PCA to reimburse MCWD based on OM Cost Share %
Existing Pipeline Facilities Renewal	X		PCA to reimburse MCWD based on Renewal Cost Share %
RUWAP Distribution Facilities CEQA, Design, Permits, Capital, O&M, and Renewal	X		Not applicable.
AWT-PHASE 1 CEQA		X	MCWD to reimburse PCA based on Capital Cost Share %
AWT-PHASE 1 Design		X	MCWD to reimburse PCA based on Capital Cost Share %
AWT-PHASE 1 Permits		X	MCWD to reimburse PCA based on Capital Cost Share %
AWT- PHASE 1 Capital		X	MCWD to reimburse PCA based on Capital Cost Share %
AWT-PHASE 1 O&M		X	MCWD to reimburse PCA based on OM Cost Share %
AWT-PHASE 1 Renewal		X	MCWD to reimburse PCA based on Renewal Cost Share %
AWT-PHASE 2 CEQA		X	MCWD to reimburse PCA based on Capital Cost Share %
AWT-PHASE 2 Design		X	MCWD to reimburse PCA based on Capital Cost Share %
AWT-PHASE 2 Permits		X	MCWD to reimburse PCA based on Capital Cost Share %
AWT-PHASE 2 Capital		X	MCWD to reimburse PCA based on Capital Cost Share %
AWT-PHASE 2 O&M		X	MCWD to reimburse PCA based on OM Cost Share %
AWT-PHASE 2 Renewal		X	MCWD to reimburse PCA based on Renewal Cost Share %
Injection Facilities CEQA, Design, Permits, Capital, O&M, and Renewal		X	Not applicable.

Exhibit G: Important Project Agreement Dates

Section 1.01 (a)	Milestone	Party	Key Date	Drop Dead Date
i	CEQA Approval-New Pipeline Facilities	MCWD		October 31, 2016
ii	CEQA Approval-AWT Phase 1 and AWT Phase 2	PCA		October 31, 2016
iii	No CEQA Lawsuits	BOTH		N/A
iv	Regulatory Approvals	PCA		October 31, 2016
v	SRF Funding Agreement	BOTH	October 31, 2016 Initial funding agreement	December 31, 2016 Final funding agreement
vi	Source waters approval	PCA		October 31, 2016
vii	CPUC approval	PCA		October 31, 2016

FIRST AMENDMENT TO

PURE WATER DELIVERY AND SUPPLY PROJECT AGREEMENT
BETWEEN MONTEREY REGIONAL WATER POLLUTION CONTROL AGENCY AND
MARINA COAST WATER DISTRICT

WHEREAS, on April 8, 2016, Marina Coast Water District (MCWD) and Monterey Regional Water Pollution Control Agency entered into the Pure Water Delivery and Supply Project Agreement (Agreement).

The parties agree to amend the Pure Water Delivery and Supply Project Agreement as follows:

1. Everywhere the term "Monterey Regional Water Pollution Control Agency" or "PCA" is used, substitute the term "Monterey One Water" and "M1W," respectively.

2. Delete Section 1.01 in its entirety. The Parties agree that this Amendment addresses all of the matters previously listed in Section 1.01.

3. Amend Section 1.03(a) as follows:

> M1W has already completed the necessary CEQA review for the use of AWT Phase 1 water for irrigation. MCWD intends to use its AWT Phase 1 water for irrigation; however, to the extent that any portion of MCWD's AWT Phase 1 water is to be used for injection, then any additional CEQA review necessary to address the use of that water for injection will be the responsibility of MCWD as described in Section 1.03(g) below.
>
> Because of the uncertainty resulting from the possibility that a portion of MCWD's AWT Phase 2 will be used for injection, details regarding Phase 2 implementation of MCWD's AWT Phase 2 water for injection will require a separate agreement or an amendment to this agreement based upon the existing terms of this agreement.

4. Add as a new Section 1.03(g) to read: M1W agrees that MCWD may use water delivered by this project, subject to the following conditions:

1. The CEQA work completed and approved by the M1W Board in October, 2017 describes a MCWD project that applies this water for irrigation. Any change to that CEQA work, from irrigation to injection and sale shall be at the sole expense of MCWD and M1W shall not be responsible for any delays that any such change might cause in the timing of delivery of water for injection to MCWD.

2. If MCWD elects to inject, it will be responsible for permitting at its injection site but M1W agrees to help by providing all of the work product it completed for its injection well project, e.g., engineering report for the drinking water permit, to MCWD for its use.

3. M1W injection well field and infrastructure will not be used for MCWD injection unless and until there is a future separate agreement between the parties hereto.

4. Any costs for a change from irrigation to injection, e.g. CEQA, engineering, permitting, test well construction, modeling, etc. shall be the sole responsibility of MCWD. To the extent that M1W agrees to do work to assist MCWD, MCWD agrees

to pay any such invoices to M1W within the time period for payment specified by the service provider.

5. FORA agrees to any such change in use from irrigation to injection and agrees to continue to fund the project as agreed to in 7 (d) (ii) of this amendment.

6. The portion of the 650 acre feet of summer delivery water that is not used by MCWD for AWT Phase 1 will be available for use by M1W. For AWT Phase 2, the entire amount of the 650 acre feet of summer delivery will be needed and used by MCWD and will no longer be available to M1W.

5. In Section 2.05(a), delete the words "Subject to Section 1.01(a) conditions" and substitute the following words, "Subject to Section 1.03(a)".

6. In Section 3.01(b), delete "January 31, 2017" and substitute "December 31, 2018".

7. Delete existing Section 4.01 in its entirety and replace with the following:

(a) Reserved.

(b) The estimated construction costs and proportional share of the New Pipeline Facilities and AWT Phase 1 are presented below (which also includes the Distribution, Diversion, and Injection Facilities to provide a total project cost perspective even though those are not part of the cost sharing). The cost allocations for the Pipeline Facilities are based upon a MCWD maximum use of 1,427 AFY and a M1W maximum use of 3,700 AFY. If any maximum use amount is exceeded, then the Parties agree to recalculate the allocations for the Pipeline Facilities, to true up those capital costs back to the date of this Agreement, and to agree on a true up amount and payment schedule.

	Costs (Millions)		
Capital Facility	M1W Share	MCWD Share	TOTAL
AWT Phase 1	$ 56.79	$ 9.21	$ 66.00
New Pipeline Facilities	$ 17.52	$ 10.28	$ 27.80
Existing Pipeline Facilities	$ 1.00	$ 0.39	$ 1.39
Diversion Facilities	$ 6.60	$ -	$ 6.60
Injection Facilities	$ 10.67	$ -	$ 10.67
Distribution Facilities	$ -	$ 11.50	$ 11.50
TOTAL	$ 92.58	$ 31.38	$ 123.96

(c) Except for the $1.39 million in Section 4.01(b) for the Existing Pipeline Facilities, the Parties agree that all dollar amounts in this Agreement, including exhibits, are estimates.

(d) Grants and Capital Contributions from Third Parties.

i. Unless otherwise agreed in writing by the Parties, each Party is only required to apply grant funds and capital contributions from third parties to cover that Party's cost share of the Pure Water Delivery and Supply Project Facilities.

ii. FORA Capital Contribution. FORA and MCWD entered into the Reimbursement Agreement for Advanced Water Treatment Phase 1 and Product Water Conveyance Facilities of the RUWAP Recycled Project dated September 6, 2016 (the FORA-MCWD Reimbursement Agreement"), pursuant to Sections 3.2.2 and 7.1.2 of the 1998 Water/Wastewater Facilities Agreement (the "1998 Agreement). If the FORA Board of Directors independently determines to provide $2.3 million to M1W for M1W's share of costs for the Project, then MCWD agrees to not object. M1W agrees to enter into a separate reimbursement agreement with FORA. M1W acknowledges FORA's obligations to MCWD under Section 7.1.2 of the 1998 Agreement. M1W agrees that it shall not be entitled to any additional funds allocated to MCWD by FORA for RUWAP and/or for Water Augmentation under the Base Reuse Plan; however, nothing herein is intended to prevent M1W from seeking additional funds directly from FORA.

8. Add the following new Subsections iv, v, and vi to Section 4.02(a):

iv. The transmission main turnouts, any other expense shown to be exclusively for the MCWD distribution system, and the potable water facility included in MCWD's transmission pipeline construction contract are considered to be a part of the Distribution System for cost sharing purposes (e.g. MCWD pays for 100% of the Distribution System costs).

v. The 2.0 million gallon recycled water reservoir included in MCWD's transmission pipeline construction contract is considered to be 25% for Injection Facilities (M1W) and 75% for Distribution Facilities (MCWD) and therefore the parties will split the cost of the recycled water reservoir along these percentages.

9. Substitute the following for Sections 4.04(b):

(b) MCWD applied for a Clean Water SRF loan to pay for its cost share of the Project Facilities except for its cost share of the AWT Phase 1 treatment plant facilities. MCWD AWT costs for Phase 1 will be included in the SRF loan referenced in Section 4.04(a) (included within M1W's SRF loan).

10. Section 5.01 has two subsections "(a)." The second subsection (a) should be re-lettered subsection (b) and the following subsections (b), (c), (d), and (e) shall be re-lettered (c), (d), (e), and (f), respectively. Subsection 5.01(b)(i) shall be deleted because M1W's SRF loan includes M1W's share of the New Pipeline Facilities.

11. Subsection 5.02(b) shall be deleted because M1W's SRF loan includes M1W's share of the New Pipeline Facilities.

12. In Section 5.10, Claims for Stranded Costs, delete "March 31, 2017" and substitute "December 31, 2018".

13. Delete the existing Exhibit A and substitute the attached new Exhibit A.

14. Delete the existing Exhibit B and substitute the attached new Exhibit B.

15. Delete the existing Exhibit C (2 pages) and substitute the attached new Exhibit C (2 pages).

16. Delete the existing Exhibit E and substitute the attached Exhibit E.

17. Delete the existing Exhibit G.

18. Except as set forth in this First Amendment, all the provisions of the Agreement shall remain unchanged and in full force and effect.

In witness whereof, the parties execute this First Amendment as follows:

M1W

Dated: 11/29/2017

Rudy Fischer

Board Chair, Board of Directors

MCWD

Dated: 12.18.17

President, Board of Directors

Approved as to form:

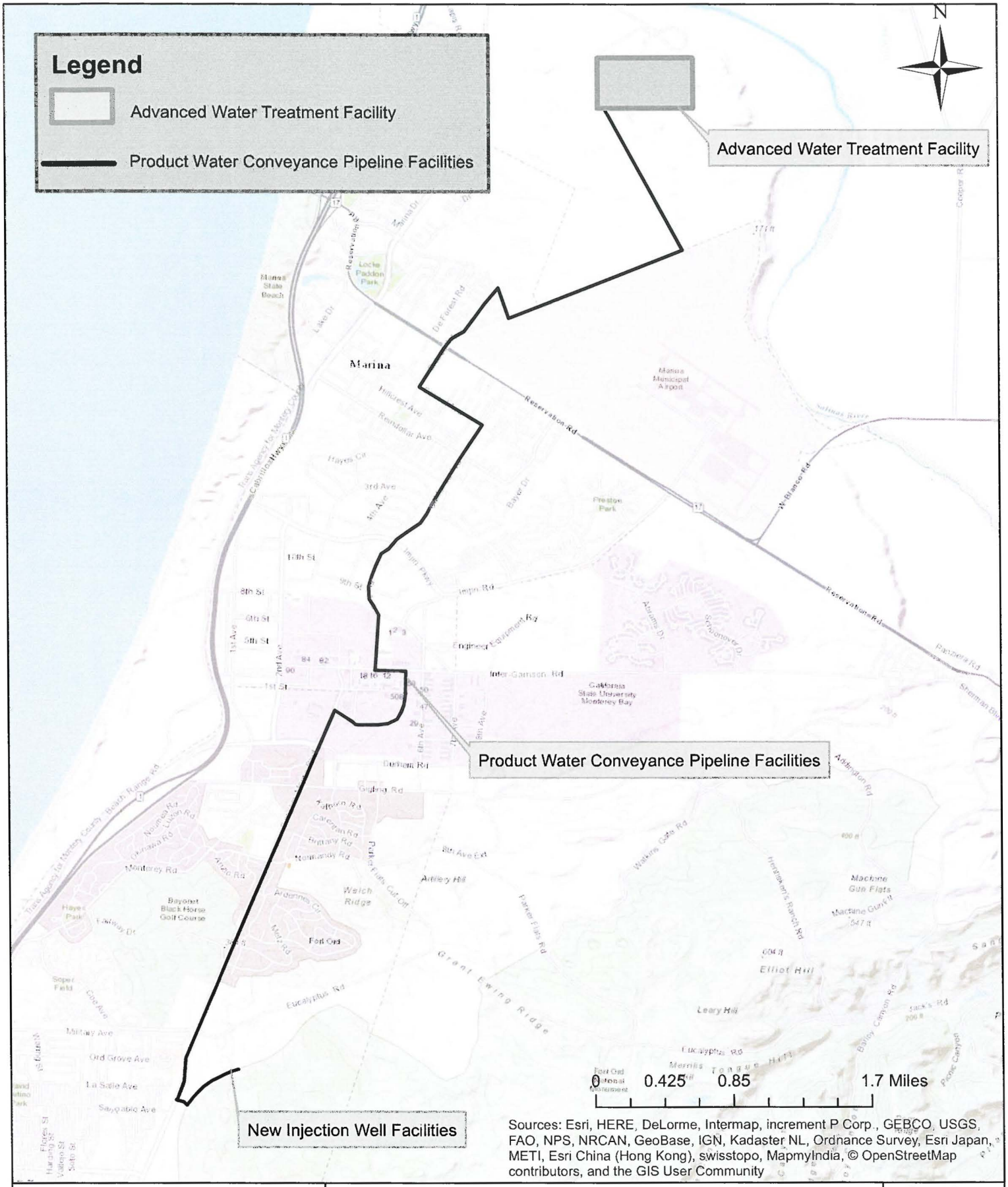
Dated: John R. Wellington 11/30/17

Counsel, M1W

Dated: 12/18/17

Roger K. Masuda

Legal Counsel, MCWD



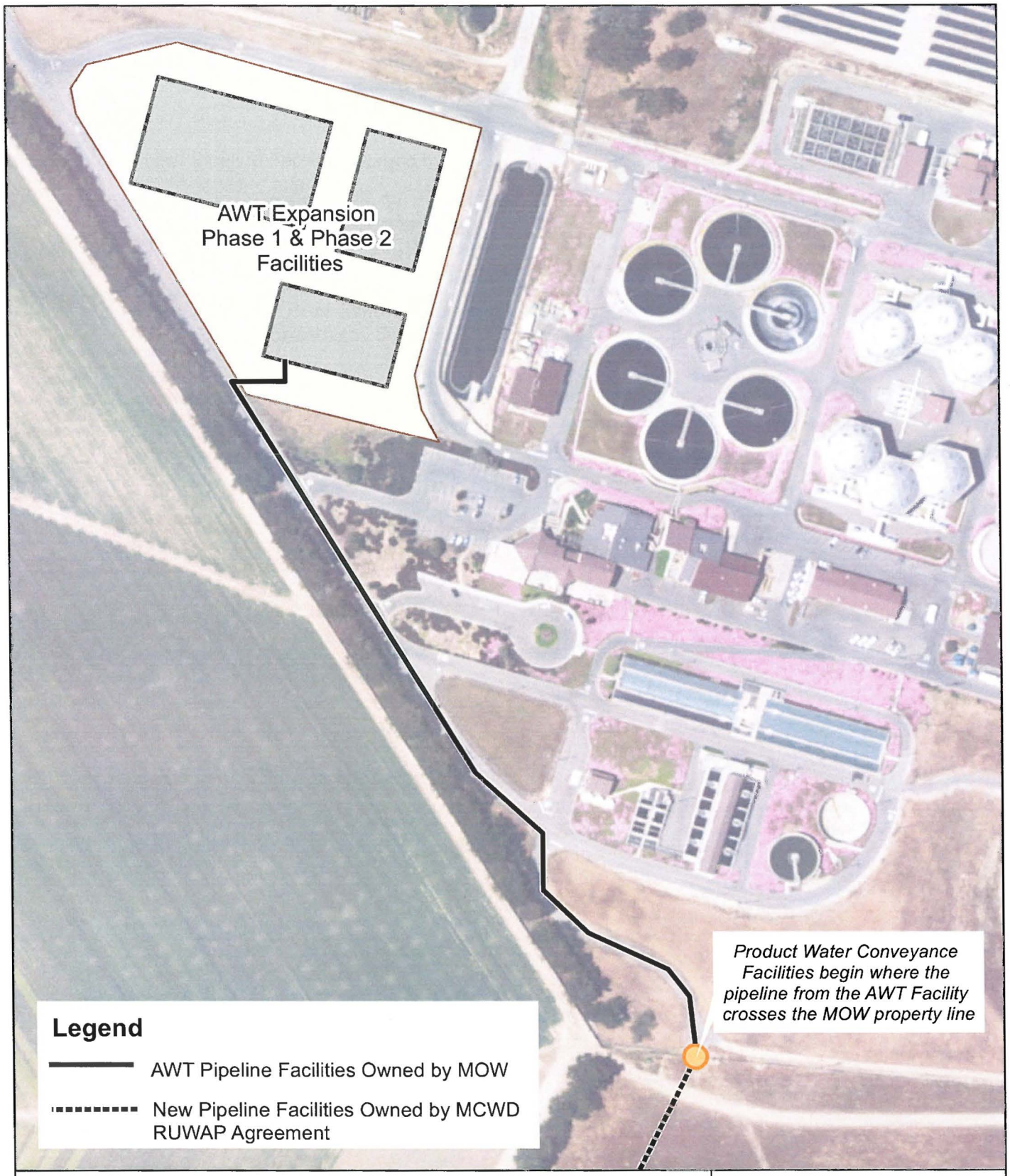
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Marina Coast Water District
11 Reservation Road
Marina, CA 93933
mcwd.org

Exhibit A
Pure Water Delivery and Supply Facility

Drawn By: J.Hollida

Date: 10/16/2017



MARINA COAST WATER DISTRICT

Exhibit B

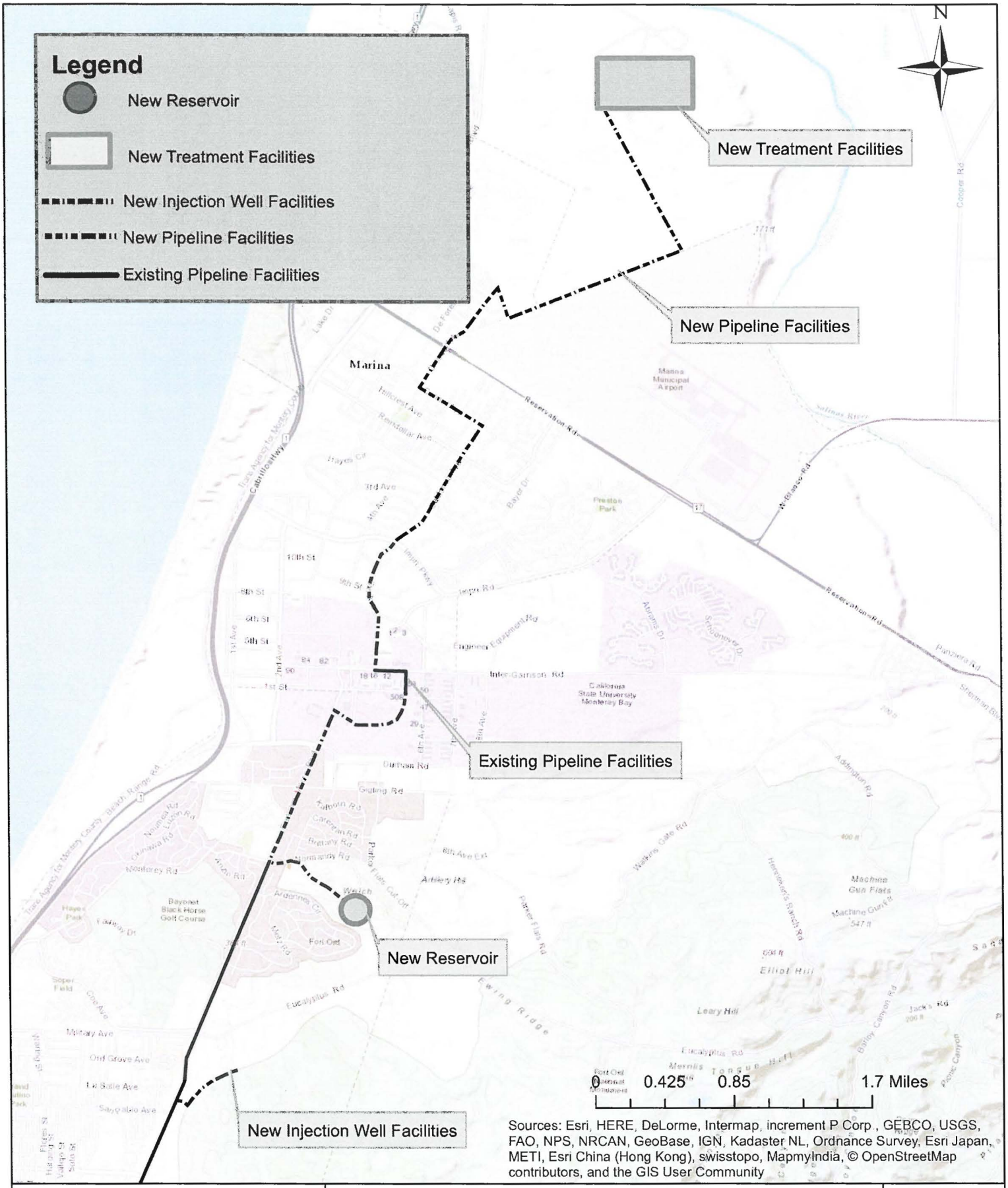
Advanced Water Treatment Facility
(Pure Water Monterey Project)
Recycled Water Delivery and Supply Project

N

0 100 200 Feet

1 inch = 200 feet

November 2017
Author: A. Racz



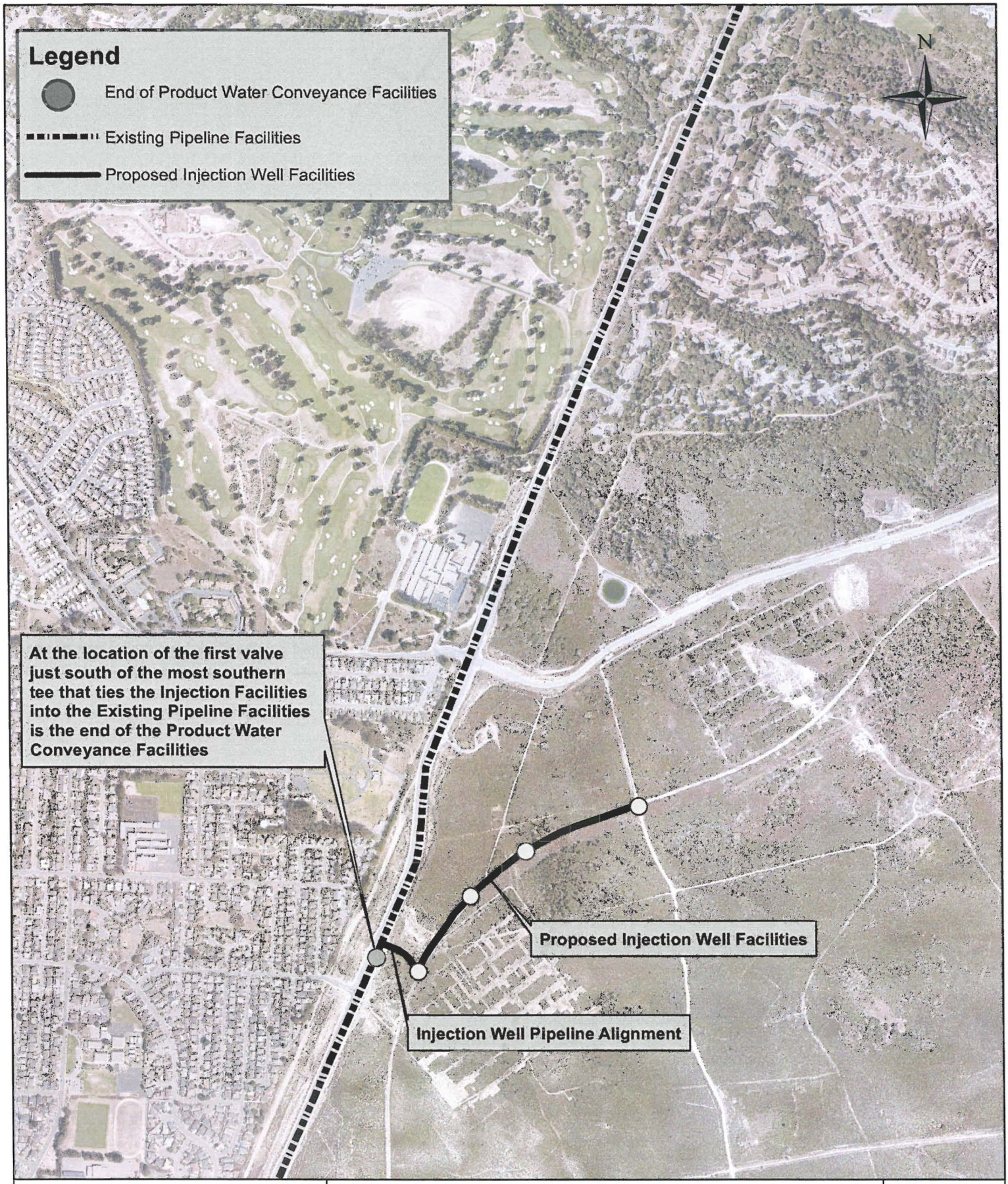
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp , GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Marina Coast Water District
11 Reservation Road
Marina, CA 93933
mcwd.org

Exhibit C
Product Water Conveyance Facilities

Drawn By: J.Hollida

Date: 10/16/2017



Marina Coast Water District
11 Reservation Road
Marina, CA 93933
mcwd.org

Exhibit C
Product Water Conveyance Facilities

Drawn By:
J.Hollida

Date:
10/16/2017

Exhibit E: Summary of Estimated Costs-Phase 1 Only

Note: This table is only cost estimates, and does not include financing reductions from either grant funds or capital contributions.

Est. Capital Costs	PCA Share	MCWD Share	PCA Share	MCWD Share	Total Amount
New Pipeline Facilities	72.167%	27.833%	$ 16,537,790	$ 6,378,210	$ 22,916,000
RUWAP Distribution Facilities	0.000%	100.000%	$ -	$ 12,464,000	$ 12,464,000
Blackhorse Reservoir	25.000%	75.000%	$ 980,000	$ 2,940,000	$ 3,920,000
AWT Phase 1	86.047%	13.953%	$ 56,790,698	$ 9,209,302	$ 66,000,000
Diversion Facilities	100.000%	0.000%	$ 6,600,000	$ -	$ 6,600,000
Existing Pipeline Facilities	72.167%	27.833%	$ 1,002,400	$ 386,600	$ 1,389,000
Injection Well Facilities	100.000%	0.000%	$ 10,670,000	$ -	$ 10,670,000
TOTAL	74.687%	25.313%	$ 92,580,887	$ 31,378,113	$ 123,959,000

Est. Annual Debt Service Costs	PCA Share	MCWD Share	PCA Share	MCWD Share	Annual Amount
New Pipeline Facilities	72.167%	27.833%	$ (640,808)	$ (277,015)	$ (917,823)
RUWAP Distribution Facilities	0.000%	100.000%	$ -	$ (541,329)	$ (541,329)
Blackhorse Reservoir	25.000%	75.000%	$ (37,973)	$ (127,688)	$ (165,662)
AWT Phase 1	86.047%	13.953%	$ (2,200,532)	$ (356,843)	$ (2,557,375)
Diversion Facilities	100.000%	0.000%	$ (255,738)	$ -	$ (255,738)
Existing Pipeline Facilities	72.167%	27.833%	$ (38,841)	$ (16,791)	$ (55,632)
Injection Well Facilities	100.000%	0.000%	$ (413,442)	$ -	$ (413,442)
TOTAL	73.106%	26.894%	$ (3,587,335)	$ (1,319,666)	$ (4,907,001)

Est. Annual OM Costs	PCA Share	MCWD Share	PCA Share	MCWD Share	Annual Amount
New Pipeline Facilities	86.047%	13.953%	$ (146,054)	$ (23,684)	$ (169,738)
RUWAP Distribution Facilities	0.000%	100.000%	$ -	$ (75,000)	$ (75,000)
Blackhorse Reservoir	25.000%	75.000%	$ (6,250)	$ (18,750)	$ (25,000)
AWT Phase 1	86.047%	13.953%	$ (2,480,395)	$ (402,000)	$ (2,882,621)
Diversion Facilities	100.000%	0.000%	$ -	$ -	$ -
Existing Pipeline Facilities	86.047%	13.953%	$ (4,595)	$ (745)	$ (5,340)
Injection Well Facilities	100.000%	0.000%	$ -	$ -	$ -
TOTAL			$ (2,637,293)	$ (520,179)	$ (3,157,699)

Est. Annual Renewal Costs	PCA Share	MCWD Share	PCA Share	MCWD Share	Annual Amount
New Pipeline Facilities	72.167%	27.833%	$ (165,378)	$ (63,782)	$ (229,160)
RUWAP Distribution Facilities	0.000%	100.000%	$ -	$ (124,640)	$ (124,640)
Blackhorse Reservoir	25.000%	75.000%	$ (9,800)	$ (29,400)	$ (39,200)
AWT Phase 1	86.047%	13.953%	$ (567,907)	$ (92,093)	$ (660,000)
Diversion Facilities	100.000%	0.000%	$ (66,000)	$ -	$ (66,000)
Existing Pipeline Facilities	72.167%	27.833%	$ (10,024)	$ (3,866)	$ (13,890)
Injection Well Facilities	100.000%	0.000%	$ (106,700)	$ -	$ (106,700)
TOTAL			$ (925,809)	$ (313,781)	$ (1,239,590)

Est Total Annual Costs		PCA Share	MCWD Share	Annual Amount
New Pipeline Facilities		$ (952,240)	$ (364,481)	$ (1,316,721)
RUWAP Distribution Facilities		$ -	$ (740,969)	$ (740,969)
Blackhorse Reservoir		$ (54,023)	$ (175,838)	$ (229,862)
AWT Phase 1		$ (5,248,834)	$ (850,936)	$ (6,099,996)
Diversion Facilities		$ (321,738)	$ -	$ (321,738)
Existing Pipeline Facilities		$ (53,460)	$ (21,402)	$ (74,862)
Injection Well Facilities		$ (520,142)	$ -	$ (520,142)
TOTAL		$ (7,150,437)	$ (2,153,627)	$ (9,304,290)

Key

Item in cost share agreement
Item not in cost share agreement

Appendix B

Backup Cost and Energy Tables

Table B-1
Conceptual Cost Estimate
California Drive Alternative
Marina Coast Water District, Marina, California

Description	Quantity	Units	Unit Cost	Total	Basis for Cost
Capital Costs					
Well Injection Facilities					
Mobilization and Demobilization	5	%	$8,531,000	$ 426,550	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). For budgeting purposes, assumed same as M1W project.
General Site Work and Piping	1	LS	$421,000	$ 421,000	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). Includes shoring, SWPPP, and traffic control.
Injection Well Installation and Testing	1	EA	$2,350,000	$ 2,350,000	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). Assumes 1,310-foot borehole and 1,300-foot deep well. 270-feet of screen.
Site and Mechanical Work at Each Well Site	1	EA	$1,430,000	$ 1,430,000	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). Includes site improvements, well pads and pedestals, well pumps, and site piping. For budgeting purposes, assume same sizes as M1W project
Monitoring Wells	2	EA	$210,000	$ 420,000	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). Assumes 1,300-foot deep 4-inch monitoring well.
Backflush Basin and Associated Appurtenances	1	LS	$200,000	$ 200,000	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). For budgeting purposes, assume same size as M1W project (125-ft x 125-ft x 5-ft), and cut/fill can be balanced.
Contingency to cover backflush basin liner (if percolation not feasible)	16000	SF	$5	$ 80,000	Based on budget cost from Layfield for a similarly sized pond. No leak detection.
Contingency to cover piping to nearest sewer lift station (if percolation not feasible)	5000	LF	$260	$ 1,300,000	Assume 10-inch diameter pipeline to nearest sewer lift station at $20/in-diameter per linear foot plus 30% for various appurtenances ($260/lf)
Contingency to cover pump station to convey water to nearest sewer lift station (if percolation not feasible)	1	LS	$450,000	$ 450,000	Based on cost curves from similar projects, with assumed flow rate of 50 gpm.
Electrical Building and Hydropneumatic Tank	1	LS	$450,000	$ 450,000	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). Reduced by 40% due to one quarter as many wells and one-quarter as many monitoring wells.
Electrical, Instrumentation, and Controls for All Wells	1	LS	$1,210,000	$ 1,210,000	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). Reduced by 60% due to one-quarter as many wells and one-quarter as many monitoring wells.
Other Site Work (i.e. landscaping, road maintenance during construction, etc.)	1	LS	$120,000	$ 120,000	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). For budgeting purposes, assume half the size of the M1W project.

Table B-1
Conceptual Cost Estimate
California Drive Alternative
Marina Coast Water District, Marina, California

Description	Quantity	Units	Unit Cost	Total	Basis for Cost
Purified Recycled Water Pipeline					
Purified Recycled Water Pipeline from Existing Purified Water Main Pipeline to Injection Wells	400	LF	$240	$ 100,000	Assume 400-ft pipeline from water main to injection well. Assumed maximum flow of 1,200 GPM. 12-inch diameter pipeline at $15/in-diameter foot plus 30% for various appurtenances ($240/LF). Rounded up to the nearest $10,000.
			Total Direct Costs	*$ 8,957,550*	
Contingency on Infrastructure Costs	35	%	$8,957,550	$ 3,135,143	Based on a Class 5 level estimate for conceptual cost estimates (AACEI, 2019).
Contingecy for Electrical Connection with PG&E at Each Well Site	1	EA	$200,000	$ 200,000	Assumes $200,000 per well site for connection and routing power lines to site.
Soft Costs: Planning, Environmental, Permitting, Engineering, Construction Management, etc.	40	%	$12,292,693	$ 4,917,077	Assumes 40% of capital costs
Capital Costs Subtotal (rounded up to nearest $100,000)				**$ 17,300,000**	
Annualized over 30 year period at 4% interest				**$ 1,000,461**	

Table B-1
Conceptual Cost Estimate
California Drive Alternative
Marina Coast Water District, Marina, California

Description	Quantity	Units	Unit Cost	Total	Basis for Cost
Operating Costs					
Annual Operating Costs	1	LS	$ 90,000	$ 90,000	Cost to operate is based on operations staff time of one day (8 hours) per week, plus 30% for office time.
Annual Overhead costs	1	LS	$ 100,000	$ 100,000	Costs for overhead of a 2,250 AFY expansion were presented in M1W Expansion Memo (M1W, 2018). Operating costs for 1,111 AFY expansion are assumed to be 20% less due to smaller production capacity.
Annual Energy Costs for Injection Well Backwash Pumps	1	LS	$ 12,000	$ 12,000	Energy costs are based on 400 HP backwash pumps and an electricity price of $0.185/KWH.
Annual Operating and Overhead Cost Subtotal				**$ 202,000**	

Total Costs		
Total Present Value over 30 Years (See Table A-2)	**$ 25,670,000**	**per year over 30 years. Rounded up to nearest $10,000**
Present Value Per Acre-Foot (827 AF/year)	**$ 1,035**	**per acre-foot.**

Abbreviations:
AFY: acre feet per year
AWPF: advanced water purification facility
EA: each
ENR CCI: Engineering News-Record Construction Cost In
gpm: gallons per minute
LF: lineal foot
LS: lump sum
M1W: Monterey One Water
MCWD: Marina Coast Water District

References
AACEI, 2019. *Recommended Practices and Standards* , Association for the Advancement of Cost Engineering International, March 2019 Update.
M1W, 2018, *Progress Report on Pure Water Monterey Expansion,* Monterey One Water, 10 May 2018.
Nellor et al, 2019, *Final Engineering Report, Pure Water Monterey Groundwater Replenishment Project* , Nellor Environmental Associates, Trussell Technologies, and Todd Groundwater, April 2019
SCI, 2018. *Schedule of Values for Pure Water Monterey, Injection Wells Ph2* , SCI Specialty Construction, May 2018.

Table B-2

30-Year Cash Flow for Injection Well at California Drive Site

Marina Coast Water District, Marina, California

Year	Annualized Capital Cost	O&M	Total Annual Costs	PV
1	$ 1,000,460.72	$ 208,060.00	$ 1,208,520.72	$ 1,173,321.08
2	$ 1,000,460.72	$ 214,301.80	$ 1,214,762.52	$ 1,145,030.18
3	$ 1,000,460.72	$ 220,730.85	$ 1,221,191.57	$ 1,117,563.28
4	$ 1,000,460.72	$ 227,352.78	$ 1,227,813.49	$ 1,090,896.39
5	$ 1,000,460.72	$ 234,173.36	$ 1,234,634.08	$ 1,065,006.20
6	$ 1,000,460.72	$ 241,198.56	$ 1,241,659.28	$ 1,039,870.10
7	$ 1,000,460.72	$ 248,434.52	$ 1,248,895.24	$ 1,015,466.11
8	$ 1,000,460.72	$ 255,887.56	$ 1,256,348.27	$ 991,772.93
9	$ 1,000,460.72	$ 263,564.18	$ 1,264,024.90	$ 968,769.83
10	$ 1,000,460.72	$ 271,471.11	$ 1,271,931.82	$ 946,436.73
11	$ 1,000,460.72	$ 279,615.24	$ 1,280,075.96	$ 924,754.11
12	$ 1,000,460.72	$ 288,003.70	$ 1,288,464.41	$ 903,703.02
13	$ 1,000,460.72	$ 296,643.81	$ 1,297,104.53	$ 883,265.06
14	$ 1,000,460.72	$ 305,543.12	$ 1,306,003.84	$ 863,422.39
15	$ 1,000,460.72	$ 314,709.42	$ 1,315,170.13	$ 844,157.66
16	$ 1,000,460.72	$ 324,150.70	$ 1,324,611.42	$ 825,454.04
17	$ 1,000,460.72	$ 333,875.22	$ 1,334,335.94	$ 807,295.19
18	$ 1,000,460.72	$ 343,891.48	$ 1,344,352.19	$ 789,665.23
19	$ 1,000,460.72	$ 354,208.22	$ 1,354,668.94	$ 772,548.77
20	$ 1,000,460.72	$ 364,834.47	$ 1,365,295.18	$ 755,930.84
21	$ 1,000,460.72	$ 375,779.50	$ 1,376,240.22	$ 739,796.93
22	$ 1,000,460.72	$ 387,052.89	$ 1,387,513.60	$ 724,132.94
23	$ 1,000,460.72	$ 398,664.48	$ 1,399,125.19	$ 708,925.19
24	$ 1,000,460.72	$ 410,624.41	$ 1,411,085.12	$ 694,160.38
25	$ 1,000,460.72	$ 422,943.14	$ 1,423,403.86	$ 679,825.61
26	$ 1,000,460.72	$ 435,631.44	$ 1,436,092.15	$ 665,908.36
27	$ 1,000,460.72	$ 448,700.38	$ 1,449,161.09	$ 652,396.46
28	$ 1,000,460.72	$ 462,161.39	$ 1,462,622.11	$ 639,278.12
29	$ 1,000,460.72	$ 476,026.23	$ 1,476,486.95	$ 626,541.87
30	$ 1,000,460.72	$ 490,307.02	$ 1,490,767.73	$ 614,176.57

Total PV	$ 25,669,471.57
Total Water Yield over 30 years (AF)	24810
Cost ($/AF)	**$ 1,034.64**

Assumptions	
Capital Costs ($)	$ 17,300,000.00
Loan Period (years)	30
Loan Interest Annual Rate (%)[2]	4%
Annual Debt Service ($)	$ 1,000,460.72
Annual O&M in 2022	$ 202,000.00
Escalation on O&M (%)[3]	3%
Discount Rate (%)[3]	3%
Annual Yield (AF)	827

Table B-2

30-Year Cash Flow for Injection Well at California Drive Site

Marina Coast Water District, Marina, California

Abbreviations:

AF = acre-feet
O&M = operations and maintenance
PV = net present value

Notes

1) See Table A-1 for Capital and O&M cost calculations.
2) The loan interest annual rate is based on recent federal 30-year interest rates, rounded up to the nearest percentage. (https://home.treasury.gov/policy-issues/financing-the-government/interest-rate-statistics)
3) The escalation rate and discount rate are based on the average annual increase in the Engineering-News Record Construction Cost Cost Index for San Francisco between 1992 and 2022. (https://www.enr.com/economics/historical_indices/SanFrancisco)

Table B-3
Conceptual Cost Estimate
Well 9 Site Alternative
Marina Coast Water District, Marina, California

Description	Quantity	Units	Unit Cost	Total	Basis for Cost
Capital Costs					
Well Injection Facilities					
Mobilization and Demobilization	5	%	$9,031,000	$ 451,550	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). For budgeting purposes, assumed same as M1W project.
General Site Work and Piping	1	LS	$421,000	$ 421,000	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). Includes shoring, SWPPP, and traffic control.
Injection Well Installation and Testing	1	EA	$2,350,000	$ 2,350,000	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). Assumes 1,310-foot borehole and 1,300-foot deep well. 270-feet of screen.
Site and Mechanical Work at Each Well Site	1	EA	$1,430,000	$ 1,430,000	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). Includes site improvements, well pads and pedestals, well pumps, and site piping. For budgeting purposes, assume same sizes as M1W project
Monitoring Wells	2	EA	$210,000	$ 420,000	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). Assumes 1,300-foot deep 4-inch monitoring well.
Backflush Basin and Associated Appurtenances	1	LS	$200,000	$ 200,000	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). For budgeting purposes, assume same size as M1W project (125-ft x 125-ft x 5-ft), and cut/fill can be balanced.
Contingency to cover backflush basin liner (if percolation not feasible)	16000	SF	$5	$ 80,000	Based on budget cost from Layfield for a similarly sized pond. No leak detection.
Contingency to cover piping to nearest sewer lift station (if percolation not feasible)	3000	LF	$260	$ 780,000	Assume 10-inch diameter pipeline to nearest sewer lift station at $20/in-diameter per linear foot plus 30% for various appurtenances ($260/lf)
Contingency to cover pump station to convey water to nearest sewer lift station (if percolation not feasible)	1	LS	$450,000	$ 450,000	Based on cost curves from similar projects, with assumed flow rate of 50 gpm.
Electrical Building and Hydropneumatic Tank	1	LS	$450,000	$ 450,000	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). Reduced by 40% due to one quarter as many wells and one-quarter as many monitoring wells.
Electrical, Instrumentation, and Controls for All Wells	1	LS	$1,210,000	$ 1,210,000	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). Reduced by 60% due to one-quarter as many wells and one-quarter as many monitoring wells.
Other Site Work (i.e. landscaping, road maintenance during construction, etc.)	1	LS	$120,000	$ 120,000	Based on Pure Water Monterey Winning Bid Schedule (SCI, 2018). For budgeting purposes, assume half the size of the M1W project.
Purified Recycled Water Pipeline					

Table B-3
Conceptual Cost Estimate
Well 9 Site Alternative
Marina Coast Water District, Marina, California

Description	Quantity	Units	Unit Cost	Total	Basis for Cost
Purified Recycled Water Pipeline from Existing Purified Water Main Pipeline to Injection Wells	3500	LF	$320	$ 1,120,000	Assume 3500-ft pipeline from water main to injection well. Assumed maximum flow of 1,200 GPM. 12-inch diameter pipeline at $20/in-diameter foot plus 30% for various appurtenances ($320/LF). Rounded up to the nearest $10,000.
			Total Direct Costs	*$ 9,482,550*	
Contingency on Infrastructure Costs	35	%	$9,482,550	$ 3,318,893	Based on a Class 5 level estimate for conceptual cost estimates (AACEI, 2019).
Contingecy for Electrical Connection with PG&E at Each Well Site	1	EA	$200,000	$ 200,000	Assumes $200,000 per well site for connection and routing power lines to site.
Soft Costs: Planning, Environmental, Permitting, Engineering, Construction Mangagement, etc.	40	%	$13,001,443	$ 5,200,577	Assumes 40% of capital costs
Capital Costs Subtotal (rounded up to nearest $100,000)				**$ 18,300,000**	
Annualized over 30 year period at 4% interest				**$ 1,058,291**	
Operating Costs					
Annual Operating Costs	1	LS	$ 100,000	$ 100,000	Cost to operate is based on operations staff time of one day (9 hours) per week, plus 30% for office time.
Annual Overhead costs	1	LS	$ 100,000	$ 100,000	Costs for overhead of a 2,250 AFY expansion were presented in M1W Expansion Memo (M1W, 2018). Operating costs for 1,111 AFY expansion are assumed to be 20% less due to smaller production capacity.
Annual Energy Costs for Injection Well Backwash Pumps	1	LS	$ 12,000	$ 12,000	Energy costs are based on 400 HP backwash pumps and an electricity price of $0.185/KWH.
Annual Operating and Overhead Cost Subtotal				**$ 212,000**	
Total Costs					
Total Present Value over 30 Years (See Table A-4)				**$ 27,110,000**	**per year over 30 years. Rounded up to nearest $10,000**
Present Value Per Acre-Foot (827 AF/year)				**$ 1,092**	**per acre-foot.**

Abbreviations:

AFY: acre feet per year
AWPF: advanced water purification facility
EA: each
ENR CCI: Engineering News-Record Constru
gpm: gallons per minute
LF: lineal foot
LS: lump sum
M1W: Monterey One Water
MCWD: Marina Coast Water District

References

AACEI, 2019. *Recommended Practices and Standards* , Association for the Advancement of Cost Engineering International, March 2019 Update.
M1W, 2018, *Progress Report on Pure Water Monterey Expansion,* Monterey One Water, 10 May 2018.
Nellor et al, 2019, *Final Engineering Report, Pure Water Monterey Groundwater Replenishment Project* , Nellor Environmental Associates, Trussell Technologies, and Todd Groundwater, April 2019
SCI, 2018. *Schedule of Values for Pure Water Monterey, Injection Wells Ph2* , SCI Specialty Construction, May 2018.

Table B-4

30-Year Cash Flow for Injection Well at Well 9 Site

Marina Coast Water District, Marina, California

Year	Annualized Capital Cost	O&M	Total Annual Costs	PV
1	$ 1,058,290.81	$ 218,360.00	$ 1,276,650.81	$ 1,239,466.81
2	$ 1,058,290.81	$ 224,910.80	$ 1,283,201.61	$ 1,209,540.59
3	$ 1,058,290.81	$ 231,658.12	$ 1,289,948.94	$ 1,180,486.01
4	$ 1,058,290.81	$ 238,607.87	$ 1,296,898.68	$ 1,152,277.68
5	$ 1,058,290.81	$ 245,766.10	$ 1,304,056.92	$ 1,124,890.95
6	$ 1,058,290.81	$ 253,139.09	$ 1,311,429.90	$ 1,098,301.90
7	$ 1,058,290.81	$ 260,733.26	$ 1,319,024.07	$ 1,072,487.28
8	$ 1,058,290.81	$ 268,555.26	$ 1,326,846.07	$ 1,047,424.54
9	$ 1,058,290.81	$ 276,611.91	$ 1,334,902.73	$ 1,023,091.79
10	$ 1,058,290.81	$ 284,910.27	$ 1,343,201.09	$ 999,467.75
11	$ 1,058,290.81	$ 293,457.58	$ 1,351,748.39	$ 976,531.80
12	$ 1,058,290.81	$ 302,261.31	$ 1,360,552.12	$ 954,263.88
13	$ 1,058,290.81	$ 311,329.15	$ 1,369,619.96	$ 932,644.55
14	$ 1,058,290.81	$ 320,669.02	$ 1,378,959.84	$ 911,654.90
15	$ 1,058,290.81	$ 330,289.09	$ 1,388,579.91	$ 891,276.60
16	$ 1,058,290.81	$ 340,197.77	$ 1,398,488.58	$ 871,491.85
17	$ 1,058,290.81	$ 350,403.70	$ 1,408,694.51	$ 852,283.35
18	$ 1,058,290.81	$ 360,915.81	$ 1,419,206.62	$ 833,634.32
19	$ 1,058,290.81	$ 371,743.28	$ 1,430,034.10	$ 815,528.46
20	$ 1,058,290.81	$ 382,895.58	$ 1,441,186.40	$ 797,949.96
21	$ 1,058,290.81	$ 394,382.45	$ 1,452,673.26	$ 780,883.46
22	$ 1,058,290.81	$ 406,213.92	$ 1,464,504.74	$ 764,314.04
23	$ 1,058,290.81	$ 418,400.34	$ 1,476,691.15	$ 748,227.22
24	$ 1,058,290.81	$ 430,952.35	$ 1,489,243.16	$ 732,608.95
25	$ 1,058,290.81	$ 443,880.92	$ 1,502,171.74	$ 717,445.59
26	$ 1,058,290.81	$ 457,197.35	$ 1,515,488.16	$ 702,723.87
27	$ 1,058,290.81	$ 470,913.27	$ 1,529,204.08	$ 688,430.94
28	$ 1,058,290.81	$ 485,040.67	$ 1,543,331.48	$ 674,554.31
29	$ 1,058,290.81	$ 499,591.89	$ 1,557,882.70	$ 661,081.86
30	$ 1,058,290.81	$ 514,579.64	$ 1,572,870.46	$ 648,001.80

Total PV	$ 27,102,967.03
Total Water Yield over 30 years (AF)	24810
Cost ($/AF)	**$ 1,092.42**

Assumptions	
Capital Costs ($)	$ 18,300,000.00
Loan Period (years)	30
Loan Interest Annual Rate (%)[2]	4%
Annual Debt Service ($)	$ 1,058,290.81
Annual O&M in 2022	$ 212,000.00
Escalation on O&M (%)[3]	3%
Discount Rate (%)[3]	3%
Annual Yield (AF)	827

Table B-4
30-Year Cash Flow for Injection Well at Well 9 Site
Marina Coast Water District, Marina, California

Abbreviations:

AF = acre-feet
O&M = operations and maintenance
PV = net present value

Notes

1) See Table A-3 for Capital and O&M cost calculations.
2) The loan interest annual rate is based on recent federal 30-year interest rates, rounded up to the nearest percentage. (https://home.treasury.gov/policy-issues/financing-the-government/interest-rate-statistics)
3) The escalation rate and discount rate are based on the average annual increase in the Engineering-News Record Construction Cost Cost Index for San Francisco between 1992 and 2022. (https://www.enr.com/economics/historical_indices/SanFrancisco)

Table B-5
Energy Calculations
Marina Coast Water District, Marina, California

Injection Well Backwash Pumping Costs				
Deep Aquifer				
Assumed average design points				
Flow		2400	gpm	
TDH (based on TDH of other wells in Deep)		500	ft	
Assumed Pump HP		400	HP	Based on backwash pumps at seaside project
		331.4	KW @ 90% efficiency	
Backwash rate		4	hr/week	
		52	weeks/year	
		90	% up time	
Energy per well		62042.24	KWH/year	
Cost of energy ($0.185/KWH)	$	11,477.81	/year	

Extraction Well Pumping costs (973 AFY)				
Deep Aquifer				
Assumed average design points				
Flow		1800	gpm	
TDH (based on TDH of other wells in Deep)		400	ft	
Assumed Pump HP		250	HP	Based on pump in Well 10
		207.1	KW @ 90% efficiency	
Production rate				
Operate		255.5	days/year	
Production Volume		973	AFY	
Production Rate		3.8	AF/day	
		1.2	MGD	
		1149.0	gpm	
		15.3	hr/day	
		3914.2	hr/year	
Energy per well		810790	KWH/year	
Cost of energy ($0.185/KWH)	$	150,000.00	/year	average cost of electricity in California, US Energy Information Administration