Malaga County Water District

DRAFT Infrastructure Master Plan

August, 2021

Prepared for:
Malaga County Water District
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Abbreviations

MCWD	Malaga County Water District
mgd	million gallons per day
SGMA	Sustainable Groundwater Management Act
USGS	United States Geological Survey
FMFCD	Fresno Metropolitan Flood Control District
FID	Fresno Irrigation District
SKF	Selma Kingsburg Fowler County Sanitation District
IRWM	Integrated Regional Water Management
KBWA	Kings Basin Water Authority
NKGSA	North Kings Groundwater Sustainability Agency
DDG	Diversified Development Group
MOU	Memorandum of Understanding
CSD	Community Services District
HSR	High Speed Rail
DAF	Dissolved Air Flotation
WWTF	Wastewater Treatment Facilities
mg/l	milligrams per liter

Executive Summary

1 Introduction

1.1 Purpose and Goals

The purpose of this report is to update an Infrastructure Master Plan for water and sanitary sewer facilities for the Malaga County Water District. A general summary of the report is as follows:

a. Review the previous master plan
b. Summarize the overall land area, present land use, and potential land uses. Summarize existing boundaries and potential Sphere of Influence boundary adjustments
c. Summarize current demands (water/sewer) and current land development
d. Summarize anticipated development sequence based on proposed annexations
e. Summarize potential demands (water/sewer) in the existing Sphere of Influence
f. Discuss potential for serving Easton CSD, HSR, others
g. Summarize design criteria for water distribution, source water, storage, fire flow
h. Describe typical water supply well requirements
i. Describe typical water storage tank and booster station requirements
j. Describe potential location and size of water distribution pipelines
k. Describe potential general location of water supply wells and storage
l. Summarize potential limitations to groundwater as defined in SGMA legislation
m. Summarize potential water assessments from FID
n. Summarize design criteria for sanitary sewer collection systems
o. Describe potential location and size of sewer collection system pipelines and lift stations
p. Describe typical sanitary sewer lift station requirements
q. Describe potential flows for wastewater treatment and disposal
r. Describe potential disposal alternatives
    a. Percolation disposal ponds
    b. Recycle
    c. Reclamation
s. Summarize the SCADA plan for water sources, storage, lift stations, and treatment facilities
t. Summarize potential replacement requirements of infrastructure (age/condition)

1.2 Background

The Malaga County Water District (MCWD) is a California Special District that provides potable water services, sanitary sewer collection services, wastewater treatment and disposal services, and recreation services to the residents and businesses within its

service area. This document is an Infrastructure Master Plan to update the water and sewer study prepared in September 1967.

The MCWD is located south of the City of Fresno along State Route 99. The general boundary streets are North Avenue to the north, American Avenue to the south, Maple Avenue to the west and Minnewawa Avenue to the east. The existing boundary and sphere of influence of the MCWD is included as Figure 1-1.

1.2.1 Previous Master Plan

The previous master plan was prepared in September 1967 (see Appendix A). The previous study reviewed conditions at the time of the study and the potential impact of development to sanitary sewage flow and water supply demand. Conclusions and recommendations of the study were a) enlarge or increase the capacity of the existing treatment plant, b) expand the capacity of the sewer collection system, c) consideration of a water storage tank with fire pumps, and d) hire a financial consultant to assist with the preparation of a financing program to enable the recommended infrastructure construction.

The previous master plan studied and extension of services to Clovis Avenue at the east side of the District and Cedar Avenue on the west side of the District. The previous master plan considered water and sewer demands ranging from 2,000 to 6,000 gpd/Ac. The study projected a potential ultimate sanitary sewer demand of 8.5 mgd.

The locations and sizes of sewer lines recommended by the previous master plan beyond the existing sewer lines are shown on Figure 1-6. It is noted that the master plan does not include potential sewer lift station locations. The locations and sizes of water mains recommended by the previous master plan beyond the existing water lines are shown on Figure 1-8. It is noted that the previous master plan included two (2) 4.0 million gallon water storage tanks.

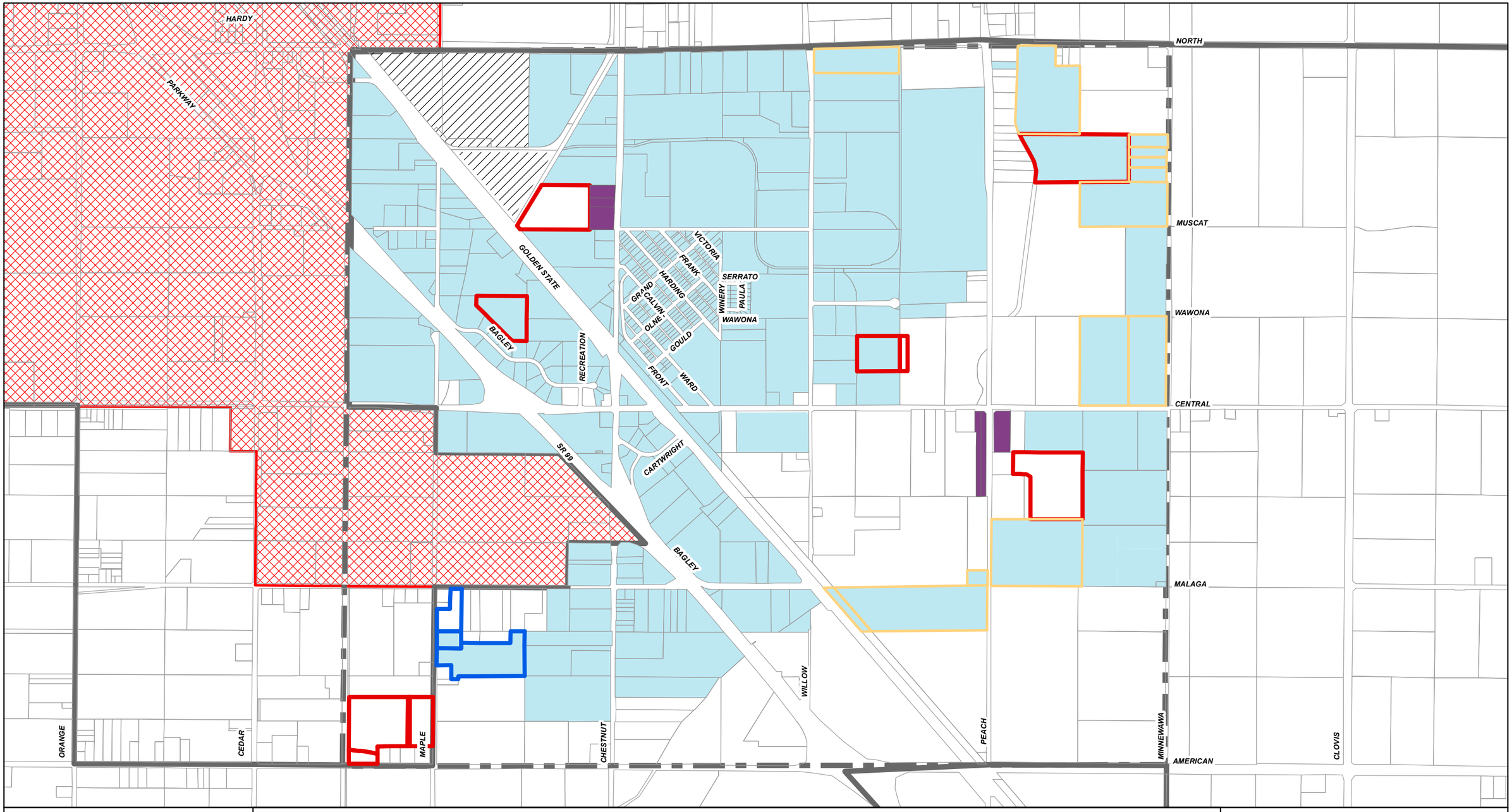

Figure 1-1 Malaga CWD

District Boundary

June 2021

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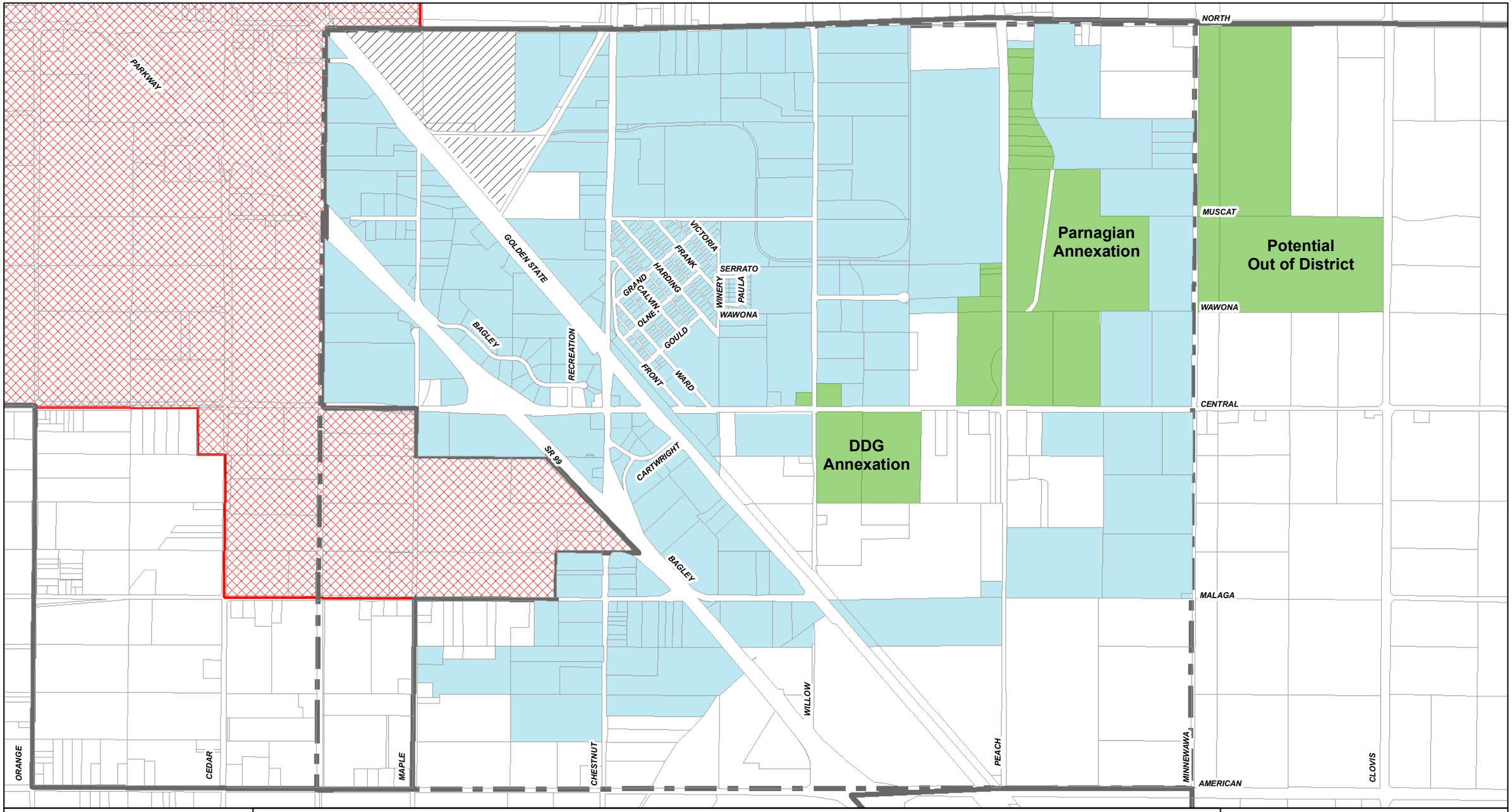

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- Proposed Annexation
- Malaga CWD Boundary
- Served by the City of Fresno
- Fresno SOI
- Malaga SOI
- Fresno City Limits

Figure 1-2 Malaga CWD

Location of Proposed Annexations

June 2021

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1.3 Project Area

The existing District boundary and Sphere of Influence are described in Section 1.2 above.

There are three identified annexations to the District boundary. The locations of the potential annexations are shown on Figure 1-2. Two of the annexations are within the existing Sphere of Influence. The third annexation is located immediately east of the existing Sphere of Influence and would require an expansion of the existing Sphere of Influence. The initial proposed expansion of the Sphere of Influence is shown in Figure 1-3. It is noted that the proposed change to the Sphere of Influence includes the removal of two areas near the northwest portion of the District. Those parcels are either currently served by the City of Fresno or would be served by the City of Fresno.

Figure 1-4 shows the proposed second expansion of the Sphere of Influence for the MCWD. Figure 1-5 shows the potential ultimate expansion of the Sphere of Influence of the MCWD. This ultimate expansion would extend east to Sunnyside Avenue and south to Jefferson Avenue between Minnewawa and Clovis Avenues and south to Lincoln Avenue between Clovis and Sunnyside Avenues. This study will review the water and sanitary sewer infrastructure that may be required for the ultimate expansion of the Sphere of Influence. It is likely that the expansion of the Sphere of Influence may require incremental steps.

The entire District area and study area are shown overlayed on a USGS topographic map in Figure 1-6.

There are several neighboring jurisdictions in the Malaga area, which are described below:

1.3.1 City of Fresno

The City of Fresno city limits overlaps with a portion of the Malaga County Water District in an area between Central Avenue and Malaga Avenue west of State Route 99. The location of the overlap is shown in Figure 1-3. The Sphere of Influence of the City of Fresno is all property north of North Avenue in this study area.

It is noted that the City of Fresno Sewer Master Plan includes sewer mains proposed in the overlap area.

1.3.1.1 Memorandum of Understanding between the City of Fresno and MCWD

The City of Fresno and Malaga County Water District entered into a Memorandum of Understanding (MOU) in 2016. A copy of the MOU is included as Appendix B. The intent of the MOU is to provide a means [for properties that are located north of North

Avenue and between Maple Avenue and Minnewawa Avenue to request water service from the MCWD. The area in question is within the Sphere of Influence of the City of Fresno, however, the City of Fresno does not have water mains in portions of said area. Properties could request that the City of Fresno allow the MCWD to provide water service (if MCWD agrees with the request) until the City of Fresno extends water mains to the frontage of the property in question. The property would then need to connect to the City of Fresno and disconnect from the MCWD. Each request would be considered on a case by case basis and is not considered to impact the Infrastructure Master Plan recommendations.

1.3.2 California Department of Transportation (Caltrans)

Caltrans owns and maintains State Route 99, which divides Malaga County Water District. There are several water and sewer crossings of State Route 99. It is understood that Caltrans is in the planning stages for interchange improvements at North Avenue, Central Avenue, Chestnut Avenue, and American Avenue. Master Planning of the water and sewer infrastructure will require coordination with Caltrans.

Conceptual interchange options for American Avenue and State Route 99 are included in **Error! Reference source not found.**.

1.3.3 Fresno Metropolitan Flood Control District (FMFCD)

The Fresno Metropolitan Flood Control District (FMFCD) owns and maintains infrastructure associated with storm drainage facilities throughout the study area.

1.3.4 Fresno Irrigation District

The Fresno Irrigation District (FID) owns and maintains surface water delivery systems throughout the study area.

1.3.5 Integrated Regional Water Management (IRWM)

The study area lies within the Upper Kings Basin Integrated Regional Water Management Authority Planning Area, commonly known as the Kings Basin Water Authority (KBWA).

1.3.6 Sustainable Groundwater Management Act (SGMA)

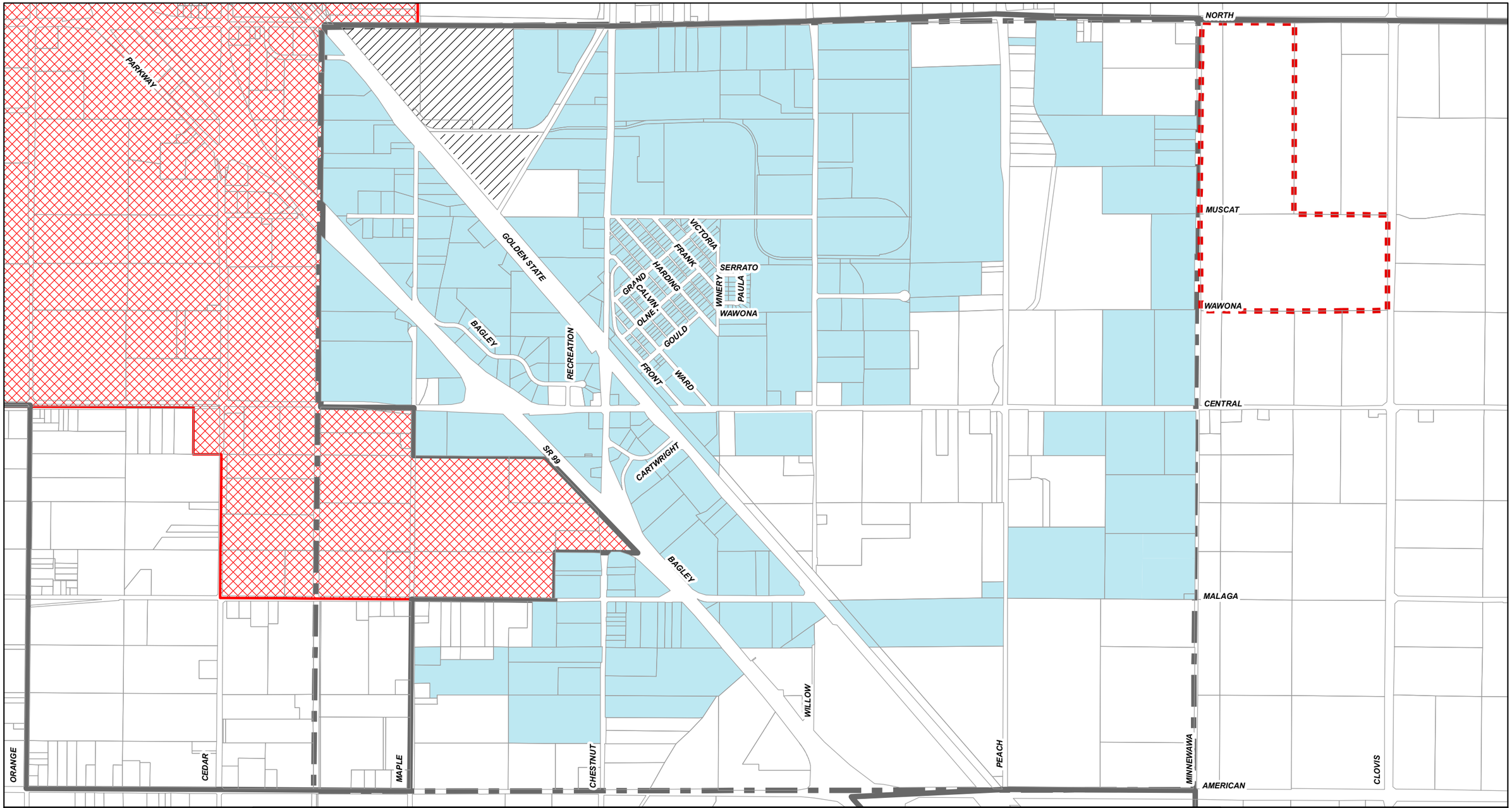
The study area lies within the North Kings Groundwater Sustainability Agency (NKGSA) boundaries.

1.3.7 Selma Kingsburg Fowler County Sanitation District (SKF)

The Selma Kingsburg Fowler County Sanitation District lies immediately south of the MCWD and is generally located on both sides of State Route 99 and Golden State Boulevard.

1.3.8 County of Fresno

The County of Fresno surrounds the MCWD and is the regulatory entity with jurisdiction over land use, building permits, transportation, street lights, fire, and sheriff services.



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- Malaga CWD SOI (LAFCo)
- SOI Initial Expansion
- Malaga CWD Boundary
- Fresno SOI
- Served by the City of Fresno
- Fresno City Limits

Figure 1-3 Malaga CWD

Initial Expansion of Sphere of Influence

June 2021

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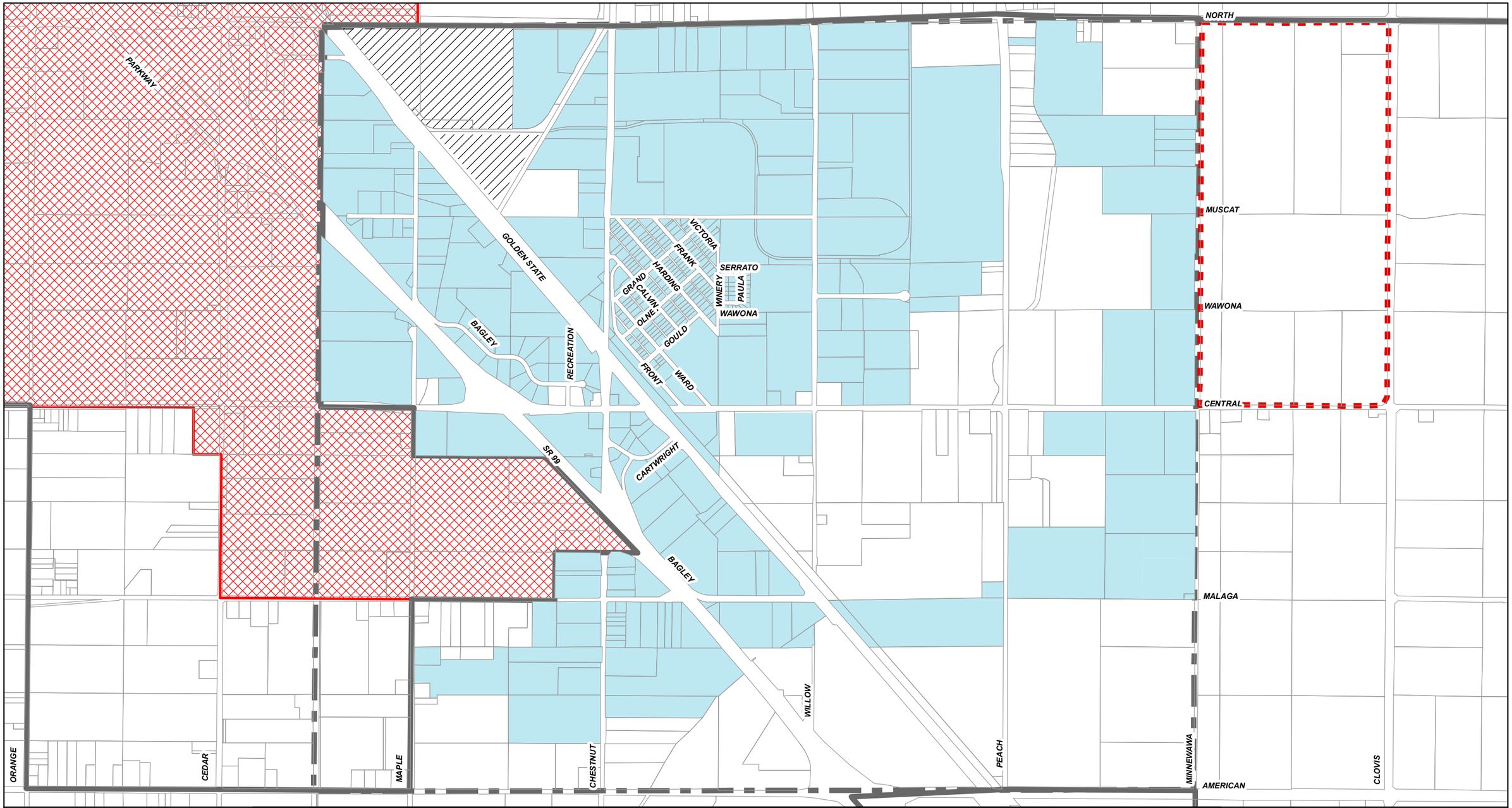

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Malaga CWD SOI (LAFCo)
SOI Second Expansion
Malaga CWD Boundary
Fresno SOI
Served by the City of Fresno
Fresno City Limits

Figure 1-4 Malaga CWD

Second Expansion of Sphere of Influence

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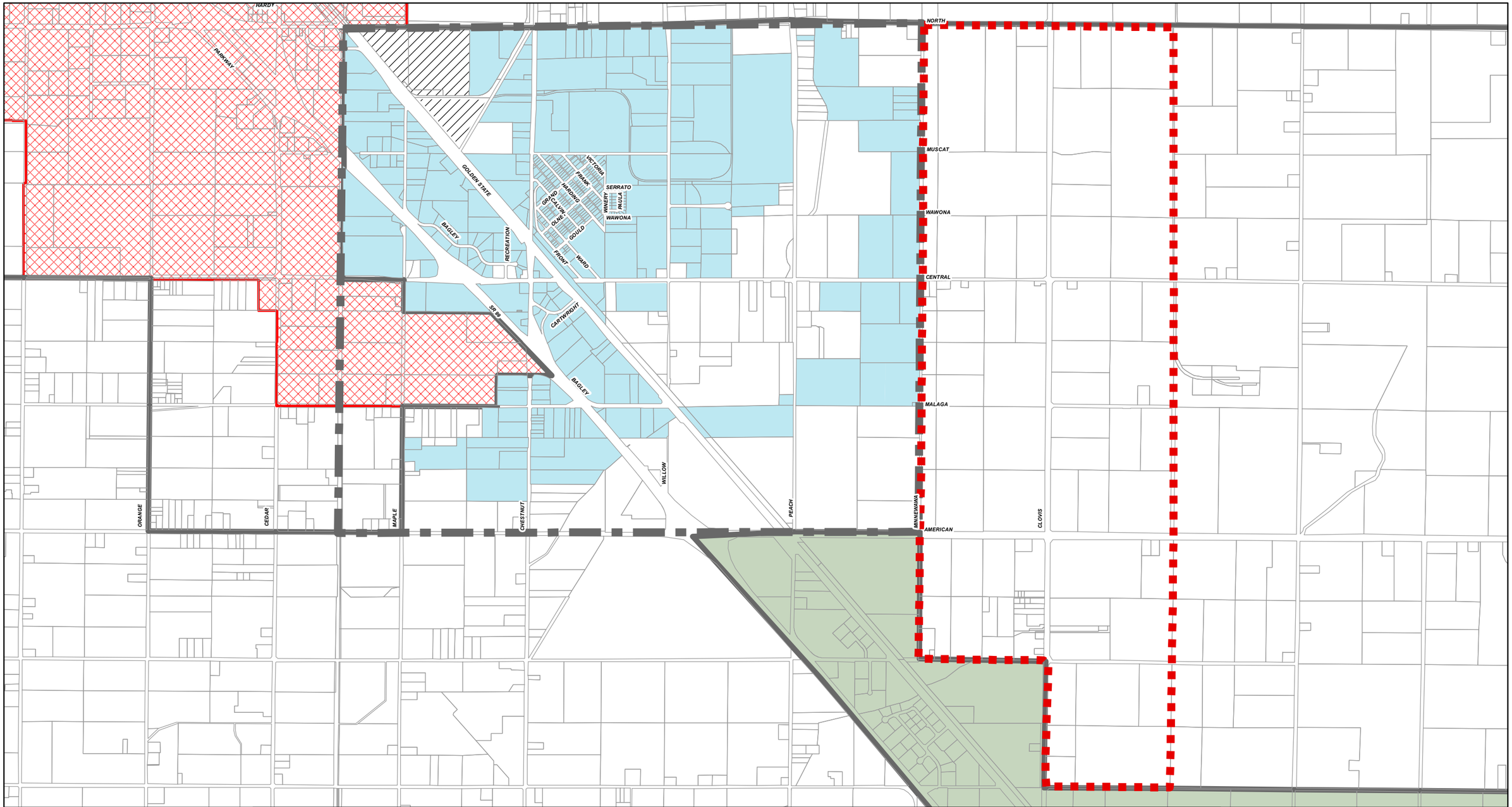

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Malaga CWD SOI (LAFCo)
Malaga CWD Boundary
Served by the City of Fresno
Fresno City Limits
SOI Ultimate Expansion
Fresno SOI
Fowler Sphere of Influence

Figure 1-5 Malaga CWD

Ultimate Expansion of Sphere of Influence

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Figure 1-6 Malaga CWD

Phase Information

June 2021

Proposed SOI Removal

Phase 1B

Phase 1A

Phase 2

Phase 3

Phase 4

Phase 1C

Phase 1D

Phase 5

Phase 6

Phase 7

Phase 8

Phase 9

Phase 10

City of Fresno

Phase Area

Malaga CWD Boundary

Proposed SOI Removal

Fresno City Limits

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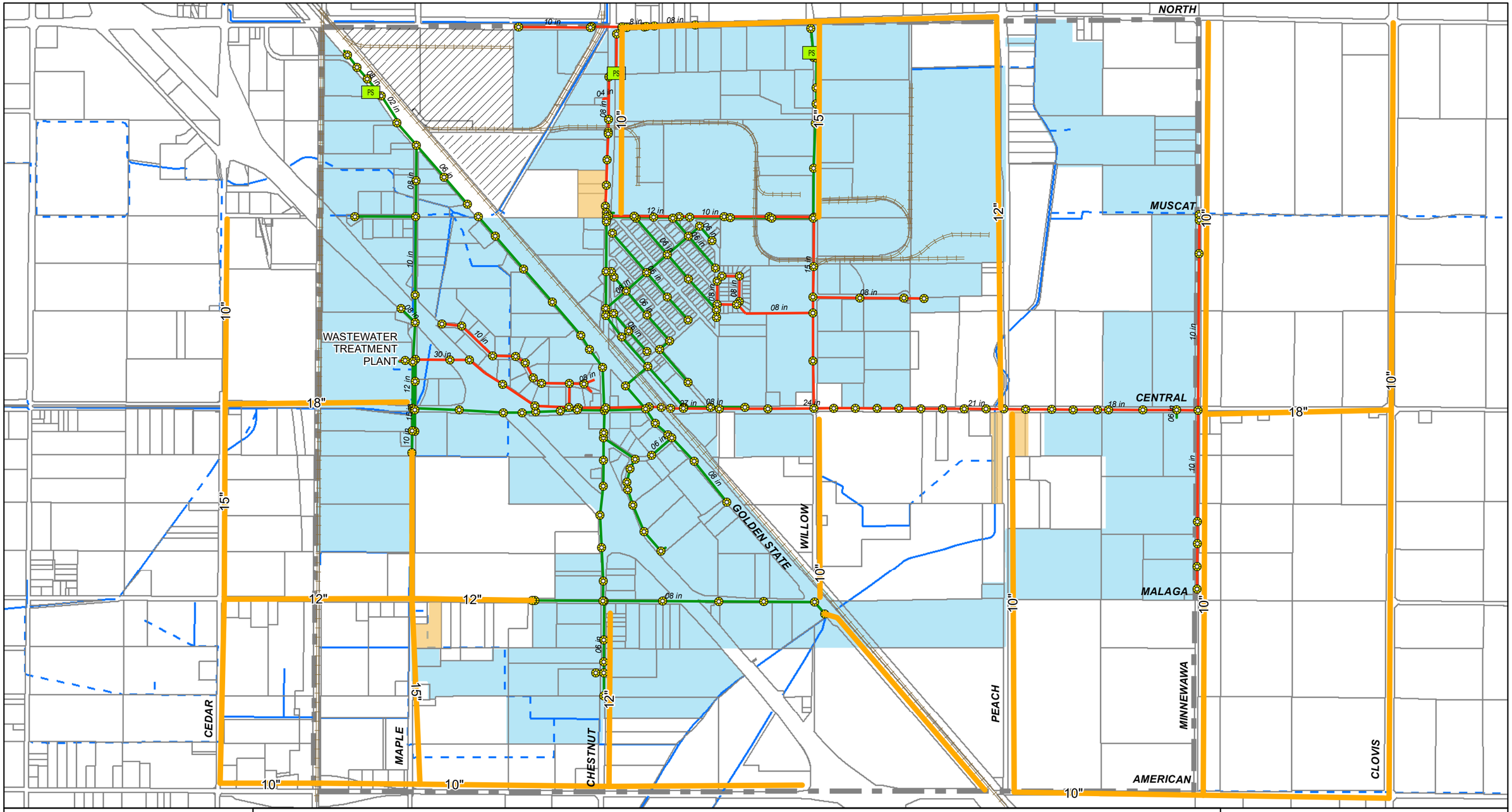

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PS Lift Sation
Manhole
Industrial Sewer Line
Domestic Sewer Line
Sewer Line Proposed By Previous Master Plan
FID Canal
FID Pipeline
MCWD Out of District Service
Served by the City of Fresno
Malaga CWD SOI (LAFCo)
Malaga CWD
Railroad

Figure 1-7 Malaga CWD

Sewer Lines Recommended By Previous Master Plan

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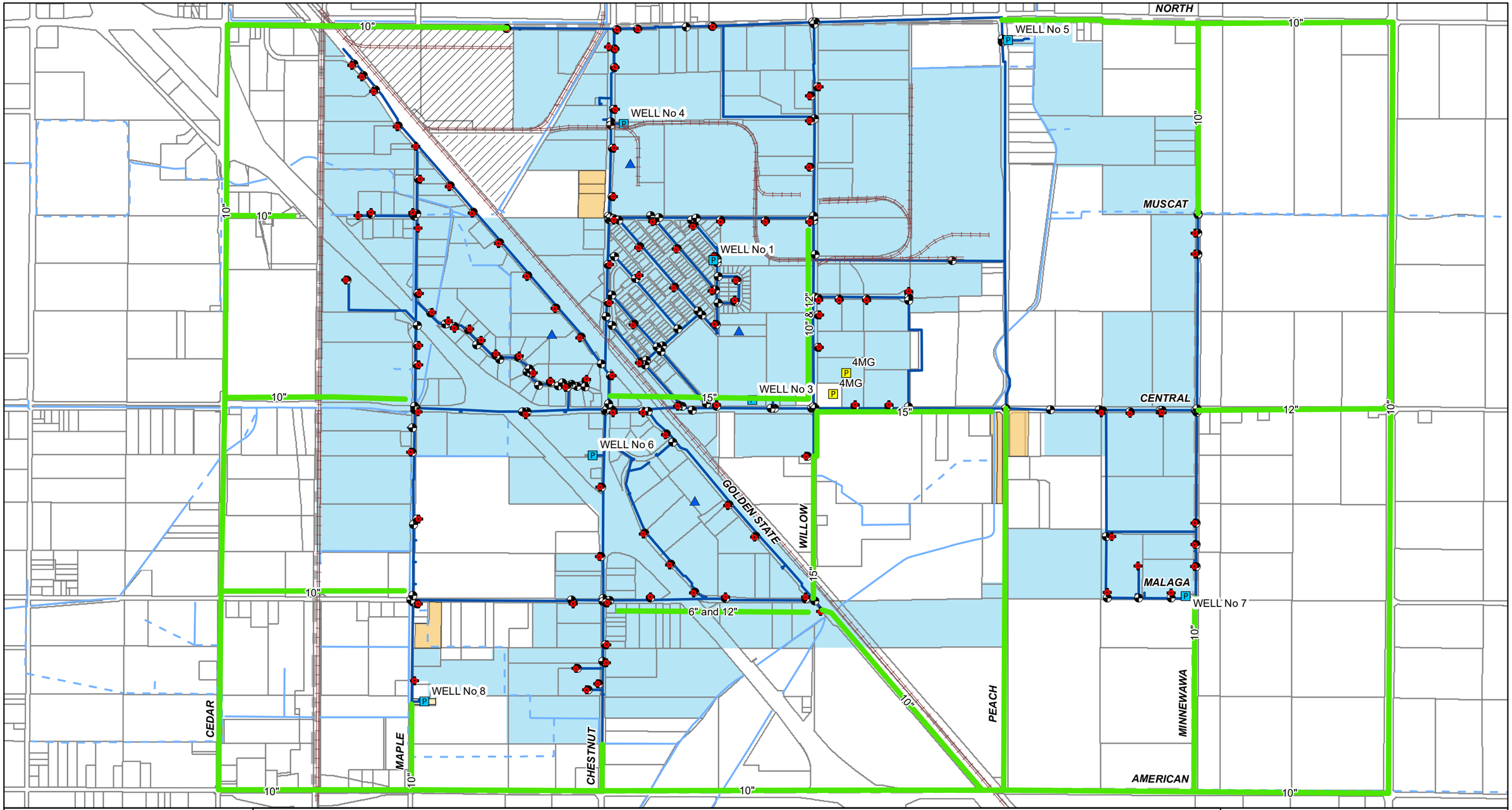

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- Proposed Well By Previous Master Plan
- MCW Well
- Private Well Location (approximate)
- Hydrant
- Valve
- Water Line
- Water Line Proposed By Previous Master Plan
- FID Canal
- FID Pipeline
- MCWD Out of District Service
- Served by the City of Fresno
- Malaga CWD SOI (LAFCo)
- Malaga CWD
- Railroad

Figure 1-8 Malaga CDW

Facilities Proposed By Previous Master Plan

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2 Land Use

2.1 Study Area

2.1.1 Zoning and Community Plan

Zoning for the entire study area is shown on Figure 2-1.

The County of Fresno adopted the Roosevelt Community Plan in 1993. The community plan encompasses a portion of the study area. The Roosevelt Community Plan is included as Appendix C.

2.1.2 APNs

The Assessor Parcel Number (APN) property lines for properties within the District and study area are shown in Figure 2-2. The Figure includes several sheets (Figures 2-2-1 through 2-2-13) that show the APNs of the individual phases.

2.1.3 Potential Annexations

There are three identified annexations to the District boundary. The location of the annexations is shown on Figure 1-2.

2.1.3.1 DDG

Diversified Development Group (DDG) has defined a proposed annexation of property southeast of the intersection of Central and Willow Avenues. The new development would consist of 46.55 acres of commercial/industrial development. The annexation would also include existing developed properties at the northwest and northeast corners of Central and Willow Avenues to eliminate an “island” of property surrounded by the new District boundary.

2.1.3.2 Parnagian

The proposed Parnagian annexation consists of 169.22 acres of commercial/industrial development on both sides of Peach Avenue north of Central Avenue.

2.1.3.3 Assemi

The Assemi annexation includes 156.38 acres of commercial/industrial development on the east side of Minnewawa Avenue between North Avenue and the Wawona Avenue

alignment. This annexation would require an expansion of the Sphere of Influence for the District.

2.1.4 Water and Sewer Demands

The present total acreage of the Malaga County Water District is 1,667.68 acres. The acreage for the significant areas that are not yet developed, flood control basins, residential areas, schools, Vitro Plate Glass, Rio Bravo Cogeneration Plant, Malaga Power, and the wastewater treatment plant totaled approximately 443 acres in 2018. The net result was approximately 1,225 acres.

The water demand for commercial and industrial areas (with the exception of Vitro Plate Glass, Rio Bravo, and Malaga Power) was approximately 43,666,733 cubic feet (326,627,163 gallons) for 2018 based on meter readings.

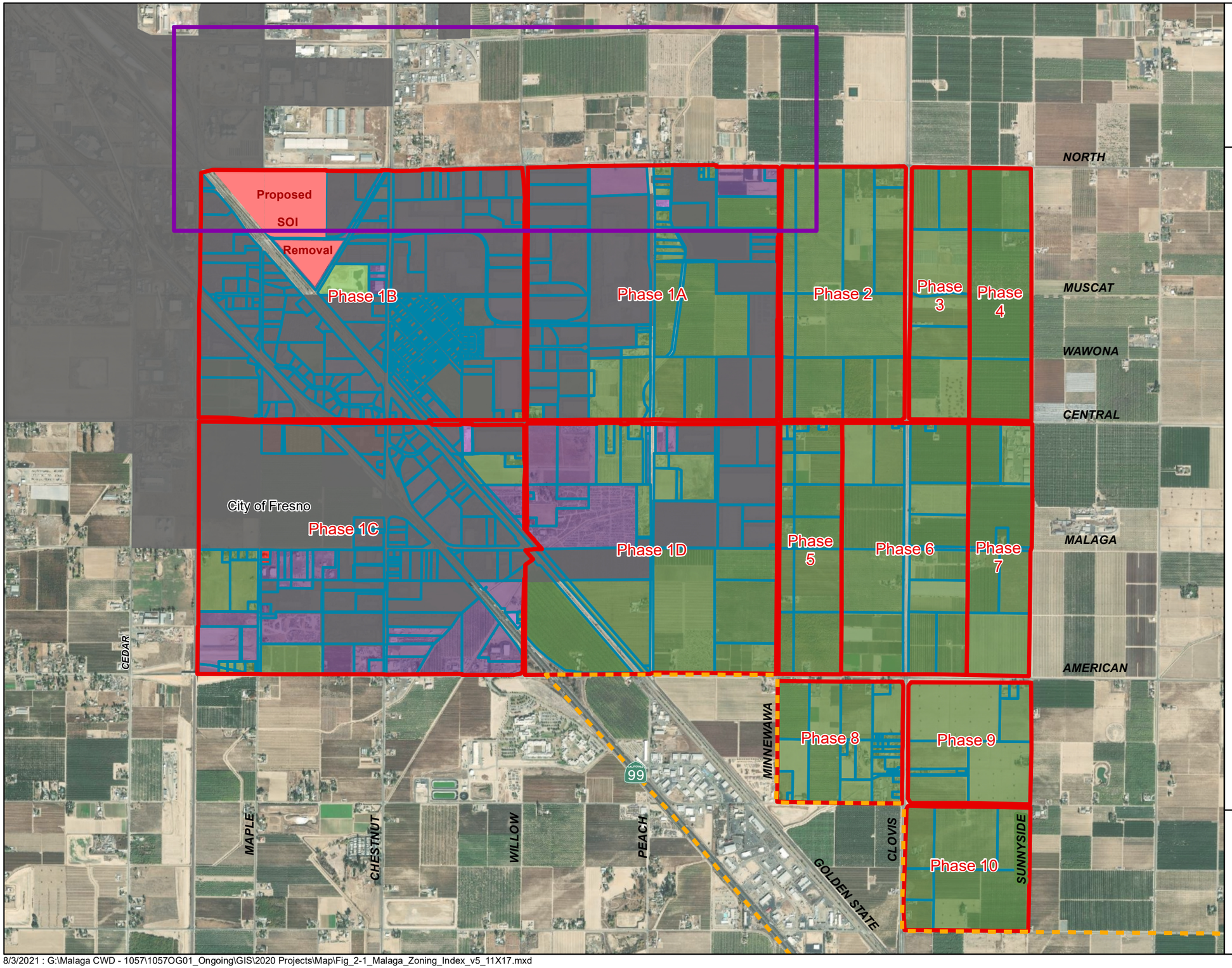
Therefore, the existing commercial area in the District generates a demand of approximately 266,634 gallons per acre per year, or 730.5 gallons per acre per day. This is equivalent to approximately 1.46 EDUs/acre. The proposed annexations are anticipated to generate a demand similar in nature. When specific development is proposed, the assumed water and sewer demands of the property may require adjustment.

It is noted that according to a report prepared by Akel Engineerng Group in 2013, the City of Fresno Wastewater Collection Master Plan utilized a coefficient of 5,000 gpd/Ac in the 2006 Master Plan for industrial flows. A coefficient of 5,000 gpd/Ac is not considered to be representative of the demands of future development in the Malaga County Water District. A coefficient of 1,500 gpd/Ac will be utilized in the analysis of future sewer demands contributing to the Malaga County Water District sanitary sewer system.

Figure 2-1 Malaga CWD

Zoning Information

June 2021



- Phase Area
- MOU Area
- Assessor Parcel
- SKF Sphere of Influence
- Fresno City Limits
- Proposed SOI Removal

Zoning

- Agriculture
- Commercial
- Light Industrial
- Heavy Industrial
- Single Family Residential Agricultural
- Low Density Multiple Family Residential
- Single Family Residential
- Trailer Park Residential
- Open Conservation

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Figure 2-2 Malaga CWD

Zoning Information

June 2021

Proposed SOI Removal

Phase 1B

Phase 1A

Phase 2

Phase 3

Phase 4

Phase 1C

Phase 1D

Phase 5

Phase 6

Phase 7

Phase 8

Phase 9

Phase 10

City of Fresno

NORTH

MUSCAT

WAWONA

CENTRAL

MALAGA

AMERICAN

CEDAR

MAPLE

CHESTNUT

WILLOW

PEACH

MINNEWAWA

CLOVIS

SUNNYSIDE

GOLDEN STATE

99

- Phase Area
- Assessor Parcel
- SKF Sphere of Influence
- Fresno City Limits
- Proposed SOI Removal

Zoning

- Agriculture
- Central Trading
- General Commercial
- Light Industrial
- Heavy Industrial
- Single Family Residential Agricultural
- Low Density Multiple Family Residential
- Single Family Residential
- Trailer Park Residential
- Open Conservation

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2.2 High Speed Rail Maintenance Station

There is a potential that the High Speed Rail (HSR) Maintenance Station would be located in an area west of the railroad and east of Cedar Avenue between Malaga Avenue and Adams Avenue. An exhibit prepared by the County of Fresno is included as Figure 2-3. This potential maintenance station area is immediately west of the MCWD Sphere of Influence. There are no readily available data regarding the potential water and sewer demands of such a facility. It is possible that discussions could investigate the potential of water and sewer service for the maintenance station to be provided by the MCWD. The information identifying the location of the potential maintenance station shows that it is west of the railroad, which serves as the boundary for the MCWD Sphere of Influence. The northern portion of the potential maintenance station is within the City of Fresno Sphere of Influence.

The City of Fresno has recently constructed a 24 inch diameter sewer trunk main in Malaga Avenue from Cedar Avenue west to Orange Avenue, which could be used to serve the potential HSR Maintenance Station. There is a City of Fresno water main (14 inch diameter) in Cedar Avenue approximately 800 feet north of Malaga Avenue.

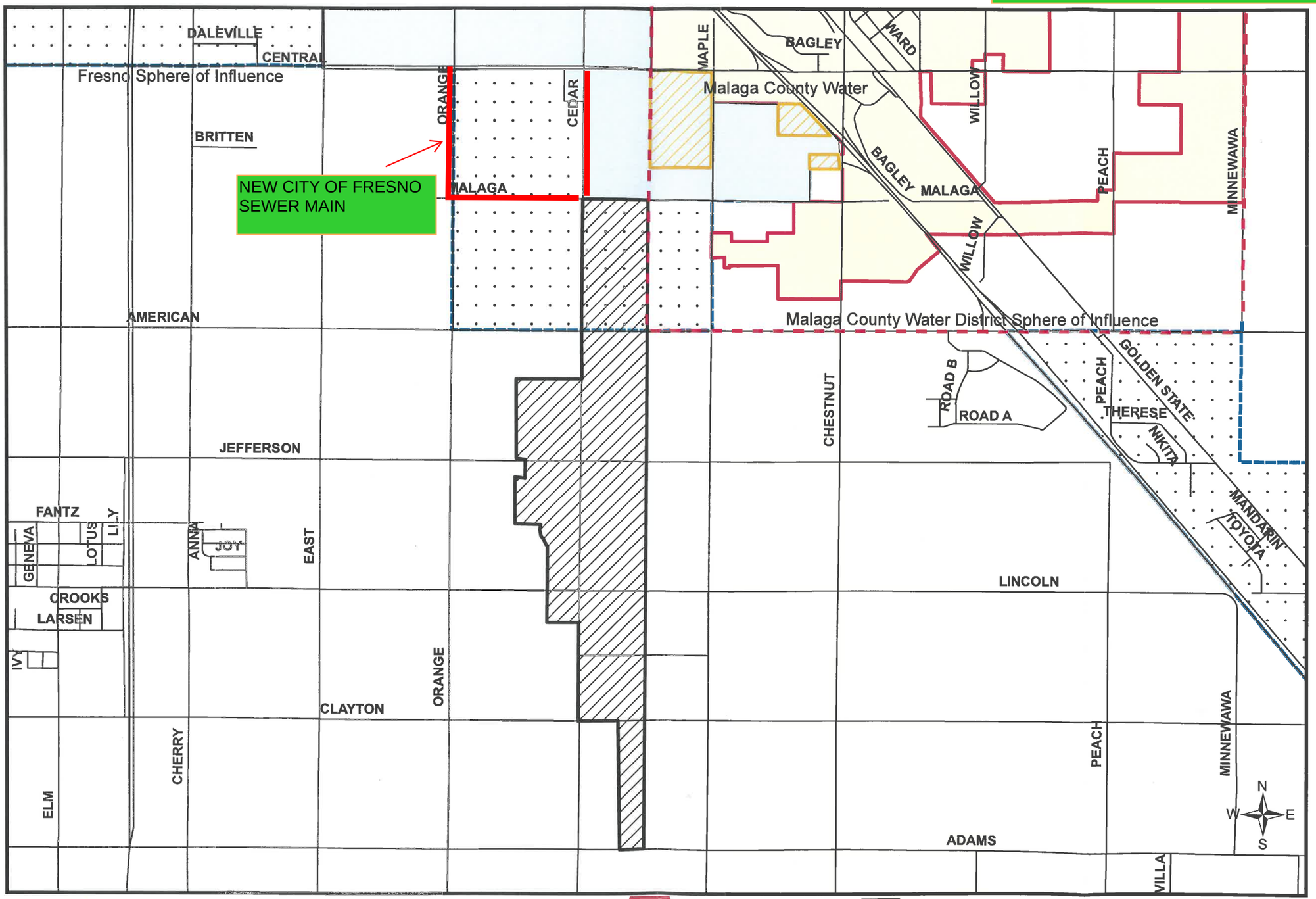
It is not recommended that the MCWD consider attempting to extend water and sewer service for the potential HSR Maintenance Station.

2.3 Easton Community Services District

The Easton Community Services District (CSD) had approached the MCWD in 2015 to explore the subject of a potential sanitary sewer connection for the Easton CSD. The general parameters of the potential connection would be approximately 0.125 mgd to the system, from approximately 500 connections. Master planning of sanitary sewer collection, treatment and disposal facilities would be required. The relative locations of MCWD, the potential HSR Maintenance Station, City of Fresno, and SKF are included in Figure 2-4.

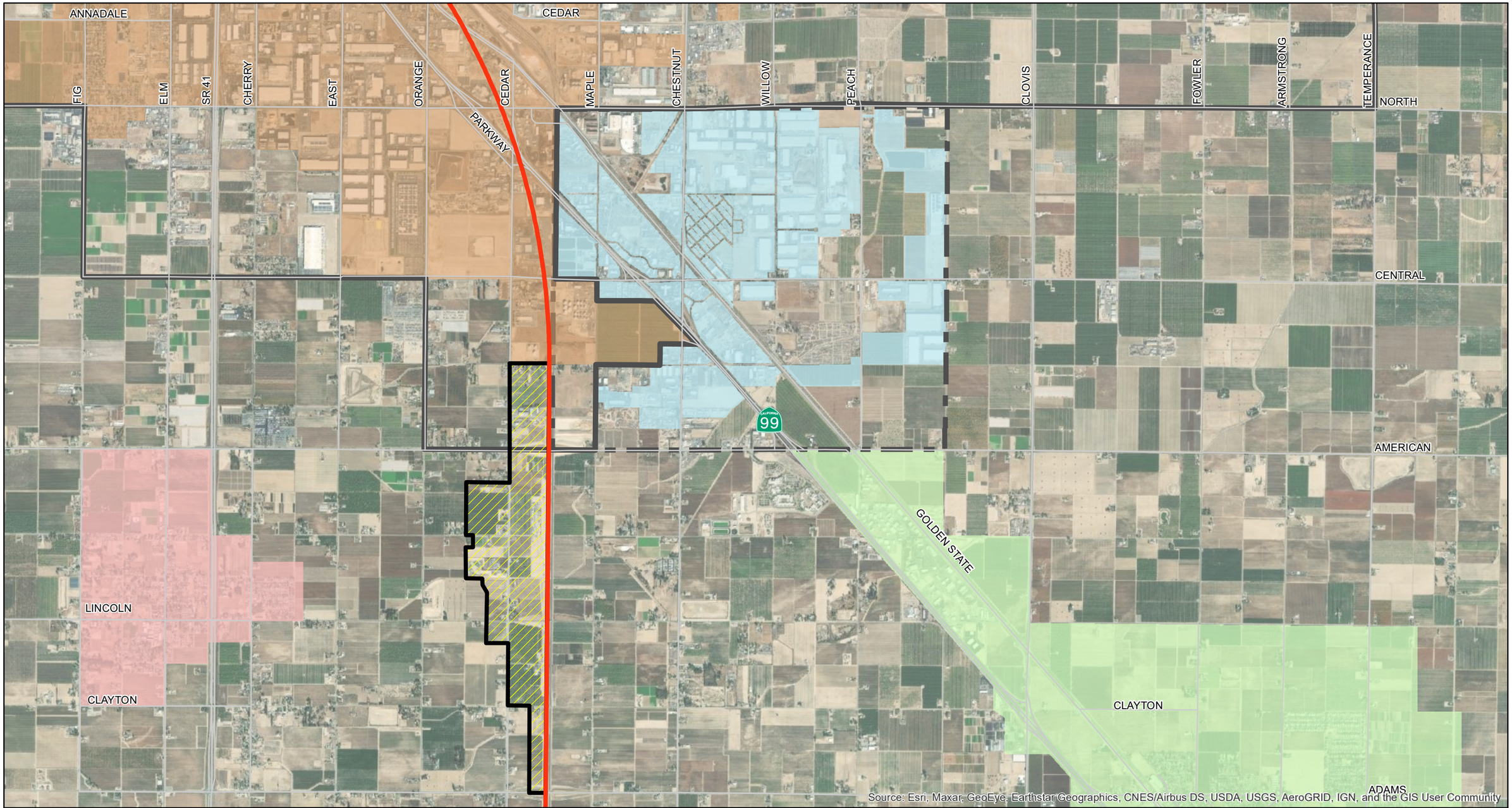
Keys to the potential of serving the Easton CSD would include the capability of the sewer main in Maple Avenue south of Central Avenue and the acquisition of additional disposal capacity to account for the additional sanitary sewer contribution. In addition, if the HSR Maintenace Station is constructed, the route to extend a sewer main from Easton to MCWD would be effectively blocked.

FIGURE 2-3



Public Works and Planning

Malaga County Water District
Malaga Co. Water District Sphere of Influence
Malaga Co. Water District Overlapping City
Fresno City Limit
Fresno Sphere of Influence



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- Proposed HSR Alignment
- Proposed HSR Maintenance Site
- Malaga CWD Boundary
- Malaga CWD SOI (LAFCo)
- Fresno SOI
- Fresno City Limits
- Easton SOI
- Selma Kingsburg Fowler SOI

Figure 2-4 Malaga CWD

Proposed High Speed Rail Alignment

June 2021

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3 Existing Capacity

3.1 Water Supply

The water supply for the MCWD is groundwater. The MCWD does not have any water storage facilities.

3.1.1 Groundwater Supply Wells

The well capacity of the MCWD is approximated below:

Well	Capacity (gpm)
1	Not Active
2	Destroyed
3	Not Active
4	Not Active
5	Not Active
6	1,350 gpm
7	1,050 gpm
8	1,200 gpm
Total	3,600 gpm

3.1.2 Daily Demands

Average day demands during the period of 2012 through 2020 were as follows:

	Total Gallons	Average Day (gal)
2012	554,560,000	1,519,342
2013	562,804,000	1,541,929
2014	534,233,000	1,463,652
2015	495.733,000	1,358,173
2016	478,976,000	1,312,263
2017	510,879,000	1,399,669
2018	506,732,000	1,388,307
2019	516,412,000	1,414,827
2020	535,838,000	1,468,049

3.1.3 Peak Demands (Maximum Day)

During the period of 2012 through 2020, the maximum day demands were as follows:

Maximum Day 2012	2,681,000 gallons	(1,862 gpm)
Maximum Day 2013	4,059,000 gallons	(2,819 gpm)
Maximum Day 2014	2,936,000 gallons	(2,039 gpm)
Maximum Day 2015	2,581,000 gallons	(1,792 gpm)
Maximum Day 2016	2,900,000 gallons	(2,014 gpm)
Maximum Day 2017	2,980,000 gallons	(2,069 gpm)
Maximum Day 2018	3,822,000 gallons	(2,654 gpm)
Maximum Day 2019 (August 11)	4,371,000 gallons	(3,035 gpm)
Maximum Day 2020 (August 23)	5,925,000 gallons	(4,115 gpm)

The ratio of maximum day versus average day was approximately 1.9:1 **(in 2013)**

Peak Hour demands are not known.

3.1.4 Fire Demands

Based upon the 2019 California Fire Code, the fire flow requirements for commercial buildings in MCWD may vary considerably. There exist multiple industrial and commercial facilities that are significant in the respect of square footage. These structures, depending on building material and fire sprinkler locations could require a significant fire flow. Determination of fire flow and fire protection requirements for buildings is not within the jurisdiction of the MCWD, however, it is recommended that the water system is capable of delivering at least 2,500 gpm with a residual pressure of at least 20 psi at the point of delivery.

3.1.5 Available Capacity

The typical evaluation considers the water supply with the largest well out of service. This method is consistent with PUC Standard Practice. PUC Standard Practice does not consider fire flow.

Similarly, in Title 22, Chapter 16 (California Waterworks Standards), Article 2 (Permit Requirements), Statute 64554(c): Community water systems using only groundwater shall have a minimum of two approved sources before being granted an initial permit. The system shall be capable of meeting MDD (Maximum Day Demand) with the highest capacity source off-line.

Therefore, the water supply is 3,600 – 1,350 = 2,250 gpm (which is less than the maximum day demand of 2013, 2018, 2019, and 2020). It is therefore recommended that the District construct a new water supply well immediately. A new water supply well of approximately 1,200 gpm would provide the MCWD with a water supply of 3,450

gpm, with the highest capacity well out of service. This water supply is less than the MDD of 2020, but would provide reliability to the MCWD during maximum demands.

A brief summary of activities associated with the pursuit of a new water supply well is described below:

2016

The Malaga County Water District utilized CDBG funds to perform test hole investigations near the Well No. 3 site and the Well No. 5 site. The test hole was constructed on the Konkel School site with FUSD permission.

2018-2019

A draft Capital Improvement Plan was developed and submitted to the District in January 2019. The recommendation was that the District needed to construct a replacement well immediately and that each of the proposed annexations would need to dedicate a new well site to the District.

May 2019

The Malaga County Water District submitted applications to the Kings Basin Water Authority for planning grant funding to prepare preliminary design and to prepare environmental compliance documents for a replacement well at the Well No. 3 site.

July 2019

Water meters. The District received funding assistance to install replacement water meters throughout the District. The Notice of Completion for the project was recorded in July 2019. Updated water use for the District should be incorporated into an updated water supply evaluation for the District. It is likely that actual records of water demands from commercial and industrial customers would have increased from historical records because the older water meters would have been reporting a lesser amount of water delivered than was actual. Conversely, with the implementation of metered water rates to residential customers (implementation of metered residential rates has not yet been initiated) could have resulted in a water demand decrease. However, residential water use was not previously recorded.

2020

In November 2019, the County of Tulare awarded funds to be used for the preliminary engineering and environmental documentation of the replacement of Well No. 3. Work

was initiated shortly thereafter. The work included meetings with District staff regarding the general layout of potential improvements. Attempts to obtain physical access to the site from the Fresno Unified School District were not successful.

The District requested a modification to the preliminary design that would place a replacement well within the existing Well No. 3 site property. An extension to the IRWM Grant was requested and authorized. Preliminary design (90%) and environmental review have been completed.

The purpose of the grant project is to generate documents that can be submitted to the State or other agencies for potential construction funding assistance for a new well. It is noted that funding applications to the State are subject to criteria regarding the purposes of the improvements (note that the meter project was a loan for all non residential meters) and that the process can take up to a year to receive a response regarding funding eligibility.

Note that the above does not include fire flow. Fire flow is a critical aspect for all of customers of the District. The large warehouses and industrial sites have significant fire flow demands. A water storage tank with booster pumps would provide significant improvement in the ability of the MCWD to provide fire flow. It is recommended that a tank of approximately 1.0 million gallons should be constructed in the near future.

A water storage tank will also allow the MCWD to operate water supply wells during off peak hours and run smaller booster pumps during peak electrical charge hours.

3.1.6 Surface Water Rights

Need to obtain information from the MCWD regarding the existing surface water rights that the MCWD has and the procedure defined for obtaining the surface water rights of properties to be developed.

Information from 2019 communications indicated 1,438 acres served by MCWD that would be allocated the surface water for the purpose of recharge. There is a recharge project presently in the works. Another information request is to understand the status of said project.

3.1.7 Recommendations

3.1.7.1 Water Supply Well

Based on the existing water demands and water supply capacity of the District, it is recommended that the District construct a new water supply well at the existing Well 3 site as soon as possible.

It is also recommended that design of a new water supply well at the existing Well 5 site is initiated as soon as possible. At such time that two new wells are constructed, the water supply with the highest capacity well out of service would be approximately 4,650 gpm, which is greater than the MDD for 2020.

3.1.7.2 Storage

A water storage tank has been identified in the past as a potential component of the District's water distribution system. Benefits of a storage tank may present themselves in the form of an opportunity to pump the wells at off-peak periods, an ability to supplement fire flow and peak hour demands, and an opportunity to offset temporary loss of a water supply well.

It is recommended that the District have water storage tanks sufficient for the maximum day demand. It is therefore recommended that at least 6.0 MG of water storage is constructed for the MCWD. It is recommended that the District have multiple storage tank locations. A preliminary plan for water storage has been defined for the Well 3A site.

It is recommended that a water storage tank of at least 1.0 MG is constructed at the Well 3 site. The water storage tank would include a booster pump station capable of discharging 3,000 gpm. The pipeline at the water storage tank would need to be a minimum of 12 inches in diameter.

Future water storage improvements should include a 2.0 MG water storage tank on the west side of State Route 99 and a 2.0 MG water storage tank in the north east portion of the District.

3.1.7.3 Water Meters

As noted in Section 3.1.5 above, the MCWD completed the installation of water meters for all existing service connections in July 2019. However, the MCWD has not implemented the metered rate schedule to all District customers. It is recommended that all customers are charged according to the water meter rate schedule. This action encourages water conservation and enables the District to identify leaks within individual properties more readily. The overall determination of unaccounted water is improved when all connections are charged based on the meter rate.

3.2 Water Service Customers

The MCWD has 310 residential water service connections and 297 commercial water service connections. In 2019 the MCWD completed a project funded by the Water Resources Control Board to install new residential water meters and replace commercial water meters.

3.2.1 Daily Demands

The MCWD has not yet implemented the metered fee schedule for residential connections. The average or peak residential demands are not yet known.

3.3 Existing Water System

3.3.1 Overall System

The existing water distribution system is included as Figure 3-1. The existing distribution system has been constructed incrementally since 1962. Figure 3-2 includes the size and year of construction of the water distribution system.

3.3.2 Crossings of State Route 99

There are four (4) water line crossings of State Route 99. The crossings of State Route 99 were constructed in 1962, which makes these water lines nearly 60 years old. Three of the crossings are 8 inch diameter and one of the crossings is 6 inch diameter. The ability to deliver significant water through any of these crossings is limited.

There are two (2) crossings of Golden State Boulevard. One of the crossings is 10 inch diameter and the other is 8 inch diameter. These two pipelines also cross the railroad.

3.3.3 Recommendations

It is also recommended that existing dead end runs are looped. The critical dead ends to address are the following:

- *Water main in Maple Avenue south of Well 8 to American Avenue, east in American Avenue to Chestnut Avenue, then north in Chestnut Avenue to the end of the existing water main.*

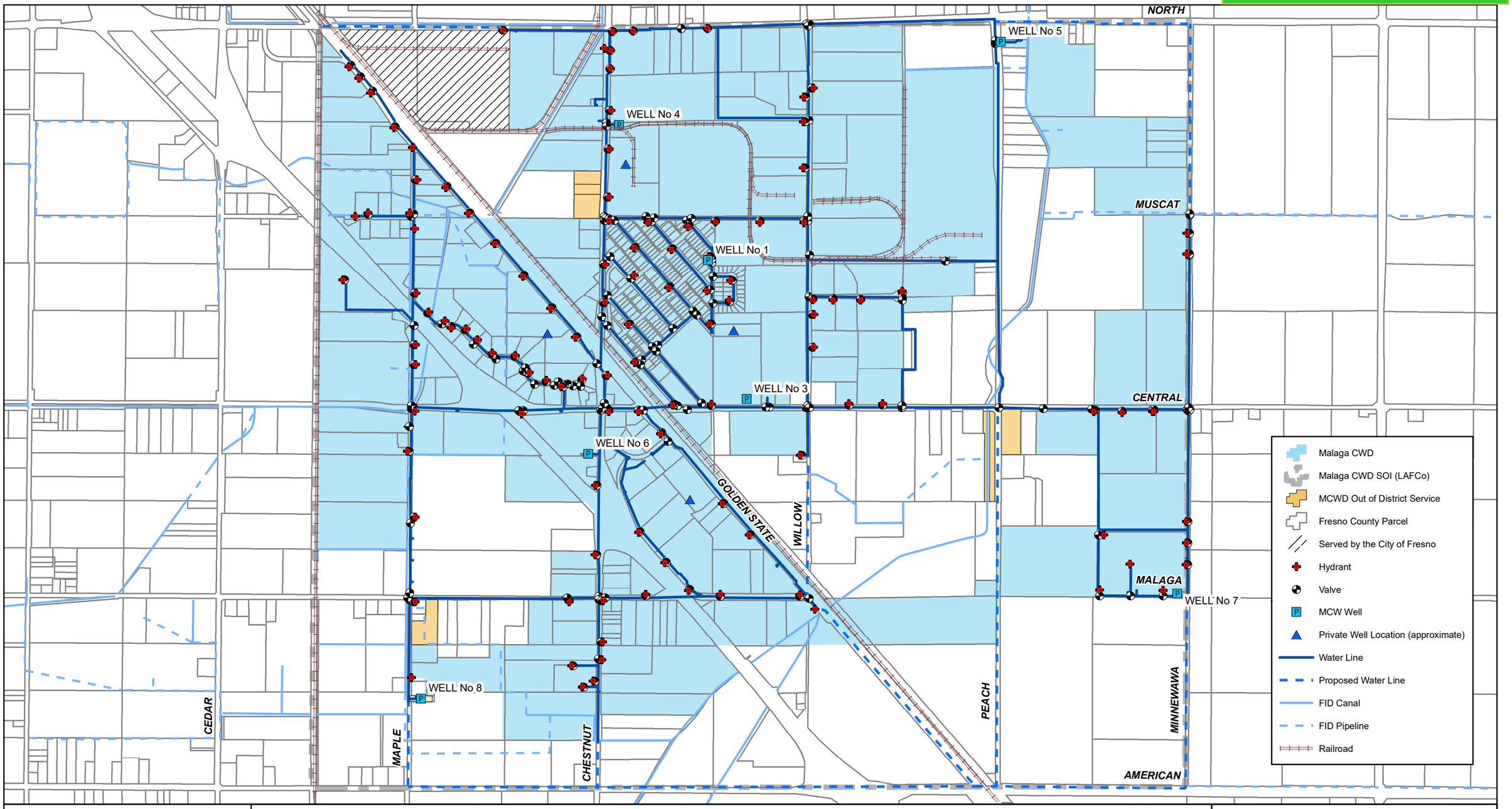
- *Water main in Willow Avenue south from Central Avenue to connect to the water main near Malaga Avenue and Golden State Boulevard.*

- *Water main from the intersection of Peach and North Avenues east along North Avenue to Minnewawa then south in Minnewawa to the existing water main approximately ½ mile south.*

Further, it is recommended that at least one new water main is constructed across both Golden State Boulevard and State Route 99 to provide for redundancy and reliability of service.

It is recommended that all new water mains are at least twelve (12) inches in diameter. Water mains near new water storage tanks are recommended to be sixteen (16) inches in diameter (or parallel water mains equivalent to 16 inches in diameter) to accommodate fire flows from booster pumps.

FIGURE 3-1



0 660 1,320 Feet

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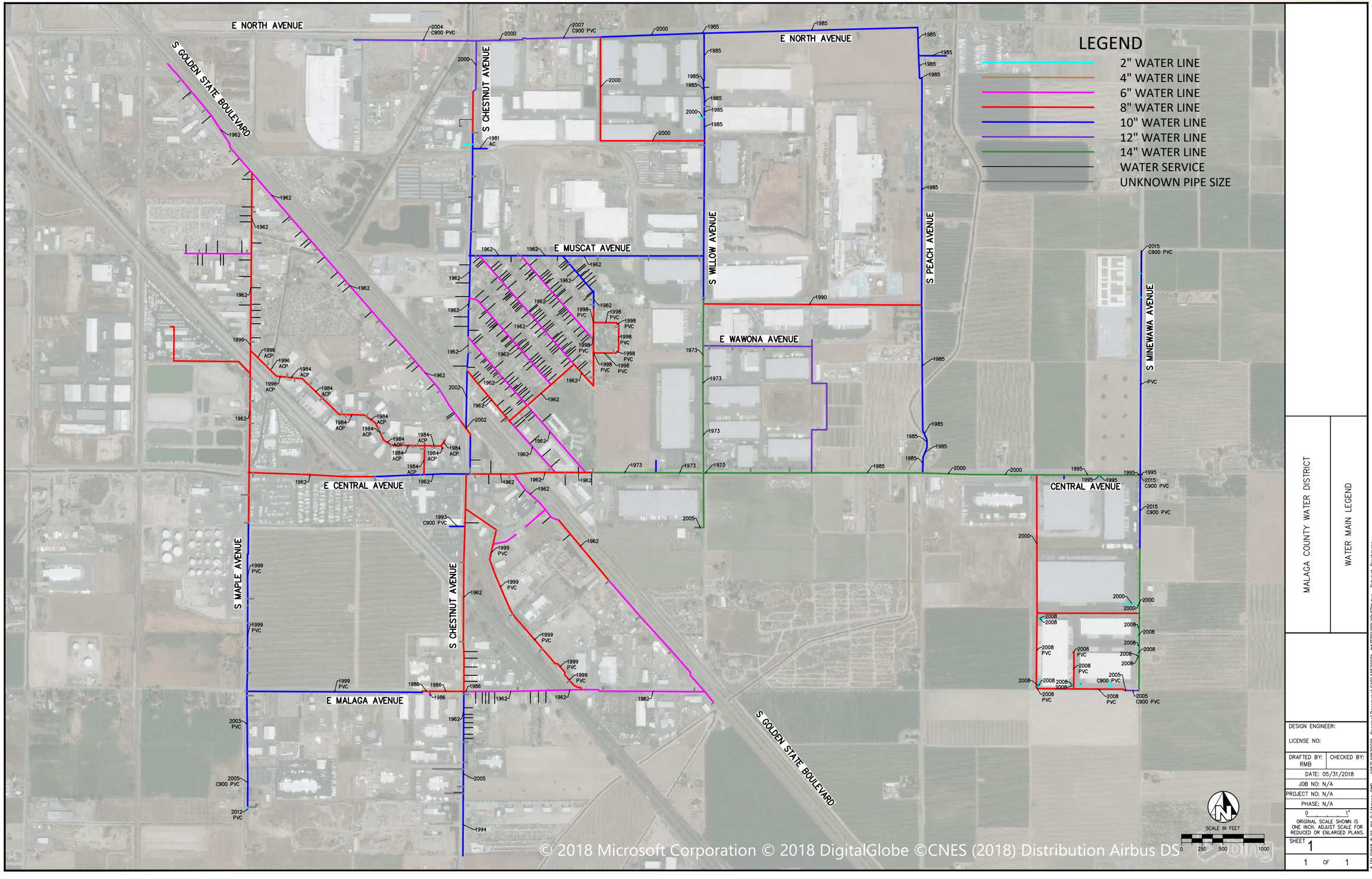
Fresno, CA 93711-6162
(559) 449-2700

MALAGA COUNTY WATER DISTRICT

EXISTING WATER FACILITIES
JULY 2016

4/19/2021 : G:\Malaga CWD - 1057\1057OG01_Ongoing\Basemaps\GIS\OGBM-WATER-11x17.mxd

FIGURE 3-2



MALAGA COUNTY WATER DISTRICT

WATER MAIN LEGEND

DESIGN ENGINEER:

LICENSE NO:

DRAFTED BY: RMB | CHECKED BY:

DATE: 05/31/2018

JOB NO: N/A

PROJECT NO: N/A

PHASE: N/A

0 1"

ORIGINAL SCALE SHOWN IS ONE INCH. ADJUST SCALE FOR REDUCED OR ENLARGED PLANS.

SHEET 1

1 OF 1

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3.4 Sanitary Sewer Collection

3.4.1 Drainage Areas

The existing sanitary sewer collection system has been constructed incrementally since 1962 and the current layout is shown in Figure 3-3. The sanitary sewer collection system consists of two separate collection lines. When the District was initially formed, the system included an Industrial Line and a Residential Line. The drainage areas for the Industrial Line are shown in Figure 3-4 while the drainage areas for the Residential Line are shown in Figure 3-5.

The collection lines remain completely separate heading into the wastewater treatment plant. Originally, the headworks and the flows from each of the two lines were to receive independent treatment processes; however, the flow from both collection lines is combined at the headworks of the wastewater treatment plant and all flow receives the same treatment.

Expansion of the service area for the District will require connection to one of the two existing sanitary sewer collection systems or construction of new facilities, depending on the location of the new development.

3.4.2 Lift Stations

There exist three (3) lift stations in the collection system. The locations of the lift stations are shown in Figure 3-3. The lift stations are required to provide service to properties at the northern side of the District due to the relatively flat topography.

3.4.3 Crossings of State Route 99

There are five (5) sewer crossings of State Route 99, however, only one of these crossings is associated with the industrial sewer line. This critical sewer line would receive the bulk of the sanitary sewer flow from expansion of the District service area.

There are only two crossings of Golden State Boulevard and the railroad, one crossing for the Industrial sewer and one for the Residential sewer.

3.4.4 Daily Demands

Sanitary sewer demands are defined by the flow received at the wastewater treatment facilities. The flows received at the wastewater treatment facilities are summarized in **Error! Reference source not found.**. The average annual flowrate received at the wastewater treatment facilities in 2020 was 633,000 gallons per day.

3.4.5 Peak Demands

The District records daily flow received at the wastewater treatment facilities. There is not a recording of peak demands over the course of a day.

It is noted that peak daily flows often coincide with storm events. The District has implemented measures such as plugging the pick hole in manhole lids to reduce stormwater contributions. It is anticipated that there are some illegal stormwater connections to the sanitary sewer system.

3.4.6 Available Capacity

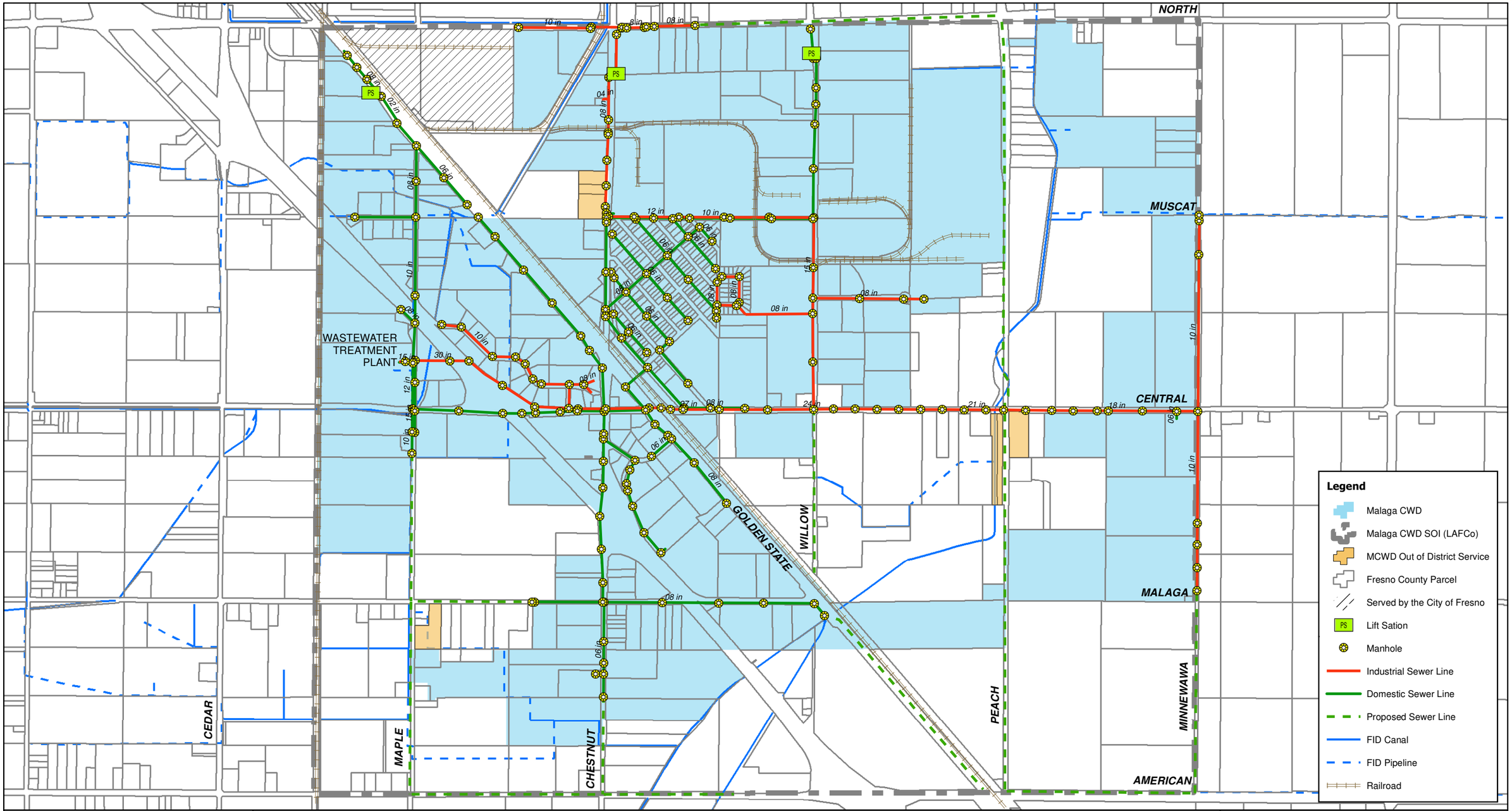
Sewer Collection System

Based on the average daily flow seen at the wastewater treatment plant, existing developed commercial land produces approximately 470 gallons of sewage per day per acre. For purposes of this report, it has been assumed that new commercial developments will produce 1,500 gallons per day per acre. The available capacity of the current sewer collection system was analyzed against the estimated current sewage production per drainage area to determine how much additional flow each reach could handle within design criteria.

The District anticipates potential expansion to the east and southeast, as shown by the ultimate sphere of influence in Figure 1-5. Therefore, the new sewage load would be directed through the sewer lines along Minnewawa towards Central Ave with a majority flowing through the main line in Central Ave to the wastewater treatment plant. The existing sewer line north of Central Ave along Minnewawa Ave is a 10-inch line. Based on the estimated current sewage production for that drainage area, there is additional capacity of approximately 220 acres using a new production rate of 1,500 gallons per day per acre. This also applies to the sewer line south of Central Ave along Minnewawa Ave.

The potential acreage to be added to the Distrct in Phase 2 through Phase 10 is approximately 1,250 acres. The limiting portion of the main sewer line along Central Avenue is the 18-inch line, which has an additional capacity of approximately 1.56 MGD or about 1,100 acres. Therefore, the existing main sewer line in Central Ave does not have the available capacity for all proposed expansions and a new sewer line is recommended.

FIGURE 3-3



0 0.125 0.25 Miles

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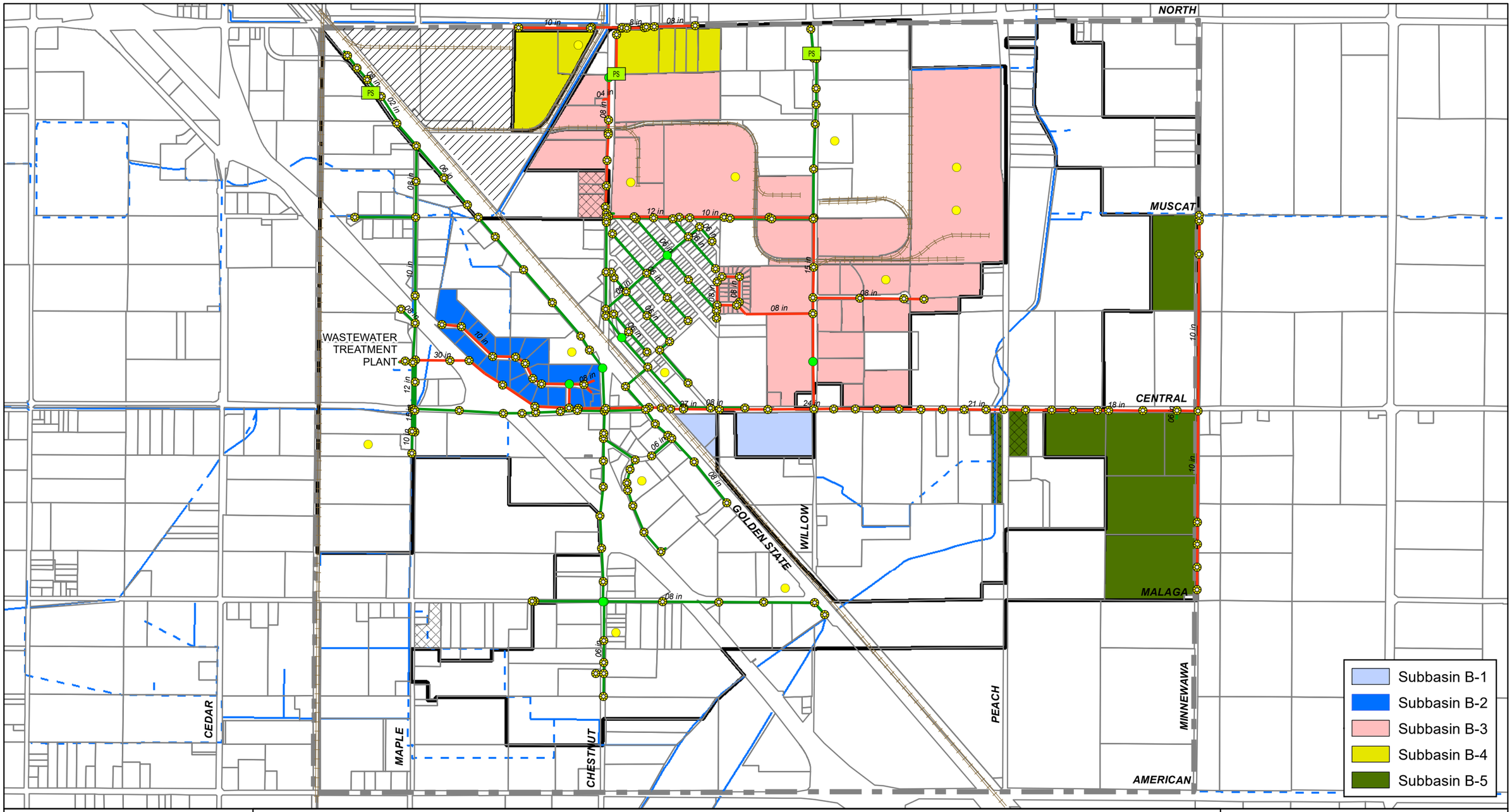
MALAGA COUNTY WATER DISTRICT

EXISTING SEWER FACILITIES
JULY 2016

7/28/2016 : G:\Malaga CWD - 1057\1057OG01_Ongoing\Basemaps\GIS\OGBM-SEWER-11x17.mxd



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Feet

Manhole
Collection System
Significant Industrial User
Lift Sation
Industrial Sewer Line
Domestic Sewer Line
FID Canal
FID Pipeline
Malaga CWD
Malaga CWD SOI (LAFCo)
MCWD Out of District Service
Served by the City of Fresno

Figure 3-4

Malaga County Water District
Collection System Line B

March 2017

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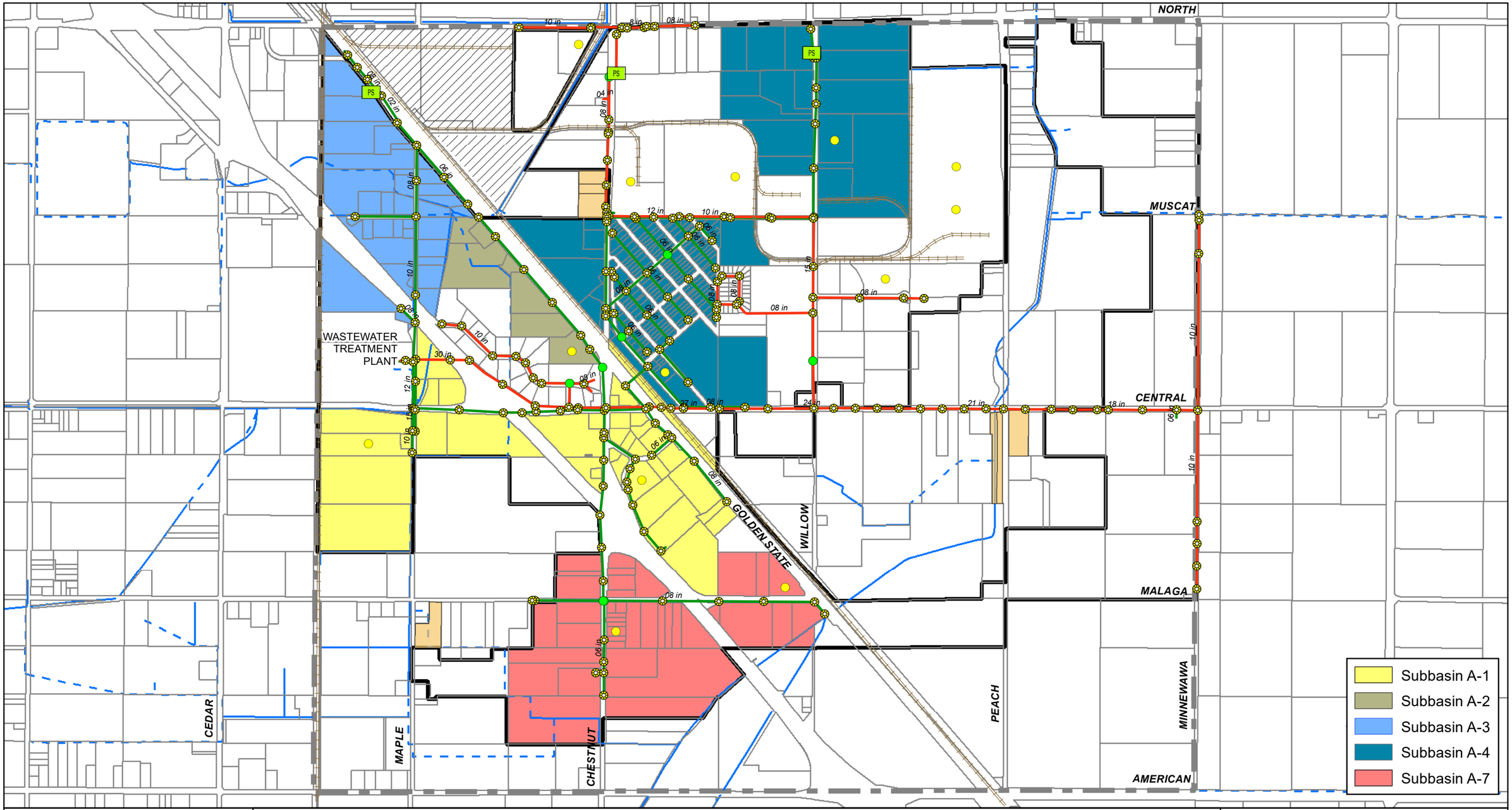

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Feet

- Manhole
- Collection System
- Significant Industrial User
- Lift Sation
- Industrial Sewer Line
- Domestic Sewer Line
- FID Canal
- FID Pipeline
- Malaga CWD
- Malaga CWD SOI (LAFCo)
- MCWD Out of District Service
- Served by the City of Fresno

Figure 3-5

Malaga County Water District
Collection System Line A

March 2017

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3.5 Wastewater Treatment

The wastewater treatment and disposal facilities are located at the northwest corner of Central and Maple Avenues. A portion of the wastewater and disposal facilities were originally constructed in the late 1950's. Significant expansion was performed in 1968 and then in 1996. Incremental expansions, improvements, or modifications have been constructed since 1996.

The District had constructed tertiary treatment facilities and obtained an NPDES Permit that allowed discharge to the Central Canal adjacent to the treatment facilities. In 2017, the District requested that the NPDES Permit be terminated. The tertiary filtration and UV facilities were removed from service and the physical connection to the Central Canal was removed.

The facilities are now regulated by Waste Discharge Requirements Order No. R5-2020-0001 (see Appendix D), which requires land disposal of the effluent. The treatment facilities have a design capacity of 1.2 mgd, however the disposal ponds have a capacity of 0.85 mgd. The facility is not allowed to discharge more than 0.85 mgd.

A site plan of the wastewater treatment facilities is included as **Error! Reference source not found.**. More detailed information of the actual treatment facilities is included in Figure 3-7.

3.5.1 Daily Flows

The flows received at the wastewater treatment facilities are summarized in **Error! Reference source not found.**. The average daily flowrate in 2020 was 0.633 mgd.

3.5.2 Peak Demands

Peak day flows are monitored at the headworks of the treatment facilities and periodically may approach 1 mgd.

3.5.3 Available Capacity

Wastewater Treatment

The treatment facilities are designed for a capacity of 1.2 mgd, and meeting effluent criteria of 40 mg/l for BOD and TSS. The treatment facilities are not designed to meet new nitrate effluent limits of 10 mg/l.

The flowrates received at the treatment facilities vary through the year and typically peak in the summer months. The average daily flow for September 2020 was 0.834 mgd, which is near the maximum permitted capacity due to limitation of the disposal

ponds. The average flowrate for the year 2020 was 633,000 gallons per day. On an annual basis, this leaves available disposal capacity of approximately 0.217 mgd.

Based on an assumed demand of 1,500 gallons per acre per day for future development in the District, there is disposal capacity for an additional 144 acres of development. However, there are approximately 1,093 acres of undeveloped property within the existing MCWD Sphere of Influence. This means that additional disposal capacity must be developed for the facilities.

3.5.4 Pretreatment Program and Local Limits

The District is also required to operate and maintain a pretreatment program and require compliance with local limits for constituents discharged to the collection system. The most recent Pretreatment Program is included as Appendix E. A component of the Pretreatment Program is that all non-residential wastewater dischargers are required to obtain an individual Non-Residential Wastewater Discharge Permit. Individual permittees must comply with the local limits defined by the MCWD and approved by the RWQCB.

3.5.5 CV-SALTS Requirements

3.5.5.1 Nitrogen

The MCWD received a Notice to Comply with the nitrate control program of the CV-SALTS as described in Water Board Resolution R5-2018-0034. The MCWD is participating in a Management Zone to investigate means to reduce nitrate contributions to groundwater. In addition, the MCWD has submitted funding applications to construct nitrogen reduction improvements to the wastewater treatment facilities (WWTF) in order to reduce effluent nitrogen concentrations to below 10 mg/l.

3.5.5.2 Salinity

The MCWD received a Notice to Comply with the salt program of CV-SALTS as described in Water Board Resolution R5-2018-0034. The MCWD will participate in a Prioritization and Optimization Study to identify opportunities to reduce salt contributions to the groundwater.

3.6 Wastewater Disposal

3.6.1 Available Capacity

The facilities currently have a total disposal capacity of about 0.85 mgd, leaving an available capacity of approximately 0.217 mgd.

The District is required to monitor the percolation capacity of the disposal ponds annually. When the percolation capacity drops to less than 1.5 inches per day, the pond shall be taken out of service for scraping and ripping.

Acquisition of new disposal capacity is required at such time that disposal demands reach eighty percent (80%) of existing capacity. This means the District will be required to define and acquire area for the expanded capacity when demands reach 680,000 gallons per day. Assuming new developments will increase total wastewater effluent, it is recommended that the District identify and acquire additional property for the purpose of percolation ponds.

TABLE 3-1

MALAGA COUNTY WATER DISTRICT
WASTEWATER TREATMENT PLANT
MONITORING AND REPORTING PROGRAM NO. R5-2020-0001

YEAR	Permit Flow	0.8 of Permit Flow	Pond Permitted Flow	AVERAGE FLOWRATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Annual Total (MG)
1990				0.677	0.660	0.667	0.694	0.610	0.688	0.709	0.652	0.664	0.679	0.726	0.741	0.632	247.04
1991				0.694	0.642	0.651	0.694	0.687	0.684	0.697	0.682	0.703	0.728	0.712	0.713	0.731	253.27
1992				0.735	0.727	0.741	0.735	0.681	0.679	0.740	0.753	0.768	0.743	0.768	0.756	0.729	268.28
1993				0.716	0.727	0.720	0.724	0.721	0.715	0.703	0.705	0.712	0.714	0.703	0.709	0.734	261.19
1994				0.724	0.748	0.739	0.743	0.743	0.745	0.740	0.739	0.737	0.731	0.722	0.669	0.636	264.35
1995				0.660	0.638	0.635	0.621	0.614	0.626	0.636	0.641	0.695	0.699	0.705	0.709	0.699	240.90
1996				0.688	0.671	0.680	0.676	0.690	0.690	0.689	0.692	0.691	0.686	0.694	0.696	0.705	251.26
1997	1.2	0.96	0.85	0.714	0.686	0.681	0.681	0.690	0.704	0.715	0.711	0.740	0.756	0.722	0.734	0.749	260.70
1998	1.2	0.96	0.85	0.745	0.744	0.743	0.737	0.772	0.755	0.756	0.738	0.775	0.740	0.739	0.706	0.738	272.03
1999	1.2	0.96	0.85	0.760	0.753	0.753	0.735	0.746	0.765	0.762	0.778	0.780	0.770	0.761	0.760	0.751	277.24
2000	1.2	0.96	0.85	0.772	0.723	0.744	0.738	0.754	0.783	0.767	0.772	0.808	0.770	0.795	0.797	0.810	281.77
2001	1.2	0.96	0.85	0.763	0.776	0.771	0.701	0.810	0.755	0.780	0.750	0.770	0.773	0.759	0.760	0.756	278.56
2002	1.2	0.96	0.85	0.748	0.742	0.750	0.737	0.748	0.745	0.737	0.746	0.740	0.755	0.754	0.753	0.763	272.83
2003	1.2	0.96	0.85	0.747	0.752	0.752	0.737	0.750	0.740	0.746	0.758	0.742	0.740	0.750	0.747	0.745	272.49
2004	1.2	0.96	0.85	0.746	0.760	0.737	0.722	0.717	0.734	0.760	0.750	0.750	0.770	0.750	0.750	0.750	272.24
2005	1.2	0.96	0.85	0.823	0.860	0.780	0.760	0.770	0.763	0.870	0.960	0.935	0.964	0.740	0.778	0.700	300.56
2006	1.2	0.96	0.85	0.788	0.740	0.740	0.760	0.744	0.757	0.806	0.849	0.882	0.803	0.820	0.798	0.752	287.61
2007	1.2	0.96	0.85	0.860	0.785	0.820	0.805	0.867	0.770	0.964	1.001	0.960	1.020	0.823	0.746	0.763	313.99
2008	1.2	0.96	0.85	0.887	0.990	0.840	0.760	0.760	0.909	0.970	0.955	0.949	0.909	0.829	0.900	0.870	323.80
2009	1.2	0.96	0.85	0.778	0.830	0.800	0.820	0.740	0.800	0.900	0.830	0.750	0.800	0.720	0.670	0.680	284.03
2010	1.2	0.96	0.85	0.658	0.512	0.431	0.650	0.580	0.640	0.720	0.740	0.750	0.740	0.710	0.710	0.710	240.64
2011	1.2	0.96	0.85	0.683	0.670	0.640	0.690	0.690	0.630	0.740	0.710	0.730	0.730	0.700	0.640	0.620	249.17
2012	1.2	0.96	0.85	0.617	0.620	0.600	0.630	0.690	0.620	0.680	0.660	0.640	0.610	0.590	0.520	0.540	225.70
2013	1.2	0.96	0.85	0.533	0.450	0.520	0.570	0.560	0.530	0.600	0.450	0.610	0.550	0.560	0.510	0.490	194.62
2014	1.2	0.96	0.85	0.563	0.560	0.480	0.550	0.550	0.650	0.600	0.620	0.580	0.560	0.550	0.540	0.520	205.87
2015	1.2	0.96	0.85	0.533	0.500	0.490	0.540	0.550	0.480	0.560	0.570	0.590	0.530	0.570	0.520	0.500	194.77
2016	1.2	0.96	0.85	0.584	0.470	0.490	0.590	0.630	0.560	0.630	0.620	0.650	0.630	0.640	0.550	0.550	213.40
2017	1.2	0.96	0.85	0.598	0.570	0.520	0.580	0.570	0.590	0.640	0.600	0.680	0.680	0.650	0.570	0.530	218.56
2018	1.2	0.96	0.85	0.569	0.510	0.570	0.610	0.610	0.451	0.620	0.631	0.576	0.620	0.580	0.550	0.500	207.56
2019	1.2	0.96	0.85	0.621	0.550	0.490	0.550	0.550	0.600	0.630	0.650	0.760	0.700	0.670	0.680	0.620	226.92
2020	0.85	0.68	0.85	0.633	0.488	0.577	0.552	0.582	0.625	0.641	0.694	0.746	0.834	0.701	0.601	0.558	231.18

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Feet

Figure 3-6

Wastewater Treatment Plant

Malaga County Water District

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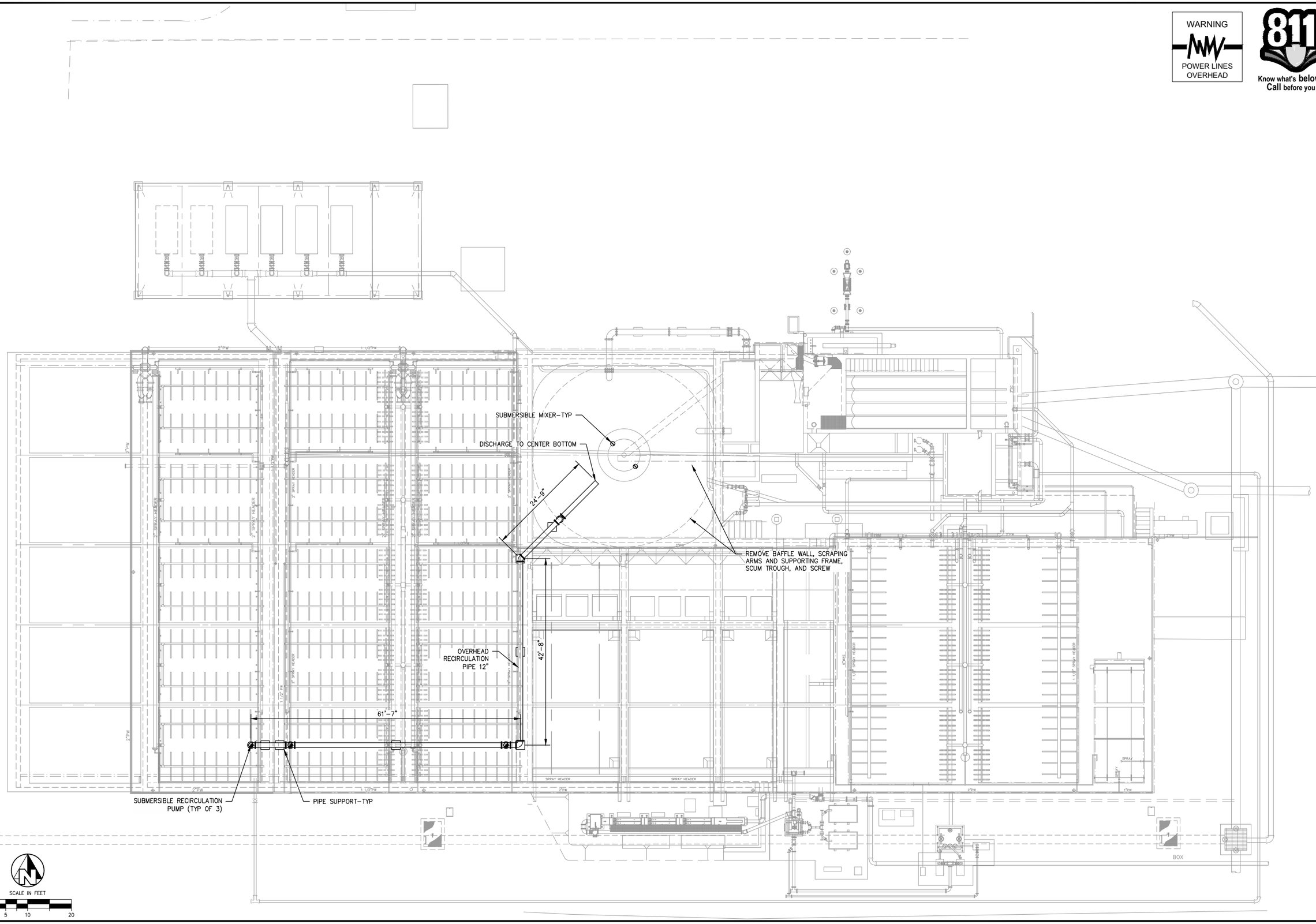

WARNING
POWER LINES OVERHEAD

811
Know what's **below.**
Call before you dig.

No.	REVISION	BY	DATE

WWTP UPGRADE PROJECT FOR RAS/WAS FLOWMETERS, DAF PUMP, AIR PIPING
MALAGA COUNTY WATER DISTRICT
FRESNO COUNTY, CA

EXHIBIT

WWTP SITE PLAN MODIFICATION

DESIGN ENGINEER: ZT
LICENSE NO: 68783
DRAFTED BY: PPI
CHECKED BY: MGT
DATE: 09-06-2016
JOB NO: 0105715002
PROJECT NO: 0105715002
PHASE: PHASE

0 1"
ORIGINAL SCALE SHOWN IS ONE INCH. ADJUST SCALE FOR REDUCED OR ENLARGED PLANS.

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4 Design Criteria

4.1 Water Supply

4.1.1 Surface Water Rights

Pending information from MCWD and FID regarding status of water rights.

4.1.2 Daily Demands

Pursuant to Title 22, Chapter 16 (California Waterworks Standards), Article 2 (Permit Requirements), Statute 64554(c): Community water systems using only groundwater shall have a minimum of two approved sources before being granted an initial permit. The system shall be capable of meeting MDD (Maximum Day Demand) with the highest capacity source off-line.

Maximum Day Demand for the years 2012 through 2020 are included in Section 3.1.3 of this report.

4.2 Water Storage

4.2.1 Daily Demands

Pursuant to Title 22, Chapter 16 (California Waterworks Standards), Article 2 (Permit Requirements), Statute 64554 (a): For systems with less than 1,000 connections, the system shall have storage capacity equal to or greater than MDD.The MDD of 2020 was 5.925 million gallons.

4.3 Water Distribution

4.3.1 Velocity

Velocity of water lines shall be less than 10 ft/s.

4.4 Wastewater Collection

4.4.1 Slope and Velocity

Velocity of new sanitary sewer shall be approximately (2) ft/s.

4.4.2 d/D

The peak flow d/D ratio shall be 0.5 for pipe sizes 12 inches in diameter and smaller. The peak flow d/D ratio can be 0.667 for pipe sizes 15 inches in diameter and larger.

4.4.3 Depth of Sewer

4.4.3.1 Minimum

The depth of sewer line shall be a minimum of five (5) ft in the middle of large commercial lots.

Sewer services shall be a minimum of 42 inches deep at the right of way.

4.4.3.2 Maximum

The maximum depth of sanitary sewer mains shall be fifteen (15) ft.

4.4.4 Lift Stations

4.4.4.1 Wet Well Storage

Minimum wet well diameter shall be eight (8) feet. Wet well storage shall be sufficient to allow for 10 pump starts per hour. Typical lift stations will be duplex. Typical pump capacity will be two times the inflow peak flow.

4.4.4.2 Discharge Capacity

Pipelines receiving the discharge from lift stations shall be of adequate diameter and slope to receive the larger discharge from the lift station pumps.

4.5 Wastewater Treatment

4.5.1 General

The treatment facilities were originally constructed in the 1960's. The technology available today is vastly different than what was available 60 years ago. In addition, the general design criteria for the original design are no longer appropriate for the existing conditions. A new facility is recommended and a Master Plan for the WWTF is recommended to determine the appropriate technology for the MCWD.

4.5.2 Nitrogen

The treatment facilities are required to make improvements to achieve an effluent nitrogen concentration of less than 10 mg/l as nitrogen. A preliminary plan of improvements to accomplish the nitrogen reduction is shown in Appendix H.

4.5.3 Electroconductivity

The MCWD has developed a Salinity Management Plan to identify sources of salinity and to develop methods to control and reduce salinity in the effluent from the WWTF.

4.6 Wastewater Disposal

The existing disposal method is through evaporation/percolation ponds.

Any modifications to the existing treatment or disposal facilities must be approved by the RWQCB. A Report of Waste Discharge must be prepared and submitted to the RWQCB for consideration.

4.6.1 Land Disposal

Land disposal improvements must be approved by the RWQCB. The existing land disposal facilities consist of evaporation/percolation ponds. A minimum percolation capacity of 1.5 inches per day is required for the existing ponds. New pond facilities would have a unique percolation capacity, depending on the soils characteristics of the site.

4.6.2 Discharge to the City of Fresno

Discharge of effluent to the City of Fresno has been discussed in the past. The MCWD has made the determination that discharge to the City of Fresno would not be pursued. The current construction of the High Speed Rail facilities would eliminate the potential to construct a pipeline along Central Avenue west to an existing City of Fresno sewer at Central and Cedar Avenues. If any connection between the two entities is contemplated in the future, the location of the connection would likely need to be further south.

4.6.3 Discharge to the SKF County Sanitation District

The SKF County Sanitation District is located south of the MCWD. It could be possible to form an agreement between the two entities to allow discharge of either raw sewage or treated effluent to the SKF system. This alternative has not been discussed between the two entities.

4.6.4 Surface Water Discharge

Surface water discharge of effluent would require the issuance of an NPDES Permit. Specific treatment and monitoring requirements are required for surface water discharge. Surface water discharge would require an agreement with the Fresno Irrigation District similar to the agreement that existed for the previous NPDES Permit for discharge to the Central Canal.

4.6.5 Reclamation

The District is required to investigate the possibility of utilizing treated effluent for reclamation or recycle purposes. No opportunities for reclamation or recycle have been identified to date. Reclamation of wastewater shall be in compliance with the State Water Board Water Reclamation Requirements for Recycled Water Use (Order WQ 2016-0068-DDW) and California Code of Regulations Regarding Recycled Water Titles 17 and 22.

5 Water System Alternatives

5.1 Water Supply

5.1.1 Well Locations

Near Term

The MCWD has investigated two locations for new wells. The locations for the proposed wells are at Well 3 and Well 5.

Well 3A has been designed to the 90 percent level. A plan view of the proposed well is included as Figure 5-1.

Well 5A has been conceptually sited and is shown in Figure 5-2.

Future water supply wells will be required as new demand is added to the system. It is anticipated that a new well will be required for each 960 acres of commercial/industrial property developed if development demand is 1,500 gallons per acre per day. Actual development demand and maximum day demands may require well construction on a different schedule. The status of water demand and well capacity should be reviewed annually.

It is noted that several proposed developments have approached the MCWD for water service commitments. The MCWD is not able to provide the water service commitment to the proposed developments until a new water supply well is constructed and placed into service.

5.2 Water Storage

5.2.1 Tank Locations

Near Term

A 1 MG water storage tank has been conceptually described at the Well 3 site (refer to Figure 5-1.

Future

It is recommended that the MCWD have storage in the amount of maximum day demand, which would be approximately 6.0 MG. Additional potential water storage tank

locations are shown in Figure 5-3. It is noted that two of the locations identified for future tanks require acquisition of property. It is recommended that discussions with property owners begin immediately to determine if the property may be acquired. Tanks would generally be 24 or 32 feet tall and would include booster pumps. Typical operation would be to operate the water supply wells at night during periods of non-peak electrical rates. The full tanks could then deliver water to the system for most of the day with smaller horsepower booster pumps, thereby saving energy costs.

5.3 Water Distribution

5.3.1 Backbone Distribution System

Near Term

Near term water distribution system improvements include elimination of dead end water mains in three locations.

The recommended water main improvements at the southwest portion of the MCWD are shown in Figure 5-4. This improvement would eliminate the dead ends in Maple Avenue and Chestnut Avenue.

The recommended water main improvements in Willow Avenue would extend south in Willow Avenue and connect to the water main on the west side of Golden State Boulevard. The improvements are shown in Figure 5-5.

The recommended water main improvements at the northeast portion of the MCWD are shown in Figure 5-6. These improvements would eliminate the dead end in Minnewawa Avenue and tie to Peach Avenue.

The overall backbone distribution system for the existing Sphere of Influence and the initial expansion is shown in Figure 5-7.

Future

Water mains are required along the primary travel routes and may be required within individual developments, depending of the specific development configuration.

Well sites and Tank sites are to be required to be dedicated to the District for the three (3) known proposed annexations. In addition, future expansion of the Sphere of Influence will require new well and tank sites offered to the MCWD.

A conceptual layout of ultimate water system facilities is included in Figure 5-8, Figure 5-9, Figure 5-10, and Figure 5-11. These figures depict the anticipated water system improvements that would be required to serve the sequential expansion of the District. The anticipated sequential expansion of the District is also described in Section 6 of this

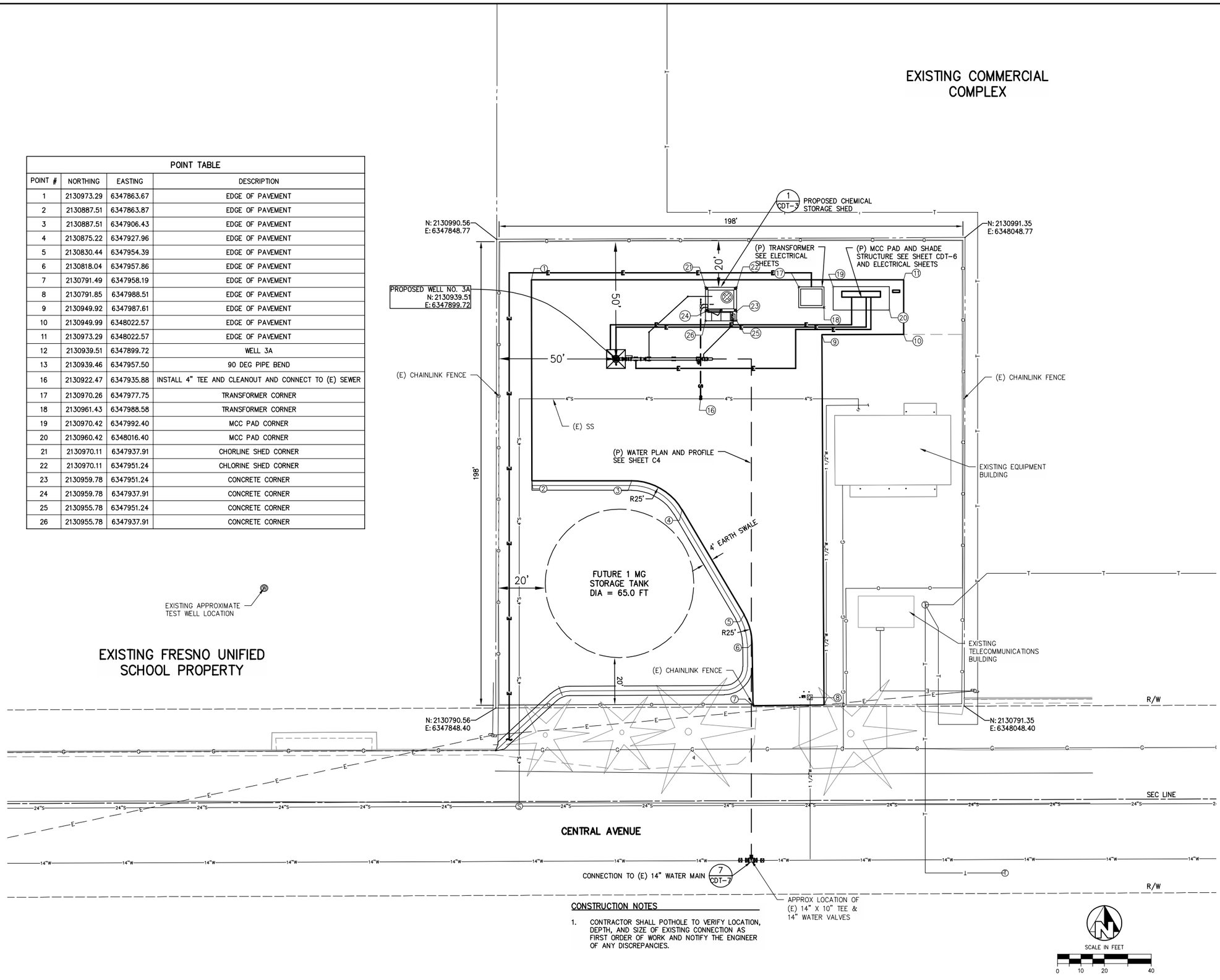
report. Due to limitations of treated effluent disposal sites, the sequential expansion of the District is somewhat tied to the ability to expand the wastewater collection, treatment, and disposal facilities.

5.4 Surface Water Recharge

The MCWD is participating with the FMFCD on a project that would allow delivery of surface water owned by the MCWD to Basin CF for the purposes of recharge. This project is associated with SGMA regulations for the purpose of achieving sustainable groundwater levels.

The conceptual layout of the improvements is shown in Appendix G.

POINT TABLE			
POINT #	NORTHING	EASTING	DESCRIPTION
1	2130973.29	6347863.67	EDGE OF PAVEMENT
2	2130887.51	6347863.87	EDGE OF PAVEMENT
3	2130887.51	6347906.43	EDGE OF PAVEMENT
4	2130875.22	6347927.96	EDGE OF PAVEMENT
5	2130830.44	6347954.39	EDGE OF PAVEMENT
6	2130818.04	6347957.86	EDGE OF PAVEMENT
7	2130791.49	6347958.19	EDGE OF PAVEMENT
8	2130791.85	6347988.51	EDGE OF PAVEMENT
9	2130949.92	6347987.61	EDGE OF PAVEMENT
10	2130949.99	6348022.57	EDGE OF PAVEMENT
11	2130973.29	6348022.57	EDGE OF PAVEMENT
12	2130939.51	6347899.72	WELL 3A
13	2130939.46	6347957.50	90 DEG PIPE BEND
16	2130922.47	6347935.88	INSTALL 4" TEE AND CLEANOUT AND CONNECT TO (E) SEWER
17	2130970.26	6347977.75	TRANSFORMER CORNER
18	2130961.43	6347988.58	TRANSFORMER CORNER
19	2130970.42	6347992.40	MCC PAD CORNER
20	2130960.42	6348016.40	MCC PAD CORNER
21	2130970.11	6347937.91	CHORLINE SHED CORNER
22	2130970.11	6347951.24	CHLORINE SHED CORNER
23	2130959.78	6347951.24	CONCRETE CORNER
24	2130959.78	6347937.91	CONCRETE CORNER
25	2130955.78	6347951.24	CONCRETE CORNER
26	2130955.78	6347937.91	CONCRETE CORNER



CONSTRUCTION NOTES

1. CONTRACTOR SHALL POTHOLE TO VERIFY LOCATION, DEPTH, AND SIZE OF EXISTING CONNECTION AS FIRST ORDER OF WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.

FIGURE 5-1

WARNING
POWER LINES OVERHEAD

811 Know what's below. Call before you dig.

PRELIMINARY
NOT FOR CONSTRUCTION
2/23/21

No.	REVISION	BY	DATE

REGISTERED PROFESSIONAL ENGINEER SCOTT T. SCHALLER STATE OF CALIFORNIA
FOR REVIEW ONLY
DATE SIGNED:

WELL NO. 3A IMPROVEMENTS PROJECT
MALAGA COUNTY WATER DISTRICT
FRESNO COUNTY
CIVIL

PROPOSED SITE PLAN

PROVOST & PRITCHARD CONSULTING GROUP
EST. 1988
An Employee Owned Company
286 WEST CROMWELL AVENUE
FRESNO, CALIFORNIA 93711-6162
559/449-2700 FAX 559/449-2715
www.ppeng.com

DESIGN ENGINEER: STS	
LICENSE NO: C54634	
DRAFTED BY: ELV	CHECKED BY: MGT
DATE: 02/22/2021	
JOB NO: 139919006	
PROJECT NO:	
PHASE:	

0 1"
ORIGINAL SCALE SHOWN IS ONE INCH. ADJUST SCALE FOR REDUCED OR ENLARGED PLANS.

SHEET C2

9 OF 28

2/23/2021 5:00 PM G:\Tulare_County of-1399\139919006-P07 Malaga CWD\DWG\340 Sheet Sets\02_Plans_Maps\C2 PROPOSED SITE PLAN.dwg -Liz Varner

0 25 50 Feet

Proposed Production Well To Be At Least 50' From Test Hole Location

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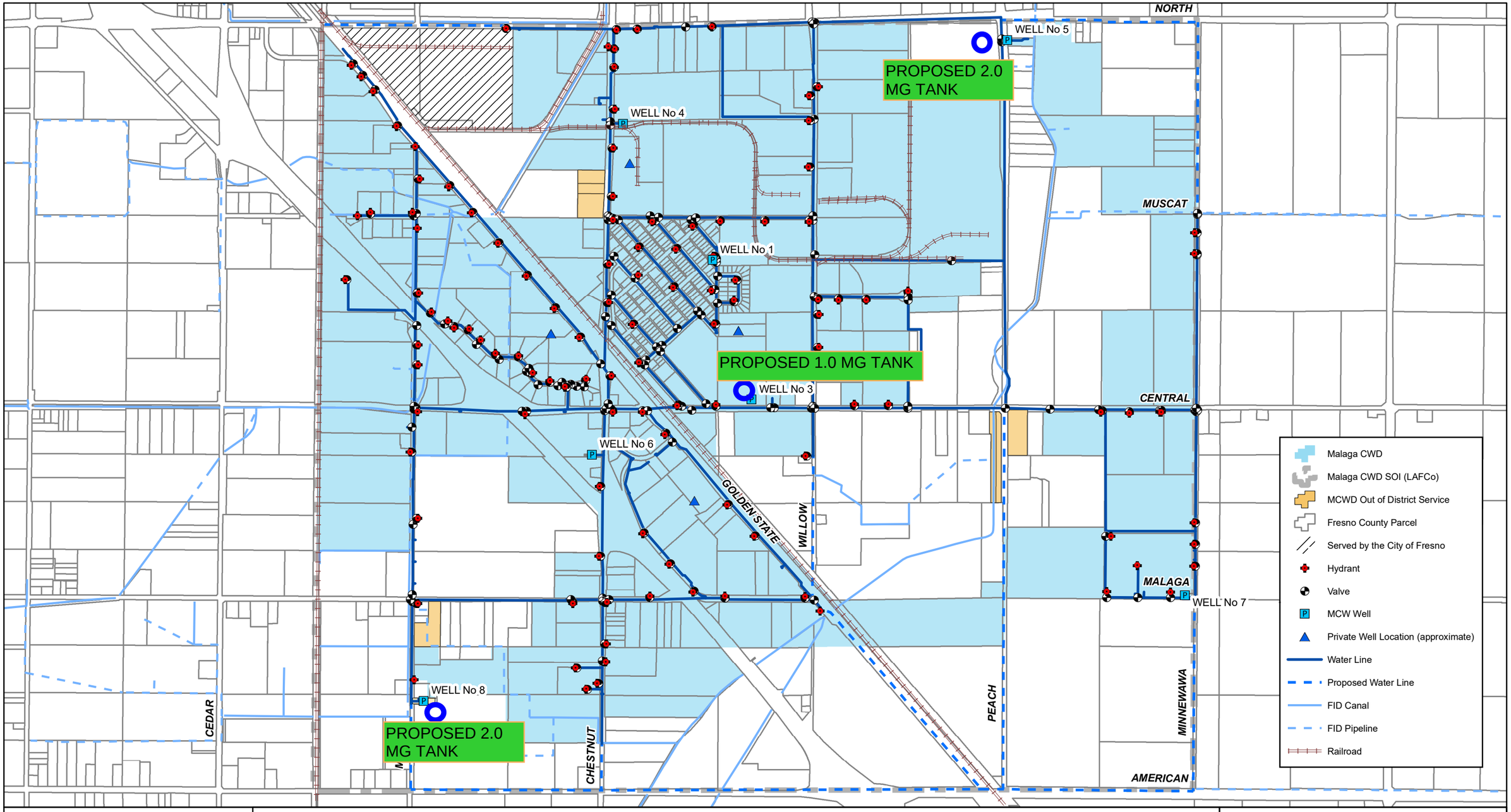
CONSULTING GROUP
An Employee Owned Company

286 W. Cromwell Ave.
Fresno, CA 93711-6162
(559) 449-2700

Malaga County Water District
Capital Improvement Plan
Water Department

FIGURE 5-2

5/30/2019 : G:\Malaga CWD - 1057\1057OG01_Ongoing\GIS\2018 Projects\Map\Well 5.mxd



0 660 1,320 Feet

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Fresno, CA 93711-6162
(559) 449-2700

MALAGA COUNTY WATER DISTRICT

EXISTING WATER FACILITIES
JULY 2016

FIGURE 5-3

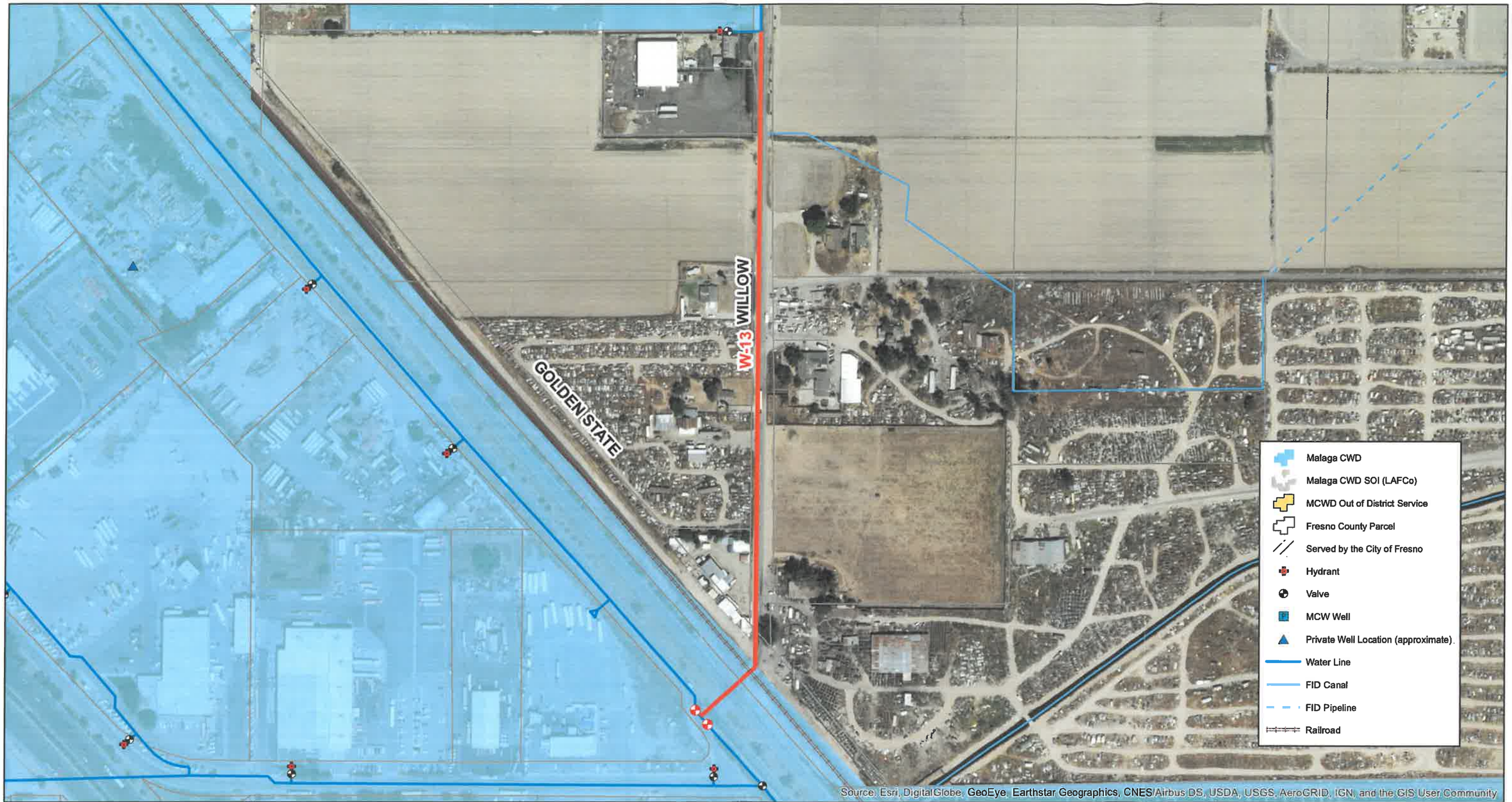
0 100 200 Feet

PROVOST & PRITCHARD CONSULTING GROUP
An Employee Owned Company
286 W. Cromwell Ave.
Fresno, CA 93711-6162
(559) 449-2700

Malaga County Water District
Capital Improvement Plan
Water Department

FIGURE 5-4

1/2/2019 : G:\Malaga CWD - 1057\1057OG01_Ongoing\GIS\2018 Projects\Map\Alignment W-12.mxd



0 125 250 Feet

N

EST 1958
PROVOST& PRITCHARD
CONSULTING GROUP
An Employee Owned Company

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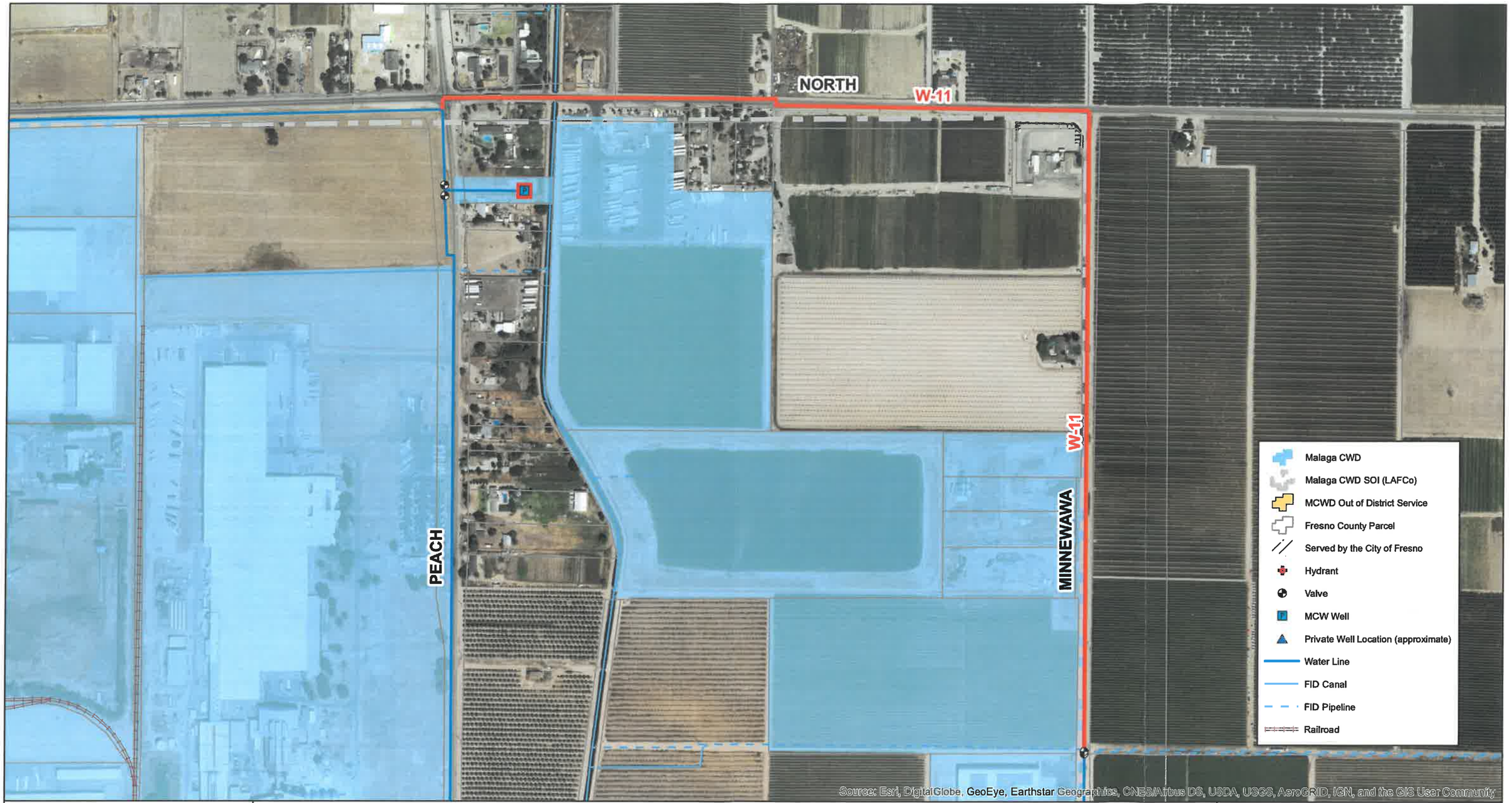
Fresno, CA 93711-6162
(559) 449-2700

Malaga County Water District
Capital Improvement Plan
Water Department

FIGURE 5-5

1/2/2019 : G:\Malaga CWD - 1057\1057OG01_Ongoing\GIS\2018 Projects\Map\Alignment W-13.mxd



0 200 400 Feet

EST 1988
PROVOST& PRITCHARD
CONSULTING GROUP
An Employee Owned Company

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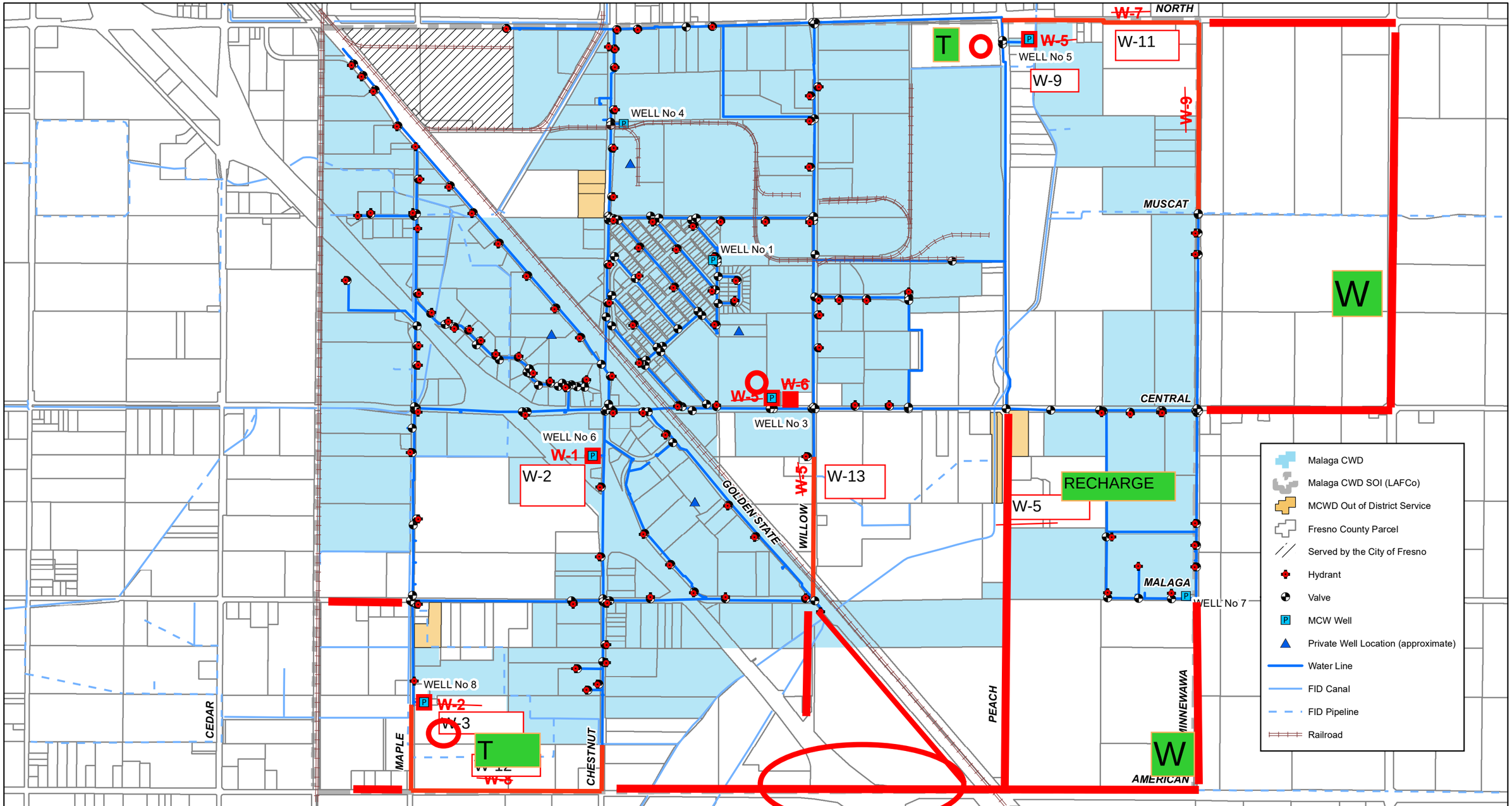
Fresno, CA 93711-6162
(559) 449-2700

Malaga County Water District
Capital Improvement Plan
Water Department

FIGURE 5-6

1/2/2019 : G:\Malaga CWD - 1057\1057OG01_Ongoing\GIS\2018 Projects\Map\Alignment W-11.mxd



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Fresno, CA 93711-6162
(559) 449-2700

CALTRANS COORDINATION REQUIRED

Legend

- Location of Proposed Well Improvements
- Location of Proposed Water Main

Malaga County Water District
Capital Improvement Plan
Water Department

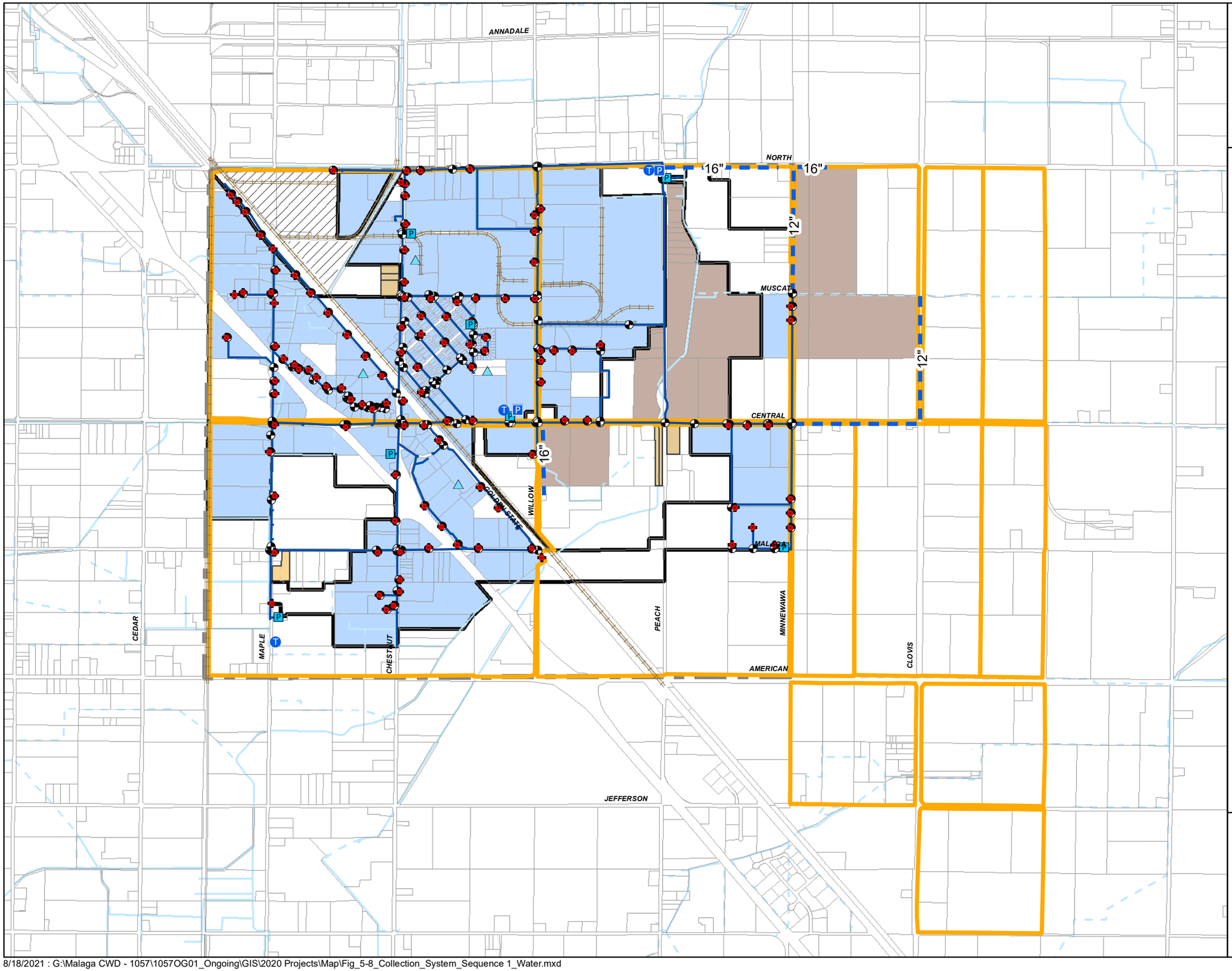
FIGURE 5-7

12/13/2018 : G:\Malaga CWD - 1057\1057OG01_Ongoing\GIS\2018 Projects\Map\Water_Improvements.mxd

Figure 5-8 Malaga CWD

Water System Facilities
Sequence 1

June 2021



- Proposed Tank
- Proposed Well
- Existing MCW Well
- Existing Private Well
- Hydrant
- Valve
- Proposed Water Line
- Existing Water Line
- FID Canal
- FID Pipeline
- Phase Area
- Malaga CWD
- Malaga CWD SOI (LAFCo)
- Proposed Annexations
- Existing Service Area
- MCWD Out of District Service
- Served by the City of Fresno
- Railroad

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N

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Miles

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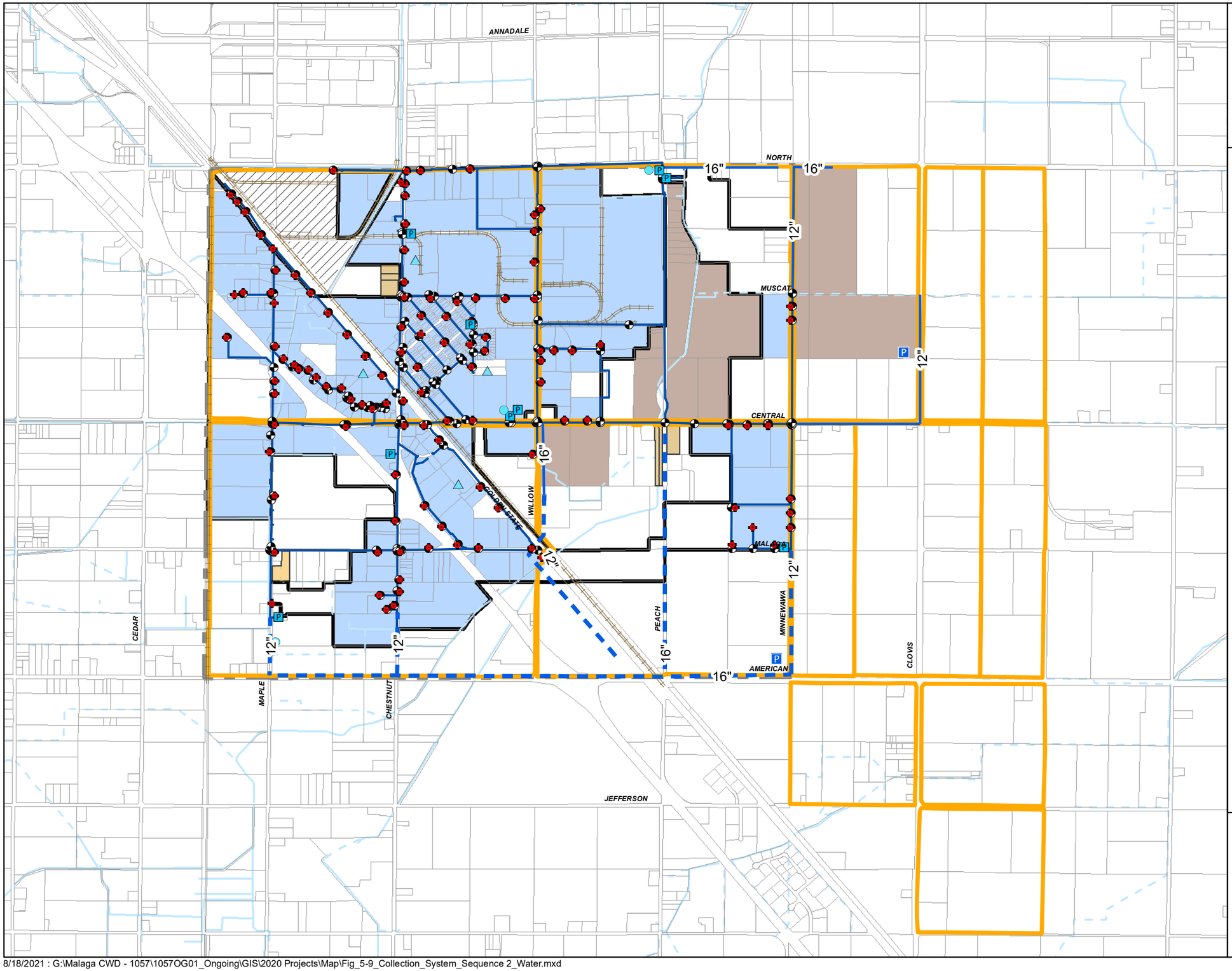
Figure 5-9 Malaga CWD

Water System Facilities
Sequence 2

June 2021



- Proposed Well
- Existing Tank
- Existing MCW Well
- Existing Private Well
- Hydrant
- Valve
- Proposed Water Line
- Existing Water Line
- FID Canal
- FID Pipeline
- Phase Area
- Malaga CWD
- Malaga CWD SOI (LAFCo)
- Proposed Annexations
- Existing Service Area
- MCWD Out of District Service
- Served by the City of Fresno
- Railroad

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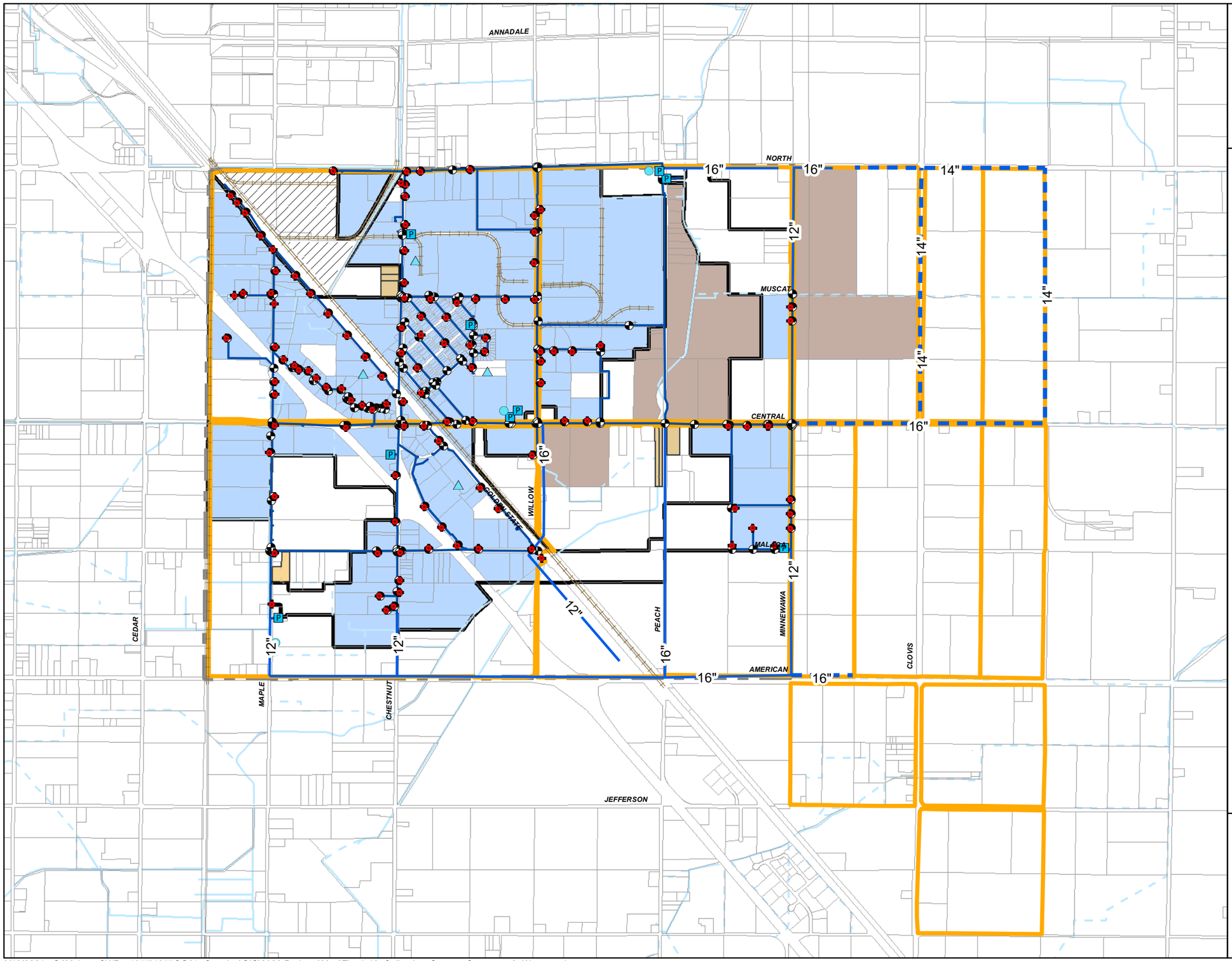
Figure 5-10 Malaga CWD

Water System Facilities
Sequence 3

June 2021



- Existing Tank
- Existing MCW Well
- Existing Private Well
- Hydrant
- Valve
- Proposed Water Line
- Existing Water Line
- FID Canal
- FID Pipeline
- Phase Area
- Malaga CWD
- Malaga CWD SOI (LAFCo)
- Proposed Annexations
- Existing Service Area
- MCWD Out of District Service
- Served by the City of Fresno
- Railroad

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PROVOST& PRITCHARD
CONSULTING GROUP
An Employee Owned Company

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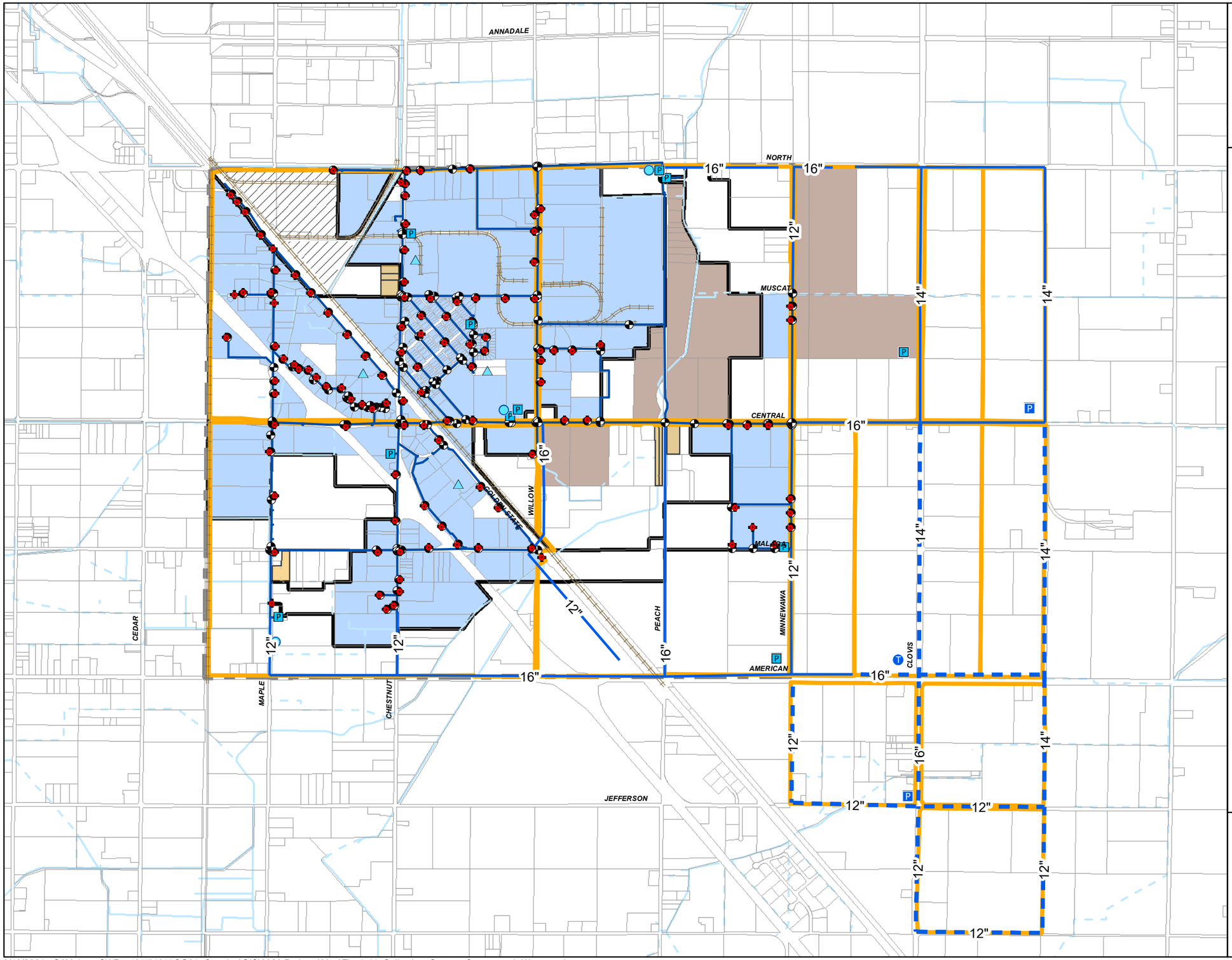
Figure 5-11 Malaga CWD

Water System Facilities
Sequence 4

June 2021



- Proposed Tank
- Proposed Well
- Existing Tank
- Existing MCW Well
- Existing Private Well
- Hydrant
- Valve
- Proposed Water Line
- Existing Water Line
- FID Canal
- FID Pipeline
- Phase Area
- Malaga CWD
- Malaga CWD SOI (LAFCo)
- Proposed Annexations
- Existing Service Area
- MCWD Out of District Service
- Served by the City of Fresno
- Railroad

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CONSULTING GROUP
An Employee Owned Company

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Miles

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6 Wastewater System Alternatives

6.1 Wastewater Treatment

The treatment facilities were originally constructed in the 1960's. The technology available today is vastly different than what was available 60 years ago. The facility has already experienced several physical failures due to deterioration, settlement, leaks, and an inability to replace or fix components in the structure. The physical facilities are beyond their useful life. The hydraulic profile of the flow streams is not conducive to routing of the flow streams required to satisfy the operational requirements of the facilities. In addition, the general design criteria for the original design are no longer appropriate for the existing conditions. The hydraulic capacity of the existing treatment facilities is 1.2 mgd, the disposal capacity is 0.85 mgd. The average flows received at the treatment and disposal facilities in 2020 was 0.633 mgd.

Near term improvements are required to enhance operational capabilities and to provide improvements to satisfy new regulatory requirements.

- **Modify the existing Dissolved Air Flotation (DAF) Clarifier to an Anoxic Basin**
    - *The improvements consist of removing some of the components in the DAF tank (baffles, scum scrapers, sludge scrapers) and adding submersible mixers to the DAF tank. Recirculating pumps and discharge piping would be installed in the aeration tanks to pump mixed liquor to the new Anoxic Tank. Raw influent would be discharged to the Anoxic Tank and combined with the recirculated mixed liquor. The improvements will result in a reduction of total effluent nitrogen to conform with current regulatory requirements.*
- **Install RAS/WAS Control System**
    - *The improvements consist of the addition of flowmeters and additional valves to control and monitor the recirculated sludge and waste sludge at the WWTP so that specific operations control may be accomplished.*
- **Reconfigure Blowers**
    - *The improvements consist primarily of aeration piping modifications to allow the operations staff to limit the amount of air that is distributed to the aeration basins.*

- **Digesters 1 and 2 Overflow Control**
    - *The improvements consist of coring between the two aerated digesters to allow for a passive overflow from the west digester to the east digester. The east digester has a passive overflow to the sludge thickener.*
- **Remove Pond Embankment between Pond No. 1 and Pond No. 2**
    - *Removal of the embankment between Pond No. 1 and Pond No. 2 will allow for reliable utilization of Pond No. 1. The existing effluent distribution piping system requires splitting the effluent flow to a separate distribution box for discharge to Pond No. 1. Removal of the embankment will allow all of the effluent to be directed through one pipeline and will result in an increase of approximately 0.08 acres of disposal pond area.*

The existing sphere of influence boundary may add approximately 1092.81 acres of commercial/industrial property to the present system. If a demand of 1,500 gallons per acre per day is assigned to the property, this would add a wastewater generation of approximately 1,639,200 gallons per day.

Applying the same load factor to the remaining phases of expansion as defined in Section 2 of this report, the following values are generated.

Phase	Undeveloped Acres (Ac)	Wastewater Generation (gpd)
Phase 1A	339.5	509,250
Phase 1B	5.8	8,700
Phase 1C	266.6	399,900
Phase 1D	480.9	721,350
Phase 2	312.1	468,150
Phase 3	131.1	196,650
Phase 4	155.2	232,800
Phase 5	155.5	233,250
Phase 6	298.4	447,600
Phase 7	156.3	234,450
Phase 8	150.8	226,200
Phase 9	147.8	221,700
Phase 10	153.2	229,800
Phases 1A through 1D		1,639,200
Phases 1A through 2		2,107,350
Phases 3 through 10		2,022,250
All Phases		4,129,800

6.1.1 Nitrogen Reduction

The waste discharge requirements and CV-SALTS regulations require that the facilities achieve effluent nitrogen concentrations less than 10 mg/l as Nitrogen. A conceptual plan to reduce effluent nitrogen has been defined and is included as **Error! Reference source not found.**.

It is recommended that the improvements to convert the DAF to an anoxic tank, in addition to air piping modifications and sludge flow meters are constructed in the immediate future. The work would require a Report of Waste Discharge to be submitted to the RWQCB for approval prior to initiating work.

These improvements would allow to the facilities to achieve regulatory compliance in the near term. However, the overall treatment facilities do not have long term viability due to deterioration (pipelines and concrete), mechanical inefficiencies, and facilities not suited to actual sanitary sewer characterization received at the headworks.

6.1.2 Separate Master Plan

A new facility is recommended and a Master Plan for the existing WWTF is recommended to determine the appropriate technology for the MCWD.

A brief outline of the recommended Master Plan topics is included below:

1. Mandatory Compliance
    a. Local Limits Study
    b. Pollution prevention Plan
    c. Salinity Minimization Plan
    d. Nitrogen reduction
        i. Air piping plan
    e. Sludge wasting control
        i. Digester flow meters
2. Review existing and anticipated Waste Discharge Requirements
3. Review estimated disposal capacity requirements
4. Summarize criteria
    a. Capacity
    b. Location
    c. Performance
    d. Life cycle costs
    e. Aesthetics
    f. Other
5. Summarize potential treatment alternatives
    a. Oxidation ditch

   b. SBR
   c. MBR
   d. Biolac or Bioworks system
   e. Combination of treatment alternatives
   f. Satellite plant for boiler and cooling tower blowdown treatment
6. Define selection criteria for a recommended treatment alternative
   a. Capital cost
   b. Operation cost
   c. Incremental expandability
   d. Overall footprint
7. Recommend a treatment alternative
8. Prepare an incremental construction layout and flow diagram for the treatment alternative
   a. Flow streams using existing and proposed treatment alternative
   b. Phaseout of existing WWTF
   c. Existing facility operational until new system operational
   d. Describe anticipated phases of construction and capital cost
9. Summarize disposal alternatives
   a. Ponds
   b. Recycle (cooling tower supplement)
   c. Reclamation (irrigation school/park)
   d. FID discharge
   e. Groundwater recharge
10. Describe anticipated phases of construction and capital cost

6.1.3 Satellite WWTF east of State Route 99

It may be appropriate to construct a WWTF south of Central Avenue between Peach and Minnewawa Avenues. There are several benefits to a second WWTF:

- *Overloaded sewer mains identified in Chapter 3 will receive reduced flows*
- *A new WWTF may be constructed in increments as capacity is needed, thereby keeping construction costs more appropriate to the actual flows received*
- *Disposal facilities are limited on the west side of State Route 99*
- *Potential recycling opportunities such as landscaping of the Malaga Park, Malaga School, Konkel School, and Vitro Plate Glass property may be more readily investigated and defined. A primary issue to overcome would be to cross State Route 99 with a recycled water pipeline if the treatment facilities are only located west of State Route 99.*

- *The waste sludge from the satellite plant could be discharged to the sewer for final processing at the existing WWTF near Central and Maple, if needed.*

It is recommended that the MCWD attempt to acquire approximately 120 acres of property east of State Route 99 and south of Central and near Peach or Minnewawa for the purposes of a satellite WWTP and evaporation/percolation ponds. Development of the proposed ultimate sphere of influence will require the acquisition of approximately 40 additional acres of property for effluent disposal.

6.1.4 Pretreatment alternatives

6.1.4.1 Boiler Blowdown

A significant portion of the wastewater received at the WWTP consists of boiler blowdown water from Vitro Plate Glass and from Rio Bravo Power Generation Facility. The boiler blowdown water is relatively free of organic waste, however, it contains a high concentration of total dissolved solids and electroconductivity. It is proposed that a planning grant is requested to evaluate treatment technologies that would be applied to the boiler blowdown waste and allow for a significant portion of the waste to be recycled at the two industrial facilities. A treatment and disposal plan would have to be defined for the waste stream of the pretreatment facilities (reverse osmosis or Voltea). It may be possible to evaporate the waste stream from the pretreatment facilities using waste heat from the Vitro Plate Glass facilities.

If a significant portion of the boiler blowdown waste could be recycled, several benefits may be realized:

- *The total flow received at the WWTP would be reduced*
- *The total electroconductivity mass loading to the WWTP would be reduced*
- *The total flow requiring treatment and disposal at the WWTP would be reduced*
- *The organic loading concentration of the influent to the WWTP would increase, which would improve the treatment performance at the WWTP*
- *The overall potable water pumped by the Malaga wells would be reduced*

Several adverse impacts may require resolution:

- *The rate structure for water supply and wastewater would need to be revised to account for the recycling aspect as there would be reduced potable water demand and reduced impact to the existing wastewater treatment facilities.*

- *Compensation to Vitro Plate Glass may be appropriate if the pretreatment facilities are located at the Vitro Plate Glass site and if waste heat from the facility can be used to evaporate the pretreatment waste stream.*

6.2 Wastewater Collection

6.2.1 Drainage Areas

The drainage areas for the Residential Sewer Line and the Industrial Sewer Line are shown in Figure 6-1. The potential expansion of the drainage areas for both sanitary sewer lines is also shown in Figure 6-1. The potential expansion of a new drainage area (shown as Line C) is also shown in Figure 6-1.

6.2.2 Limitations

The wastewater collection system is limited by the existing sewer line crossings of State Route 99 (Central Ave., Chestnut Ave.). Future crossings of State Route 99 are limited to American Avenue. Preliminary master planning information provided by CalTrans for an American Avenue interchange is included in Appendix E. Coordinating a sewer line crossing of State Route 99 at American Avenue will require significant effort. The limited disposal capacity west of State Route 99 does not support a new sanitary sewer main crossing at American Avenue.

Extending sanitary sewer lines east may require lift stations to be included in the collection system to allow the sewer line to be deep enough to serve the new properties.

As discussed previously in this report, existing sewer lines were designed with the intent to serve the existing Sphere of Influence. Including new service areas will create an overloaded (d/D) condition for the existing sewer mains.

6.2.3 Sewer Collection Mains

Near Term (Sequence 1)

The first sequence of development is expected to serve the three identified proposed annexations to the District.

The expansion would include extending a 10 inch sewer main in Willow Avenue south from Central Avenue to Golden State Boulevard. The expansion would also include extending a 12 inch sewer main in Peach Avenue from Central Avenue to North Avenue and a 10 inch sewer main in Minnewawa Avenue to North Avenue. Sewer main construction in North Avenue would be 10 inch sewers. The recommended sewer main improvement is shown in Figure 6-2.

The Second Sequence of development would include the extension of sewer mains at several locations to complete the trunk lines within the existing Sphere of Influence.

Extend the 15 inch sewer main in Maple Avenue from Kinder Morgan to Malaga Avenue.

The proposed project will include a connection into the existing sewer main in Maple Avenue with a proposed 15-inch sewer extension. The design Includes approximately 3300 LF of 15-inch PVC sewer main with ten (10), 4-ft diameter manholes and an FID open- cut canal crossing. The design was completed and is represented in the Construction of Water and Sewer Improvements – 1995 plans. The design would require updating to address present conditions and regulatory requirements.

Extend a 12 inch sewer main in Maple Avenue from Malaga Avenue to American Avenue.

The proposed project will be the connection to the proposed 15-Inch Sewer main (S-1) at Malaga Ave along Maple Ave and extending a 12 inch sewer south to American Ave. The design would Include approximately ½ Mile of 15-inch sewer main extension with an estimated six (6), 4-ft diameter manholes (500-ft spacing). The extension may require a sewer lift station if the 0.004 ft/ft slope is maintained in the line with a 3.5-ft minimum coverage in the roadway. Installation of the sewer main is assumed to be in the Fresno County road ROW. Several commercial facilities located along the east side of Maple Ave. south of Malaga Ave. are served by the Malaga CWD water system and utilize on-site sanitary sewer facilities. The sewer project would allow those sites to eliminate the on-site sanitary sewer systems and connect to the community collection system.

Extend a 12 inch sewer main in Malaga Avenue from Maple to Chestnut, then south in Chestnut to American Avenue.

The proposed project includes the extension of the proposed 12 inch sewer along Malaga Ave. to Chestnut Ave. The existing sewer line in Malaga Avenue near Chestnut Avenu is shallow. The existing 6 inch sewer line in Chestnut Avenue south of Malaga Avenue is also shallow. Extension of the gravity sewer line will allow for service of the area without the requirement for a lift station.

Extend a 24 inch sewer main in Peach Avenue from Central Avenue to American Avenue and a 12 inch sewer main in Minnewawa Avenue from the Malaga Avenue alignment to American Avenue. A 24 inch sewer main would be constructed in American Avenue from Minnewawa to Peach Avenue. In addition, a 10 inch sewer main would be constructed in American Avenue between State Route 99 and Peach Avenue. Finally, a 10 inch sewer main would be constructed along Golden State Boulevard between Willow Avenue and American Avenue.

The recommended sewer main improvement is shown in Figure 6-3.

The Third Sequence of expansion would include extending an 18 inch sewer main in Central Avenue from Minnewawa Avenue to Clovis Avenue, and a 15 inch sewer main in Central Avenue to Sunnyside Avenue. A 12 inch sewer main would be constructed north in Clovis Avenue from Central Avenue to North Avenue. Similarly, a 12 inch sewer main would be constructed in Sunnyside Avenue north from Central Avenue to North Avenue. This sequence of development would include construction of 10 inch sewer mains in North Avenue between Clovis Avenue and Sunnyside Avenue. This sequence of development would also include construction of a 21 inch sewer main in American Avenue from Minnewawa Avenue west ¼ mile. The recommended sewer main improvement is shown in Figure 6-4.

The Fourth Sequence of expansion would include extension of the 21 inch sewer main in American Avenue east to Clovis Avenue, then extending east with a 12 inch sewer main to Sunnyside Avenue. This sequence of development would include a 15 inch sewer main in Clovis Avenue north from American Avenue to Central Avenue, a 12 inch sewer main in Sunnyside Avenue north from American Avenue to Central Avenue. The expansion would include 12 inc h sewer mains in Minnewawa Avenue, Clovis Avenue, and Sunnyside Avenue south from American Avenue to Jefferson Avenue, and 10 inch sewer mains in Jefferson Avenue between Minnewawa Avenue and Sunnyside Avenue. Finally the expansion would include 10 inch sewer mains in Clovis Avenue and Sunnyside Avenue from Lincoln Avenue to Jefferson Avenue, and a 10 inch sewer main in Lincoln Avenue between Sunnyside Avenue and Clovis Avenue.

A conceptual layout of ultimate wastewater system facilities is included as Figure 6-5.

6.3 Wastewater Disposal

6.3.1 Limiting Factor

Wastewater disposal is the critical limiting factor for additional development of the MCWD. The existing disposal capacity is 0.85 mgd. The potential sanitary sewer generation in the ultimate sphere of influence could be 4.1298 mgd if a demand of 1,500 gallons per acre per day is realized. The potential sanitary sewer demand could be much greater if development generates a greater per acre flowrate. The ultimate sphere of influence area cannot be supported by existing facilities.

The District has determined to remove a pond embankment that separates Disposal Ponds 1 and 2. The removal of the embankment will improve operation of the disposal ponds due to the configuration of the effluent pipelines from the WWTF. Removal of the embankment will result in a slight increase to the overall disposal capacity of the site.

6.3.2 Alternatives

6.3.2.1 Additional Land Disposal

A land disposal alternative would expand on the existing disposal method. This alternative would require the purchase of additional property, construction of pipelines from treatment facilities to the site, and improvements at the new site that would include fencing, pond construction and groundwater monitoring wells.

The MCWD had purchased property at the northwest corner of Maple and Malaga Avenues for the purpose of constructing additional percolation/evaporation ponds. The MCWD has subsequently sold the property and does not presently have property available for expansion of the land disposal alternative.

Near Term

The First Sequence of development would be the properties identified in the proposed annexations. The wastewater would be conveyed through the existing sanitary sewer pipelines in Central Avenue to the existing WWTF. A new pipeline would be constructed (approximately 1 mile) from the existing WWTF south in Maple Avenue to a property to be acquired for the purpose of wastewater disposal. This First Sequence of development would include the construction of a sanitary sewer pipeline in Willow Avenue along the frontage of the DDG annexation north to Central Avenue, the construction of a sanitary sewer pipeline in Peach Avenue south from North Avenue to

Central Avenue, and a sanitary sewer pipeline in Minnewawa Avenue south from North Avenue to the Muscat Avenue alignment.

It is presumed that the proposed annexations will be the next areas to develop in the MCWD. The proposed annexations total 372.15 acres, which would generate a wastewater flowrate of 558,225 gallons per day. The average flowrate for the year 2020 was 633,000 gallons per day. The total flowrate, with the addition of the proposed annexations is therefore 1,191,225 gallons per day. For the purposes of this report a value of 1.2 mgd will be used. This flowrate can be accommodated by the treatment facilities with several modifications. The estimated disposal pond area required for 1.2 mgd of effluent is approximately 12.06 acres. The total land area required is approximately 18.7 acres. For the purposes of this report an area of approximately 20 acres is required. There are a couple of vacant properties near the intersection of American Avenue and Maple Avenue that are approximately 20 acres. An effluent disposal pipeline would be required to be constructed from the existing wastewater treatment facilities to the new disposal ponds. A lift station would also be required to discharge the effluent into the actual ponds. The additional property would require chain link fencing.

As noted above, the existing collection system does not have the capacity to serve the remaining area within the existing Sphere of Influence and the additional area described as the Assemi Annexation. In addition, the disposal capacity west of State Route 99 is not sufficient for the existing Sphere of Influence, even with the acquisition of the recommended additional 20 acres for disposal ponds.

The Second Sequence of development would include the construction of a new wastewater treatment and disposal facility approximately ½ mile south of Central Avenue east of Peach Avenue. The Second Sequence of development would include the construction of a sanitary sewer pipeline in Peach Avenue south from Central Avenue to the new WWTF. The work would include constructing a plug in the existing manhole at the intersection of Central Avenue and Peach Avenue, which would serve to divert all sanitary sewer flows that would be generated east or north of that intersection to the south toward the new WWTF. Approximately 55 acres would be required for the disposal ponds and approximately 5 acres would be required for the treatment facilities. The site would also need to be master planned for the ultimate expansion requirements.

It is recommended that the MCWD acquire approximately 80 acres east of Peach Avenue approximately ½ mile south of Central Avenue. A new wastewater treatment and disposal facility would be required in this general vicinity in order to be able to serve properties within the existing Sphere of Influence.

Third Sequence of development would include development of remaining property in Phase 2, and Phases 3, 4, and 5. Similar to the treatment improvements for the Second Sequence of development, treatment facilities could be constructed in increments that ultimately add up to the final capacity. The demand generated from the Third Sequence of development is estimated to be 1,310,000 gallons per day. Required

disposal pond wet area is estimated to be 41.56 acres, which would require approximately 50 acres of property. An additional 2 acres of property is estimated to be required for the additional treatment facilities. The total property required east of State Route 99 through the Third Sequence of development would be approximately 112 acres. An additional 40 acres or property would need to be acquired to accommodated the Third Sequence of development.

The Fourth Sequence of development would include development of property in Phases 6 through 10 of the ultimate Sphere of Influence. Similar to the treatment improvements for the Third Sequence of development, treatment facilities could be constructed in increments that ultimately add up to the final capacity. The demand generated from the Fourth Sequence of development is estimated to be 1,360,000 gallons per day. Required disposal pond wet area is estimated to be 43.14 acres, which would require approximately 52 acres of property. An additional 2 acres of property is estimated to be required for the additional treatment facilities. The total property required east of State Route 99 through the Fourth Sequence of development is approximately 167 acres.

The general sequence of development is described in Figures 6-7 through 6-10. Water balances for Sequence 1, 2, 3, and 4 are included as Table 6-1, Table 6-2, Table 6-3, and Table 6-4, respectively.

6.3.2.2 Surface Water Discharge

Treated effluent disposal could be accomplished through surface water discharge to a Fresno Irrigation District canal. The most likely location would be at the existing wastewater treatment plant with a discharge to the Central Canal. The regulatory aspects of a surface water discharge include the issuance of a NPDES Permit from the RWQCB. MCWD had obtained a NPDES Permit in the past. The Fresno Irrigation District requested that the MCWD discontinue discharge to the Central Canal. Subsequently, the MCWD requested that the NPDES Permit be discontinued and the only method of effluent disposal remaining is evaporation/percolation ponds. The pipeline connection between the MCWD WWTF and the FID Central Canal has been removed.

The likelihood of obtaining approval from FID for a new surface water discharge is marginal. The capital construction requirements for tertiary treatment facilities would include a new tertiary filter system and either a retrofit or replacement of the existing UV disinfection facilities. Operational (testing, monitoring, reporting, operator qualifications) requirements for NPDES Permit compliance are significant.

6.3.2.3 Reclamation

The MCWD has investigated reclamation alternatives in the past and is required to review reclamation alternatives prior to February 2022 (required by the WDRs). To date, no viable reclamation alternatives have been identified.

6.3.2.4 Connect to City of Fresno or to SKF County Sanitation District

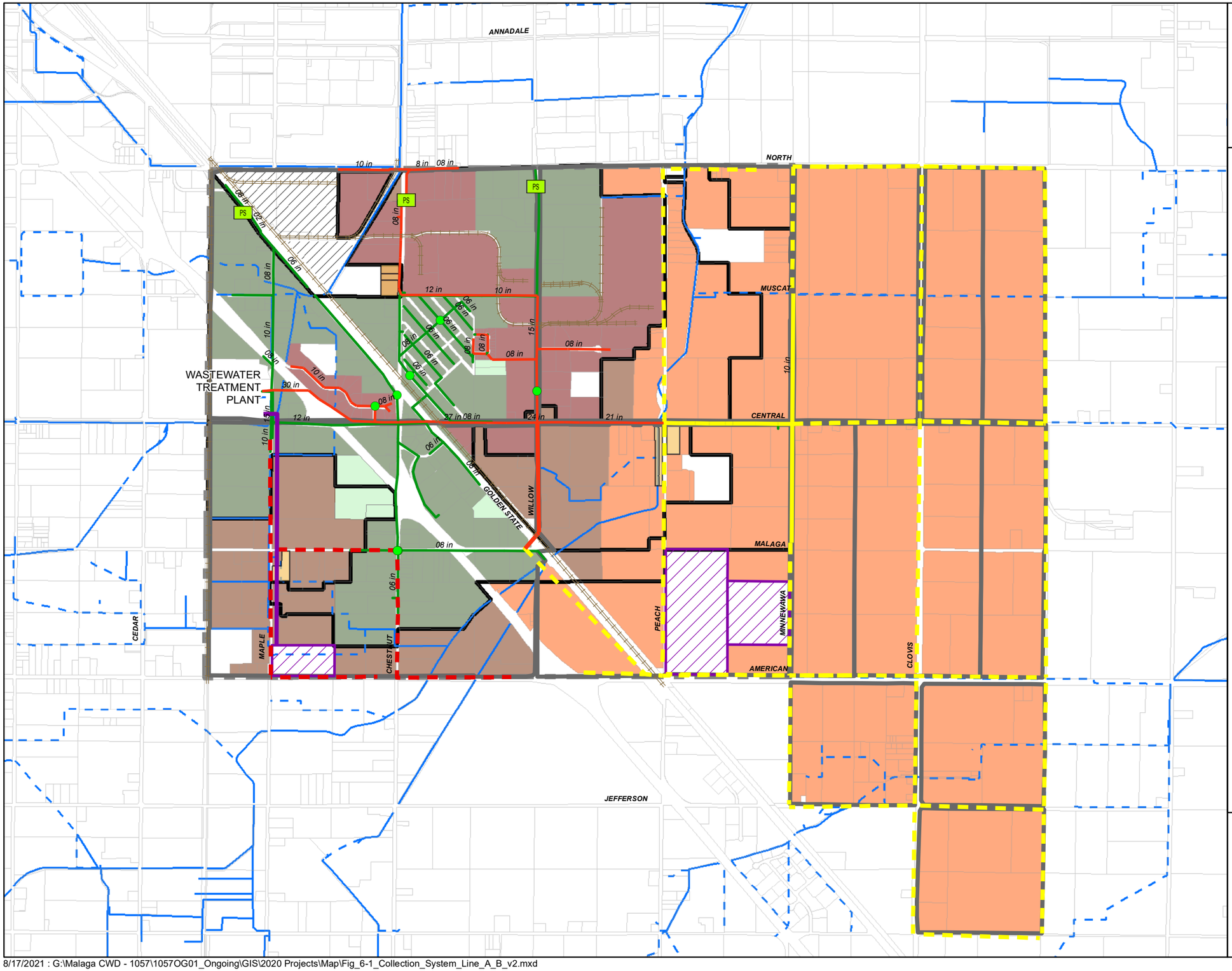
The option to connect to the City of Fresno collection system has been discussed previously and does not appear to be a viable option.

The option to connect to the SKF County Sanitation District has not been discussed with SKF. The northernmost SKF facility is a lift station near Minnewawa and Lincoln. A connection between the two systems would require a pipeline of approximately 1.5 miles from Central and Minnewawa Avenues.A connection to an adjacent entity would require regulary approval (RWQCB, approval of the local agencies, LAFCo approval, and likely coordination with SGMA entities to ensure consistency with groundwater sustainability regulations.

Figure 6-1 Malaga CWD

Ultimate Wastewater System Facilities

June 2021



- Lift Sation
- Collection System
- Manhole
- Domestic Sewer Line
- Industrial Sewer Line
- Proposed Sewer Line - Line B
- Proposed Line B
- Existing Line B
- Proposed Line C
- Existing Line C
- Treatment Pipeline
- FID Canal
- FID Pipeline
- Phase Area
- Malaga CWD
- Malaga CWD SOI (LAFCo)
- Proposed Treated Effluent Disposal Site
- MCWD Out of District Service
- Projected Service Area Line A
- Projected Service Area Line B
- Projected Service Area Line C
- Existing Service Area - Line A
- Existing Service Area - Line B
- Served by the City of Fresno
- Railroad

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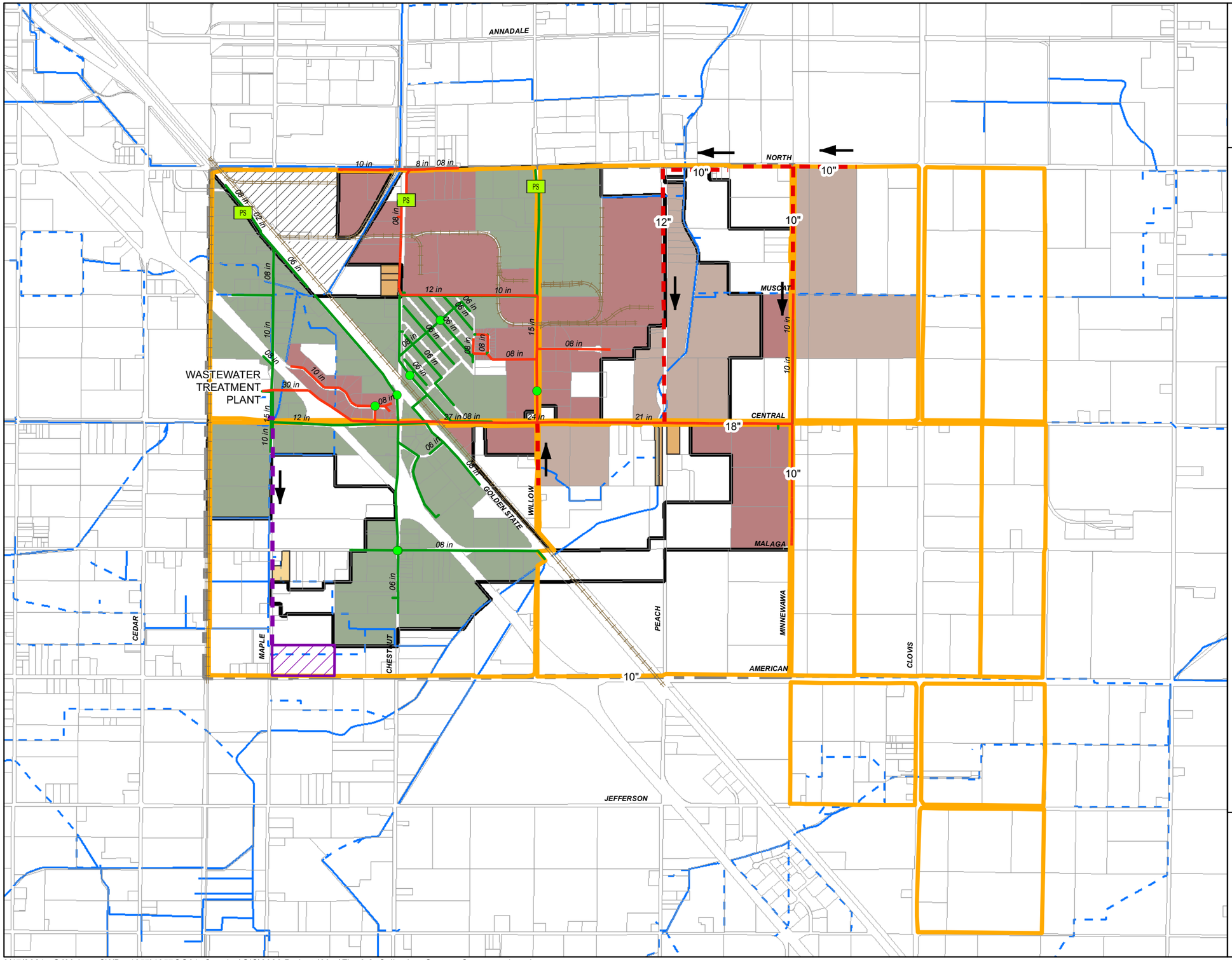
Figure 6-2 Malaga CWD

Wastewater System Facilities
Sequence 1

June 2021



- Lift Sation
- Collection System
- Manhole
- Domestic Sewer Line
- Industrial Sewer Line
- Proposed Line B
- Proposed Treatment Pipeline
- Direction of Flow
- FID Canal
- FID Pipeline
- Phase Area
- Malaga CWD
- Malaga CWD SOI (LAFCo)
- Existing Service Area - Line A
- Existing Service Area - Line B
- Proposed Annexations
- 20 Acre Treated Effluent Disposal
- MCWD Out of District Service
- Served by the City of Fresno
- Railroad

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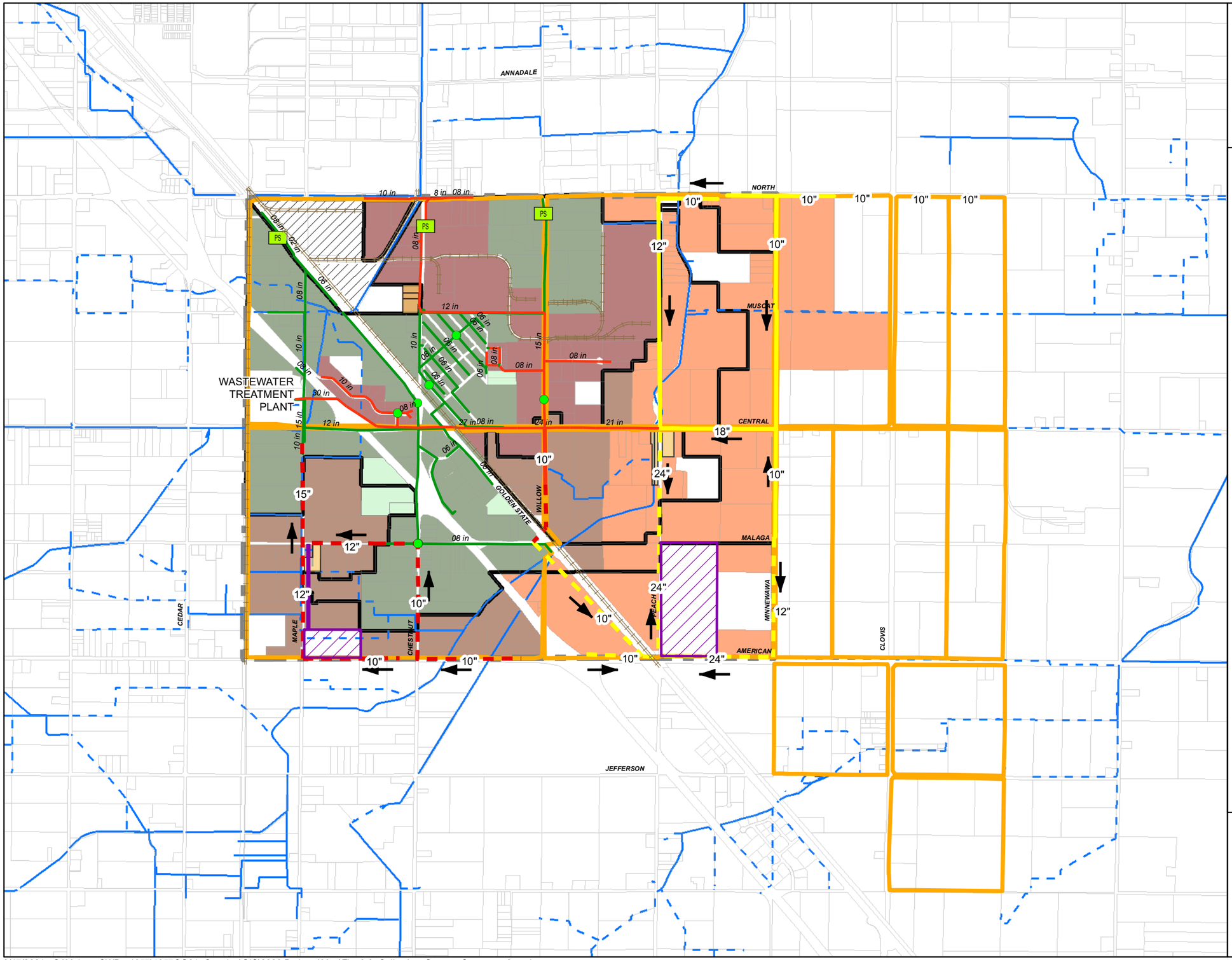
Figure 6-3 Malaga CWD

Wastewater System Facilities
Sequence 2

June 2021



- Lift Sation
- Collection System
- Manhole
- Domestic Sewer (Line A)
- Industrial Sewer (Line B)
- Proposed Line B
- Existing Line B
- Proposed Line C
- Existing Line C
- Treatment Pipeline
- FID Canal
- FID Pipeline
- Direction of Flow
- Phase Area
- Malaga CWD
- Malaga CWD SOI (LAFCo)
- Proposed Treated Effluent Disposal Site
- Projected Service Area Line A
- Projected Service Area Line B
- Projected Service Area Line C
- Existing Service Area - Line A
- Existing Service Area - Line B
- MCWD Out of District Service
- Served by the City of Fresno
- Railroad

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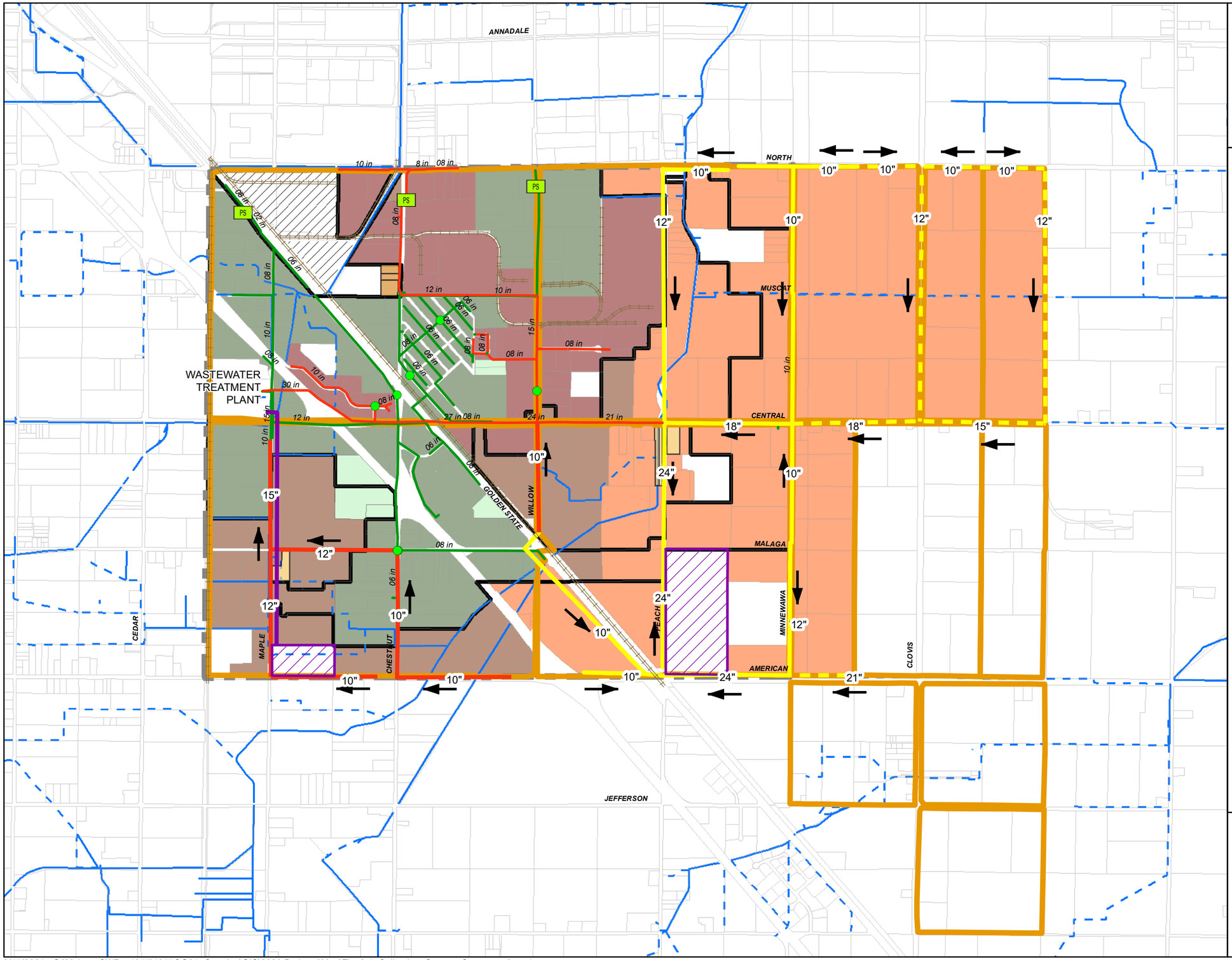
Figure 6-4 Malaga CWD

Wastewater System Facilities
Sequence 3

June 2021



- Lift Sation
- Collection System
- Manhole
- Domestic Sewer (Line A)
- Industrial Sewer (Line B)
- Existing Line B
- Proposed Line B
- Proposed Line C
- Existing Line C
- Treatment Pipeline
- FID Canal
- FID Pipeline
- Direction of Flow
- Phase Area
- Malaga CWD
- Malaga CWD SOI (LAFCo)
- Proposed Treated Effluent Disposal Site
- Projected Service Area Line A
- Projected Service Area Line B
- Projected Service Area Line C
- Existing Service Area - Line B
- Existing Service Area - Line A
- MCWD Out of District Service
- Served by the City of Fresno
- Railroad

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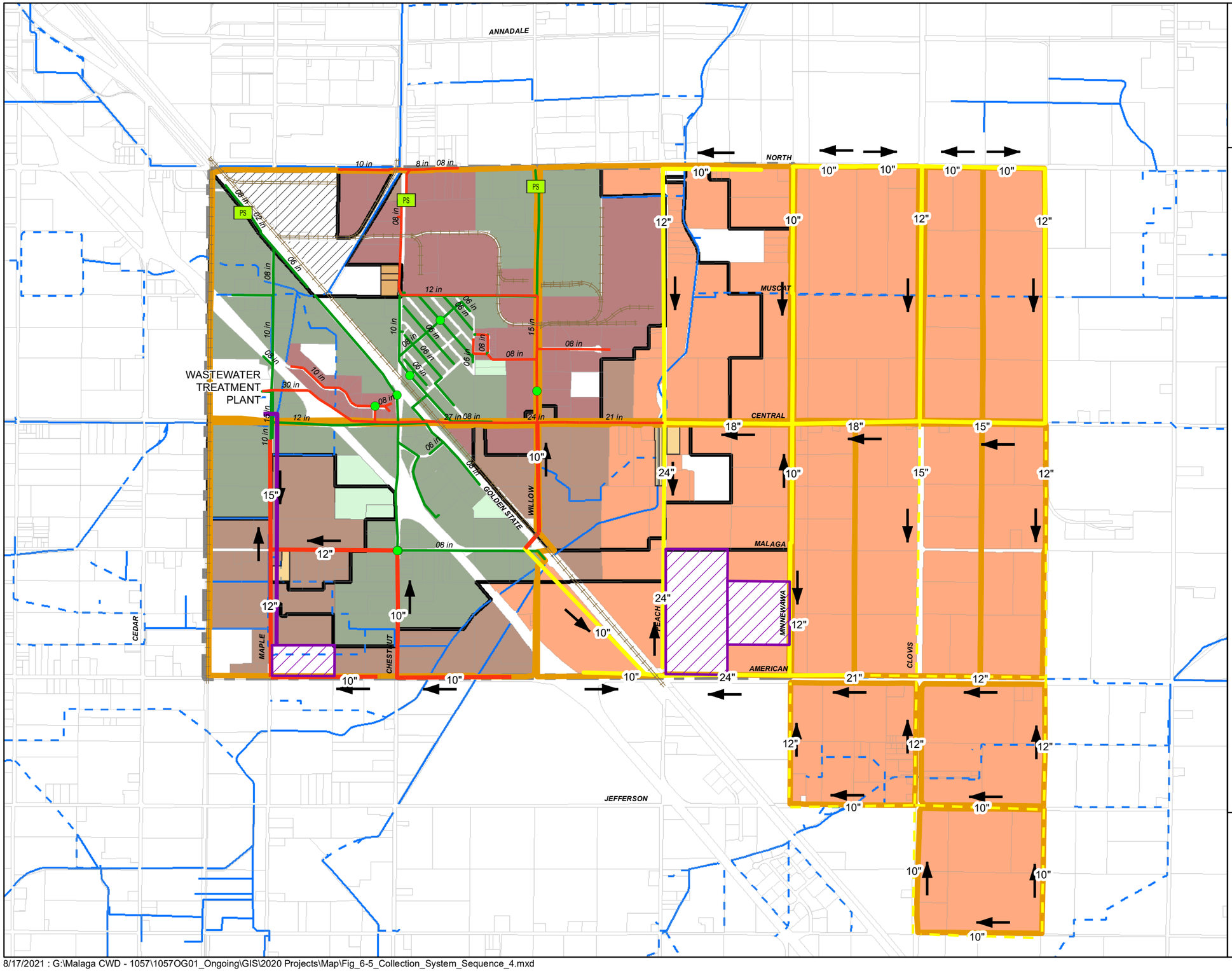
Figure 6-5 Malaga CWD

Wastewater System Facilities
Sequence 4

June 2021



- Lift Sation
- Collection System
- Manhole
- Domestic Sewer (Line A)
- Industrial Sewer (Line B)
- Proposed Line B
- Existing Line B
- Proposed Line C
- Existing Line C
- Treatment Pipeline
- FID Canal
- FID Pipeline
- Direction of Flow
- Phase Area
- Malaga CWD
- Malaga CWD SOI (LAFCo)
- Proposed Treated Effluent Disposal Site
- Projected Service Area Line A
- Projected Service Area Line B
- Projected Service Area Line C
- Existing Service Area - Line A
- Existing Service Area - Line B
- MCWD Out of District Service
- Served by the City of Fresno
- Railroad

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Table 6-1

Net Disposal Area needed West of SR 99

Malaga County Water District
Wastewater Treatment & Disposal Facilities
Estimated Capacity Wastewater Disposal - 100 Year Rainfall Water Balance, Discharge and Storage

DATA:

Month	Number of Days per Month	100 Yr. Rainfall [1/] (in/month)	100 Yr. Evaporation [3/] (in/month)
January	31	5.14	0.90
February	28	3.70	1.46
March	31	4.53	2.09
April	30	2.76	3.71
May	31	0.01	6.21
June	30	0.31	6.85
July	31	0.00	8.14
August	31	0.00	6.99
September	30	1.10	4.68
October	31	1.58	3.09
November	30	3.16	1.20
December	31	1.59	0.85
Total	**365**	**23.88**	**46.17**

Discharge to canal		**0**	**MGD**	
Daily Effluent Production [5/]	=	1,220,000	gpd	
Pond Wet Area [7]	=	**23.24**	acres	
Pond Storage	=	**139.4**	ac-ft	*6 ft deep*
Pond Percolation Rate	=	**1.29**	in/day	
Additional Pond Wet Area	=	**12.76**	acres	
Additional Pond Storage	=	**76.6**	ac-ft	*6 ft deep*
Estimated Pond Percolation Rate	=	**1.00**	in/day	
Total Storage	=	**216.0**	ac-ft	
Total Storage	=	70,383,913	gal	
Total Area	=	*36.0*	*acres*	

WWTF POND CALCULATIONS:

Month	Effluent Produced (gal/month)	Effluent To Canal (gal/month)	Effluent to Ponds (gal/month)	Surface Rainfall [19/] (gal/month)	Surface Evaporation [20/] (gal/month)	Pond Percolation [21/] (gal/month)	Monthly Change in Storage (gal/month)	Required Storage Capacity [23/] (gal)	
January	37,820,000	0	37,820,000	5,024,629	879,799	35,977,465	5,987,365	12,618,824	
February	34,160,000	0	34,160,000	3,616,951	1,427,229	32,495,775	3,853,947	16,472,771	
March	37,820,000	0	37,820,000	4,428,321	2,043,089	35,977,465	4,227,767	20,700,538	
April	36,600,000	0	36,600,000	2,698,050	3,626,727	34,816,901	854,422	21,554,960	
May	37,820,000	0	37,820,000	9,776	6,070,613	35,977,465	(4,218,302)	17,336,658	
June	36,600,000	0	36,600,000	303,042	6,696,247	34,816,901	(4,610,106)	12,726,552	
July	37,820,000	0	37,820,000	0	7,957,292	35,977,465	(6,114,757)	6,611,795	
August	37,820,000	0	37,820,000	0	6,833,105	35,977,465	(4,990,570)	1,621,225	
September	36,600,000	0	36,600,000	1,075,310	4,574,954	34,816,901	(1,716,545)	0	*
October	37,820,000	0	37,820,000	1,544,536	3,020,643	35,977,465	366,428	366,428	
November	36,600,000	0	36,600,000	3,089,072	1,173,065	34,816,901	3,699,106	4,065,534	
December	37,820,000	0	37,820,000	1,554,311	830,921	35,977,465	2,565,925	6,631,459	
Total (gal)	445,300,000	0	445,300,000	23,343,998	45,133,684	423,605,634	-95,320	** Start at 0 Stored*	
Total (ac-ft)	**1,366.6**	**0.0**	**1,366.6**	**71.6**	**138.5**	**1,300.0**	**-0.3**	*September 1st*	
							-95,320		

1/ Rainfall Data per the Western Regional Climate Center.
3/ Evaporation data per WRCC X 0.75
5/ Design Capacity Effluent Production
7/ Total existing wet area of the existing lagoons.
19/ Surface Rainfall = Volume of 100 Year rainfall on the existing WWTF treatment and storage ponds and proposed storage ponds.
20/ Surface Evaporation = Volume of effluent and rain water evaporating from the existing WWTF treatment and disposal ponds.
21/ Pond Percolation = Volume of effluent and rain water percolating into the ground for existing ponds 1 through 8.
23/ Required Storage = Theoretical starting point Sept. 1st where pond storage starts at zero with monthly contributions.

36/ Maximum Storage Needed = Peak end of month pond storage volume needed (gallons & ac-ft).
37/ Storage Available from all ponds = Total volume of available storage.
39/ Check Balance = Comparison of this value with total wastewater processed.

Maximum Required storage	21,554,960	
Total Storage Available [37/]:	70,383,913	gal
Extra Storage:	**48,828,953**	gal
	150	ac-ft
Total Effluent Production:	445,300,000	gal
Total Effluent Exported:	0	gal
Total Surface Rainfall [19/]:	23,343,998	gal
Total Evaporation [20/]:	45,133,684	gal
Total Percolation [21/]:	423,605,634	gal
Effluent Applied to Crop:	0	gal
Check Balance [39/]:	445,395,320	gal

Updated: **10/14/15**
Print Date: *8/12/21*

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Table 6-2

Sequence 2 Disposal Area east of SR 99

Malaga County Water District
Wastewater Treatment & Disposal Facilities
Estimated Capacity Wastewater Disposal - 100 Year Rainfall Water Balance, Discharge and Storage

DATA:

Month	Number of Days per Month	100 Yr. Rainfall [1/] (in/month)	100 Yr. Evaporation [3/] (in/month)
January	31	5.14	0.90
February	28	3.70	1.46
March	31	4.53	2.09
April	30	2.76	3.71
May	31	0.01	6.21
June	30	0.31	6.85
July	31	0.00	8.14
August	31	0.00	6.99
September	30	1.10	4.68
October	31	1.58	3.09
November	30	3.16	1.20
December	31	1.59	0.85
Total	**365**	**23.88**	**46.17**

Discharge to canal		0	MGD	
Daily Effluent Production [5/]	=	1,465,000	gpd	
Pond Wet Area [7]	=	0.00	acres	
Pond Storage	=	0.0	ac-ft	*6 ft deep*
Pond Percolation Rate	=	1.29	in/day	
Additional Pond Wet Area	=	46.50	acres	
Additional Pond Storage	=	279.0	ac-ft	*6 ft deep*
Estimated Pond Percolation Rate	=	1.10	in/day	
Total Storage	=	279.0	ac-ft	
Total Storage	=	90,912,555	gal	
Total Area	=	*46.5*	*acres*	

WWTF POND CALCULATIONS:

Month	Effluent Produced (gal/month)	Effluent To Canal (gal/month)	Effluent to Ponds (gal/month)	Surface Rainfall [19/] (gal/month)	Surface Evaporation [20/] (gal/month)	Pond Percolation [21/] (gal/month)	Monthly Change in Storage (gal/month)	Required Storage Capacity [23/] (gal)	
January	45,415,000	0	45,415,000	6,490,146	1,136,407	43,057,196	7,711,543	16,211,480	
February	41,020,000	0	41,020,000	4,671,895	1,843,505	38,890,371	4,958,019	21,169,499	
March	45,415,000	0	45,415,000	5,719,915	2,638,989	43,057,196	5,438,730	26,608,229	
April	43,950,000	0	43,950,000	3,484,981	4,684,522	41,668,254	1,082,205	27,690,434	
May	45,415,000	0	45,415,000	12,627	7,841,208	43,057,196	(5,470,777)	22,219,657	
June	43,950,000	0	43,950,000	391,429	8,649,319	41,668,254	(5,976,144)	16,243,513	
July	45,415,000	0	45,415,000	0	10,278,169	43,057,196	(7,920,365)	8,323,148	
August	45,415,000	0	45,415,000	0	8,826,094	43,057,196	(6,468,290)	1,854,858	
September	43,950,000	0	43,950,000	1,388,942	5,909,316	41,668,254	(2,238,628)	0	*
October	45,415,000	0	45,415,000	1,995,026	3,901,664	43,057,196	451,166	451,166	
November	43,950,000	0	43,950,000	3,990,051	1,515,209	41,668,254	4,756,588	5,207,754	
December	45,415,000	0	45,415,000	2,007,652	1,073,273	43,057,196	3,292,183	8,499,937	
Total (gal)	534,725,000	0	534,725,000	30,152,664	58,297,675	506,963,759	-383,770		* *Start at 0 Stored*
Total (ac-ft)	**1,641.0**	**0.0**	**1,641.0**	**92.5**	**178.9**	**1,555.8**	**-1.2**		*September 1st*
							-383,770		

1/ Rainfall Data per the Western Regional Climate Center.
3/ Evaporation data per WRCC X 0.75
5/ Design Capacity Effluent Production
7/ Total existing wet area of the existing lagoons.
19/ Surface Rainfall = Volume of 100 Year rainfall on the existing WWTF treatment and storage ponds and proposed storage ponds.
20/ Surface Evaporation = Volume of effluent and rain water evaporating from the existing WWTF treatment and disposal ponds.
21/ Pond Percolation = Volume of effluent and rain water percolating into the ground for existing ponds 1 through 8.
23/ Required Storage = Theoretical starting point Sept. 1st where pond storage starts at zero with monthly contributions.

36/ Maximum Storage Needed = Peak end of month pond storage volume needed (gallons & ac-ft).
37/ Storage Available from all ponds = Total volume of available storage.
39/ Check Balance = Comparison of this value with total wastewater processed.

Maximum Required storage	27,690,434	
Total Storage Available [37/]:	90,912,555	gal
Extra Storage:	**63,222,121**	gal
	194	ac-ft
Total Effluent Production:	534,725,000	gal
Total Effluent Exported:	0	gal
Total Surface Rainfall [19/]:	30,152,664	gal
Total Evaporation [20/]:	58,297,675	gal
Total Percolation [21/]:	506,963,759	gal
Effluent Applied to Crop:	0	gal
Check Balance [39/]:	535,108,770	gal

Updated: **10/14/15**
Print Date: *8/12/21*

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Table 6-3

Sequence 3 Additional Disposal Area

Malaga County Water District
Wastewater Treatment & Disposal Facilities
Estimated Capacity Wastewater Disposal - 100 Year Rainfall Water Balance, Discharge and Storage

DATA:

Month	Number of Days per Month	100 Yr. Rainfall [1/] (in/month)	100 Yr. Evaporation [3/] (in/month)
January	31	5.14	0.90
February	28	3.70	1.46
March	31	4.53	2.09
April	30	2.76	3.71
May	31	0.01	6.21
June	30	0.31	6.85
July	31	0.00	8.14
August	31	0.00	6.99
September	30	1.10	4.68
October	31	1.58	3.09
November	30	3.16	1.20
December	31	1.59	0.85
Total	**365**	**23.88**	**46.17**

Discharge to canal		**0**	**MGD**	
Daily Effluent Production [5/]	=	1,310,000	gpd	
Pond Wet Area [7]	=	**0.00**	acres	
Pond Storage	=	**0.0**	ac-ft	*6 ft deep*
Pond Percolation Rate	=	**1.29**	in/day	
Additional Pond Wet Area	=	**41.56**	acres	
Additional Pond Storage	=	**249.4**	ac-ft	*6 ft deep*
Estimated Pond Percolation Rate	=	**1.10**	in/day	
Total Storage =		**249.4**	ac-ft	
Total Storage =		81,254,318	gal	
Total Area =		*41.6*	*acres*	

WWTF POND CALCULATIONS:

Month	Effluent Produced (gal/month)	Effluent To Canal (gal/month)	Effluent to Ponds (gal/month)	Surface Rainfall [19/] (gal/month)	Surface Evaporation [20/] (gal/month)	Pond Percolation [21/] (gal/month)	Monthly Change in Storage (gal/month)	Required Storage Capacity [23/] (gal)	
January	40,610,000	0	40,610,000	5,800,655	1,015,679	38,482,948	6,912,028	14,567,524	
February	36,680,000	0	36,680,000	4,175,569	1,647,657	34,758,792	4,449,120	19,016,644	
March	40,610,000	0	40,610,000	5,112,251	2,358,632	38,482,948	4,880,671	23,897,315	
April	39,300,000	0	39,300,000	3,114,749	4,186,854	37,241,562	986,333	24,883,648	
May	40,610,000	0	40,610,000	11,285	7,008,185	38,482,948	(4,869,848)	20,013,800	
June	39,300,000	0	39,300,000	349,845	7,730,446	37,241,562	(5,322,163)	14,691,637	
July	40,610,000	0	40,610,000	0	9,186,252	38,482,948	(7,059,200)	7,632,437	
August	40,610,000	0	40,610,000	0	7,888,440	38,482,948	(5,761,388)	1,871,049	
September	39,300,000	0	39,300,000	1,241,385	5,281,531	37,241,562	(1,981,708)	0	*
October	40,610,000	0	40,610,000	1,783,081	3,487,164	38,482,948	422,969	422,969	
November	39,300,000	0	39,300,000	3,566,162	1,354,239	37,241,562	4,270,361	4,693,330	
December	40,610,000	0	40,610,000	1,794,366	959,252	38,482,948	2,962,166	7,655,496	
Total (gal)	478,150,000	**0**	478,150,000	26,949,348	52,104,331	453,105,676	-110,659	* *Start at 0 Stored*	
Total (ac-ft)	**1,467.4**	**0.0**	**1,467.4**	**82.7**	**159.9**	**1,390.5**	**-0.3**	*September 1st*	
							-110,659		

1/ Rainfall Data per the Western Regional Climate Center.
3/ Evaporation data per WRCC X 0.75
5/ Design Capacity Effluent Production
7/ Total existing wet area of the existing lagoons.
19/ Surface Rainfall = Volume of 100 Year rainfall on the existing WWTF treatment and storage ponds and proposed storage ponds.
20/ Surface Evaporation = Volume of effluent and rain water evaporating from the existing WWTF treatment and disposal ponds.
21/ Pond Percolation = Volume of effluent and rain water percolating into the ground for existing ponds 1 through 8.
23/ Required Storage = Theoretical starting point Sept. 1st where pond storage starts at zero with monthly contributions.

36/ Maximum Storage Needed = Peak end of month pond storage volume needed (gallons & ac-ft).
37/ Storage Available from all ponds = Total volume of available storage.
39/ Check Balance = Comparison of this value with total wastewater processed.

Maximum Required storage	24,883,648	
Total Storage Available [37/]:	81,254,318	gal
Extra Storage:	**56,370,670**	gal
	173	ac-ft
Total Effluent Production:	478,150,000	gal
Total Effluent Exported:	0	gal
Total Surface Rainfall [19/]:	26,949,348	gal
Total Evaporation [20/]:	52,104,331	gal
Total Percolation [21/]:	453,105,676	gal
Effluent Applied to Crop:	0	gal
Check Balance [39/]:	478,260,659	gal

Updated: **10/14/15**
Print Date: *8/12/21*

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Table 6-4

Sequence 4 Additional Disposal Area east of SR 99

Malaga County Water District
Wastewater Treatment & Disposal Facilities
Estimated Capacity Wastewater Disposal - 100 Year Rainfall Water Balance, Discharge and Storage

DATA:

Month	Number of Days per Month	100 Yr. Rainfall [1/] (in/month)	100 Yr. Evaporation [3/] (in/month)
January	31	5.14	0.90
February	28	3.70	1.46
March	31	4.53	2.09
April	30	2.76	3.71
May	31	0.01	6.21
June	30	0.31	6.85
July	31	0.00	8.14
August	31	0.00	6.99
September	30	1.10	4.68
October	31	1.58	3.09
November	30	3.16	1.20
December	31	1.59	0.85
Total	365	23.88	46.17

Discharge to canal	0	MGD		
Daily Effluent Production [5/] =	1,360,000	gpd		
Pond Wet Area [7] =	0.00	acres		
Pond Storage =	0.0	ac-ft	6 ft deep	
Pond Percolation Rate =	1.29	in/day		
Additional Pond Wet Area =	43.14	acres		
Additional Pond Storage =	258.8	ac-ft	6 ft deep	
Estimated Pond Percolation Rate =	1.10	in/day		
Total Storage =	258.8	ac-ft		
Total Storage =	84,343,390	gal		
Total Area =	*43.1*	*acres*	**Total (gal)**	
			Total (ac-ft)	

WWTF POND CALCULATIONS:

Month	Effluent Produced (gal/month)	Effluent To Canal (gal/month)	Effluent to Ponds (gal/month)	Surface Rainfall [19/] (gal/month)	Surface Evaporation [20/] (gal/month)	Pond Percolation [21/] (gal/month)	Monthly Change in Storage (gal/month)	Required Storage Capacity [23/] (gal)	
January	42,160,000	0	42,160,000	6,021,181	1,054,292	39,945,966	7,180,923	15,145,613	
February	38,080,000	0	38,080,000	4,334,313	1,710,297	36,080,228	4,623,788	19,769,401	
March	42,160,000	0	42,160,000	5,306,605	2,448,301	39,945,966	5,072,338	24,841,739	
April	40,800,000	0	40,800,000	3,233,163	4,346,027	38,657,387	1,029,749	25,871,488	
May	42,160,000	0	42,160,000	11,714	7,274,617	39,945,966	(5,048,869)	20,822,619	
June	40,800,000	0	40,800,000	363,145	8,024,336	38,657,387	(5,518,578)	15,304,041	
July	42,160,000	0	42,160,000	0	9,535,489	39,945,966	(7,321,455)	7,982,586	
August	42,160,000	0	42,160,000	0	8,188,337	39,945,966	(5,974,303)	2,008,283	
September	40,800,000	0	40,800,000	1,288,580	5,482,320	38,657,387	(2,051,127)	0	*
October	42,160,000	0	42,160,000	1,850,869	3,619,737	39,945,966	445,166	445,166	
November	40,800,000	0	40,800,000	3,701,738	1,405,723	38,657,387	4,438,628	4,883,794	
December	42,160,000	0	42,160,000	1,862,583	995,721	39,945,966	3,080,896	7,964,690	
Total	496,400,000	**0**	496,400,000	27,973,891	54,085,197	470,331,538	-42,844	* *Start at 0 Stored*	
	1,523.4	**0.0**	**1,523.4**	**85.8**	**166.0**	**1,443.4**	**-0.1**	*September 1st*	
							-42,844		

1/ Rainfall Data per the Western Regional Climate Center.
3/ Evaporation data per WRCC X 0.75
5/ Design Capacity Effluent Production
7/ Total existing wet area of the existing lagoons.
19/ Surface Rainfall = Volume of 100 Year rainfall on the existing WWTF treatment and storage ponds and proposed storage ponds.
20/ Surface Evaporation = Volume of effluent and rain water evaporating from the existing WWTF treatment and disposal ponds.
21/ Pond Percolation = Volume of effluent and rain water percolating into the ground for existing ponds 1 through 8.
23/ Required Storage = Theoretical starting point Sept. 1st where pond storage starts at zero with monthly contributions.

36/ Maximum Storage Needed = Peak end of month pond storage volume needed (gallons & ac-ft).
37/ Storage Available from all ponds = Total volume of available storage.
39/ Check Balance = Comparison of this value with total wastewater processed.

Maximum Required storage	25,871,488	
Total Storage Available [37/]:	84,343,390	gal
Extra Storage:	**58,471,902**	gal
	179	ac-ft
Total Effluent Production:	496,400,000	gal
Total Effluent Exported:	0	gal
Total Surface Rainfall [19/]:	27,973,891	gal
Total Evaporation [20/]:	54,085,197	gal
Total Percolation [21/]:	470,331,538	gal
Effluent Applied to Crop:	0	gal
Check Balance [39/]:	496,442,844	gal

Updated: **10/14/15**
Print Date: *8/12/21*

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7 Capital Cost Opinion

7.1 Capital Cost Opinion

8 Associated Topics

8.1 Economic Impact

8.1.1 Service Charges

8.1.2 Connection Fees, Annexation Fees

8.2 SGMA Requirements

Recharge – CF project

8.3 Recreation System Master Plan

Existing Facilities and Programs

Planned Facilities See Figure 8-1.

Funding

Fees

Staffing

8.4 Konkel School Site

The District has determined that the property formerly occupied by the Konkel School would be an appropriate area for District facilities. Said facilities may include community improvements and capital improvements associated with water supply and wastewater reclamation.

FIGURE 8-1

LEGEND

1. Existing Community Center
2. Existing Restroom Facility
3. Expanded Pool Restroom Facility (Additional Stalls per Code Requirements)
4. Concession Stand Addition
5. Bandstand / Gazebo @ Central Plaza
6. Central Plaza w/ Tables and Seating
7. Dining Pavilions w/ Family Tables and Grills
8. Resort Style Family Pool (42" Depth)
9. Shade Shelter @ Pool
10. Toddler Pool w/ Interactive Water Features
11. Splash Park w/ Shade Canopies
12. Age 5-12 Play Equipment w/ PIP Surfacing
13. Age 2-5 Play Equipment w/ PIP Surfacing
14. Multi-Bay Swings
15. Shade Canopy @ Play Areas
16. Community Center Signage
17. Roundabout - Drop Off and Handicap Parking
18. Community Center Entry
19. "Futsal" Court - Enclosed 5v5 Soccer
20 . Basketball Court
21. Pickleball / Badminton Multi-Court
22. Soccer Field
23. Softball Field w/ Backstop
24. Park Walking Trail
25. Par Course Equipment / Workout Stations
26. Food Truck Stalls w/ Power Hookup
27. Solar Parking Stalls
28 . Staff Parking and Maintenance Yard

MALAGA PARK AND COMMUNITY CENTER

PROP 68 SITE REDESIGN

9 Environmental Issues and Permitting

9.1 Biological Review

9.2 Laws, Regulations and Permits

Need to be in compliance with:

WDRs

Water Supply Permit

Land Use Regulations – future public facilities

SGMA

CV-SALTS

LAFCo

9.3 Local Issues

10 Conclusions and Recommendations

10.1 Summary of Findings

Existing water supply deficiency

Requirement to improve the wastewater treatment facilities to reduce effluent nitrogen

Requirement to obtain addition effluent disposal capacity

10.2 Recommendations for Near Term action (within 24 months)

10.2.1 Construct a new well at the Well 3 site.

10.2.2 Construct improvements at the WWTP to reduce effluent nitrogen

10.2.3 Construct a 1.0 MG water storage tank with appurtenances at the Well 3 site

10.2.4 Acquire additional property for effluent disposal capacity on both sides of State Route 99

10.2.5 Finalize Water Rights Agreements with FID

10.2.6 Finalize Recharge Agreement with FMFCD

10.2.7 Finalize Municipal Service Review (MSR)

10.2.8 Finalize Fee Structure Update for Connections

10.2.9 Construct improvements at the WWTP for aeration, flowmeters, digester overflow, Pond Embankment removal

10.2.10 Prepare a WWTP Master Plan

10.3 Capital Cost Opinion

10.4 Areas of Additional Research / Next Steps

Investigate and acquire potential land acquisition opportunities west of State Route 99 for the purposes of wastewater disposal.

Investigate and acquire potential land acquisition opportunities east of State Route 99 for the purposes of wastewater treatment and disposal.

Investigate and acquire potential land acquisition opportunities north of Vitro Plate Glass for the purposes of a water storage tank.

Investigate and acquire potential land acquisition opportunities south of Well No. 8 for the purposes of a water storage tank.

Appendix A: Malaga County Water District Sewer & Water Study September 1967

Appendix B: Memorandum of Understanding between the City of Fresno and MCWD

Appendix C: Roosevelt Community Plan

Appendix D: Waste Discharge Requirements

Appendix E: Conceptual Interchange at State Route 99 and American Avenue

Appendix F: Nitrogen Reduction Plan for WWTP

Appendix G: Surface Water Discharge to Basin CF

Appendix H: Pretreatment Program