

Appendix L

Water Supply Assessment

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ACRONYMS AND ABBREVIATIONS

AF	acre-feet
AFY	acre-feet per year
AWWA	American Water Works Association
cfs	cubic feet per second
EIR	Environmental Impact Report
GPCD	gallons per capita per day
gpd	gallons per day
GPM	Gallons Per Minute
HCCII	Hesperia Commerce Center II Project
HGL	Hydraulic Grade Line
HWD	Hesperia Water District
HWL	High Water Level
MWA	Mojave Water Agency
Project	Hesperia Commerce Center II Project
SB	Senate Bill
SF	Square feet
SWP	State Water Project
UWMP	Urban Water Management Plan
WSA	Water Supply Assessment

Introduction

The information provided in the preparation of this Water Supply Assessment is mainly obtained from the review of the Hesperia Water District Urban Water Management Plan (2015), Hesperia Water District Water Master Plan (2015), and information obtained from the City of Hesperia, Planning Department, Engineering Department, and the GIS Department staff.

Water Code Section 10910:

The California Water Code section 10910 commonly known as Senate Bill (SB) 610 requires preparation of a Water Supply Assessment (WSA). As part of that assessment, the public water system shall indicate whether its total projected water supplies available during normal, single-dry, and multiple-dry water years included in the 20-year projection contained in the urban water management plan will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses.

Water Code Section 10913. Project:

Section 10913 of the Water Code defines a "Project" for which a WSA must be prepared as any of the following:

- a) A proposed residential development of more than 500 dwelling units.
- b) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.
- c) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.
- d) A proposed hotel or motel, or both, having more than 500 rooms.
- e) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land or having more than 650,000 square feet of floor area.
- f) A mixed-use project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling-unit project.

Project General Information

Project Name

Hesperia Commerce Center II (HCCII)
In the City of Hesperia

Developer/Owner:

Covington Group
14180 Dallas Parkway
Dallas, TX. 75254

Project Architect:

HPA Architecture, Inc.
18831 Bardeen Ave. Suite #100
Irvine, CA. 92612

Project Civil Engineer:

Westland Group
4150 Concourse, Suit 100
Ontario, CA. 91764

Project Description:

The Hesperia Commerce Center II is a project comprised of 4 warehouse buildings located south of Yucca Terrace, east of Highway 395, and north of Phelan Road in the City of Hesperia. The City's zoning designation for this site is Commercial/Industrial Business Park.

Building 1: APN # 3064-XX-XX is 1,547,317 S.F. of warehouse with 20,000 S.F. office

Building 2: APN # 3064- XX-XX is 1,280,595 S.F. of warehouse with 10,000 S.F. office

Building 2A: APN # 3064-XX-XX is 765,392 S.F. of warehouse with 10,000 S.F. office

Building 3: APN #306-XX-XX is 103,125 S.F. of warehouse with 9,000 S.F. office



(FIG. 1) Project Site

Hesperia Water District Water Purveyor

The original town site of Hesperia was laid out in 1891 as part of the U.S. and Santa Fe Railroad efforts. Water for the community was provided by Victor Valley County Water District (VVCWD) until 1975, when the Hesperia Water District was formed as a self-governed special district. The City of Hesperia was incorporated in 1988, and in 1992 the District was reorganized as a subsidiary special district of the City. The District operates as a self-sustaining utility business enterprise and the City Council serves as the District's Board of Directors.

The District is located in the High Desert region of San Bernardino County and is bordered by the town of Apple Valley to the northeast, the City of Victorville to the north, and the community of Phelan to the west.

The District's water service area matches the City's boundaries, with minor exceptions, and covers approximately 74 square miles (FIG. 2). The District provides domestic water from sixteen (16) active wells within this area. All wells are within Mojave River Ground Water Basin. Water is conveyed from the wells to the consumers via a distribution system with pipe sizes ranging from 4 to 24-inches in diameter. The District currently maintains 14 water storage reservoirs within the distribution system with a total capacity of nearly 200 AF, or 64 million gallons.

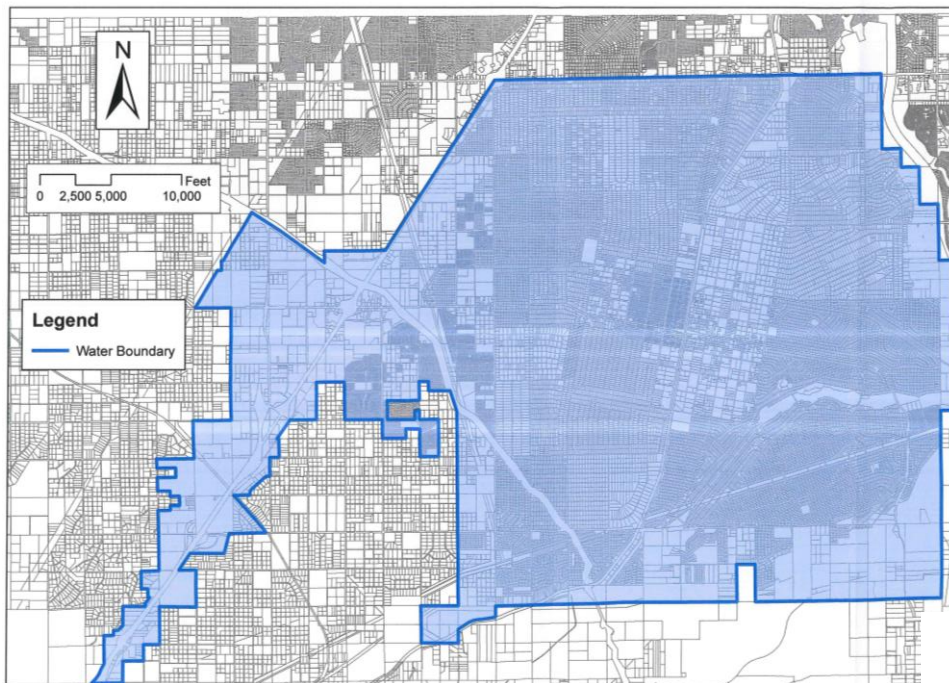


Fig 2. City of Hesperia Water Service Boundary

Current Water Demands:

In 2015, the District produced 12,688 AF of water into the Distribution system. The residential delivery of the metered potable water was 79% of all metered flow. Less than 5% of the total water production was not accounted for due to unmetered flow and/or water losses. Table 4-2 and 4-3 of the 2015 Urban Water Management Plan depict the water demands for different use. This table depicts that demand for the combined commercial and industrial developments were under 15% of the total water production. Such ratio signifies that the commercial and industrial development will continue to have a low impact on the water system except for the fire protection and or any new establishment requiring high levels of water usage (i.e. bottling, agrarian, meat processing, etc.).

Hesperia Water District
2015 Urban Water Management Plan

Table 4-2 Retail: Demands for Potable and Raw Water					
Use Type	Additional Description	Projected Water Use			
		2020	2025	2030	2035
Single Family		11,339	12,255	13,342	14,511
Multi-Family		521	563	613	667
Commercial		1,309	1,496	1,717	1,955
Industrial		10	10	11	12
Landscape		0	0	0	0
Other		190	206	224	244
Losses	<i>Includes all unaccounted water and "apparent losses"</i>	709	767	835	908
TOTAL		14,078	15,298	16,743	18,297
NOTES: The "Losses" category includes actual and apparent losses, including all unaccounted for water.					

Recycled water demands were also provided by MWA, and are estimated at 1,000 AFY starting in 2020 and continuing through the planning horizon of 2035. Potable and recycled water demands are summarized in Table 4-3 below.

Table 4-3 Retail: Total Water Demands					
	2015	2020	2025	2030	2035
Potable and Raw Water	12,668	14,078	15,298	16,743	18,297
Recycled Water Demand	-	1,000	1,000	1,000	1,000
TOTAL WATER DEMAND	12,668	15,078	16,298	17,743	19,297
NOTES:					

Future Water Demands

Based on the population growth projections provided by Beacon Economics, Mojave Water Agency developed water demand projections by region as well as by purveyor service area, including the Hesperia Water District. The MWA methodology utilized historical water production and population data (2010 through 2015) to develop a trend in GPCD that was then applied to the Beacon population growth. Using the past historical data MWA projected the water demand in 5- year increments by multiplying the average GPCD to the projected population provided by Beacon Economics. Base on the UWMP, the year 2015 shows the Daily Per Capita Water Use (GPCD) to be 123 gallons which is more a representative of average normal water demand after implementation of the water conservation programs. However, the Hesperia Water District's Water Master Plan suggests using a GPCD of 135 gallons.

Table1 of the 2015 Water Master Plan depicts the projected water demands through year 2040.

Table 1: Water Demand Projection

Year	GPD	MGD	GPM
Existing	12,074,818	12.1	8,385
2020	14,543,100	14.5	10,099
2025	15,943,824	15.9	11,072
2030	17,498,988	17.5	12,152
2035	19,299,852	19.3	13,403
2040	21,432,996	21.4	14,884

Water Supplies:

The District has historically utilized ground water as its sole source of water supply, but has implemented, and is implementing new projects to diversify its supplies including recycled water and imported State Water Project (SWP). The District pays for a portion of the ground water to the Mojave Basin Area Watermaster for replenishment of the Mojave water Basin. In 2013, the MWA, in partnership with retail water purveyors, completed the Regional Recharge and Recovery Project known as "R3" (See Figure 3). This project banks SWP in the Mojave River ground water basin and then later recovers and delivers the water, as a potable supply. The District has a direct connection to the R3 project.

Hesperia Water District
2015 Urban Water Management Plan

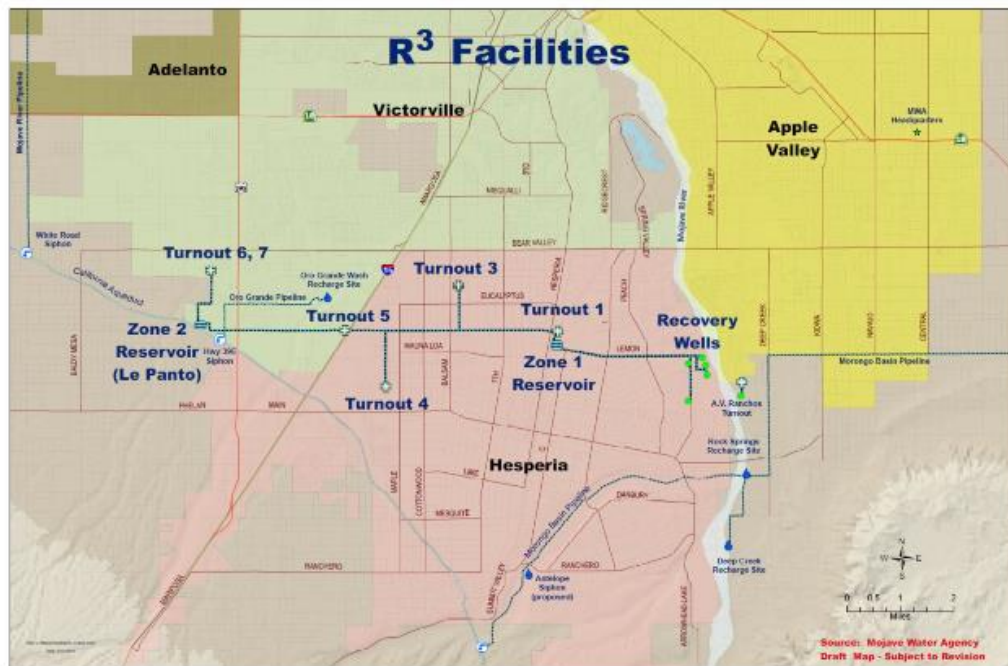


Fig 3. Regional and Recharge Recovery Project

Pressure Zone:

The HCCII project is located in Pressure Zone #5 and being gravity fed from Plant #30 with three reservoirs (30-1, 30-2, and 30-3) of 15 million gallons combined storage capacity with High Water Level (HWL) of 3,852 feet. The average general ground elevation of the proposed development is about 3,565 feet. This elevation drop from the HWL to the project pad elevation will result in a static water pressure of about 124 psi which necessitate installation of pressure regulators for each of the proposed buildings.

Water Transmission Pipelines:

In accordance with the District's Water Master Plan, Plant #30 has an 18" transmission pipeline from the three reservoirs extending to the vicinity of Caliente Road and from there the transmission pipe diameter changes from 18-inch to a 16-inch PVC, traverses northerly to Muscatel Street then continues easterly to connect to a 12-inch PVC pipe in the vicinity of Muscatel and Outpost Road. The City requires construction of approximately 5,400 feet of 16" diameter pipe in the westerly prolongation of Sultana St. then northerly along Los Banos Ave. to Main Street. See Exhibit "A". The highlighted yellow depicts the existing 18-inch and 16-inch transmission pipeline delivering water to pressure zone 5, and the redlines depict new 16-inch transmission pipelines required by the City as part of this development.

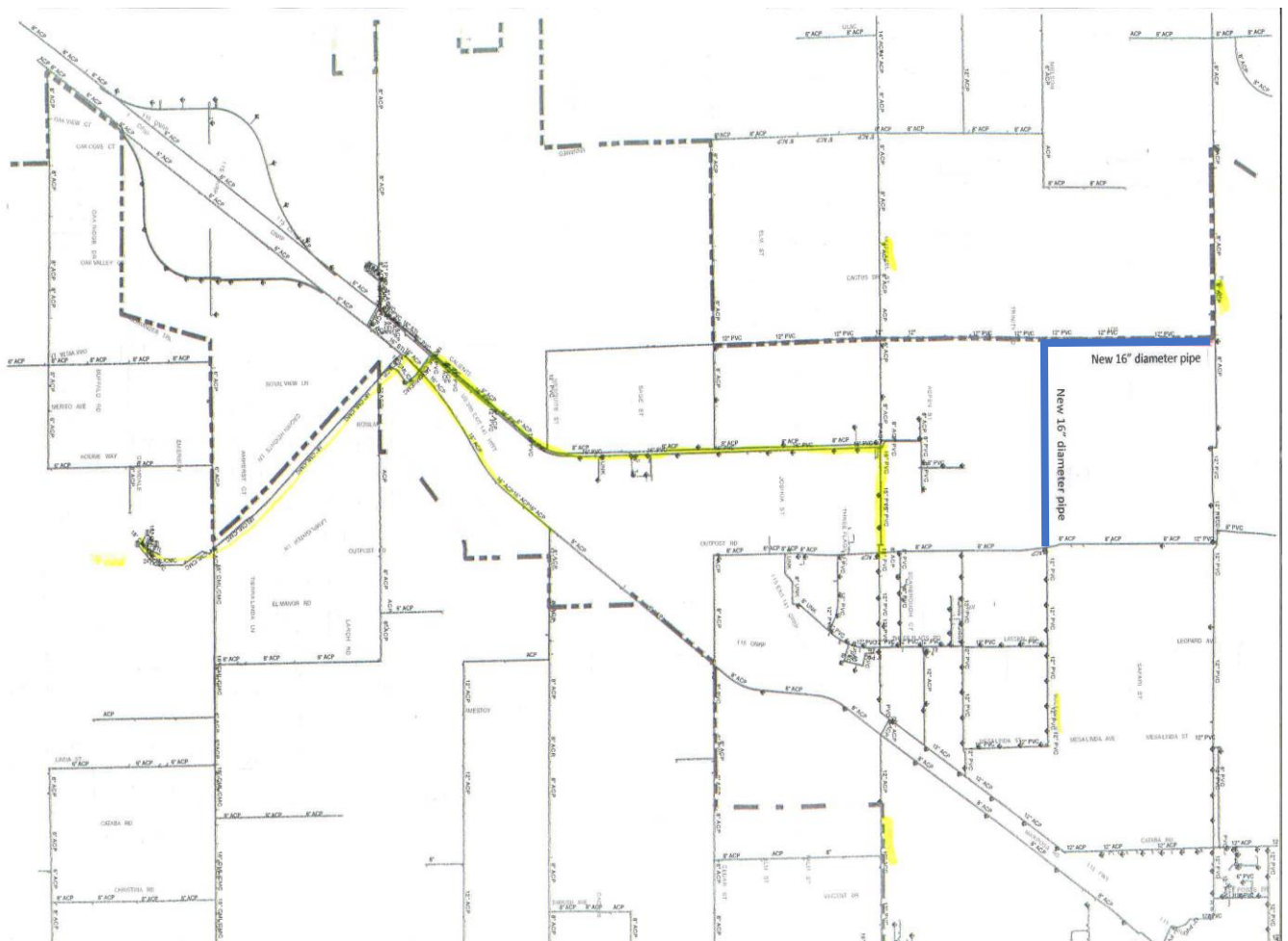


EXHIBIT A

Water Distribution pipelines:

A looped on-site water system for serving the four proposed warehouses for domestic and fire flow will be necessary. The on-site water system must be calculated for the size to deliver about 4,211 gpm for fire flow and maximum day demand. The on-site water distribution system is not shown in the Exhibit "A" at this time.

Hesperia Water District Design Criteria:

The District's recommended water system design criteria from the 2015 Water Mater Plan is utilized to establish the water availability serving The HCC II. The design criteria include the following:

- Distribution System Criteria
 - Pump Station Criteria
 - Pressure reducing Valve Criteria
 - Storage Criteria
- 1- The distribution system criteria is to deliver Maximum Day Demand plus 4,000 gpm for the fire flow. Based on the 2015 Water Master Plan, the Water Duty Factor (See Table 2) for industrial park is established at 866 GPD/Unit.

Zoning Code	Zoning Description	Area	Type	Persons per Household	Water		Wastewater	
					Duty Factor (gpd/unit)	GPD/du	Duty Factor (gpd/unit)	GPD/du
AU	Airport Use	General Plan	Commercial	N/A	578	N/A	153	N/A
C1	Neighborhood Commercial	General Plan	Commercial	N/A	578	N/A	153	N/A
C2	General Commercial	General Plan	Commercial	N/A	578	N/A	153	N/A
C3	Service Commercial	General Plan	Commercial	N/A	578	N/A	153	N/A
P-GOVT	Government Facility	General Plan	Commercial	N/A	578	N/A	153	N/A
P-SCHOOL	Public School	General Plan	Commercial	N/A	578	N/A	153	N/A
Rec-Com	Recreational Commercial	General Plan	Commercial	N/A	578	N/A	153	N/A
ASC	Auto Sales Commercial	Main Street/Freeway Corridor	Commercial	N/A	578	N/A	153	N/A
IBP	Com/Ind Business Park	Main Street/Freeway Corridor	Commercial	N/A	578	N/A	153	N/A
MU	Mixed Use	Main Street/Freeway Corridor	Commercial	N/A	578	N/A	153	N/A
NC	Neighborhood Commercial	Main Street/Freeway Corridor	Commercial	N/A	578	N/A	153	N/A
OC	Office Commercial	Main Street/Freeway Corridor	Commercial	N/A	578	N/A	153	N/A
OP	Office Park	Main Street/Freeway Corridor	Commercial	N/A	578	N/A	153	N/A
PC	Pedestrian Commercial	Main Street/Freeway Corridor	Commercial	N/A	578	N/A	153	N/A
PIO	Public/Institutional Overlay	Main Street/Freeway Corridor	Commercial	N/A	578	N/A	153	N/A
RC	Regional Commercial	Main Street/Freeway Corridor	Commercial	N/A	578	N/A	153	N/A
I1	Limited Manufacturing	General Plan	Industrial	N/A	866	N/A	230	N/A
I2	General Manufacturing	General Plan	Industrial	N/A	866	N/A	230	N/A
GI	General Industrial	Main Street/Freeway Corridor	Industrial	N/A	866	N/A	230	N/A

Table 2: Water Duty Factor

$$866 \text{ GPD/AC} \times 194.8 \text{ AC} = 168,697 \text{ GPD}$$

$$168,697 \div 24 = 7,029 \text{ GPH}$$

$$7,029 \div 60 = 117.2 \text{ gpm (Average Day Demand)}$$

$$117.2 \times 1.8 = 211 \text{ gpm (MDD)}$$

*1.8 is the MDD peaking factor for Zone 5.

Zone	Average Day Demand (mgd)	Maximum Day Demand (mgd)	Operational Storage (MG)	Emergency Storage (MG)	Fire Flow Storage (MG)	Total Storage Required	Storage Available (MG)	GW Supply Available @90% (MG)	Surplus/ Shortfall (MG)
1	2.0	3.4	1.0	9.9	1.0	11.9	11.5	22.9	22.5
2	5.9	10.2	3.1	29.3	1.0	33.3			
2A	0.1	0.2	0.1	0.7	0.6	1.4			
2B	0.9	1.5	0.5	4.4	1.0	5.8			
2/2A/2B	6.9	12.0	3.6	34.3	1.0	38.9	18.0	10.8	-10.1
3	3.5	6.2	1.8	17.7	1.0	20.5	20.0	4.4	3.9
4	0.4	0.8	0.2	2.2	1.0	3.4			
5	1.4	2.5	0.7	7.1	0.6	8.5			
4/5	1.9	3.2	1.0	9.3	1.0	11.3	15.0	0.0	3.7
FC	0.3	0.5	0.2	1.4	0.6	2.2	0.0	0.0	-2.2
TOTALS	14.5	25.3	7.6	72.7	4.5	84.8	64.5	38.2	17.9

Table 6 - 2025 Storage Requirements

Zone	Average Day Demand (mgd)	Maximum Day Demand (mgd)	Operational Storage (MG)	Emergency Storage (MG)	Fire Flow Storage (MG)	Total Storage Required	Storage Available (MG)	GW Supply Available @90% (MG)	Surplus/ Shortfall (MG)
1	2.0	3.4	1.0	9.9	1.0	11.9	11.5	22.9	22.5
2	5.9	10.2	3.1	29.4	1.0	33.4			
2A	0.1	0.2	0.1	0.7	0.6	1.4			
2B	0.9	1.5	0.5	4.4	1.0	5.8			
2/2A/2B	6.9	12.0	3.6	34.5	1.0	39.1	18.0	10.8	-10.2
3	4.4	7.7	2.3	22.0	1.0	25.3	20.0	4.4	-0.9
4	0.4	0.8	0.2	2.2	1.0	3.4			
5	1.9	3.3	1.0	9.6	0.6	11.2			
4/5	2.4	4.1	1.2	11.8	1.0	14.0	15.0	0.0	1.0
FC	0.3	0.5	0.2	1.4	0.6	2.2	0.0	0.0	-2.2
TOTALS	15.9	27.7	8.3	79.7	4.5	92.5	64.5	38.2	10.2

Pumping Stations:

This project is being served from Plant 30 reservoirs with the HWL of 3,852' and thus, no pumping will be required.

See Exhibit "R" for the Clustered of existing reservoirs serving pressure Zone #5.

Storage Criteria:

In Accordance with the District's water storage requirement, consists of operational, fire flow, and emergency storage.

Operational Storage:

The City must provide sufficient storage under normal operating conditions to balance differences between water supply and weekly and diurnal variations in water demand.

In accordance with AWWA Manual of Standard Practice (M31 & M32), the minimum operational storage requirement averages at 30% maximum day demand which is consistent with the City's Water Master Plan.

Fire Flow Storage:

Fire flow storage requirements are based on the San Bernardino County Fire Department, which has been established at 4,000 gpm, for 4 hours duration at 20 psi residual pressure.

According to the City's Water Master Plan, Table 5- 2025 Supply Requirements, it states that:

The combined water pressure Zones 4/5: Avg. Day Demand = 2.4 MG
Max Day Demand = 4.1 MG

The water storage requirement for both zones 4 and 5 are as follows:

- 1- Operational Storage = $4.1 \text{ (MDD)} \times (30\%) = 1.23 \text{ MG}$
- 2- Emergency Storage = $2.4 \text{ (ADD)} \times 500\% = 12 \text{ MG}$
- 3- Fire flow Storage = $4,000 \text{ gpm} \times 4 \times 60 = 0.96 \text{ MG}$

Total storage required through 2025= 14.19MG

Knowing that the current available water storage in Zone 4 and 5 is 15MG, there is more than 800,000-gallon surplus storage capacity for the proposed development.

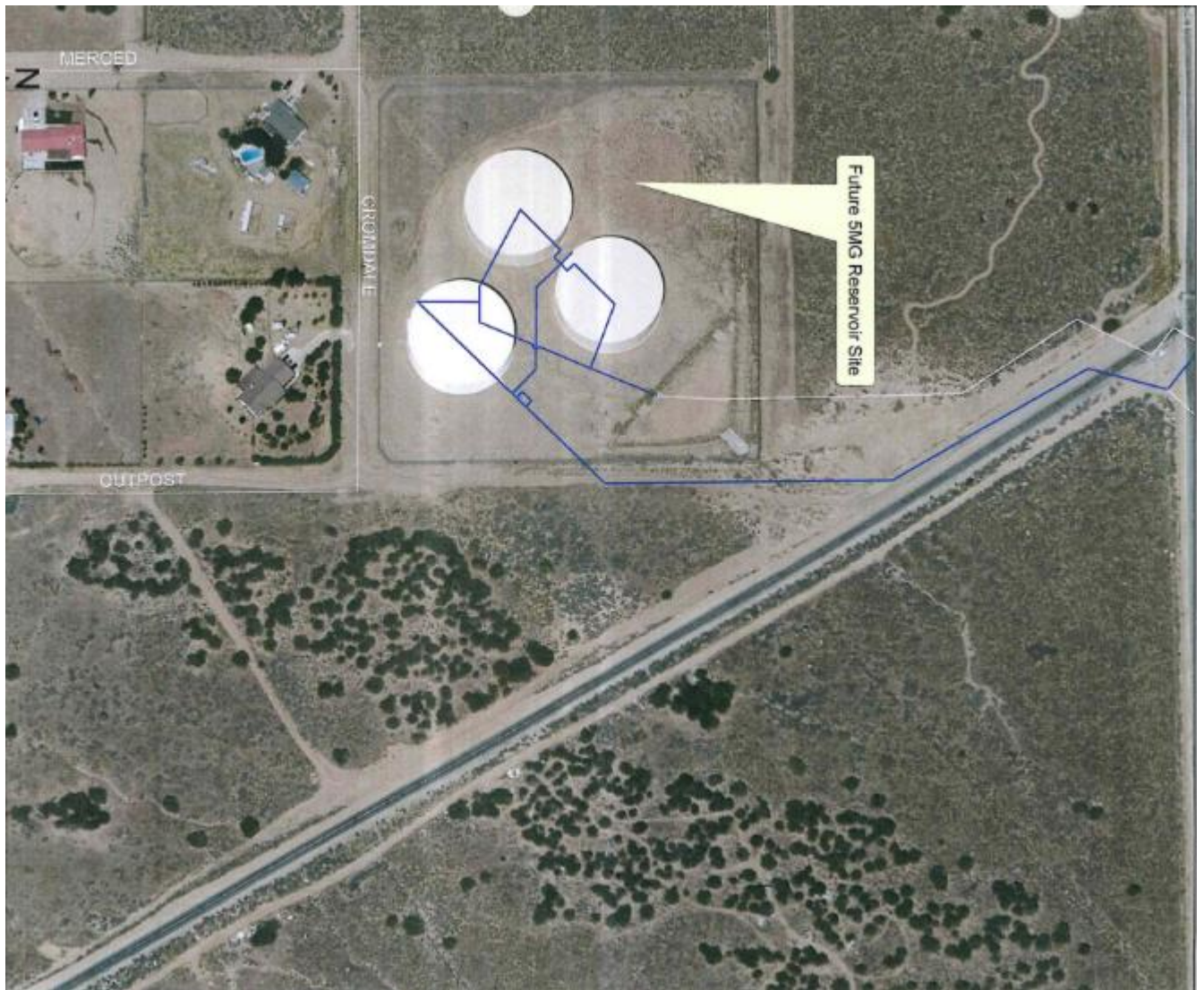


EXHIBIT "R"

Pressure Reducing Valve Criteria:

The on-site water distribution system for the proposed development would be delivering water at an average static water pressure of approximately 130 psi which is slightly high but within acceptable pressure range for a water distribution system. However, based on the Uniform Plumbing Code, water services with over 80 psi must

be equipped with a pressure regulating valve which applies to all 4 services for this development.

Conclusion:

In accordance with the foregoing and the standards set forth by SB 610, this WSA concludes that the total projected water supplies available to Hesperia Water District during normal, single-dry, and multiple-dry water years over the next 20 years will be sufficient to meet the projected water demands for the proposed project.

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