DRAFT TECHNICAL MEMORANDUM

Updated Water Demand Projections for the Entrada South and Valencia Commerce Center Developments (Valencia, California)

To: Matt Carpenter, Five Point Holdings, LLC

From: John Porcello, GSI Water Solutions, Inc.

Date: December 10, 2021

1. Introduction

This technical memorandum presents water demand projections for the Entrada South and Valencia Commerce Center developments, which are two of the nine West Side communities being developed by Five Point Holdings, LLC (FivePoint)[1], in the Santa Clarita Valley, California.

The projected values of long-term average annual water demands for the fully built Entrada South and Valencia Commerce Center developments are provided in Table 1. The remainder of this technical memorandum discusses the water demand calculation methodology (Section 2); the current land use plans and a description of each land use type (Section 3); the water demand factors associated with each type of land use (Section 4); the estimated long-term annual average water demands (Section 5); and a list of references cited in this technical memorandum (Section 6). Supporting information is also provided in the following attachments:

- **Attachment 1:** Detailed Land Use Tables
- **Attachment 2:** Summary of State and Local Laws and Regulations Governing Water Conservation in California
- **Attachment 3:** Derivation of Water Demand Factors
- **Attachment 4:** 2016 Analysis of Dwelling Unit Occupancy Rates
- **Attachment 5:** Water Demand Calculations for Entrada South
- **Attachment 6:** Water Demand Calculations for Valencia Commerce Center

2. Water Demand Calculation Methodology

The water demand projections for Entrada South and Valencia Commerce Center use the same calculation methodology as was presented in GSI Water Solutions, Inc.'s (GSI's) prior technical memoranda (GSI, 2014 and 2016a) for estimating long-term average annual water demands in these and other West Side communities, while taking into account current water conservation standards and measures as summarized

[1] Five Point Holdings, LLC (FivePoint) owns and is developing Entrada South and Valencia Commerce Center through its subsidiaries, The Newhall Land and Farming Company (Newhall) and Stevenson Ranch Venture.

below in Section 4 and in Attachments 2 and 3.[2] The water demand calculation method has been programmed into a series of linked Microsoft Excel spreadsheets that estimate potable and nonpotable water demands. Land use details, which are presented in Section 3 of this technical memorandum, are manually entered in the spreadsheets and are coupled with pre-programmed water demand factors to calculate and categorize the amounts of indoor (potable) water demands, outdoor potable water demands, and outdoor nonpotable water demands.

3. Land Use Plan

Table 2 summarizes the current land use plan for Entrada South and Valencia Commerce Center. Table 2 has two parts:

- The upper portion of Table 2 shows the residential land use plan, including details contained in the vesting tentative tract maps (VTTMs)[3] regarding the number of dwelling units and their acreage on an area-wide basis. Table 2 also differentiates between the three primary types of residential units (single-family residences, detached multi-family residential units [detached condominiums], and attached multi-family residential units [attached condominiums, apartments, and mixed-use developments]).
- The lower portion of Table 2 shows the acreages that will be dedicated to residential units, nonresidential developments, and other noncommercial land uses that provide public services (recreation, arterials, stormwater management facilities, slope stability, open space, and river corridors).

Attachment 1 provides the details of the land uses for the Entrada South and Valencia Commerce Center developments. Key aspects of the tables and the land uses shown in Attachment 1 are as follows:

1. Each table presents the land use information in the form of land use classifications that are used directly by the water demand tool. These classifications and the data that are shown for each land use type have been derived from detailed land use information that is contained in the VTTMs and associated planning data for each village.

2. Each table presents the VTTM Planning Area designations and a description of the product type in each case where this information applies. Additionally:

    a. For residential developments, information is provided on the number of detached condominiums and attached residences, plus the acreages associated with each of these types of residential units. Residential units are planned in Entrada South, consisting solely of multi-family dwellings (and no single-family dwellings). Residential development will not be present in Valencia Commerce Center, which is solely a commercial and industrial development.
    b. For nonresidential developments, the indoor square footage is shown for those facility types whose water use is dependent on the size of the facility.

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[2] In 2012, SCV Water and Newhall agreed to follow the 2010 GSI Water Solutions, Inc. (GSI) technical memorandum methodology for water demand calculations for the West Side communities when the Castaic Lake Water Agency acquired all stock of VWC from Newhall under an eminent domain settlement agreement (the 2012 Settlement Agreement). SCV Water took on the rights, responsibilities, and obligations under the 2012 Settlement Agreement when it was formed as an agency in accordance with Senate Bill 634. The first water demand analysis for the West Side communities (CH2M HILL, 1996) was conducted for the Newhall Ranch Specific Plan. Subsequent revisions to that analysis were conducted at various times during the late 1990s (CH2M HILL, 1999) and through 2001 during final preparation of the Specific Plan and Water Reclamation Plant Environmental Impact Report (EIR) (Impact Sciences, 2003), which was approved by Los Angeles County on May 27, 2003. Additional revisions were conducted to the present to support further land plan revisions and project-level EIRs for individual villages (see, for example, GSI, 2008, 2010, 2014, and 2016a) and to support SCV Water's development of its 2020 Urban Water Management Plan (KJ, 2021).

[3] The vesting tentative tract map (VTTM) applications are used for planning purposes of providing a reasonable estimate of land uses for this water demand projection. The VTTMs and land uses may be refined or changed over time by FivePoint

3. For the residential developments in Entrada South:

    a. The low-medium residential developments are comprised solely of detached multi-family residences (condominiums).
    b. The medium density residential developments are comprised exclusively of attached multi-family residences (condominiums, duplexes, and townhomes).
    c. The "high and mixed use" category is comprised of attached condominiums and other residences, including residences that are part of larger developments that include retail facilities.

4. For nonresidential developments in both Entrada South and Valencia Commerce Center:

    a. Separate land use categories are defined for retail and office space in mixed-use developments and in purely commercial developments. Industrial business parks are treated as an additional separate land use category.
    b. Two specialty land uses in Entrada South are identified because of the unique nature of their water needs—specifically, hotels and spas and an elementary school.

5. Public noncommercial portions of each village are listed in Table 2 under the heading "Recreation, Arterials, and Open Space." These land uses focus primarily on irrigation along public rights of way, including transportation corridors, river corridors, irrigated slopes, and stormwater facilities. In Entrada South, parks and recreation centers are also included in the "Recreation, Arterials, and Open Space" land use category and have a mixture of potable water demands and nonpotable (landscape irrigation) demands.

4. Water Demand Factors

The water demand factors for indoor and outdoor uses of water in Entrada South and Valencia Commerce Center are described in detail in Attachment 3. In summary, the indoor and outdoor water demand factors have been derived from review of the State of California's Green Building Standards Code (CALGreen) and Model Water Efficient Landscape Ordinance (MWELO), and by considering the effects of recent (2018) state legislation on water-use efficiency standards and performance measures (Assembly Bill 1668 and Senate Bill 606). Attachment 2 discusses the requirements of the state codes and legislation.

Summaries of the demand factors are as follows:

- Demand factors for potable water uses are listed in Table 3 for residential development and in Table 4 for nonresidential development and are described in Section 4.1. For indoor water uses, the values of potable demand factors have been developed by applying the results of industry research on water use behavior patterns to the flow rates for indoor fixtures that are specified under the current mandatory water conservation standards contained in CALGreen.
- Demand factors for outdoor uses of potable water pertain to potable non-irrigation needs in residential and nonresidential land uses.
- Demand factors for outdoor irrigation water demands that are anticipated to be met with nonpotable water supplies are listed in Table 5 and are described in Section 4.2. These demand factors are developed under the assumption that irrigation of common landscape areas will meet current requirements contained in MWELO, but with consideration of how future irrigation demands may be affected by climate change and the inefficiencies and periodic degradation that could occur with irrigation systems. These landscape demand factors are based on MWELO-defined rates of irrigation with potable water, even though the demand from these landscapes can be met with nonpotable water and is planned to be met by recycled water use in most (if not all) common areas in Entrada South, Valencia Commerce Center, and other West Side communities.

4.1 Demand Factors for Water Uses Requiring Potable Water Supplies

Following are discussions of potable water demands for residential land uses (Section 4.1.1) and for nonresidential land uses (Section 4.1.2).

4.1.1 Residential Demand Factors for Potable Water

Table 3 shows the daily per-person rates of indoor and outdoor potable water uses (rates that are expressed in units of gallons per capita per day [gpcpd]); the number of persons per dwelling unit that is assumed for each residential land use category; and the combined total rate of daily potable water use per dwelling unit for each residential land use category. As discussed in Attachment 3, in Entrada South the indoor per-capita potable water use rates for residences are between 67 percent and 71 percent of the per-capita potable water use rates that were used in prior analyses conducted before 2020, which preceded the current modern-day water conservation standards (i.e., the standards contained in the latest CALGreen Code and the 2018 legislation).

Residential uses of potable water consist of the following:

- **Indoor Uses.** These uses involve indoor human contact with water in kitchens, bathrooms, laundry facilities, and other washing and serving areas of the household.
- **Outdoor Uses.** Potable water will be the source of supply for outdoor residential water uses that involve human contact, such as filling swimming pools, watering landscaping outside of common areas, and washing cars, pavement, and outdoor surfaces.

Multi-family residential developments have lower per-capita uses of water both indoors and outdoors than single-family residential developments. This is based on (1) the comparatively smaller lot sizes and floor space for multi-family dwellings versus single-family dwellings, (2) fewer persons per dwelling unit (in most cases), and (3) a building footprint that occupies a larger percentage of a lot than in the case of lower-density single-family developments. Accordingly, both the indoor and outdoor per-capita rates of water use are generally lower for attached multi-family residences than for single-family residences.

In late 2015 and early 2016, GSI and Valencia Water Company (VWC) reviewed the population densities (occupancy rates) for each category of residential land uses. The review examined census data for recently constructed developments inside VWC's service area (in the Bridgeport, North Park, and Stevenson Ranch neighborhoods). Census data that were examined consisted of decennial census block data for the year 2010 and annual census block group data from the American Community Survey, collected from 2011 through 2014. As shown in Table 6, the review identified that these recently constructed developments have average occupancy rates of 3.292 persons per household (PPHH) for single-family homes, 2.367 PPHH for condominiums and townhomes, and 2.103 PPHH for apartments. Because these values come from recent census data in new residential construction located within VWD's service area, these average occupancy rates are now used in the water demand projections for Entrada South, Valencia Commerce Center, and other West Side communities. See GSI, 2016b, which is contained in Attachment 4, for details.

4.1.2 Nonresidential Demand Factors for Potable Water

Table 4 shows the daily rates of indoor and outdoor potable water uses for developed facilities that are not residential in nature. For most of the nonresidential land uses, the indoor per-capita water use rates are 90 percent of the per-capita rates that were used in prior analyses conducted before 2020 (analyses which preceded the current water conservation standards).

Interior uses of water on nonresidential lands are calculated from daily water demand factors for potable water use that are based on the size of the facility (in square feet or acres); however, these rates of use (i.e., demand factors) differ for schools (based on the number of students). Exterior uses of potable water are calculated based on the number of acres occupied by the lot containing the facility, with the potable water

demand factors accounting for the water uses that require potable water on each different type and size of nonresidential facility.

Uses of nonpotable water in nonresidential developments consist of the following:

- **Indoor Use.** Indoor use rates for potable water range from 0.009 to 0.18 gallon per day per square foot (gpd/ft^2) for facilities with high occupancy during portions of the day, such as retail commercial facilities, business parks, and hotels. School uses are assigned an indoor potable use rate of 20 gallons per student.
- **Outdoor Use.** Potable water will be used outdoors for nonresidential uses that have the potential for human contact with the water (primarily swimming pools, wash water, and some landscape irrigation). The outdoor potable water use rate is specified as 275 gallons per acre per day for industrial facilities.

The commercial land use categories in the water demand tool that apply to Entrada South and Valencia Commerce Center are:

- Mixed-use commercial (retail)
- Mixed-use commercial (office)
- Commercial (retail)
- Commercial (office)
- Business park (industrial)
- Hotel/spa, which is assumed to have a similar indoor potable water use rate as business parks and institutional facilities (0.18 gpd/ft^2)

4.2 Demand Factors for Water Uses That Can Be Met with Nonpotable Water Supplies or Potable Water Supplies if Nonpotable Water is Not Available

Irrigation demands for common-area landscaping can be met with nonpotable water supplies, which may consist of recycled water or other available nonpotable water supplies, or potable water supplies if nonpotable water is not available. Common-area landscaping will be present in areas containing multi-family residential developments, nonresidential developments, recreational facilities, and irrigated slopes. Table 5 shows the exterior nonpotable water demand factors that are used in the water demand tool, as well as the percentage of each type of lot that will be irrigated. Comparisons of these demand factors with those used in prior water demand analyses are also shown.

Irrigation demands are defined from the monthly distribution of reference evapotranspiration rates (ETo) for turf grass. The ETo value describes the amount of evaporation plus plant transpiration that occurs from a standardized grass surface. The water demand projections for Entrada South and Valencia Commerce Center presented in this technical memorandum are based on an ETo value of 67.7 inches per year (approximately 5.65 feet per year), which is the average during the past approximately 10 years of ETo measurements at a monitoring station located at SCV Water's Rio Vista water treatment plant.[4] As discussed in Attachment 3, the 2015 Model Water Efficient Landscape Ordinance specifies an ETo value of 61.5 inches per year for Santa Clarita and limits the maximum allowable water application rate on landscapes using potable water to 55 percent of this lower ETo value for residential landscapes and 45 percent of this lower ETo value for nonresidential landscapes. Using the higher ETo value of 67.7 inches per year provides a conservative (high) estimate of potential outdoor water demands for nonpotable water. The maximum allowable water application rates under MWELO that arise from using an ETo value of

[4] Personal communication from Rick Vasilopulos/SCV Water to John Porcello/GSI, October 4, 2021.

67.7 inches are 37.25 inches per year (approximately 3.1 feet per year) on residential landscapes and 30.5 inches per year (approximately 2.5 feet per year) on nonresidential landscapes.

However, climate change is expected to increase evaporation and hence the ETo value that describes the water requirement of standardized turf grass. Therefore, to avoid underestimating water demands and to be consistent with demand estimation methods used in SCV Water's 2020 Urban Water Management Plan (UWMP) (see KJ, 2021 and MWM, 2021), the ETo values used in the demand calculations for Entrada South and Valencia Commerce Center account for climate-change influences on future water demands. The California Department of Water Resources (DWR) has published local-scale climate-change factors at 6-kilometer (3.75-mile) intervals across the state that can be applied to historical measurements of ETo. GSI has studied these evapotranspiration (ET) change factors at two locations in the Santa Clarita Valley, and for the two future time periods for which DWR has published these factors (representing 2030 and 2070 levels of projected climate change). GSI derived month-by-month values of long-term average climate change from the 2030 and 2070 change factors, using the same approach to these calculations as is used in the 2020 UWMP for estimating demands throughout SCV Water's service area (see MWM, 2021 for details). The ETo change factors range from 1.056 in July (a 5.6 percent increase in ETo) to 1.126 in December (a 12.6 percent increase in ETo). Applying each monthly change factor to the monthly ETo values raises the annual ETo from 67.7 inches to 72.7 inches, which in turn raises the maximum allowable water application rates to 40.0 inches per year (approximately 3.33 feet per year) on residential landscapes (55 percent of ETo) and 32.7 inches per year (approximately 2.73 feet per year) on nonresidential landscapes (45 percent of ETo). See Table 3-7 in Attachment 3 for these calculation details.

In addition to applying climate change factors to the outdoor water demand calculations, the water demand projections for Entrada South and Valencia Commerce Center also incorporate an additional water loss factor to account for potential inefficiencies and deterioration of irrigation systems, consistent with the approach used to develop the 2020 UWMP's water demand forecasts for SCV Water's service area. The overirrigation factor is set at 15 percent. See Section 4.3 of Attachment 3 for details on the establishment of this factor, as well as the details of monthly ETo, climate change factors, the landscape design details, and the calculations of nonpotable water demand factors for each type of irrigated landscape. Table 5 shows the new nonpotable water demand factors that account for the current MWELO conservation standards, climate change, and the 15 percent overirrigation factor. Table 5 shows that the new nonpotable demand factors provide a 31 percent reduction in nonpotable demand on residential lands compared with the nonpotable demand factors used in prior water demand projections (conducted prior to the current MWELO standards). For nonresidential lands, the percentage reductions in the nonpotable demand factors are between 23.5 percent and 43.9 percent, except for schools (a 7.5 percent increase). For the recreation/arterials/open space land use categories, the percentage changes in the nonpotable demand factors range from an 8.9 percent increase to an 18.4 percent decrease.

Although certain industrial water users may be able to use nonpotable supplies in their production processes, the water demand calculation process for Entrada South and Valencia Commerce Center assumes that (1) commercial and industrial facilities will use recycled water solely for landscape irrigation, (2) that all industrial process water needs will be met with potable water supplies, and (3) any nonpotable demand can be met with nonpotable supplies if nonpotable water is not available.

5. Water Demand Summary

The current projections of long-term average annual water demands for the fully built Entrada South and Valencia Commerce Center developments are presented in Table 1. For Entrada South, the current water demand projections are also compared with projections developed in 2014 for the Water Supply Assessment that was adopted by the Valencia Water Company for an earlier version of the Entrada South

project (GSI, 2014). Supporting calculations for the current projections are provided in Attachment 5 for Entrada South and Attachment 6 for Valencia Commerce Center.

5.1 Projected Water Demand for Entrada South

Under the current land use plan, and with implementation of current water conservation standards, the long-term average annual water demand for the fully built Entrada South development is estimated to be 863 acre-feet per year (AFY), which as shown in Table 7 is 24 percent lower than the prior projection developed in 2014 for Entrada South (GSI, 2014). Specific aspects of this projection of long-term average annual water demands in Entrada South are as follows:

1. Potable water demand is projected to be 435 AFY, which is 38 percent lower than projected in 2014.
2. Nonpotable water demand is projected to be 428 AFY, which is 3 percent lower than projected in 2014.
3. Based on the projected population of 3,726 residents, the combined residential, nonresidential, and other daily per-capita demands for potable plus nonpotable (recycled) water across Entrada South are projected to be 207 gpcpd.
4. Indoor residential per-capita demands for potable water are estimated to be 50 gpcpd when considering all residences together (see Table 5-3 of Attachment 5).
5. The total water demand in residential developments within Entrada South is projected to be 434 AFY, which (as shown in Table 5-3 of Attachment 5) consists of:
   a. 353 AFY of potable water demand (of which 210 AFY is for indoor use and 143 AFY is for outdoor use), and
   b. 81 AFY of nonpotable water demand (for landscape irrigation on multi-family lots).
6. The total water demand in nonresidential developments within Entrada South is projected to be 145 AFY, which (as shown in Table 5-4 of Attachment 5) consists of 81 AFY of indoor potable water demand and 64 AFY of outdoor nonpotable water demand.
7. The total water demand for recreation/arterials/open space lands within Entrada South is projected to be 284 AFY, which (as shown in Table 5-5 of Attachment 5) consists of 1 AFY of indoor potable water demand and 283 AFY of outdoor nonpotable water demand.

5.2 Projected Water Demand for Valencia Commerce Center

Under the current land use plan, and with implementation of current water conservation standards, the long-term average annual water demand for the fully built Valencia Commerce Center development is estimated to be 951 AFY. Specific aspects of this projection of long-term average annual water demands in Valencia Commerce Center are as follows:

1. Potable water demand is projected to be 591 AFY.
2. Nonpotable water demand is projected to be 327 AFY.
3. Accordingly, the total water demand is projected to be 918 AFY.
4. Daily per-capita demands have not been estimated because Valencia Commerce Center will not contain any residential development.
5. The total water demand in nonresidential developments within Valencia Commerce Center is projected to be 765 AFY, which (as shown in Table 6-2 of Attachment 6) consists of 591 AFY of indoor potable water demand and 174 AFY of outdoor nonpotable water demand.
6. The total water demand for recreation/arterials/open space lands within Valencia Commerce Center is projected to be 153 AFY, which (as shown in Table 6-3 of Attachment 6) consists solely of outdoor nonpotable water demand (with no indoor water demand).

6. References

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Tables

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Table 1

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Summary of Water Demands for Entrada South and Valencia Commerce Center

	Potable Demand	Nonpotable Demand	Total Demand	Total Population	Per Capita Demands
Entrada South	435	428	863	3,726	207
Valencia Commerce Center	591	327	918	0	—

Notes

(1) Demand values are in units of acre-feet per year (AF/yr), except per-capita demands are in units of gallons per person per day.

(2) Demand estimates incorporate current water conservation standards (CALGreen and MWELO).

(3) The values in this water demand estimate are approximate and are subject to change at the time of preparation of tentative or final land use maps.

Table 2

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Land Use Summary from Vesting Tentative Tract Maps

Residential Land Use Plan

Development	Single-Family Lots (Detached Dwellings)		Multi-Family Dwellings (Detached Condominiums)		Multi-Family Dwellings (Attached Condominiums, Apartments, Mixed-Use)		Total	
	Units	Acreage	Units	Acreage	Units	Acreage	Units	Acreage
Entrada South	0	0	452	53	1,122	62	1,574	115
Valencia Commerce Ctr.	0	0	0	0	0	0	0	0

Acreage for Residential, Nonresidential, and Public Noncommercial Land Uses

Development	Residential Development	Nonresidential Development	Public Noncommercial (Recreation, Arterials, Open Space)	Total
Entrada South	115	67	201	383
Valencia Commerce Ctr.	0	220	350	570

Notes

All acreages in this analysis are rounded to the nearest acre for presentation purposes. Actual acreages may vary slightly as shown in Attachment 1.
All data and acreages are subject to change at the time of preparation of tentative or final land use maps.

Table 3

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Potable Water Demand Factors for Residential Development

Residential Land Use Category	Indoor Use (gpcpd)	Outdoor Use (gpcpd)	Persons per Dwelling Unit	Total Potable Use (gpd/DU)
Low Medium (Multi-Family Detached)	50	34	2.367	199
Low Medium (Multi-Family Attached)	50	34	2.367	199
Medium (Multi-Family Detached)	50	34	2.367	199
Medium (Multi-Family Attached)	50	34	2.367	199
High and Mixed Use (Multi-Family)	50	34	2.367	199
Apartments (Multi-Family)	50	32	2.103	172

Notes

DU = dwelling units

gpcpd = gallons per capita per day

gpd = gallons per day

Table 4 *Draft*

Potable Water Demand Factors for Nonresidential Development

Nonresidential Land Use Category	Indoor Use		Outdoor Use
	Units	Factor	gpapd
Mixed-Use Commercial (Retail)	gpd/sq. ft.	0.009	0
Mixed-Use Commercial (Office)	gpd/sq. ft.	0.045	0
Commercial (Retail)	gpd/sq. ft.	0.18	0
Business Park (Office)	gpd/sq. ft.	0.045	0
Business Park (Industrial)	gpd/sq. ft.	0.18	275
Institutional	gpd/sq. ft.	0.18	0
Hotel/Spa	gpd/sq. ft.	0.18	0
Hospital	gpd/bed	450	0
Sr. Assisted Living	gpd/bed	90	108
Golf Club House	gpd/sq. ft.	0.009	0
Visitor Serving	gpd/sq. ft.	0.009	275
Water Reclamation Plant	gpapd	200	0
Electrical Substation	gpapd	0	0
Fire Stations	gpd/sq. ft.	0.18	275
Schools	gpd/student	20	13
Recreation Centers	gpapd	90	0
Neighborhood Parks	gpapd	90	0
Lake - Water	gpapd	0	0
Lake - Park Area	gpapd	0	0
Golf Course	gpapd	0	0
Hardscape/Road Section	gpapd	0	0
Landscape Area	gpapd	0	0
Natural Open Space	gpapd	0	0
River Corridor	gpapd	0	0
Non-Irrigated Slopes	gpapd	0	0
Irrigated Slopes, Wet Zones	gpapd	0	0
O.S. Drainage Facilities	gpapd	0	0

Notes

For schools, the exterior value of 13 has units of AF/pool/year (not gpapd)

gpapd = gallons per acre per day, based on average square footage per acre
gpd = gallons per day
sq. ft. = square foot
O.S. = open space

Table 5 *Draft*

Nonpotable Water Demand Factors

Land Use Category	Percent Irrigated with Recycled Water	Nonpotable Irrigation Demand Factors (AF/acre/year)	Comparison with Prior Net-Acreage Demand Factors (AF/acre/year)		
			Prior Rate	Rate Reduction	Percent Reduction
Residential					
Low Medium (Multi-Family Detached)	15%	4.62	6.70	2.08	31.0%
Low Medium (Multi-Family Attached)	15%	4.62	6.70	2.08	31.0%
Medium (Multi-Family Detached)	15%	4.62	6.70	2.08	31.0%
Medium (Multi-Family Attached)	15%	4.62	6.70	2.08	31.0%
High and Mixed Use (Multi-Family)	15%	4.62	6.70	2.08	31.0%
Apartments (Multi-Family)	15%	4.62	6.70	2.08	31.0%
Nonresidential					
Mixed-Use Commercial (Retail)	25%	3.14	5.36	2.22	41.4%
Mixed-Use Commercial (Office)	25%	3.14	5.36	2.22	41.4%
Commercial (Retail)	25%	3.14	5.36	2.22	41.4%
Business Park (Office)	25%	3.14	5.36	2.22	41.4%
Business Park (Industrial)	25%	3.14	5.36	2.22	41.4%
Institutional	25%	3.14	5.60	2.46	43.9%
Hotel/Spa	25%	4.10	5.36	1.26	23.5%
Hospital	25%	4.10	5.60	1.50	26.8%
Sr. Assisted Living	25%	4.10	5.60	1.50	26.8%
Golf Club House	0%	—	—	—	—
Visitor Serving	25%	3.14	5.60	2.46	43.9%
Water Reclamation Plant	25%	3.14	4.48	1.34	29.9%
Electrical Substation	0%	—	—	—	—
Fire Stations	25%	3.14	5.60	2.46	43.9%
Schools	25%	6.02	5.60	-0.42	-7.5%
Recreation, Arterials, Open Space					
Recreation Centers	75%	5.25	5.10	-0.15	-2.9%
Neighborhood Parks	75%	5.25	5.10	-0.15	-2.9%
Golf Course	100%	6.21	5.80	-0.41	-7.1%
Lake (Water Feature)	100%	6.97	6.4	-0.57	-8.9%
Arterial Highway Hardscape / Road Section	0%	—	—	—	—
Arterial Highway Landscaped Areas	100%	3.14	3.47	0.33	9.5%
Natural Open Space	0%	—	—	—	—
River Corridor	0%	—	—	—	—
Non-Irrigated Slopes	0%	—	—	—	—
Irrigated Slopes, Wet Zones	100%	3.14	3.47	0.33	9.5%
O.S. Drainage Facilities	0%	—	—	—	—
O.S. LDZ, O.S. Trail LDZ, SD&SS easements	90%	3.14	3.85	0.71	18.4%

Notes

— = Denotes that this land type is not irrigated.

AF = acre-feet O.S. = open space

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Table 6
Single Family and Multi-Family Persons per Household Assessment for Recently-Constructed Residences at the Bridgeport, North Park, and Stevenson Ranch Developments (Using 2010 U.S. Census Block Data)
(Prepared by Valencia Water Company and GSI Water Solutions, Inc. in 2016)

Location	Housing Type	Attached/Detached	Units	Population	PPHH	Notes
Bridgeport	SF	Detached	206	608	2.95	SF Attached around lake and west on NH Ranch Parkway
North Park	SF	Detached	139	436	3.14	
North Park	SF	Detached	214	720	3.36	
North Park	SF	Detached	125	424	3.39	
North Park	SF	Detached	44	153	3.48	High Density Detached
Stevenson Ranch	SF	Detached	128	275	2.15	
Stevenson Ranch	SF	Detached	189	523	2.77	Stevenson Ranch Parkway and The Old Road
Stevenson Ranch	SF	Detached	78	262	3.36	North of Pacific Colony
Stevenson Ranch	SF	Detached	22	80	3.64	
Stevenson Ranch	SF	Detached	146	540	3.70	
Stevenson Ranch	SF	Detached	30	130	4.33	
Westridge	SF	Detached	877	3085	3.52	
Bridgeport	SF	Attached	118	272	2.31	
North Park	SF	Attached	27	44	1.63	
North Park	SF	Attached	46	95	2.07	Village Walk
North Park	SF	Attached	52	123	2.37	
North Park	SF	Attached	20	52	2.60	
North Park	SF	Attached	30	86	2.87	
North Park	SF	Attached	21	64	3.05	Provence
Stevenson Ranch	SF	Attached	24	58	2.42	Marblehead Palisades Condos
Stevenson Ranch	SF	Attached	57	141	2.47	Marblehead Palisades Condos
Bridgeport	MF	Attached	188	402	2.14	Bridgeport Coast Apartments
North Park	MF	Attached	201	416	2.07	Skycrest Apartments

Housing Type	Attached/Detached	Mean PPHH	PPHH Range
SF	Detached	3.292	2.15 to 4.33
SF	Attached	2.367	1.63 to 3.05
MF	Attached	2.103	2.07 to 2.14

Notes

MF = multi family

SF = single family

PPHH = persons per household

Table 7 *Draft*

Changes in Water Demands Projections for Entrada South

Demand Projection	Potable Demand (AFY)	Nonpotable Demand (AFY)	Total Demand (AFY)	Total Population	Per Capita Demands (gpcpd)
2014 Projection	703	440	1,143	4,506	226
2021 Projection	435	428	863	3,726	207
Change from 2014 Projection	-268	-12	-280	-780	-20
Percent Change from 2014 Projection	-38%	-3%	-24%	-17%	-9%

Notes

(1) Demand values are in units of acre-feet per year (AFY), except per-capita demands are in units of gallons per person per day.

(2) Demand estimates in 2014 use demand factors without the current CALGreen and MWELO water conservation standards. Demand estimates in 2021 incorporate current water conservation standards (CALGreen and MWELO).

(3) The values in this water demand estimate are approximate and are subject to change at the time of preparation of tentative or final land use maps.

AFY = acre-feet per year gpcpd = gallons per capita per day

CALGreen = State of California's Green Building Standards Code

MWELO = Model Water Efficient Landscape Ordinance

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Attachment 1

Detailed Land Use Tables for Entrada South and Valencia Commerce Center December 2021

All data and acreages in this analysis are approximate and are subject to change at the time of preparation of tentative or final land use maps.

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Land Use Details for Entrada South

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Land Use Category	VTTM Planning Area	No. Of Units	Square Footage	Acreage	Product Type	Notes	Number of Dwellings				Acreage			
Residential							SFD	Detached Condos	Attached	Total DU's	SFD	Detached Condos	Attached	Total Acreage
Estate		0	---	0.0			0	0	0	0	0	0	0	0
Low		0	---	0.0			0	0	0	0	0	0	0	0
Low Medium		452	---	53.2	SFD: 5a, 5b, 5c, 6a, 6b, 7a, 7b, 7c, 8a, 8b, 8c, 8d		0	452	0	452	0	53.2	0	53.2
Medium		839	---	57.9	SFA: 4e, 4f, 4g, 4h, 9a, 9b, 9c, 9d, 10a, 10b, 13a, 13b		0	0	839	839	0	0	57.9	57.9
High and Mixed Use		283	---	4.3	4b		0	0	283	283	0	0	4.3	4.3
Apartments		0	---	0.0			0	0	0	0	0	0	0.0	0.0
Subtotal		**1,574**		**115.4**			**0**	**452**	**1,122**	**1,574**	**0.0**	**53.2**	**62.2**	**115.4**
Non-Residential														
Mixed Use Commercial - Retail			6,495	1.5	4B, 4C	4B already counted in Residential AC								
Mixed Use Commercial - Office			518,505	46.9	1, 2, 3, 4a, 4d,									
Mixed Use Commercial - Total			**525,000**	**48.4**										
Commercial - Retail			0	0.0	PA 14									
Commercial - Office			45,000	2.8										
Commercial-Total			**45,000**	**2.8**										
Business Park (Office)														
Hotels and Spas			160,000	5.6	PA 12									
SCE Substation														
Fire Station														
Sheriff Station														
Water reclamation plant														
Sr. Assisted Living														
Business Park (Industrial)														
Visitor center														
Golf club house														
Library														
Elementary School(s)				10.0	750 students									
Middle School														
High School														
Subtotal			**730,000**	**66.8**										
Recreation, Arterials, and Open Space														
Water Feature														
Irrigated Slope				66.6	Measured flat; multiply by 1.12 slope factor									
Irrigated Flat				4.7										
Wet Zone (Unspecified Length)														
30' wet zone														
50' wet zone														
70' wet zone														
Roads/bridge				12.9										
Existing Roads				13.0										
Access Road														
Non irrigated slope														
Non irrigated flat														
Non irrigated-brush clearing zone														
Debris basin				8.1										
Water quality				7.6										
Natural OS				58.7										
LDZ OS				4.7										
Trail OS														
Unspecified OS														
Trailhead														
Parkways & medians				4.1										
Lake														
Sidewalk				2.9										
Private Utility														
Bank Protection														
River														
Drainage				9.4										
Golf course														
Recreation centers	PA-8		0											
Parks	PA-8		0	8.1										
SD & SS Easement														
Channel														
Subtotal				**200.8**										

Abbreviations: SFD = single-family detached, SFA = single-family attached, DU = dwelling unit
VTTM = Vesting Tentative Tract Map

	Units	SF (Non-Res)	Acreage
GRAND TOTAL	**1,574**	**730,000**	**383.0**

All data and acreages in this analysis are approximate and are subject to change at the time of preparation of the tentative or final land use maps.

Land Use Details for Valencia Commerce Center

Draft

Land Use Category	VTTM Planning Area	No. Of Units	Square Footage	Acreage	Product Type	Notes
Residential						
Estate						
Low						
Low Medium						
Medium						
High and Mixed Use						
Apartments						
Subtotal		**0**		**0.0**		
Non-Residential						
Mixed Use Commercial - Retail						
Mixed Use Commercial - Office	PA-2, PA-3, PA-5		911,400	68.5		Mixed-use office (low rise offices)
Mixed Use Commercial - Total			**911,400**	**68.5**		
Commercial - Retail	PA-2, PA-5		58,400	11.9		
Commercial - Office						
Commercial - Total			**58,400**	**11.9**		
Business Park (Office)						
Hotels and spas						
SCE Substation						
Fire Station						
Sheriff Station						
Water reclamation plant						
Sr. Assisted Living						
Business Park (Industrial)	PA-1, PA-3, PA-4, PA-6, PA-7		2,430,200	139.2		
Visitor center						
Golf Club House						
Library						
Elementary School(s)						
Middle School						
High School						
Subtotal			**3,400,000**	**219.6**		
Recreation, Arterials, and Open Space						
Water Feature						
Irrigated Slope				27.7		
Irrigated Flat						
Wet Zone (Unspecified Length)						
30' wet zone						
50' wet zone						
70' wet zone						
Roads/bridge				12.4		
Existing Roads						
Access Road						
Non irrigated slope				8.3		
Non irrigated flat						
Non irrigated-brush clearing zone						
Debris basin				2.5		
Water quality				1.2		
Natural OS				264.6		
LDZ OS						
Trail OS						
Unspecified OS				21.0		
Trailhead						
Parkways & medians				1.9		
Lake						
Sidewalk						
Private Utility						
Bank Protection						
River						
Drainage				10.4		
Golf course						
Recreation centers						
Parks						
SD & SS Easement						
Channel						
Subtotal				**350.0**		

	Units	SF (Non-Res)	Acreage
GRAND TOTAL	**0**	**3,400,000**	**569.6**

All data and acreages in this analysis are approximate and are subject to change at the time of preparation of the tentative or final land use maps.

Attachment 2

Summary of State and Local Laws and Regulations Governing Water Conservation in California December 2021

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DRAFT ATTACHMENT 2: SUMMARY OF STATE AND LOCAL LAWS AND REGULATIONS GOVERNING WATER CONSERVATION IN CALIFORNIA

1. Introduction

Dating back to 2006, a series of noteworthy California laws have been enacted that affect the types and implementation of various water conservation and water use reduction activities and programs that are ongoing throughout the state. Below are discussions of the state's laws and regulations (Section 2); County of Los Angeles (L.A. County or County) ordinances (Section 3); and water use reduction activities and programs being implemented by the Santa Clarita Valley Water Agency (SCV Water), including by its Valencia Water Division (VWD), which is the water provider for the West Side Communities (Section 4). Section 5 contains a list of references cited in this attachment.

2. State Laws and Regulations

Table 2-1 lists the state laws and ordinances that collectively have promoted greater water use efficiency and conservation since the time that the original water demand factors for the West Side Communities were first established. Table 2-1 also identifies the entities and types of development activities to which the state laws and ordinances apply.

2.1 Early Legislation

Four laws were enacted by the California State Legislature from 2006 through 2009 to promote efforts to reduce water use state-wide in response to drought conditions and increasing population. These laws were accompanied by the passage of ordinances by state and local regulatory agencies to implement the legislation.

While three of the laws targeted specific uses, the fourth law (Senate Bill SBX7-7) was a much broader legislation that addressed urban water use on a state-wide scale and that officially sunsetted on December 31, 2020. SBX7-7 required the state to achieve a 20-percent reduction in urban per-capita water use by the end of 2020. Locally, this was implemented in the Urban Water Management Plans (UWMPs) prepared by SCV Water and its predecessor agency (the former Castaic Lake Water Agency [CLWA]). The UWMPs contained demand-reduction targets and associated implementation programs involving best management practices (BMPs) or demand management measures (DMMs) to implement the required 20-percent reduction in urban per-capita water use by the end of 2020. In the Santa Clarita Valley, this was implemented in part by requiring SCV Water, CLWA, and the former local retail water purveyors to establish (in their UWMP) demand-reduction targets and associated implementation programs involving BMPs or DMMs.

Currently, two sets of state rules and regulations govern the design and construction of buildings and landscapes for new developments: the state's green building standards (California's Green Building Standards Code [CALGreen]), and the state's landscape ordinance (Model Water Efficient Landscape Ordinance [MWELO]). Additionally, state legislation promulgated by both the Assembly and the House in 2018 sets future targets for per-person residential indoor water use that municipal water providers must achieve on an average basis within their service area. These three topics are discussed in Sections 2.2 through 2.4.

2.2 California's Green Building Standards (CALGreen)

CALGreen is the state's green building standards code. It is formally known as Title 24, Part 11, the California Green Building Standards Code. CALGreen identifies mandatory and voluntary provisions that apply to the planning, design, operation, construction, use, and occupancy of every newly constructed building or structure on a statewide basis. Certain provisions that are under the jurisdiction of the California Department of Housing and Community Development (HCD) apply to "low-rise residential" facilities, which are defined by

CALGreen as "[a] building that is of Occupancy Group R and is three stories or less, or that is a one- or two-family dwelling or townhouse" (HCD, 2010). CALGreen also requires that each portion of a mixed occupancy building comply with the specific green building measures applicable to that occupancy. Therefore, if a building's design includes commercial and residential uses, then both the non-residential and residential provisions apply to appropriate portions of the building.

The California Building Standards Commission (CBSC) first published CALGreen in mid-2010 as part of the 2010 code adoption process (CBSC, 2010), and CALGreen became effective on January 1, 2011. A comprehensive update of CALGreen is conducted every 3 years or less. The 2013 California Building Standards Code, which includes the 2013 version of CALGreen, was published on July 1, 2013 (CBSC, 2013) and became effective on January 1, 2014. Additional updates to CALGreen were issued on July 1, 2015, July 1, 2016, January 1, 2018, and January 1, 2021 (CBSC, 2015, 2016, 2018, and 2021). Table 2-2 lists the CALGreen standards that were issued on January 1, 2021, and became effective on July 1, 2021, categorized as mandatory versus voluntary measures, and categorizing them by residential and nonresidential requirements.

The 2021 update of CALGreen contains the most current sets of mandatory water use measures for residences (see Division 4.3 of the code) and nonresidential buildings (see Division 5.3 of the code). A more stringent set of voluntary measures is published in Appendix A4 of the code for residences and in Appendix A5 of the code for nonresidential buildings; if these measures are adopted by the local jurisdiction, then some of the measures become mandatory while others remain voluntary.

2.3 State Legislation Revising Future Residential Indoor Water Use Standards

Assembly Bill (AB) 1668 and Senate Bill (SB) 606 were signed into law on May 31, 2018, and together set permanent overall targets for water consumption, with particular focus on indoor uses of water.

AB 1668 requires the establishment of specific long-term standards for per-capita daily indoor residential water use, plus performance measures for commercial, industrial, and institutional water use. The bill requires the California Department of Water Resources (DWR) and the State Water Resources Control Board (SWRCB) to study urban indoor water-use standards and make recommendations for those standards to the state legislature by January 1, 2021. Final standards for urban indoor water-use will be adopted by the state legislature for incorporation into Section 10609.4 of the California Water Code. AB 1668 contains provisional standards for indoor residential water use rates as follows:

- Until January 1, 2025: 55 gallons per capita per day
- Beginning January 1, 2025: The greater of 52.5 gallons per capita per day or a standard recommended by DWR and the SWRCB
- Beginning January 1, 2030: The greater of 50 gallons per capita per day or a standard recommended by DWR and the SWRCB

AB 1668 defines performance measures for commercial, industrial, and institutional (CII) water use as consisting of actions taken by urban retail water suppliers that result in increased water use efficiency for water uses other than process water (defined in Section 10608.12(p) of the State Water Code). The bill amends Section 10608.12(n) of the State Water Code to state that performance measures may include educating CII water users on BMPs, conducting water use audits, and preparing water management plans. AB 1668 requires SWRCB to adopt long-term performance measures for CII water uses by June 30, 2022.

While AB 1668 is focused primarily on indoor water uses of urban water, it also revises State Water Code Section 10608.20(b)(2)(B) to require that landscapes irrigated through dedicated or residential meters or connections must meet the state's standards for irrigated landscape design (discussed in Section 2.4).

SB 606 requires an urban retail water supplier to calculate an urban water use objective no later than November 1, 2023, and by November 1 of each year thereafter. This bill also revises certain provisions in the

Urban Water Management Planning Act, including requiring that urban water suppliers include in their UWMP a drought risk assessment that examines water shortage risks for a 5-year-long drought. In a case where an urban water supplier has not submitted its UWMP to DWR, SB 606 deems the supplier to be ineligible for any water grant or loan, whereas prior law had limited this ineligibility to just certain types of water grants and loans. SB 606 also requires urban water suppliers to prepare, adopt, and periodically review a water shortage contingency plan, conduct an annual supply and demand assessment, and submit an annual water shortage assessment report to DWR.

In August 2018, DWR issued a public-review draft version of a detailed primer discussing these two bills and their implementation (DWR, 2018). As noted on page 7 of the primer, the SWRCB's actions for adopting and implementing water use efficiency standards have been deemed by the legislature to be Class 8 actions for protecting the environment and hence are exempt from the requirements of the California Environmental Quality Act. The primer goes on to note that the new authorities and requirements for urban water use objectives (1) are enforceable after 2022, (2) do not modify the current statewide goal of a 20 percent reduction in urban per-capita water use by 2020, and (3) should result in urban water conservation that exceeds the 2020 targets.

2.4 California's Model Water Efficient Landscape Ordinance (MWELO)

In 2006, the California Assembly passed AB 1881, which is known as the *Water Conservation in Landscaping Act of 2006*. AB 1881 requires cities and counties to develop and implement (1) guidelines for local landscape ordinances and water-efficient landscape design, and (2) regulations and performance standards for energy-efficient landscape materials (including controllers and soil moisture sensors). This legislation also requires that water purveyors, after January 1, 2005, install separate water meters to measure the volume of water used exclusively for landscape purposes.

On September 10, 2009, DWR adopted its MWELO in response to the passage of AB 1881. This ordinance specified calculation methods and key input parameters (such as reference evapotranspiration rates [ETo] values) for determining the Maximum Applied Water Allowance (MAWA), which is the maximum amount of water that can be applied to an irrigated landscape. Local agencies were required to adopt the MWELO or an alternative local ordinance by January 2010. At that time, the City of Santa Clarita notified DWR that it would adopt the state's MWELO ordinance rather than develop its own ordinance (DWR, 2010). In contrast, L.A. County did not provide such a notification, most likely because it had already enacted ordinances in 2009 that specify water use efficiency requirements for landscapes.

DWR enacted new rules that updated the MWELO, effective September 2015. This update of the MWELO is contained in Sections 490 through 495, Chapter 2.7, Division 2, Title 23 in the California Code of Regulations. The 2015 MWELO applies to landscaping and irrigation systems at most new construction sites and in landscapes 500 square feet or larger that are being renovated. DWR enacted the 2015 MWELO in response to the Governor's Executive Order B-29-15 of April 1, 2015, which ordered further cuts in water use and included (in paragraph 11) a directive for DWR to update the MWELO to increase water efficiency standards for new and existing landscapes. Noteworthy aspects of the 2015 MWELO update include the following:

- Appendix A of the 2015 MWELO specifies the ETo that is to be used for evaluating compliance with the MWELO. These rates were updated in some locations from values published in the prior version of the MWELO. In Santa Clarita, Appendix A of the 2015 MWELO specifies an annual water demand for cool-season turf grass to be 61.5 inches per year, which is equivalent to approximately 5.1 feet per year.
- For landscapes using potable water, the 2015 MWELO update limits the maximum allowable water application rate to 55 percent of ETo for residential landscapes and 45 percent of ETo for non-residential landscapes. In Santa Clarita, this equates to 33.8 inches per year (approximately 2.8 feet per year) on residential landscapes and 27.7 inches per year (approximately 2.3 feet per year) on non-residential landscapes.

- For landscapes that meet the 2015 MWELO's definition of a Special Landscape Area (SLA), water application is allowed at rates up to 100 percent of ETo. SLAs include landscapes solely dedicated to edible plants; recreational areas outside of residential land parcels that are designated for active play, recreation, or public assembly; areas irrigated with recycled water; and water features that use recycled water.

Local agencies had until December 1, 2015, to adopt the 2015 MWELO ordinance or to adopt a Local Ordinance at least as effective in conserving water as the 2015 MWELO ordinance. Local agencies working together to develop a Regional Ordinance had until February 1, 2016, to adopt such an ordinance, but they were still subject to the December 2015 reporting requirements described in the 2015 MWELO ordinance.

3. County of Los Angeles Ordinances

L.A. County's Green Building Standards (contained in Title 31 of its municipal code) include requirements for water efficiency and conservation. These requirements were first enacted on December 18, 2008 in the form of two ordinances[1] which amended Title 21 (Subdivisions) and Title 22 (Planning and Zoning) of the L.A. County Code to:

- Establish drought-tolerant landscaping requirements for projects constructed after January 1, 2009 (ordinance number 2008-0064), and
- Establish green building development standards for projects constructed after January 1, 2009 (ordinance number 2008-0065)

On March 29, 2016, the L.A. County Board of Supervisors removed these particular ordinances from Title 21 and Title 22 of the Code and incorporated them into Title 31, along with a new tree-planting ordinance.[2]

The drought-tolerant landscaping ordinance (number 2008-0064) requires that 75 percent of a lot or parcel's landscaped area contain native and/or non-native plants listed by the County as being drought-tolerant. The ordinance also specifies that no more than 25 percent of the total landscaped area on a lot or parcel can consist of turf. The County's list of drought-tolerant plants and turf is organized by ecological zones, as described in the County's drought-tolerant landscaping handbook (L.A. County, 2012). The Santa Clarita Valley is identified in the handbook as residing in *Zone 6 Inland Mountains (Grapevine, Castaic, Santa Clarita).* For this zone and other zones in L.A. County, the handbook identifies the specific trees, vines, perennials, ground covers, hedges, decorative grasses, and turfs that meet the drought-tolerant landscaping requirement. The ordinance applies to residential and non-residential properties, but provides exemptions for public recreational lawns, parks, orchards, and vegetable gardens. The ordinance also states that exemptions may be granted by the L.A. County Department of Public Works for (1) landscaped areas constructed as part of stormwater low impact development facilities, and (2) manufactured cut or fill slopes that have gradients equal to or exceeding a slope of 3:1.

The County's requirements to maintain water efficient landscapes are contained in Title 20 (Utilities), Division 1 (Water), Chapter 20.09, with reference to (and additional requirements in) the County's building code (Title 26). Chapter 20.09 of Title 20 includes requirements for water purveyors to conduct water consumption audits on outdoor landscapes and provide audit results to the County's public works director. Subchapter 20.09.080 specifies that new and rehabilitated landscaping projects will require a permit under Title 26 (the building code).

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[1] Available at http://planning.lacounty.gov/assets/upl/data/ord_green-building-final-ordinances.pdf.
All County-adopted ordinances are available at http://planning.lacounty.gov/ord/adopted
[2] See http://planning.lacounty.gov/assets/upl/project/tpo_adopt_cert.pdf for details of this change.
The new tree planting ordinance is available at http://planning.lacounty.gov/tree

Title 22 (Planning and Zoning) of the County Code also contains development standards that specify the use of drought-tolerant lawn, shrubbery, flowers, or trees in certain land use zones.

- These requirements are specified for zones C-RU (rural commercial) and MXD-RU (rural mixed use development).
- In commercial zone C-MJ (major commercial), the code requires that any installed lawn be drought-tolerant.
- In its Hillside Design Guidelines (Appendix I to Title 22), Chapter V (for sensitive hillside design measures) specifies in Section 5.4 that landscapes on graded slopes and improved open spaces should utilize native and drought-tolerant trees, shrubs, and ground cover over all exposed graded areas. Section 5.3 states that at least two of six state- or County-required minimum standards must be achieved or exceeded, of which conserving water and improving water quality are two of these standards.
- For utility-scale solar energy facilities, Title 22 requires not only the use of non-invasive drought-tolerant vegetation (which must be approved by a County biologist), but also requires that hardscape materials be incorporated into the landscape design.

4. Local Water Conservation and Water Use Reduction Activities

This section of Attachment 2 contains information presented in CLWA's 2015 UWMP (Kennedy/Jenks Consultants et al., 2016) and SCV Water's recently completed 2020 UWMP (KJ, 2021).

The water purveyors in the Santa Clarita Valley have long recognized the need to encourage their customers to use water wisely. Educational programs and customer incentives to reduce water have been in place for many years. The Valencia Water Division (VWD) of SCV Water (formerly the Valencia Water Company [VWC]) has employed a full-time water conservation coordinator since 2005 and has added two more conservation specialists since that time. SCV Water/CLWA has a long history of also utilizing consultant services to implement various programs, including water audits, landscape training, and public outreach. A list of key activities by VWD/VWC through the year 2015 is contained in Table 2-3.

In 2006, VWC became a signatory to the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding (MOU), establishing a firm commitment to the implementation of BMPs or DMMs. In 2007, VWC coordinated the development and execution of an MOU with the other retail water purveyors to develop a Water Use Efficiency Strategic Plan (WUESP; A&N Technical Services, 2008) for the Santa Clarita Valley. The WUESP provided detailed information on available water use efficiency opportunities and defined concepts for program implementation, including a mix of recommended programs, a stakeholder engagement process, and funding mechanisms. While the plan focused on reducing existing demands, the plan also identified building ordinances as an essential tool for further increasing water use efficiency in new construction. The WUESP developed a comprehensive list of new building standards beyond those contained in local ordinances at that time. Those standards identified design improvements in the water-use efficiency of plumbing fixtures that were estimated to capture 60 percent of the expected reduction in water demand envisioned under the WUESP.

The WUESP was updated in 2015 (Maddaus Water Management and Western Policy Research, 2015) and adopted by the CLWA Board of Directors in June 2015. Several of the changes identified in the 2008 and 2015 versions of the WUESP are now captured by recent ordinances – in particular, the state's MWELO for landscaping (effective January 2010 and updated effective September 2015), the CALGreen Building Code (effective January 2011 and updated as recently as 2021, as discussed in Section 2.2), and L.A. County's related ordinances (effective January 2009). VWC and the other purveyors in the Santa Clarita Valley were implementing the majority of the WUESP programs by 2009, including managing and financing the WUESP programs.

As discussed in CLWA's 2010 and 2015 UWMPs (Kennedy/Jenks Consultants et al., 2011 and 2016) and SCV Water's 2020 UWMP (KJ, 2021), VWC/VWD continued to expand its conservation programs and efforts to meet both its SBX7-7 and DMM requirements. CLWA's 2015 UWMP demonstrated compliance by the local water retailers in meeting interim water use targets related to SBX7-7 requirements, and SCV Water's 2020 UWMP demonstrated compliance with its 2020 target. As discussed in Section 8 of the 2020 UWMP, SCV Water was able to meet its 2020 water use reduction targets through conservation and water use efficiency efforts that connected its water customers to the policies, programs, and practices that were necessary to meet these targets. Section 8 of the 2020 UWMP identifies 7 categories of DMMs that have been implemented by CLWA/SCV Water over the past 5 to 10 years in accordance with the UWMP Act:

1. Water waste prevention ordinance
2. Metering
3. Conservation pricing
4. Public education and outreach
5. Programs to assess and manages real losses in the distribution system
6. Water conservation program coordination and staffing support
7. Other DMMs which during the past five year, which have consisted of:
    a. Conservation programs:
        i. Lawn replacement incentives
        ii. Distribution and rebate program for irrigation smart controllers and soil moisture sensors
        iii. Rebates for irrigation efficiency upgrades, under its Healthy and Efficient Landscape Program (HELP)
        iv. Drip irrigation rebates for non-turf irrigation systems
        v. Rebates for purchase and installation of permanent pool covers
        vi. Providing water use efficiency benchmarking data to customers
        vii. Water efficiency checkup and retrofit program for residential and commercial customers, examining both indoor and landscape water uses
        viii. Distribution of residential home water efficiency kits
        ix. Online WaterSMART workshops on improving home water use efficiency
        x. Courtesy notifications of high water use to customers experiencing water use that is unusually high or above efficiency goals
        xi. Customized water efficiency rebates that were available from other southern California water districts from 2015 through 2018
        xii. School retrofit program for water use efficiency upgrades
        xiii. Commercial rebates for ultra-high-efficiency toilets (UHETs), high-efficiency toilets (HETs), and dual flush valve toilets (DFVTs)
        xiv. Commercial low/no water urinal rebates
        xv. Customized drought reports during the 2011-2017 drought
    b. Asset management practices:
        i. Implementation of a comprehensive pipeline replacement program
        ii. Annual electro-potential pipeline-to-soil surveys and evaluations of pipeline systems
        iii. Ongoing updates of the system hydraulic model and system evaluation
        iv. Installation, monitoring, and programming of telemetry equipment
        v. Use, development, and upgrade of GIS systems
        vi. Implementation of a new software system for tracking and scheduling the maintenance, repair, and replacement of system assets
        vii. Development and updating of a long-term repair and rehabilitation schedule and costs

Section 8.3 of the 2020 UWMP identifies that SCV Water plans to update the WUESP in 2022 while maintaining the operational levels identified in the 2015 WUESP for its active water conservation programs.

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Table 2-1

Draft

State Laws, Codes, and Other Requirements for Water-Use Efficiency Enacted Since 2006

Year	Who	Description	What	Applicable To	Compliance Date or Effective Date
2006	California State Assembly	AB 1881	Water Conservation in Landscaping Act of 2006	Local agencies (cities, counties, and/or water purveyors)	1/1/2010 compliance date
2007	California State Assembly	AB 715	Toilets and urinals	New sales and new installations	1/1/2014 effective date
2009	California State Senate	SB 407	Toilets, urinals, showerheads, and interior faucets	Buildings constructed on or before January 1, 1994	1/1/2017 compliance date for single-family residences
					1/1/2019 compliance date for multi-family residences and commercial properties
2009	California State Senate	SBX7-7	Reductions in Gallons per Capita per Day	Statewide water use	12/31/2020 compliance date
2009	California Department of Water Resources (DWR)	Updated Model Water Efficient Landscape Ordinance (MWELO)	Landscape irrigation (system design, scheduling, and application rates); plant selection; landscape maintenance	Landscapes that require a building or landscape permit	9/10/2009 adoption date
2010	California Building Standards Commission	CALGreen Building Standards Code	Indoor and outdoor water use standards	New construction	1/1/2011 effective date
2013	California Building Standards Commission	Current update to CALGreen Building Standards Code	Indoor and outdoor water use standards	New construction	7/1/2021 effective date
2015	Governor	Executive Order B-29-15	Drought-related order that included a directive to DWR to update the MWELO	Landscapes that require a building or landscape permit	4/1/2015 issuance date
2015	California Department of Water Resources (DWR)	Updated Model Water Efficient Landscape Ordinance (MWELO)	Landscape irrigation (system design, scheduling, and application rates); plant selection; landscape maintenance	Landscapes that require a building or landscape permit	7/15/2015 adoption date 9/15/2015 effective date
2018	California State Assembly and State Senate	AB 1668 and SB 606	Water management planning	Urban water suppliers (retail and wholesale, indoor and outdoor water uses) and agricultural water suppliers	5/31/2018 effective date 1/1/2021 DWR and SWRCB recommend long-term urban indoor water-use standards to legislature 6/30/2022 SWRCB adopts long-term CII water use performance measures

Notes

AB = Assembly Bill

CII = commercial/industrial/institutional

DWR = California Department of Water Resources

SB = Senate Bill

SBX7 = Senate Bill during Extended Session 7 of the 2009 Session

SWRCB = State Water Resources Control Board

Table 2-2 *Draft*

CALGreen Indoor Water Use Standards (Effective July 1, 2021)

Fixture	Mandatory Standard	Voluntary Standard
Residential (Division 4.3 for Mandatory Standards and Division A4.3 for Voluntary Standards)		
Toilets (Water Closets)	≤ 1.28 gal/flush	
Urinals	≤ 0.125 gal/flush (wall-mounted) ≤ 0.5 gal/flush (all others)	
Single showerheads	≤ 1.8 gpm @ 80 psi	
Multiple showerheads	≤ 1.8 gpm @ 80 psi (per valve)	
Lavoratory faucets in residences	≤ 1.2 gpm @ 60 psi	
Lavoratory faucets in common areas	≤ 0.5 gpm @ 60 psi	
Kitchen faucets	≤ 1.8 gpm @ 60 psi	≤ 1.5 gpm @ 60 psi
Metering faucets	≤ 0.2 gallons per cycle	
Standard residential dishwashers		≤ 4.25 gallons per cycle and ENERGY STAR certified[1]
Compact residential dishwashers		≤ 3.5 gallons per cycle and ENERGY STAR certified[1]
		Install at least one qualified ENERGY STAR dishwasher or clothes washer.
		Install nonwater urinals, hybrid urinals, or waterless toilets.
		Install a demand-based hot water recirculation system in 1- and 2-family dwellings.
Nonresidential (Division 5.3 for Mandatory Standards and Division A5.3 for Voluntary Standards)		
Toilets (Water Closets)	≤ 1.28 gal/flush	< 1.12 gal/flush
Urinals	≤ 0.125 gal/flush (wall-mounted) ≤ 0.5 gal/flush (all others)	≤ 0.11 gal/flush (wall-mounted) ≤ 0.44 gal/flush (all others)
Single showerheads	≤ 1.8 gpm @ 80 psi	≤ 1.6 gpm @ 80 psi
Multiple showerheads	≤ 1.8 gpm @ 80 psi (per valve)	
Lavoratory faucets	≤ 0.5 gpm @ 60 psi	≤ 0.35 gpm @ 60 psi
Kitchen faucets	≤ 1.8 gpm @ 60 psi	≤ 1.6 gpm @ 60 psi
Wash fountains	≤ 1.8 gpm per 20 rim space inches @ 60 psi	< 1.6 gpm per 20 rim space inches @ 60 psi
Metering faucets	≤ 0.20 gallons per cycle	< 0.18 gallons per cycle
Metering faucets for wash fountains	≤ 0.20 gpm per cycle per 20 rim space inches @ 60 psi	< 0.18 gpm per cycle per 20 rim space inches @ 60 psi
Food waste disposers	≤ 1.0 gpm when not in use ≤ 8.0 gpm when in use	
Food waste pulping system		≤ 2 gpm
Pre-rinse spray valves		≤ 1.6 gpm @ 60 psi
Food steamers		≤ 2 gal/pan/hour, including condensate water (batch-type steamers) ≤ 5 gal/pan/hour, including condensate water (cook-to-order steamers)
Combination ovens		≤ 1.5 gal/pan/hour, including condensate water
Commercial clothes washers		At least 10 percent below CA Energy Commission standards
Commercial dishwashers		Variable (see Table A5.303.3 in Division A5.3 of the 2021 CALGreen code)

Notes

[1] These standards are listed in the "nonresidential voluntary measures" portion of the 2021 CALGreen code update (in Division A5.303.3 of Appendix A5 of the code).

For residential buildings, Tier 1 status is achieved when mandatory measures plus at least 2 voluntary measures are met, and Tier 2 is achieved when mandatory measures plus at least 3 voluntary measures are met.

For nonresidential buildings, Tier 1 or Tier 2 status is achieved with either a minimum 12% or 20% reduction (respectively) in potable water use above a demonstrated baseline amount.

gal= gallons

gpm = gallons per minute

psi = pounds per square inch

Table 2-3 *Draft*

Select Water Conservation Activities by Valencia Water Company through 2015

Year	Who	Description	What
2006	Valencia Water Co.	CUWCC MOU	Commitment to implement BMPs or DMMs
2008	Valencia Water Co. and other local water purveyors	Local purveyors' collective strategy for increasing water use efficiency	Water Use Efficiency Strategic Plan (prepared for Santa Clarita Valley Family of Water Suppliers)
2011	Valencia Water Co.	Revisions to billing rate structure	Switch from volumetric rate structure to tiered rate structure, to support VWC's WaterSMART Allocation program.
2011	Valencia Water Co. and other local water purveyors	2010 UWMP	Established urban water use targets for SBX7-7 (reductions in per-capita water use by the years 2015 and 2020); presented accordant demand estimates every 5 years for the period 2015 through 2050; and presented Demand Management Measures (DMMs) and recycled water usage plans that are designed to meet the SBX7-7 water use reduction targets. Identified landscape irrigation as providing the greatest opportunity to achieve the reductions.
2015	Valencia Water Co. and other local water purveyors	Update of local purveyors' collective strategy for increasing water use efficiency	Update of Water Use Efficiency Strategic Plan (prepared for Santa Clarita Valley Family of Water Suppliers) (adopted by CLWA Board, June 2015)

Notes

BMPs = Best Management Practices

CLWA = Castaic Lake Water Agency

CUWCC = California Urban Water Conservation Council

DMMs = Demand Management Measures

MOU = Memorandum of Understanding

UWMP = Urban Water Management Plan

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Attachment 3

Derivation of Water Demand Factors December 2021

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DRAFT ATTACHMENT 3:
TEXT - DERIVATION OF WATER DEMAND FACTORS

1. Introduction

Water demand factors were first developed and applied to the planning for Newhall Ranch during the mid-1990s (CH2M HILL, 1996). Minor adjustments to the factors being used in the analyses for Entrada South, Valencia Commerce Center, and other West Side communities[1] were made in 2007 by GSI Water Solutions, Inc. (GSI), in coordination with a separate recycled water master plan study (DWE, 2007) conducted for the former Valencia Water Company (VWC), which is now the Valencia Water Division (VWD) of the Santa Clarita Valley Water Agency (SCV Water). The VWD is the retail water provider that is expected to serve the West Side communities. GSI documented the details regarding the 2007 adjustments to the water demand factors (2008 and 2010). Those water demand factors later were used to prepare comprehensive summaries of water demand projections for each village—first in 2010 (GSI, 2010), and then in a later update (GSI, 2016a) that was conducted to incorporate revisions at that time to the land use plans for each community. These factors were also used in an update conducted in 2014 for Entrada South (GSI, 2014).

Since that time, changes in state and local water use regulations and standards have established indoor and outdoor water use requirements and water conservation standards that will reduce the water demands in Entrada South, Valencia Commerce Center, and other West Side communities compared with previous estimates. Accordingly, during 2020, GSI revised the water demand factors based on current state and local water conservation standards and developed new water demand projections (GSI, 2020) to support SCV Water's development of its 2020 Urban Water Management Plan (KJ, 2021). Section 2 describes the approach for estimating new water demand factors and water-use savings under the state's current water conservation standards. Sections 3 and 4 present the calculations of new water demand factors and water-use savings for indoor and outdoor water uses, respectively.

2. Approach for Estimating New Water Demand Factors and Water Savings

GSI has conducted analyses of the amount of water that can be expected to be used annually for each type of land use under the current water conservation standards, as defined in the state's Green Building Standards Code (CALGreen) and the state's requirements for irrigation on urban landscapes (the Model Water Efficiency Landscape Ordinance [MWELO]). GSI conducted separate analyses of the amount of water demand and water-use savings that potentially can be achieved by implementing current water conservation standards for:

- Indoor water use in single-family and multi-family residences and in commercial/industrial/institutional (CII) facilities
- Outdoor water use for (1) potable needs such as swimming pools, washing, and landscape irrigation on certain residential properties, and (2) landscape irrigation with recycled water or other available supplies on residential and nonresidential common spaces and easements

Methods for evaluating indoor and outdoor water demands and water-use savings are discussed in Section 2.1 for indoor water uses and Section 2.2 for outdoor water uses.

[1] The West Side Communities are comprised of the Newhall Ranch Specific Plan villages along with Entrada South, Entrada North, Legacy Village, and Valencia Commerce Center. Five Point Holdings, LLC (FivePoint) is the developer of the West Side Communities.

2.1 Methodology for Evaluating Indoor Water Demands and Water-Use Savings

GSI's methodology for developing indoor water demand factors and estimates of potential indoor water-use savings under the state's current indoor water conservation standard (CALGreen) was as follows:

- **Identify and review available literature quantifying indoor water use details for historical time periods prior to 2000 (i.e., 1990s and earlier).** Publications and prior studies by the American Water Works Association Research Foundation (AWWARF) (1999) and the California Homebuilding Foundation (CONSOL, 2015) quantify historical water usage rates of individual indoor plumbing fixtures from the 1970s through the 1990s. Some of these studies also discuss the frequency of the use of each fixture and appliance. GSI used this information to calculate bulk indoor residential per capita use rates for typical indoor water use conditions prior to the year 2000. See Tables 3-1a and 3-1b for these details. These rates also were compared with the rates used in prior water demand models for Entrada South, Valencia Commerce Center, and other West Side communities, as shown in Table 3-2.
- **Conduct an initial comparison of historic and modern-day water consumption rates for indoor water uses.** The set of fixture-by-fixture rates and daily bulk indoor water use rates developed in the prior step for historical (1990s-era) conditions was compared in tabular form with the lower water consumption rates that are mandated under current state and local green building standards—particularly Los Angeles County's (L.A. County's) Green Building Standards (Title 31 of its municipal code), which by reference complies with the CALGreen standards that were first published in 2010 (CBSC, 2010) and have since been updated/supplemented approximately every 2 to 3 years (CBSC, 2013, 2015, 2016, 2018, and 2021). GSI then tabulated the fixture-specific differences between the historic and modern-day consumption rates using both the 2015 version of the CALGreen standards (see Table 3-1a) and the 2021 version of the CALGreen standards (see Table 3-1b). Both tables show the resulting reductions in daily indoor water use rates that arise from the CALGreen standards compared with historical (1990s) rates of water use. The reductions in daily indoor water use were evaluated for each residential land use type and for each type of CII facility, as defined in the water demand model (see Tables 3-3, 3-4, 3-5, and 3-6). In preparing these tables, GSI used per capita, per acre, and square footage measures for calculating the bulk daily rates, to be consistent with methods used in the water demand model for each type of residence and CII facility.
- **Cross-check the initial estimates of past and current per capita rates of indoor use against historic population and water reclamation plant (WRP) flow data.** During development of a numerical groundwater flow model for the Santa Clarita Valley (CH2M HILL, 2004), the local water agencies provided monthly and annual WRP flow data dating back to 1980 for the Saugus and Valencia WRPs. For the current evaluation of water demands and potential water-use savings, GSI obtained population and other census data for the City of Santa Clarita and Stevenson Ranch and calculated per capita indoor water use rates using the census data and the WRP flow data. The resulting per capita flow rates then were compared with the per capita indoor water use rates developed in the prior steps for (1) historic conditions (the 1990s) and (2) more recent conditions that reflect a mixture of indoor facilities and water uses (old, remodeled homes with updated fixtures and appliances; older homes with little or no updates to fixtures and appliances; and new homes that meet current or recent building standards). See Table 3-2.
- **Develop a final set of past and current per capita rates of indoor use.** The per capita rates identified from the prior step were then assembled into a table to provide a direct comparison of the volumetric reduction in daily per capita indoor water use from residences from the mid-1990s to the present, and to define the percentage by which historic per capita rates of residential water use would be reduced under the requirements of current green building standards (see Table 3-3). The percentage decline was applied as a scaling factor to develop indoor water use rates for CII facilities (see Tables 3-4 and 3-5), given that the planned CII facilities inside Entrada South, Valencia Commerce Center, and other West Side communities will largely be commercial and institutional in nature, with industrial facilities consisting solely of light industry in Valencia Commerce Center. Additionally, as indicated in Table 3-4, the measurement units for

indoor water demand factors at elementary, middle, and high schools were changed from gallons per acre per day (gpcpd) to gallons per student per day, with the new demand factor (20 gallons per student per day) derived from water use and demographic data provided by SCV Water for existing schools in the Santa Clarita Valley (as shown in Table 3-6).

2.2 Methodology for Evaluating Outdoor Water Demands and Water-Use Savings

GSI's methodology for developing outdoor water demand factors and estimates of potential outdoor water-use savings under the state's current outdoor water conservation standard (MWELO) was as follows:

- **Calculate the expected reduction in outdoor potable water demands in residential and nonresidential areas.** These demands primarily consist of volumetrically driven water uses (such as filling swimming pools and washing cars) that will decline only modestly under the current water conservation standards for non-irrigation uses of water (see Table 3-5). For single-family residences, the potable demands also include irrigation because these land parcels will not be served with recycled water.
- **Identify and review available state and local code requirements for water efficiency and water use standards on irrigated landscapes.** This effort focused on the requirements contained in the MWELO, for which an extensive change became effective in September 2015. This ordinance specifies calculation methods and key input parameters (such as reference evapotranspiration rates [ETo] values in Santa Clarita) that are used to determine the Maximum Applied Water Allowance (MAWA) for landscapes that are irrigated with potable water. The MWELO ordinance also provides certain exceptions that are granted for Special Landscape Areas, which include areas that are irrigated with recycled water. While the 2015 MWELO was the primary ordinance that GSI used to estimate outdoor water savings, GSI also reviewed L.A. County publications (including L.A. County, 2012) and the County's website for further supplemental information on water demand limits and requirements for landscapes (see Table 3-7). Additionally, at the request of SCV Water, GSI used an ETo value (67.7 inches per year) that is based on measurements collected by SCV Water at its Rio Vista Water Treatment Plant during the past approximately 10 years. This ETo value provided by SCV Water is 6.2 inches per year greater than the ETo value of 61.5 inches per year that is specified in the MWELO, and thereby provides a more conservative analysis of potential irrigation demands.
- **Estimate the typical acreages to be irrigated.** The water demand model estimates irrigation needs based in part on the percentage of land that requires irrigation. This is identified separately for each type of residential, CII, and other land use. For example, residential lots containing single-family residences are estimated to have between 25 and 45 percent of their total acreage consist of landscaping that requires irrigation (depending on the lot size), while irrigated landscaping is estimated to comprise 15 percent of the acreage for multi-family residential lots. In contrast, many CII facilities are estimated to have 25 percent of their total acreage require irrigation, and other properties (such as parks and irrigated slopes) will have even higher percentages (see Table 3-8).

3. Indoor Water Demand Factors and Water-Use Savings

The process of estimating indoor water demand factors is described below on a step-by-step basis, consisting of:

- A review of the details of historical indoor residential water-use estimates from the 1990s for two other Los Angeles area water districts (Section 3.1).
- A comparison of those study results with historical discharges to WRPs in the Santa Clarita Valley (Section 3.2).
- An evaluation of current water conservation standards for indoor water use, and a comparison of the current standards against the historical water use estimates (Section 3.3).

- A comparison of the historical and conservation-related per capita water use values with those used prior to 2020 in the water demand model (Section 3.4).
- A discussion of population density data in Santa Clarita and a comparison of those data with values used for different types of residences in the water demand model (Section 3.5).
- A discussion of indoor consumption rates for nonresidential development (Section 3.6).

3.1 Studies of Historical Indoor Residential Water Use in Nearby Communities

A study by the AWWARF (1999) of indoor water uses in single-family residences served as the primary source of data and details for evaluating historical indoor residential water demand factors. The AWWARF study estimated indoor residential water use for nine water utilities across the United States. The estimates were calculated in two ways: (1) from surveys of residents living in single-family housing inside each water utility service area, and (2) from models of different indoor uses in single-family homes, using data from each water utility. GSI made use of the study's data for two southern California water utilities—the Las Virgenes Municipal Water District (in Calabasas) and the Walnut Valley Water District (in West Covina)—because both utilities are located in the Los Angeles area and likely have had similar past water fixtures and water use behaviors as in the Santa Clarita Valley during the 1990s-era time period that was studied by the AWWARF.

The AWWARF report identified that its findings were based on a total of 783 water use survey respondents from these two California water utilities. The data from the AWWARF report for these two water utilities are presented in Tables 3-1a and 3-1b and include two sets of per capita water use estimates: (1) values listed in the AWWARF report that were based on their modeling of utility-provided data, and (2) GSI's calculations of per capita consumption using the reported individual components of residential water use (as derived from customer survey data provided in the AWWARF report). Indoor residential use based on these two methods ranged from 67.6 to 82.1 gpcpd.

3.2 Comparison with Historical Santa Clarita Discharges to WRPs

As a cross-check on the applicability in Santa Clarita of the historical per capita use rates derived from the Las Virgenes and Walnut Valley data, GSI calculated per capita inflows to the Valencia and Saugus WRPs for the period 1995 through 1999, using (1) historical population data for SCV Water's service area as published in the 2010 Urban Water Management Plan (KJC et al., 2011) and (2) WRP inflow data from 1995 through 1999 that were compiled during prior groundwater modeling studies (CH2M HILL, 2004). From 1995 through 1999, the population inside SCV Water's service area is estimated to have increased from 171,537 people to 195,556 people, while inflows to the two WRPs (combined) ranged between approximately 14.1 and 16.1 million gallons per day (mgd) on an average daily basis and averaged 15.4 mgd. Year-by-year calculations indicate that per capita inflows ranged from 92.8 gpcpd in 1995 to 78.3 gpcpd in 1997, with an average of 84.5 gpcpd from 1995 through 1999. However, the WRP inflows include a component of flow from CII facilities. Accordingly, consumption rates from residential areas alone will be lower than indicated by the WRP inflow volumes, as is apparent when comparing the calculations that examine the details of historical residential indoor use (67.6 to 82.1 gpcpd) against the higher values derived from WRP inflow data (78.3 to 92.8 gpcpd).

3.3 Indoor Water Consumption Rates and Water-Use Reductions in Residences Under Current Conservation Standards

To conserve water, the State of California building code contains mandatory water conservation standards for new buildings (CBSC, 2021). These standards include fixture-specific updates and restrictions on water flow. GSI applied the historical water use behavior patterns from the AWWARF (1999) study to the current flow rates for indoor fixtures that are specified under the current mandatory water conservation standards, then recalculated the indoor water demands on a per capita basis. The new estimates for indoor residential water use as of the 2015 update of CALGreen are shown in Table 3-1a for each indoor activity, along with a

comparison of the historical rates and conservation-related rates. Table 3-1b shows the same information using the 2021 update of CALGreen. As shown in Table 3-1a, the conservation-based residential indoor water demand under the 2015 update of CALGreen is estimated to be 49.1 gpcpd, which is an 18.5 to 33.1 gpcpd decrease from the GSI-calculated historical rates of 67.6 to 82.1 gpcpd. For the 2021 update of CALGreen, the flow rate requirements for showers/baths and for faucets were lowered, resulting in an overall residential indoor water demand estimate of 45.3 gpcpd, which is a 22.2 to 36.8 gpcpd decrease from the GSI-calculated historical rates of 67.6 to 82.1 gpcpd.

As shown in Table 3-2, population and WRP inflow data from 2017 through 2019 (after the recent drought of 2012 through 2016) show average daily inflow rates to the WRPs ranging between 68.7 and 71.6 gpcpd, with an average during this 5-year period of 70.1 gpcpd. While these flows are notably lower than during the late 1990s, they likely overestimate the per capita use that must be achieved for new construction under the CALGreen building standards because plumbing and water use fixtures have not been upgraded to CALGreen standards in all residential and commercial facilities in the valley. For this reason, and to reduce the potential for underestimation of water demands, the estimate of 49.1 gpcpd that GSI has derived from the 2015 version of CALGreen (before considering fixture leakage and failure) is deemed by GSI to be an appropriate estimate of future indoor per capita use for newly constructed single-family dwellings in the West Side communities.

The AWWARF (1999) residential indoor water use study was performed on single-family residences. However, Entrada South and other West Side communities will have several different housing types and variable densities. As with the indoor residential demand factors used in prior water demand estimates, the updated demand factors that implement indoor water conservation standards in multi-family dwellings are equal to 93 percent of the conservation-based demand factors for low-density single-family dwellings. Accordingly, multiplying the 18.5 to 33.1 gpcpd savings rate for single-family homes (under the 2015 CALGreen standards) by 93 percent results in 17.2 to 30.7 gpcpd of indoor water use savings for multi-family dwellings when implementing indoor water conservation measures in Entrada South and other West Side communities.

3.4 Comparison of Calculated Per Capita Rates with Prior Water Demand Factors

Table 3-2 compares the calculated per capita indoor water use rates for historical conditions and current water conservation standards against (1) the WRP inflows described previously and (2) the indoor water demand factors for residences that have been used in water demand projections conducted prior to 2020 for Entrada South, Valencia Commerce Center, and other West Side communities. The comparisons also differentiate between per capita indoor uses for single-family dwellings versus multi-family dwellings. As shown in Table 3-2, prior water demand analyses have used rates of 80 to 100 gpcpd for low-density (single-family) housing and 70 to 75 gpcpd for high-density (multi-family) housing.

Based on the calculations described in Sections 3.1 through 3.3, under the 2015 update of the CALGreen building standards (CBSC, 2015), the indoor water demand factors are estimated to be 49 gpcpd for the estate and low residential land use categories and 46 gpcpd for the low medium, medium, and high/mixed-use residential categories and for apartments. However, these rates do not account for leakage and failure of plumbing fixtures as they age. Accordingly, as shown in the bottom two rows of Table 3-2, these per capita use rates have been multiplied by 1.1, to add a 10 percent leakage rate to the estimated indoor uses, resulting in per capita indoor water use estimates of 54 gpcpd for single-family dwellings and 50 gpcpd for multi-family dwellings. Table 3-3 compares these rates with the historical indoor water consumption rates that have been used prior to 2020 in the water demand model for each of the residential land use categories evaluated by the water demand model for Entrada South. Indoor per capita water use rates in Entrada South under current water conservation standards are between 67 percent and 71 percent of the indoor per capita rates that do not account for modern-day standards.

3.5 Population Densities

The estimated population of any given community is used to translate the per capita water use reductions to volumes of water savings that are achieved inside the community by implementing water conservation standards. In the water demand model, the population densities are 3.292 persons per household (PPHH) for single-family homes (estate, low, and low medium residential areas), 2.367 PPHH for condominiums and townhomes (medium density and high/mixed use developments), and 2.103 PPHH for apartments. These values were derived by GSI and VWC in early 2016, based on detailed examinations of census data for recently constructed developments inside VWC's service area (USDOC, 2015). Based on these occupancy rates and the number of dwelling units in each land use category (single-family homes, condominiums, townhomes, and apartments), the average population density is 2.37 PPHH in Entrada South. (No residential communities will be constructed in Valencia Commerce Center.) See GSI, 2016b for details.

3.6 Indoor Consumption Rates for Nonresidential Development

Other indoor uses of potable water are those occurring in CII facilities, including recreational facilities. These nonresidential types of land uses also have a set of green building code requirements (including water conservation standards) that will be implemented for water fixtures that are used within any indoor structures that are present on these land parcels.

As shown in Table 3-4, for most of the nonresidential land uses, the indoor per capita water use rates are 90 percent of the per capita rates that were used in prior analyses which preceded current water conservation standards. This percentage reduction for CII uses of indoor water accounts for how certain CII and recreational water uses are volumetrically based rather than rate based. A value of 90 percent was chosen to strike a balance between (1) recognizing that a certain amount of water use reduction would occur under the CALGreen building and water conservation standards while (2) seeking to minimize the potential of underestimating the specific water use needs of each type of nonresidential facility. However, the demand factor that describes the potable water supply need for the future Newhall Ranch WRP was not reduced, because the treatment process needs are not likely to reduce water demands below the amounts estimated in the past.

4. Outdoor Water Demand Factors and Water-Use Savings

This section discusses the water demand factors for outdoor uses of potable water that are estimated for residential areas (Section 4.1) and nonresidential developments (Section 4.2), and the reductions in water demand factors that Five Point Holdings, LLC (FivePoint) will achieve in meeting the state's potable water irrigation standards in areas where FivePoint plans to use recycled water (Section 4.3).

4.1 Demand Factors for Residential Outdoor Uses of Potable Water

Potable outdoor water needs will consist of non-irrigation needs (such as filling swimming pools and washing cars) and will have volumetrically driven water demands that are expected to decline modestly from the prior water demand factor of 45 gpcpd to 34 gpcpd under current water conservation standards. As shown in the last column of Table 3-3, the ratio of new to old water demand factors for outdoor potable water uses in multi-family dwellings is approximately 0.75.

4.2 Demand Factors for Nonresidential Outdoor Uses of Potable Water

In nonresidential developments, potable water will not be used for irrigation but will be used to meet other outdoor water needs. Table 3-5 lists the nonresidential water demand factors for outdoor (non-irrigation) potable use that were contained in prior water demand projections (including those presented in GSI, 2010, 2014, and 2016a) and the factors that are used in new model projections under current water conservation standards. As with indoor uses in nonresidential developments, the adjustments from the original to new demand factors for outdoor uses in nonresidential developments were based on a ratio of 0.90. This value

was selected for nonresidential outdoor uses of potable water because the potable water use efficiencies that are achievable indoors for nonresidential developments will also be achievable outdoors (and might provide more water savings than is assumed in this analysis).

4.3 Demand Factors for Landscape Irrigation with Nonpotable Water

For landscape irrigation, GSI conducted its analysis of water demand factors and potential outdoor water-use savings under the assumption that FivePoint will design its landscapes in common areas to meet the 2015 MWELO requirements for landscapes that are irrigated with potable water, even though the actual water supply will consist of recycled water in most (if not all) common areas. This distinction is important because on landscapes being irrigated with recycled water, the 2015 MWELO allows water application to occur at rates equal to the ETo for healthy turf grass, whereas the maximum allowable water application rate on landscapes using potable water is limited by the 2015 MWELO to be 55 percent of the ETo for residential landscapes and 45 percent of the ETo for nonresidential landscapes. A landscape using recycled water is classified as a Special Landscape Area (SLA) in the 2015 MWELO and defined in Section 491.ttt of Title 23 as "*an area of the landscape dedicated solely to edible plants, recreational areas, areas irrigated with recycled water, or water features using recycled water*."

The 2015 MWELO specifies the ETo rate for healthy turf grass in Santa Clarita that must be used as the basis for calculating the maximum allowable irrigation application rate (called the MAWA in the 2015 ordinance) for landscapes being irrigated with potable water supplies in Santa Clarita.[2] The MWELO-specified ETo value for Santa Clarita is 61.5 inches per year. Under the MWELO rules, landscapes inside Santa Clarita that are subject to the MWELO rules must limit annual irrigation volumes of potable water to MAWA values of 61.5 inches per year in SLAs (based on nonpotable water use at 100 percent of ETo), 33.8 inches per year in residential landscapes (based on potable water use at 55 percent of ETo), and 27.7 inches per year in nonresidential landscapes (based on potable water use at 45 percent of ETo).

For water supply planning purposes, the MAWA values are calculated using an ETo value that is higher based on two considerations:

- **The average ETo measured during the past 10 years at a monitoring station located at SCV Water's Rio Vista water treatment plant.** This average is 67.7 inches per year.
- **Climate change considerations.** Rising temperatures associated with climate change will increase the ETo value that describes the water requirement of standardized turf grass. GSI has derived month-by-month values of long-term average climate change from change factors for ETo and precipitation provided by the California Department of Water Resources (DWR) on its internet data portal for the Sustainable Groundwater Management Act. The change factors are for 2030 and 2070 levels of climate change and can be applied to historical ETo and precipitation records. Table 3-7 shows the average monthly change factors for both levels of climate change and the 2030/2070 average values of the monthly factors, which were then applied to each month's historical average ETo to derive climate-change-influenced monthly and annual ETo values as shown in the table.

The resulting annual ETo value that arises from local historical data and climate-change considerations is 72.7 inches per year (6.06 feet per year). Table 3-7 presents the monthly distribution of turf evapotranspiration demands under this annual ETo value and identifies the resulting limits on monthly irrigation rates for residential landscapes (40.0 inches per year, which is 55 percent of ETo) and nonresidential landscapes (32.7 inches/year, which is 45 percent of ETo) under the MWELO calculation procedure for landscapes that are irrigated with potable water.

[2] Section 491.mmm of the MWELO rule defines reference evapotranspiration as an estimate of the amount of evapotranspiration occurring from a large field of 4-inch to 7-inch tall cool-season grass that is well watered. ETo differs from one location to another, as listed in Appendix A of the 2015 MWELO.

In comparing pre-2020 water demand models for Entrada South, Valencia Commerce Center, and other West Side communities (i.e., without current landscape irrigation conservation standards) with the standards established by the MWELO (including climate change), the demand factor values and the achievable reductions in irrigation water consumption on a unit land area are presented in Table 3-8 and summarized below:

- **Residential water use:**
  - Demand factor without current standards: 6.7 feet per year (80.4 inches per year)
  - Demand factor with current standards (MWELO):
    - 3.33 feet per year (40.0 inches per year) where using potable water
    - 6.06 feet per year (72.7 inches per year) where using recycled water
  - Amount of water use reduction achieved under the MWELO:
    - 3.37 feet per year (40.4 inches per year) where using potable water
    - 0.64 feet per year (7.7 inches per year) where using recycled water

- **Commercial/industrial/institutional:**
  - Demand factor without current standards: 4.5 to 5.6 feet per year (54 to 67 inches per year)
  - Demand factor with current standards (MWELO):
    - 2.73 feet per year (32.8 inches per year) where using potable water
    - 6.06 feet per year (72.7 inches per year) where using recycled water
  - Amount of water use reduction achieved under the MWELO:
    - 1.77 to 2.87 feet per year (21.2 to 34.4 inches per year) where using potable water
    - 0 feet per year (0 inches per year) where using recycled water

- **Other areas (recreation, arterials, and open spaces):**
  - Demand factor without current standards: 3.47 to 6.4 feet per year (41.6 to 76.8 inches per year)
  - Demand factor with current standards (MWELO):
    - 2.73 feet per year (32.8 inches per year) where using potable water
    - 6.06 feet per year (72.7 inches per year) where using recycled water
  - Amount of water use reduction achieved under the MWELO:
    - 0.74 to 3.67 feet per year (8.9 to 44.0 inches per year) where using potable water
    - 0 to 0.36 feet per year (0 to 4.1 inches per year) where using recycled water

However, for parcels of land that will consist of a mixture of turf and other plants, the water demand calculations assume that (1) recycled water will be used in sufficient quantities to maintain a healthy turf (annual water demand 6.06 feet), and (2) only the non-turf landscapes being irrigated with recycled water will be designed to meet the lower residential (3.33 feet) or nonresidential (2.73 feet) annual limits shown in Table 3-7 for irrigation with potable water. Table 3-8 shows the landscape design details for each type of land use, including the percentage of irrigated land that will consist of turf and an inventory of which irrigated lands will be supplied with potable supplies rather than recycled water. For each land use type, Table 3-8 then shows (1) the MAWA values for landscapes that will be irrigated with potable water versus recycled water, and (2) the resulting net average water use across the entire irrigated landscape for each land use category. As indicated in footnote (b) of Table 3-8, the MAWA values for landscapes using nonpotable water (i.e., landscapes for multi-family lots plus other common-areas) are calculated from the net of reference ETo demands for (1) turf areas under the nonpotable irrigation limit of 6.06 feet per year, and (2) non-turf areas under the applicable potable irrigation limit (which is 3.33 feet per year for residential lands and 2.73 feet per year for nonresidential/recreation/arterials/ open space lands).[3]

[3] See Table 3-7 for the derivation of the potable irrigation limits for residential lands and other (nonresidential) lands.

Note that the values listed in Tables 3-7 and 3-8 do not account for the potential for overirrigation to occur. Table 3-9 shows the MAWA values that arise from multiplying the values in Table 3-8 by a 15 percent overirrigation factor that accounts for potential inefficiencies and deterioration of irrigation systems. The values in Table 3-9 provide the irrigation demand factors that are used in the water demand calculations for Entrada South and Valencia Commerce Center, including consideration of the potential for overirrigation to occur as contemplated in the 2020 UWMP (KJ, 2021). In support of the 2020 UWMP, SCV Water conducted a study of developments constructed after promulgation of the 2015 MWELO irrigation standards and found that actual outdoor water uses exceeded MWELO limits by 26.5 percent for residential developments and 25.6 percent for nonresidential developments (MWM, 2021). The study noted that the measured water use volumes likely included other outdoor water uses besides irrigation, which means actual overirrigation rates were likely lower than the UWMP's estimates of overirrigation. Because the water demand tool for Entrada South and Valencia Commerce Center explicitly accounts for non-irrigation outdoor uses of water separately from irrigation uses, the combined volume of irrigation uses plus other non-irrigation outdoor uses of water are not expected to exceed MWELO limits by as large an amount as the 25.6 to 26.5 percent factors identified in the SCV Water study. Accordingly, the water demand analyses for Entrada South and Valencia Commerce Center use a lower overirrigation factor, which provides a reasonably conservative estimate that minimizes the potential for underestimating future outdoor water uses in a manner consistent with the 2020 UWMP. This is shown in the case of residential development in Table 3-10, which compares the resulting water use factors (in units of gallons per day per dwelling unit, gpd/DU) for Entrada South residential land uses with the equivalent gpd/DU factors that would arise from applying the 2020 UWMP factors to the residential land use mix for Entrada South. Table 3-10 shows the following:

- The upper half of Table 3-10 shows that before applying an overirrigation factor, the 34 gpcpd rate of potable residential outdoor water use in Entrada South results in an equivalent usage rate of 80 gallons per day per dwelling unit (gpd/DU), which is higher than the range of rates (58 to 74 gpd/DU, as shown in the lower half of Table 3-10) that is used in the 2020 UWMP water demand analyses for total residential outdoor water use at detached condominiums having the dwelling unit densities that will occur in Entrada South (6 gpd/DU or higher), In other words, the residential potable outdoor water uses for Entrada South (which do not include irrigation) are calculated using higher gpd/DU water use factors than the 2020 UWMP factors that represent total outdoor water use with overirrigation for the types of multi-family dwellings planned for Entrada South.
- Additionally, the lower half of Table 3-10 shows that when adding together the outdoor potable and nonpotable water use volumes that have been estimated for Entrada South, the three residential land uses in Entrada South have gpd/DU rates for total outdoor water use that are between 1.53 and 2.12 times the total outdoor water use rates from the 2020 UWMP, with this ratio being 2.08 for the aggregate (net) group of residential developments in Entrada South (based on a net usage of 135 gpd/DU in Entrada South and 65 gpd/DU when applying the 2020 UWMP factors to the Entrada South residential land use mix).

Accordingly, the method used to calculate total outdoor water demands (with a 15 percent overirrigation factor) in Entrada South and Valencia Commerce Center (1) reduces the risk of underestimating future water demands in a manner that is consistent with the 2020 UWMP and (2) conservatively does not take into account the potential for Entrada South, as a master planned community with a master HOA, to achieve higher water conservation levels than the new development assumed in the 2020 UWMP analysis.

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Table 3-1a *Draft*

Indoor Residential Water Use Details for Single-Family Dwellings under the 2015 CALGreen Standards

Description	Units	1997/98 Literature Value (Modeled from Utility Data)[a,b]	Source	1997/98 Calculated Use (Calculated by GSI from User Survey)[a,c]	Source	Modern-Day Plumbing Code Values (CALGreen 2015)[d]	Source	Reductions Arising from Plumbing Code Compared with 1997/98 Calculated Use[e]
Toilet								
Flush volume (water closets)	gal per flush			3.35	*1*	1.28	*4*	
Flushes	per capita per day			4.71	*1*	[f]		
Toilet total (water closets)	***gpcpd***	***16.9***	*1*	***15.8***	*3*	***6.0***	*3*	***-9.7 to -10.8***
Showers/Baths								
Frequency	per capita per day			0.74	*1*	[f]		
Duration	minutes per event			8.15	*1*	[f]		
Flow rate	gpm			2.1	*1*	2.0	*4*	
Bathing total	***gpcpd***	***11.6***	*1*	***12.9***	*3*	***12.1***	*3*	***-0.8 to 0.5***
Faucet								
Faucet duration	minutes per capita per day			8.6	*1*	[f]		
Faucet flow rate	gpm			2.5	*2*	1.5	*4*	
Faucet total	***gpcpd***	***11.8***	*1*	***21.5***	*3*	***12.9***	*3*	***-8.6 to 1.2***
Dishwasher								
frequency	per capita per day			0.08	*1*	[f]		
volume	gal per cycle			40.9	*1*	4.25	*4*	
Dishwasher total	***gpcpd***	***0.9***	*1*	***3.3***	*3*	***0.3***	*3*	***-2.9 to -0.5***
Clothes washer machine								
frequency	cycle per capita per day			0.37	*1*	[f]		
volume	gal per cycle			47.6	*1*	18	*4*[g]	
Washer total	***gpcpd***	***15.5***	*1*	***17.6***	*3*	***6.7***	*3*	***-11.0 to -8.8***
Other indoor use								
Other domestic use	gpcpd	1.7	*1*	1.7	*1*	[f]		
Leaks	gpcpd	9.4	*1*	9.4	*1*	[f]		
Other Indoor Total	***gpcpd***	***11.1***	*3*	***11.1***	*3*	***11.1***		***0.0 to 0.0***
Total Indoor Water Use	**gpcpd**	**67.6**	*1*	**82.1**	*1*	**49.1**	*3*	**-33.1 to -18.5**

Notes

[a] Values for 1997/1998 are based on averages of data from the Las Virgenes Municipal Water District (in Calabasas, CA) and the Walnut Valley Water District (in West Covina, CA).

[b] Totals from individual uses are as presented in AWWARF (1999), as modeled from utility data. Values are for single-family houses.

[c] Totals from individual uses are calculated from flow and user behavior as indicated in the report (AWWARF, 1999). Values are for single-family houses.

[d] Totals from individual uses are calculated from user behavior as indicated in the report (AWWARF, 1999), and flow data in CALGreen building standards (CBSC, 2015). Values are for single-family houses.

[e] Difference is between values calculated in the same way (from behavior and flow data).

[f] Assumes fixtures have changed since 1990s, but indoor water use behavior has not. Calculation uses 1997/98 behavior data.

[g] Based on energy-star high efficiency appliance. Not required by CALGreen, but assumed to be average use of modern-day appliance.

CALGreen = California Green Building Standards Code
gpcpd = gallons per capita per day
gpm = gallons per minute

Sources

1 Average of data collected in 1997 and 1998 from Walnut Valley, CA and Las Virgenes, CA, published in a study sponsored by the AWWA Research Foundation (AWWARF, 1999).
2 Standards from 1992, as published by the California Homebuilding Foundation (CONSOL, 2015).
3 Calculated value.
4 Value listed in the 2015 supplement to the CALGreen Green Building Code (CBSC, 2015).

Table 3-1b *Draft*

Indoor Residential Water Use Details for Single-Family Dwellings under the 2019/2021 CALGreen Standards

Description	Units	1997/98 Literature Value (Modeled From Utility Data)[a,b]	Source	1997/98 Calculated Use (Calculated by GSI from User Survey)[a,c]	Source	Modern-Day Plumbing Code Values (CALGreen 2021)[d]	Source	Reductions Arising from Plumbing Code Compared with 1997/98 Calculated Use[e]
Toilet								
Flush volume (water closets)	gal per flush			3.35	*1*	1.28	*4*	
Flushes	per capita per day			4.71	*1*	[f]		
Toilet total (water closets)	***gpcpd***	***16.9***	*1*	***15.8***	*3*	***6.0***	*3*	***-9.7 to -10.8***
Showers/Baths								
Frequency	per capita per day			0.74	*1*	[f]		
Duration	minutes per event			8.15	*1*	[f]		
Flow rate	gpm			2.1	*1*	1.8	*4*	
Bathing total	***gpcpd***	***11.6***	*1*	***12.9***	*3*	***10.9***	*3*	***-2.1 to -0.7***
Faucet								
Faucet duration	minutes per capita per day			8.6	*1*	[f]		
Faucet flow rate (lavatory)	gpm			2.5	*2*	1.2	*4*	
Faucet flow rate (kitchen)	gpm			2.5	*2*	1.8	*4*	
Faucet total	***gpcpd***	***11.8***	*1*	***21.5***	*3*	***10.3***	*3*	***-11.2 to -1.4***
Dishwasher								
frequency	per capita per day			0.08	*1*	[f]		
volume	gal per cycle			40.9	*1*	4.25	5	
Dishwasher total	***gpcpd***	***0.9***	*1*	***3.3***	*3*	***0.3***	*3*	***-2.9 to -0.5***
Clothes washer machine								
frequency	cycle per capita per day			0.37	*1*	[f]		
volume	gal per cycle			47.6	*1*	18	5[g]	
Washer total	***gpcpd***	***15.5***	*1*	***17.6***	*3*	***6.7***	*3*	***-11.0 to -8.8***
Other indoor use								
Other domestic use	gpcpd	1.7	*1*	1.7	*1*	[f]		
Leaks	gpcpd	9.4	*1*	9.4	*1*	[f]		
Other Indoor Total	***gpcpd***	***11.1***	*3*	***11.1***	*3*	***11.1***		***0.0 to 0.0***
Total Indoor Water Use	**gpcpd**	**67.6**	*1*	**82.1**	*1*	**45.3**	*3*	**-36.8 to -22.2**

Notes

[a] Values for 1997/1998 are based on averages of data from the Las Virgenes Municipal Water District (in Calabasas, CA) and the Walnut Valley Water District (in West Covina, CA).

[b] Totals from individual uses are as presented in AWWARF (1999), as modeled from utility data. Values are for single family houses.

[c] Totals from individual uses are calculated from flow and user behavior as indicated in the report (AWWARF, 1999). Values are for single family houses.

[d] Totals from individual uses are calculated from user behavior as indicated in the report (AWWARF, 1999), and flow data in CALGreen building standards (CBSC, 2021). Values are for single family houses.

[e] Difference is between values calculated in the same way (from behavior and flow data).

[f] Assumes fixtures have changed since 1990s, but indoor water use behavior has not. Calculation uses 1997/98 behavior data.

[g] Based on energy-star high efficiency appliance. Not required by CALGreen, but assumed to be average use of modern-day appliance.

CALGreen = California Green Building Standards Code
gpcpd = gallons per capita per day
gpm = gallons per minute

Sources

1 Average of data collected in 1997 and 1998 from Walnut Valley, CA and Las Virgenes, CA, published in a study sponsored by the AWWA Research Foundation (AWWARF, 1999).
2 Standards from 1992, as published by the California Homebuilding Foundation (CONSOL, 2015).
3 Calculated value.
4 Value is a mandatory measure listed in Chapter 4 of the 2019 CALGreen Green Building Code (CBSC, 2019) and the July 2021 supplement (CBSC, 2021).
5 Value is a voluntary measure listed in Appendix A4 of the 2019 CALGreen Green Building Code (CBSC, 2019) and the July 2021 supplement (CBSC, 2021).

Table 3-2 *Draft*

Comparison of Historical and Modern-Day Indoor Residential Water Use Factors

Time Period	Housing Type	Indoor Water Use Factors from Studies and Building Standards (Residential Only) [a] (gpcpd)	Indoor Water Use Factors Specified in the NHR Water Demand Model (Residential Only) (gpcpd)	Measured Flows into WRPs in the Santa Clarita Valley (Residential and CII) [b] (gpcpd)
Historical (1990s)	Single-Family	67-82	80-100	1995-1999 Average: 84.5 Range: 78.3 to 92.8
	Multi-Family	62-76	70-75	
Modern-Day Plumbing Code (Without System Leakage)[c]	Single-Family	46	---	2017-2019[e] Average: 70.1 Range: 68.7 to 71.6
	Multi-Family	43	---	
Modern-Day Plumbing Code (Accounting for 10% System Leakage)[d]	Single-Family	51	54	
	Multi-Family	47	50	

Notes

[a] Historical estimates from literature are based on AWWARF surveys of single-family homes in Walnut Valley Water District and Las Virgenes Municipal Water District, 1997/1998.

[b] WRP flows reflect aggregate indoor use by residences and commercial/industrial/institutional (CII) facilities of all ages and various states of remodel. Historical values are for the period 1995 through 1999, and modern-day values are for the period 2017 through 2019.

[c] Modern day use is based on mandatory flow restrictions for plumbing fixtures in the 2021 supplement to the CALGreen Code (CBSC, 2021).

[d] Values are 1.1 times the CALGreen code values, to account for periodic system leakage and malfunction of indoor fixtures.

[e] Based on 2017-2019 data (WRP influent flows of 19.7 to 19.9 millions gallons per day and population range of 275,000 to 290,000).

AWWARF = American Water Works Association Research Foundation
CALGreen = California Green Building Standards Code
CII = commercial/industrial/institutional
gpcpd = gallons per capita per day
NHR = Newhall Ranch
WRP = water reclamation plant

Table 3-3

Draft

Original and New Rates of Potable Water Use for Residential Development

Type of Residential Development	Original Potable Demand Factors				New Potable Demand Factors				Ratio of New/Original Potable Demand Factors	
	Indoor gpcpd	Outdoor gpcpd	Outdoor gpcpd Relative to Total gpcpd	Ratio of Outdoor gpcpd to Indoor gpcpd	Indoor gpcpd	Outdoor gpcpd	Outdoor gpcpd Relative to Total gpcpd	Ratio of Outdoor gpcpd to Indoor gpcpd	Indoor Use	Outdoor Use
Low Medium (Multi-Family Detached)	75	45	37.5%	60.0%	50	34	40.5%	68.0%	0.67	0.75
Low Medium (Multi-Family Attached)	75	45	37.5%	60.0%	50	34	40.5%	68.0%	0.67	0.75
Medium (Multi-Family Detached)	75	45	37.5%	60.0%	50	34	40.5%	68.0%	0.67	0.75
Medium (Multi-Family Attached)	75	45	37.5%	60.0%	50	34	40.5%	68.0%	0.67	0.75
High and Mixed Use (Multi-Family)	75	45	37.5%	60.0%	50	34	40.5%	68.0%	0.67	0.75
Apartments (Multi-Family)	70	42	37.5%	60.0%	50	32	39.0%	64.0%	0.71	0.76

Notes

Non-irrigation uses are volume-driven (rather than rate-driven) and decrease modestly from 42 to 45 gpcpd without current water conservation standards to 32 to 34 gpcpd under current water conservation standards.

For multi-family units, potable water use to meet outdoor demands is for all needs other than common-area irrigation. (Common-area irrigation demands will be met with nonpotable water supplies.)

AF = acre-feet

gpcpd = gallons per capita per day

Table 3-4 *Draft*

Indoor Rates of Potable Water Use for Nonresidential Developments

Land Use	Original Indoor Potable Demand Factors		Amount of Indoor Potable Water Use Reduction Estimated Under Current Water Conservation Standards		New Indoor Potable Demand Factors	
	Indoor Use		Ratio of New to Old	Rationale	Indoor Use	
	Units	Factor			Units	Factor
Mixed-Use Commercial (Retail)	gpd/sq. ft.	0.010	0.90	Average Indoor Change for All Residential Categories	gpd/sq. ft.	0.009
Mixed-Use Commercial (Office)	gpd/sq. ft.	0.050	0.90	Similar to Indoor Change for Residences Other than Estates	gpd/sq. ft.	0.045
Commercial (Retail)	gpd/sq. ft.	0.200	0.90	Similar to Indoor Change for Residences Other than Estates	gpd/sq. ft.	0.18
Business Park (Office)	gpd/sq. ft.	0.050	0.90	Similar to Indoor Change for Residences Other than Estates	gpd/sq. ft.	0.045
Business Park (Industrial)	gpd/sq. ft.	0.200	0.90	More Modest Reduction than Residences	gpd/sq. ft.	0.18
Institutional	gpd/sq. ft.	0.200	0.90	Similar to Indoor Change for Residences Other than Estates	gpd/sq. ft.	0.18
Hotel/Spa	gpd/sq. ft.	0.200	0.90	Similar to Indoor Change for Residences Other than Estates	gpd/sq. ft.	0.18
Hospital	gpd/bed	500	0.90	Similar to Indoor Change for Residences Other than Estates	gpd/bed	450
Sr. Assisted Living	gpd/bed	100	0.90	Similar to Indoor Change for Residences Other than Estates	gpd/bed	90
Golf Club House	gpd/sq. ft.	0.010	0.90	Similar to Indoor Change for Residences Other than Estates	gpd/sq. ft.	0.009
Visitor Serving	gpd/sq. ft.	0.010	0.90	Similar to Indoor Change for Residences Other than Estates	gpd/sq. ft.	0.009
Water Reclamation Plant	gpapd	200	1.00	No Change Because of Treatment Process Needs	gpapd	200
Electrical Substation	gpapd	0	---	No Interior Potable Water Use	gpapd	0
Fire Stations	gpd/sq. ft.	0.200	0.90	Similar to Indoor Change for Residences Other than Estates	gpd/sq. ft.	0.18
Schools	gpapd	260	---	Not Applicable (Units Have Changed)	gpd/student	20
Recreation Centers	gpapd	100	0.90	More Modest Reduction than Residences	gpapd	90
Neighborhood Parks	gpapd	100	0.90	Similar to Indoor Change for Residences Other than Estates	gpapd	90
Lake - Water	gpapd	0	---	No Interior Potable Water Use	gpapd	0
Lake - Park Area	gpapd	0	---	No Interior Potable Water Use	gpapd	0
Golf Course	gpapd	0	---	No Interior Potable Water Use	gpapd	0
Hardscape/Road Section	gpapd	0	---	No Interior Potable Water Use	gpapd	0
Landscape Area	gpapd	0	---	No Interior Potable Water Use	gpapd	0
Natural Open Space	gpapd	0	---	No Interior Potable Water Use	gpapd	0
River Corridor	gpapd	0	---	No Interior Potable Water Use	gpapd	0
Non-Irrigated Slopes	gpapd	0	---	No Interior Potable Water Use	gpapd	0
Irrigated Slopes, Wet Zones	gpapd	0	---	No Interior Potable Water Use	gpapd	0
O.S. Drainage Facilities	gpapd	0	---	No Interior Potable Water Use	gpapd	0

Notes

gpd = gallons per day

gpapd = gallons per acre per day

sq. ft. = square foot

Table 3-5

Draft

Outdoor Rates of Non-Irrigation Potable Water Use for Nonresidential Developments

	Original Outdoor Potable Demand Factors	Amount of Outdoor Potable Water Use Reduction Estimated under Current Water Conservation Standards		New Outdoor Potable Demand Factors
Land Use	Outdoor Use (gpapd)	Adjustment Factor	Rationale	Outdoor Use (gpapd)
Mixed-Use Commercial (Retail)	0	---	No Exterior Potable Water Use	0
Mixed-Use Commercial (Office)	0	---	No Exterior Potable Water Use	0
Commercial (Retail)	0	---	No Exterior Potable Water Use	0
Business Park (Office)	0	---	No Exterior Potable Water Use	0
Business Park (Industrial)	305	0.90	Based on Rounding Up the Amount of Outdoor Change in Residential Areas	275
Institutional	0	---	No Exterior Potable Water Use	0
Hotel/Spa	0	---	No Exterior Potable Water Use	0
Hospital	0	---	No Exterior Potable Water Use	0
Sr. Assisted Living	120	0.90	Based on Rounding Up the Amount of Outdoor Change in Residential Areas	108
Golf Club House	0	---	No Exterior Potable Water Use	0
Visitor Serving	305	0.90	Based on Rounding Up the Amount of Outdoor Change in Residential Areas	275
Water Reclamation Plant	0	---	No Exterior Potable Water Use	0
Electrical Substation	0	---	No Exterior Potable Water Use	0
Fire Stations	305	0.90	Based on Rounding Up the Amount of Outdoor Change in Residential Areas	275
Schools	0	---	New Analysis Uses this for Olympic-Size Pool at High School	13
Recreation Centers	0	---	No Exterior Potable Water Use	0
Neighborhood Parks	0	---	No Exterior Potable Water Use	0
Lake - Water	0	---	No Exterior Potable Water Use	0
Lake - Park Area	0	---	No Exterior Potable Water Use	0
Golf Course	0	---	No Exterior Potable Water Use	0
Hardscape/Road Section	0	---	No Exterior Potable Water Use	0
Landscape Area	0	---	No Exterior Potable Water Use	0
Natural Open Space	0	---	No Exterior Potable Water Use	0
River Corridor	0	---	No Exterior Potable Water Use	0
Non-Irrigated Slopes	0	---	No Exterior Potable Water Use	0
Irrigated Slopes, Wet Zones	0	---	No Exterior Potable Water Use	0
O.S. Drainage Facilities	0	---	No Exterior Potable Water Use	0

Notes

gpapd = gallons per acre per day

Table 3-6

Draft

Summary of K-12 School Demographics and Water Use in the Santa Clarita Valley, California

	Elementary School					Middle School					High School					Total				
School District	No. Schools	No. Students	Annual CCF Water Use	gpd per school	gpd per student	No. Schools	No. Students	Annual CCF Water Use	gpd per school	gpd per student	No. Schools	No. Students	Annual CCF Water Use	gpd per school	gpd per student	No. Schools	No. Students	Annual CCF Water Use	gpd per school	gpd per student
Castaic Union	3	1,612	17,028	11,633	21.6	1	539	18,327	37,560	69.7	0	0	---	---	---	4	2,151	35,355	18,115	33.7
Newhall	10	6,535	51,752	10,606	16.2	0	0	---	---	---	0	0	---	---	---	10	6,535	51,752	10,606	16.2
Saugus Union	15	9,924	84,277	11,515	17.4	0	0	---	---	---	0	0	---	---	---	15	9,924	84,277	11,515	17.4
Sulphur Springs[1]	8	4,821	39,052	10,004	16.6	0	0	---	---	---	0	0	---	---	---	8	4,821	39,052	10,004	16.6
William S. Hart Union[2]	0	0	---	---	---	6	6,965	90,071	30,766	26.5	7	14,982	140,301	41,077	19.2	13	21,947	230,372	36,318	21.5
Total	**36**	**22,892**	**192,109**	**10,937**	**17.2**	**7**	**7,504**	**108,398**	**31,737**	**29.6**	**7**	**14,982**	**140,301**	**41,077**	**19.2**	**50**	**45,378**	**440,808**	**18,068**	**19.9**

Notes

This analysis is based on data obtained from SCV Water on October 21, 2019.

[1] Excludes Valley View Community School, which has no annual consumption data.

[2] Excludes Castaic High School, which is too new to have any annual consumption data at this time.

CCF = centum cubic feet

gpd = gallons per day

SCV Water = Santa Clarita Valley Water Agency

Table 3-7 *Draft*

Reference Evapotranspiration (ETo) Water Demands and Associated Water Demands in the City of Santa Clarita, California

Month	Estimated Monthly Turf ET Demand as Percent of Annual Demand[a]	Reference ET for Turf Grass (without Climate Change) (ETo, inches)[b]	Annual Limit (inches) without Climate Change[b]		Average DWR Climate Change Factors for 2030 and 2070[c]			Reference ET (for Turf Grass) (with Climate Change) (ETo, inches)[b]	Annual Limit (inches) with Climate Change	
			Residential (55% of ETo)	Nonresidential (45% of ETo)	2030	2070	Average		Residential (55% of ETo)	Nonresidential (45% of ETo)
January	5%	3.1	1.71	1.40	1.066	1.145	1.106	3.43	1.89	1.54
February	5%	3.1	1.71	1.40	1.040	1.105	1.073	3.33	1.83	1.50
March	7%	4.5	2.48	2.03	1.037	1.098	1.068	4.81	2.65	2.16
April	9%	6.2	3.41	2.79	1.043	1.109	1.076	6.67	3.67	3.00
May	10%	6.6	3.63	2.97	1.057	1.110	1.084	7.15	3.93	3.22
June	11%	7.5	4.13	3.38	1.037	1.095	1.066	8.00	4.40	3.60
July	12%	8.4	4.62	3.78	1.033	1.078	1.056	8.87	4.88	3.99
August	13%	8.6	4.73	3.87	1.039	1.079	1.059	9.11	5.01	4.10
September	9%	6.4	3.52	2.88	1.038	1.078	1.058	6.77	3.72	3.05
October	8%	5.7	3.14	2.57	1.046	1.088	1.067	6.08	3.34	2.74
November	6%	4.1	2.26	1.85	1.061	1.135	1.098	4.50	2.48	2.03
December	5%	3.5	1.93	1.58	1.076	1.176	1.126	3.94	2.17	1.77
Annual (inches)		**67.7**	**37.24**	**30.47**				**72.66**	**39.97**	**32.70**
Annual (feet)		**5.64**	**3.10**	**2.54**				**6.06**	**3.33**	**2.73**

Notes

[a] Percentage values are calculated by GSI Water Solutions using the monthly and annual ETo values listed for Santa Clarita in Appendix A of the 2015 version of the MWELO.

[b] ETo values without climate change are based on a recent average annual ET rate of 67.7 inches/year, as measured at SCV Water's Rio Vista Water Treatment Facility. For comparison, the reference ET value (ETo) specified in MWELO for Santa Clarita is 61.5 inches/year (5.1 feet/year).

[c] Climate change factors are provided by DWR and are the average of values from DWR for the period 1925-2019. These climate-change factors are for the grid blocks identified as 10052 and 10134 on the DWR data portal where these data are housed.

DWR = California Department of Water Resources

ET = evapotranspiration

ETo = reference evapotranspiration for turf grass = 67.7 inches/year in Santa Clarita; from 10 most recent years of data from SCV Water's Rio Vista monitoring station (received from SCV Water on October 4, 2021).

MWELO = Model Water Efficient Landscape Ordinance (State of California)

Table 3-8
Irrigation Landscape Types and Maximum Allowable Irrigation Rates under the MWELO

Draft

	Landscape Design			*Irrigation Rates (feet per year)*				
				Maximum Applied Water Allowance (MAWA) Values in Santa Clarita Under the MWELO[a]			Irrigation Rates Used in Prior Demand Estimates	Reduction under MWELO
Land Use Category	Irrigated Landscaping Area as a Percentage of Gross Acreage	Turf Percentage within Irrigated Landscaping Area	Will Turf Area or Water Feature Use Potable Supply?	Landscapes Using Potable Water	Landscapes Using Recycled Water	Net Allowed for Mixture of Landscapes[b]		
Residential Development								
Low Medium (Multi-Family Detached)	15%	25%	No	3.33	6.06	4.02	6.70	2.68
Low Medium (Multi-Family Attached)	15%	25%	No	3.33	6.06	4.02	6.70	2.68
Medium (Multi-Family Detached)	15%	25%	No	3.33	6.06	4.02	6.70	2.68
Medium (Multi-Family Attached)	15%	25%	No	3.33	6.06	4.02	6.70	2.68
High and Mixed Use (Multi-Family)	15%	25%	No	3.33	6.06	4.02	6.70	2.68
Apartments (Multi-Family)	15%	25%	No	3.33	6.06	4.02	6.70	2.68
Nonresidential Development (Commercial/Industrial/Institutional)								
Mixed-Use Commercial (Retail)	25%	0%	No	2.73	6.06	2.73	5.36	2.63
Mixed-Use Commercial (Office)	25%	0%	No	2.73	6.06	2.73	5.36	2.63
Commercial (Retail)	25%	0%	No	2.73	6.06	2.73	5.36	2.63
Business Park (Office)	25%	0%	No	2.73	6.06	2.73	5.36	2.63
Business Park (Industrial)	25%	0%	No	2.73	6.06	2.73	5.36	2.63
Institutional	25%	0%	No	2.73	6.06	2.73	5.60	2.87
Hotel/Spa	25%	25%	No	2.73	6.06	3.57	5.36	1.79
Hospital	25%	25%	No	2.73	6.06	3.57	5.60	2.03
Sr. Assisted Living	25%	25%	No	2.73	6.06	3.57	5.60	2.03
Golf Club House	0%	0%	No	---	---	---	---	---
Visitor Serving	25%	0%	No	2.73	6.06	2.73	5.60	2.87
Water Reclamation Plant	25%	0%	No	2.73	6.06	2.73	4.48	1.75
Electrical Substation	0%	0%	No	---	---	---	---	---
Fire Stations	25%	0%	No	2.73	6.06	2.73	5.60	2.87
Schools (Elementary)	25%	75%	No	2.73	6.06	5.23	5.60	0.37
Schools (Middle/Junior High)	25%	75%	No	2.73	6.06	5.23	5.60	0.37
Schools (High Schools)	25%	75%	No	2.73	6.06	5.23	5.60	0.37
Recreation, Arterials, Open Space								
Recreation Centers	75%	55%	No	2.73	6.06	4.57	5.10	0.53
Neighborhood Parks	75%	55%	No	2.73	6.06	4.57	5.10	0.53
Golf Course	100%	80%	No	2.73	6.06	5.40	5.80	0.40
Lake - Water (Using Reclaimed Supply Only)	100%	0%	No	---	6.06	6.06	6.40	0.34
Lake - Park Area (Using Reclaimed Supply Only)	100%	75%	No	---	6.06	6.06	6.40	0.34
Hardscape/Road Section of Arterial Highways	0%	0%	No	---	---	---	---	---
Landscape Area of Arterial Highways	100%	0%	No	2.73	6.06	2.73	3.47	0.74
Natural Open Space	0%	0%	No	---	---	---	---	---
River Corridor	0%	0%	No	---	---	---	---	---
Non-Irrigated Slopes	0%	0%	No	---	---	---	---	---
Irrigated Slopes, Wet Zones	100%	0%	No	2.73	6.06	2.73	3.47	0.74
O.S. Drainage Facilities	0%	0%	No	---	---	---	---	---
O.S. LDZ, O.S. Trail LDZ, SD&SS easements	90%	0%	No	2.73	6.06	2.73	3.85	1.12

Notes

[a] MAWA values are based on a recent average annual ET rate of 67.7 inches/year (5.64 feet/year) as measured at SCV Water's Rio Vista Water Treatment Facility, multiplied by average DWR climate change factors for 2030 and 2070 levels of future climate change. For comparison, the reference ET value (ETo) specified in MWELO for Santa Clarita is 61.5 inches/year (5.1 feet/year).

[b] For multi-family residences, nonresidential developments, and recreation/arterials/open space lands, this value is the net use when applying recycled water at (1) reference ET (ETo) rates on turf and (2) MWELO-specified potable-water limits on other landscapes.

DWR = California Department of Water Resources MWELO = Model Water Efficient Landscape Ordinance (State of California)

Table 3-9
Irrigation Landscape Types and Maximum Allowable Irrigation Rates under the MWELO Including a 15 Percent Overirrigation Factor

Draft

	Landscape Design			*Irrigation Rates (feet per year)*				
				Maximum Applied Water Allowance (MAWA) Values With 15 Percent Overirrigation Factor				
Land Use Category	Irrigated Landscaping Area as a Percentage of Gross Acreage	Turf Percentage within Irrigated Landscaping Area	Will Turf Area or Water Feature Use Potable Supply?	Landscapes Using Potable Water	Landscapes Using Recycled Water	Net Allowed for Mixture of Landscapes [b]	Irrigation Rates Used in Prior Demand Estimates	Reduction under MWELO
Residential Development								
Low Medium (Multi-Family Detached)	15%	25%	No	3.83	6.97	4.62	6.70	2.08
Low Medium (Multi-Family Attached)	15%	25%	No	3.83	6.97	4.62	6.70	2.08
Medium (Multi-Family Detached)	15%	25%	No	3.83	6.97	4.62	6.70	2.08
Medium (Multi-Family Attached)	15%	25%	No	3.83	6.97	4.62	6.70	2.08
High and Mixed Use (Multi-Family)	15%	25%	No	3.83	6.97	4.62	6.70	2.08
Apartments (Multi-Family)	15%	25%	No	3.83	6.97	4.62	6.70	2.08
Nonresidential Development (Commercial/Industrial/Institutional)								
Mixed-Use Commercial (Retail)	25%	0%	No	3.14	6.97	3.14	5.36	2.22
Mixed-Use Commercial (Office)	25%	0%	No	3.14	6.97	3.14	5.36	2.22
Commercial (Retail)	25%	0%	No	3.14	6.97	3.14	5.36	2.22
Business Park (Office)	25%	0%	No	3.14	6.97	3.14	5.36	2.22
Business Park (Industrial)	25%	0%	No	3.14	6.97	3.14	5.36	2.22
Institutional	25%	0%	No	3.14	6.97	3.14	5.60	2.46
Hotel/Spa	25%	25%	No	3.14	6.97	4.10	5.36	1.26
Hospital	25%	25%	No	3.14	6.97	4.10	5.60	1.50
Sr. Assisted Living	25%	25%	No	3.14	6.97	4.10	5.60	1.50
Golf Club House	0%	0%	No	---	---	---	---	---
Visitor Serving	25%	0%	No	3.14	6.97	3.14	5.60	2.46
Water Reclamation Plant	25%	0%	No	3.14	6.97	3.14	4.48	1.34
Electrical Substation	0%	0%	No	---	---	---	---	---
Fire Stations	25%	0%	No	3.14	6.97	3.14	5.60	2.46
Schools (Elementary)	25%	75%	No	3.14	6.97	6.02	5.60	-0.42
Schools (Middle/Junior High)	25%	75%	No	3.14	6.97	6.02	5.60	-0.42
Schools (High Schools)	25%	75%	No	3.14	6.97	6.02	5.60	-0.42
Recreation, Arterials, Open Space								
Recreation Centers	75%	55%	No	3.14	6.97	5.25	5.10	-0.15
Neighborhood Parks	75%	55%	No	3.14	6.97	5.25	5.10	-0.15
Golf Course	100%	80%	No	3.14	6.97	6.21	5.80	-0.41
Lake - Water (Using Reclaimed Supply Only)	100%	0%	No	---	6.97	6.97	6.40	-0.57
Lake - Park Area (Using Reclaimed Supply Only)	100%	75%	No	---	6.97	6.97	6.40	-0.57
Hardscape/Road Section of Arterial Highways	0%	0%	No	---	---	---	---	---
Landscape Area of Arterial Highways	100%	0%	No	3.14	6.97	3.14	3.47	0.33
Natural Open Space	0%	0%	No	---	---	---	---	---
River Corridor	0%	0%	No	---	---	---	---	---
Non-Irrigated Slopes	0%	0%	No	---	---	---	---	---
Irrigated Slopes, Wet Zones	100%	0%	No	3.14	6.97	3.14	3.47	0.33
O.S. Drainage Facilities	0%	0%	No	---	---	---	---	---
O.S. LDZ, O.S. Trail LDZ, SD&SS easements	90%	0%	No	3.14	6.97	3.14	3.85	0.71

Notes

[a] MAWA values are based on a recent average annual ET rate of 67.7 inches/year (5.64 feet/year) as measured at SCV Water's Rio Vista Water Treatment Facility, multiplied by average DWR climate change factors for 2030 and 2070 levels of future climate change, and further multiplied by a 15 percent overirrigation factor. For comparison, the reference ET value (ETo) specified in MWELO for Santa Clarita is 61.5 inches/year (5.1 feet/year).

[b] For multi-family residences, nonresidential developments, and recreation/arterials/open space lands, this value is the net use when applying recycled water at (1) reference ET (ETo) rates on turf and (2) MWELO-specified potable-water limits on other landscapes.

DWR = California Department of Water Resources MWELO = Model Water Efficient Landscape Ordinance (State of California)

Table 3-10

Draft

Comparison of Residential Water Demand Factors for Entrada South and the 2020 UWMP

Entrada South Residential Land Use Category	Residential Land Use Details				Potable Outdoor Use			Nonpotable Use	Total Outdoor Use
	Acreage	% of Residential Acreage	No. of DUs	DUs/acre	PPHH	gpcpd	gpd/DU	gpd/DU	gpd/DU
Low Medium (Detached)	53.2	46.1%	452	8.50	2.367	34	80	71	151
Medium (Attached)	57.9	50.2%	839	14.49	2.367	34	80	43	123
High and Mixed Use	4.3	3.7%	283	65.81	2.367	34	80	9	89
Sum	**115.4**	**100.0%**	**1,574**	---					

Entrada South Residential Land Use Category	Entrada South DUs/acre	Name of Equivalent Land Use Category in 2020 UWMP	2020 UWMP gpd/DU	Entrada South gpd/DU	Entrada South Departure from 2020 UWMP	
					gpd/DU Difference	gpd/DU Ratio
Low Medium (Detached)	8.50	detcondo2 (6-10 DUs/acre)	74	151	77	2.04
Medium (Attached)	14.49	detcondo1 (10 DUs/acre or more)	58	123	65	2.12
High and Mixed Use	65.81	detcondo1 (10 DUs/acre or more)	58	89	31	1.53
	Net for Multi-Family Dwellings in Entrada South		**65**	**135**	**70**	**2.08**

Notes

All residential land uses are multi-family dwellings.

2020 UWMP land use categories and water demand factors are from Table 3 of Appendix H of MWM (2021).

DU = dwelling units DUs/acre = dwelling units per acre gpcpd = gallons per capita per day gpd/DU = gallons per day per dwelling unit PPHH = persons per household

Attachment 4

2016 Analysis of Dwelling Unit Occupancy Rates

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GSI Water Solutions, Inc.

Technical Memorandum

To: Dirk Marks – Castaic Lake Water Agency
Lisa Maddaus – Maddaus Water Management

Copy: Mary Lou Cotton – Kennedy Jenks Consultants
Ken Peterson – Valencia Water Company
Matt Dickens – Valencia Water Company
Steve Zimmer– Newhall Land and Farming Company
Corey Harpole – Newhall Land and Farming Company
Alex Herrell – Newhall Land and Farming Company

From: John Porcello – GSI Water Solutions, Inc.
Cindy Ryals – GSI Water Solutions, Inc.

Date: February 10, 2016

Re: Evaluation of Dwelling Unit Occupancy Rates for Newhall Ranch and the West Side Communities

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Introduction

A population analysis was issued in November 2014 for the Castaic Lake Water Agency (CLWA) by Maddaus Water Management (Maddaus, 2014), in support of CLWA's activities to (1) develop its 2015 Water Use Efficiency Strategic Plan (Maddaus and Western Policy Research, 2015) and (2) begin preparation and reporting activities for its 2015 Urban Water Management Plan (UWMP). In both plans, the population analysis is critical input for estimating current and projected future water demands and daily per-person (per-capita) rates of water use within a given water provider's service area. For each type of residential land use, two key values used in the population analysis that affect projections of future water demands are (1) the number of dwelling units in a given retail water purveyor's service area and (2) the occupancy rate (population density), which is the number of persons per household (PPHH) for each classification of single family (SF) and multi-family (MF) structures in the water service area.

At the request of the Newhall Land and Farming Company (NLF) and CLWA, GSI Water Solutions, Inc. (GSI), reviewed the population analysis conducted by Maddaus for the portion of the CLWA service area containing the retail service area of the Valencia Water Company (VWC). The analysis compared 2010 occupancy rates estimated by Maddaus across the VWC

service area (from 2010 U.S. Census data) with (1) census analyses in relatively newer portions of the VWC service area (where the median year built is 2000 or newer); (2) more recent (2011 through 2014) census-based occupancy rates of the newest developments in this same area and (3) buyer profile data collected by NLF in its newest developments from 2010 to the present. This comparative analysis was conducted to understand the applicability of the 2010-bsaed Maddaus occupancy rates to the specific types of residential structures and developments that are planned in the West Side Communities, which are expected to be gradually built and occupied beginning in 2018 and continuing to full build out in 2034. Results of the analysis are presented in Table 1, which lists the occupancy rates in order from smallest to highest values for the net average PPHH (which is the net area-wide average occupancy rate across the entire mixture of single-family and multi-family housing in a given area).

The remainder of this technical memorandum presents the following:

- Estimates of current occupancy rates inside the VWC service area
- Estimates of occupancy rates in existing recently-constructed residences inside VWC's service area and future planned residential construction in the West Side Communities
- Recommended occupancy rates for future residences in the West Side Communities
- Updates to land use details for the West Side Communities

Estimates of Current Occupancy Rates inside the VWC Service Area

The person per household (PPHH) occupancy rates calculated by Maddaus (2014) are based on an evaluation of U.S. Census data that incorporates decennial census block data from 2010 with block group data from the American Community Survey (ACS), collected from 2006 through 2011. ACS data are issued by the U.S. Census Bureau (USCB), and reflect changing trends in population statistics over time. The ACS survey is distributed to a portion of the population annually, and the responses over a 5-year period are grouped to provide a streamlined understanding of a population's characteristics over time (USCB, 2008). Although ACS data are not available at the block level and only are published as aggregated values over 3-year or 5-year periods, the ACS data provide more detailed statistics than decennial census data. The Maddaus analysis results for occupancy rates of single-family and multi-family residences are shown in Table 1, and include a net average occupancy rate for the mixture of all dwelling unit types (single- and multi-family buildings) of 2.71 PPHH (as calculated by GSI using the population distribution reported by Maddaus [2014]). As shown in Table 1, this net average occupancy rate estimated for VWC's service area is lower than reported in the 2010 U.S. Census (USCB, 2015) for the City of Santa Clarita (2.98 PPHH) and Stevenson Ranch (3.14 PPHH).

Because of the differences in collection methods and representative time frames for the decennial census data versus the 5-year ACS data, GSI reviewed the same population statistics using just the data issued by ACS and only at the tract level. GSI's results were similar to the Maddaus values for net average occupancy rates in VWC's service area. However, several

additional sources of information indicate that occupancy rates may differ for the specific types of planned residential structures in the future West Side Communities, as discussed below.

Occupancy Rate Estimates for Existing Recently-Constructed Residences in VWC's Service Area and Planned Residential Construction in Future West Side Communities

As stated previously, Maddaus (2014) used a combination of decennial census data and ACS 5-year aggregate data for the period 2006 through 2011 to derive occupancy rates based on land use. The results for the different land uses, also shown in the first row of Table 1, are:

- Single family houses – 2.97 PPHH
- Condominiums/Townhomes – 2.97 PPHH
- Apartments – 1.87 PPHH
- VWC service area – 2.71 PPHH

The VWC service area occupancy rate estimates reported by Maddaus (2014) relied on data which included neighborhoods that were developed over the past four to five decades. Accordingly, the current area-wide occupancy rates in the VWC service area may not be representative of the newest developments that are now present nor the future types of residences to be built in the West Side Communities. To evaluate this, GSI reviewed multiple sources of population and projected development information, including information showing general trends in occupancy rates over time, to estimate future occupancy rates for Newhall Ranch and the West Side Communities. GSI considers these analyses to provide more representative estimates of current development and occupancy trends, and hence future population projections. The various sources of information reviewed and the findings of each analysis are discussed below.

Valencia Water Company – Selected Census Block Data Based on Locations that Include Apartment Complexes

VWC staff reviewed decennial (2010) census data at the block level for Bridgeport, North Park, and Stevenson Ranch, which are all recently-constructed neighborhoods with a mixture of houses, condominiums, townhomes, and apartment complexes. Their findings are presented in Table 2. In these neighborhoods, VWC found average occupancy rate values of 3.06 PPHH for SF detached units, 2.43 PPHH for SF attached units, and 2.10 PPHH for MF attached units (apartments). Of note are (1) the lower average occupancy rate for condominiums and townhomes (2.43 PPHH) than the Maddaus estimate for all categories of SF units (2.97 PPHH); (2) the wide range of occupancy rates for condominiums and townhomes (1.63 to 3.05 PPHH); and (3) the higher estimated occupancy rates for apartments (average of 2.10 PPHH) compared with the Maddaus estimate (1.87 PPHH).

NLF – Buyer Profile Surveys

NLF surveys the buyers of new properties for demographic information, which includes questions about the number of people living in the dwelling unit. NLF queried their database to

provide this information, based on 1,233 profile surveys received from June 2010 through early February 2016. The average occupancy rates identified by this query are as follows:

- Single family houses – 3.41 PPHH
- Detached Condominiums/Townhomes – 2.54 PPHH
- Attached Condominiums/Townhomes – 2.34 PPHH

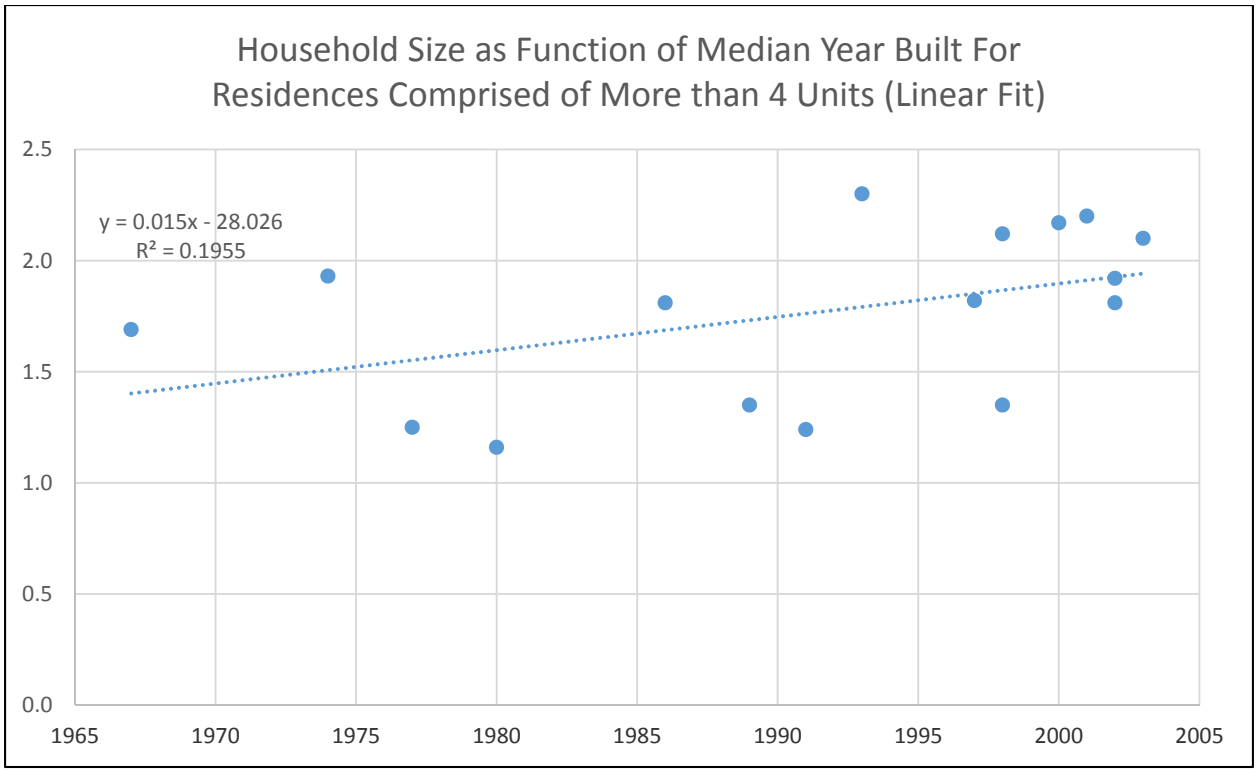
The results of this query are presented in Table 3, and provide more recent occupancy rate information than 2010 census data. Compared with the 2010 average occupancy rate derived by Maddaus for all SFD dwellings in VWC's service area (2.97 PPHH), the NLF survey values are 0.44 PPH higher for single family houses, 0.43 PPHH lower for detached condominiums/ townhomes, and 0.63 PPHH lower for attached condominiums/townhomes.

GSI – American Community Survey Census Data

To verify the findings of both the VWC and NLF evaluations, GSI evaluated two sets of data from ACS. First, the average occupancy rate was compared with the median year a home was built to confirm a reported trend towards higher occupancy rates in more recent homes. This evaluation used 2010 decennial census data for household size and 2006 through 2010 ACS data for the median year of built structures. Second, occupancy rate values based on land use type were calculated from ACS census data for 2011 through 2014 and compared to the values calculated from 2010 census data.

For both comparisons, tract level data were used to provide a more robust comparison between the scales of available ACS data and the decennial census data (rather than comparing data attained from different collection methods for the different scales). ACS data were needed because of the level of detail provided about number of housing units in a structure and the year that housing units were built.

GSI found an increasing trend over time in the household size of apartments, which are assumed to be the structures consisting of more than 4 housing units. This data trend is shown in the chart on the next page. Housing occupancy rates for these types of housing unit appear to be trending up during the past 10 to 15 years, compared with the early years of development.



For all tracts inside VWC's service area, and using 2010 through 2014 ACS data (as opposed to the earlier 5-year period of 2006 through 2011), GSI calculated the following average PPHH occupancy rates for different sizes of housing units:

- 1 unit (attached and detached) – 3.1 PPHH
- 2-4 unit structures – 2.3 PPHH
- >4 unit structures – 1.8 PPHH
- All units combined – 2.9 PPHH

These values are very similar to the 2010 values presented by Maddaus, because they include the entire VWC service area. In the five census tracts inside VWC's service area where the median year-built of all residences (SF and MF combined) is the year 2000 or newer, the tract-level census data in 2010 and in 2011 through 2014 indicate that the PPHH for apartments (i.e., the " > 4 unit structures " category) ranges from 1.81 to 2.20, with a mean PPHH of 2.05 and a standard deviation of 0.15 (see Table 4). When compared with the average apartment occupancy rate of 1.87 PPHH developed by Maddaus (2014) for the entire VWC service area, these higher values for newly-constructed apartments indicate that occupancy rates for apartments are increasing over time.

Recommended Occupancy Rates for Future Residences in the West Side Communities

The West Side Communities represent the majority of the future development that will occur within the VWC service area. Below is a summary of the occupancy rates that GSI recommends be used in future population projects and water demand estimates.

Apartments

Based on the review of 2011 through 2014 ACS data, GSI recommends the use of 2.20 PPHH, which is the mean value + 1 standard deviation and provides a reasonable (and not too low) estimate of occupancy rates in future newly constructed apartments in the West Side Communities. This value also is similar to VWC's analysis of new apartments (using 2010 block data), for which the mean value + 1 standard deviation sums to a value of 2.15 PPHH. GSI's recommended value of 2.20 PPHH provides a water use estimate that acknowledges the likely lower occupancy rates of apartments than other multi-family dwellings, while also reducing the chance of underestimating actual indoor water needs in apartment units.

Condominiums/Townhomes

For condominiums and townhomes, census tract data evaluated by VWC in recent developments indicate an average of 2.43 PPHH, with a standard deviation of 0.44 PPHH. The mean value + 1 standard deviation sums to a value of 2.87 PPHH. GSI recommends using a value of 2.60 PPHH in future water demand estimates because (1) this is between than the VWC mean value and the VWC "mean + 1 standard deviation" value; (2) VWC's analysis indicates that occupancy rates can be as high as at least 3.05 PPHH; (3) NLF's Buyer Profile Database indicates an average PPHH of 2.54 for detached condominiums/townhomes and 2.34 for attached condominiums/townhomes; and (4) the recommended value of 2.60 PPHH reduces the chance of underestimating actual indoor water needs in condominiums and townhomes.

Single-Family Detached Homes

Similarly, NLF's Buyer Profile Database indicates an average occupancy rate of 3.41 PPHH for single-family homes during the past five to six years (June 2010 through early February 2016). VWC's evaluation of 2010 census block data in recent developments indicates that single-family homes average 3.06 PPHH with a standard deviation of 0.55 PPHH and values as high as at least 3.64 PPHH. Accordingly, GSI recommends the use of a 3.40 PPHH occupancy rate, which is 0.21 PPHH lower than the mean value + 1 standard deviation from the VWC analysis (3.61 PPHH), and is similar to the average from the NLF surveys (3.41 PPHH). This value is also similar to (1) SCAG and OVOV projections in the SCAG North LA Subregion (range 3.19 PPHH [from the OVOV EIR] to 3.42 PPHH [from the SCAG 2008 RTP]); and (2) SCAG projections for unincorporated LA County (range 3.25 to 3.56 PPHH [from the SCAG 2016 RTP]), where these statistics reflect the predominance of single-family dwellings.[1]

[1] SCAG stands for Southern California Association of Governments. OVOV stands for One Valley – One Vision. RTP stands for Regional Transportation Plan.

Accordingly, the 3.40 PPHH value is a reasonable (and not too low) estimate of occupancy for future newly constructed detached single-family homes in the West Side Communities, based on the aforementioned analyses and the desire to not underestimate potential water needs in these housing units.

Update to Land Use Details for West Side Communities

The water demand models for the West Side Communities use a different land use classification system for residential housing types than are used in the Maddaus water demand models. Tables 5 and 6 present information on the number of dwelling units and acreages for each of the West Side and Maddaus land use categories. Table 5 presents this information for full build-out conditions, which NLF expects to be obtained by the end of the year 2034. Table 6 presents the same information at the end of 2020, which is the time when the Maddaus model transitions from an econometric analysis (through the year 2020) to a land-use based analysis.

Tables 5 and 6 also present the recommendation for occupancy rates to use in the West Side Communities, based on the assessment of more recent population information (described above) than was used in the original Maddaus (2014) population analysis. As shown in Table 1, these rates result in average occupancy rates of 2.80 PPHH for Newhall Ranch and 2.78 PPHH for the collective group of nine West Side Communities (which includes Newhall Ranch).

References Cited

Maddaus Water Management. 2014. *DRAFT – CLWA Population Assessment and GPCD Review*. Prepared for Stephanie Anagnoson, Castaic Lake Water Agency. November 20, 2014.

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United States Census Bureau (USCB). 2008. *A Compass for Understanding and Using American Community Survey Data, What General Users Need to Know*. U.S. Government Printing Office, Washington, DC. October 2008.

United States Census Bureau (USCB). 2015. *2010 and Historic Census Data.* Accessed online on December 8, 2015 at http://www.census.gov/ .

United States Census Bureau (USCB). 2016. American FactFinder data search. Accessed online on January 21, 2016 at http://factfinder.census.gov/.

Table 1
Comparison of Occupancy Rate Estimates
Valencia, California

Area	Occupancy Rate (PPHH) for Single-Family Houses	Occupancy Rate (PPHH) for Condominiums and Townhomes	Occupancy Rate (PPHH) for Apartments	Net Average Occupancy Rate (PPHH)	Source
VWC Service Area in 2010 (Using Census Blocks)	2.97	2.97	1.87	2.71	Maddaus, Nov. 2014 (U.S. Census 2010 Block Data)
Projection for Future West Side Communities	3.40	2.60	2.20	2.78	GSI Analysis of Net PPHH and GSI Recommendations for Each Residence Type
Projection for Future Newhall Ranch	3.40	2.60	2.20	2.80	GSI Analysis of Net PPHH and GSI Recommendations for Each Residence Type
City of Santa Clarita in 2010	---	---	---	2.98	U.S. Census 2010 (Table Data)
VWC Service Area (2010 Census Block Data Analysis) (Recently Constructed Developments)	2.15 to 3.64 3.06 (avg) 0.55 (std. dev.) 3.61 (avg. + 1 std. dev.)	1.63 to 3.05 2.43 (avg) 0.44 (std. dev.) 2.87 (avg. + 1 std. dev.)	2.07 to 2.14 (2.10 avg) 0.05 (std. dev.) 2.15 (avg. + 1 std. dev.)	---	VWC Analysis of U.S. Census 2010 Block Data
VWC Service Area (2011-2014 Census Tract Data Analysis) (5 Census Tracts With Median Year Built of 2000 or More Recent)	---	---	1.81 to 2.20 (2.05 avg) 0.15 (std. dev.) 2.20 (avg. + 1 std. dev.)	2.28 to 3.12 (2.72 avg) 0.28 (std. dev.) 3.00 (avg. + 1 std. dev.)	GSI Analysis of U.S. Census 2011-2014 Tract Data
NLF Recently Constructed Developments	3.41	2.54 (detached) 2.34 (attached)	---	3.14 (Excluding Apartments)	NLF Buyer Profile Surveys (June 2010 through February 2016)
Stevenson Ranch in 2010	---	---	---	3.14	U.S. Census 2010 (Table Data)

Notes
PPHH = persons per household VWC = Valencia Water Company Data are listed from lowest to highest values of the net average PPHH.

Table 2

Single Family and Multi-Family Persons Per Household Assessment For Recently-Constructed Residences at the Bridgeport, North Park, and Stevenson Ranch Developments (Using 2010 U.S. Census Block Data)

Prepared by Valencia Water Company and GSI Water Solutions

Location	Housing Type	Attached/Detached	Units	Population	PPHH	Notes
Bridgeport	SF	Detached	206	608	2.95	SF Attached around lake and west on NH Ranch Parkway
North Park	SF	Detached	44	153	3.48	High Density Detached
Stevenson Ranch	SF	Detached	189	523	2.77	Stevenson Ranch Parkway and The Old Road
Stevenson Ranch	SF	Detached	128	275	2.15	
Stevenson Ranch	SF	Detached	22	80	3.64	
Stevenson Ranch	SF	Detached	78	262	3.36	North of Pacific Colony
North Park	SF	Attached	52	123	2.37	
North Park	SF	Attached	27	44	1.63	
North Park	SF	Attached	30	86	2.87	
North Park	SF	Attached	20	52	2.60	
North Park	SF	Attached	21	64	3.05	Provence
North Park	SF	Attached	46	95	2.07	Village Walk
Stevenson Ranch	SF	Attached	24	58	2.42	Marblehead Palisades Condos
Stevenson Ranch	SF	Attached	57	141	2.47	Marblehead Palisades Condos
Bridgeport	MF	Attached	188	402	2.14	Bridgeport Coast Apartments
North Park	MF	Attached	201	416	2.07	Skycrest Apartments

Location	Housing Type	Attached/Detached	Mean PPHH	Std. Dev.	Range	Mean + 1 Std. Dev.
All of Above	SF	Detached	3.06	0.55	2.15 to 3.64	3.61
All of Above	SF	Attached	2.43	0.44	1.63 to 3.05	2.87
All of Above	MF	Attached	2.10	0.05	2.07 to 2.14	2.15

Table 3
NLF Buyers Survey
Valencia, CA
Prepared by Newhall Land and Farming Company

Neighborhood	Product Type	No. of Beds	Avg. Sq.Ft.	Avg. HH Size
Attached				
Artisan	2-Story Town	3	1724	2.69
Claridad	2-Story Town	2-3	1397	2.09
Esperto	2/3 Story Town	2-3	1470	2.12
Hartford	2-Story Town	2-3	1683	2.20
Kensington	3-Story Town	4-5	2511	4.20
Cielo	3-Story Live/Work Town	2-3	2400	2.63
Overall Average				**2.34**
Single Family Detached Clusters				
Aqua	SFD Cluster	2-3	1205	2.00
Aria	SFD Cluster	3-5	1989	2.72
Providence	SFD Cluster	4-5	2225	2.83
Sol	SFD Cluster	4-5	1748	2.82
Terra	SFD Cluster	2-3	1590	2.19
Overall Average				**2.54**
Traditional Single Family Detached				
Belmont	SFD	3-6	3322	3.08
Brookville	SFD	4-5	2844	3.41
Capri	SFD	4-5	2811	3.05
Charleston	SFD	4-5	4117	3.27
Classics	SFD	4-6	4150	3.94
Estrella	SFD	4-5	2270	3.51
Heirloom	SFD	4-5	3480	3.60
Highgate	SFD	3-5	2786	3.14
Lavello	SFD	4-5	2763	3.67
Lexington	SFD	4-5	3511	3.73
Milan	SFD	3-4	3336	3.76
Monument	SFD	4-6	3770	3.41
Mosaic	SFD	4-5	3131	3.39
Toscana	SFD Alley	4	2472	3.20
Overall Average				**3.41**
Overall Average for All Product Types				**3.07**

Weighted Average		
Type	**Total People**	**Avg. HH Size**
SFD Cluster	518	2.54
SFD	2728	3.41
Attached	528	2.34
Overall	**3774**	**3.14**
SFD Cluster	518	2.54
SFD	2728	3.41
Overall	**3246**	**3.27**

Source: 1,233 individual Valencia Buyer Profiles from West Creek, West Hills, RiverVillage, and Villa Metro, collected between June 2010 and February 2016.

Table 4
Estimated Occupancy Rates in Developments with Median Year-Built of 2000 or Newer

Valencia, California

Tract No.	Median Yr Built	>4+ Units PPHH (Apartments)	Avg. PPHH (All Residences)
9203.39	2000	2.17	3.12
9201.14	2001	2.20	2.72
9201.09	2002	1.92	2.59
9203.28	2002	1.81	2.28
9201.08	2003	2.10	2.88
Min		1.81	2.28
Median		2.10	2.72
Mean		2.05	2.72
Max		2.20	3.12
Std. Dev.		0.15	0.28
Mean + 1 Std. Dev.		**2.20**	**3.00**

Table 5

Residential Land Uses and Occupancy Rates at Build-Out (Year 2034)

West Side Communities (9 Villages Combined)

Prepared by Newhall Land and Farming Company and GSI Water Solutions

LAND USE CATEGORIES, ACREAGES, AND DWELLING UNITS							FUTURE WEST SIDE OCCUPANCY RATES	
Maddaus's Water Demand Model			Newhall Land's Water Demand Model				Newhall Land's Water Demand Model	
Land Use Category	Acreage	Number of DU's	Land Use Category	Housing	Acreage	Number of DU's	Old Occupancy Rate (PPHH)	New Occupancy Rate (PPHH)
Single Family (<1 DU/acre)	263.3	589	Estate	Single-Family	61.2	65	3.40	3.40
			Low	Single-Family	202.1	524	3.40	3.40
Single Family (1-5 DU/acre)	395.3	3,199	Low Medium	Single-Family	809.4	6,550	3.40	3.40
Single Family (6-10 DU/acre)	414.1	3,351						
Condos/Townhomes	727.6	10,024	Medium (Detached Condos)	Multi-Family	475.2	5,676	2.60	2.60
			High and Mixed Use	Multi-Family	252.4	4,348	2.60	2.60
Apartments	236.5	4,337	Apartments	Multi-Family	236.5	4,337	2.60	2.20
Mobile Homes	0	0	---	---	---	---	---	---
Senior (Active)	0	0	---	---	---	---	---	---
TOTAL	**2,036.8**	**21,500**	**TOTAL**	**---**	**2,036.8**	**21,500**	**61,613**	**59,877**
							Total Population	

DU = dwelling unit PPHH = persons per household

Table 6

Estimated Residential Land Uses and Occupancy Rates for December 31, 2020

West Side Communities (9 Villages Combined)

Prepared by Newhall Land and Farming Company and GSI Water Solutions

LAND USE CATEGORIES, ACREAGES, AND DWELLING UNITS							FUTURE WEST SIDE OCCUPANCY RATES	
Maddaus's Water Demand Model			Newhall Land's Water Demand Model				Newhall Land's Water Demand Model	
Land Use Category	Acreage	Number of DU's	Land Use Category	Housing	Acreage	Number of DU's	Old Occupancy Rate (PPHH)	New Occupancy Rate (PPHH)
Single Family (<1 DU/acre)	0.0	0	Estate	Single-Family	0.0	0	3.40	3.40
			Low	Single-Family	0.0	0	3.40	3.40
Single Family (1-5 DU/acre)	3.9	32	Low Medium	Single-Family	8.0	65	3.40	3.40
Single Family (6-10 DU/acre)	4.1	33						
Condos/Townhomes	15.6	215	Medium (Detached Condos)	Multi-Family	10.2	122	2.60	2.60
			High and Mixed Use	Multi-Family	5.4	93	2.60	2.60
Apartments	32.2	590	Apartments	Multi-Family	32.2	590	2.60	2.20
Mobile Homes	0	0	---	---	---	---	---	---
Senior (Active)	0	0	---	---	---	---	---	---
TOTAL	**55.8**	**870**	**TOTAL**	**---**	**55.8**	**870**	**2,314**	**2,078**
							Total Population	

DU = dwelling unit PPHH = persons per household

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Attachment 5

Water Demand Calculations for Entrada South
December 2021

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Table 5-1
Land Use Plan Statistics
Entrada Village South

Land Use	Has Water Demands?	Area (acres)			Dwelling Units			
		Detached	Attached	Total	Detached	Attached	Total	
Residential Development								
Estate (Single-Family Detached)	Yes	0.0	0.0	0.0	0	0	0	
Low (Single-Family Detached)	Yes	0.0	0.0	0.0	0	0	0	
Low Medium (Single-Family Detached)	Yes	0.0	0.0	0.0	0	0	0	
Low Medium (Multi-Family Detached)	Yes	53.2	0.0	53.2	452	0	452	
Low Medium (Multi-Family Attached)	Yes	0.0	0.0	0.0	0	0	0	
Medium (Multi-Family Detached)	Yes	0.0	0.0	0.0	0	0	0	
Medium (Multi-Family Attached)	Yes	0.0	57.9	57.9	0	839	839	
High and Mixed Use (Multi-Family)	Yes	0.0	4.3	4.3	0	283	283	
Apartments (Multi-Family)	Yes	0.0	0.0	0.0	0	0	0	
Subtotals		**53.2**	**62.2**	**115.4**	**517**	**1,057**	**1,574**	
Nonresidential Development								
Mixed-Use Commercial								
Retail	Yes			1.50	Mixed use retail (including library)			
Office	Yes			46.90	Mixed use office			
Commercial	Yes			0.0	Commercial retail			
Business Park	Yes			2.80	Industrial + office that is in the commercial category			
Visitor Serving	Yes			0.0	Visitor center			
Water Reclamation Plant	Yes			0.0	Newhall WRP (assigned to Landmark)			
Electrical Substation	No			0.0	Has no water use			
Fire Station	Yes			0.0	Fire station(s)			
Hotel/Spa	Yes			5.6	Hotel/spa			
Sr. Assisted Living	Yes			0.0	Sr. Assisted Living (built into Residential Mixed Use)			
Golf Club House	Yes			0.0	Golf club house			
Schools	Yes							
Elementary (1)	Yes			10.0				
Middle (0)	Yes			0.0				
High (0)	Yes			0.0				
Subtotal				**66.8**				
Recreation, Arterials, Open Space								
Recreation								
Recreation Centers	Yes			0.0	Rec center (community park)			
Neighborhood Parks	Yes			8.1	Park (community park)			
Lake - Water	Yes			0.0	Water feature			
Lake - Park Area	Yes			0.0	Assume this is in "Lake-Water" category			
Golf Course	Yes			0.0	Irrigated - excludes the club house			
Arterial Highways								
Hardscape/Road Section	No			28.8	Not irrigated			
Landscape Area	Yes			4.1	Landscape in parkways and medians			
Major Open Areas								
Natural Open Space	No			58.7	Open space that is not part of "High Country" category			
River Corridor	No			0.0	Included in "Natural Open Space & High Country"			
Non-Irrigated Slopes	No			0.0	Previously "Community Open Area"			
Irrigated Slopes, Wet Zones	Yes			71.3	Previously "Community Slopes"			
O.S. Drainage Facilities	No			25.1	Debris basins, water quality basins, drainage channels			
O.S. LDZ, O.S. Trail LDZ, SD&SS easements	Yes			4.7	Previously "Ungraded Areas and Easements"			
Subtotal				**200.8**				
Totals				**383.0**	**517**	**1,057**	**1,574**	

Updated December 2021 by GSI Water Solutions, Inc.

All data and acreages in this analysis are approximate and are subject to change at the time of preparation of tentative or final land use maps.

Table 5-2
Verification of Updated Population and Density
Entrada Village South

RESIDENTIAL LAND USE	Acreage	Dwelling Units		Occupancy persons/DU	Population Estimate
		Detached	Attached		
Estate (Single-Family Detached)	0.0	0	0	3.292	0
Low (Single-Family Detached)	0.0	0	0	3.292	0
Low Medium (Single-Family Detached)	0.0	0	0	3.292	0
Low Medium (Multi-Family Detached)	53.2	452	0	2.367	1,070
Low Medium (Multi-Family Attached)	0.0	0	0	2.367	0
Medium (Multi-Family Detached)	0.0	0	0	2.367	0
Medium (Multi-Family Attached)	57.9	0	839	2.367	1,986
High and Mixed Use (Multi-Family)	4.3	0	283	2.367	670
Apartments (Multi-Family)	0.0	0	0	2.103	0
TOTAL	**115.4**	**452**	**1,122**		**3,726**

Average Occupancy

Population	3,726	**2.37 persons/DU**
Total Dwelling Units	1,574	

Updated December 2021 by GSI Water Solutions, Inc.
DU = dwelling unit

All data and acreages in this analysis are approximate and are subject to change at the time of preparation of tentative or final land use maps.

Table 5-3
Water Demand Calculations for Residential Development
Entrada Village South

Land Use	Acreage			Dwelling Units		Estimated Water Demand											
						Potable Use						Nonpotable Use				Total Use	
	Total	Detached	Attached	Detached	Attached	Interior Use gpcpd (a)	Exterior Use gpcpd (b)	Occupancy p/DU (c)	Interior (AFY)	Exterior (AFY)	**Subtotal (AFY)**	Irrigated Area (d)	Acreage Multi-Family Units (Nonpotable Water)	Annual Use Rate (AF/ac)	**Subtotal (AFY)**	(AFY)	Gallons Per Day Per Dwelling Unit
Estate (Single-Family Detached)	0.0	0.0	0.0	0	0	54	475	3.292	**0**	**0**	**0**	45%	0.0	0.0	**0**	**0**	**---**
Low (Single-Family Detached)	0.0	0.0	0.0	0	0	54	200	3.292	**0**	**0**	**0**	35%	0.0	0.0	**0**	**0**	**---**
Low Medium (Single-Family Detached)	0.0	0.0	0.0	0	0	54	90	3.292	**0**	**0**	**0**	25%	0.0	0.0	**0**	**0**	**---**
Low Medium (Multi-Family Detached)	53.2	53.2	0.0	452	0	50	34	2.367	**60**	**41**	**101**	15%	53.2	4.6	**37**	**138**	**273**
Low Medium (Multi-Family Attached)	0.0	0.0	0.0	0	0	50	34	2.367	**0**	**0**	**0**	15%	0.0	4.6	**0**	**0**	**---**
Medium (Multi-Family Detached)	0.0	0.0	0.0	0	0	50	34	2.367	**0**	**0**	**0**	15%	0.0	4.6	**0**	**0**	**---**
Medium (Multi-Family Attached)	57.9	0.0	57.9	0	839	50	34	2.367	**112**	**76**	**188**	15%	57.9	4.6	**41**	**229**	**244**
High and Mixed Use (Multi-Family)	4.3	0.0	4.3	0	283	50	34	2.367	**38**	**26**	**64**	15%	4.3	4.6	**3**	**67**	**211**
Apartments (Multi-Family)	0.0	0.0	0.0	0	0	50	32	2.103	**0**	**0**	**0**	15%	0.0	4.6	**0**	**0**	**---**
Total Water Demands									**210**	**143**	**353**				**81**	**434**	
Per-Capita Use (gallons/person/day)									**50**	**34**	**85**				**20**	**104**	

Notes:
(a) gpcpd = gallons per capita per day.
Interior water uses include drinking, bathing, laundry, sanitation, etc.
(b) gpcpd = gallons per capita per day.
Exterior water uses include landscape irrigation, washing cars, filling swimming pools, etc.
(c) p/DU = persons per dwelling unit.
(d) Irrigated areas include common areas, greenbelt irrigation within residential neighborhoods, etc.
The percentage value is the percentage of the gross lot area that is irrigated with nonpotable water.

Updated December 2021 by GSI Water Solutions, Inc.
AFY = acre-feet per year AF/ac = acre-foot per acre

Single-family residences shown in green. Multi-family detached residences shown in blue. Multi-family attached residences shown in reddish-brown.

The values shown in this analysis are approximate and are subject to change at the time of preparation of tentative or final land use maps.

Table 5-4
Water Demand Calculations for Nonresidential Development
Entrada Village South

Land Use	Acreage (a)	Floor Space (sq. ft.)	Estimated Water Demand											
			Potable Use					Nonpotable Use			Total			
			Interior Rate (a)	Exterior Rate gpapd (b)	Interior Use (AFY)	Exterior Use (AFY)	Subtotal (AFY)	Percent Irrigable Land	Annual Use (AF/ac)	Subtotal (AFY)	(AFY)	Units	No. of Units	Gallons Per Day Per Unit
Mixed-Use Commercial														
Retail (including library)	1.5	**6,495**	0.01	0	1	0	**1**	25%	3.14	**2**	**3**	TSF	6	**412**
Office	46.9	**518,505**	0.05	0	27	0	**27**	25%	3.14	**37**	**64**	TSF	519	**110**
Commercial (Retail)	0.0	**0**	0.18	0	0	0	**0**	25%	3.14	**0**	**0**	TSF	0	**0**
Business Park (Office)	**2.8**	**45,000**	0.05	0	3	0	**3**	25%	3.14	**3**	**6**	TSF	45	**119**
Business Park (Industrial)	**0.0**	**0**	0.18	275	0	0	**0**	25%	3.14	**0**	**0**	TSF	0	**0**
Visitor Serving	0.0	**0**	0.01	275	0	0	**0**	25%	3.14	**0**	**0**	TSF	0	**0**
Water Reclamation Plant	0.0	**0**	0.18	0	0	0	**0**	25%	3.14	**0**	**0**	TSF	0	**0**
Electrical Substation	0.0	**0**	0.00	0	0	0	**0**	0%	0.00	**0**	**0**	TSF	0	**0**
Fire Stations	0.0	**0**	0.18	275	0	0	**0**	25%	3.14	**0**	**0**	TSF	0	**0**
Institutional	**0.0**	**0**	0.18	0	0	0	**0**	25%	3.14	**0**	**0**	TSF	0	**0**
Hotel/Spa	5.6	**160,000**	0.18	0	33	0	**33**	25%	4.10	**6**	**39**	ROOM	100	**348**
Hospital	**0.0**	**0**	450	0	0	0	**0**	25%	4.10	**0**	**0**	TSF	0	**0**
Sr. Assisted Living	0.0	**0**	90	108	0	0	**0**	25%	4.10	**0**	**0**	ROOM	0	**0**
Golf Club House	0.0	**0**	0.01	0	0	0	**0**	0%	3.14	**0**	**0**	TSF	0	**0**
Schools														
Elementary **(1)**	10.0		20	0	17	0	**17**	25%	6.02	**16**	**33**	STUDENTS	**750**	**39.3**
Middle **(0)**	0.0		20	0	0	0	**0**	25%	6.02	**0**	**0**	STUDENTS	**0**	**0.0**
High **(0)**	0.0		20	13.0	0	0	**0**	25%	6.02	**0**	**0**	STUDENTS	**0**	**0.0**
Total Water Demands					**81**	**0**	**81**			**64**	**145**			

Notes:
(a) Interior water uses include drinking and sanitation.
Units are in gallons per day per square foot for the commercial, business park, visitor serving, water reclamation plant, institutional, hotel/spa, and fire station land uses.
Units are in gallons per day per acre for the water treatment plant and electrical substation land uses.
Units are in gallons per day per student for schools.
Units are in gallons per day per bed for the hospital and Sr. Assisted Living land use categories. In Table A-1, the Sr. Assisted Living acreage is shown in the "High and Mixed Use (Multi-Family)" land use category.
(b) Potable water is used for outdoor uses that have potential human contact (e.g., swimming pools, wash water, some landscape irrigation). Units are in gallons per acre per day.
For Hospitals and for Sr. Assisted Living, the units are gallons per day per bed. For schools, this is the AF/year used by 1 Olympic-size swimming pool per high school (flushed 6 times/year); other outdoor needs are met with nonpotable water.

Updated December 2021 by GSI Water Solutions, Inc.
AFY = acre-feet per year AF/ac = acre-foot per acre gpapd = gallons per acre per day TSF = thousands of square feet

Table 5-5
Water Demand Calculations for Recreation, Arterial, and Open Space Land Uses
Entrada Village South

Land Use	Acreage	Estimated Water Demand					
		Potable Use		Nonpotable Use			
		Potable Use gpapd	Subtotal (AFY)	Percent Irrigable Land	Annual Use (AF/ac)	Subtotal (AFY)	Total (AFY)
Recreation							
Recreation Centers	0.0	90	**0**	75%	5.25	**0**	**0**
Neighborhood Parks	8.1	90	**1**	75%	5.25	**32**	**33**
Lake - Water	0.0	0	**0**	100%	6.97	**0**	**0**
Lake - Park Area	0.0	0	**0**	100%	6.97	**0**	**0**
Golf Course	0.0	0	**0**	100%	6.21	**0**	**0**
Arterial Highways							
Hardscape/Road Section	28.8	0	**0**	0%	0	**0**	**0**
Landscape Area	4.1	0	**0**	100%	3.14	**13**	**13**
Major Open Areas							
Natural Open Space	58.7	0	**0**	0%	0	**0**	**0**
River Corridor	0.0	0	**0**	0%	0	**0**	**0**
Non-Irrigated Slopes	0.0	0	**0**	0%	0	**0**	**0**
Irrigated Slopes, Wet Zones	71.3	0	**0**	100%	3.14	**224**	**224**
O.S. Drainage Facilities	25.1	0	**0**	0%	0	**0**	**0**
O.S. LDZ, O.S. Trail LDZ, SD&SS easements	4.7	0	**0**	90%	3.14	**14**	**14**
Total Water Demands			**1**			**283**	**284**

Updated December 2021 by GSI Water Solutions, Inc.
AFY = acre-feet per year AF/ac = acre-foot per acre gpapd = gallons per acre per day

The values shown in this analysis are approximate and are subject to change at the time of preparation of tentative or final land use maps.

Table 5-6
Summary of Water Demands
Entrada Village South

Land Use	Water Demand (AFY)		
	Potable	Nonpotable	Total
Residential Development			
Estate (Single-Family Detached)	0	0	0
Low (Single-Family Detached)	0	0	0
Low Medium (Single-Family Detached)	0	0	0
Low Medium (Multi-Family Detached)	101	37	138
Low Medium (Multi-Family Attached)	0	0	0
Medium (Multi-Family Detached)	0	0	0
Medium (Multi-Family Attached)	188	41	229
High and Mixed Use (Multi-Family)	64	3	67
Apartments (Multi-Family)	0	0	0
Subtotals	**353**	**81**	**434**
Nonresidential Development			
Mixed-Use Commercial			
Retail (including library)	1	2	3
Office	27	37	64
Commercial (Retail)	0	0	0
Business Park (Office)	3	3	6
Business Park (Industrial)	0	0	0
Visitor Serving	0	0	0
Water Reclamation Plant	0	0	0
Electrical Substation	0	0	0
Fire Stations	0	0	0
Institutional	0	0	0
Hotel/Spa	33	6	39
Hospital	0	0	0
Sr. Assisted Living	0	0	0
Golf Club House	0	0	0
Schools	17	16	33
Subtotals	**81**	**64**	**145**
Recreation, Arterials, Open Space			
Recreation			
Recreation Centers	0	0	0
Neighborhood Parks	1	32	33
Lake - Water	0	0	0
Lake - Park Area	0	0	0
Golf Course	0	0	0
Arterial Highways			0
Hardscape/Road Section	0	0	0
Landscape Area	0	13	13
Major Open Areas			0
Natural Open Space	0	0	0
River Corridor	0	0	0
Non-Irrigated Slopes	0	0	0
Irrigated Slopes, Wet Zones	0	224	224
O.S. Drainage Facilities	0	0	0
O.S. LDZ, O.S. Trail LDZ, SD&SS easements	0	14	14
Subtotals	**1**	**283**	**284**
Totals	**435**	**428**	**863**

Updated December 2021 by GSI Water Solutions, Inc.
AFY = acre-feet per year

The values shown in this analysis are approximate and are subject to change at the time of preparation of tentative or final land use maps.

Attachment 6

Water Demand Calculations for Valencia Commerce Center December 2021

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Table 6-1
Land Use Plan Statistics
Valencia Commerce Center

Land Use	Has Water Demands?	Area (acres)			Dwelling Units			
		Detached	Attached	Total	Detached	Attached	Total	
Residential Development								
Estate (Single-Family Detached)	Yes	0.0	0.0	0.0	0	0	0	
Low (Single-Family Detached)	Yes	0.0	0.0	0.0	0	0	0	
Low Medium (Single-Family Detached)	Yes	0.0	0.0	0.0	0	0	0	
Low Medium (Multi-Family Detached)	Yes	0.0	0.0	0.0	0	0	0	
Low Medium (Multi-Family Attached)	Yes	0.0	0.0	0.0	0	0	0	
Medium (Multi-Family Detached)	Yes	0.0	0.0	0.0	0	0	0	
Medium (Multi-Family Attached)	Yes	0.0	0.0	0.0	0	0	0	
High and Mixed Use (Multi-Family)	Yes	0.0	0.0	0.0	0	0	0	
Apartments (Multi-Family)	Yes	0.0	0.0	0.0	0	0	0	
Subtotals		**0.0**	**0.0**	**0.0**	**0**	**0**	**0**	
Nonresidential Development								
Mixed-Use Commercial								
Retail	Yes			0.0	Mixed use retail (including library)			
Office	Yes			68.5	Mixed use office			
Commercial	Yes			11.9	Commercial retail			
Business Park	Yes			139.2	Industrial + office that is in the commercial category			
Visitor Serving	Yes			0.0	Visitor center			
Water Reclamation Plant	Yes			0.0	Newhall WRP (assigned to Landmark)			
Electrical Substation	No			0.0	Has no water use			
Fire Station	Yes			0.0	Fire station(s)			
Hotel/Spa	Yes			0.0	Hotel/spa			
Sr. Assisted Living	Yes			0.0	Sr. Assisted Living			
Golf Club House	Yes			0.0	Golf club house			
Schools	Yes							
Elementary (0)	Yes			0.0				
Middle (0)	Yes			0.0				
High (0)	Yes			0.0				
Subtotal				**219.6**				
Recreation, Arterials, Open Space								
Recreation								
Recreation Centers	Yes			0.0	Rec center (community park)			
Neighborhood Parks	Yes			0.0	Park (community park)			
Lake - Water	Yes			0.0	Water feature			
Lake - Park Area	Yes			0.0	Assume this is in "Lake-Water" category			
Golf Course	Yes			0.0	Irrigated - excludes the club house			
Arterial Highways				0.0				
Hardscape/Road Section	No			12.4	Not irrigated			
Landscape Area	Yes			1.9	Landscape in parkways and medians			
Major Open Areas								
Natural Open Space	No			264.6	Open space that is not part of "High Country" category			
River Corridor	No			0.0	Included in "Natural Open Space & High Country"			
Non-Irrigated Slopes	No			8.3	Previously "Community Open Area"			
Irrigated Slopes, Wet Zones	Yes			27.7	Previously "Community Slopes"			
O.S. Drainage Facilities	No			14.1	Debris basins, water quality basins, drainage channels			
O.S. LDZ, O.S. Trail LDZ, SD&SS easements	Yes			21.0	Previously "Ungraded Areas and Easements"			
Subtotal				**350.0**				
Totals				**569.6**	**0**	**0**	**0**	

Updated December 2021 by GSI Water Solutions, Inc.

All data and acreages in this analysis are approximate and are subject to change at the time of preparation of tentative or final land use maps.

Table 6-2
Water Demand Calculations for Nonresidential Development
Valencia Commerce Center

Land Use	Acreage (a)	Floor Space (sq. ft.)	Estimated Water Demand											
			Potable Use					Nonpotable Use			Total			
			Interior Rate (a)	Exterior Rate gpapd (b)	Interior Use (AFY)	Exterior Use (AFY)	Subtotal (AFY)	Percent Irrigable Land	Annual Use (AF/acre)	Subtotal (AFY)	(AFY)	Units	No. of Units	Gallons Per Day Per Unit
Mixed-Use Commercial														
Retail (including library)	0.0	**0**	0.01	0	0	0	**0**	25%	3.14	**0**	**0**	TSF	0	**0**
Office	68.5	**911,400**	0.05	0	46	0	**46**	25%	3.14	**54**	**100**	TSF	911	**98**
Commercial (Retail)	11.9	**58,400**	0.18	0	12	0	**12**	25%	3.14	**10**	**22**	TSF	58	**336**
Business Park (Office)	**0.0**	**0**	0.05	0	0	0	**0**	25%	3.14	**0**	**0**	TSF	0	**0**
Business Park (Industrial)	**139.2**	**2,430,200**	0.18	275	490	43	**533**	25%	3.14	**110**	**643**	TSF	2,430	**236**
Visitor Serving	0.0	**0**	0.01	275	0	0	**0**	25%	3.14	**0**	**0**	TSF	0	**0**
Water Reclamation Plant	0.0	**0**	0.18	0	0	0	**0**	25%	3.14	**0**	**0**	TSF	0	**0**
Electrical Substation	0.0		0.00	0	0	0	**0**	0%	0.00	**0**	**0**	TSF	0	**0**
Fire Stations	0.0	**0**	0.18	275	0	0	**0**	25%	3.14	**0**	**0**	TSF	0	**0**
Institutional	**0.0**	**0**	0.18	0	0	0	**0**	25%	3.14	**0**	**0**	TSF	0	**0**
Hotel/Spa	0.0	**0**	0.18	0	0	0	**0**	25%	4.10	**0**	**0**	ROOM	100	**0**
Hospital	**0.0**		450	0	0	0	**0**	25%	4.10	**0**	**0**	TSF	0	**0**
Sr. Assisted Living	0.0		90	108	0	0	**0**	25%	4.10	**0**	**0**	ROOM	0	**0**
Golf Club House	0.0	**0**	0.01	0	0	0	**0**	0%	3.14	**0**	**0**	TSF	0	**0**
Schools														
Elementary **(0)**	0.0		20	0	0	0	**0**	25%	6.02	**0**	**0**	STUDENTS	**0**	**0.0**
Middle **(0)**	0.0		20	0	0	0	**0**	25%	6.02	**0**	**0**	STUDENTS	**0**	**0.0**
High **(0)**	0.0		20	13	0	0	**0**	25%	6.02	**0**	**0**	STUDENTS	**0**	**0.0**
Total Water Demands					**548**	**43**	**591**			**174**	**765**			

Notes:
(a) Interior water uses include drinking and sanitation.
Units are in gallons per day per square foot for the commercial, business park, visitor serving, water reclamation plant, institutional, hotel/spa, and fire station land uses.
Units are in gallons per day per acre for the water treatment plant and electrical substation land uses.
Units are in gallons per day per student for schools.
Units are in gallons per day per bed for the hospital and Sr. Assisted Living land use categories. In Table A-1, the Sr. Assisted Living acreage is shown in the "High and Mixed Use (Multi-Family)" land use category.
(b) Potable water is used for outdoor uses that have potential human contact (e.g., swimming pools, wash water, some landscape irrigation). Units are in gallons per acre per day.
For Hospitals and for Sr. Assisted Living, the units are gallons per day per bed. For schools, this is the AF/year used by 1 Olympic-size swimming pool per high school (flushed 6 times/year); other outdoor needs are met with nonpotable water.

Updated December 2021 by GSI Water Solutions, Inc.
AFY = acre-feet per year AF/ac = acre-foot per acre gpapd = gallons per acre per day TSF = thousands of square feet

Table 6-3
Water Demand Calculations for Recreation, Arterial, and Open Space Land Uses
Valencia Commerce Center

Land Use	Acreage	Estimated Water Demand					
		Potable Use		Nonpotable Use			
		Potable Use gpapd	Subtotal (AFY)	Percent Irrigable Land	Annual Use (AF/ac)	Subtotal (AFY)	Total (AFY)
Recreation							
Recreation Centers	0.0	90	**0**	75%	5.25	**0**	**0**
Neighborhood Parks	0.0	90	**0**	75%	5.25	**0**	**0**
Lake - Water	0.0	0	**0**	100%	6.97	**0**	**0**
Lake - Park Area	0.0	0	**0**	100%	6.97	**0**	**0**
Golf Course	0.0	0	**0**	100%	6.21	**0**	**0**
Arterial Highways							
Hardscape/Road Section	12.4	0	**0**	0%	0	**0**	**0**
Landscape Area	1.9	0	**0**	100%	3.14	**6**	**6**
Major Open Areas							
Natural Open Space	264.6	0	**0**	0%	0	**0**	**0**
River Corridor	0.0	0	**0**	0%	0	**0**	**0**
Non-Irrigated Slopes	8.3	0	**0**	0%	0	**0**	**0**
Irrigated Slopes, Wet Zones	27.7	0	**0**	100%	3.14	**87**	**87**
O.S. Drainage Facilities	14.1	0	**0**	0%	0	**0**	**0**
O.S. LDZ, O.S. Trail LDZ, SD&SS easements	21.0	0	**0**	90%	3.14	**60**	**60**
Total Water Demands			**0**			**153**	**153**

Updated December 2021 by GSI Water Solutions, Inc.
AFY = acre-feet per year AF/ac = acre-foot per acre gpapd = gallons per acre per day

The values shown in this analysis are approximate and are subject to change at the time of preparation of tentative or final land use maps.

Table 6-4
Summary of Water Demands
Valencia Commerce Center

Land Use	Water Demand (AFY)		
	Potable	Nonpotable	Total
Residential Development			
Estate (Single-Family Detached)	0	0	0
Low (Single-Family Detached)	0	0	0
Low Medium (Single-Family Detached)	0	0	0
Low Medium (Multi-Family Detached)	0	0	0
Low Medium (Multi-Family Attached)	0	0	0
Medium (Multi-Family Detached)	0	0	0
Medium (Multi-Family Attached)	0	0	0
High and Mixed Use (Multi-Family)	0	0	0
Apartments (Multi-Family)	0	0	0
Subtotals	**0**	**0**	**0**
Nonresidential Development			
Mixed-Use Commercial			
Retail (including library)	0	0	0
Office	46	54	100
Commercial (Retail)	12	10	22
Business Park (Office)	0	0	0
Business Park (Industrial)	533	110	643
Visitor Serving	0	0	0
Water Reclamation Plant	0	0	0
Electrical Substation	0	0	0
Fire Stations	0	0	0
Institutional	0	0	0
Hotel/Spa	0	0	0
Hospital	0	0	0
Sr. Assisted Living	0	0	0
Golf Club House	0	0	0
Schools	0	0	0
Subtotals	**591**	**174**	**765**
Recreation, Arterials, Open Space			
Recreation			
Recreation Centers	0	0	0
Neighborhood Parks	0	0	0
Lake - Water	0	0	0
Lake - Park Area	0	0	0
Golf Course	0	0	0
Arterial Highways			0
Hardscape/Road Section	0	0	0
Landscape Area	0	6	6
Major Open Areas			0
Natural Open Space	0	0	0
River Corridor	0	0	0
Non-Irrigated Slopes	0	0	0
Irrigated Slopes, Wet Zones	0	87	87
O.S. Drainage Facilities	0	0	0
O.S. LDZ, O.S. Trail LDZ, SD&SS easements	0	60	60
Subtotals	**0**	**153**	**153**
Totals	**591**	**327**	**918**

Updated December 2021 by GSI Water Solutions, Inc.
AFY = acre-feet per year

The values shown in this analysis are approximate and are subject to change at the time of preparation of tentative or final land use maps.