GSI Water Solutions, Inc., "Technical Memorandum, Water Demand Update for Newhall Ranch" (September 24, 2008)

GSI Water Solutions, Inc.

Technical Memorandum

To: Robert DiPrimio, President – Valencia Water Company

From: John Porcello – GSI Water Solutions, Inc.

Date: September 24, 2008

Re: Water Demand Update for Newhall Ranch

Introduction

Land use and water demand projections for the Newhall Ranch community were developed and presented in the Newhall Ranch Specific Plan and Water Reclamation Plant Environmental Impact Report (Specific Plan EIR), which was approved by Los Angeles County on May 27, 2003. The analysis projected a total average water demand of 17,680 acre-feet per year (AF/yr) (CH2M HILL, 1999; Impact Sciences, 2001). The average demand was projected to consist of 8,645 AF/yr of potable water demand and 9,035 AF/yr of nonpotable water demand. These demands were identified using a water demand projection methodology developed by the Irvine Ranch Water District (IRWD).

GSI Water Solutions, Inc. (GSI), has applied the IRWD methodology to project the demands in each of the four individual villages comprising Newhall Ranch (Landmark, Mission, Homestead, and Potrero). This analysis was requested by the Valencia Water Company (VWC), which will provide potable water service to the Newhall Ranch Specific Plan site. This analysis is also timely, as Newhall Land has submitted tract maps for three of the four Newhall Ranch villages to Los Angeles County. These tract maps identify in detail irrigated/landscaped areas, commercial square footages, and the mix and type of residential units for a majority of Newhall Ranch. This analysis also is being developed to provide information needed by VWC to report to the Los Angeles County Department of Regional Planning during implementation of the Newhall Ranch Specific Plan; more specifically, as part of the project-level EIR for each village.

Methodology

Newhall Ranch is being designed with the goal of creating a water reuse system that will recycle (after treatment) virtually all the wastewater generated by the community. Under this approach,

discharges from the approved Newhall Ranch Water Reclamation Plant (WRP) to the Santa Clara River will not occur or will be minor in volume and occur only seasonally. The water demand projection tool categorizes a community's water demands as indoor (potable) demands, outdoor potable demands, and outdoor demands that can be met with nonpotable water. The tool defines the available supply of recycled water as being equal to the indoor potable water use. The tool also compares the nonpotable water demands with the available recycled water supply and, on a month-by-month basis, identifies the amount of recycled water that must be discharged to the Santa Clara River (during the lowest-demand months) or the amount of nonpotable demand that must be met by other water supplies (during all other months).

The updated water demand projections were calculated using the following information:

1. **Land Use.** The current land use plan for each village is directly specified in the water demand calculations, using information from Tentative Tract Maps that have been submitted to Los Angeles County. The land use information consists of the acreage of each land use category, the number of attached and detached residential dwelling units, the occupancy rates and corresponding residential population, and the square footage of certain non-residential facilities. Key details concerning this information are as follows:

    - Table 1 summarizes the acreage and number of dwelling units under the current land use plans for each village. Newhall Ranch will contain 20,885 dwelling units situated on 2,022.5 acres designated for residential land use. Multi-family residences will comprise 18,392 of these residential units, or 88 percent of the residential units within the Specific Plan.

    - Table 1 also summarizes the acreage for residential, non-residential, and open space land uses. The total acreage for Newhall Ranch is 11,963.8 acres, of which 9,531.7 acres (80 percent) is designated primarily for recreational facilities and major open areas.

    - Occupancy rates used in the water demand analysis are 3.4 persons per dwelling unit for single-family residences (CLWA et al., 2005) and 2.6 persons per dwelling unit for multi-family residences. These occupancy rates result in an estimated residential population of 56,295 residents for Newhall Ranch upon full build-out, which is within the range of population estimates for the Specific Plan that have been derived using other means (personal communication, Alex Herrell, Newhall Ranch Company, September 8, 2008).

2. **Residential Use of Potable Water.** For residential areas, the water demand calculations use the same rates of indoor and outdoor potable water consumption that were used in the original water demand analysis for Newhall Ranch (CH2M HILL, 1996 and 1999).

    - **Indoor Use.** For residential areas, the water demand projection tool uses a per-capita potable water use rate of 75 gallons per capita per day (gpcpd) for attached residences and for the highest-density single-family residences. Lower-density

single-family residences are assigned rates ranging from 80 gpcpd to as much as 100 gpcpd (for estates).

- **Outdoor Use.** Potable water will be the source of supply for outdoor residential water uses that occur outside of common areas, such as on single-family lots. Potable water also will be used for certain outdoor needs in multi-family residential communities, such as filling swimming pools and washing cars, pavement, and outdoor surfaces. The water demand projection tool uses outdoor potable water use rates of 40 to 45 gpcpd for high- and medium-density residential developments, and 50 to 60 gpcpd for low-density single-family housing (including estates).

3. **Nonresidential Use of Potable Water.** For nonresidential developments, the water demand calculations use the same rates of indoor and outdoor potable water consumption that were used in the original water demand analysis for the Specific Plan (CH2M HILL, 1996 and 1999). Exceptions are hotels, visitor-serving facilities, and club houses at golf courses, which were not identified in the original analysis for the Specific Plan, but are part of the development plan for Newhall Ranch.

    - **Indoor Use.** Indoor use rates for potable water range from 0.01 to 0.20 gallon per day per square foot for facilities with high occupancy during portions of the day, such as retail commercial facilities, business parks, and hotels. Schools are assigned an indoor potable use rate of 260 gallons per acre per day.

    - **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 use rate is specified as 305 gallons per acre per day for industrial facilities, fire stations, hotels, and visitor-serving facilities (including the club houses at golf courses).

4. **Nonpotable Water Use.** The water demand calculations use revised rates of annual nonpotable water use, as determined by VWC and Dexter Wilson Engineering, Inc. (DWE), during a recent update of the recycled water master plan for VWC's service area (DWE, 2007). In Newhall Ranch, nonpotable water will be used for irrigation of common-area landscaping. Common-area landscaping will be present in areas containing attached residential developments, nonresidential developments, recreational facilities, and irrigated slopes. In order to provide conservative (high) estimates of water use for planning purposes, the water demand calculations assume the following rates of nonpotable water use:

    - 6.7 feet per year (ft/yr) (equivalent to about 80 inches per year [in/yr]) for attached residential development, assuming 15 percent of the area containing these developments will be irrigated

    - 1.34 to 1.40 ft/yr (16 to 17 in/yr) for nonresidential development, assuming 25 percent of the area containing nonresidential development will be irrigated

- 1.12 ft/yr (13.5 in/yr) at the Newhall Ranch WRP, assuming 25 percent of the area containing this facility will be irrigated
- 4.59 ft/yr (55 in/yr) for golf courses and water features
- 3.43 ft/yr (41 in/yr) for other recreational facilities and for parks
- 3.47 ft/yr (42 in/yr) for landscaping located on irrigated slopes and along arterial highways and easements

Results

Table 2 summarizes the water demands for each village. Table 2 also calculates the total water demand for Newhall Ranch and compares this demand with the original demand estimates contained in the Specific Plan. Figure 1 shows the relationship among water demands, water supplies, wastewater generation, and recycled water use inside Newhall Ranch. The principal findings from this analysis are:

1. The first two villages inside Newhall Ranch to be developed will have total water demands of 972 AF/yr (Landmark) and 3,200AF/yr (Mission). The last two villages to be developed will have larger water demands (4,436 AF/yr in Homestead and 7,792 AF/yr in Potrero).

2. Total water demand in Newhall Ranch (16,400 AF/yr) is projected to be 1,280 AF/yr lower than originally projected during the development of the Specific Plan (17,680 AF/yr).

    a. Potable water demand is projected to be 8,135 AF/yr, which is 510 AF/yr lower than the volume of 8,645 AF/yr originally projected for the Specific Plan. This reduction arises from a change in land use density (more attached dwellings and fewer detached dwellings than in the Specific Plan).

    b. Nonpotable water demand is projected to be 8,265 AF/yr, which is 770 AF/yr lower than the volume of 9,035 AF/yr originally projected for the Specific Plan. This demand will be met by 4,948 AF/yr of recycled water from the approved Newhall Ranch WRP and 3,317 AF/yr of recycled water from the existing Valencia WRP.

    c. Residential uses are projected to be 7,620 AF/yr for potable water and 1,097 AF/yr for nonpotable water, for a total of 8,717 AF/yr. This is equivalent to (a) 138 gpcpd, based on the projected population of 56,295 residents; and (b) 373 gallons per day per dwelling unit, based on the total number of dwelling units (20,885) in the Specific Plan.

d. The amount of wastewater generated in Newhall Ranch is predicted to be 5,230 AF/yr, which is 400 AF/yr lower than the volume of 5,630 AF/yr originally projected for the Specific Plan. Ninety-one (91) percent of this wastewater volume (4,759 AF/yr) is from residences, with the remaining 9 percent (471 AF/yr) being generated by nonresidential development and recreational facilities. The annual wastewater volume of 5,230 AF/yr is equivalent to 4.67 million gallons per day (mgd), which is about 67 percent of the average flow (6.93 mgd) for which the Newhall Ranch WRP has been designed. (The design is based on a design rate of 85 gpcpd that was specified by the Los Angeles County Sanitation District during the early planning for the Newhall Ranch WRP [CH2M HILL, 1999].) Of the 5,230 AF/yr that flows into the Newhall Ranch WRP, 95 percent (4,948 AF/yr) is recycled for irrigation use within Newhall Ranch, and the remaining 5 percent (282 AF/yr) is discharged to the Santa Clara River during winter (primarily from late November through late January).

References

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Impact Sciences, Inc. 2001. *Draft Additional Analysis to the Newhall Ranch Specific Plan and Water Reclamation Plant Final Environmental Impact Report.* Project # 94087, SCH # 95011015. Prepared for the Los Angeles County Department of Regional Planning. April 2001.

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Table 1
Land Use in Newhall Ranch (from Tentative Tract Maps)
Valencia, California

Residential Land Use Plan

West Side Community	Single Family Residential		Detached Residential		Attached Residential		New Total	
	Units	Acreage	Units	Acreage	Units	Acreage	Units	Acreage
Landmark	308	37.9	282	30.2	854	49.7	1,444	117.8
Mission	291	91.3	304	41.7	4,736	195.0	5,331	328.0
Homestead	976	359.7	290	38.5	4,511	282.8	5,777	681.0
Potrero	918	160.7	1,493	177.1	5,922	557.9	8,333	895.7
Total	**2,493**	**649.6**	**2,369**	**287.5**	**16,023**	**1,085.4**	**20,885**	**2,022.5**

Acreage for Residential, Nonresidential, and Other Land Uses

West Side Community	Residential Development	Nonresidential Development	Other	Total
Landmark	117.8	48.4	141.2	307.4
Mission	328.0	81.5	897.4	1,306.9
Homestead	681.0	163.2	2123.1	2,967.3
Potrero	895.7	116.5	6370	7,382.2
Total	**2,022.5**	**409.6**	**9,531.7**	**11,963.8**

Note: "Other" land uses consist of recreational facilities (indoor and outdoor), arterial roadways, and major open areas.

NHR = Newhall Ranch

Created September 2008 by
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Table 2
Summary of Water Demand
Newhall Ranch
(AF/yr)

		Potable	Nonpotable	Total
2003 Specific Plan for Newhall Ranch				
	Total	8,645	9,035	17,680
2008 Analysis for Newhall Ranch				
	Landmark Village	608	364	972
	Mission Village	1,961	1,239	3,200
	Homestead Village	2,475	1,961	4,436
	Potrero Village	3,091	4,701	7,792
	Total	**8,135**	**8,265**	**16,400**

Note: AF/yr = acre-feet per year

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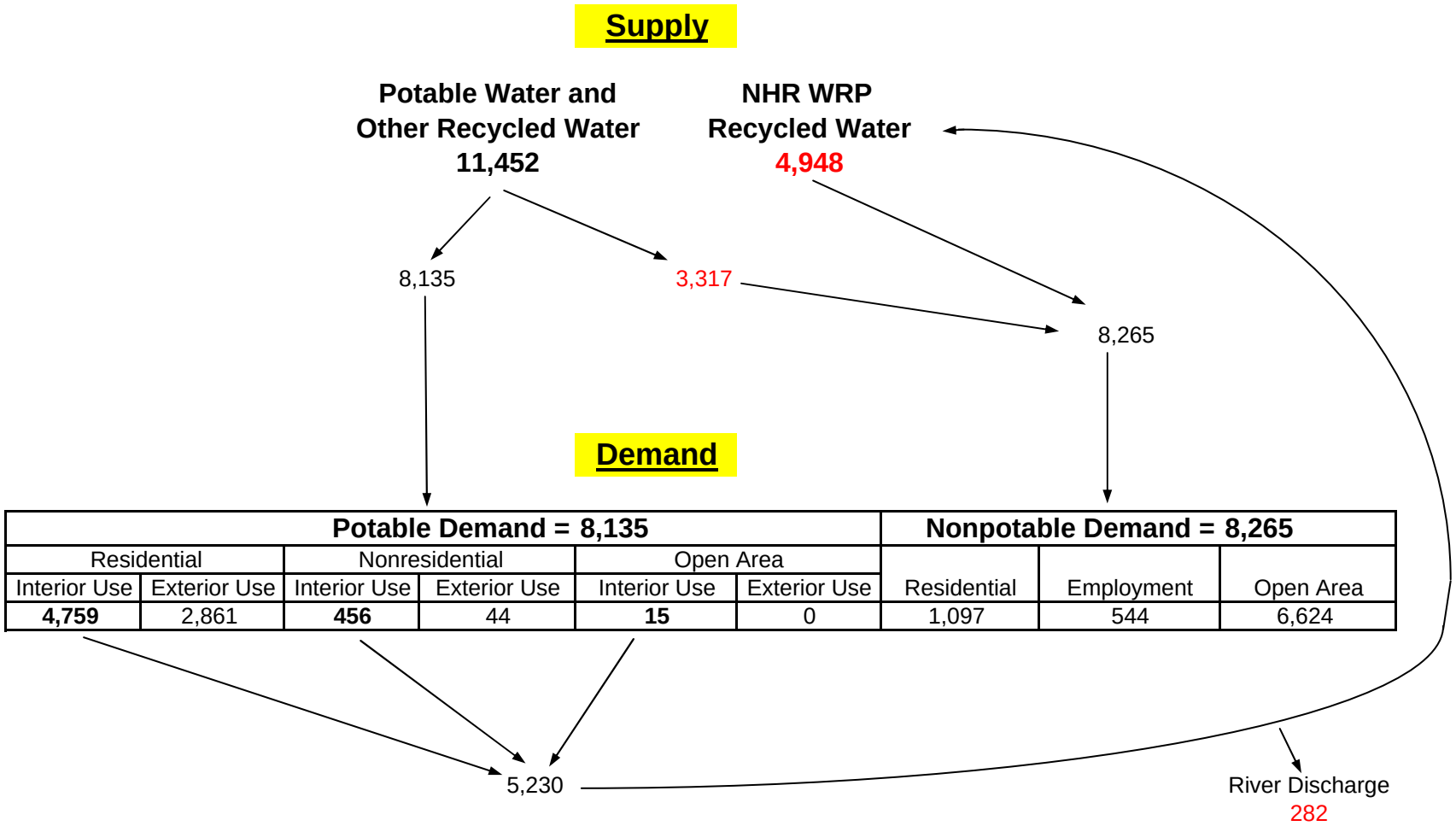
Figure 1
Newhall Ranch Water Balance

All units in acre-feet/year



Potable Demand = 8,135						Nonpotable Demand = 8,265		
Residential		Nonresidential		Open Area				
Interior Use	Exterior Use	Interior Use	Exterior Use	Interior Use	Exterior Use	Residential	Employment	Open Area
4,759	2,861	**456**	44	**15**	0	1,097	544	6,624

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