



MEMORANDUM

Date: January 29, 2008
To: David Tirman
From: Christian Heinbaugh
Subject: 514.02.14: Madden Creek Water System information

Existing information provided by Madden Creek – reference drawing and meeting with Madden Creek Water System operator on December 21, 2007:

- 160 residential services currently –
 - Estimated peak demand is 1.67 gpm/service = 267 gpm for the entire service area.
 - Estimated average daily flow demand is 750 gpd/service = 120,000 gpd.
- Approximately 10 fire hydrants on system
- Largest pipe diameter is 6".
 - Assuming 10 fps, flow capacity is approximately 900 gpm.
- 6" diameter pipe on Sacramento St. and between Sacramento St. and the storage tank. All others are 4" or smaller.
- (1) 100,000 gal. storage tank
- (1) 300 gpm (peak capacity) pump that is 200' deep

Anticipated preliminary flow requirements:

- BG Report states that the average day development total is 70,400 gpd plus the required 210,000 gpd for fire flow = 280,400 gpd (excludes snow making)
 - 568,400 gpd with snowmaking
- BG Report states that the peak development total is 1,730 gpm plus the required 2,000 gpm for fire flow = 3,730 gpm (excludes snow making)
 - 7,230 gpm with snowmaking operations

Expected issues with Madden Creek's current capacity:

- Existing system only has one pump – no backup capability should that pump go down.
- At peak demand, system will not be able to keep up with demand and all storage would be lost should demand stay at peak for two hours or more. Once all storage is lost the resort will lose water until demand goes down and storage tanks can be refilled.
- 300 gpm pump would take 17 hours to refill Homewood's storage tanks assuming all 300 gpm can be dedicated to filling storage tanks.

(TCPUD 2006). Once created, this surface treatment facility will have regulated flows based on Public Law 101-618 (Settlement Act), and the TROA (TCPUD 2006). Section 204 of the Settlement Act would limit California's total gross diversions in the Lake Tahoe Basin to 23,000 AF/Y. The particular water rights for each California water supplier that would draw on Lake Tahoe surface waters are currently being evaluated. At this time, the TCPUD is granted Lake Tahoe surface water diversions, and does operate in accordance with the Settlement Act; however, the portion of diverted California waters (23,000 AF/Y) to be allocated specifically to TCPUD has not been finalized (Lalotus 2009). TCPUD expects to receive a sufficient amount of diversions to meet their projected demands (Lalotus 2009).

MCWC Supply

MCWC does not utilize surface water. Groundwater is the sole water source for MCWC.

4.2 Groundwater Supply

Water Code 10910 limits groundwater discussion to the basin or basins that will serve the proposed project. Additional requirements are found in:

Water Code 10631(b):

- (1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.*
- (2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater.*
- (3) A detailed description and analysis of the location, amount, and sufficiency of groundwater that is projected to be pumped by the urban water supplier for the past 5 years.*
- (4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier.*

Water Code 10910(f)(5): An analysis of the sufficiency of the groundwater from the basin...to meet the projected water demand associated with the proposed project.

Basin Characteristics

The Tahoe Valley Groundwater Basin is located within the larger structural feature commonly referred to as the Lake Tahoe Basin. It is bounded on the east by the western shore of the Lake, and on the west by the Sierra Nevada, with an approximate north-south boundary that lies about 0.5 mile west of Dollar Point and 2 miles west of Meeks Bay. Elevations within the sub-basin range from 6,225 feet at lake level rising to above 6,400 feet in the west (DWR 2003).

Groundwater recharge in the proposed area is primarily from infiltration of precipitation into faults and fractures in bedrock, into the soil and decomposed granite that overlies much of the bedrock, and into unconsolidated basin-fill deposits. Groundwater is recharged over the entire extent of the flow path, except where the land surface is impermeable or where the groundwater table coincides with land surface (Thodal 1997).

TCPUD Supply

As required by Code Section 10631(b)(2) and (3), Table 2 provides a summary of the volume of water produced from the Crystal Way Well between 2000 and 2004, and identifies the USGS groundwater basin designations.

6.0 COMPARISON OF PROJECTED WATER SUPPLIES AND DEMANDS

Alternative 1

Based on operating history, and without implementation of water conservation measures, the existing McKinney/Quail groundwater supply system is inadequate to meet current peak demands during the summer. During the summer months, the TCPUD augments water supply in the McKinney/Quail Sub-district with surface water diversions from Lake Tahoe. The TCPUD intends to continue the practice of augmenting groundwater supply with surface water diversions. The TCPUD 5-year Capital Plan includes funding for a permanent treatment system for surface water diversions. The permanent treatment system will be designed to increase reliability to meet projected demands during a normal water year, a single dry water year, and multiple dry water years. Table 7 shows the water supply and demand comparison for the McKinney/Quail Sub-district.

Table 7. Water Supply and Demand Comparison for McKinney/Quail Sub-district

	2009 (AF/Y)	2010 (AF/Y)	2011 (AF/Y)
Current Supply Total	185	185	185
Demand Total (including the proposed project)	381	385	447
Difference (deficiency compensated by surface water)	196	200	262

The projected annual water demand (2011 and beyond) for the McKinney/Quail Sub-district (which includes the proposed project) is 447 AF/Y. The TCPUD Crystal Way Well production in 2004 was 185 AF/Y (TCPUD 2006). Treated surface water from Lake Tahoe augments supply to meet the current demand. TCPUD plans to continue utilizing surface water from Lake Tahoe to meet the demands of the proposed project. The particular water rights for each California water supplier that would draw on Lake Tahoe surface waters are currently being evaluated. At this time, the TCPUD is granted Lake Tahoe surface water diversions, and does operate in accordance with the Settlement Act; however, the portion of diverted California waters (23,000 AF/Y) to be allocated specifically to TCPUD has not been finalized (Lalotis 2009). TCPUD expects to receive a sufficient amount of diversions to meet their projected demands (Lalotis 2009). This amount will be adequate in meeting the required 447 AF/Y. Therefore, based on available information, the TCPUD would be capable of supplying water to the McKinney/Quail Sub-district (including the proposed project).

Alternative 2

MCWC Service Area

Table 8 shows the water supply and demand comparison for the MCWC Service Area.

Table 8. Water Supply and Demand Comparison for MCWC Service Area

	2009 (AF/Y)	2010 (AF/Y)	2011 (AF/Y)
Current Supply Total	134	134	134
Demand Total (including the proposed project)	134	134	176
Difference	0	0	42

The projected annual water demand for the MCWC Service Area (which includes the proposed project - North Base Area) is 176 AF/Y. MCWC utilizes groundwater to supply their service area. Based on available information, MCWC has not disclosed the details of groundwater supply in their service area; however, based on the fact that they are currently meeting the water demand of their customers (160 connections), it can be assumed that their supply is 134 AF/Y. To meet the water demand for the proposed project (North Base Area), MCWC will need additional production capacity and storage to meet demand and be capable of supplying the additional water to the proposed project area (increase of 42 AF/Y). Based on available information, MCWC should be able to add production capacity and storage to meet the demand of the MCWC Service Area (including the proposed project).

TCPUD Service Area – McKinney/Quail Sub-district

Based on operating history, and without implementation of water conservation measures, the existing McKinney/Quail groundwater supply system is inadequate to meet current peak demands during the summer. During the summer months, the TCPUD augments water supply in the McKinney/Quail Sub-district with surface water diversions from Lake Tahoe. The TCPUD intends to continue the practice of augmenting groundwater supply with surface water diversions. The TCPUD 5-year Capital Plan includes funding for a permanent treatment system for surface water diversions. The permanent treatment system will be designed to increase reliability to meet projected demands during a normal water year, a single dry water year, and multiple dry water years. Table 9 shows the water supply and demand comparison for McKinney/Quail Sub-district for Alternative 2.

Table 9. Water Supply and Demand Comparison for TCPUD Service Area

	2009 (AF/Y)	2010 (AF/Y)	2011 (AF/Y)
Current Supply Total	185	185	185
Demand Total (including the proposed project)	381	385	405
Difference (deficiency compensated by surface water)	196	200	220

The projected annual water demand for the McKinney/Quail Sub-district (which includes the proposed project) is 405 AF/Y. The TCPUD Crystal Way Well production in 2004 was 185 AF/Y (TCPUD 2006). Treated surface water from Lake Tahoe augments supply to meet the current demand. TCPUD plans to continue utilizing surface water from Lake Tahoe to meet the demands of the proposed project. The particular water rights for each California water supplier that would draw on Lake Tahoe surface waters are currently being evaluated. At this time, the TCPUD is granted Lake Tahoe surface water diversions, and does operate in accordance with the Settlement Act; however, the portion of diverted California waters (23,000 AF/Y) to be allocated specifically to TCPUD has not been finalized (Lalotis 2009). TCPUD expects to receive a sufficient amount of diversions to meet their projected demands (Lalotis 2009). This amount is adequate in meeting the required 405 AF/Y. Therefore, based on available information, the TCPUD is capable of supplying water to the McKinney/Quail Sub-district (including the proposed project).

7.0 REFERENCES

- BGCE (Beaudin Ganze Consulting Engineers). (2007). *Homewood Mountain Resort Development Water, Gas, and Electric Energy Use Projection*. Truckee, CA.
- County of Placer. (2008). "Notice of Preparation of a Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) for the Homewood Mountain Resort Master Plan Project, 5145 Westlake Boulevard, Placer County, Homewood, California." In conjunction with the Tahoe Regional Planning Agency.
- DWR (California Department of Water Resources). (2003). *California's Groundwater: Bulletin 118 Update 2003*.
- HMR (Homewood Mountain Resort). (2009). *Homewood Mountain Resort Snowmaking Planning Report*. Prepared by SMI Snowmakers, Midland, MI.
- Laliotis, Tony. (2009). Tahoe City Public Utility District, Director of Utilities. Personal communication with M. Comer on May 1, 2009.
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- TCPUD (Tahoe City Public Utility District). (2002). *Water Master Plan*. Prepared by West Yost & Associates, Tahoe City, CA.
- TCPUD. (2006). *2005 Urban Water Management Plan*. Prepared by Auerbach Engineering Corporation, Tahoe City, CA.
- Thodal, Carl E. 1997. Hydrogeology of Lake Tahoe Basin, California and Nevada, and Results of a Ground-Water Quality Monitoring Network, Water Years 1990-1992. Water-Resources Investigations Report 97-4072. USGS. 53 p.