July 12, 2010

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Madden Creek Water Co. Chuck Marr P.O. Box 264 Tahoma, CA 96142

Dear Mr. Marr:

As you requested, I have reviewed the letter from JMA Ventures of March 27, 2008 regarding water supply needs for their Homewood Mountain Resort (HMR) development, and the capability of the Madden Creek Water Company (MCWC) to serve those needs.

First I will review here the estimates of required service by Nichols Consulting Engineers (NCE) as outlined in the JMA letter. I will then present options for the MCWC to serve those needs.

Review of JMA Design Assumptions

Domestic Water Use:

Their estimate of domestic water demand for the development is consistent with engineering standards and local records from area water systems. The proposal of 184 residential units (including hotel rooms), with an estimated consumption of 300 gpd/unit would require 55,200 gpd, slightly higher than the 44,700 gpd estimated by NCE. Assuming modern water conservation measures, and native landscaping their estimate of 44,700 gpd is good.

Fire Flow:

I do not understand or agree with the fire flow estimates by NCE. There are a number of ways to determine required fire flow and duration depending on building square footage, volume, separation to other structures, fire resistant construction, and occupancy. For standard construction the fire flows required by the 2007 California Fire Code "top out" at 8,000 gpm for hours for un-rated buildings in excess of 85,000 square feet. These flows can then be reduced by up to 75% if buildings are fully sprinklered.

While fire flows can be supplemented with pumping from supply, the most reliable way to meet those demands is from storage. The storage required to meet fire flow would be 2,000 gpm for four hours = 480,000 gallons.

Estimated Peak Demand:

Assuming fire flow is provided from storage, the estimated peak demand is that required for domestic consumption only. For the estimated peak day demand of 44,700 gpd, the average peak

day consumption is only 31 gpm. With a peaking factor of 2.0 for instantaneous demand the Estimated Peak Demand for the development is 62 gpm.

Existing System Summary:

Connections:

Approximately 160

Existing demand:

120,000 GPD (peak day)

Source:

Sacramento Ave. Well = 300 gpm

Storage:

Trout Street Tank = 125,000 gallons

Improvements required for service to existing and HMR development.

Source:

Existing demand = 120,000 gpd New demand = 44,700 gpd Total demand = 164,700 gpd

Existing source capacity =

432,000 gpd

While the existing well has adequate capacity to serve the proposed development, a second source would be recommended for reliability.

The existing Sacramento Ave. well is a high quality source with excellent history of production up to 300 gpm continuously. An intertie to the adjoining utility to the North (Tahoe Swiss Village Utility) serves as the required second source. With the increased demands and in order to provide first class service, a second groundwater source would be recommended. That source may be located in the vicinity of the Sacramento Ave. well in order to take advantage of that proven high quality aquifer.

New source assumptions and estimate: New 200' well, 24" bore w/ 10" casing 300 sqft pump house w/ generator and controls

New Well Cost = \$350.000

Storage:

Recommended storage capacity for domestic supply is one day storage at peak day demand.

Domestic Storage = 164,700 gallons Fire Flow Storage = 480,000 gallons Total Storage required = 644,700 gallons

Existing Trout Street Tank =	125,000 gallons
New storage required =	519,700 gallons

For new 500,000 gallon water tank, installed, estimate at \$1.00/ gallon New Tank Cost = \$500,000

The tank size and cost could be reduced by including pumping from the source(s) to help meet fire flow.

Distribution:

I am assuming here that the distribution system installation within the HMR development would be included with the construction of the resort. Improvements to the existing MCWC system would be only those necessary to provide fire flow to the development, and intertie the proposed storage tank and well.

New 12" main, Sacramento Ave. from Trout Street Tank HMR property 12" Main, 1,750 If @ \$175/ft = \$306,250

New 12" main from new tank to existing system 12" main, 900 lf @ 150/R = 135,000

<u>Distribution Improvement Cost = \$441,250</u>

Total costs for North Base Water Supply

Source:	\$350,000
Storage:	\$500,000
Distribution:	\$441,250
Total Construction Cost	\$1,291,250

Assume 50% mark up for plans, permitting, and contingencies

Total Budgetary Allowance \$1,936,875

Additional requirements for Day Lodge service.

Serving the proposed day lodge will required significant additional facilities and cost. Fire flow required for the 14,000 sqft would be 3,250 gpm (reduced to 1,500 gpm w/ sprinklers) for 3 hours (270,000 gallons).

Day-Lodge Storage: 300,000 gallons At \$1.00 per gallon, cost = \$300,000 Transmission main to day lodge: Assume 6" main, 4,300 ft At \$100/ ft = \$430,000

Booster Pump Station. Assuming incorporated within new well pump house. Booster Pump Cost = \$100,000

Total Day-Lodge water service cost =	\$830,000
With 50% plans, permits, contingency =	\$1,245,000

Summary and Conclusion

Water service to the proposed North Base facilities of the HMR development is well within the capacity of the Madden Creek Water Company. Improvements will be required to meet the higher fire flows associated with the development, and a second source is recommended for improved reliability.

Total capital cost for the MCWC improvements will be in the order of \$2 million. Additional cos to serve the Day-Lodge would be approximately \$1.3 million. On site water distribution system costs for HMR are not included.

Please note, land acquisition costs are not included in this analysis.

Funding:

There are a number of financing mechanisms available to fund the proposed improvements. The most straightforward for this project would be an advancement for construction by the developer. With this process, HMR would pay MCWC to make the required improvements. Those costs would then be paid back to the developer over time. The advantage to the MCWC is that the improvements go into Rate Base, increasing the company's value and potential for future income. The benefit to JMA is that the costs are paid back over time, becoming a long term source of income for the developer.

I trust this analysis will allow further discussion with HMR regarding their water supply needs, and look forward to further planning on this project.

Sincerely

Stephen Twomey, P.E. C54681