

Bear Valley Water District

MEMORANDUM

TO Board of Directors

FROM Gary S. Ghio, District Engineer *GS*

RE Capacity Analysis of Existing Treatment and Disposal Facilities

DATE February 1, 2010

As directed by the Board, I have completed my review of existing District documents in order to provide the Board an updated estimate of capacity in the existing treatment and disposal facilities.

Attached to this memorandum is Summary of Fact Finding which presents information derived from existing District documents for each of the District's main treatment and disposal facilities/options. In addition Item 6 of the Summary of Fact Finding presents information on assumptions with regards to sewage generation per equivalent single family unit which was contained in various reports from 2004 through 2006.

Based upon the information contained within the Summary of Fact Finding, Table 1 on page 4 of this memorandum presents the estimated available capacity of the District's existing treatment and disposal facilities. The footnotes in the table also provide reference to the items in the Summary of Fact Finding.

With regards to the main facility components in the attached Table 1 and their available capacity, the following should be noted:

1. Main Pump Station – Past reports prepared by Eco:Logic indicate the main pump station has a reliable flow of 400 GPD which equates to 576,000 GPD. I have discussed this flow rate with the General Manager and recommend the District verify the actual pump flow rates to provide accurate verification of the assumed flow rate and resulting capacity.
2. Plant Influent/Aeration Basin – The estimated capacity for the treatment plant contained in the referenced table delineates three available capacities for the facility. The District's existing Waste Discharge Requirements (WDRs) from 2001 limit the plant influent to

100,000 GPD on an annual average. Although the design treatment capacity is 500,000 GPD this limit was placed at the time of issuance of the WDRs due to the spills which had been occurring and the District not being in possession of an NPDES permit. Subsequent to the issuance of the WDRs, the District successfully obtained an NPDES permit permitting discharge to Bloods Creek. When the District applies for new WDRs, the Regional Water Quality Control Board (RWQCB) should be amiable to increasing the treatment plant capacity up to the design rate of capacity of 500,000 GPD. The only unknown is whether the RWQCB will place this limit on peak flows or average annual flows. Therefore, I have presented the available capacity for both of these options.

3. Effluent Storage Reservoir – The available capacity for the Effluent Storage Reservoir is to be based on the one in one hundred year precipitation projections as required by the RWQCB. Based upon the most current water balance which is attached to the Summary of Fact Finding, during the projected one hundred year season, the existing storage reservoir would fill and discharges to Bloods Creek would be required. Therefore, the effluent storage reservoir has zero capacity to handle additional flows. Any additional flows would need to be discharged to Bloods Creek in order to prevent the storage reservoir from spilling which would be in violation of the District's permits.
4. Spray fields – Design effluent disposal capacity determined by Eco:Logic was 76 MG per year based upon the existing District disposal land consisting of approximately 80 acres which included the temporary USFS Special Permit Land (40 acres). Eco:Logic also indicated that without the temporary USFS land, the disposal area would be reduced to approximately 62 acres and the disposal capacity reduced to approximately 54 MG per year.

Review of actual disposal volumes from 2005 to 2009 indicates the District discharged a maximum of 84 MG during the 2006 spray season to the available 80 acres. The land maximization report for that year indicates the District utilized all of the available 80 acres to facilitate this discharge. The 2006 disposal season lasted from June 23 through October 23 which appears to be an average disposal season for the District. Therefore, the 84 MG per year is used as the basis for the maximum capacity in the spray fields to date.

When considering the one in one hundred year precipitation period, the time periods for disposal on the spray fields are shortened considerably due to snow remaining on the ground and saturated fields much later in the year; therefore Eco:Logic reduced the spray field disposal capacity to approximately 58.2 MG per year for the one in one hundred year water balances. The estimated available capacity in the spray fields is therefore presented both ways as the one in one hundred year precipitation year would be the governing design requirement for any new spray fields.

5. Bloods Creek – 2003 monitoring of Bloods Creek indicates up to 63 MG per year could be feasibility discharged while maintaining the required NPDES 20:1 dilution in a one in one hundred year storm period. Based upon one in one hundred year projections of wastewater flow, snow fall, precipitation, evaporation, and percolation in the District's treatment facilities a variety of water balances have been created since 2004. These water balances

have indicated a need to discharge to Bloods Creek from 11.6 MG in 2004 up to 61.7 MG in 2009 as contained in the 2008 Land Disposal Maximization Report prepared by Eco:Logic. Review of these water balances indicates there was a lack of information in 2004 when the original water balances were created and in subsequent years Eco:Logic used actual recorded data to refine the projections contained in the water balances leading to the latest 2009 water balance. During review of the Eco:Logic 2009 one in one hundred year projection water balance, several errors were discovered in the equations in the spreadsheet which were corrected resulting in the revised 2009 one in one hundred year projection prepared by my office. Based upon this projection, it is estimated 60 MG of wastewater would need to be discharged to Bloods Creek during a one in one hundred year storm period which results in an estimated available capacity in Bloods Creek of 3 MG per year.

6. Flow Per Equivalent Single Family Unit (ESFU) and Occupancy Rates – Review of past documents prepared by Eco:Logic shows assumptions for occupied residences wastewater production varied from 180 gallons to 190 gallons of sewage per unit per day on average. In addition current occupancy within the District is stated as approximately 32 to 34 percent based upon District flow records. These flows were used in future projections for determining District capacity as well as in some of the water balances which were provided to the RWQCB. The occupancy factor was assumed at 47% in one of the water balances prepared by Eco:Logic (see item 5.d.i in Summary of Fact Finding). The remainder of the water balances and projections did not use an occupancy factor.

As the Calaveras County Water District Standards require design of facilities based upon an average dry weather flow of 195 GPD, this flow rate would be in conformance with actual flow rates experienced by the District should the Board wish to adopt these standards. Should the Board adopt an occupancy rate for design/capacity determination of its treatment and disposal facilities it is recommended the Board consider an occupancy rate that will provide some conservative design of future District facilities. In addition, the District should continue tracking of projected occupancies as increases in average yearly occupancy over and above what is adopted by the District can have a serious impact to District's facilities and their capacity.

I will be present at the February 15, 2010 board meeting to discuss the capacity projections and associated information contained in this memorandum with the Board.

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