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October 19, 2007

Mr. David Atkinson
Placer County Dept. of Facility Services
11476 C Avenue
Auburn, California 95603

Re: Placer County – SMD 1 Wastewater Treatment Plant
Owen Psomas Project No. 06-306.4
Capacity, Upgrade, and Interim Improvements Study

Dear David:

This letter summarizes the results from the engineering and analysis performed regarding Placer County's (County) SMD 1 Wastewater Treatment Plant (SMD 1 WWTP). The purpose of this study is to provide information needed to allow the County to determine the best course of action to take, with respect to this facility. The County is considering the following options:

- Abandoning the SMD 1 WWTP and conveying the wastewater to a Regional WWTP in Lincoln, California for treatment. Based on the April 2007 Status Report for the Placer Nevada Wastewater Authority, Placer County's share of the regional conveyance and treatment facilities for the SMD 1 WWTP is currently estimated to cost over $93 Million.

- Upgrading and expanding the SMD 1 WWTP to treat the wastewater in accordance with existing waste discharge requirements (WDRs) adopted by the California Regional Water Quality Control Board (RWQCB) in Order No. R5-2005-074, dated June 23, 2005.

The County has raised three questions for Owen Psomas (Owen) to answer:

1. What is the capacity of the existing SMD 1 WWTP, and how does that compare with current loading?

2. What would it cost to construct interim improvements at the SMD 1 WWTP to meet the WDRs until the facility is abandoned?

3. What would it cost to construct permanent improvements at the SMD 1 WWTP to meet the WDRs?

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In order to respond to the questions, the currently available information was reviewed and utilized as the basis for the results. In addition, assumptions have been made based on our understanding of existing conditions and engineering judgment to estimate the approximate sizing for new facilities. For a planning level effort such as this, these assumptions will produce the preliminary results needed, but will have to be refined prior to detailed design.

Answer to Question No. 1:

Based on plant operating records, the loading on the existing SMD 1 WWTP is estimated to be as follows:

Table 1. Existing SMD 1 WWTP Loading

Parameter	Units	Current Loading
Population	people	15,000*
Average Dry Weather Flow (ADWF)	gal/capita/day	113
	mgd	1.70
Average Annual Flow (AAF)	mgd	2.00
Peak Hour Hydraulic Flow	mgd	10.4
Biochemical Oxygen Demand (BOD_5)	lb/capita/day	0.26
	lb/day	3,900
Total Suspended Solids (TSS)	lb/capita/day	0.26
	lb/day	3,900
Total Kjeldahl Nitrogen (TKN)	lb/capita/day	0.052
	lb/day	780

*Based on the population estimate presented in the current WDRS adopted by the RWQCB. WWTP records suggest that the population equivalent organic loading may be closer to that for a population of 19,000 to 20,000 (rather than 15,000). This will have to be reconciled prior to detailed design.

The answer to the capacity issue is complex because the permit utilizes average dry weather flow (ADWF) as the permitting requirement, yet the capacity of each component of the plant depends on a number of parameters including peak flow, biological loading for maximum month, required process redundancy, and other permit requirements. The estimated capacity of the existing SMD 1 WWTP without denitrification is as shown in Table 2:

As shown therein, the SMD 1 WWTP is biologically loaded above its existing capacity. In addition, a number of the plant components are operating above their hydraulic capacity during peak flow conditions. When this occurs, the biological components are adversely impacted. The biological overloading is primarily due to the fact that the WDRs have become more stringent in 2005; and to a lesser degree, growth in the service area. Current data indicates that the treatment plant cannot reliably meet the Ammonium-Nitrogen limit of approximately 1.0 mg/L nor the 10 mg/L Nitrate plus Nitrite-Nitrogen limit.

Table 2. Existing SMD 1 WWTP Capacity

Component	Capacity	Criteria
Headworks	6.5 mgd	Peak hour hydraulic flow
Primary Clarifiers	6.4 mgd	Peak hour flow and solids removals
RBC / TF	1.5 mgd Average	Peak month biological capacity
Secondary Clarifiers	5.6 mgd	Peak hour hydraulic flow and solids removals
Filters	2.3 mgd	Peak day hydraulic flow
Disinfection Basins	4.5 mgd	Peak day hydraulic flow
Solids Processing	4,700 lb/day	Maximum month solids loading

Answer to Question No. 2:

The estimated capital cost for interim improvements needed for approximately 7 years until the SMD 1 WWTP is abandoned is between $20 Million and $23 Million. This estimate is based on the following assumptions:

- The RWQCB will not extend schedules for compliance with existing WDRs for at least seven years.
- The interim improvements were assumed to have a limited service life, unlike typical municipal WWTPs that are built to last a lifetime.
- The interim SMD 1 improvements will need to be sufficient to fully comply with the existing WDRs until the wastewater is diverted to the Lincoln Regional WWTP.

- The SMD 1 WWTP capacity would be sufficient to treat current ADWF and biological loading plus the additional flow and loading resulting from 5-7 years of relatively low service area growth (2 percent per year maximum). The treatment capacity required will be approximately 2.0 mgd ADWF. If actual service area growth is greater, the flow and loading could exceed treatment process capacity and jeopardize the SMD 1 WWTP ability to meet the WDRs.

- Buildings will not be added to house equipment where they are not mandatory.

- Patching or renovating of some existing structures would occur, recognizing this would not be reasonable as a long-term fix.

- The treatment processes will be selected solely based on the least capital cost. As a result, the improvements will have relatively higher operating costs, will be more complicated and complex to operate, and be less reliable than conventional facilities.

- The interim improvements include:

  - ✓ Headworks modifications.
  - ✓ Chemical feed systems.
  - ✓ Primary clarifiers.
  - ✓ Equalization basin and associated pumping systems.
  - ✓ Cooling towers.
  - ✓ Secondary clarifier.
  - ✓ Denitrification filters.
  - ✓ U.V. disinfection system.
  - ✓ Post aeration.
  - ✓ Digester heating/mixing improvements.
  - ✓ New power service and generator.
  - ✓ Upgrade existing operations/lab building.
  - ✓ Odor control system.

Answer to Question No. 3:

The estimated capital cost to upgrade and expand the SMD 1 WWTP is between $58 Million and $64 Million. This estimate is based on the following assumptions:

- The upgraded and expanded SMD 1 WWTP would have to fully comply with the existing WDRs, and be designed to be reasonably expanded and upgraded in the future to comply with anticipated additional future requirements that may be adopted by the RWQCB (e.g. phosphorus effluent limit).

- In order to meet the County planning requirements for the SMD 1 service area, the County has estimated the following flow conditions will apply:

Table 3. Projected Future SMD 1 WWTP Flow Conditions

	ADWF	Maximum Day Flow (MDF)	Maximum Hour Flow (MHF)
Current	1.7	7.3	10.4
Future	3.0	10.4	14.8
Buildout	4.0	12.8	18.2

The upgraded and expanded SMD 1 WWTP will be design-based on the "Future" flow conditions, but will be designed for further expansion to accommodate the "Buildout" flow conditions. These flow estimates assume that the County will continue to take steps to mitigate Infiltration/Inflow (I/I) in the sewer service area.

- The information and data presented in the following engineering reports prepared by Owen Engineering and Management Consultants, Inc., (now Owen Psomas):

  - ✓ SMD 1 Wastewater Master Plan, Existing Facilities Evaluation T.M. No. 1, dated June 2007.
  - ✓ SMD 1 Wastewater Master Plan, Recommended Interim Modifications T.M. No. 2, dated June 2007.
  - ✓ SMD 1 Wastewater Master Plan, Cease and Desist Order (CDO) No. 2 Report, Data Collection Plan, June 2007.
  - ✓ SMD 1 Wastewater Master Plan, CDO No. 2 Report, (Nitrate and Nitrite), July 2007.
  - ✓ SMD 1 Wastewater Master Plan, CDO No. 3 Report, (Non-CTR Constituents and Turbidity, July 2007.

- The primary capacity issues relate to the improvements needed to comply with existing effluent limits for Biochemical Oxygen Demand, Ammonia-Nitrogen, Total Nitrate plus Nitrate Nitrogen, Total Coliform, Turbidity, and Trihalomethanes; existing receiving water limits for Temperature and Dissolved Oxygen; and anticipated future effluent limits for Total Dissolved Solids.

- The improvements to increase capacity to 3.0 mgd (ADWF) include:
  - ✓ Headworks.
  - ✓ Primary clarifiers.
  - ✓ Equalization basin (and associated pumping systems).
  - ✓ Activated sludge process that includes nitrification and denitrification.
  - ✓ Secondary clarifiers.
  - ✓ Cooling towers.
  - ✓ Final effluent filters.
  - ✓ U.V. disinfection system.
  - ✓ Post aeration.
  - ✓ Waste Activated Sludge pumping system.
  - ✓ WAS Thickening.
  - ✓ Added anaerobic digestion.
  - ✓ Renovation of existing digesters.
  - ✓ Solids dewatering improvements.
  - ✓ Utilization of existing tanks for recycle flow control and solids holding.
  - ✓ Power service.
  - ✓ Standby generator.
  - ✓ Expanded operations/laboratory building.
  - ✓ Odor control system.
  - ✓ Stream monitoring stations.
  - ✓ Added site improvements (including paving).

- Due to the limited available nitrogen data, the size for the proposed denitrification facilities is conservative. If the County elects to upgrade of the SMD 1 WWTP, collection and analysis of additional weekly composite samples for COD, BOD_5, TSS and TKN may allow for construction of somewhat smaller denitrification facilities. In any event, the proposed denitrification improvements are reasonable for comparison and decision-making purposes.

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Cost Estimates.

The cost estimates are based on the most recent Engineering News Record (ENR) 20 City Construction Cost Index (1913=100) of 8045.14 for October 2007 and costs for comparable facilities in Northern California. The cost estimates are intended to be used for comparison and planning purposes. The analysis did not include phasing of construction for the 3.0 mgd facility, which could mitigate the timing of cost impacts. The interim plan would not lend itself to phasing unless the RWQCB allowed for significantly reduced discharge standards until the SMD 1 WWTP is abandoned.

Implementation Schedules.

The interim improvements would take less overall time to implement, but it still would be 2009-2010 before any degree of reliable effluent quality could be provided. The permanent improvements would take twice as long to implement; but since the activated sludge components would have to be constructed first, the denitrification facilities may be functional as early as 2010. A detailed project schedule would be a key component that would have to be included in the pre-design report prepared at the beginning of the design process.

Project Financing.

Finally, it is our understanding that the County is evaluating alternatives for project financing. We have recently learned that it is highly likely that the State Water Resources Control Board will have sufficient funds available to finance the improvements with a low interest (currently 2.4%) State Revolving Fund (SRF) loan. However, SRF funds are committed on a "first come, first served" basis. We suggest that the County initiate the process to obtain an SRF loan as soon as possible.

The results from this analysis will be compiled in an engineering report that will be submitted to the County in November 2007. The report will provide added understanding of the detail and basis for the estimates presented in this letter. If you have any questions, please contact Steve Herrera or myself.

Very truly yours,

Webster J. Owen, Jr., P.E.
Senior Vice President

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