

Donner Summit Public Utility District Treatment Feasibility Study Work Plan and Time Schedule for Aluminum

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Prepared for
Donner Summit Public Utility District

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1.0 INTRODUCTION

On April 24, 2009 the California Regional Water Quality Control Board, Central Valley Region (Regional Water Board) adopted Waste Discharge Requirements for the Donner Summit Public Utility District Wastewater Treatment Plant (Order No. R5-2009-0034, NPDES No. CA0081621) (Order) and Cease and Desist Order No. R5-2009-0035 (CDO). The Order contains final effluent limitations on aluminum based on protection of freshwater aquatic life. Compliance with these final effluent limitations is not immediately achievable. Therefore, interim effluent limitations for aluminum, and a schedule for achieving compliance, are included in the Order. Compliance with the final effluent limitations for aluminum is required by expiration of the Order (April 1, 2014).

The Order, in Special Provision VI.C.7.a.iv, specifies that the Donner Summit Public Utility District (District) shall perform an engineering treatment feasibility study examining the feasibility, costs, and benefits of different treatment options that may be required to remove aluminum from the District's Wastewater Treatment Plan (WWTP) discharge.

Further, the Order specifies that a work plan and time schedule for preparation of the treatment feasibility study be completed and submitted to the Regional Water Board within six months of the effective date of the Order (December 13, 2009). This document has been prepared to fulfill the treatment feasibility study work plan and time schedule requirement of the Order.

2.0 EFFLUENT DATA AND LIMITATIONS

The Order contains an interim effluent limitation for aluminum effective until April 1, 2014. The Order also contains final effluent limitations for aluminum which will be effective April 1, 2014, and thereafter.. A comparison of effluent monitoring data with interim and final effluent limitations is presented in Table 1.

Table 1
Donner Summit PUD Effluent Data for Aluminum ($\mu\text{g/L}$)

| Sample Date | Total Recoverable Effluent Concentration | Interim Effluent Limitation | Final Effluent Limitations | |
|---------------|--|-----------------------------|----------------------------|---------------|
| | | (Daily Maximum) | Average Monthly | Maximum Daily |
| November 2003 | 620 | | | |
| February 2004 | 1,310* | | | |
| December 2005 | 38.4 | 1,930** | 71** | 143** |
| December 2006 | 127 | | | |
| January 2008 | 952 | | | |
| June 2009 | <0.1 | | | |

*This result suspected to be in error because effluent and receiving water results were reported at the same concentration on the same day.

**Compliance with effluent limitations can be demonstrated using either total recoverable or acid-soluble aluminum.

Based on the limited available historical WWTP effluent data presented in Table 1, the WWTP should be capable of complying with the interim effluent aluminum limitation of 1,930 $\mu\text{g/L}$. However, all but two historical effluent aluminum concentrations exceed final limitations.

The Donner Summit PUD 2008 Consumer Confidence Report contains a single aluminum drinking water result of 829 $\mu\text{g/L}$ collected in 2004. This result is below the drinking water Maximum Contaminant Level (MCL) for aluminum of 1,000 $\mu\text{g/L}$. However, this one drinking water result is significantly higher than the final average monthly aluminum effluent limitation of 71 $\mu\text{g/L}$. In other words, the drinking water supply, itself, does not appear to comply with the final effluent limitations on aluminum. Although there is only one drinking water supply result available at this time, it appears that the drinking water supply is a, if not the, major source of aluminum in the service area, as a result of either aluminum in the raw surface water supply, or aluminum added (e.g., alum) as a coagulate during drinking water treatment.

3.0 COMPLIANCE STRATEGIES FOR ALUMINUM

As described in the District's Pollution Prevention Plan Work Plan and Time Schedule for Aluminum, submitted to the Regional Water Board on November 12, 2009, and the District's Corrective Action Plan and Implementation Schedule for Aluminum, submitted to the Regional Water Board on December 11, 2009, the District is exploring multiple alternatives for achieving compliance with final effluent limitations for aluminum. These compliance alternatives will be more thoroughly developed during the preparation and implementation of the final Pollution Prevention Plan, which is required to be completed and submitted to the Regional Water Board within two years following approval of the Work Plan by the Executive Officer. The primary strategies considered for complying with final effluent limitations for aluminum include a combination of 1) source control measures, and 2) initiation of technical studies to develop site-specific water quality objectives and final effluent limitations for aluminum to replace the current default, generic objectives and limitations used in the current Order.

4.0 TREATMENT FEASIBILITY STUDY WORK PLAN

There are no known common treatment technologies for removal of dissolved aluminum from wastewater. Reverse osmosis (RO), typically, would be used to remove dissolved ions from solution such as aluminum. RO is costly to build and operate. It requires a substantial amount of power, and produces a brine stream (about 20% of effluent flow rate) in need of special disposal, usually oceanic discharge. This study will include examination of reverse osmosis and potentially other treatment options such as nanofiltration or ion exchange/absorption for aluminum removal. It is anticipated that the conclusions drawn from this examination will support a compliance approach that includes a combination of source control measures and the implementation of technical studies necessary to develop site-specific aluminum water quality objectives and effluent limitations. As examples, coagulants that do not contain aluminum may be able to replace alum use at the water and/or wastewater treatment plant. Alternatively, if the drinking water aluminum is naturally from the watershed, then aluminum sensitive aquatic life will not exist in the South Yuba River, and the default/generic aluminum effluent limitations of 71 $\mu\text{g/L}$ and 143 $\mu\text{g/L}$ are inappropriate for the District's discharge.

5.0 TREATMENT FEASIBILITY STUDY TIME SCHEDULE

An estimated time schedule for completing the treatment feasibility study is presented in Table 2. The study is required to be completed and submitted to the Regional Water Board within two years following approval of this work plan by the Executive Officer. Further, the District is required to submit progress reports December 1st annually following approval of this work plan by the Executive Officer. Compliance with current or revised final effluent limitations for aluminum is required by April 1, 2014.

Table 2
Donner Summit PUD Treatment Feasibility Study Time Schedule

| Task | Approximate Completion Date |
|--|---|
| Submit this Work Plan for Approval | December 11, 2009 |
| Approval of Work Plan by Executive Officer | June 1, 2010 (assumed) |
| Complete Treatment Feasibility Study | June 1, 2012 (2 years after work plan approval) |
| Progress Reports | December 1, annually after work plan approval |
| Final Compliance | April 1, 2014 |