Characterization of mercury concentrations in suspended sediment loads in Guadalupe River and Coyote Creek, San Jose, California: Can TMDL targets be met?

**ABSTRACT**

The Merced River, a tributary of the San Francisco Bay, was designated as a Total Maximum Daily Load (TMDL) site for mercury in 2001. In response to the implementation strategy, a mercury TMDL was developed by the Region 5 Regional Water Quality Control Board. The TMDL contains specific recommendations for the Guadalupe River, including the following: "Quantitatively determine the mercury concentrations of suspended sediment that flow across a sub-basin discharge from the watershed to San Francisco Bay to be below the suspended sediment target." The question: Can this target be met? We monitored total mercury in water and sediment during some storms. It is hypothesized that this was caused by the supply of mercury to tributary creeks during very wet years. In contrast, pilot study data for Coyote Creek suggest approximately 3 mg/kg. Thus, present Coyote Creek appears to meet the Bay TMDL sediment target. The data support hypothesis that other Bay Area watersheds dominated by urban and atmospheric sources can be managed to meet the target but it is presently difficult to predict if the Guadalupe River can be remediated and managed to meet the target.

**METHODS:**

Mercury concentrations were determined using clean hands protocols and a D-95 method. Mercury concentrations in water and sediment were collected using a water quality sampler (WQS) at upstream WQS, a D-95. In addition, bed load sediment samples were collected using an 8 inch sampler (8 inch). Sediment samples were analyzed using an XRF/Fractometer. Total mercury concentrations of suspended sediment (suspended matter) were collected using a Guadalupe River at the sampling location. Our sampling location is not surprising given that >90% of the suspended sediments are derived from Guadalupe River. In addition, bed load mercury concentrations and particulate mercury in the sediment target cannot be met over, for example, 20 years. In contrast, pilot study data for Coyote Creek suggest approximately 3 mg/kg. Thus, present Coyote Creek appears to meet the Bay TMDL sediment target. The data support hypothesis that other Bay Area watersheds dominated by urban and atmospheric sources can be managed to meet the target but it is presently difficult to predict if the Guadalupe River can be remediated and managed to meet the target.

**RESULTS:**

During water year 2004, total mercury concentrations in water and sediment were collected using an 8 inch sampler (8 inch). Sediment samples were analyzed using an XRF/Fractometer. Total mercury concentrations of suspended sediment (suspended matter) were collected using a water quality sampler (WQS) at upstream WQS, a D-95. In addition, bed load mercury concentrations and particulate mercury in the sediment target cannot be met over, for example, 20 years. In contrast, pilot study data for Coyote Creek suggest approximately 3 mg/kg. Thus, present Coyote Creek appears to meet the Bay TMDL sediment target. The data support hypothesis that other Bay Area watersheds dominated by urban and atmospheric sources can be managed to meet the target but it is presently difficult to predict if the Guadalupe River can be remediated and managed to meet the target.

**DISCUSSION:**

Just seven samples were gathered on Coyote Creek during water year 2005. Dissolved methyl mercury did not form a strong relationship with discharge. Concentrations observed on Coyote Creek appear to be much lower than those observed in Guadalupe River, however on a relative basis, Coyote Creek is mainly sourced from industrial and minor influences from small mercury mines in the upper watershed. In addition to industrial and other Bay Area watersheds dominated by urban and atmospheric sources can be managed to meet the target but it is presently difficult to predict if the Guadalupe River can be remediated and managed to meet the target.

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