MEMORANDUM

April 18th, 2007

To: RMP Steering Committee

From: Meg Sedlak, Don Yee, and Jay Davis

Re: 2006 RMP/CEP Coring Project

The RMP has an opportunity to analyze the 17 cores that were collected in 2006 as part of the RMP/CEP coring project for several additional trace metals at a considerably reduced cost ($16/each element). At present, we are recommending that the 150 samples from the cores be analyzed for three additional parameters: lead, silver and zinc. The total cost of this additional analysis will be approximately $12,000. This cost includes $8,000 of analytical costs; $4,000 of labor costs. This funding would be taken from the unallocated 2006 subcontract funds. Assuming the TRC approves of this request, this proposal will be submitted to the SC.

Background
In 2006, the RMP/CEP embarked on a joint study to collect and analyze 17 sediment cores from the Bay and adjacent wetlands. The study has three objectives: (1) provide a more comprehensive characterization of contamination with depth that can be used to assess future changes, (2) verify the historic loading of pollutants to the Bay and how those loads have changed in the last several decades, and (3) provide valuable data for parameterization and evaluation of the multi-box or other Bay models.

The cores were collected in 2006 and have been segmented for radiodating using thorium, cesium and lead. The radiodating process should be completed by early June. Depending on the date of the segment, the segments will then be analyzed for pesticides, PCBs, PBDEs, and mercury.

The RMP was recently approached by the Copper Development Association which offered to fund analysis of the cores for copper. Because there is sufficient sample size, the sediment sections can be analyzed for copper with no adverse consequences to the existing study. Much of the cost of the copper analyses is in the digestion of the sample prior to analysis. As a result, there is a nominal fee for analyzing samples for additional elements (i.e., $16 per analyte per sample).

The RMP would like to take advantage of this opportunity to analyze the cores for several other trace metals of interest to the Bay. We propose analyzing for three compounds in addition to copper: lead, silver, and zinc. These four elements were included in a previous USGS study of Bay cores, and showed among the highest enrichment factors in deposited sediments, whereas other elements such as Ni and Cr are often naturally at high concentrations in regional geologic formations and showed less anthropogenic enhancement.

The rationale for analyzing for these compounds is that they are expected to show signals indicating/confirming human disturbance. Lead and silver both had substantial use in the industrial age; loadings of both these compounds increased in the 20th century but dropped substantially in the 1970s and 80s with the advent of unleaded gasoline and with improvement in effluent treatment. Copper and zinc are also widely used elements in a wide variety of applications including paints, galvanic coatings, brake pads, and tires. Concentrations of both copper and zinc are also expected to increase in sediments deposited during industrial development, but will likely show somewhat less decrease than lead or silver in the most recently deposited sediments due to ongoing uses in many applications.