

Memorandum

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Kim Taylor, Regional Water Quality Control Board
Lila Tang, Regional Water Quality Control Board
Karen Taberski, Regional Water Quality Control Board
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From: Geoff Brosseau

Date: March 12, 1999

CC: Marcia Brockbank, SFEP
Betsy Salter, USEPA

Project: Development & Implementation of a Monitoring Program for Specific Emission Sources (Great Waters Grant to BASMAA and SFEP)

Subject: Selection of study topic

The purpose of this memo is to give you a status report and to solicit your feedback on the referenced project and subject.

Background

As most of you know, USEPA awarded to the Bay Area Stormwater Management Agencies Association (BASMAA) and San Francisco Estuary Project (SFEP), an \$80,000 1-year grant (with potential for up to 3-years funding) to develop and implement a monitoring program for specific emission sources to storm water runoff (see attached pre-proposal concept). After the award, I attended an USEPA-sponsored workshop on air deposition to learn about the state of this work and to use the information to complete their first year work plan. As a result of the workshop, it became clear that BASMAA and SFEP's interests could be characterized by the following attributes:

- emissions (as opposed to deposition)
- mobile/local sources
- metals, toxics
- near-ground pollution (close to source as possible)
- controlling sources

Since the workshop, I have been exploring where best to focus these funds. I have reviewed numerous disparate reports and web sites and spoken with individuals at many organizations including CARB, BAAQMD, UC Riverside, Brake Manufacturers Council, Brake Pad Partnership, and USEPA-Office of Pesticide Programs. The following table is a brief representation of the potential topics of study showing pollutants versus selection criteria. Many of the draft entries are meant to represent the latest thinking or common understanding under the selection criteria.

Table of Potential Topics of Study

Pollutant	Problem definition	Great Waters POC?	Storm water significance	Air significance	Source to storm water	Reasons to do	Other studies addressing topic?	How will data be used?
Copper	303(d) listing - San Francisco Bay	No	Yes, 42%	Deposition data says no but emission estimates say yes	Brake pad wear	Focus on apparent significant source; Topic needs funds; Loads expected to increase	Yes, Brake Manufacturers Council pilot study	Confirm/revise need to reduce copper; Inform decisions of BPP and manufacturers
Diazinon	303(d) listing - Urban creeks / SFBay	No	Yes	Too little data to say	Urban / suburban uses	Focus on apparent significant problem; Ability to control research as opposed to manufacturers	None specifically on urban / suburban uses	Confirm/revise need to reduce diazinon; Inform decisions of EPA and manufacturers
Dioxin	Fish advisory - SFBay	Yes	Yes, 80%	Yes	Tailpipe emissions - diesel	Need for better information on mobile sources	Yes, USEPA reassessment; CARB and UCR research	Confirm/modify load estimates
Mercury	Fish advisory - SFBay	Yes	Yes, 33%	Yes	Tailpipe emissions - diesel	Need for watershed council information	Yes, USEPA FL/WI emission impacts; also Great Lakes TMDL (deposition)	Confirm/modify load estimates
PAHs	Water quality guidelines - SFBay	Yes	Maybe, data too limited to say	Yes	Tailpipe emissions - diesel	Need for BPTCP information	Yes, CARB and UCR research; also Great Lakes IADN and NJADN (deposition)	Confirm/modify load estimates
PCBs	Fish advisory - SFBay	Yes	Maybe, data too limited to say	Yes	Historic deposits	Need for BPTCP information	Yes, CARB and UCR research; also Great Lakes IADN, DWSD, NJADN (deposition)	Confirm/modify load estimates

Notes

Great Waters POC (pollutant of concern) - USEPA's Great Waters Program has a list of about 15 pollutants and related compounds

Storm water significance / Air significance - Has storm water or air been identified as significant conveyances?

Source to storm water - What has been identified as the dominant source?

BPTCP = Bay Protection Toxic Cleanup Program; CARB = California Air Resources Board; UCR = UC Riverside; IADN = Integrated Atmospheric Deposition Network; NJADN = New Jersey Atmospheric Deposition Network; DWSD = Detroit Water and Sewerage Department; BPP = Brake Pad partnership; UPC = Urban Pesticide Committee; FL = Florida, WI = Wisconsin

Feedback

Basically, I would like your feedback on the characterization of each of these pollutants. In particular:

Storm water significance – Do you agree with this assessment? Is storm water a significant conveyance for these pollutants to San Francisco Bay? This characterization of copper and mercury is based on the Metals Control Measurers Plan (SCVURPPP, 1997). The 303(d) listing for diazinon in creeks defines storm water as a significant conveyance. A RWQCB staff report (2/98) shows storm water as contributing 80% of the dioxin to San Francisco Bay.

Air significance – Is air a significant conveyance for these pollutants to San Francisco Bay? The USEPA Great Waters list of pollutants of concern defines air as a significant conveyance for dioxin, mercury, PAHs, and PCBs.

Source to storm water – This characterization of copper and mercury is based on the Metals Control Measurers Plan (SCVURPPP, 1997). The dioxin characterization is based on the RWQCB staff report and a 1996 BAAQMD report and a December 1998 memorandum. An Alameda County and SWRCB report (1997) described the occurrence and potential impact of diazinon. Numerous literature sources postulate PAH and PCB sources.

Reasons to do – Do you agree with this assessment? Copper loads from brake wear are expected to increase because copper content in brakes is increasing. BAAQMD staff believes that better data on mobile sources of dioxin will determine their significance relative to historic deposits. RWQCB estimates of mercury in urban runoff suffer from limited data collected without clean sampling techniques and high detection limits. The Regional Toxic Hot Spot Cleanup Plan notes the need for better source information for PAHs and PCBs.

Other studies addressing topic – Are you aware of other emissions studies not listed?

How will data be used – Do you agree with this assessment? Are there other uses not listed?

Tentative conclusions

Assuming that the characterization of our shared understanding presented in the table is basically right, some tentative conclusions appear to be:

- **Data needs** – The most significant data needs seem to be for copper and diazinon (what is significance of air as a conveyance?) and PAHs and PCBs (what is the significance of storm water as a conveyance?)
- **Source to storm water** – The most significant uncontrolled sources appear to be copper in brake pads and diazinon use in urban/suburban areas. Tailpipe emissions from diesel engines (dioxin, mercury, PAHs) appear to be addressed by ARB regulations. With a few minor exceptions, the manufacture, import, processing, and use of PCBs was banned 20 years ago.
- **Other studies** – Copper and diazinon seem “understudied.” Both the emissions and deposition of dioxin, mercury, PAHs, and PCBs appear to have been under study for some time, with more studies planned.

- Decisions – The most basic policy and management decisions on copper and diazinon appear wanting for data on significant sources and conveyances. It appears that the most significant policy and management decisions on dioxin, mercury, PAHs, and PCBs have been made.
- Topics of study – Given these tentative conclusions, it appears the following studies should be conducted because the data needs match up with the need to make better or different decisions:
 - Copper
 - Brake and tire wear, fate, and transport – in the lab
 - Brake and tire wear, fate, and transport – in the field, near the ground
 - Diazinon – Basic emissions and deposition from urban/suburban uses

I would like your feedback by Tuesday March 30. You can respond via phone (650) 322-3070, fax (650) 322-5147, or email gabrosseau@aol.com. Thanks for taking the time to look this over!

93

References

Alameda County et al., 1997. *Diazinon in Surface Waters in the San Francisco Bay Area: Occurrence and Potential Impact*, Prepared by Woodward-Clyde Consultants and RWQCB-SFB.

BAAQMD, 1996. *Air Emissions of Dioxins in the Bay Area*. BAAQMD Staff Report.

BAAQMD, 1998. Memo from Executive Officer to Communities for a Better Environment.

RWQCB, 1998. *Dioxin in the Bay Environment – A Review of the Environmental Concerns, Regulatory History, Current Status, and Possible Regulatory Options*, RWQCB Staff Report.

RWQCB, 1998. *Draft Final Regional Toxic Hot Spot Cleanup Plan – BPTCP*.

RWQCB, 1998. Executive Officer's Report – A Monthly Report to the Board.

SCVURPPP, 1997. *Metals Control Measurers Plan*, Prepared by Woodward-Clyde Consultants.

Pre-Proposal Concept
U.S. EPA Great Waters Program / Air Deposition Initiative
National Estuary Program

Title: Development & Implementation of a Monitoring Program for Specific Emission Sources

Proposing Entities: Bay Area Stormwater Management Agencies Association (BASMAA)
San Francisco Estuary Project

with support from: San Francisco Estuary Institute
California Regional Water Quality Control Board-SFBay Region
Bay Area Air Quality Management District

in coordination with: Santa Monica Bay Restoration Project

Background: Storm water quality management programs in the San Francisco Bay Area have become increasingly concerned about air pollution as a potential “source” for pollutants of growing concern to water quality (e.g., PCBs, mercury, pesticides, dioxin, particulate matter). As a result, there is a growing need for information about airsheds and their potential impact to watersheds in the San Francisco Bay Area. Recognizing this need, the Bay Area Stormwater Management Agencies Association (BASMAA)—a consortium of seven municipal storm water programs—performed a preliminary review of air monitoring activities conducted by the Bay Area Air Quality Management District, California Air Resources Board, USGS and other agencies to determine if current air quality monitoring is adequate for the needs of BASMAA agencies. The results of this scoping study indicate that the current air monitoring network and the data it generates do not help water quality agencies in identifying the relative magnitude of this pollutant transport pathway or possible control strategies. The study includes recommendations for cooperative efforts between water quality and air quality agencies, including new or additional sampling and analyses.

Concurrently, the City of San Jose has allocated significant resources to collaborate with the San Francisco Estuary Institute (SFEI), the scientific arm of the Estuary Project, in a three-year pilot aerial deposition study to determine, on a gross scale, the magnitude of air deposition as a source of pollutant loadings to San Francisco Bay. Through the Regional Monitoring Program (RMP), which SFEI manages, sixty-eight local participants contribute funding to this effort to design, set up, and run a monitoring network for trace elements and organic pollutants. Also, over the next three years, air quality agencies will be setting up a new monitoring network to measure PM_{2.5} in order to monitor compliance with new emission standards.

Collaborative efforts such as those described above have built effective working relationships between the various entities. As a result, the participating organizations are well positioned to seize this opportunity and address this multi-media issue in an efficient and effective way.

Purpose: The purpose of the proposed project is to implement the recommendations of the scoping study and to supplement the pilot aerial deposition study with information on specific, contributing sources. It appears from the scoping study analyses that for more localized, near-ground sources (e.g., vehicles) and non-volatile pollutants (e.g., heavy metals, particulate matter) that there is a disconnect between the pollutant levels measured in standard air monitoring stations and the amount of these substances emitted. The difference, in many cases, appears to be an order of magnitude and may be explained by where and how air deposition is usually sampled.

Concept: Our concept is to use a collaborative effort to investigate this issue and to develop a monitoring program that makes a more direct link between air quality and water quality—between emission sources and pollutant loadings. Our team includes a National Estuary

Program, water quality agencies, air quality agencies, and a research institute. Our intent is to address some of the needs listed in the Excerpts from Draft Research Strategy for Great Waters Program (September 1997). Specifically, we would focus on the fundamental questions – How does air deposition contribute to adverse health and environmental effects?; and Can specific emission sources be identified (and quantified)? We expect to be able to identify and quantify specific, contributing emission sources in the airshed for the San Francisco Estuary.

Local and State agencies on our team will help address two of the current priorities listed in the Draft Research Strategy – investigation of cost-effective emission reduction options, and quantification of benefits associated with emission reduction efforts. These local and State agencies and organizations bring first-hand knowledge of environmental impacts, and potential control strategies to address these impacts. For example, the California Regional Water Quality Control Board–San Francisco Bay Region and SFEI conduct the RMP, a long-term monitoring program designed to assess the health of the San Francisco Estuary. In addition, local storm water programs are hands-on organizations that regularly investigate and implement various control strategies as part of their watershed management efforts.

Finally, the need for a PM_{2.5} monitoring network to monitor compliance with the new emission standards may present an opportunity for water quality agencies and air quality agencies to coordinate their efforts. Storm water quality agencies have found that sediment is often a carrier for many of their pollutants of concern (e.g., heavy metals, pesticides). The same may be true for air quality agencies and particulate matter.

We plan to conduct an annual workshop with the Santa Monica Bay Restoration Project to exchange data and to discuss its implications for future efforts. In addition, we expect that some of the data will provide the basis for a more specific and targeted public education effort about the linkages between air quality and water quality.

Implementation of the proposed program will help accomplish the following actions listed in the Comprehensive Conservation and Management Plan (CCMP) for the San Francisco Estuary: Improve the management and control of urban runoff from public and private sources (PO-2.4); Develop control measures to reduce pollutant loadings from energy and transportation systems (PO-2.5); Work to fund and support existing and new public involvement, education, research, and monitoring activities that seek to fulfill the goals of the CCMP (PI-4.2); Ensure that a technical/scientific/academic entity has responsibility to promote scientific research on and monitoring of the Estuary and provide advice and guidance related to those activities (PI-4.3).

Preliminary Budget and Timeline: BASMAA and some of the other supporting entities plan to contribute in-kind support and potentially other resources as well.

Year 1: Methods development, Monitoring deployment, Data collection and analysis, Progress report, Workshop (\$100,000)

Year 2: Data collection and analysis, Progress report, Workshop (\$100,000)

Year 3: Data collection and analysis, Quantification of specific emission sources, Cost-benefit analysis of emission reduction options, Final report, Workshop (\$100,000)

Deliverables: Methods development; Annual information exchange workshops with SMBRP; Air deposition data; Reports with national applicability

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