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Mr. Douglas Tomchuk
Emergency and Remedial Response Division
U.S. Environmental Protection Agency
Region 2
290 Broadway - 20th Floor
New York, NY 10007-1866

Re: Hudson River PCBs Superfund Site: PMCR Comments

Dear Mr. Tomchuk:

Attached are General Electric Company's ("GE's") comments on EPA's "Phase 2 Report - Review Copy, Further Site Characterization and Analysis, Volume 2B - Preliminary Model Calibration Report, Hudson River PCBs Reassessment RI/FS" (October 1996) ("Report"). Please place this letter and the attached comments in the administrative record for the Hudson River PCBs Superfund Site ("Site").

The Report provides an overview of the current status of EPA's modeling effort for the Site, which is designed to assess the effect of possible remedial actions, including no action, addressing the PCB-contaminated sediments in the Upper Hudson River. GE applauds EPA's decision to provide an opportunity to comment on its modeling effort while it is still a work in progress and is in fundamental agreement with the Agency's stated goals for preparing and using these models, the the principles which guide the development of these models, and the Agency's intent to validate them against existing data.

GE has a number of concerns about the models that EPA is developing. The solids mass balance underestimates solids loading from tributaries to the Upper River, overestimates resuspension and deposition rates, and improperly decouples net sedimentation from resuspension and deposition, all of which lead to an overstatement of the transfer of PCBs from solids to water. The PCB mass balance uses sediment data from 1991 to represent 1993 conditions, ignoring the substantial release of sediments and PCBs to the River from the Allen Mill during the interim. These and other problems with the fate and transport model will become more apparent as EPA

attempts to complete its "hindcasting" against the historical data. In addition, although EPA's steady-state, statistically-based bioaccumulation models may provide some useful information, the Agency should not use them as predictive tools because they ignore variability in the relationships among PCBs in water, sediment and biota; a time-variable, mechanistic food-web model, such as the Gobas Model, is more appropriately used for predictive purposes. Finally, although EPA's depth of scour model uses the right approach to analyze the resuspension of cohesive sediments during flood conditions, EPA has made several errors in developing this model and must take care in selecting an appropriate formulation for estimating resuspension of non-cohesive sediments. All these issues, as well as several others, are set out in detail in the attachment.

There are three issues that we emphasize in this letter. First, as the Agency acknowledges in the Report, its PCB mass balance cannot calibrate to the water column PCB data in the Thompson Island Pool ("TIP") without resorting to an untested hypothesis. With no supporting data, EPA assumes the existence of a spatially-limited groundwater influx through the TIP sediments that purports to flush a sufficient quantity of PCBs from the sediment to account for the mass imbalance of PCBs across the TIP. EPA must recognize, however, that there are other, equally plausible hypotheses that can account for this mass imbalance. For example, the release of a large volume of PCB-contaminated sediments from the Allen Mill between 1991 and 1993 could have deposited fresh PCBs into the TIP sediments and, combined with biodegradation of these PCBs, could provide the source of the "excess" PCBs found in the water column at the Thompson Island Dam. Alternatively, it is possible that the water column sampling stations are not identifying the true amount of PCBs that move through the TIP, either under-quantifying the amount of PCBs entering the pool or over-quantifying the amount leaving the pool.

All these hypotheses must be considered and tested if EPA is to rely on its model with any confidence to make predictions about potential courses of action. The mass imbalance of PCBs across the TIP affects PCB levels in the TIP and further downstream. Understanding the source of these excess PCBs is critical to understand the effects of various potential courses of remediation. Without a factual grounding for and understanding of the cause of the mass imbalance, the model will not accurately predict the fate and transport of PCBs into the future. If, for example, EPA assumes an untested groundwater influx, the model may suggest that remediation addressed to deeply buried sediments will reduce the bioavailability of PCBs in the Upper River. If, however, the apparent imbalance were the result of being unable to measure the full amount of PCBs passing Rogers Island, an intrusive remedy aimed at deep sediments would have no real benefit and could possibly worsen conditions in the River. As a result, EPA cannot use its model to make predictions until the issue of the mass imbalance of PCBs across the TIP is resolved.

As EPA is aware, GE is undertaking studies aimed at answering this question and identifying which of the possible hypotheses is the cause of the TIP imbalance. We intend to

provide the results of these studies to EPA as they become available and look forward to working with the Agency to resolve this critical issue.

Second, to ensure that one can have confidence in the models when they are used to predict the effects of various remedial alternatives, the models must closely match available data. To date, EPA has only calibrated its models against a temporally limited data set between January and September 1993. If EPA's models provide a close fit against the more extensive historical data set, then arguments for their use as predictive tools will be stronger. There are a number of tests to validate the models:

- Solids Balance: comparison of model predictions with data on the spatial patterns of TSS during low flow, temporal and spatial patterns of TSS and water column PCBs during flood events, and annual average solids loading passing Schuylerville, Stillwater and Waterford will all verify the solids balance.

- PCB Fate: comparison of model predictions with data on spatial patterns of water column PCBs during low flow and spatial changes in water column PCB composition will verify PCB flux from pore water and PCB loss by volatilization.

- PCB Loss: comparison of model predictions with data on long-term changes in surface sediment PCB levels, vertical profiles of PCBs in sediments, and PCB inventory in sediment will verify the loss of bioavailable PCBs from sediment.

- Overall Test of Model: comparison of model results with data on the annual average flux of PCBs passing Schuylerville, Stillwater and Waterford will provide an overall test of the model.

- Effect of Allen Mill Release: comparison of model results with data on the apparent increase in the PCB flux from Fort Edward to Thompson Island Dam/Schuylerville that occurred between the mid- to late-1980s and the 1990s will verify that the model reflects the effects of the Allen Mill release.

- Bioaccumulation Models: comparison of model results with data on temporal changes in predatory and forage fish at the TIP and Stillwater over a 15-year period and the response of the fish to the short-term changes in water column PCB levels in the early 1990s will verify the predictive power of the bioaccumulation models.

These comparisons will uncover any apparent biases and are essential to have confidence in the predictive power of the models.

Third, the proposed use of the Thomann model, which analyzes and predicts the body burden of PCBs in striped bass in the Lower Hudson River, raises fundamental issues about the scope and focus of the reassessment. The Report states, "The purpose of the Reassessment is to determine an appropriate course of action for the PCB contaminated sediments in the Upper Hudson River in order to protect human health and the environment." (Report at E-1) The scope and focus does not include any consideration of remedial action in the Lower Hudson. It is undisputable that there are a number of significant PCB discharges into the Lower Hudson River which affect PCB levels in fish, such as the striped bass, in the Lower River and that EPA has not identified any parties responsible for those Lower River discharges as PRPs in this matter. Presumably, the justification for this is found in the purpose of the Reassessment: its remedial scope and focus are confined to the Upper River. This scope is appropriate because, notwithstanding EPA's claim to the contrary in the Report (Report at E-1), the Site is confined entirely to the Upper River. See Administrative Record, NPL-U1-2-29 (EPA).

EPA must accept the constraints that are imposed as a result of the limited geographical reach of the Site and the Agency's choice to limit its review to the Upper River. It is reasonable to look at the effect of potential remedial measures in the Upper River to assure that a possible remedial course of action will not have adverse remedial effects on the Lower River or, at most, if there are adverse effects, that they are acceptable when weighed against other benefits.

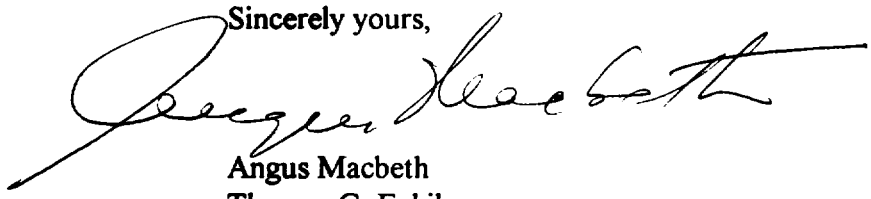
Justifying Upper River remedial action on the basis of benefits to Lower River fish is an entirely different matter. If benefits to the Lower River are to be used to justify remedial action in the Upper River, there must be an investigation and evaluation of remedial alternatives, such as source control, in the Lower River, and a congruent recognition that responsibility for achieving these benefits falls on a much wider group of parties than the present PRPs; that wider group must be classified as PRPs and treated as parties to this proceeding.

EPA must be clear what its objectives in the Lower River are in this reassessment. If the objective is simply to avoid any increase in risk in the Lower River, the scope of the reassessment need not address sources of PCB discharge in the Lower River. If the objective is to decrease risk or attain a human health protection or an ecological risk reduction goal in the Lower River, EPA must address the Lower River sources of PCB discharge. EPA can not defend as cost-effective a remedy for the Lower River which examines only Upper River sources. It may well be that the cost effective remedy for the Lower River is control of Lower River sources, and the failure of the Agency to consider and analyze that obvious and plausible possibility will render clearly arbitrary any Upper River course of action which is justified on the basis of Lower River benefits. In addition, fundamental fairness is involved: the costs of a Lower River remedy should not be borne entirely by Upper River sources, thus providing a remarkable windfall to Lower River sources.

It follows that if EPA intends in any way to justify and support a remedial course of action in the Upper River by reference to benefits in the Lower River, it must investigate the sources of PCB discharge to the Lower River that contribute to the human health or ecological risk in the Lower River; and determine whether the cost effective remedy to obtain that beneficial reduction in risk is remedial action in the Upper River or the Lower River or a combination of the two. Such an investigation and determination calls for identifying the Lower River dischargers as PRPs so that, like GE, they can fairly express their views and provide the benefit of their expertise and analysis.

GE looks forward to working with the Agency to address the issues we have identified in these comments. In light of GE's own experience developing an integrated PCB fate, transport and bioaccumulation model for the Upper Hudson River, we are available to discuss our comments and the related issues with the Agency and to work with EPA to improve the predictive power of the models to ensure that a factually-based remedy is selected.

Sincerely yours,



Angus Macbeth
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attachment

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