January 14, 2005

Ms. Susan Svirsky
Rest of River Project Manager
c/o Weston Solutions
10 Lyman Street
Pittsfield, MA 01201

Dear Ms. Svirsky:

The Connecticut Department of Environmental Protection (CTDEP) appreciates the opportunity to provide comments on the revised Ecological Risk Assessment for the GE/Housatonic River Site Rest of River dated November 12, 2004. This report identifies potential risks to ecological populations within the Housatonic River ecosystem due to the presence of polychlorinated biphenyls (PCBs). Connecticut shares EPA's goals of restoring the Housatonic River to a condition that allows attainment of Water Quality Standards and designated uses for the river. We acknowledge that there have been previous opportunities for CTDEP to provide comment and apologize for not doing so at that time. While we recognize that we are providing comments late in the process, the Ecological Risk Assessment is an important step towards restoring the Housatonic River and so we feel it is critical that the issues outlined in the attached comments be considered in order to achieve an acceptable outcome within Connecticut.

CTDEP supports the risk assessment process that has been used to evaluate potential risks to ecological communities within the Housatonic River basin. However, there are deficiencies within the dataset used to evaluate the Connecticut portion of the Rest of River site that must be recognized and considered as the process for investigation and remediation of PCBs moves forward. Connecticut maintains that the dataset used within the Ecological Risk Assessment was not sufficient to provide a definitive characterization of current and future risks. CTDEP is requesting a revision to the risk assessment in consideration of this issue.

Similarly, CTDEP acknowledges the utility of the Maximum Acceptable Threshold Concentrations within the Ecological Risk Assessment but recognizes that these values may not necessarily be substituted for acceptable ambient conditions within the ecosystem, representative of remedial goals. CTDEP looks forward to participating in the development of remedial goals and plans for the Housatonic River within Connecticut as the process outlined in the consent decree with General Electric moves forward.

CTDEP recognizes the extensive amount of effort expended by EPA to produce such a comprehensive document. We appreciate the opportunity to provide comment at this time and look forward to working with EPA to resolve the water quality impairments within the Housatonic River. Please contact Ms. Traci Iott at (860) 424-3082 or Ms. Susan Peterson at (860) 424-3854 with any questions you may have.

Sincerely,

Betsey Wingfield
Acting Director
Bureau of Water Management
Planning and Standards Division

Comments have additionally been transmitted via:

FAX: Attention: Ms Susan Svirsky
FAX # (413) 442-4447

EMAIL: svirsky.susan@epa.gov

Review of Revised Ecological Risk Assessment for the Housatonic River

Traci Iott
Environmental Analyst III
CT DEP
Bureau of Water Management

January 14, 2005

12 Pages Including 1 Figure

EPA is currently accepting public comment, through January 18, 2005, on new information that was added to the Ecological Risk Assessment for the GE-Pittsfield/Housatonic River Site (the Site). This information was added in response to written comments provided by the Peer Review Panel. EPA has provided a listing of the new material added to the risk assessment, along with the revised Ecological Risk Assessment and the Responsiveness Summary, which provides EPA's responses to the Peer Review comments received. I have reviewed these documents in addition to the written comments provided by the Peer Review Panel in order to summarize these documents with respect to their applicability to Connecticut and within context of the proposed remedial process for the Site, identify issues of concern for the State, and provide comment to EPA.

Background

Polychlorinated biphenyls (PCBs) were released into the Housatonic River from the General Electric (GE) facility located in Pittsfield Massachusetts. These PCBs were subsequently distributed throughout the river, including portions within Connecticut (CT). As a result, fish consumption advisories have been in place for the CT portion of the river since 1977. GE is currently involved in the investigation/remediation of contamination at their facility, within the City of Pittsfield and within the river as a result of releases from their facility. This very large study area has been divided into several portions. The Housatonic River within CT is included in the Rest of the River portion of the Site that extends from the confluence of the East and West Branches of the Housatonic River two miles below the GE facility in MA, to the confluence of the Housatonic River with Long Island Sound in the Stratford/Milford Area. (See map in Appendix A) Because of the presence of PCBs downstream of the Derby Dam from sources other than GE, the practical limit of the study area within CT has been set at the Derby Dam.

As part of the regulatory process, Human Health and Ecological Risk Assessments have been prepared for the Rest of River portion of the Site. These documents were previously released and underwent public comment and a peer review process. The revised Ecological Risk Assessment has recently been released for public comment. This document will contribute to future regulatory decisions regarding what activities, if any, occur within the Connecticut portion of the river. In the future, GE will propose cleanup values and analyze alternatives. EPA will draft a Cleanup Plan, expected in 2007.

Summary Ecological Risk Assessment for CT Portions of the River

The Ecological Risk Assessment (ERA) was conducted to evaluate risks to ecological populations within the Rest of River (ROR) portion of the Site. The main focus of the ERA was the Primary Study Area (PSA), a 10.7 mile subset of the ROR area that is located in Massachusetts and extends from the confluence of the East and West Branches of the Housatonic River down to Woods Pond Dam. Extensive sampling of

environmental media and biological communities occurred within the PSA. Ecological risks within CT were evaluated by identifying important biological communities within the State. These included benthic invertebrates, amphibians, warmwater fish (e.g. bass, sunfish, perch), coldwater fish (trout), mink, river otter and the bald eagle. Maximum Acceptable Threshold Concentrations (MATCs) for either sediment or biota (tissue) were developed based on the results of studies conducted within the PSA. These values are set as threshold concentrations between low and moderate risks. As such, they are not conservative concentrations delineating areas of "no risk" from "risk". Low to moderate levels of risk are associated with the MATCs. The MATCs were used within the ERA to screen sediment and fish tissue data available for CT or were compared with the results of wildlife exposure modeling conducted for the mink, otter and bald eagle. A summary of the ERA evaluation and conclusions regarding risks for each organism is provided below:

Benthic Invertebrates: Two MATCs were developed to assess risks to this population. A benchmark for PCB concentrations in bulk sediment of 3 mg PCB/kg sediment was developed based on chronic toxicity tests using *Chironomus* and observed effects on the benthic community in the Primary Study Area in Massachusetts. Another MATC was developed using tissue concentrations reported in the scientific literature. The MATC of 3 mg/kg wet weight in tissues of the benthic organisms represents the concentration below which adverse effects were not reported in the studies examined. Based on comparisons to PCB concentrations in the upper 6 inches of sediments collected from various points in the river, and limited benthic tissue samples, EPA concluded that PCBs within the CT portion of the river pose a low risk of harm to the benthic community.

Amphibians: A soil and sediment MATC of 3.27 mg/kg tPCBs (total PCBs) was derived for the PSA based on developmental malformations observed in studies conducted on amphibians. This value represents the concentration of PCBs at which some sensitive endpoints (alteration of the gender ratio within the population studied) showed a response, but was not deemed as biologically relevant as the MATC based on malformations. Above this concentration, ecologically significant responses are expected. Sediment concentrations for the Housatonic River downstream of the PSA and into CT were used to evaluate potential effects on amphibians. Additionally, estimates of floodplain tPCB concentrations were made by interpolating the river based sediment values to the limit of the 100-year floodplain. In this manner, risks within the floodplain were also assessed. Sediment PCB concentrations within CT were below the MATC so amphibian populations were not identified as being at risk.

Warmwater Fish: A MATC of 55 mg/kg ww tPCBs in fish tissues was established to separate low risk groups from those exposed to intermediate or high risks. This value was derived based on results of studies on Largemouth Bass, evaluating accumulation of PCBs and potential reproductive/developmental

effects. Additionally, studies conducted on warmwater fish and rainbow trout to simulate the maternal transfer of PCBs to oocytes were also considered. Literature based tissue concentration thresholds were developed but not included in the MATC. The literature based value was lower than that derived from the studies conducted as part of the ERA. However, EPA determined that there was a higher level of uncertainty associated with the literature studies. Tissue concentrations in warmwater fish (bass, perch, sunfish) collected in CT were evaluated using the MATC of 55 mg/kg ww in fish tissue. Tissue concentrations in warmwater fish collected in CT were below the MATC.

Coldwater Fish (Trout): A MATC of 14 mg/kg ww tPCBs in fish tissues was established based on the MATC for warmwater fish species, divided by a factor of 4 to account for potential differences in sensitivities between the different species. The MATC separates low risk groups from those exposed to intermediate or high risks. In order to evaluate risks to trout, warmwater fish data, and/or trout fillet data were used to estimate whole body trout concentrations. These estimates indicate that whole body trout concentrations within CT should be below the MATC for trout. Risks to trout were not evaluated downstream of Reach 12 (Bull's Bridge). EPA did not believe that there was suitable trout habitat below Bulls Bridge Dam. However, there is the Bull's Bridge Trout Management Area, which extends from the Bull's Bridge Impoundment to the Gaylordsville Bridge (Route 7) in New Milford.

Mink and River Otter: A MATC of 0.984 mg/kg tPCBs in fish was developed based on the mink kit survival from 0 - 6 weeks in a single, long-term feeding study on captive mink exposed to fish collected from the Primary Study Area in Massachusetts. Dietary exposures to mink and river otter were based on the proportion of contaminated prey items (fish and crayfish) likely contained in their diets. Since data for tPCB concentrations in crayfish tissue was not available for the rest of river study area, crayfish concentrations were assumed to be equal to fish tissue concentrations. Based on these assumptions, it was assumed that 59% of the diet of mink and 100% of the diet of river otter were composed of fish/crayfish. Mink and river otter were identified as potentially at risk from the CT/Massachusetts border down to the Stevenson Dam on Lake Zoar.

Bald Eagle: Risks to bald eagles were evaluated based on toxicity estimates from a surrogate species as well as modeled concentrations to estimate accumulation of PCBs in eggs. The MATC of 30.41 mg/kg tPCBs in fish was developed based on a determination of the threshold at which the total daily intake of PCBs for an eagle would exceed the toxicity threshold for tPCBs in eggs. The diet of eagles was assumed to consist of 83.4% fish and 16.1% waterfowl. EPA assumed that the waterfowl consumed during the winter were likely to have migrated to the Housatonic Area from northern locations, and therefore, were unlikely to contain PCBs. However, it is the experience of CTDEP Wildlife staff that waterfowl residing in CT during the winter are likely to remain in the area for extended periods of time, allowing for potential uptake of contaminants such as PCBs.

Additionally, there are no data available to substantiate the assumption that waterfowl caught within CT do not possess a body burden of PCBs. CTDEP has data from only one duck collected within the Housatonic Basin, and tissue concentrations of PCBs were elevated. Finally, it must be noted that there are bald eagles that reside within the basin for the entire year. Assumptions made regarding contaminant concentrations in the diet of overwintering eagles may not apply to those eagles that reside throughout the entire year.

An additional evaluation of risks to bald eagles breeding within the study area was conducted within the ERA. The study focused on a breeding pair of bald eagles located south of Interstate 84. It was assumed that this pair would forage in the southern reach of Lake Lillinoah and within Lake Zoar. Low, moderate and high tPCB intake rates were evaluated and compared with the MATC. Risks to bald eagles within CT were determined to be low.

Note: In Appendix K - Survival, Growth and Reproduction of Threatened and Endangered Species, reference is made to a personal communication of Ms. Julie Victoria, CTDEP, with Woodlot Alternatives Inc. on December 12, 2002. Ms. Victoria's name is misspelled throughout the Appendix as "Bictoria".

Revised ERA - Outstanding Issues

Under the current comment period EPA has established that only issues raised during the peer review process or modified within the risk assessment in response to comments are available for further discussion. There are two issues that were raised during the peer review process that pertain to Connecticut: 1) the characterization of the river within the rest of river segment which includes CT; and 2) the derivation of Maximum Acceptable Threshold Concentrations. These issues will be discussed below.

1: Characterization of the Housatonic River within Connecticut

Peer Review Comments:

Several members of the Peer Review requested justification for the reduced sampling within CT or recommended that the river within CT be better characterized. Several reviewers specifically identified sediments behind the dams as areas that could accumulate higher concentrations of PCBs in sediments.

EPA Response:

EPA disagreed and asserted that adequate characterization of the physical, ecological and cultural aspects of the river were provided. EPA also sited the inclusion of historical data as well as additional samples collected as part of the ERA.

Summary of CT DEP Response:

The characterization of PCBs within abiotic and biotic media in CT is limited and prevents a complete evaluation of risk to ecological receptors at this time. The limitations of the characterization arise from the difficulty in precisely characterizing such a large area as the Housatonic River within the State. The data contained within the current draft of the ERA is sufficient to provide a limited assessment of risks within CT. However, the inadequacies in the dataset, both regarding the number and type of samples collected, prevent reaching a definitive conclusion regarding risks within all reaches of the river in CT at this time. Additionally, potential future risks from mobilization or migration of deeper bedded sediments were not included in the risk assessment.

Discussion:

The current revisions to the Ecological Risk Assessment do not adequately address concerns regarding the environmental characterization within Connecticut. This is of particular importance given that future activities within the river to address PCBs are based, at least in part, on the conclusions of the human and ecological risk assessments.

The Ecological Risk Assessment reflects the following summary provided in the Executive Summary (pages ES-1 to ES-2) in several places throughout the report:

> "The purpose of this ecological risk assessment (ERA) is to **characterize and quantify the current and potential risks to biota** exposed to contaminants of potential concern (COPCs) in the Housatonic River below the confluence of the East and West Branches (known as the "Rest of River"), **focusing on polychlorinated biphenyls (PCBs) and other hazardous substances** originating from the General Electric Company (GE) facility in Pittsfield, MA." (Emphasis added)

Addtionally, Section 1.3 (Regulatory Background) of the revised report states:

> "The ecological risk assessment, together with the human health risk assessment and the model of PCB fate, transport, and bioaccumulation, **will inform EPA's decision on what additional remedial actions, if any, may be required** in the river and floodplain downstream of the confluence." (Emphasis added)

The adequacy of the characterization of the Rest of River area is germane both to the ERA as well as to potential future activities/requirements for the Connecticut portion of the river. In response to comments expressing concern about the limited amount of data collected within CT, EPA stated that the characterization was adequate. However, given the stated purpose of the risk assessment, the characterization of current and potential risks, and the potential implications of its conclusions, a further evaluation of the adequacy of the characterization within CT is warranted.

Consider a practical illustration of this matter - a new project, possibly a new road project, maintenance of a dam, installation of a fish ladder or a fishing pier, is proposed within the Housatonic River somewhere in Connecticut. Is there sufficient information available within the ERA to quantify the PCB concentrations within the proposed project area? Is there sufficient information available within the ERA to determine that PCBs do not pose an environmental risk within the project area? The answer to both questions is "no". The level of detail present within the ERA is insufficient to adequately characterize the levels of PCBs with a high level of detail. Any future activities within the river cannot rely on the environmental characterization of the PCB levels in the river as present within the risk assessment to define the scope of the PCBs within the project area. Similarly, this lack of specificity creates uncertainty regarding potential risks to environmental receptors due to exposures to PCBs, currently and in the future.

The study area within the CT portion of the river encompasses approximately 72 river miles. This is a very large area to definitively characterize. It would take a huge effort, much time and great expense to explicitly identify and quantify PCBs within an area this large. So, while a large number of samples may contribute to the existing risk assessment, it is not sufficient to definitively quantify the nature and extent of contamination within CT. There is not sufficient information available to **specifically** identify PCB concentrations within various portions of the river. There is sufficient information to **generally** identify PCB concentrations within surficial sediments in the river. It is this general, surficial data that serves as the basis for the ERA.

There are several problems with this approach that must be considered as the river restoration process moves forward. First, by restricting the evaluation of risk to the consideration of surficial sediments, EPA is assuming that the river is static; that in the future there are no opportunities for deeper sediments to become mobilized and influence the concentrations of PCBs available within biologically active sediment horizons. Consideration of surficial sediments may address **current** risks, but will not necessarily address **potential** risks, as identified within the purpose for the risk assessment. There is limited data available for deeper sediments, mostly from samples collected in association with the dams on the river. However, this limited data set does identify higher concentrations of PCBs at depth within some areas. Some of these concentrations exceed the MATC values used by EPA, indicating that risk to various populations may occur if the deeper sediments were made available.

Secondly, there is the practical aspect that the risk assessment cannot assure that there are not significant areas with elevated PCB levels within the river. It was not possible to sample all major depositional areas within CT, for example. And so, the conclusions presented within the ERA must be viewed with the understanding that they pertain to the current dataset but cannot be taken as a definitive characterization for all portions of the river within CT.

The characterization within CT is also incomplete due in part to the omission of contaminants of concerns evaluated within the PSA in addition to PCBs. For example,

within the PSA, risks to the benthic invertebrate community were evaluated relative to exposures to dioxins/furans, metals, dibenzofuran and PAHs in addition to total PCBs. Exposure to these additional constituents potentially increases risks to exposed populations. The lack of inclusion of these substances within the CT portion of the study is inconsistent with the goals of the ERA, to characterize and quantify the current and potential risks to biota focusing on polychlorinated biphenyls (PCBs) and other hazardous substances originating from the General Electric Company (GE) facility in Pittsfield, MA. The omission is understandable due to the practical consideration that the historical datasets that comprise a substantial part of the ERA data did not include these substances. However, the lack of inclusion of these substances in the rest of river evaluations and the lack of consideration, even indirectly, of these substances to contribute to risk within CT is a data gap and contributes uncertainty to the conclusions reached in the ERA and may underestimate risks to ecological populations within CT.

Additionally, adequate descriptions of the sampling locations within CT are not provided within the report. It is not possible to determine if the sediment samples were obtained from depositional areas, or were from areas less likely to accumulate PCBs, for example. The details of the sampling locations and sediment type are important factors for characterizing the sediments within CT and interpreting the available data.

Finally, there was limited sampling of biological communities within CT. I do not believe that it is necessary to conduct additional toxicity studies within CT as were conducted within the PSA. However, additional sampling of biological tissues within CT may be needed. There are limited data for fish and benthic invertebrates. However, there is no data available for waterfowl. Waterfowl have accumulated PCBs within Massachusetts. Additionally, CT DEP has data from one duck collected within the Housatonic River basin that had elevated PCB levels.

Recommendations - Characterization of CT

These criticisms underscore the difficult nature of the task undertaken to evaluate ecological risks within the Housatonic River in CT. To summarize, the ERA provides an overview of the general risks experienced by ecological populations within CT exposed to surficial sediments under current conditions. However, the report does not present sufficient data to definitively assess ecological risks within CT. Additionally, the report did not adequately assess potential risks that could occur if bedded sediments with higher concentrations of PCBs were mobilized. Therefore, revisions to the ERA to address these issues are recommended.

2: Maximum Acceptable Threshold Concentrations

Peer Review Comments:

The Peer Review Panel made several comments regarding the derivation of the MATC values. The comments focused on the method by which the values were derived, such as

separating acute and chronic endpoints, eliminating redundancy, defining the most appropriate data to use, etc. The Reviewers had differing opinions regarding the conservatism of the MATC values.

EPA Response:

EPA agreed with most of the recommendations and made changes within the documents. These changes, however, did not change the conclusions from the first draft ERA to the revision.

Summary of CT DEP Response:

The MATC values developed within the risk assessment provide a means to evaluate risks to ecological communities and are sufficient for the purposes of the ERA. However, these values may not reflect acceptable thresholds from a environmental management perspective for ambient PCBs within the environment. Such discussions are most appropriate during the evaluation of cleanup goals for the river.

Discussion:

The MATC values for the various endpoints were established to separate populations experiencing lower levels of risk from those exposed to intermediate/high risk levels. The different MATC values have differing levels of conservatism, depending upon the strength of the data used and the interpretation of the data. Within the context of the ERA, the MATC values serve a useful purpose, allowing the qualitative evaluation of risks within Connecticut. These concentrations, however, have been established within a risk assessment, and, in accordance with EPA Guidance, separate from the risk management process but considering general management goals. These values are not numeric interpretations of acceptable environmental concentrations established in accordance with State policy statements, such as the Connecticut Water Quality Standards. In accepting the qualitative assessment of risks within CT, CT DEP does not imply that the MATC values are numeric interpretations of our policy nor do we agree, at this time, that these values are acceptable ambient concentrations of PCBs, beyond which there are no risks, or acceptable risks, to the ecosystem within our State. It is beyond the scope of the risk assessment to discuss the way these MATC values may be used, if at all, in future risk management decisions. Acceptable ambient values based on State policy must be addressed as the remedial process for the river moves forward.

<u>Recommendations – MATC</u>

CT DEP accepts the use of the MATC within the context of the ERA for delineating exposures to PCB concentrations with lower risks from those associated with

moderate/high risks. As such, they are not conservative concentrations delineating areas of "no risk" from "risk". Low to moderate levels of risk are associated with the MATCs. However, it is noted that the level of risk associated with these values (intermediate risk to exposed populations) is not necessarily consistent with management goals for the river. I recommend that the CT portions of the Housatonic River be considered during the future phases of remedial investigation and implementation, especially during the development of remediation goals. I am not recommending changes to the ERA regard MATC values.

Summary

I support the screening level approach to evaluating risks to ecological communities in CT used within the ERA. However, due to the weakness associated with the characterization of the ambient PCB concentrations within the river and within associated biological communities, a definitive characterization of risks within all areas of the river in CT is precluded. Additionally, future risks from potential releases of bedded sediments that contain higher levels of PCBs were not evaluated. I recommend that these deficiencies be addressed within revisions to the ERA. Additionally, remedial goals established consistent with management objectives for the river must be established as part of the remedial process.

Appendix A:

Map of the Housatonic River Study Area