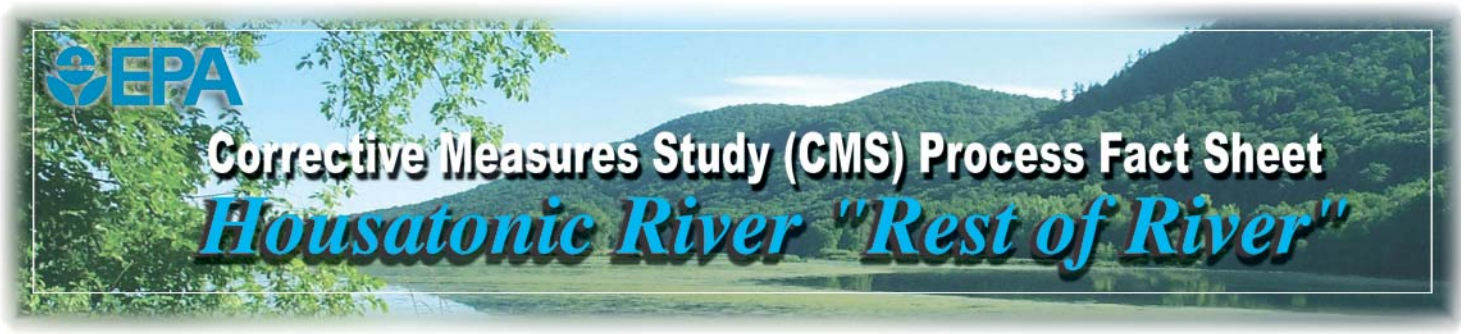


October 2007

United States
Environmental Protection Agency
New England Region
1 Congress Street
Boston, MA 02114

Schedule For Corrective Measures Study (CMS) Process

EPA Outreach
November 2007 through March 2008:
Ongoing meetings with local governments and interest groups upon request

Connecticut Citizens Coordinating Council (CCC) Meeting:
November 28, 2007

Massachusetts CCC Meeting:
December 5, 2007

GE Submits CMS
March 21, 2008

EPA Begins Informal Public Input Period
March 22, 2008

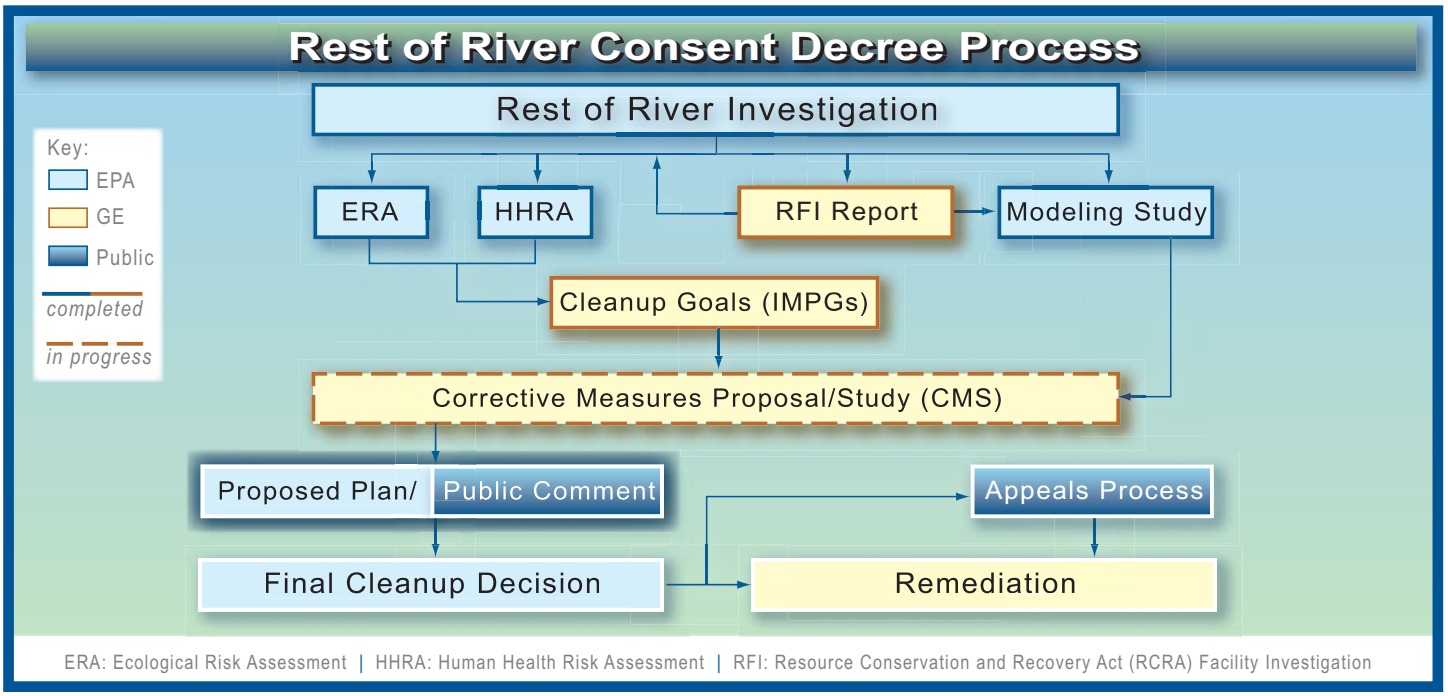
Presentation of CMS
MA and CT CCC Meetings:
March 26 and 27, 2008

Evaluation of Cleanup Alternatives Underway for the GE/Housatonic River Site, Rest of River

Under its legal agreement with EPA, General Electric is currently evaluating potential cleanup alternatives for polychlorinated biphenyls (PCBs) released from the GE facility in Pittsfield, Massachusetts to the Housatonic River/Rest of River. The Rest of River extends from the Confluence of the East and West Branches in Pittsfield to the Derby-Shelton Dam in Connecticut. Upon completion of the evaluation, GE will submit for EPA's review and approval a Corrective Measures Study (CMS) documenting this work, including GE's preferred cleanup plan. EPA will follow the process outlined in this Fact Sheet and make the final remedy selection decision.

This fact sheet summarizes the CMS process, the alternatives and technologies being evaluated, the evaluation criteria that will be used by EPA to select a cleanup plan, and the opportunities for public input to the process.

Copies of the CMS Proposal and other Rest of River documents are available for public review at the locations listed on the back page, or on EPA's website at **www.epa.gov/ne/ge.**



Housatonic River / Rest of River: Background

GE used PCBs at its 254-acre facility in Pittsfield from 1932 to 1977. During this time, the Transformer Division manufactured and repaired transformers containing dielectric fluids, some of which included PCBs. PCBs were released to soil, groundwater, Silver Lake, and the river, and used and disposed of within and around the facility in landfills, former river oxbows, and other locations.

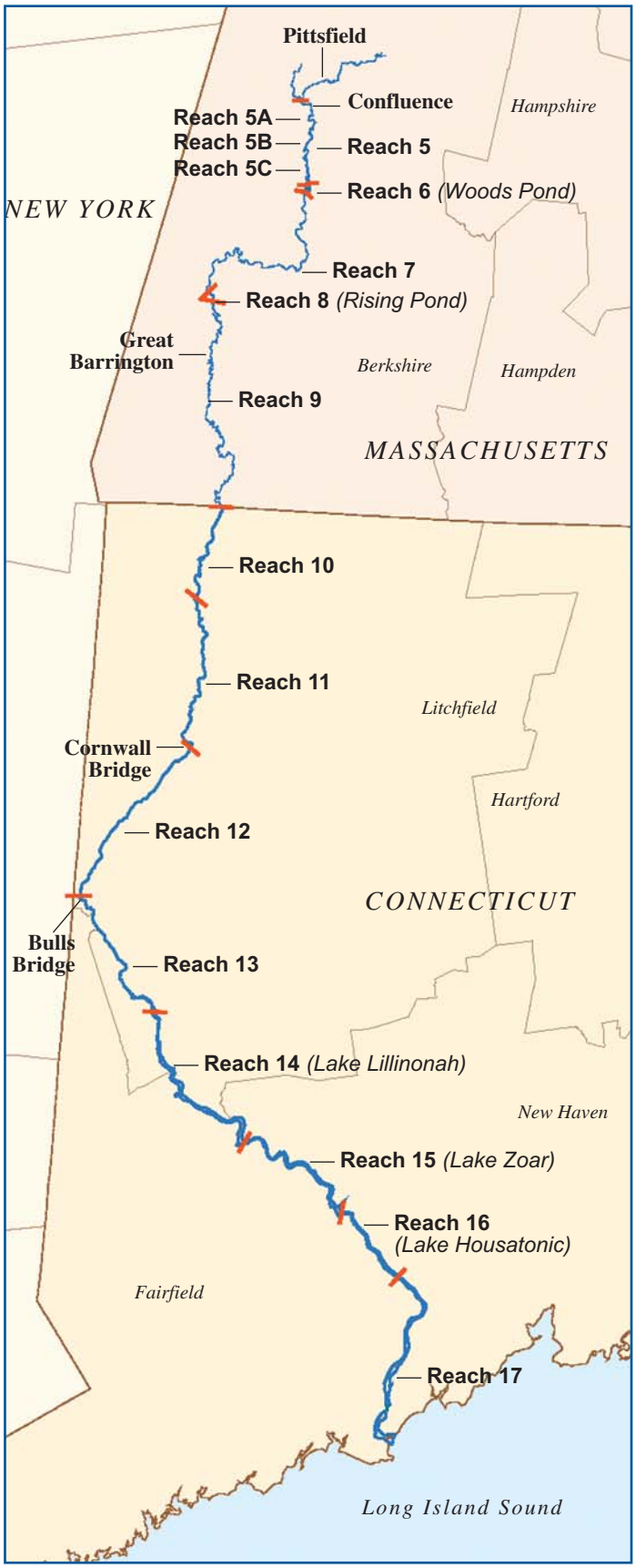
The Pittsfield facility is the only known major source of PCBs to the Housatonic River in Massachusetts. Most of the mass of these PCBs is now located in the river sediment and floodplain soil between the Confluence of the East and West Branches and Woods Pond Dam, but PCBs have also been found throughout the Rest of River, as far downstream as Long Island Sound.

In addition to the river, other areas in Pittsfield and surrounding communities have been discovered over the years to have received PCB-contaminated waste from the GE facility. These areas include 11 former oxbows on the East Branch, residential properties, the Pittsfield Landfill, the Rose Disposal Site in Lanesboro, MA, and Dorothy Amos Park located on the West Branch of the Housatonic River.

The Consent Decree for the General Electric/Housatonic River Site was approved by the federal court in October 2000. The Consent Decree (CD), the legal agreement between EPA and GE, calls for the river to be addressed in three phases: the cleanup of the Upper 1/2-Mile Reach (conducted by GE in 1999-2002); the cleanup of the 1 1/2-Mile Reach (conducted by EPA, with funding shared by GE and EPA, in 2002-2007); and the investigation of the Rest of River, which includes the downstream portions of the river in Massachusetts and Connecticut.

As shown in the figure on the front page of this fact sheet, the CD and Reissued RCRA Permit ("Permit," Attachment G to the CD) required that EPA conduct the Human Health and Ecological Risk Assessments and the Modeling Study, and that these studies be subjected to independent public Peer Review before any potential cleanup alternatives were considered for the Rest of River. GE had the responsibility upon completion of the Peer Reviews of the risk assessments, taking these into account, to propose Interim Media Protection Goals (IMPGs), or preliminary cleanup goals for both human and ecological receptors found to be at risk in the Rest of River. GE submitted the initial IMPG Proposal in 2005, and EPA approved the revised submittal in 2006. After approval of the IMPGs by EPA and completion of the Peer Review of the Modeling Study, GE submitted the Corrective Measures Study Proposal (CMS-P) in 2007 and it was approved by EPA. The CMS-P is the work plan for the CMS.

In addition to these river cleanup actions, the Consent Decree requires GE to investigate and clean up 19 areas outside the river. To date, GE has substantially completed the remediation of 13 of these areas. One area is currently undergoing remediation activities, and soil investigations and the development of cleanup plans are well underway at the remaining five areas.



Rest of River

What Is a Corrective Measures Study?

The purpose of the Corrective Measures Study (CMS) being performed by GE is to evaluate potentially applicable technologies and cleanup alternatives for the Rest of River to reduce risk to human health and the environment from exposure to PCBs. The CMS for Rest of River follows the process approved in the CMS Proposal (CMS-P) and described in the Permit, including the technologies to be considered, the range of alternatives to be evaluated (described on Pages 4 and 5), and the process and criteria used for evaluation (described on Page 7).

The various technologies (discussed on Page 6) that were retained after screening in the CMS-P are applicable to one or more of three categories of remedial actions:

- In-place sediment and riverbank soil
- In-place floodplain soil
- Management of materials (that have been removed)

The evaluation criteria will first be applied separately to in-place sediment and riverbank soil alternatives and then to in-place floodplain soil alternatives. Then, the management-of-materials alternatives (materials handling specific to removal alternatives, including treatment and disposal) will be evaluated as appropriate, in combination with the removal alternative(s). This process is shown in the figure on the top of Page 4.

An important component of the evaluation is the application of the mathematical model framework developed by EPA (described on the right). The model framework will be used to evaluate the effectiveness of each sediment alternative, and the time frame necessary to achieve the IMPGs.

Estimates of the costs, volumes of sediment/soil, and PCB mass associated with the various alternatives will be generated as part of the CMS.

In addition, GE will make a recommendation for consideration by EPA as to which remedial alternative(s) for sediment/banks, floodplain soil, and management of materials (if appropriate) would in their opinion best meet the evaluation criteria.

Where is the "Rest of River"?

The area known as the "Rest of River" includes the main stem of the Housatonic River and its floodplain from the Confluence of the East and West Branches in Pittsfield downstream to the Derby-Shelton Dam in Connecticut, which is the downstream end of Reach 16 (see map to the left).

For the purposes of evaluation and discussion in the EPA studies and the CMS, the Rest of River has been divided into 17 reaches. EPA and GE studies show that the greatest mass of PCBs is located within Reaches 5 and 6, the 10 1/2 miles of river and floodplain between the Confluence and Woods Pond Dam.

Massachusetts Advisory

Application of the Model Framework

EPA developed and submitted for Peer Review a model framework that includes three mathematical models that are linked to simulate the Rest of River from Reach 5 to Reach 8. The three models include:

- A watershed model (HSPF),
- A water, sediment, and PCB fate and transport model (EFDC), and
- A food chain model (FCM).

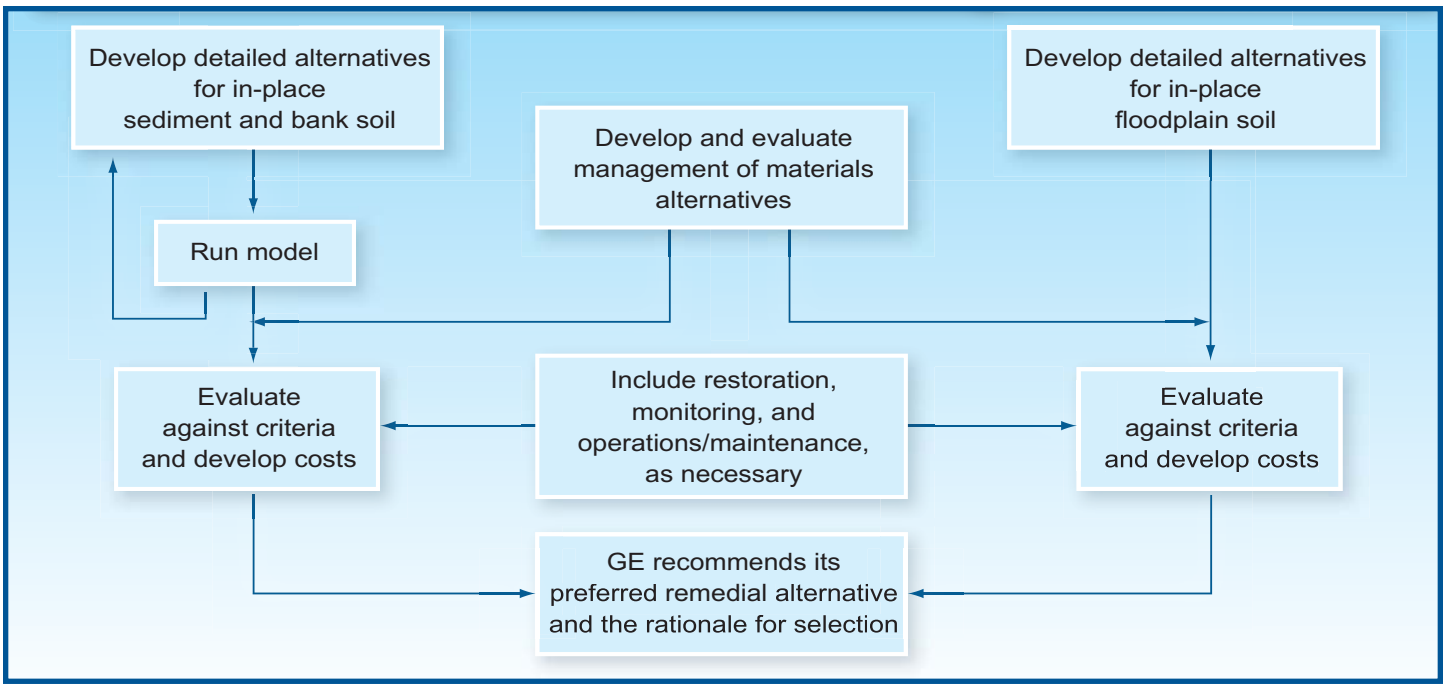
These models will be run for each sediment/bank alternative for a simulation period of 52 years (repeating the 26-year hydrograph used for the Model Validation performed by EPA and Peer Reviewed) which will include an extreme storm event. The model will be used to simulate each of the remediation alternatives, including estimated time for production, residuals, and resuspension rates as appropriate for the alternative, as well as atmospheric and other ongoing PCB loads. Both optimistic and conservative parameter values will be used to indicate the uncertainty associated with the inputs to the model simulation.

The outcome of each model simulation will include water, sediment, and fish tissue PCB concentrations over time and location for each alternative.

In addition, the output of the EFDC model from Reach 8 will be used with FCM to estimate fish tissue concentrations in downstream reaches.

This information will be used to compare the effectiveness of the alternatives in achieving the IMPGs, and projections of the timeframe over which it can be expected to occur.

Process for GE Conducting the CMS



Alternatives Being Evaluated in the CMS

In-Place Sediment Alternatives

Alt.	Reach 5A	Reach 5B	Reach 5 Erodible Banks	Reach 5C	Reach 5 Backwaters	Reach 6 Woods Pond	Reach 7 Impoundments	Reach 7 Channel	Reach 8 Rising Pond	Reaches 9-16
SED 1	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action
SED 2	MNR	MNR	MNR	MNR	MNR	MNR	MNR	MNR	MNR	MNR
SED 3	2 ft removal with capping	MNR	Removal/ stabilization	Combination of TLC and MNR	MNR	TLC	MNR	MNR	MNR	MNR
SED 4	2 ft removal with capping	Combination of 2 ft removal with capping and TLC (per depth and velocity)	Removal/ stabilization	Combination of TLC (in shallow and depositional areas) and capping (in deeper areas)	Combination of TLC and MNR	Combination of 1.5 ft removal with capping in shallow areas and TLC in deep area	MNR	MNR	MNR	MNR
SED 5	2 ft removal with capping	2 ft removal with capping	Removal/ stabilization	Combination of 2 ft removal with capping (in shallow areas) and capping (in deeper areas)	Combination of TLC and MNR	Combination of 1.5 ft removal with capping in shallow areas and capping in deep area	MNR	MNR	TLC	MNR
SED 6	2 ft removal with capping	2 ft removal with capping	Removal/ stabilization	2 ft removal with capping	Removal of sediments >50 mg/kg in top 1 ft (with capping/backfill); TLC for remainder >1 mg/kg	Combination of 1.5 ft removal with capping in shallow areas and capping in deep area	TLC	MNR	Combination of TLC in shallow areas and capping in deep areas	MNR
SED 7	3-3.5 ft removal with backfill	2.5 ft removal with backfill	Removal/ stabilization	2 ft removal with capping	Removal of sediments >10 mg/kg in top 1 ft (with capping/backfill); TLC for remainder >1 mg/kg	Combination of 2.5 ft removal with capping in shallow areas and capping in deep area	Removal of higher PCB levels (e.g.,>3 mg/kg) in top 1.5 ft (with capping/ backfill); TLC for remainder >1 mg/kg	MNR	Combination of removal of higher PCB levels (e.g.,>3 mg/kg) in top 1.5 ft (with capping/ backfill); TLC in shallow areas and capping in deep areas	MNR
SED 8	Removal to 1 mg/kg depth horizon with backfill	Removal to 1 mg/kg depth horizon with backfill	Removal/ Stabilization	Removal to 1 mg/kg depth horizon with backfill	Removal to 1 mg/kg depth horizon with backfill	Removal to 1 mg/kg depth horizon with backfill	Removal to 1 mg/kg depth horizon with backfill	MNR	Removal to 1 mg/kg depth horizon with backfill	MNR

Notes: MNR - *Monitored Natural Recovery* | TLC - *Thin-Layer Capping*

Alternatives Being Evaluated in the CMS *(continued)*

In-Place Riverbank Alternatives *(considered in connection with Sediment Alternatives)*

- No Action
- Remove/Replace Bank Soil
- Stabilize Riverbank

In-Place Floodplain Soil Alternatives

Alt.	Human Health IMPG	Ecological IMPG
FP-1	No Action	No Action
FP-2	Remove/replace top 12 inches to 10^{-4} ICR or HI = 1	As determined to be appropriate in addition to human health action
FP-3	Remove/replace top 12 inches to 10^{-4} ICR or HI = 1, except high-use areas to 10^{-5}	As determined to be appropriate in addition to human health action
FP-4	Remove/replace top 12 inches to 10^{-5} ICR or HI = 1	As determined to be appropriate in addition to human health action
FP-5	Remove/replace top 12 inches ≥50 ppm	As determined to be appropriate in addition to human health action
FP-6	Remove/replace top 12 inches ≥25 ppm	As determined to be appropriate in addition to human health action
FP-7	Remove/replace top 12 inches to 10^{-6} ICR but not <2 ppm	As determined to be appropriate in addition to human health action

ICR: Incremental Cancer Risk

Management-of-Materials Alternatives
(after removal)

- Dewatering/water treatment
- *Ex-situ* stabilization
- Chemical extraction
- Thermal desorption
- Confined disposal facility (CDF) – local disposal
- Upland disposal facility – local disposal
- Off-site permitted landfill

Capping

What are IMPGs?

An Interim Media Protection Goal (IMPG) is a media-specific cleanup goal for human health or ecological receptors that is determined by EPA to be protective. The IMPGs for the Rest of River were derived by GE, taking into account information in the Peer-Reviewed Human Health and Ecological Risk Assessments performed by EPA. The IMPGs for human health are expressed as the media-specific concentration of PCBs that results in an incremental cancer risk (ICR) from exposure ranging from 10^{-4} (1 in 10,000) to 10^{-6} (1 in 1,000,000), or as a noncancer risk exceeding a Hazard Index (HI) of 1.

The ecological IMPGs are typically expressed as a Maximum Acceptable Threshold Concentration (MATC) below which no significant risk to ecological receptors is expected. The IMPG Proposal prepared by GE and approved by EPA in 2006 provides a more detailed description of the derivation and meaning of the IMPGs.

Description of Technologies Being Evaluated

Technologies retained in the initial screening in the CMS-P that are under consideration in the CMS are described below. Many of these technologies can be applied to in-place sediment, riverbanks, and floodplain soil. The management-of-materials technologies apply to material after it has been removed from the river, banks, or floodplain. All alternatives (except No Action [NA]) possibly will require engineering and/or institutional controls. All alternatives include a restoration (except NA and MNR), operation, maintenance and monitoring component (except NA).

No Action The No Action (NA) response does not include any active or passive remediation or long-term monitoring. EPA requires that a No Action response be considered at every site.

Engineering/Institutional Controls There are four general types of institutional controls to reduce exposure to humans: 1. governmental (e.g., fish advisories); 2. proprietary (e.g., deed restriction); 3. enforcement (e.g., provisions in the CD); and 4. informational (e.g., public education).

Monitored Natural Recovery (MNR) MNR is a response action that relies on ongoing, naturally occurring processes (including physical, biological, and/or chemical mechanisms) to contain, destroy, or otherwise reduce the bioavailability or toxicity of contaminants in sediment, with monitoring to assess the rate of recovery. MNR may also include enhancements, such as thin-layer capping, to accelerate the rate of recovery.

Removal Removal techniques include mechanical excavation in the "dry" as was performed for the 2 miles of the East Branch that have already been cleaned up, or removal in the "wet," commonly referred to as dredging. Excavation in the dry is typically performed using conventional excavation equipment. Dredging may be conducted using either mechanical or hydraulic equipment. Removal of sediment or bank/floodplain soil often is coupled with backfilling using clean material to meet original elevations and contain any residual PCBs, and also requires one or more management-of-materials alternatives for implementation.

Capping This technology requires the placement of a layer of clean material over the in-place contaminated sediment/soil, at a thickness suitable to create a clean bioavailable zone and to isolate the contaminated material. Depending on site-specific objectives, the cap design may include materials to enhance the isolation (e.g., geotextiles) or sorption of contaminants (e.g., organic carbon), and a protective layer (e.g., armor stone) to prevent erosion.

Bank Stabilization Stabilization of the banks is required when the potential remains for erosion of in-place contaminated bank soil. Stabilization techniques range from bioengineering to hard engineering (e.g., armor stone), and the use of a particular technique is dependent on bank slope/stability and water velocities.

Dewatering/Water Treatment Dewatering and/or water treatment is often a necessary step in the handling of materials that are removed, particularly sediment, to facilitate treatment and/or disposal of the material.

Removal – Excavation in the "Dry"

***Ex-Situ* Stabilization** This technology is being included in the evaluation for potential use in sediment/soil handling as a means of dewatering, reducing the leachability of contaminants, or to modify the structural properties of the material. This involves mixing the sediment/soil with a stabilizing agent (e.g., Portland cement, lime, kiln dust, fly ash).

Chemical Extraction Mechanical separation methods combined with an extraction fluid can potentially be used to desorb PCBs from sediment/soil after removal, resulting in a large reduction in the volume of contaminated material. At EPA's request, GE is performing a study of the effectiveness and implementability of this technology on site-specific sediment and soil samples. The potential for reuse of the material after treatment is a significant consideration with this technology.

Thermal Desorption Thermal desorption separates the PCBs from the sediment/soil by adding heat to the material. The heat then volatilizes the PCBs, which are then condensed as a liquid, captured, and/or destroyed in an afterburner, resulting in a large reduction in the volume of contaminated material. The potential for reuse of the material after treatment is a significant consideration with this technology.

Confined Disposal Facility (CDF) CDFs involve the placement of contaminated sediment/soil in an engineered structure constructed in a nearshore environment in such a way as to permanently isolate the PCBs from the environment.

Upland Disposal Facility After dewatering, sediment/soil is placed in an engineered upland landfill typically constructed in close proximity to the river but outside the floodplain. The facility is engineered appropriately to permanently isolate the PCBs.

Off-Site Disposal Facility After dewatering and achievement of any other requirements of the facility, sediment/soil would be transported to an existing, licensed off-site landfill.

Evaluation Criteria

Remedial Action Objectives (RAOs) are specified in the CMS-P. RAOs are broad statements of the objectives of the remedial action. There are three RAOs for the CMS that can be summarized as:

- Reduction of risks to human health,
- Reduction of risks to the environment, and
- Elimination/minimization of long-term downstream transport of PCBs and control of sources of releases to the river.

There are three **General Standards** specified in the Permit:

1. Overall Protection of Human Health and the Environment
2. Control of Sources of Releases (how each alternative would reduce/minimize possible further releases)
3. Compliance with Applicable or Relevant and Appropriate Federal and State Requirements (ARARs)

In addition, there are six **Selection Decision Factors** specified in the Permit:

1. Long-Term Reliability and Effectiveness
   - Magnitude of residual risk
   - Adequacy and reliability
   - Potential long-term adverse impacts on human health and the environment
2. Attainment of IMPGs
3. Reduction of Toxicity, Mobility, and Volume
   - Treatment process used and materials treated
   - Amount of hazardous materials destroyed or treated
   - Degree of expected reduction in toxicity, mobility, or volume
   - Degree to which treatment is irreversible
   - Type and quantity of residuals remaining after treatment
4. Short-Term Effectiveness
5. Implementability
   - Ability to construct and operate the technology
   - Reliability of the technology
   - Regulatory and zoning restrictions
   - Ease of undertaking additional corrective measures if necessary
   - Ability to monitor the effectiveness of the remedy
   - Coordination with other agencies
   - Availability of suitable on-site or off-site treatment, storage, and disposal facilities and specialists
   - Availability of prospective technologies
6. Cost
   - Capital costs
   - Operating and maintenance costs
   - Present worth costs

Process After EPA Receives CMS

EPA will evaluate the CMS developed by GE and GE's recommended alternative, considering the criteria described on the left, and input received from the public. EPA may then approve, conditionally approve, or disapprove the CMS. If EPA conditionally approves the CMS, GE will need to revise the CMS to meet EPA's conditions and/or requirements. If EPA disapproves the CMS, then GE must address the deficiencies or EPA will make the modifications to the CMS.

Based upon the information provided in the CMS, EPA will develop a preferred remedial alternative or set of alternatives (Preferred Alternative). This Preferred Alternative will undergo Regional and National EPA review for consistency with remedies implemented or proposed for other hazardous waste sites and the degree of achievement of the criteria.

After these reviews, EPA will propose the Preferred Alternative for formal public comment as a draft modification to the RCRA Permit. Following closure of the public comment period, EPA will consider the comments received and issue a final decision and a Responsiveness Summary addressing the comments received. Prior to issuing the final remedy decision, as required by the Permit, EPA will notify GE of the final decision, and GE has the right to invoke administrative dispute resolution.

Upon resolution of GE's dispute (if invoked), EPA will issue a modification to the Permit. This final cleanup decision is then subject to appeal by GE and the public for review by EPA's Environmental Appeals Board (EAB) and subsequently the U.S. Court of Appeals. During appeals, there are provisions for design of the remedy to take place as the appeals progress.

Upon completion of all appeals, GE is required to implement and pay for the remedial action under CERCLA authority and the Consent Decree.

Habitat Restoration Following Remediation

Want to Read More?

Visit the EPA website or an Information Repository listed on the back page and read the Risk Assessments, Final Model Documentation Report, IMPG Proposal, CMS-P, EPA's approval letters, the Consent Decree, or Reissued RCRA Permit. Also consult the EPA Contaminated Sediment Guidance available at **www.epa.gov/superfund/**.

Opportunities for Public Input

There are numerous opportunities for the public to provide input to EPA on the cleanup for Rest of River going forward. These include:

- Attend a Citizens Coordinating Council (CCC) meeting.
- The informal public input period on the CMS (comments received will be added to the administrative record for Rest of River).
- Organized community groups may submit up to 10 pages of comments for consideration by EPA's National Remedy Review Board during their review.
- The formal public comment period on EPA's Preferred Alternative (issued as a proposed modification to the RCRA Permit).
- Appeal to the EPA Environmental Appeals Board.
- Appeal to the U.S. Court of Appeals.

In addition, interested groups can contact EPA and set up an individual meeting to discuss the CMS process from November 2007 through March 2008.

What is the Citizens Coordinating Council?

The Citizens Coordinating Council (CCC) is a group of interest groups and agencies that have committed to work with EPA and GE to build understanding about the PCB remediation. It was formed in 1998 with the purpose of fostering information exchange among federal and state agencies, GE, and the community interests involved in or affected by the PCB cleanup in Pittsfield and in and around the Housatonic River.

▼ For More Information . . .

For more information on the CMS Proposal and CMS process, go to: www.epa.gov/ne/ge

or visit an Information Repository at:

Berkshire Athenaeum Public Library Reference Department
Pittsfield, MA 01201 (413) 499-9480

Cornwall Public Library
Cornwall, CT 06796 (860) 672-6874

Kent Memorial Library (Kent Library Association)
Kent, CT 06757 (860) 927-3761

Housatonic Valley Association
Cornwall Bridge, CT 06754 (860) 672-6678

EPA Records Center
Boston, MA 02114 (617) 918-1440

Massachusetts Department of Environmental Protection
Springfield, MA 01103 (413) 784-1100

Connecticut Department of Environmental Protection
Hartford, CT 06106 (860) 424-3854

If you have any questions regarding the CMS process, contact:

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