



GE/Housatonic River Site
Rest of River
Corrective Measures Study Process

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Evaluation of Cleanup Alternatives Underway

- GE is currently evaluating cleanup alternatives for PCBs in the Rest of River
- GE will submit Corrective Measures Study (CMS) to EPA for review and approval (3/21/08)
- CMS will include GE's preferred cleanup plan
- EPA will propose EPA's "preferred alternative" for public comment, and make final remedy decision
- Today's presentation provides an overview of the CMS process



Housatonic River "Rest of River"

- Begins at Confluence of East & West Branches in Pittsfield, MA
- Divided into Reaches 5-9 in MA, Reaches 10-16 in CT
- Majority of PCBs located in Reaches 5 and 6 (10½ miles)
- Includes:
 - Main stem of river
 - Adjacent floodplain
 - Backwaters and tributaries





Rest of River Reach Designations

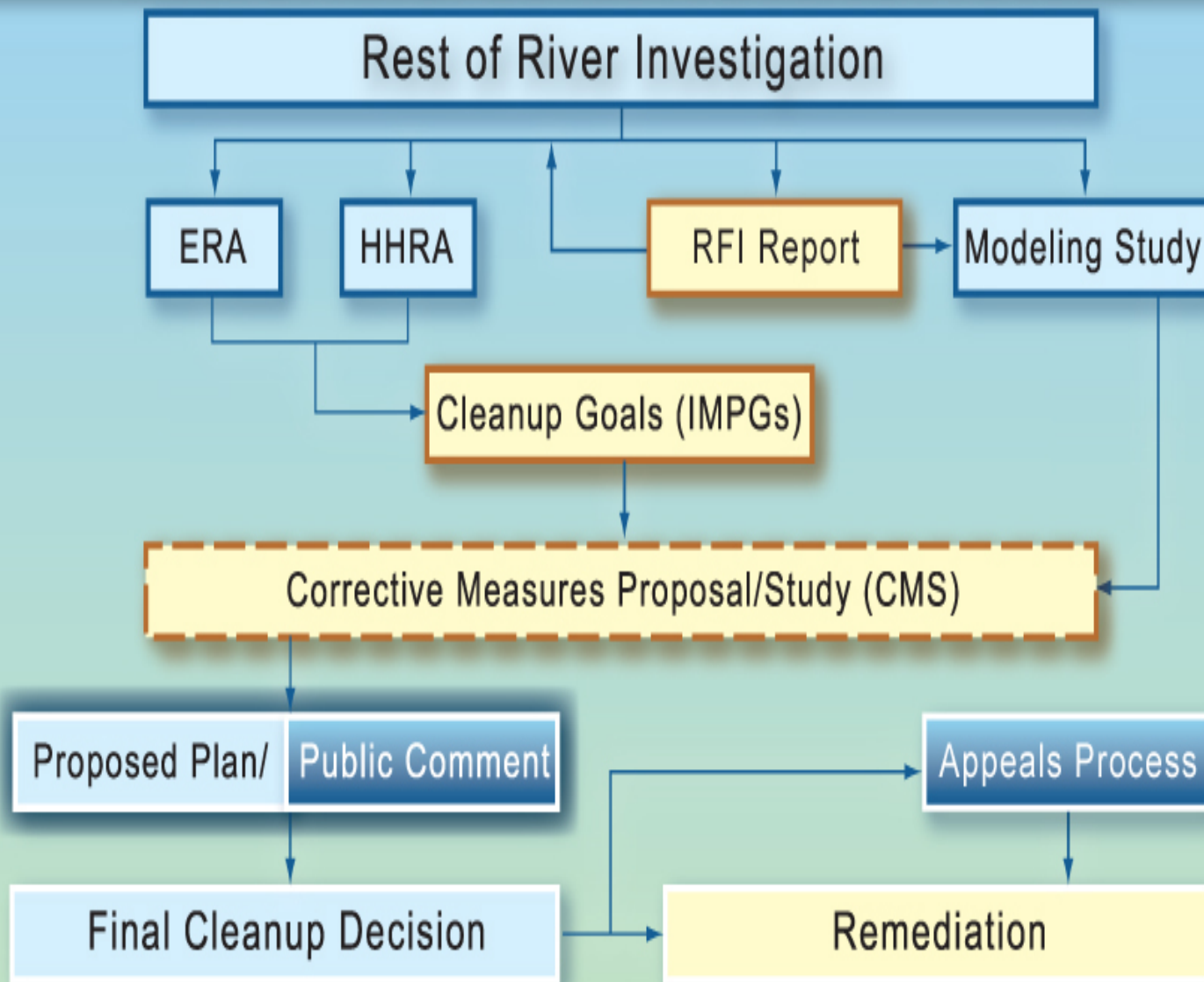
GE/Housatonic River Site Background

- PCBs used at GE facility in Pittsfield (1932-1977)
 - Released to soil, groundwater, river and other media
 - Only known major source of PCBs to Housatonic River
- Consent Decree approved by court in 2000
 - Calls for river to be addressed in 3 stages:
 - Upper ½-Mile Reach (cleaned up by GE 1999-2002)
 - 1½-Mile Reach (cleaned up by EPA in 2002-2007)
 - Rest of River
 - CD specified that EPA and GE conduct various studies to address contamination in Rest of River

Rest of River Consent Decree Process

Key:

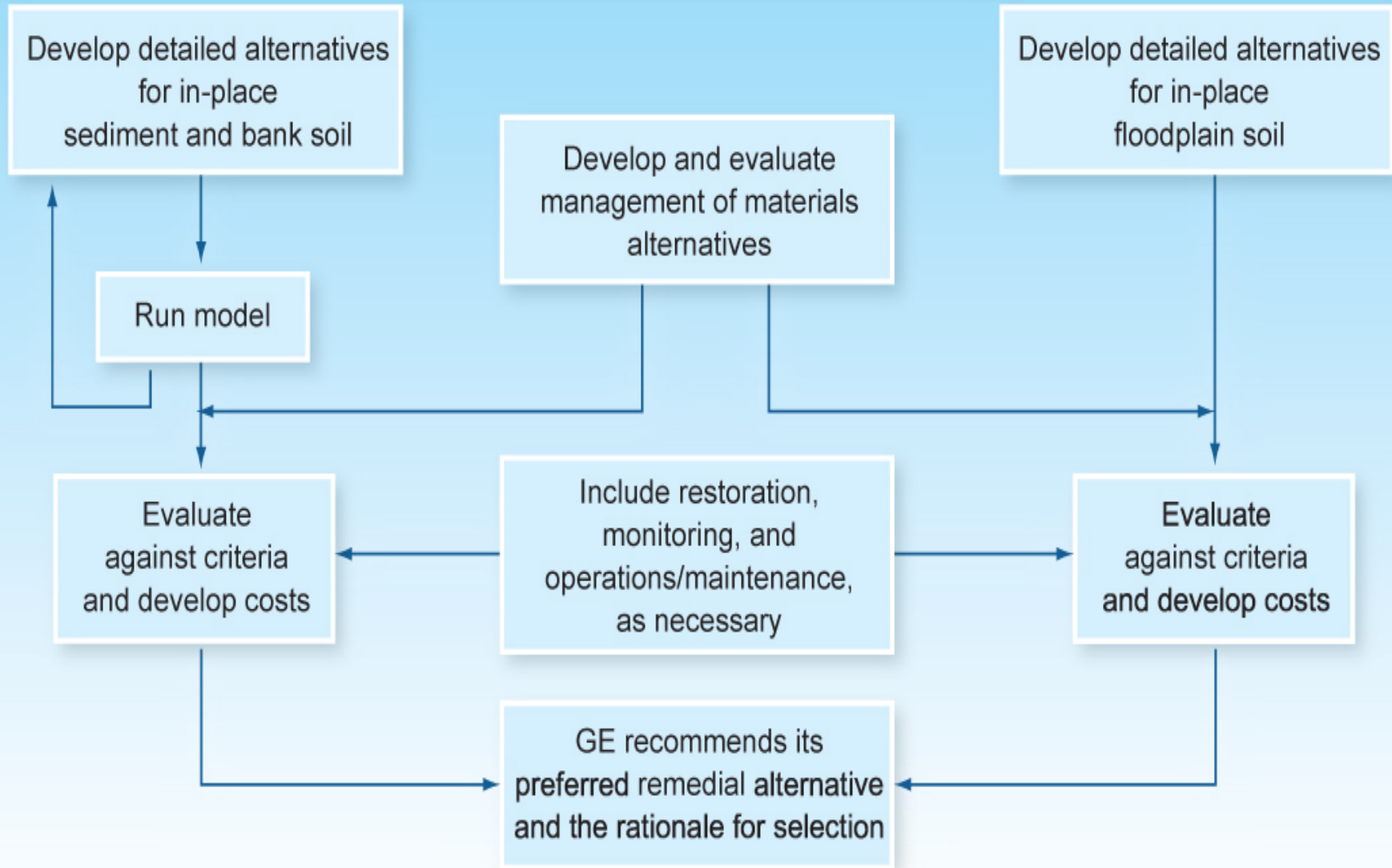
- EPA
- GE
- Public
- completed
- in progress



What is a Corrective Measures Study?

- Evaluates potentially applicable technologies and cleanup alternatives
- CMS for Rest of River follows process approved in CMS-P and specified in RCRA permit
- Three categories of remedial actions:
 - In-place sediment and bank soil
 - In-place floodplain soil
 - Management of materials removed
- Evaluation criteria applied separately to each category, then combined into alternatives
- Sediment/bank alternatives evaluated using model framework
- CMS will include GE's recommended alternative

Process for GE Conducting the CMS



Use of the Model in the CMS

- EPA developed a model framework to simulate Rest of River from Confluence to Rising Pond (Reaches 5 to 8)
- Includes three linked mathematical models:
 - Watershed model (HSPF)
 - Water, sediment, PCB fate & transport model (EFDC)
 - Food chain model (FCM)
- Simulates each sediment/bank remediation alternative for minimum 52-yr period, including (as needed):
 - Time for cleanup
 - Residual concentrations
 - Resuspension rates
 - Atmospheric and other PCB and solids loadings
- Ranges of parameter values will be used to evaluate uncertainty
- Model outputs will include water, sediment, fish tissue PCB concentrations over time for each alternative
- Information will be used to evaluate effectiveness and timeframe for each alternative

In-Place Sediment Alternatives

MNR – Monitored Natural Recovery
TLC – Thin-layer Capping

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

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 needed 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 needed in addition to human health action
FP-4	Remove/replace top 12 inches to 10^{-5} ICR or HI = 1	As determined to be needed in addition to human health action
FP-5	Remove/replace top 12 inches ≥ 50 ppm	As determined to be needed in addition to human health action
FP-6	Remove/replace top 12 inches ≥ 25 ppm	As determined to be needed 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 needed in addition to human health action

ICR – Incidental Cancer Risk
 HI – Hazard Index

Technologies Being Evaluated (Sediment, Bank, and Floodplain Soil)

- No Action
- Engineering/Institutional Controls
- Monitored Natural Recovery (MNR)
- Removal
- Capping
- Bank Stabilization



Management of Materials Alternatives (after removal)

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



Evaluation Criteria

- Remedial Action Objectives (broad goals)
 - Reduction of risks to human health
 - Reduction of risks to the environment
 - Minimization of downstream transport and control of sources
- General Standards (1st tier of criteria)
 - Overall protection of HH and the environment
 - Control of sources
 - Compliance with ARARS
- Selection Decision Factors (2nd tier of criteria)
 - Long-term reliability and effectiveness
 - Attainment of IMPGs
 - Reduction of TMV
 - Short-term effectiveness
 - Implementability
 - Cost

Interim Media Protection Goals (IMPGs)

- Media-specific cleanup goal(s) for human health or ecological receptors
- Determined by EPA to be protective
- IMPGs for ROR derived by GE, taking into account information in risk assessments
 - HH IMPGs = ICR of 10^{-4} (1 in 10,000) to 10^{-6} (1 in 1,000,000), or Hazard Index (HI) of <1
 - Eco IMPGs = no significant risk to receptors
- IMPG Proposal prepared by GE and approved by EPA in 2006

Process Following GE Submittal of CMS

- EPA evaluates CMS and GE's recommended alternative, considering:
 - Evaluation criteria
 - Input received from public
- EPA may approve, conditionally approve, or disapprove the CMS
- EPA develops preferred alternative for public comment
 - Formal Public Comment Period
- EPA notifies GE of intended cleanup decision and issues Responsiveness Summary
 - GE has opportunity to invoke dispute resolution
- EPA issues final permit modification following resolution of dispute
- Public/GE have right of appeal (EAB and US Appeals Court)
- Following completion of all appeals, GE is required to implement and pay for the remedial action per the Consent Decree

Schedule for CMS Process

- EPA Outreach
 - November 2007 through March 2008:
 - Ongoing meetings with members of public
 - Connecticut 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
 - Connecticut CCC Meeting – March 26, 2008
 - Massachusetts CCC Meeting – March 27, 2008

Opportunities for Public Involvement

- To obtain more information:
 - All reports available on EPA's GE/Housatonic River website: www.epa.gov/ne/ge under Rest of River
 - EPA Contaminated Sediment Guidance: www.epa.gov/superfund/health
 - Visit an Information Repository
 - Attend a Citizens Coordinating Council (CCC) Meeting
 - Schedule a session with EPA
- To provide input:
 - Informal input period following completion of CMS
 - Organized groups may submit input to NRRRB during their review
 - Formal comment period on EPA's Preferred Alternative