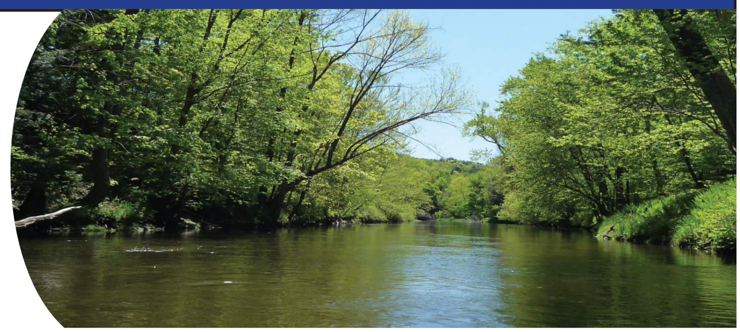
Housatonic River Public Charrette

This Public Charrette is part of the EPA's public outreach effort and builds upon the Mini Workshops offered April 5-7, 2011. It is a unique opportunity for individual citizens to interact, to offer their input and to share their ideas on possible cleanup options.



SATURDAY • MAY 7, 2011

Public Charrette • The Community Contributes
8:30am - 5:30pm followed by Reception

A Practical, All-Day, Hands-On Workshop for the Community to Better Understand the "Rest of River" Issues, to Explore the Pros and Cons of the Alternatives, and for the EPA to Hear the Community's Ideas

Charrette will be held at Shakespeare & Co., 70 Kemble Street, Lenox, MA

This Workbook contains key information and materials being presented at the Public Charrette. Additional information and full presentations will be available at:
www.housatonicworkshops.org

SDMS DocID 518376

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United States Environmental Protection Agency
5 Post Office Sq.,
Suite 100
Boston, MA 02109-3912

Dear Friends,

Once again, it is my pleasure to welcome you to this important event regarding the Housatonic River. First, I would like to thank you for taking the time to participate in these important public engagement and education programs. I am keenly aware of the high level of interest in EPA's upcoming decision about the scope and type of work that will be required of GE in the "Rest of River" portion of the Housatonic, as the river winds south from Pittsfield through Berkshire County and Connecticut. I have been very impressed with everyone's commitment to the River and its connection to the people in the communities through which it flows. There is a lot at stake – including protecting the character of the Housatonic and making the right decisions for current and future generations to safely enjoy the river environment.

EPA designed the series of workshops held in April and today's charrette not only to help you better understand what we've learned about the River and the PCB contamination but to also help us better understand your views as we move forward in our decision-making process. I am committed to making decisions based on sound science, and based on the best available information. I am also committed to an open, inclusive and transparent process that allows the communities of the Berkshires and Connecticut to weigh in with their concerns and priorities. Today's charrette is another important step towards that goal.

EPA hopes to use what we learn from you and others to aid in our ongoing evaluation of cleanup options. We also hope that, through this process, you gain a broader understanding of the numerous technical and policy issues at hand. After EPA issues our formal cleanup proposal, all members of the public will, once again, have an opportunity to comment on the proposal. EPA will then review those comments and make our final cleanup decision. I will ensure that whatever plan EPA ultimately decides is best, it will be implemented by GE in a manner that is sensitive to the unique character of the river and to the community.

Thank you again for attending and I hope you find the hands-on workshops that are part of today's agenda informative and worthwhile.

Curt Spalding
Regional Administrator

LEARN MORE AT: www.epa.gov/region1/ge

Today's Agenda

8:30 - 9:00	**Registration + Coffee • Poster Session Tour**
9:00 - 10:15	**PLENARY A • Bernstein Theatre** Welcome by Curt Spalding–EPA New England Regional Administrator Introduction of Workshop 1 • Criteria Scorecard
10:15 - 10:30	Break + Move to assigned Workshop 1 Groups according to name tag color and symbol
10:30 - 12:00	**Workshop 1 • Permit Scorecard • Meeting the Criteria** A facilitated group activity in which participants work through the process of applying the decision criteria required by the Consent Decree to a range of cleanup alternatives
12:00 - 2:00	**Poster Session • Lunch** • A wide-ranging display of technical information from EPA's "Rest of River" studies, practical tools relevant to cleanup, and an opportunity to directly engage EPA's experts • Lunch
2:00 - 2:45	**PLENARY B • Bernstein Theatre** Workshop 1 Group Reports Introduction of Workshop 2 • Comprehensive Guidelines
2:45 - 2:55	Break + Move to Workshop 2 groups
2:55 - 4:30	**Workshop 2 • Comprehensive Guidelines** A facilitated group activity in which participants tackle the issues from the community's perspective, apply the under-standings of Workshop 1, and craft a set of guidelines for EPA to consider in its decision
4:30 - 4:40	Move to Closing Plenary
4:40 - 5:30	**PLENARY C • Bernstein Theatre** • Workshop 2 Group Reports • Moving Forward • Thank you
5:30	**Reception + Further Conversation with EPA's Experts**

Poster Session Exhibits

History of the River, Richard DiNitto, *The Isosceles Group* and John Field, Ph.D, *Field Geology Services*

Summarizes the geological and cultural history of the Housatonic River watershed, with particular emphasis on how the River has been shaped by human activity over the last 250 years

Geomorphology/River Processes, George Athanasakes, *Stantec Consulting, Inc.*, Keith Bowers, *Biohabitats Inc*., and David Bidelspach, *Stantec Consulting, Inc.*

Discusses the fundamental processes that govern the structure and evolution of all rivers, and their implications for potential remediation of the Housatonic River

Ecological Characterization, John Lortie, *Stantec Consulting, Inc.*

Describes the habitats and natural communities found in the Housatonic River and floodplain, their interrelationships, and their resident species, with details on rare, threatened, and endangered species in the area

What Are PCBs and How Do They Behave in the Environment?, Richard McGrath, *The Isosceles Group*

Provides information on the physical structure and chemistry of PCBs (polychlorinated biphenyls), with additional information on PCB toxicity, and their behavior following release to the environment

PCB Distribution, Fate, and Transport, Edward Garland, *HDR HydroQual*

Summarizes the location and concentrations of PCBs in the Housatonic River, and what EPA has learned about their transport and fate

Human Health Risks, Donna Vorhees, Sc.D, *The Science Collaborative*

Provides a summary of EPA's Human Health Risk Assessment, including an overview of risks due to the exposure pathways of direct contact, fish and waterfowl consumption, and consumption of agricultural products grown in the floodplain

Ecological Risks, Gary Lawrence, *Golder Associates*

Summarizes EPA's Ecological Risk Assessment, which included an analysis of risks to eight different receptor groups due to their exposure to PCBs

Why Use Models for the Housatonic River? Mark Velleux, Ph.D, *HRD HydroQual*

Describes and summarizes the results of the linked hydrological/hydrodynamic and sediment/contaminant fate and transport/food-chain models being used to better understand the movement of contaminants in the River and floodplain and to evaluate potential remedial alternatives

Remediation Technologies and Techniques, Michael Palermo Ph.D, *Mike Palermo Consulting Inc.*

Presents the various options for remediating contaminated sediments and discusses their relative merits

Ecological Restoration, Keith Bowers, *Biohabitats Inc.*

Provides an overview of habitat restoration, and presents several examples of successful restoration projects conducted on ecosystems similar to and different from that of the Housatonic River

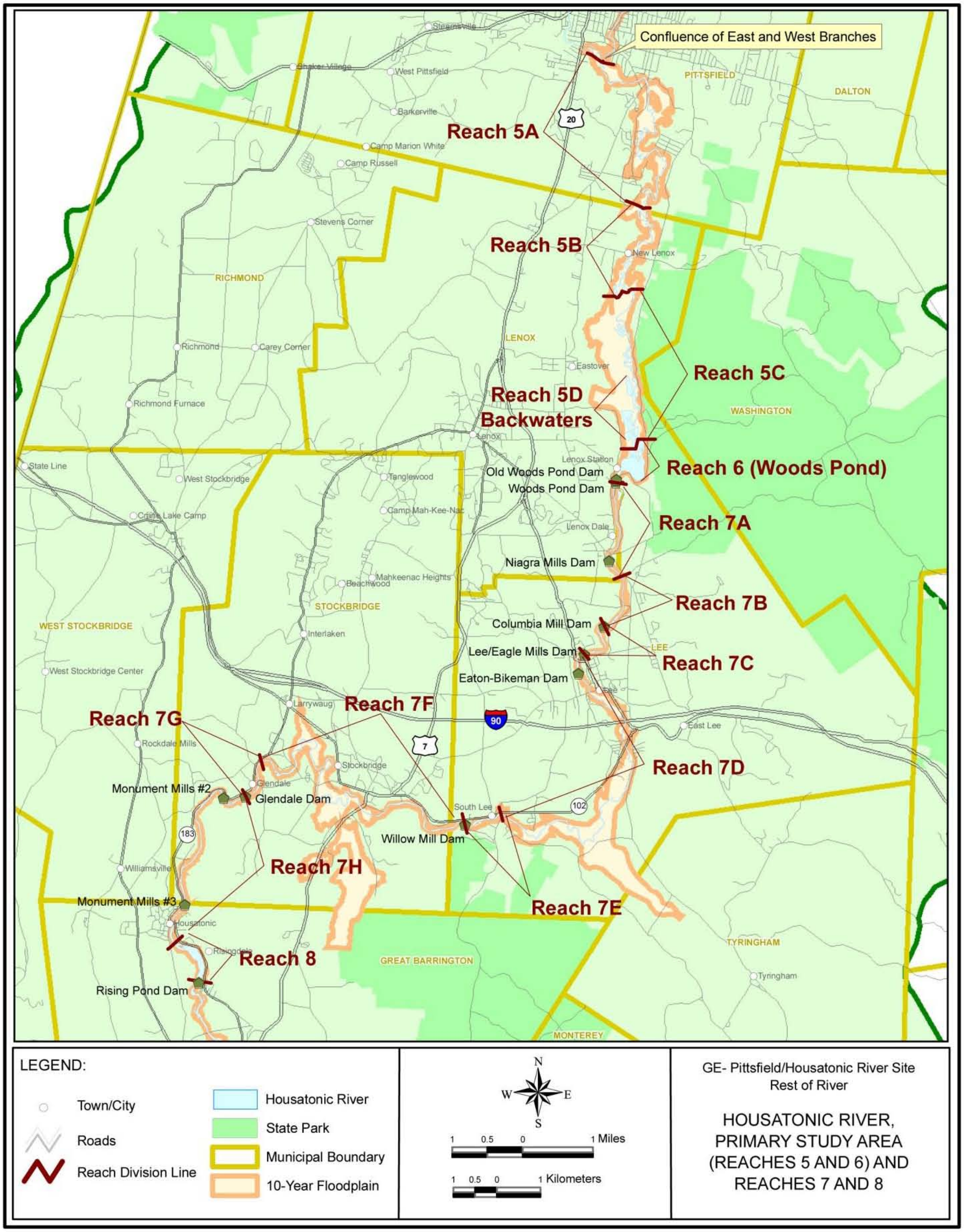
Stream Table Demonstration, Richard DiNitto, *The Isosceles Group* and David Bidelspach, *Stantec Consulting, Inc.* (Presenters); Stream tables compliments of John Field, Ph.D, *Field Geology Services* and John Cassels, *Geodesy, Inc.*

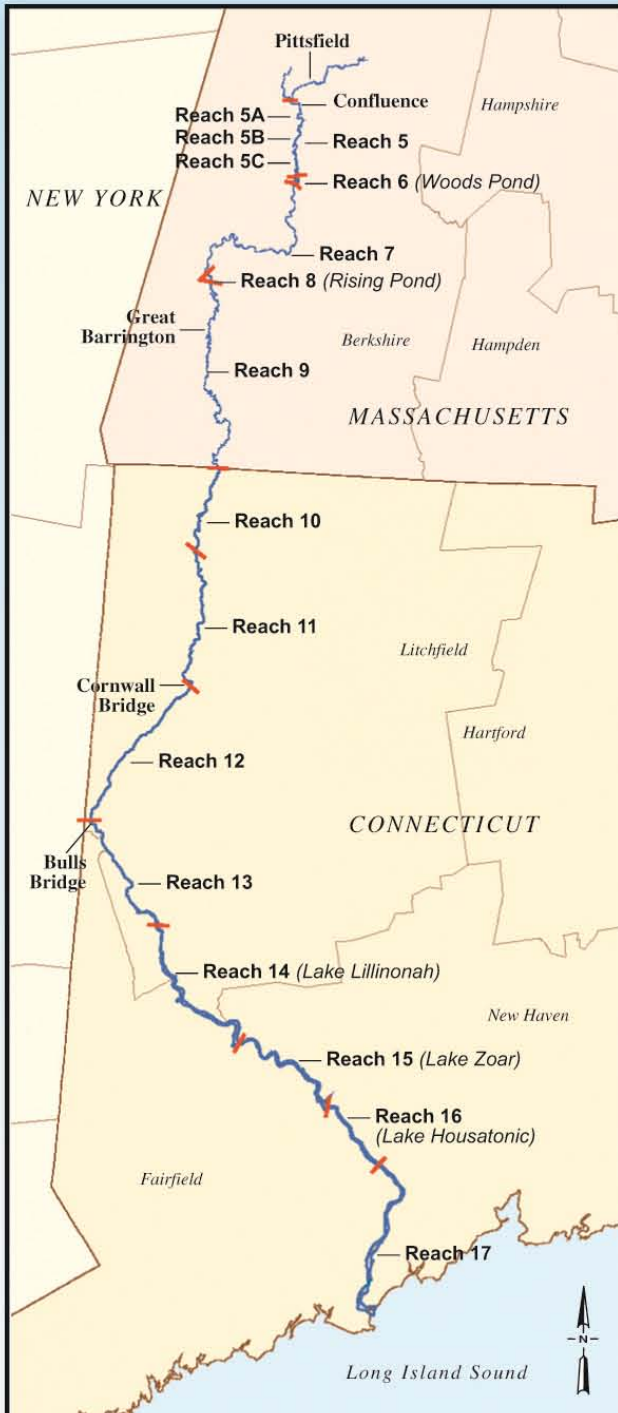
Provides observers an opportunity to watch in real time as flowing water and basic stream processes shape the morphology of a stream

Using GIS to Understand Remedial Alternatives, John Cassels, *Geodesy, Inc.*

Highlights the computerized tool EPA has developed to evaluate ways to implement potential remedial alternatives while minimizing their impact on the river and floodplain

River Reaches





GE-Pittsfield/Housatonic River Site

HOUSATONIC RIVER, REACHES 5 THROUGH 17

11D-0379

Description of the Remedial Action Objectives + the 9 Decision Criteria Specified in the RCRA

Remedial Action Objectives (RAOs)

The RAOs describe overall goals and desired outcomes for the Rest of River.

- "Reduce the cancer risk and non-cancer health hazard for humans (defined as achieving concentrations that do not pose unacceptable risks using EPA's cancer risk range of 1 x 10-6 to 1 x 10-4 and a non-cancer Hazard Index [HI] of 1) from exposure to PCBs in dietary items, floodplain soil, and/or sediment in the Rest of River."

- "Reduce the risks to ecological receptors from exposure to PCBs in dietary items, floodplain soil, and/or sediment in the Rest of River to levels that will result in the recovery and maintenance of healthy local populations and communities of biota."

- "Eliminate/minimize the long-term downstream transport of PCBs in the Rest of River. The objective of this RAO is to reduce the transport of PCBs from the highly contaminated upper reaches of the River to downstream reaches as quickly as possible and over the long term. This RAO also includes the control of sources of releases to the River."

Under the terms of the Consent Decree, EPA must evaluate all cleanup alternatives against the following 9 Criteria:

3 General Standards

1. **Overall Protection of Human Health and the Environment**
   How each alternative or combination of alternatives would provide human health and environmental protection, taking into account EPA's Human Health and Ecological Risk Assessments.

2. **Control of Sources of Releases**
   How each alternative or combination of alternatives would reduce or minimize possible further releases, including (but not limited to) the extent to which each alternative would eliminate the effects of a flood that could cause contaminated sediments to become available for human and ecological exposure.

3 Compliance with Applicable or Relevant and Appropriate Federal and State Requirements (ARARs)

How each alternative or combination of alternatives would meet such requirements or, when such a requirement should not be met, the basis for 'a waiver under CERCLA and the National Contingency Plan (NCP).

6 Selection Decision Factors

1 Long-Term Reliability and Effectiveness

- Magnitude of residual risk, including (but not limited to) the extent to which each alternative would mitigate long-term potential exposure to residual contamination, and the extent to which and time over which each alternative would reduce the level of exposure to contaminants;

- Adequacy and reliability of each alternative or combination of alternatives, including (i) operation, monitoring, and maintenance requirements; (ii) availability of labor and materials needed for operation; (iii) whether the technologies have been used under analogous conditions; and (iv) whether the combination of technologies (if any) have been used together effectively; and

- Any potential long-term adverse impacts of each alternative or combination of alternatives on human health or the environment, including (but not limited to) potential exposure routes and potentially affected populations, any impacts of dewatering and disposal facilities on human health or the environment, any impacts on wetlands or other environmentally sensitive areas, and any measures that may be employed to mitigate such impacts.

2 Attainment of Interim Media Protection Goals (IMPGs)

The ability of each alternative or combination of alternatives to achieve the Interim Media Protection Goals approved by EPA including (if applicable) the time period in which each alternative would result in the attainment of the IMPGs and an evaluation of whether and the extent to which each alternative would accelerate such attainment compared to natural processes.

3 Reduction of Toxicity, Mobility, and Volume

- If applicable, treatment process used and materials treated;
- If applicable, amount of hazardous materials destroyed or treated;
- If applicable, degree of expected reductions in toxicity, mobility, or volume;

- If applicable, degree to which treatment is irreversible; and
- If applicable, type and quantity of residuals remaining after treatment.

4 Short-Term Effectiveness

Impacts to nearby communities, workers, or the environment during implementation of each alternative, including (but not limited to) risks associated with excavation, transportation, dewatering, disposal, or containment of sediments, soils, or other materials containing hazardous constituents.

5 Implementability

- Ability to construct and operate the technology, taking into account any relevant site characteristics;
- 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; and
- Availability of prospective technologies.

6 Cost

- Capital costs;
- Operating and maintenance costs; and
- Present worth costs.

Four Representative Options Spanning the Range of Those Evaluated in the Revised Corrective Measures Study

GLOSSARY

MNR	Monitored Natural Recovery
HI	Hazard Index
EAs	Exposure Areas
RME	Reasonable Maximum Exposure
IMPGs	Interim Media Protection Goals
Upper-Bound	Those IMPGs based on a 10^{-4} cancer risk or a noncancer HI of 1, whichever is lower for humans, or the higher IMPG for animals
Mid-Range	Those IMPGs based on a 10^{-5} cancer risk or a noncancer HI of 1, whichever is lower
Lower-Bound	Those IMPGs based on a 10^{-6} cancer risk or a noncancer HI of 1, whichever is lower for humans, or the lower IMPG for animals
2 mg/kg	The residential cleanup standard specified in the Consent Decree

OPTION A

Option A consists of a combination of Monitored Natural Recovery (MNR) with institutional controls for all reaches of the River downstream of the Confluence and no action for the floodplain. This combination would rely on upstream source control and remediation measures, natural recovery processes in the River and floodplain, and institutional controls. The River monitoring program would include biota, water column, and sediment monitoring for a period of 100 years.

OPTION B

The sediment component of Option B would involve sediment removal followed by capping in portions of Reach 5A and Woods Pond (Reach 6). Some soil removal and bank stabilization would be conducted in Reaches 5A and 5B. Specifically, the components of Option B include the following:

- Reach 5A: Sediment removal (66,000 yd^3 over 20 acres), followed by capping, in areas determined based on ecological criteria.
- Riverbanks in Reaches 5A and 5B: Bank stabilization adjacent to certain of the sediment removal areas in Reach 5A and areas in Reach 5B determined based on ecological criteria (total of 1.6 linear miles), with removal of bank soils where necessary as part of the stabilization (6,700 yd^3).
- Reach 6 (Woods Pond): Sediment removal (169,000 yd^3 over 42 acres) in areas with PCB concentrations generally greater than 13 mg/kg in the top 6 inches.

- Remainder of Rest of River: MNR.

The floodplain component of Option B would involve the removal and backfill of floodplain soils to achieve average PCB concentrations that would meet upper-bound RME IMPGs for human health. Specifically, this option has been developed to achieve the following IMPGs:

- The upper-bound RME IMPGs for human health (i.e., those based on a 10^{-4} cancer risk or a noncancer HI of 1, whichever is lower) based on direct contact with floodplain soils.
- The upper-bound RME IMPGs for human health (i.e., those based on a 10^{-4} cancer risk or a noncancer HI of 1, whichever is lower) based on consumption of agricultural products from the floodplain.
- Not designed to achieve any of the ecological IMPGs, although some may be met in some areas.

Option B would involve removing and replacing floodplain soils as necessary to achieve average PCB concentrations in the top foot of the relevant averaging areas that are equal to or less than the above-mentioned IMPGs. In addition, this option would involve the removal and backfill of soils in the top 3 feet in the Heavily Used Subareas of Frequent-Use EAs as necessary to achieve average PCB concentrations in the 0- to 3-foot depth increment that are equal to or less than the upper-bound IMPGs based on human direct contact. This option would involve the removal of approximately 26,000 yd^3 of soil from approximately 14 acres of the floodplain.

<u>OPTION C</u>

The sediment component of Option C would involve sediment removal followed by capping in Reaches 5A through 5C, portions of the backwaters (Reach 5D), Woods Pond (Reach 6), the Reach 7 impoundments, and Rising Pond (Reach 8). Riverbank soil would be removed as necessary, and the eroding banks stabilized in Reaches 5A and 5B. Specifically, the elements of this option include the following:

- Reach 5A: Sediment removal in the entire reach (134,000 yd^3 over 42 acres), followed by capping.
- Reach 5B: Sediment removal in the entire reach (88,000 yd^3 over 27 acres), followed by capping.
- Reach 5C: Sediment removal in the entire reach (156,000 yd^3 over 57 acres), followed by capping.
- Riverbanks in Reaches 5A and 5B: Bank stabilization of eroding banks (14 linear miles, comprising both banks along 7 miles of river) and removal of bank soils where necessary as part of the stabilization (35,000 yd^3).
- Reach 5 backwaters: Combination of sediment removal with capping (109,000 yd^3 over 68 acres) and capping without removal (3 acres).
- Reach 6 (Woods Pond): Sediment removal (244,000 yd^3 over 60 acres), followed by capping.

- Reach 7 impoundments (Reaches 7B, 7C, 7E, 7G): Sediment removal (84,000 yd^3 over 38 acres), followed by capping.
- Reach 8 (Rising Pond): Sediment removal (71,000 yd^3 over 41 acres), followed by capping.
- Reach 7 (channel) and Reaches 9 through 16: MNR.

Option C differs from the other sediment removal alternatives in that: (1) All sediment removal and capping work, including in Reaches 5A and 5B, would be performed in the "wet" by equipment operating in the river (either on the river bottom or on barges); and (2) Removal of the sediment in the Reach 5 backwaters and Reaches 6, 7, and 8 would be performed concurrently with removal activities in the Reach 5 channel. However, capping in those reaches would be delayed, where necessary, until after all the removal/capping activities in Reach 5 have been completed.

The floodplain component of Option C would involve the removal and backfill of floodplain soils to achieve average PCB concentrations that would meet the mid-range (10^{-5}) RME IMPGs for human health and lower-bound IMPGs for amphibians in vernal pools, as well as removal of any additional soils within the top foot that contain PCB concentrations at or above 50 mg/kg. Specifically, this alternative would achieve the following IMPGs:

- The mid-range RME IMPGs for human health (i.e., those based on a 10^{-5} cancer risk or a noncancer HI of 1, whichever is lower) based on direct contact with floodplain soils.
- The mid-range RME IMPGs for human health (i.e., those based on a 10^{-5} cancer risk or a noncancer HI of 1, whichever is lower) based on consumption of agricultural products from the floodplain.
- The lower-bound IMPG for amphibians in vernal pools.

Option C would involve removing and replacing floodplain and vernal pool soils as necessary to achieve average PCB concentrations in the top foot of the relevant averaging areas that are equal to or less than the above-mentioned IMPGs. In addition, this alternative would involve the removal and backfill of any additional soils within the top foot that contain PCB concentrations at or above 50 mg/kg. Lastly, this option would involve the removal and backfill of soils in the top 3 feet in the Heavily Used Subareas of Frequent-Use EAs as necessary to achieve average PCB concentrations in the 0- to 3-foot depth increment in those areas that are equal to or less than the mid-range IMPGs based on human direct contact. This option would involve the removal and backfill of approximately 177,000 yd^3 of soil across approximately 108 acres of the floodplain.

<u>Option D</u>

The sediment component of Option D would include the removal of a total of 2,287,000 cy of sediment and riverbank soil, including 2,252,000 cy of sediment over 351 acres plus 35,000 cy of bank soil as part of bank stabilization over 14 linear miles of riverbank. Sediment removal would be performed in Reaches 5A, 5B, and 5C, the Reach 5 backwaters, Woods Pond, the Reach 7 impoundments, and Rising Pond to the 1 mg/kg depth horizon, and would be followed by backfilling to grade. MNR would be included for the remaining portions of the River (Reach 7 channel and Reaches 9 through 16). Additionally, the eroding riverbanks along 7 miles on both sides of the River in Reaches 5A and 5B, comprising 14 linear miles, would be stabilized. Remediation would proceed from upstream to downstream to minimize the potential for recontamination of remediated areas.

The floodplain component of Option D would involve the removal and backfill of floodplain soils to achieve average PCB concentrations that would meet lower-bound RME IMPGs for human health and the lower-bound IMPGs for ecological receptors. Specifically, this alternative would achieve the following IMPGs:

- The lower-bound RME IMPGs for human health (i.e., those based on a 10^{-6} cancer risk or a noncancer HI of 1, whichever is lower) based on direct contact with floodplain soils, but not lower than 2 mg/kg (the residential standard specified in the Consent Decree).
- The lower-bound RME IMPGs for human health (i.e., those based on a 10^{-6} cancer risk or a noncancer HI of 1, whichever is lower) based on consumption of agricultural products from the floodplain.
- The lower-bound floodplain IMPGs for ecological receptors, i.e., amphibians (represented by wood frogs), omnivorous/carnivorous mammals (represented by shrews), insectivorous birds (represented by wood ducks), and piscivorous mammals (represented by mink), assuming, for the latter two receptors, the floodplain soil IMPGs associated with a sediment target level of 1 mg/kg.

Option D would involve removing and replacing floodplain soils as necessary to achieve average PCB concentrations in the top foot of the relevant averaging areas that are equal to or less than the above-mentioned IMPGs. In addition, this alternative would involve the removal and backfill of soils in the top 3 feet in the Heavily Used Subareas of the Frequent-Use EAs as necessary to achieve average PCB concentrations in the 0- to 3-foot depth increment that meet the lower-bound IMPGs based on human direct contact, but not lower than 2 mg/kg.

Option D would involve the removal and backfill of approximately 615,000 yd^3 of soil across approximately 377 acres. Approximately 287 acres of this removal (464,000 yd^3) would occur within the Reaches 5 and 6 floodplain; the remaining 90 acres of removal (151,000 yd^3) would occur in the Reach 7 floodplain.

Notes

Workshop 1 • Criteria Scorecard Worksheet

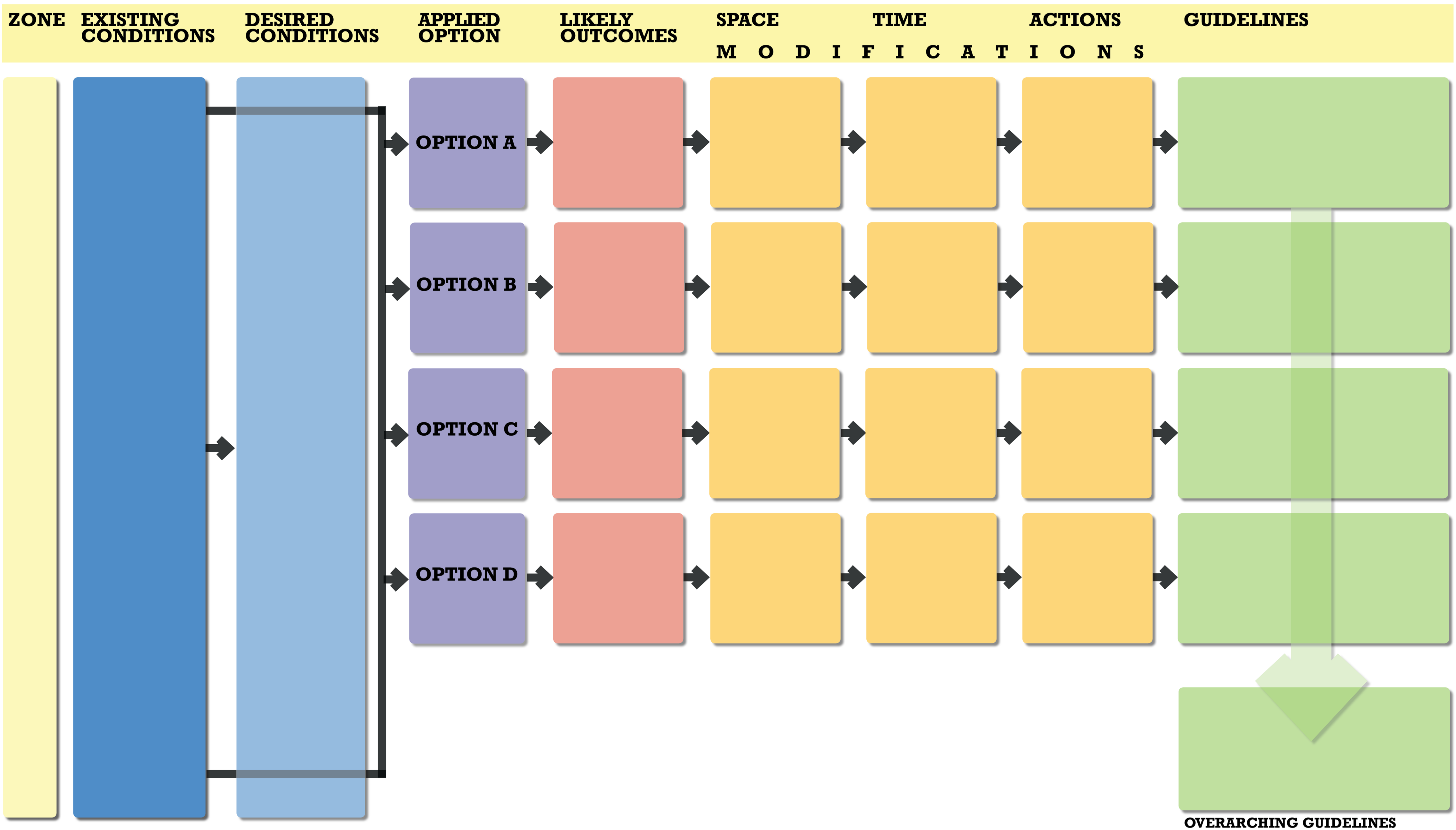
Workshop 1 • Criteria Scorecard
Housatonic River Public Charrette May 7, 2011

Criterion	Metric(s)	Option A	Option B	Option C	Option D	Assessment
GENERAL STANDARDS						
1 Overall Protection of Human Health and the Environment						
2 Control of Sources of Releases						
3 Compliance with ARARs						
FIRST TIER ASSESSMENT						
SELECTION DECISION FACTORS						
1 Long-Term Reliability and Effectiveness						
2 Attainment of Interim Media Protection Goals (IMPGs)						
3 Reduction of Toxicity, Mobility, and Volume						
4 Short-Term Effectiveness						
5 Implementability						
6 Cost						
SECOND TIER SCORE						

scoring scale

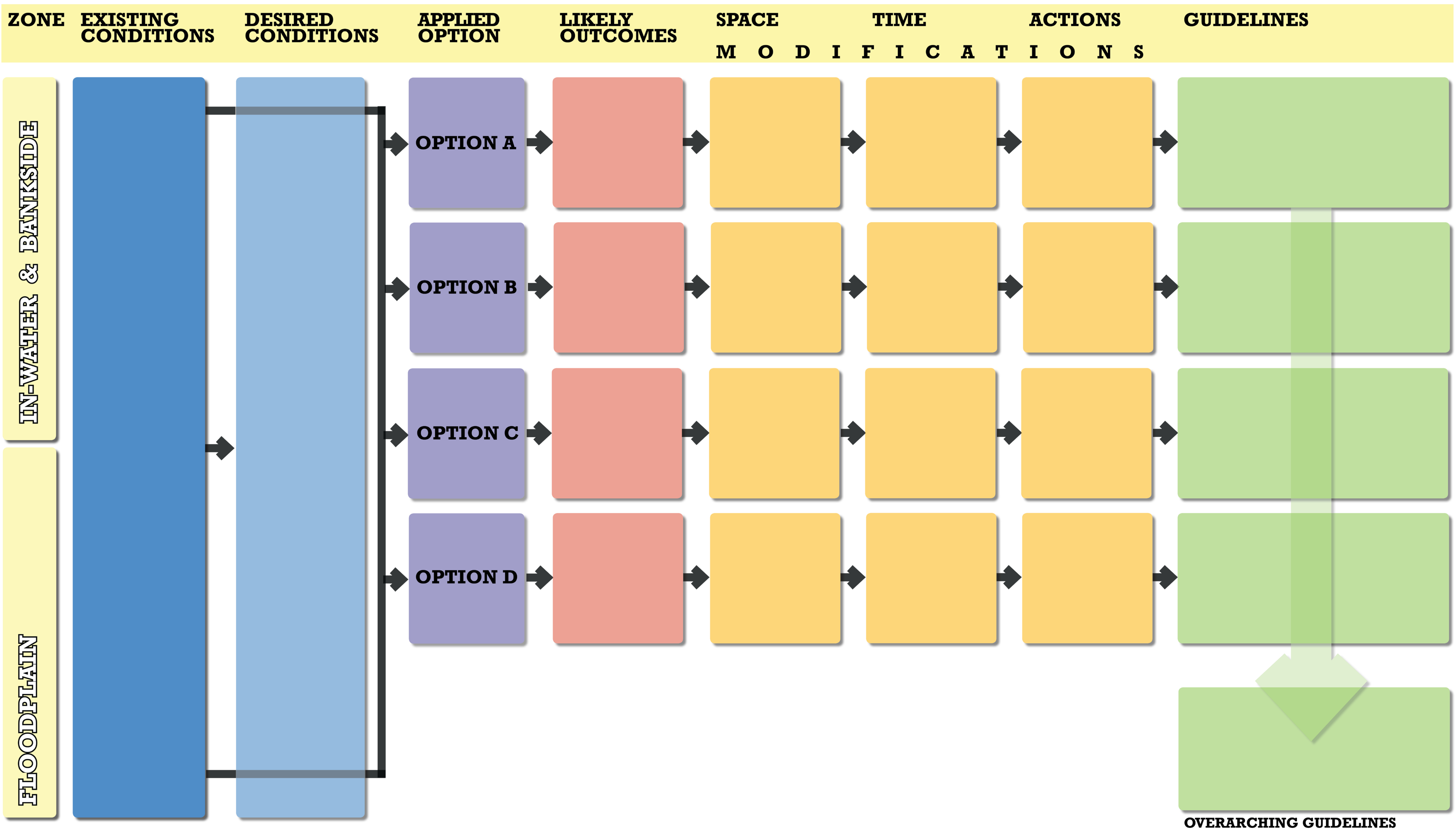
○ Does Not Meet This Criterion → ◉ Partially Meets This Criterion → ● Best Meets This Criterion

Community Life

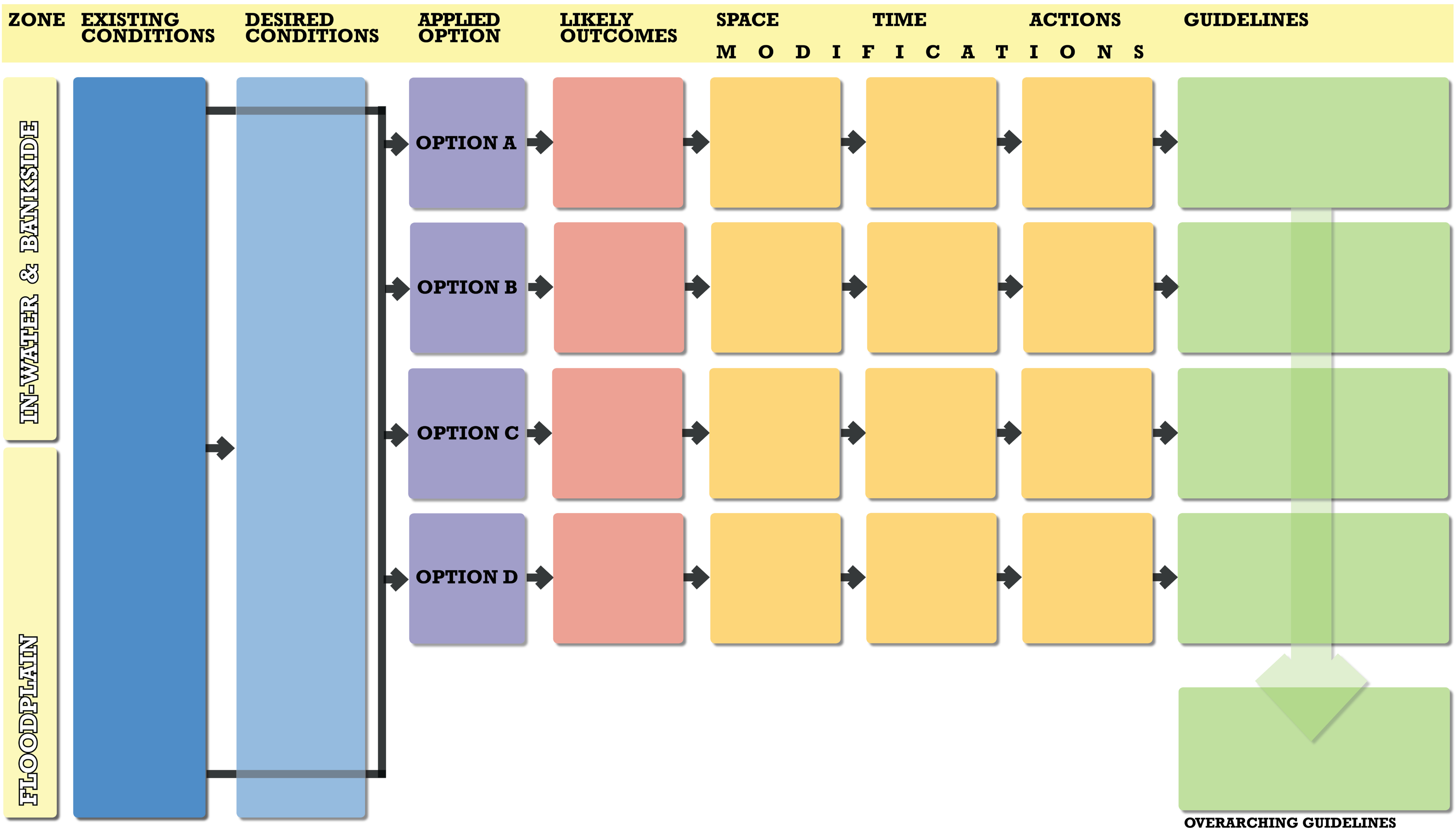


River Aesthetics

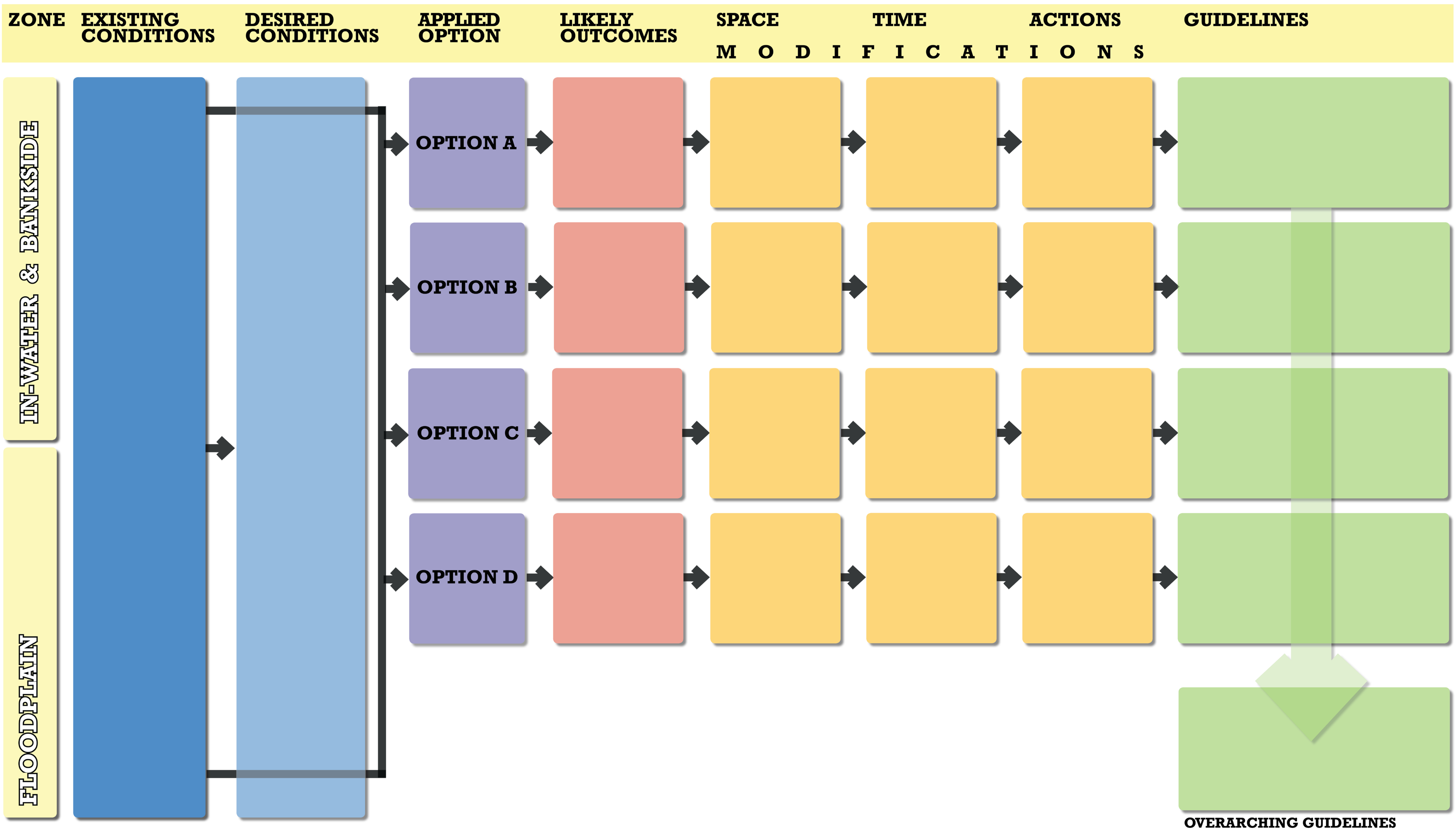
Workshop 2 • Comprehensive Guildelines
Housatonic River Public Charrette May 7, 2011



River Ecology



River Uses


ZONE
EXISTING CONDITIONS
DESIRED CONDITIONS
APPLIED OPTION
LIKELY OUTCOMES
SPACE
TIME
ACTIONS
GUIDELINES
M O D I F I C A T I O N S
IN-WATER & BANKSIDE
FLOODPLAIN
OPTION A
OPTION B
OPTION C
OPTION D
OVERARCHING GUIDELINES

Biographies

J. George Athanasakes, P.E., Ecosystem Restoration Services Manager
Stantec Consulting Services, Inc., Louisville, KY

George Athanasakes leads the Ecosystem Restoration Group for Stantec, Inc. He has a diverse background which includes civil engineering, stream restoration, wetland restoration, and watershed planning. For the Housatonic River Project, Mr. Athanasakes provides review of GE submittals and proposed remedial alternatives with particular emphasis on habitat restoration following remediation. Mr. Athanasakes completed his first stream restoration project nearly 20 years ago and has served as the Project Manager and/or Design Engineer on over 100 stream restoration and assessment projects incorporating natural channel design principles and soil bioengineering techniques. His involvement with these projects has included conceptual level planning, preliminary and final design, permitting, assistance during construction, and post-construction monitoring. Mr. Athanasakes has also helped to bring innovation to the field of stream restoration by leading the development of the RIVERMorph software, which is the industry standard for software providing a tool for stream assessment, monitoring and Natural Channel Design throughout the United States and internationally. Because of his broad stream restoration experience, Mr. Athanasakes has instructed several stream restoration training workshops and has presented at many national conferences on the subject. In addition, he has authored a number of technical papers on the subject of stream restoration.

David A. Bidelspach, P.E., Stream Restoration Specialist
Stantec Consulting Services, Inc., Raleigh, NC

Dave Bidelspach is an environmental engineer with 10 years of experience designing and constructing river restoration projects. He has been recognized for the development of a 3D design process that allows the rapid evaluation of numerous iterations to optimize the designs for river restoration, and has piloted the use of Survey Grade GPS equipment to lower the costs associated with pre- and post-construction surveys. Mr. Bidelspach has worked hand-in-hand with contractors to couple his 3D designs with GPS-enabled construction equipment to speed the construction process and insure the right outcome, and has been responsible for the development and application of several new in-stream structures which have proven to be robust yet easy to construct. As one of the few stream restoration designers who has actually operated equipment and constructed restoration projects, Mr. Bidelspach is known for producing accurate estimates and designs that are both constructible and have long-term stability and effectiveness. For the Housatonic River Project, Mr. Bidelspach has conducted the detailed study of river bank stability and erodability from the Confluence to Woods Pond Dam. He is reviewing and evaluating proposed remedial options with regard to restoration and geomorphic stability issues.

Keith Bowers, RLA, PWS, President and Founder
Biohabitats, Inc., North Charleston, SC

Keith Bowers is the President and Founder of Biohabitats, Inc., one of the premier firms specializing in environmental restoration, conservation planning and regenerative design. He is an internationally recognized landscape architect who has planned, designed, and managed the construction of over 200 ecological restoration projects throughout the United States. Mr. Bowers also teaches ecological restoration seminars and workshops and participates on numerous industry panels. He is currently serving as Chairman of the Board for the Society for Ecological Restoration International. For the Housatonic River Project, he has a lead role in evaluating remedial alternatives with respect to their ecological restoration components, and provides senior level expertise in the feasibility and expected effectiveness of proposed restoration plans and techniques. He also assists in community outreach and meeting facilitation.

John W. Cassels, Principal Scientist
Geodesy, Inc., Downingtown, PA

John Cassels is a biologist with over with 27 years of experience supporting scientific staff in ecological and human health risk assessments. He is an expert in GIS development, database analysis, and cartographic presentation. Mr. Cassels has served as the GIS Manager for the GE/Housatonic River Project since 1999, with responsibility for managing geospatial information related to contaminant assessments of all Operable Units (OU's) within the investigation area. His efforts support the various program components and principal investigators in the compilation of large analytical databases. Under his guidance, several innovative data management, analysis, and presentation approaches were developed to effectively streamline the flow of information to Project Managers, decision makers and stakeholders on the project.

Bob Cianciarulo, Chief, Massachusetts Superfund Section Office of Site Remediation and Restoration, EPA New England

Bob Cianciarulo is Chief of the Massachusetts Superfund Section in EPA's New England Regional Office. In that capacity, he supervises a group of fourteen Remedial Project Managers (RPMs) overseeing investigation, cleanup, and monitoring of Superfund National Priorities List (NPL) sites in Massachusetts. In his over 20 years with EPA, Mr. Cianciarulo has served as a RCRA hazardous waste inspector, a project manager in both RCRA Corrective Action and in Superfund, and in the region's Brownfields program. Prior to his current position, he served as Chief of Region I's Superfund Technical Support and Site Assessment Section. Mr. Cianciarulo has a degree in Chemical Engineering from the University of Lowell (MA).

Tim Conway, Senior Enforcement Counsel, EPA New England

Tim Conway is currently a Senior Enforcement Counsel at the U.S. Environmental Protection Agency's office in Boston. Prior to his current position, Tim served as Deputy Commissioner for Legal Affairs for the Indiana Department of Environmental Management, supervised environmental attorneys at EPA in Boston, and worked as a staff attorney at EPA's offices in Boston and Chicago. Prior to working at EPA, Tim served as a VISTA Volunteer. Tim is a Phi Beta Kappa graduate of Indiana University/Bloomington, a cum laude graduate of Indiana University School of Law, and received a M.P.A from the I.U. School of Public and Environmental Affairs.

Richard G. DiNitto, Principal/Co-Owner
The Isosceles Group, Inc., Boston, MA

Mr. DiNitto is a Principal of The Isosceles Group of Boston, Massachusetts with more than 30 years of environmental consulting experience. During the past 11 years, Mr. DiNitto has been working on the GE/Housatonic River Rest of River Site in several roles: as a Project Hydrogeologist and Geomorphologist, Site Assessment Analyst, Chemical Fate and Transport Scientist, Public Communications Specialist, and as a Project Coordinator. Mr. DiNitto has been one of the principal investigators in determining the nature and extent of PCB contamination at the site. He worked with the modeling and risk assessment teams to evaluate the data in conjunction with fate and transport mechanisms and human and ecological exposures. He also assisted in the coordination of a variety of subcontractors and their efforts, primarily the fate and transport modeling using HSPF, EFDC, and FCM. Recently, Mr. DiNitto has been involved with the historical land use analyses associated with the Housatonic River valley and its influence on fate and transport characteristics. Mr. DiNitto's 30 years of experience includes environmental multi-media assessments and remediation of contaminated sediments, riverine and groundwater systems. He has completed more than 1000 environmental assessment projects across the United States and internationally, and has successfully managed several environmental, engineering and energy-related consulting firms.

John J. Field, Ph.D
Field Geology Services, Farmington, ME

Dr. John Field is a fluvial geomorphologist and hydrologist with 25 years of experience specializing in assessments of stability and habitat conditions of rivers and streams, identifying restoration strategies at the watershed scale, and evaluating results to ensure improvements to channel stability and aquatic habitat are sustainable. For the Housatonic River Project, Dr. Field provided historical analysis and interpretation of shifts in the morphology of the Housatonic River over time and is reviewing proposed remedial alternatives for their effects on river geomorphology and long-term stability. During eight years as a university professor, Dr. Field was active in training teachers and government agency personnel on techniques for the practical application of river morphology. His research has included previous work in Massachusetts, including an erosion control study of Turners Falls Pool on the Connecticut River, an assessment of causes for channel instability on the Sawmill River in Montague, and the design for a bank stabilization project on the South River in Ashfield. Dr. Field's research on flooding and habitat issues both in the United States and internationally has been published in numerous peer-reviewed scientific publications and presented at professional conferences.

Edward J. Garland, Senior Professional Associate
HDR HydroQual, Inc., Mahwah, NJ

Ed Garland is an environmental engineer with 30 years of experience in water and sediment quality modeling, including over 25 years with HydroQual, Inc., where he serves as Technical Director of the Environmental Fate and Transport practice area. His expertise includes developing and applying complex, integrated models of environmental hydrodynamics, sediment transport, and contaminant transport and fate to studies of contaminated rivers and estuaries. For the Housatonic River Project, Mr. Garland has overall technical and supervisory responsibility for the team that has calibrated, validated, and applied the three-part linked modeling framework (HSPF/EFDC/FDCHN) to evaluating the effect of the proposed remedial alternatives on PCB concentrations in the Housatonic River, its floodplain, and its resident biota. In addition to his work on the Housatonic, Mr. Garland has developed national recognition for his direction of modeling efforts for contaminated sediment mega-sites such as the Passaic River, New Jersey, and Green Bay, Wisconsin. He has also applied numerical models of hydrologic processes to a wide variety of other riverine sites across the United States in support of waste load application regulatory processes, and has authored a number of technical articles and presentations at national and international technical conferences.

Gary Lawrence, M.R.M., R.P.Bio Associate/Senior Environmental Scientist - Risk Assessment
Golder Associates, Inc., Vancouver, BC, Canada

Gary Lawrence is a Senior Scientist with Golder Associates. He specializes in aquatic and terrestrial ecological risk assessment, ecotoxicology, risk modeling of environmental systems (including chemical bioaccumulation modeling), sediment quality assessments, resource management, and statistical data analysis. Because of his broad technical skills and project experience, he has served in a variety of capacities on the Housatonic River Project. Mr. Lawrence has primary responsibility for the calibration, validation, and application of the food-chain/bioaccumulation model that predicts PCB concentrations in fish and other biota under each of the proposed remedial alternatives. He also was responsible for Ecological Risk Assessment for the benthic invertebrate and fish receptor groups, and consulted on the amphibian risk assessment. Mr. Lawrence has served as Project Manager and Principal Investigator for numerous ecological and human health environmental risk assessments, both in North America and internationally. He has contributed to regional and national guidance documents on the implementation and interpretation of detailed risk assessments. This involvement included guidance on weight-of-evidence approach, sediment quality triad, application of toxicity tests, and risk characterization methods. He specializes in the fate and effects of substances that bioaccumulate and/or biomagnify in the environment, including PCBs, dioxins/furans, mercury, and tributyltin. Mr. Lawrence currently manages a group of approximately 25 environmental professionals in the Golder Associates Greater Vancouver Office, and has more than 15 years of experience in risk and environmental assessment.

John Lortie, Vice President
Stantec Consulting Services, Inc., Topsham, ME

John Lortie is a Professional Wetland Scientist, a Certified Wildlife Biologist, an accomplished botanist, and an experienced ecological risk assessor. He has directed numerous projects involving complex environmental regulations at hazardous waste sites and marine facilities, and has taught short courses at international environmental conferences on ecological risk assessment protocols, field methods, and restoration design. For the Housatonic River Project, Mr. Lortie serves as the lead ecologist for the G.E./Housatonic River Site Ecological Risk Assessment, with particular responsibility for the Ecological Characterization and in evaluating risks to amphibians. In his previous position as President of Woodlot Alternatives, Inc. (now part of Stantec), Mr. Lortie was responsible for many aspects of the site investigations, including the field studies program, and was the lead investigator for the Ecological Characterization of the site. In addition to managing significant habitat restoration projects and ecological risk projects, he has also led large-scale ecological inventories to search for rare animals and plants, directed coastal migratory bird studies, and evaluated complex natural communities throughout the northern Atlantic region. A former National Wildlife Refuge manager, he also offers special expertise in migratory bird studies. As a Professional Wetland Scientist, Mr. Lortie also specializes in interpretation of wetland regulations, and wetland identification, evaluation, mitigation and restoration.

Richard A. McGrath, Principal/Co-Owner
The Isosceles Group, Inc., Boston, MA

Dick McGrath is an aquatic ecologist with 40 years of experience conducting and managing research in oceans, estuaries, and rivers. He has served as the Technical Director for the Rest of River investigations for the last 10 years and, for 2 years prior to that, was the Quality Assurance Manager. In addition to his continuing wide-ranging technical oversight and coordination responsibilities on the project, he also provides specialized expertise in PCB analysis and biogeochemistry and has provided assistance to EPA on many of the technical documents presenting the results of the studies conducted on the project.

Mr. McGrath specializes in the assessment and remediation of contaminated sediments, particularly sediments contaminated with PCBs and other organic compounds. In his career, he has been a Vice President and/or General Manager for three large international consulting organizations, and has conducted investigations of contaminated sediments on all three coasts of the United States as well as in the Great Lakes. He has authored, edited, and reviewed hundreds of scientific papers, reports, and other documents and has been an invited participant at national and international technical conferences. He has also been an invited participant on the PBS NOVA television series, discussing his work on PCB-contaminated sediments in New Bedford Harbor.

Michael R. Palermo, Ph.D., P.E., President
Mike Palermo Consulting, Inc., Durham, NC

Dr. Mike Palermo is a consulting engineer with extensive internationally recognized experience in dredged material management and contaminated sediment remediation. For the majority of his career, Dr. Palermo served with the U.S. Army Corps of Engineers as a Research Civil Engineer and Director of the Center for Contaminated Sediments at the Engineer Research and Development Center (ERDC) at the Waterways Experiment Station (WES), where he managed and conducted both research and applied studies for the USACE, EPA, DOJ, NOAA, U.S. Navy, and others. He also managed the WES/ERDC research focus area for contaminated sediments. Since entering private practice in 2003, he has provided design services and technical review and oversight for clients, both in the U.S. and abroad, on a wide range of sediment remediation and navigation projects involving contaminated sediments including sediment mega-sites such as the Hudson River, Housatonic River, Fox River, Portland Harbor, and Onondaga Lake. In his role on the Housatonic River Project Dr. Palermo serves as Senior Reviewer and technical resource for issues related to sediment dredging, capping, and dredged material management. Dr. Palermo is a Registered Professional Engineer and a member of the Western Dredging Association (WEDA), International Navigation Association (PIANC), and American Society of Civil Engineers (ASCE). He has served on the adjunct faculty at Texas A&M University and Mississippi State University and is also Associate Editor for the WEDA Journal of Dredging Engineering. He has authored numerous publications in the area of dredging and dredged material disposal technology and remediation of contaminated sediments. He is a lead author of USACE, EPA, and international guidance documents pertaining to contaminated sediments, including the USEPA 1998 Guidance for In-Situ Subaqueous Capping of Contaminated Sediment, USEPA 2005 Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, and the USACE/USEPA 2008 Technical Guidelines for Environmental Dredging of Contaminated Sediments.

Kathy Poole, RLA, LEED AP, Principal
Poole Design, LLC, Baltimore, MD

Kathy Poole is Principal of Poole Design, a firm specializing in Landscape Architecture, Urban Design, and Ecological Infrastructure. For the Housatonic River Project, she assists EPA in developing community outreach programs. Through her 25 years of collegiate teaching and professional practice, she has developed a national reputation for integrating ecology and design toward projects that both regenerate ecological systems and connect people to landscapes in engaging and beautiful ways. Her many successful environmental design projects include a range of scales, from public plazas of a few hundred square feet, to new communities of hundreds of acres, to master plans encompassing thousands of acres. She completed her undergraduate architecture degree at Clemson University and was awarded her Master of Landscape Architecture degree at Harvard University with distinction and garnering the university's top awards. She has published several book chapters and over a dozen articles, and her work has been exhibited across the nation. A popular speaker, Ms. Poole has keynoted conferences both at home and abroad. These skills, combined with her 10 years of experience as an academic, result in her often being called upon to lead public forums, working sessions, and charrettes, and to lead mediations between private citizens and public or corporate entities.

Susan C. Svirsky, EPA Project Manager Rest of River

Ms. Svirsky has worked for EPA for over 30 years in many different capacities. She graduated with a degree in Wildlife Ecology from the University of Maine and subsequently worked for Maine Inland Fisheries and Wildlife. From there, she began her career at EPA in the Water Quality Monitoring Program in Washington, D.C. Upon returning to New England, she worked with EPA in various roles, including serving as the chair of the multi-agency regional Superfund Ecological Assessment Team. In this role Ms. Svirsky began her work with contaminated sediment site assessment, cleanup, and restoration, with a particular focus on PCB-contaminated sites, and participated in national guidance development. Her involvement with the GE-Housatonic River site began over 14 years ago. This involvement led to her becoming the Project Manager for Rest of River, overseeing all of the data collection, risk assessment, modeling, and Corrective Measures Study activities. In addition, Ms. Svirsky has taught sessions on ecological risk assessment and restoration of contaminated sediment sites, and has authored numerous technical papers on these issues as well as those associated with Rest of River.

Dean Tagliaferro, EPA Pittsfield/Housatonic River Team Leader

Dean Tagliaferro is the Team Leader for the GE-Pittsfield/Housatonic River Consent Decree Site. He also is EPA's project manager for the 1 ½ Mile Reach and other cleanup actions at the Site. He has over 25 years of experience at EPA. For the last 14 years, he has been involved in the GE-Pittsfield Site, first as the project manager for the Building 68 removal action, then the Upper ½-Mile reach cleanup, and for the last seven years as the Team Leader. Prior to that, Mr. Tagliaferro has worked as an On-Scene Coordinator directing short-term cleanup actions at Superfund sites and as a member of the emergency response team. Mr. Tagliaferro has a bachelor's degree in chemical engineering from Tufts University and a master's degree in civil (environmental) engineering from the University of Lowell (MA).

Mark Velleux, Ph.D., P.H., P.E. Senior Project Manager
HDR HydroQual, Inc., Mahwah, NJ

Dr. Mark Velleux is a civil engineer with over 20 years of experience in the development and application of surface water and watershed-scale contaminant transport and fate models. He has both technical and managerial experience investigating contaminated sediment sites, establishing clean-up goals, and evaluating remediation alternatives. For the Housatonic River Project, Dr. Velleux was responsible for review and analyses of EFDC model results to evaluate model performance to support supplemental data collection and field surveys related to modeling studies. He conducted analyses to quantify PCB transport and fate processes in river sediment and surface water that were used to define inputs for model validation and demonstration simulations, and contributed to sediment transport and PCB transport and fate model performance evaluations as well as efforts to evaluate model sensitivity and uncertainty. In addition to his work on the Housatonic, Dr. Velleux has also been a senior member of teams investigating metals transport in the Upper Columbia River, PCB transport and fate modeling efforts and analysis in the Lower Fox River, and modeling the potential for PCB release from confined disposal facilities in Saginaw Bay (Lake Huron). With the Wisconsin Department of Natural Resources, he was responsible for PCB transport and fate models developed for CERCLA (Superfund) and NRDA efforts for the Lower Fox River/Green Bay PCB Superfund Site. He is the author of a number of peer-reviewed articles in scientific journals, in addition to a wide variety of presentations at national and international scientific conferences.

Donna J. Vorhees, Sc.D., Principal
The Science Collaborative, Ipswich, MA

Dr. Donna Vorhees specializes in multi-pathway exposure assessment and human health risk assessment of chemicals in indoor and outdoor environments. Dr. Vorhees (at the time with Menzie-Cura Associates) participated in all aspects of the Human Health Risk Assessment for the GE/Housatonic River Site and was the primary author of the assessment of agricultural products such as milk, beef, chicken, eggs, and vegetables, and the probabilistic assessment of soil exposure and agricultural products. She holds an Sc.D. from the Harvard School of Public Health and has nearly 20 years of experience conducting deterministic and probabilistic exposure and risk modeling for environmental contaminants such as polychlorinated biphenyls, dioxins and furans, petroleum hydrocarbons, volatile organic compounds, and metals (e.g., arsenic, lead, and mercury). She is also an Adjunct Assistant Professor in the Department of Environmental Health at the Boston University School of Public Health where she teaches Risk Assessment Methods. In addition to her work on the Housatonic River, Dr. Vorhees has conducted risk assessments on a wide range of environmental health issues, including determining whether and to what extent contaminated sites should be remediated, identifying research priorities and comparing risks among dredged material management alternatives for the U.S. Army Corps of Engineers, and providing guidance for responding to and evaluating petroleum spills in and near private residences. She is also leading a health study as part of a United Nations environmental assessment of petroleum contamination in the Niger Delta. Dr. Vorhees is a Councilor for the Society for Risk Analysis and recently served on two National Research Council Committees (Health Risks of Phthalates and Sediment Dredging at Superfund Megasites). She is the author or co-author of numerous scientific publications and has presented the results of her work at a variety of national and international technical conferences.

www.epa.gov/region1/ge

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