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HUDSON RIVER PCB PROJECT

ACTION PLAN

December 15, 1989

New York State Department of Environmental Conservation
Albany, New York

OVERVIEW

On January 9, 1989, the Industrial Hazardous Waste Facility Siting Board, which had been empaneled for the Site G encapsulation facility, and the Commissioner of the Department of Environmental Conservation (DEC) announced rejection of that location. Simultaneously, the Commissioner directed the DEC task force in charge of the Project [Project Sponsor Group (PSG)] to evaluate approaches to carrying out a more comprehensive PCB cleanup in the upper Hudson River Valley. This narrative, prepared by the PSG in furtherance of carrying out the Commissioner's directive, discusses the foundations for the scope and breadth of a comprehensive clean-up effort; evaluates potential remedial actions and alternative technologies; and presents a schedule for carrying out the rescoped Project. This Plan lays out a course of action for remediating identified sites based on current evaluations of available or developing technologies. The Plan also provides, however, for an on-going analysis of potential remedial actions and for the selection of alternative options based on these determinations.

EXECUTIVE SUMMARY

A. Commissioner's Directive

The Commissioner directed the PSG to undertake a comprehensive PCB response action, using Site 10 for whatever facilities may be necessary. PCB-contaminated materials are to be removed and either encapsulated or, if feasible, decontaminated. Available information suggests that the Commissioner based his decision upon the majority determination of the Siting Board that there is a need for a PCB clean-up Project and both the record of the proceeding and the history of the PCB contamination problem.

Presuming suitability of Site 10, the PSG is to commence the necessary process to effectuate the sanctioned scope within 15 months of the Commissioner's Decision. The overall action is to be initiated with dredging of the Thompson Island Pool, as previously proposed, to be accomplished in 1994 or as soon as possible thereafter. In addition, the Commissioner directed that alternative technologies be evaluated for the purpose of eventually accomplishing decontamination of the dredged and relocated materials.

The total amount of contaminated sediment from these sites, approximately 3 million cubic yards, contains about 250,000 pounds of PCBs. Remediation of all these sites, which is the ultimate goal of the Project, would bring about the greatest reduction in PCB input to the Hudson River system.

Remediation of these sites will require that contaminated materials be brought to a secure dewatering/encapsulation facility at Site 10 on the banks of the Hudson in the Town of Fort Edward. The facility will be designed to accommodate eventual decontamination procedures if and when it is determined that such procedures can be effectively applied. An on-going analysis of available remedial options, sediment and soil disposal options and alternative technologies will provide a basis for determining the remedy to be implemented as each site is considered.

It is currently estimated that the total costs of encapsulation of the 3 million cubic yards of contaminated material identified above is $280 million. It should be stressed that these estimates are given in 1989 dollars and that they only pertain to the total costs of an encapsulation project. Estimated costs associated with decontamination technologies are less certain, but as Project technical evaluations are completed, costs for decontamination technology may be different from the total cost of encapsulation. The present state of technology regarding destruction of PCBs generally, and in materials such as Hudson River sediment in particular is being assessed by the PSG, and developments will be monitored throughout the life of the Project. Optimistically, the presently identifiable, most promising and least expensive interim solution alternatives to encapsulation are solvent extraction, incineration and chemical decontamination. The concept of biodegradation is appealing due to its relatively low cost and potential application within the confines of a secure encapsulation facility. However, the PCB biodegradation rate and ultimate PCB concentration attainable in an encapsulation facility managed as a biological reactor are as yet quite uncertain. Therefore, long-term, secure containment is incorporated in the current design of the facility.

commercial use of the Hudson River, its fishery and the Champlain Canal;

(5) Due to unpredictable River action, a major scouring event could occur at any time, requiring dredging of the Thompson Island Pool at the earliest possible time;

(6) The use of Site G would not have mitigated the adverse environmental impacts of encapsulation to the greatest extent practicable;

(7) In addition, there are PCB sources in the upper Hudson which would not have been addressed by the former proposal;

(8) Therefore, a more comprehensive assault on the Upper Hudson PCB contamination problem is desirable, which mandates the use of the larger and previously evaluated Site 10;

(9) Given the evolving state-of-the-art and the public policy of both the State and the Nation, as expressed in SARA, in developing the Project, due consideration is to be given to possible, permanent solutions within the target time period, specifically those alternatives to containment -- i.e., chemical, biological and thermal decontamination processes-- as may be cost effective; and,

(10) Considering the on-going EPA efforts regarding the remnants, the continuing jurisdiction of EPA under CERCLA and the timetables within the Consent Order, consultations and a cooperative effort with EPA should be undertaken.

The environmentally preferable undertaking always has been -- as reflected in the USEPA FEIS of October 1982 -- the broadest possible attack. It remains the Department's commitment to apply ultimate PCB destruction technology whenever such can be demonstrated clearly to be feasible and environmentally preferable, including the technology retrofit to the encapsulated spoil material.

The character of the action will be multi-faceted: it will remediate an inactive hazardous waste site; it will demonstrate the effectiveness of pollutant removal as a means of restoring a vital, national waterway; and it will afford the opportunity to evaluate both long-term secure storage and, if available, developing destruction or decontamination technologies.

Based on the best information available regarding PCB mass, material volume and costs, a Project addressing all of the sediments and spoils contemplated would involve a total volume of approximately 3 million cubic yards containing approximately 250,000 pounds of PCBs. The total estimated cost for encapsulation of that amount of material would be about $280 million (1989 dollars). Current cost estimates for decontamination of these materials are more than three times the costs of encapsulation but are subject to change based upon technological developments.

Candidate Project constituents and their characteristics are as follows:

A. Thompson Island Pool

Deposits targeted for removal in the recently denied project account for 24,000 pounds of PCBs in 400,000 cubic yards of sediment. The expanded Project's scope would include dredging and encapsulation of an additional 9,000 pounds of PCBs in 220,000 cubic yards from the Thompson Island Pool.

B. Lock 6/5 Pool Hot Spots.

It has been estimated that hotspots in the Lock 6/5 Pool, which is just below the Thompson Island Pool, contain 21,000 lbs of PCBs in 390,000 cubic yards of sediment. The cost per cubic yard of sediment encapsulated will be higher than the costs associated with Thompson Island Pool sediments due to the increase in transport costs to Site 10.

C. Remnant Deposits 2, 3, 4, and 5

These areas contain the highest concentrations and largest mass of PCBs in the Hudson River, with an estimated 46,000 pounds of PCBs in 360,000 cubic yards of sediments that were exposed when the former Ft. Edward dam was removed in 1973. In-place they represent a potential long-term source of PCBs to the lower River.

D. SA13, Buoy 212, Site 518, 204 Annex, Rogers Island, Lock 4, Lock 1 and Old Moreau (NYSDOT Sites)

SA13 and Buoy 212 contain approximately 16,000 pounds of PCBs that are currently the subject of a suit filed on April 4, 1989, under TSCA, in which EPA is claiming that NYSDOT did not comply with limitations imposed by EPA

PROJECT SCHEDULE

Action	Timeframe
Scope feasibility studies, environmental analyses and risk assessment	7/90
Ongoing study of alternative technologies (Implement alternatives when feasible)	12/89-12/96
Siting board application/hearing process	12/90-11/91*
Final design of facilities	12/91-11/92
Contract process for site construction starts	12/92
Site construction	5/93-11/97
Translocate SA 13 and Buoy 212 spoils	2-5/93
Contract process for dredging TIP starts	12/93
Dredge TIP	5-11/94
NYSDOT canal maintenance dredging	5/93-11/97
Interim cover (4 winters)	11/93, 11/94, 11/95, 11/96
Contract process for dredging other areas starts	12/94
Dredge other areas	5-11/95
Contract process for remnants translocation starts	9/95
Translocate remnants	2-11/98
Contracting for translocation of NYSDOT spoils starts	9/96
Translocate NYSDOT spoils	2-11/97
Contract process for closure or alternative destruction technology starts	6/96
Close encapsulation facility or destroy PCBs	11/97-11/98

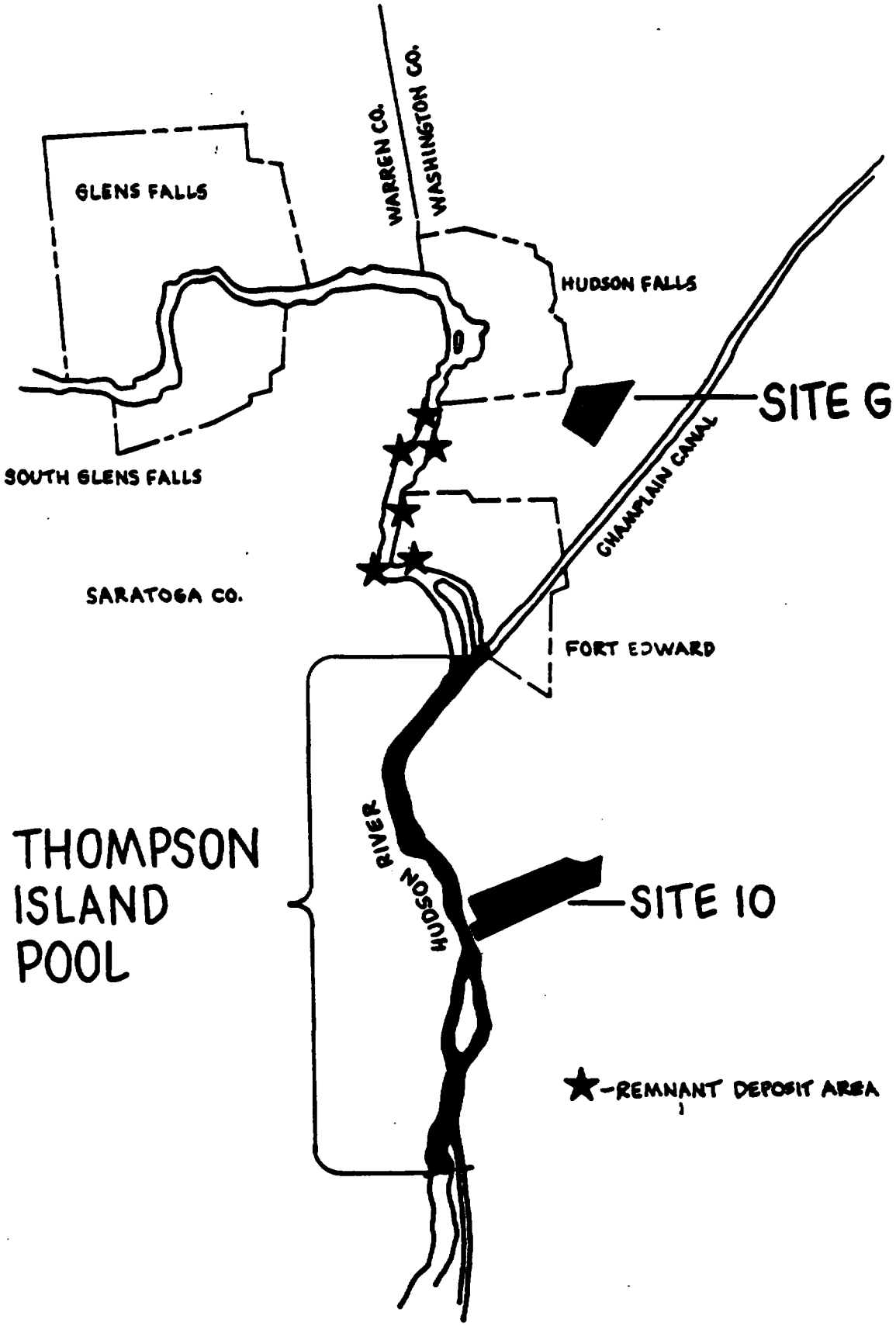
* The time allotted will be sufficient for focussing on aspects of the action which have not previously been subject to adjudication. Due to the nature of the hearing process, however, additional time may be needed.

The thermal processes are the most well developed, reliable and expensive of the destruction technologies. The unit price of incinerating soils is largely a function of fuel and labor costs for operating the incinerator when dealing with total volumes on the order of 1,000,000 cubic yards. Incineration technology to process 25 cubic yards per hour is available. Processing time for a single unit would be in the range of five to seven years. Unit incineration price bids of approximately $150 per cubic yard, which would include capital expenditures, materials handling and incineration, would be expected, based upon PSG communications with vendors. Possible restrictions on the disposal of ash and other contingencies suggest the use of $200 per cubic yard as an estimate of unit price, which would include incineration and ash stabilization. Such a cost should not be considered valid for planning projects with total volumes less than 100,000 cubic yards. The chemical destruction process would be less effective, but also less expensive, than incineration. Costs for chemical destruction would be approximately $150 per cubic yard. The solvent extraction method offers the lowest cost option at $100 per cubic yard, but is not yet fully proven, as discussed below. There is no biological technology that could be currently applied with a reasonable degree of reliability to decontaminate PCB-contaminated sediment.

An area for optimism regarding future developments of PCB biodegradation technology lies in the possible merging and acceleration of the recently discovered anaerobic PCB-dechlorination process with the aerobic process. Only if there were not heavy subsidization, however, could biodegradation be a highly effective means of decontaminating the encapsulated sediments. Scientists at the NYS Department of Health are pursuing their investigation of the anaerobic process found to be taking place in the laboratory to determine the extent to which the rate of PCB dechlorination can be accelerated. Progress in this area will be closely monitored including evaluation of research and development efforts by General Electric in the area of biodegradation technology. Landfill operation and design modifications that would provide for greater flexibility in water, gas and solute transport within the containment cell will be considered in relation to developments regarding the nutritional requirements and kinetics related to PCB biodegradation processes.

HUDSON RIVER PCB PROJECT

NEW YORK STATE DEPARTMENT of ENVIRONMENTAL CONSERVATION, JAN. 1989



HUDSON RIVER PCB PROJECT
CHRONOLOGY

September, 1976 - A settlement agreement between General Electric (GE) and the New York State Department of Environmental Conservation (DEC) was signed, providing for a reduction in daily PCB discharge from two GE facilities on the upper Hudson River and for the expenditure of $7 million to assess both the contamination problem and possible remedial actions.

October, 1979 - The expenditure of $20 million was authorized by the U.S. Congress under Section 116 of the Clean Water Act (CWA) to "demonstrate methods for the selective removal of polychlorinated biphenyls contaminating bottom sediments of the Hudson River."

April, 1982 - The use of a location known as Site 10 for a sediment encapsulation facility was approved by an Industrial Hazardous Waste Facility Siting Board, and necessary State permits for that site were issued by the Commissioner.

October, 1982 - The Final Environmental Impact Statement, support Site 10 and the proposed dredging project, was published by the U.S. Environmental Protection Agency (EPA).

December, 1982 - EPA issued a Record of Decision denying release of the CWA Section 116 funds for the Project, pending review of eligibility under federal Superfund.

July, 1983 - State approvals for Site 10 were revoked by the NYS Supreme Court on grounds, among others, of improper zoning.

November, 1984 - To protect against ultimate rejection of Site 10 by the courts, a consultant is retained to find another location, one which is in an industrially zoned district.

May, 1984 - As a result of a State lawsuit against EPA seeking release of Section 116 funds, EPA agreed to an Order on Consent for release of the then remaining $19 million.

March, 1985 - The Court of Appeals upheld lower court decisions regarding Site 10 on the grounds of improper zoning, thereby removing it from further consideration as a sediment encapsulation site. Site G was selected and announced as the replacement site.

March, 1989 - The PSG initiated procurement activities needed in order to have an engineering consultant in a position to proceed with field activities during the summer of 1989.

May, 1989 - The PSG submitted an Action Plan for executive consideration and approval. The Plan for the revised project would address the remediation of approximately 1.43 million cubic yards containing approximately 115,600 pounds of PCBs, at an estimated cost of $112 million for encapsulation alone or $370 million for application of the most promising decontamination technology. Areas of remediation in this expanded scope include remnant deposits 3, 4, and 5, the Thompson Island Pool, the Lock 6/5 pool, and the Buoy 212 dredged spoils site.