U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I
J.F.K. FEDERAL BUILDING, BOSTON, MA 02203

Norwood
5.6.1

TE: January 31, 1996

SUBJ: Rough Cost Estimate Calculations for Building Remedy and Soil Incineration Remedy, Norwood PCB Superfund Site

FROM: Robert G. Cianciarulo, Remedial Project Manager
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SDMS DocID **456988**

TO: Site File, Administrative Record

Building Demoltion vs. Decontamination, Comparison of Cost Estimates

Following are the rough calculations for the estimated cost of building remediation via demolition and building remediation via decontamination (for reuse of building). These calculations support the cost figures reported in the Proposed Amended Cleanup Plan. As is the case for typical "ROD" cost estimates, these estimates are expected to be accurate only within + or - 50% and are presented mainly for comparison purposes.

Summary of Building Remedy Cost Estimate for Building Demolition:

Item of Work	Cost Estimate	Basis
Demolition of Building (Including Asbestos Abatement)	$2.2 million	Foster-Wheeler 12/5/95 memo
Disposal of Demolition Debris	$0.2 million	Foster-Wheeler 12/5/95 memo, Option 3A
Subtotal, Demolition & Disposal	**$2.4 million**	
15% contingency	$0.4 million	for cost growth/inaccuracies
TOTAL, Bldg. Demolition & Disposal	**$2.8 million**	
Decontamination of 57 pieces of Equipment (essentially complete)	$1.2 million	Foster-Wheeler Delivery Order 9 + government oversight costs
TOTAL BUILDING REMEDY COST	**$4.0 million**	**DEMOLITION OPTION**

For more information supporting the table above, see the following documents:

Foster Wheeler Environmental Corporation, Interoffice Memorandum, To: Ev Washer, From: Bill Pencola, Marcia Walter, December 5, 1995, Description of Options for Demolition and Disposal of the Grant Gear Building, Norwood, MA.

Public Voucher for Purchases and Services Other Than Personal, Voucher No. 15, December 11, 1995, showing total estimated cost of delivery order no. 9 (equipment decontamination).
Summary of Cost Estimate for Building Decontamination (rather than demolition):

00455400

Item of Work	Cost Estimate	Basis
Decontamination of Overhead Beams	*$0.3 million*	*Pre-Design Study, M&E, 1993*
Installation of New Concrete Floor	$0.3 million	Pre-Design Study, M&E, 1993
Flush Drainage System	$0.1 million	Pre-Design Study, M&E, 1993
Install New Drainage System	$0.3 million	Pre-Design Study, M&E, 1993
Remove and Replace Roof (upper)	$0.6 million	Pre-Design Study, M&E, 1993
Remove and Replace Roof (lower)	$0.3 million	Pre-Design Study, M&E, 1993
Subtotal of work listed above	**$1.9 million**	
Correction (1992 dollars to 1995 dollars)	$0.3 million	Escalation of 4.5% per year
Disposal of Remaining Equipment in bldg	$0.1 million	Foster-Wheeler 12/5/95 memo
Subtotal, Decontamination of Building	$2.3 million	
15% contingency	$0.3 million	for cost growth/inaccuracies
TOTAL, Building Decontamination	**$2.6 million**	
Decontamination of 57 pieces of Equipment (essentially complete)	$1.2 million	Foster-Wheeler Delivery Order 9 + government oversight costs
TOTAL BUILDING REMEDY	**$3.8 million**	**DECONTAMINATION OPT'N**

Please note that he building decontamination cost estimate presented above is based in large part upon conceptual cost estimates generated as part of Metcalf & Eddy Inc.'s Pre Design Studies and, as such, is expected to be less accurate than the estimate presented for the demolition option (which was based upon an estimate produced in late-1995 following extensive sampling of building materials and analysis to determine appropriate disposal methods and resultant costs). Furthermore, since Metcalf & Eddy's estimate was prepared, lessons have been learned about the considerable difficulty of decontaminating surfaces inside the building (based upon the experience gained as part of the equipment decontamination effort), raising further questions about the accuracy of this 1993 cost estimate (note the apparently low cost estimate ($0.3 million) for decontamination of the overhead beams, an activity very similar to the equipment decontamination (which cost $1.2 million prior to suspending work)). Cost estimate was corrected to current (1995) dollars using an escalation factor of 4.5% per year, the M&E estimate was reported in January 1993 but the estimate was calculated during 1992.

For information supporting the table above, see the following documents:

"Pre-Design Study Report" Norwood PCB Superfund Site, Volume 1: Field Investigations, Section 2: Building Investigation Report; Metcalf & Eddy, Inc., January, 1993.
Foster Wheeler Environmental Corporation, Interoffice Memorandum, To: Ev Washer, From: Bill Pencola, Marcia Walter, December 5, 1995, Description of Options for Demolition and Disposal

of the Grant Gear Building, Norwood, MA.

Public Voucher for Purchases and Services Other Than Personal, Voucher No. 15, December 11, 1995, showing total estimated cost of delivery order no. 9 (equipment decontamination).

Soil Incineration Remedy Cost Estimate:

Following is a rough "order of magnitude" cost estimate for the contingency remedy at the site: on site soil treatment via incineration. As noted below, this estimate likely represents the lower end of the spectrum of probable costs of the remedy if incineration was implemented.

Item of Work	Cost Estimate	Basis
Incinerator Mob/Demob,Startup, Trial Burn, Standby, etc.	$4.3 million	Sum of Item No. 10 from New Bedford Harbor successful bid
Incineration	$2.9 million	Item No. 11 from New Bedford Harbor successful bid
Subtotal Incineration Tasks	$7.2 million	
All Other Site Work (assume all non-treatment costs are the same for incineration and solvent extraction and assume that these costs represented approx. 60% of contractor's Norwood Proposal for completing solvent extraction remedy)	$32.9 million	Foster Wheeler Delivery Order #8 Cost Proposal, May 1995 (60% of $54.8 million)
Total Soil Incineration Remedy	$40.1 million	

Please note that the $2.9 million figure in line 2 of the above table is taken from the successful bid for the New Bedford Harbor Superfund Site. That bid was based upon incineration of 7,500 tons of PCB contaminated sediment. The Norwood job would entail the incineration of over 58,000 tons of contaminated soil and sediment. Also, the New Bedford Harbor bid assumed unit costs of $388/ton for incineration. Due to site-specific factors (mostly soil vs. sediment, concentration, cleanup goal, larger volume (economy of scale), etc.), unit costs would likely be different at Norwood. Thus, the $2.9 million figure represents a rough, order of magnitude estimate for incineration at Norwood. Precise costs of incineration at Norwood are not known, but would likely be higher than represented in the above table.

For more information supporting the table above, see the following documents:

Delivery Order 8, Summary for all Tasks, Foster-Wheeler Environmental Corp., May 1995 (showing total estimated cost of soil remedy using solvent extraction at $54.8 million)

New Bedford Harbor Hot Spots Superfund Project, Initial Successful Bid Cost, US Army Corps of Engineers

Soil Consolidation and Capping Remedy Cost Estimate:

Following is a rough cost estimate for the preferred amended remedy for the site as set forth in

the Proposed Amended Cleanup Plan: consolidation and capping.

Item of Work	Cost Estimate	Basis
Grant Gear property soil consolidation, construction and maintenance of cap	$2.1 million	EPA recalculation of GZA consolidation/capping estimate
Meadow Brook remediation and restoration	$4.3 million	Foster Wheeler cost estimate, 12/19/95
Subtotal, Consolidation and Capping	$6.4 million	
15% Contingency	$1.0 million	For cost growth/inaccuracies
TOTAL, CONSOL. AND CAPPING	$ 7.4 million	

For more information supporting the table above, see the following documents:

Foster Wheeler Environmental Corporation Fax, To: MAJ Brian Baker, US Army Corps of Engineers, From: E.M. Washer, FWENC, December 19, 1995, Order of Magnitude Estimate for Meadow Brook Remediation

Remedial Alternative Evaluation, Norwood PCB Superfund Site, GZA GeoEnvironmental, Inc., November 1995, Table E-2

Revision of non-brook related soil consolidation/capping cost estimate originally developed by GZA, US Environmental Protection Agency, January 31, 1995

Norwood PCB Superfund Site
Revision of non-brook related soil consolidation/capping cost estimate originally developed by GZA

The following is an update of the cost estimate originally prepared by GZA GeoEnvironmental for a consolidation and capping remedy at the Norwood PCB Superfund Site. This revision addresses the consolidation of soils from elsewhere on the Grant Gear property to a portion of the Grant Gear property where they will be placed under an asphalt cap. This estimate does not include amounts for remediation and consolidation of soils/sediment from Meadow Brook or the restoration of the brook, those amounts have been estimated elsewhere. The GZA estimate has been adjusted to account for increased volume estimates associated with the cleanup levels set forth in the proposed amended cleanup plan as well as other adjustments deemed appropriate by EPA. Unit prices developed by GZA were used in this revision.

Task	Work Item	Quantity	Unit Cost	Total	Note:
GRANT GEAR SOIL CONSOLIDATION					
Excavate/Transport Soils	Excavate Contaminated Soils	10,000 CY	$8.31/CY	$83,100	
	Transport Contaminated Soils	10,000 CY	$2.01/CY	$20,100	
Confirmation Sampling/Analysis	Sampling/Screening Labor	70 DAYS	$720/DAY	$50,400	
	Field Screening Tests	18,000 SY	$2.70/SY	$48,600	
	Laboratory Confirmation (8080)	18,000 SY	$1.35/SY	$24,300	
Backfill Excavated Areas	Fill Material	6,000 CY	$16.54/CY	$99,240	18,000 SY x 1 foot depth (soil cover)
	Compact Fill	6,000 CY	$0.46/CY	$ 2,760	
Place and Compact Soils on Portion of Site to be Capped	Place Contaminated Soil	10,000 CY	$1.76/CY	$17,600	
	Compact Contaminated Soil	10,000 CY	$0.46/CY	$ 4,600	
			SUBTOTAL	$350,700	
ASPHALT CAP OVER CONTAMINATED SOILS				$410,500	from GZA subtotal
	10% allowance for enlargement of aerial extent of cap			$ 41,050	
			SUBTOTAL	$451,550	
ASPHALT CAP OVER GRANT GEAR BUILDING SLAB				$179,400	from GZA subtotal
			SUBTOTAL	$179,400	
ENGINEERING, WORKPLANS, SUBMITTALS, etc.				$500,000	
			SUBTOTAL OF ALL ITEMS LISTED ABOVE	$1,481,650	
PROJECT MANAGEMENT			15%	$ 222, 248	
HEALTH AND SAFETY, AIR MONITORING, etc.			15%	$ 222,248	
			TOTAL CAPITAL COST ESTIMATE	$1,926,146	(no contingency)
ANNUAL CAP MAINTENANCE AND REPAIR		30 YEARS	$10,000/YR	$300,000	
	present value of 30 years O&M (assume first maint. 6/97)			$155,640	
TOTAL, CONSOLIDATION AND CAPPING (excluding Meadow Brook remediation/consolidation)				$2,081,785 (no contingency)	

January 31, 1996

CASHOUT, VERSION 1.4

NORWOOD PCBS JANUARY 31, 1996

THE PRESENT VALUE OF SUPERFUND CLEANUP
COSTS FOR SUPERFUND SITE AS OF PRP PAYMENT
DATE, 17 MONTHS BEFORE SUPERFUND COSTS COMMENCE $ 155640

USER SPECIFIED VALUES
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1. SUPERFUND SITE NAME =	NORWOOD PCBS			
2. RECURRING EXPENDITURES		= $	0	1997 DOLLARS
3. ONE-TIME EXPENDITURE		= $	0	1997 DOLLARS
4. ANNUAL EXPENSE FOR 30 YEARS		= $	10000	1996 DOLLARS
5. PRP PAYMENT DATE		=	1, 1996	
6. SUPERFUND CLEANUP COSTS COMMENCEMENT DATE		=	6, 1997	

STANDARD VALUES
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7. ANNUAL INFLATION RATE	=	1.30%
8. DISCOUNT RATE	=	5.90%