

SCANNED

SITE ASSESSMENT AND REMEDIATION STATUS REPORT
and
RELEASE ABATEMENT MEASURE PLAN SUPPORT DOCUMENT

prepared for

BUCKLEY & MANN INC.

NORFOLK, MASSACHUSETTS

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE SITE CLEAN-UP SITE NUMBER 3-0173

Prepared by

CAMP DRESSER & McKEE INC.

April 1996

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Complete Analytical Report

SITE ASSESSMENT AND REMEDIATION STATUS REPORT

1.0 INTRODUCTION

This report presents the results of a Phase II environmental assessment for the Buckley & Mann, Inc. (B&M) site, 17 Lawrence Street, Norfolk, Massachusetts and proposes a remediation plan. The site is on the Massachusetts Contingency Plan (MCP) Transition List as number 3-0173, a non-priority site with a Waiver from direct Department of Environmental Protection (DEP) supervision. The Waiver is valid through February 22, 1998. Camp Dresser & McKee Inc.'s (CDM) May 1995 Site Assessment and Remediation Work Plan describes the history of the site and prior investigations. That Plan also included a recommendation for further site characterization prior to remediation.

This April 1996 report presents the results of the characterization study completed in October and November 1995 and updates the May 1995 Work Plan based on the new data. The new work plan outlines the steps proposed to achieve a condition of No Significant Risk (NSR), as defined in the MCP.

CDM prepared a Notice of Intent for submittal to the Norfolk Conservation Commission (NCC) in anticipation that soils would be excavated within wetlands buffer zones during the October 1995 sampling program and subsequent removal of debris and possibly, contaminated soil. In August 1995, after a site visit and a public hearing, the NCC issued an Order of Conditions authorizing the work as proposed in the Notice. The site has been assigned DEP File #240-191.

2.0 FIELD SAMPLING PROGRAM

Twenty-three test pits between 3 and 8 feet deep were excavated with a backhoe at the B&M site on October 25 and 26, 1995. Sample locations were selected to characterize the soils in the disposal areas identified in CDM's May 1995 Site Assessment and Remediation Work Plan. Table 1 lists the areas and the number of samples collected. The test pit and sample locations are shown on Drawing C-3.

Soil samples were collected from fifteen of the twenty-three test pits. CDM did not collect samples from Test Pits 11, 12 and 13 because these pits did not include debris, coal ash or other materials associated with contamination. CDM did not collect samples from Test Pits 3, 4, 7, 9, and 13 because the non-native materials in these pits (small fragments of building demolition debris) were similar in appearance, and thus duplicative, to the material found in other, nearby test pits.

CDM also collected soil samples from five additional locations with hand tools. Three of these were background samples from areas on or near the property where there was no indication of past contamination.

Many of the Carbonizer, coal ash and debris disposal area (Area 10) test pits were stratified, with clean sand interspersed with layers of coal ash and/or building debris, plastic sheeting, and buttons, fabric scraps or other residues from textile operations. In these test pits, samples were collected from the layers of man-made material, rather than the clean sand. A few pits contained recognizable debris, such as porcelain plumbing and light fixtures, pieces of pipe and partially decomposed textile processing belts. Appendix A provides a description of each test pit and manually excavated sampling points.

No unusual odors were encountered in any of the test pits. Total volatile organic compounds in soils were measured in the field with a Thermo Environmental Instruments model 580B Organic Vapor Monitor (OVM with a 10.6 eV photo ionization detector) by both headspace and direct aspiration from the side walls of fresh excavations. No readings above background were detected. Test pits 1, 2, 3, 4, and 6 encountered shallow groundwater. No sheen or floating non-aqueous product was observed, except in Test Pit 16 (see below).

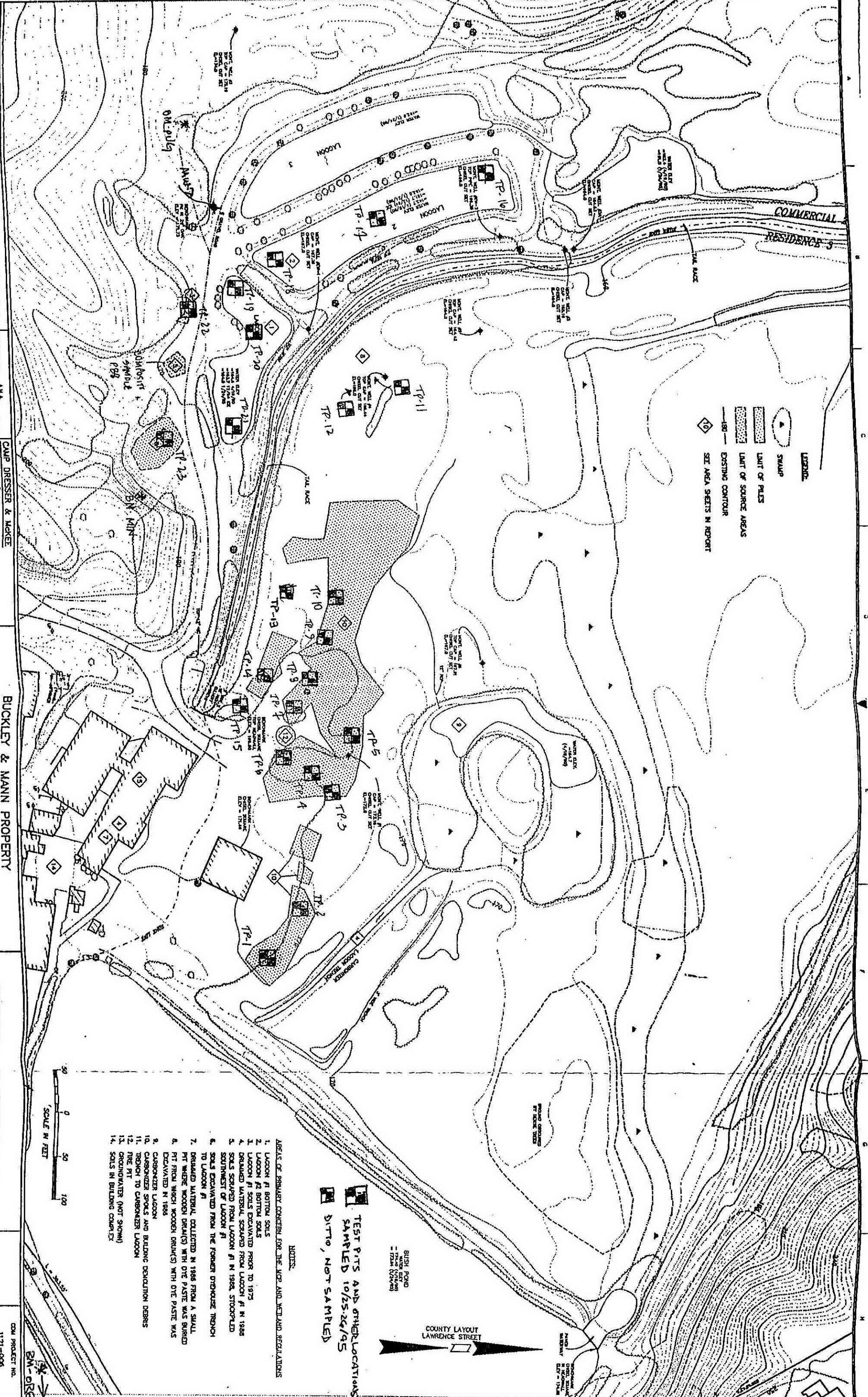
Test pits in Lagoons #1 and #2 revealed tan sand layers interspersed with black sand layers. The black sands had a slightly anaerobic odor with a faint petroleum tone. When the soil in Test Pit 16 was disturbed, small areas of sheen formed on the water surface in the pit.

DESIGNED BY:	AKA
DRAWN BY:	CEC
CHECKED BY:	
APPROVED BY:	
DATE:	12/28/93
PROJECT:	CCC LAA

CAMP DRESSER & MCKEE
100 Cambridge Street
Cambridge, Massachusetts 02142

BUCKLEY & MANN PROPERTY
NORFOLK, MASSACHUSETTS

ASSESSMENT AND REMEDIATION AREAS
PRELIMINARY DESIGN



SCALE IN FEET
0 50 100

- NOTES:
1. LAGOON #1 BOTTOM SOILS
 2. LAGOON #2 BOTTOM SOILS
 3. LAGOON #1 SOILS EXCAVATED PRIOR TO 1975
 4. DEBRIS MATERIAL SCARRED FROM LAGOON #1 IN 1988
 5. SOILS SCARRED FROM LAGOON #1 IN 1988, STOCKPILED SOUTHWEST OF LAGOON #1
 6. SOILS EXCAVATED FROM THE FORMER OTTOWAGE TRENCH TO LAGOON #1
 7. DEBRIS MATERIAL COLLECTED IN 1988 FROM A SMALL PIT WHERE WOODEN DRUMS WITH OTE PASTE WAS BURIED
 8. PIT FROM WHICH WOODEN DRUMS WITH OTE PASTE WAS EXCAVATED IN 1988
 9. CARBONIZER LAGOON
 10. CARBONIZER SPILLS AND BUILDING DEMOLITION DEBRIS
 11. TRENCH TO CARBONIZER LAGOON
 12. FIRE PIT
 13. GROUNDWATER (NOT SHOWN)
 14. SOILS IN BUILDING COMPLEX

TEST PITS AND OTHER LOCATIONS
SAMPLED 10/25/26/95
DITTO, NOT SAMPLED

BUSH POND
WATER LEVEL
= 17.0m (55.76ft)

COUNTY LAYOUT
LAWRENCE STREET

CDM PROJECT NO.
1121-005

SHEET NO.
C-3

3.0 ANALYTICAL PROGRAM

Table 1 summarizes the number of analyses and analytical parameters for each sample. CDM analyzed the samples for the following constituents:

- **Total metals:** silver, arsenic, barium, cadmium, chromium, mercury, lead and selenium.
- **TCLP metals** (hazardous waste characteristic): cadmium, chromium and/or lead. Only samples with a total metal concentration greater than 20 times the TCLP limit were tested, and only for the metal(s) which exceeded that 20 times factor. Samples with a total concentration below that factor are unlikely to fail the TCLP test.
- **Total Petroleum Hydrocarbons (TPH)** by solvent extraction and infrared absorption.
- **Volatile Organic Compounds (VOCs)** by gas chromatography/mass spectroscopy.
- Acid extractable and base/neutral extractable **Semi-Volatile Organic Compounds (SVOCs)** by solvent extraction followed by gas chromatography/mass spectroscopy. Certain compounds with similar chemical structures in the SVOC group are designated **Polyaromatic Hydrocarbons (PAH)**.
- **Pesticides**, at three sampling points considered most likely to contain pesticide residues like dieldrin, a mothproofing agent for wool, and **PCBs**, also at three points, by solvent extraction followed by gas chromatography/mass spectroscopy.
- **Local Landfill Reuse Criteria** for daily cover material: pH, ignitability, reactive cyanide and sulfide, and specific conductance. Data on other analytes listed above, including TPH, PAH, PCBs and metals must also be submitted to qualify for landfill acceptance as daily cover. Soils with contaminant concentrations exceeding the Criteria (but not hazardous waste) may be disposed of in a local landfill, but may not be used as cover material. Landfills also have requirements on the physical size of the material suitable for daily cover and prefer silt though gravel size material. Construction debris, with the exception of small concrete pieces, may not be accepted as cover material.

TABLE 1

OCTOBER 1995 SAMPLING PROGRAM AT BUCKLEY MANN INC.

AREA #	NAME	SAMPLING POINTS # of samples at # of points		ANALYTICAL PARAMETERS # samples analyzed for each parameter									
		Backhoe test pits # of samples	Backhoe test pits ID #'s	Manual excavation	Metals	TCLP	TPH	VOC	SVOC	Pesticides	PCBs	Landfill Acceptance	Criteria
1	Lagoon #1 bottom soil	3 at 3	19, 20, 21		3	1	3	3	3	1	1	3	
2	Lagoon #2 bottom soil (2 depths in each test pit)	6 at 3	16, 17, 18		6	1	6	6	6	0	0	6	
3	Lagoon #1 soil excavated prior to 1975	1 at 1	22		1	1	1	1	1	0	0	1	
4	Drummed material scraped from Lagoon #1 in 1988			2 at 1	2	2	2	0	2	1	1	2	
5	Soil scraped from Lagoon #1 in 1988, stockpiled southwest of Lagoon #1			1 at 1	1	1	1	1	1	0	0	1	
6	Soil excavated from the former dyehouse trench to Lagoon #1	1 at 1	23		1	1	1	1	1	0	0	1	
7	Drummed material collected in 1986 from a small pit where wooden drum(s) with dye paste had been buried				0	0	0	0	0	0	0	0	
8	Pit from which wooden drum(s) with dye paste were excavated in 1986	0 at 2			0	0	0	0	0	0	0	0	
9	Carbonizer Lagoon				0	0	0	0	0	0	0	0	
10	Carbonizer spoils, coal ash and debris disposal	6 at 12	1, 2, 5, 8, 10, 15		6	5	6	6	6	0	0	6	
11	Trench to Carbonizer Lagoon				0	0	0	0	0	0	0	0	
12	Fire pit	1 at 1	6		1	1	1	1	1	1	1	1	
n/a	Background (3 types of soils)			3 at 3	3	0	2	0	2	0	0	0	
Total number of samples analyzed		18		6	24	13	23	19	23	3	3	21	

Test pits not sampled	3, 4, 7, 9, 11, 12, 13, 14
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4.0 ANALYTICAL RESULTS

The analytical results are summarized in Tables 2 through 5 and are discussed below. For VOCs, SVOCs, PCBs and Pesticides, Tables 2 through 5 show only those analytes which were detected in any sample. The tables in Appendix B summarize all of the analytical data. The complete laboratory report, with the chain of custody documentation, analytical methods references, complete list of analytes, complete results, detection limits, and quality control data, accompanies this report in a separate volume.

In the following discussion, contaminant concentrations are compared to Hazardous Waste inclusionary criteria, MCP No Significant Risk (NSR) criteria and Landfill Reuse Criteria. These criteria are shown in Tables 2 through 5.

Site wide

- CDM tested samples with a total metal concentration(s) high enough to potentially be a "characteristic" hazardous waste by the Toxicity Characteristic Leaching Potential (TCLP) procedure. None of the samples tested exhibited the characteristic of a hazardous waste by this test.
- None of the samples contained contaminants at concentrations which would be considered an Imminent Hazard under the MCP.
- No VOCs were detected in the samples from the Carbonizer, coal ash and debris disposal areas (Area 10). Traces of chlorobenzene, dichlorobenzene, ethylbenzene, xylenes and tetrachloroethene were found in Lagoon #1 and Lagoon #2 bottom soils at concentrations well below MCP NSR criteria. These compounds remain from the period prior to 1986 when the lagoons received dye house wastewater.
- The following samples exceeded the Landfill Reuse Criteria:

The drummed soils scraped from Lagoon #1 in 1988 (Area 4) exceeded the TPH, PAH and chromium criteria.

Test Pit 5 (contained debris and cloth) and Test Pit 10 (contained rags, a decomposed textile processing belt and buttons) from the Carbonizer, coal ash and debris disposal area (Area 10), and soil excavated from Lagoon #1 in 1988 (Area 5) exceeded the chromium criteria. The Test Pit 10 soil also exceeded the lead criteria.

Test Pit 8 (contained metal and building demolition debris) from the Carbonizer, coal ash and debris disposal area (Area 10) slightly exceeded the PAH criteria.

Lagoon #1 (Area 1)

- The metals concentrations were below MCP criteria.
- Dye carrier components methylnaphthalene and naphthalene were found at concentrations above the MCP S-1 (children present, frequent and/or intense contact in a residential setting) and S-2 (children present, infrequent and low intensity contact) NSR criteria. Traces of other dye carrier compounds were found, but at concentrations below the S-1 NSR criteria.
- The average TPH concentration slightly exceeded the MCP S-1 NSR criteria, but was less than the S-2 criteria.

Lagoon #2 (Area 2)

- The metals concentrations were below MCP NSR criteria.
- Methylnaphthalene, a dye carrier component, was found at concentrations above the S-2 NSR criteria in three of six samples. Traces of other dye carrier compounds were found at concentrations below the S-1 NSR criteria.
- The average TPH concentration was below the S-1 NSR criteria. Two of six samples exceeded the S-1 criteria but were less than the S-2 criteria.

Carbonizer, coal ash and debris disposal areas (Area 10)

- Some samples in this group exceed MCP NSR criteria for TPH, individual PAHs, and metals. CDM divided the test pit data into two groups. Table 4 shows the data for below-grade material representative of the conditions likely to remain on-site after removal of unsuitable material. In this sample group, the average concentration of TPH slightly exceeds S-1 NSR criteria and the average of certain PAH compounds slightly exceed S-2 NSR criteria. As explained in Section 8.0, Risk Assessment, unbiased sampling of the area after removal of unsuitable material will likely show average exposure concentrations below No Significant Risk criteria. Table 5 shows the data for above-grade material in discrete piles which would be removed from the site for reuse (cover material) or disposal at a landfill.

Drummed material (Area 4)

- Methylnaphthalene, naphthalene, acenaphthene, TPH, dieldrin (see Specific Chemicals, below) and diethylphthalate were found at concentrations above the S-2 NSR criteria. Chromium was found at a concentration above the S-1 but below the S-2 criteria.

Table 2

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Lagoon 1 Data

(Samples collected October 25-26, 1995. All Results in mg/kg unless otherwise noted.)

	MCP Method 1 Standards			Soil Reuse Levels at Lined Landfills	Lagoon 1 (Area 1)			Average Concentration Lagoon 1
	S-1/GW-1	S-1/GW-3	S-2/GW-1	S-2/GW-3	BM-TP19-L1-N1	BM-TP20-L1-C1	BM-TP21-L1-S1	
Volatile Organic Compounds¹								
Acetone	3.0	60	3.0	60	< 0.061	< 0.59	< 0.068	ND
1,4-dichlorobenzene	2.0	40	2.0	60	< 0.028	< 0.32	< 0.12	0.060
Chlorobenzene	8.0	40	8.0	40	< 0.0030	< 0.029	< 0.020	ND
1,3-dichlorobenzene	100	100	200	500	< 0.0055	< 0.029	< 0.022	ND
1,2-dichlorobenzene	100	100	200	500	< 0.020	< 0.17	< 0.047	0.079
Ethylbenzene	80	500	80	500	< 0.0030	< 0.038	< 0.026	0.021
Tetrachloroethene	0.50	200	0.50	300	< 0.0030	< 0.035	< 0.018	0.018
Total Xylenes	500	500	800	1,000	< 0.0030	< 0.29	< 0.13	0.14
Acid/Base Neutral Compounds²								
Carbazole	NL	NL	NL	NL	< 0.77	< 1.9	< 0.37	ND
2-methylnaphthalene	0.70	7.0	0.70	7.0	9.2	33	4.3	1.6
Naphthalene	4.0	100	4.0	1,000	2.9	6.1	1.1	4.4
Acenaphthene	20	1,000	20	2,000	1.6	1.5	1.5	3.1
Acenaphthylene	100	100	100	800	< 0.39	< 0.96	< 0.19	ND
Fluorene	400	900	400	1,000	< 0.69	< 1.5	< 0.77	1.0
Anthracene	1,000	1,000	1,000	1,000	< 0.39	< 0.96	< 0.19	ND
Fluoranthene	600	600	600	600	< 0.39	< 0.96	< 0.19	ND
Hexachlorobenzene	0.70	0.80	0.80	0.80	< 0.39	< 0.96	< 0.19	ND
Phenanthrene	700	100	700	100	< 0.39	< 0.96	< 0.35	ND
1,2,4-trichlorobenzene	100	400	100	800	< 0.39	< 0.96	< 0.35	ND
Dibenzofuran	NL	NL	NL	800	5.4	11	1.1	5.8
Diethylphthalate	100	0.70	100	0.70	1.3	3.8	0.93	2.0
Bis(2-ethoxy)phthalate	100	100	100	300	< 0.39	< 0.96	< 0.96	ND
Benz(a)anthracene	0.70	0.70	1.0	1.0	< 0.39	< 0.96	< 0.96	ND
Chrysene	7.0	7.0	10	10	< 0.39	< 0.96	< 0.96	ND
Pyrene	500	500	500	500	< 0.39	< 0.96	< 0.96	ND
Benz(b)fluoranthene	0.70	0.70	1.0	1.0	< 0.39	< 0.96	< 0.96	ND
Benz(k)fluoranthene	7.0	7.0	10	10	< 0.39	< 0.96	< 0.96	ND
Benz(g,h,i)perylene	100	100	100	100	< 0.39	< 0.96	< 0.96	ND
Benz(a)pyrene	0.70	0.70	0.70	0.70	< 0.39	< 0.96	< 0.96	ND
Indeno(1,2,3-cd)pyrene	0.70	0.70	1.0	1.0	< 0.39	< 0.96	< 0.96	ND
Dibenzo(a,h)anthracene	0.70	0.70	0.70	0.70	< 0.39	< 0.96	< 0.96	ND
TPH	500	500	2,500	2,500	350	940	300	550
RCRA 8 Metals								
Silver	100	100	200	200	< 2.0	< 2.0	< 2.0	ND
Arsenic	30	30	30	30	1.1	0.79	0.65	0.85
Barium	1,000	1,000	2,500	2,500	15	23	13	17
Cadmium	30	30	80	80	< 1.0	< 1.0	< 1.0	ND
Chromium	1,000	1,000	2,500	2,500	150	64	49	88
Mercury	10	10	60	60	< 0.30	< 0.30	< 0.30	ND
Lead	300	300	600	600	< 10	< 10	< 10	ND
Selenium	300	300	2,500	2,500	< 1.0	< 1.0	< 1.0	ND

Notes

1. Concentration in boxes exceeds at least one of the criteria listed (i.e., MCP Standards or Soil Reuse Levels)
2. If a compound was not detected in a sample, then the detection limit is shown next to the less-than symbol. Detection limits were not used in the calculation of the average concentration.
3. Only those compounds detected in at least one sample are listed.

Legend

ND, Not Detected
NL, Value Not Listed

Table 3

Buckley & Mann

Lagoon 2 Data 13

(Samples collected October 25-26, 1995. All Results in mg/kg unless otherwise noted.)

	MCP Method 1 Standards				Soil Reuse Levels at Lined Landfills	Lagoon 2 (Area 2)						Average Concentration Lagoon 2
	S-1/GW-1	S-1/GW-3	S-2/GW-1	S-2/GW-3		BM-TP15-L2-NOR	BM-TP16-L2-NOR2	BM-TP17-L2-C1	BM-TP17-L2-C2	BM-TP18-L2-S1	BM-TP18-L2-S2	
Volatile Organic Compounds¹					10							
Acetone	3.0	60	3.0	60		< 0.055	< 0.055	0.11	< 0.060	< 0.056	0.14	0.042
1,4-dichlorobenzene	2.0	40	2.0	60		< 0.0027	< 0.0027	< 0.0036	< 0.0032	< 0.0028	0.0097	0.0016
Chlorobenzene	8.0	40	8.0	60		< 0.0027	< 0.0027	< 0.0036	< 0.0032	< 0.0028	< 0.0014	ND
1,3-dichlorobenzene	100	100	200	500		< 0.0027	< 0.0027	< 0.0036	< 0.0032	< 0.0028	0.011	ND
1,2-dichlorobenzene	100	100	200	500		< 0.0027	< 0.0027	< 0.0036	< 0.0032	< 0.0028	0.0028	ND
Ethylbenzene	80	500	80	500		< 0.0027	< 0.0027	< 0.0036	< 0.0032	< 0.0028	< 0.0014	ND
Tetrachloroethene	0.50	200	0.50	300		< 0.0027	< 0.0027	< 0.0036	< 0.0032	< 0.0028	< 0.0014	ND
Total Xylene	500	500	800	1,000		< 0.0027	< 0.0027	< 0.0036	< 0.0032	< 0.0028	< 0.0014	ND
Acid/Base Neutral Compounds²												
Carbazole	NL	NL	NL	NL		< 1.8	< 0.36	2.3	0.41	< 0.37	< 0.73	ND
2-methylnaphthalene	0.70	7.0	0.70	7.0		< 0.89	0.23	< 1.1	< 0.20	< 0.18	4.6	1.4
Naphthalene	4.0	100	4.0	1,000		< 0.89	0.87	< 1.1	< 0.20	< 0.18	1.0	0.21
Acenaphthene	20	1,000	20	2,000		< 0.89	0.18	< 1.1	< 0.20	< 0.18	1.7	0.43
Acenaphthylene	100	100	100	800		< 0.89	0.52	< 1.1	< 0.20	< 0.18	< 0.36	ND
Fluorene	400	900	400	1,000		< 0.89	0.18	< 1.1	< 0.20	< 0.18	0.69	0.20
Anthracene	1,000	1,000	1,000	1,000		< 0.89	0.18	< 1.1	< 0.20	< 0.18	< 0.36	ND
Fluoranthene	600	600	600	600		< 0.89	0.18	< 1.1	< 0.20	< 0.18	< 0.36	ND
Hexachlorobenzene	0.70	0.70	0.80	0.80		< 0.89	0.32	< 1.1	< 0.20	< 0.18	< 0.36	ND
Phenanthrene	700	100	700	100		< 0.89	0.18	< 1.1	< 0.20	< 0.18	< 0.36	ND
1,2,4-trichlorobenzene	100	400	100	800		< 0.89	0.18	< 1.1	< 0.20	< 0.18	0.64	ND
Dibenzofuran	NL	NL	NL	NL		0.93	0.71	< 1.1	< 0.20	< 0.18	0.79	0.41
Diethylphthalate	100	0.70	100	0.70		< 0.89	0.22	< 1.1	< 0.20	< 0.18	< 0.36	ND
Bis(2-ethylhexyl)phthalate	100	100	100	300		< 0.89	0.18	< 1.1	< 0.20	< 0.18	< 0.36	ND
Benzodanthracene	0.70	0.70	1.0	1.0		< 0.89	0.18	< 1.1	< 0.20	< 0.18	< 0.36	ND
Chrysene	7.0	7.0	10	10		< 0.89	0.18	< 1.1	< 0.20	< 0.18	< 0.36	ND
Pyrene	500	500	500	500		< 0.89	0.18	< 1.1	< 0.20	< 0.18	< 0.36	ND
Benzobifluorene	0.70	0.70	1.0	1.0		< 0.89	0.18	< 1.1	< 0.20	< 0.18	< 0.36	ND
Benzofluoranthene	7.0	7.0	10	10		< 0.89	0.18	< 1.1	< 0.20	< 0.18	< 0.36	ND
Benzog(h,i)perylene	100	100	100	100		< 0.89	0.18	< 1.1	< 0.20	< 0.18	< 0.36	ND
Benzofluoranthene	0.70	0.70	0.70	0.70		< 0.89	0.18	< 1.1	< 0.20	< 0.18	< 0.36	ND
Indeno(1,2,3-cd)pyrene	0.70	0.70	1.0	1.0		< 0.89	0.18	< 1.1	< 0.20	< 0.18	< 0.36	ND
Dibenzofluoranthene	0.70	0.70	0.70	0.70		< 0.89	0.18	< 1.1	< 0.20	< 0.18	< 0.36	ND
TPH	500	500	2,500	2,500	5,000	92	60	1,400	27	190	540	380
RCRA 8 Metals												
Silver	100	100	200	200	40	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	ND
Arsenic	30	30	30	30	40	< 0.71	< 0.25	< 1.7	< 0.25	< 0.25	0.54	0.49
Barium	1,000	1,000	2,500	2,500	31	< 31	< 31	54	21	14	20	29
Cadmium	30	30	80	80	80	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ND
Chromium	1,000	1,000	2,500	2,500	1,000	< 37	< 15	540	11	58	43	117
Mercury	10	10	60	60	10	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	ND
Lead	300	300	600	600	2,000	< 10	< 10	< 10	< 10	< 10	< 10	ND
Selenium	300	300	2,500	2,500		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ND

Notes

1. Concentration in boxes exceeds at least one of the criteria listed (i.e., MCP Standards or Soil Reuse Levels)
2. If a compound was not detected in a sample, then the detection limit is shown next to the less-than symbol. Detection limits were not used in the calculation of average concentration.
3. Only those compounds detected in at least one sample are listed.

Legend

ND, Not Detected
NL, Value Not Listed

Table 4

Buckley & Mann

October 1995 Test Pit Investigation Results

Test Pit Data for Soil Material to Remain On Site^{1,2}

(Samples collected October 25-26, 1995. All Results in mg/kg unless otherwise noted.)

	MCP Method 1 Standards				Soil Reuse Levels at Lined Landfills	Area 10		Area 12		Area 10		Area 6		Average Concentration	
	S-LGW-1	S-MGW-3	S-2GW-1	S-2GW-3		BM-TP1-PD	BM-TP5-MW1	BM-TP6-FP	BM-TP15-SD	BM-TP23-WD					
Volatile Organic Compounds ³															
Acetone	3.0	60	3.0	60	10	< 0.068	< 0.064	< 0.062	< 0.058	< 0.058	< 0.058	< 0.058	ND		
1,4-dichlorobenzene	2.0	40	2.0	60		< 0.034	< 0.032	< 0.031	< 0.029	< 0.029	< 0.029	< 0.028	ND		
Chlorobenzene	8.0	40	8.0	40		< 0.034	< 0.032	< 0.031	< 0.029	< 0.029	< 0.029	< 0.028	ND		
1,3-dichlorobenzene	100	100	200	500		< 0.034	< 0.032	< 0.031	< 0.029	< 0.029	< 0.029	< 0.028	ND		
1,2-dichlorobenzene	100	100	200	500		< 0.034	< 0.032	< 0.031	< 0.029	< 0.029	< 0.029	< 0.028	ND		
Ethylbenzene	80	500	80	500		< 0.034	< 0.032	< 0.031	< 0.029	< 0.029	< 0.029	< 0.028	ND		
Tetrachloroethene	0.50	200	0.50	300		< 0.034	< 0.032	< 0.031	< 0.029	< 0.029	< 0.029	< 0.028	ND		
Total Xylenes	500	500	800	1,000		< 0.034	< 0.032	< 0.031	< 0.029	< 0.029	< 0.029	< 0.028	ND		
Acid/Base Neutral Compounds ³															
Carbazole	NL	NL	NL	NL		2.9	< 0.83	< 0.38	< 0.38	< 0.38	< 0.38	< 0.37	0.58		
2-methylnaphthalene	0.70	7.0	0.70	7.0	< 0.43	< 0.42	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	ND			
Naphthalene	4.0	100	4.0	1,000	0.45	< 0.42	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	ND			
Acenaphthene	20	1,000	20	2,000	1.7	< 0.42	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	0.44			
Acenaphthylene	100	100	100	800	< 0.43	< 0.42	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	ND			
Fluorene	400	900	400	1,000	1.8	< 0.42	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	0.36			
Anthracene	1,000	1,000	1,000	600	4.5	< 0.42	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	0.90			
Fluoranthene	600	600	600	600	13	< 0.42	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	2.7			
Hexachlorobenzene	0.70	0.70	0.80	0.80	< 0.43	< 0.62	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	ND			
Phenanthrene	700	100	700	100	16	< 0.42	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	3.3			
1,2,4-trichlorobenzene	100	400	100	800	< 0.43	< 0.42	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	ND			
Dibenzofuran	NL	NL	NL	NL	1.1	< 0.42	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	0.22			
Diethylphthalate	100	0.70	100	0.70	0.48	< 0.42	< 0.31	< 0.19	< 0.19	< 0.19	< 0.21	ND			
Bis(2-ethylhexyl)phthalate	100	100	100	300	< 0.43	< 0.42	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	ND			
Benzofluoranthene	0.70	0.70	1.0	1.0	6.7	< 0.42	< 0.19	< 0.19	< 0.20	< 0.20	< 0.19	1.4			
Chrysene	7.0	7.0	10	10	6.5	< 0.42	< 0.19	< 0.20	< 0.25	< 0.25	< 0.19	1.4			
Pyrene	500	500	500	500	14	< 0.42	< 0.19	< 0.20	< 0.35	< 0.35	< 0.19	2.9			
Benzofluoranthene	0.70	0.70	1.0	1.0	6.3	< 0.42	< 0.19	< 0.19	< 0.27	< 0.27	< 0.19	1.3			
Benzofluoranthene	7.0	7.0	10	10	2.1	< 0.42	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	0.42			
Benzofluoranthene	100	100	100	100	3.6	< 0.42	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	0.72			
Benzofluoranthene	0.70	0.70	0.70	0.70	5.4	< 0.42	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	1.1			
Indeno(1,2,3-cd)pyrene	0.70	0.70	1.0	1.0	2.9	< 0.42	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	0.58			
Dibenzofluoranthene	0.70	0.70	0.70	0.70	0.93	< 0.42	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	ND			
TPH	500	500	2,500	2,500	74	830	38	25	2.700	2.700	730	730			
RCRA 8 Metals															
Silver	100	100	200	200	< 2.0	22	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	4.4			
Arsenic	30	30	30	30	3.7	12	3.6	6.4	6.4	6.4	9.6	7.1			
Barium	1,000	1,000	2,500	2,500	44	590	50	150	150	150	26	170			
Cadmium	30	30	80	80	< 1.0	21	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	4.2			
Chromium	1,000	1,000	2,500	2,500	23	1,600	23	59	59	59	480	480			
Mercury	10	10	60	60	2.2	0.36	1.0	< 0.30	< 0.30	< 0.30	< 0.30	0.71			
Lead	300	300	600	600	83	800	240	120	120	120	20	250			
Selenium	300	300	2,500	2,500	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ND			

Notes

1. Concentration in boxes exceeds at least one of the criteria listed (i.e., MCP Standards or Soil Reuse Levels)
2. If a compound was not detected in a sample, then the detection limit is shown next to the less-than symbol. Detection limits were not used in the calculation of the average concentration.
3. Only those compounds detected in at least one sample are listed.

Legend

ND, Not Detected
NL, Value Not Listed

Table 5

Buckley & Mann

Test Pit Data for Materials to be Removed^{1,2}
(Samples collected October 25-26, 1995. All Results in mg/kg unless otherwise noted.)

	MCP Method 1 Standards			Soil Reuse Levels at Lined Landfills	Area 4 (Drum Material)		Area 10	Area 10	Area 3	Area 5
	S-1/GW-1	S-1/GW-3	S-2/GW-1		BM-DM-C1	BM-DM-C2				
Volatile Organic Compounds³				10						
Acetone	3.0	60	3.0		NA	NA	< 0.060	< 0.060	< 0.058	< 0.063
1,4-dichlorobenzene	2.0	40	2.0		NA	NA	< 0.0030	< 0.0030	< 0.0029	< 0.0032
Chlorobenzene	8.0	40	8.0		NA	NA	< 0.0030	< 0.0030	< 0.0029	< 0.0032
1,3-dichlorobenzene	100	100	200		NA	NA	< 0.0030	< 0.0030	< 0.0029	< 0.0032
1,2-dichlorobenzene	100	100	200		NA	NA	< 0.0030	< 0.0030	< 0.0029	< 0.0032
Ethylbenzene	80	500	80		NA	NA	< 0.0030	< 0.0030	< 0.0029	< 0.0032
Tetrachloroethene	0.50	200	0.50		NA	NA	< 0.0030	< 0.0030	< 0.0029	< 0.0032
Total Xylenes	500	500	800		NA	NA	< 0.0030	< 0.0030	< 0.0029	< 0.0032
Acid/Base Neutral Compounds³										
Carbazole	NL	NL	NL		< 8.8	< 3.5	2.3	< 0.48	< 0.38	< 2.1
2-methylnaphthalene	0.70	7.0	0.70		130	4.4	< 0.70	< 0.24	< 0.19	< 1.0
Naphthalene	4.0	100	4.0		12	4.0	< 0.70	< 0.24	< 0.19	< 1.0
Acenaphthene	20	1,000	20		35	18	0.74	< 0.24	< 0.19	< 1.9
Acenaphthylene	100	100	100		< 4.4	< 1.8	< 0.70	< 0.24	< 0.19	< 1.0
Fluorene	400	900	400		18	8.0	0.88	< 0.24	< 0.19	< 1.0
Anthracene	1,000	1,000	1,000		< 4.4	< 1.8	3.0	< 0.24	< 0.19	< 1.0
Fluoranthene	600	600	600		< 4.4	< 1.8	16	< 0.24	< 0.19	< 1.0
Hexachlorobenzene	0.70	0.80	0.80		< 4.4	< 1.8	< 0.70	< 0.24	< 0.19	< 1.0
Phenanthrene	700	100	700		7.6	3.8	11	< 0.24	< 0.19	< 1.0
1,2,4-trichlorobenzene	100	400	100		35	16	< 0.70	< 0.24	< 0.19	< 1.3
Dibenzofuran	NL	NL	NL		23	9.8	< 0.70	< 0.24	< 0.19	< 1.0
Diethylphthalate	100	100	100		< 4.4	2.0	< 0.70	< 0.24	< 0.19	< 1.0
Bis(2-ethylhexyl)phthalate	100	100	100		< 4.4	3.7	< 0.70	< 0.24	< 0.19	< 1.0
Benzofuran	0.70	0.70	1.0		< 4.4	< 1.8	10	< 0.24	< 0.19	< 1.0
Chrysene	7.0	7.0	10		< 4.4	< 1.8	10	< 0.24	< 0.19	< 1.0
Pyrene	500	500	500		< 4.4	< 1.8	15	< 0.24	< 0.19	< 1.0
Benzofluoranthene	0.70	0.70	1.0		< 4.4	< 1.8	4.4	< 0.24	< 0.19	< 1.0
Benzokluoranthene	7.0	7.0	10		< 4.4	< 1.8	7.3	< 0.24	< 0.19	< 1.0
Benzog(h,i)perylene	100	100	100		< 4.4	< 1.8	9.1	< 0.24	< 0.19	< 1.0
Benzofluoranthene	0.70	0.70	0.70		< 4.4	< 1.8	5.9	< 0.24	< 0.19	< 1.0
Indeno(1,2,3-cd)pyrene	0.70	0.70	1.0		< 4.4	< 1.8	1.8	< 0.24	< 0.19	< 1.0
Dibenzofluoranthene	0.70	0.70	0.70		< 4.4	< 1.8	1.8	< 0.24	< 0.19	< 1.0
TPH	500	500	2,500	5,000	5,100	6,000	650	130	550	< 25
RCRA 9 Metals										
Silver	100	100	200		< 2.0	< 2.0	3.6	< 2.0	< 2.0	< 2.0
Arsenic	30	30	30	40	17	10	9.3	3.4	4.3	2.4
Barium	1,000	1,000	2,500		31	25	290	1,300	22	24
Cadmium	30	30	80	80	< 1.0	< 1.0	8.2	20	< 1.0	< 1.0
Chromium	1,000	1,000	2,500	1,000	1,300	920	340	1,900	890	1,100
Mercury	10	10	60	10	< 0.30	< 0.30	0.44	1.7	0.33	< 0.30
Lead	300	300	600	2,000	23	16	750	5,000	23	20
Selenium	300	300	2,500		< 1.0	< 1.0	< 1.0	1.2	< 1.0	< 1.0

Notes

1. Concentration in boxes exceeds at least one of the criteria listed (i.e., MCP Standards or Soil Reuse Levels)
2. If a compound was not detected in a sample, then the detection limit is shown next to the less-than symbol. Detection limits were not used in the calculation of the average concentration.
3. Only those compounds detected in at least one sample are listed.

Legend

NA, Not Analyzed
NL, Value Not Listed

Background samples

- The metals concentrations were measured in a native sandy mineral soil sample (BM-MIN) collected from the hillside south of Lagoon #1. The sample contained metals concentrations below detection limits and below the DEP's Background Soil Concentrations for rural and suburban soils. The sample was not analyzed for organic chemicals because these were not likely to be present.
- The SVOC, TPH and metals concentrations were measured in a humus-rich top soil sample (BM-PUG) collected from one of many small soil piles south of Lagoon #3. The location and appearance of the humus soil piles suggest that the humus was relocated to its current location in 1979 from the area where Lagoons #2 and #3 were built. Sample BM-PUG contained 250 mg/kg TPH, but no SVOC compounds were found above detection limits, other than a trace of diethylphthalate (see Specific Chemicals, below). The TPH in this humic soil sample likely is from naturally occurring plant waxes and similar compounds in decayed vegetation.

Metals concentrations in the sample were well below NSR criteria. Traces of arsenic, chromium and lead were found, although the concentrations were below the DEP's draft Background Concentrations for rural and suburban soils. Barium slightly exceeded the DEP Background Concentration.

- The SVOC, TPH and metals concentrations were measured in a soil/sediment sample (BM-ORG) collected at the edge of Bush Pond south of Lawrence Street, upstream of B&M and away from the street. The sample contained several PAH compounds at concentrations up to 1.4 mg/kg. Some of these concentrations exceeded the 0.7 mg/kg MCP S-1 NSR criteria. PAH compounds are ubiquitous in soils and sediments near fossil fuel (particularly coal) combustion sources, such as the coal fired boiler operated by B&M for several decades and near roads in urban and suburban locations.

The soil/sediment sample contained 440 mg/kg TPH, but no compounds other than the PAHs were found above detection limits. The PAHs account for not more than 12 mg/kg of the TPH. The remainder of the TPH is likely of natural origin, as explained above.

Specific Chemicals

- PCBs were not found in the three samples tested.
- Dieldrin, a chlorinated pesticide used to moth proof wool, was found at 0.91 mg/kg in the drummed soils scraped from Lagoon #1 in 1988 (Area 4). Traces (0.021 mg/kg) of dieldrin and heptachlorepoxyde (0.005 mg/kg), a degradation product of heptachlor, another pesticide, were found in Lagoon #1 bottom soils, but at concentrations below the

5.0 SOIL AND GROUNDWATER CLASSIFICATIONS

Soils and groundwater with contaminant concentrations below MCP No Significant Risk (NSR) criteria require no further remediation, except where remediation to (or approaching) background concentrations would be technically or economically feasible. The MCP discourages remediation to background concentrations if the action would damage wetlands or other protected resource areas.

Soil

The east side of the Tail Race, including the Carbonizer, coal ash and debris disposal area, and the Carbonizer Lagoon, is zoned Residential 3. The west side of the Tail Race, including Lagoons #1 and #2, is zoned Commercial 2 (for the former textile manufacturing operations), but may be changed to residential zoning in the future. The nearest residential properties abutting the perimeter of the site are at least 300 feet from where contaminants were found in this site assessment.

The site is currently unused. Children are present infrequently (trespass) on the site and, if present, conduct passive activities within the MCP definition of low intensity use. In the future, with development of residential property on the site, patterns will not change significantly in the areas subject to this assessment because Lagoons #1 and #2 will revert to wetlands (see below), and the Carbonizer, coal ash and debris disposal area will remain undeveloped woodlands within a wetlands buffer zone. Hence, the soils within three feet of the surface will be classified S-2 for comparison to the MCP Method 1 and/or Method 2 NSR criteria.

Lagoons #1 and #2 were constructed as facultative wastewater treatment ponds for the dye house wastewater. These shallow lagoons were designed to infiltrate treated wastewater to the Tail Race after filtration through the sandy lagoon bottoms. Because the lagoon bottoms are below the groundwater table much of the year, infiltration is slow. Lagoon #1 contains approximately 12 inches of water, except during summer droughts. In Lagoon #2, the northern quarter retains surface water in a summer with average rainfall, but the remainder of the lagoon bottom is slightly above the water table. As these lagoons were constructed for wastewater treatment, they are not considered ponds under wetlands regulations. The material on the bottom of the lagoons is soil, not sediment.

Groundwater

Through the end of operations in 1995, the manufacturing building and the office on the site were served by private bedrock production wells. Groundwater elevations measured in disposal area monitoring wells showed that the production wells were upgradient of the disposal areas. Data from 1986, the last year the dyehouse produced wastewater, showed that groundwater quality was unaffected by the disposal areas, except for the 30 foot wide strip separating Lagoons #1 and

8.0 RISK ASSESSMENT

For the B&M site, CDM recommends that risks be evaluated with MCP Method 1 for the Carbonizer, coal ash and debris area. For Lagoons #1 and #2, CDM recommends that the risks be evaluated by MCP Method 2, to adjust the Method 1 limit to consider the site specific leaching component for methylnaphthalene and related compounds. The risk assessment approach should proceed as follows:

- Resample Carbonizer, coal ash and demolition debris area (Area 10) after unsuitable material is removed for off-site disposal or reuse. Collect samples in a grid system with randomized sample locations within each grid cell. Analyze the samples for metals and base/neutral SVOCs and compare the results with the MCP Method 1 S-2 soil criteria. This approach will eliminate any bias toward samples which visually appeared most contaminated and provide a fair basis to estimate average exposure point concentrations.
- Test groundwater from monitoring wells MW-1, MW-2, MW-4, MW-5 and MW-6 for soluble metals and SVOCs to confirm 1986 findings that groundwater in these areas is not contaminated.
- For methylnaphthalene and related compounds in Lagoons #1 and #2, evaluate the leaching component and available dilution by MCP Method 2. If bioremediation is necessary, as described in Section 8.0 above, resample soils after treatment and compare the results to MCP Method 1 risk assessment criteria.

CDM anticipates that an Activity and Use Limitation may be required to restrict future residential development in Area 10, the Carbonizer, coal ash and demolition debris area, because the soils may exceed S-1, but not S-2 criteria after remediation.

9.0 FINAL DISPOSITION

Lagoons #1 and #2

After reaching a MCP Response Action Outcome, CDM recommends that B&M connect Lagoons #1 and #2 with the existing wetlands system immediately to the north of Lagoon #2. This work would require approval from the Norfolk Conservation Commission (NCC). The proposed work would be to:

- Raise the bottom of Lagoon # 1 to elevation 163.5 by adding approximately one foot of clean sand fill, available on-site. Breach the dike at the north end of Lagoon #1 at an invert elevation of 163.5 to create a drain to Lagoon #2.
- Raise the bottom of the middle and north end of Lagoon # 2 to elevation 162.0 by adding approximately 0.6 feet of clean sand fill, available on-site. Breach the dike at the northwest corner of Lagoon #2 at an invert elevation of 162.0 and construct a short trench to the existing drainage swale at the northeast corner of Lagoon #3.
- Seed Lagoons #1 and #2 with wetlands vegetation.

B&M may request from the NCC that the wetlands created from Lagoons #1 and #2 be allowed to offset future wetlands losses during site development. This concept is referred to as "banking".

Carbonizer, Coal Ash and Debris Disposal Area

The site would be regraded as needed to fill excavation holes and create a uniform bank sloping down toward the wetlands north of this area. Clean sand available on-site would be used to replace material removed for off site disposal or reuse. The area would be hydroseeded with grasses for an initial cover. Additional vegetation such as tree saplings may be added, depending on the degree of forest clearing required during the debris removal work.

10.0 RELEASE ABATEMENT MEASURE (RAM) PLAN

Assessment only activities, such as groundwater sampling, may be done without a RAM Plan.

Removal of debris and contaminated soil may be done as part of a Comprehensive Response Action, or more conveniently, a RAM. Hence, CDM has prepared a RAM Plan for the work in the Carbonizer, coal ash and debris disposal area. Work may begin 21 days after the plan is received by hand or certified mail by the DEP (regional office in Woburn) based on presumptive approval, assuming that the DEP has no comments. Other notification requirements must be followed, as explained in the Public Involvement section below.

Because more than 1,500 cubic yards of material may be excavated, B&M must prepare a letter documenting that adequate funds are available for the work.

A brief summary of the RAM Plan containing the specific information required by the DEP and the transmittal form is enclosed, and references this Site Assessment and Remediation Status Report for pertinent information.

11.0 PUBLIC INVOLVEMENT REQUIREMENTS

Submittal of this Site Assessment and Remediation Status Report (minus the laboratory report volume) and the RAM Plan would satisfy the requirements marked with an asterisk.

MCP Regulations

The MCP requires that B&M submit the following to the Chief Municipal Officer (in Norfolk, the selectmen) and the Board of Health:

- 7 day advance notice prior to implementation of a RAM *
- Notice of completion statements
- (additional requirements, depending on the MCP path)

Per Mr. Hughs' request, these notices should also be sent to the Zoning Board. *

Norfolk Conservation Commission

The NCC Order of Conditions requires that B&M submit the following to the NCC:

- A copy of any DEP comments on the RAM Plan
- A schedule for field work in the assessment phase (verbal notice submitted in October 1995)
- Notice of completion of the assessment phase *
- All laboratory data *
- Plans for additional field sampling/assessment, if required to expand the October 1995 work *
- 48 hour advance notice prior to conducting field work
- Request for final inspection (at project completion)

APPENDIX A
TEST PIT DESCRIPTIONS

APPENDIX A

Description of Test Pits at B&M

The following observations were made during a field sampling program at the Buckley & Mann Inc. property on October 25 and 26, 1996. The field program involved the excavation of twenty-three test pits and sampling of soils from the excavations. The test pits were excavated in areas previously identified by CDM as possible disposal areas. Most of the test pits were excavated into piles of debris deposited above the original topography and extended into native soils. Samples were collected based on visual observations and were generally collected from the side walls, with a bias toward non-native materials. The following is a brief description of each of the test pit excavations.

Refer to Drawing C-3 in the main text of the report for sample locations.

Test Pit No. 1 - This test pit is near the Carbonizer Lagoon trench and contained concrete debris and small cobbles. Groundwater was observed at 2.6 ft below the surface. A paper drum with a plastic liner was observed above ground adjacent to this test pit. The capacity of the drum was approximately 25 gallons and contained about 2 gallons of water (the drum was labeled ICO-211). Sample BM-TP1-PD was collected from the test pit.

Test Pit No. 2 - This test pit is west of TP1, just inside the wood line behind a pile of timbers. Groundwater was observed at 1 ft below the surface. Cloth rags, buttons, concrete debris, brick, and tar paper shingles were observed. Sample BM-TP2-BT was collected from the test pit.

Test Pit Nos. 3 and 4 - These test pits are near MW-1, and contained some metal debris and brick, but appeared more like native material. Groundwater was observed 2 ft below grade. No samples were collected.

Test Pit No. 5 - This test pit is adjacent to MW-1, and contained cloth rag material, glass bottles, large rocks, remains of a 55-gallon drum, metal piping, and plastic sheets. Sample BM-TP5-MW1 was collected from the test pit.

Test Pit No. 6 - This test pit is in an area identified as the fire pit and contained charred wood, brick and concrete debris. Sample BM-TP6-FP was collected from the backhoe bucket.

Test Pit No. 7 - This test pit contained some concrete debris, but appeared mostly as native material. No sample was collected.

Test Pit No. 8 - This test pit contained metal debris, large pieces of sheet metal, wood debris, a porcelain sink, granite pieces, tar paper, and a light fixture. Sample BM-TP8-KS was collected.

Test Pit No. 9 - This test pit contained brick and concrete debris, similar to material observed in

other test pits. No sample was collected.

Test Pit No. 10 - This test pit contained cloth rags, buttons and metal shavings (from a process belt). The iron rust made the excavated material red. Sample BM-TP10-RB was collected from the backhoe bucket.

Test Pit Nos. 11 & 12 - These test pits, near MW-4, contained native soil. No samples were collected.

Test Pit No. 13 - This test pit, adjacent to the Tail Race, contained native soil. No sample was collected.

Test Pit No. 14 - This test pit, adjacent to the Tail Race, contained brick, concrete debris and piece of pipe in concrete. A thin layer of red and black material similar to the material found in TP10 was observed. No sample was collected.

Test Pit No. 15 - This test pit contained sand, brick and plastic sheeting. The sand appears to have been piled on the plastic sheeting. Below the sheeting, a layer of reddish material and coal and ash was observed. Sample BM-TP15-SD was collected from the backhoe bucket.

Test Pit No. 16 - This test pit is in Lagoon No. 2 at the north end of the lagoon. Two soil samples were collected, a surficial sample and a second at approximately 3 feet below grade. The material was mostly rock mixed with grey sand. Black staining on the sidewall was noted as well as a sheen on the water that had accumulated in the excavation. Sample BM-TP16-L2-NOR2 was collected at depth from the area of black staining. Sample BM-TP16-L2-NOR1 was collected at the surface.

Test Pit No. 17 - This test pit is in the center of Lagoon No. 2. Two samples were collected, BM-TP17-L2-C1 near the surface and BM-TP17-L2-C2 at approximately 3 feet below grade. The material was similar to that observed in TP16 but more sand.

Test Pit No. 18 - This test pit is at the southern end of Lagoon No. 2. The soil was stony mixed with brown sand and grey and black sand. There was a black layer and then a greenish/grey clay layer. An organic odor was detected in the deeper sample (no measurable reading on the OVM). Two samples were collected, BM-TP18-L2-S1 near the surface and BM-TP18-L2-S2 at approximately 3 feet below grade.

Test Pit No. 19 - This test pit is at the north end of Lagoon No. 1. Test pit was excavated in approximately 1 ft of water. The material was medium coarse black sandy soil with a petroleum odor. Sample BM-TP19-L1-N1 was collected approximately three feet below grade.

Test Pit No. 20 - This test pit is in the center of Lagoon No. 1. Layers of sand, rocks and leaves were observed. Sample BM-TP20-L1-C1 was collected approximately three feet below grade.

and has a petroleum odor.

Test Pit No. 21 - This test pit is at the southern end of Lagoon No. 1. The material was sandy and black with a petroleum odor. Sample BM-TP21-L1-S1 was collected approximately three feet below grade.

Test Pit No. 22 - This test pit is in a pile of soil excavated from Lagoon No. 1 prior to 1975 and contained rag fragments and a light brown sand. Sample BM-TP22-P75 was collected.

Test Pit No. 23 - This test pit is where the soils excavated from the trench from the dyehouse to Lagoon #1 were placed in approximately 1986. A layer of leaves and small pieces of cloth rag was observed. Sample BM-TP23-WD was collected.

Manual sample- Composite (grab samples from 5 locations were composited) sample BM-COMP-P88 was collected manually from a pile of material dredged from Lagoon No. 1 in 1988. The material consisted of mostly decomposed leaves.

Manual samples- Two samples were composited from 14 55-gallon drums that contain material scraped from Lagoon No. 1 in 1988 and material collected in 1986 from wooden drums that contained dye paste. Visually, the material in the 14 drums was indistinguishable. Two composite samples (a sample was collected from 7 drums for one composite, and the remaining 7 drums were used for the second composite sample) were collected manually and identified as BM-DM-C1 and BM-DM-C2. The drums contained a mixture of dark sand and leaves. Six of the drums contained several inches of water (probably rain water that had leaked through the roof of the storage building). Some of the drums contained paint chips which appeared to have peeled off the ceiling.

Manual samples- Three background samples were collected manually from the following locations:

Organic Material

- A pile located upgradient from Lagoon No. 3 (BM-PUG)
- An area off the property located across the street on the lip of Bush Pond (BM-ORGO)

Inorganic Material

- From a sand bank upgradient from Lagoon No. 1 (BM-MIN)

APPENDIX B

NORFOLK CONSERVATION COMMISSION ORDER OF CONDITIONS

(To be provided by DEP)

Form 5

City/Town NORFOLKApplicant Buckley & Mann, Inc.Commonwealth
of Massachusetts

Order of Conditions
Massachusetts Wetlands Protection Act
G.L. c. 131, §40 & NORFOLK WETLAND PROTECTION BYLAW

From Norfolk Conservation Commission Issuing Authority

To Buckley & Mann, Inc. same
 (Name of Applicant) (Name of property owner)

Address 14 Bush Pond Road, Norfolk Address same

This Order is issued and delivered as follows:

☐ by hand delivery to applicant or representative on _____ (date)☒ by certified mail, return receipt requested on August 14, 1995 (date)This project is located at 17 Lawrence St., Norfolk, MAThe property is recorded at the Registry of Norfolk CountyBook 1989, 4973 Page 475, 494

Certificate (if registered) _____

The Notice of Intent for this project was filed on 6/7/95 (date)The public hearing was closed on 7/20/95 (date)**Findings**

The Conservation Comm. has reviewed the above-referenced Notice of Intent and plans and has held a public hearing on the project. Based on the information available to the Commission at this time, the Commission has determined that the area on which the proposed work is to be done is significant to the following interests in accordance with the Presumptions of Significance set forth in the regulations for each Area Subject to Protection Under the Act (check as appropriate):

<input checked="" type="checkbox"/> Public water supply	<input checked="" type="checkbox"/> Flood Control	<input type="checkbox"/> Land containing shellfish
<input checked="" type="checkbox"/> Private water supply	<input checked="" type="checkbox"/> Storm damage prevention	<input checked="" type="checkbox"/> Fisheries
<input checked="" type="checkbox"/> Ground water supply	<input checked="" type="checkbox"/> Prevention of pollution	<input checked="" type="checkbox"/> Protection of Wildlife Habitat

Total Filing Fee Submitted \$525.00 State Share \$250.00
 (1/2 fee in excess of \$25)

City/Town Share \$275.00

Total Refund Due \$ _____ City/Town Portion \$ _____ State Portion \$ _____
 (1/2 total) (1/2 total)

cc: DEP
 Robert Dangel, Camp, Dresser, McKe
 Board of Health
 Building Dept.
 Planning Board
 Water Commissioners

Therefore, the Commission hereby finds that the following conditions are necessary, in accordance with the Performance Standards set forth in the regulations, to protect those interests checked above. The Commission orders that all work shall be performed in accordance with said conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications or other proposals submitted with the Notice of Intent, the conditions shall control.

General Conditions

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state or local statutes, ordinances, by-laws or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
 - (a) the work is a maintenance dredging project as provided for in the Act; or
 - (b) the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance and both that date and the special circumstances warranting the extended time period are set forth in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. Any fill used in connection with this project shall be clean fill, containing no trash, refuse, rubbish or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles or parts of any of the foregoing.
7. No work shall be undertaken until all administrative appeal periods from this order have elapsed or, if such an appeal has been filed, until all proceedings before the Department have been completed.
8. No work shall be undertaken until the Final order has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of registered land, the Final order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is to be done. The recording information shall be submitted to the Commission on the form at the end of this Order prior to commencement of the work.
9. A sign shall be displayed at the site not less than two square feet or more than three square feet in size bearing the words,
"Massachusetts Department of Environmental Protection,
File Number 240-197"
10. Where the Department of Environmental Protection is requested to make a determination and to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before the Department.

11. Upon completion of the work described herein, the applicant shall forthwith request in writing that a Certificate of Compliance be issued stating that the work has been satisfactorily completed.

12. The work shall conform to the following plans and special conditions:

Plans:

Title	Dated	Signed and Stamped by:	On File with:
Attachment 1, Site Location (USGS), Project Description			
Plan C-1, Buckley & Mann Property:	2/28/95		
Plan C-2; Overlays and Limits of Work,	2/28/95		
Plan C-3; Assessment and Remediation Areas;	2/28/95		
Plan C-4; Lagoon #2 and Tail Race (Cross Section);	2/28/95		
Attachment 2; Site Assessment and Remediation Work Plan;	May 1995		
Special Conditions (Use additional paper if necessary)			

1. All work will be conducted in accordance with the submittal from Camp Dresser, and McKee, dated May 1995, entitled "Site Assessment and Remediation Work Plan for Buckley and Mann, Inc., Norfolk, Massachusetts", dated May, 1995. As part of the work, a Release Abatement Measure (RAM) Plan will be submitted to the Department of Environmental Protection (DEP). Once approval has been granted for the plan, the approved RAM Plan will be incorporated into these Orders. Should the DEP have specific conditions for the RAM Plan, a copy of those conditions will be sent to the Conservation Commission and these conditions will be incorporated into these Orders.

continued on following pages

(Leave Space Blank)

2. A detailed schedule for the assessment phase of the project shall be submitted to the Conservation Commission prior to starting work. A schedule detailing the remediation tasks will be submitted at the completion of the assessment phase. Notice will be given to the Conservation Commission once the assessment phase is completed.
3. All existing monitoring wells will be sampled for the appropriate laboratory parameters necessary for assessing the site. In addition, all laboratory data generated during this assessment and remediation shall be submitted to the Conservation Commission.
4. Should the assessment data show that additional assessment of the impacted areas is necessary, the Conservation Commission will be notified, IN WRITING, of the necessary changes. The notice should include the areas where the assessment will be performed, any modifications to the sampling and laboratory parameters, if necessary, and a revised project schedule. A written notice to proceed will be issued by the Conservation Commission within 10 days.
5. Erosion control barriers shall be installed along the edge of the BVW to demarcate the LIMIT OF WORK and to prevent erosion/sedimentation to the resource area.
6. No work is to be performed until the erosion controls are installed. Once the erosion controls are installed, it is the responsibility of the applicant to request a site inspection by the Commission. Once the Commission gives its approval of the erosion controls, the work may commence. The Commission reserves the right to request any additional erosion controls for the protection of the resource areas.
7. During clearing operations, trees adjacent to the wetlands should be felled away from the wetland and should be removed from the buffer.
8. Members and agents of the Conservation Commission shall have the right to enter and inspect the premises to evaluate and ensure compliance with the conditions, the Act, 310 CMR 10.00, and the Norfolk Wetland Protection Bylaw, and may acquire any information, measurements, photographs, observations, and/or materials or may require the submittal of any data or information deemed necessary by this Commission for that evaluation.
9. The applicant or his representative shall notify the Conservation Commission, in writing, 48 hours before any activity commences on the site.

10. Any changes made or intended to be made in the plans shall require the applicant to file a new Notice of Intent, or to inquire of the Conservation Commission, in writing, whether the change is substantial enough to require a new filing.

11. Proof of recording of this Order of Conditions in the Norfolk County Registry of Deeds must be presented to the Commission prior to any work activity.

12. Before a Certificate of Compliance is issued for this project the following conditions must be met:

- a. Any disturbed soils must be stabilized with a permanent vegetative cover to the satisfaction of the Commission
- b. A written request for a final inspection must be submitted to the Commission AT LEAST 21 DAYS PRIOR TO ANY ANTICIPATED SIGN OFF FOR THE PROJECT

13. Please refer to the additional conditions on the following page entitled, "INSTRUCTIONS TO APPLICANTS".

INSTRUCTIONS TO APPLICANT

The Order of Conditions issued pursuant to your hearing before the Norfolk Conservation Commission is enclosed.

Please read these conditions carefully and make sure that all work is done in accordance therewith.

We wish to point out that you are obligated to:

1. Record the Order at the Registry of Deeds in Dedham and mail proof of recording to the Conservation Commission.
2. No work may begin until:
 - a. The recording information is returned to the Conservation Commission;
 - b. Ten (10) business days have elapsed from the date you receive the Order of Conditions; and
 - c. You have given the Conservation Commission twenty-four (24) hours notice that work is to commence.
3. Any change made or intended to be made in the plans submitted to the Conservation Commission shall require that you notify the Conservation Commission in writing of the change.
4. A sign not less than two feet (2') square or more than three feet (3') square bearing the DEP File Number shall be posted at the work site. (See Condition 9 on the Order of Conditions.) Also, a copy of the site plans must be kept on site at all times.
5. Upon completion of the work, notice is to be given to the Conservation Commission for final inspection. If all conditions on the Order have been complied with, a Certificate of Compliance will be issued.
6. If the work will not be completed within three years from the date of the Order, an extension may be requested by written application to the Commission at least thirty (30) days prior to the expiration date of the original Order. If this is not done, the Order will expire and a new hearing will be required. No certificate of compliance will be issued by the Commission for work undertaken pursuant to an expired Order of Conditions.

Failure to comply with all of the conditions stated in the Order of Conditions shall be sufficient reason to revoke or modify the Order.

NORFOLK CONSERVATION COMMISSION

10/90

Issued By Norfolk Conservation Commission

Signature(s) Alan M. Shaw Thomas R. Hebert
Wayne T. Wagner
Aprelia C. Andrade

This Order must be signed by a majority of the Conservation Commission.

On this 14th day of August 19 95, before me personally appeared Andrew J. Beckwith, to me known to be the person described in and who executed the foregoing instrument and acknowledged that he/she executed the same as his/her free act and deed.

Paul A. Simpson September 4, 1995
Notary Public My commission expires

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land upon which the proposed work is to be done, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the Department of Environmental Protection to issue a Superseding Order, providing the request is made by certified mail or hand delivery to the Department, with the appropriate filing fee and Fee Transmittal Form as provided in 310 CMR 10.03(7), within ten days from the date of issuance of this determination. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and the applicant.

Detach on dotted line and submit to the Norfolk Conservation Commission to commencement of work.

To Norfolk Conservation Commission Issuing Authority

Please be advised that the Order of Conditions for the project at 17 Lawrence St (Buckley & Mann, Inc.)
File Number 240-191 has been recorded at the Registry of Norfolk County and

has been noted in the chain of title of the affected property in accordance with General Condition 8 on
 , 19 .

If recorded land, the instrument number which identifies this transaction is

If registered land, the document number which identifies this transaction is

Signature Applicant