APPENDICES

1. Sedimentary Chemistry Data from Chapter 3
2. Water Quality Data from Chapter 6

APPENDIX 1

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

TPH ANALYSIS BY STANDARD METHODS 5520 A, E, & F

CITY/TOWN: Hamilton
COLLECTOR: J. Sablock

Source A Lake Chebaco, #6A
Source B Lake Chebaco, #7A
Source C Lake Chebaco, #8A
Source D Lake Chebaco, #9A
Source E Lake Chebaco, #10A

	A	B	C	D	E
Sample No.	L980307-6	L980307-7	L980307-8	L980307-9	L980307-10
Date of Collection	4/6/98	4/6/98	4/6/98	4/6/98	4/6/98
Date of Receipt	4/8/98	4/8/98	4/8/98	4/8/98	4/8/98
Date Analyzed	4/14-22/98	4/14-22/98	4/14-22/98	4/14-22/98	4/14-22/98
Total petroleum hydrocarbons (ug/g)	ND	ND	ND	ND	ND
Spike % Recovery					

REMARKS: The samples were analyzed according to Methods 5520A, E & F "Extraction Method for Sludge Samples". Standard Methods, 18th Edition, 1992.

ND = Not detected or the analytical result is at or below the established MDL of 45. ug/g.

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

TPH ANALYSIS BY STANDARD METHODS 5520 A, E, & F

CITY/TOWN: Hamilton
COLLECTOR: J. Sablock

Source A Lake Chebaco, #1A
Source B Lake Chebaco, #2A
Source C Lake Chebaco, #3A
Source D Lake Chebaco, #4A
Source E Lake Chebaco, #5A

Michael D. Gebone
4/27/98

	A	B	C	D	E
Sample No.	L980307-1	L980307-2	L980307-3	L980307-4	L980307-5
Date of Collection	4/6/98	4/6/98	4/6/98	4/6/98	4/6/98
Date of Receipt	4/8/98	4/8/98	4/8/98	4/8/98	4/8/98
Date Analyzed	4/14-22/98	4/14-22/98	4/14-22/98	4/14-22/98	4/14-22/98
Total petroleum hydrocarbons (ug/g)	ND	ND	ND	ND	ND
Spike % Recovery					

REMARKS: The samples were analyzed according to Methods 5520A, E & F "Extraction Method for Sludge Samples". Standard Methods, 18th Edition, 1992.

ND = Not detected or the analytical result is at or below the established MDL of 45. ug/g.

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

TPH ANALYSIS BY STANDARD METHODS 5520 A, E, & F

CITY/TOWN: Hamilton
COLLECTOR: J. Sablock

Source A Lake Chebaco, #10A, duplicate
Source B Lake Chebaco, #11A
Source C Laboratory Blank
Source D Laboratory Spike, Lube Oil, Theoretical = 560 ug/g
Source E

	A	B	C	D	E
Sample No.	L980307-10 duplicate	L980307-11	Laboratory Blank	Laboratory Spike	
Date of Collection	4/6/98	4/6/98	4/6/98	4/6/98	
Date of Receipt	4/8/98	4/8/98	4/8/98	4/8/98	
Date Analyzed	4/14-22/98	4/14-22/98	4/14-22/98	4/14-22/98	
Total petroleum hydrocarbons (ug/g)	ND	ND	ND	500	
Spike % Recovery				89	

REMARKS: The samples were analyzed according to Methods 5520A, E & F "Extraction Method for Sludge Samples". Standard Methods, 18th Edition, 1992.

ND = Not detected or the analytical result is at or below the established MDL of 45. ug/g.

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF SEMIVOLATILE ORGANIC COMPOUNDS

Sample Number	L980307-1	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	5/26/98-6/5/98
Source	Chebacco Lake	Extracted	4/16/98
Field ID	1A		

RESULTS		MDL*	QUALITY CONTROL		
Target Compound(s) † Detected	µg/g Dry	µg/g	Surrogate Standards	%Recovery	Acceptance Limits
Not detected			2-fluorobiphenyl	49	30-115
			4-terphenyl-D14	51	18-137
Remarks:					

*** MDL = Method Detection Limits**

The sample was extracted by the EPA procedure, "Method 3541B, Automated Soxhlet Extraction" and analyzed by EPA "Method 8270B, Semivolatile Organic Compounds by Gas Chromatography Mass Spectrometry (GC/MS):Capillary Column Technique".

† See attached list of target compounds.

** Non-target conmpounds. No standard available for verification or quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor [signature]
6/15/98

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MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF SEMIVOLATILE ORGANIC COMPOUNDS

Sample Number	L980307-4	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	5/26/98-6/5/98
Source	Chebacco Lake	Extracted	4/16/98
Field ID	4A		

RESULTS		MDL*	QUALITY CONTROL		
Target Compound(s) † Detected	μg/g Dry	μg/g	Surrogate Standards	%Recovery	Acceptance Limits
Not detected			2-fluorobiphenyl	61	30-115
			4-terphenyl-D14	80	18-137
Remarks:					

*** MDL = Method Detection Limits**

The sample was extracted by the EPA procedure, "Method 3541B, Automated Soxhlet Extraction" and analyzed by EPA "Method 8270B, Semivolatile Organic Compounds by Gas Chromatography Mass Spectrometry (GC/MS):Capillary Column Technique".

† See attached list of target compounds.

** Non-target conmpounds. No standard available for verification or quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor *[signature]*
6/15/98

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MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF SEMIVOLATILE ORGANIC COMPOUNDS

Sample Number	L980307-6	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	5/26/98-6/5/98
Source	Chebacco Lake	Extracted	4/16/98
Field ID	6A		

RESULTS		MDL*	QUALITY CONTROL		
Target Compound(s) † Detected	µg/g Dry	µg/g	Surrogate Standards	%Recovery	Acceptance Limits
Not detected			2-fluorobiphenyl	49	30-115
			4-terphenyl-D14	65	18-137
Remarks:					

*** MDL = Method Detection Limits**

The sample was extracted by the EPA procedure, "Method 3541B, Automated Soxhlet Extraction" and analyzed by EPA "Method 8270B, Semivolatile Organic Compounds by Gas Chromatography Mass Spectrometry (GC/MS):Capillary Column Technique".

† See attached list of target compounds.

** Non-target conmpounds. No standard available for verification or quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor [signature] 6/15/98

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MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF SEMIVOLATILE ORGANIC COMPOUNDS

Sample Number	L980307-8	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	5/26/98-6/5/98
Source	Chebacco Lake	Extracted	4/16/98
Field ID	8A		

RESULTS		MDL*	QUALITY CONTROL		
Target Compound(s) † Detected	µg/g Dry	µg/g	Surrogate Standards	%Recovery	Acceptance Limits
Not detected			2-fluorobiphenyl	54	30-115
			4-terphenyl-D14	95	18-137
Remarks:					

*** MDL = Method Detection Limits**

The sample was extracted by the EPA procedure, "Method 3541B, Automated Soxhlet Extraction" and analyzed by EPA "Method 8270B, Semivolatile Organic Compounds by Gas Chromatography Mass Spectrometry (GC/MS):Capillary Column Technique".

† See attached list of target compounds.

** Non-target conmpounds. No standard available for verification or quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor Albert Filibutty
6/15/98

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MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF SEMIVOLATILE ORGANIC COMPOUNDS

Sample Number	L980307-10	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	5/26/98-6/5/98
Source	Chebacco Lake	Extracted	4/16/98
Field ID	10A		

RESULTS		MDL*	QUALITY CONTROL		
Target Compound(s) † Detected	µg/g Dry	µg/g	Surrogate Standards	%Recovery	Acceptance Limits
Not detected			2-fluorobiphenyl	58	30-115
			4-terphenyl-D14	105	18-137
Remarks:					

*** MDL = Method Detection Limits**
The sample was extracted by the EPA procedure, "Method 3541B, Automated Soxhlet Extraction" and analyzed by EPA "Method 8270B, Semivolatile Organic Compounds by Gas Chromatography Mass Spectrometry (GC/MS):Capillary Column Technique".

† See attached list of target compounds.

** Non-target conmpounds. No standard available for verification or quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor Ellen L. Flaherty
6/15/98

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MA DEPT OF ENVIRONMNTL PROTECTION
Analysis Report
Apr. 30, 1998
Login Number:L980307
Account: BRP BUREAU OF RESOURCE PROTECTION
Project:
Site: CHEBACCO
Collector: Chris Buchunan

KGH, 5/12/98

Lab Sample Number	Client Locator/ Client Number	Collect/ Receive Date	Result mg/kg	Method	Analyze Date	MDL mg/kg
L980307-22	CHEBACCO LAK 11 B	06-APR-98 08-APR-98				
	ARSENIC (6010)		8.1	EPA 6010B	4/29/98	2.5
	CHROMIUM (6010)		4.0	EPA 6010B	4/29/98	0.25
	COPPER (6010)		4.0	EPA 6010B	4/29/98	0.50
	LEAD (6010)		11	EPA 6010B	4/29/98	1.8
	MERCURY (7471A)		0.032	EPA 7471A	4/29/98	0.010
	ZINC (6010)		28	EPA 6010B	4/29/98	0.25
	KJELDAHL-N		950	EPA 351.2	5/7/98	25
	PHOSPHORUS-P		120	EPA 365.4	5/7/98	12
	PERCENT SOLIDS		24%	SM 2540 G	4/16/98	

MA DEPT OF ENVIRONMNTL PROTECTION
Analysis Report
Apr. 30, 1998
Login Number:L980307
Account: BRP BUREAU OF RESOURCE PROTECTION
Project:
Site: CHEBACCO

Collector: Chris Buchunan

KGK, 5/12/98

Lab Sample Number	Client Locator/ Client Number	Collect/ Receive Date	Result mg/kg	Method	Analyze Date	MDL mg/kg
	KJELDAHL-N		1300	EPA 351.2	5/7/98	25
	PHOSPHORUS-P		96	EPA 365.4	5/7/98	12
	PERCENT SOLIDS		9.3%	SM 2540 G	4/16/98	
L980307-17	CHEBACCO LAK 6 B	06-APR-98 08-APR-98				
	ARSENIC (6010)		2.8	EPA 6010B	4/29/98	2.5
	CHROMIUM (6010)		8.6	EPA 6010B	4/29/98	0.25
	COPPER (6010)		4.1	EPA 6010B	4/29/98	0.50
	LEAD (6010)		9.4	EPA 6010B	4/29/98	1.8
	MERCURY (7471A)		0.013	EPA 7471A	4/29/98	0.010
	ZINC (6010)		25	EPA 6010B	4/29/98	0.25
	KJELDAHL-N		580	EPA 351.2	5/7/98	25
	PHOSPHORUS-P		260	EPA 365.4	5/7/98	12
	PERCENT SOLIDS		39%	SM 2540 G	4/16/98	
L980307-18	CHEBACCO LAK 7 B	06-APR-98 08-APR-98				
	ARSENIC (6010)		4.3	EPA 6010B	4/29/98	2.5
	CHROMIUM (6010)		4.0	EPA 6010B	4/29/98	0.25
	COPPER (6010)		1.6	EPA 6010B	4/29/98	0.50
	LEAD (6010)		5.3	EPA 6010B	4/29/98	1.8
	MERCURY (7471A)		0.013	EPA 7471A	4/29/98	0.010
	ZINC (6010)		21	EPA 6010B	4/29/98	0.25
	KJELDAHL-N		930	EPA 351.2	5/7/98	25
	PHOSPHORUS-P		250	EPA 365.4	5/7/98	12
	PERCENT SOLIDS		41%	SM 2540 G	4/16/98	
L980307-19	CHEBACCO LAK 8 B	06-APR-98 08-APR-98				
	ARSENIC (6010)		9.8	EPA 6010B	4/29/98	2.5
	CHROMIUM (6010)		3.3	EPA 6010B	4/29/98	0.25
	COPPER (6010)		2.3	EPA 6010B	4/29/98	0.50
	LEAD (6010)		5.0	EPA 6010B	4/29/98	1.8
	MERCURY (7471A)		0.017	EPA 7471A	4/29/98	0.010
	ZINC (6010)		26	EPA 6010B	4/29/98	0.25

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Senator William X. Wall Experiment Station

ARGEO PAUL CELLUCCI
Governor

TRUDY CO
Secreta

DAVID B. STRU
Commission

MEMORANDUM

TO: Peter Sablock, Salem State College

FROM: Kenneth Hulme, Deputy Director, DEP-WES

THROUGH: Dr. Oscar C. Pancorbo, Director, DEP-WES

SUBJECT: Analytical Results for the Hamilton samples.

DATE: July 14, 1998

Enclosed are the **validated** analytical results for the samples from Hamilton, Lake Chebacco. The sampling round consisted of 22 samples to be analyzed for VOCs, EPA Method 8260B, SVOCS, EPA Method 8270B, PCBs and organochlorine pesticides, EPA Method 8082, metals, EPA Method 6010B, TKN, EPA Method 351.2, phosphorous, EPA Method 365.4, and TPH, SM5520A. Also, included is a copy of our second-level quality assurance (QA) review, completed by Robert Serabian, Quality Assurance Officer, DEP-WES. If you have any questions about these data, please contact me at 508 682-5237, ext. 313.

MA DEPT OF ENVIRONMNTL PROTECTION
Analysis Report
Apr. 30, 1998
Login Number:L980307
Account: BRP BUREAU OF RESOURCE PROTECTION
Project:
Site: CHEBACCO

Collector: Chris Buchunan

KAH, 5/12/98

Lab Sample Number	Client Locator/ Client Number	Collect/ Receive Date	Result mg/kg	Method	Analyze Date	MDL mg/kg
L980307-14	CHEBACCO LAK	06-APR-98				
	3 B	08-APR-98				
	ARSENIC (6010)		3.4	EPA 6010B	4/29/98	2.5
	CHROMIUM (6010)		1.2	EPA 6010B	4/29/98	0.25
	COPPER (6010)		1.2	EPA 6010B	4/29/98	0.50
	LEAD (6010)		2.9	EPA 6010B	4/29/98	1.8
	MERCURY (7471A)		0.010	EPA 7471A	4/29/98	0.010
	ZINC (6010)		10	EPA 6010B	4/29/98	0.25
	KJELDAHL-N		1400	EPA 351.2	5/7/98	25
	PHOSPHORUS-P		57	EPA 365.4	5/7/98	12
	PERCENT SOLIDS		7.1%	SM 2540 G	4/16/98	
L980307-15	CHEBACCO LAK	06-APR-98				
	4 B	08-APR-98				
	ARSENIC (6010)		6.4	EPA 6010B	4/29/98	2.5
	CHROMIUM (6010)		3.6	EPA 6010B	4/29/98	0.25
	COPPER (6010)		1.6	EPA 6010B	4/29/98	0.50
	LEAD (6010)		9.8	EPA 6010B	4/29/98	1.8
	MERCURY (7471A)		0.030	EPA 7471A	4/29/98	0.010
	ZINC (6010)		25	EPA 6010B	4/29/98	0.25
	KJELDAHL-N		1100	EPA 351.2	5/7/98	25
	PHOSPHORUS-P		86	EPA 365.4	5/7/98	12
	PERCENT SOLIDS		42%	SM 2540 G	4/16/98	
L980307-16	CHEBACCO LAK	06-APR-98				
	5 B	08-APR-98				
	ARSENIC (6010)		2.6	EPA 6010B	4/29/98	2.5
	CHROMIUM (6010)		1.4	EPA 6010B	4/29/98	0.25
	COPPER (6010)		1.1	EPA 6010B	4/29/98	0.50
	LEAD (6010)		4.5	EPA 6010B	4/29/98	1.8
	MERCURY (7471A)		0.032	EPA 6010B	4/29/98	0.010
	ZINC (6010)		12	EPA 6010B	4/29/98	0.25

MA DEPT OF ENVIRONMNTL PROTECTION
Analysis Report
Apr. 30, 1998
Login Number:L980307
Account: BRP BUREAU OF RESOURCE PROTECTION
Project:
Site: CHEBACCO

Collector: Chris Buchunan

KAH 5/12/98

Lab Sample Number	Client Locator/ Client Number	Collect/ Receive Date	Result mg/kg	Method	Analyze Date	MDL mg/kg
	KJELDAHL-N		1100	EPA 351.2	5/7/98	25
	PHOSPHORUS-P		170	EPA 365.4	5/7/98	12
	PERCENT SOLIDS		19%	SM 2540 G	4/16/98	
L980307-20	CHEBACCO LAK 9 B	06-APR-98 08-APR-98				
	ARSENIC (6010)		2.8	EPA 6010B	4/29/98	2.5
	CHROMIUM (6010)		3.4	EPA 6010B	4/29/98	0.25
	COPPER (6010)		0.8	EPA 6010B	4/29/98	0.50
	LEAD (6010)		4.0	EPA 6010B	4/29/98	1.8
	MERCURY (7471A)		0.023	EPA 7471A	4/29/98	0.010
	ZINC (6010)		22	EPA 6010B	4/29/98	0.25
	KJELDAHL-N		930	EPA 351.2	5/7/98	25
	PHOSPHORUS-P		120	EPA 365.4	5/7/98	12
	PERCENT SOLIDS		61%	SM 2540 G	4/16/98	
L980307-21	CHEBACCO LAK 10 B	06-APR-98 08-APR-98				
	ARSENIC (6010)		8.9	EPA 6010B	4/29/98	2.5
	CHROMIUM (6010)		4.2	EPA 6010B	4/29/98	0.25
	COPPER (6010)		4.3	EPA 6010B	4/29/98	0.50
	LEAD (6010)		13	EPA 6010B	4/29/98	1.8
	MERCURY (7471A)		0.029	EPA 7471A	4/29/98	0.010
	ZINC (6010)		31	EPA 6010B	4/29/98	0.25
	KJELDAHL-N		1000	EPA 351.2	5/7/98	25
	PHOSPHORUS-P		160	EPA 365.4	5/7/98	12
	PERCENT SOLIDS		21%	SM 2540 G	4/16/98	

GEOLABS, INC.
10 PLAIN STREET
BRAINTREE, MA 02184

LIMITATIONS & EXCLUSIONS

All the professional opinions presented in this report are based solely on the scope of work conducted and sources referred to in our report. The data presented by GeoLabs in this report was collected and analyzed using generally accepted industry methods and practices at the time the report was generated. This report represents the conditions, locations and materials that were observed at the time the work was conducted. No inferences regarding other conditions, locations or materials, at a later or earlier time may be made based on the contents of the report. No other warranty, express or implied is made.

This report was prepared for the sole use of our client. Portions of the report may not be used independent of the entire report.

All analyses were performed within required holding times, in accordance with EPA protocols and using accepted QA/QC procedures. The information contained in this report is, to the best of my knowledge, accurate and complete.

CLIENT NAME:	**SALEM STATE COLLEGE**	PROJECT ID:	CHEBACCO LAKE
SAMPLE TYPE:	SURFACE WATER	REPORT DATE:	03/25/98
COLLECTION DATE:	03/11/98	ANALYZED BY:	SM 03/14/98
REC'D BY LAB:	03/13/98	EXTRACTION DATE:	N/A
COLLECTED BY:	CLIENT	DIGESTION DATE:	N/A

ALKALINITY

SAMPLE NUMBER	SAMPLE LOCATION	ALKALINITY (mg/L)	DETECTION LIMIT (mg/L)
64910	SITE 7	3.50	1.78
64911	SITE 8	4.50	1.78
64912	SITE 11	4.50	1.78
64913	SITE 12	ND	1.78
64914	SITE 16	3.00	1.78
64915	SITE 26	4.50	1.78
64916	SITE 27	3.50	1.78
64917	SITE 31	5.50	1.78
64918	SITE 38	5.00	1.78
64919	SITE 41	4.50	1.78
64920	SITE 1	5.50	1.78
64921	SITE 2	3.50	1.78
64922	SITE 3	7.00	1.78
64923	SITE 4	5.00	1.78
64924	SITE 5	3.00	1.78
64925	SITE 6	ND	1.78
64926	SITE 7	4.50	1.78
64927	SITE 3	7.00	1.78

ND = NOT DETECTED

Method Reference:

EPA Method 310.1 (1)

1) U.S. EPA 1983. "Methods for Chemical Analysis of Water and Wastes." EPA-600/4-79-020, EPA, EMSL, Cincinnati, Ohio 45268.

GeoLabs, Inc.
Environmental Laboratories

PREPARED FOR: Salem State College
352 Lafayette Street
Salem, MA 01970

Attn: Jeanette Sablock

PROJECT ID: Chebacco Lake
Hamilton, MA

GEOLABS CLIENT #: 1629-98

SAMPLE NUMBER: 64910-64927

DATE PREPARED: March 25, 1998

PREPARED BY: Christine Johnson

APPROVED BY: Jim Chen 3-25-98
Jim Chen, Laboratory Director/Date

Chapter 6 – Geolabs water chemistry data

Table 1A

Data for Beck, Round, and Gravely Ponds

	pH	Alkalinity (mg/L)	TSS (mg/L)	Hardness (mg/L)	Chlorides (mg/L)	Ortho P (mg/L)	Total P (mg/L)	Nitrate (mg/L)	Ammonia (mg/L)	Nitrite (mg/L)
R1	7.15	14.5	2	23.1	39.7	<0.05	<0.05	0.27	0.376	<0.05
R2	7.24	14.5	<1	22.6	38.8	<0.05	<0.05	0.25	0.356	<0.05
R3	7.25	15.7	<1	24.8	43.2	<0.05	<0.05	0.17	0.308	<0.05
R4	7.16	16	4	24.1	50.1	<0.05	<0.05	0.19	0.278	<0.05
R5	7.19	14.1	4	23.7	47.3	<0.05	<0.05	0.34	0.25	<0.05
R6	7.26	13	2	29.9	42.6	<0.05	<0.05	0.25	0.24	<0.05
R7	7.24	13.7	2	24.8	43.9	<0.05	<0.05	0.14	2.04	<0.05
R8	7.18	12.8	2	22	48.4	<0.05	<0.05	0.35	<0.02	<0.05
R9	7.21	10.1	8	21.3	39.5	<0.05	<0.05	0.15	<0.02	<0.05
R10	6.84	6.38	48	19.2	44.4	<0.05	<0.05	0.23	<0.02	<0.05
G1	6.84	22.9	<1	32.8	23.2	<0.05	<0.05	<0.1	<0.02	<0.05
G2	7.18	23.7	<1	27.9	18.2	<0.05	<0.05	<0.1	<0.02	<0.05
G3	7.12	25.7	<1	27.9	18.8	<0.05	<0.05	<0.1	<0.02	<0.05
G4	7.13	24.7	<1	29	17.3	<0.05	<0.05	<0.1	<0.02	<0.05
G5	6.89	21.8	<1	27.9	20.3	<0.05	<0.05	<0.1	<0.02	<0.05
B1	6.16	23.3	<1	19.4	28.7	<0.05	<0.05	<0.1	<0.02	<0.05
B2	6.79	13.9	<1	18.9	20.7	<0.05	<0.05	<0.1	<0.02	<0.05
B3	6.89	14.4	<1	19.1	18.9	<0.05	<0.05	<0.1	<0.02	<0.05

Code	Sample #	Nitrate	Nitrite	Phosphate	Ammonia
GPI	5/15	0.0	0.0	0.0	0.2007
GPI	5/15	0.0	0.0	0.0	0.3010
MSO	5/21	0.0	0.0	0.0176	0.8239
MSO	5/21	0.0	0.0	0.0	#NUM!
MSO	5/21	0.0	0.0	0.0	1.2218
MSO	5/22	0.0	0.0	0.0	0.9586
MS	5/22	0.0	0.0	0.0	0.6198
CP	5/22	0.0	0.0	0.0	0.4949
GP	6/5	0.0	0.0	0.0838	0.4437
GP	6/5(2)	0.0	0.0	0.0	0.2441
MS	6/5(8)	0.0	0.0	0.0	0.8539
MSO	6/5(9)	0.0	0.0	0.0614	1.0458
CP	6/5(11)	0.0	0.0	0.3218	1.5229
GP	7/1(1)	0.0	0.0	0.0176	0.1805
MS	7/1(7)	0.0	0.0	0.0	1.3010
MSO	7/1(8)	0.0	0.0	0.0	1.3979
AB	5/21	0.0	0.0	0.0	0.3768
AB	5/21	0.0	0.0	0.0	0.3565
AB	5/21	0.0259	0.0	0.0614	0.4202
AB	5/22	0.0	0.0	0.0838	0.5376
AB	6/5(7)	0.0	0.0	0.0395	0.4437
AB	7/1(6)	0.0	0.0	0.0	0.2218

Iron (mg/L)	Maganese (mg/L)	DO ppm	Cond
0.199	0.078	7.56	216
0.254	0.087	7.45	207
0.295	0.068	7.65	215
0.272	0.071	7.32	235
0.235	0.094	7.14	224
0.221	0.047	7.15	209
0.258	0.085	7.94	207
0.269	0.091	7.75	214
0.247	0.071	7.17	231
0.258	0.062	3.24	317
0.115	0.132	7.52	175
0.182	0.125	7.41	145
0.178	0.119	7.62	149
0.169	0.117	7.32	176
0.148	0.127	7.39	163
0.138	0.099	7.59	189
0.147	0.069	7.62	195
0.156	0.084	7.29	183

CLIENT NAME:	**SALEM STATE COLLEGE**	PROJECT ID:	CHEBACCO LAKE
SAMPLE TYPE:	SURFACE WATER	REPORT DATE:	03/25/98
COLLECTION DATE:	03/11/98	ANALYZED BY:	SS/SM 03/18/98
REC'D BY LAB:	03/13/98	EXTRACTION DATE:	N/A
COLLECTED BY:	CLIENT	DIGESTION DATE:	N/A

TOTAL PHOSPHORUS

SAMPLE NUMBER	SAMPLE LOCATION	TOTAL PHOSPHORUS (mg/L)	DETECTION LIMIT (mg/L)
64910	SITE 7	ND	0.0215
64911	SITE 8	ND	0.0215
64912	SITE 11	ND	0.0215
64913	SITE 12	ND	0.0215
64914	SITE 16	ND	0.0215
64915	SITE 26	ND	0.0215
64916	SITE 27	ND	0.0215
64917	SITE 31	ND	0.0215
64918	SITE 38	ND	0.0215
64919	SITE 41	ND	0.0215
64920	SITE 1	ND	0.0215
64921	SITE 2	ND	0.0215
64922	SITE 3	ND	0.0215
64923	SITE 4	ND	0.0215
64924	SITE 5	ND	0.0215
64925	SITE 6	ND	0.0215
64926	SITE 7	ND	0.0215
64927	SITE 3	ND	0.0215

Method Reference:

EPA Method 365.2 (1)

1) U.S. EPA 1983. "Methods for Chemical Analysis of Water and Wastes." EPA-600/4-79-020, EPA, EMSL, Cincinnati, Ohio 45268.

GeoLabs, Inc.
Environmental Laboratories

CLIENT NAME:	**SALEM STATE COLLEGE**	PROJECT ID:	CHEBACCO LAKE
SAMPLE TYPE:	SURFACE WATER	REPORT DATE:	03/25/98
COLLECTION DATE:	03/11/98	ANALYZED BY:	SS/SM 03/24/98
REC'D BY LAB:	03/13/98	EXTRACTION DATE:	N/A
COLLECTED BY:	CLIENT	DIGESTION DATE:	N/A

AMMONIA

SAMPLE NUMBER	SAMPLE LOCATION	AMMONIA (mg/L)	DETECTION LIMIT (mg/L)
64910	SITE 7	ND	0.291
64911	SITE 8	ND	0.291
64912	SITE 11	ND	0.291
64913	SITE 12	ND	0.291
64914	SITE 16	ND	0.291
64915	SITE 26	0.327	0.291
64916	SITE 27	ND	0.291
64917	SITE 31	0.387	0.291
64918	SITE 38	0.370	0.291
64919	SITE 41	0.414	0.291
64920	SITE 1	ND	0.291
64921	SITE 2	0.392	0.291
64922	SITE 3	0.484	0.291
64923	SITE 4	0.332	0.291
64924	SITE 5	ND	0.291
64925	SITE 6	0.348	0.291
64926	SITE 7	0.339	0.291
64927	SITE 3	0.312	0.291

ND = NOT DETECTED

Method Reference:

EPA Method 350.2 (1)

1) U.S. EPA 1983. "Methods for Chemical Analysis of Water and Wastes." EPA-600/4-79-020, EPA, EMSL, Cincinnati, Ohio 45268.

DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

PCB and ORGANOCHLORINE PESTICIDE ANALYSIS

CITY/TOWN: Hamilton

COLLECTOR: J. Sablo

Source A Lake Chebaco, #10A, duplicate
Source B Lake Chebaco, #11
Source C Laboratory Blank
Source D Laboratory Spike, PCB A1254, Theoretical = 0.41 ug/g
Source E

	A	B	C	D	E
Sample No.	L980307-10 duplicate	L980307-11	Laboratory Blank	Laboratory Spike	
Date of Collection	4/6/98	4/6/98	4/6/98	4/6/98	
Date of Receipt	4/8/98	4/8/98	4/8/98	4/8/98	
Date Analyzed	4/13-23/98	4/13-23/98	4/13-23/98	4/13-23/98	
PCB and Organochlorine Pesticide Analysis, (ug/g)	ND	ND	ND	ND	
Spike % Recovery				85	
PCNB Surrogate % Recovery	83	85	70	88	

REMARKS: The samples were analyzed according to EPA Method 8081A, 8082 and 3541, SW-846.

ND = Not detected or the analytical result is at or below the established MDL of: (See last page)

APPENDIX 2

Table 6.1 A list of the water quality data collected at stations 1 – 43.
Station Numbers are shown in Figure 6.1.

Station #	Depth (FT)	Temp (F)	pH	TDS	DO
1	-2.00	75.00	7.06	144.00	9.40
	-3.00	74.80	7.06	142.00	9.10
	-4.00	74.80	7.05	145.00	9.10
	-5.00	74.80	7.06	144.00	9.20
2	-2.00	75.00	7.03	128.00	12.30
	-3.00	74.70	7.03	128.00	9.80
	-4.00	74.50	7.01	127.00	9.30
	-5.00	74.50	7.00	125.00	9.00
	-6.00	74.30	6.95	126.00	9.00
	-7.00	74.10	6.94	127.00	8.90
	-8.00	74.00	6.91	124.00	8.20
	-9.00	74.00	6.81	125.00	7.60
3	-2.00	74.80	7.08	127.00	10.00
	-3.00	74.60	7.02	126.00	9.50
	-4.00	74.50	7.01	128.00	9.40
	-5.00	74.40	7.01	128.00	9.40
	-6.00	74.30	7.04	127.00	9.20
4	-2.00	74.50	7.06	131.00	9.80
	-3.00	74.40	7.02	130.00	9.30
	-4.00	74.30	7.01	128.00	9.20
	-5.00	74.20	7.01	129.00	9.30
	-6.00	74.20	7.01	129.00	9.10
	-7.00	74.20	7.00	129.00	9.10
	-8.00	74.10	6.92	127.00	8.40
5	-2.00	74.90	7.05	127.00	9.50
	-3.00	74.50	7.02	129.00	9.20
	-4.00	74.40	7.00	129.00	9.00
	-5.00	74.30	7.00	129.00	9.00
	-6.00	74.20	7.00	129.00	9.00
	-7.00	74.20	7.00	129.00	9.00
	-8.00	74.20	7.02	128.00	9.00
	-9.00	74.10	7.00	129.00	8.80
	-10.00	74.00	6.85	128.00	7.70

Station #	Depth (Ft)	Temp. (F)	pH	TDS	DO
	-15.00	66.50	6.89	157.00	0.50
10	-2.00	75.10	7.04	134.00	9.50
	-3.00	75.10	7.04	131.00	9.30
	-4.00	74.70	7.03	133.00	9.40
	-5.00	74.50	7.03	130.00	9.20
11	0.00	76.10	7.02	135.00	9.70
	-2.00	75.40	6.99	131.00	9.00
	-3.00	75.10	7.00	130.00	8.70
12	-2.00	76.10	7.04	134.00	9.80
	-3.00	75.90	7.05	130.00	9.40
	-4.00	75.70	7.06	131.00	9.30
	-5.00	75.00	6.99	128.00	9.00
	-6.00	74.80	6.97	131.00	8.70
	-7.00	74.50	6.86	131.00	7.80
13	-2.00	76.20	7.11	132.00	9.70
	-3.00	76.20	7.10	132.00	9.50
	-4.00	76.10	7.12	132.00	9.30
	-5.00	76.10	7.10	132.00	9.40
	-6.00	75.10	6.95	130.00	8.40
	-7.00	74.70	6.88	132.00	8.10
	-8.00	74.50	6.84	132.00	7.30
14	-2.00	76.40	7.15	134.00	9.60
	-3.00	76.30	7.14	135.00	9.40
15	-2.00	75.70	7.13	134.00	9.90
	-3.00	75.70	7.11	130.00	9.60
	-4.00	75.60	7.11	131.00	9.60
	-5.00	75.60	7.12	130.00	9.50
	-6.00	75.60	7.10	129.00	9.40
16	-2.00	76.40	7.10	135.00	10.00
	-3.00	76.20	7.11	135.00	9.70
	-4.00	75.30	7.06	132.00	9.50
	-5.00	75.00	7.01	130.00	9.00
	-6.00	74.80	6.97	133.00	8.60
	-7.00	74.70	6.93	131.00	8.40
	-8.00	74.40	6.78	131.00	7.20
	-9.00	73.50	6.63	129.00	4.80

Station #	depth	Temp. (F)	pH	TDS	DO
	-7.00	74.00	6.74	130.00	6.70
	-8.00	73.80	6.73	129.00	6.70
	-9.00	73.60	6.67	129.00	6.10
	-10.00	72.80	6.59	130.00	3.8!
22	-2.00	77.00	7.14	134.00	10.00
	-3.00	76.80	7.12	132.00	10.00
	-4.00	76.00	7.10	134.00	10.00
	-5.00	75.80	7.07	132.00	10.20
	-6.00	75.00	6.95	130.00	9.80
	-7.00	74.70	6.86	132.00	9.40
	-8.00	74.50	6.83	132.00	9.40
	-9.00	74.10	6.72	131.00	8.60
	-10.00	73.40	6.60	129.00	6.70
	-11.00	72.30	6.54	130.00	5.10
	-12.00	71.00	6.41	130.00	3.40
	-13.00	69.40	6.49	130.00	3.70
	-14.00	67.00	6.61	133.00	2.50
	-15.00	63.50	6.10	133.00	2.10
	-16.00	61.20	6.09	133.00	1.90
	-17.00	59.00	6.18	131.00	1.40
	-18.00	57.50	6.29	133.00	1.20
	-19.00	56.50	6.43	139.00	1.00
	-20.00	55.80	6.60	145.00	1.00
23	-2.00	76.40	7.17	134.00	9.90
	-3.00	76.40	7.16	132.00	9.60
	-4.00	76.50	7.16	131.00	9.50
	-5.00	76.70	7.17	128.00	9.60
	-6.00	76.70	7.16	128.00	9.40
	-7.00	76.80	7.13	128.00	9.60
	-8.00	76.70	7.14	128.00	9.00
24	-2.00	77.50	7.17	152.00	9.70
	-3.00	77.30	7.20	149.00	9.80
25	-2.00	77.10	7.13	151.00	9.80
	-3.00	77.10	7.12	149.00	9.60
	-4.00	77.00	7.13	150.00	9.60
	-5.00	76.90	7.11	149.00	9.60

Station #	Depth	Temp. (F)	pH	TDS	DO
	-6.00	77.50	7.20	132.00	9.90
	-7.00	77.50	7.20	132.00	9.90
	-8.00	77.40	7.20	131.00	9.70
	-9.00	77.30	7.20	131.00	9.40
	-10.00	77.10	7.12	130.00	8.40
	-11.00	73.50	6.55	129.00	3.50
	-12.00	71.60	6.45	129.00	0.90
28	-2.00	78.70	7.31	151.00	10.30
	-3.00	78.70	7.32	151.00	10.30
29	-2.00	77.70	7.24	152.00	10.50
	-3.00	77.50	7.23	151.00	9.60
	-4.00	77.40	7.20	150.00	9.90
	-5.00	77.40	7.21	150.00	9.80
	-6.00	77.20	7.19	149.00	9.50
	-7.00	77.10	7.17	148.00	9.60
	-8.00	77.00	7.20	147.00	9.40
	-9.00	76.90	7.16	147.00	9.70
	-10.00	76.60	7.01	148.00	8.90
30	-2.00	77.70	7.26	151.00	9.90
	-3.00	77.20	7.21	151.00	10.00
	-4.00	77.10	7.24	150.00	9.70
	-5.00	76.90	7.23	150.00	9.30
	-6.00	76.80	7.21	149.00	9.30
30a	-2.00	78.70	7.38	151.00	10.10
	-3.00	78.20	7.39	153.00	10.30
	-4.00	78.00	7.37	152.00	10.00
	-5.00	78.70	7.27	151.00	10.10
	-6.00	77.50	7.24	149.00	10.00
31	-2.00	78.20	7.37	152.00	10.40
	-3.00	77.80	7.37	151.00	10.30
	-4.00	77.70	7.38	151.00	10.30
	-5.00	77.50	7.35	150.00	10.00
	-6.00	77.00	7.37	149.00	9.70
	-7.00	76.80	7.35	148.00	9.30
	-8.00	75.50	7.01	147.00	7.90
	-9.00	74._	6.69	148.00	4.30

Station #	Depth	Temp. (F)	pH	TDS	DO
	-8.00	75.20	6.89	147.00	7.70
	-9.00	74.10	6.69	149.00	5.50
	-10.00	72.20	6.48	146.00	1.80
	-11.00	70.50	6.57	149.00	0.50
	-12.00	68.10	6.64	144.00	1.40
	-13.00	66.10	6.61	144.00	0.40
	-14.00	62.80	6.83	153.00	0.10
	~~-15.00~~	~~61.10~~	~~7.11~~	~~170.00~~	~~0.10~~
36	-2.00	77.90	7.45	155.00	10.40
	-3.00	77.50	7.41	153.00	10.20
	-4.00	77.10	7.38	152.00	10.10
	-5.00	77.00	7.36	151.00	10.10
	-6.00	77.00	7.37	151.00	9.90
	-7.00	74.80	6.81	150.00	7.10
	-8.00	74.40	6.73	150.00	6.40
	-9.00	73.60	6.65	148.00	5.30
	-10.00	72.80	6.59	149.00	2.80
	-11.00	69.00	6.60	149.00	0.90
	-12.00	67.70	6.65	152.00	0.70
	-13.00	66.60	6.61	144.00	0.40
	-14.00	63.10	6.81	152.00	0.10
	-15.00	60.00	7.25	179.00	0.10
	-16.00	59.00	7.40	178.00	0.05
37	-2.00	77.10	7.37	154.00	10.40
	-3.00	76.60	7.40	153.00	10.10
	-4.00	75.80	7.27	150.00	9.30
	-5.00	75.20	7.06	149.00	8.40
	-6.00	75.00	7.00	148.00	8.50
	-7.00	74.60	6.93	150.00	7.70
	-8.00	74.00	6.80	149.00	7.10
	-9.00	73.60	6.69	148.00	5.50
	-10.00	73.10	6.64	146.00	4.20
	~~-10.50~~	~~72.60~~	~~6.58~~	~~149.00~~	~~3.30~~
38	-2.00	77.70	7.60	153.00	10.70
	-3.00	75.90	7.60	152.00	10.00
	-4.00	75.20	7.27	150.00	9.00

Station #	Depth	Temp. (F)	pH	TDS	DO
	-9.00	74.00	6.69	149.00	5.50
	-10.00	72.80	6.53	148.00	2.70
	-11.00	70.40	6.57	149.00	0.50
	-12.00	67.50	6.66	148.00	0.60
	-13.00	66.20	6.67	147.00	0.20

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

PCB and ORGANOCHLORINE PESTICIDE ANALYSIS

CITY/TOWN: Hamilton

COLLECTOR: J. Sabloc

Source A Lake Chebaco, #6A
Source B Lake Chebaco, #7A
Source C Lake Chebaco, #8A
Source D Lake Chebaco, #9A
Source E Lake Chebaco, #10A

	A	B	C	D	E
Sample No.	L980307-6	L980307-7	L980307-8	L980307-9	L980307-10
Date of Collection	4/6/98	4/6/98	4/6/98	4/6/98	4/6/98
Date of Receipt	4/8/98	4/8/98	4/8/98	4/8/98	4/8/98
Date Analyzed	4/13-23/98	4/13-23/98	4/13-23/98	4/13-23/98	4/13-23/98
PCB and Organochlorine Pesticide Analysis, (ug/g)	ND	ND	ND	ND	ND
Spike % Recovery					
PCNB Surrogate % Recovery	86	82	82	88	80

REMARKS: The samples were analyzed according to EPA Method 8081A, 8082 and 3541, SW-846.

ND = Not detected or the analytical result is at or below the established MDL of: (See last page)

MINIMUM DETECTION LIMITS

SW-846 Method 8081a and 8082
PCBs and Organochlorine Pesticides
in Sediments and Sludges

Compound	MDL (ug/g)
PCB A1232	0.052
PCB A1242	0.010
PCB A1248	0.022
PCB A1254	0.0054
PCB A1260	0.014
a-BHC	0.0020
b-BHC	0.0019
Lindane	0.0035
Heptachlor	0.0026
Aldrin	0.0013
Heptachlor Epoxide	0.0050
DDE	0.0004
DDD	0.0011
DDT	0.0082
Chlordane	0.0067
Toxaphene	0.022

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF PURGEABLE ORGANICS

Sample Number	L980307-10	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	4/16-24/98
Source	Chebacco Lake		
Field Number	10A		

RESULTS		MDL *	QUALITY CONTROL		
Target Compound(s) [1] Detected	ng/g wet	ng/g	Surrogate Standards	% Recovery	Acceptance Limits
Not detected			Dibromofluoromethane	106	80-120
			Toluene-D8	105	81-117
			1,4-bromofluorobenzene	102	74-121

* MDL = Method Detection Limits

The sample was analyzed according to the EPA procedure, "Method 8260B-Gas Chromatography Mass Spectrometry for Volatile Organics, SW-846 3rd Edition". Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

[1] See attached list of target compounds.

**Non-target analyte, no standard available for quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor *[signature]*

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF PURGEABLE ORGANICS

Sample Number	L980307-8	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	4/16-24/98
Source	Chebacco Lake		
Field Number	8A		

RESULTS		MDL*	QUALITY CONTROL		
Target Compound(s)[1] Detected	ng/g wet	ng/g	Surrogate Standards	% Recovery	Acceptance Limits
Not detected			Dibromofluoromethane	105	80-120
			Toluene-D8	104	81-117
			1,4-bromofluorobenzene	98	74-121
* MDL = Method Detection Limits					

The sample was analyzed according to the EPA procedure, "Method 8260B-Gas Chromatography Mass Spectrometry for Volatile Organics, SW-846 3rd Edition". Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

[1] See attached list of target compounds.

**Non-target analyte, no standard available for quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor Albert R. Flaherty
6/15/98

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF PURGEABLE ORGANICS

Sample Number L980307-6 | City/Town Hamilton
Collector Chris Buchanan | Collected 4/6/98
Received 4/8/98 | Analyzed 4/16-24/98
Source Chebacco Lake
Field Number 6A

RESULTS		MDL *	QUALITY CONTROL		
Target Compound(s) [1] Detected	ng/g wet	ng/g	Surrogate Standards	% Recovery	Acceptance Limits
Toluene	34	0.33	Dibromofluoromethane	96	80-120
Methylene heptane	**		Toluene-D8	98	81-117
			1,4-bromofluorobenzene	97	74-121
percent solids, 20					

* MDL = Method Detection Limits

The sample was analyzed according to the EPA procedure, "Method 8260B-Gas Chromatography Mass Spectrometry for Volatile Organics, SW-846 3rd Edition". Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

[1] See attached list of target compounds.

**Non-target analyte, no standard available for quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor Alan R. Fletcher
[illegible]

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF PURGEABLE ORGANICS

Sample Number	L980307-4	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	4/16-24/98
Source	Chebacco Lake		
Field Number	4A		

RESULTS		MDL *	QUALITY CONTROL		
Target Compound(s)[1] Detected	ng/g wet	ng/g	Surrogate Standards	% Recovery	Acceptance Limits
Not detected			Dibromofluoromethane	94	80-120
			Toluene-D8	101	81-117
			1,4-bromofluorobenzene	96	74-121

* MDL = Method Detection Limits

The sample was analyzed according to the EPA procedure, "Method 8260B-Gas Chromatography Mass Spectrometry for Volatile Organics, SW-846 3rd Edition". Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

[1] See attached list of target compounds.

**No standard available for quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor *Oscar C. Pancorbo*

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF PURGEABLE ORGANICS

Sample Number	L980307-2	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	4/16-24/98
Source	Chebacco Lake		
Field Number	2A		

RESULTS		MDL *	QUALITY CONTROL		
Target Compound(s) [1] Detected	ng/g wet	ng/g	Surrogate Standards	% Recovery	Acceptance Limits
Not detected			Dibromofluoromethane	109	80-120
			Toluene-D8	104	81-117
			1,4-bromofluorobenzene	106	74-121

* MDL = Method Detection Limits

The sample was analyzed according to the EPA procedure, "Method 8260B-Gas Chromatography Mass Spectrometry for Volatile Organics, SW-846 3rd Edition". Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

[1] See attached list of target compounds.

**No standard available for quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor Alba R. Gilchrist
1/15/99

Compound Name	
Pentachloroethane	Propionitrile
n-Propylbenzene	Styrene
1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane
Tetrachloroethene	Tetrahydrofuran
Toluene	1,2,3-Trichlorobenzene
1,2,4-Trichlorobenzene	1,1,1-Trichloroethane
1,1,2-Trichloroethane	Trichloroethene
Trichlorofluoromethane	1,2,3-Trichloropropane
1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
Vinyl chloride	o-Xylene
m-Xylene	p-Xylene

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METHOD 8270

TARGET COMPOUNDS

BASE/NEUTRAL

Dimethyl-phthalate

Diethyl-phthalate

Naphthalene

Acenaphthyene

Acenaphthlene

Fluorene

Phenanthrene

Anthracene

Dibutyl-phthalate

Fluoranthene

Pyrene

Butyl-benzo-phthalate

Bis(2-EH)adipate

Benzo-@-anthracene

Chrysene

Bis-(2-EH)phthalate

Benzo-B-fluoranthene

Benzo-K-fluoranthene

Benzo-@-pyrene

Indeno-1,2,3-pyrene

Dibenzo-AH-anthracene

Benzo-GHI-perylene

ACID

Phenol

2-chclo4ophenol

2-nitrophenol

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WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF PURGEABLE ORGANICS

Sample Number	L980307-1	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	4/16-24/98
Source	Chebacco Lake		
Field Number	1A		

RESULTS		MDL*	QUALITY CONTROL		
Target Compound(s)[1] Detected	ng/g wet	ng/g	Surrogate Standards	% Recovery	Acceptance Limits
Not detected			Dibromofluoromethane	108	80-120
			Toluene-D8	100	81-117
			1,4-bromofluorobenzene	94	74-121

* MDL = Method Detection Limits

The sample was analyzed according to the EPA procedure, "Method 8260B-Gas Chromatography Mass Spectrometry for Volatile Organics, SW-846 3rd Edition". Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

[1] See attached list of target compounds.

*No standard available for quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor Oscar R. Pancorbo[illegible]
1/15/00

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF PURGEABLE ORGANICS

Sample Number	L980307-3	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	4/16-24/98
Source	Chebacco Lake		
Field Number	3A		

RESULTS		MDL *	QUALITY CONTROL		
Target Compound(s) [1] Detected	ng/g wet	ng/g	Surrogate Standards	% Recovery	Acceptance Limits
Not detected			Dibromofluoromethane	103	80-120
			Toluene-D8	106	81-117
			1,4-bromofluorobenzene	94	74-121

* MDL = Method Detection Limits

The sample was analyzed according to the EPA procedure, "Method 8260B-Gas Chromatography Mass Spectrometry for Volatile Organics, SW-846 3rd Edition". Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

[1] See attached list of target compounds.

**No standard available for quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor *[signature]*

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DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF PURGEABLE ORGANICS

Sample Number	L980307-5	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	4/16-24/98
Source	Chebacco Lake		
Field Number	5A		

RESULTS		MDL *	QUALITY CONTROL		
Target Compound(s) [1] Detected	ng/g wet	ng/g	Surrogate Standards	% Recovery	Acceptance Limits
Not detected			Dibromofluoromethane	94	80-120
			Toluene-D8	101	81-117
			1,4-bromofluorobenzene	96	74-121
* MDL = Method Detection Limits					

The sample was analyzed according to the EPA procedure, "Method 8260B-Gas Chromatography Mass Spectrometry for Volatile Organics, SW-846 3rd Edition". Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

[1] See attached list of target compounds.

**No standard available for quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor Alba R. D'Doherty
[illegible]

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF PURGEABLE ORGANICS

Sample Number	L980307-7	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	4/16-24/98
Source	Chebacco Lake		
Field Number	7A		

RESULTS		MDL *	QUALITY CONTROL		
Target Compound(s) [1] Detected	ng/g wet	ng/g	Surrogate Standards	% Recovery	Acceptanc Limits
Not detected			Dibromofluoromethane	102	80-120
			Toluene-D8	103	81-117
			1,4-bromofluorobenzene	99	74-121

* MDL = Method Detection Limits

The sample was analyzed according to the EPA procedure, "Method 8260B-Gas Chromatography Mass Spectrometry for Volatile Organics, SW-846 3rd Edition". Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

[1] See attached list of target compounds.

**Non-target analyte, no standard available for quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor [signature]
5/15/98

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF PURGEABLE ORGANICS

Sample Number	L980307-9	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	4/16-24/98
Source	Chebacco Lake		
Field Number	9A		

RESULTS		MDL *	QUALITY CONTROL		
Target Compound(s) [1] Detected	ng/g wet	ng/g	Surrogate Standards	% Recovery	Acceptanc Limits
Not detected			Dibromofluoromethane	100	80-120
			Toluene-D8	101	81-117
			1,4-bromofluorobenzene	104	74-121

* MDL = Method Detection Limits

The sample was analyzed according to the EPA procedure, "Method 8260B-Gas Chromatography Mass Spectrometry for Volatile Organics, SW-846 3rd Edition". Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

[1] See attached list of target compounds.

**Non-target analyte, no standard available for quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor Alba R. Fitchetty
1/15/98

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF PURGEABLE ORGANICS

Sample Number	L980307-11	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	4/16-24/98
Source	Chebacco Lake		
Field Number	11A		

RESULTS		MDL *	QUALITY CONTROL		
Target Compound(s) [1] Detected	ng/g wet	ng/g	Surrogate Standards	% Recovery	Acceptance Limits
Not detected			Dibromofluoromethane	101	80-120
			Toluene-D8	102	81-117
			1,4-bromofluorobenzene	103	74-121

* MDL = Method Detection Limits

The sample was analyzed according to the EPA procedure, "Method 8260B-Gas Chromatography Mass Spectrometry for Volatile Organics, SW-846 3rd Edition". Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

[1] See attached list of target compounds.

**Non-target analyte, no standard available for quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor Alan R. Gilchrist
6/15/98

DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

PCB and ORGANOCHLORINE PESTICIDE ANALYSIS

CITY/TOWN: Hamilton

COLLECTOR: J. Sabloc

Source A Lake Chebaco, #1A
Source B Lake Chebaco, #2A
Source C Lake Chebaco, #3A
Source D Lake Chebaco, #4A
Source E Lake Chebaco, #5A

Michael D. Bolrin
4/27/98

	A	B	C	D	E
Sample No.	L980307-1	L980307-2	L980307-3	L980307-4	L980307-5
Date of Collection	4/6/98	4/6/98	4/6/98	4/6/98	4/6/98
Date of Receipt	4/8/98	4/8/98	4/8/98	4/8/98	4/8/98
Date Analyzed	4/13-23/98	4/13-23/98	4/13-23/98	4/13-23/98	4/13-23/98
PCB and Organochlorine Pesticide Analysis, (ug/g)	ND	ND	ND	ND	ND
Spike % Recovery					
PCNB Surrogate % Recovery	75	82	91	86	91

REMARKS: The samples were analyzed according to EPA Method 8081A, 8082 and 3541, SW-846.

ND = Not detected or the analytical result is at or below the established MDL of: (See last page)

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WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF SEMIVOLATILE ORGANIC COMPOUNDS

Sample Number	L980307-11	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	5/26/98-6/5/98
Source	Chebacco Lake	Extracted	4/16/98
Field ID	11A		

RESULTS		MDL*	QUALITY CONTROL		
Target Compound(s) † Detected	µg/g Dry	µg/g	Surrogate Standards	%Recovery	Acceptance Limits
Not detected			2-fluorobiphenyl	40	30-115
			4-terphenyl-D14	74	18-137
Remarks:					

*** MDL = Method Detection Limits**
The sample was extracted by the EPA procedure, "Method 3541B, Automated Soxhlet Extraction" and analyzed by EPA "Method 8270B, Semivolatile Organic Compounds by Gas Chromatography Mass Spectrometry (GC/MS):Capillary Column Technique".

† See attached list of target compounds.

** Non-target conmpounds. No standard available for verification or quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor Albert A. Schultz
6/15/98

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MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF SEMIVOLATILE ORGANIC COMPOUNDS

Sample Number	L980307-9	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	5/26/98-6/5/98
Source	Chebacco Lake	Extracted	4/16/98
Field ID	9A		

RESULTS		MDL*	QUALITY CONTROL		
Target Compound(s) † Detected	µg/g Dry	µg/g	Surrogate Standards	%Recovery	Acceptance Limits
Not detected			2-fluorobiphenyl	61	30-115
			4-terphenyl-D14	92	18-137
Remarks:					

*** MDL = Method Detection Limits**
The sample was extracted by the EPA procedure, "Method 3541B, Automated Soxhlet Extraction" and analyzed by EPA "Method 8270B, Semivolatile Organic Compounds by Gas Chromatography Mass Spectrometry (GC/MS):Capillary Column Technique".

† See attached list of target compounds.

** Non-target conmpounds. No standard available for verification or quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor [signature]
6/15/98

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MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF SEMIVOLATILE ORGANIC COMPOUNDS

Sample Number	L980307-7	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	5/26/98-6/5/98
Source	Chebacco Lake	Extracted	4/16/98
Field ID	7A		

RESULTS		MDL*	QUALITY CONTROL		
Target Compound(s) † Detected	µg/g Dry	µg/g	Surrogate Standards	%Recovery	Acceptance Limits
Not detected			2-fluorobiphenyl	60	30-115
			4-terphenyl-D14	112	18-137
Remarks:					

*** MDL = Method Detection Limits**

The sample was extracted by the EPA procedure, "Method 3541B, Automated Soxhlet Extraction" and analyzed by EPA "Method 8270B, Semivolatile Organic Compounds by Gas Chromatography Mass Spectrometry (GC/MS):Capillary Column Technique".

† See attached list of target compounds.

** Non-target conmpounds. No standard available for verification or quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor [signature]
6/15/98

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MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF SEMIVOLATILE ORGANIC COMPOUNDS

Sample Number	L980307-5	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	5/26/98-6/5/98
Source	Chebacco Lake	Extracted	4/16/98
Field ID	5A		

RESULTS		MDL*	QUALITY CONTROL		
Target Compound(s) † Detected	μg/g Dry	μg/g	Surrogate Standards	%Recovery	Acceptance Limits
Not detected			2-fluorobiphenyl	52	30-115
			4-terphenyl-D14	104	18-137
Remarks:					

*** MDL = Method Detection Limits**

The sample was extracted by the EPA procedure, "Method 3541B, Automated Soxhlet Extraction" and analyzed by EPA "Method 8270B, Semivolatile Organic Compounds by Gas Chromatography Mass Spectrometry (GC/MS):Capillary Column Technique".

† See attached list of target compounds.

** Non-target conmpounds. No standard available for verification or quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor Albert R. Flaherty
6/15/98

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MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station: 1887-1989

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF SEMIVOLATILE ORGANIC COMPOUNDS

Sample Number	L980307-2	City/Town	Hamilton
Collector	Chris Buchanan	Collected	4/6/98
Received	4/8/98	Analyzed	5/26/98-6/5/98
Source	Chebacco Lake	Extracted	4/16/98
Field ID	2A		

RESULTS		**MDL***	**QUALITY CONTROL**		
Target Compound(s) † Detected	µg/g Dry	µg/g	Surrogate Standards	%Recovery	Acceptance Limits
Not detected			2-fluorobiphenyl	55	30-115
			4-terphenyl-D14	48	18-137

Remarks:

*** MDL = Method Detection Limits**

The sample was extracted by the EPA procedure, "Method 3541B, Automated Soxhlet Extraction" and analyzed by EPA "Method 8270B, Semivolatile Organic Compounds by Gas Chromatography Mass Spectrometry (GC/MS):Capillary Column Technique".

† See attached list of target compounds.

** Non-target conmpounds. No standard available for verification or quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor [signature]
6/15/98

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Target Compounds for EPA Method 8260B846

Compound Name	
Dichlorodifluoromethane	Chlorobenzene
Chloromethane	1,1,1,2-tetrachloroethane
Vinyl chloride	Ethylbenzene
Bromomethane	p,m-xylene
Chloroethane	o-xylene
Trichlorofluoromethane	Styrene
1,1-dichloroethene	Bromoform
Methylene chloride	Isoprylbenzene
trans-1,2-dichloroethene	Bromobenzene
1,1-dichloroethane	1,1,2,2-tetrachloroethane
2,2-dichloropropane	1,2,3-trichloropropane
cis-1,2-dichloroethene	n-propylbenzene
Bromochloromethane	2-chlorotoluene
Chloroform	4-chlorotoluene
1,1,1-trichloroethane	1,3,5-trimethylbenzene
Carbon tetrachloride	tert-butylbenzene
1,1-dichloropropene	1,2,4-trimethylbenzene
Benzene	sec-butylbenzene
1,2-dichloroethane	1,3-dichlorobenzene
Trichloroethene	4-isopryltoluene
1,2-dichloropropane	1,4-dichlorobenzene
Dibromomethane	1,2-dichlorobenzene
Bromodichloromethane	n-butylbenzene
cis-1,3-dichloropropene	1,2-dibromo-3-chloropane
Toluene	1,2,4-trichlorobenzene
trans-1,3-dichloropropene	Hexachlorobutadiene
1,1,2-trichloroethane	Naphthalene
Tetrachloroethene	1,2,3-trichlorobenzene
1,2-dichloropropane	Methyl tert. butyl ether
Dibromochloromethane	
1,2-dibromoethane	

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
WILLIAM X. WALL EXPERIMENT STATION
Lawrence Experiment Station 1887-1989

QUALITY CONTROL DATA

:ity/Town: Hamilton

:ollector: Chris Buchanan

:emarks:

/atrix: Sediments

:onc. Units: mg/kg

SAMPLE ID	ANALYTE	PRECISION			ACCURACY, % RECOVERY			MDL mg/kg	METHO:
		Sample	Duplicate	Range	LFB	QCS	LFM		
:980307-20	Arsenic	2.8	2.9	0.1	94	99	92	2.5	EPA 6010E
	Chromium	3.4	3.4	0.0	120	103	113	0.25	EPA 6010E
	Copper	0.8	0.6	0.2	105	92	109	0.50	EPA 6010E
	Lead	4.0	4.9	0.9	107	103	107	1.8	EPA 6010E
	Zinc	22	24	2.0	92	88	80	0.25	EPA 6010E
	Mercury	0.024	0.039	0.015	100	100	120	0.01	EPA 7471/

Remarks:

Approved: KMH

Date: 5/12/98

AC980307.DOC

MA DEPT OF ENVIRONMNTL PROTECTION
WILLIAM X. WALL EXPERIMENT STATION
Analysis Report
Apr. 30, 1998
Login Number:L980307

Account: BRP BUREAU OF RESOURCE PROTECTION
Project:

Site: CHEBACCO
Collector: Chris Buchunan

KBH, 5/12/98

Lab Sample Number	Client Locator/ Client Number	Collect/ Receive Date	Result mg/kg	Method	Analyze Date	MDL mg/kg
L980307-12	CHEBACCO LAK 1 B	06-APR-98 08-APR-98				
	ARSENIC (6010)		6.9	EPA 6010B	4/29/98	2.5
	CHROMIUM (6010)		2.4	EPA 6010B	4/29/98	0.25
	COPPER (6010)		3.0	EPA 6010B	4/29/98	0.50
	LEAD (6010)		30	EPA 6010B	4/29/98	1.8
	MERCURY (7471A)		0.059	EPA 7471A	4/29/98	0.010
	ZINC (6010)		37	EPA 6010B	4/29/98	0.25
	KJELDAHL-N		880	EPA 351.2	5/7/98	25
	PHOSPHORUS-P		130	EPA 365.4	5/7/98	12
	PERCENT SOLIDS		14%	SM 2540 G	4/16/98	
L980307-13	CHEBACCO LAK 2 B	06-APR-98 08-APR-98				
	ARSENIC (6010)		6.5	EPA 6010B	4/29/98	2.5
	CHROMIUM (6010)		2.1	EPA 6010B	4/29/98	0.25
	COPPER (6010)		0.8	EPA 6010B	4/29/98	0.50
	LEAD (6010)		7.2	EPA 6010B	4/29/98	1.8
	MERCURY (7471A)		<MDL	EPA 7471A	4/29/98	0.010
	ZINC (6010)		24	EPA 6010B	4/29/98	0.25
	KJELDAHL-N		950	EPA 351.2	5/7/98	25
	PHOSPHORUS-P		110	EPA 365.4	5/7/98	12
	PERCENT SOLIDS		40%	SM 2540 G	4/16/98	

SUMMARY OF RESULTS & CONCLUSIONS

1. Geological setting generally not suitable for cesspools or traditional septic systems.

2. Outlet was changed between 1941 & 1955.

3. Inlets carry higher amounts of nutrients than lake.

4. The Lake is not shallowing with in-lake sediment.

5. Fine-grained in-lake sediment is not a blanket of uniform thickness; instead it is a patchwork of variable thickness.

6. Dredge spoils would be a mixture of gravel, sand & fines – not suitable for resale as landfill capping material.

7. Cabomba is distributed around the lake – it is growing in all types of sediment.

8. Essex – 42% - 86% of septic systems within 200 feet of water could be 20 years or older.
   Hamilton – 31% – 73% of septic systems within 200 feet of water could be 20 years old or older.

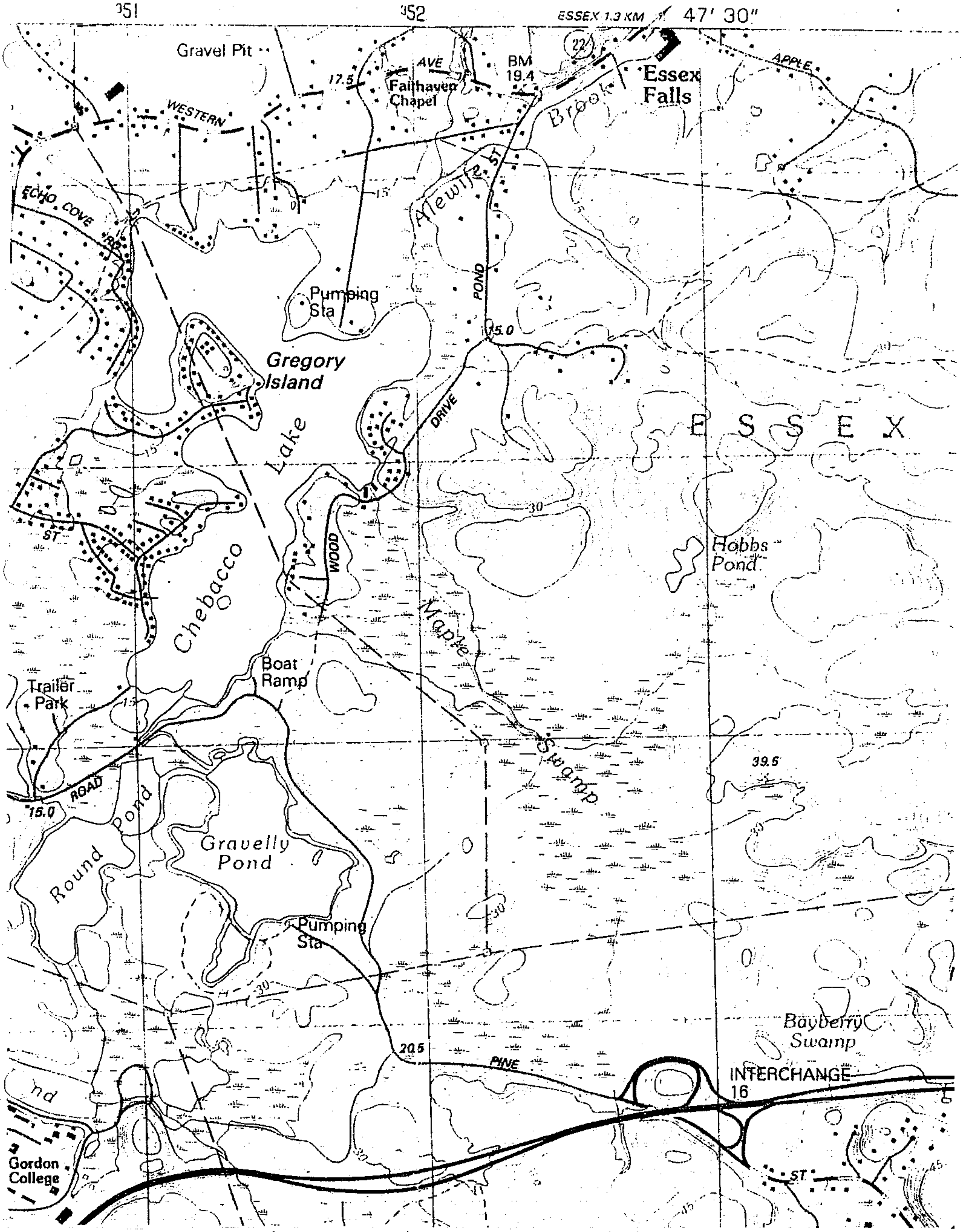
9. Desired outcomes for lake:
   - decrease nutrients from septic & runoff,
   - decrease exotic vegetation in lake, without causing algal increase,
     - 1. application of appropriate herbicide
       2. harvesting dead plant material to prevent decay & nutrient release.

10. Remediation will be slow because nutrients are stored in lake sediments.

11. Real solution will demand more public education & community determination to preserve resource.

Salem State College has completed a study of Chebacco Lake was done with input from the CLA, Mass. DEM, local conservation commissions, Sen. Tarr, Rep. Verga and others. This study involved a lot of time and effort. Some of the data collection was difficult due to the low water flow during two summers and the lack of safe ice during both winters. Current information was compared to the 1985 Lycott Study. This report looked at the entire Chebacco Lake watershed in addition to the actual lake and shoreline. Along with handling the issue of exotic weeds, the purpose of the study was to design a lake management program to protect water quality, protect and enhance the habitat of the alewife and other fish/ wildlife, improve public safety and recreational access.

Some of the studys findings were different than had been expected. The lake has not become unusable as predicted by the Lycott Study, in fact, the depth of the lake hasn't changed since 1912 when measurements were taken. The lake depth was also measured in 1949. The average water temperatures and clarity have also stayed about the same. At this point the shoreline trees and plants along with the invasive cabomba are absorbing all of the phosphorus entering the lake. If large amounts of cabomba are removed and the nutrients entering the lake remain at the same levels that they are now, other vegetation or algae will grow quickly. If the phosphorus levels can be reduced, herbicide treatments should work. The State is going to want to see that residents are doing their part to reduce nutrients if they are to provide funding for a project. The CLA has put many articles in past newsletters dealing with ways to reduce nutrients and control erosion and will continue to do so.


351
352
ESSEX 1.3 KM
47′ 30″
Gravel Pit
AVE
17.5
BM
19.4
Faithaven
Chapel
22
Essex
Falls
APPLE
WESTERN
Brook
Alewife
ST
ECHO COVE RD
POND
Pumping
Sta
15.0
Gregory
Island
Lake
DRIVE
E S S E X
ST
Chebacco
WOOD
Hobbs
Pond
Maple
Swamp
Boat
Ramp
Trailer
Park
ROAD
15.0
Pond
Round
Gravelly
Pond
39.5
Pumping
Sta
Bayberry
Swamp
20.5
PINE
INTERCHANGE
16
Gordon
College
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Survey ... Revised 3/1/40 ...

ENG. OCT. 26, 1937
REVISIONS
2ND ED. SEPT. 1938
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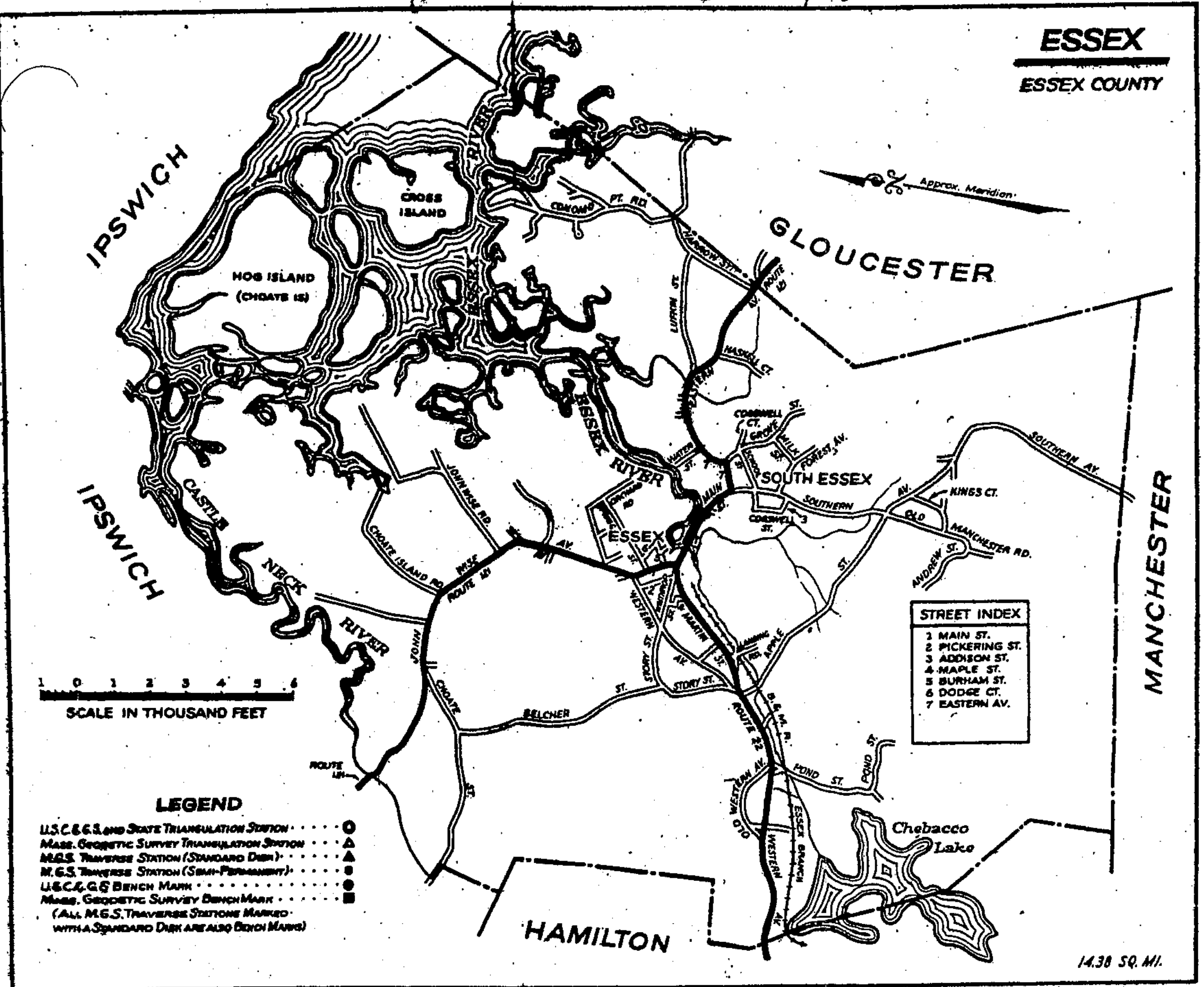
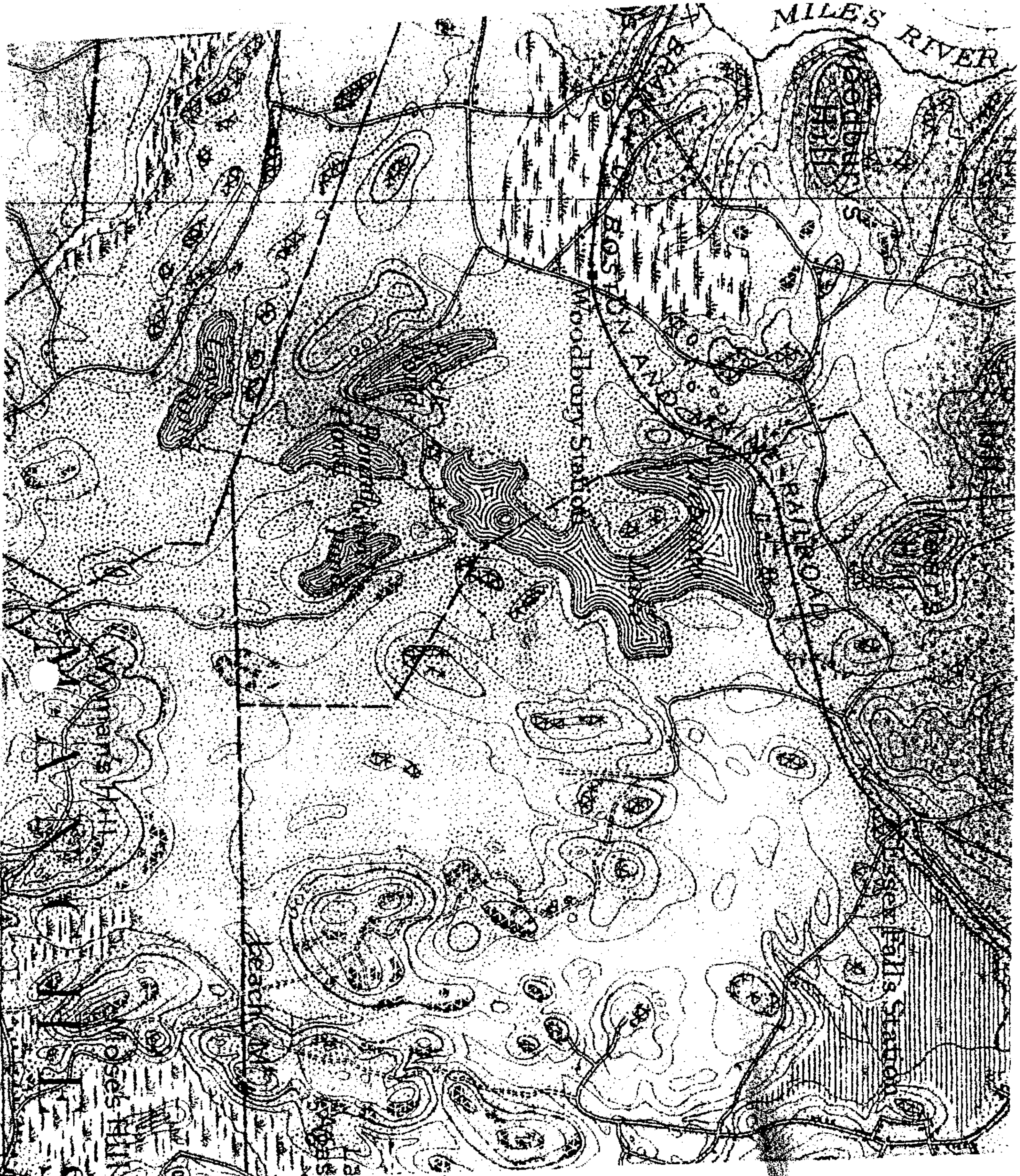


ESSEX


MILES RIVER
Woodbury Station

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