US ENVIRONMENTAL PROTECTION AGENCY
60 Westview Street
Lexington, MA. 02173

DATE: July 27, 1998

SUBJECT: **NUTMEG VALLEY**
- Volatile Organic Analysis by GC/MS

FROM: Joseph Montanaro, EIA

TO: Carolyn Pina-Springer, SEA & John Mullaney, USGS

THRU: William J. Andrade, Ph. D., Analytical Specialist
WJA 7/28/98

PROJECT NUMBER: 98563

DATES(S) SAMPLES RECEIVED BY THE LABORATORY: 07/24/98

SAMPLE NUMBERS: WC78, 98563-Trip Blank

ANALYTICAL PROCEDURE:

EPA Method 524.2, Methods for the Determination of Organic Compounds in Drinking Water - Supplement III, EPA/600/R-95/131, August 1995, Modified.

QUALITY ASSURANCE

1. A laboratory blank was analyzed prior to sample analysis.

2. Each sample was spiked with three surrogate compounds at 5 ppb concentration. The results for the surrogate recoveries are reported for each sample.

3. One sample WC78, was spiked in duplicate to determine laboratory precision and accuracy.

DATA FILE: j:\chemstry\reports\voa\98563dw.wk4

ANALYTICAL PARAMETERS
PURGEABLE ORGANIC ANALYSIS

INSTRUMENTS: Varion Archon Purge and Trap Autosampler
Tekmar LSC 2000
Finnigan INCOS-50 XL

PURGE CONDITIONS:

Gas:	Helium
Purge Time and Flow:	8 min., 40 ml/min
Dry Purge Time and Flow:	4 min., 40 ml/min
Trap:	25 cm stainless steel (1/8 in. OD) packed with Carbopack B (10 cm), Carboxen 1000 (6 cm), and Carboxen 1001 (1 cm)
Desorption Time,Flow,Temperature:	1 min, 40 ml/min., 250 C
Bake out cycle:	8 min. at 260 C

CHROMATOGRAPHIC CONDITIONS:

Column:	Restek 502.2 40 M length, 0.18 mm id, 1.0 df (um)
Program:	Initial 35 C programmed at 8 C/min to 220 C and held 220 C for 7 minutes.
Injector and Transfer Temperatures:	200 C
Carrier Gas and Flow:	Helium, 15 ml/min

MASS SPECTROMETER CONDITIONS:

Electron Energy:	70 eV
Mass Range:	35-300 amu
Scan Rate:	1.5 seconds

US ENVIRONMENTAL PROTECTION AGENCY
REGION 1 LABORATORY
PROJECT AND REPORT FORM

Chemist Reviewing Data: Dan Boudreau

Method Modification: None

Limitation of Data: None

Laboratory Blank Problems: None

Instrument Performance Problems: None

Surrogate or Spike Recovery Problems: None

Additonal Comments: None

MATRIX SPIKE DUPLICATE ANALYSIS

FACILITY SAMPLED: NUTMEG VALLEY
SAMPLE NUMBER: WC78
FILE NAME(S): 07248F18 & 07248F19
DATE OF ANALYSIS: 07/24/98

ACCURACY

COMPOUND	AVERAGE % RECOVERY	ACCEPTABLE RANGE[2]
1,1 Dichloroethylene	120	50-150
Chloroform	112	62-128
1,2 Dichloroethane	102	57-141
1,1,1 Trichloroethane	106	51-142
Carbon tetrachloroide	114	60-139
Bromodichloromethane	94	44-133
Trichloroethylene	108	65-132
Benzene	106	67-132
Dibromochloromethane	95	36-125
Bromoform	101	25-118
1,4 Dichlorobenzene	110[1]	55-102
Vinyl Chloride	114	44-170

PRECISION

COMPOUND	#1 % RECOV	#2 % RECOVERY	RPD	ACCEPTABLE RANGE[2]
1,1 Dichloroethylene	122	115	4	0-15
Chloroform	113	112	1	0-23
1,2 Dichloroethane	105	100	5	0-36
1,1,1 Trichloroethane	105	106	1	0-19
Carbon tetrachloride	115	113	2	0-17
Bromodichloromethane	94	95	1	0-33
Trichloroethylene	110	106	4	0-44
Benzene	106	105	1	0-24
Dibromochloromethane	93	97	4	0-41
Bromoform	104	98	6	0-65
1,4 Dichlorobenzene	111	110	1	0-25
Vinyl Chloride	114	115	1	0-19

[1]=out of range
[2]=quality control acceptance criteria as per laboratory

FACILITY SAMPLED: NUTMEG VALLEY

US ENVIRONMENTAL PROTECTION AGENCY
REGION I LABORATORY
GC/MS PURGEABLE ORGANIC ANALYSIS - DRINKING WATER

SAMPLE ID: Lab Blank
FILE NAME(S): 07248F14
DATE OF ANALYSIS: 07/24/98

DILUTION FACTOR(S): 1

CAS No.	Compound	Conc. (ug/L)	Reporting Limits (ug/L)	MCL'S (ug/L)	QUALIFIER
	REGULATED VOC'S				
75-01-4	Vinyl Chloride	ND	1	2	
75-35-4	1,1 Dichloroethylene	ND	1	7	
107-06-2	1,2 Dichloroethane	ND	1	5	
71-55-6	1,1,1 Trichloroethane	ND	1	200	
56-23-5	Carbon Tetrachloride	ND	1	5	
79-01-6	Trichloroethylene	ND	1	5	
71-43-2	Benzene	ND	1	5	
106-46-7	1,4, Dichlorobenzene	ND	1	75	
75-09-2	Methylene Chloride	ND	1	5	
156-59-2	c-1,2-Dichloroethylene	ND	1	70	
156-60-5	t-1,2-Dichloroethylene	ND	1	100	
78-87-5	1,2-Dichloropropane	ND	1	5	
79-00-5	1,1,2-Trichloroethane	ND	1	5	
127-18-4	Tetrachloroethylene	ND	1	5	
108-88-3	Toluene	ND	1	1000	
108-90-7	Chlorobenzene	ND	1	100	
100-41-4	Ethylbenzene	ND	1	700	
100-42-5	Styrene	ND	1	100	
95-50-1	1,2- Dichlorobenzene	ND	1	600	
1330-20-7	Total Xylenes	ND	2	10000	
120-82-1	1,2,4 Trichlorobenzene	ND	1	70	
	TRIHALOMETHANES				
67-66-3	Chloroform	ND	1		
75-27-4	Dichlorobromomethane	ND	1		
124-48-1	Dibromochloromethane	ND	1		
75-25-2	Bromoform	ND	1		
------	Total Trihalomethanes	ND	1	100	
	UNREGULATED VOC'S			MCLG'S (ug/L)	
74-87-3	Chloromethane	ND	1		
74-83-9	Bromomethane	ND	1		
74-97-5	Bromochloromethane	ND	1		
75-00-3	Chloroethane	ND	1		
75-69-4	Trichlorofluoromethane	ND	1		
75-34-3	1,1-Dichloroethane	ND	1		
10061-02-6	t-1,3-Dichloropropene	ND	1		
10061-01-5	c-1,3-Dichloropropene	ND	1		
563-58-6	1,1-Dichloropropene	ND	1		

US ENVIRONMENTAL PROTECTION AGENCY
REGION I LABORATORY
GC/MS PURGEABLE ORGANIC ANALYSIS - DRINKING WATER

SAMPLE ID:	Lab Blank UNREGULATED VOC'S	Conc. (ug/L)	Reporting Limits (ug/L)	MCLG's (ug/L)	QUALIFIER
108-86-1	Bromobenzene	ND	1		
79-34-5	1,1,2,2-Tetrachloroethane	ND	1		
630-20-6	1,1,1,2-Tetrachloroethane	ND	1		
103-65-1	n-Propyl Benzene	ND	1		
104-51-8	n-Butyl Benzene	ND	1		
135-98-8	sec-Butylbenzene	ND	1		
98-06-6	tert-Butylbenzene	ND	1		
541-73-1	1,3-Dichlorobenzene	ND	1		
74-95-3	Dibromomethane	ND	1		
75-71-8	Dichlorodifluoromethane	ND	1		
142-28-9	1,3-Dichloropropane	ND	1		
590-20-7	2,2-Dichloropropane	ND	1		
87-68-3	Hexachlorobutadiene	ND	1		
98-82-8	Isopropylbenzene	ND	1		
96-18-4	1,2,3-Trichloropropane	ND	1		
99-87-6	1,4 Isopropyl toluene (para)	ND	1		
91-20-3	Naphthalene	ND	1		
87-61-6	1,2,3 Trichlorobenzene	ND	1		
95-63-6	1,2,4 Trimethylbenzene	ND	1		
108-67-8	1,3,5 Trimethylbenzene	ND	1		
95-49-8	2-Chlorotoluene	ND	1		
106-43-4	4-Chlorotoluene	ND	1		
	OTHER COMPOUNDS QUANTITATED				
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1		
67-64-1	Acetone	ND	10		
75-15-0	Carbon Disulfide	ND	3		
78-93-3	2-Butanone (MEK)	ND	20		
591-10-6	2-Hexanone	ND	2		
108-10-1	4-Methyl-2-Pentanone (MIBK)	ND	2		
109-99-9	Tetrahydrofuran (THF)	ND	7		
60-29-7	Ethyl Ether	ND	3		
106-93-4	1,2-Dibromoethane (EDB)	ND	1		
96-12-8	1,2-Dibromo-3-chloropropane	ND	1		

QUALITY CONTROL Surrogate Compounds		Percent Recoveries	Confidence Limits
2199-69-1	1,2-Dichlorobenzene-D4	96	60-123
2037-26-5	Toluene-D8	94	80-117
460-00-4	4-Bromofluorobenzene	95	65-118

ND=Not Detected above the reporting limit.
RL=Reporting Limit
J=Approximate
NA=Not available due to dilution or interference
B=analyte is associated with lab blank
MCL=Maximum Contaminant Level
MCLG=Maximum Contaminant Level Goal
E=estimated value exceeds the calibration range
L=estimated value is below the calibration range
$_2$=quality control acceptance criteria as per lab

FACILITY SAMPLED: NUTMEG VALLEY

US ENVIRONMENTAL PROTECTION AGENCY
REGION I LABORATORY
GC/MS PURGEABLE ORGANIC ANALYSIS - DRINKING WATER

SAMPLE ID: WC78
FILE NAME(S): 07248F17
DATE OF COLLECTION: 07/23/98
DATE OF ANALYSIS: 07/24/98

DILUTION FACTOR(S): 1
PRESERVATIVE: Cool to 4 C
Acidified to pH <2

CAS No.	Compound	Conc. (ug/L)	Reporting Limits (ug/L)	MCL'S (ug/L)	QUALIFIER
	REGULATED VOC'S				
75-01-4	Vinyl Chloride	ND	1	2	
75-35-4	1,1 Dichloroethylene	ND	1	7	
107-06-2	1,2 Dichloroethane	ND	1	5	
71-55-6	1,1,1 Trichloroethane	ND	1	200	
56-23-5	Carbon Tetrachloride	ND	1	5	
79-01-6	Trichloroethylene	ND	1	5	
71-43-2	Benzene	ND	1	5	
106-46-7	1,4, Dichlorobenzene	ND	1	75	
75-09-2	Methylene Chloride	ND	1	5	
156-59-2	c-1,2-Dichloroethylene	ND	1	70	
156-60-5	t-1,2-Dichloroethylene	ND	1	100	
78-87-5	1,2-Dichloropropane	ND	1	5	
79-00-5	1,1,2-Trichloroethane	ND	1	5	
127-18-4	Tetrachloroethylene	ND	1	5	
108-88-3	Toluene	ND	1	1000	
108-90-7	Chlorobenzene	ND	1	100	
100-41-4	Ethylbenzene	ND	1	700	
100-42-5	Styrene	ND	1	100	
95-50-1	1,2- Dichlorobenzene	ND	1	600	
1330-20-7	Total Xylenes	ND	2	10000	
120-82-1	1,2,4 Trichlorobenzene	ND	1	70	
	TRIHALOMETHANES				
67-66-3	Chloroform	ND	1		
75-27-4	Dichlorobromomethane	ND	1		
124-48-1	Dibromochloromethane	ND	1		
75-25-2	Bromoform	ND	1		
-------	Total Trihalomethanes	ND	1	100	
	UNREGULATED VOC'S			MCLG'S (ug/L)	
74-87-3	Chloromethane	ND	1		
74-83-9	Bromomethane	ND	1		
74-97-5	Bromochloromethane	ND	1		
75-00-3	Chloroethane	ND	1		
75-69-4	Trichlorofluoromethane	ND	1		
75-34-3	1,1-Dichloroethane	ND	1		
10061-02-6	t-1,3-Dichloropropene	ND	1		
10061-01-5	c-1,3-Dichloropropene	ND	1		
563-58-6	1,1-Dichloropropene	ND	1		

US ENVIRONMENTAL PROTECTION AGENCY
REGION I LABORATORY
GC/MS PURGEABLE ORGANIC ANALYSIS - DRINKING WATER

SAMPLE ID: WC78

	UNREGULATED VOC'S	Conc. (ug/L)	Reporting Limits (ug/L)	MCLG's (ug/L)	QUALIFIER
108-86-1	Bromobenzene	ND	1		
79-34-5	1,1,2,2-Tetrachloroethane	ND	1		
630-20-6	1,1,1,2-Tetrachloroethane	ND	1		
103-65-1	n-Propyl Benzene	ND	1		
104-51-8	n-Butyl Benzene	ND	1		
135-98-8	sec-Butylbenzene	ND	1		
98-06-6	tert-Butylbenzene	ND	1		
541-73-1	1,3-Dichlorobenzene	ND	1		
74-95-3	Dibromomethane	ND	1		
75-71-8	Dichlorodifluoromethane	ND	1		
142-28-9	1,3-Dichloropropane	ND	1		
590-20-7	2,2-Dichloropropane	ND	1		
87-68-3	Hexachlorobutadiene	ND	1		
98-82-8	Isopropylbenzene	ND	1		
96-18-4	1,2,3-Trichloropropane	ND	1		
99-87-6	1,4 Isopropyl toluene (para)	ND	1		
91-20-3	Naphthalene	ND	1		
87-61-6	1,2,3 Trichlorobenzene	ND	1		
95-63-6	1,2,4 Trimethylbenzene	ND	1		
108-67-8	1,3,5 Trimethylbenzene	ND	1		
95-49-8	2-Chlorotoluene	ND	1		
106-43-4	4-Chlorotoluene	ND	1		
	OTHER COMPOUNDS QUANTITATED				
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1		
67-64-1	Acetone	ND	10		
75-15-0	Carbon Disulfide	ND	3		
78-93-3	2-Butanone (MEK)	ND	20		
591-10-6	2-Hexanone	ND	2		
108-10-1	4-Methyl-2-Pentanone (MIBK)	ND	2		
109-99-9	Tetrahydrofuran (THF)	ND	7		
60-29-7	Ethyl Ether	ND	3		
106-93-4	1,2-Dibromoethane (EDB)	ND	1		
96-12-8	1,2-Dibromo-3-chloropropane	ND	1		

QUALITY CONTROL Surrogate Compounds		Percent Recoveries	Confidence Limits
2199-69-1	1,2-Dichlorobenzene-D4	99	60-123
2037-26-5	Toluene-D8	96	80-117
460-00-4	4-Bromofluorobenzene	95	65-118

ND=Not Detected above the reporting limit.
RL=Reporting Limit
J=Approximate
NA=Not available due to dilution or interference
B=analyte is associated with lab blank
MCL=Maximum Contaminant Level
MCLG=Maximum Contaminant Level Goal
E=estimated value exceeds the calibration range
L=estimated value is below the calibration range
$_2$=quality control acceptance criteria as per lab

FACILITY SAMPLED: NUTMEG VALLEY

US ENVIRONMENTAL PROTECTION AGENCY
REGION I LABORATORY
GC/MS PURGEABLE ORGANIC ANALYSIS - DRINKING WATER

SAMPLE ID: 98563 - Trip Blank
FILE NAME(S): 07248F16
DATE OF COLLECTION: 07/23/98
DATE OF ANALYSIS: 07/24/98

DILUTION FACTOR(S): 1
PRESERVATIVE: Cool to 4 C
Acidified to pH <2

CAS No.	Compound	Conc. (ug/L)	Reporting Limits (ug/L)	MCL'S (ug/L)	QUALIFIER
	REGULATED VOC'S				
75-01-4	Vinyl Chloride	ND	1	2	
75-35-4	1,1 Dichloroethylene	ND	1	7	
107-06-2	1,2 Dichloroethane	ND	1	5	
71-55-6	1,1,1 Trichloroethane	ND	1	200	
56-23-5	Carbon Tetrachloride	ND	1	5	
79-01-6	Trichloroethylene	ND	1	5	
71-43-2	Benzene	ND	1	5	
106-46-7	1,4, Dichlorobenzene	ND	1	75	
75-09-2	Methylene Chloride	ND	1	5	
156-59-2	c-1,2-Dichloroethylene	ND	1	70	
156-60-5	t-1,2-Dichloroethylene	ND	1	100	
78-87-5	1,2-Dichloropropane	ND	1	5	
79-00-5	1,1,2-Trichloroethane	ND	1	5	
127-18-4	Tetrachloroethylene	ND	1	5	
108-88-3	Toluene	ND	1	1000	
108-90-7	Chlorobenzene	ND	1	100	
100-41-4	Ethylbenzene	ND	1	700	
100-42-5	Styrene	ND	1	100	
95-50-1	1,2- Dichlorobenzene	ND	1	600	
1330-20-7	Total Xylenes	ND	2	10000	
120-82-1	1,2,4 Trichlorobenzene	ND	1	70	
	TRIHALOMETHANES				
67-66-3	Chloroform	ND	1		
75-27-4	Dichlorobromomethane	ND	1		
124-48-1	Dibromochloromethane	ND	1		
75-25-2	Bromoform	ND	1		
-------	Total Trihalomethanes	ND	1	100	
	UNREGULATED VOC'S			MCLG'S (ug/L)	
74-87-3	Chloromethane	ND	1		
74-83-9	Bromomethane	ND	1		
74-97-5	Bromochloromethane	ND	1		
75-00-3	Chloroethane	ND	1		
75-69-4	Trichlorofluoromethane	ND	1		
75-34-3	1,1-Dichloroethane	ND	1		
10061-02-6	t-1,3-Dichloropropene	ND	1		
10061-01-5	c-1,3-Dichloropropene	ND	1		
563-58-6	1,1-Dichloropropene	ND	1		

US ENVIRONMENTAL PROTECTION AGENCY
REGION I LABORATORY
GC/MS PURGEABLE ORGANIC ANALYSIS - DRINKING WATER

SAMPLE ID: 98563 - Trip Blank

	UNREGULATED VOC'S	Conc. (ug/L)	Reporting Limits (ug/L)	MCLG's (ug/L)	QUALIFIER
108-86-1	Bromobenzene	ND	1		
79-34-5	1,1,2,2-Tetrachloroethane	ND	1		
630-20-6	1,1,1,2-Tetrachloroethane	ND	1		
103-65-1	n-Propyl Benzene	ND	1		
104-51-8	n-Butyl Benzene	ND	1		
135-98-8	sec-Butylbenzene	ND	1		
98-06-6	tert-Butylbenzene	ND	1		
541-73-1	1,3-Dichlorobenzene	ND	1		
74-95-3	Dibromomethane	ND	1		
75-71-8	Dichlorodifluoromethane	ND	1		
142-28-9	1,3-Dichloropropane	ND	1		
590-20-7	2,2-Dichloropropane	ND	1		
87-68-3	Hexachlorobutadiene	ND	1		
98-82-8	Isopropylbenzene	ND	1		
96-18-4	1,2,3-Trichloropropane	ND	1		
99-87-6	1,4 Isopropyl toluene (para)	ND	1		
91-20-3	Naphthalene	ND	1		
87-61-6	1,2,3 Trichlorobenzene	ND	1		
95-63-6	1,2,4 Trimethylbenzene	ND	1		
108-67-8	1,3,5 Trimethylbenzene	ND	1		
95-49-8	2-Chlorotoluene	ND	1		
106-43-4	4-Chlorotoluene	ND	1		
	OTHER COMPOUNDS QUANTITATED				
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1		
67-64-1	Acetone	ND	10		
75-15-0	Carbon Disulfide	ND	3		
78-93-3	2-Butanone (MEK)	ND	20		
591-10-6	2-Hexanone	ND	2		
108-10-1	4-Methyl-2-Pentanone (MIBK)	ND	2		
109-99-9	Tetrahydrofuran (THF)	ND	7		
60-29-7	Ethyl Ether	ND	3		
106-93-4	1,2-Dibromoethane (EDB)	ND	1		
96-12-8	1,2-Dibromo-3-chloropropane	ND	1		

QUALITY CONTROL Surrogate Compounds		Percent Recoveries	Confidence Limits
2199-69-1	1,2-Dichlorobenzene-D4	95	60-123
2037-26-5	Toluene-D8	97	80-117
460-00-4	4-Bromofluorobenzene	91	65-118

ND=Not Detected above the reporting limit.
RL=Reporting Limit
J=Approximate
NA=Not available due to dilution or interference
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MCLG=Maximum Contaminant Level Goal
E=estimated value exceeds the calibration range
L=estimated value is below the calibration range
$_2$=quality control acceptance criteria as per lab