SEG ENGINEERS & CONSULTANTS, INC.
ENGINEERS • LANDSCAPE ARCHITECTS • SURVEYORS

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DNR - REG

October 30, 1987

US EPA RECORDS CENTER REGION 5
513048

Mr. Howard McCaffery, P.E.
Director of Public Service
732 City Hall
124 W. Michigan Avenue
Lansing, Michigan 48933

RE: First Quarterly Report Revised, Fiscal Year 1988 on
Aurelius Road Landfill Groundwater Monitoring

Dear Mr. McCaffery:

This is the quarterly report for the first quarter of Fiscal Year 1988, regarding the groundwater monitoring at Aurelius Road Landfill performed by SEG Laboratories, Inc. for the City of Lansing. This report summarizes the work we performed and the analytical results for samples collected on August 4 and 5, 1987.

Services Performed

During the First quarter of Fiscal Year 1988, SEG Engineers & Consultants, Inc. performed the following work on August 4 and 5, 1987.

1. Static groundwater elevations were measured at monitoring wells OW-3, OW4, OW-5, OW-7D, OW9D, OW-10S and OW-10D. Casings of wells MW-1 and MW-5 were recently replaced and new elevations were not available at the time of the survey. Static water level measurements were therefore not taken. The static water levels for the other wells (listed above) are summarized on Table 1 of this report.

2. Wells OW-7D, OW-10S, and OW-10D were pumped in accordance with the Michigan DNR recommended procedures. Note: Wells MW-1 and MW-5 are pumping wells and do not need bailing.

3. Samples were collected from OW-7, OW-10S, OW-10D, MW-1, and MW-5 on August 5, 1987. The Ingham County Health Department did split samples with SEG on these wells.

4. Samples collected from the wells listed in Task 3 were analyzed for the conventional parameters. In addition, the sample from OW-7D was analyzed for priority pollutants. The analytical results for these analyses are attached to this report in Appendix A.

1120 May Street, Lansing, Michigan 48906 • (517) 374-6800 • CABLE "SNELL" • TELEX 229458
A Snell Environmental Group Company

Summary of Quarterly Analyses

Conventional analyses reported on the first two pages of Appendix A show that six parameters exceed the drinking water standard in one or more wells. These parameters are summarized in Table 1 below.

TABLE 1

PARAMETERS EXCEEDING THE DRINKING WATER STANDARDS
DURING THE FIRST QUARTER OF FISCAL YEAR 1988
AT AURELIUS ROAD LANDFILL, LANSING, MICHIGAN

	WELLS				
Parameter	OW-7	OW-10S	OW-10D	MW-1	MW-5
Iron	X	X	X	X	-
Zinc	X	-	X	-	-
Chloride	X	-	X	-	-
Total Dissolved Solids	X	X	X	X	X
Sulfate	X	-	-	-	-

Note: The established and recommended drinking water standards for many parameters are summarized in Appendix B.

Priority Pollutant Scan:

The results of the priority pollutant scan performed on Well OW-7D are summarized in the an analytical report in Appendix A of this report. The metals on the priority pollutant scan are shown on the first page of the report under OW-7. the priority pollutant organics are summarized on the remaining pages. No organic compounds on the priority pollutant organic list were detected.

With the exception of zinc, the concentrations of the priority pollutant metals were below drinking water standards in the samples collected from the five wells.

Conclusions

The analytical results do not show significant changes from past monitoring results.

If you have any questions regarding the contents of this report, please call me at (517) 374-6800.

Very truly yours,

Peter F. Cole, P.E.
Project Manager

PFC/caf

cc: Mr. Robert Erter, Ingham County Health Department
Mr. Rod Mosier, Michigan DNR

TABLE 2
AURELIUS ROAD LANDFILL
STATIC WATER LEVELS

Well No.	Top of Casing Elevation	GROUND WATER ELEVATIONS 1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
		8-5-87			
OW-3	856.11	831.08			
OW-4	838.21	830.59			
OW-5	861.23	826.11			
OW-7D	855.81	827.59			
OW-9D	856.41	834.84			
OW-10S	844.40	826.34			
OW-100	845.46	822.72			
MW-1					
MW-5		* NA			

D = Deep

S = Shallow

* Not Available, guages did not work.

APPENDIX A

Groundwater Analytical Results

SEG LABORATORIES, INC.

September 19, 1987

Analytical results for well water samples collected by SEG Laboratories, Inc., at for the quarterly sampling at the Aurelius Road Landfill, Lansing, Michigan on August 5, 1987.

PO#: C18951; Amendment #1

SEG Number:	71277	71279	71280
Tag:	DW-7 08/05/87	DW-10S 08/05/87	DW-10D 08/05/87
Arsenic mg/L	<0.002	---	---
Beryllium mg/L	<0.002	---	---
Cadmium mg/L	0.005	<0.005	<0.005
Total Chromium mg/L	<0.008	<0.008	<0.008
Copper mg/L	0.010	0.005	0.005
Iron mg/L	3.4	2.9	3.1
Lead mg/L	<0.01	<0.01	<0.01
Mercury mg/L	<0.0013	---	---
Nickel mg/L	0.02	<0.01	0.02
Selenium mg/L	0.003	---	---
Silver mg/L	<0.008	---	---
Zinc mg/L	14	4.2	14
Antimony mg/L	<0.125	---	---
Thallium mg/L	0.06	---	---
Total Cyanide mg/L	0.004	---	---
Chloride mg/L	360	68	310
COD mg/L	7.5	18	47
Total Dissolved Solids mg/L	1,900	540	1,400
Sulfate mg/L	260	33	88
pH	6.8	7.8	6.8
Naphthalene ug/L	*	<5	<5
Bis (2-Ethylhexyl) Phthalate ug/L	*	<5	<5

*See Priority Pollutant Organics List.

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Aurelius Road Landfill
Analytical results continued
September 19, 1987
Page Two

SEG Number:	71281	71282
Tag:	MW-1 08/05/87	MW-5 08/05/87
Iron mg/L	0.51	1.9
Lead mg/L	<0.01	<0.01
COD mg/L	15	15
Total Dissolved Solids mg/L	520	1,300
pH	7.2	6.7
Naphthalene ug/L	<5	<5
Bis (2-Ethylhexyl) Phthalate ug/L	<5	<5

Aurelius Road Landfill
Analytical results continued
September 19, 1987
Page Three

SEG Number:	71277	71278
Tag:	OW-7 (PPO) 08/05/87	Trip Blank for PPO on OW-7 08/05/87

* Volatile Organics Compounds

Acrolein ug/L	<10	<10
Acrylonitrile ug/L	<10	<10
Benzene ug/L	<10	<10
Bromodichloromethane ug/L	<10	<10
Bromoform ug/L	<10	<10
Bromomethane ug/L	<10	<10
Carbon tetrachloride ug/L	<10	<10
Chlorobenzene ug/L	<10	<10
Chloroethane ug/L	<10	<10
2-Chloroethylvinyl ether ug/L	<10	<10
Chloroform ug/L	<10	<10
Chloromethane ug/L	<10	<10
Dibromochloromethane ug/L	<10	<10
1,1-Dichloroethane ug/L	<10	<10
1,2-Dichloroethane ug/L	<10	<10
1,1-Dichloroethylene ug/L	<10	<10
trans-1,2-Dichloroethylene ug/L	<10	<10
1,2-Dichloropropane ug/L	<10	<10
1,3-Dichloropropene ug/L	<10	<10
Ethylbenzene ug/L	<10	<10
Methylene chloride ug/L	<10	<10
1,1,2,2-Tetrachloroethane ug/L	<10	<10
Tetrachloroethylene ug/L	<10	<10
Toluene ug/L	<10	<10
1,1,1-Trichloroethane ug/L	<10	<10
1,1,2-Trichloroethane ug/L	<10	<10
Trichloroethylene ug/L	<10	<10
Trichlorofluoromethane ug/L	<10	<10
Vinyl Chloride ug/L	<10	<10

* 40 CFR 136 EPA Method 624.

Aurelius Road Landfill
Analytical results continued
September 19, 1987
Page Four

SEG Number:	71277
Tag:	OW-7 (PPO) 08/05/87

Semi-Volatile Organic Compounds

Bis(2-chloroethoxy)methane ug/L	<10
Bis(2-chloroethyl)ether ug/L	<10
Bis(2-ethylhexyl)phthalate ug/L	<10
Bis(2-chloroisopropyl)ether ug/L	<10
4-Bromophenylphenyl ether ug/L	<10
Butyl benzyl phthalate ug/L	<10
4-Chlorophenylphenyl ether ug/L	<10
Diethyl phthalate ug/L	<10
Dimethyl phthalate ug/L	<10
Di-n-butyl phthalate ug/L	<10
Di-n-octyl phthalate ug/L	<10
N-Nitrosodimethylamine ug/L	<10
N-Nitrosodi-n-propylamine ug/L	<10
N-Nitrosodiphenylamine ug/L	<10
Azobenzene ug/L	<10
2-Chloronaphthalene ug/L	<10
1,2-Dichlorobenzene ug/L	<10
1,3-Dichlorobenzene ug/L	<10
1,4-Dichlorobenzene ug/L	<10
2,4-Dinitrotoluene ug/L	<10
2,6-Dinitrotoluene ug/L	<10
Hexachlorobenzene ug/L	<10
Hexachlorobutadiene ug/L	<10
Hexachlorocyclopentadiene ug/L	<10
Hexachloroethane ug/L	<10
Isophorone ug/L	<10
Nitrobenzene ug/L	<10
1,2,4-Trichlorobenzene ug/L	<10
Benzoic acid ug/L	<10
2-Methylphenol ug/L	<10
4-Methylphenol ug/L	<10
2,4,5-Trichlorophenol ug/L	<10

Aurelius Road Landfill
Analytical results continued
September 19, 1987
Page Five

SEG Number:	71277
Tag:	OW-7 (PPO) 08/05/87
Aniline ug/L	<10
Benzyl alcohol ug/L	<10
4-Chloroaniline ug/L	<10
Dibenzofuran ug/L	<10
2-Methylnaphthalene ug/L	<10
2-Nitroaniline ug/L	<10
3-Nitroaniline ug/L	<10
4-Nitroaniline ug/L	<10
Benzidine ug/L	<10
3,3-Dichlorobenzidine ug/L	<10
Acenaphthene ug/L	<10
Acenaphthylene ug/L	<10
Anthracene ug/L	<10
Benzo(a)anthracene ug/L	<10
Benzo(a)pyrene ug/L	<10
Benzo(b)fluoranthene ug/L	<10
Benzo(ghi)perylene ug/L	<10
Benzo(k)fluoranthene ug/L	<10
Chrysene ug/L	<10
Dibenzo(a,h)anthracene ug/L	<10
Fluoranthene ug/L	<10
Fluorene ug/L	<10
Indeno(1,2,3-cd)pyrene ug/L	<10
Naphthalene ug/L	<10
Phenanthrene ug/L	<10
Pyrene ug/L	<10
Aldrin ug/L	<10
a-BHC ug/L	<10
B-BHC ug/L	<10
y-BHC ug/L	<10
S-BHC ug/L	<10
4,4'-DDD ug/L	<10
4,4'-DDE ug/L	<10
4,4'-DDT ug/L	<10

Aurelius Road Landfill
Analytical results continued
September 19, 1987
Page Six

SEG Number:	71277
Tag:	OW-7 (PPO) 08/05/87
Dieldrin ug/L	<10
Endosulfan I ug/L	<10
Ensosulfan II ug/L	<10
Endosulfan sulfate ug/L	<10
Endrin ug/L	<10
Endrin aldehyde ug/L	<10
Heptachlor ug/L	<10
Heptachlor epoxide ug/L	<10
4-Chloro-3-methylphenol ug/L	<10
2-Chlorophenol ug/L	<10
2,4-Dichlorophenol ug/L	<10
2,4-Dimethylphenol ug/L	<10
2,4-Dinitrophenol ug/L	<10
2-Methyl-4,6-dinitrophenol ug/L	<10
2-Nitrophenol ug/L	<10
4-Nitrophenol ug/L	<10
Pentachlorophenol ug/L	<10
Phenol ug/L	<10
2,4,6-Trichlorophenol ug/L	<10

Approved by Lori A. Vachon
Lori A. Vachon

brs

APPENDIX B

DRINKING WATER STANDARDS
FOR THE PARAMETERS BEING MONITORED QUARTERLY
AT AURELIUS ROAD LANDFILL
DURING FISCAL 1988 BY SEG

Parameter	Drinking Water Standard
Arsenic mg/L	0.05
Beryllium mg/L	-
Cadmium mg/L	0.010
Total Chromium mg/L	0.05
Copper mg/L	1.0
Iron mg/L	0.3 R
Lead mg/L	0.05
Mercury mg/L	0.002
Nickel mg/L	0.1 R
Selenium mg/L	0.01 R
Silver mg/L	0.05
Zinc mg/L	5.0
Antimony mg/L	-
Thallium mg/L	-
Total Cyanide mg/L	0.2
COD mg/L	LT 50 R
Chloride mg/L	250 R
Dissolved Solids mg/L	500 R
Sulfate mg/L	250 R
pH	6.5 - 8.5
Naphthalene ug/L	-
Bis(2-ethylhexyl)phthalate ug/L	-

R = Recommended

LT = Less Than

Volatile Organic Chemicals

	New Final RMCL (mg/L)	Proposed MCL (mg/L)
Benzene	Zero	0.005
Vinyl chloride	Zero	0.001
Carbon tetrachloride	Zero	0.005
1,2-Dichloroethane	Zero	0.005
Trichloroethylene	Zero	0.005
1,1-Dichloroethylene	0.007	0.007
1,1,1-Trichloroethane	0.20	0.20
p-Dichlorobenzene	0.75	0.75

Inorganic Chemicals

	Proposed RMCL (mg/L)	Current Interim Standard (mg/L)
Arsenic	0.05	0.05
Asbestos	7.1*	—
Barium	1.5	1.0
Cadmium	0.005	0.01
Chromium (Total)	0.12	0.05
Copper	1.3	—
Lead	0.020	0.05
Mercury	0.003	0.002
Nitrate (as N)	10.0	10.0
Nitrite (as N)	1.0	—
Selenium	0.045	0.01
Silver	—	0.05

*Million fibers per liter

— indicates no standard

Synthetic Organic Chemicals

	Proposed RMCL (mg/L)	Current Interim Standard (mg/L)
Acrylamide	Zero	—
Alachlor	Zero	—
Aldicarb, Aldicarb Sulfoxide, and Aldicarb Sulfone	0.009	—
Carbofuran	0.036	—
Chlordane	Zero	—
cis-1,2-Dichloroethylene	0.07	—
DBCP	Zero	—
1,2-Dichloropropane	0.006	—
o-Dichlorobenzene	0.62	—
2,4-D	0.07	0.01
EDB	Zero	—
Epichlorohydrin	Zero	—
Ethylbenzene	0.68	—
Heptachlor	Zero	—
Heptachlor epoxide	Zero	—
Lindane	0.0002	0.004
Methoxychlor	0.34	0.1
Monochlorobenzene	0.06	—
PCBs	Zero	—
Pentachlorophenol	0.22	—
Styrene	0.14	—
Toluene	2.0	—
2,4,5-TP Silvex	0.052	0.01
Toxaphene	Zero	0.005
trans-1,2-Dichloroethylene	0.07	—
Xylene	0.44	—

Ingham 641

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL LABORATORY

REPORT Waste Management Division
TO Ottawa Building
Lansing, MI 48909

ATTEN K. KLIGMAN

LABORATORY WORK ORDER # 87-08-039
WORK ID AURELIUS RD LANDFILL
P.O. # 90175 COST $ 2001.00
RECEIVED 08/06/87 CLIENT WM
REPORTED _____ NUMBER OF SAMPLES 6
LAB CONTACT BN JP RW MATRIX WATER

TEST / UNITS	MW-1	MW 5	MW-7D	MW-10S
Alkalinity of Water mg CaCO3/l	282	386	450	280
Carbonate Alkalinity mg CaCO3/l	K 5.0	K 5.0	K 5.0	K 5.0
Bicarbonate Alkalinity mg CaCO3/l	282	386	450	280
Chloride in Water mg/l	44	120	360	67
COD mg/l	15	14	27	23
Conductivity of Water umho/cm	729	1513	2270	791
Arsenic - Dissolved ug/l (Diss)	8.5	K 2.0	K 2.0	K 2.0
Calcium - Dissolved mg/l (Diss)	73.8	187	222	77.6
Cadmium - Dissolved ug/l (Diss)	K 20	K 20	K 20	K 20
Cobalt - Dissolved ug/l (Diss)	K 50	K 50	K 50	K 50
Chromium - Dissolved ug/l (Diss)	K 50	K 50	K 50	K 50
Copper - Dissolved ug/l (Diss)	K 20	K 20	K 20	K 20
Iron - Dissolved ug/l (Diss)	K 100	K 100	K 100	K 100
Potassium - Dissolved mg/l (Diss)	4.15	1.64	2.7	2.07
Lithium - Dissolved ug/l (Diss)	K 20	K 20	K 20	K 20
Magnesium - Dissolved mg/l (Diss)	27.6	52	66	27.3
Manganese - Dissolved ug/l (Diss)	K 20	220	250	95
Sodium - Dissolved mg/l (Diss)	22.4	54.1	151	37.1
Nickel - Dissolved ug/l (Diss)	K 50	K 50	K 50	K 50

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TEST	MW-1	MW 5	MW-7D	MW-10S
UNITS				
Lead - Dissolved ug/l (Diss)	55	K 50	K 50	K 50
Zinc - Dissolved ug/l (Diss)	K 50	120	14000	1600
Nitrate + Nitrite mg N/l	K .01	K .01	K .01	K .01
Ammonia mg N/l	3.3	.32	.22	1.1
Kjeldahl Nitrogen mg N/l	3.9 HT	.85 HT	.78 HT	1.6 HT
pH of Water pH	7.85	7.36	7.83	8.28
Total Phosphorus mg P/l	.02 HT	.02 HT	.02 HT	.49 HT
Sulfate in Water mg/l	32	250	220	29
TOC mg/l	5.6	4.4	3.9	8.3

TEST	MW-10D	BLANK
UNITS		
Alkalinity of Water mg CaCO3/l	383	K 5.0
Carbonate Alkalinity mg CaCO3/l	K 5.0	K 5.0
Bicarbonate Alkalinity mg CaCO3/l	383	K 5.0
Chloride in Water mg/l	290	K 1.0
COD mg/l	58	K 3
Conductivity of Water umho/cm	1754	2.0
Arsenic - Dissolved ug/l (Diss)	K 2.0	K 2.0
Calcium - Dissolved mg/l (Diss)	150	K 1
Cadmium - Dissolved ug/l (Diss)	K 20	K 20
Cobalt - Dissolved ug/l (Diss)	K 50	K 50
Chromium - Dissolved ug/l (Diss)	K 50	K 50
Copper - Dissolved ug/l (Diss)	K 20	K 20
Iron - Dissolved ug/l (Diss)	K 100	K 100
Potassium - Dissolved mg/l (Diss)	2.25	K .1

TEST	MW-10D	BLANK
UNITS		
Lithium - Dissolved ug/l (Diss)	K 20	K 20
Magnesium - Dissolved mg/l (Diss)	44	K 1
Manganese - Dissolved ug/l (Diss)	170	K 20
Sodium - Dissolved mg/l (Diss)	128	K 1
Nickel - Dissolved ug/l (Diss)	K 50	K 50
Lead - Dissolved ug/l (Diss)	K 50	K 50
Zinc - Dissolved ug/l (Diss)	11000	75
Nitrate + Nitrite mg N/l	K .01	K .01
Ammonia mg N/l	.75	K .01
Kjeldahl Nitrogen mg N/l	1.5 HT	K .05 HT
pH of Water pH	7.53	INT
Total Phosphorus mg P/l	.03 HT	K .01 HT
Sulfate in Water mg/l	83	K 1.0
TOC mg/l	19.	K 0.2

SUPERNATANT WAS ANALYZED ON ALL GENERAL CHEMISRTY UNIT SAMPLES EXCEPT FOR CYANIDE AND SULFIDE.

Report prepared By: Dawn Hartig OCT 14 '87

Received: 08/06/87

DNR Laboratory REPORT
Results by Sample

Work Order # 87-08-039

SAMPLE ID MW-1 FRACTION 01B TEST CODE SC 1 NAME Scan 1 Water
Date & Time Collected 08/05/87 Category

ANALYST KAJIYA
ANALYZED 08/10/87
DILUTION 1

UNITS ug/L ppb

CAS#	COMPOUND	RESULT	REMARK	DETECTION LIMIT
75-01-4	Vinyl chloride			5.0
74-83-9	*Bromomethane			5.0
75-00-3	*Chloroethane			5.0
75-69-4	*Trichlorofluoromethane			5.0
75-35-4	1,1-Dichloroethene			1.0
75-09-2	*Methylene chloride			5.0
156-60-5	trans-1,2-Dichloroethene			1.0
75-34-3	*1,1-Dichloroethane			1.0
156-59-2	cis-1,2-Dichloroethene			1.0
67-66-3	*Chloroform			1.0
71-55-6	*1,1,1-Trichloroethane			1.0
56-23-5	*Carbon tetrachloride			1.0
107-06-2	*1,2-Dichloroethane			1.0
79-01-6	Trichloroethene			1.0
78-87-5	*1,2-Dichloropropane			1.0
75-27-4	*Bromodichloromethane			1.0
10061-01-5	cis-1,3-Dichloropropene			1.0
10061-02-6	trans-1,3-Dichloropropene			1.0
79-00-5	*1,1,2-Trichloroethane			1.0
127-18-4	Tetrachloroethene			1.0
124-48-1	*Dibromochloromethane			1.0
108-90-7	Chlorobenzene			5.0
75-25-2	*Bromoform			1.0
79-34-5	*1,1,2,2-Tetrachloroethane			1.0

COMMENTS

* Compound identity not confirmed by second independent technique.
Unless otherwise noted, sample was analyzed for ALL compounds listed.

Received: 08/06/87

DNR Laboratory REPORT Work Order # 87-..-039
Results by Sample

SAMPLE ID MW-1 FRACTION 01B TEST CODE SC 2 NAME Scan 2 Water
Date & Time Collected 08/05/87 Category

ANALYST KAJIYA
ANALYZED 08/10/87
DILUTION 1

UNITS ug/L ppb

CAS#	COMPOUND	RESULT	REMARK	DETECTION LIMIT
71-43-2	Benzene			1.0
108-88-3	Toluene			1.0
100-41-4	Ethylbenzene			1.0
108-38-3	Xylene isomers			1.0

COMMENTS

Unless otherwise noted, sample was analyzed for ALL compounds listed.

Received: 08/06/87

DNR Laboratory REPORT Work Order # 87-08-039

Results by Sample

SAMPLE ID MW-1 FRACTION 01C TEST CODE SC 3 NAME Scan 3 Water

Date & Time Collected 08/05/87 Category

ANALYST CALERA

ANALYZED 09/09/87

DILUTION 1

UNITS ug/L ppb

CAS#	COMPOUND	RESULT	REMARK	DETECTION LIMIT
541-73-1	1,3-Dichlorobenzene			0.10
106-46-7	1,4-Dichlorobenzene			0.10
95-50-1	1,2-Dichlorobenzene			0.10
67-72-1	Hexachloroethane			0.010
108-70-3	1,3,5-Trichlorobenzene			0.010
120-82_1	1,2,4-Trichlorobenzene			0.010
87-61-6	1,2,3-Trichlorobenzene			0.010
87-68-3	Hexachlorobutadiene			0.010
95-94-3	1,2,4,5-Tetrachlorobenzene			0.010
77-47-4	Hexachlorocyclopentadiene			0.010
91-58-7	2-Chloronaphthalene			0.20
634-66-2	1,2,3,4-Tetrachlorobenzene			0.010
608-68-8	Pentachlorobenzene			0.010
319-84-6	a-BHC			0.010
118-74-1	Hexachlorobenzene			0.010
319-85-7	b-BHC			0.010
58-89-9	g-BHC (Lindane)			0.010
82-68-8	Pentachloronitrobenzene			0.010
319-86-8	d-BHC			0.010
76-44-8	Heptachlor			0.010
309-00-2	Aldrin			0.010
1024-57-3	Heptachlor epoxide			0.010
5103-74-2	g-Chlordane			0.010
959-98-8	Endosulfan I			0.010
5103-71-9	a-Chlordane			0.010
72-55-9	4,4'-DDE			0.010
72-20-8	Endrin			0.010
60-57-1	Dieldrin			0.010
72-54-8	4,4'-DDD			0.010
789-02-6	1,4'-DDT			0.010
50-29-3	4,4'-DDT		BLK	0.040
79-34-5	Hexabromobenzene		BLK	0.050
72-43-2	Methoxychlor			0.010
2385-85-5	Mirex			0.010
53469-21-9	Aroclor 1242 (PCB)			0.050
11097-69-1	Aroclor 1254 (PCB)			0.050
11096-82-5	Aroclor 1260 (PCB)			0.050
12674-11-1	*Aroclor 1016 (PCB)			0.050
11104-28-2	*Aroclor 1221 (PCB)			0.050
11141-16-5	*Aroclor 1232 (PCB)			0.050
12672-29-6	*Aroclor 1248 (PCB)			0.050
- -	*Aroclor 1262 (PCB)			0.050
11100-14-4	*Aroclor 1268 (PCB)			0.050
37324-23-5	*BP-6 (PBB)			0.050
8001-35-2	*Toxaphene			0.050

COMMENTS

* Seldomly encountered, reported semi-quantitatively.
Unless otherwise noted, sample was analyzed for ALL compounds listed.

Received: 08/06/87

DNR Laboratory REPORT
Results by Sample

Work Order # 87-08-039

SAMPLE ID MW-5 FRACTION 02B TEST CODE SC 1 NAME Scan 1 Water
Date & Time Collected 08/05/87 Category

ANALYST KAJIYA
ANALYZED 08/10/87
DILUTION 1

UNITS ug/L ppb

CAS#	COMPOUND	RESULT	REMARK	DETECTION LIMIT
75-01-4	Vinyl chloride			5.0
74-83-9	*Bromomethane			5.0
75-00-3	*Chloroethane			5.0
75-69-4	*Trichlorofluoromethane			5.0
75-35-4	1,1-Dichloroethene			1.0
75-09-2	*Methylene chloride			5.0
156-60-5	trans-1,2-Dichloroethene			1.0
75-34-3	*1,1-Dichloroethane			1.0
156-59-2	cis-1,2-Dichloroethene			1.0
67-66-3	*Chloroform			1.0
71-55-6	*1,1,1-Trichloroethane			1.0
56-23-5	*Carbon tetrachloride			1.0
107-06-2	*1,2-Dichloroethane			1.0
79-01-6	Trichloroethene			1.0
78-87-5	*1,2-Dichloropropane			1.0
75-27-4	*Bromodichloromethane			1.0
10061-01-5	cis-1,3-Dichloropropene			1.0
10061-02-6	trans-1,3-Dichloropropene			1.0
79-00-5	*1,1,2-Trichloroethane			1.0
127-18-4	Tetrachloroethene	3.1		1.0
124-48-1	*Dibromochloromethane			1.0
108-90-7	Chlorobenzene			5.0
75-25-2	*Bromoform			1.0
79-34-5	*1,1,2,2-Tetrachloroethane			1.0

COMMENTS

* Compound identity not confirmed by second independent technique.
Unless otherwise noted, sample was analyzed for ALL compounds listed.

Received: 08/06/87 Results by Sample

SAMPLE ID MW-5 FRACTION 02B TEST CODE SC 2 NAME Scan 2 Water
Date & Time Collected 08/05/87 Category

ANALYST KAJIYA
ANALYZED 08/10/87
DILUTION 1

UNITS ug/L ppb

CAS#	COMPOUND	RESULT	REMARK	DETECTION LIMIT
71-43-2	Benzene			1.0
108-88-3	Toluene			1.0
100-41-4	Ethylbenzene			1.0
108-38-3	Xylene isomers		INT	2.5

COMMENTS

Unless otherwise noted, sample was analyzed for ALL compounds listed.

Received: 08/06/87

DNR Laboratory REPORT Work Order # 87-08-039
Results by Sample

SAMPLE ID MW-5 FRACTION 02C TEST CODE SC 3 NAME Scan 3 Water
Date & Time Collected 08/05/87 Category

ANALYST CALERA
ANALYZED 09/09/87
DILUTION 1

UNITS ug/L ppb

CAS#	COMPOUND	RESULT	REMARK	DETECTION LIMIT
541-73-1	1,3-Dichlorobenzene			0.10
106-46-7	1,4-Dichlorobenzene			0.10
95-50-1	1,2-Dichlorobenzene			0.10
67-72-1	Hexachloroethane			0.010
108-70-3	1,3,5-Trichlorobenzene			0.010
120-82_1	1,2,4-Trichlorobenzene			0.010
87-61-6	1,2,3-Trichlorobenzene			0.010
87-68-3	Hexachlorobutadiene			0.010
95-94-3	1,2,4,5-Tetrachlorobenzene			0.010
77-47-4	Hexachlorocyclopentadiene			0.010
91-58-7	2-Chloronaphthalene			0.20
634-66-2	1,2,3,4-Tetrachlorobenzene			0.010
608-68-8	Pentachlorobenzene			0.010
319-84-6	a-BHC			0.010
118-74-1	Hexachlorobenzene			0.010
319-85-7	b-BHC			0.010
58-89-9	g-BHC (lindane)			0.010
82-68-8	Pentachloronitrobenzene			0.010
319-86-8	d-BHC			0.010
76-44-8	Heptachlor			0.010
309-00-2	Aldrin			0.010
1024-57-3	Heptachlor epoxide			0.010
5103-74-2	g-Chlordane			0.010
959-98-8	Endosulfan I			0.010
5103-71-9	a-Chlordane			0.010
72-55-9	4,4'-DDE			0.010
72-20-8	Endrin			0.010
60-57-1	Dieldrin			0.010
72-54-8	4,4'-DDD			0.010
789-02-6	1,4'-DDT			0.010
50-29-3	4,4'-DDT		BLK	0.040
79-34-5	Hexabromobenzene		BLK	0.050
72-43-2	Methoxychlor			0.010
2385-85-5	Mirex			0.010
53469-21-9	Aroclor 1242 (PCB)			0.050
11097-69-1	Aroclor 1254 (PCB)			0.050
11096-82-5	Aroclor 1260 (PCB)			0.050
12674-11-1	*Aroclor 1016 (PCB)			0.050
11104-28-2	*Aroclor 1221 (PCB)			0.050
11141-16-5	*Aroclor 1232 (PCB)			0.050
12672-29-6	*Aroclor 1248 (PCB)			0.050
- -	*Aroclor 1262 (PCB)			0.050
11100-14-4	*Aroclor 1268 (PCB)			0.050
37324-23-5	*BP-6 (PBB)			0.050
8001-35-2	*Toxaphene			0.050

COMMENTS

* Seldomly encountered, reported semi-quantitatively.
Unless otherwise noted, sample was analyzed for ALL compounds listed.

Received: 08/06/87

DNR Laboratory REPORT
Results by Sample

Work Order # 87-08-039

SAMPLE ID MW-7D FRACTION 03B TEST CODE SC 1 NAME Scan 1 Water
Date & Time Collected 08/05/87 Category

ANALYST KAJIYA
ANALYZED 08/10/87
DILUTION 1

UNITS ug/L ppb

CAS#	COMPOUND	RESULT	REMARK	DETECTION LIMIT
75-01-4	Vinyl chloride			5.0
74-83-9	*Bromomethane			5.0
75-00-3	*Chloroethane			5.0
75-69-4	*Trichlorofluoromethane			5.0
75-35-4	1,1-Dichloroethene			1.0
75-09-2	*Methylene chloride			5.0
156-60-5	trans-1,2-Dichloroethene			1.0
75-34-3	*1,1-Dichloroethane			1.0
156-59-2	cis-1,2-Dichloroethene			1.0
67-66-3	*Chloroform			1.0
71-55-6	*1,1,1-Trichloroethane			1.0
56-23-5	*Carbon tetrachloride			1.0
107-06-2	*1,2-Dichloroethane			1.0
79-01-6	Trichloroethene			1.0
78-87-5	*1,2-Dichloropropane			1.0
75-27-4	*Bromodichloromethane			1.0
10061-01-5	cis-1,3-Dichloropropene			1.0
10061-02-6	trans-1,3-Dichloropropene			1.0
79-00-5	*1,1,2-Trichloroethane			1.0
127-18-4	Tetrachloroethene			1.0
124-48-1	*Dibromochloromethane			1.0
108-90-7	Chlorobenzene			5.0
75-25-2	*Bromoform			1.0
79-34-5	*1,1,2,2-Tetrachloroethane			1.0

COMMENTS

* Compound identity not confirmed by second independent technique.
Unless otherwise noted, sample was analyzed for ALL compounds listed.

 DNR Laboratory REPORT Work Order # 87-[illegible]-039
Received: 08/06/87 Results by Sample

SAMPLE ID MW-7D FRACTION 03B TEST CODE SC 2 NAME Scan 2 Water
Date & Time Collected 08/05/87 Category

ANALYST KAJIYA
ANALYZED 08/10/87
DILUTION 1 UNITS ug/L ppb

CAS#	COMPOUND	RESULT	REMARK	DETECTION LIMIT
71-43-2	Benzene			1.0
108-88-3	Toluene			1.0
100-41-4	Ethylbenzene			1.0
108-38-3	Xylene isomers		INT	2.4

COMMENTS

Unless otherwise noted, sample was analyzed for ALL compounds listed.

Received: 08/06/87

DNR Laboratory REPORT
Results by Sample

Work Order # 87-08-039

SAMPLE ID MW-10S FRACTION 04B TEST CODE SC 1 NAME Scan 1 Water
Date & Time Collected 08/05/87 Category

ANALYST KAJIYA
ANALYZED 08/10/87
DILUTION 1

UNITS ug/L ppb

CAS#	COMPOUND	RESULT	REMARK	DETECTION LIMIT
75-01-4	Vinyl chloride			5.0
74-83-9	*Bromoethane			5.0
75-00-3	*Chloroethane			5.0
75-69-4	*Trichlorofluoromethane			5.0
75-35-4	1,1-Dichloroethene			1.0
75-09-2	*Methylene chloride			5.0
156-60-5	trans-1,2-Dichloroethene			1.0
75-34-3	*1,1-Dichloroethane			1.0
156-59-2	cis-1,2-Dichloroethene			1.0
67-66-3	*Chloroform			1.0
71-55-6	*1,1,1-Trichloroethane			1.0
56-23-5	*Carbon tetrachloride			1.0
107-06-2	*1,2-Dichloroethane			1.0
79-01-6	Trichloroethene			1.0
78-87-5	*1,2-Dichloropropane			1.0
75-27-4	*Bromodichloromethane			1.0
10061-01-5	cis-1,3-Dichloropropene			1.0
10061-02-6	trans-1,3-Dichloropropene			1.0
79-00-5	*1,1,2-Trichloroethane			1.0
127-18-4	Tetrachloroethene			1.0
124-48-1	*Dibromochloromethane			1.0
108-90-7	Chlorobenzene			5.0
75-25-2	*Bromoform			1.0
79-34-5	*1,1,2,2-Tetrachloroethane			1.0

COMMENTS

* Compound identity not confirmed by second independent technique.
Unless otherwise noted, sample was analyzed for ALL compounds listed.

SAMPLE ID MW-10S FRACTION 04B TEST CODE SC 2 NAME Scan 2 Water
Date & Time Collected 08/05/87 Category

ANALYST KAJIYA
ANALYZED 08/10/87
DILUTION 1 UNITS ug/L ppb

CAS#	COMPOUND	RESULT	REMARK	DETECTION LIMIT
71-43-2	Benzene			1.0
108-88-3	Toluene			1.0
100-41-4	Ethylbenzene		INT	2.0
108-38-3	Xylene isomers		INT	3.5

COMMENTS

Unless otherwise noted, sample was analyzed for ALL compounds listed.

Received: 08/06/87

DNR Laboratory REPORT
Results by Sample

Work Order # 87-08-039

SAMPLE ID MW-10S FRACTION 04C TEST CODE SC 3 NAME Scan 3 Water
Date & Time Collected 08/05/87 Category

ANALYST CALERA
ANALYZED 09/09/87
DILUTION 1

UNITS ug/L ppb

CAS#	COMPOUND	RESULT	REMARK	DETECTION LIMIT
541-73-1	1,3-Dichlorobenzene			0.10
106-46-7	1,4-Dichlorobenzene			0.10
95-50-1	1,2-Dichlorobenzene			0.10
67-72-1	Hexachloroethane	0.19		0.010
108-70-3	1,3,5-Trichlorobenzene			0.010
120-82_1	1,2,4-Trichlorobenzene			0.010
87-61-6	1,2,3-Trichlorobenzene			0.010
87-68-3	Hexachlorobutadiene			0.010
95-94-3	1,2,4,5-Tetrachlorobenzene			0.010
77-47-4	Hexachlorocyclopentadiene			0.010
91-58-7	2-Chloronaphthalene			0.20
634-66-2	1,2,3,4-Tetrachlorobenzene			0.010
608-68-8	Pentachlorobenzene			0.010
319-84-6	a-BHC			0.010
118-74-1	Hexachlorobenzene			0.010
319-85-7	b-BHC			0.010
58-89-9	g-BHC (lindane)			0.010
82-68-8	Pentachloronitrobenzene			0.010
319-86-8	d-BHC			0.010
76-44-8	Heptachlor			0.010
309-00-2	Aldrin			0.010
1024-57-3	Heptachlor epoxide			0.010
5103-74-2	g-Chlordane			0.010
959-98-8	Endosulfan I			0.010
5103-71-9	a-Chlordane			0.010
72-55-9	4,4'-DDE			0.010
72-20-8	Endrin			0.010
60-57-1	Dieldrin			0.010
72-54-8	4,4'-DDD			0.010
789-02-6	1,4'-DDT			0.010
50-29-3	4,4'-DDT		BLK	0.040
79-34-5	Hexabromobenzene		BLK	0.050
72-43-2	Methoxychlor			0.010
2385-85-5	Mirex			0.010
53469-21-9	Aroclor 1242 (PCB)			0.050
11097-69-1	Aroclor 1254 (PCB)			0.050
11096-82-5	Aroclor 1260 (PCB)			0.050
12674-11-1	*Aroclor 1016 (PCB)			0.050
11104-28-2	*Aroclor 1221 (PCB)			0.050
11141-16-5	*Aroclor 1232 (PCB)			0.050
12672-29-6	*Aroclor 1248 (PCB)			0.050
- -	*Aroclor 1262 (PCB)			0.050
11100-14-4	*Aroclor 1268 (PCB)			0.050
37324-23-5	*BP-6 (PBB)			0.050
8001-35-2	*Toxaphene			0.050

COMMENTS

* Seldomly encountered, reported semi-quantitatively.
Unless otherwise noted, sample was analyzed for ALL compounds listed.

Received: 08/06/87

DNR Laboratory REPORT
Results by Sample

Work Order # 87-[illegible]-039

SAMPLE ID MW-10D FRACTION 05B TEST CODE SC 1 NAME Scan 1 Water
Date & Time Collected 08/05/87 Category

ANALYST KAJIYA
ANALYZED 08/11/87
DILUTION 1

UNITS ug/L ppb

CASO	COMPOUND	RESULT	REMARK	DETECTION LIMIT
75-01-4	Vinyl chloride			5.0
74-83-9	*Bromomethane			5.0
75-00-3	*Chloroethane			5.0
75-69-4	*Trichlorofluoromethane			5.0
75-35-4	1,1-Dichloroethene			1.0
75-09-2	*Methylene chloride			5.0
156-60-5	trans-1,2-Dichloroethene			1.0
75-34-3	*1,1-Dichloroethane			1.0
156-59-2	cis-1,2-Dichloroethene			1.0
67-66-3	*Chloroform			1.0
71-55-6	*1,1,1-Trichloroethane			1.0
56-23-5	*Carbon tetrachloride			1.0
107-06-2	*1,2-Dichloroethane			1.0
79-01-6	Trichloroethene			1.0
78-87-5	*1,2-Dichloropropane			1.0
75-27-4	*Bromodichloromethane			1.0
10061-01-5	cis-1,3-Dichloropropene			1.0
10061-02-6	trans-1,3-Dichloropropene			1.0
79-00-5	*1,1,2-Trichloroethane			1.0
127-18-4	Tetrachloroethene			1.0
124-48-1	*Dibromochloromethane			1.0
108-90-7	Chlorobenzene			5.0
75-25-2	*Bromoform			1.0
79-34-5	*1,1,2,2-Tetrachloroethane			1.0

COMMENTS

* Compound identity not confirmed by second independent technique.
Unless otherwise noted, sample was analyzed for ALL compounds listed.

Received: 08/06/87 Results by Sample

SAMPLE ID MW-10D FRACTION 05B TEST CODE SC 2 NAME Scan 2 Water
Date & Time Collected 08/05/87 Category

ANALYST KAJIYA
ANALYZED 08/11/87
DILUTION 1 UNITS ug/L ppb

CAS#	COMPOUND	RESULT	REMARK	DETECTION LIMIT
71-43-2	Benzene			1.0
108-88-3	Toluene			1.0
100-41-4	Ethylbenzene			1.0
108-38-3	Xylene isomers			1.0

COMMENTS

Unless otherwise noted, sample was analyzed for ALL compounds listed.

Received: 08/06/87

DNR Laboratory REPORT Work Order # 87-08-039
Results by Sample

SAMPLE ID MW-10D FRACTION 05C TEST CODE SC 3 NAME Scan 3 Water
Date & Time Collected 08/05/87 Category

ANALYST CALERA
ANALYZED 09/09/87
DILUTION 1

UNITS ug/L ppb

CAS#	COMPOUND	RESULT	REMARK	DETECTION LIMIT
541-73-1	1,3-Dichlorobenzene			0.10
106-46-7	1,4-Dichlorobenzene			0.10
95-50-1	1,2-Dichlorobenzene			0.10
67-72-1	Hexachloroethane	0.22		0.010
108-70-3	1,3,5-Trichlorobenzene			0.010
120-82-1	1,2,4-Trichlorobenzene			0.010
87-61-6	1,2,3-Trichlorobenzene			0.010
87-68-3	Hexachlorobutadiene			0.010
95-94-3	1,2,4,5-Tetrachlorobenzene			0.010
77-47-4	Hexachlorocyclopentadiene			0.010
91-58-7	2-Chloronaphthalene			0.20
634-66-2	1,2,3,4-Tetrachlorobenzene			0.010
608-68-8	Pentachlorobenzene			0.010
319-84-6	a-BHC			0.010
118-74-1	Hexachlorobenzene			0.010
319-85-7	b-BHC			0.010
58-89-9	g-BHC (lindane)			0.010
82-68-8	Pentachloronitrobenzene			0.010
319-86-8	d-BHC			0.010
76-44-8	Heptachlor			0.010
309-00-2	Aldrin			0.010
1024-57-3	Heptachlor epoxide			0.010
5103-74-2	g-Chlordane			0.010
959-98-8	Endosulfan I			0.010
5103-71-9	a-Chlordane			0.010
72-55-9	4,4'-DDE			0.010
72-20-8	Endrin			0.010
60-57-1	Dieldrin			0.010
72-54-8	4,4'-DDD			0.010
789-02-6	1,4'-DDT			0.010
50-29-3	4,4'-DDT		BLK	0.040
79-34-5	Hexabromobenzene		BLK	0.050
72-43-2	Methoxychlor			0.010
2385-85-5	Mirex			0.010
53469-21-9	Aroclor 1242 (PCB)			0.050
11097-69-1	Aroclor 1254 (PCB)			0.050
11096-82-5	Aroclor 1260 (PCB)			0.050
12674-11-1	*Aroclor 1016 (PCB)			0.050
11104-28-2	*Aroclor 1221 (PCB)			0.050
11141-16-5	*Aroclor 1232 (PCB)			0.050
12672-29-6	*Aroclor 1248 (PCB)			0.050
- -	*Aroclor 1262 (PCB)			0.050
11100-14-4	*Aroclor 1268 (PCB)			0.050
37324-23-5	*BP-6 (PBB)			0.050
8001-35-2	*Toxaphene			0.050

COMMENTS

* Seldomly encountered, reported semi-quantitatively.
Unless otherwise noted, sample was analyzed for ALL compounds listed.

Received: 08/06/87

DNR Laboratory REPORT
Results by Sample

Work Order # 87-[illegible]039

SAMPLE ID BLANK FRACTION 06B TEST CODE SC 1 NAME Scan 1 Water
Date & Time Collected 08/05/87 Category

ANALYST KAJIYA
ANALYZED 08/11/87
DILUTION 1

UNITS ug/L ppb

CAS#	COMPOUND	RESULT	REMARK	DETECTION LIMIT
75-01-4	Vinyl chloride			5.0
74-83-9	*Bromomethane			5.0
75-00-3	*Chloroethane			5.0
75-69-4	*Trichlorofluoromethane			5.0
75-35-4	1,1-Dichloroethene			1.0
75-09-2	*Methylene chloride			5.0
156-60-5	trans-1,2-Dichloroethene			1.0
75-34-3	*1,1-Dichloroethane			1.0
156-59-2	cis-1,2-Dichloroethene			1.0
67-66-3	*Chloroform			1.0
71-55-6	*1,1,1-Trichloroethane			1.0
56-23-5	*Carbon tetrachloride			1.0
107-06-2	*1,2-Dichloroethane			1.0
79-01-6	Trichloroethene			1.0
78-87-5	*1,2-Dichloropropane			1.0
75-27-4	*Bromodichloromethane			1.0
10061-01-5	cis-1,3-Dichloropropene			1.0
10061-02-6	trans-1,3-Dichloropropene			1.0
79-00-5	*1,1,2-Trichloroethane			1.0
127-18-4	Tetrachloroethene			1.0
124-48-1	*Dibromochloromethane			1.0
108-90-7	Chlorobenzene			5.0
75-25-2	*Bromoform			1.0
79-34-5	*1,1,2,2-Tetrachloroethane			1.0

COMMENTS

* Compound identity not confirmed by second independent technique.
Unless otherwise noted, sample was analyzed for ALL compounds listed.

Received: 08/06/87

DNR Laboratory REPORT
Results by Sample

Work Order # 87-08-039

SAMPLE ID BLANK FRACTION 06B TEST CODE SC 2 NAME Scan 2 Water
Date & Time Collected 08/05/87 Category

ANALYST KAJIYA
ANALYZED 08/11/87
DILUTION 1

UNITS ug/L ppb

CAS#	COMPOUND	RESULT	REMARK	DETECTION LIMIT
71-43-2	Benzene			1.0
108-88-3	Toluene			1.0
100-41-4	Ethylbenzene			1.0
108-38-3	Xylene isomers			1.0

COMMENTS

Unless otherwise noted, sample was analyzed for ALL compounds listed.

DNR Laboratory REPORT Work Order # 87-08-039

Received: 08/06/87

Results by Sample

SAMPLE ID BLANK FRACTION 06C TEST CODE SC 3 NAME Scan 3 Water

Date & Time Collected 08/05/87 Category

ANALYST NONE

ANALYZED

DILUTION 0

UNITS ug/L ppb

CAS#	COMPOUND	RESULT	REMARK	DETECTION LIMIT
541-73-1	1,3-Dichlorobenzene			0
106-46-7	1,4-Dichlorobenzene			0
95-50-1	1,2-Dichlorobenzene			0
67-72-1	Hexachloroethane			0
108-70-3	1,3,5-Trichlorobenzene			0
120-82_1	1,2,4-Trichlorobenzene			0
87-61-6	1,2,3-Trichlorobenzene			0
87-68-3	Hexachlorobutadiene			0
95-94-3	1,2,4,5-Tetrachlorobenzene			0
77-47-4	Hexachlorocyclopentadiene			0
91-58-7	2-Chloronaphthalene			0
634-66-2	1,2,3,4-Tetrachlorobenzene			0
608-68-8	Pentachlorobenzene			0
319-84-6	a-BHC			0
118-74-1	Hexachlorobenzene			0
319-85-7	b-BHC			0
58-89-9	g-BHC (lindane)			0
82-68-8	Pentachloronitrobenzene			0
319-86-8	d-BHC			0
76-44-8	Heptachlor			0
309-00-2	Aldrin			0
1024-57-3	Heptachlor epoxide			0
5103-74-2	g-Chlordane			0
959-98-8	Endosulfan I			0
5103-71-9	a-Chlordane			0
72-55-9	4,4'-DDE			0
72-20-8	Endrin			0
60-57-1	Dieldrin			0
72-54-8	4,4'-DDD			0
789-02-6	1,4'-DDT			0
50-29-3	4,4'-DDT			0
79-34-5	Hexabromobenzene			0
72-43-2	Methoxychlor			0
2385-85-5	Mirex			0
53469-21-9	Aroclor 1242 (PCB)			0
11097-69-1	Aroclor 1254 (PCB)			0
11096-82-5	Aroclor 1260 (PCB)			0
12674-11-1	*Aroclor 1016 (PCB)			0
11104-28-2	*Aroclor 1221 (PCB)			0
11141-16-5	*Aroclor 1232 (PCB)			0
12672-29-6	*Aroclor 1248 (PCB)			0
- -	*Aroclor 1262 (PCB)			0
11100-14-4	*Aroclor 1268 (PCB)			0
37324-23-5	*BP-6 (PBB)			0
8001-35-2	*Toxaphene			0

COMMENTS LAB ACCIDENT

* Seldomly encountered, reported semi-quantitatively.

Unless otherwise noted, sample was analyzed for ALL compounds listed.

Dain C

SEG ENGINEERS & CONSULTANTS, INC.
ENGINEERS • LANDSCAPE ARCHITECTS • SURVEYORS

DNR—REGION III
MAR 10 1987
RECEIVED

March 9, 1987

Ingham Co.

Mr. Howard McCaffery, P.E.
Director of Public Service
732 City Hall
124 W. Michigan Avenue
Lansing, Michigan 48933

RE: Third Quarterly Report, Fiscal Year 1987 on Aurelius Road Landfill Groundwater Monitoring

Dear Mr. McCaffery:

This is the quarterly report for the third quarter of Fiscal Year 1987 regarding the groundwater monitoring at Aurelius Road Landfill performed by SEG Laboratories, Inc. for the City of Lansing, This report summarizes the work we performed and the analytical results for samples collected on January 21 and 22, 1987.

Services Performed

During the third quarter of Fiscal Year 1987, SEG Laboratories, Inc. performed the following work on January 21 and 22, 1987.

1. We measured the static groundwater elevations at monitoring wells OW-3, OW-4, OW-5, OW-7D, OW-9D, OW-10S and OW-10D. Casings of wells MW-1 and MW-5 were recently replaced and new elevations were not available at the time of the survey. Static water level measurements were therefore not taken. The static water levels for the other wells (listed above) are summarized on Table 2 of this report.

2. We bailed wells OW-7D, OW-10S and OW-10D in accordance with the Michigan DNR recommended procedures. Note: Wells MW-1 and MW-5 are pumping and so do not need bailing

3. We collected samples from OW-7, OW-10S, OW-10D, MW-5, MW-1 and MW-5 on January 21 and 22, 1987. This time the Ingham County Health Department did not split samples with us on these wells.

4. We analyzed the samples collected from the wells listed in Task 3 and analyzed them for the conventional parameters. In addition, we analyzed the sample from OW-7D for priority pollutants. The analytical results for these analyses are attached to this report in Appendix A.

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Summary of Quarterly Analyses

Conventional analyses reported on the first two pages of Appendix A show that six parameters exceed the drinking water standard in one or more wells. These parameters are summarized in Table 1 below.

TABLE 1

PARAMETERS EXCEEDING THE DRINKING WATER STANDARDS
DURING THE THIRD QUARTER OF FISCAL YEAR 1987
AT AURELIUS ROAD LANDFILL, LANSING, MICHIGAN

	WELLS				
Parameter	OW-7	OW-10S	OW-10D	MW-1	MW-5
Iron	X	X	X	X	-
Lead	X	X	X	X	X
Zinc	X	-	X	-	-
Chloride	X	-	X	-	-
Total Dissolved Solids	X	-	X	X	-
Sulfate	X	-	-	-	-

Note: The established and recommended drinking water standards for many parameters are summarized in Appendix B.

Priority Pollutant Scan:

The results of the priority pollutant scan performed on Well OW-7D are summarized in the analytical report in Appendix A of this report. The metals on the priority pollutant scan are shown on the first page of the report under OW-7. The priority pollutant organics are summarized on the remaining pages. No organic compounds on the priority pollutant organic list were detected. However, one chemicaly which is not on the EPA Priority Pollutant Organic list was detected for the first time. This compound is tentatively identified as the following:

6 Octen 1 ol, 3,7 Dimethyl, Propanoate

With the exception of lead and zinc, the concentrations of the priority pollutant metals were below drinking water standards in the samples collected from the five wells.

Conclusions

The analytical results do not show changes from past monitoring results except that lead was detected in concentrations exceeding the drinking water standard for that parameter in all well samples. The non-priority pollutant organic compound detected for the first time this quarter does deviate from past results. However, these results must be verified in future monitoring before their significance can be determined.

Groundwater Levels

The static groundwater levels observed in the wells at Aurelius Road Landfill on January 21, 1987 are summarized in Table 2 attached.

If you have any questions regarding the contents of this report, please call me at 374-6800.

Very truly yours,

Michael G. Goergen

Michael G. Goergen
President/Manager of
Laboratory Services

MGG/skv

cc: Mr. Robert Erter, Ingham County Health Dept.
Mr. Dan Cummins, Michigan DNR

TABLE 2
STATIC GROUNDWATER LEVELS IN THE WELLS AT AURELIUS ROAD LANDFILL, LANSING, MICHIGAN
OBSERVED IN THE FIRST, SECOND AND THIRD QUARTER OF FISCAL YEAR 1987

(units = feet)

WELL #:		OW-3	OW-4	OW-5	OW-7D	OW-9D	OW-10S	OW-10D	MW-1	MW-5
8/20/86	Groundwater Elevation	830.34	831.53	826.23	828.07	828.31	826.14	821.84	NA*	--
8/20/86	Depth to Groundwater (FTOC)	25.77	6.68	35.00	27.74	28.10	18.26	23.62	NA*	74
10/16/86	Groundwater Elevation	831.25	831.73	826.25	828.89	829.16	827.35	822.87	NA*	--
10/16/86	Depth to Groundwater (FTOC)	24.86	6.48	34.98	26.92	27.25	17.35	22.87	NA*	125
1/21/87	Groundwater Elevation	830.44	832.38	826.90	835.71	836.18	827.06	823.46	--	--
1/21/87	Depth to Groundwater (FTOC)	25.67	5.83	34.33	20.10	20.23	17.34	22.00	--	--

D = Deep

S = Shallow

FTOC = From Top of Casing

* Not Available, gauges do not work

APPENDIX A

SEG LABORATORIES, INC.

February 19, 1987

Analytical results for well water samples collected by SEG Laboratories, Inc., at the Aurelius Road Landfill, Lansing, Michigan, on January 21-22, 1987. PO#: Internal

SEG Number:	67262	67263	67264
Tag:	OW-7D	OW-10S	OW-10D
Arsenic mg/L	<0.002	---	---
Beryllium mg/L	<0.002	---	---
Cadmium mg/L	0.010	<0.005	0.008
Total Chromium mg/L	0.010	0.012	<0.008
Copper mg/L	<0.005	0.008	0.005
Iron mg/L	5.2	0.43	3.2
Lead mg/L	0.12	0.06	0.07
Mercury mg/L	<0.0005	---	---
Nickel mg/L	0.04	0.02	0.02
Selenium mg/L	<0.002	---	---
Silver mg/L	0.03	---	---
Zinc mg/L	11	4.0	11
Antimony mg/L	<0.12	---	---
Thallium mg/L	<0.02	---	---
Total Cyanide mg/L	<0.001	---	---
Chloride mg/L	380	69	280
COD mg/L	17	22	40
Total Dissolved Solids mg/L	1,600	480	1,000
Sulfate mg/L	280	64	91
pH	6.9	7.2	6.9
Naphthalene ug/L	---	<5	<5
Bis (2-Ethylhexyl) Phthalate ug/L	---	<5	<5

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Aurelius Road Landfill
Analytical results cont'd
February 19, 1987
Page Two

SEG Number:	67265	67266
Tag:	MW-1	MW-5
Iron mg/L	3.3	0.28
Lead mg/L	0.10	0.06
COD mg/L	15	20
Total Dissolved Solids mg/L	970	410
pH	6.9	7.2
Naphthalene ug/L	<5	<5
Bis (2-Ethylhexyl) Phthalate ug/L	<5	<5

Aurelius Road Landfill
Analytical results cont'd
February 19, 1987
Page Three

	Concentration: ug/L	
SEG Number:	67261	67262
Tag:	Field Blank	OW-7D
PRIORITY POLLUTANT ORGANIC ANALYSIS		
Chloromethane	<10	<10
Bromomethane	<10	<10
Vinyl chloride	<10	<10
Chloroethane	<10	<10
Methylene chloride	<10	<10
Trichlorofluoromethane	<10	<10
1,1-Dichloroethene	<10	<10
1,1-Dichloroethane	<10	<10
trans-1,2-Dichloroethene	<10	<10
Chloroform	<10	<10
1,2-Dichloroethane	<10	<10
1,1,1-Trichloroethane	<10	<10
Carbon tetrachloride	<10	<10
Bromodichloromethane	<10	<10
1,2-Dichloropropane	<10	<10
1,3-Dichloropropene	<10	<10
Trichloroethene	<10	<10
Dibromochloromethane	<10	<10
1,1,2-Tetrachloroethane	<10	<10
2-Chloroethylvinyl ether	<10	<10
Bromoform	<10	<10
1,1,2,2-Tetrachloroethane	<10	<10
Tetrachloroethene	<10	<10
Chlorobenzene	<10	<10
1,3-Dichlorobenzene	<10	<10
1,2-Dichlorobenzene	<10	<10
1,4-Dichlorobenzene	<10	<10

Aurelius Road Landfill
Analytical results cont'd
February 19, 1987
Page Four

	Concentration:	ug/L
SEG Number:	67261	67262
Tag:	Field Blank	OW-7D
PRIORITY POLLUTANT ORGANIC ANALYSIS cont'd		
Benzene	<10	<10
Toluene	<10	<10
Ethyl benzene	<10	<10
Acrolein	<10	<10
Acrylonitrile	<10	<10
N-Nitrosodimethylamine	---	<10
Phenol	---	<10
Bis(2-Chloroethyl)Ether	---	<10
2-Chlorophenol	---	<10
1,3-Dichlorobenzene	---	<10
1,4-Dichlorobenzene	---	<10
1,2-Dichlorobenzene	---	<10
Bis(2-Chloroisopropyl)ether	---	<10
Hexachloroethane	---	<10
N-nitroso-dipropylamine	---	<10
Nitrobenzene	---	<10
Isophorone	---	<10
2-Nitrophenol	---	<10
2,4-Dimethylphenol	---	<10
Bis(2-Chloroethoxy)Methane	---	<10
2,4-Dichlorophenol	---	<10
1,2,4-Trichlorobenzene	---	<10
Naphtalene	---	<10
Hexachlorobutadiene	---	<10
4-Chloro-3-Methylphenol	---	<10
Hexachlorocyclopentadiene	---	<10
2,4,6-Trichlorophenol	---	<10
2-Chloronaphthalene	---	<10
Acenaphythylene	---	<10
Dimethyl phtahalate	---	<10

Concentration: ug/L

SEG Number: 67262

Tag: OW-7D

PRIORITY POLLUTANT ORGANIC ANALYSIS cont'd

2,6-Dinitrotoluene	<10
Acenaphthene	<10
2,4-Dinitrophenol	<10
4-Nitrophenol	<10
2,4-Dinitrotoluene	<10
Fluorene	<10
Diethylphthalate	<10
4-Chlorophenyl phenyl ether	<10
N-Nitrosodipenylamine	<10
4,6-Dinitro-2-methylphenol	<10
1,2-Diphenylhydrazine	<10
4-Bromophyenyl phenyl ether	<10
Hexachlorobenzene	<10
Pentachlorophenol	<10
Benzidine	<10
Phenanthrene	<10
Anthracene	<10
Di-N-Butyl phthalate	<10
Fluoranthene	<10
Pyrene	<10
Butyl benzyl phthalate	<10
3,3'-Dichlorobenzidine	<10
Benzo(a)anthracene	<10
Bis(2-ethylhexyl)phthalate	<10
Chrysene	<10
Di-n-octyl phthalate	<10
Benzo(b)fluoranthene	<10
Benzo(k)fluoranthene	<10

Aurelius Road Landfill
Analytical results cont'd
February 19, 1987
Page Six

	Concentration: ug/L
SEG Number:	67262
Tag:	OW-7D

PRIORITY POLLUTANT ORGANIC ANALYSIS cont'd

Benzo(a)pyrene	<10
Indeno(1,2,3-CD)pyrene	<10
Dibenz(a,h)anthracene	<10
Benzo(g,h,i)perylene	<10
Alpha-BHC	<10
Gamma-BHC	<10
Beta-BHC	<10
Heptachlor	<10
Delta-BHC	<10
Aldrin	<10
Heptachlor epoxide	<10
Endosulfan I	<10
4,4'-DDE	<10
Dieldrin	<10
Endrin	<10
4,4'-DDD	<10
Endosulfan II	<10
4,4'-DDT	<10
Endrin aldehyde	<10
Endosulfan sulfate	<10
Chlordane	<10
Toxaphene	<10
PCB-1016	<10
PCB-1221	<10
PCB-1232	<10
PCB-1242	<10
PCB-1248	<10
PCB-1254	<10
PCB-1260	<10
2,3,7,8-Tetrachlorodibenzo-p-dioxin	<10

NOTE: The following compounds are tentative identifications of compounds found in the sample which are not part of the priority pollutant organic list.

6 Octen 1 ol, 3,7 Dimethyl, Propanoate

Approved by _____
Michael G. Goergen

MGG/bld

APPENDIX B

APPENDIX B

DRINKING WATER STANDARDS
FOR THE PARAMETERS BEING MONITORED QUARTERLY
AT AURELIUS ROAD LANDFILL
DURING FISCAL 1987 BY SEG

Parameter	Drinking Water Standard
Arsenic mg/L	0.05
Beryllium mg/L	-
Cadmium mg/L	0.010
Total Chromium mg/L	0.05
Copper mg/L	1.0
Iron mg/L	0.3R
Lead mg/L	0.05
Mercury mg/L	0.002
Nickel mg/L	0.1R
Selenium mg/L	0.01
Silver mg/L	0.05
Zinc mg/L	5.0
Antimony mg/L	-
Thallium mg/L	-
Total Cyanide mg/L	0.2
COD mg/L	LT 50R
Chloride mg/L	250 R
Dissolved Solids mg/L	500 R
Sulfate mg/L	250 R
pH	6.5 - 8.5
Naphthalene ug/L	-
Bis(2-ethylhexyl) phthalate ug/L	-

R = Recommended

LT = Less Than

DRINKING WATER STANDARDS - 3/1987

Volatile Organic Chemicals

	New Final RMCL (mg/L)	Proposed MCL (mg/L)
Benzene	Zero	0.005
Vinyl chloride	Zero	0.001
Carbon tetrachloride	Zero	0.005
1,2-Dichloroethane	Zero	0.005
Trichloroethylene	Zero	0.005
1,1-Dichloroethylene	0.007	0.007
1,1,1-Trichloroethane	0.20	0.20
p-Dichlorobenzene	0.75	0.75

Inorganic Chemicals

	Proposed RMCL (mg/L)	Current Interim Standard (mg/L)
Arsenic	0.05	0.05
Asbestos	7.1*	—
Barium	1.5	1.0
Cadmium	0.005	0.01
Chromium (Total)	0.12	0.05
Copper	1.3	—
Lead	0.020	0.05
Mercury	0.003	0.002
Nitrate (as N)	10.0	10.0
Nitrite (as N)	1.0	—
Selenium	0.045	0.01
Silver	—	0.05

*Million fibers per liter

— indicates no standard

Synthetic Organic Chemicals

	Proposed RMCL (mg/L)	Current Interim Standard (mg/L)
Acrylamide	Zero	—
Alachlor	Zero	—
Aldicarb, Aldicarb Sulfoxide, and Aldicarb Sulfone	0.009	—
Carbofuran	0.036	—
Chlordane	Zero	—
cis-1,2-Dichloroethylene	0.07	—
DBCP	Zero	—
1,2-Dichloropropane	0.006	—
o-Dichlorobenzene	0.62	—
2,4-D	0.07	0.01
EDB	Zero	—
Epichlorohydrin	Zero	—
Ethylbenzene	0.68	—
Heptachlor	Zero	—
Heptachlor epoxide	Zero	—
Lindane	0.0002	0.004
Methoxychlor	0.34	0.1
Monochlorobenzene	0.06	—
PCBs	Zero	—
Pentachlorophenol	0.22	—
Styrene	0.14	—
Toluene	2.0	—
2,4,5-TP Silvex	0.052	0.01
Toxaphene	Zero	0.005
trans-1,2-Dichloroethylene	0.07	—
Xylene	0.44	—