file. hw. 828044. 1990 - 10-19. State-st-Mt-hopeturnel-lab-results. Par Please son to size { Glor



THOMAS R. FREY COUNTY EXECUTIVE

Andrew S. Doniger, M.D., M.P.H.
DIRECTOR

October 19, 1990

Wayne Mizerak
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation
New York State Department of
Environmental Conservation
50 Wolf Road
Albany, New York 12233

SUBJECT: Upper to Lower Falls Waste Site

NYS ID # 828044

Dear Mr. Mizerak:

On August 13, 1990 staff with the Monroe County Department of Health collected water and solids samples at seep locations in the Monroe County Pure Water's State/Mt. Hope tunnel and at the face of the Genesee River Lower Falls. The samples were analyzed at the Monroe County Department of Health's Environmental Health Laboratory for aerobic and anaerobic plate count, microscopic analysis, and spectrographic analyses.

Water samples collected from three sites were sent to Frontier Environmental Laboratories, Incorporated in Niagara Falls and analyzed for volatile organic compounds by Environmental Protection Agency Method 8240 and semi-volatile (base/neutral/acid extractable) organic compounds.

Laboratory results are attached for your information and files.



Wayne Mizerak RE: Upper to Lower Falls Waste Site October 19, 1990 NYS ID # 828044

Page 2

Feel free to contact me at (716) 274-6067 should you have any questions in this regard.

Sincerely,

Richard S. Elliott, P.E.

Principal Public Health Engineer

RSE:ts att.

c: Kevin Hylton, RG&E Michael Khalil, NYSDEC-Region 8 Phil Steinfeldt, Monroe County Engineering Mark Gregor, City of Rochester Robert Barrows, City of Rochester Dr. Richard Young, SUNY-Geneseo Louise Hartshorn, MC Environmental Management Council Richard Burton, Monroe County Health Department file

#### MEMORANDUM

# RECEIVED

DATE: 21 September 1990

OCT 1 2 1990

TO:

Richard S Burton, Laboratory Administrator

FROM:

Lisa P Spittal, Senior Chemist

MONROE COUNTY HEALTH DEPARTMENT

SUBJECT: Special Samples: State/Mt.Hope Tunnel Seeps, Log# 123968 - 123974

Samples were collected on 13 August 1990 by R.Burton, R.Elliott, and others from seeps in the State/Mt. Hope Tunnel and from the Genesee River Lower Falls. Seven samples were collected from 6 sites into Whirl-pak bags and brought to EHL for aerobic and anaerobic plate count, microscopic, and spectrographic analyses; it should be noted that there was a distinct odor of hydrogen sulfide . emanating from the unopened bags upon receipt at the lab. Water samples were collected from 3 of the sites into glass vials and shipped to Frontier Environmental Laboratories (FEL) for analysis of volatile organic compounds (VOCs) by EPA method 8240; subsequently, we requested that FEL also scan for semi-volatile (base/neutral/acid extractable) organic compounds if sufficient sample remained. The table below identifies each of the samples and which analyses are being performed.

Log#	Site	Analyses	Description	_
123968	Tunnel @ 7350	EHL	Grey-white solid "rock" with laminated appearance; large chunks about 2"x3"x1"	
123969	Tunnel <b>0</b> 7358	EHL	Grey-white solid rock; small chips in water	
123970	Tunnel @ 7370	EHL & FEL	Milky water	
123971	Tunnel @ 7500	EHL	Soft fibrous-looking white-grey "biofilm"; long ropy (3/8" diameter) strands	
123972	Tunnel 0 7565	EHL & FEL	Soft fibrous-looking white-grey "biofilm"; short pieces ( $\pm 1$ mm diameter) in water	
123973	Tunnel @ 7565	EHL	Same as 123972 (duplicate sample), but with rusty tint	a
123974	Lower Falls	EHL & FEL	Soft fibrous-looking black-white "biofilm"; short pieces in water	

Results of the microscopic examinations are reported in the 14 August memo from N. Howard and J. McCart (attached), and summarized below. Results of the aerobic and anaerobic plate counts are reported in J.Klein's attached 24 August memo, and are summarized below. Results of the spectrographic scans are reported in the 31 August memo from L.Steadman (attached), and summarized below. Results of the three samples analyzed for volatile organic compounds by EPA method 8240 and subsequent semi-volatile scans by EPA method 8270 are listed in FEL's 17 September report (attached) and summarized below.

cc: R.Elliott

Analyte	Seep 7350 123968	Seep 7358 123969	Seep 7370 123970	Seep 7500 123971	Seep 7565 123972	Seep 7565 123973	Lower Falls 123974
Appearance	Grey-white rock; laminated, large chunks	Grey-white rock; small chips in water	Milky water	Soft white-grey biofilm; fibrous; long ropy strands with some water	Soft white-grey biofilm; fibrous; short pieces in water	Soft white-grey biofilm; fibrous; short pieces in water; rusty tint	Soft black-white biofilm; fibrous; short pieces in water
Microscopic	Carbonaceous Calcareous Shale; Moderate-large amount Quartz	Carbonaceous Calcareous Shale with friable Gypsum	Quartz and Carbonate parti- cles: v.sm.amt	Unicellular and filamentous bact- eria: v.lg.amt; Pennate diatoms: lg.amt	Filamentous bact- eria: lg.amt; Unicellular bact- eria: sm.amt; Fine grain Quartz and Carbonate	Filamentous bacteria: lg.amt; Unicellular bacteria: sm.amt; Fine grain Quartz and Carbonate	Pennate diatoms: lg.amt; Filament- ous bacteria: mod.amt; Guartz grains: sm.amt; Carbonate:mod.amt
Micrbiologic: Aerobic CFU/mL Anaerobic CFU/mL	28,000,000 1,000,000	29,000,000 1,000,000 LT	60,000 10,000 LT	2,600,000,000 1,000,000 LT	40,000,000 1,000,000	4,000,000 3,000,000	2,000,000 1,000,000
Physical: HC1 treatment Density g/mL Solids mg/L Organic matter mg/L Ash weight mg/L	Carbonate present	1.2	1400	32,000 24,000	5,000	510	900
Spectrographic: Major elements Minor elements Trace elements Not detected	Ca,Mg,Si Al Na,Pb,Cu,Fe P,B,Ag,Sn,Mn,Cr,Ni	Na,Ca,Si Mg,Al Cu,Fe,Mn	Na,Ca,Mg Cu,Si	Na Ca,Si,Al Cu,Ag,Fe,Mg,Mn	Na Ca,Si,Al Cu,Mg,Fe,Mn Ag	Na Al,Ca Cu,Ag,Fe,Mn,Si,Mg	Na Al,Ca Cu,Ag,Fe,Kn,Mg,Si
Approximate values	Pb <u>tó</u> ug/gDN	Cu <u>+</u> 12000 ug/L	Cu <u>+</u> 40 ug/L	Cu <u>+6</u> 00 ug/L Ag <u>+</u> 60 ug/L	Cu <u>+</u> 600 ug/L	Cu ±100 ug/L Ag ±1 ug/L	Cu <u>+</u> 70 ug/L Ag <u>+</u> 1 ug/L
Organics: VOCs (8240 HSL)	Not analyzed	Not analyzed	All (4ug/L except Benzene 24.2	Not analyzed	All (4ug/L except Acetone 10.6 Methylene chloride 10.7	Not analyzed	All (4ug/L except Benzene 7.0 Ethylbenzene 10.0 Xylenes, Tot. 50.4
BNA SCAN (8270 HSL)	Not analyzed	Not analyzed	All (500 ug/L	Not analyzed	All <1000 ug/L	Not analyzed	All ( 500 ug/L

#### State/Mt.Hope Tunnel Seep 7350, Collected 13 Aug 90, Log# 123968

Appearance: Grey-white solid rock with laminated appearance; large chunks

about 2"x3"x1"

Microscopic: Carbonaceous Calcareous Shale: dark organic shale with Calcite

The white reaction area is an alteration zone in which the carbonaceous material has been removed and oxidized. The white reaction areas appear to have concentrated carbonates, and are likely the result of groundwater action. Based on reaction with 1:20 HCL, the carbonates are assumed to be

calcite; Dolomite could also be present.

Moderate to large amount of Quartz in the rock

Microbiologic: Aerobic plate count (CFU/mL): 28,000,000

Anaerobic plate count (CFU/mL): 1,000,000

Spectrographic: Presence of carbonates indicated by treatment with HCl

Major elements: Ca, Mg, Si

Minor elements: Al

Trace elements: Na, Pb (+ 6 ug/gDW), Cu, Fe Not detected: P, B, Ag, Sn, Mn, Cr, Ni

Organics: No sample was collected for the analysis of volatile organic

compounds.

#### State/Mt.Hope Turnel Seep 7358, Collected 13 Aug 90, Log# 123969

Appearance: Grey-white solid rock; small chips in water

Microscopic: Carbonaceous Calcareous Shale with friable Gypsum particles.

The ground-up material is the breakdown product of both.

Microbiologic: Aerobic plate count (CFU/mL): 29,000,000

Anaerobic plate count (CFU/mL): 1,000,000 LT

Spectrographic: Density: 1.2 g/mL.

Major elements: Na, Ca, Si Minor elements: Mg, Al

Trace elements: Cu (+ 12000 ug/L), Fe, Mn

Organics: No sample was collected for the analysis of volatile organic

compounds.

#### State/Mt.Hope Tummel Seep 7370, Collected 13 Aug 90, Log# 123970

Appearance:

Milky water

Microscopic:

Very small amount of Quartz and Carbonate particles.

Microbiologic: Aerobic plate count (CFU/mL):

Anaerobic plate count (CFU/mL): 10,000 LT

Spectrographic: Solids:

1400 mg/L

Major elements: Na, Ca, Mg

Trace elements: Cu (+ 40 ug/L), Si

Organics:

HSL Volatile Organic Compounds (VOCs) by EPA method 8240:

Benzene: 24.2 ug/L

All other VOCs were below detection (4 ug/L)

Trip and laboratory blanks were clean

Semi-volatile (base/neutral/acid extractable) organic compounds

SCAN by EPA method 8270 on the remainder of the sample

collected for VOC analysis; due to the small sample volume, the

detection limit is high

All compounds were below detection (500 ug/L)

#### State/Mt.Hope Tunnel Seep 7500, Collected 13 Aug 90, Log# 123971

Appearance:

Soft fibrous-looking white-grey "biofilm"; long ropy (3/8"

diameter) strands

Microscopic:

Very large amount of unicellular and filamentous bacteria;

large amount of pennate diatoms.

Microbiologic: Aerobic plate count (CFU/mL): 2,600,000,000

Anaerobic plate count (CFU/mL): 1,000,000 LT

Spectrographic: Dry weight:

32000 mg/L

Organic matter: 75% of dry weight (24000 mg/L)

Major elements: Na

Minor elements: Ca. Si. Al

Trace elements: Cu (+ 600 ug/L), Ag (+ 60 ug/L), Fe, Mg, Mn

Organics:

No sample was collected for the analysis of volatile organic

compounds.

#### State/Mt.Hope Tummel Seep 7565, Collected 13 Aug 90, Log# 123972

Appearance: Soft fibrous-looking white-grey "biofilm"; short pieces (+1 mm

diameter) in water

Microscopic: Large amount filamentous bacteria; small amount of unicellular

bacteria; fine Quartz and Carbonate grains

Microbiologic: Aerobic plate count (CFU/mL): 40,000,000

Anaerobic plate count (CFU/mL): 1,000,000

Spectrographic: Ash weight: 5000 mg/L

Major elements: Na

Minor elements: Ca, Si, Al

Trace elements: Cu (+ 600 ug/L), Mg, Fe, Mn

Not detected: Ag

Organics: HSL volatile organic compounds (VOCs) by EPA method 8240

Acetone: 10.6 ug/L Methylene chloride: 10.7 ug/L

All other HSL VOCs were below detection (< 4 ug/L)

Trip and laboratory blanks were clean

Semi-volatile (base/neutral/acid extractable) organic compounds

SCAN by EPA method 8270 on the remainder of the sample

collected for VOC analysis; due to the small sample volume, the

detection limit is high

All compounds were below detection (1000 ug/L)

#### State/Mt.Hope Tunnel Seep 7565, duplicate, Collected 13 Aug 90, Log# 123973

Appearance: Soft fibrous-looking white-grey "biofilm"; short pieces (+1 mm

diameter) in water; rusty colored tint

Microscopic: Large amount filamentous bacteria; small amount of unicellular

bacteria; fine Quartz and Carbonate grains

Microbiologic: Aerobic plate count (CFU/mL): 4,000,000

Anaerobic plate count (CFU/mL): 3,000,000

Spectrographic: Ash weight: 510 mg/L

Major elements: Na Minor elements: Al, Ca

Trace elements: Cu ( $\pm$  100 ug/L), Ag ( $\pm$  1 ug/L), Fe, Mn, Si, Mg

Organics: No sample was collected for the analysis of volatile organic

compounds.

#### Lower Falls, Collected 13 Aug 90, Log# 123974

Appearance: Soft fibrous-looking black-white "biofilm"; short pieces in

water

Microscopic: Large amount of pennate diatom species; Moderate amount of

filamentous bacteria; Small amount of Quartz grains; Moderate

3 s + - \*

amount of assorted size Carbonate grains

Microbiologic: Aerobic plate count (CFU/mL): 2,000,000

Anaerobic plate count (CFU/mL): 1,000,000

Spectrographic: Ash weight: 900 mg/L

Major elements: Na Minor elements; Al, Ca

Trace elements; Cu ( $\pm$  70 ug/L), Ag ( $\pm$  1 ug/L), Fe, Mn, Mg, Si

Organics:

HSL volatile organic compounds (VOCs) by EPA method 8240

Benzene: 7.0 ug/L Ethylbenzene: 10.0 ug/L Total xylenes: 50.4 ug/L

All other VOCs were below detection (4 ug/L)

Trip and laboratory blanks were clean

Semi-volatile (base/neutral/acid extractable) organic compounds

SCAN by EPA method 8270 on the remainder of the sample

collected for VOC analysis; due to the small sample volume, the

detection limit is high

All compounds were below detection (500 ug/L)

#### MEMORANDUM

DATE: 14 August 1990

TO:

Lisa P Spittal, Senior Chemist \

FROM:

Nancy G Howard, Laboratory Technician III AHA Joseph D McCart, Laboratory Technician II QD'M

SUBJECT: Microscopic Examination of #123968K through 123974K

On 13 August 1990, seven samples were collected from the State/Mt.Hope Tunnel by R.Burton and R.Elliott, and submitted to the Environmental Health Laboratory for microscopic analysis. A wet mount was prepared from each of the samples, except 123968 and 123969, which were large enough to see with the naked eye. The slides were examined on an inverted microscope. The results were as follows:

123968 Tunnel 7350 Grey-white solid

Carbonaceous Calcareous¹ Shale - dark organic Shale with Calcite¹

The white reaction area is an alteration zone in which the carbonaceous material has been removed and oxidized. The white reaction areas appear to have concentrated carbonates, which is likely the result of groundwater action.

Moderate to large amount of Quartz in the rock

123969 Tunnel 7358 Grey-white solid

Carbonaceous Calcareous¹ Shale with friable Gypsum particles
The ground-up material is the breakdown of both.

123970 Tunnel 7350 Milky water

Very small amount of Quartz and Carbonate particles

123971 Tunnel 7500 Soft fibrous-looking biofilm

Very large amount of unicellular and filamentous bacteria

Large amount of Pennate diatoms

The carbonates seen are assumed to predominantly Calcite, due to a reaction with 1:20 HCl solution; Dolomite may be present, but a thin section would have to be made to determine this.

- 123972 Tunnel 7565 Soft fibrous-looking biofilm

  Large amount of filamentous bacteria

  Small amount of unicellular bacteria

  Fine quartz and carbonate grains
- 123973 Tunnel 7565R Soft fibrous-looking biofilm

  Large amount of filamentous bacteria

  Small amount of unicellular bacteria

  Fine quartz and carbonate grains
- 123974 Lower Falls Soft fibrous-looking white biofilm
  Large amount of Pennate diatom spp.

  Moderate amount of filamentous bacteria

  Small amount of Quartz grains

  Moderate amount of assorted size Carbonate grains

#### MEMORANDUM

DATE: 24 August 1990

TO:

Lisa P Spittal, Senior Chemist 🖇

FROM:

Joseph A Klein, Chemist SAC

SUBJECT: Microbiologic Analyses of Samples from the State/Mt.Hope Tunnel

Log# 123968 - 123974

On 13 August 1990, seven samples were collected from the State/Mt.Hope Tunnel by R.Burton and R.Elliott, and submitted to the Environmental Health Laboratory for microbiologic analyses. The samples were collected into Whirl-Pak bags, and were kept chilled in a cooler until receipt at the laboratory.

The samples were homogenized and three aliquots withdrawn for triplicate analysis. Results are shown in the table below.

Plate Count

	Aerobic	Anaerobic		
Log#	CFU/mL	CFU/mL		
123968	28,000,000	1,000,000		
123969	29,000,000	1,000,000 LT		
123970	60,000	10,000 LT		
123971	2,600,000,000	1,000,000 LT		
123972	40,000,000	1,000,000		
123973	4,000,000	3,000,000		
123974	2,000,000	1,000,000		

3

#### MEMORANDUM

DATE: 31 August 1990

TO:

Lisa P Spittal, Senior Chemist 4

FROM:

Luville T Steadman, PhD

K. J. S.

SUBJECT: Spectrographic Analyses of Samples from the State/Mt.Hope Tunnel

Log# 123968 - 123974

Sample 123968: Rock specimen. A piece was ground up. Some of the powder was treated with HCl. Gas was evolved, indicating that carbonates are present. Spectrographic analysis showed:

Major elements: Ca, Mg, Si

Minor elements: Al

Trace elements: Na, Pb (about 6 ug/gDW), Cu, Fe

Not detected: P, B, Ag, Sn, Mn, Cr, Ni

Sample 123970: Water sample. Some was dried, producing 140 mg of solids per 100mL. This was positive for carbonates. Spectrographic analysis showed:

Major elements: Na, Ca, Mg

Trace elements: Cu (about 40 ug/L), Si

Sample 123969: Water with some fine sand. Density is 1.2 g/mL. Spectrographic analysis showed:

Major elements: Na, Ca, Si

Minor elements: Mg, Al

Trace elements: Cu (about 12000 ug/L), Fe, Mn

Sample 123971: Water with floating lumpy whitish material. The dry weight is 3.2 g/100mL, and the ash weight is 25% of the dry weight. Thus, 75% of the sample is an unidentified organic substance. Spectrographic analysis was done on the ash:

Major elements: Na

Minor elements: Ca, Si, Al

Trace elements: Cu (about 600 ug/L), Ag (about 60 ug/L), Fe, Mg, Mn

Sample 123972: Water with fine whitish material. Ash weight is 500 mg/100mL. Spectrographic analysis:

Major elements: Na

Minor elements: Ca, Si, Al

Trace elements: Cu (about 600 ug/L), Mg, Fe, Mn

Not detected:

Ag

State/Mt. Hope Tunnel - 31 Aug 90 - page 2

<u>Sample 123973: Water with fine whitish material</u>. Ash weight is 51 mg/100mL. Spectrographic analysis:

Major elements: Na Minor elements: Al, Ca

Trace elements: Cu (about 100 ug/L), Ag (about 1 ug/L), Fe, Mn, Si, Mg

Sample 123974: Water with brown material. Ash weight is 90 mg/100mL. Spectrographic analysis:

Major elements: Na Minor elements: Al, Ca

Trace elements: Cu (about 70 ug/L), Ag (about 1 ug/L), Fe, Mn, Mg, Si

4626 Royal Avenue • M.P.O. Box 309 • Niagara Falls, New York 14302 • Phone (716) 285-2587 — FAX (716) 285-3521

Date: September 17, 1990

ANALYTICAL RESULTS FOR

Monroe County Environmental Health Laboratory 435 East Henrietta Road Rochester, New York 14620

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM (ELAP) CERTIFICATION #10797

#### FIELD INFORMATION

Name of Collector: R.S. Burton & R.S. Elliott

Date of Collection: August 13, 1990

Time of Collection: Not Available

ASSIGNED			Site	, Date and
FEL# I.D.	SAMPLE I.D.#	SAMPLE TYPE	Time of	Collection
4477-01	Tunnel 73-70	Groundwater	Site:	Tunnel 73-70
4477-02	Tunnel 75-65	u		Tunnel 75-65
4477-03	Lower Falls	11		Lower Falls
4477-04	Trip Blank	FEL Water		

#### Laboratory Information

Sample ID	Preservation Status Upon Acceptance	Date/Ti	me Received	
FEL #s: 4477-01/04	Properly preserved and collected.	-	August 13,	1990

REPORT RELEASED BY:

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SEP 1 9 1990

Env. Health Laboratory

FEL CHAIN OF CUSTODY

PROJECT #

PROJECT NAME State- Mt. Hope Tunnel

CHAIN OF CO									
Samuelers Signati	re R.S.Bu	rton e	R.S.	Elliott				i i	
Constonner Sample 1.D.	FEL #		mple Time	Sample Location	Sample Type	# of Cont	Type of Cont	Rema	iks
Tunnel 73-70	4477-01	13 Aug 90	NA	Tunnel - 73.70	Groundwater	1.	voa vial	the manifes of the second	20
Tunnel 75-65	1 02		NA	Tunnel- 75.65	Grundwater	1	VOA vial		
Lower falls	, 03	90 carried	NA	Lower Falls	Groundwater	2	VOA vials		
TripBlank	V og	13 Aug 90		Trip Blank	FEL water	1	voA vial	**********	4 4 5 5 7 7 8 8 8 8 8 8
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Killeliand of Shipment Express									

4626 Royal Avenue • M.P.O. Box 309 • Niagara Falls, New York 14302 • Phone (716) 285-2587 — FAX (716) 285-3521

DATE: September 17, 1990

DL = DETECTION LIMIT

ELAP# 10797

ANALYSIS FOR: Monroe County Environmental Health Laboratory

FEL# 4477-01 SAMPLE ID: Tunnel 73-70

PARAMETER	DETECTION LIMIT Mg/L	RESULTS Ag/L
Chloromethane	4.0	<dl< td=""></dl<>
Bromomethane	4.0	<dl< td=""></dl<>
Vinyl Chloride	4.0	⟨DL
Chloroethane	4.0	⟨DL
Methylene Chloride	4.0	⟨DL
Acetone	4.0	⟨DL
Carbon Disulfide	4.0	⟨DL
1,1-Dichloroethene	4.0	⟨DL
1,1-Dichloroethane	4.0	<dl< td=""></dl<>
Trans-1,2-Dichloroethylene	4.0	<dl< td=""></dl<>
Chloroform	4.0	<dl< td=""></dl<>
1,2-Dichloroethane	4.0	<dl -<="" td=""></dl>
2-Butanone	4.0	⟨DL
1,1,1-Trichloroethane	4.0	⟨DL
Carbon Tetrachloride	4.0	⟨DL
Vinyl Acetate	4.0	<dl< td=""></dl<>
Bromodichloromethane	4.0	⟨DL
1,2-Dichloropropane	4.0	<dl< td=""></dl<>
Trans-1,3-Dichloropropene	4.0	<dl< td=""></dl<>
Trichloroethene	4.0	⟨DL
Benzene	4.0	24.2
Dibromochloromethane	4.0	⟨DL
Cis-1,3-Dichloropropene	4.0	⟨DL
1,1,2-Trichloroethane	4.0	⟨DL
2-Chloroethylvinyl Ether	4.0	<dl< td=""></dl<>
Bromoform	4.0	<dl< td=""></dl<>
4-Methyl-2-Pentanone	4.0	⟨DL
Tetrachloroethene	4.0	⟨DL
1,1,2,2-Tetrachloroethane	4.0	<dl< td=""></dl<>
2-Hexanone	4.0	⟨DL
Toluene	4.0	<dl< td=""></dl<>
Chlorobenzene	4.0	⟨DL
Ethylbenzene	4.0	<dl< td=""></dl<>
Styrene	4.0	⟨DL
Total Xylenes	4.0	<dl< td=""></dl<>
SURROGATE RECOVERIES	% RECOVERY	
1,2-Dichloroethane D4	100	
Toluene D8	93	
4-Bromofluorobenzene	102	
Method: EPA SW-846 (8240)		

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DATE: September 17, 1990

ELAP# 10797

ANALYSIS FOR: Monroe County Environmental Health Laboratory

FEL# 4477-01

		DETECTION	
SAMPLE ID	PARAMETER	LIMIT Kg/L	RESULTS Kg/L
Tunnel 73-70	Phenanthrene	500	<dl< td=""></dl<>
	Anthracene	500	<dl< td=""></dl<>
	Di-N-Butylphthalate	500	<dl< td=""></dl<>
	Fluoranthene	500	<dl< td=""></dl<>
	Pyrene	500	<dl< td=""></dl<>
	Butylbenzylphthalate	500	<dl< td=""></dl<>
	3,3'-Dichlorobezidine	500	<dl< td=""></dl<>
	Benzo (a) Anthracene	500	<dl< td=""></dl<>
	Bis (2-ethylhexyl) Phthalate	500	<dl< td=""></dl<>
	Chrysene	500	<dl< td=""></dl<>
	di-N-Octyl Phthalate	500	<dl< td=""></dl<>
	Benzo (d) & Benzo (k) Fluoranthen	e 500	<dl< td=""></dl<>
	Benzo (a) Pyrene	500	<dl< td=""></dl<>
	Indeno (1, 2, 3-ad) Pyrene	500	<dl< td=""></dl<>
	Dibenzo (a,h) anthracene	500	<dl< td=""></dl<>
	Benzo(g,h,i)Perylene	500	<dl< td=""></dl<>

SURROGATE RECOVERIES	% RECOVERY
Nitrobenzene -d5	76
2-Fluorobiphenyl	77
4-Terphenyl- dl4	96

METHOD REFERENCE: EPA SW-846 (8270)

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DATE: September 17, 1990

ELAP# 10797

ANALYSIS FOR: Monroe County Environmental Health Laboratory

FEL# 4477-Ø1

SAMPLE ID	PARAMETER	LIMIT µg/L	RESULTS Ag/L
Tunnel 73-70	Bis-(2-Chloroethyl) ether	500	<dl< td=""></dl<>
	1,3-Dichlorobenzene	500	⟨DL
	1,4-Dichlorobenzene	500	<dl< td=""></dl<>
	1,2-Dichlorobenzene	500	<dl< td=""></dl<>
	Bis-(2-Chloroisopropyl) ether	r 500	<dl< td=""></dl<>
	N-Nitroso-Di-Propylamine	- 500	⟨DL
	Hexachloroethane	500	(DL
	Nitrobenzene	500	⟨DL
	Isophorone	500	<dl< td=""></dl<>
	Bis-(2-Chloroethyoxy) Methane	e 500	<dl< td=""></dl<>
	1,2,4-Trichlorobenzene	500	⟨DL
	Naphthalene	500	· OL
	4-Chloroaniline	500	⟨DL
	Hexachlorobutadiene	500	⟨DL
	2-Methylnaphthalene	500	⟨DL
	Hexachlorocyclopentadiene	500	(DL
	2-Chloronaphthalene	500	(DL
	Dimethyl Phthalate	500	⟨DL
	Acenaphthylene	500	⟨DL
	3-Nitroaniline	500	⟨DL
	2-Nitroaniline	500	⟨DL
	Acenaphthene	500	⟨DL
	Dibenzofuran	500	⟨DL
	2,4-Dinitrotoluene	500	<dl< td=""></dl<>
	2,6-Dinitrotoluene	500	<dl< td=""></dl<>
	Diethylphthalate	500	⟨DL
	4-Chlorophenyl-phenylether	500	<dl< td=""></dl<>
	Fluorene	500	<dl< td=""></dl<>
	4-Nitroaniline	500	⟨DL
	N-Nitrosodiphenylamine	500	<dl< td=""></dl<>
	4-Bromophenyl-phenylether	500	⟨DL
	Hexachlorobenzene	500	<b>OL</b>

METHOD REFERENCE: EPA SW-846 (8270)

DL = Detection Limit

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DATE: September 17, 1990

ELAP# 10797

ANALYSIS FOR: Monroe County Environmental Health Laboratory

FEL# 4477-Ø1

		DETECTION	
SAMPLE ID	PARAMETER	LIMIT Kg/L	RESULTS MG/L
Tunnel 73-70	Phenol	500	<dl< td=""></dl<>
	2-Chlorophenol	500	<dl< td=""></dl<>
	Benzyl Alcohol	500	<dl< td=""></dl<>
_	2-Methylphenol	500	<dl< td=""></dl<>
	4-Methylphenol	500	<dl< td=""></dl<>
	2-Nitrophenol	500	<dl< td=""></dl<>
	2,4-Dimethylphenol	500	<dl< td=""></dl<>
	Benzoic Acid	500	<dl< td=""></dl<>
	2,4-Dichlorophenol	500	<dl< td=""></dl<>
	4-Chloro-3-Methylphenol	500	<dl< td=""></dl<>
	2,4,6-Trichlorophenol	500	<dl< td=""></dl<>
	2,4,5-Trichlorophenol	500	<dl< td=""></dl<>
	2,4-Dinitrophenol	500	<dl< td=""></dl<>
	4-Nitrophenol	500	<dl< td=""></dl<>
	4-6-Dinitro-2-Methylphenol	500	<dl< td=""></dl<>
	Pentachlorophenol	500	<dl< td=""></dl<>

SURROGATE RECOVERIES	% RECOVERY
Phenol-d6	65
2-Fluorophenol	59
2,4,6-Tribromophenol	68

METHOD REFERENCE: EPA SW-846 (8270)

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DATE: September 17, 1990

ELAP# 10797

ANALYSIS FOR: Monroe County Environmental Health Laboratory

FEL# 4477-02 SAMPLE ID: Tunnel 75-65

PARAMETER	DETECTION LIMIT Ag/L	RESULTS /kg/L
Chloromethane	4.0	<dl< td=""></dl<>
Bromomethane	4.0	<b>(DL</b>
Vinyl Chloride	4.0	<dl< td=""></dl<>
Chloroethane	4.0	<dl< td=""></dl<>
Methylene Chloride	4.0	10.7
Acetone	4.0	10.6
Carbon Disulfide	4.0	⟨DL
1,1-Dichloroethene	4.0	⟨DL
1,1-Dichloroethane	4.0	⟨DL
Trans-1,2-Dichloroethylene	4.0	(DL
	4.0	
Chloroform		ØL
1,2-Dichloroethane	4.0	- OL
2-Butanone	4.0	⟨DL
1,1,1-Trichloroethane	4.0	<dl< td=""></dl<>
Carbon Tetrachloride	4.0	<dl< td=""></dl<>
Vinyl Acetate	4.0	<dl< td=""></dl<>
Bromodichloromethane	4.0	<dl< td=""></dl<>
1,2-Dichloropropane	4.0	<dl< td=""></dl<>
Trans-1,3-Dichloropropene	4.0	<dl< td=""></dl<>
Trichloroethene	4.0	<dl< td=""></dl<>
Benzene	4.0	⟨DL
Dibromochloromethane	4.0	⟨DL
Cis-1,3-Dichloropropene	4.0	⟨DL
1,1,2-Trichloroethane	4.0	⟨DL
2-Chloroethylvinyl Ether	4.0	⟨DL
Bromoform	4.0	(DL
4-Methyl-2-Pentanone	4.0	(DL
Tetrachloroethene	4.0	(DL
1,1,2,2-Tetrachloroethane	4.0	ØL
2-Hexanone	4.0	⟨DL
Toluene	4.0	(DL
Chlorobenzene	4.0	ØL.
Ethylbenzene	4.0	⟨DL
Styrene	4.0	<b>OL</b>
Total Xylenes	4.0	⟨DL
SURROGATE RECOVERIES	% RECOVERY	
1,2-Dichloroethane D4	102	
Toluene D8	93	
4-Bromofluorobenzene	92	
Method: EPA SW-846 (8240) DL = DETECTION LIMIT		

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ELAP# 10797

ANALYSIS FOR: Monroe County Environmental Health Laboratory

FEL# 4477-02

SAMPLE ID	PARAMETER	LIMIT Kg/L	RESULTS/Cg/L
Tunnel 75-65	Bis-(2-Chloroethyl) ether	1000	<dl< td=""></dl<>
	1,3-Dichlorobenzene	1000	⟨DL
	1,4-Dichlorobenzene	1000	<dl< td=""></dl<>
	1,2-Dichlorobenzene	1000	<dl< td=""></dl<>
	Bis-(2-Chloroisopropyl) ether	1000	<dl< td=""></dl<>
	N-Nitroso-Di-Propylamine	1000	<dl< td=""></dl<>
	Hexachloroethane	1000	<dl< td=""></dl<>
	Nitrobenzene	1000	<dl< td=""></dl<>
	Isophorone	1000	<dl< td=""></dl<>
	Bis-(2-Chloroethyoxy) Methane	e 1000	<dl< td=""></dl<>
	1,2,4-Trichlorobenzene	1000	<dl< td=""></dl<>
	Naphthalene	1000	<dl< td=""></dl<>
	4-Chloroaniline	1000	<dl< td=""></dl<>
	Hexachlorobutadiene	1000	<dl< td=""></dl<>
	2-Methylnaphthalene	1000	(DL
	Hexachlorocyclopentadiene	1000	<dl< td=""></dl<>
	2-Chloronaphthalene	1000	<b>OL</b>
	Dimethyl Phthalate	1000	<b>CDL</b>
	Acenaphthylene	1000	<dl< td=""></dl<>
	3-Nitroaniline	1000	<dl< td=""></dl<>
	2-Nitroaniline	1000	<b>CDL</b>
	Acenaphthene	1000	<dl< td=""></dl<>
	Dibenzofuran	1000	<dl< td=""></dl<>
	2,4-Dinitrotoluene	1000	<dl< td=""></dl<>
	2,6-Dinitrotoluene	1000	<dl< td=""></dl<>
	Diethylphthalate	1000	<dl< td=""></dl<>
	4-Chlorophenyl-phenylether	1000	<dl< td=""></dl<>
	Fluorene	1000	<□L
	4-Nitroaniline	1000	<dl< td=""></dl<>
	N-Nitrosodiphenylamine	1000	<dl< td=""></dl<>
	4-Bromophenyl-phenylether	1000	<dl< td=""></dl<>
	Hexachlorobenzene	1000	⟨DL

METHOD REFERENCE: EPA SW-846 (8270)

DL = Detection Limit

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DATE: September 17, 1990

ELAP# 10797

ANALYSIS FOR: Monroe County Environmental Health Laboratory

FEL# 4477-Ø2

SAMPLE	ID	PARAMETER	DETECTION LIMIT LG/L	RESULTS Kg/L
10	7			P =-
Tunnel	75–65	Phenanthrene	1000	⟨DL
		Anthracene	1000	<dl< td=""></dl<>
		Di-N-Butylphthalate	1000	(DL
		Fluoranthene	1000	<dl .<="" td=""></dl>
		Pyrene	1000	⟨DL
		Butylbenzylphthalate	1000	<dl< td=""></dl<>
		3,3'-Dichlorobezidine	1000	⟨DL
		Benzo (a) Anthracene	1000	⟨DL
		Bis (2-ethylhexyl) Phthalate	1000	<dl< td=""></dl<>
		Chrysene	1000	<dl< td=""></dl<>
		di-N-Octyl Phthalate	1000	<dl< td=""></dl<>
		Benzo (d) & Benzo (k) Fluoranthene	e 1000	<dl< td=""></dl<>
		Benzo (a) Pyrene	1000	<dl< td=""></dl<>
		Indeno (1, 2, 3-ad) Pyrene	1000	<dl< td=""></dl<>
		Dibenzo (a,h) anthracene	1000	⟨DL
		Benzo (g,h,i) Perylene	1000	<dl< td=""></dl<>

SURROGATE RECOVERIES	% RECOVERY
Nitrobenzene -d5	64
2-Fluorobiphenyl	61
4-Terphenyl- dl4	89

METHOD REFERENCE: EPA SW-846 (8270)

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DATE: September 17, 1990

ELAP# 10797

ANALYSIS FOR: Monroe County Environmental Health Laboratory

FEL# 4477-02

		DETECTION	
SAMPLE ID	PARAMETER	LIMIT Mg/L	RESULTS Mg/L
Tunnel 75-65	Phenol	1000	<dl< td=""></dl<>
	2-Chlorophenol	1000	<dl< td=""></dl<>
	Benzyl Alcohol	1000	<dl< td=""></dl<>
	2-Methylphenol	1000	<dl< td=""></dl<>
	4-Methylphenol	1000	- <dl< td=""></dl<>
	2-Nitrophenol	1000	<dl< td=""></dl<>
	2,4-Dimethylphenol	1000	(DL
	Benzoic Acid	1000	<dl< td=""></dl<>
	2,4-Dichlorophenol	1000	(DL
	4-Chloro-3-Methylphenol	1000	<b>OL</b>
	2,4,6-Trichlorophenol	1000	(DL
	2,4,5-Trichlorophenol	1000	⟨DL
	2,4-Dinitrophenol	1000	<dl< td=""></dl<>
	4-Nitrophenol	1000	<dl< td=""></dl<>
	4-6-Dinitro-2-Methylphenol	1000	<dl< td=""></dl<>
	Pentachlorophenol	1000	(DL

SURROGATE RECOVERIES	% RECOVERY
Phenol-d6	54
2-Fluorophenol	45
2,4,6-Tribromophenol	65

METHOD REFERENCE: EPA SW-846 (8270)

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DATE: September 17, 1990

DL = DETECTION LIMIT

ELAP# 10797

ANALYSIS FOR: Monroe County Environmental Health Laboratory

FEL# 4477-03 SAMPLE ID: Lower Falls

PARAMETER	DETECTION LIMIT + 4g/L	RESULTS Mg/L
Chloromethane	4.0	<dl< td=""></dl<>
Bromomethane	4.0	<dl< td=""></dl<>
Vinyl Chloride	4.0	<dl< td=""></dl<>
Chloroethane	4.0	<dl< td=""></dl<>
Methylene Chloride	4.0	⟨DL
Acetone	4.0	<dl< td=""></dl<>
Carbon Disulfide	4.0	⟨DL
1,1-Dichloroethene	4.0	⟨DL
1,1-Dichloroethane	4.0	⟨DL
Trans-1,2-Dichloroethylene	4.0	<dl< td=""></dl<>
Chloroform	4.0	<dl< td=""></dl<>
1,2-Dichloroethane	4.0	(DL
2-Butanone	4.0	⟨DL
1,1,1-Trichloroethane	4.0	ØL.
Carbon Tetrachloride	4.0	⟨DL
Vinyl Acetate	4.0	ØL.
Bromodichloromethane	4.0	ØL.
1,2-Dichloropropane	4.0	⟨DL
Trans-1,3-Dichloropropene	4.0	ØL.
Trichloroethene	4.0	⟨DL
Benzene	4.0	7.0
Dibromochloromethane	4.0	⟨DL
Cis-1,3-Dichloropropene	4.0	⟨DL
1,1,2-Trichloroethane	4.0	⟨DL
2-Chloroethylvinyl Ether	4.0	⟨DL
Bromoform	4.0	⟨DL
4-Methy1-2-Pentanone	4.0	⟨DL
Tetrachloroethene	4.0	⟨DL
1,1,2,2-Tetrachloroethane	4.0	<dl< td=""></dl<>
2-Hexanone	4.0	<dl< td=""></dl<>
Toluene	4.0	<dl< td=""></dl<>
Chlorobenzene	4.0	<dl< td=""></dl<>
Ethylbenzene	4.0	10.0
Styrene	4.0	⟨DL
Total Xylenes	4.0	50.4
SURROGATE RECOVERIES	% RECOVERY	
1,2-Dichloroethane D4	98	
Toluene D8	98	
4-Bromofluorobenzene	103	
Method: EPA SW-846 (8240)		

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DATE: September 17, 1990

ELAP# 10797

ANALYSIS FOR: Monroe County Environmental Health Laboratory

FEL# 4477-03

SAMPLE ID	PARAMETER	LIMIT Kg/L	RESULTS Ag/L
Lower Falls	Bis-(2-Chloroethyl) ether 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Bis-(2-Chloroisopropyl) ethe		<pre></pre>
	N-Nitroso-Di-Propylamine Hexachloroethane Nitrobenzene Isophorone	500 500 500 500	⟨DL ⟨DL ⟨DL ⟨DL
	Bis-(2-Chloroethyoxy) Methan 1,2,4-Trichlorobenzene Naphthalene	500 500	<dl <dl <dl< td=""></dl<></dl </dl 
	4-Chloroaniline Hexachlorobutadiene 2-Methylnaphthalene Hexachlorocyclopentadiene	500 500 500 500	⟨DL ⟨DL ⟨DL ⟨DL
	2-Chloronaphthalene Dimethyl Phthalate Acenaphthylene	500 500 500	ØL ØL ØL
	3-Nitroaniline 2-Nitroaniline Acenaphthene	500 500 500	<dl <dl <dl< td=""></dl<></dl </dl 
	Dibenzofuran 2,4-Dinitrotoluene 2,6-Dinitrotoluene Diethylphthalate	500 500 500 500	<dl <dl <dl< td=""></dl<></dl </dl 
	4-Chlorophenyl-phenylether Fluorene 4-Nitroaniline N-Nitrosodiphenylamine 4-Bromophenyl-phenylether Hexachlorobenzene	500 500 500 500 500 500	<dl <dl <dl <dl <dl< td=""></dl<></dl </dl </dl </dl 

METHOD REFERENCE: EPA SW-846 (8270)

DL = Detection Limit

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DATE: September 17, 1990

ELAP# 10797

ANALYSIS FOR: Monroe County Environmental Health Laboratory

FEL# 4477-Ø3

		DETECTION	
SAMPLE ID	PARAMETER	LIMIT Mg/L	RESULTS Ag/L
Lower Falls	Phenanthrene	500	<dl< td=""></dl<>
	Anthracene	500	⟨DL
*.	Di-N-Butylphthalate	500	<dl< td=""></dl<>
	Fluoranthene	500	⟨DL
	Pyrene	500	<dl< td=""></dl<>
	Butylbenzylphthalate	500	OL 7
	3,3'-Dichlorobezidine	500	<dl< td=""></dl<>
	Benzo (a) Anthracene	500	(DL
	Bis (2-ethylhexyl) Phthalate	500	<dl< td=""></dl<>
	Chrysene	500	<dl< td=""></dl<>
	di-N-Octyl Phthalate	500	(DL
	Benzo (d) & Benzo (k) Fluoranthen	ne 500	<dl< td=""></dl<>
	Benzo (a) Pyrene	500	<dl< td=""></dl<>
	Indeno (1, 2, 3-ad) Pyrene	500	(DL
	Dibenzo (a,h) anthracene	500	<dl< td=""></dl<>
	Benzo (g,h,i) Perylene	500	ØL.

SURROGATE RECOVERIES	% RECOVERY
Nitrobenzene -d5	66
2-Fluorobiphenyl	70
4-Terphenyl- dl4	97

METHOD REFERENCE: EPA SW-846 (8270)

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DATE: September 17, 1990

ELAP# 10797

ANALYSIS FOR: Monroe County Environmental Health Laboratory

FEL# 4477-Ø3

		DETECTION	
SAMPLE ID	PARAMETER	LIMIT49/L	RESULTS µg/L
Lower Falls	Phenol	500	<dl< td=""></dl<>
	2-Chlorophenol	500	<dl< td=""></dl<>
	Benzyl Alcohol	500	<dl< td=""></dl<>
	2-Methylphenol	500	<dl< td=""></dl<>
	4-Methylphenol	500	- <dl< td=""></dl<>
	2-Nitrophenol	500	<dl< td=""></dl<>
	2,4-Dimethylphenol	500	<dl< td=""></dl<>
	Benzoic Acid	500	<dl< td=""></dl<>
	2,4-Dichlorophenol	500	<dl< td=""></dl<>
	4-Chloro-3-Methylphenol	500	<dl< td=""></dl<>
	2,4,6-Trichlorophenol	500	<dl< td=""></dl<>
	2,4,5-Trichlorophenol	500	<dl< td=""></dl<>
	2,4-Dinitrophenol	500	<dl< td=""></dl<>
	4-Nitrophenol	500	<dl< td=""></dl<>
	4-6-Dinitro-2-Methylphenol	500	<dl< td=""></dl<>
	Pentachlorophenol	500	<dl< td=""></dl<>

SURROGATE RECOVERIES	% RECOVERY
Phenol-d6	60
2-Fluorophenol	55
2,4,6-Tribromophenol	78

METHOD REFERENCE: EPA SW-846 (8270)

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DATE: September 17, 1990

DL = DETECTION LIMIT

ELAP# 10797

ANALYSIS FOR: Monroe County Environmental Health Laboratory

FEL# 4477-04 SAMPLE ID: Trip Blank

PARAMETER	DETECTION LIMIT AG/L	RESULTS Mg/L	
Chloromethane	4.0	⟨DL	
Bromomethane	4.0	⟨DL	
Vinyl Chloride	4.0	<dl< td=""><td></td></dl<>	
Chloroethane	4.0	⟨DL	
Methylene Chloride	4.0	⟨DL	
Acetone	4.0	<dl< td=""><td></td></dl<>	
Carbon Disulfide	4.0	⟨DL	
1,1-Dichloroethene	4.0	⟨DL	
1,1-Dichloroethane	4.0	⟨DL	
Trans-1,2-Dichloroethylene	4.0	⟨DL	
Chloroform	4.0	⟨DL	
1,2-Dichloroethane	4.0	, <dl< td=""><td>,</td></dl<>	,
2-Butanone	4.0	⟨DL	
	4.0	ØL.	
1,1,1-Trichloroethane	4.0	⟨DL	
Carbon Tetrachloride			
Vinyl Acetate	4.0	<dl< td=""><td></td></dl<>	
Bromodichloromethane	4.0	⟨DL	
1,2-Dichloropropane	4.0	⟨DL	
Trans-1,3-Dichloropropene	4.0	⟨DL	
Trichloroethene	4.0	⟨DL	
Benzene	4.0	⟨DL	
Dibromochloromethane	4.0	<b>CDL</b>	
Cis-1,3-Dichloropropene	4.0	<dl< td=""><td></td></dl<>	
1,1,2-Trichloroethane	4.0	<b>OL</b>	
2-Chloroethylvinyl Ether	4.0	⟨DL	
Bromoform	4.0	<b>(DL</b>	
4-Methyl-2-Pentanone	4.0	⟨DL	
Tetrachloroethene	4.0	⟨DL	
1,1,2,2-Tetrachloroethane	4.0	⟨DL	
2-Hexanone	4.0	⟨DL	
Toluene	4.0	⟨DL	
Chlorobenzene	4.0	<b>OL</b>	
Ethylbenzene	4.0	<dl< td=""><td></td></dl<>	
Styrene	4.0	<dl< td=""><td></td></dl<>	
Total Xylenes	4.0	<dl< td=""><td></td></dl<>	
SURROGATE RECOVERIES	% RECOVERY		
1,2-Dichloroethane D4	100		
Toluene D8	96		
4-Bromofluorobenzene	103		
Method: EPA SW-846 (8240)			

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#### QUALITY ASSURANCE/QUALITY CONTROL DATA

CUSTOMER NAME: Monroe County Environmental Health Laboratory

FEL# 4477

SAMPLE ID #	PARAMETER	MATRIX SPIKE DUPLICATE RPD	MATRIX SPIKE % REC	QUANTITY OF SPIKE ADDED
Tunnel				×
75-65	1,1-Dichloroethene	2	80	250 ng
	Trichloroethene	2	92	250 ng
	Benzene	2	97	250 ng
	Toluene	6	81	250 ng
	Chlorobenzene	1	110	250 ng
Blank	Phenol	2	75	200 ng
	2-Chlorophenol	1	72	200 ng
	1,4-Dichlorobenzene	Ø	83	100 ng
N-N	itroso-Di-Propylamine	9	81	100 ng
1	,2,4-Trichlorobenzene	4	77	100 ng
4-C	hloro-3-Methylphenol	10	94	200 ng
	Acenaphthene	2	84	100 ng
	4-Nitrophenol	14	55	200 ng
	2,4-Dinitrotoluene	6	85	100 ng
	Pentachlorophenol	6	69	200 ng
	Pyrene	1	87	100 ng

RPD = Relative Percent Difference

TV = True Value