



# Ambient Air Sampling Report

**Date:** June 23, 2011

**To:** Brian Kelly, U.S. EPA

**CC:** Joseph DeGrazia, MDEQ; Paul Max, City of Detroit DHWP; Yousef S. Ahmed, DWSD; William Burbidge, DWSD; Raymond Scott, City of Detroit Environmental Affairs; Honor Sheard, MPC; Greg Smith, MPC; Lisa Lautermilch, MPC

**From:** Joseph F. Marra

**RE:** June Ambient Air Sampling Report

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Ambient air sampling per the Sewer Vapor Investigation Work Plan (revision 2; March 16, 2011) was conducted on June 13-14, 2011.

On the date of sampling the refinery was not operating the 4 carbon beds at the wastewater treatment plant (WWTP) outfall. Instead the refinery was running a hydrogen peroxide system to treat for Benzene. This was necessary as the refinery was completing a sand filter media change out in the wastewater treatment which did not allow for the carbon system to be operational. It should be noted that the treatment of Benzene with peroxide should continue through the DWSD sewer system with the additional residence time. The samples are analyzed for benzene in the water phase of the sample per EPA Method 8260, results are reported in ppb.

Date	Peroxide Wastewater Effluent
6/8/11	83
6/9/11	59
6/13/11	97
6/14/11	15
6/15/11	41

*Results in Italics are from the Date of Ambient Air Testing, all results are in ppb.*

Per Attachment 1 – Figure 3 Ambient Air Sample Locations the four 'Monthly Community Air Sample Locations' were collected as described in the Work Plan. In addition, two background samples were collected from the two locations on Fort Street identified on the Figure as 'Monthly Background Air Sample Location'. Canisters were set-up at the specified location based on a predicted North-North West wind.

Lab data for the air samples are contained in *Attachment 2 – Analytical Results*. Benzene concentrations are summarized as follows:

Location	Benzene (ppbv)
I-75	0.37
Patricia	0.302
Liebold	0.308
Liddesdale	0.305
Background: East Fort Street	0.431
Background: West Fort Street	0.493

*Attachment 3 – Indoor/Ambient Air Sample Collection Log* contains the field notes for the sampling. All flow controllers were checked in the afternoon on June 13, 2011 and appeared to be operating properly, no changes were required. The only items noted by the sampling crew was increased vehicle activity related to the Fort Street Bridge project.

*Attachment 4 – Detailed Weather June 13-14, 2011* contains weather conditions as acquired from the [www.weatherunderground.com](http://www.weatherunderground.com). The refinery's air modeling Safer Software did not capture data on the day of testing to provide the normal hourly graphs, this data should be available in future reports. Winds were typically less than 10 mph but were higher on June 13 from 11 am until 7 pm.

Attachments:

*Attachment 1 – Figure 3 Ambient Air Sample Locations*

*Attachment 2 – Analytical Results*

*Attachment 3 – Indoor/Ambient Air Sample Collection Log*

*Attachment 4 – Detailed Weather June 13-14, 2011*

*Attachment 5 – Ambient Air and Wastewater Sample results March 2011 through June 2011*

## **Attachment 1 – Figure 3 Ambient Air Sample Locations**





## **Attachment 2 – Analytical Results**





Pace Analytical Services, Inc.  
 1700 Elm Street – Suite 200  
 Minneapolis, MN 55414  
 Phone: 612.607.1700  
 Fax: 612.607.6444

## ANALYTICAL RESULTS

Client: Marathon Oil  
 Phone: 419-421-2012

Lab Project Number: 10160337  
 Project Name: Detroit Sewer Investigation

Lab Sample No: 10160337001  
 Client Sample ID: EAST FORT\_061311

ProjSampleNum: 10160337001  
 Matrix: Air

Date Collected: 06/14/11 8:43  
 Date Received: 06/15/11 9:40

Parameters	Results	Units	Report Limit	DF	Analyzed	CAS No.	Qualifiers
<b>Air</b>							
TO-15							
1,1,1-Trichloroethane	ND	ppbv	0.41	2.06	06/17/11 11:49 DR1	71-55-6	
1,1,2,2-Tetrachloroethane	ND	ppbv	0.2	2.06	06/17/11 11:49 DR1	79-34-5	
1,1,2-Trichloroethane	ND	ppbv	0.2	2.06	06/17/11 11:49 DR1	79-00-5	
1,1,2-Trichlorotrifluoroethane	ND	ppbv	0.42	2.06	06/17/11 11:49 DR1	76-13-1	
1,1-Dichloroethane	ND	ppbv	0.41	2.06	06/17/11 11:49 DR1	75-34-3	
1,1-Dichloroethene	ND	ppbv	0.42	2.06	06/17/11 11:49 DR1	75-35-4	
1,2,4-Trichlorobenzene	ND	ppbv	0.27	2.06	06/17/11 11:49 DR1	120-82-1	
1,2,4-Trimethylbenzene	0.64	ppbv	0.42	2.06	06/17/11 11:49 DR1	95-63-6	
1,2-Dibromoethane (EDB)	ND	ppbv	0.42	2.06	06/17/11 11:49 DR1	106-93-4	
1,2-Dichlorobenzene	ND	ppbv	0.41	2.06	06/17/11 11:49 DR1	95-50-1	
1,2-Dichloroethane	ND	ppbv	0.2	2.06	06/17/11 11:49 DR1	107-06-2	
1,2-Dichloropropane	ND	ppbv	0.4	2.06	06/17/11 11:49 DR1	78-87-5	
1,3,5-Trimethylbenzene	0.48	ppbv	0.42	2.06	06/17/11 11:49 DR1	108-67-8	
1,3-Butadiene	ND	ppbv	0.41	2.06	06/17/11 11:49 DR1	106-99-0	
1,3-Dichlorobenzene	ND	ppbv	0.41	2.06	06/17/11 11:49 DR1	541-73-1	
1,4-Dichlorobenzene	ND	ppbv	0.41	2.06	06/17/11 11:49 DR1	106-46-7	
2-Butanone (MEK)	3.04	ppbv	0.4	2.06	06/17/11 11:49 DR1	78-93-3	
2-Hexanone	ND	ppbv	0.41	2.06	06/17/11 11:49 DR1	591-78-6	
2-Propanol	9.08	ppbv	2.1	2.06	06/17/11 11:49 DR1	67-63-0	
4-Ethyltoluene	ND	ppbv	1	2.06	06/17/11 11:49 DR1	622-96-8	
4-Methyl-2-pentanone (MIBK)	1.08	ppbv	0.41	2.06	06/17/11 11:49 DR1	108-10-1	
Acetone	50.1	ppbv	0.41	2.06	06/17/11 11:49 DR1	67-64-1	
Benzene	0.431	ppbv	0.21	2.06	06/17/11 11:49 DR1	71-43-2	
Benzyl chloride	ND	ppbv	0.42	2.06	06/17/11 11:49 DR1	100-44-7	
Bromodichloromethane	ND	ppbv	0.43	2.06	06/17/11 11:49 DR1	75-27-4	
Bromoform	ND	ppbv	0.41	2.06	06/17/11 11:49 DR1	75-25-2	
Bromomethane	ND	ppbv	0.41	2.06	06/17/11 11:49 DR1	74-83-9	
Carbon disulfide	1.45	ppbv	0.41	2.06	06/17/11 11:49 DR1	75-15-0	
Carbon tetrachloride	ND	ppbv	0.2	2.06	06/17/11 11:49 DR1	56-23-5	
Chlorobenzene	ND	ppbv	0.41	2.06	06/17/11 11:49 DR1	108-90-7	
Chloroethane	ND	ppbv	0.41	2.06	06/17/11 11:49 DR1	75-00-3	

## SUPPLEMENTAL REPORT

Date: 6/20/2011

Units Conversion Request

Page 1



Pace Analytical Services, Inc.  
 1700 Elm Street – Suite 200  
 Minneapolis, MN 55414  
 Phone: 612.607.1700  
 Fax: 612.607.6444

## ANALYTICAL RESULTS

Client: Marathon Oil  
 Phone: 419-421-2012

Lab Project Number: 10160337  
 Project Name: Detroit Sewer Investigation

Chloroform	ND	ppbv	0.4	2.06	06/17/11 11:49	DR1	67-66-3	
Chloromethane	ND	ppbv	0.41	2.06	06/17/11 11:49	DR1	74-87-3	
cis-1,2-Dichloroethene	ND	ppbv	0.42	2.06	06/17/11 11:49	DR1	156-59-2	
cis-1,3-Dichloropropene	ND	ppbv	0.41	2.06	06/17/11 11:49	DR1	10061-01-5	
Cyclohexane	0.743	ppbv	0.4	2.06	06/17/11 11:49	DR1	110-82-7	
Dibromochloromethane	ND	ppbv	0.4	2.06	06/17/11 11:49	DR1	124-48-1	
Dichlorodifluoromethane	0.537	ppbv	0.42	2.06	06/17/11 11:49	DR1	75-71-8	
Dichlorotetrafluoroethane	ND	ppbv	0.41	2.06	06/17/11 11:49	DR1	76-14-2	
Ethanol	6.37	ppbv	2	2.06	06/17/11 11:49	DR1	64-17-5	SS
Ethyl acetate	ND	ppbv	0.41	2.06	06/17/11 11:49	DR1	141-78-6	
Ethylbenzene	0.498	ppbv	0.41	2.06	06/17/11 11:49	DR1	100-41-4	
Hexachloro-1,3-butadiene	ND	ppbv	0.42	2.06	06/17/11 11:49	DR1	87-68-3	
m&p-Xylene	1.43	ppbv	0.82	2.06	06/17/11 11:49	DR1	179601-23-	
Methylene Chloride	48.1	ppbv	0.42	2.06	06/17/11 11:49	DR1	75-09-2	
Methyl-tert-butyl ether	ND	ppbv	0.41	2.06	06/17/11 11:49	DR1	1634-04-4	
Naphthalene	ND	ppbv	1.1	2.06	06/17/11 11:49	DR1	91-20-3	
n-Heptane	ND	ppbv	0.41	2.06	06/17/11 11:49	DR1	142-82-5	
n-Hexane	7.76	ppbv	0.42	2.06	06/17/11 11:49	DR1	110-54-3	
o-Xylene	0.408	ppbv	0.41	2.06	06/17/11 11:49	DR1	95-47-6	
Propylene	ND	ppbv	0.41	2.06	06/17/11 11:49	DR1	115-07-1	
Styrene	ND	ppbv	0.42	2.06	06/17/11 11:49	DR1	100-42-5	
Tetrachloroethene	ND	ppbv	0.2	2.06	06/17/11 11:49	DR1	127-18-4	
Tetrahydrofuran	3.67	ppbv	0.4	2.06	06/17/11 11:49	DR1	109-99-9	SS
Toluene	1.93	ppbv	0.42	2.06	06/17/11 11:49	DR1	108-88-3	
trans-1,2-Dichloroethene	ND	ppbv	0.42	2.06	06/17/11 11:49	DR1	156-60-5	
trans-1,3-Dichloropropene	ND	ppbv	0.41	2.06	06/17/11 11:49	DR1	10061-02-6	
Trichloroethene	ND	ppbv	0.2	2.06	06/17/11 11:49	DR1	79-01-6	
Trichlorofluoromethane	ND	ppbv	0.4	2.06	06/17/11 11:49	DR1	75-69-4	
Vinyl acetate	ND	ppbv	0.42	2.06	06/17/11 11:49	DR1	108-05-4	
Vinyl chloride	ND	ppbv	0.21	2.06	06/17/11 11:49	DR1	75-01-4	

DISCLAIMER: These results have been converted to the units shown from the original units of measurement assuming 20 degrees Celsius and 1 atmosphere pressure. Values were not rounded according to EPA rounding rules. THC is quantitated based on the average response factors of several compounds; the nominal molecular weight of THC used for units conversion is the average of the molecular weights of the compounds used for quantitation.

## SUPPLEMENTAL REPORT

Units Conversion Request



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 Minneapolis, MN 55414  
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 Fax: 612.607.6444

## ANALYTICAL RESULTS

Client: Marathon Oil  
 Phone: 419-421-2012

Lab Project Number: 10160337  
 Project Name: Detroit Sewer Investigation

Lab Sample No: 10160337002  
 Client Sample ID: I-75\_061311

ProjSampleNum: 10160337002  
 Matrix: Air

Date Collected: 06/14/11 8:49  
 Date Received: 06/15/11 9:40

Parameters	Results	Units	Report Limit	DF	Analyzed	CAS No.	Qualifiers
<b>Air</b>							
<b>TO-15</b>							
1,1,1-Trichloroethane	ND	ppbv	0.32	1.66	06/16/11 15:54 DR1	71-55-6	
1,1,2,2-Tetrachloroethane	ND	ppbv	0.17	1.66	06/16/11 15:54 DR1	79-34-5	
1,1,2-Trichloroethane	ND	ppbv	0.16	1.66	06/16/11 15:54 DR1	79-00-5	
1,1,2-Trichlorotrifluoroethane	ND	ppbv	0.35	1.66	06/16/11 15:54 DR1	76-13-1	
1,1-Dichloroethane	ND	ppbv	0.34	1.66	06/16/11 15:54 DR1	75-34-3	
1,1-Dichloroethene	ND	ppbv	0.32	1.66	06/16/11 15:54 DR1	75-35-4	
1,2,4-Trichlorobenzene	ND	ppbv	0.21	1.66	06/16/11 15:54 DR1	120-82-1	
1,2,4-Trimethylbenzene	0.5	ppbv	0.34	1.66	06/16/11 15:54 DR1	95-63-6	
1,2-Dibromoethane (EDB)	ND	ppbv	0.35	1.66	06/16/11 15:54 DR1	106-93-4	
1,2-Dichlorobenzene	ND	ppbv	0.33	1.66	06/16/11 15:54 DR1	95-50-1	
1,2-Dichloroethane	ND	ppbv	0.17	1.66	06/16/11 15:54 DR1	107-06-2	
1,2-Dichloropropane	ND	ppbv	0.34	1.66	06/16/11 15:54 DR1	78-87-5	
1,3,5-Trimethylbenzene	0.36	ppbv	0.34	1.66	06/16/11 15:54 DR1	108-67-8	
1,3-Butadiene	ND	ppbv	0.33	1.66	06/16/11 15:54 DR1	106-99-0	
1,3-Dichlorobenzene	ND	ppbv	0.33	1.66	06/16/11 15:54 DR1	541-73-1	
1,4-Dichlorobenzene	ND	ppbv	0.33	1.66	06/16/11 15:54 DR1	106-46-7	
2-Butanone (MEK)	0.534	ppbv	0.33	1.66	06/16/11 15:54 DR1	78-93-3	
2-Hexanone	ND	ppbv	0.34	1.66	06/16/11 15:54 DR1	591-78-6	
2-Propanol	ND	ppbv	1.7	1.66	06/16/11 15:54 DR1	67-63-0	
4-Ethyltoluene	ND	ppbv	0.84	1.66	06/16/11 15:54 DR1	622-96-8	
4-Methyl-2-pentanone (MIBK)	ND	ppbv	0.34	1.66	06/16/11 15:54 DR1	108-10-1	
Acetone	4.89	ppbv	0.33	1.66	06/16/11 15:54 DR1	67-64-1	
Benzene	0.37	ppbv	0.17	1.66	06/16/11 15:54 DR1	71-43-2	
Benzyl chloride	ND	ppbv	0.32	1.66	06/16/11 15:54 DR1	100-44-7	
Bromodichloromethane	ND	ppbv	0.34	1.66	06/16/11 15:54 DR1	75-27-4	
Bromoform	ND	ppbv	0.33	1.66	06/16/11 15:54 DR1	75-25-2	
Bromomethane	ND	ppbv	0.33	1.66	06/16/11 15:54 DR1	74-83-9	
Carbon disulfide	ND	ppbv	0.32	1.66	06/16/11 15:54 DR1	75-15-0	
Carbon tetrachloride	ND	ppbv	0.17	1.66	06/16/11 15:54 DR1	56-23-5	
Chlorobenzene	ND	ppbv	0.34	1.66	06/16/11 15:54 DR1	108-90-7	
Chloroethane	ND	ppbv	0.34	1.66	06/16/11 15:54 DR1	75-00-3	

## SUPPLEMENTAL REPORT

Units Conversion Request





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 Minneapolis, MN 55414  
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 Fax: 612.607.6444

## ANALYTICAL RESULTS

Client: Marathon Oil  
 Phone: 419-421-2012

Lab Project Number: 10160337  
 Project Name: Detroit Sewer Investigation

Chloroform	ND	ppbv	0.32	1.66	06/16/11 15:54	DR1	67-66-3	
Chloromethane	ND	ppbv	0.33	1.66	06/16/11 15:54	DR1	74-87-3	
cis-1,2-Dichloroethene	ND	ppbv	0.32	1.66	06/16/11 15:54	DR1	156-59-2	
cis-1,3-Dichloropropene	ND	ppbv	0.33	1.66	06/16/11 15:54	DR1	10061-01-5	
Cyclohexane	0.543	ppbv	0.31	1.66	06/16/11 15:54	DR1	110-82-7	
Dibromochloromethane	ND	ppbv	0.32	1.66	06/16/11 15:54	DR1	124-48-1	
Dichlorodifluoromethane	0.458	ppbv	0.34	1.66	06/16/11 15:54	DR1	75-71-8	
Dichlorotetrafluoroethane	ND	ppbv	0.32	1.66	06/16/11 15:54	DR1	76-14-2	
Ethanol	9.45	ppbv	1.7	1.66	06/16/11 15:54	DR1	64-17-5	SS
Ethyl acetate	ND	ppbv	0.33	1.66	06/16/11 15:54	DR1	141-78-6	
Ethylbenzene	0.43	ppbv	0.34	1.66	06/16/11 15:54	DR1	100-41-4	
Hexachloro-1,3-butadiene	ND	ppbv	0.34	1.66	06/16/11 15:54	DR1	87-68-3	
m&p-Xylene	1.16	ppbv	0.66	1.66	06/16/11 15:54	DR1	179601-23-	
Methylene Chloride	1.02	ppbv	0.34	1.66	06/16/11 15:54	DR1	75-09-2	
Methyl-tert-butyl ether	ND	ppbv	0.33	1.66	06/16/11 15:54	DR1	1634-04-4	
Naphthalene	ND	ppbv	0.84	1.66	06/16/11 15:54	DR1	91-20-3	
n-Heptane	0.552	ppbv	0.34	1.66	06/16/11 15:54	DR1	142-82-5	
n-Hexane	1.28	ppbv	0.33	1.66	06/16/11 15:54	DR1	110-54-3	
o-Xylene	0.34	ppbv	0.34	1.66	06/16/11 15:54	DR1	95-47-6	
Propylene	ND	ppbv	0.33	1.66	06/16/11 15:54	DR1	115-07-1	
Styrene	ND	ppbv	0.32	1.66	06/16/11 15:54	DR1	100-42-5	
Tetrachloroethene	ND	ppbv	0.16	1.66	06/16/11 15:54	DR1	127-18-4	
Tetrahydrofuran	ND	ppbv	0.33	1.66	06/16/11 15:54	DR1	109-99-9	
Toluene	1.12	ppbv	0.34	1.66	06/16/11 15:54	DR1	108-88-3	
trans-1,2-Dichloroethene	ND	ppbv	0.32	1.66	06/16/11 15:54	DR1	156-60-5	
trans-1,3-Dichloropropene	ND	ppbv	0.33	1.66	06/16/11 15:54	DR1	10061-02-6	
Trichloroethene	0.311	ppbv	0.17	1.66	06/16/11 15:54	DR1	79-01-6	
Trichlorofluoromethane	0.315	ppbv	0.32	1.66	06/16/11 15:54	DR1	75-69-4	
Vinyl acetate	ND	ppbv	0.34	1.66	06/16/11 15:54	DR1	108-05-4	
Vinyl chloride	ND	ppbv	0.17	1.66	06/16/11 15:54	DR1	75-01-4	

DISCLAIMER: These results have been converted to the units shown from the original units of measurement assuming 20 degrees Celsius and 1 atmosphere pressure. Values were not rounded according to EPA rounding rules. THC is quantitated based on the average response factors of several compounds; the nominal molecular weight of THC used for units conversion is the average of the molecular weights of the compounds used for quantitation.

## SUPPLEMENTAL REPORT

Units Conversion Request



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## ANALYTICAL RESULTS

Client: Marathon Oil  
Phone: 419-421-2012

Lab Project Number: 10160337  
Project Name: Detroit Sewer Investigation

Lab Sample No: 10160337003  
Client Sample ID: PATRICIA\_061311

ProjSampleNum: 10160337003  
Matrix: Air

Date Collected: 06/14/11 8:52  
Date Received: 06/15/11 9:40

Parameters	Results	Units	Report Limit	DF	Analyzed	CAS No.	Qualifiers
<b>Air</b>							
TO-15							
1,1,1-Trichloroethane	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	71-55-6	
1,1,2,2-Tetrachloroethane	ND	ppbv	0.13	1.34	06/16/11 16:52 DR1	79-34-5	
1,1,2-Trichloroethane	ND	ppbv	0.13	1.34	06/16/11 16:52 DR1	79-00-5	
1,1,2-Trichlorotrifluoroethane	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	76-13-1	
1,1-Dichloroethane	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	75-34-3	
1,1-Dichloroethene	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	75-35-4	
1,2,4-Trichlorobenzene	ND	ppbv	0.17	1.34	06/16/11 16:52 DR1	120-82-1	
1,2,4-Trimethylbenzene	0.4	ppbv	0.26	1.34	06/16/11 16:52 DR1	95-63-6	
1,2-Dibromoethane (EDB)	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	106-93-4	
1,2-Dichlorobenzene	ND	ppbv	0.26	1.34	06/16/11 16:52 DR1	95-50-1	
1,2-Dichloroethane	ND	ppbv	0.13	1.34	06/16/11 16:52 DR1	107-06-2	
1,2-Dichloropropane	ND	ppbv	0.28	1.34	06/16/11 16:52 DR1	78-87-5	
1,3,5-Trimethylbenzene	0.28	ppbv	0.26	1.34	06/16/11 16:52 DR1	108-67-8	
1,3-Butadiene	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	106-99-0	
1,3-Dichlorobenzene	ND	ppbv	0.26	1.34	06/16/11 16:52 DR1	541-73-1	
1,4-Dichlorobenzene	ND	ppbv	0.26	1.34	06/16/11 16:52 DR1	106-46-7	
2-Butanone (MEK)	0.901	ppbv	0.27	1.34	06/16/11 16:52 DR1	78-93-3	
2-Hexanone	ND	ppbv	0.26	1.34	06/16/11 16:52 DR1	591-78-6	
2-Propanol	ND	ppbv	1.4	1.34	06/16/11 16:52 DR1	67-63-0	
4-Ethyltoluene	ND	ppbv	0.68	1.34	06/16/11 16:52 DR1	622-96-8	
4-Methyl-2-pentanone (MIBK)	ND	ppbv	0.26	1.34	06/16/11 16:52 DR1	108-10-1	
Acetone	4.1	ppbv	0.27	1.34	06/16/11 16:52 DR1	67-64-1	
Benzene	0.302	ppbv	0.14	1.34	06/16/11 16:52 DR1	71-43-2	
Benzyl chloride	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	100-44-7	
Bromodichloromethane	ND	ppbv	0.28	1.34	06/16/11 16:52 DR1	75-27-4	
Bromoform	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	75-25-2	
Bromomethane	ND	ppbv	0.28	1.34	06/16/11 16:52 DR1	74-83-9	
Carbon disulfide	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	75-15-0	
Carbon tetrachloride	ND	ppbv	0.13	1.34	06/16/11 16:52 DR1	56-23-5	
Chlorobenzene	ND	ppbv	0.28	1.34	06/16/11 16:52 DR1	108-90-7	
Chloroethane	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	75-00-3	

## SUPPLEMENTAL REPORT

Units Conversion Request



Pace Analytical Services, Inc.  
 1700 Elm Street – Suite 200  
 Minneapolis, MN 55414  
 Phone: 612.607.1700  
 Fax: 612.607.6444

## ANALYTICAL RESULTS

Client: Marathon Oil  
 Phone: 419-421-2012

Lab Project Number: 10160337  
 Project Name: Detroit Sewer Investigation

Chloroform	ND	ppbv	0.26	1.34	06/16/11 16:52 DR1	67-66-3	
Chloromethane	0.286	ppbv	0.27	1.34	06/16/11 16:52 DR1	74-87-3	
cis-1,2-Dichloroethene	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	156-59-2	
cis-1,3-Dichloropropene	ND	ppbv	0.26	1.34	06/16/11 16:52 DR1	10061-01-5	
Cyclohexane	ND	ppbv	0.26	1.34	06/16/11 16:52 DR1	110-82-7	
Dibromochloromethane	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	124-48-1	
Dichlorodifluoromethane	0.477	ppbv	0.26	1.34	06/16/11 16:52 DR1	75-71-8	
Dichlorotetrafluoroethane	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	76-14-2	
Ethanol	3.86	ppbv	1.3	1.34	06/16/11 16:52 DR1	64-17-5	SS
Ethyl acetate	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	141-78-6	
Ethylbenzene	0.317	ppbv	0.27	1.34	06/16/11 16:52 DR1	100-41-4	
Hexachloro-1,3-butadiene	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	87-68-3	
m&p-Xylene	0.929	ppbv	0.54	1.34	06/16/11 16:52 DR1	179601-23-	
Methylene Chloride	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	75-09-2	
Methyl-tert-butyl ether	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	1634-04-4	
Naphthalene	ND	ppbv	0.68	1.34	06/16/11 16:52 DR1	91-20-3	
n-Heptane	ND	ppbv	0.26	1.34	06/16/11 16:52 DR1	142-82-5	
n-Hexane	0.447	ppbv	0.27	1.34	06/16/11 16:52 DR1	110-54-3	
o-Xylene	0.272	ppbv	0.27	1.34	06/16/11 16:52 DR1	95-47-6	
Propylene	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	115-07-1	
Styrene	ND	ppbv	0.28	1.34	06/16/11 16:52 DR1	100-42-5	
Tetrachloroethene	ND	ppbv	0.13	1.34	06/16/11 16:52 DR1	127-18-4	
Tetrahydrofuran	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	109-99-9	
Toluene	0.522	ppbv	0.26	1.34	06/16/11 16:52 DR1	108-88-3	
trans-1,2-Dichloroethene	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	156-60-5	
trans-1,3-Dichloropropene	ND	ppbv	0.26	1.34	06/16/11 16:52 DR1	10061-02-6	
Trichloroethene	ND	ppbv	0.14	1.34	06/16/11 16:52 DR1	79-01-6	
Trichlorofluoromethane	0.28	ppbv	0.26	1.34	06/16/11 16:52 DR1	75-69-4	
Vinyl acetate	ND	ppbv	0.27	1.34	06/16/11 16:52 DR1	108-05-4	
Vinyl chloride	ND	ppbv	0.13	1.34	06/16/11 16:52 DR1	75-01-4	

DISCLAIMER: These results have been converted to the units shown from the original units of measurement assuming 20 degrees Celsius and 1 atmosphere pressure. Values were not rounded according to EPA rounding rules. THC is quantitated based on the average response factors of several compounds; the nominal molecular weight of THC used for units conversion is the average of the molecular weights of the compounds used for quantitation.

## SUPPLEMENTAL REPORT

Units Conversion Request





Pace Analytical Services, Inc.  
 1700 Elm Street – Suite 200  
 Minneapolis, MN 55414  
 Phone: 612.607.1700  
 Fax: 612.607.6444

## ANALYTICAL RESULTS

Client: Marathon Oil

Phone: 419-421-2012

Lab Sample No: 10160337004

Client Sample ID: Liddesdale\_061311

Lab Project Number: 10160337

Project Name: Detroit Sewer Investigation

ProjSampleNum: 10160337004

Date Collected: 06/14/11 8:57

Matrix: Air

Date Received: 06/15/11 9:40

Parameters	Results	Units	Report Limit	DF	Analyzed	CAS No.	Qualifiers
<b>Air</b>							
TO-15							
1,1,1-Trichloroethane	ND	ppbv	0.31	1.54	06/16/11 17:20 DR1	71-55-6	
1,1,2,2-Tetrachloroethane	ND	ppbv	0.16	1.54	06/16/11 17:20 DR1	79-34-5	
1,1,2-Trichloroethane	ND	ppbv	0.15	1.54	06/16/11 17:20 DR1	79-00-5	
1,1,2-Trichlorotrifluoroethane	ND	ppbv	0.32	1.54	06/16/11 17:20 DR1	76-13-1	
1,1-Dichloroethane	ND	ppbv	0.32	1.54	06/16/11 17:20 DR1	75-34-3	
1,1-Dichloroethene	ND	ppbv	0.3	1.54	06/16/11 17:20 DR1	75-35-4	
1,2,4-Trichlorobenzene	ND	ppbv	0.2	1.54	06/16/11 17:20 DR1	120-82-1	
1,2,4-Trimethylbenzene	0.4	ppbv	0.3	1.54	06/16/11 17:20 DR1	95-63-6	
1,2-Dibromoethane (EDB)	ND	ppbv	0.32	1.54	06/16/11 17:20 DR1	106-93-4	
1,2-Dichlorobenzene	ND	ppbv	0.29	1.54	06/16/11 17:20 DR1	95-50-1	
1,2-Dichloroethane	ND	ppbv	0.15	1.54	06/16/11 17:20 DR1	107-06-2	
1,2-Dichloropropane	ND	ppbv	0.3	1.54	06/16/11 17:20 DR1	78-87-5	
1,3,5-Trimethylbenzene	0.32	ppbv	0.3	1.54	06/16/11 17:20 DR1	108-67-8	
1,3-Butadiene	ND	ppbv	0.31	1.54	06/16/11 17:20 DR1	106-99-0	
1,3-Dichlorobenzene	ND	ppbv	0.29	1.54	06/16/11 17:20 DR1	541-73-1	
1,4-Dichlorobenzene	ND	ppbv	0.29	1.54	06/16/11 17:20 DR1	106-46-7	
2-Butanone (MEK)	ND	ppbv	0.31	1.54	06/16/11 17:20 DR1	78-93-3	
2-Hexanone	ND	ppbv	0.31	1.54	06/16/11 17:20 DR1	591-78-6	
2-Propanol	ND	ppbv	1.5	1.54	06/16/11 17:20 DR1	67-63-0	
4-Ethyltoluene	ND	ppbv	0.76	1.54	06/16/11 17:20 DR1	622-96-8	
4-Methyl-2-pentanone (MIBK)	ND	ppbv	0.31	1.54	06/16/11 17:20 DR1	108-10-1	
Acetone	1.78	ppbv	0.31	1.54	06/16/11 17:20 DR1	67-64-1	
Benzene	0.305	ppbv	0.15	1.54	06/16/11 17:20 DR1	71-43-2	
Benzyl chloride	ND	ppbv	0.3	1.54	06/16/11 17:20 DR1	100-44-7	
Bromodichloromethane	ND	ppbv	0.32	1.54	06/16/11 17:20 DR1	75-27-4	
Bromoform	ND	ppbv	0.3	1.54	06/16/11 17:20 DR1	75-25-2	
Bromomethane	ND	ppbv	0.3	1.54	06/16/11 17:20 DR1	74-83-9	
Carbon disulfide	ND	ppbv	0.31	1.54	06/16/11 17:20 DR1	75-15-0	
Carbon tetrachloride	ND	ppbv	0.15	1.54	06/16/11 17:20 DR1	56-23-5	
Chlorobenzene	ND	ppbv	0.3	1.54	06/16/11 17:20 DR1	108-90-7	
Chloroethane	ND	ppbv	0.31	1.54	06/16/11 17:20 DR1	75-00-3	

## SUPPLEMENTAL REPORT

Date: 6/20/2011

Units Conversion Request

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Pace Analytical Services, Inc.  
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 Phone: 612.607.1700  
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## ANALYTICAL RESULTS

Client: Marathon Oil  
 Phone: 419-421-2012

Lab Project Number: 10160337  
 Project Name: Detroit Sewer Investigation

Chloroform	ND	ppbv	0.3	1.54	06/16/11 17:20	DR1	67-66-3	
Chloromethane	0.362	ppbv	0.31	1.54	06/16/11 17:20	DR1	74-87-3	
cis-1,2-Dichloroethene	ND	ppbv	0.3	1.54	06/16/11 17:20	DR1	156-59-2	
cis-1,3-Dichloropropene	ND	ppbv	0.3	1.54	06/16/11 17:20	DR1	10061-01-5	
Cyclohexane	ND	ppbv	0.29	1.54	06/16/11 17:20	DR1	110-82-7	
Dibromochloromethane	ND	ppbv	0.3	1.54	06/16/11 17:20	DR1	124-48-1	
Dichlorodifluoromethane	0.497	ppbv	0.3	1.54	06/16/11 17:20	DR1	75-71-8	
Dichlorotetrafluoroethane	ND	ppbv	0.31	1.54	06/16/11 17:20	DR1	76-14-2	
Ethanol	5.43	ppbv	1.5	1.54	06/16/11 17:20	DR1	64-17-5	SS
Ethyl acetate	ND	ppbv	0.3	1.54	06/16/11 17:20	DR1	141-78-6	
Ethylbenzene	0.362	ppbv	0.32	1.54	06/16/11 17:20	DR1	100-41-4	
Hexachloro-1,3-butadiene	ND	ppbv	0.31	1.54	06/16/11 17:20	DR1	87-68-3	
m&p-Xylene	1.06	ppbv	0.61	1.54	06/16/11 17:20	DR1	179601-23-	
Methylene Chloride	ND	ppbv	0.31	1.54	06/16/11 17:20	DR1	75-09-2	
Methyl-tert-butyl ether	ND	ppbv	0.3	1.54	06/16/11 17:20	DR1	1634-04-4	
Naphthalene	ND	ppbv	0.79	1.54	06/16/11 17:20	DR1	91-20-3	
n-Heptane	ND	ppbv	0.31	1.54	06/16/11 17:20	DR1	142-82-5	
n-Hexane	0.363	ppbv	0.31	1.54	06/16/11 17:20	DR1	110-54-3	
o-Xylene	ND	ppbv	0.32	1.54	06/16/11 17:20	DR1	95-47-6	
Propylene	ND	ppbv	0.31	1.54	06/16/11 17:20	DR1	115-07-1	
Styrene	ND	ppbv	0.3	1.54	06/16/11 17:20	DR1	100-42-5	
Tetrachloroethene	ND	ppbv	0.16	1.54	06/16/11 17:20	DR1	127-18-4	
Tetrahydrofuran	ND	ppbv	0.31	1.54	06/16/11 17:20	DR1	109-99-9	
Toluene	0.496	ppbv	0.31	1.54	06/16/11 17:20	DR1	108-88-3	
trans-1,2-Dichloroethene	ND	ppbv	0.3	1.54	06/16/11 17:20	DR1	156-60-5	
trans-1,3-Dichloropropene	ND	ppbv	0.3	1.54	06/16/11 17:20	DR1	10061-02-6	
Trichloroethene	ND	ppbv	0.16	1.54	06/16/11 17:20	DR1	79-01-6	
Trichlorofluoromethane	0.315	ppbv	0.3	1.54	06/16/11 17:20	DR1	75-69-4	
Vinyl acetate	ND	ppbv	0.31	1.54	06/16/11 17:20	DR1	108-05-4	
Vinyl chloride	ND	ppbv	0.15	1.54	06/16/11 17:20	DR1	75-01-4	

DISCLAIMER: These results have been converted to the units shown from the original units of measurement assuming 20 degrees Celsius and 1 atmosphere pressure. Values were not rounded according to EPA rounding rules. THC is quantitated based on the average response factors of several compounds; the nominal molecular weight of THC used for units conversion is the average of the molecular weights of the compounds used for quantitation.

## SUPPLEMENTAL REPORT

Units Conversion Request

Date: 6/20/2011

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Pace Analytical Services, Inc.  
 1700 Elm Street – Suite 200  
 Minneapolis, MN 55414  
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## ANALYTICAL RESULTS

Client: Marathon Oil  
 Phone: 419-421-2012

Lab Project Number: 10160337  
 Project Name: Detroit Sewer Investigation

Lab Sample No: 10160337005  
 Client Sample ID: Liebold\_061311

ProjSampleNum: 10160337005  
 Matrix: Air

Date Collected: 06/14/11 9:00  
 Date Received: 06/15/11 9:40

Parameters	Results	Units	Report Limit	DF	Analyzed	CAS No.	Qualifiers
<b>Air</b>							
TO-15							
1,1,1-Trichloroethane	ND	ppbv	0.31	1.59	06/16/11 17:49 DR1	71-55-6	
1,1,2,2-Tetrachloroethane	ND	ppbv	0.16	1.59	06/16/11 17:49 DR1	79-34-5	
1,1,2-Trichloroethane	ND	ppbv	0.16	1.59	06/16/11 17:49 DR1	79-00-5	
1,1,2-Trichlorotrifluoroethane	ND	ppbv	0.32	1.59	06/16/11 17:49 DR1	76-13-1	
1,1-Dichloroethane	ND	ppbv	0.32	1.59	06/16/11 17:49 DR1	75-34-3	
1,1-Dichloroethene	ND	ppbv	0.32	1.59	06/16/11 17:49 DR1	75-35-4	
1,2,4-Trichlorobenzene	ND	ppbv	0.21	1.59	06/16/11 17:49 DR1	120-82-1	
1,2,4-Trimethylbenzene	0.44	ppbv	0.32	1.59	06/16/11 17:49 DR1	95-63-6	
1,2-Dibromoethane (EDB)	ND	ppbv	0.32	1.59	06/16/11 17:49 DR1	106-93-4	
1,2-Dichlorobenzene	ND	ppbv	0.31	1.59	06/16/11 17:49 DR1	95-50-1	
1,2-Dichloroethane	ND	ppbv	0.16	1.59	06/16/11 17:49 DR1	107-06-2	
1,2-Dichloropropane	ND	ppbv	0.32	1.59	06/16/11 17:49 DR1	78-87-5	
1,3,5-Trimethylbenzene	0.32	ppbv	0.32	1.59	06/16/11 17:49 DR1	108-67-8	
1,3-Butadiene	ND	ppbv	0.32	1.59	06/16/11 17:49 DR1	106-99-0	
1,3-Dichlorobenzene	ND	ppbv	0.31	1.59	06/16/11 17:49 DR1	541-73-1	
1,4-Dichlorobenzene	ND	ppbv	0.31	1.59	06/16/11 17:49 DR1	106-46-7	
2-Butanone (MEK)	0.6	ppbv	0.32	1.59	06/16/11 17:49 DR1	78-93-3	
2-Hexanone	ND	ppbv	0.31	1.59	06/16/11 17:49 DR1	591-78-6	
2-Propanol	ND	ppbv	1.6	1.59	06/16/11 17:49 DR1	67-63-0	
4-Ethyltoluene	ND	ppbv	0.8	1.59	06/16/11 17:49 DR1	622-96-8	
4-Methyl-2-pentanone (MIBK)	ND	ppbv	0.31	1.59	06/16/11 17:49 DR1	108-10-1	
Acetone	2.44	ppbv	0.31	1.59	06/16/11 17:49 DR1	67-64-1	
Benzene	0.308	ppbv	0.16	1.59	06/16/11 17:49 DR1	71-43-2	
Benzyl chloride	ND	ppbv	0.32	1.59	06/16/11 17:49 DR1	100-44-7	
Bromodichloromethane	ND	ppbv	0.32	1.59	06/16/11 17:49 DR1	75-27-4	
Bromoform	ND	ppbv	0.31	1.59	06/16/11 17:49 DR1	75-25-2	
Bromomethane	ND	ppbv	0.33	1.59	06/16/11 17:49 DR1	74-83-9	
Carbon disulfide	ND	ppbv	0.32	1.59	06/16/11 17:49 DR1	75-15-0	
Carbon tetrachloride	ND	ppbv	0.16	1.59	06/16/11 17:49 DR1	56-23-5	
Chlorobenzene	ND	ppbv	0.32	1.59	06/16/11 17:49 DR1	108-90-7	
Chloroethane	ND	ppbv	0.32	1.59	06/16/11 17:49 DR1	75-00-3	

## SUPPLEMENTAL REPORT

Date: 6/20/2011

Units Conversion Request

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Pace Analytical Services, Inc.  
 1700 Elm Street – Suite 200  
 Minneapolis, MN 55414  
 Phone: 612.607.1700  
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## ANALYTICAL RESULTS

Client: Marathon Oil  
 Phone: 419-421-2012

Lab Project Number: 10160337  
 Project Name: Detroit Sewer Investigation

Chloroform	ND	ppbv	0.32	1.59	06/16/11 17:49	DR1	67-66-3	
Chloromethane	0.343	ppbv	0.32	1.59	06/16/11 17:49	DR1	74-87-3	
cis-1,2-Dichloroethene	ND	ppbv	0.32	1.59	06/16/11 17:49	DR1	156-59-2	
cis-1,3-Dichloropropene	ND	ppbv	0.33	1.59	06/16/11 17:49	DR1	10061-01-5	
Cyclohexane	ND	ppbv	0.31	1.59	06/16/11 17:49	DR1	110-82-7	
Dibromochloromethane	ND	ppbv	0.31	1.59	06/16/11 17:49	DR1	124-48-1	
Dichlorodifluoromethane	0.458	ppbv	0.32	1.59	06/16/11 17:49	DR1	75-71-8	
Dichlorotetrafluoroethane	ND	ppbv	0.31	1.59	06/16/11 17:49	DR1	76-14-2	
Ethanol	5.17	ppbv	1.6	1.59	06/16/11 17:49	DR1	64-17-5	SS
Ethyl acetate	ND	ppbv	0.33	1.59	06/16/11 17:49	DR1	141-78-6	
Ethylbenzene	0.385	ppbv	0.32	1.59	06/16/11 17:49	DR1	100-41-4	
Hexachloro-1,3-butadiene	ND	ppbv	0.32	1.59	06/16/11 17:49	DR1	87-68-3	
m&p-Xylene	1.09	ppbv	0.63	1.59	06/16/11 17:49	DR1	179601-23-	
Methylene Chloride	0.963	ppbv	0.31	1.59	06/16/11 17:49	DR1	75-09-2	
Methyl-tert-butyl ether	ND	ppbv	0.33	1.59	06/16/11 17:49	DR1	1634-04-4	
Naphthalene	ND	ppbv	0.81	1.59	06/16/11 17:49	DR1	91-20-3	
n-Heptane	0.408	ppbv	0.31	1.59	06/16/11 17:49	DR1	142-82-5	
n-Hexane	0.949	ppbv	0.31	1.59	06/16/11 17:49	DR1	110-54-3	
o-Xylene	ND	ppbv	0.32	1.59	06/16/11 17:49	DR1	95-47-6	
Propylene	ND	ppbv	0.32	1.59	06/16/11 17:49	DR1	115-07-1	
Styrene	ND	ppbv	0.32	1.59	06/16/11 17:49	DR1	100-42-5	
Tetrachloroethene	ND	ppbv	0.16	1.59	06/16/11 17:49	DR1	127-18-4	
Tetrahydrofuran	ND	ppbv	0.32	1.59	06/16/11 17:49	DR1	109-99-9	
Toluene	0.574	ppbv	0.31	1.59	06/16/11 17:49	DR1	108-88-3	
trans-1,2-Dichloroethene	ND	ppbv	0.32	1.59	06/16/11 17:49	DR1	156-60-5	
trans-1,3-Dichloropropene	ND	ppbv	0.33	1.59	06/16/11 17:49	DR1	10061-02-6	
Trichloroethene	ND	ppbv	0.16	1.59	06/16/11 17:49	DR1	79-01-6	
Trichlorofluoromethane	0.315	ppbv	0.3	1.59	06/16/11 17:49	DR1	75-69-4	
Vinyl acetate	ND	ppbv	0.31	1.59	06/16/11 17:49	DR1	108-05-4	
Vinyl chloride	ND	ppbv	0.16	1.59	06/16/11 17:49	DR1	75-01-4	

DISCLAIMER: These results have been converted to the units shown from the original units of measurement assuming 20 degrees Celsius and 1 atmosphere pressure. Values were not rounded according to EPA rounding rules. THC is quantitated based on the average response factors of several compounds; the nominal molecular weight of THC used for units conversion is the average of the molecular weights of the compounds used for quantitation.

## SUPPLEMENTAL REPORT

Units Conversion Request

Date: 6/20/2011

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Pace Analytical Services, Inc.  
 1700 Elm Street – Suite 200  
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 Phone: 612.607.1700  
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## ANALYTICAL RESULTS

Client: Marathon Oil  
 Phone: 419-421-2012

Lab Project Number: 10160337  
 Project Name: Detroit Sewer Investigation

Lab Sample No: 10160337006  
 Client Sample ID: WEST FORT\_061311

ProjSampleNum: 10160337006  
 Matrix: Air

Date Collected: 06/14/11 9:06  
 Date Received: 06/15/11 9:40

Parameters	Results	Units	Report Limit	DF	Analyzed	CAS No.	Qualifiers
<b>Air</b>							
TO-15							
1,1,1-Trichloroethane	ND	ppbv	0.29	1.48	06/16/11 18:18 DR1	71-55-6	
1,1,2,2-Tetrachloroethane	ND	ppbv	0.14	1.48	06/16/11 18:18 DR1	79-34-5	
1,1,2-Trichloroethane	ND	ppbv	0.15	1.48	06/16/11 18:18 DR1	79-00-5	
1,1,2-Trichlorotrifluoroethane	ND	ppbv	0.31	1.48	06/16/11 18:18 DR1	76-13-1	
1,1-Dichloroethane	ND	ppbv	0.29	1.48	06/16/11 18:18 DR1	75-34-3	
1,1-Dichloroethene	ND	ppbv	0.3	1.48	06/16/11 18:18 DR1	75-35-4	
1,2,4-Trichlorobenzene	ND	ppbv	0.2	1.48	06/16/11 18:18 DR1	120-82-1	
1,2,4-Trimethylbenzene	0.54	ppbv	0.3	1.48	06/16/11 18:18 DR1	95-63-6	
1,2-Dibromoethane (EDB)	ND	ppbv	0.31	1.48	06/16/11 18:18 DR1	106-93-4	
1,2-Dichlorobenzene	ND	ppbv	0.29	1.48	06/16/11 18:18 DR1	95-50-1	
1,2-Dichloroethane	ND	ppbv	0.15	1.48	06/16/11 18:18 DR1	107-06-2	
1,2-Dichloropropane	ND	ppbv	0.3	1.48	06/16/11 18:18 DR1	78-87-5	
1,3,5-Trimethylbenzene	0.34	ppbv	0.3	1.48	06/16/11 18:18 DR1	108-67-8	
1,3-Butadiene	ND	ppbv	0.3	1.48	06/16/11 18:18 DR1	106-99-0	
1,3-Dichlorobenzene	ND	ppbv	0.29	1.48	06/16/11 18:18 DR1	541-73-1	
1,4-Dichlorobenzene	ND	ppbv	0.29	1.48	06/16/11 18:18 DR1	106-46-7	
2-Butanone (MEK)	0.534	ppbv	0.3	1.48	06/16/11 18:18 DR1	78-93-3	
2-Hexanone	ND	ppbv	0.29	1.48	06/16/11 18:18 DR1	591-78-6	
2-Propanol	ND	ppbv	1.5	1.48	06/16/11 18:18 DR1	67-63-0	
4-Ethyltoluene	ND	ppbv	0.74	1.48	06/16/11 18:18 DR1	622-96-8	
4-Methyl-2-pentanone (MIBK)	ND	ppbv	0.29	1.48	06/16/11 18:18 DR1	108-10-1	
Acetone	4.47	ppbv	0.29	1.48	06/16/11 18:18 DR1	67-64-1	
Benzene	0.493	ppbv	0.15	1.48	06/16/11 18:18 DR1	71-43-2	
Benzyl chloride	ND	ppbv	0.3	1.48	06/16/11 18:18 DR1	100-44-7	
Bromodichloromethane	ND	ppbv	0.31	1.48	06/16/11 18:18 DR1	75-27-4	
Bromoform	ND	ppbv	0.3	1.48	06/16/11 18:18 DR1	75-25-2	
Bromomethane	ND	ppbv	0.3	1.48	06/16/11 18:18 DR1	74-83-9	
Carbon disulfide	ND	ppbv	0.29	1.48	06/16/11 18:18 DR1	75-15-0	
Carbon tetrachloride	ND	ppbv	0.15	1.48	06/16/11 18:18 DR1	56-23-5	
Chlorobenzene	ND	ppbv	0.3	1.48	06/16/11 18:18 DR1	108-90-7	
Chloroethane	ND	ppbv	0.3	1.48	06/16/11 18:18 DR1	75-00-3	

## SUPPLEMENTAL REPORT

Date: 6/20/2011

Units Conversion Request

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Pace Analytical Services, Inc.  
**1700 Elm Street – Suite 200**  
**Minneapolis, MN 55414**  
**Phone: 612.607.1700**  
**Fax: 612.607.6444**

## ANALYTICAL RESULTS

Client: Marathon Oil  
 Phone: 419-421-2012

Lab Project Number: 10160337  
 Project Name: Detroit Sewer Investigation

Chloroform	ND	ppbv	0.3	1.48	06/16/11 18:18	DR1	67-66-3	
Chloromethane	0.376	ppbv	0.3	1.48	06/16/11 18:18	DR1	74-87-3	
cis-1,2-Dichloroethene	ND	ppbv	0.3	1.48	06/16/11 18:18	DR1	156-59-2	
cis-1,3-Dichloropropene	ND	ppbv	0.3	1.48	06/16/11 18:18	DR1	10061-01-5	
Cyclohexane	1.2	ppbv	0.29	1.48	06/16/11 18:18	DR1	110-82-7	
Dibromochloromethane	ND	ppbv	0.29	1.48	06/16/11 18:18	DR1	124-48-1	
Dichlorodifluoromethane	0.477	ppbv	0.3	1.48	06/16/11 18:18	DR1	75-71-8	
Dichlorotetrafluoroethane	ND	ppbv	0.3	1.48	06/16/11 18:18	DR1	76-14-2	
Ethanol	9.19	ppbv	1.5	1.48	06/16/11 18:18	DR1	64-17-5	SS
Ethyl acetate	1.31	ppbv	0.3	1.48	06/16/11 18:18	DR1	141-78-6	
Ethylbenzene	0.476	ppbv	0.29	1.48	06/16/11 18:18	DR1	100-41-4	
Hexachloro-1,3-butadiene	ND	ppbv	0.3	1.48	06/16/11 18:18	DR1	87-68-3	
m&p-Xylene	1.13	ppbv	0.59	1.48	06/16/11 18:18	DR1	179601-23-	
Methylene Chloride	5.1	ppbv	0.31	1.48	06/16/11 18:18	DR1	75-09-2	
Methyl-tert-butyl ether	ND	ppbv	0.3	1.48	06/16/11 18:18	DR1	1634-04-4	
Naphthalene	ND	ppbv	0.75	1.48	06/16/11 18:18	DR1	91-20-3	
n-Heptane	1.01	ppbv	0.29	1.48	06/16/11 18:18	DR1	142-82-5	
n-Hexane	3.04	ppbv	0.31	1.48	06/16/11 18:18	DR1	110-54-3	
o-Xylene	0.408	ppbv	0.29	1.48	06/16/11 18:18	DR1	95-47-6	
Propylene	ND	ppbv	0.3	1.48	06/16/11 18:18	DR1	115-07-1	
Styrene	ND	ppbv	0.3	1.48	06/16/11 18:18	DR1	100-42-5	
Tetrachloroethene	ND	ppbv	0.15	1.48	06/16/11 18:18	DR1	127-18-4	
Tetrahydrofuran	1.63	ppbv	0.3	1.48	06/16/11 18:18	DR1	109-99-9	
Toluene	3.81	ppbv	0.29	1.48	06/16/11 18:18	DR1	108-88-3	
trans-1,2-Dichloroethene	ND	ppbv	0.3	1.48	06/16/11 18:18	DR1	156-60-5	
trans-1,3-Dichloropropene	ND	ppbv	0.3	1.48	06/16/11 18:18	DR1	10061-02-6	
Trichloroethene	0.86	ppbv	0.15	1.48	06/16/11 18:18	DR1	79-01-6	
Trichlorofluoromethane	0.298	ppbv	0.28	1.48	06/16/11 18:18	DR1	75-69-4	
Vinyl acetate	ND	ppbv	0.31	1.48	06/16/11 18:18	DR1	108-05-4	
Vinyl chloride	ND	ppbv	0.15	1.48	06/16/11 18:18	DR1	75-01-4	

DISCLAIMER: These results have been converted to the units shown from the original units of measurement assuming 20 degrees Celsius and 1 atmosphere pressure. Values were not rounded according to EPA rounding rules. THC is quantitated based on the average response factors of several compounds; the nominal molecular weight of THC used for units conversion is the average of the molecular weights of the compounds used for quantitation.

## SUPPLEMENTAL REPORT

Units Conversion Request





*Pace Analytical Services, Inc.  
1700 Elm Street – Suite 200  
Minneapolis, MN 55414  
Phone: 612.607.1700  
Fax: 612.607.6444*

## ANALYTICAL RESULTS

Client: Marathon Oil  
Phone: 419-421-2012

Lab Project Number: 10160337  
Project Name: Detroit Sewer Investigation

## PARAMETER FOOTNOTES

ND Not detected at or above adjusted reporting limit

NC Not Calculable

J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

[SS] This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.

## SUPPLEMENTAL REPORT

Units Conversion Request



Pace Analytical Services, Inc.  
1700 Elm Street - Suite 200  
Minneapolis, MN 55414  
(612)607-1700

June 20, 2011

Honor Sheard  
Marathon Oil  
1300 Fort Street  
Detroit, MI 48217

RE: Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

Dear Honor Sheard:

Enclosed are the analytical results for sample(s) received by the laboratory on June 15, 2011. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Andrea Opland

andrea.opland@pacelabs.com  
Project Manager

Enclosures

## REPORT OF LABORATORY ANALYSIS

Page 1 of 27

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## CERTIFICATIONS

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

### Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414  
A2LA Certification #: 2926.01  
Alaska Certification #: UST-078  
Alaska Certification #MN00064  
Arizona Certification #: AZ-0014  
Arkansas Certification #: 88-0680  
California Certification #: 01155CA  
EPA Region 8 Certification #: Pace  
Florida/NELAP Certification #: E87605  
Georgia Certification #: 959  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Louisiana Certification #: 03086  
Louisiana Certification #: LA080009  
Maine Certification #: 2007029  
Maryland Certification #: 322  
Michigan DEQ Certification #: 9909  
Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace  
Montana Certification #: MT CERT0092  
Nevada Certification #: MN\_00064  
Nebraska Certification #: Pace  
New Jersey Certification #: MN-002  
New Mexico Certification #: Pace  
New York Certification #: 11647  
North Carolina Certification #: 530  
North Dakota Certification #: R-036  
North Dakota Certification #: R-036A  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: D9921  
Oklahoma Certification #: 9507  
Oregon Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification  
Tennessee Certification #: 02818  
Texas Certification #: T104704192  
Washington Certification #: C754  
Wisconsin Certification #: 999407970

## REPORT OF LABORATORY ANALYSIS

Page 2 of 27

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## SAMPLE SUMMARY

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10160337001	EAST FORT_061311	Air	06/14/11 08:43	06/15/11 09:40
10160337002	I-75_061311	Air	06/14/11 08:49	06/15/11 09:40
10160337003	PATRICIA_061311	Air	06/14/11 08:52	06/15/11 09:40
10160337004	Liddesdale_061311	Air	06/14/11 08:57	06/15/11 09:40
10160337005	Liebold_061311	Air	06/14/11 09:00	06/15/11 09:40
10160337006	WEST FORT_061311	Air	06/14/11 09:06	06/15/11 09:40
10160337007	1206	Air		06/15/11 09:40

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE ANALYTE COUNT

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10160337001	EAST FORT_061311	TO-15	DR1	61	PASI-M
10160337002	I-75_061311	TO-15	DR1	61	PASI-M
10160337003	PATRICIA_061311	TO-15	DR1	61	PASI-M
10160337004	Liddesdale_061311	TO-15	DR1	61	PASI-M
10160337005	Liebold_061311	TO-15	DR1	61	PASI-M
10160337006	WEST FORT_061311	TO-15	DR1	61	PASI-M

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Detroit Sewer Investigation

Pace Project No.: 10160337

Sample: EAST FORT\_061311 Lab ID: 10160337001 Collected: 06/14/11 08:43 Received: 06/15/11 09:40 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR</b>		Analytical Method: TO-15						
Acetone	121	ug/m3	0.99	2.06		06/17/11 11:49	67-64-1	
Benzene	1.4	ug/m3	0.67	2.06		06/17/11 11:49	71-43-2	
Benzyl chloride	ND	ug/m3	2.2	2.06		06/17/11 11:49	100-44-7	
Bromodichloromethane	ND	ug/m3	2.9	2.06		06/17/11 11:49	75-27-4	
Bromoform	ND	ug/m3	4.3	2.06		06/17/11 11:49	75-25-2	
Bromomethane	ND	ug/m3	1.6	2.06		06/17/11 11:49	74-83-9	
1,3-Butadiene	ND	ug/m3	0.93	2.06		06/17/11 11:49	106-99-0	
2-Butanone (MEK)	9.1	ug/m3	1.2	2.06		06/17/11 11:49	78-93-3	
Carbon disulfide	4.6	ug/m3	1.3	2.06		06/17/11 11:49	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.3	2.06		06/17/11 11:49	56-23-5	
Chlorobenzene	ND	ug/m3	1.9	2.06		06/17/11 11:49	108-90-7	
Chloroethane	ND	ug/m3	1.1	2.06		06/17/11 11:49	75-00-3	
Chloroform	ND	ug/m3	2.0	2.06		06/17/11 11:49	67-66-3	
Chloromethane	ND	ug/m3	0.87	2.06		06/17/11 11:49	74-87-3	
Cyclohexane	2.6	ug/m3	1.4	2.06		06/17/11 11:49	110-82-7	
Dibromochloromethane	ND	ug/m3	3.5	2.06		06/17/11 11:49	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	3.3	2.06		06/17/11 11:49	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.5	2.06		06/17/11 11:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.5	2.06		06/17/11 11:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.5	2.06		06/17/11 11:49	106-46-7	
Dichlorodifluoromethane	2.7	ug/m3	2.1	2.06		06/17/11 11:49	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.7	2.06		06/17/11 11:49	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.84	2.06		06/17/11 11:49	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.7	2.06		06/17/11 11:49	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.7	2.06		06/17/11 11:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.7	2.06		06/17/11 11:49	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.9	2.06		06/17/11 11:49	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.9	2.06		06/17/11 11:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.9	2.06		06/17/11 11:49	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.9	2.06		06/17/11 11:49	76-14-2	
Ethanol	12.2	ug/m3	3.9	2.06		06/17/11 11:49	64-17-5	SS
Ethyl acetate	ND	ug/m3	1.5	2.06		06/17/11 11:49	141-78-6	
Ethylbenzene	2.2	ug/m3	1.8	2.06		06/17/11 11:49	100-41-4	
4-Ethyltoluene	ND	ug/m3	5.2	2.06		06/17/11 11:49	622-96-8	
n-Heptane	ND	ug/m3	1.7	2.06		06/17/11 11:49	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	4.5	2.06		06/17/11 11:49	87-68-3	
n-Hexane	27.8	ug/m3	1.5	2.06		06/17/11 11:49	110-54-3	
2-Hexanone	ND	ug/m3	1.7	2.06		06/17/11 11:49	591-78-6	
Methylene Chloride	170	ug/m3	1.5	2.06		06/17/11 11:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	4.5	ug/m3	1.7	2.06		06/17/11 11:49	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	1.5	2.06		06/17/11 11:49	1634-04-4	
Naphthalene	ND	ug/m3	5.6	2.06		06/17/11 11:49	91-20-3	
2-Propanol	22.7	ug/m3	5.2	2.06		06/17/11 11:49	67-63-0	
Propylene	ND	ug/m3	0.72	2.06		06/17/11 11:49	115-07-1	
Styrene	ND	ug/m3	1.8	2.06		06/17/11 11:49	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.4	2.06		06/17/11 11:49	79-34-5	
Tetrachloroethene	ND	ug/m3	1.4	2.06		06/17/11 11:49	127-18-4	

Date: 06/20/2011 03:04 PM

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Detroit Sewer Investigation

Pace Project No.: 10160337

**Sample:** EAST FORT\_061311 **Lab ID:** 10160337001 **Collected:** 06/14/11 08:43 **Received:** 06/15/11 09:40 **Matrix:** Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR</b>		Analytical Method: TO-15						
Tetrahydrofuran	11.0	ug/m3	1.2	2.06		06/17/11 11:49	109-99-9	SS
Toluene	7.4	ug/m3	1.6	2.06		06/17/11 11:49	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	2.0	2.06		06/17/11 11:49	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	2.3	2.06		06/17/11 11:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	1.1	2.06		06/17/11 11:49	79-00-5	
Trichloroethene	ND	ug/m3	1.1	2.06		06/17/11 11:49	79-01-6	
Trichlorofluoromethane	ND	ug/m3	2.3	2.06		06/17/11 11:49	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	3.3	2.06		06/17/11 11:49	76-13-1	
1,2,4-Trimethylbenzene	3.2	ug/m3	2.1	2.06		06/17/11 11:49	95-63-6	
1,3,5-Trimethylbenzene	2.4	ug/m3	2.1	2.06		06/17/11 11:49	108-67-8	
Vinyl acetate	ND	ug/m3	1.5	2.06		06/17/11 11:49	108-05-4	
Vinyl chloride	ND	ug/m3	0.54	2.06		06/17/11 11:49	75-01-4	
m&p-Xylene	6.3	ug/m3	3.6	2.06		06/17/11 11:49	179601-23-1	
o-Xylene	1.8	ug/m3	1.8	2.06		06/17/11 11:49	95-47-6	

## ANALYTICAL RESULTS

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

Sample: I-75_061311		Lab ID: 10160337002	Collected: 06/14/11 08:49	Received: 06/15/11 09:40	Matrix: Air			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR</b>		Analytical Method: TO-15						
Acetone	11.8 ug/m3		0.80	1.66		06/16/11 15:54	67-64-1	
Benzene	1.2 ug/m3		0.54	1.66		06/16/11 15:54	71-43-2	
Benzyl chloride	ND ug/m3		1.7	1.66		06/16/11 15:54	100-44-7	
Bromodichloromethane	ND ug/m3		2.3	1.66		06/16/11 15:54	75-27-4	
Bromoform	ND ug/m3		3.5	1.66		06/16/11 15:54	75-25-2	
Bromomethane	ND ug/m3		1.3	1.66		06/16/11 15:54	74-83-9	
1,3-Butadiene	ND ug/m3		0.75	1.66		06/16/11 15:54	106-99-0	
2-Butanone (MEK)	1.6 ug/m3		1.0	1.66		06/16/11 15:54	78-93-3	
Carbon disulfide	ND ug/m3		1.0	1.66		06/16/11 15:54	75-15-0	
Carbon tetrachloride	ND ug/m3		1.1	1.66		06/16/11 15:54	56-23-5	
Chlorobenzene	ND ug/m3		1.6	1.66		06/16/11 15:54	108-90-7	
Chloroethane	ND ug/m3		0.90	1.66		06/16/11 15:54	75-00-3	
Chloroform	ND ug/m3		1.6	1.66		06/16/11 15:54	67-66-3	
Chloromethane	ND ug/m3		0.70	1.66		06/16/11 15:54	74-87-3	
Cyclohexane	1.9 ug/m3		1.1	1.66		06/16/11 15:54	110-82-7	
Dibromochloromethane	ND ug/m3		2.8	1.66		06/16/11 15:54	124-48-1	
1,2-Dibromoethane (EDB)	ND ug/m3		2.7	1.66		06/16/11 15:54	106-93-4	
1,2-Dichlorobenzene	ND ug/m3		2.0	1.66		06/16/11 15:54	95-50-1	
1,3-Dichlorobenzene	ND ug/m3		2.0	1.66		06/16/11 15:54	541-73-1	
1,4-Dichlorobenzene	ND ug/m3		2.0	1.66		06/16/11 15:54	106-46-7	
Dichlorodifluoromethane	2.3 ug/m3		1.7	1.66		06/16/11 15:54	75-71-8	
1,1-Dichloroethane	ND ug/m3		1.4	1.66		06/16/11 15:54	75-34-3	
1,2-Dichloroethane	ND ug/m3		0.68	1.66		06/16/11 15:54	107-06-2	
1,1-Dichloroethene	ND ug/m3		1.3	1.66		06/16/11 15:54	75-35-4	
cis-1,2-Dichloroethene	ND ug/m3		1.3	1.66		06/16/11 15:54	156-59-2	
trans-1,2-Dichloroethene	ND ug/m3		1.3	1.66		06/16/11 15:54	156-60-5	
1,2-Dichloropropane	ND ug/m3		1.6	1.66		06/16/11 15:54	78-87-5	
cis-1,3-Dichloropropene	ND ug/m3		1.5	1.66		06/16/11 15:54	10061-01-5	
trans-1,3-Dichloropropene	ND ug/m3		1.5	1.66		06/16/11 15:54	10061-02-6	
Dichlorotetrafluoroethane	ND ug/m3		2.3	1.66		06/16/11 15:54	76-14-2	
Ethanol	18.1 ug/m3		3.2	1.66		06/16/11 15:54	64-17-5	SS
Ethyl acetate	ND ug/m3		1.2	1.66		06/16/11 15:54	141-78-6	
Ethylbenzene	1.9 ug/m3		1.5	1.66		06/16/11 15:54	100-41-4	
4-Ethyltoluene	ND ug/m3		4.2	1.66		06/16/11 15:54	622-96-8	
n-Heptane	2.3 ug/m3		1.4	1.66		06/16/11 15:54	142-82-5	
Hexachloro-1,3-butadiene	ND ug/m3		3.7	1.66		06/16/11 15:54	87-68-3	
n-Hexane	4.6 ug/m3		1.2	1.66		06/16/11 15:54	110-54-3	
2-Hexanone	ND ug/m3		1.4	1.66		06/16/11 15:54	591-78-6	
Methylene Chloride	3.6 ug/m3		1.2	1.66		06/16/11 15:54	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND ug/m3		1.4	1.66		06/16/11 15:54	108-10-1	
Methyl-tert-butyl ether	ND ug/m3		1.2	1.66		06/16/11 15:54	1634-04-4	
Naphthalene	ND ug/m3		4.5	1.66		06/16/11 15:54	91-20-3	
2-Propanol	ND ug/m3		4.2	1.66		06/16/11 15:54	67-63-0	
Propylene	ND ug/m3		0.58	1.66		06/16/11 15:54	115-07-1	
Styrene	ND ug/m3		1.4	1.66		06/16/11 15:54	100-42-5	
1,1,2,2-Tetrachloroethane	ND ug/m3		1.2	1.66		06/16/11 15:54	79-34-5	
Tetrachloroethene	ND ug/m3		1.1	1.66		06/16/11 15:54	127-18-4	

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## ANALYTICAL RESULTS

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

Sample: I-75_061311		Lab ID: 10160337002	Collected: 06/14/11 08:49	Received: 06/15/11 09:40	Matrix: Air			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR</b>		Analytical Method: TO-15						
Tetrahydrofuran	ND	ug/m3	1.0	1.66		06/16/11 15:54	109-99-9	
Toluene	4.3	ug/m3	1.3	1.66		06/16/11 15:54	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	1.6	1.66		06/16/11 15:54	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.8	1.66		06/16/11 15:54	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.91	1.66		06/16/11 15:54	79-00-5	
Trichloroethene	1.7	ug/m3	0.91	1.66		06/16/11 15:54	79-01-6	
Trichlorofluoromethane	1.8	ug/m3	1.8	1.66		06/16/11 15:54	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.7	1.66		06/16/11 15:54	76-13-1	
1,2,4-Trimethylbenzene	2.5	ug/m3	1.7	1.66		06/16/11 15:54	95-63-6	
1,3,5-Trimethylbenzene	1.8	ug/m3	1.7	1.66		06/16/11 15:54	108-67-8	
Vinyl acetate	ND	ug/m3	1.2	1.66		06/16/11 15:54	108-05-4	
Vinyl chloride	ND	ug/m3	0.43	1.66		06/16/11 15:54	75-01-4	
m&p-Xylene	5.1	ug/m3	2.9	1.66		06/16/11 15:54	179601-23-1	
o-Xylene	1.5	ug/m3	1.5	1.66		06/16/11 15:54	95-47-6	



## ANALYTICAL RESULTS

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

Sample: PATRICIA\_061311 Lab ID: 10160337003 Collected: 06/14/11 08:52 Received: 06/15/11 09:40 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR</b>		Analytical Method: TO-15						
Acetone	9.9	ug/m3	0.64	1.34		06/16/11 16:52	67-64-1	
Benzene	0.98	ug/m3	0.44	1.34		06/16/11 16:52	71-43-2	
Benzyl chloride	ND	ug/m3	1.4	1.34		06/16/11 16:52	100-44-7	
Bromodichloromethane	ND	ug/m3	1.9	1.34		06/16/11 16:52	75-27-4	
Bromoform	ND	ug/m3	2.8	1.34		06/16/11 16:52	75-25-2	
Bromomethane	ND	ug/m3	1.1	1.34		06/16/11 16:52	74-83-9	
1,3-Butadiene	ND	ug/m3	0.60	1.34		06/16/11 16:52	106-99-0	
2-Butanone (MEK)	2.7	ug/m3	0.80	1.34		06/16/11 16:52	78-93-3	
Carbon disulfide	ND	ug/m3	0.84	1.34		06/16/11 16:52	75-15-0	
Carbon tetrachloride	ND	ug/m3	0.86	1.34		06/16/11 16:52	56-23-5	
Chlorobenzene	ND	ug/m3	1.3	1.34		06/16/11 16:52	108-90-7	
Chloroethane	ND	ug/m3	0.72	1.34		06/16/11 16:52	75-00-3	
Chloroform	ND	ug/m3	1.3	1.34		06/16/11 16:52	67-66-3	
Chloromethane	0.60	ug/m3	0.56	1.34		06/16/11 16:52	74-87-3	
Cyclohexane	ND	ug/m3	0.91	1.34		06/16/11 16:52	110-82-7	
Dibromochloromethane	ND	ug/m3	2.3	1.34		06/16/11 16:52	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.1	1.34		06/16/11 16:52	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	1.6	1.34		06/16/11 16:52	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	1.6	1.34		06/16/11 16:52	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	1.6	1.34		06/16/11 16:52	106-46-7	
Dichlorodifluoromethane	2.4	ug/m3	1.3	1.34		06/16/11 16:52	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.1	1.34		06/16/11 16:52	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.55	1.34		06/16/11 16:52	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.1	1.34		06/16/11 16:52	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.1	1.34		06/16/11 16:52	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.1	1.34		06/16/11 16:52	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.3	1.34		06/16/11 16:52	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.2	1.34		06/16/11 16:52	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.2	1.34		06/16/11 16:52	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	1.9	1.34		06/16/11 16:52	76-14-2	
Ethanol	7.4	ug/m3	2.5	1.34		06/16/11 16:52	64-17-5	SS
Ethyl acetate	ND	ug/m3	0.98	1.34		06/16/11 16:52	141-78-6	
Ethylbenzene	1.4	ug/m3	1.2	1.34		06/16/11 16:52	100-41-4	
4-Ethyltoluene	ND	ug/m3	3.4	1.34		06/16/11 16:52	622-96-8	
n-Heptane	ND	ug/m3	1.1	1.34		06/16/11 16:52	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	2.9	1.34		06/16/11 16:52	87-68-3	
n-Hexane	1.6	ug/m3	0.96	1.34		06/16/11 16:52	110-54-3	
2-Hexanone	ND	ug/m3	1.1	1.34		06/16/11 16:52	591-78-6	
Methylene Chloride	ND	ug/m3	0.95	1.34		06/16/11 16:52	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	1.1	1.34		06/16/11 16:52	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	0.98	1.34		06/16/11 16:52	1634-04-4	
Naphthalene	ND	ug/m3	3.6	1.34		06/16/11 16:52	91-20-3	
2-Propanol	ND	ug/m3	3.4	1.34		06/16/11 16:52	67-63-0	
Propylene	ND	ug/m3	0.47	1.34		06/16/11 16:52	115-07-1	
Styrene	ND	ug/m3	1.2	1.34		06/16/11 16:52	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	0.94	1.34		06/16/11 16:52	79-34-5	
Tetrachloroethene	ND	ug/m3	0.92	1.34		06/16/11 16:52	127-18-4	

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## ANALYTICAL RESULTS

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

Sample: PATRICIA_061311		Lab ID: 10160337003	Collected: 06/14/11 08:52	Received: 06/15/11 09:40	Matrix: Air			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR</b>		Analytical Method: TO-15						
Tetrahydrofuran	ND	ug/m3	0.80	1.34		06/16/11 16:52	109-99-9	
Toluene	2.0	ug/m3	1.0	1.34		06/16/11 16:52	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	1.3	1.34		06/16/11 16:52	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.5	1.34		06/16/11 16:52	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.74	1.34		06/16/11 16:52	79-00-5	
Trichloroethene	ND	ug/m3	0.74	1.34		06/16/11 16:52	79-01-6	
Trichlorofluoromethane	1.6	ug/m3	1.5	1.34		06/16/11 16:52	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.1	1.34		06/16/11 16:52	76-13-1	
1,2,4-Trimethylbenzene	2.0	ug/m3	1.3	1.34		06/16/11 16:52	95-63-6	
1,3,5-Trimethylbenzene	1.4	ug/m3	1.3	1.34		06/16/11 16:52	108-67-8	
Vinyl acetate	ND	ug/m3	0.95	1.34		06/16/11 16:52	108-05-4	
Vinyl chloride	ND	ug/m3	0.35	1.34		06/16/11 16:52	75-01-4	
m&p-Xylene	4.1	ug/m3	2.4	1.34		06/16/11 16:52	179601-23-1	
o-Xylene	1.2	ug/m3	1.2	1.34		06/16/11 16:52	95-47-6	

## ANALYTICAL RESULTS

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

Sample: Liddesdale_061311		Lab ID: 10160337004	Collected: 06/14/11 08:57	Received: 06/15/11 09:40	Matrix: Air			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR</b>		Analytical Method: TO-15						
Acetone	4.3 ug/m3		0.74	1.54		06/16/11 17:20	67-64-1	
Benzene	0.99 ug/m3		0.50	1.54		06/16/11 17:20	71-43-2	
Benzyl chloride	ND ug/m3		1.6	1.54		06/16/11 17:20	100-44-7	
Bromodichloromethane	ND ug/m3		2.2	1.54		06/16/11 17:20	75-27-4	
Bromoform	ND ug/m3		3.2	1.54		06/16/11 17:20	75-25-2	
Bromomethane	ND ug/m3		1.2	1.54		06/16/11 17:20	74-83-9	
1,3-Butadiene	ND ug/m3		0.69	1.54		06/16/11 17:20	106-99-0	
2-Butanone (MEK)	ND ug/m3		0.92	1.54		06/16/11 17:20	78-93-3	
Carbon disulfide	ND ug/m3		0.97	1.54		06/16/11 17:20	75-15-0	
Carbon tetrachloride	ND ug/m3		0.99	1.54		06/16/11 17:20	56-23-5	
Chlorobenzene	ND ug/m3		1.4	1.54		06/16/11 17:20	108-90-7	
Chloroethane	ND ug/m3		0.83	1.54		06/16/11 17:20	75-00-3	
Chloroform	ND ug/m3		1.5	1.54		06/16/11 17:20	67-66-3	
Chloromethane	0.76 ug/m3		0.65	1.54		06/16/11 17:20	74-87-3	
Cyclohexane	ND ug/m3		1.0	1.54		06/16/11 17:20	110-82-7	
Dibromochloromethane	ND ug/m3		2.6	1.54		06/16/11 17:20	124-48-1	
1,2-Dibromoethane (EDB)	ND ug/m3		2.5	1.54		06/16/11 17:20	106-93-4	
1,2-Dichlorobenzene	ND ug/m3		1.8	1.54		06/16/11 17:20	95-50-1	
1,3-Dichlorobenzene	ND ug/m3		1.8	1.54		06/16/11 17:20	541-73-1	
1,4-Dichlorobenzene	ND ug/m3		1.8	1.54		06/16/11 17:20	106-46-7	
Dichlorodifluoromethane	2.5 ug/m3		1.5	1.54		06/16/11 17:20	75-71-8	
1,1-Dichloroethane	ND ug/m3		1.3	1.54		06/16/11 17:20	75-34-3	
1,2-Dichloroethane	ND ug/m3		0.63	1.54		06/16/11 17:20	107-06-2	
1,1-Dichloroethene	ND ug/m3		1.2	1.54		06/16/11 17:20	75-35-4	
cis-1,2-Dichloroethene	ND ug/m3		1.2	1.54		06/16/11 17:20	156-59-2	
trans-1,2-Dichloroethene	ND ug/m3		1.2	1.54		06/16/11 17:20	156-60-5	
1,2-Dichloropropane	ND ug/m3		1.4	1.54		06/16/11 17:20	78-87-5	
cis-1,3-Dichloropropene	ND ug/m3		1.4	1.54		06/16/11 17:20	10061-01-5	
trans-1,3-Dichloropropene	ND ug/m3		1.4	1.54		06/16/11 17:20	10061-02-6	
Dichlorotetrafluoroethane	ND ug/m3		2.2	1.54		06/16/11 17:20	76-14-2	
Ethanol	10.4 ug/m3		2.9	1.54		06/16/11 17:20	64-17-5	SS
Ethyl acetate	ND ug/m3		1.1	1.54		06/16/11 17:20	141-78-6	
Ethylbenzene	1.6 ug/m3		1.4	1.54		06/16/11 17:20	100-41-4	
4-Ethyltoluene	ND ug/m3		3.8	1.54		06/16/11 17:20	622-96-8	
n-Heptane	ND ug/m3		1.3	1.54		06/16/11 17:20	142-82-5	
Hexachloro-1,3-butadiene	ND ug/m3		3.4	1.54		06/16/11 17:20	87-68-3	
n-Hexane	1.3 ug/m3		1.1	1.54		06/16/11 17:20	110-54-3	
2-Hexanone	ND ug/m3		1.3	1.54		06/16/11 17:20	591-78-6	
Methylene Chloride	ND ug/m3		1.1	1.54		06/16/11 17:20	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND ug/m3		1.3	1.54		06/16/11 17:20	108-10-1	
Methyl-tert-butyl ether	ND ug/m3		1.1	1.54		06/16/11 17:20	1634-04-4	
Naphthalene	ND ug/m3		4.2	1.54		06/16/11 17:20	91-20-3	
2-Propanol	ND ug/m3		3.8	1.54		06/16/11 17:20	67-63-0	
Propylene	ND ug/m3		0.54	1.54		06/16/11 17:20	115-07-1	
Styrene	ND ug/m3		1.3	1.54		06/16/11 17:20	100-42-5	
1,1,2,2-Tetrachloroethane	ND ug/m3		1.1	1.54		06/16/11 17:20	79-34-5	
Tetrachloroethene	ND ug/m3		1.1	1.54		06/16/11 17:20	127-18-4	

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## ANALYTICAL RESULTS

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

Sample: Liddesdale_061311		Lab ID: 10160337004	Collected: 06/14/11 08:57	Received: 06/15/11 09:40	Matrix: Air			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR</b>		Analytical Method: TO-15						
Tetrahydrofuran	ND	ug/m3	0.92	1.54		06/16/11 17:20	109-99-9	
Toluene	1.9	ug/m3	1.2	1.54		06/16/11 17:20	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	1.5	1.54		06/16/11 17:20	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.7	1.54		06/16/11 17:20	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.85	1.54		06/16/11 17:20	79-00-5	
Trichloroethene	ND	ug/m3	0.85	1.54		06/16/11 17:20	79-01-6	
Trichlorofluoromethane	1.8	ug/m3	1.7	1.54		06/16/11 17:20	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.5	1.54		06/16/11 17:20	76-13-1	
1,2,4-Trimethylbenzene	2.0	ug/m3	1.5	1.54		06/16/11 17:20	95-63-6	
1,3,5-Trimethylbenzene	1.6	ug/m3	1.5	1.54		06/16/11 17:20	108-67-8	
Vinyl acetate	ND	ug/m3	1.1	1.54		06/16/11 17:20	108-05-4	
Vinyl chloride	ND	ug/m3	0.40	1.54		06/16/11 17:20	75-01-4	
m&p-Xylene	4.7	ug/m3	2.7	1.54		06/16/11 17:20	179601-23-1	
o-Xylene	ND	ug/m3	1.4	1.54		06/16/11 17:20	95-47-6	

## ANALYTICAL RESULTS

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

Sample: Liebold_061311		Lab ID: 10160337005	Collected: 06/14/11 09:00	Received: 06/15/11 09:40	Matrix: Air			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR</b>		Analytical Method: TO-15						
Acetone	5.9 ug/m3		0.76	1.59		06/16/11 17:49	67-64-1	
Benzene	1.0 ug/m3		0.52	1.59		06/16/11 17:49	71-43-2	
Benzyl chloride	ND ug/m3		1.7	1.59		06/16/11 17:49	100-44-7	
Bromodichloromethane	ND ug/m3		2.2	1.59		06/16/11 17:49	75-27-4	
Bromoform	ND ug/m3		3.3	1.59		06/16/11 17:49	75-25-2	
Bromomethane	ND ug/m3		1.3	1.59		06/16/11 17:49	74-83-9	
1,3-Butadiene	ND ug/m3		0.72	1.59		06/16/11 17:49	106-99-0	
2-Butanone (MEK)	1.8 ug/m3		0.95	1.59		06/16/11 17:49	78-93-3	
Carbon disulfide	ND ug/m3		1.0	1.59		06/16/11 17:49	75-15-0	
Carbon tetrachloride	ND ug/m3		1.0	1.59		06/16/11 17:49	56-23-5	
Chlorobenzene	ND ug/m3		1.5	1.59		06/16/11 17:49	108-90-7	
Chloroethane	ND ug/m3		0.86	1.59		06/16/11 17:49	75-00-3	
Chloroform	ND ug/m3		1.6	1.59		06/16/11 17:49	67-66-3	
Chloromethane	0.72 ug/m3		0.67	1.59		06/16/11 17:49	74-87-3	
Cyclohexane	ND ug/m3		1.1	1.59		06/16/11 17:49	110-82-7	
Dibromochloromethane	ND ug/m3		2.7	1.59		06/16/11 17:49	124-48-1	
1,2-Dibromoethane (EDB)	ND ug/m3		2.5	1.59		06/16/11 17:49	106-93-4	
1,2-Dichlorobenzene	ND ug/m3		1.9	1.59		06/16/11 17:49	95-50-1	
1,3-Dichlorobenzene	ND ug/m3		1.9	1.59		06/16/11 17:49	541-73-1	
1,4-Dichlorobenzene	ND ug/m3		1.9	1.59		06/16/11 17:49	106-46-7	
Dichlorodifluoromethane	2.3 ug/m3		1.6	1.59		06/16/11 17:49	75-71-8	
1,1-Dichloroethane	ND ug/m3		1.3	1.59		06/16/11 17:49	75-34-3	
1,2-Dichloroethane	ND ug/m3		0.65	1.59		06/16/11 17:49	107-06-2	
1,1-Dichloroethene	ND ug/m3		1.3	1.59		06/16/11 17:49	75-35-4	
cis-1,2-Dichloroethene	ND ug/m3		1.3	1.59		06/16/11 17:49	156-59-2	
trans-1,2-Dichloroethene	ND ug/m3		1.3	1.59		06/16/11 17:49	156-60-5	
1,2-Dichloropropane	ND ug/m3		1.5	1.59		06/16/11 17:49	78-87-5	
cis-1,3-Dichloropropene	ND ug/m3		1.5	1.59		06/16/11 17:49	10061-01-5	
trans-1,3-Dichloropropene	ND ug/m3		1.5	1.59		06/16/11 17:49	10061-02-6	
Dichlorotetrafluoroethane	ND ug/m3		2.2	1.59		06/16/11 17:49	76-14-2	
Ethanol	9.9 ug/m3		3.0	1.59		06/16/11 17:49	64-17-5	SS
Ethyl acetate	ND ug/m3		1.2	1.59		06/16/11 17:49	141-78-6	
Ethylbenzene	1.7 ug/m3		1.4	1.59		06/16/11 17:49	100-41-4	
4-Ethyltoluene	ND ug/m3		4.0	1.59		06/16/11 17:49	622-96-8	
n-Heptane	1.7 ug/m3		1.3	1.59		06/16/11 17:49	142-82-5	
Hexachloro-1,3-butadiene	ND ug/m3		3.5	1.59		06/16/11 17:49	87-68-3	
n-Hexane	3.4 ug/m3		1.1	1.59		06/16/11 17:49	110-54-3	
2-Hexanone	ND ug/m3		1.3	1.59		06/16/11 17:49	591-78-6	
Methylene Chloride	3.4 ug/m3		1.1	1.59		06/16/11 17:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND ug/m3		1.3	1.59		06/16/11 17:49	108-10-1	
Methyl-tert-butyl ether	ND ug/m3		1.2	1.59		06/16/11 17:49	1634-04-4	
Naphthalene	ND ug/m3		4.3	1.59		06/16/11 17:49	91-20-3	
2-Propanol	ND ug/m3		4.0	1.59		06/16/11 17:49	67-63-0	
Propylene	ND ug/m3		0.56	1.59		06/16/11 17:49	115-07-1	
Styrene	ND ug/m3		1.4	1.59		06/16/11 17:49	100-42-5	
1,1,2,2-Tetrachloroethane	ND ug/m3		1.1	1.59		06/16/11 17:49	79-34-5	
Tetrachloroethene	ND ug/m3		1.1	1.59		06/16/11 17:49	127-18-4	

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## ANALYTICAL RESULTS

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

Sample: Liebold_061311		Lab ID: 10160337005	Collected: 06/14/11 09:00	Received: 06/15/11 09:40	Matrix: Air			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR</b>		Analytical Method: TO-15						
Tetrahydrofuran	ND	ug/m3	0.95	1.59		06/16/11 17:49	109-99-9	
Toluene	2.2	ug/m3	1.2	1.59		06/16/11 17:49	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	1.6	1.59		06/16/11 17:49	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.7	1.59		06/16/11 17:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.87	1.59		06/16/11 17:49	79-00-5	
Trichloroethene	ND	ug/m3	0.87	1.59		06/16/11 17:49	79-01-6	
Trichlorofluoromethane	1.8	ug/m3	1.7	1.59		06/16/11 17:49	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.5	1.59		06/16/11 17:49	76-13-1	
1,2,4-Trimethylbenzene	2.2	ug/m3	1.6	1.59		06/16/11 17:49	95-63-6	
1,3,5-Trimethylbenzene	1.6	ug/m3	1.6	1.59		06/16/11 17:49	108-67-8	
Vinyl acetate	ND	ug/m3	1.1	1.59		06/16/11 17:49	108-05-4	
Vinyl chloride	ND	ug/m3	0.41	1.59		06/16/11 17:49	75-01-4	
m&p-Xylene	4.8	ug/m3	2.8	1.59		06/16/11 17:49	179601-23-1	
o-Xylene	ND	ug/m3	1.4	1.59		06/16/11 17:49	95-47-6	

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## ANALYTICAL RESULTS

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

Sample: WEST FORT_061311		Lab ID: 10160337006	Collected: 06/14/11 09:06	Received: 06/15/11 09:40	Matrix: Air			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR</b>		Analytical Method: TO-15						
Acetone	10.8	ug/m3	0.71	1.48		06/16/11 18:18	67-64-1	
Benzene	1.6	ug/m3	0.48	1.48		06/16/11 18:18	71-43-2	
Benzyl chloride	ND	ug/m3	1.6	1.48		06/16/11 18:18	100-44-7	
Bromodichloromethane	ND	ug/m3	2.1	1.48		06/16/11 18:18	75-27-4	
Bromoform	ND	ug/m3	3.1	1.48		06/16/11 18:18	75-25-2	
Bromomethane	ND	ug/m3	1.2	1.48		06/16/11 18:18	74-83-9	
1,3-Butadiene	ND	ug/m3	0.67	1.48		06/16/11 18:18	106-99-0	
2-Butanone (MEK)	1.6	ug/m3	0.89	1.48		06/16/11 18:18	78-93-3	
Carbon disulfide	ND	ug/m3	0.93	1.48		06/16/11 18:18	75-15-0	
Carbon tetrachloride	ND	ug/m3	0.95	1.48		06/16/11 18:18	56-23-5	
Chlorobenzene	ND	ug/m3	1.4	1.48		06/16/11 18:18	108-90-7	
Chloroethane	ND	ug/m3	0.80	1.48		06/16/11 18:18	75-00-3	
Chloroform	ND	ug/m3	1.5	1.48		06/16/11 18:18	67-66-3	
Chloromethane	0.79	ug/m3	0.62	1.48		06/16/11 18:18	74-87-3	
Cyclohexane	4.2	ug/m3	1.0	1.48		06/16/11 18:18	110-82-7	
Dibromochloromethane	ND	ug/m3	2.5	1.48		06/16/11 18:18	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.4	1.48		06/16/11 18:18	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	1.8	1.48		06/16/11 18:18	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	1.8	1.48		06/16/11 18:18	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	1.8	1.48		06/16/11 18:18	106-46-7	
Dichlorodifluoromethane	2.4	ug/m3	1.5	1.48		06/16/11 18:18	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.2	1.48		06/16/11 18:18	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.61	1.48		06/16/11 18:18	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.2	1.48		06/16/11 18:18	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.2	1.48		06/16/11 18:18	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.2	1.48		06/16/11 18:18	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.4	1.48		06/16/11 18:18	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.4	1.48		06/16/11 18:18	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.4	1.48		06/16/11 18:18	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.1	1.48		06/16/11 18:18	76-14-2	
Ethanol	17.6	ug/m3	2.8	1.48		06/16/11 18:18	64-17-5	SS
Ethyl acetate	4.8	ug/m3	1.1	1.48		06/16/11 18:18	141-78-6	
Ethylbenzene	2.1	ug/m3	1.3	1.48		06/16/11 18:18	100-41-4	
4-Ethyltoluene	ND	ug/m3	3.7	1.48		06/16/11 18:18	622-96-8	
n-Heptane	4.2	ug/m3	1.2	1.48		06/16/11 18:18	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.3	1.48		06/16/11 18:18	87-68-3	
n-Hexane	10.9	ug/m3	1.1	1.48		06/16/11 18:18	110-54-3	
2-Hexanone	ND	ug/m3	1.2	1.48		06/16/11 18:18	591-78-6	
Methylene Chloride	18.0	ug/m3	1.1	1.48		06/16/11 18:18	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	1.2	1.48		06/16/11 18:18	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	1.1	1.48		06/16/11 18:18	1634-04-4	
Naphthalene	ND	ug/m3	4.0	1.48		06/16/11 18:18	91-20-3	
2-Propanol	ND	ug/m3	3.7	1.48		06/16/11 18:18	67-63-0	
Propylene	ND	ug/m3	0.52	1.48		06/16/11 18:18	115-07-1	
Styrene	ND	ug/m3	1.3	1.48		06/16/11 18:18	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.0	1.48		06/16/11 18:18	79-34-5	
Tetrachloroethene	ND	ug/m3	1.0	1.48		06/16/11 18:18	127-18-4	

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## ANALYTICAL RESULTS

Project: Detroit Sewer Investigation

Pace Project No.: 10160337

Sample: WEST FORT_061311		Lab ID: 10160337006	Collected: 06/14/11 09:06	Received: 06/15/11 09:40	Matrix: Air			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### TO15 MSV AIR

Analytical Method: TO-15

Tetrahydrofuran	4.9 ug/m3		0.89	1.48		06/16/11 18:18	109-99-9	
Toluene	14.6 ug/m3		1.1	1.48		06/16/11 18:18	108-88-3	
1,2,4-Trichlorobenzene	ND ug/m3		1.5	1.48		06/16/11 18:18	120-82-1	
1,1,1-Trichloroethane	ND ug/m3		1.6	1.48		06/16/11 18:18	71-55-6	
1,1,2-Trichloroethane	ND ug/m3		0.81	1.48		06/16/11 18:18	79-00-5	
Trichloroethene	4.7 ug/m3		0.81	1.48		06/16/11 18:18	79-01-6	
Trichlorofluoromethane	1.7 ug/m3		1.6	1.48		06/16/11 18:18	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND ug/m3		2.4	1.48		06/16/11 18:18	76-13-1	
1,2,4-Trimethylbenzene	2.7 ug/m3		1.5	1.48		06/16/11 18:18	95-63-6	
1,3,5-Trimethylbenzene	1.7 ug/m3		1.5	1.48		06/16/11 18:18	108-67-8	
Vinyl acetate	ND ug/m3		1.1	1.48		06/16/11 18:18	108-05-4	
Vinyl chloride	ND ug/m3		0.38	1.48		06/16/11 18:18	75-01-4	
m&p-Xylene	5.0 ug/m3		2.6	1.48		06/16/11 18:18	179601-23-1	
o-Xylene	1.8 ug/m3		1.3	1.48		06/16/11 18:18	95-47-6	

## QUALITY CONTROL DATA

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

QC Batch: AIR/12502 Analysis Method: TO-15  
QC Batch Method: TO-15 Analysis Description: TO15 MSV AIR Low Level  
Associated Lab Samples: 10160337001

METHOD BLANK: 995511 Matrix: Air  
Associated Lab Samples: 10160337001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/m3	ND	1.1	06/17/11 08:51	
1,1,2,2-Tetrachloroethane	ug/m3	ND	0.70	06/17/11 08:51	
1,1,2-Trichloroethane	ug/m3	ND	0.55	06/17/11 08:51	
1,1,2-Trichlorotrifluoroethane	ug/m3	ND	1.6	06/17/11 08:51	
1,1-Dichloroethane	ug/m3	ND	0.82	06/17/11 08:51	
1,1-Dichloroethene	ug/m3	ND	0.81	06/17/11 08:51	
1,2,4-Trichlorobenzene	ug/m3	ND	0.99	06/17/11 08:51	
1,2,4-Trimethylbenzene	ug/m3	ND	1.0	06/17/11 08:51	
1,2-Dibromoethane (EDB)	ug/m3	ND	1.6	06/17/11 08:51	
1,2-Dichlorobenzene	ug/m3	ND	1.2	06/17/11 08:51	
1,2-Dichloroethane	ug/m3	ND	0.41	06/17/11 08:51	
1,2-Dichloropropane	ug/m3	ND	0.94	06/17/11 08:51	
1,3,5-Trimethylbenzene	ug/m3	ND	1.0	06/17/11 08:51	
1,3-Butadiene	ug/m3	ND	0.45	06/17/11 08:51	
1,3-Dichlorobenzene	ug/m3	ND	1.2	06/17/11 08:51	
1,4-Dichlorobenzene	ug/m3	ND	1.2	06/17/11 08:51	
2-Butanone (MEK)	ug/m3	ND	0.60	06/17/11 08:51	
2-Hexanone	ug/m3	ND	0.83	06/17/11 08:51	
2-Propanol	ug/m3	ND	2.5	06/17/11 08:51	
4-Ethyltoluene	ug/m3	ND	2.5	06/17/11 08:51	
4-Methyl-2-pentanone (MIBK)	ug/m3	ND	0.83	06/17/11 08:51	
Acetone	ug/m3	ND	0.48	06/17/11 08:51	
Benzene	ug/m3	ND	0.32	06/17/11 08:51	
Benzyl chloride	ug/m3	ND	1.0	06/17/11 08:51	
Bromodichloromethane	ug/m3	ND	1.4	06/17/11 08:51	
Bromoform	ug/m3	ND	2.1	06/17/11 08:51	
Bromomethane	ug/m3	ND	0.79	06/17/11 08:51	
Carbon disulfide	ug/m3	ND	0.63	06/17/11 08:51	
Carbon tetrachloride	ug/m3	ND	0.64	06/17/11 08:51	
Chlorobenzene	ug/m3	ND	0.94	06/17/11 08:51	
Chloroethane	ug/m3	ND	0.54	06/17/11 08:51	
Chloroform	ug/m3	ND	0.99	06/17/11 08:51	
Chloromethane	ug/m3	ND	0.42	06/17/11 08:51	
cis-1,2-Dichloroethene	ug/m3	ND	0.81	06/17/11 08:51	
cis-1,3-Dichloropropene	ug/m3	ND	0.92	06/17/11 08:51	
Cyclohexane	ug/m3	ND	0.68	06/17/11 08:51	
Dibromochloromethane	ug/m3	ND	1.7	06/17/11 08:51	
Dichlorodifluoromethane	ug/m3	ND	1.0	06/17/11 08:51	
Dichlorotetrafluoroethane	ug/m3	ND	1.4	06/17/11 08:51	
Ethanol	ug/m3	ND	1.9	06/17/11 08:51	
Ethyl acetate	ug/m3	ND	0.73	06/17/11 08:51	
Ethylbenzene	ug/m3	ND	0.88	06/17/11 08:51	
Hexachloro-1,3-butadiene	ug/m3	ND	2.2	06/17/11 08:51	

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## QUALITY CONTROL DATA

Project: Detroit Sewer Investigation

Pace Project No.: 10160337

METHOD BLANK: 995511

Matrix: Air

Associated Lab Samples: 10160337001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
m&p-Xylene	ug/m3	ND	1.8	06/17/11 08:51	
Methyl-tert-butyl ether	ug/m3	ND	0.73	06/17/11 08:51	
Methylene Chloride	ug/m3	ND	0.71	06/17/11 08:51	
n-Heptane	ug/m3	ND	0.83	06/17/11 08:51	
n-Hexane	ug/m3	ND	0.72	06/17/11 08:51	
Naphthalene	ug/m3	ND	2.7	06/17/11 08:51	
o-Xylene	ug/m3	ND	0.88	06/17/11 08:51	
Propylene	ug/m3	ND	0.35	06/17/11 08:51	
Styrene	ug/m3	ND	0.87	06/17/11 08:51	
Tetrachloroethene	ug/m3	ND	0.69	06/17/11 08:51	
Tetrahydrofuran	ug/m3	ND	0.60	06/17/11 08:51	
Toluene	ug/m3	ND	0.77	06/17/11 08:51	
trans-1,2-Dichloroethene	ug/m3	ND	0.81	06/17/11 08:51	
trans-1,3-Dichloropropene	ug/m3	ND	0.92	06/17/11 08:51	
Trichloroethene	ug/m3	ND	0.55	06/17/11 08:51	
Trichlorofluoromethane	ug/m3	ND	1.1	06/17/11 08:51	
Vinyl acetate	ug/m3	ND	0.71	06/17/11 08:51	
Vinyl chloride	ug/m3	ND	0.26	06/17/11 08:51	

LABORATORY CONTROL SAMPLE: 995512

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/m3	55.5	49.0	88	66-133	
1,1,2,2-Tetrachloroethane	ug/m3	69.8	64.3	92	70-140	
1,1,2-Trichloroethane	ug/m3	55.5	48.0	86	68-132	
1,1,2-Trichlorotrifluoroethane	ug/m3	77.9	72.4	93	60-137	
1,1-Dichloroethane	ug/m3	41.2	33.7	82	65-131	
1,1-Dichloroethene	ug/m3	40.3	35.6	88	65-132	
1,2,4-Trichlorobenzene	ug/m3	75.5	121	160	30-150	CH,L3
1,2,4-Trimethylbenzene	ug/m3	50	48.0	96	69-140	
1,2-Dibromoethane (EDB)	ug/m3	78.1	72.3	93	71-139	
1,2-Dichlorobenzene	ug/m3	61.2	68.5	112	68-139	
1,2-Dichloroethane	ug/m3	41.2	32.4	79	66-132	
1,2-Dichloropropane	ug/m3	47	37.6	80	69-130	
1,3,5-Trimethylbenzene	ug/m3	50	46.9	94	70-141	
1,3-Butadiene	ug/m3	22.5	18.6	83	68-128	
1,3-Dichlorobenzene	ug/m3	61.2	58.6	96	66-146	
1,4-Dichlorobenzene	ug/m3	61.2	65.5	107	66-142	
2-Butanone (MEK)	ug/m3	30	32.5	108	68-134	
2-Hexanone	ug/m3	41.7	36.2	87	70-144	
2-Propanol	ug/m3	23.8	20.8	87	66-139	
4-Ethyltoluene	ug/m3	50	49.3	99	65-145	
4-Methyl-2-pentanone (MIBK)	ug/m3	41.7	36.2	87	70-139	
Acetone	ug/m3	24.2	19.9	82	56-142	
Benzene	ug/m3	32.5	27.6	85	69-129	

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## QUALITY CONTROL DATA

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

LABORATORY CONTROL SAMPLE: 995512

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzyl chloride	ug/m3	52.5	45.6	87	68-138	
Bromodichloromethane	ug/m3	68.2	58.5	86	70-130	
Bromoform	ug/m3	105	100	95	67-147	
Bromomethane	ug/m3	39.5	35.0	89	67-127	
Carbon disulfide	ug/m3	31.7	29.3	92	65-131	
Carbon tetrachloride	ug/m3	64	59.0	92	62-137	
Chlorobenzene	ug/m3	46.8	44.7	95	72-133	
Chloroethane	ug/m3	26.8	22.1	82	66-127	
Chloroform	ug/m3	49.7	42.5	85	67-130	
Chloromethane	ug/m3	21	16.0	76	63-127	
cis-1,2-Dichloroethene	ug/m3	40.3	35.9	89	69-130	
cis-1,3-Dichloropropene	ug/m3	46.2	41.8	90	74-137	
Cyclohexane	ug/m3	35	28.7	82	69-137	
Dibromochloromethane	ug/m3	86.6	84.7	98	69-140	
Dichlorodifluoromethane	ug/m3	50.3	44.6	89	62-131	
Dichlorotetrafluoroethane	ug/m3	71.1	59.0	83	63-130	
Ethanol	ug/m3	19.2	15.4	80	63-135 SS	
Ethyl acetate	ug/m3	36.6	29.9	82	70-135	
Ethylbenzene	ug/m3	44.2	40.2	91	71-141	
Hexachloro-1,3-butadiene	ug/m3	108	172	158	30-150 CH,L3	
m&p-Xylene	ug/m3	88.3	79.7	90	68-144	
Methyl-tert-butyl ether	ug/m3	36.7	33.5	91	54-136	
Methylene Chloride	ug/m3	35.3	34.7	98	56-143	
n-Heptane	ug/m3	41.7	34.2	82	72-130	
n-Hexane	ug/m3	35.8	30.9	86	68-130	
Naphthalene	ug/m3	53.3	83.6	157	30-150 CH,L1	
o-Xylene	ug/m3	44.2	40.1	91	70-141	
Propylene	ug/m3	17.5	17.4	100	61-139	
Styrene	ug/m3	43.3	41.4	95	68-145	
Tetrachloroethene	ug/m3	69	64.8	94	64-142	
Tetrahydrofuran	ug/m3	30	27.8	93	70-134 SS	
Toluene	ug/m3	38.3	33.7	88	69-133	
trans-1,2-Dichloroethene	ug/m3	40.3	44.3	110	64-132	
trans-1,3-Dichloropropene	ug/m3	46.2	44.6	97	71-140	
Trichloroethene	ug/m3	54.6	53.5	98	68-132	
Trichlorofluoromethane	ug/m3	57.1	53.5	94	59-136	
Vinyl acetate	ug/m3	35.8	30.3	85	70-142	
Vinyl chloride	ug/m3	26	26.5	102	64-129	

SAMPLE DUPLICATE: 998520

Parameter	Units	10159636004 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/m3	ND	ND		25	
1,1,2,2-Tetrachloroethane	ug/m3	ND	ND		25	
1,1,2-Trichloroethane	ug/m3	ND	ND		25	
1,1,2-Trichlorotrifluoroethane	ug/m3	ND	ND		25	
1,1-Dichloroethane	ug/m3	ND	ND		25	

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## QUALITY CONTROL DATA

Project: Detroit Sewer Investigation

Pace Project No.: 10160337

SAMPLE DUPLICATE: 998520

Parameter	Units	10159636004 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1-Dichloroethene	ug/m3	ND	ND			25
1,2,4-Trichlorobenzene	ug/m3	ND	ND			25
1,2,4-Trimethylbenzene	ug/m3	3.4	3.4	2		25
1,2-Dibromoethane (EDB)	ug/m3	ND	ND			25
1,2-Dichlorobenzene	ug/m3	ND	ND			25
1,2-Dichloroethane	ug/m3	ND	ND			25
1,2-Dichloropropane	ug/m3	ND	ND			25
1,3,5-Trimethylbenzene	ug/m3	2.2	2.1	3		25
1,3-Butadiene	ug/m3	ND	ND			25
1,3-Dichlorobenzene	ug/m3	ND	ND			25
1,4-Dichlorobenzene	ug/m3	ND	ND			25
2-Butanone (MEK)	ug/m3	1.8	1.8	2		25
2-Hexanone	ug/m3	ND	ND			25
2-Propanol	ug/m3	ND	ND			25
4-Ethyltoluene	ug/m3	ND	ND			25
4-Methyl-2-pentanone (MIBK)	ug/m3	ND	ND			25
Acetone	ug/m3	11.6	12.0	4		25
Benzene	ug/m3	1.3	1.3	.09		25
Benzyl chloride	ug/m3	ND	ND			25
Bromodichloromethane	ug/m3	ND	ND			25
Bromoform	ug/m3	ND	ND			25
Bromomethane	ug/m3	ND	ND			25
Carbon disulfide	ug/m3	ND	ND			25
Carbon tetrachloride	ug/m3	ND	ND			25
Chlorobenzene	ug/m3	ND	ND			25
Chloroethane	ug/m3	ND	ND			25
Chloroform	ug/m3	ND	ND			25
Chloromethane	ug/m3	0.99	1.1	10		25
cis-1,2-Dichloroethene	ug/m3	ND	.93J			25
cis-1,3-Dichloropropene	ug/m3	ND	ND			25
Cyclohexane	ug/m3	ND	ND			25
Dibromochloromethane	ug/m3	ND	ND			25
Dichlorodifluoromethane	ug/m3	ND	1.7J			25
Dichlorotetrafluoroethane	ug/m3	ND	ND			25
Ethanol	ug/m3	8.7	8.4	4		25 SS
Ethyl acetate	ug/m3	ND	ND			25
Ethylbenzene	ug/m3	2.2	2.1	.7		25
Hexachloro-1,3-butadiene	ug/m3	ND	ND			25
m&p-Xylene	ug/m3	6.2	6.2	.1		25
Methyl-tert-butyl ether	ug/m3	ND	ND			25
Methylene Chloride	ug/m3	ND	ND			25
n-Heptane	ug/m3	ND	ND			25
n-Hexane	ug/m3	ND	1.3J			25
Naphthalene	ug/m3	ND	4.5J			25
o-Xylene	ug/m3	1.7	ND			25
Propylene	ug/m3	ND	ND			25
Styrene	ug/m3	ND	ND			25
Tetrachloroethene	ug/m3	4.9	4.6	5		25

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## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

SAMPLE DUPLICATE: 998520

Parameter	Units	10159636004 Result	Dup Result	RPD	Max RPD	Qualifiers
Tetrahydrofuran	ug/m3	ND	ND		25	
Toluene	ug/m3	4.7	4.8	1	25	
trans-1,2-Dichloroethene	ug/m3	ND	ND		25	
trans-1,3-Dichloropropene	ug/m3	ND	ND		25	
Trichloroethene	ug/m3	2.0	2.1	5	25	
Trichlorofluoromethane	ug/m3	ND	1.8J		25	
Vinyl acetate	ug/m3	ND	ND		25	
Vinyl chloride	ug/m3	ND	ND		25	

## QUALITY CONTROL DATA

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

QC Batch: AIR/12517 Analysis Method: TO-15  
QC Batch Method: TO-15 Analysis Description: TO15 MSV AIR Low Level  
Associated Lab Samples: 10160337002, 10160337003, 10160337004, 10160337005, 10160337006

METHOD BLANK: 996477 Matrix: Air  
Associated Lab Samples: 10160337002, 10160337003, 10160337004, 10160337005, 10160337006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/m3	ND	1.1	06/16/11 09:55	
1,1,2,2-Tetrachloroethane	ug/m3	ND	0.70	06/16/11 09:55	
1,1,2-Trichloroethane	ug/m3	ND	0.55	06/16/11 09:55	
1,1,2-Trichlorotrifluoroethane	ug/m3	ND	1.6	06/16/11 09:55	
1,1-Dichloroethane	ug/m3	ND	0.82	06/16/11 09:55	
1,1-Dichloroethene	ug/m3	ND	0.81	06/16/11 09:55	
1,2,4-Trichlorobenzene	ug/m3	ND	0.99	06/16/11 09:55	
1,2,4-Trimethylbenzene	ug/m3	ND	1.0	06/16/11 09:55	
1,2-Dibromoethane (EDB)	ug/m3	ND	1.6	06/16/11 09:55	
1,2-Dichlorobenzene	ug/m3	ND	1.2	06/16/11 09:55	
1,2-Dichloroethane	ug/m3	ND	0.41	06/16/11 09:55	
1,2-Dichloropropane	ug/m3	ND	0.94	06/16/11 09:55	
1,3,5-Trimethylbenzene	ug/m3	ND	1.0	06/16/11 09:55	
1,3-Butadiene	ug/m3	ND	0.45	06/16/11 09:55	
1,3-Dichlorobenzene	ug/m3	ND	1.2	06/16/11 09:55	
1,4-Dichlorobenzene	ug/m3	ND	1.2	06/16/11 09:55	
2-Butanone (MEK)	ug/m3	ND	0.60	06/16/11 09:55	
2-Hexanone	ug/m3	ND	0.83	06/16/11 09:55	
2-Propanol	ug/m3	ND	2.5	06/16/11 09:55	
4-Ethyltoluene	ug/m3	ND	2.5	06/16/11 09:55	
4-Methyl-2-pentanone (MIBK)	ug/m3	ND	0.83	06/16/11 09:55	
Acetone	ug/m3	ND	0.48	06/16/11 09:55	
Benzene	ug/m3	ND	0.32	06/16/11 09:55	
Benzyl chloride	ug/m3	ND	1.0	06/16/11 09:55	
Bromodichloromethane	ug/m3	ND	1.4	06/16/11 09:55	
Bromoform	ug/m3	ND	2.1	06/16/11 09:55	
Bromomethane	ug/m3	ND	0.79	06/16/11 09:55	
Carbon disulfide	ug/m3	ND	0.63	06/16/11 09:55	
Carbon tetrachloride	ug/m3	ND	0.64	06/16/11 09:55	
Chlorobenzene	ug/m3	ND	0.94	06/16/11 09:55	
Chloroethane	ug/m3	ND	0.54	06/16/11 09:55	
Chloroform	ug/m3	ND	0.99	06/16/11 09:55	
Chloromethane	ug/m3	ND	0.42	06/16/11 09:55	
cis-1,2-Dichloroethene	ug/m3	ND	0.81	06/16/11 09:55	
cis-1,3-Dichloropropene	ug/m3	ND	0.92	06/16/11 09:55	
Cyclohexane	ug/m3	ND	0.68	06/16/11 09:55	
Dibromochloromethane	ug/m3	ND	1.7	06/16/11 09:55	
Dichlorodifluoromethane	ug/m3	ND	1.0	06/16/11 09:55	
Dichlorotetrafluoroethane	ug/m3	ND	1.4	06/16/11 09:55	
Ethanol	ug/m3	ND	1.9	06/16/11 09:55	
Ethyl acetate	ug/m3	ND	0.73	06/16/11 09:55	
Ethylbenzene	ug/m3	ND	0.88	06/16/11 09:55	
Hexachloro-1,3-butadiene	ug/m3	ND	2.2	06/16/11 09:55	

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## QUALITY CONTROL DATA

Project: Detroit Sewer Investigation

Pace Project No.: 10160337

METHOD BLANK: 996477

Matrix: Air

Associated Lab Samples: 10160337002, 10160337003, 10160337004, 10160337005, 10160337006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
m&p-Xylene	ug/m3	ND	1.8	06/16/11 09:55	
Methyl-tert-butyl ether	ug/m3	ND	0.73	06/16/11 09:55	
Methylene Chloride	ug/m3	ND	0.71	06/16/11 09:55	
n-Heptane	ug/m3	ND	0.83	06/16/11 09:55	
n-Hexane	ug/m3	ND	0.72	06/16/11 09:55	
Naphthalene	ug/m3	ND	2.7	06/16/11 09:55	
o-Xylene	ug/m3	ND	0.88	06/16/11 09:55	
Propylene	ug/m3	ND	0.35	06/16/11 09:55	
Styrene	ug/m3	ND	0.87	06/16/11 09:55	
Tetrachloroethene	ug/m3	ND	0.69	06/16/11 09:55	
Tetrahydrofuran	ug/m3	ND	0.60	06/16/11 09:55	
Toluene	ug/m3	ND	0.77	06/16/11 09:55	
trans-1,2-Dichloroethene	ug/m3	ND	0.81	06/16/11 09:55	
trans-1,3-Dichloropropene	ug/m3	ND	0.92	06/16/11 09:55	
Trichloroethene	ug/m3	ND	0.55	06/16/11 09:55	
Trichlorofluoromethane	ug/m3	ND	1.1	06/16/11 09:55	
Vinyl acetate	ug/m3	ND	0.71	06/16/11 09:55	
Vinyl chloride	ug/m3	ND	0.26	06/16/11 09:55	

LABORATORY CONTROL SAMPLE: 996478

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/m3	55.5	50.2	91	66-133	
1,1,2,2-Tetrachloroethane	ug/m3	69.8	61.4	88	70-140	
1,1,2-Trichloroethane	ug/m3	55.5	45.7	82	68-132	
1,1,2-Trichlorotrifluoroethane	ug/m3	77.9	65.6	84	60-137	
1,1-Dichloroethane	ug/m3	41.2	31.8	77	65-131	
1,1-Dichloroethene	ug/m3	40.3	33.3	83	65-132	
1,2,4-Trichlorobenzene	ug/m3	75.5	125	166	30-150	CH,L3
1,2,4-Trimethylbenzene	ug/m3	50	48.1	96	69-140	
1,2-Dibromoethane (EDB)	ug/m3	78.1	70.2	90	71-139	
1,2-Dichlorobenzene	ug/m3	61.2	68.9	113	68-139	
1,2-Dichloroethane	ug/m3	41.2	32.7	79	66-132	
1,2-Dichloropropane	ug/m3	47	35.4	75	69-130	
1,3,5-Trimethylbenzene	ug/m3	50	48.2	96	70-141	
1,3-Butadiene	ug/m3	22.5	17.4	77	68-128	
1,3-Dichlorobenzene	ug/m3	61.2	57.5	94	66-146	
1,4-Dichlorobenzene	ug/m3	61.2	65.1	106	66-142	
2-Butanone (MEK)	ug/m3	30	30.7	102	68-134	
2-Hexanone	ug/m3	41.7	36.9	89	70-144	
2-Propanol	ug/m3	23.8	20.8	87	66-139	
4-Ethyltoluene	ug/m3	50	50.1	100	65-145	
4-Methyl-2-pentanone (MIBK)	ug/m3	41.7	36.6	88	70-139	
Acetone	ug/m3	24.2	19.0	79	56-142	
Benzene	ug/m3	32.5	25.1	77	69-129	

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## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Detroit Sewer Investigation

Pace Project No.: 10160337

LABORATORY CONTROL SAMPLE: 996478

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzyl chloride	ug/m3	52.5	51.0	97	68-138	
Bromodichloromethane	ug/m3	68.2	57.7	85	70-130	
Bromoform	ug/m3	105	103	98	67-147	
Bromomethane	ug/m3	39.5	31.5	80	67-127	
Carbon disulfide	ug/m3	31.7	25.5	81	65-131	
Carbon tetrachloride	ug/m3	64	60.6	95	62-137	
Chlorobenzene	ug/m3	46.8	43.5	93	72-133	
Chloroethane	ug/m3	26.8	19.4	72	66-127	
Chloroform	ug/m3	49.7	40.4	81	67-130	
Chloromethane	ug/m3	21	15.3	73	63-127	
cis-1,2-Dichloroethene	ug/m3	40.3	33.7	84	69-130	
cis-1,3-Dichloropropene	ug/m3	46.2	40.6	88	74-137	
Cyclohexane	ug/m3	35	27.2	78	69-137	
Dibromochloromethane	ug/m3	86.6	85.4	99	69-140	
Dichlorodifluoromethane	ug/m3	50.3	43.4	86	62-131	
Dichlorotetrafluoroethane	ug/m3	71.1	54.9	77	63-130	
Ethanol	ug/m3	19.2	15.2	79	63-135 SS	
Ethyl acetate	ug/m3	36.6	29.9	82	70-135	
Ethylbenzene	ug/m3	44.2	39.3	89	71-141	
Hexachloro-1,3-butadiene	ug/m3	108	193	178	30-150 CH,L3	
m&p-Xylene	ug/m3	88.3	79.5	90	68-144	
Methyl-tert-butyl ether	ug/m3	36.7	34.0	93	54-136	
Methylene Chloride	ug/m3	35.3	33.0	93	56-143	
n-Heptane	ug/m3	41.7	33.4	80	72-130	
n-Hexane	ug/m3	35.8	30.2	84	68-130	
Naphthalene	ug/m3	53.3	82.2	154	30-150 CH,L1	
o-Xylene	ug/m3	44.2	39.5	90	70-141	
Propylene	ug/m3	17.5	16.7	96	61-139	
Styrene	ug/m3	43.3	40.2	93	68-145	
Tetrachloroethene	ug/m3	69	64.0	93	64-142	
Tetrahydrofuran	ug/m3	30	27.2	91	70-134 SS	
Toluene	ug/m3	38.3	31.6	83	69-133	
trans-1,2-Dichloroethene	ug/m3	40.3	40.0	99	64-132	
trans-1,3-Dichloropropene	ug/m3	46.2	44.2	96	71-140	
Trichloroethene	ug/m3	54.6	51.4	94	68-132	
Trichlorofluoromethane	ug/m3	57.1	52.5	92	59-136	
Vinyl acetate	ug/m3	35.8	30.1	84	70-142	
Vinyl chloride	ug/m3	26	22.8	88	64-129	

SAMPLE DUPLICATE: 997172

Parameter	Units	10160337002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/m3	ND	ND		25	
1,1,1,2,2-Tetrachloroethane	ug/m3	ND	ND		25	
1,1,1,2-Trichloroethane	ug/m3	ND	ND		25	
1,1,1,2-Trichlorotrifluoroethane	ug/m3	ND	ND		25	
1,1-Dichloroethane	ug/m3	ND	ND		25	

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## QUALITY CONTROL DATA

Project: Detroit Sewer Investigation

Pace Project No.: 10160337

SAMPLE DUPLICATE: 997172

Parameter	Units	10160337002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1-Dichloroethene	ug/m3	ND	ND			25
1,2,4-Trichlorobenzene	ug/m3	ND	ND			25
1,2,4-Trimethylbenzene	ug/m3	2.5	2.4	3		25
1,2-Dibromoethane (EDB)	ug/m3	ND	ND			25
1,2-Dichlorobenzene	ug/m3	ND	ND			25
1,2-Dichloroethane	ug/m3	ND	ND			25
1,2-Dichloropropane	ug/m3	ND	ND			25
1,3,5-Trimethylbenzene	ug/m3	1.8	1.8	0		25
1,3-Butadiene	ug/m3	ND	ND			25
1,3-Dichlorobenzene	ug/m3	ND	ND			25
1,4-Dichlorobenzene	ug/m3	ND	ND			25
2-Butanone (MEK)	ug/m3	1.6	1.8	8		25
2-Hexanone	ug/m3	ND	ND			25
2-Propanol	ug/m3	ND	ND			25
4-Ethyltoluene	ug/m3	ND	ND			25
4-Methyl-2-pentanone (MIBK)	ug/m3	ND	ND			25
Acetone	ug/m3	11.8	11.9	.8		25
Benzene	ug/m3	1.2	1.3	1		25
Benzyl chloride	ug/m3	ND	ND			25
Bromodichloromethane	ug/m3	ND	ND			25
Bromoform	ug/m3	ND	ND			25
Bromomethane	ug/m3	ND	ND			25
Carbon disulfide	ug/m3	ND	ND			25
Carbon tetrachloride	ug/m3	ND	ND			25
Chlorobenzene	ug/m3	ND	ND			25
Chloroethane	ug/m3	ND	ND			25
Chloroform	ug/m3	ND	ND			25
Chloromethane	ug/m3	ND	0.71			25
cis-1,2-Dichloroethene	ug/m3	ND	ND			25
cis-1,3-Dichloropropene	ug/m3	ND	ND			25
Cyclohexane	ug/m3	1.9	2.0	1		25
Dibromochloromethane	ug/m3	ND	ND			25
Dichlorodifluoromethane	ug/m3	2.3	2.4	4		25
Dichlorotetrafluoroethane	ug/m3	ND	ND			25
Ethanol	ug/m3	18.1	19.2	6		25 SS
Ethyl acetate	ug/m3	ND	ND			25
Ethylbenzene	ug/m3	1.9	1.9	.3		25
Hexachloro-1,3-butadiene	ug/m3	ND	ND			25
m&p-Xylene	ug/m3	5.1	5.1	.4		25
Methyl-tert-butyl ether	ug/m3	ND	ND			25
Methylene Chloride	ug/m3	3.6	3.6	1		25
n-Heptane	ug/m3	2.3	2.2	2		25
n-Hexane	ug/m3	4.6	4.6	.7		25
Naphthalene	ug/m3	ND	3.1J			25
o-Xylene	ug/m3	1.5	1.5	.3		25
Propylene	ug/m3	ND	ND			25
Styrene	ug/m3	ND	ND			25
Tetrachloroethene	ug/m3	ND	ND			25

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## QUALITY CONTROL DATA

Project: Detroit Sewer Investigation

Pace Project No.: 10160337

SAMPLE DUPLICATE: 997172

Parameter	Units	10160337002 Result	Dup Result	RPD	Max RPD	Qualifiers
Tetrahydrofuran	ug/m3	ND	ND		25	
Toluene	ug/m3	4.3	4.3	.2	25	
trans-1,2-Dichloroethene	ug/m3	ND	ND		25	
trans-1,3-Dichloropropene	ug/m3	ND	ND		25	
Trichloroethene	ug/m3	1.7	1.7	3	25	
Trichlorofluoromethane	ug/m3	1.8	1.8		25	
Vinyl acetate	ug/m3	ND	ND		25	
Vinyl chloride	ug/m3	ND	ND		25	

## QUALIFIERS

Project: Detroit Sewer Investigation  
Pace Project No.: 10160337

## DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.  
ND - Not Detected at or above adjusted reporting limit.  
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.  
MDL - Adjusted Method Detection Limit.  
S - Surrogate  
1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.  
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.  
LCS(D) - Laboratory Control Sample (Duplicate)  
MS(D) - Matrix Spike (Duplicate)  
DUP - Sample Duplicate  
RPD - Relative Percent Difference  
NC - Not Calculable.  
SG - Silica Gel - Clean-Up  
U - Indicates the compound was analyzed for, but not detected.  
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.  
Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

## LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

## ANALYTE QUALIFIERS

CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results may be biased high.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples. Results unaffected by high bias.
SS	This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.



# AIR: CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10/60337

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:		Section D Required Client Information	
Company: <b>MARATHON</b>	Report To: <b>HEATHER CHAN</b>	Attention: <b>HEATHER CHAN</b>	Invoice Number: <b>04135</b>		Page: <b>1</b> of <b>1</b>		
Address: <b>534 South Main St.</b>	Copy To: <b>HARVE Sheard</b>	Company Name: <b>MARATHON</b>	Program				
City: <b>Minneapolis</b>	Project Name: <b>HEATHER CHAN</b>	Address: <b>534 South Main St.</b>	UST <input type="checkbox"/> Superfund <input type="checkbox"/> Emissions <input type="checkbox"/> Clean Air Act <input type="checkbox"/>				
State: <b>Minnesota</b>	Project Number: <b>449.421.200</b>	City: <b>Minneapolis</b>	Voluntary Clean Up <input type="checkbox"/> Dry Clean <input type="checkbox"/> RCRA <input type="checkbox"/> Other <input type="checkbox"/>				
Zip: <b>55401</b>	Project Name: <b>HEATHER CHAN</b>	City: <b>Minneapolis</b>	Location of Sampling by State: <b>MI</b>		Reporting Units: mg/m <sup>3</sup> <input type="checkbox"/> PPM <input checked="" type="checkbox"/> Other <input type="checkbox"/>		
Phone: <b>612.421.200</b>	Project Number: <b>449.421.200</b>	City: <b>Minneapolis</b>	Report Level: I. <input type="checkbox"/> II. <input type="checkbox"/> III. <input type="checkbox"/> IV. <input type="checkbox"/> Other <input type="checkbox"/>				
Requested Due Date: <b>10/13/11</b>	Project Name: <b>HEATHER CHAN</b>	City: <b>Minneapolis</b>	Method:				
Section D Required Client Information		Section B Required Project Information		Section C Invoice Information		Section D Required Client Information	
AIR SAMPLE ID	Media Codes	Media Codes	Media Codes	Media Codes	Media Codes	Media Codes	Media Codes
Sample IDs MUST BE UNIQUE	TB 1 Liter Sample Can 6 Liter Sample Can Low Volume Puff High Volume Puff Other	TB 1 Liter Sample Can 6 Liter Sample Can Low Volume Puff High Volume Puff Other	TB 1 Liter Sample Can 6 Liter Sample Can Low Volume Puff High Volume Puff Other	TB 1 Liter Sample Can 6 Liter Sample Can Low Volume Puff High Volume Puff Other	TB 1 Liter Sample Can 6 Liter Sample Can Low Volume Puff High Volume Puff Other	TB 1 Liter Sample Can 6 Liter Sample Can Low Volume Puff High Volume Puff Other	TB 1 Liter Sample Can 6 Liter Sample Can Low Volume Puff High Volume Puff Other
1 EAST FORT - 06/13/11	6LC	6LC	6LC	6LC	6LC	6LC	6LC
2 I-75 - 06/13/11	6LC	6LC	6LC	6LC	6LC	6LC	6LC
3 PATRICIA - 06/13/11	6LC	6LC	6LC	6LC	6LC	6LC	6LC
4 Liddesdale - 06/13/11	6LC	6LC	6LC	6LC	6LC	6LC	6LC
5 Liebold - 06/13/11	6LC	6LC	6LC	6LC	6LC	6LC	6LC
6 WEST FORT - 06/13/11	6LC	6LC	6LC	6LC	6LC	6LC	6LC
7							
8							
9							
10							
11							
12							
Comments: Rush Samples 6/20.		RELINQUISHED BY / AFFILIATION		DATE		TIME	
		ACCEPTED BY / AFFILIATION		DATE		TIME	
		SAMPLE CONDITIONS		DATE		TIME	
		Temp in °C		Y/N		Y/N	
		Received on		Y/N		Y/N	
		Sealed Cooler		Y/N		Y/N	
		Custody		Y/N		Y/N	
		Samples Intact		Y/N		Y/N	
		SAMPLER NAME AND SIGNATURE		DATE		TIME	
		SIGNATURE OF SAMPLER		DATE		TIME	
		SIGNATURE OF ANALYST		DATE		TIME	



# AIR Sample Condition Upon Receipt

Pace Analytical

Client Name: MARATHON

Project # 10160337

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other \_\_\_\_\_

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☒ Other \_\_\_\_\_

Tracking #: 8758 9446 3700, 3711

Comments:

Date and Initials of person examining contents: 6-15-11

Chain of Custody Present: ☒ Yes ☐ No ☐ N/A

Chain of Custody Filled Out: ☒ Yes ☐ No ☐ N/A

Chain of Custody Relinquished: ☒ Yes ☐ No ☐ N/A

Sampler Name & Signature on COC: ☒ Yes ☐ No ☐ N/A

Samples Arrived within Hold Time: ☒ Yes ☐ No ☐ N/A

Short Hold Time Analysis (<72hr): ☐ Yes ☒ No ☐ N/A

Rush Turn Around Time Requested: ☒ Yes ☐ No ☐ N/A

Sufficient Volume: ☒ Yes ☐ No ☐ N/A

Correct Containers Used: ☒ Yes ☐ No ☐ N/A

-Pace Containers Used: ☒ Yes ☐ No ☐ N/A

Containers Intact: ☒ Yes ☐ No ☐ N/A

Media: AIR (CAN)

Sample Labels match COC: ☒ Yes ☐ No ☐ N/A

Samples Received: 7 CANS, 7 FC'S

Canisters		Flow Controllers		Stand Alone G		Tedlar Bags	
Sample Number	Can ID	Sample Number	Can ID	Sample Number	Can ID	Sample Number	Can ID
<u>EAST FORT</u>	<u>1708</u>		<u>FC0231</u>				
<u>I-75</u>	<u>1671</u>		<u>FC0202</u>				
<u>PATRICIA</u>	<u>2029</u>		<u>FC0137</u>				
<u>Lindale</u>	<u>0858</u>		<u>FC0234</u>				
<u>Liebold</u>	<u>1534</u>		<u>FC0205</u>				
<u>West Fort</u>	<u>1616</u>		<u>FC0229</u>				
	<u>1206</u>		<u>FC0206</u>				

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: \_\_\_\_\_

Date: 6/26/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

A106 Rev.01 (22May2009)