COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF WASTE, AIR, RADIATION AND REMEDIATION
BUREAU OF ENVIRONMENTAL CLEANUP AND BROWNFIELDS

Southeast Regional Office
Hazardous Sites Cleanup Program
2 E. Main Street
Norristown, PA 19401

Boyertown Landfill HSCA Site
Douglass Township
Montgomery County, PA

JULY 2020 AMBIENT AIR SAMPLING SUMMARY REPORT

November 2020

Prepared by:

Colin R. Wade
Environmental Protection Specialist

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1.0 BACKGROUND

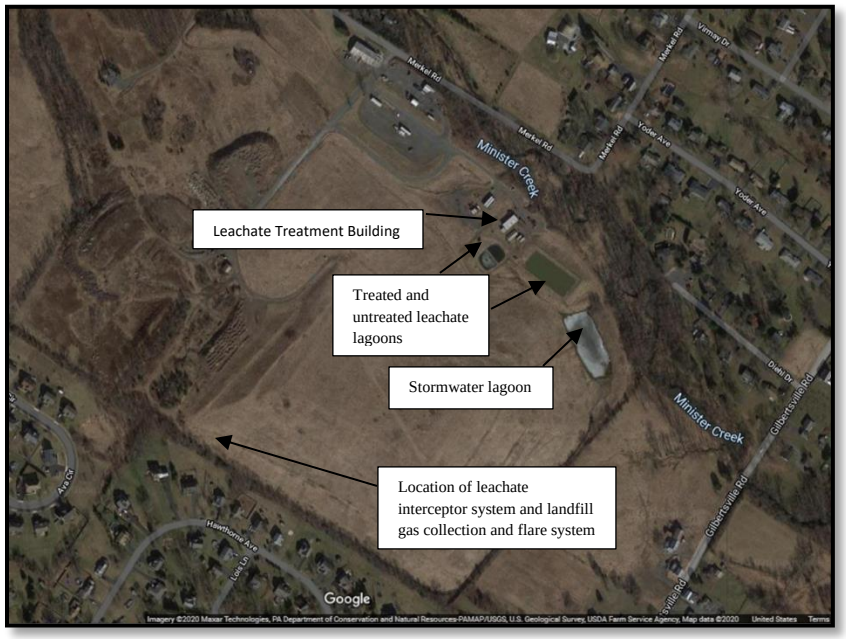
1.1 Introduction

The Pennsylvania Department of Environmental Protection (DEP)'s Hazardous Sites Clean Up Act (HSCA) Program, in conjunction with the DEP's Bureau of Laboratories, conducted ambient air sampling at the Boyertown Landfill HSCA Site (Site) between July 27, 2020 and July 31, 2020 in order to investigate odor complaints from a residential community adjacent to the Site.

1.2 Site Description

The Site encompasses the Boyertown Sanitary Disposal Landfill (Landfill) located at 300 Merkel Road, Gilbertsville, PA in Douglass Township, and surrounding area where hazardous substances and contaminants have come to be located. The Landfill footprint is approximately 30-acres, with additional Landfill infrastructure on the northern portion of the Site consisting of two untreated leachate lagoons, one stormwater retention lagoon, a leachate treatment system, and a treated leachate lagoon. A DEP-installed leachate interceptor system and landfill gas collection and flare system exists on the southern boundary of the Landfill (Figure 1-1).

Figure 1-1. Boyertown Sanitary Disposal Landfill Location and Infrastructure



1.3 Site History

The Landfill received municipal, residual and hazardous wastes from the 1960s until 1985, when a request to further expand the Landfill by was denied by the Pennsylvania Department of Environmental Resources. The Landfill cap was installed in 1997, with landfill gas managed through a series of passive vents.

In 2003, the Summer Hill Development (Summer Hill), consisting of single-family homes was constructed adjacent to the southern boundary of the Landfill. DEP was alerted to leachate and/or landfill gas surfacing into multiple residential backyards and basements within Summer Hill. In response, in October 2003, the HSCA Program installed a leachate interceptor system and landfill gas extraction system to pump leachate into Landfill's existing leachate collection system and collect and flare the landfill gas. The system ran for less than one year and was shut down after observed concentrations of landfill gas decreased.

In February 2020, DEP received multiple complaints from Summer Hill residents regarding strong odors. In response, DEP conducted a site inspection on February 28, 2020 which confirmed the presence of an odor along the southern boundary the Landfill. DEP received another compliant in June 2020, and DEP conducted a site inspection June 16, 2020, using a photoionization detector (PID) to collect real-time measurements of Volatile Organic Compounds (VOCs), and Hydrogen Sulfide. During the June 16, 2020 site inspection, neither VOCs nor Hydrogen Sulfide were detected, however an odor was noticed at the Landfill.

1.4 Objectives

The July 2020 Ambient Air Sampling was designed to follow-up on the June 16, 2020 site inspection and had two objectives:

1.) Identify the odorous compounds in the ambient air at the Site to allow for targeted analysis of specific compounds in the future.

2.) Quantify the concentrations of the compounds to allow acute risks posed to human-health to be identified.

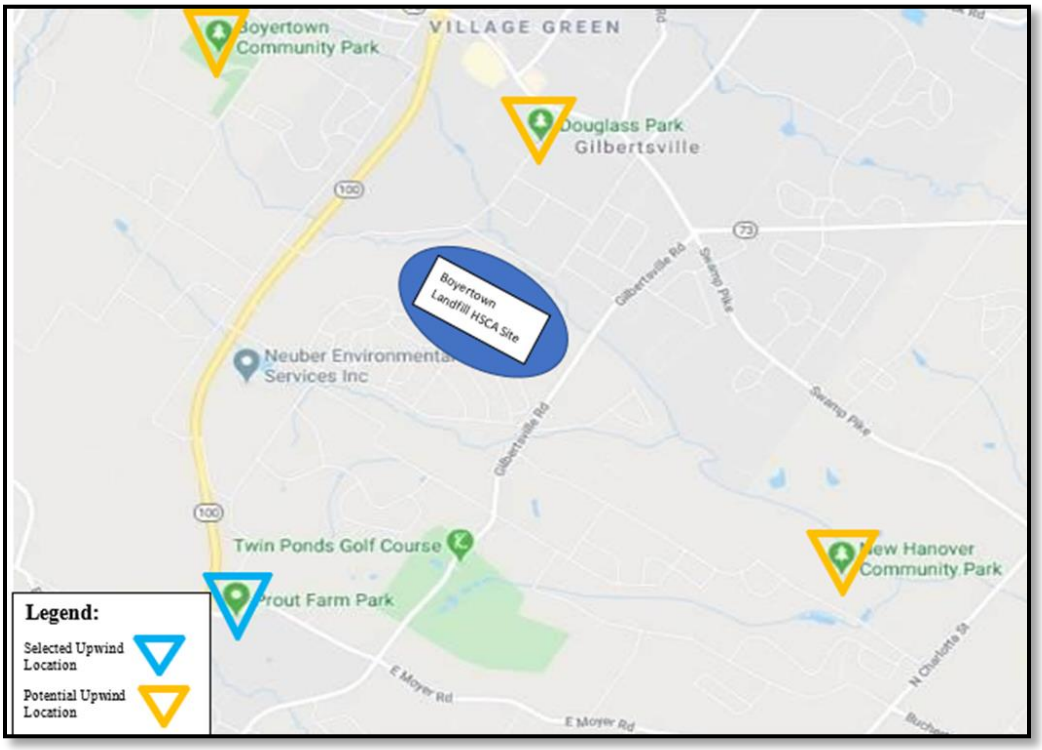
2.0 AMBIENT AIR SAMPLING EVENT

2.1 Methodology

For the July 2020 Ambient Air Sampling, DEP utilized the DEP Bureau of Laboratories (BOL) Mobile Lab Analytical Unit #4 to perform analysis via United States Environmental Protection Agency Compendium Method TO-16, Long-Path Open-Path Fourier Transform Infrared Monitoring of Atmospheric Gases (TO-16). BOL Mobile Lab Analytical Unit #4 was equipped with a RAM 2000 Open Path Fourier Transform Infrared Spectrometer.

This method requires samples to be taken from upwind locations for comparison so that onsite sample results can be accurately evaluated. Four potential upwind locations geographically surrounding the Site were identified prior to the sampling event to ensure at least one would be upwind of the Site during the event. Following the event, based on meteorological data collected during the event, DEP selected Prout Farm Park as the upwind sample location for comparison to the onsite samples (Figure 2-1).

Figure 2-1 Potential and Selected Upwind Locations and the Site



2.2 Analysis

DEP's Mobile Lab conducted the ambient air analysis via TO-16 at the four potential upwind locations (Table 2-1) and 3 onsite locations (Figure 2-2, Table 2-2) at the Site during the week of July 27th.

Table 2-1 Analysis at Potential Upwind Locations

Date	Time	Location	Average Wind Direction, Speed (miles per hour)
7/28/2020	0954-1024	Douglass Park	North, 5
7/28/2020	1133-1203	New Hanover Community Park	West-Northwest, 4
7/31/2020	0936-1006	Prout Farm Park	North, 3
7/31/2020	1120-1150	Boyertown Community Park	East Northeast, 1

Table 2-2 Analysis at Onsite Locations			
Date	**Time**	**Location**	**Average Wind Direction, Speed (miles per hour)**
7/27/2020	1019-1420	Boyertown Landfill Site 1	West, 4
7/29/2020	1005-1405	Summer Hill Development	North-Northwest, 3
7/30/2020	0955-1355	Boyertown Landfill Site 2	West, 2

Figure 2-2 Sampling of Onsite Locations

3.0 RESULTS

There can be multiple sources of compounds in ambient air including from vehicles, vehicle exhaust, transport from distant manufacturing sources, vegetation, and photolytic reactions in the atmosphere. To determine if compounds detected in the ambient air at the onsite locations had compounds elevated above these background sources, the analysis (Tables 3-1, 3-2, 3-3) of the onsite locations is the difference between the concentrations of the compounds detected at the selected upwind location (Prout Farm Park) and each onsite location.

To evaluate acute risks associated with the compounds detected, screening levels were determined by using four sources: Act 2 Residential Indoor Air Site Specific Screening Values (DEP, 2020), National Ambient Air Standards (NAAS) (USEPA, 2020), Percentage of Lower Explosive Limits (%LEL) (NIOSH, 2020) for flammable compounds, and National Institute for Occupational Safety and Health Recommended Exposure Limits (NIOSH REL) (NIOSH, 2020). Act 2 Screening Values. Act 2 Residential Indoor Air Site Specific Screening Values are based

on a 24-hour sample, and are meant to address lifetime risk, and their use is intentionally conservative as screening levels. The NAAS and NIOSH REL are based on an 8-hour time-weighted average. % LEL screening level is not time weighted. The screening levels for each compound were based on the most conservative concentration from the four sources.

Table 3-1 Boyertown Landfill Site 1 Detected Compounds

Compound	Reporting Limit (ppb)	Screening Level (Source) (Time - weighted Average Concentration, ppb)	Time-weighted Average Concentration (ppb)	Maximum Concentration (ppb)
1,2,4-Trimethyl benzene	449	0.73 (Act 2)	--	576
Carbon Monoxide	41	9000 (NAAQS)	--	96
Formaldehyde	21	0.19(Act2)	--	24
Hydrogen Chloride	29	50000 (NIOSH REL)	--	36
iso-Butane	44	800000 (NIOSH REL)	--	47
Methane	131	50000 (%LEL)	372	531
Methanol	16	420 (Act2)	--	22
Methyl mercaptan	357	500 (NIOSH REL)	--	571
Methylamine	181	10000 (NIOSH REL)	--	205
n-Heptane	436	85000 (NIOSH REL)	--	600
Nitrous Oxide	33	25000 (NIOSH REL)	51	61
o-Xylene	150	10000 (Act 2)	--	207
Ozone	25	75(NAAS)	53	72

Table 3-2 Summer Hill Detected Compounds

Compound	Reporting Limit (ppb)	Screening Level (Time -weighted Average Concentration, ppb)	Time-weighted Average Concentration (ppb)	Maximum Concentration (ppb)
1,2,4-Trimethyl benzene	318	0.73 (Act 2)	--	407
Carbon Monoxide	37	9000 (NAAQS)	38	114
Ethanol	60	1000000 (NIOSH REL)	--	148
Hydrogen Chloride	25	5000 (NIOSH REL)	--	26
Methane	122	50000 (%LEL)	731	1124
Methanol	13	420 (Act 2)	--	17
Methyl mercaptan	375	500 (NIOSH REL)	410	749
Methylamine	149	10000 (NIOSH REL)	--	217
Nitric Acid	22	2000 (NIOSH REL)	--	33
Nitrous Oxide	44	25000 (NIOSH REL)	76	135
o-Xylene	212	10000(Act 2)	--	260
Ozone	19	75(NAAS)	53	71

Table 3-3 Boyertown Landfill Site 2 Detections

Compound	Reporting Limit (ppb)	Screening Level (Time -weighted Average Concentration, ppb)	Time-weighted Average Concentration (ppb)	Maximum Concentration (ppb)
2-Methyl Butane	37	8000000 (NIOSH REL)	--	82
3-Methyl Pentane	50	120000(NIOSH REL)	--	83
Ammonia	6	25000 (NIOSH REL)	--	7
Carbon Monoxide	29	9000 (NAAQS)	--	43
Chloroform	8	0.11 (Act 2)	--	10
Ethanol	27	1000000 (NIOSH REL)	--	79
Ethylbenzene	137	9.7(Act 2)	--	250
Hydrogen Chloride	27	5000 (NIOSH REL)	--	34
iso-Butane	37	800000 (NIOSH REL)	--	52
Methane	121	50000 (%LEL)	--	302
Methanol	13	420 (Act 2)	--	22
Methyl mercaptan	238	500 (NIOSH REL)	--	367
n-Hexane	89	50000(NIOSH REL)	--	218
n-Octane	245	75000(NIOSH REL)	--	405
o-Xylene	55	10000 (Act 2)	--	90
Ozone	24	75(NAAQS)	24	53
Propane	51	21000 (%LEL)	--	111

4.0 DISCUSSION

Landfill gas is generated by bacteria metabolizing household garbage and consists of a variety of compounds including but not limited to carbon dioxide, methane, volatile organic compounds, ammonia, methyl mercaptan, and hydrogen sulfide.

Ten compounds were detected at Summer Hill and either one or both of the Boyertown Landfill Sites above their reporting limit, and eight compounds were detected in all three locations. A summary of detected compounds that are associated with landfill gas (USEPA, 2005) are shown in Table 4-1.

Table 4-1 Summary of Compounds Detected at Summer Hill and the Boyertown Landfill

Compound	Generally Recognized Component of Landfill Gas	Boyertown Landfill Site 1 Location Maximum Concentration (ppb)	Summer Hill Maximum Concentration (ppb)	Boyertown Landfill Maximum Concentration Location (ppb)
Carbon Monoxide	X	96	114	43
Ethanol	X	--	148	79
Hydrogen Chloride	X	36	26	34
Methane	X	531	1124	302
Methanol		22	17	22
Methyl Mercaptan	X	571	749	367
Methylamine		205	217	--
Nitrous Oxide	X	61	135	--
o-Xylene	X	207	260	90
Ozone		72	71	53

Of the compounds shown in Table 4-1, methyl mercaptan appears to be the most likely source of the odor complaints in February and June 2020. Methyl mercaptan at temperatures above 43 degrees Fahrenheit is a flammable, odorous gas, without color, often referred to having an unpleasant, “swampy” or “rotten egg” odor, that is detectable by humans at concentrations as low as 2 parts per billion in air (ATSDR, 2014).

25 Pa. Code § 121.1. defines a malodor as “An odor which causes annoyance or discomfort to the public and which the Department determines to be objectionable to the public.”

Based on these results, the characteristics of the compounds detected, and complaints received from residents, a malodor is originating at the Boyertown Landfill. None of the compounds detected exceeded their screening levels, therefore, no acute health risks associated with the compounds were identified.

5.0 RECOMMENDATIONS

The management of landfill gas at the Landfill should be further evaluated to determine the most effective method of preventing malodors from impacting Summer Hill, by completing the following actions:

1.) Additional sampling to evaluate the sources of the landfill gas on the Landfill

2.) Development of alternatives to address the landfill gas and malodors dependent on the concentrations detected from the landfill gas events and including:

- The redesign of the passive landfill gas vents to allow for dispersal of the landfill gas above downwind breathing heights.

- The design of a new landfill gas collection and flare system constructed in the vicinity of the existing landfill passive gas vents.

6.0 REFERENCES

United States Environmental Protection Agency (USEPA). October 2020. NAAQS Table.

https://www.epa.gov/criteria-air-pollutants/naaqs-table

The National Institute for Occupational Safety and Health (NIOSH) October 2020. NIOSH Pocket Guide to Chemical Hazards.

https://www.cdc.gov/niosh/npg/default.html

Pennsylvania Department of Environmental Protection (DEP). October 2020. Vapor Intrusion Screening Value Tables (Excel).

https://www.dep.pa.gov/Business/Land/LandRecycling/Standards-Guidance-Procedures/Guidance-Technical-Tools/Pages/Vapor-Intrusion.aspx

United States Environmental Protection Agency (USEPA). 2005. Guidance for Evaluating Gas Emissions from Closed or Abandoned Facilities. Retrieved from: https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NRMRL&dirEntryId=137824

Agency for Toxic Substances and Disease Registry (ATSDR). October 2014. ADDENDUM for Methyl Mercaptan Supplement to the 1992 Toxicological Profile for Methyl Mercaptan. https://www.atsdr.cdc.gov/toxprofiles/methyl_mercaptan_addendum.pdf

Appendix A: Analysis Report for July 27-31, 2020

COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection
Bureau of Laboratories
(717) 346-7200
September 15, 2020

SUBJECT: Analysis Report for July 27-31, 2020

TO: Colin Wade, Environmental Protection Specialist
Department of Environmental Protection,
Southeast Regional Office
2 East Main Street
Norristown, PA 19401

FROM: Linda Hreha, Supervisor
Mobile Laboratory Group
Bureau of Laboratories
P.O. Box 1467
Harrisburg, PA 17105

The following report outlines results obtained from air analysis performed between July 27-31, 2020, at several locations in and around Gilbertsville, Douglass Township, Montgomery County. The instrumentation utilized in the testing was a RAM 2000 Open Path Fourier Transform Infrared Spectrometer (OPFTIR). The analytical method performed was EPA Compendium Method TO-16.

This report makes use of the following terms:

Time Weighted Average (TWA)	The average concentration of a compound measured during the specified analysis time period.
Maximum (Max)	The maximum concentration of a compound observed during the specified analysis time period.
Time of Maximum	The specific time during analysis that the maximum concentration of a compound was observed.

Analytical Report

Upwind Locations and Weather Conditions

Date	Sample ID	Location	Analysis Period (24-Hour)	Average Wind Direction*	Average Wind Speed (mph)	Weather Conditions
07/28/2020	28JUL20MLG0954	Douglass Park Gilbertsville, Douglass Twp., Montgomery County	0954-1024	N	5	Sunny, humid
07/28/2020	28JUL20MLG1133	New Hanover Community Park New Hanover, Douglass Twp., Montgomery County	1133-1203	WNW	4	Sunny, humid
07/31/2020	31JUL20MLG0936	Prout Farm Park Pottstown, Montgomery County	0936-1006	N	3	Cloudy, light rain/drizzle
07/31/2020	31JUL20MLG1120	Boyertown Community Park Boyertown, Berks County	1120-1150	ENE	1	Cloudy, light drizzle tapering off

* Wind Direction refers to where the wind originates.

The upwind spectrum obtained is representative of ambient atmospheric conditions near the analysis site but upwind of the specific analysis site. This upwind spectrum does not represent a zero concentration for constituents, only a representation of constituents in the air upwind of analysis site. All subsequent sampling was compared to this upwind spectrum. The format in which this upwind spectrum is obtained does not allow for concentration derivation. DEP Regional Staff directed the Mobile Laboratory Group Staff as to where this upwind spectrum was to be obtained.

Analytical Report

Sampling Locations and Weather Conditions During Analysis

Date	Sample ID	Location	Analysis Period (24-Hour)	Average Wind Direction*	Average Wind Speed (mph)	Weather Conditions
07/27/2020	27JUL20MLG1019	Boyertown Landfill (first site) Gilbertsville, Douglass Twp., Montgomery County	1019-1420	W	4	Sunny, humid
07/29/2020	29UL20MLG1005	135 Ava Circle Gilbertsville, Douglass Twp., Montgomery County	1005-1405	NNW	3	Sunny
07/30/2020	30JUL20MLG0955	Boyertown Landfill (second site) Gilbertsville, Douglass Twp., Montgomery County	0955-1355	W	2	Partly cloudy, becoming sunny, humid

* Wind Direction refers to where the wind originates.

Analytical Report

Laboratory:
DEP Bureau of Laboratories
Mobile Laboratories Group
P.O. Box 1467
Harrisburg, PA 17105

Client:
Colin Wade, Environmental Program Specialist
DEP Southeast Regional Office
2 East Main Street
Norristown, PA 19401

Date of Analysis: July 27, 2020

Sample ID: 27JUL20MLG1019

Upwind Spectrum*: 31JUL20MLG0936

Sample Matrix: Atmospheric Gas

Method: EPA Compendium Method TO-16

Location(s) of sampling as determined by DEP Southeast Regional Office Staff

Sampling Location: Boyertown Landfill
300 Merkel Road, Gilbertsville, PA 19525

***** The upwind spectrum obtained is representative of ambient atmospheric conditions near the analysis site but upwind of the specific analysis site. This upwind spectrum does not represent a zero concentration for constituents, only a representation of constituents in the air upwind of analysis site. All subsequent sampling was compared to this upwind spectrum. The format in which this upwind spectrum is obtained does not allow for concentration derivation. DEP Regional Staff directed the Mobile Laboratory Group Staff as to where this upwind spectrum was to be obtained and which upwind sample was associated with which sampling location.

Analytical Report

SAMPLE: 27JUL20MLG1019

Compound	Analyst(s)	Method	Analysis Period (24-hour)	Reporting Limit (ppb)	TWA (ppb)	MAX (ppb)	Time of MAX (24-hour)
1,2,4-Trimethyl benzene	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	449	--	576	12:15
2-Methyl Butane	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	56	--	--	--
2-Methyl Pentane	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	74	--	--	--
3-Methyl Pentane	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	73	--	--	--
Acetaldehyde	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	204	--	--	--
Ammonia	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	16	--	--	--
Benzene	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	199	--	--	--
Carbon Disulfide	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	193	--	--	--
Carbon Monoxide	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	41	--	96	10:34
Carbonyl Sulfide	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	22	--	--	--
Chloroform	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	29	--	--	--
Chloromethane	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	403	--	--	--
Dimethyl sulfide	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	167	--	--	--
Ethane	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	193	--	--	--
Ethanol	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	78	--	--	--
Ethylbenzene	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	183	--	--	--
Ethylene	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	45	--	--	--
Formaldehyde	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	21	--	24	13:53
Hydrogen Chloride	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	29	--	36	12:37
Hydrogen Sulfide	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	13340	--	--	--
iso-Butane	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	44	--	47	12:05
Methane	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	131	372	531	10:23
Methanol	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	16	--	22	13:12
Methyl mercaptan	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	357	--	571	13:20
Methyl tert-butyl ether (MTBE)	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	26	--	--	--
Methylamine	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	181	--	205	10:20
m-Xylene	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	141	--	--	--
Naphthalene	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	52	--	--	--
n-Butane	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	58	--	--	--
n-Heptane	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	436	--	600	10:23
n-Hexane	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	135	--	--	--
Nitric Acid	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	29	--	--	--
Nitric Oxide	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	1336	--	--	--
Nitrogen Dioxide	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	217	--	--	--
Nitrous Acid	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	8	--	--	--
Nitrous Oxide	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	33	51	61	11:02
n-Octane	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	328	--	--	--
n-Pentane	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	99	--	--	--
o-Xylene	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	150	--	207	12:58
Ozone	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	25	53	72	12:43
Propane	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	78	--	--	--
p-Xylene	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	347	--	--	--
Styrene	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	49	--	--	--
Sulfur Dioxide	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	268	--	--	--
Toluene	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	279	--	--	--
Triethylamine	L. Hreha/A.Friedline	EPA TO-16	10:20-14:20	41	--	--	--

Analytical Report

Laboratory:
DEP Bureau of Laboratories
Mobile Laboratories Group
P.O. Box 1467
Harrisburg, PA 17105

Client:
Colin Wade, Environmental Program Specialist
DEP Southeast Regional Office
2 East Main Street
Norristown, PA 19401

Date of Analysis: July 28, 2020

Sample ID: 28JUL20MLG0954

Upwind Spectrum*: 28JUL20MLG0954

Sample Matrix: Atmospheric Gas

Method: EPA Compendium Method TO-16

Location(s) of sampling as determined by DEP Southeast Regional Office Staff

Sampling Location: Douglass Park
44 Jackson Road, Gilbertsville, PA 19525

***** The upwind spectrum obtained is representative of ambient atmospheric conditions near the analysis site but upwind of the specific analysis site. This upwind spectrum does not represent a zero concentration for constituents, only a representation of constituents in the air upwind of analysis site. All subsequent sampling was compared to this upwind spectrum. The format in which this upwind spectrum is obtained does not allow for concentration derivation. DEP Regional Staff directed the Mobile Laboratory Group Staff as to where this upwind spectrum was to be obtained and which upwind sample was associated with which sampling location.

Analytical Report

Laboratory:
DEP Bureau of Laboratories
Mobile Laboratories Group
P.O. Box 1467
Harrisburg, PA 17105

Client:
Colin Wade, Environmental Program Specialist
DEP Southeast Regional Office
2 East Main Street
Norristown, PA 19401

Date of Analysis: July 28, 2020

Sample ID: 28JUL20MLG1133

Upwind Spectrum*: 28JUL20MLG1133

Sample Matrix: Atmospheric Gas

Method: EPA Compendium Method TO-16

Location(s) of sampling as determined by DEP Southeast Regional Office Staff

Sampling Location: New Hanover Community Park
2766 Gail Drive, Gilbertsville, PA 19525

***** The upwind spectrum obtained is representative of ambient atmospheric conditions near the analysis site but upwind of the specific analysis site. This upwind spectrum does not represent a zero concentration for constituents, only a representation of constituents in the air upwind of analysis site. All subsequent sampling was compared to this upwind spectrum. The format in which this upwind spectrum is obtained does not allow for concentration derivation. DEP Regional Staff directed the Mobile Laboratory Group Staff as to where this upwind spectrum was to be obtained and which upwind sample was associated with which sampling location.

Analytical Report

Laboratory:
DEP Bureau of Laboratories
Mobile Laboratories Group
P.O. Box 1467
Harrisburg, PA 17105

Client:
Colin Wade, Environmental Program Specialist
DEP Southeast Regional Office
2 East Main Street
Norristown, PA 19401

Date of Analysis: July 29, 2020

Sample ID: 29JUL20MLG1005

Upwind Spectrum*: 31JUL20MLG0936

Sample Matrix: Atmospheric Gas

Method: EPA Compendium Method TO-16

Location(s) of sampling as determined by DEP Southeast Regional Office Staff

Sampling Location: 135 Ava Circle
Gilbertsville, PA 19525

***** The upwind spectrum obtained is representative of ambient atmospheric conditions near the analysis site but upwind of the specific analysis site. This upwind spectrum does not represent a zero concentration for constituents, only a representation of constituents in the air upwind of analysis site. All subsequent sampling was compared to this upwind spectrum. The format in which this upwind spectrum is obtained does not allow for concentration derivation. DEP Regional Staff directed the Mobile Laboratory Group Staff as to where this upwind spectrum was to be obtained and which upwind sample was associated with which sampling location.

Analytical Report

SAMPLE: 29JUL20MLG1005

Compound	Analyst(s)	Method	Analysis Period (24-hour)	Reporting Limit (ppb)	TWA (ppb)	MAX (ppb)	Time of MAX (24-hour)
1,2,4-Trimethyl benzene	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	318	--	407	14:03
2-Methyl Butane	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	66	--	--	--
2-Methyl Pentane	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	85	--	--	--
3-Methyl Pentane	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	82	--	--	--
Acetaldehyde	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	129	--	--	--
Ammonia	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	10	--	--	--
Benzene	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	165	--	--	--
Carbon Disulfide	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	290	--	--	--
Carbon Monoxide	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	37	38	114	11:54
Carbonyl Sulfide	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	18	--	--	--
Chloroform	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	19	--	--	--
Chloromethane	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	336	--	--	--
Dimethyl sulfide	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	151	--	--	--
Ethane	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	209	--	--	--
Ethanol	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	60	--	148	12:39
Ethylbenzene	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	221	--	--	--
Ethylene	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	28	--	--	--
Formaldehyde	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	20	--	--	--
Hydrogen Chloride	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	25	--	26	12:10
Hydrogen Sulfide	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	10078	--	--	--
iso-Butane	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	57	--	--	--
Methane	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	122	731	1124	10:05
Methanol	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	13	--	17	10:48
Methyl mercaptan	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	375	410	749	12:30
Methyl tert-butyl ether (MTBE)	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	17	--	--	--
Methylamine	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	149	--	217	13:24
m-Xylene	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	112	--	--	--
Naphthalene	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	36	--	--	--
n-Butane	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	66	--	--	--
n-Heptane	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	572	--	--	--
n-Hexane	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	159	--	--	--
Nitric Acid	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	22	--	33	10:25
Nitric Oxide	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	730	--	--	--
Nitrogen Dioxide	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	246	--	--	--
Nitrous Acid	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	6	--	--	--
Nitrous Oxide	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	44	76	135	10:36
n-Octane	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	441	--	--	--
n-Pentane	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	98	--	--	--
o-Xylene	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	212	--	260	11:49
Ozone	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	19	53	71	13:12
Propane	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	94	--	--	--
p-Xylene	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	217	--	--	--
Styrene	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	33	--	--	--
Sulfur Dioxide	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	182	--	--	--
Toluene	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	318	--	--	--
Triethylamine	L. Hreha/A.Friedline	EPA TO-16	10:05-14:05	23	--	--	--

Analytical Report

Laboratory:
DEP Bureau of Laboratories
Mobile Laboratories Group
P.O. Box 1467
Harrisburg, PA 17105

Client:
Colin Wade, Environmental Program Specialist
DEP Southeast Regional Office
2 East Main Street
Norristown, PA 19401

Date of Analysis: July 30, 2020

Sample ID: 30JUL20MLG0955

Upwind Spectrum*: 31JUL20MLG0936

Sample Matrix: Atmospheric Gas

Method: EPA Compendium Method TO-16

Location(s) of sampling as determined by DEP Southeast Regional Office Staff

Sampling Location: Boyertown Landfill
300 Merkel Road, Gilbertsville, PA 19525

***** The upwind spectrum obtained is representative of ambient atmospheric conditions near the analysis site but upwind of the specific analysis site. This upwind spectrum does not represent a zero concentration for constituents, only a representation of constituents in the air upwind of analysis site. All subsequent sampling was compared to this upwind spectrum. The format in which this upwind spectrum is obtained does not allow for concentration derivation. DEP Regional Staff directed the Mobile Laboratory Group Staff as to where this upwind spectrum was to be obtained and which upwind sample was associated with which sampling location.

Analytical Report

SAMPLE: 30JUL20MLG0955

Compound	Analyst(s)	Method	Analysis Period (24-hour)	Reporting Limit (ppb)	TWA (ppb)	MAX (ppb)	Time of MAX (24-hour)
1,2,4-Trimethyl benzene	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	333	--	--	--
2-Methyl Butane	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	37	--	82	9:59
2-Methyl Pentane	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	59	--	--	--
3-Methyl Pentane	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	50	--	83	9:59
Acetaldehyde	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	185	--	--	--
Ammonia	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	6	--	7	13:54
Benzene	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	172	--	--	--
Carbon Disulfide	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	126	--	--	--
Carbon Monoxide	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	29	--	43	10:01
Carbonyl Sulfide	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	11	--	--	--
Chloroform	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	8	--	10	11:45
Chloromethane	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	336	--	--	--
Dimethyl sulfide	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	114	--	--	--
Ethane	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	138	--	--	--
Ethanol	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	27	--	79	9:58
Ethylbenzene	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	137	--	250	10:04
Ethylene	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	14	--	--	--
Formaldehyde	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	19	--	--	--
Hydrogen Chloride	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	27	--	34	11:20
Hydrogen Sulfide	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	11093	--	--	--
iso-Butane	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	37	--	52	9:55
Methane	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	121	--	302	11:31
Methanol	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	13	--	22	11:37
Methyl mercaptan	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	238	--	367	11:42
Methyl tert-butyl ether (MTBE)	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	18	--	--	--
Methylamine	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	151	--	--	--
m-Xylene	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	91	--	--	--
Naphthalene	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	32	--	--	--
n-Butane	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	51	--	--	--
n-Heptane	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	312	--	--	--
n-Hexane	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	89	--	218	9:58
Nitric Acid	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	24	--	--	--
Nitric Oxide	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	1137	--	--	--
Nitrogen Dioxide	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	151	--	--	--
Nitrous Acid	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	7	--	--	--
Nitrous Oxide	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	11	--	--	--
n-Octane	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	245	--	405	9:56
n-Pentane	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	63	--	--	--
o-Xylene	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	55	--	90	11:37
Ozone	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	24	24	53	13:12
Propane	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	51	--	111	9:59
p-Xylene	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	182	--	--	--
Styrene	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	38	--	--	--
Sulfur Dioxide	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	202	--	--	--
Toluene	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	111	--	--	--
Triethylamine	L. Hreha/A. Friedline	EPA TO-16	09:55-13:56	28	--	--	--

Analytical Report

Laboratory:
DEP Bureau of Laboratories
Mobile Laboratories Group
P.O. Box 1467
Harrisburg, PA 17105

Client:
Colin Wade, Environmental Program Specialist
DEP Southeast Regional Office
2 East Main Street
Norristown, PA 19401

Date of Analysis: July 31, 2020

Sample ID: 31JUL20MLG0936

Upwind Spectrum*: 31JUL20MLG0936

Sample Matrix: Atmospheric Gas

Method: EPA Compendium Method TO-16

Location(s) of sampling as determined by DEP Southeast Regional Office Staff

Sampling Location: Prout Farm Park
145-429 West Moyer Road, Pottstown, PA 19464

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Analytical Report

Laboratory:
DEP Bureau of Laboratories
Mobile Laboratories Group
P.O. Box 1467
Harrisburg, PA 17105

Client:
Colin Wade, Environmental Program Specialist
DEP Southeast Regional Office
2 East Main Street
Norristown, PA 19401

Date of Analysis: July 31, 2020

Sample ID: 31JUL20MLG1120

Upwind Spectrum*: 31JUL20MLG1120

Sample Matrix: Atmospheric Gas

Method: EPA Compendium Method TO-16

Location(s) of sampling as determined by DEP Southeast Regional Office Staff

Sampling Location: Boyertown Community Park
417 South Madison Street, Boyertown, PA 19512

***** The upwind spectrum obtained is representative of ambient atmospheric conditions near the analysis site but upwind of the specific analysis site. This upwind spectrum does not represent a zero concentration for constituents, only a representation of constituents in the air upwind of analysis site. All subsequent sampling was compared to this upwind spectrum. The format in which this upwind spectrum is obtained does not allow for concentration derivation. DEP Regional Staff directed the Mobile Laboratory Group Staff as to where this upwind spectrum was to be obtained and which upwind sample was associated with which sampling location.