

LETTER HEALTH CONSULTATION

EVALUATION OF AMBIENT AIR MONITORING DATA TERVITA LANDFILL, ROSTRAVER TOWNSHIP, WESTMORELAND COUNTY, PENNSYLVANIA

April 26, 2013

Prepared by:



Pennsylvania Department of Health
Division of Environmental Health Epidemiology

Health Consultation: A Disclaimer

The Pennsylvania Department of Health (PADOH) Health Assessment Program (HAP) collaborates with the Agency for Toxic Substances and Disease Registry (ATSDR), the lead federal public health agency, to prepare health consultation documents which determine if exposure to contaminants can harm people's health as well as prevent and reduce exposures and illnesses. A health consultation is a written response to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material, and considers the levels of hazardous substances at a site, whether people might be exposed to contaminants, by what pathways, and what potential harm the substances might cause to them. In order to prevent or mitigate exposures, a consultation may lead to specific actions and recommendations, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material. In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; conducting health studies; characterizing demographics; recommending changes/additions to related Commonwealth of Pennsylvania policies/regulations, improving quality of life; and/or providing health education for health care providers and community members.

ATSDR provides technical assistance and funding to PADOH to help identify and evaluate environmental health threats to communities using the best science, taking responsive public health actions, and providing trusted health information. While this health consultation was supported by funds from a cooperative agreement with the ATSDR, it was not published by ATSDR. More information about ATSDR is available online at www.atsdr.cdc.gov.

The conclusions and recommendations presented in this health consultation document are based on an analysis of the environmental sampling data and information made available to the PADOH within a limited time frame. The availability of additional sampling data, new information and/or changes in site conditions could affect the conclusions and recommendations presented in this document. PADOH will consider reviewing additional future data related to the site, if made available and deemed appropriate.



To: Debbie Fought
Bell Vernon, PA 15012

From: Farhad Ahmed, Epidemiologist/Program Manager Health Assessment Program
Pennsylvania Department of Health (PADOH)

Subject: Review of Ambient Air Monitoring Data near the Tervita Landfill,
Rostraver Township, Westmoreland County, PA

Background and Statement of Issues

Residents have raised concerns about air quality and odors nearby the Tervita Landfill, Rostraver Township, Westmoreland County, PA. For example, seven individuals contacted Pennsylvania Department of Environmental Protection (PADEP) with air quality complaints about the landfill in 14 different reports from March 19 through April 3, 2013. The Tervita Landfill is an active engineered landfill disposal facility that currently accepts trash and liquid-containing drill cuttings (<http://www.tervita.com/about-tervita/facilities-and-locations/Pages/default.aspx?locationId=457>). Per information in PADEP's e-FACTS system, this landfill appears to have been operating since the late 1990s (http://www.ahs.dep.pa.gov/eFACTSWeb/searchResults_singleFacility.aspx?FacilityID=514148). In response to resident concerns, in February 19-21, 2013, PADEP conducted ambient air monitoring in three locations surrounding the landfill using an open path fourier-transform spectrometer (OP-FTIR). In April 2013, PADEP shared the monitoring results from February 20-21, 2013 with the Pennsylvania Department of Health (PADOH) for public health interpretation. In April 2013, the Agency for Toxic Substances and Disease Registry (ATSDR)/Centers for Disease Control and Prevention (CDC) was contacted by a resident requesting assistance in interpreting this ambient air monitoring information. In response, PADOH and ATSDR collaborated in this preliminary public health evaluation of the PADEP ambient air monitoring results.

Air Sampling Investigation discussion

An OP-FTIR device is used to identify the presence of chemicals from a known library of chemical compounds. OP-FTIR monitoring data have limitations. The information provides an instantaneous average reading along the entire path of the infrared beam and due to environmental variables (e.g., humidity), it has a high lower detection limit (LDL). OP-FTIR

data has limited quality control and quality assurance, so these data are typically only used as screening level data. For this reason, PADOH and ATSDR would report conclusions from an evaluation of OP-FTIR data as having the potential for public health concern, but would not use instantaneous OP-FTIR data to conduct quantitative exposure dose evaluation for public health evaluation purposes. Instead, agencies use this type of information to qualitatively identify the presence of chemicals in the air.

Results

The OP-FTIR air monitoring data collected from nearby the Tervita Landfill included the detection of several chemicals associated with landfill gases, including methane, dimethyl sulfide, and methyl mercaptan in the air of the community. PADOH and ATSDR note that the detection limits for the sulfur compounds (particularly hydrogen sulfide) in this monitoring information were notably high and above health-based screening values. Please see sampling results on tables on page 5 and page 6 for sampling results collected on Feb 20, 2013 and Feb 21, 2013 respectively. A background ambient air sample was collected in the Lowes Parking Lot located at 203 Sara Way, Belle Vernon, PA, on Feb 19, 2013. All subsequent sampling was compared to this background.

Discussion on health effects

People are capable of detecting a number of chemicals by smell at very low concentrations. A number of chemicals with offensive odors and low odor thresholds are associated with landfill gases, including dimethyl sulfide, hydrogen sulfide, methyl mercaptan and methylamine. For some chemicals, odor thresholds can be orders of magnitude below the levels known to cause adverse human health effects. Even when chemical concentrations of odorous compounds are not high enough to cause toxic health effects, the odors by themselves can cause health symptoms (such as headaches, nausea, watery eyes, irritated throat, coughing and congestion) that induce stress and negatively impact quality of life.

Conclusions and Recommendations

PADOH and ATSDR conclude that the potential exists for unhealthy exposures to these chemicals in the air in the community. However, given the limitations of OP-FTIR monitoring data generally, it is not possible for health agencies to quantitatively assess the potential health impacts of exposures to the chemicals detected in the air of the community using this data set. The noted nuisance odors in the community, and the offsite identification of chemicals associated with landfill gases in the OP-FTIR air monitoring (including peak levels of methane in the offsite air monitoring above expected background levels of approximately 1-2 ppm (http://www.ars.usda.gov/research/publications/publications.htm?seq_no_115=265831))

<http://www.esrl.noaa.gov/gmd/aggi/>
<http://www.cleanair.org/sites/default/files/Report%20to%20Clean%20Air%20Council%20on%20June%202012%20Field%20Inspection%20and%20Methane%20Sampling%20Survey.pdf>),

suggest landfill gas is migrating from the facility. Further air monitoring and sampling investigations could be implemented to better characterize chemical exposures in this community. However, PADOH and ATSDR recommend that the appropriate solution to mitigating this potential health problem and confirmed nuisance odor concern is further engineering steps at the landfill (e.g., improving the vapor collection systems and improving the cover on the landfill) to further reduce the offsite migration of landfill gas.

Sincerely,

Farhad Ahmed MBBS, MPH
Epidemiologist/Program Manager Health Assessment Program
Division of Environmental Health Epidemiology

Results for sampling - February 20, 2013 (0905-1800): The Mobile Laboratory was stationed on Lenity School Road near the Vance Deicas Highway overpass, Rostraver Township, Westmoreland County, PA during the entire sampling session.

Compound	Reporting Limit (ppb)	Average Concentration (ppb)	Maximum Concentration (ppb)	Time of Maximum Concentration detection* (24 hr format)
1,2,4-Trimethyl benzene	178	---	---	---
2-Methyl Butane	122	---	---	---
2-Methyl Pentane	81	---	---	---
3-Methyl Pentane	88	---	---	---
Acetaldehyde	123	---	---	---
Ammonia	5	---	---	---
Benzene	108	---	180	---
Carbon Disulfide	214	---	---	---
Carbon Monoxide	29	64	427	1531
Carbonyl Sulfide	19	---	---	---
Chloroform	15	---	---	---
Chloromethane	217	---	288	1237
Dimethyl sulfide	135	---	161	1230
Ethane	198	---	---	---
Ethanol	35	---	---	---
Ethylbenzene	234	---	---	---
Ethylene	14	---	---	---
Formaldehyde	17	---	---	---
Hydrogen Chloride	21	---	---	---
Hydrogen Sulfide	7931	---	---	---
iso-Butane	66	---	---	---
Methane	118	1581	3261	1742
Methanol	9	---	15	1042
Methyl mercaptan	300	---	461	906
Methyl tert-butyl ether (MTBE)	9	---	31	923
Methylamine	101	---	---	---
m-Xylene	53	---	69	921
Naphthalene	21	---	---	---
n-Butane	75	---	---	---
n-Heptane	959	---	987	941
n-Hexane	296	---	---	---
Nitric Acid	15	---	25	1511
Nitric Oxide	1435	---	---	---
Nitrogen Dioxide	342	---	---	---
Nitrous Acid	4	---	---	---
Nitrous Oxide	13	84	99	1008
n-Octane	725	---	---	---
n-Pentane	173	---	---	---
o-Xylene	68	---	---	---
Ozone	17	---	22	1718
Propane	144	---	---	---
p-Xylene	119	---	---	---
Styrene	19	---	---	---
Sulfur Dioxide	154	---	---	---
Toluene	205	---	---	---
Triethylamine	15	---	18	1719

“--“ Concentration below Reporting Limit

“ * ”Highest concentration existed for less than a 2 minute episode unless otherwise noted.

Results for sampling: February 21, 2013 (0717-1800) The Mobile Laboratory was stationed on Lenity School Road near the Vance Deicas Highway overpass, Rostraver Township, Westmoreland County, PA during the entire sampling session.

Compound	Reporting Limit (ppb)	Average Concentration (ppb)	Maximum Concentration (ppb)	Time of Maximum Concentration Detection* (24 hour format)
1,2,4-Trimethyl benzene	197	---	---	---
2-Methyl Butane	93	---	---	---
2-Methyl Pentane	72	---	---	---
3-Methyl Pentane	75	---	---	---
Acetaldehyde	111	---	---	---
Ammonia	5	---	---	---
Benzene	135	---	180	752
Carbon Disulfide	591	---	---	---
Carbon Monoxide	41	252	1049	1651
Carbonyl Sulfide	19	---	---	---
Chloroform	8	---	23	844
Chloromethane	298	---	332	1414
Dimethyl sulfide	178	---	230	1141
Ethane	177	---	224	1308
Ethanol	25	---	92	821
Ethylbenzene	235	---	---	---
Ethylene	12	---	---	---
Formaldehyde	18	---	30	1800
Hydrogen Chloride	25	---	---	---
Hydrogen Sulfide	8726	---	---	---
iso-Butane	57	---	65	1308
Methane	137	1143	6961	807
Methanol	11	---	56	1002
Methyl mercaptan	380	---	1372	807
Methyl tert-butyl ether (MTBE)	11	---	43	843
Methylamine	123	---	321	819
m-Xylene	60	---	---	---
Naphthalene	18	---	---	---
n-Butane	67	---	136	1308
n-Heptane	780	---	980	836
n-Hexane	227	---	---	---
Nitric Acid	18	---	27	1521 & 1544
Nitric Oxide	1372	---	---	---
Nitrogen Dioxide	292	---	---	---
Nitrous Acid	4	---	---	---
Nitrous Oxide	46	57	165	829
n-Octane	585	---	---	---
n-Pentane	137	---	---	---
o-Xylene	149	---	---	---
Ozone	20	---	66	804
Propane	125	---	---	---
p-Xylene	93	---	---	---
Styrene	25	---	30	1418
Sulfur Dioxide	159	---	---	---
Toluene	305	---	---	---
Triethylamine	26	---	81	807

“-” Concentration below Reporting Limit

“*” Highest concentration existed for less than a 2 minute episode unless otherwise noted.