TCEQ Interoffice Memorandum

To: Lorinda Gardner, Regional Director

From: Sabine Lange, Ph.D. SL
Toxicology Division, Office of the Executive Director

Date: August 22, 2016

Subject: Health Effects Review of 2015 Ambient Air Network Monitoring Data in Region 7, Midland

Conclusions

- In 2015, a canister sampler replaced the automated gas chromatograph (autoGC) present at the Odessa-Hays monitoring site in Region 7, Midland. This caused a 7-month gap in volatile organic compound (VOC) data at this site. Lacking a full year's worth of data prevents the assessment of long-term human health and vegetation effects for the monitored chemicals. However, based on the available data, we would not expect to see short-term health effects from the measured VOCs.

Background

This memorandum conveys the Toxicology Division's (TD's) evaluation of ambient air sampling conducted at the network monitoring site in Region 7, Midland during 2015. The Odessa-Hays Elementary School site in Midland has had an autoGC in place for 16 years, but because of critical equipment failures, this piece of equipment was decommissioned on April 18, 2015. A canister sampler replaced the autoGC at the same site, and began to produce validated data in December 2015. TCEQ Region 7 monitoring site information is presented in Table 1, along with a hyperlink to the monitoring site map and detailed information. List 1 in Attachment A gives the target analytes for the monitoring site for the autoGC, and List 2 gives the target analytes for the canister sampler.

Table 1. Monitoring Site Located in TCEQ Region 7

City and Site Location	County	Monitor ID	Monitored Compounds
Odessa-Hays Elementary School, Barrett and Monahans Streets	Ector	48-135-0003	VOCs: Hourly autoGC – 1/1/15 to 4/18/15 Canister – 12/2/15 to present

The TCEQ has developed 24-hour air monitoring comparison values (AMCVs) for specific measured chemicals. As such, 24-hour canister samples were compared to the available TCEQ 24-hour AMCVs for 1,3-butadiene, benzene and ethylene dichloride. Available 1-hour autoGC data were compared to the 1-hour AMCVs. More information about AMCVs is available online at: https://www.tceq.texas.gov/toxicology/AirToxics.html.

While the TD evaluated summary results for VOCs collected at the Odessa-Hays monitoring site from both the autoGC and the canister sampler, none of the chemicals met the annual data completeness objective of 75 percent data return, or at least 6,570 valid samples per year for the autoGC data, or 45 samples per year for the canister sampler. Due to this insufficient data completeness in 2015, annual averages from the 24-hour canister samples and 1-hour measurements from the autoGC could not be compared to long-term AMCVs. Therefore, the VOC data could not be evaluated for their potential to adversely impact long-term human health and vegetation effects.

Evaluation

Short-Term Data

All of the hourly concentrations of each of the reported 46 VOCs measured by autoGC were below their respective short-term AMCVs. Similarly, the canister-measured 24-hour concentrations of 1,3-butadiene, benzene, and ethylene dichloride were below their respective 24-hour AMCVs. Therefore, adverse health or welfare effects would not be expected to occur as a result of short-term exposure to the reported levels of these chemicals.

Long-Term Data

Because full-year data is not available, no conclusions can be drawn about long-term adverse human health or vegetation effects at the Odessa-Hays monitoring site.

If you have any questions about this evaluation, please contact Sabine Lange at sabine.lange@tceq.texas.gov or (512) 239-3108.

Attachment A

List 1. Target VOC Analytes for AutoGC Samples

1-Butene	c-2-Butene	n-Hexane
1-Pentene	c-2-Pentene	n-Nonane
1,2,3-Trimethylbenzene	Cyclohexane	n-Octane
1,2,4-Trimethylbenzene	Cyclopentane	n-Pentane
1,3-Butadiene	Ethane	n-Propylbenzene
1,3,5-Trimethylbenzene	Ethyl Benzene	o-Xylene
2-Methylheptane	Ethylene	p-Xylene + m-Xylene
2-Methylhexane	Isobutane	Propane
2,2-Dimethylbutane	Isopentane	Propylene
2,2,4-Trimethylpentane	Isoprene	Styrene
2,3-Dimethylpentane	Isopropyl Benzene	t-2-Butene
2,3,4-Trimethylpentane	(Cumene)	t-2-Pentene
2,4-Dimethylpentane	Methylcyclohexane	Toluene
3-Methylheptane	Methylcyclopentane	
3-Methylhexane	n-Butane	
Acetylene	n-Decane	
Benzene	n-Heptane	

List 2. Target VOC Analytes in Canister Samples

1,1,2,2-Tetrachloroethane	2-Methylhexane	Ethylene
1,1,2-Trichloroethane	2-Methylpentane	Ethylene Dibromide
1,1-Dichloroethane	3-Methyl-1-Butene	Ethylene Dichloride
1,1-Dichloroethylene	3-Methylheptane	Isobutane
1,2,3-Trimethylbenzene	3-Methylhexane	Isopentane
1,2,4-Trimethylbenzene	3-Methylpentane	Isoprene
1,2-Dichloropropane	4-Methyl-1-Pentene	Isopropylbenzene
1,3,5-Trimethylbenzene	Acetylene	Methyl Chloroform
1,3-Butadiene	Benzene	Methylcyclohexane
1-Butene	Bromomethane	Methylcyclopentane
1-Hexene & 2-Methyl-1-Pentene	Carbon Tetrachloride	Propane
1-Pentene	Chlorobenzene	Propylene
2,2,4-Trimethylpentane	Chloroform	Styrene
2,2-Dimethylbutane	Chloromethane	Tetrachloroethylene
2,3,4-Trimethylpentane	Cyclohexane	Toluene
2,3-Dimethylbutane	Cyclopentane	Trichloroethylene
2,3-Dimethylpentane	Cyclopentene	Trichlorofluoromethane
2,4-Dimethylpentane	Dichlorodifluoromethane	Vinyl Chloride
2-Chloropentane	Dichloromethane	cis-1,3-Dichloropropene
2-Methyl-2-Butene	Ethane	cis-2-Butene
2-Methylheptane	Ethylbenzene	cis-2-Hexene

cis-2-Pentene	n-Hexane	o-Xylene
m-Diethylbenzene	n-Nonane	p-Diethylbenzene
m-Ethyltoluene	n-Octane	p-Ethyltoluene
m/p Xylene	n-Pentane	trans-1,3-Dichloropropene
n-Butane	n-Propylbenzene	trans-2-Butene
n-Decane	n-Undecane	trans-2-Hexene
n-Heptane	o-Ethyltoluene	trans-2-Pentene