

TCEQ Interoffice Memorandum

To: Leroy Biggers, Regional Director

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

Date: October 20, 2017

Subject: Toxicological Review of 2016 Ambient Air Network Monitoring Data in Region 5, Tyler

Conclusions

- All 24-hour average and annual average concentrations of volatile organic compounds (VOCs) at the Longview and Karnack monitoring locations in Region 5 in 2016 were below their respective Texas Commission on Environmental Quality (TCEQ) air monitoring comparison values (AMCVs) and would not be expected to cause adverse health effects or vegetation effects.
- All 24-hour average and annual average concentrations of polycyclic aromatic hydrocarbons (PAHs), carbonyls, the speciated metals from particulate matter less than 10 microns in diameter (PM₁₀), or the speciated metals from particulate matter less than 2.5 microns in diameter (PM_{2.5}) at the Karnack monitoring location in 2016 were below their respective TCEQ AMCVs and would not be expected to cause adverse health or vegetation effects.

Background

This memorandum conveys the Toxicology Division's (TD's) evaluation of ambient air sampling conducted at two ambient air network monitoring sites in Region 5, Tyler during 2016. Ambient air samples were collected every sixth-day from (1) a site located at Gregg County Airport in Longview (24-hour VOC), and from (2) a site located at Highway 143 and Spur 449 in Karnack [24-hour VOC, PAH, carbonyl, and speciated metals (PM_{2.5} & PM₁₀)]; these results were evaluated on a chemical-by-chemical basis. All data collected for the Longview and Karnack monitoring sites met the data completeness objective of 75 percent data return. Information about the Region 5 monitoring sites is presented in Table 1, along with hyperlinks to the monitoring site maps and more detailed information. Complete lists of all target analytes are provided in Attachment A.

Table 1. Monitoring Sites Located in TCEQ Region 5

City and Site Location	County	Monitor ID	Monitored Compounds
Longview, Gregg County Airport	Gregg	481830001	VOCs ^a

City and Site Location	County	Monitor ID	Monitored Compounds
Karnack, Highway 134 and Spur 449	Harrison	482030002	VOCs ^a , PAHs, carbonyls, and metals (PM _{2.5} & PM ₁₀)

^a24-hour canister

The TCEQ Monitoring Division reported the data for all chemicals evaluated in this memorandum. Because short-term or peak concentrations are not necessarily captured by 24-hour samples, daily concentrations have limited use in evaluating the potential for acute health effects. Rather, 24-hour air samples collected every-sixth day for a year are intended to provide representative long-term average concentrations. Therefore, the TD evaluated the reported annual average concentrations from 24-hour samples for each target analyte for potential chronic health and vegetation concerns by comparing measured chemical concentrations to long-term AMCVs or, for lead, to the applicable comparison level. In order to be able to evaluate 24-hour monitoring data more fully, TCEQ has also developed 24-hour acute AMCVs for specific chemicals. As such, 24-hour samples were compared to the available TCEQ 24-hour AMCVs for 1,3-butadiene, 2,2-dimethylbutane, 2,3-dimethylbutane, 2-methylpentane, 3-methylpentane, acrolein, benzene, cadmium, chromium, crotonaldehyde, ethylene dichloride, formaldehyde, and n-hexane. More information about AMCVs is available online at: <https://www.tceq.texas.gov/toxicology/AirToxics.html>.

Evaluation

Longview, Gregg County Airport Site

All annual average concentrations of the monitored 84 VOCs, and the 24-hour concentrations of 1,3-butadiene, 2,2-dimethylbutane, 2,3-dimethylbutane, 2-methylpentane, 3-methylpentane, benzene, ethylene dichloride, and n-hexane at the Longview site were below their AMCVs and would not be expected to cause adverse chronic health or vegetation effects.

Karnack, Highway 134 and Spur 449 Site

All annual average concentrations of the monitored 85 VOCs, 16 PAHs, 17 carbonyls, 5 speciated PM₁₀ metals, and 15 speciated PM_{2.5} metals, and the 24-hour concentrations of 1,3-butadiene, 2,2-dimethylbutane, 2,3-dimethylbutane, 2-methylpentane, 3-methylpentane, acrolein, benzene, cadmium, chromium, crotonaldehyde, ethylene dichloride, formaldehyde, and n-hexane at the Karnack site were below their AMCVs and would not be expected to cause adverse chronic health or vegetation effects.

Air Pollutant Watch List (APWL) Area

There is one APWL area ([APWL0501](#)) in Region 5 for hydrogen sulfide, which covers parts of both Bowie and Cass Counties. This area is discussed in detail in the 2012 [annual APWL](#) report.¹

¹ Report on the Air Pollutant Watch List Areas in Texas; Prepared by the Texas Commission on Environmental Quality, February 2012

Biggers et al,
October 20, 2017
Page 3 of 5

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

Attachment A

List 1. Target VOC Analytes in Canister Samples

1,1,2,2-Tetrachloroethane	Bromomethane	Vinyl Chloride
1,1,2-Trichloroethane	Carbon Tetrachloride	cis-1,3-Dichloropropene
1,1-Dichloroethane	Chlorobenzene	cis-2-Butene
1,1-Dichloroethylene	Chloroform	cis-2-Hexene
1,2,3-Trimethylbenzene	Chloromethane	cis-2-Pentene
1,2,4-Trimethylbenzene	Cyclohexane	m-Diethylbenzene
1,2-Dichloropropane	Cyclopentane	m-Ethyltoluene
1,3,5-Trimethylbenzene	Cyclopentene	m/p Xylene
1,3-Butadiene	Dichlorodifluoromethane	n-Butane
1-Butene	Dichloromethane	n-Decane
1-Hexene & 2-Methyl-1-Pentene	Ethane	n-Heptane
1-Pentene	Ethylbenzene	n-Hexane
2,2,4-Trimethylpentane	Ethylene	n-Nonane
2,2-Dimethylbutane	Ethylene Dibromide	n-Octane
2,3,4-Trimethylpentane	Ethylene Dichloride	n-Pentane
2,3-Dimethylbutane	Isobutane	n-Propylbenzene
2,3-Dimethylpentane	Isopentane	n-Undecane
2,4-Dimethylpentane	Isoprene	o-Ethyltoluene
2-Chloropentane	Isopropylbenzene	o-Xylene
2-Methyl-2-Butene	Methyl Chloroform	p-Diethylbenzene
2-Methylheptane	Methylcyclohexane	p-Ethyltoluene
2-Methylhexane	Methylcyclopentane	trans-1,3-Dichloropropene
2-Methylpentane	Propane	trans-2-Butene
3-Methyl-1-Butene	Propylene	trans-2-Hexene
3-Methylheptane	Styrene	trans-2-Pentene
3-Methylhexane	Tetrachloroethylene	
3-Methylpentane	Toluene	
4-Methyl-1-Pentene	Trichloroethylene	
Acetylene	Trichlorofluoromethane	
Acrolein-Verified*		
Benzene		

*Not a target analyte at the Longview monitor in 2015

List 2. Target Metal Analytes

Aluminum (PM _{2.5})	Chromium (PM _{2.5})	Nickel (PM _{2.5} , PM ₁₀)
Antimony (PM _{2.5})	Cobalt (PM _{2.5})	Selenium (PM _{2.5})
Arsenic (PM _{2.5} , PM ₁₀)	Copper (PM _{2.5})	Tin (PM _{2.5})
Barium (PM _{2.5})	Lead (PM _{2.5} , PM ₁₀)	Vanadium (PM _{2.5})
Cadmium (PM _{2.5} , PM ₁₀)	Manganese (PM _{2.5} , PM ₁₀)	Zinc (PM _{2.5})

List 3. Target PAH Analytes

Acenaphthene	Benzo (g,h,i) perylene	Indeno (1,2,3-cd) pyrene
Acenaphthylene	Benzo (k) fluoranthene	Naphthalene
Anthracene	Chrysene	Phenanthrene
Benzo (a) anthracene	Dibenzo (a,h) anthracene	Pyrene
Benzo (a) pyrene	Fluoranthene	
Benzo (b) fluoranthene	Fluorene	

List 4. Target Carbonyl Analytes

2,5-Dimethylbenzaldehyde	Crotonaldehyde	Methacrolein
Acetaldehyde	Formaldehyde	Methyl Ethyl Ketone
Acetone	Heptanal	Propionaldehyde
Acrolein - Unverified	Hexanaldehyde	Valeraldehyde
Benzaldehyde	Isovaleraldehyde	o-Tolualdehyde
Butyraldehyde	m & p-Tolualdehyde	