

Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Susan Clewis, Regional Director
David Turner, Regional Air Section
Manager
TCEQ Region 14–Corpus Christi
David Bower, Coastal Texas Area
Director

Date: January 4, 2007

From: Angela Curry, Toxicology Section, Chief Engineer's Office

Subject: Health Effects Review of Air Monitoring Data Collected in TCEQ Region 14
Corpus Christi during 2005

Conclusions

- All reported concentrations of 96 volatile organic compounds (VOCs) and 15 metals are not expected to cause adverse health effects or odors.
- The annual average benzene concentration exceeded the long-term screening level at one of the three monitoring locations (Huisache).

Background

This memorandum conveys the Toxicology Section's evaluation of ambient air sampling conducted at monitoring network sites in Region 14–Corpus Christi during 2005. We reviewed annual summary results for VOCs from 24-hour canister samples collected in Region 14 (Table 1). In addition, we reviewed summary results for speciated metals from 24-hour PM_{2.5} samples collected sixth day (Table 2). For a list of target analytes, see Table 3.

For all VOCs and speciated metals, the 24-hour maximum and available annual average concentrations were compared to their respective short-term and long-term [TCEQ health-based Effects Screening Levels \(ESLs\)](#). Generally, TCEQ requires a 75 percent data return for air monitoring data as a data completeness objective. All VOC data highlighted in this memorandum met the data completeness objective.

Table 1. Monitoring Site Locations in TCEQ Region 14

City and Site Location	County	Monitor ID	Monitored Compounds
3810 Huisache St.	Nueces	483550032	VOC (24-hour canister)
1804/1807 Nueces Bay Blvd.	Nueces	483550029/483559029 (co-located)	VOC (24-hour canister)
5707 Up River Rd.	Nueces	483550034	VOC (24-hour canister)

Table 2. Monitoring Site Locations in TCEQ Region 14(Metals)			
City and Site Location	County	Monitor ID	Monitored Compounds
20420 Park Rd.	Kleberg	482730314	PM _{2.5}
5707 Up River Rd.	Nueces	483550034	PM _{2.5}

Evaluation

All reported annual average concentrations of 96 VOCs and 15 PM_{2.5} metals were below their long-term ESLs except benzene at Huisache. All annual average concentrations, including benzene, would not be expected to cause chronic health effects. In addition, 24-hour concentrations for all reported VOCs and metals were below levels that would cause acute health effects or odors. Benzene at Huisache is discussed further below.

TCEQ Monitoring Locations

Benzene

Huisache

An annual average benzene level of 1.7 ppbv was reported for Huisache. At this site, 24-hour samples were collected daily during months when north winds typically occur and every sixth day otherwise. A weighted annual average (i.e., average of the monthly averages) of 1.9 ppbv, which may be calculated to better accommodate the irregular sampling schedule, differs only slightly from the reported simple average. As shown in the chart below, the annual average benzene concentration at this location in 2005 again exceeded the long-term ESL of 1 ppbv.

The former Oak Park neighborhood surrounding the Huisache monitor has largely been bought out by industry. However, one residence remains occupied approximately 600 feet from the monitor; therefore, we recommend that ambient benzene levels be reduced. Benzene in this area will remain on TCEQ's [Air Pollutant Watch List](#). Given the proximity of the Huisache monitor to industrial sources of benzene, it is expected that potential benzene exposures in the communities farther east and south would be significantly less than the monitored levels at Huisache.

Corpus Christi Air Quality Project

Additional ambient air samples were collected as part of the Corpus Christi Air Quality Project (CCAQP). For more information on this project, visit: http://www.utexas.edu/research/ceer/ccapp/about_CCAQP.htm. VOC samples for the CCAQP were collected *via* Automated Gas Chromatography and/or event canisters. Several sites reported VOC levels above TCEQ's odor thresholds (e.g. isoprene at the Grain Elevator monitoring location, 1-butene at the J.I. Hailey Site monitoring location) and would be expected

Susan Clewis, et al.
Page 3
January 4, 2007

to be odorous. Overall reported levels were below levels that would be of concern from a short-term health effects perspective.

Although the 2005 CCAQP data do not meet the TCEQ 75% data completeness objective, the available data do not indicate any long-term health concerns. In particular the available benzene data suggest that long-term benzene averages at these residential sites are expected to be less than the long-term ESL.

Please contact me at 512-239-1306 or acurry@tceq.state.tx.us if you have any questions regarding this memorandum.

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Table 3: VOCs and Metals (PM_{2.5}) Analyte List

CATMN VOC		AutoGC VOC		Metals (PM _{2.5})
1,1,1-Trichloroethane	Ethyl Benzene	1,2,3-Trimethylbenzene	n-Heptane	Aluminum
1,1,2,2-Tetrachloroethane	Ethylene	1,2,4-Trimethylbenzene	n-Hexane	Antimony
1,1,2-Trichloroethane	Isobutane	1,3,5-Trimethylbenzene	n-Nonane	Arsenic
1,1-Dichloroethylene	Isopentane	1,3-Butadiene	n-Octane	Barium
1,2,3-Trimethylbenzene	Isoprene	1-Butene	n-Pentane	Beryllium
1,2,4-Trimethylbenzene	Isopropylbenzene	1-Hexene	n-Propylbenzene	Cadmium
1,2-Dibromoethane	Methyl Butyl Ketone (MBK)	1-Pentene	n-Undecane	Chromium
1,2-Dichloroethane	Methyl t-Butyl ether	2,2,4-Trimethylpentane	o-Ethyltoluene	Cobalt
1,2-Dichloropropane	Methylcyclohexane	2,2-Dimethylbutane	o-Xylene	Copper
1,3,5-Trimethylbenzene	Methylcyclopentane	2,3,4-Trimethylpentane	p-Diethylbenzene	Manganese
1,3-Butadiene	Methylene Chloride	2,3-Dimethylbutane	p-Ethyltoluene	Molybdenum
1-Butene	Methylisobutylketone	2,3-Dimethylpentane	p-Xylene + m-Xylene	Nickel
1-Hexene+2-methyl-1-pentene	Propane	2,4-Dimethylpentane	t-2-Butene	Selenium
1-Pentene	Propylene	2-Methyl-1-Pentene	t-2-Hexene	Tin
2,2,4-Trimethylpentane	Styrene	2-Methyl-2-Butene	t-2-Pentene	Zinc
2,2-Dimethylbutane - Neohexane	Tetrachloroethylene	2-Methylheptane		
2,3,4-Trimethylpentane	Perchloroethylene	2-Methylhexane		
2,3-Dimethylbutane	Toluene	2-Methylpentane		
2,3-Dimethylpentane	Trichloroethylene	3-Methyl-1-Butene		
2,4-Dimethylpentane	Trichlorofluoromethane	3-Methyl-1-Butene		
2-Butanone	Vinyl Chloride	Butene+Cyclopentene		
2-Chloropentane	c-2-Butene	3-Methylheptane		
2-Methyl-2-Butene	c-2-Hexene	3-Methylhexane		
2-Methylheptane	c-2-Pentene	3-Methylpentane		
2-Methylhexane	Dichlorodifluoromethane	4-Methyl-1-Pentene		
2-Methylpentane - Isohexane	Isobutyraldehyde	Acetylene		
2-Methyl-3-Hexanone	m-Diethylbenzene	Benzene		
3-Methyl-1-Butene	m-Ethyltoluene	Cyclohexane		
3-Methylheptane	Methyl Chloride	Cyclopentane		
3-Methylhexane	n-Butane	Cyclopentene		
3-Methylpentane	n-Decane	Ethane		
3-Hexanone	n-Heptane	Ethyl Benzene		
3-Pentanone	n-Hexane	Ethylene		
4-Methyl-1-Pentene	n-Nonane	Isobutane		
Acetylene	n-Octane	Isobutene		
Benzene	n-Pentane	Isopentane		
Bromomethane	n-Propyl Acetate	Isoprene		
Butyl Acetate	n-Propylbenzene	Isopropyl Benzene - Cumene		
Butyraldehyde	n-Undecane	Methylcyclohexane		
cis 1,3-Dichloropropylene	o-Ethyltoluene	Methylcyclopentane		
Carbon Tetrachloride	o-Xylene	Propane		
Chlorobenzene	p-Diethylbenzene	Propylene		
Chloroform	p-Ethyltoluene	Styrene		
Chloroprene	p-Xylene + m-Xylene	Toluene		
Cyclohexane	t-2-Butene	a-Pinene		
Cyclopentane	t-2-Hexene	b-Pinene		
Cyclopentene	t-2-Pentene	c-2-Butene		
Ethane	trans-1-3-Dichloropropylene	c-2-Hexene		
Ethyl Acetate		c-2-Pentene		
		m-Diethylbenzene		
		m-Ethyltoluene		
		n-Butane		
		n-Decane		

**Annual Average Benzene Concentrations (ppbv)
at TCEQ Air Toxics Monitoring Sites in Corpus Christi**

