Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Lorinda Gardner, Director
Rose Luna-Pirtle, Air Section Manager
TCEQ Region 16 – Laredo
Carlos Rubinstein, Texas Border Area Director

Date: October 9, 2006

From: Michael S. Aplin, M.S.
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Subject: Health Effects Review of 2005 Ambient Air Network Monitoring Data in Region 16 – Laredo

Conclusions

- Annual average concentrations of all 96 volatile organic compounds (VOCs), 16 polycyclic aromatic hydrocarbons (PAHs), and 2 metals from total suspended particulate matter (TSP) were either not detected or monitored at levels below health-based screening values at the Washington Street site in Laredo, and would not be expected to cause adverse health effects.
- Annual average concentrations for 95 of 96 VOCs were either not-detected or monitored at levels below health-based screening values at the Zaragosa Street – Laredo Bridge site, and would not be expected to cause adverse health effects.
- The annual average benzene concentration at the Zaragosa Street – Laredo Bridge site, slightly exceeded its long-term ESL. Available evidence indicates that mobile sources are the major contributor to benzene detected at this site. Although lifetime exposure is a potential concern because benzene is a known human carcinogen, several proposed rules from the U.S Environmental Protection Agency (EPA) will begin to address mobile source contributions to air toxics, like benzene. The Zaragosa Street – Laredo Bridge site will not be added to the Texas Commission on Environmental Quality (TCEQ) Air Pollutant Watch List (APWL), which is primarily designed to address point sources rather than mobile sources.

Background

This memorandum conveys the Toxicology Section (TS) evaluation of ambient air sampling conducted at two Community Air Toxics Monitoring Network (CATMN) sites in Laredo during 2005. Table 1 contains information regarding the two sites located in TCEQ Region 16. The TS reviewed air monitoring summary results for VOCs from 24-hour canister samples collected every sixth day, PAHs from 24-hour canister samples collected every third day, and speciated metals from 24-hour TSP samples collected every sixth day from the West End Washington Street site in Laredo (Figure 1). In addition, the TS reviewed air monitoring summary results for VOCs from 24-hour canister samples collected every sixth day from the Zaragosa Street –

Laredo Bridge site (Figure 2). For a complete list of all examined chemicals, please see Table 2. This memorandum evaluates air monitoring data on a chemical-by-chemical basis.

Table 1. Monitoring Site Information for TCEQ Region 16

County	City and Site Location	EPA Site ID	Monitored Compounds
Webb	Laredo, West End Washington Street	48-479-0016	VOCs, PAHs, Metals (TSP)
Webb	Laredo, 700 Zaragosa Street, Bridge	48-479-0017	VOCs

The TCEQ Monitoring Operations Division reported the data for all chemicals evaluated in this memorandum. All data collected for VOCs, PAHs, and TSP metals met the data completeness requirement for estimating annual average concentrations at both the Laredo sites. For all VOCs, PAHs, and speciated TSP metals, annual average concentrations were compared to their respective long-term ESLs. Because 24-hour air samples are designed to provide representative long-term average concentrations, annual averages from 24-hour samples were evaluated for potential chronic health concerns. Short-term or peak concentrations are not captured by 24-hour samples; therefore, daily maximum concentrations have limited use in evaluating the potential for acute health effects.

Information on the ESLs can be obtained by contacting the TS (512-239-1795) or visiting the TCEQ ESL website: www.tceq.state.tx.us/implementation/tox/esl/ESLMAIN.html.

Evaluation

Out of 96 VOCs reported for 2005, 50 were not detected at either monitoring location in Laredo. The annual average concentrations for all 96 of the reported VOCs, all 16 PAHs, and TSP antimony and arsenic at the Washington Street monitoring site (see Table 1) for the year 2005 were less than their respective annual (long-term) health-based ESLs. Therefore, they do not present a health concern and no adverse health effects would be expected. The annual average concentrations for 95 of the 96 reported VOCs at the Zaragosa Street – Laredo Bridge monitoring site (see Table 1) were less than their respective annual (long-term) health-based ESLs. Benzene had an annual average in 2005 that slightly exceeded its long-term ESL at the Zaragosa Street – Laredo Bridge site and is discussed below. With the exception of benzene we do not anticipate any long-term health concerns from monitored levels of VOCs, PAHs or metals in Laredo.

Benzene

The 2005 annual average benzene concentration at the Zaragosa Street – Laredo Bridge site, 1.1 parts per billion by volume (ppb_v), slightly exceeded its long-term ESL (1.0 ppb_v). Lifetime

exposure to benzene is a potential concern because benzene is a known human carcinogen at much higher exposure levels. Available evidence indicates that mobile sources, primarily automobile traffic crossing the international bridge between Nuevo Laredo, Mexico and Laredo, Texas, are the major contributor to benzene detected at the Zaragosa Street – Laredo Bridge site. Information on the location of the monitor, potential sources, predominant wind direction, emission inventory information, and discussions with TCEQ staff support the conclusion that mobile sources are the primary contributor to ambient benzene levels at this site.

The TS feels that the EPA 2001 proposed "Mobile Source Air Toxics" (MSAT) rule and the 2006 proposed "Control of Hazardous Air Pollutants from Mobile Sources" (CHAPMS) rule will begin to address mobile source contributions to air toxics, like benzene. The CHAPMS rule would limit the benzene content of gasoline and reduce toxic emissions from passenger vehicles and gas cans. Given the minor exceedence of the benzene ESL and these federal programs that are expected to reduce mobile source emissions, the Zaragosa Street – Laredo Bridge site will not be added to the TCEQ APWL. The APWL is designed to address significant ambient air concentrations with a focus on point sources rather than mobile sources. The TCEQ is continuing efforts to characterize ambient air quality and encourages reductions in ambient benzene concentrations.

If you have any questions about this evaluation, please call me at (512) 239-1792 or e-mail me at maplin@tceq.state.tx.us.

Table 2. VOCs, PAHs and TSP Metals Evaluated

CATMN VOCs		
1,1,1-Trichloroethane	3-Hexanone	Tetrachloroethylene, Perchloroethylene
1,1,2,2-Tetrachloroethane	3-Pentanone	Toluene
1,1,2-Trichloroethane	4-Methyl-1-Pentene	Trichloroethylene
1,1-Dichloroethane	Acetylene	Trichlorofluoromethane
1,1-Dichloroethylene	Benzene	Vinyl Chloride
1,2,3-Trimethylbenzene	Bromomethane	c-2-Butene
1,2,4-Trimethylbenzene	Butyl Acetate	c-2-Hexene
1,2-Dibromoethane	cis 1,3-Dichloropropylene	c-2-Pentene
1,2-Dichloroethane	Carbon Tetrachloride	Dichlorodifluoromethane
1,2-Dichloropropane	Chlorobenzene	Isobutyraldehyde
1,3,5-Trimethylbenzene	Chloroform	m-Diethylbenzene
1,3-Butadiene	Chloroprene	m-Ethyltoluene
1-Butene	Cyclohexane	Methyl Chloride
1-Hexene+2-methyl-1-pentene	Cyclopentane	n-Butane
1-Pentene	Cyclopentene	n-Decane
2,2,4-Trimethylpentane	Ethane	n-Heptane
2,2-Dimethylbutane - Neohexane	Ethyl Acetate	n-Hexane
2,3,4-Trimethylpentane	Ethyl Benzene	n-Nonane
2,3-Dimethylbutane	Ethylene	n-Octane
2,3-Dimethylpentane	Isobutane	n-Pentane
2,4-Dimethylpentane	Isopentane	n-Propyl Acetate
2-Butanone	Isoprene	n-Propylbenzene
2-Chloropentane	Isopropylbenzene	n-Undecane
2-Methyl-2-Butene	Methyl Butyl Ketone (MBK)	o-Ethyltoluene
2-Methylheptane	Methyl t-Butyl ether	o-Xylene
2-Methylhexane	Methylcyclohexane	p-Diethylbenzene
2-Methylpentane - Isohexane	Methylcyclopentane	p-Ethyltoluene
2-Methyl-3-Hexanone	Methylene Chloride	p-Xylene + m-Xylene
3-Methyl-1-Butene	Methylisobutylketone	t-2-Butene
3-Methylheptane	Propane	t-2-Hexene
3-Methylhexane	Propylene	t-2-Pentene
3-Methylpentane	Styrene	trans-1-3-Dichloropropylene
PAHs		
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) fluroanthene	Fluorene	
TSP Metals		
Antimony	Arsenic	

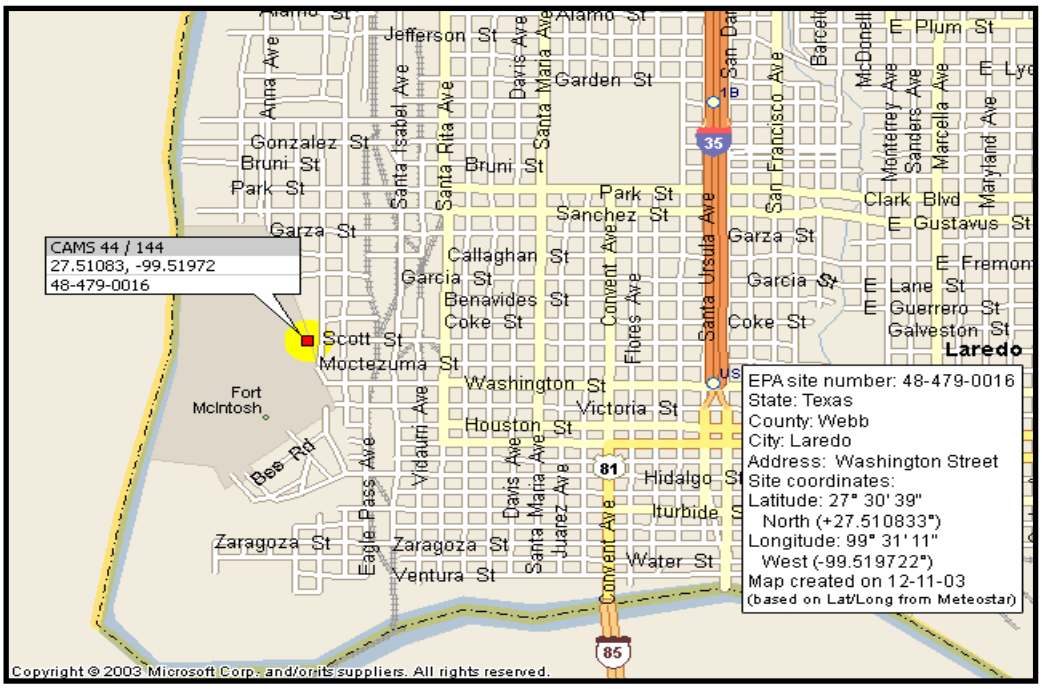

Figure 1. Location of West End Washington Street Monitor

Figure 2. Location of Zaragosa Street – Laredo Bridge Monitor

cc: Casso, Ruben – EPA Region 6, Dallas (via e-mail)
Prosperie, Susan – Department of State Health Services (via e-mail)