Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Archie Clouse, Regional Director
Kevin Smith, Regional Air Manager
TCEQ Region 6 - El Paso
Carlos Rubinstein, Texas Border Area Director

Date: December 4, 2006

From: Angela Curry, M.S.
Toxicology Section,
Chief Engineer Office

Subject: Health Effects Review of 2005 Data Collected from Ambient Air Network Monitoring Sites in Region 6, El Paso

Conclusions:

- Annual average concentrations for 110 of the 113 volatile organic compounds (VOCs) and 15 metals from particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) were monitored at levels below health-based screening values, and would not be expected to cause adverse health effects.

- Elevated hydrogen sulfide (H_2S) concentrations have been frequently measured at the El Paso-Community Air Monitoring Site (CAMS 36) since H_2S monitoring began at this site in August 2004.

Background Information

This memorandum conveys the Toxicology Section's evaluation of ambient air sampling conducted at monitoring network sites (see Tables 1 & 2) in Region 6–El Paso during 2005. We reviewed annual summary results for 24- and/or 1-hour VOCs including Carbonyls, and Polycylic Aromatic Hydrocarbons (PAHs). In addition, we reviewed summary results for speciated metals from 24-hour $PM_{2.5}$ samples collected every third and/or sixth day and hourly H_2S samples. 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). The 24-hour canister samples are designed to provide representative long-term average concentrations and have limited use in evaluating the potential for acute health effects or odors that could be caused by short-term or peak concentrations. 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.

Evaluation

All reported 24- and/or 1-hour concentrations of VOCs, PAHs, and metals were measured below levels that would cause acute health effects or odors. The annual average concentrations for 110 of the 113 reported VOCs, 15 of the16 PAHs, and all 15 metals at the noted monitoring sites for 2005 were less than their respective long-term health-based ESLs, and do not present a long-term health concern. Benzene, MEK/methacrolein, and phenanthrene had reported annual average concentrations that exceeded their respective long-term ESLs and are discussed below. In addition, elevated hourly H_2S levels that have the potential for acute health effects and odors are also discussed below.

Benzene
Womble

The 2005 annual average benzene concentration at the Womble site, 1.1 parts per billion by volume (ppb_v), slightly exceeded its long-term ESL (1.0 ppb_v). The 2004 annual average benzene concentration was also 1.1 ppb_v. These benzene levels are not expected to cause long-term adverse health effects. Because benzene is a human carcinogen, TCEQ is continuing efforts to characterize its impact on ambient air quality and reduce the potential for public exposure.

MEK/Methacrolein
Chamizal

The annual average MEK/methacrolein concentration (4.1 ppb_v) exceeded the methacrolein long-term ESL of 0.13 ppb_v. MEK and methacrolein are not analytically separated by the method, and it is unknown whether the reported concentrations were only MEK, only methacrolein, or both MEK and methacrolein. However, exposure to the reported MEK/methacrolein concentrations would not be expected to cause adverse health effects even if they were comprised entirely of methacrolein.

Phenanthrene
Sun Metro

The reported annual average phenanthrene concentration (130 ppb_v) exceeded the long-term ESL of 50 ppb_v. However, this annual average concentration would not be expected to cause long-term health effects.

H_2S
El Paso -CAMS 36

Numerous H_2S levels exceeded the state regulatory standard, as well as the odor threshold. Investigations have shown that the Juarez North Wastewater Treatment Plant is the primary H_2S source. The Department of State Health Services (DSHS) prepared a Health Consultation, dated December 28, 2005 which details the methods, findings, and conclusions of their evaluation of H_2S levels associated with the wastewater treatment plant. According to the DSHS, exposure to the measured levels could potentially cause health effects (e.g., eye irritation, decreased lung function, headache) in sensitive individuals. For more information on the findings of this report, visit http://www.dshs.state.tx.us/epitox/consults/elpaso_juarez_final.pdf

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

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

Table 1. Monitoring Site Locations in TCEQ Region 6

County	City and Site Location	EPA Site ID	Monitored Compounds
El Paso	El Paso, 650 R E Thomason Loop (Ascarte Park)	48-141-0055	VOCs
	El Paso, 800 S. San Marcial Street (Chazimal)	48-141-0044	VOCs, Carbonyls
	El Paso, 700 San Francisco Ave (Sun Metro)	48-141-0053	VOCs, PAHs
	El Paso, 250 Rim Rd. (UTEP)	48-141-0037	VOCs
	El Paso, Clark & Cleveland Streets (Womble)	48-141-0047	VOCs
	El Paso, 8470 Plant Road (CAMS 36)	48-141-0054	H_2S

Table 2. Monitoring Site Locations in TCEQ Region 6 - Metals

County	City and Site Location	EPA Site ID	Monitored Compounds
El Paso	El Paso, 800 S. San Marcial Street (Chazimal)	48-141-0044	$PM_{2.5}$
	El Paso, 700 San Francisco Ave (Sun Metro)	48-141-0053	$PM_{2.5}$
Brewster	Alpine, 222 South Campbell St. (Tillman)	48-141-0002	$PM_{2.5}$
	Big Ben, Rt. 12 and K-Bar Rd.	48-043-0101	$PM_{2.5}$
Jeff Davis	Fort Davis, HC 75 Box 1337-MCD (McDonalds Observatory)	48-243-0004	$PM_{2.5}$

Table 3: VOCs, Carbonyls, PAHs, and Metals ($PM_{2.5}$)

CATMN VOCs		AutoGC VOCs		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+Cyclopentene		
2-Butanone	Vinyl Chloride	3-Methylheptane		
2-Chloropentane	c-2-Butene	3-Methylhexane		
2-Methyl-2-Butene	c-2-Hexene	3-Methylpentane		
2-Methylheptane	c-2-Pentene	4-Methyl-1-Pentene		
2-Methylhexane	Dichlorodifluoromethane	Acetylene		
2-Methylpentane - Isohexane	Isobutyraldehyde	Benzene		
2-Methyl-3-Hexanone	m-Diethylbenzene	Cyclohexane		
3-Methyl-1-Butene	m-Ethyltoluene	Cyclopentane		
3-Methylheptane	Methyl Chloride	Cyclopentene		
3-Methylhexane	n-Butane	Ethane		
3-Methylpentane	n-Decane	Ethyl Benzene		
3-Hexanone	n-Heptane	Ethylene		
3-Pentanone	n-Hexane	Isobutane		
4-Methyl-1-Pentene	n-Nonane	Isobutene		
Acetylene	n-Octane	Isopentane		
Benzene	n-Pentane	Isoprene		
Bromomethane	n-Propyl Acetate	Isopropyl Benzene - Cumene		
Butyl Acetate	n-Propylbenzene	Methylcyclohexane		
Butyraldehyde	n-Undecane	Methylcyclopentane		
cis 1,3-Dichloropropylene	o-Ethyltoluene	Propane		
Carbon Tetrachloride	o-Xylene	Propylene		
Chlorobenzene	p-Diethylbenzene	Styrene		
Chloroform	p-Ethyltoluene	Toluene		
Chloroprene	p-Xylene + m-Xylene	a-Pinene		
Cyclohexane	t-2-Butene	b-Pinene		
Cyclopentane	t-2-Hexene	c-2-Butene		
Cyclopentene	t-2-Pentene	c-2-Hexene		
Ethane	trans-1-3-Dichloropropylene	c-2-Pentene		
Ethyl Acetate		m-Diethylbenzene		
		m-Ethyltoluene		
		n-Butane		
		n-Decane		

Carbonyls
2,5-Dimethylbenzaldehyde
Acetaldehyde
Acetone
Acrolein
Benzaldehyde
Butylaldehyde
Crotonaldehyde - 2-Butenal
Formaldehyde
Heptaldehyde
Hexanaldehyde
Isovaleraldehyde
m-Tolualdehyde
MEK/Methacrolein
o-Tolualdehyde
p-Tolualdehyde
Propanal - Propionaldehyde
Valeraldehyde

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