

TCEQ Interoffice Memorandum

To: Lorinda Gardener, Regional Director
Kent Waggoner, Air Section Manager
Ramiro Garcia, Border and South Central Texas Area Director

From: Tiffany Bredfeldt, Ph.D.
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Date: March 8, 2011

Subject: Health Effects Review of 2009 Ambient Air Network Monitoring Data in
Region 6, El Paso

Conclusions

- Reported short-term concentrations of volatile organic compounds (VOCs) as detected by autoGC would not be expected to cause adverse acute health effects, vegetative effects, or odorous conditions. Reported annual concentrations of VOCs, poly aromatic hydrocarbons (PAHs), carbonyls, and metals reported as particulate matter with aerodynamic diameter of 2.5 microns or less (PM_{2.5}) would also not be expected to cause adverse effects to long-term human health for Region 6-El Paso.
- Elevated levels of hydrogen sulfide (H₂S) that exceed the state regulatory standard as well as the odor threshold have been reported annually at Community Air Monitoring Station (CAMS) 36 station since 2004. Further information regarding the data collected at this monitoring station is available from the Air Pollutant Watch List (APWL) [website](#).

Background

This memorandum conveys the Toxicology Division's (TD) evaluation of ambient air sampling conducted at four monitoring sites in Region 6-El Paso during 2009. TCEQ Region 6 monitoring site information is presented in Table 1 along with hyperlinks to detailed information regarding the monitoring sites and their maps. Lists 1-5, which can be found in Attachment A, display the target analytes for all four monitoring sites. The fifth monitoring site called CAMS 36 is the location of a station used to monitor ambient concentrations of hydrogen sulfide (H₂S). Elevated levels of this chemical have been reported annually at the CAMS 36 monitoring station since 2004. Further information regarding the data collected at this monitoring station is available from the Air Pollutant Watch List [website](#). The TD reviewed air monitoring summary results from 1-hour automated gas chromatography (autoGC) VOCs samples, VOCs samples collected on a 24-hour every sixth day schedule at Community Air Toxics Monitoring Network (CATMN) monitors, 24-hour metals samples (PM_{2.5}), 24-hour carbonyl samples, and 24-hour PAH or semivolatile organic compound (SVOC) samples.

The TCEQ Field Operations Support Division (FOSD) reported the data for all chemicals evaluated in this memorandum. Data discussed in this evaluation, 84 VOCs from canister samples, 46 VOCs from autoGC, 17 carbonyls, 14 metals, and 16 PAHs, for all four monitoring sites met the data completeness objective of 75 percent data return or at least 45 valid samples per year. Since 24-hour samples collected using the every sixth day schedule are designed to

provide a representative long-term, ambient concentration for chemicals of concern, annual averages from all 24-hour samples were evaluated using appropriate long-term Air Monitoring Comparison Values (AMCVs) for the potential to adversely impact long-term human health. Thus, annual average concentrations of carbonyls, metals, PAHs, and VOCs collected via canister sample or autoGC, were compared to their respective, long-term AMCVs. Hourly concentrations of VOCs collected by the autoGC were evaluated using the appropriate short-term AMCV. Additional information regarding the derivation and application of AMCVs is publically available [online](#).

Table 1. Monitoring Sites Located in TCEQ Region 11

City and Site Location	County	Monitor ID	Monitored Compounds
8470 Plant Road (CAMS 36)	El Paso	48-141-0054	H ₂ S
800 S. San Marcial Street (Chamizal)	El Paso	48-141-0044	VOCs ^b , Carbonyls, Metals (PM _{2.5})
700 San Francisco Ave (Sun Metro)	El Paso	48-141-0053	VOCs ^a , PAHs, Metals (PM _{2.5})
Clark & Cleveland Streets (Womble)	El Paso	48-141-0047	VOCs ^a
Rt.12 and K-Bar Rd. (Big Bend)	Brewster	48-043-0101	Metals (PM _{2.5})

^a24-hour Canister only; ^b24-hour Canister and One-hour AutoGC

Evaluation

VOCs

Hourly average concentrations of the 46 VOCs collected at the Chamizal autoGC monitoring site were below their respective short-term, health-based and odor-based AMCVs. Thus, exposure to the reported hourly average concentrations would not be expected to cause to adverse human health effects or odorous conditions.

The 2009 annual average concentrations for all 84 VOCs collected as 24-hour canister samples at the Sun Metro and Womble monitoring sites were well below their respective long-term AMCVs. Thus, adverse human health effects would not be expected to occur as a result of long-term exposure to the reported levels of these chemicals at these monitoring sites.

Carbonyls

Reported annual average concentrations of the 17 carbonyls measured at the Chamizal monitoring site were below their respective long-term, health-based AMCVs and would not be expected to cause long-term adverse human health effects.

Metals

Reported annual average concentrations for all 14 metals (PM_{2.5}) were below their respective AMCVs and would not be expected to cause long-term adverse human health effects.

PAHs

The reported annual average concentrations for 15 of the 16 PAHs reported at the Sun Metro monitoring site in 2009 were well below their long-term AMCVs and would not be expected to cause long-term adverse human health effects. Phenanthrene was the only PAH with an annual average concentration (53.1 ng/m³) that slightly exceeded the long-term, health-based AMCV (50 ng/m³). Notably, the magnitude of this exceedance is quite small. Given the conservative nature of the long-term, health-based AMCVs, we would not expect adverse effects on human health or welfare to occur as a result of exposure to the reported concentration of phenanthrene.

If you have any questions or comments regarding this evaluation, please feel free to contact me at (512) 239-1799 or tiffany.bredfeldt@tceq.texas.gov.

cc (via email):

Casso, Ruben – EPA Region 6, Dallas

Prosperie, Susan – Department of State Health Services

Attachment A**List 1. Target VOC Analytes in Canister Samples**

1,1,1-Trichloroethane	3-Methylhexane	Methylcyclopentane
1,1,2,2-Tetrachloroethane	3-Methylpentane	Methylene Chloride
1,1,2-Trichloroethane	4-Methyl-1-Pentene	m-Ethyltoluene
1,1-Dichloroethane	Acetylene	n-Butane
1,1-Dichloroethylene	Benzene	n-Decane
1,2,3-Trimethylbenzene	Bromomethane	n-Heptane
1,2,4-Trimethylbenzene	c-1,3-Dichloropropylene	n-Hexane
1,2-Dibromoethane	c-2-Butene	n-Nonane
1,2-Dichloroethane	c-2-Hexene	n-Octane
1,2-Dichloropropane	c-2-Pentene	n-Pentane
1,3,5-Trimethylbenzene	Carbon Tetrachloride	n-Propylbenzene
1,3-Butadiene	Chlorobenzene	n-Undecane
1-Butene	Chloroform	o-Ethyltoluene
1-Hexene + 2-Methyl-1-Pentene	Cyclohexane	o-Xylene
1-Pentene	Cyclopentane	p-Diethylbenzene
2,2,4-Trimethylpentane	Cyclopentene	p-Ethyltoluene
2,2-Dimethylbutane (Neohehexane)	Dichlorodifluoromethane	Propane
2,3,4-Trimethylpentane	Ethane	Propylene
2,3-Dimethylbutane	Ethyl Benzene	Styrene
2,3-Dimethylpentane	Ethylene	t-1,3-Dichloropropylene
2,4-Dimethylpentane	Isobutane	t-2-Butene
2-Chloropentane	Isopentane	t-2-Hexene
2-Methyl-2-Butene	Isoprene	t-2-Pentene
2-Methylheptane	Isopropylbenzene	Tetrachloroethylene
2-Methylhexane	m & p-Xylene	Toluene
2-Methylpentane (Isohexane)	m-Diethylbenzene	Trichloroethylene
3-Methyl-1-Butene	Methyl Chloride	Trichlorofluoromethane
3-Methylheptane	Methylcyclohexane	Vinyl Chloride

List 2. Target Carbonyl Analytes

2,5-Dimethylbenzaldehyde	Formaldehyde	o-Tolualdehyde
Acetaldehyde	Heptaldehyde	Propanal - Propionaldehyde
Acetone	Hexanaldehyde	p-Tolualdehyde
Acrolein	Isovaleraldehyde	Valeraldehyde
Benzaldehyde	Methyl Ethyl Ketone	
Butyraldehyde	(MEK)/Methacrolein	
Crotonaldehyde - 2-Butenal	m-Tolualdehyde	

List 3. Target Metal Analytes

Aluminum (PM _{2.5})	Arsenic (PM _{2.5})	Cadmium (PM _{2.5})
Antimony (PM _{2.5})	Barium (PM _{2.5})	Chromium (PM _{2.5})

Cobalt (PM_{2.5})
Copper (PM_{2.5})
Manganese (PM_{2.5})

Molybdenum (PM_{2.5})
Nickel (PM_{2.5})
Selenium (PM_{2.5})

Tin (PM_{2.5})
Zinc (PM_{2.5})

List 4. Target PAH Analytes

Acenaphthene
Acenaphthylene
Anthracene
Benzo (a) anthracene
Benzo (a) pyrene
Benzo (b) fluoranthene

Benzo (ghi) perylene
Benzo (k) fluoranthene
Chrysene
Dibenzo (a,h) anthracene
Fluoranthene
Fluorene

Indeno (1,2,3-cd) pyrene
Naphthalene
Phenanthrene
Pyrene

List 5. Target VOC Analytes in AutoGC

1-Butene
1-Pentene
1,2,3-Trimethylbenzene
1,2,4-Trimethylbenzene
1,3-Butadiene
1,3,5-Trimethylbenzene
2-Methylheptane
2-Methylhexane
2,2-Dimethylbutane
2,2,4-Trimethylpentane
2,3-Dimethylpentane
2,3,4-Trimethylpentane
2,4-Dimethylpentane
3-Methylheptane
3-Methylhexane
Acetylene

Benzene
c-2-Butene
c-2-Pentene
Cyclohexane
Cyclopentane
Ethane
Ethyl Benzene
Ethylene
Isobutane
Isopentane
Isoprene
Isopropyl Benzene - Cumene
Methylcyclohexane
Methylcyclopentane
n-Butane
n-Decane

n-Heptane
n-Hexane
n-Nonane
n-Octane
n-Pentane
n-Propylbenzene
o-Xylene
p-Xylene + m-Xylene
Propane
Propylene
Styrene
t-2-Butene
t-2-Pentene
Toluene