


TCEQ Interoffice Memorandum

To: Heather Feldman, Regional Director
Kathryn Saucedo, Air Section Manager, R10 Beaumont
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From: Carla Kinslow, Ph.D. 
Toxicology Division, Chief Engineer's Office

Date: March 4, 2011

Subject: Health Effects Review of 2009 Ambient Air Network Monitoring Data in
Region 10, Beaumont

Conclusions

- The annual average benzene concentration for 2009 at the Port Arthur City Service Center is below the long-term air monitoring comparison value (AMCV) for benzene and would not be expected to cause chronic adverse human health or vegetative effects.
- Exposure to the reported annual average concentrations for all other monitored volatile organic compounds (VOCs) and all 14 metals measured in particulate matter less than 2.5 microns in diameter (PM_{2.5}) would not be expected to cause chronic adverse human health or vegetative effects.

Background

This memorandum conveys the Toxicology Division's (TD's) evaluation of ambient air sampling conducted at nine sites in Region 10-Beaumont from January 1 through December 31, 2009. Information about the locations of the monitoring sites, monitored compounds and a hyperlink to more information on the sites is provided in Table 1.

The TCEQ Field Operations Support Division reported the data for all chemicals evaluated in this memorandum. TD reviewed air monitoring summary results for 46 VOCs from two automated gas chromatograph (autoGC) sites, 84 VOCs from six canister samplers, and 14 metals from one PM_{2.5} filter sampler. All reviewed data met or exceeded TCEQ's 75 percent annual data completeness requirement to help ensure the representativeness of calculated annual average concentrations. Lists of all target analytes at these monitoring locations are included in Attachment A.

TD evaluated hourly VOC concentrations collected from the two autoGC samplers for their potential to cause acute (short-term) adverse health effects and odors. In addition, TD evaluated annual average VOC concentrations to determine their potential to cause chronic (long-term) adverse health and vegetative effects.

TD also evaluated data collected from 24-hour samples taken every sixth day from seven sampling sites measuring 84 VOCs and/or 14 metals (PM_{2.5}). 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.

Chemicals were evaluated individually by comparing the reported concentrations to their respective AMCVs. TD compared the measured hourly concentrations for 46 VOCs from the two autoGC monitoring sites to their respective short-term AMCVs. TD compared annual average concentrations of all VOCs and metals to their respective long-term AMCVs. More information about AMCVs is available online at:

<http://www.tceq.state.tx.us/implementation/tox/AirToxics.html#amcv>.

Table 1 - Region 10 Sites that Provided Air Toxics Monitoring Data Evaluated in this Memorandum

City and Site Location	County	EPA Site ID	Monitored Compounds
Beaumont, Downtown Lamar Univ. 1086 Vermont Avenue	Jefferson	48-245-0009	VOCs (24-hour canister & hourly autoGC)
Port Arthur, West 800 El Vista Rd	Jefferson	48-245-0011	VOCs (24-hour canister)
Groves 3355 Grandview Avenue & 32nd Street	Jefferson	48-245-0014	VOCs (24-hour canister)
Port Neches 1225 Merriman Street	Jefferson	48-245-0017	VOCs (24-hour canister)
Port Arthur, Jefferson County Airport	Jefferson	48-245-0018	VOCs (24-hour canister)
Port Arthur, City Service Center 201 H.O. Mills Blvd.	Jefferson	48-245-0019	VOCs (24-hour canister)
Port Arthur, Memorial School 2200 Jefferson Dr.	Jefferson	48-245-0021	PM _{2.5} Metals (24-hour filter)
Nederland, High School Seattle St	Jefferson	48-245-1035	VOCs (hourly autoGC)

Evaluation

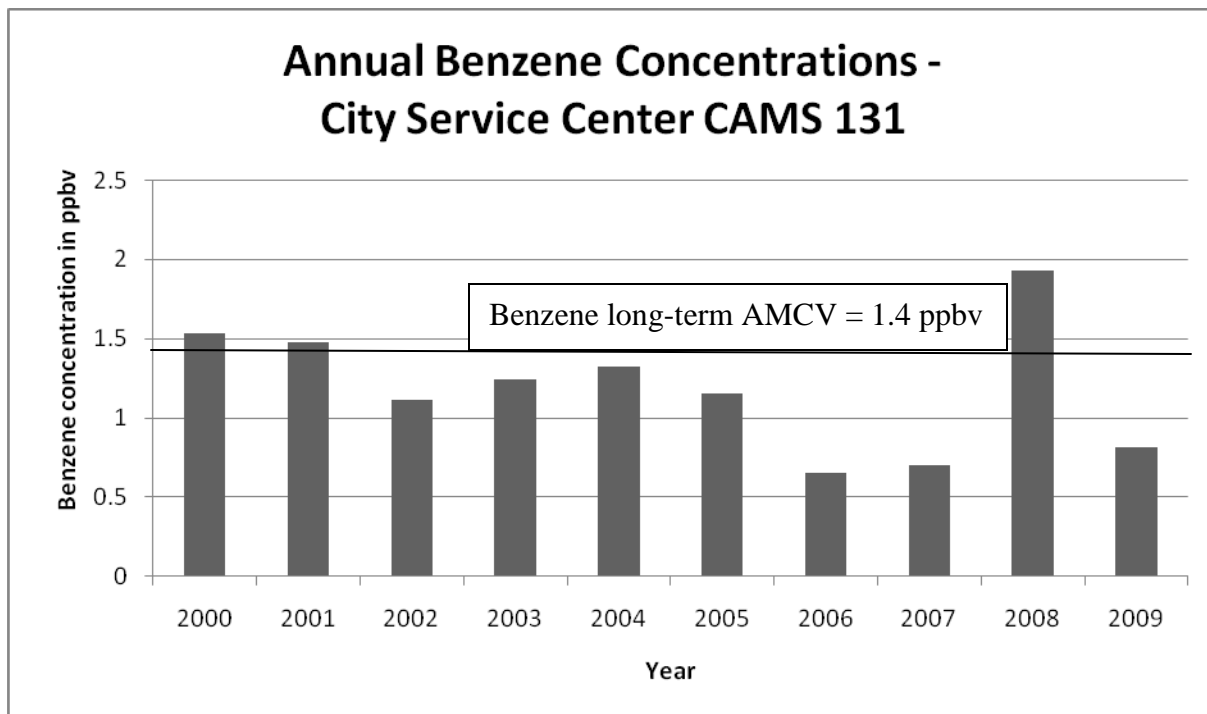
VOCs

All hourly and annual VOC concentrations gathered from the autoGCs at the Beaumont, Downtown Lamar University and Nederland High School sites were below their respective short-term and long-term AMCVs (including odor thresholds) and would not be expected to cause acute or chronic health effects or nuisance odors.

All reported annual average concentrations of VOC's from 24-hour canister samplers were below their respective long-term AMCVs at all sites. Thus, the annual average VOC concentrations at all sites were below a level of potential long-term health or vegetative concern.

Port Arthur City Service Center

The reported 2009 average benzene concentration at the City Service Center site based on every sixth-day 24-hour canister samples was 0.8 ppb_v. Annual average benzene concentrations at this site have decreased significantly from 2000 (1.5 ppb_v) to 2007 (0.7 ppb_v). However, the average concentration in 2008 (2.0 ppb_v) showed an increase of 2.8 times over the 2007 (0.7 ppb_v) average concentration and was above TCEQ's long-term AMCV of 1.4 ppb_v. In 2009, annual average concentrations decreased to those similar to 2007 and are no longer considered of potential health concern.



Metals

Annual average metal concentrations in PM_{2.5} samples were below their respective long-term AMCVs and would not be expected to cause chronic health effects.

Heather Feldman

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Air Pollutant Watch List (APWL) Areas

There are four APWL areas (1001, 1002, 1003 and 1004) in Region 10. These areas will be discussed in the annual APWL report. Information provided in this annual evaluation will be considered when status of these watch list areas is re-evaluated.

If you have any questions regarding the contents of this review, please do not hesitate to contact me at (713-422-8976) or via email at carla.kinslow@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 - Neohexane	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 Metal Analytes

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

List 3. Target VOC Analytes in AutoGC

1-Butene	Benzene	n-Heptane
1-Pentene	c-2-Butene	n-Hexane
1,2,3-Trimethylbenzene	c-2-Pentene	n-Nonane
1,2,4-Trimethylbenzene	Cyclohexane	n-Octane
1,3-Butadiene	Cyclopentane	n-Pentane
1,3,5-Trimethylbenzene	Ethane	n-Propylbenzene
2-Methylheptane	Ethyl Benzene	o-Xylene
2-Methylhexane	Ethylene	p-Xylene + m-Xylene
2,2-Dimethylbutane	Isobutane	Propane
2,2,4-Trimethylpentane	Isopentane	Propylene
2,3-Dimethylpentane	Isoprene	Styrene
2,3,4-Trimethylpentane	Isopropyl Benzene - Cumene	t-2-Butene
2,4-Dimethylpentane	Methylcyclohexane	t-2-Pentene
3-Methylheptane	Methylcyclopentane	Toluene
3-Methylhexane	n-Butane	
Acetylene	n-Decane	