

# Texas Commission on Environmental Quality

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## INTEROFFICE MEMORANDUM

**To:** Georgie Volz, Regional Director  
Heather Ross, Air Section Manager  
TCEQ Region-10 Beaumont  
David Bower, Area Director

**Date:** November 10, 2006

**From:** Darrell D. McCant,  
Toxicology Section, Chief Engineer Office

**Subject:** Health Effects Review of 2005 Data Collected from Ambient Air Network  
Monitoring Sites in Region 10-Beaumont

### Conclusions

- Annual average concentrations for 94 of 96 volatile organic compounds (VOCs) and all 14 metals from particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>) were monitored at levels below health-based screening values, and would not be expected to cause adverse health effects.
- Annual benzene levels exceeded the long-term ESL at two of the seven VOC monitoring sites in Region 10 (Port Arthur City Service Center, and Beaumont Carroll Street Park). These benzene levels are not expected to cause immediate adverse health effects. However, because benzene is a known human carcinogen and the reported annual levels exceed our long-term ESL the City Service Center area and Carroll Street Park area will remain on TCEQ's Air Pollutant Watch List (APWL). The Toxicology Section (TS) continues to encourage efforts to reduce benzene emission in these areas.
- The annual 1,3-butadiene level did not exceed the long-term ESL. In addition, the Port Neches 1225 Merriman Street monitoring site has reported a downward trend since its start in 1996 to the latest 2005 data set. However, 1,3-butadiene will remain on the APWL because TS is in the process of re-evaluating the current 1,3-butadiene long-term screening value using the new ESL derivation process. The TS continues to encourage efforts that will result in reduced 1,3-butadiene emissions in this Port Neches area.

### Background Information

This memorandum conveys the Toxicology Section (TS) evaluation of ambient air sampling conducted at nine monitoring sites in Region 10-Beaumont that reported summary results for 96 different VOCs and 14 metals (PM<sub>2.5</sub>) to TCEQ during 2005. The target analytes are listed in Table 1 and the monitoring sites are summarized in Table 2. All reported analytes were evaluated on a chemical-by-chemical basis. The VOC data were obtained from seven Community Air Toxics Monitoring Network (CATMN) sites that collected 24-hour canister samples every sixth day. 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. All reported VOC and speciated metal (see Table 1) concentrations were compared to their respective [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.

## **Evaluation**

### VOCs

Only 15 to 20 VOCs of the 96 monitored were actually detected over 50% of the time at the seven CATMN sites in the Beaumont region. All but two of the reported annual 24-hour average VOC concentrations were less than their respective long-term screening value. Annual benzene levels at two CATMN sites (Port Arthur City Service Center and the Beaumont Carroll Street Park) exceeded the long-term screening value of 1 part per billion by volume (ppb<sub>v</sub>) for benzene and are discussed below. Also discussed below are reported annual 1,3-butadiene levels in Port Neches warranted further discussion even though they did not exceed the current TCEQ long-term screening level.

#### Benzene

##### *City Service Center and Carroll Street Park*

The Carroll Street Park and the City Service Center CATMN sites both reported an annual benzene concentration of 1.2 ppb<sub>v</sub>. These average benzene concentrations exceeded TCEQ's long-term screening value of 1 ppb<sub>v</sub>. In addition, benzene is one of the constituents monitored in the Huntsman-Port Arthur Aromatic & Olefin Facility's Supplemental Environmental Project which includes two fence-line VOC monitors. One of the fence-line monitors that is less than a quarter of a mile from the nearest neighborhood reported an annual benzene average of 3.2 ppb<sub>v</sub> for 2005 which over three times our annual screening value. *Because benzene is a known human carcinogen and the fact that annual 2005 levels were reported above our annual screening value, it will remain on TCEQ's APWL for areas near the City Service Center and the Carroll Street Park. In addition, TS encourages efforts to reduce benzene emissions in these areas.*

#### 1,3-Butadiene

##### *Port Neches, 1225 Merriman Street*

The annual 1,3-butadiene concentration of 1.4 ppb<sub>v</sub> at the Port Neches, 1225 Merriman Street CATMN site did not exceed TCEQ's current long-term screening value of 5 ppb<sub>v</sub>. Current trend analysis of annual 1,3-butadiene concentrations from 1996 to 2005 indicates that ambient concentrations at the Port Neches monitor, have declined due to cooperative agreements with industries such as Huntsman's C-4 facility and ISP Synthetic Elastomers LP (formerly Ameripol Synpol). The most recent agreement requires Huntsman C-4 to conduct fence-line VOC monitoring at site that is approximately 0.4 mile southeast of the CATMN site. The Huntsman fence-line monitor for 2004 and 2005 has reported annual 1,3-butadiene concentrations of 1.9 and 1.5 ppb<sub>v</sub>, respectively. For the past six years at the Port Neches CATMN site and for the past two years at the Huntsman-sponsored monitoring site reported annual levels were below 5 ppb<sub>v</sub>. The TS is in the process of re-evaluating the current 1,3-butadiene long-term screening value using the new ESL derivation process. *Therefore, despite the downward trend in 1,3-butadiene levels in Port Neches near and on the fence-line of the Huntsman C-4 facility, 1,3-butadiene will remain on the APWL until its current long-term screening value has been updated. TS encourages even further reductions of 1,3-butadiene emissions in the area.*

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### Metals

The annual average concentrations for all speciated metals (Table 1) from the 24-hour PM<sub>2.5</sub> metal samples collected in both Jefferson County (Hamshire, 12552 2<sup>nd</sup> Street) and Orange County (Port Arthur, Mauriceville) in 2005 were less than their respective long-term health-based ESLs. No adverse health effects would be expected from exposure to the measured PM<sub>2.5</sub> metals.

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

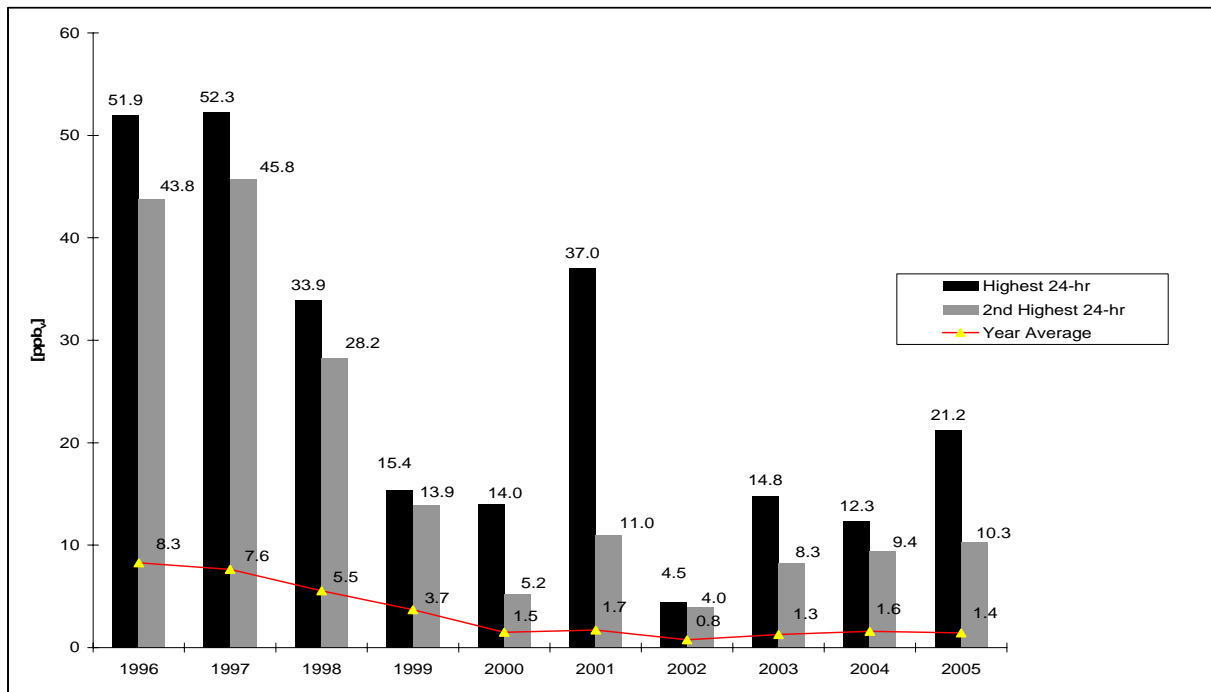
If you have any questions regarding this evaluation, please contact me at (512)-239-4477.

**Table 1: CATMN VOCs and Metals (PM<sub>2.5</sub>)**

CATMN VOCs			Metals (PM <sub>2.5</sub> )
1,1,1-Trichloroethane	4-Methyl-1-Pentene	Toluene	Aluminum
1,1,2,2-Tetrachloroethane	Acetylene	Trichloroethylene	Antimony
1,1,2-Trichloroethane	Benzene	Trichlorofluoromethane	Arsenic
1,1-Dichloroethylene	Bromomethane	Vinyl Chloride	Barium
1,2,3-Trimethylbenzene	Butyl Acetate	c-2-Butene	Cadmium
1,2,4-Trimethylbenzene	Butyraldehyde	c-2-Hexene	Chromium
1,2-Dibromoethane	cis 1,3-Dichloropropylene	c-2-Pentene	Cobalt
1,2-Dichloroethane	Carbon Tetrachloride	Dichlorodifluoromethane	Copper
1,2-Dichloropropane	Chlorobenzene	Isobutyraldehyde	Manganese
1,3,5-Trimethylbenzene	Chloroform	m-Diethylbenzene	Molybdenum
1,3-Butadiene	Chloroprene	m-Ethyltoluene	Nickel
1-Butene	Cyclohexane	Methyl Chloride	Selenium
1-Hexene+2-methyl-1-pentene	Cyclopentane	n-Butane	Tin
1-Pentene	Cyclopentene	n-Decane	Zinc
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	
3-Hexanone	Tetrachloroethylene		
3-Pentanone	Perchloroethylene		

**Table 2: Region 10 Monitoring Sites Evaluated 2005**

County	City and Site Location	EPA Site ID	Monitored Compounds
Jefferson	<a href="#">Beaumont, Lamar University</a>	482450009	VOCs
	<a href="#">Port Arthur, Wheatley Elementary</a>	482450011	VOCs
	<a href="#">Groves, 3355 Grandview Avenue &amp; 32<sup>nd</sup> Street</a>	482450014	VOCs
	<a href="#">Port Neches, 1225 Merriman Street</a>	482450017	VOCs
	<a href="#">Port Arthur, City Service Center</a>	482450019	VOCs
	<a href="#">Beaumont, Carroll Street Park</a>	482450020	VOCs
	<a href="#">Hamshire, 12552 2<sup>nd</sup> Street</a>	482450022	Metals (PM <sub>2.5</sub> )
Orange	<a href="#">West Orange, Police Station</a>	483611001	VOCs
	<a href="#">Port Arthur, Mauriceville</a>	483611100	Metals (PM <sub>2.5</sub> )



**Figure 1: 1,3-butadiene Trend Data at the Port Neches, 1225 Merriman Street Monitor Site**

cc (via email): Casso, Reuben – EPA Region 6  
Prosperie, Susan – Department of State Health Services