

**Allegheny County Health Department
Air Quality Program
04/30/09**

Sto-Rox Elementary and Middle School Sampling Results

Introduction

Air monitoring was conducted inside the Sto-Rox Elementary and Middle Schools by the request of the school district. Concern for the air quality inside of the school was generated by an article recently published by USA Today entitled, Toxic Air and America's Schools. The analysis performed as part of this article ranked Sto-Rox Elementary as 28th worst school for toxic air pollution in the nation out of 128,000 schools. According to the article, dicyclopentadiene (DCPD) is the chemical that drives 95% of the total risk of toxic exposure at this school.

Sampling

For the first sampling effort, air was sampled inside of the elementary school at two locations for 4 days from the dates 2/10/2009 to 2/13/2009. The second sampling effort was conducted on 03/23, 03/25 and 03/27/09. Samples were taken from the same two locations in the elementary school. In addition, a sample was taken from the outside of the elementary school on 03/23/09. During the second effort, sampling was also conducted at the faculty lounge and the library in the middle school building on the same days.

Sampling Methodology

The sampling method utilized SKC brand charcoal tube sampling media. Air was drawn through this tube at a rate of 2 liters per minute for a duration of 8 hours. The samples were all taken during normal school days. After the sample period the tubes were sealed and delivered to the Allegheny County Department of Laboratories for analysis by gas chromatograph. Analysis was performed for not only DCPD but also for BTEX compounds (benzene, ethyl benzene, toluene and xylenes) which are also known to be emitted by nearby industrial and mobile sources.

Outdoor air sampling was performed around the same time as the indoor sampling at existing air monitoring sites in Stowe and Avalon. The Stowe air monitoring site is located on the same side of the river as the Sto-Rox Elementary school and is about one mile to the east of the school. The Stowe monitoring site and the school are each situated at the edge of the hillside facing the industrial area. The Avalon air monitoring site is situated across the river (see Figure 1 for locations of monitoring sites). One outdoor sample was also collected directly outside of the elementary school on 03/23/09 using the same methodology as the indoor sampling. The same type of charcoal tubes were used for the outdoor air monitoring at the monitoring stations, but the flow rate was reduced to 1 liter per minute and each sample operated for 24 hours.

Discussion of Sampling Results

Sampling results showed no detectable concentrations of dicyclopentadiene (DCPD), ethyl benzene or xylenes in any of the indoor school samples. To date, no DCPD has been detected in any outdoor samples collected by the Air Quality Program.

Sampling results show no detectable concentration of benzene in any of the indoor school samples.

- Concentrations of benzene in some samples from the first sampling run were initially thought to be measured at several times higher than outdoor concentrations measured around the same time at the outdoor sampling locations. However upon closer examination of the results, the laboratory discovered interfering compounds that were producing erroneous benzene readings on many of the indoor samples. Eventually the compound was identified as isopropyl alcohol. Trace quantities of this compound caused interference in the analytical technique, making accurate benzene analysis impossible. The library samples from both buildings on 03/23 and from the elementary school library on 02/11 were free of the contaminant and both samples showed no detectable concentration of benzene. The sample taken outside of the elementary school on 03/23 was also free of the contaminant and also showed no detectable benzene concentration.

Measurable concentrations of toluene were found at two locations inside of each school building. Average concentrations were measured at 0.26 ppb in the elementary school and at 0.49 ppb in the middle school. These concentrations are similar to or lower than average concentrations in the ambient air in most parts of Allegheny County. The EPA IRIS Rfc (Reference concentration for chronic inhalation) for toluene is currently listed at 1,300 ppb. **Based on this information, there is no long term health risk associated with the measured concentrations of toluene in either building.**

Indoor Air Assessments

Indoor air assessments were conducted during walk-throughs of both buildings on March 23, 2009 using various instrumental methods. Parameters measured included oxygen, carbon dioxide, carbon monoxide and total volatile organic compounds

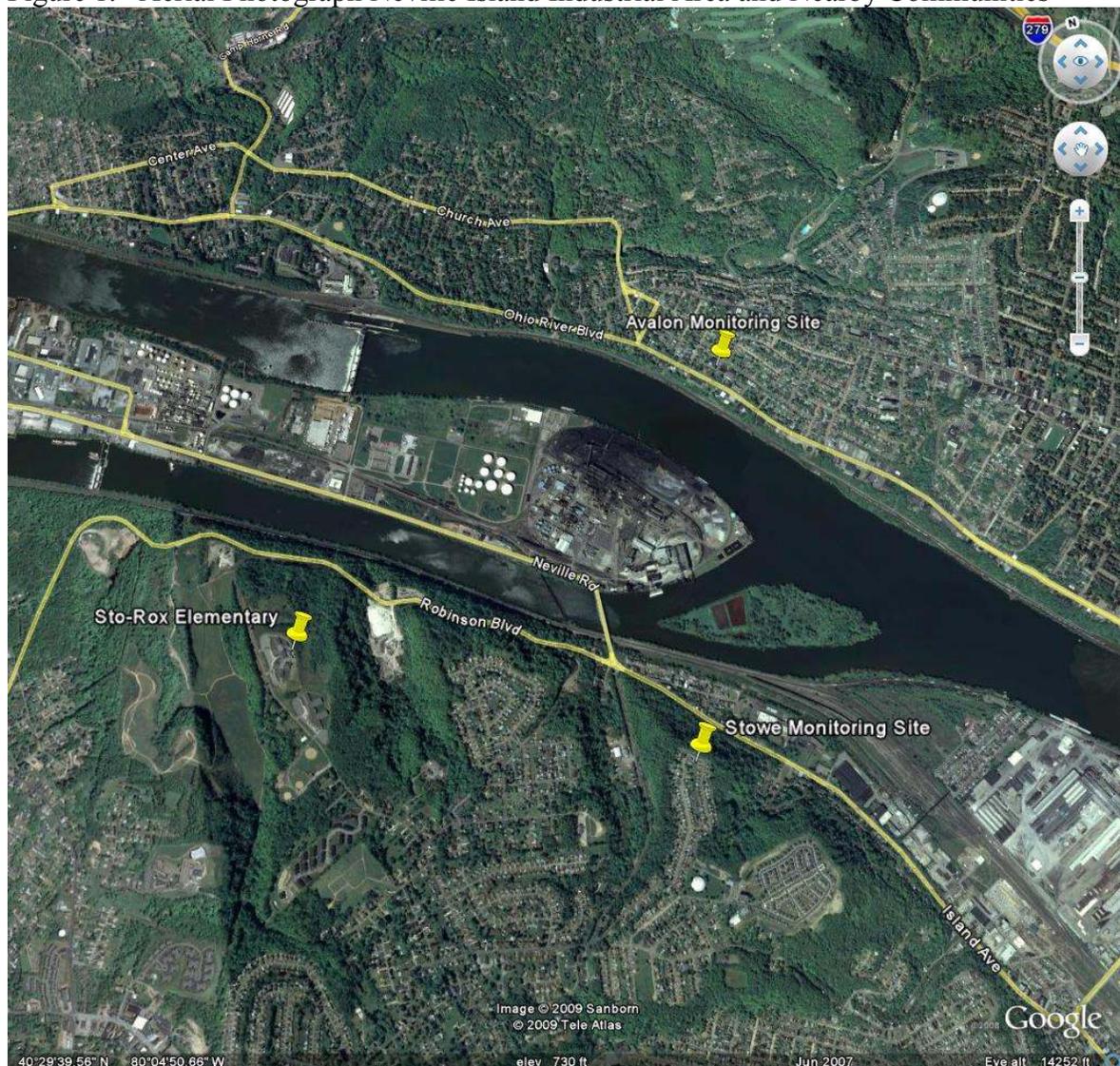
No problems were discovered during the walk-through of the elementary school. Carbon dioxide and oxygen levels were measured at near outside levels at all locations, and there was no detectable carbon monoxide or volatile organic compounds. The building appeared to have adequate ventilation in all locations.

The middle school did not appear to be as well ventilated. While no measureable levels of carbon monoxide or volatile organic compounds were detected and oxygen levels were close to normal, several locations in the building were found to have elevated carbon dioxide readings. Occupied classrooms were higher as a rule, and occupied rooms that had the ventilation systems shut off were the highest. These rooms were seen to have carbon dioxide measurements up to 1350 ppm. The Department routinely recommends increased ventilation when carbon dioxide readings exceed 1000 ppm.

Future Sampling

The outdoor sampling will be continued at the Stowe and Avalon air monitoring sites for at least the next few months to confirm the absence of measurable quantities of DCPD in the ambient air. The Sto-Rox Elementary School has been selected by the EPA for sampling under the new national air toxics initiative. Sampling for coke oven emission related compounds will be conducted outside of the school for a trial period of 90 days. Compounds of interest include benzene, polycyclic aromatic compounds and heavy metals. This sampling is expected to start as soon as late May 2009. The initial phase of this monitoring will last for 60 days.

Figure 1. Aerial Photograph Neville Island Industrial Area and Nearby Communities



Sto-Rox Elementary School charcoal tube indoor sampling results (8 hour samples @ 2 lpm)

Date	Location	Benzene (ppb)	Toluene (ppb)	Ethyl Benzene (ppb)	p-Xylene (ppb)	m-Xylene (ppb)	o-Xylene (ppb)	DCPD (ppb)
2/10/2009	Library	N/D	0.51	<0.10	<0.10	<0.10	<0.11	<0.06
2/11/2009	Library	<0.14	<0.12	<0.10	<0.10	<0.10	<0.11	<0.06
2/12/2009	Library	N/D	<0.12	<0.10	<0.10	<0.10	<0.11	<0.06
2/13/2009	Library	N/D	0.14	<0.10	<0.10	<0.10	<0.11	<0.06
2/11/2009	Faculty Lounge	N/D	<0.12	<0.10	<0.10	<0.10	<0.11	<0.06
2/12/2009	Faculty Lounge	N/D	<0.12	<0.10	<0.10	<0.10	<0.11	<0.06
03/23/09	Library	<0.14	0.25	<0.10	<0.10	<0.10	<0.11	<0.06
03/25/09	Library	N/D	0.44	<0.10	<0.10	<0.10	<0.11	<0.06
03/27/09	Library	N/D	0.61	<0.10	<0.10	<0.10	<0.11	<0.06
03/23/09	Faculty Lounge	N/D	0.46	<0.10	<0.10	<0.10	<0.11	<0.06
03/25/09	Faculty Lounge	N/D	0.24	<0.10	<0.10	<0.10	<0.11	<0.06
03/27/09	Faculty Lounge	N/D	0.54	<0.10	<0.10	<0.10	<0.11	<0.06
03/23/09	Outdoor	<0.14	0.12	<0.10	<0.10	<0.10	<0.11	<0.06

Sto-Rox Middle School charcoal tube indoor sampling results (8 hour samples @ 2 lpm)

Date	Location	Benzene (ppb)	Toluene (ppb)	Ethyl Benzene (ppb)	p-Xylene (ppb)	m-Xylene (ppb)	o-Xylene (ppb)	DCPD (ppb)
3/23/2009	Conference Room	N/D	0.72	<0.10	<0.10	<0.10	<0.10	<0.06
3/25/2009	Conference Room	N/D	0.73	<0.10	<0.10	<0.10	<0.10	<0.06
3/27/2009	Conference Room	N/D	0.27	<0.10	<0.10	<0.10	<0.10	<0.06
3/23/2009	Library	<0.14	0.19	<0.10	<0.10	<0.10	<0.10	<0.06
3/25/2009	Library	N/D	0.39	<0.10	<0.10	<0.10	<0.10	<0.06
3/27/2009	Library	N/D	0.65	<0.10	<0.10	<0.10	<0.10	<0.06

Neville Island Area charcoal tube outdoor sampling results (24 hour samples @ 1 lpm)

Stowe Air Monitoring Station

DATE	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	p-Xylene (ppb)	m-Xylene (ppb)	o-Xylene (ppb)	DCPD (ppb)
01/31/09	<0.09	0.16	<0.07	<0.07	<0.07	<0.07	<0.04
02/12/09	<0.09	<0.08	<0.07	<0.07	<0.07	<0.07	<0.04
02/18/09	0.31	0.32	<0.07	<0.07	<0.07	<0.07	<0.04
02/24/09	0.53	0.43	<0.07	<0.07	<0.07	<0.07	<0.04
03/04/09	<0.09	0.13	<0.07	<0.07	<0.07	<0.07	<0.04
03/08/09	0.49	0.35	<0.07	<0.07	<0.07	<0.07	<0.04
03/14/09	0.63	0.41	<0.07	<0.07	<0.07	<0.07	<0.04
03/20/09	0.22	0.15	<0.07	<0.07	<0.07	<0.07	<0.04
03/26/09	0.30	0.41	<0.07	<0.07	<0.07	<0.07	<0.04
04/01/09	0.44	0.18	<0.07	<0.07	<0.07	<0.07	<0.04

Avalon Air Monitoring Station

DATE	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	p-Xylene (ppb)	m-Xylene (ppb)	o-Xylene (ppb)	DCPD (ppb)
01/31/09	2.37	0.38	<0.07	<0.07	<0.07	<0.07	<0.04
02/06/09	1.66	0.88	<0.07	<0.07	<0.07	<0.07	<0.04
02/18/09	0.47	1.06	<0.07	<0.07	<0.07	<0.07	<0.04
02/24/09	0.53	0.60	0.20	<0.07	<0.07	<0.07	<0.04
03/04/09	<0.09	0.10	<0.07	<0.07	<0.07	<0.07	<0.04
03/08/09	0.49	0.73	<0.07	<0.07	0.22	<0.07	<0.04
03/14/09	0.63	0.58	<0.07	<0.07	<0.07	<0.07	<0.04
03/20/09	0.22	0.32	<0.07	<0.07	<0.07	<0.07	<0.04
03/26/09	0.30	0.63	<0.07	<0.07	0.20	<0.07	<0.04
04/01/09	0.44	0.48	<0.07	<0.07	<0.07	<0.07	<0.04

Allegheny County SUMMA Canister Benzene Results (24 hour samples)

Location	Benzene ppb (2006 Average)	Benzene ppb (2006 Max)	Benzene ppb (2007 Average)	Benzene ppb (2007 Max)
Stowe Twp.	0.52	2.27	0.73	3.63
Avalon	0.73	3.49	0.71	2.64
Flag Plaza (Downtown Pittsburgh)	0.42	1.51	0.41	1.02
South Fayette (Background Site)	0.33	3.03	0.28	0.80

Allegheny County SUMMA Canister Toluene Results (24 hour samples)

Location	Toluene ppb (2006 Average)	Toluene ppb (2006 Max)	Toluene ppb (2007 Average)	Toluene ppb (2007 Max)
Stowe Twp.	0.68	1.87	0.58	2.12
Avalon	0.98	2.84	0.81	1.83
Flag Plaza (Downtown Pittsburgh)	0.85	8.23	0.68	2.11
South Fayette (Background Site)	0.51	3.94	0.39	2.46