



April 1, 2011

Mr. Ken Meyer
Director of Risk Management
Environmental Health & Safety
Minneapolis Public Schools
807 NE Broadway
Minneapolis, Minnesota 55413

ARS Report No. 1118-031811

Dear Mr. Meyer:

ARS Environmental Health, Inc. performed an industrial hygiene assessment in the Records Department at the Minneapolis Public Schools offices at 807 NE Broadway on March 18, 2011. The purpose of this assessment was to allow the Risk Management Department to assess health risks associated with employee exposure to airborne chemicals in the area. This assessment was performed in accordance with the scope of work presented in ARS Proposal No.11-08. This proposal was accepted in writing on March 10, 2011.

SUMMARY

Analyses for mercury, radon, and 63 VOCs from the EPA TO-15 analysis showed all concentrations to be below the analytical limits of quantification: no airborne contaminants were found.

FINDINGS and OBSERVATIONS

Air samples for mercury, radon, and a standard list of 63 volatile organic chemicals (VOCs) were collected in the Records Department in the basement of the Minneapolis Public Schools offices at 807 NE Broadway. An air sample for VOCs was collected in the central parking courtyard of the office building.

Mercury

No mercury was found in either of the two samples place in the Records Department (see Table I). The limit of quantification (LOQ) for mercury was about 0.002 mg/m³. This may be compared with the Threshold Limit Value (TLV) adopted by the American Conference of Governmental Industrial Hygienists (ACGIH) of 0.025 mg/m³. Samples for mercury were collected because of the possibility that fluorescent bulbs were manufactured in the building before it was purchased by the Minneapolis School District.



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Radon

No radon was found in the canister placed in the Records Department (see Table I). The LOQ for radon was 1 picocurie/liter (pCi/L) and the EPA limit is 4 pCi/L. The sample for radon was collected because of general concerns about the potential for radon to be present in basements. The canister was left over a weekend when we would have expected less air movement in the area and so radon levels would have been more likely to build.

Total VOCs

No VOCs were found in the Records Department or in the parking courtyard of the office building (Table II). The midmorning outdoor temperature on March 18 was about 32°F and so we were not too surprised that no VOCs were present in the courtyard.

Analysis was run for 63 different VOCs. The LOQs for these chemicals were generally 5 parts per billion (ppb) with two LOQs at 10 ppb and 3 LOQs at 20 ppb. Occupational exposure limits for these 63 materials were generally 1,000x to 10,000x higher than the LOQ for the respective materials.

ARS lists, at MPS' request, the most conservative of the available OELs used in the United States. That is generally the TLV rather than the PEL. There were several chemicals for which no OEL could be found.

STANDARDS AND GUIDELINES

The exposure standards and guidelines used to evaluate the data generated during this assessment were taken from the following sources:

- American Conference of Governmental Industrial Hygienists 2010 TLV Booklet
- *Minnesota Statute 182*, Chapter 5205.0010 adopts the Federal OSHA Z-Table and the "Appendix G of the NIOSH Pocket Guide"
- American Industrial Hygiene Association 2010 Workplace Environmental Exposure Limit list.



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Compound	TLV (ppb) ^a	PEL	WEEL
Mercury	0.025 mg/m ³	--	--
Radon (EPA Value)	4 pCi/L		
Propylene	500,000	--	--
Freon-12	1,000,000	--	--
Chloromethane	50,000	--	--
Freon-114	1,000,000	--	--
Vinyl Chloride	1,000	--	--
1,3-Butadiene	--	1,000 ^c	--
Bromomethane	1,000	--	--
Chloroethane	100,000	--	--
Vinyl Bromide	500	--	--
Freon 11	1,000,000	--	--
Isopropyl Alcohol	100,000	--	--
Acetone	500,000	--	--
1,1-Dichloroethene	5,000	--	--
Methylene Chloride	--	25,000 ^c	--
Freon 113	1,000,000	--	--
Allyl Chloride	1,000	--	--
Carbon Disulfide	1,000	--	--
Trans-1,2-Dichloroethene	5,000	--	--
Methyl Tert-Butyl Ether	--	--	--
1,1-Dichloroethane	100,000	--	--
Vinyl Acetate	10,000	--	--



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Compound	TLV (ppb) ^a	PEL	WEEL
Methyl Ethyl Ketone	200,000	--	--
cis-1,2-Dichloroethylene	5,000	--	--
Hexane	50,000	--	--
Ethyl Acetate	400,000	--	--
Chloroform	10,000	--	--
Tetrahydrofuran	50,000	--	--
1,2-Dichloroethane	100,000	--	--
1,1,1-Trichloroethane	350,000	--	--
Cyclohexane	100,000	--	--
Carbon Tetrachloride	5,000	--	--
Benzene	500	--	--
1,4-Dioxane	20,000	--	--
2,2,4-Trimethylpentene	--	--	300,000 ^d
Heptane	400,000	--	--
1,2-Dichloropropane	10,000	--	--
Trichloroethylene	10,000	--	--
Bromodichloromethane	--	--	--
cis-1,3-Dichloropropene	1,000	--	--
trans-1,3-Dichloropropene	1,000	--	--
1,1,2-Trichloroethane	10,000	--	--
Toluene	20,000	--	--
Dibromochloromethane	--	--	--
Methyl Isobutyl Ketone	20,000	--	--



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Compound	TLV (ppb) ^a	PEL	WEEL
Methyl Butyl Ketone	5,000	--	--
1,2-Dibromoethane	--	20,000 ^c	--
Tetrachloroethylene	25,000	--	--
Chlorobenzene	10,000	--	--
Ethylbenzene	100,000	--	--
Bromoform	500	--	--
m & p-xylene	100,000	--	--
Styrene	20,000	--	--
o-xylene	100,000	--	--
1,1,2,2-Tetrachloroethane	1,000	--	--
4-Ethyltoluene	--	--	--
1,3,5-Trimethylbenzene	25,000	--	--
1,2,4-Trimethylbenzene	25,000	--	--
1,3-Dichlorobenzene	--	--	--
Benzyl Chloride	1,000	--	--
1,4-Dichlorobenzene	10,000	--	--
1,2-Dichlorobenzene	25,000	--	--

SAMPLING AND ANALYTICAL METHODS

Low flow sampling pumps used to collect mercury vapors were calibrated before and after the assessment. The radon canister was weighed at the lab before and after the assessment. A vacuum was drawn on the Mini-Cans before they were shipped to ARS.

Sampling media and analytical methods follow:



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Mercury Vapor - SKC 226-17-1A sorbent tubes. OSHA 140 digestion followed by ICP/MS using a modified OSHA Method 140.

Radon - Standard Radon Charcoal Cartridge. Gamma spectroscopy was performed using EPA Method 5205-87-005

VOCs - Evacuated Mini-Cans. GC/MS using a modified OSHA PV2120/EPA TO-15

Report Prepared by:

A handwritten signature in black ink, appearing to read "David S. Abrams", written in a cursive style.

David S. Abrams, CIH
ARS Environmental Health, Inc.



Table I

**Airborne Concentrations
Mercury and Radon
Records Department
Minneapolis Public Schools
807 NE Broadway
Minneapolis, Minnesota**

March 18, 2011

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Sample Number	Description	Sample Time (Start - Stop)	Sample Duration (Min)	Radon pCi/L ^a	Mercury mg/m ³ ^b
32476	On Top of Shelf in NE Corner of Supply, Copier and Shredder Area	7:42 (3/18/11) - 11:25 (3/21/11)		<1.0	--
031811-01	Area: Filing Cabinet by Dolphin Picture	7:25 - 11:25	240	--	<0.0020
031811-02	Area: Phone Table by Copy Machine, 2 nd Pillar from North Wall	7:15 - 11:25	240	--	<0.0019
US EPA Indoor Air Limit				4.0	--
ACGIH TLV: 8 Hour Average				--	0.025

a - picocuries per liter of air

b - milligrams of contaminant per cubic meter of air

c - below analytical limit of quantification: none was found

Radon analysis by gamma spectroscopy using EPA Method 5205-87-005

Mercury analysis by ICP/MS using a modified OSHA Method 140

All analyses by the Travelers' Industrial Hygiene Laboratory which is accredited by the American Industrial Hygiene Association.



Table II

Airborne Concentrations
Volatile Organic Compounds
Records Department
Minneapolis Public Schools
807 NE Broadway
Minneapolis, Minnesota

March 18, 2011

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Compound	<u>Observed Concentration (ppb)</u>		TLV (ppb) ^a
	Records Parking	Room Central	
Propylene	< 5.0 ^b	< 5.0 ^b	500,000
Freon-12	< 5.0 ^b	< 5.0 ^b	1,000,000
Chloromethane	< 5.0 ^b	< 5.0 ^b	50,000
Freon-114	< 5.0 ^b	< 5.0 ^b	1,000,000
Vinyl Chloride	< 5.0 ^b	< 5.0 ^b	1,000
1,3-Butadiene	< 5.0 ^b	< 5.0 ^b	1,000 ^c
Bromomethane	< 5.0 ^b	< 5.0 ^b	1,000
Chloroethane	< 5.0 ^b	< 5.0 ^b	100,000
Vinyl Bromide	< 5.0 ^b	< 5.0 ^b	500
Freon 11	< 5.0 ^b	< 5.0 ^b	1,000,000
Isopropyl Alcohol	< 5.0 ^b	< 5.0 ^b	100,000
Acetone	< 5.0 ^b	< 5.0 ^b	500,000
1,1-Dichloroethene	< 5.0 ^b	< 5.0 ^b	5,000
Methylene Chloride	< 5.0 ^b	< 5.0 ^b	25,000 ^c
Freon 113	< 5.0 ^b	< 5.0 ^b	1,000,000
Allyl Chloride	< 5.0 ^b	< 5.0 ^b	1,000
Carbon Disulfide	< 10.0 ^b	< 10.0 ^b	1,000
Trans-1,2-Dichloroethene	< 5.0 ^b	< 5.0 ^b	5,000
Methyl Tert-Butyl Ether	< 5.0 ^b	< 5.0 ^b	--
1,1-Dichloroethane	< 5.0 ^b	< 5.0 ^b	100,000
Vinyl Acetate	< 5.0 ^b	< 5.0 ^b	10,000



Compound	Observed Concentration (ppb)		TLV (ppb) ^a
	Records Parking	Room Central	
Methyl Ethyl Ketone	< 5.0 ^b	< 5.0 ^b	200,000
cis-1,2-Dichloroethylene	< 5.0 ^b	< 5.0 ^b	5,000
Hexane	< 5.0 ^b	< 5.0 ^b	50,000
Ethyl Acetate	< 5.0 ^b	< 5.0 ^b	400,000
Chloroform	< 5.0 ^b	< 5.0 ^b	10,000
Tetrahydrofuran	< 5.0 ^b	< 5.0 ^b	50,000
1,2-Dichloroethane	< 5.0 ^b	< 5.0 ^b	100,000
1,1,1-Trichloroethane	< 5.0 ^b	< 5.0 ^b	350,000
Cyclohexane	< 5.0 ^b	< 5.0 ^b	100,000
Carbon Tetrachloride	< 5.0 ^b	< 5.0 ^b	5,000
Benzene	< 5.0 ^b	< 5.0 ^b	500
1,4-Dioxane	< 20 ^b	< 20 ^b	20,000
2,2,4-Trimethylpentene	< 5.0 ^b	< 5.0 ^b	300,000 ^d
Heptane	< 5.0 ^b	< 5.0 ^b	400,000
1,2-Dichloropropane	< 5.0 ^b	< 5.0 ^b	10,000
Trichloroethylene	< 5.0 ^b	< 5.0 ^b	10,000
Bromodichloromethane	< 5.0 ^b	< 5.0 ^b	--
cis-1,3-Dichloropropene	< 5.0 ^b	< 5.0 ^b	1,000
trans-1,3-Dichloropropene	< 5.0 ^b	< 5.0 ^b	1,000
1,1,2-Trichloroethane	< 5.0 ^b	< 5.0 ^b	10,000
Toluene	< 5.0 ^b	< 5.0 ^b	20,000
Dibromochloromethane	< 5.0 ^b	< 5.0 ^b	--
Methyl Isobutyl Ketone	< 20 ^b	< 20 ^b	20,000
Methyl Butyl Ketone	< 20 ^b	< 20 ^b	5,000
1,2-Dibromoethane	< 5.0 ^b	< 5.0 ^b	20,000 ^c



Compound	Observed Concentration (ppb)		TLV (ppb) ^a
	Records Parking	Room Central	
Tetrachloroethylene	< 5.0 ^b	< 5.0 ^b	25,000
Chlorobenzene	< 5.0 ^b	< 5.0 ^b	10,000
Ethylbenzene	< 5.0 ^b	< 5.0 ^b	100,000
Bromoform	< 5.0 ^b	< 5.0 ^b	500
m & p-xylene	< 10 ^b	< 10 ^b	100,000
Styrene	< 5.0 ^b	< 5.0 ^b	20,000
o-xylene	< 5.0 ^b	< 5.0 ^b	100,000
1,1,2,2-Tetrachloroethane	< 5.0 ^b	< 5.0 ^b	1,000
4-Ethyltoluene	< 5.0 ^b	< 5.0 ^b	--
1,3,5-Trimethylbenzene	< 5.0 ^b	< 5.0 ^b	25,000
1,2,4-Trimethylbenzene	< 5.0 ^b	< 5.0 ^b	25,000
1,3-Dichlorobenzene	< 5.0 ^b	< 5.0 ^b	--
Benzyl Chloride	< 5.0 ^b	< 5.0 ^b	1,000
1,4-Dichlorobenzene	< 5.0 ^b	< 5.0 ^b	10,000
1,2-Dichlorobenzene	< 5.0 ^b	< 5.0 ^b	25,000

All OEL values, unless otherwise stated, are from the 2010 TLV Booklet published by the American Conference of Governmental Industrial Hygienists.

- a - parts of contaminant per billion parts of air on a volume per volume basis
- b - below analytical limit of quantification: none was found
- c - OSHA PEL
- d - AIHA WEEL

Samples collected in Mini Suma Canisters.

Analysis by GC/MS using a modified OSHA Method PV2120/EPA method TO15 by Galson Laboratories which is accredited by the American Industrial Hygiene Association.