Toxicological Review of 2003 Air Toxics Data from Nashville MSA

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Background

- **Data from 2003 UATMP**
- **“…designed to characterize the magnitude and composition of potentially toxic air pollution…”**

Background

- **2 sites in Nashville –EATN and LOTN**
- **VOCs, COs, and Metals analyzed**
- **Metals not included until data verification**

Sites

- ***EATN*** **– This site is located on the roof of East Health Center, north of the city (predominantly downwind). It is a population oriented site predominantly influenced by commercial and mobile sources**

Sites

- ***LOTN*** **– This site is located on the roof of Lockland School in the heart of downtown Nashville. It is also a population oriented site influenced predominantly by commercial and mobile sources**

Objectives

- **Health effects evaluation**
- **Analyze compound-specific spatial and temporal trends**
- **ID emission sources**

Health Effect Evaluation

Background

- **Average and highest concentrations were normalized using URE for cancer and RfC for noncancer compounds when available**

- **Prevalent compounds defined as those whose average cancer or noncancer toxicity contributes to the top 95% of total toxicity weighting score at a site**

Noncancer risk Evaluation

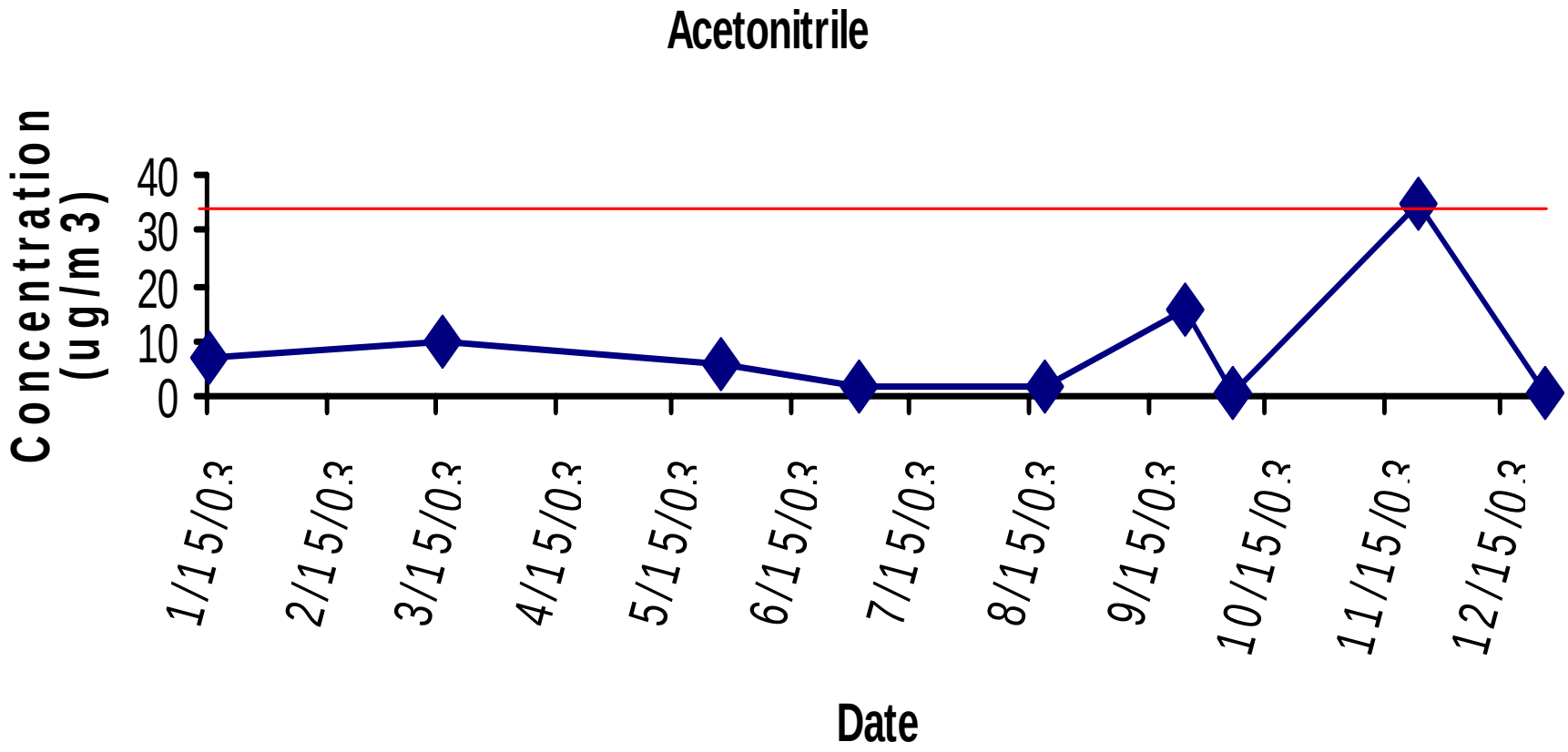
- **Compare average and maximum values of detected compounds to suggested chronic screening levels**
- **For chemicals that fail screening level test, % of detections at and above these levels were determined**

Prevalent Compounds - LOTN

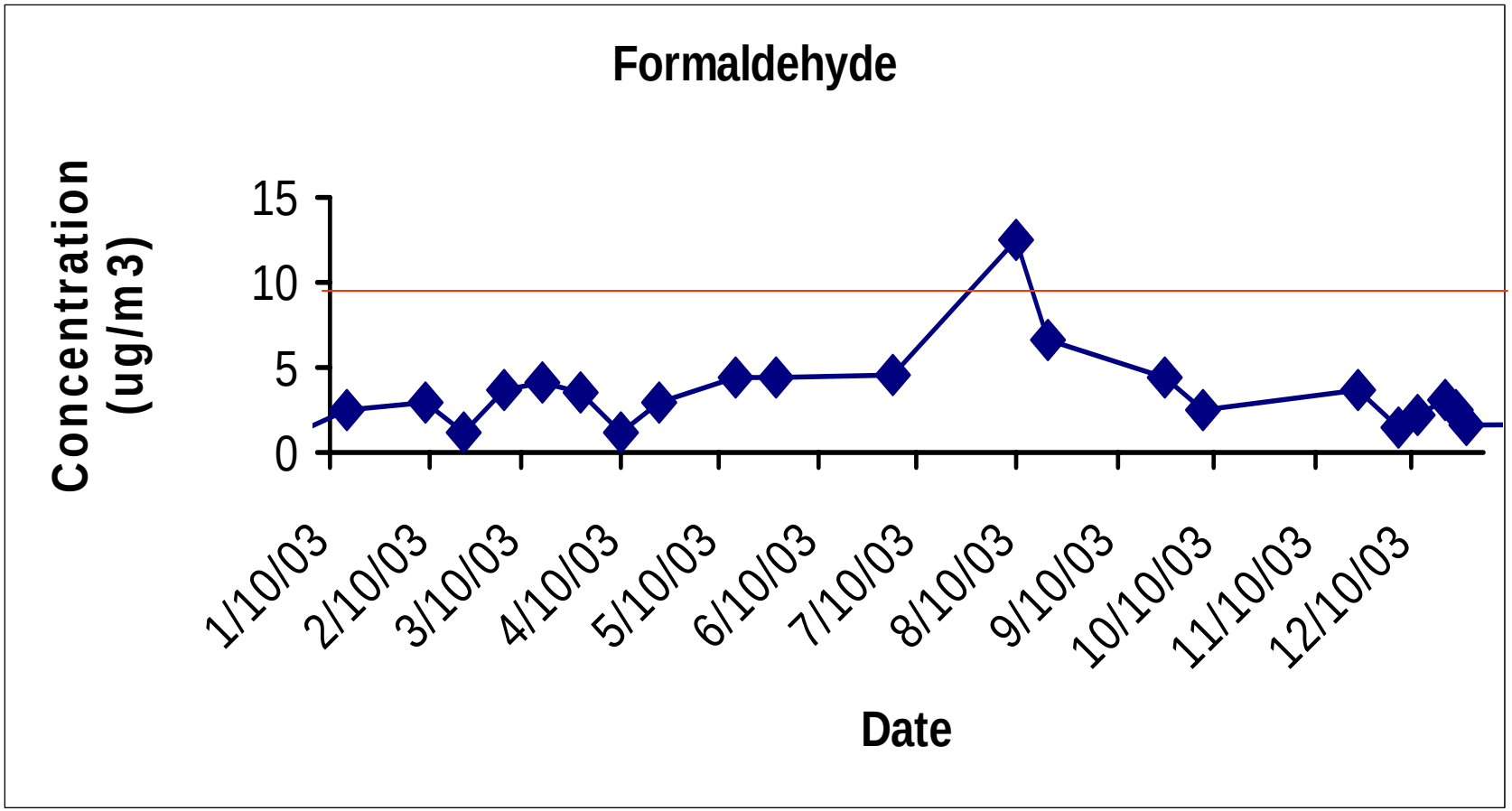
Compound	RfC* (µg/m³)	Source	Average Conc. (µg/m³)	Highest Conc. (µg/m³)	Adverse Noncancer Conc.
Acetonitrile	34	TX ESL	29.235	215.4	1
Formaldehyde	9.8	ATSDR	3.531	12.50	1
Acetaldehyde	9	Iris	1.477	2.69	0
1,3-Butadiene	2	Iris	0.257	0.42	0
Xylenes (o-, m-, p-)	100	Iris	4.887	29.53	0
Benzene	3	TX ESL	1.342	3.42	1
Methyl Bromide	5	Iris	0.094	0.11	0

* EPA RfCs or similar values from other agencies

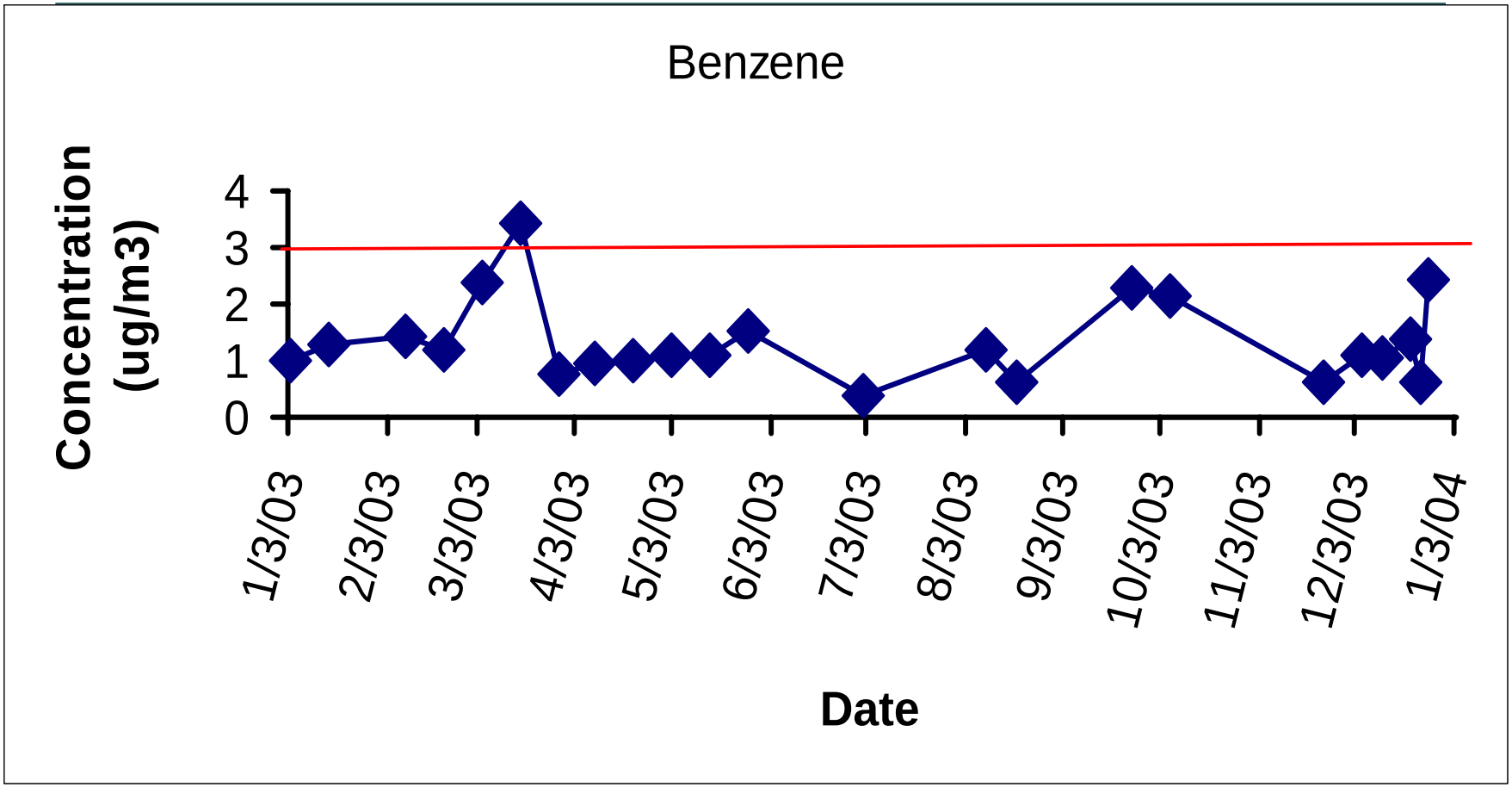
LOTN


Acetonitrile
Concentration (ug/m3)
40
30
20
10
0
1/15/03
2/15/03
3/15/03
4/15/03
5/15/03
6/15/03
7/15/03
8/15/03
9/15/03
10/15/03
11/15/03
12/15/03
Date

LOTN


Formaldehyde
Concentration (ug/m3)
15
10
5
0
1/10/03
2/10/03
3/10/03
4/10/03
5/10/03
6/10/03
7/10/03
8/10/03
9/10/03
10/10/03
11/10/03
12/10/03
Date

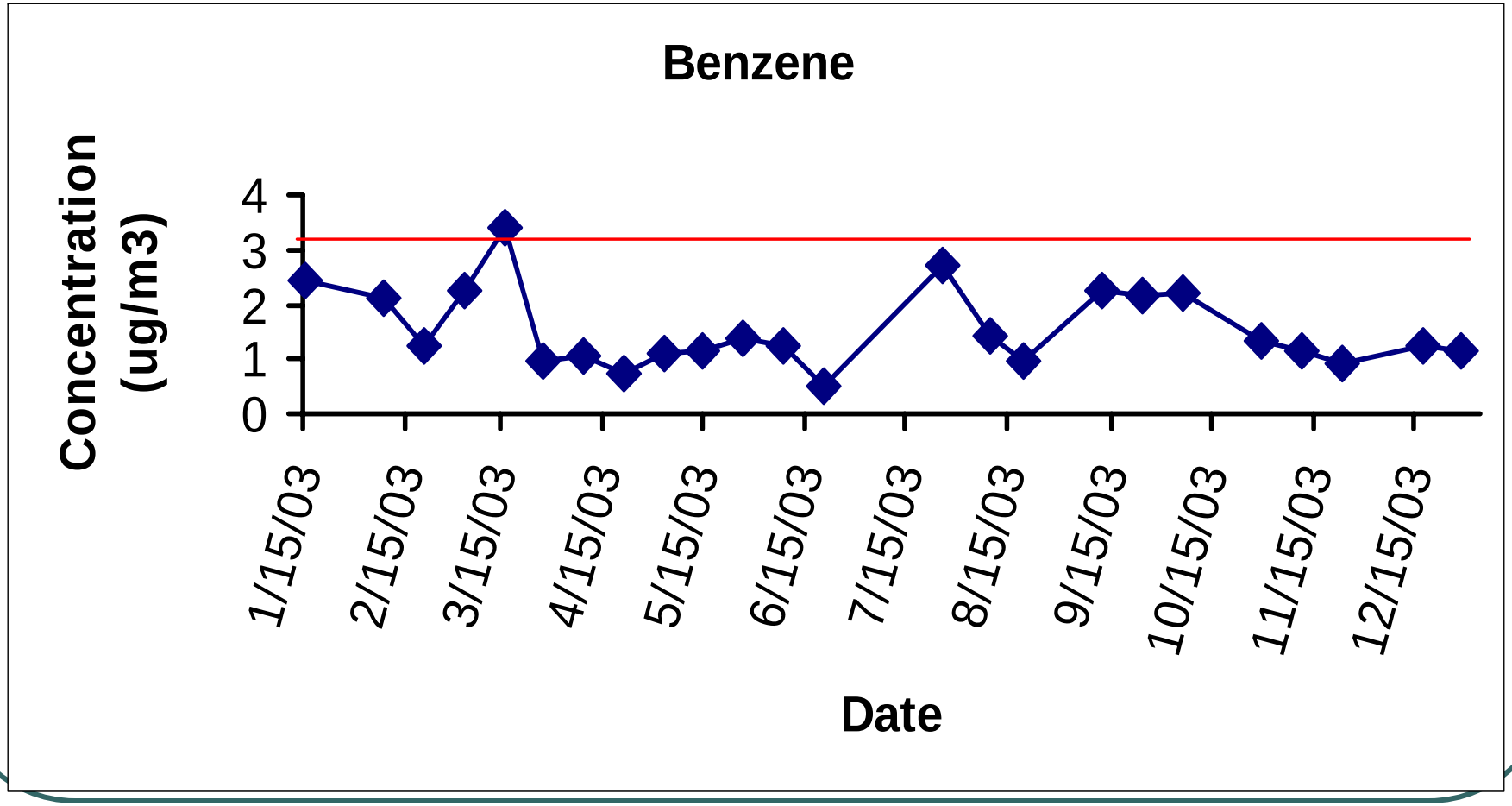
LOTN


Benzene
Concentration (ug/m3)
0
1
2
3
4
1/3/03
2/3/03
3/3/03
4/3/03
5/3/03
6/3/03
7/3/03
8/3/03
9/3/03
10/3/03
11/3/03
12/3/03
1/3/04
Date

Prevalent Compounds - EATN

Compound	RfC* (µg/m^3)	Source	Average Conc. (µg/m^3)	Highest Conc. (µg/m^3)	Adverse Noncancer Conc.
Formaldehyde	9.8	ATSDR	3.586	6.90	0
Acetaldehyde	9	Iris	1.678	2.69	0
Acetonitrile	34	TX ESL	8.192	16.18	0
1,3-Butadiene	2	Iris	0.200	0.38	0
Benzene	3	TX ESL	1.527	3.39	1
Xylenes (o-, m-, p-)	100	Iris	4.623	11.85	0
Methyl Bromide	5	Iris	0.198	0.62	0

EATN


Benzene
Concentration (ug/m3)
4
3
2
1
0
1/15/03
2/15/03
3/15/03
4/15/03
5/15/03
6/15/03
7/15/03
8/15/03
9/15/03
10/15/03
11/15/03
12/15/03
Date

Cancer risk Evaluation

- Unit Risk Estimate used to normalize average and highest measured concentration

Cancer Risk Evaluation - EATN

Compound	Cancer URE	Cancer risk (avg conc.) (1×10^{-6})	Cancer risk (highest conc.) (1×10^{-6})
Benzene	7.80×10^{-6}	11.93	26.44
Carbon Tetrachloride	1.50×10^{-5}	7.94	14.10
1,3-Butadiene	3.00×10^{-5}	6.00	11.40
Acetaldehyde	2.20×10^{-6}	3.69	5.92
Tetrachloroethylene	5.90×10^{-6}	2.86	11.21
p-Dichlorobenzene	1.10×10^{-5}	1.80	2.64
Methylene Chloride	4.70×10^{-7}	0.20	0.31
Trichloroethylene	2.00×10^{-6}	0.02	0.22
Formaldehyde	5.50×10^{-9}	0.02	0.04