Overview on Alternative Asbestos Control Method Research and NESHAP Comparison

EIA 2009 Keynote Presentation

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History of AACM Method

- City of Fort Worth XL Project – 1997 – expanded use of emergency provision of Asbestos NESHAP for substandard structures – Phased approach
- Cow Town Inn – City of Fort Worth withdrew XL submittal – 2003
- EPA Region 6 and ORD continued dialogue for next steps – development of Alternative Asbestos Control Method Research

“Wet Method not AACM”

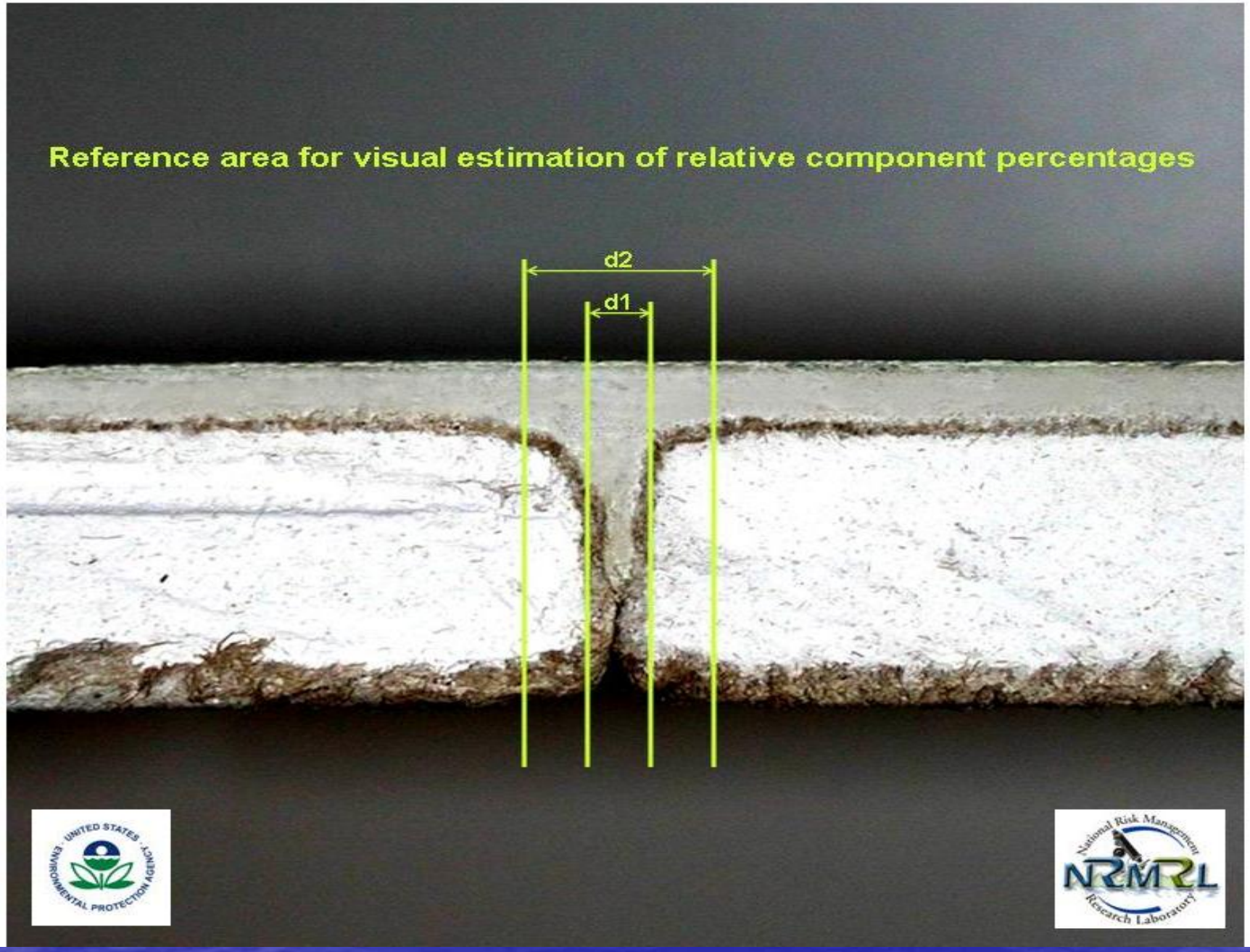
The AACM is not the “Wet Method or Fort Worth Method or the St Louis Airport Method”

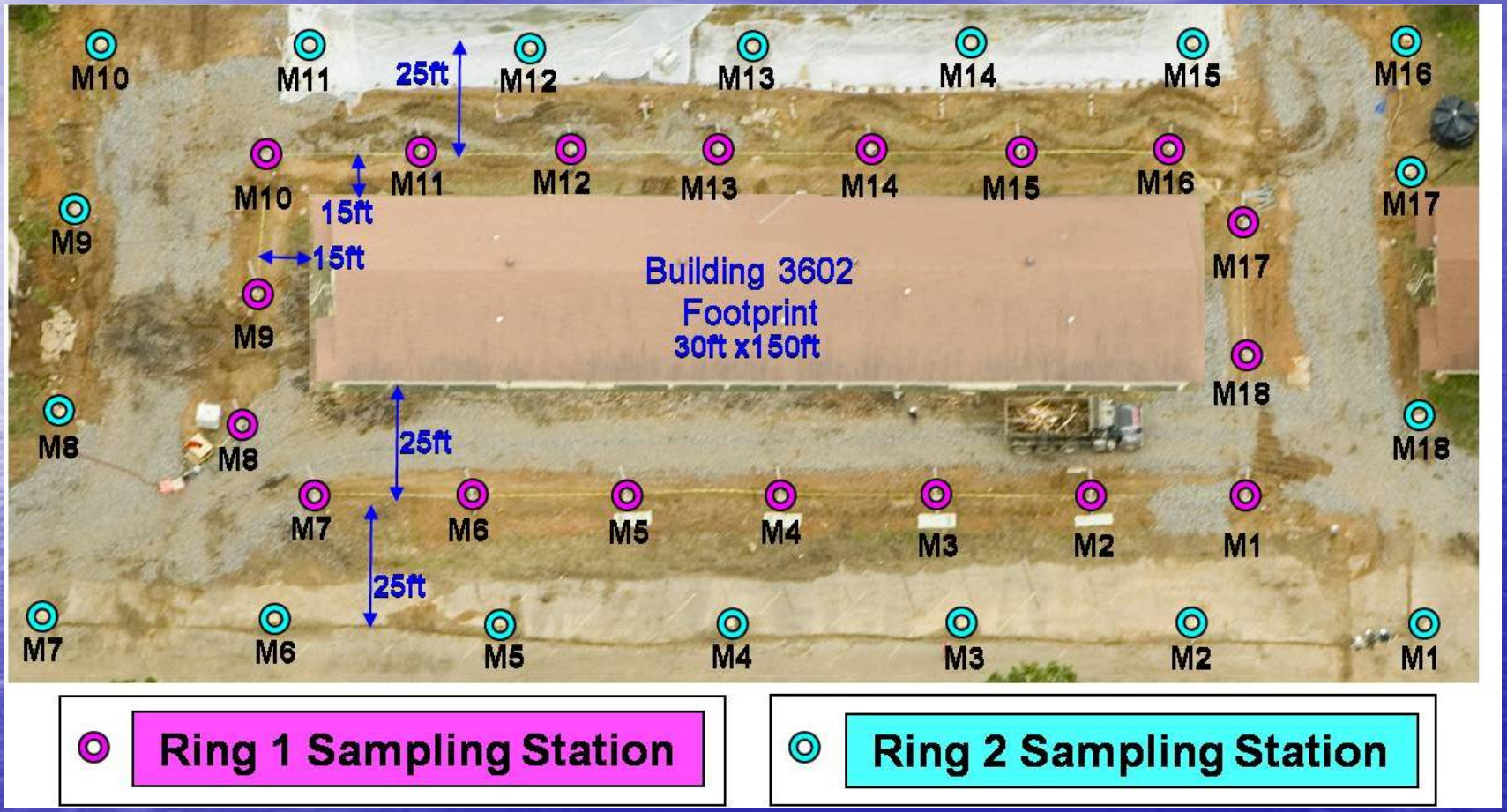
- Emergency Provision of Asbestos NESHAP – Provides owners of structures in “imminent danger of collapse” use of water, all asbestos remains, during demolition with notice to State

AACM1

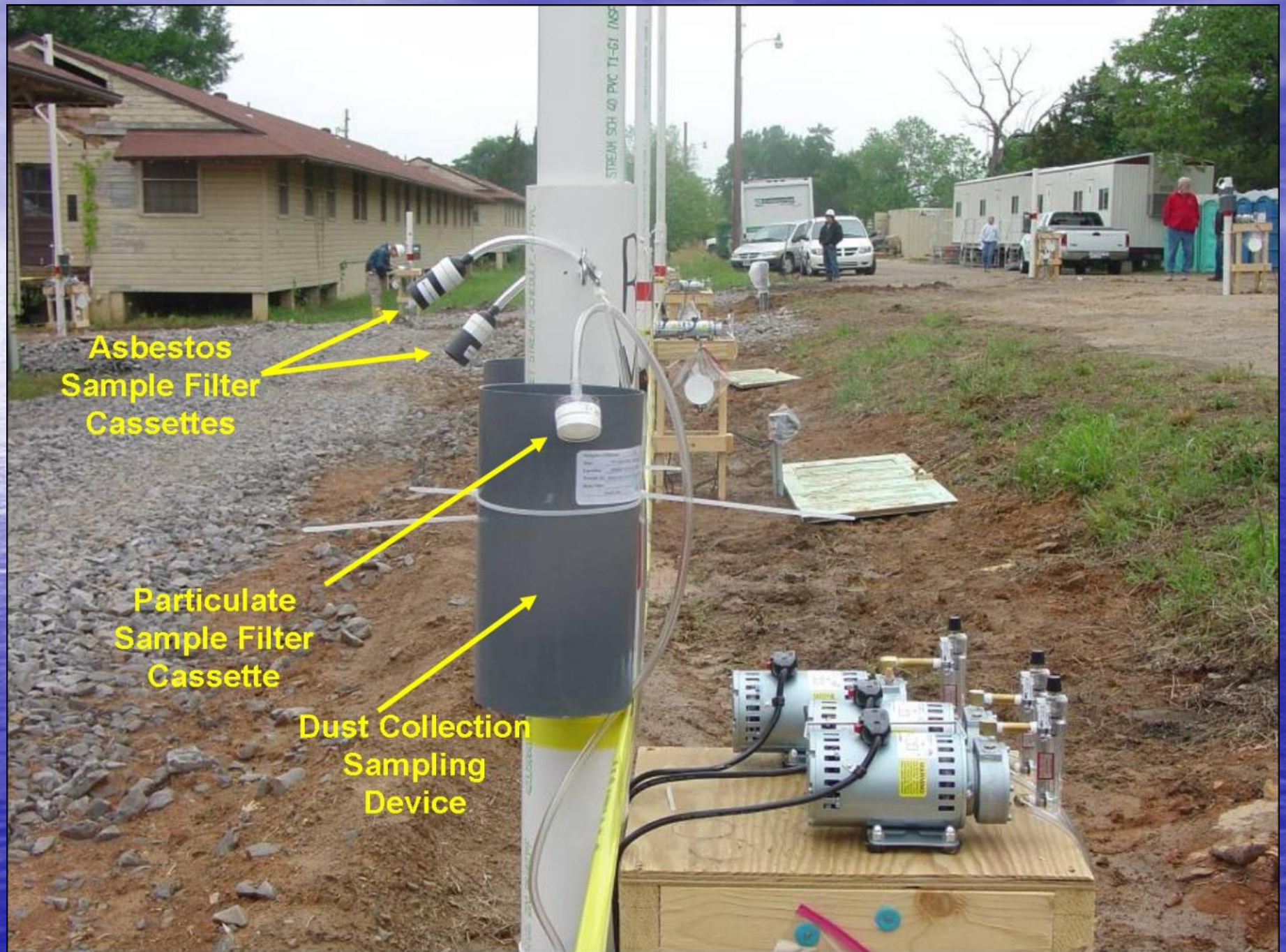
- Fort Chaffee, AR
- Identical buildings (one by AACM other by NESHAP)
- Positive Asbestos wall systems and VAT
- Soil

AACM
NESHAP


Reference area for visual estimation of relative component percentages
d2
d1

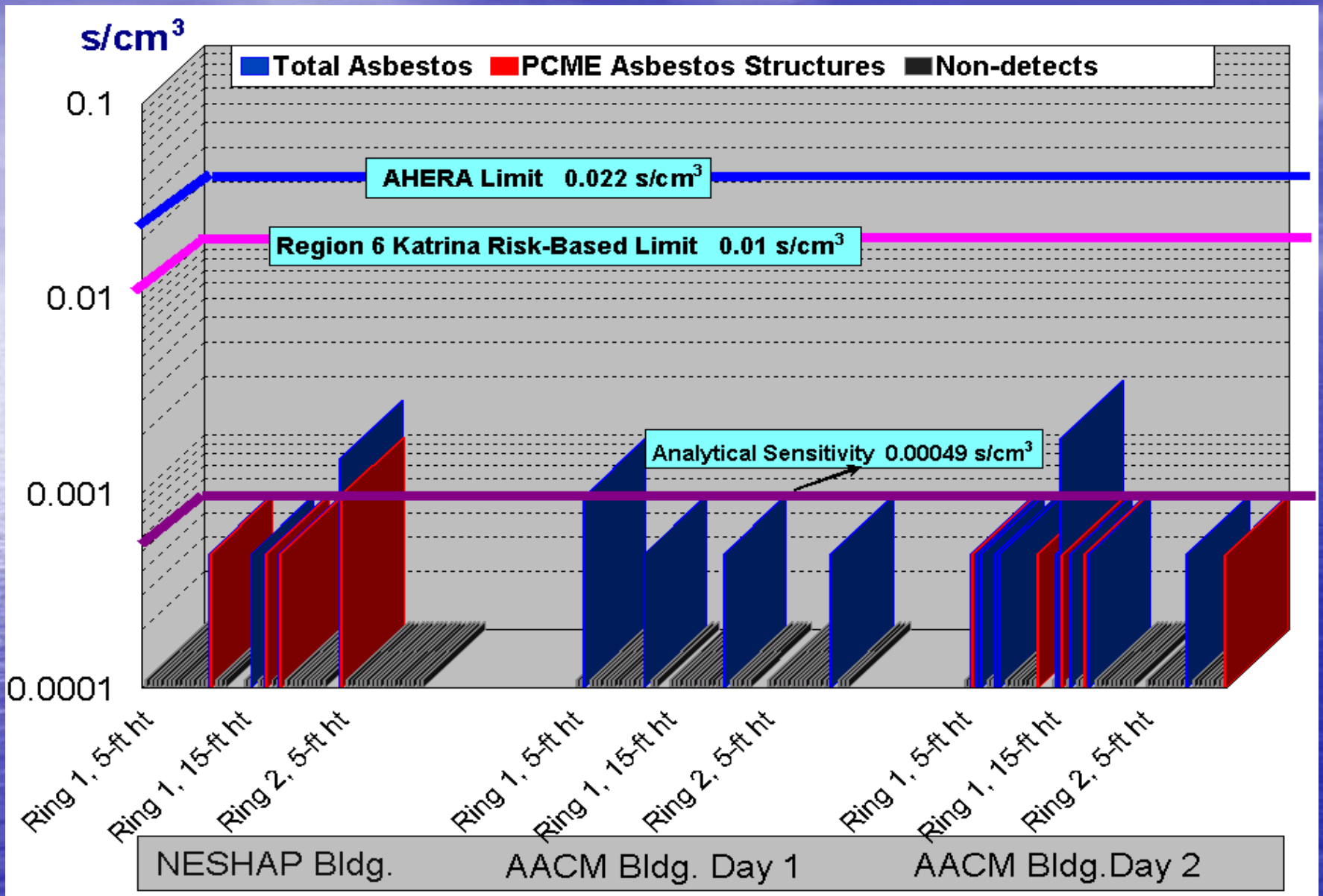

M10
M11
25ft
M12
M13
M14
M15
M16
M10
M11
M12
M13
M14
M15
M16
M17
M9
15ft
15ft
M17
Building 3602
Footprint
30ft x150ft
M9
M18
M8
M8
25ft
M18
M7
M6
M5
M4
M3
M2
M1
25ft
M7
M6
M5
M4
M3
M2
M1
Ring 1 Sampling Station
Ring 2 Sampling Station

APR 13 2008

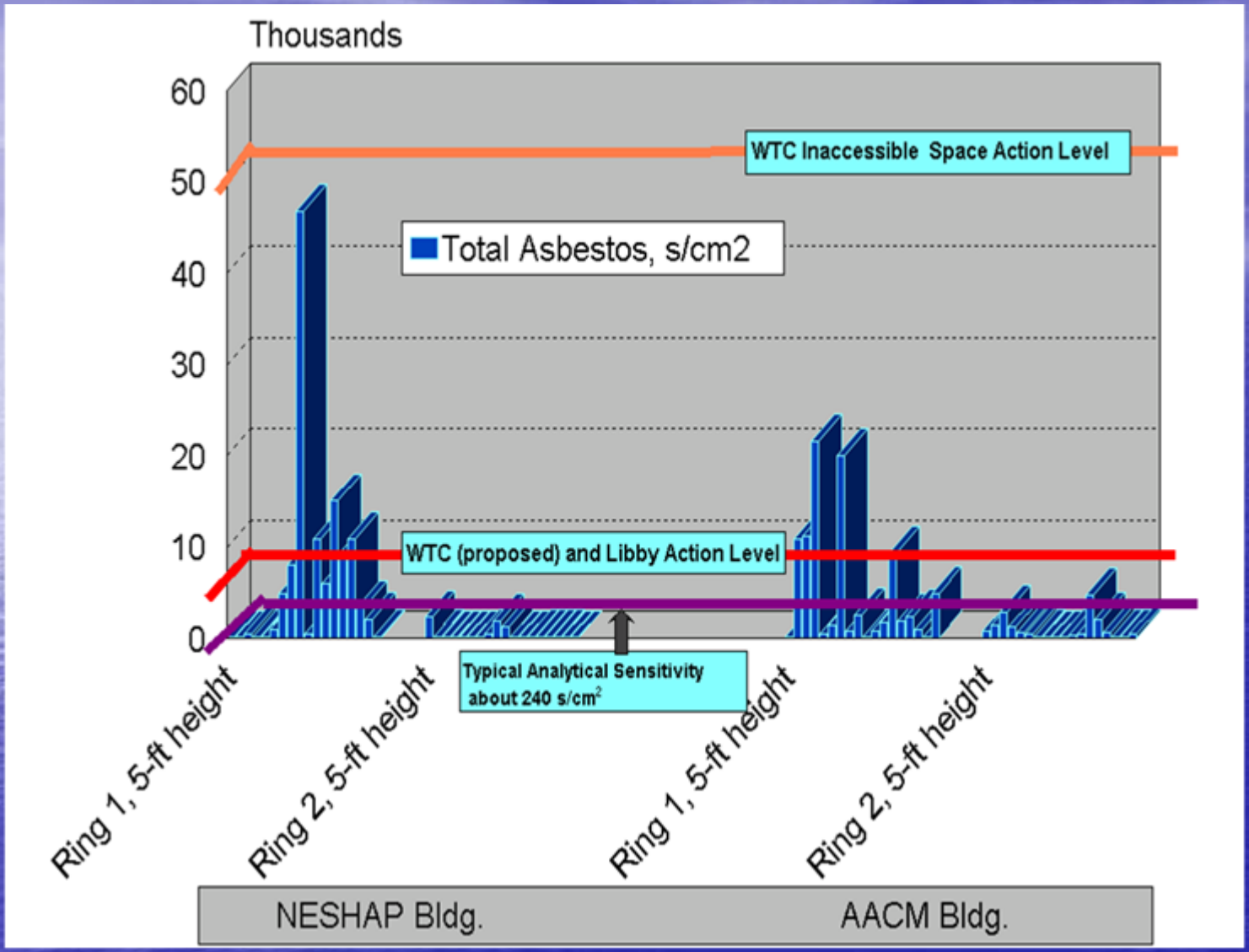

Asbestos
Sample Filter
Cassettes
Particulate
Sample Filter
Cassette
Dust Collection
Sampling
Device

CAUTION

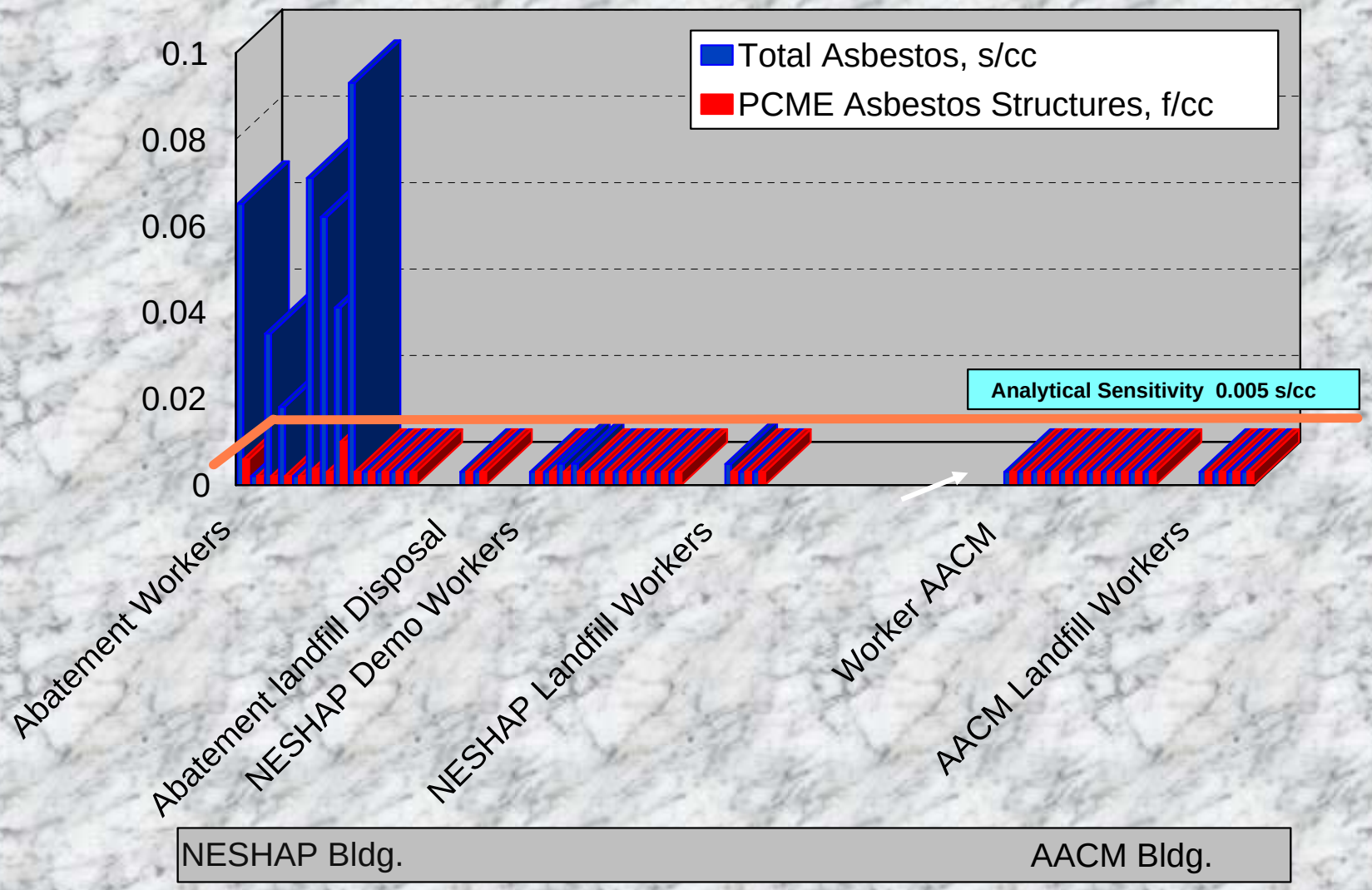
CAT



Non-detects are shown as near zero for illustration.

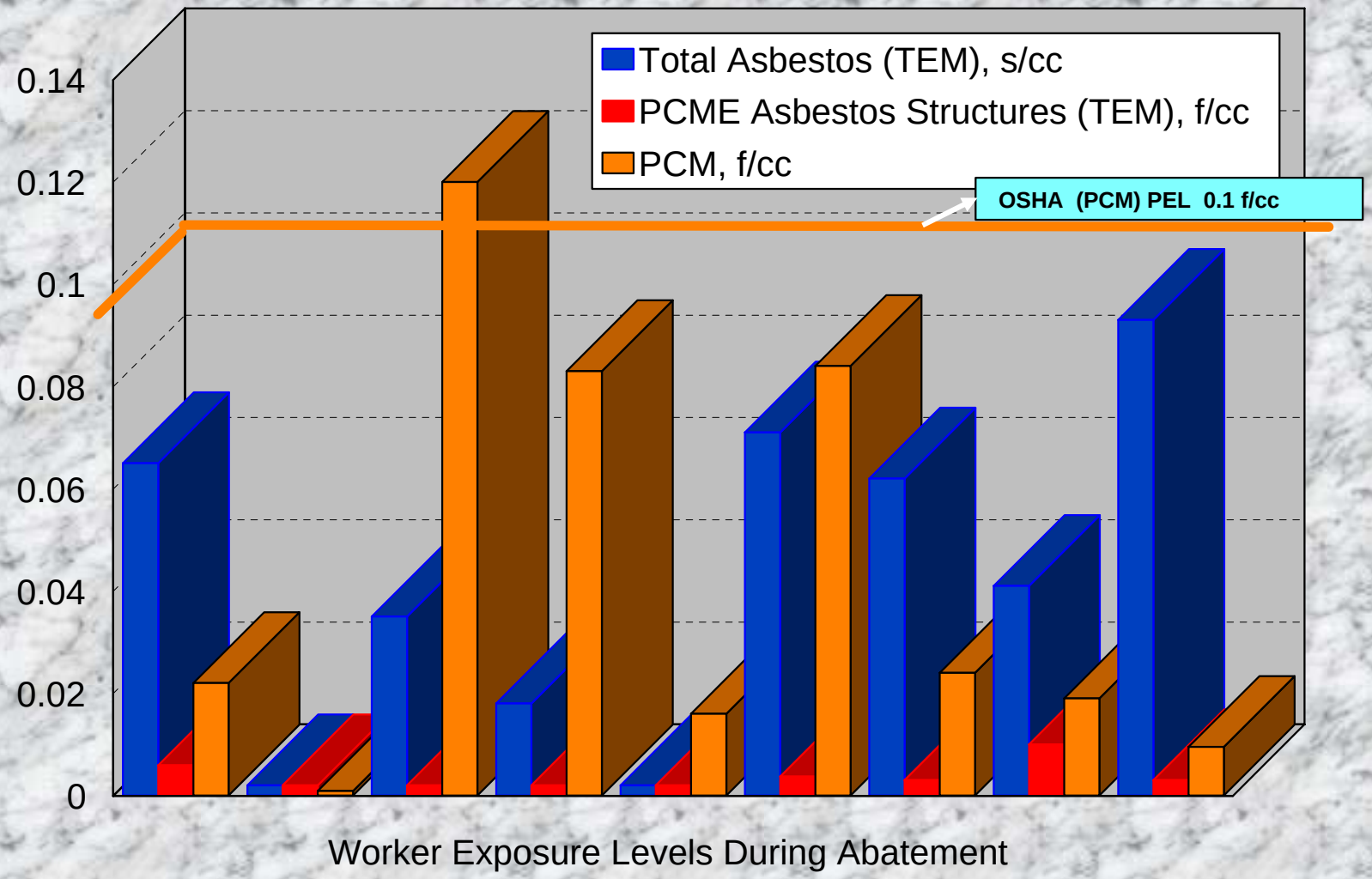


Total Asbestos Loading, s/cm²

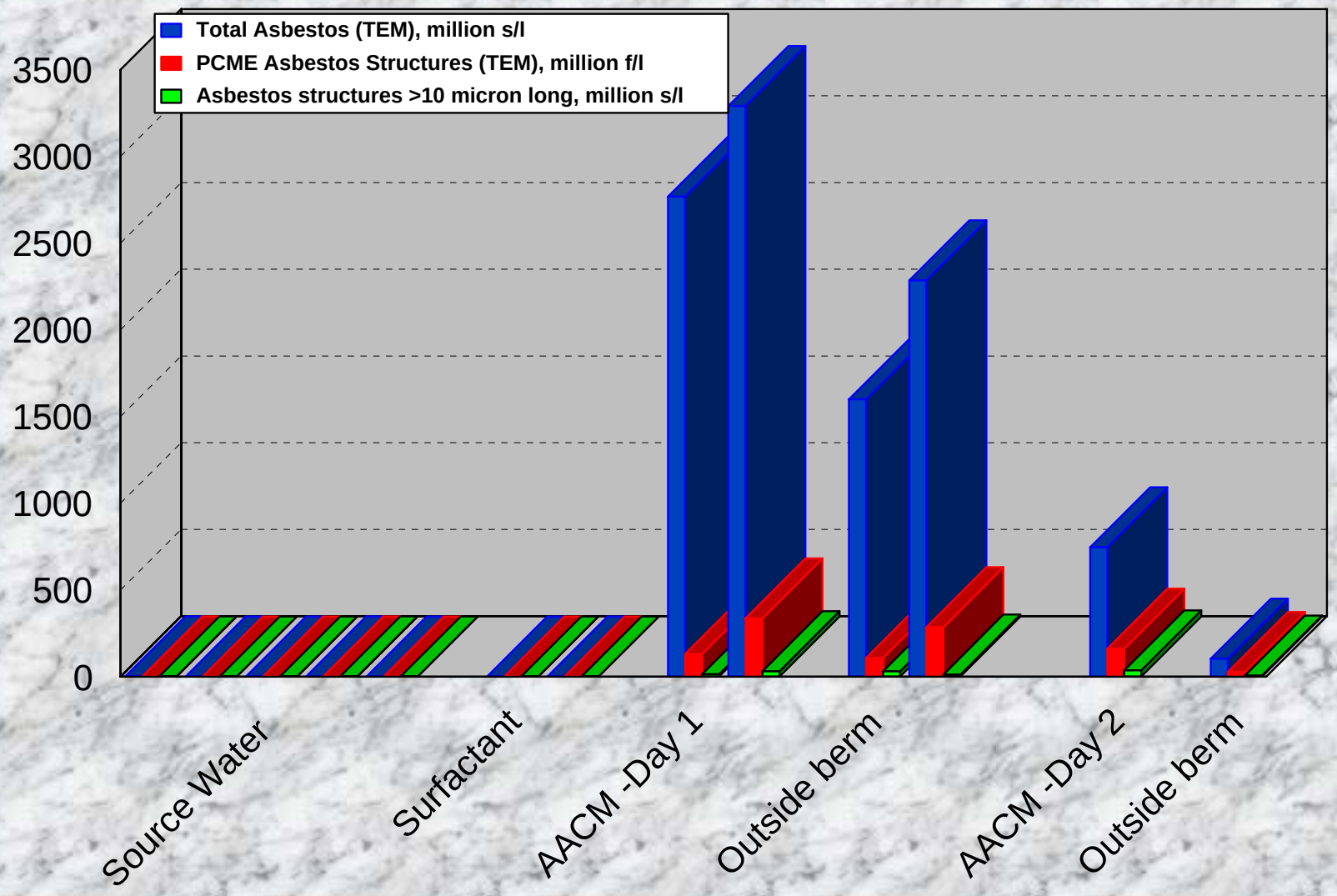


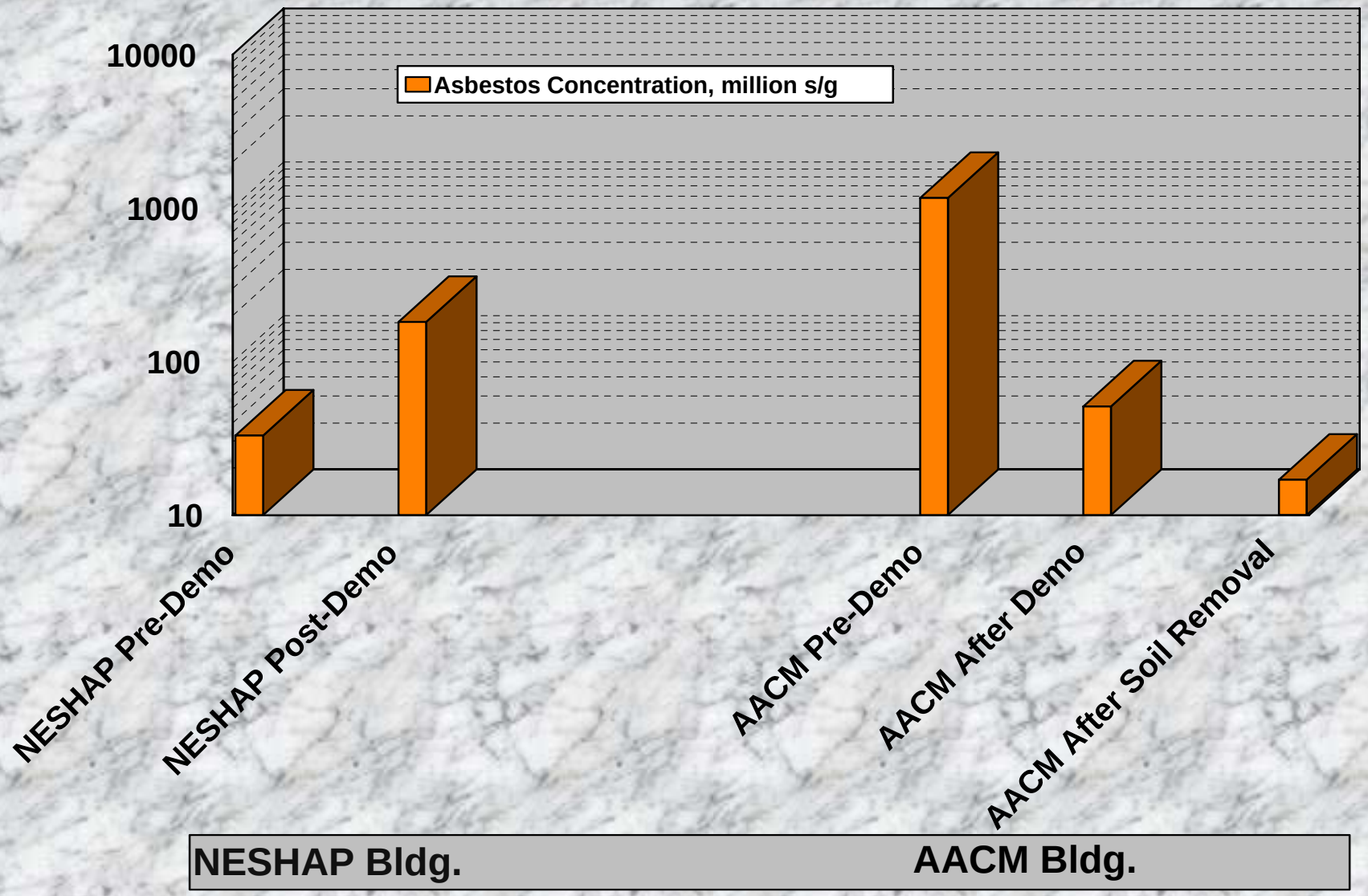
AACM Worker Breathing Zone Asbestos, s/cc

Worker Asbestos Fiber/Structure Concentrations During Abatement of NESHAP Building at Fort Chaffee



Actual Worker Breathing Zone Asbestos, s/cc


Total Asbestos (TEM), million s/l
PCME Asbestos Structures (TEM), million f/l
Asbestos structures >10 micron long, million s/l
3500
3000
2500
2000
1500
1000
500
0
Source Water
Surfactant
AACM -Day 1
Outside berm
AACM -Day 2
Outside berm



Results: Wipe/Soil Asbestos, million s/g

AACM vs NESHAP at AACM1 Research

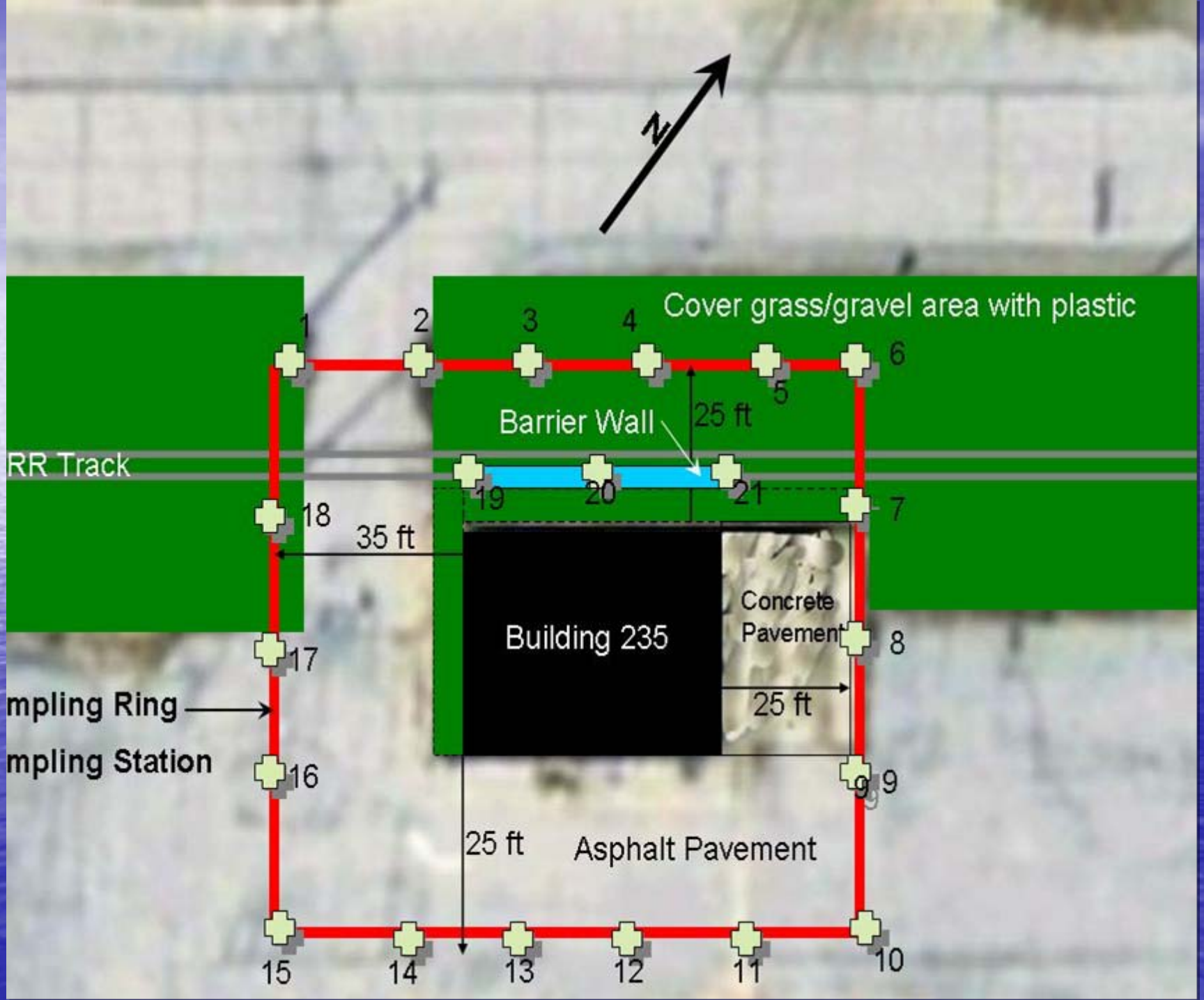
- Over six times faster
- Cost half as much
- Less asbestos in final soil
- Lower worker breathing zone asbestos levels

AACM 2

- Fort Chaffee, AR
- Single building in danger of imminent collapse
- Transite siding
- Pavement

235
1. 29. 2007

YIELD


N
Cover grass/gravel area with plastic
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
Barrier Wall
25 ft
RR Track
35 ft
Building 235
Concrete Pavement
25 ft
mpling Ring
mpling Station
25 ft
Asphalt Pavement

TURGET

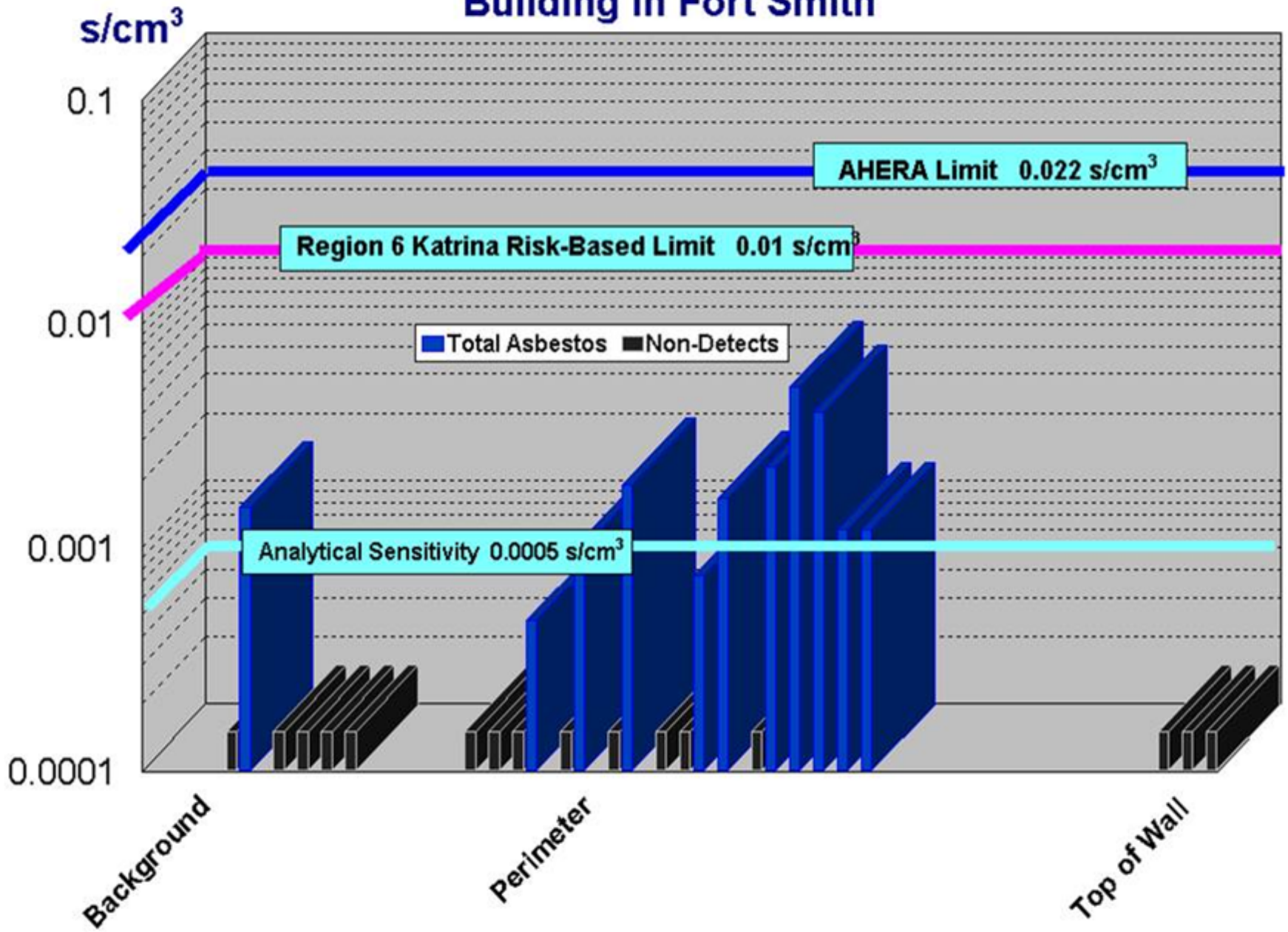
Kitchen & Bath
Cocina y Baño

KOBELCO

LVI
Roll Off Service

KOBELCO
SK 210

Asbestos Fiber/Structure Concentrations During Demolition of Transite Building in Fort Smith



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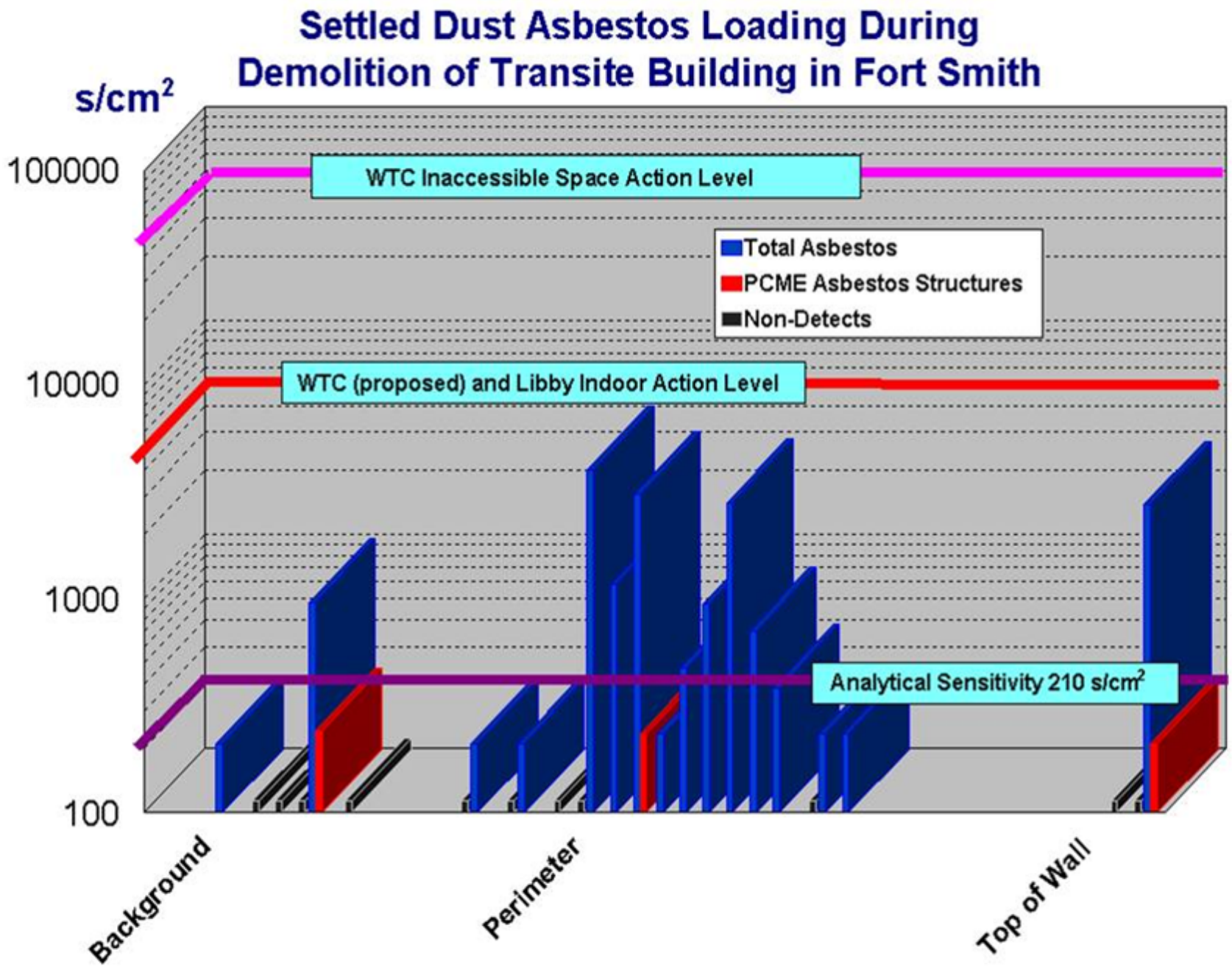

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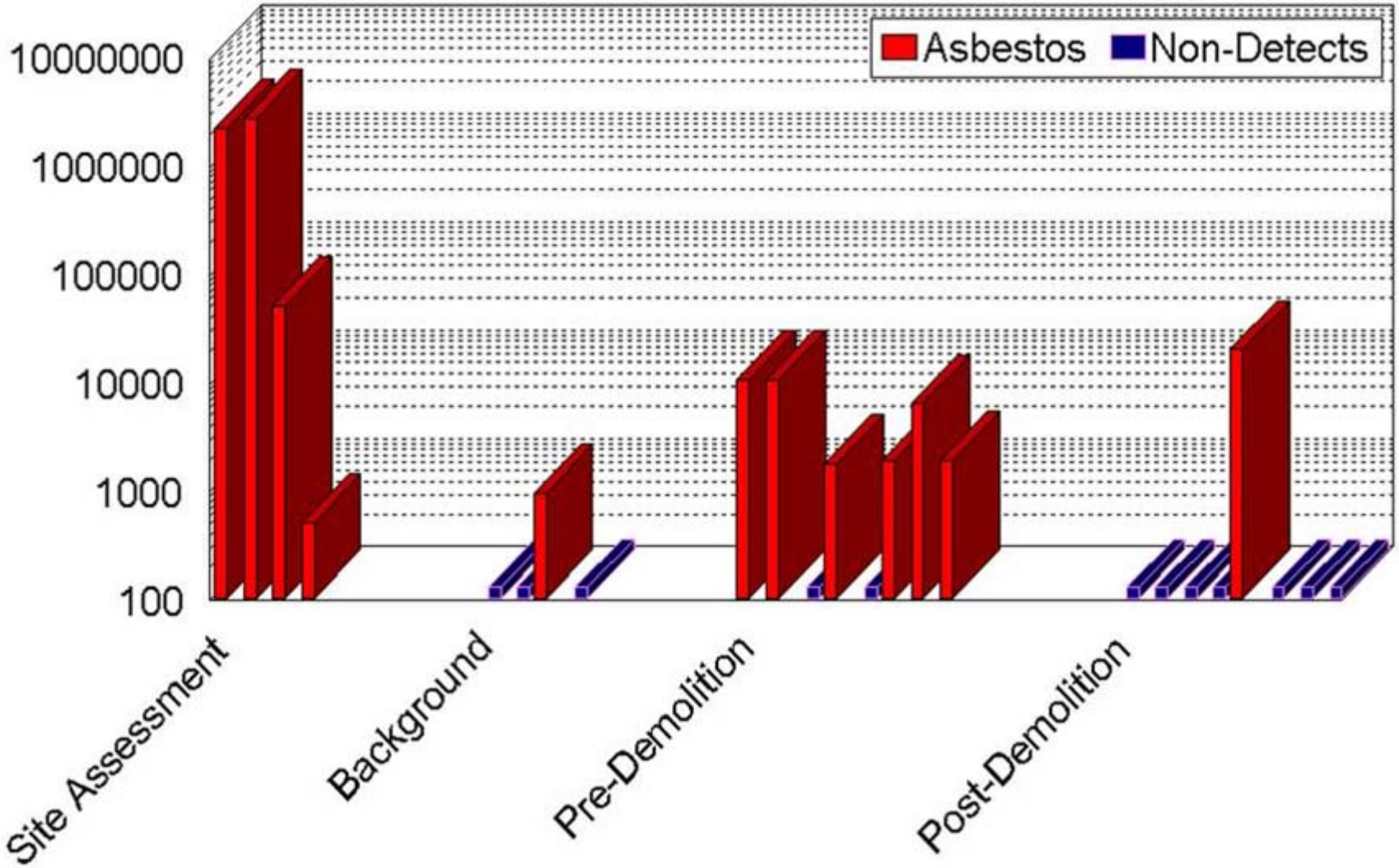
Pavement Asbestos Loadings at the Transite Building, s/cm^2



Non-detects are shown as near zero for illustration.

AACM 3

- Fort Worth, Texas
- Single building
- Popcorn Ceiling, troweled on surfacing on walls
- Pavement and soil

AACM Site
OAKLAND HILLS
OAKLAND HILLS
BOCA
BOCA

Fort Worth
Boca Raton Blvd
Boca Hill Circle
Microsoft
Virtual Earth™

CAUTION
CAUTION
CAUTION

CENTER

10
9
11
8
12
7
13
6
14
BR1
15
5
16
4
17
BR2
3
18
2
1
BR3
Weather Station
WA1-3

FREE RENT
APARTMENTS
RENTA GRATIS
WOODSTO
APARTME

5901
5901
17 12 2007

KOMATSU
912 U5
EAGLE
PC20

CAUTION

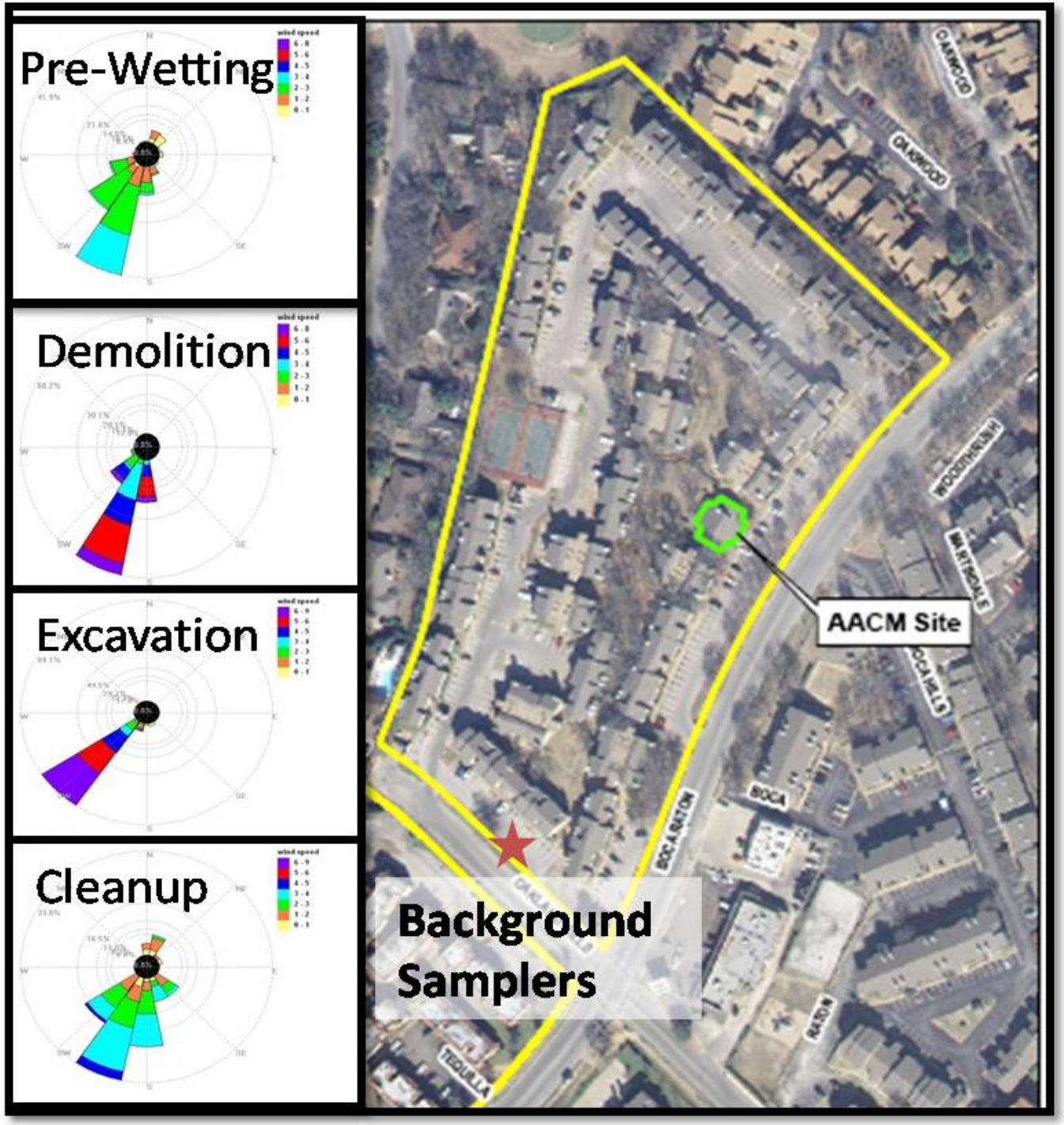
KOMATSU
PC200LC

KOMATSU
PC200LC

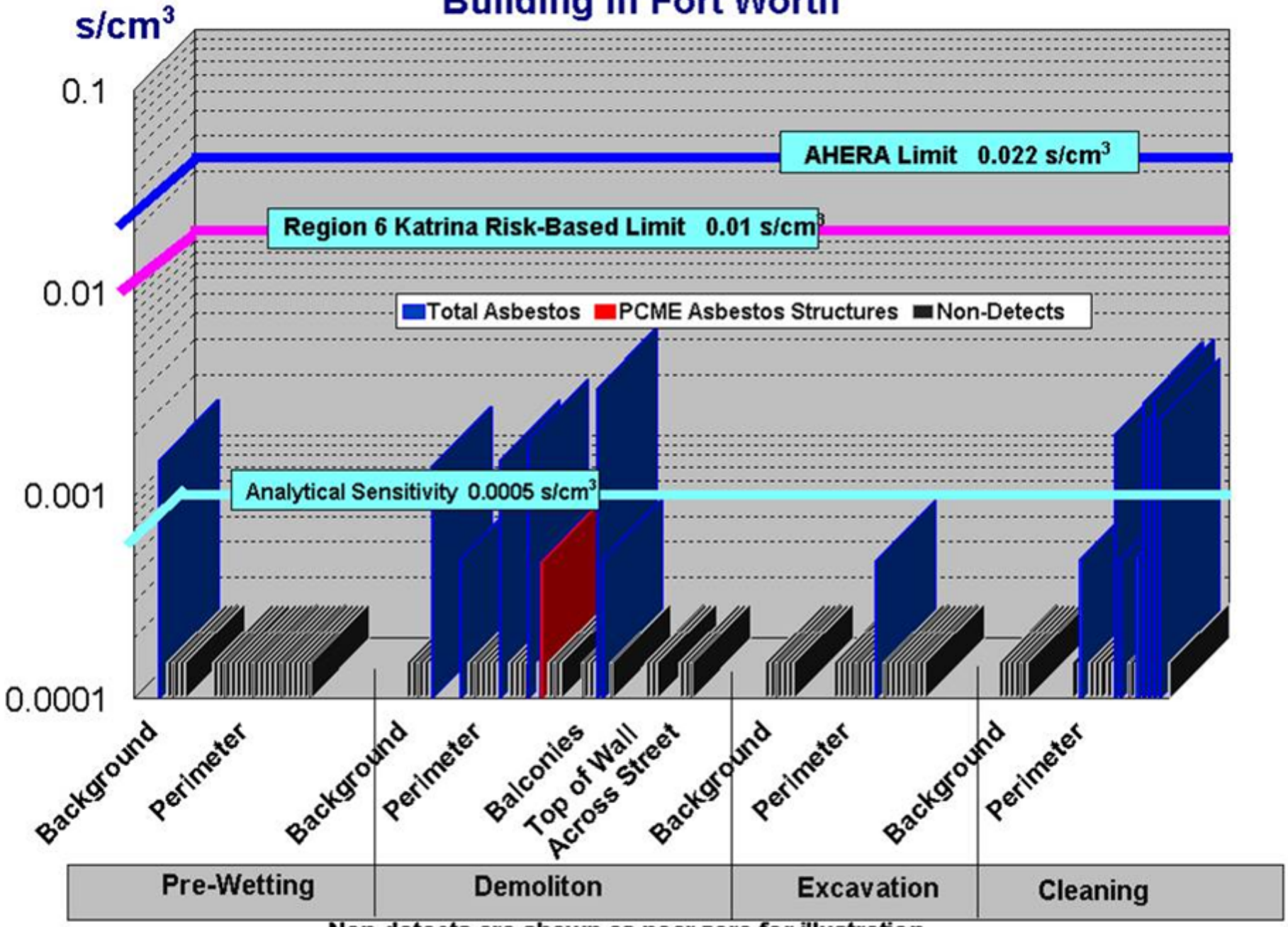
5911
BOCA RATON
141-148
188-2
CAUTION
CAUTION
CAUTION
CAUTION

GRADALL
534D10-4E
N29516
2212
EVERGREEN
TANK SOLUTIONS
25 CU. YD.
EMPTY WT.
6,334

N-34031
BEFORE BOX CAN BE

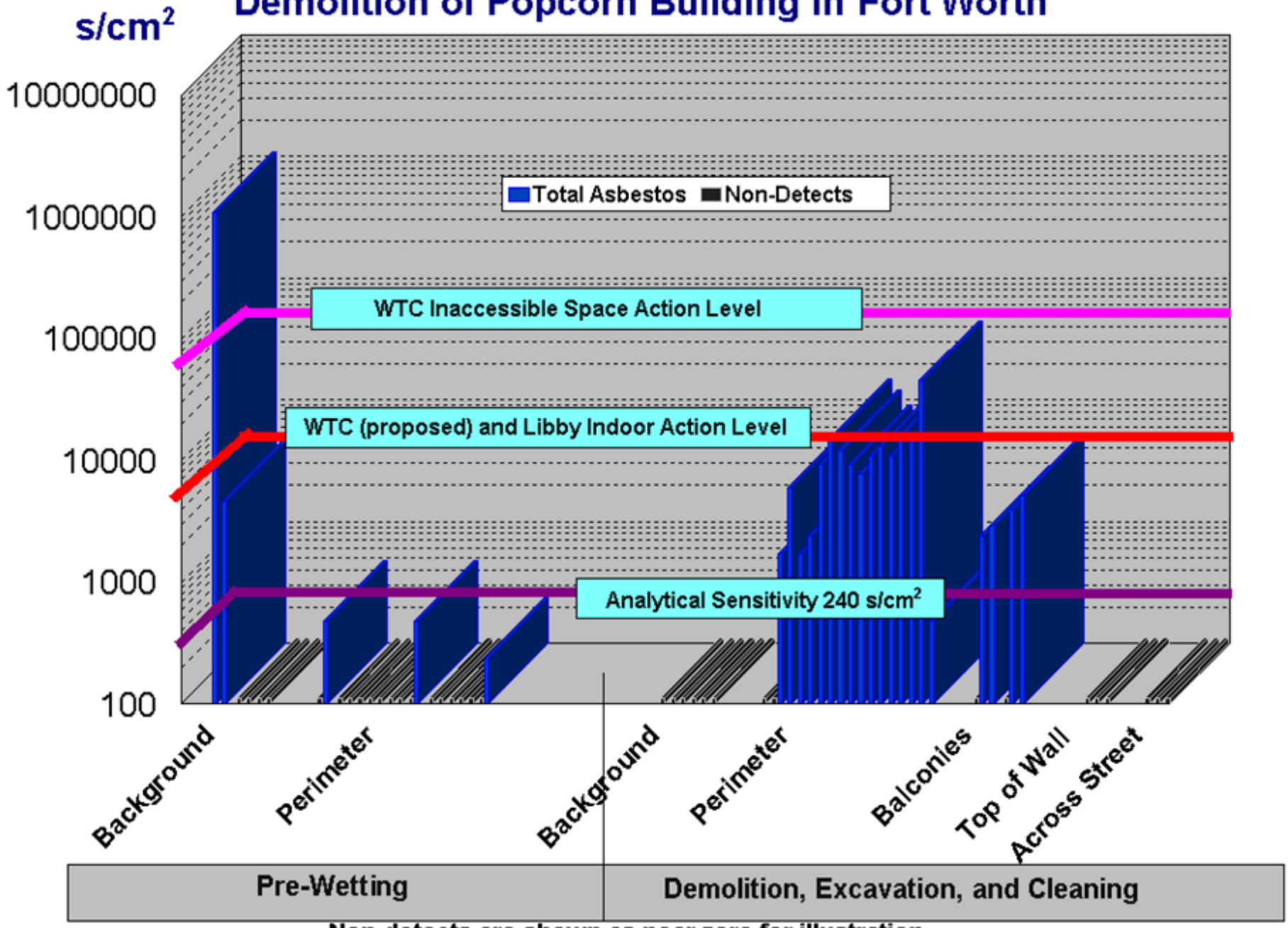

Pre-Wetting
Demolition
Excavation
Cleanup
AACM Site
Background Samplers
OAKWOOD
WOODMERE
MERTON
BOCA
BOCA RATON
RATON
TEQUILLA

Asbestos Fiber/Structure Concentrations During Demolition of Popcorn Building in Fort Worth



Non-detects are shown as near zero for illustration.

Settled Dust Asbestos Loading During Demolition of Popcorn Building in Fort Worth



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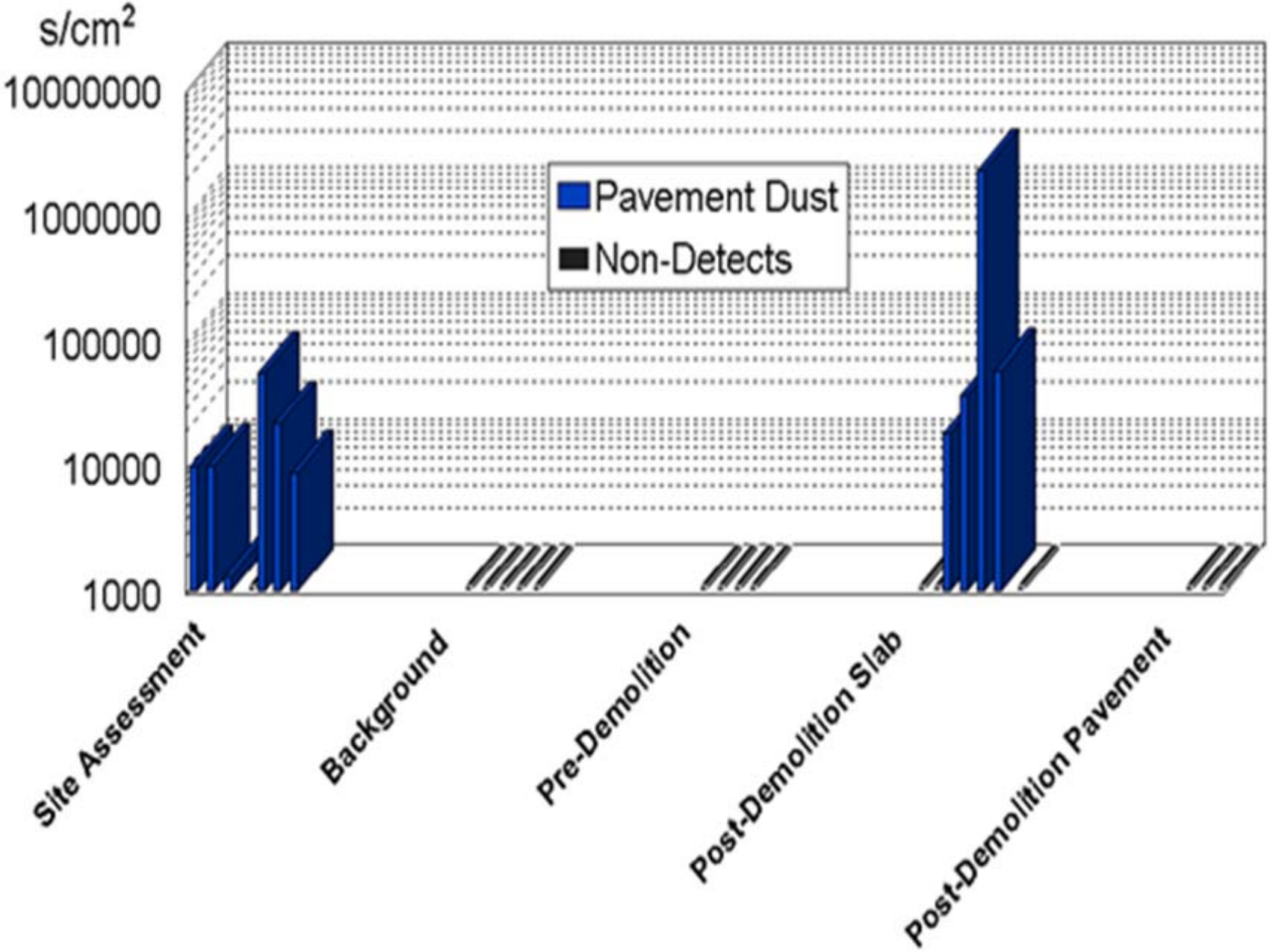
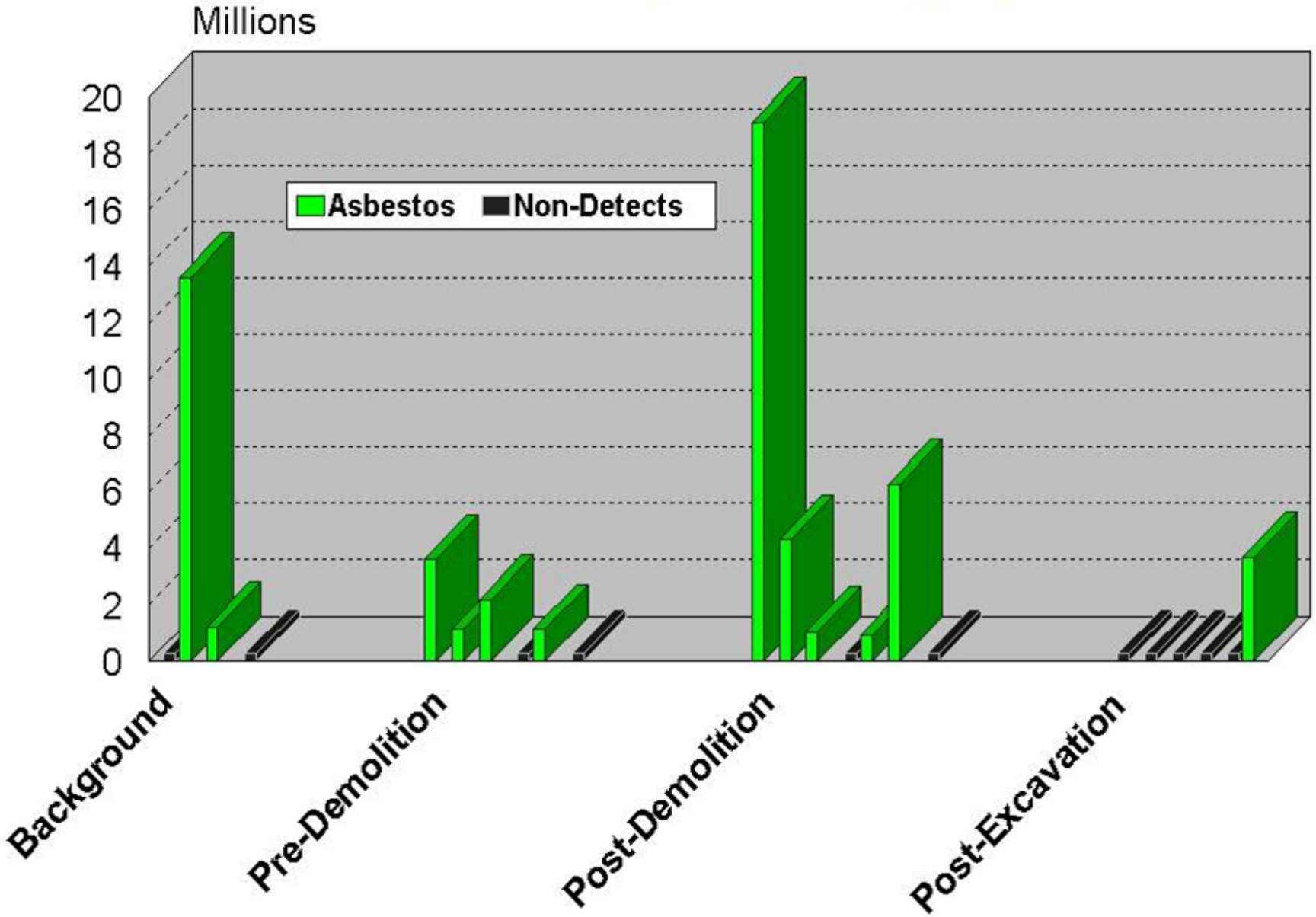
Pavement Dust at Popcorn Building Demolition



Soil Asbestos Concentrations (TEM) During Demolition of Popcorn Building, s/g



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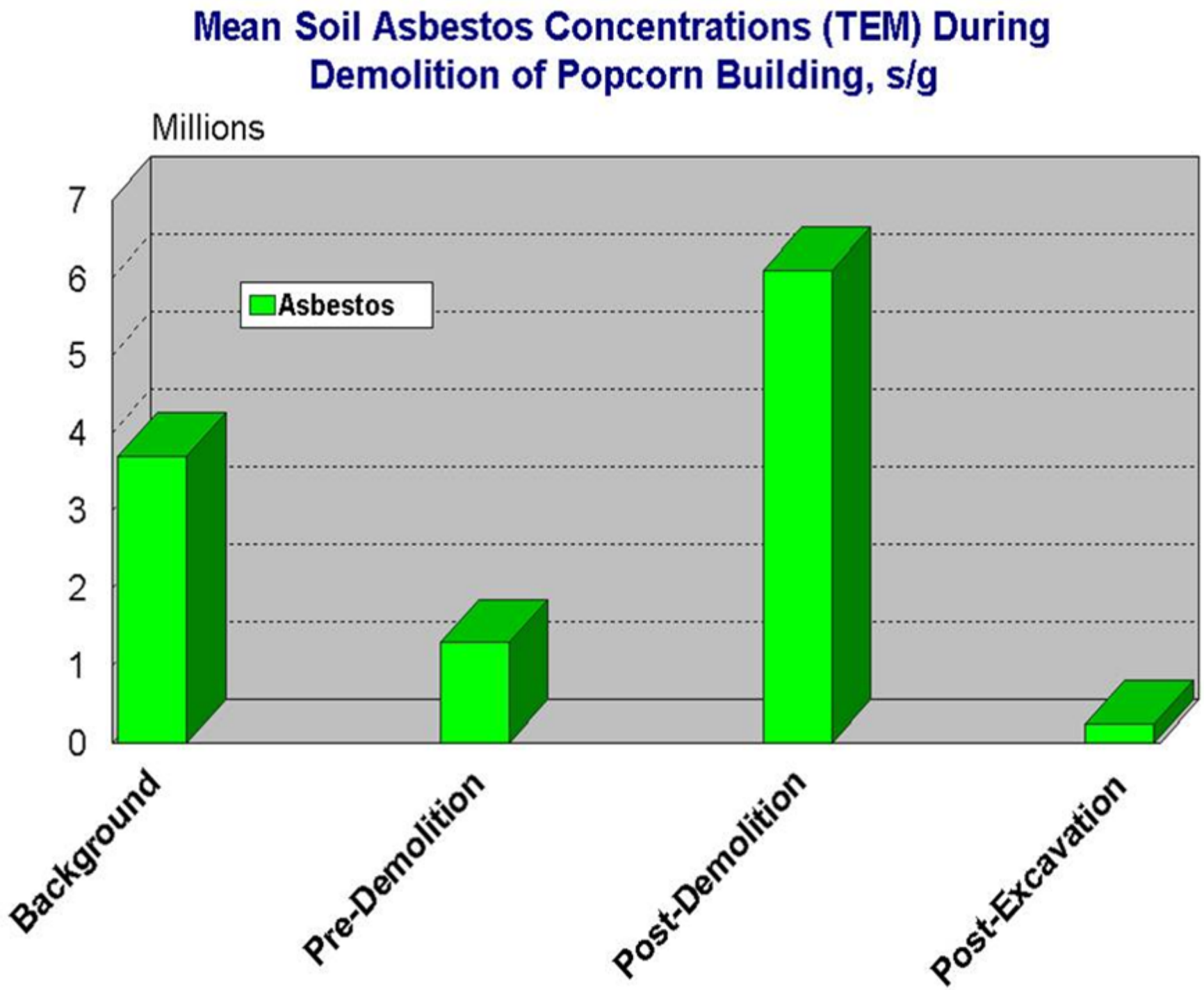

Mean Soil Asbestos Concentrations (TEM) During Demolition of Popcorn Building, s/g
Millions
7
6
5
4
3
2
1
0
Asbestos
Background
Pre-Demolition
Post-Demolition
Post-Excavation

COMPARISON OF AACM1,2, and 3

All asbestos has been removed before a NESHAP demolition.....?

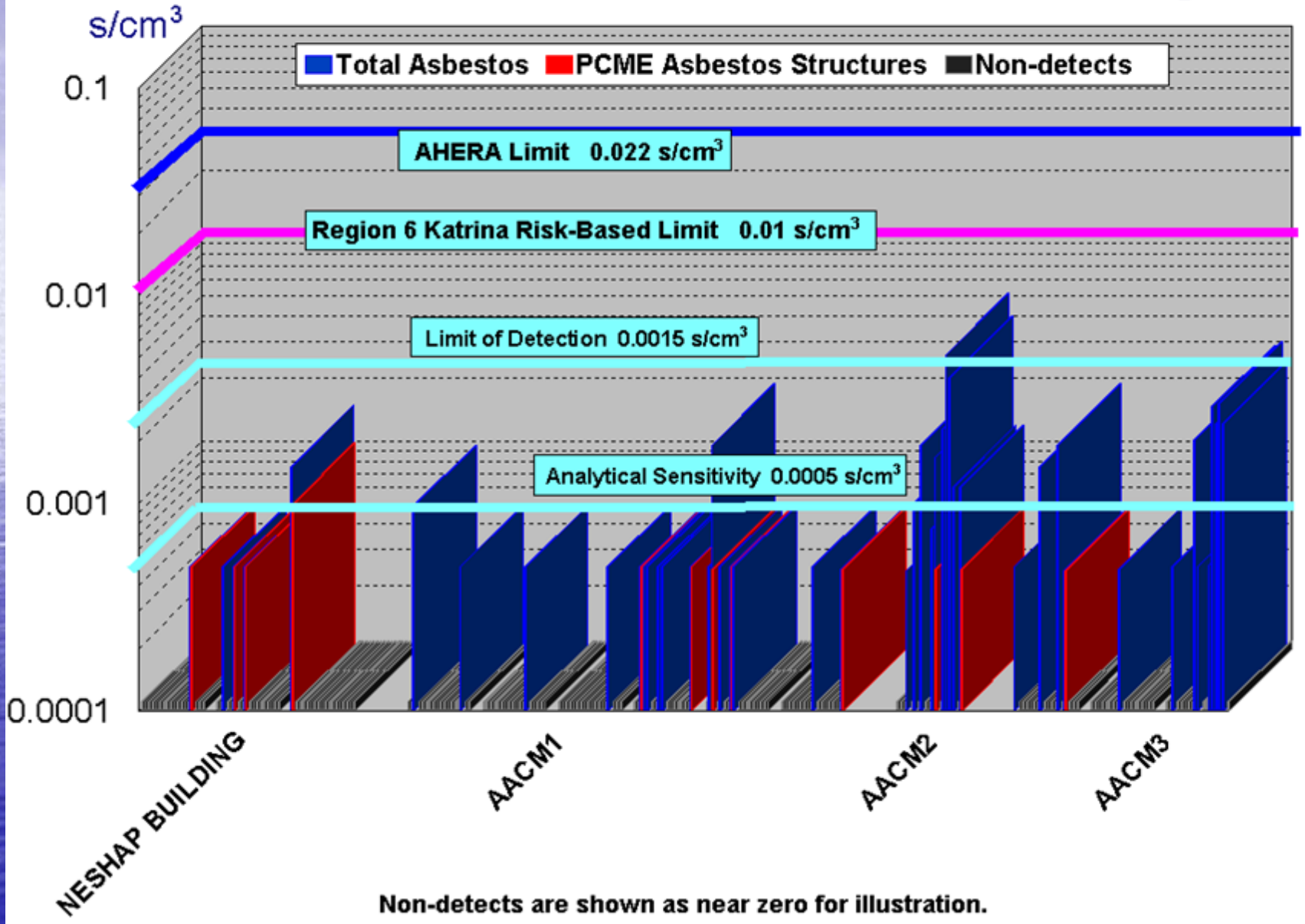
Material

- Joint Compound
- Surfacing
- VAT
- Pipe wrap
- Caulk
- Roofing
- Mastic

Amounts

- Less than 260 sq ft
- content less than 1.5%
- Less than 160 lf
- Less than 35 cu ft

Airborne Asbestos Concentrations (TEM) During Demolition of AACM1 NESHAP, AACM1, AACM2, and AACM3 Buildings



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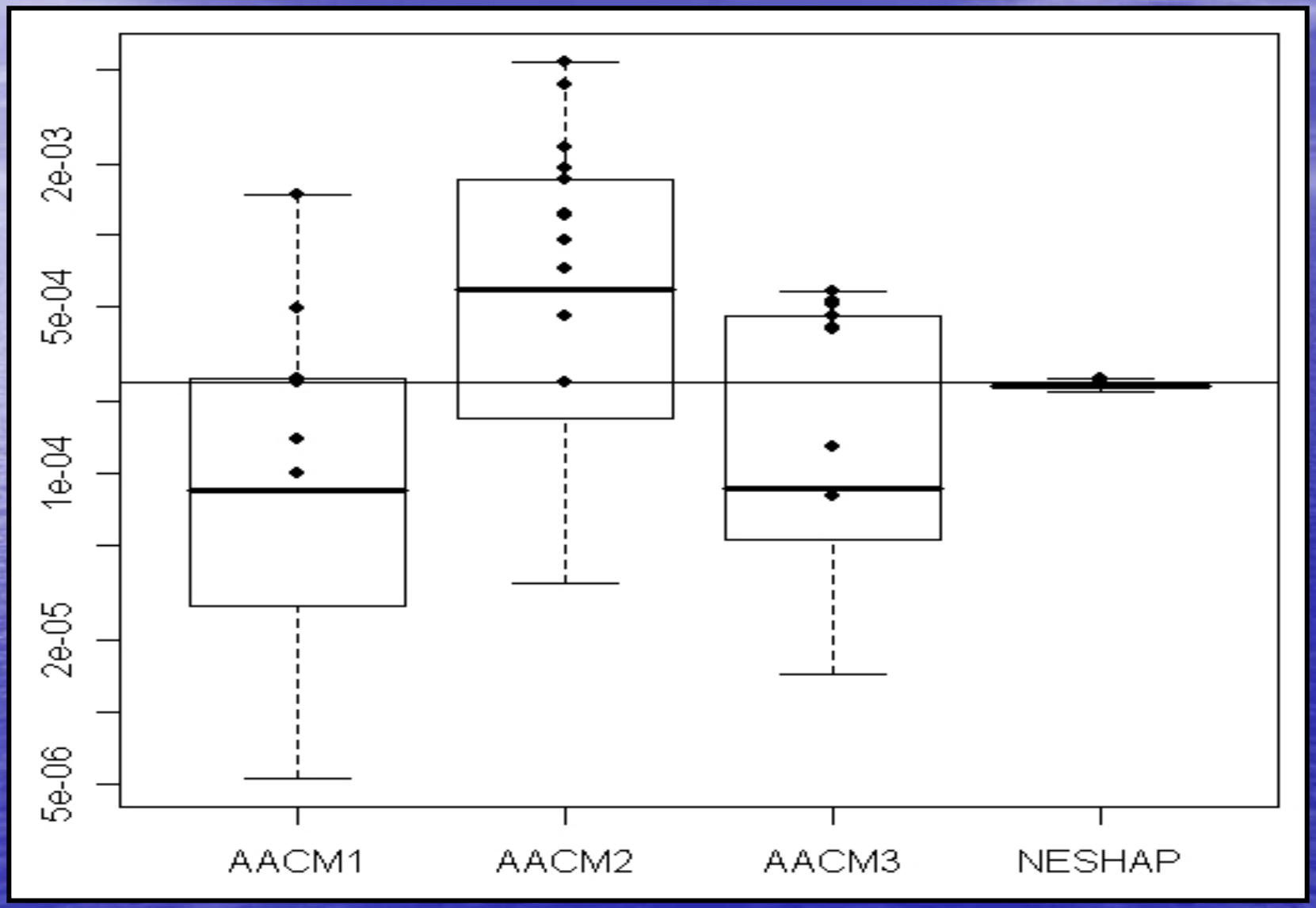
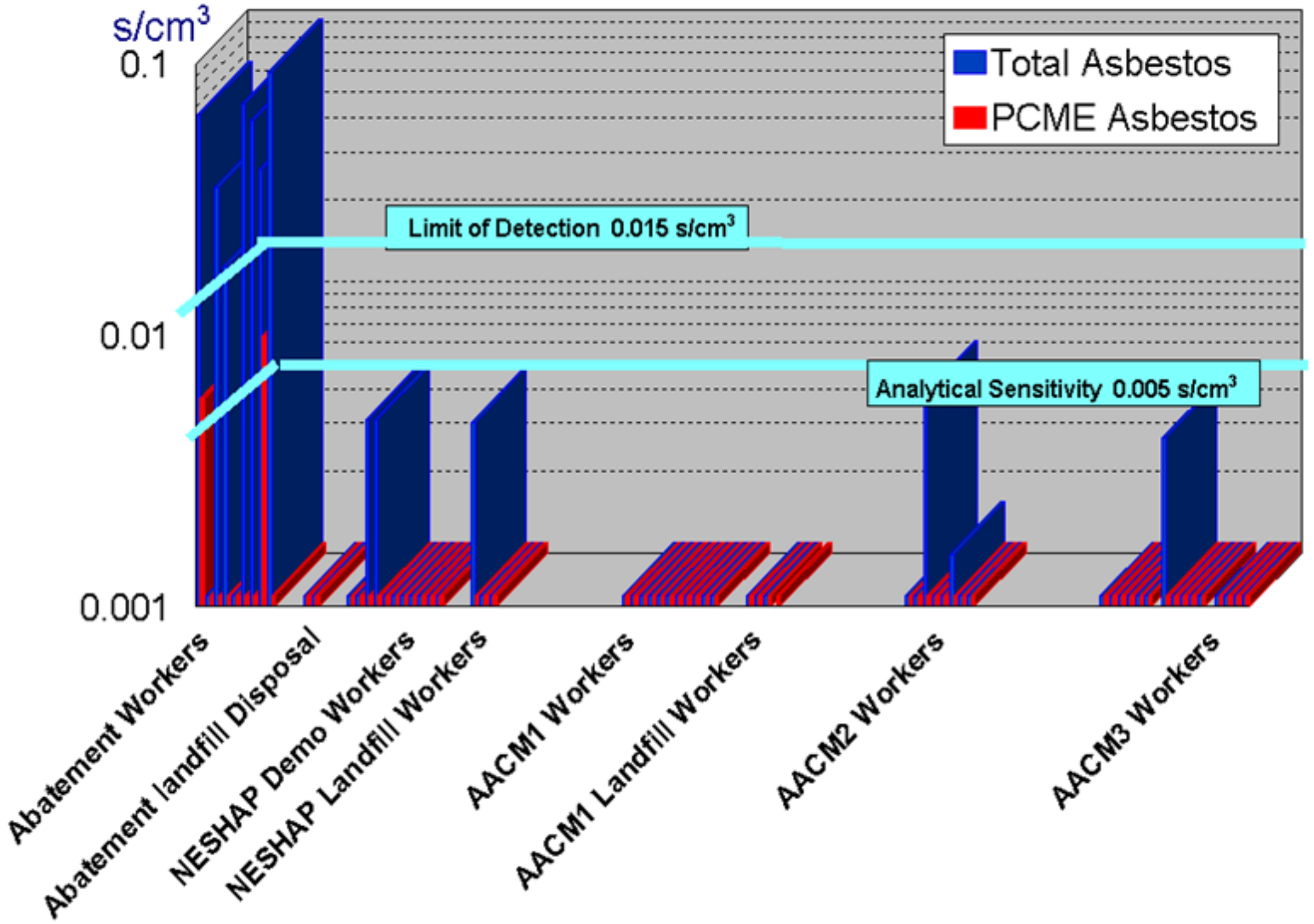


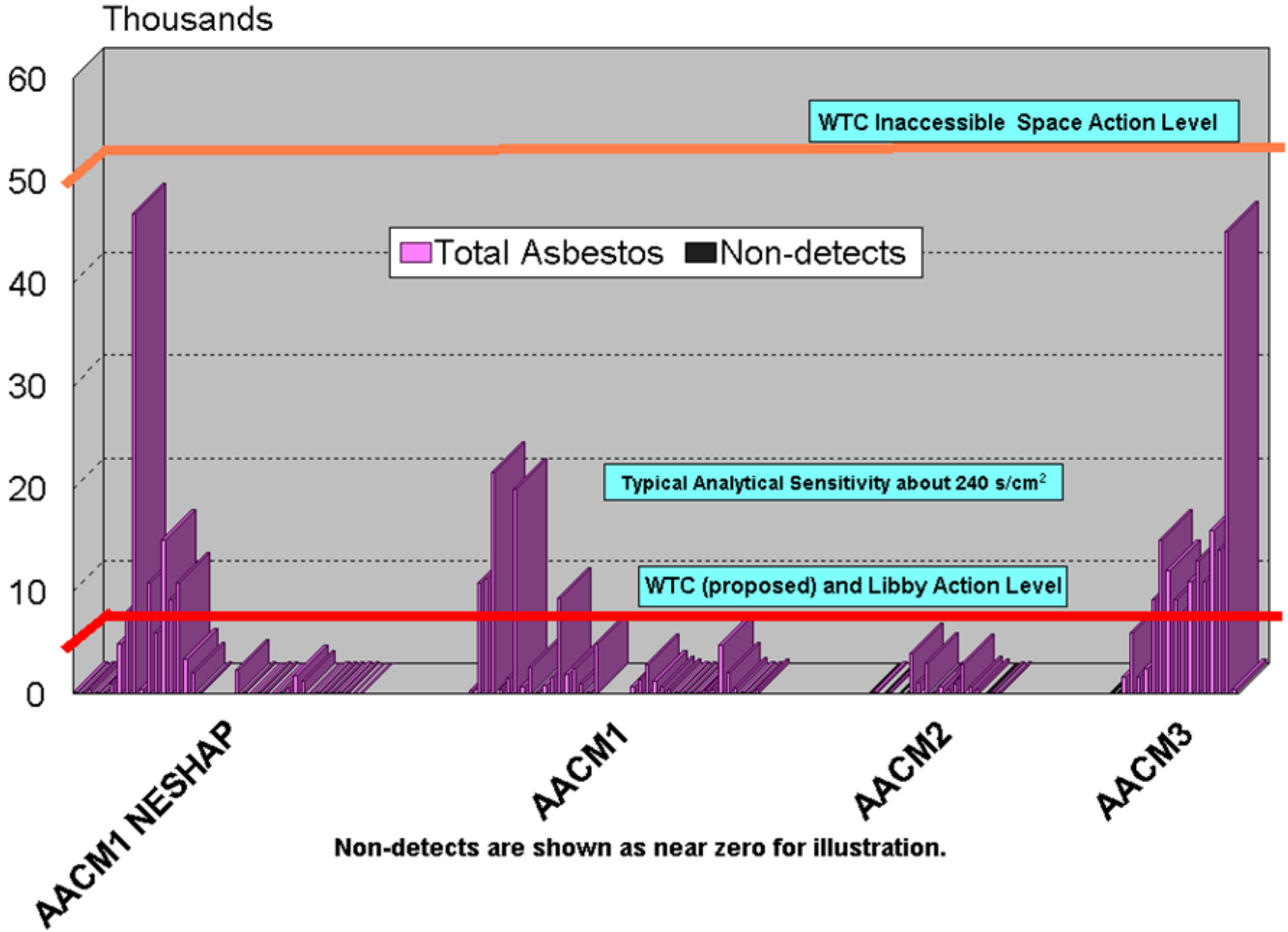
BOXPLOTS OF AIRBORNE ASBESTOS CONCENTRATIONS S/CM3

Worker Breathing Zone Asbestos Concentrations (TEM) During Demolition of AACM1 NESHAP, AACM1, AACM2, and AACM3 Buildings



Non-detects are shown as near zero for illustration.

Dust Asbestos Loadings (TEM) During Demolition of AACM1 NESHAP, AACM1, AACM2, and AACM3 Buildings, s/cm^2



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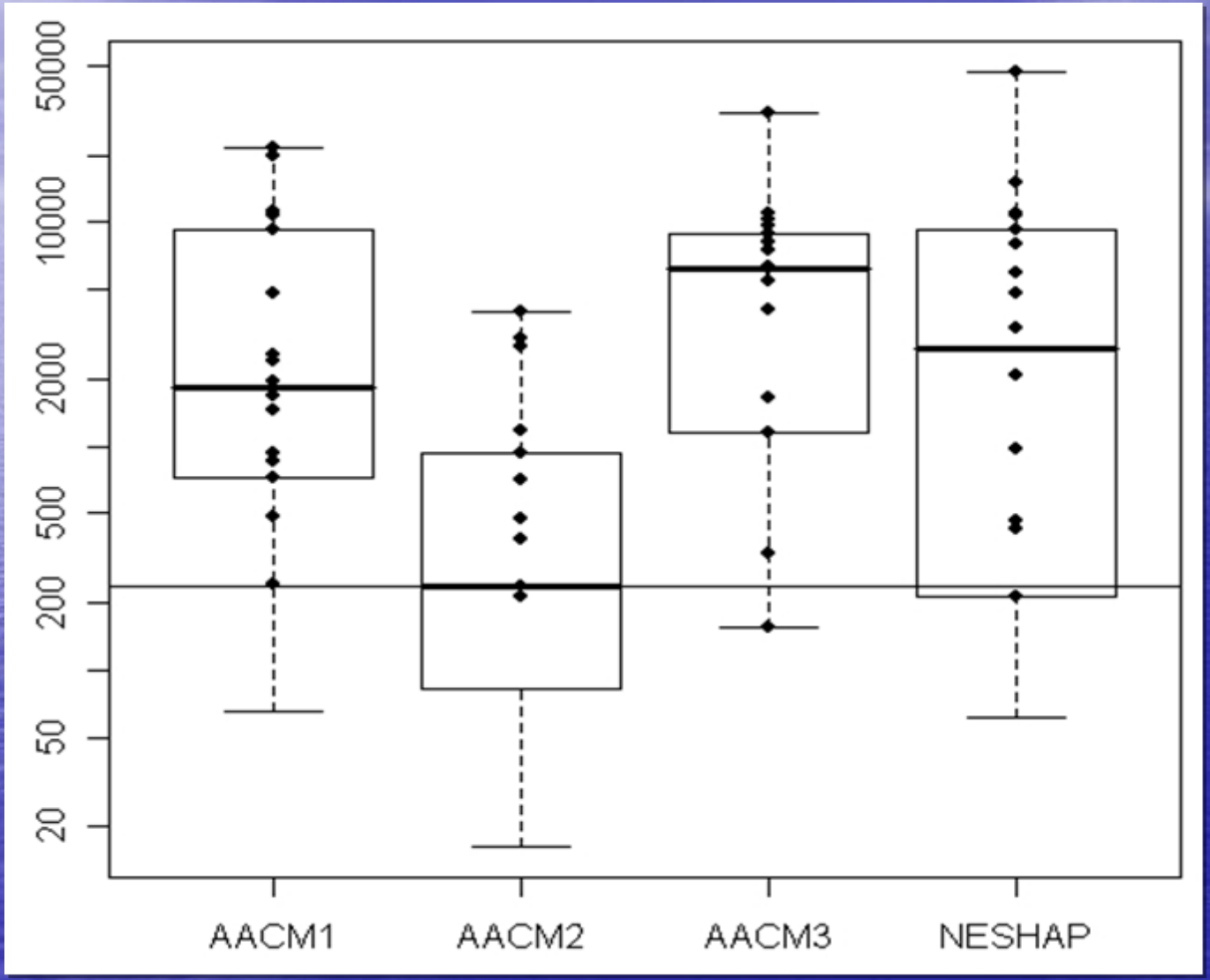
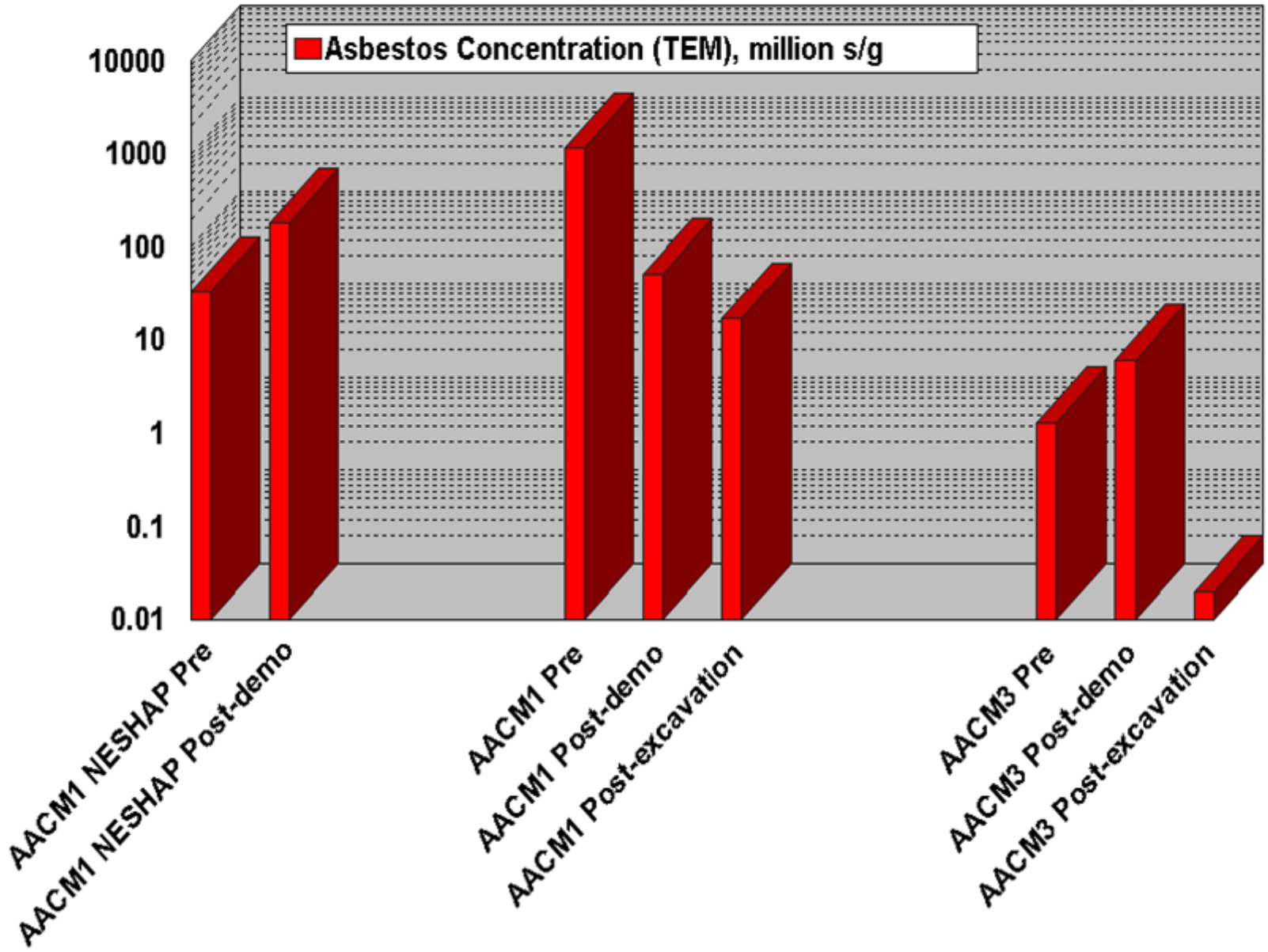
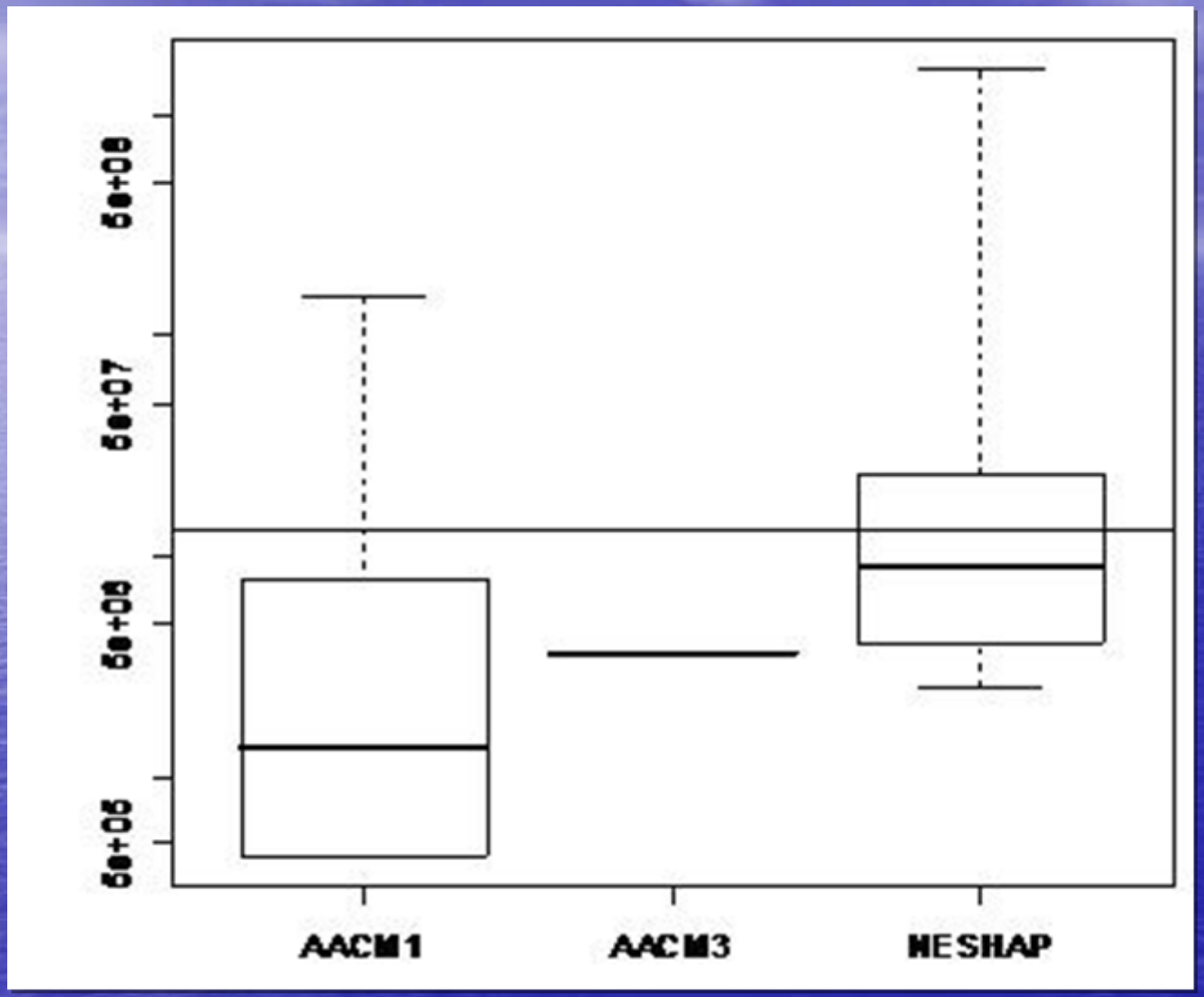


BOXPLOTS OF SETTLED DUST ASBESTOS CONCENTRATIONS, S/CM2

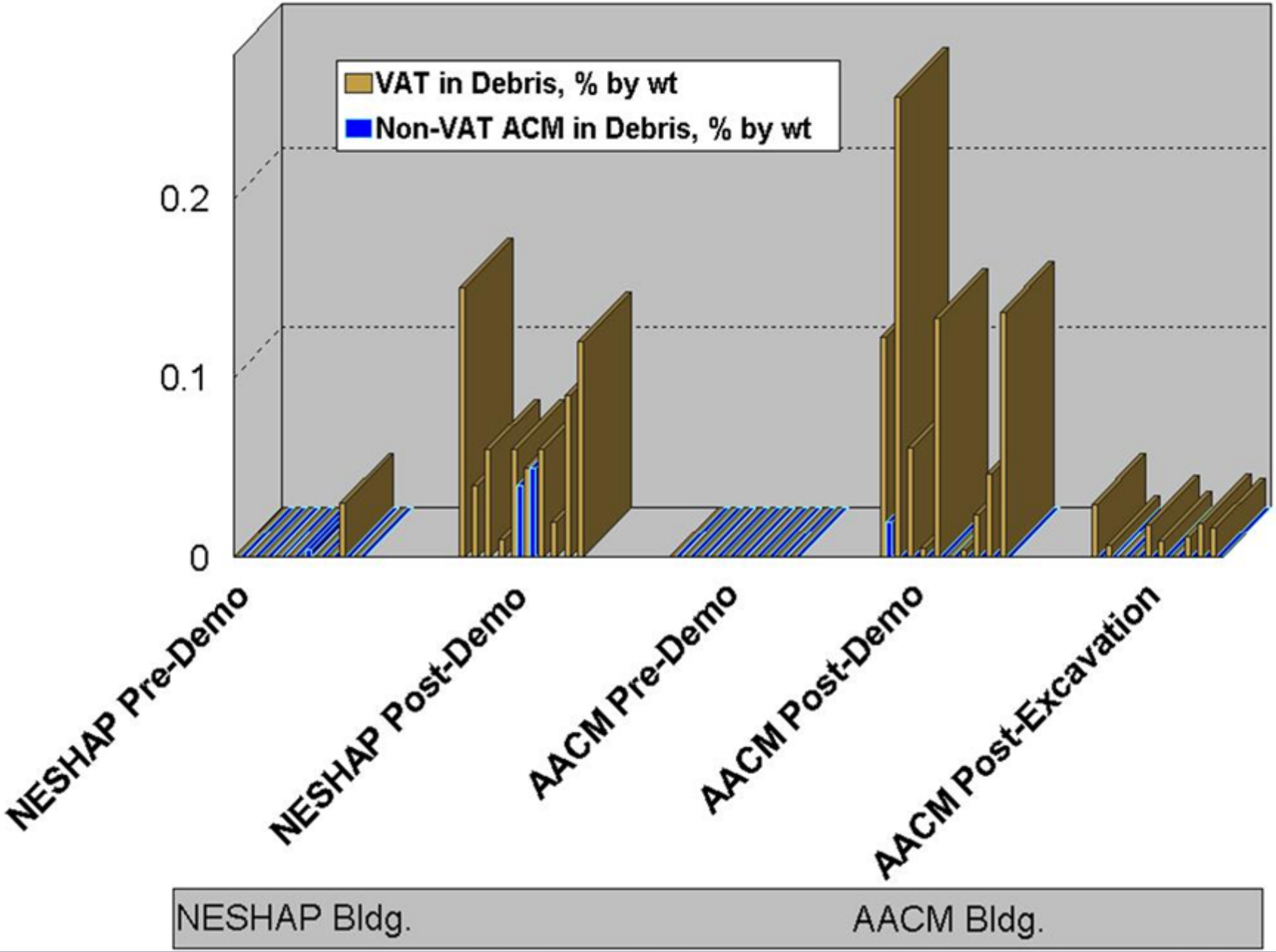
Mean Soil Asbestos Concentrations (TEM) During Demolition of AACM1 NESHAP, AACM1, and AACM3 Buildings



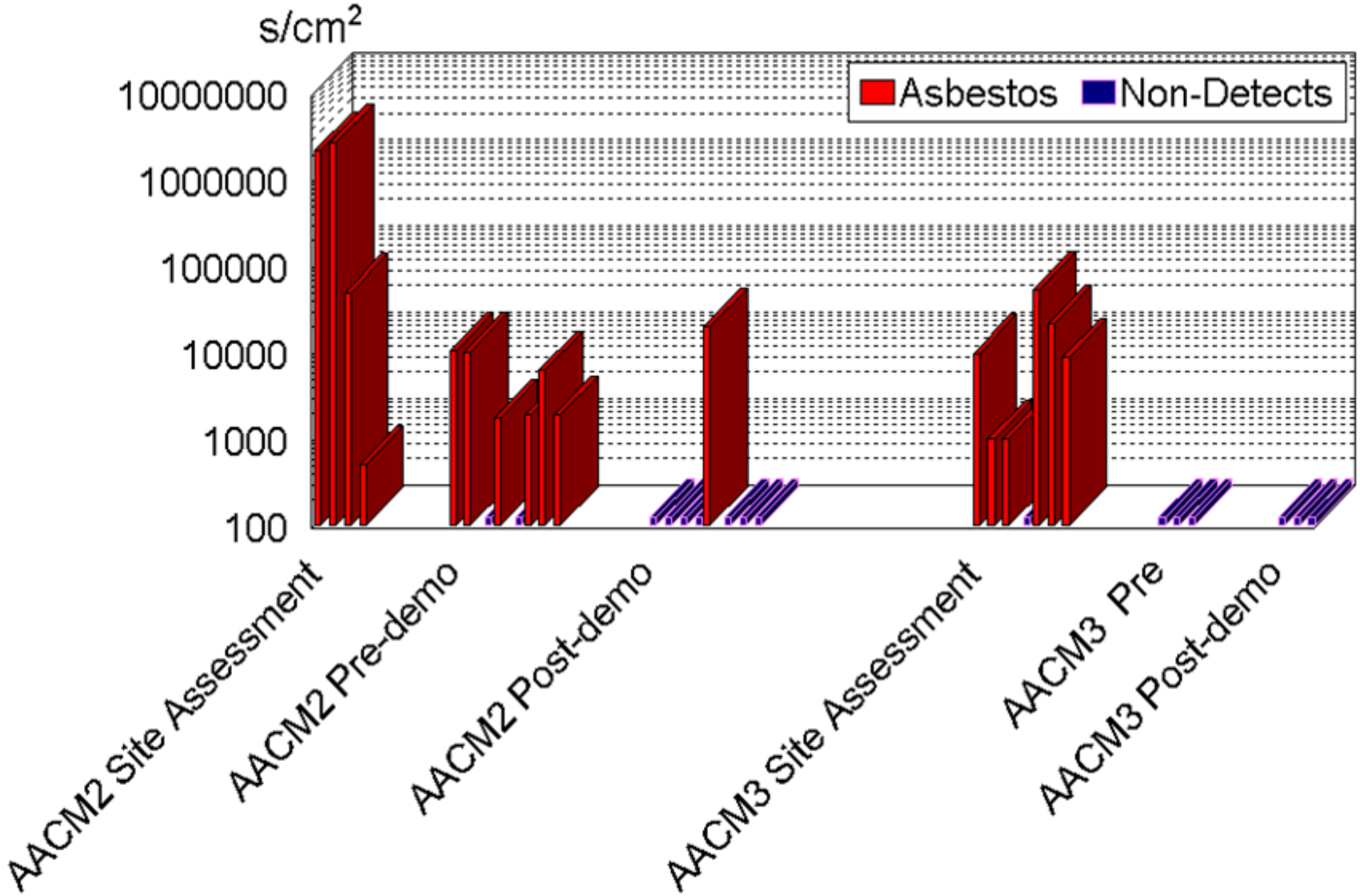


BOXPLOTS OF SOIL ASBESTOS CONCENTRATIONS, S/G

Vinyl Asbestos Tile Debris in Soil During Demolition of AACM1 NESHAP and AACM1 Buildings at Fort Chaffee



Pavement Asbestos Loadings During AACM2 and AACM3



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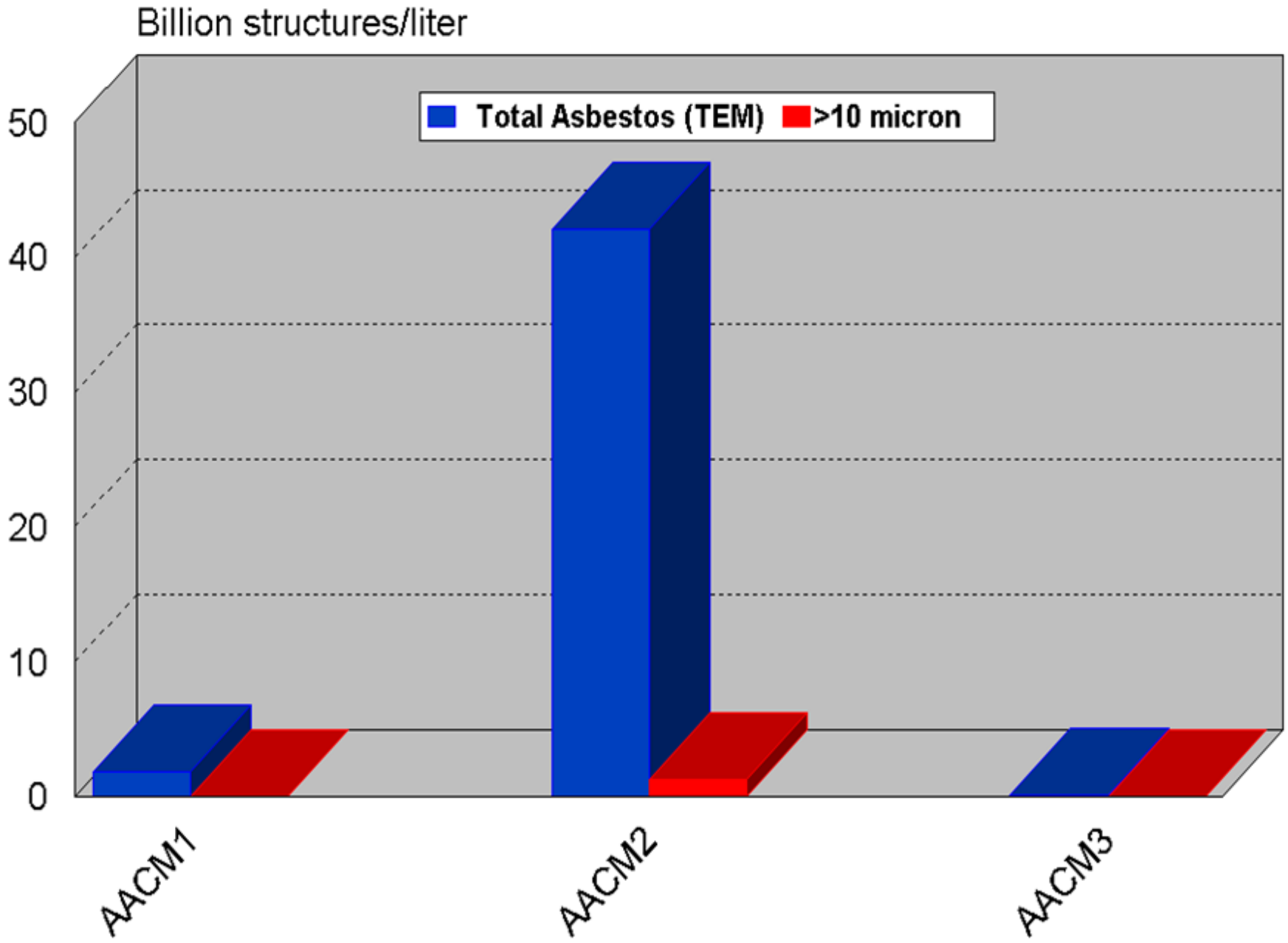
Ponded Water Asbestos Concentrations During AACM Demolitons



Site	Cost		
	$/ft^2 of building footprint	$/ft^2 of RACM	Cost Comparison of NESHAP vs AACM
AACM1			
NESHAP (Actual)	$24.07	$ 5.23	NESHAP 87% More
AACM1	$12.86	$ 2.80	
AACM2			
NESHAP (Estimated)	$15.69	$ 9.54	NESHAP 2% More
AACM2	$15.54	$ 9.44	
AACM3			
NESHAP (Estimated)	$13.58	$ 3.64	NESHAP 9% Less
AACM3	$14.91	$ 4.06	

Site	Time	
	Days	Comparison of NESHAP vs AACM
AACM1		
NESHAP (Actual)	10	NESHAP 6.7 Times Longer
AACM1	1.5	
AACM2		
NESHAP (Estimated)	3	NESHAP 1.5 Times Longer
AACM2	2	
AACM3		
NESHAP (Estimated)	6	NESHAP 1.7 Times Longer
AACM3	3.5	

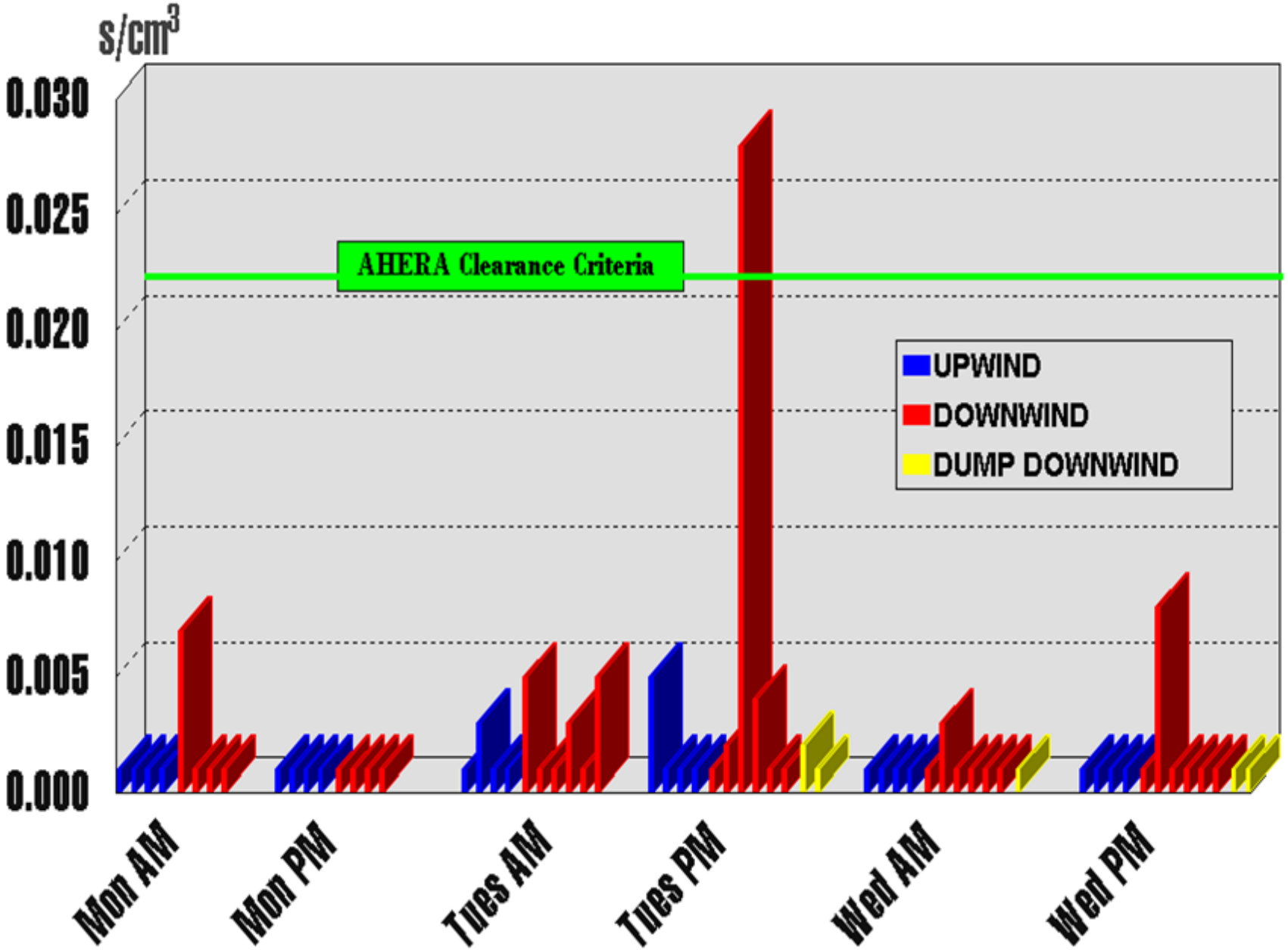
OTHER DEMOLITIONS

NESHAP COMPLIANT DEMOLITIONS

AURORA SCHOOL IN LANGSANG

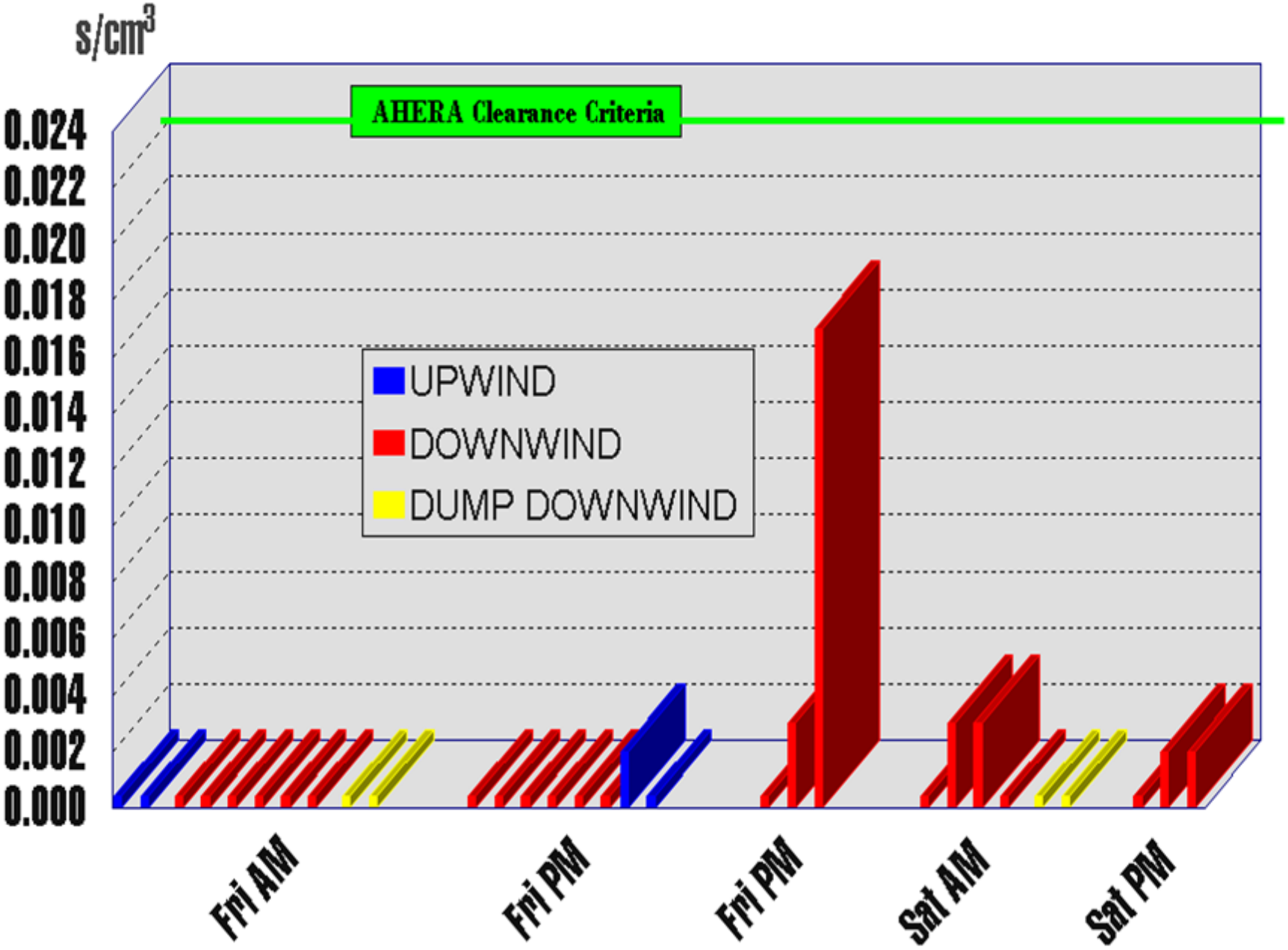
AURORA SCHOOL

ASBESTOS RELEASE FROM THE NESHAP DEMOLITION OF THE AURORA SCHOOL



FORT WAINWRIGHT SCHOOL

ASBESTOS RELEASE FROM THE NESHAP DEMOLITION OF THE FORT WAINWRIGHT SCHOOL



SANDER HALL IMPLOSION

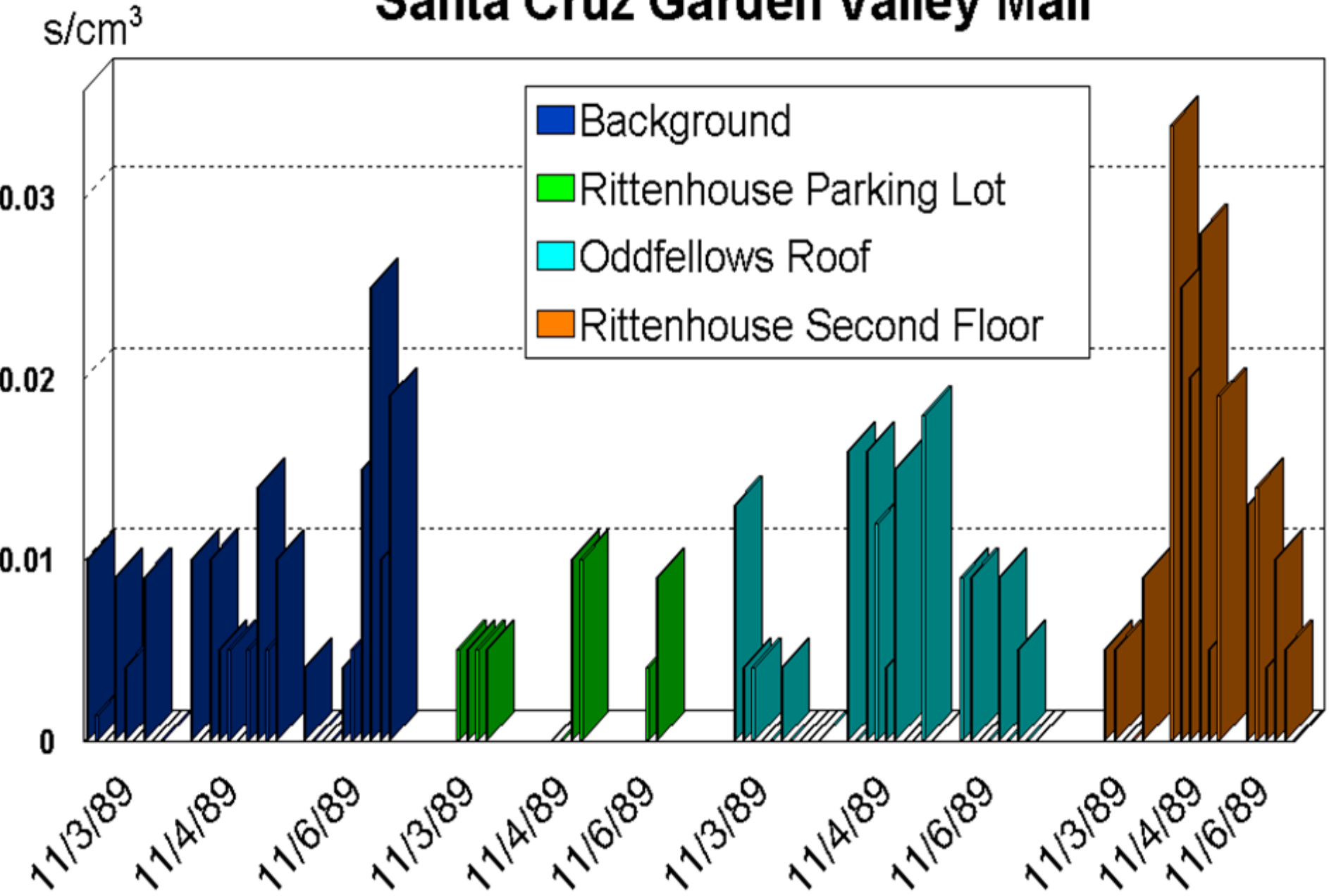
IMMINENT DANGER DEMOLITIONS

LOMA PREITO EARTHQUAKE

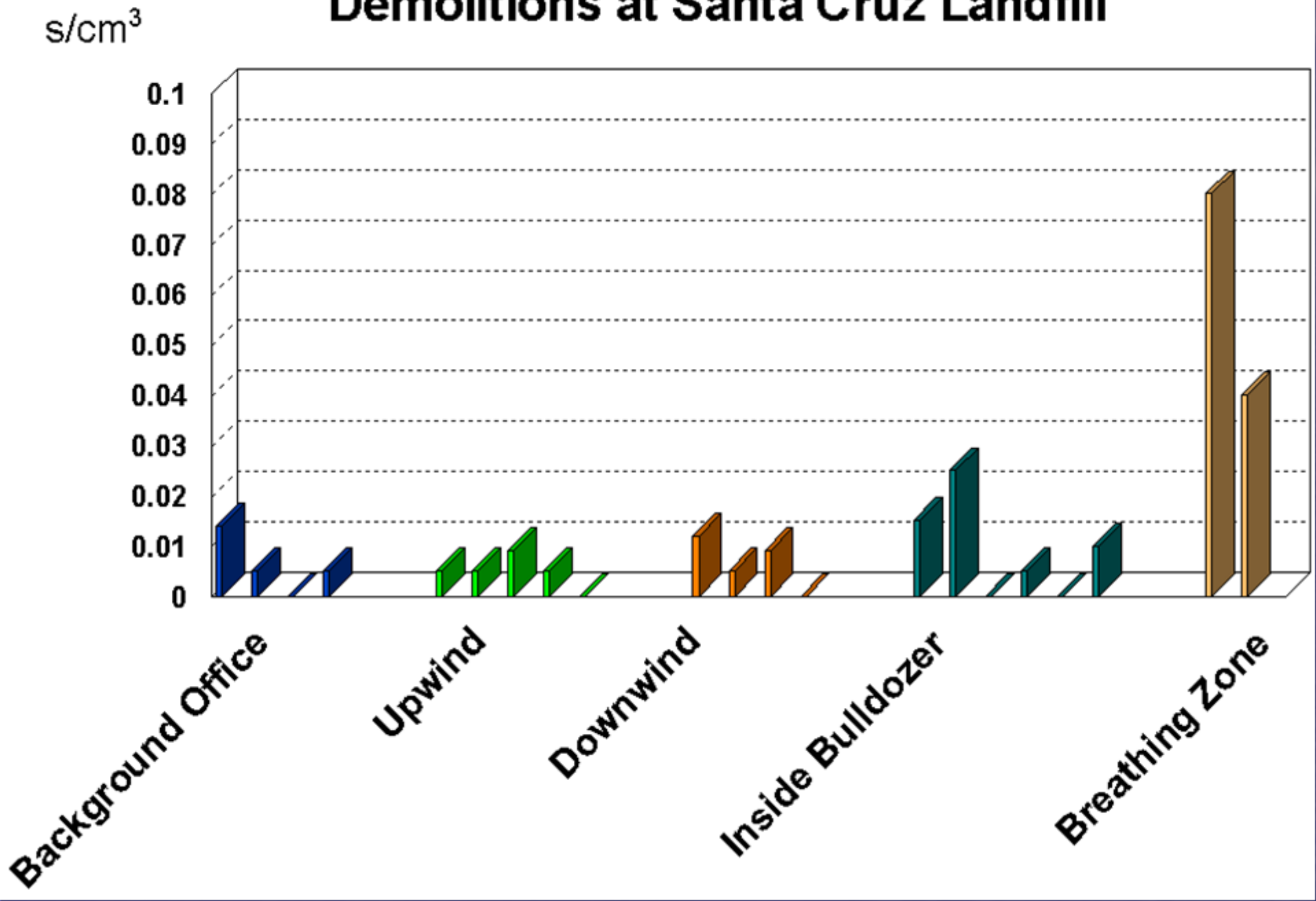
SANTA CRUZ

SHANDRYDAN
SHEN'S GALLERY
GALLERY

Airborne Asbestos (TEM) from Demolitions at Santa Cruz Garden Valley Mall

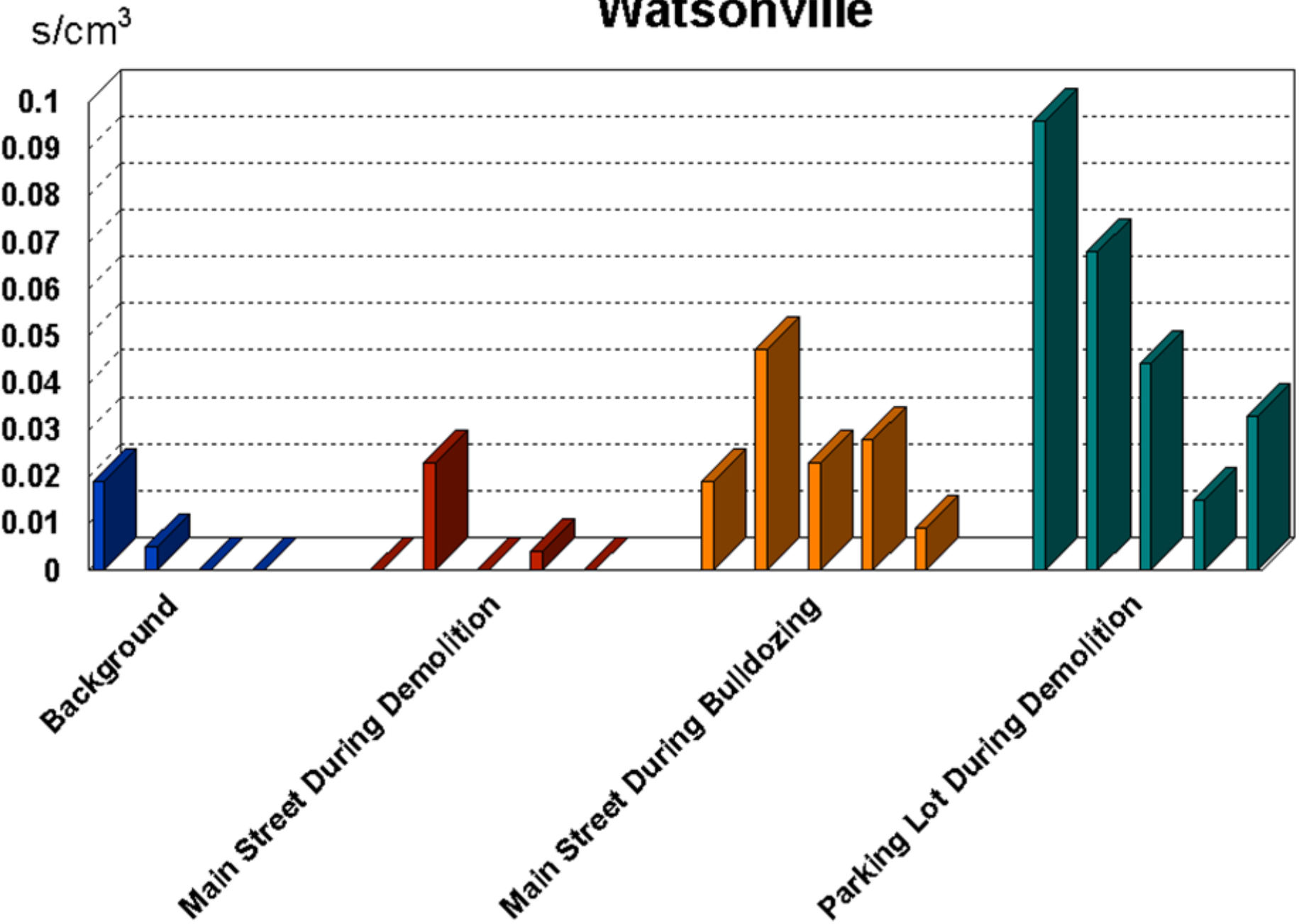


Airborne and Worker Asbestos (TEM) from Debris Demolitions at Santa Cruz Landfill



WATSONVILLE

Airborne Asbestos (TEM) from Demolitions at Watsonville

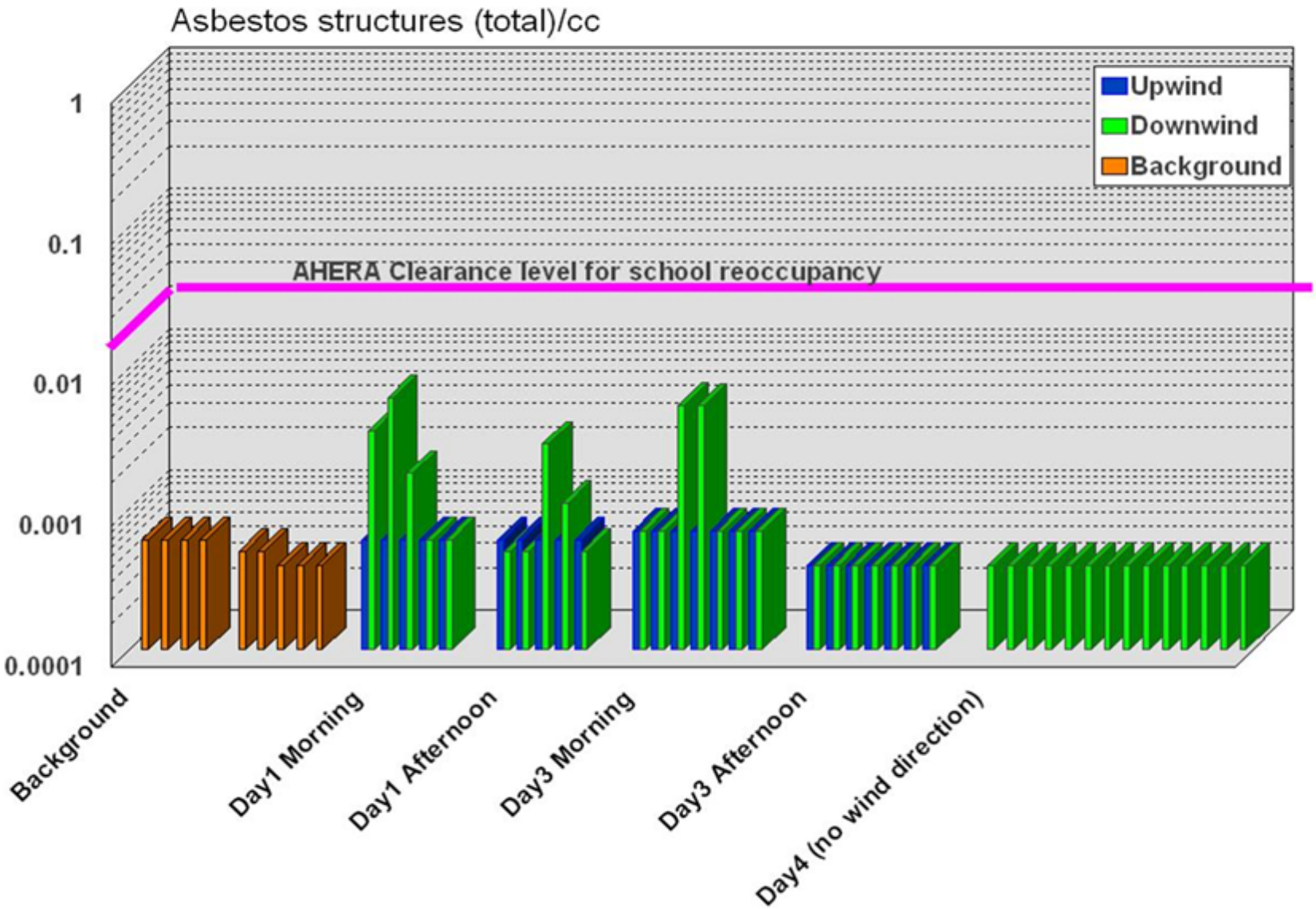


ST. LOUIS AIRPORT LANDSCAPE BUILDING

KOBELCO

Asbestos Monitoring Results from Demolition of the Landscape Building

All asbestos structures counted by TEM



Data Source: December 17, 2004 report from Lambert- St. Louis Airport Authority

FAIRBANKS

6 18 '99

NEW ORLEANS KATRINA

WET DEMOLITIONS

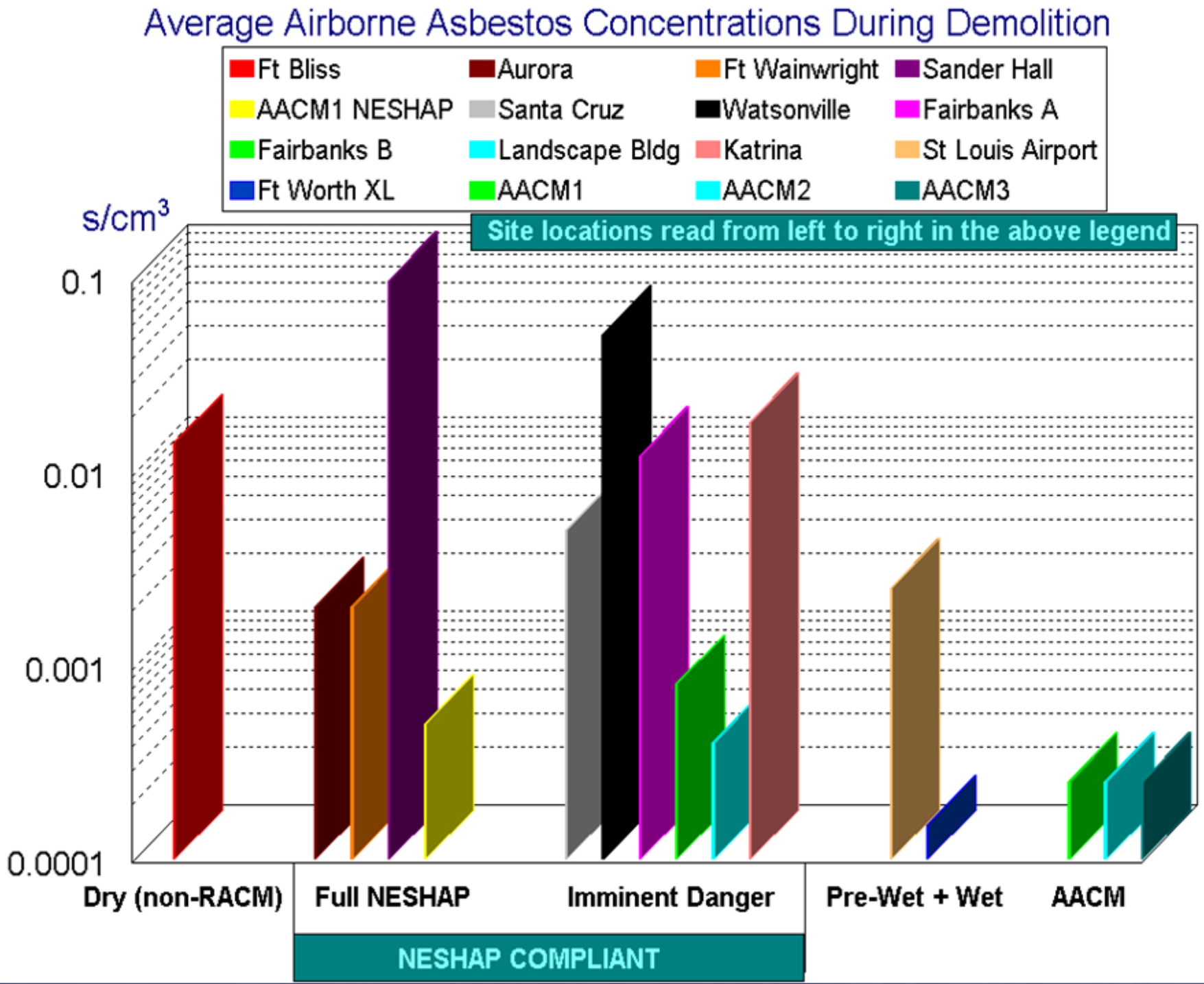
FORT WORTH XL

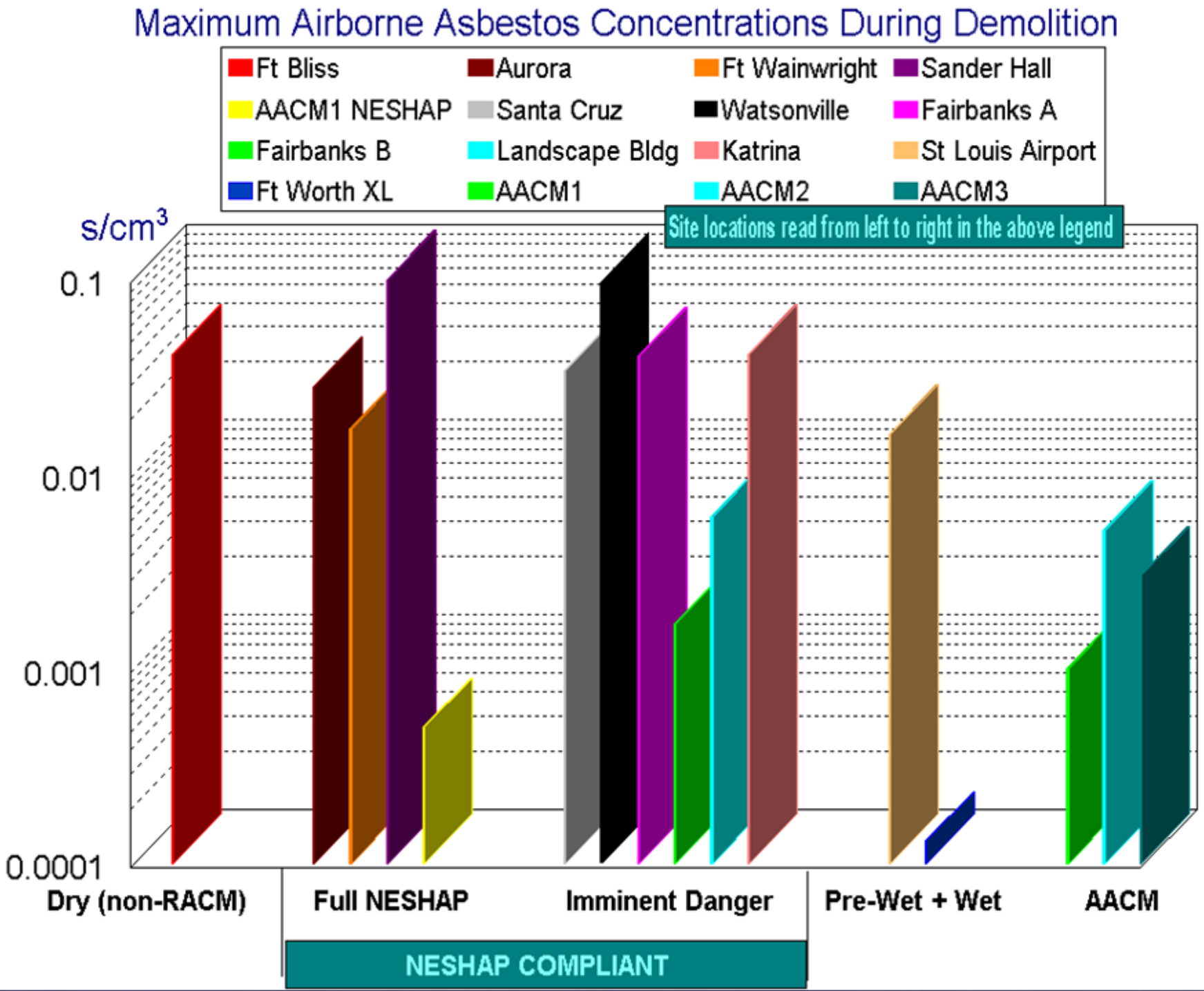
KOMATSU

ST. LOUIS AIRPORT EXPANSION

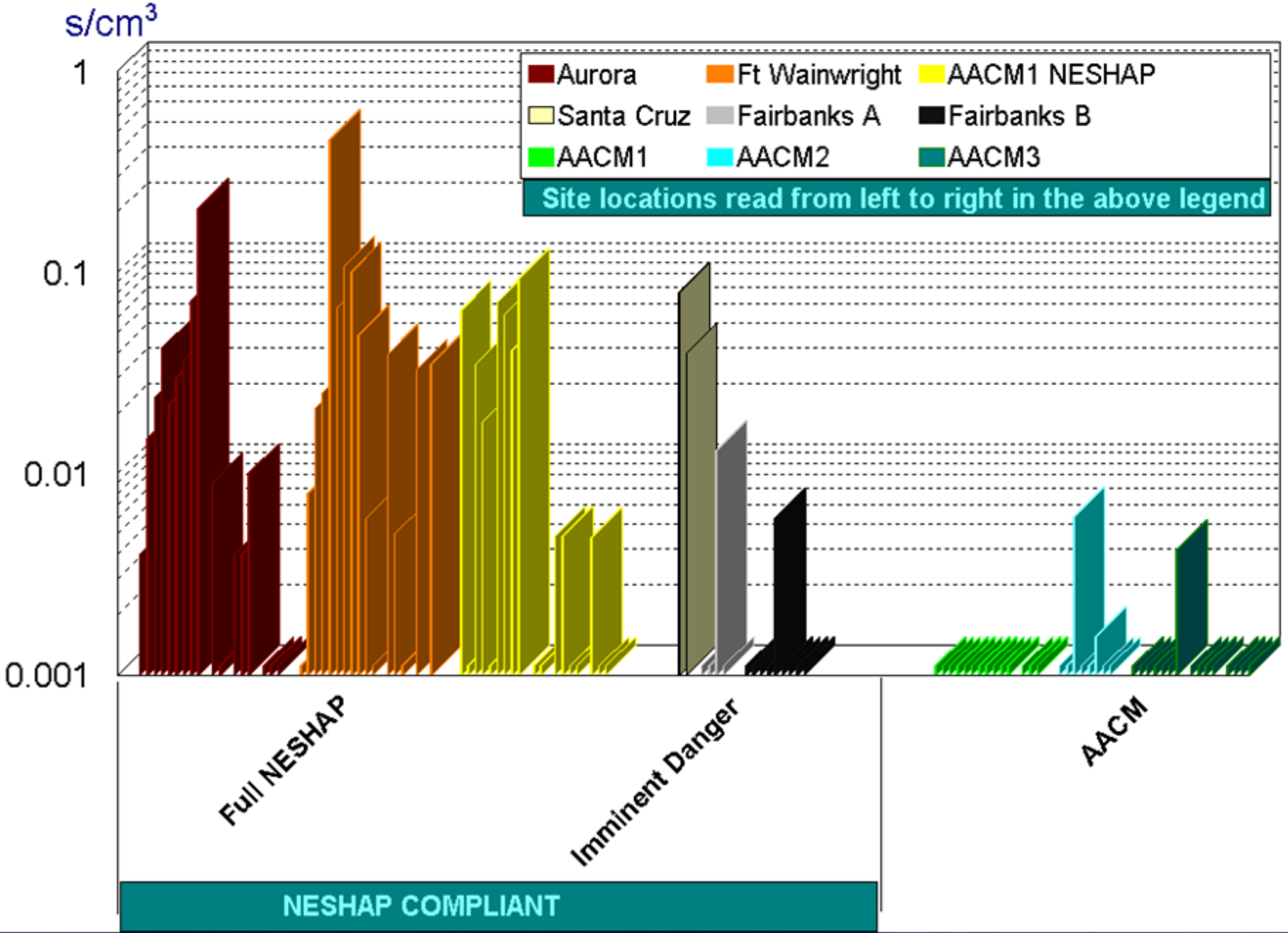
ST. LOUIS AIRPORT LANDSCAPE BUILDING

SUMMARY


Average Airborne Asbestos Concentrations During Demolition
Ft Bliss
Aurora
Ft Wainwright
Sander Hall
AACM1 NESHAP
Santa Cruz
Watsonville
Fairbanks A
Fairbanks B
Landscape Bldg
Katrina
St Louis Airport
Ft Worth XL
AACM1
AACM2
AACM3
s/cm3
Site locations read from left to right in the above legend
0.1
0.01
0.001
0.0001
Dry (non-RACM)
Full NESHAP
Imminent Danger
Pre-Wet + Wet
AACM
NESHAP COMPLIANT


Maximum Airborne Asbestos Concentrations During Demolition
Ft Bliss
Aurora
Ft Wainwright
Sander Hall
AACM1 NESHAP
Santa Cruz
Watsonville
Fairbanks A
Fairbanks B
Landscape Bldg
Katrina
St Louis Airport
Ft Worth XL
AACM1
AACM2
AACM3
Site locations read from left to right in the above legend
s/cm3
0.1
0.01
0.001
0.0001
Dry (non-RACM)
Full NESHAP
Imminent Danger
Pre-Wet + Wet
AACM
NESHAP COMPLIANT

Worker Breathing Zone Asbestos Concentrations (TEM) During Demolitions and Disposal of Asbestos-Containing Buildings



Questions??

For additional Information:

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