APPENDIX D

Field Interview Instruction Manual

TABLE OF CONTENTS

		PAGE
1.	OVERVIEW	1-1
1.1	Introduction to the Study	1-1
1.2	The Role of the Interviewer	1-2
1.3	Outline of the Manual	1-2
2.	PROJECT INFORMATION	2-1
3.	ADMINISTRATIVE PROCEDURES	3-1
3.1	Introduction	3-1
3.2	Employment	3-1
3.3	Equipment and Supplies	3-1
3.4	Production, Time, and Expense Reporting	3-2
3.4.1	Reporting Production	3-2
3.4.2	Reporting Time	3-2
3.4.3	Reporting Expenses	3-4
3.4.4	Allowable Time and Expense Charges	3-4
3.4.5	Other Time and Expense Considerations	3-5
3.4.6	Procedures for Paying Interviewers	3-6
3.4.7	Expense Advances	3-7
3.5	Interviewers' Responsibilities	3-7
3.5.1	Assignments	3-7
3.5.2	Scheduling Work	3-7
3.5.3	Maintaining Contact with Supervisors	3-8
3.5.4	Verification of Your Work	3-8
3.6	Professional Ethics	3-9
3.7	Confidentiality	3-9
3.8	Forms' Handling	3-10
4.	HOUSEHOLD SCREENING	4-1
4.1	Overview	4-1
4.2	Sample Assignments	4-1
4.3	Contacting the Sample Housing Units	4-3
4.4	Completing the Household Enumeration Questionnaire (HEQ)	4-11
4.5	Selecting a Study Participant	4-13
4.6	Recruiting the Selected Participant	4-14
4.7	Appointment Schedules	4-19
4.8	Refusals	4-26
4.9	Validations	4-29
5.	ADMINISTERING THE STUDY QUESTIONNAIRE	5-1
5.1	Overview	5-1
5.2	Question by Question Specifications	5-1
5.3	Final Steps	5-3

APPENDIX E

Household Enumeration Questionnaire

OMB No.: 2080-0037
Expires: June, 1992

Research Triangle Institute
THE PERSONAL EXPOSURE STUDY OF AIRBORNE PARTICLES IN RIVERSIDE

HOUSEHOLD ENUMERATION QUESTIONNAIRE

A. Household Identification

(PLACE LABEL HERE)

Segment No: ☐☐

SHU No: ☐☐☐-☐-☐

Sample Person No.: ☐☐

Street Address

_____

_____ ☐☐☐☐☐
City State Zip

_____
County

Telephone No.: ☐☐☐-☐☐☐-☐☐☐☐

B. Record of Calls

Day	Date	Time	Result of Call	Code	FI ID Number
		am/pm			
		am/pm			
		am/pm			
		am/pm			

C. Final Screening Result

Ineligible HU: (Circle One)

Vacant	01	
Not an HU	02	Section D
Temporary/Vacation Home	03	
Screening Not Completed:		
Refusal (Provide Documentation)	04	
No one at home (after repeated visits)	05	FS Approval
No eligible respondent (after repeated visits)	06	
Language Barrier	07	
Other (SPECIFY)	08	

_____

_____

_____

_____

Screening complete 09

D. Informant ID

Name: _____

Address: _____

_____

_____

_____ _____ _____
City State Zip

☐☐☐☐☐

_____
Relationship/Title:

_____

Telephone Number:

☐☐☐-☐☐☐-☐☐☐☐

No phone 00
Refused 01

Comments: _____

_____

FS USE ONLY

FS APPROVAL:

_____

Verified ?

Yes ...01
No 02

Date of Verification

__/__/__

NOTES:

E. Household Roster

BE SURE YOU ARE TALKING TO AN ELIGIBLE ENUMERATION INFORMANT: i.e. A FULL-TIME RESIDENT OF THE HOUSEHOLD AT LEAST 16 YEARS OF AGE.

1. How many people currently live in this home? _____ people

2. What are the names of all the people who currently live here? Let's list them in order of age, starting with the oldest.

CHECKPOINT: DOES THE NUMBER OF NAMES IN THE ROSTER EQUAL THE ENTRY FOR QUESTION 1?

☐ Yes - CONTINUE WITH QUESTION 3

☐ No - RESOLVE WITH RESPONDENT, CORRECT QUESTION OR ROSTER AS NECESSARY, THEN CONTINUE.

3. For each person in the roster, including yourself, I need to know the following:

   a. age (in years at last birthday),
   b. the type of work of each person currently employed outside of the home for at least 30 hours a week or more, and
   c. current smoking status (Yes/No). (Yes = at least 1 cigarette, cigar, or pipeful per day)

INDICATE THE ENUMERATION RESPONDENT BY PLACING "R" IN THE MARGIN BESIDE THE NAME

Household Member Name	(a) Age	(b) Type of Work Outside The Home 30 Hrs a Week Or More	(c) Smoker(Y/N)	(d) Consecutive # for Non-Smoker

4. Is there anyone else, such as a relative or roomer, who is currently living here, who you did not list above?

   Yes - ADD TO LIST AND COMPLETE ALL INFORMATION
   No - CONTINUE

5. How many years of school has the head of the household completed? _____ years

F. Sample Respondent Selection

(PLACE SAMPLING LABEL HERE)

INTERVIEWER: USE THE FOLLOWING SAMPLING INSTRUCTIONS TO DETERMINE WHICH, IF ANY, OF THE ROSTERED MEMBERS SHOULD BE INCLUDED IN THE STUDY.

1. Consecutively number the non-smoking household residents 10 years of age or older in column (d) of the roster.
2. Circle the number of non-smokers aged 10 or more on line 1 of the sampling label.
3. Circle the Y or N on line 2 immediately below the circled number on line 1.
4. If circled letter is N, thank respondent for cooperation. Answer any questions. Leave household. Circle code 20 in Section H.
5. If circled letter is Y, circle the person number on line 3 immediately below the circled number on line 1.
6. Circle the selected number from line 3 in column (d) of the roster. This is your selected respondent. At the same time, circle the respondent's name in column (a) and enter the same number in the "sample person number" blanks on the label on the top of the front page of this document. Enter selected respondents name on line 1, Section G.
7. If the entry in column (b) for the selected respondent indicates that he/she is employed or if anyone in the household is a smoker, continue with the contacting and recruiting process. Otherwise, if the selected respondent is not employed and no one smokes, use the inclusion indicator on line 4 of the sample label to determine if the respondent is to be included. If the indicator is "Y", continue with the contacting and recruiting process. If the indicator is "N", thank the respondent, answer any questions, and leave. Circle code 20 in Section H.
8. Use the random day number found on line 5 of the sample label to determine the selected monitoring day.

INSTRUCTIONS FOR THE MONITORING DAY SELECTION PROCESS ARE IN YOUR FI MANUAL. ENTER SELECTED DAY IN SECTION G, LINE 5, BELOW.

G. **Participant Recruitment**

1. Selected Participant's Name: _____

2. Recruitment effort completed during enumeration visit.

   Yes - GO TO 5
   No - CONTINUE

3. Appointment to return to complete recruitment of the selected respondent.

   Day: _____ Date: _____ Time: _____

4. Appointment made by:

   Selected participant _____ Enumeration respondent _____

5. Selected Day for Monitoring _____

6. Monitoring Appointment:

   Day: _____ Date: _____ Time: _____

H. **Results of Recruitment Effort**

   10 - Participant agrees to participate on selected date
   11 - Participant agrees to participate on other date
   12 - Unable to schedule monitoring appointment on available dates
   13 - No contact with selected participant after multiple attempts
   14 - Refusal
   20 - Household not selected

   If refusal, indicate main reason: _____

   _____

APPENDIX F

Study Questionnaire

OMB No.: 2080-0037
Expires: June, 1992

THE PERSONAL EXPOSURE STUDY OF AIRBORNE PARTICLES IN RIVERSIDE

Sponsored by:

U.S. Environmental Protection Agency
Environmental Monitoring systems Laboratory
Research Triangle Park, N.C.
and
California Air Resources Board
Sacremento, California

Conducted by:

Research Triangle Institute
Research Triangle Park, NC 27709
and
Harvard School of Public Health
Harvard University
Boston, MA 02115

QUESTIONNAIRE

The Research Triangle Institute and the Harvard School of Public Health are undertaking a research study for the U.S. Environmental Protection Agency and the California Air Resources Board to assess levels of human exposure to particulate matter during normal daily activities. The information recorded in this questionnaire will be held in strict confidence and will be used solely for research into the effects of environmental factors on public health. All results will be summarized for groups of people; no information about individual persons will be released without the consent of the individual. While you are not required to respond, your cooperation is needed to make the results of this survey comprehensive, accurate, and timely.

NOTIFICATION TO RESPONDENT OF ESTIMATED BURDEN

Public reporting burden for this collection of information is estimated to vary from 3.5 to 4.0 hours per response, with an average of 3.75 hours per response, including time for reviewing instructions and completing the survey and log. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M St., S.W., Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503, marked "Attention: Desk Officer for EPA."

Participant ID # ☐☐ - ☐☐☐ - ☐ - ☐ - ☐☐
Seg # SHU # CHK MHU Per ID #

Chemistry ID # _____ (PLACE LABEL HERE) _____

The purpose of this questionnaire is to obtain information about you, your residence, your occupation and the environment in which you work. We are asking the same questions of each respondent in the study.

First, I would like to ask some general questions about you.

1. Sex? (by observation) 1) MALE 2) FEMALE

2. What is your year of birth? 19___

3. What is the last year of school which you completed? (CIRCLE ONE)
(IF CURRENTLY IN SCHOOL, INDICATE CURRENT YEAR)

Elementary	1	2	3	4	5	6
Jr/Sr. High	7	8	9	10	11	12
College (Tech School)	13	14	15	16	17	17+

4. To what ethnic group (race) do you belong?
(RECORD BY OBSERVATION, IF POSSIBLE)

1) White, Non-Hispanic [1]

2) Hispanic [2]

3) Black [3]

4) Asian [4]

5) Other (SPECIFY) [5]

_____

5. About when was your home originally built? Please consider when it was originally built, not when it was remodeled, added to, or converted.
(CHECK ONE BOX)

1)	1985 to Present	[1]	5)	1960-1969	[5]
2)	1980-1984	[2]	6)	1950-1959	[6]
3)	1975-1979	[3]	7)	1949 or Earlier	[7]
4)	1970-1974	[4]	8)	Don't Know	[8]

6. Do you have:

	Yes	No
a. an unvented clothes dryer located in the house or an attached structure, such as a garage?	1	2
b. an unvented kerosene heater in the house or an attached structure?	1	2
c. a fireplace or wood stove in the house or an attached structure?	1	2
d. a whole-house or attic fan?	1	2

7. How many rooms do you have in your home? (Do not count bathrooms, porches, balconies, foyers, or halls.)

_____ rooms

8. Please list each room in your home and estimate the percentage of usable floor space covered by rugs or carpets.

Room	% Of Floor Covered by Rug or Carpet
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
(Other areas not identified as a unique room.)	_____

9. Do you have any pets, such as dogs or cats or other furry animals, which usually spend some time each day in your home?

Yes [1]

No [2]

10. How many people regularly smoke INSIDE YOUR HOME?

[0] 0

[1] 1

[2] 2

[3] 3 or more

Finally, I have a few questions about your occupation and work environment.

11. Do you have a paid job outside of the home?

1) Yes (CONTINUE)
2) No, self-employed in the home. (CONTINUE)
3) No, a full-time student. (CONTINUE)
4) No, full-time homemaker. (GO TO 20)
5) No, out of work just now, but usually employed. (GO TO 20)
6) No, retired or disabled (GO TO 20)
7) No, other (SPECIFY) _____ (GO TO 20)

12. At the present time, how many hours per day and days per week do you normally work at your primary job or attend classes?

1) _____ hours/day 2) _____ days/week

13. What are your primary job duties? _____

14. a. Which of the following describes your primary work or school setting?

[1] Indoors (CONTINUE)

[2] Outdoors (GO TO 15)

[3] In a vehicle (GO TO 16)

b. Which of the following best describes your indoor work or school setting?

[1] office, educational facility, medical facility

[2] warehouse, factory, plant

[3] retail, sales

[4] Other, (SPECIFY): _____

15. What is the address of the specific location where your primary work station is located? (Include the building name or number number, if appropriate.) If student, indicate name and location of school.

_____

_____

_____

_____ ZIP

16. Do you have another job, or if employed, do you go to school part-time?

1) Yes (CONTINUE) 2) No (GO TO 20)

(IF RESPONDENT INDICATES BOTH SECOND JOB AND SCHOOL, ANSWER 17-19 FOR SECOND JOB ONLY)

17. How many hours per day and days per week do you work during a normal week at your second job or are you in school?

1) _____ hours/day 2) _____ days/week

18. What are your primary duties at this job? _____

19. a. Which of the following describes the work or school setting?

[1] Indoors (CONTINUE)

[2] Outdoors (GO TO 20)

[3] In a vehicle (GO TO 20)

b. Which of the following best describes this indoor work or school setting?

[1] office, educational facility, medical facility

[2] warehouse, factory, plant

[3] retail, sales

[4] Other, (SPECIFY): _____

20. Do you have a part-time job or work as a volunteer?

1) Yes (CONTINUE) 2) No (GO TO 24)

21. How many hours per week do you work part-time or as a volunteer?

_____ hours

22. What are your job duties at this job? _____

23. a. Which of the following describe the work setting?

[1] Indoors (CONTINUE)

[2] Outdoors (GO TO 24)

[3] In a vehicle (GO TO 24)

b. Which of the following best describe this indoor work setting?

[1] office, educational facility, medical facility

[2] warehouse, factory, plant

[3] retail, sales

[4] Other, (SPECIFY): _____

24. INTERVIEWER: IF RESPONDENT REFUSES TO RESPOND OR DEMONSTRATES RELUCTANCE, DO NOT ATTEMPT TO FORCE A RESPONSE.

As I indicated before, all your responses are strictly confidential, and you may refuse to answer any question. In order to make comparisons of groups of people, information about approximate household income is important. Please estimate the total gross income of all members of the household. Which of the following categories contains your estimate?

1. less than $10,000	[1]	4. $50,000 to $79,999	[4]
2. $10,000 to $29,999	[2]	5. $80,000 or greater	[5]
3. $30,000 to $49,999	[3]		

[94] RE [97] DK

This completes the interview. Are there any questions which you have that I can answer? (ANSWER ANY QUESTIONS AND CONTINUE) Thank you very much for your cooperation.

Interviewer # ☐☐☐☐☐☐

Date of Interview ☐☐-☐☐-☐☐

Comments:

_____

_____

_____

RECORD ANSWERS TO QUESTIONS A, B, AND C BY OBSERVATION.

A. Which best describes this building?

1. A MOBILE HOME OR TRAILER
2. A ONE-FAMILY HOUSE DETACHED FROM ANY OTHER HOUSE
3. A ONE-FAMILY HOUSE ATTACHED TO ONE OR MORE HOUSES
4. A BUILDING FOR 2 FAMILIES
5. A BUILDING FOR 3 OR 4 FAMILIES
6. A BUILDING FOR 5 TO 9 FAMILIES
7. A BUILDING FOR 10 TO 19 FAMILIES
8. A BUILDING FOR 20 OR MORE FAMILIES
9. A BOAT, TENT, VAN, ETC.
10. OTHER, PLEASE SPECIFY: _____

B. Is the house located within 100 yards of a busy roadway?

Yes [1]

No [2]

C. Are any of the following sources of dirt located within 100 yards of this house?

	Yes	No
1) Dirt drive	[1]	[2]
2) Other, (SPECIFY) _____	[1]	[2]

APPENDIX G

Time/Activity Survey

12 HOUR TIME/ACTIVITY SURVEY

A. Identification

Participant ID ☐☐-☐☐☐-☐-☐-☐☐

B. Monitoring Period 1

1. Date: _____/_____/_____
2. PEM Monitoring start time _____:_____ pm
3. PEM Monitoring stop time _____:_____ am

C. Monitoring Period 2

1. Date: _____/_____/_____
2. PEM Monitoring start time _____:_____ am
3. PEM Monitoring stop time _____:_____ pm

B. Recall Diary

PERIOD NO.: 1 2

DESCRIPTION	TIME ACTIVITY		INSIDE		OUTSIDE		TRAVEL ON ROADWAY*	TIME IN PRESENCE OF SMOKING
	START	END	HOME	OTHER	NEAR HOME	OTHER		
			1	2	3	4	5	00 ____% ____:____ hr/min
			1	2	3	4	5	00 ____% ____:____ hr/min
			1	2	3	4	5	00 ____% ____:____ hr/min
			1	2	3	4	5	00 ____% ____:____ hr/min
			1	2	3	4	5	00 ____% ____:____ hr/min
			1	2	3	4	5	00 ____% ____:____ hr/min
			1	2	3	4	5	00 ____% ____:____ hr/min

*Include: (1) time walking to and from vehicle
(2) time walking, biking, etc. along a roadway
(3) time in a car, bus, truck, etc. on a roadway

C. Potential Exposure Influence During the Monitoring Period

1. a. Did you go to work during this monitoring period?

[1] Yes (GO TO b)

[2] No (GO TO 2)

1. b. Of the time you spent at work during this monitoring period, how long did you spend in the following locations?

INTERVIEWER: ENTER RESPONSES IN i-iii IN HOURS/MINUTES. ACCOUNT FOR ENTIRE WORK DAY.

i) At your usual indoor work location ____/____

ii) At your usual outdoor work location ____/____

iii) At another work location ____/____

2. I am going to read you a list of activities. For each activity, please tell me if you did this activity yourself, were near where this activity was done, or if this activity was done at your home while you were away.

INTERVIEWER: CIRCLE Y OR N BY EACH ACTIVITY AND FOR EACH ACTIVITY WITH A Y CIRCLED, ENTER THE MINUTES THE RESPONDENT ENGAGED IN OR WAS IN THE SAME AREA FOR EACH ACTIVITY AT HOME OR AWAY. ENTER -0- WHERE NECESSARY. NEAR THE ACTIVITY IS GENERALLY WITHIN 100 YARDS OR CLOSE ENOUGH TO SMELL ODORS FROM THE ACTIVITY.

Activity	Done or Nearby	DONE		NEARBY		At Home,
		At home	Away	At home	Away	Resp. Away
a) vacuuming	Y/N	_____	_____	_____	_____	_____
b) dusting	Y/N	_____	_____	_____	_____	_____
c) carpet cleaning	Y/N	_____	_____	_____	_____	_____
d) lawn mowing	Y/N	_____	_____	_____	_____	_____
e) gardening	Y/N	_____	_____	_____	_____	_____
f) burning leaves or rubbish	Y/N	_____	_____	_____	_____	_____
g) outdoor cooking-grilling, frying, barbecuing	Y/N	_____	_____	_____	_____	_____

Activity	Done or Nearby	DONE At home	DONE Away	NEARBY At home	NEARBY Away	At Home, Resp. Away
h) indoor cooking - grilling, frying	Y/N					
i) using clothes dryer	Y/N					
j) woodworking	Y/N					
k) metal working, welding	Y/N					
l) spray painting	Y/N					
m) other painting	Y/N					
n) outdoor recreation	Y/N					
o) other activities near areas with dust, smoke, or pollen	Y/N					

(SPECIFY): _____

3. Which of the following heating, ventilating, or air cleaning devices were used in your home during this period? Please indicate the duration of use, in hours, for each item used.

	Yes	No	Duration
a) natural ventilation (open doors or windows)	1	2	_____
b) central air conditioning or heating (Estimate actual time the device was running.)	1	2	_____
c) whole-house or attic fan	1	2	_____
d) ultrasonic or cool mist humidifiers	1	2	_____
e) filtration systems (including filters, ionizers and electrostatic precipitators)	1	2	_____
f) unvented kerosene heaters	1	2	_____
g) fire place	1	2	_____
h) wood-burning stove	1	2	_____

4. How many cigarettes, pipefuls, and/or cigars were smoked in your house during this period?

_____ # cigarettes _____ # pipes and/or cigars

5. Did you smoke any tobacco products (cigarettes, cigars, pipes) during this period?

[1] Yes

[2] No

6. Were there any other sources of smoke present in the home during this period, such as burnt food or candles?

[1] Yes

[2] No

7. a. Was a vehicle started or run in a garage attached to your home during this period?

[1] No (GO TO END)

[2] Yes (CONTINUE)

b. For how long? _____ minute(s)

c. Was it diesel powered?

[1] Yes

[2] No

APPENDIX H

Field Control Losses

February 6, 1991

Ms. Liz Ota
Indoor Exposure Assessment Section
Air Resources Board
1102 Q Street
P. O. Box 2815
Sacramento, CA 95812

Dear Liz:

The purpose of this letter is to provide a project update and to apprise you of a change in our QC procedures. In early January, we started our sample analyses for the PTEAM project. This began with a simple laboratory validation of spiked and unspiked XAD/filter cartridges similar to the experiments performed in September. The results of the analyses showed little background contamination and high recovery (>75%) of all PAHs and phthalates. Based on these results, we proceeded to analyze several field control and field blank samples. Field blanks were XAD/filter cartridges that were prepared then shipped to the field and handled with field samples. The field controls were XAD/filter cartridges that were spiked with known amounts of target compounds, as shown in Table 1 then shipped to the field and handled with field samples. As indicated on the table, the lower molecular weight PAHs and phthalates were spiked into the XAD cartridges, the higher molecular weight PAHs were spiked directly onto the filter. Analytical results for these samples showed little background contamination on the field blanks, although some background was found for the phthalates. Recovery of the field controls was good (80-110%) for those chemicals spiked onto the XAD. However, poor recovery was seen for those chemicals spiked directly onto the filter, with BaP giving the lowest result (30-40%).

Since this appeared to be a very significant problem, I did a survey (both literature and personal contact) to determine the validity of using spiked filters as field controls for the higher molecular weight PAHs. The results of this review are summarized in Table 2. Essentially, there is no good way to prepare field controls for the high molecular weight PAHs including BaP. Further, our approach of spiking onto the filters would probably accelerate both volatilization and chemical decomposition losses compared to the actual particulate matrix found on field sample. As a consequence, the approach will not provide a valid indicator for sample behavior.

Based on this information and in keeping with procedures used in other laboratories, we now propose to run laboratory controls, (i.e. material spiked onto the XAD/filter cartridge with no storage) in lieu of field controls to demonstrate method recovery for the high molecular weight PAHs. We will also analyze multiple samples of the NBS urban particulate to demonstrate efficiency of the extraction and analysis procedure. Field controls will still be used to assess the method performance for those chemicals spiked onto the XAD resin. We are currently working on methods for embedding NBS urban particulates on filters that can be used as field controls during future studies.

We are now analyzing samples using these QC procedures. Approximately 60 samples have been analyzed to date. Recoveries for all control samples look good with the exception discussed above. In addition, recovery of surrogate compounds added to each sample prior to extraction look good. We are hoping to analyze 12 to 14 samples/day and finish sample analyses toward the end of March.

I will call you to discuss this later today but thought a summary of this information would be useful prior to our phone conversation. Talk to you shortly.

Sincerely,

Linda S. Sheldon, Ph.D.

LSS:mhg

Attachments (2)

Table 1. Field Controls

Compound	Level (ng)
Spiked onto XAD	
Acenaphthylene	100
Phenanthrene	245
Anthracene	13
Fluoranthene	102
Pyrene	53
Benzo(a)anthracene	10
Chrysene	10
Diethyl phthalate	500
Di-n-butyl phthalate	505
n-Butylbenzyl Phthalate	505
Di-n-octyl Phthalate	500
Di-2-(ehylhexyl)Phthalate	497
Spike onto Filter	
Benzo(k)fluoranthene	10
Benzo(e)pyrene	10
Benzo(a)pyrene	5
Indeno(c,d)pyrene	5
Benzo(g,h,i)perylene	12
Coronene	10

Table 2. Summary of Field Control Survey

Contact	Information
Nancy Wilson - EPA	They have not spiked filter with neat PAHs for field control. Would expect significant compound losses during storage.
Jane Chuang - Battelle	They have not spiked neat PAHs onto filter. For PTEAM prepilot they spiked some low molecular weight PAHs into XAD as field controls, did not prepare field controls for higher molecular weight PAHs. Published study in ES & T (21:748, 1987) shows stability of PAHs on particulate on filter but no data on neat compounds on filters.
Paul Leoy	Published data (Arch. of Env. Health, 43:304, 1988). Did not use field controls for high molecular weight PAH. Rather used spiked filters in lab to demonstrate recovery from medium. Analyzed NBS urban dust as additional control.
Joan Daisey	CARB report. Did not prepare field controls for PAHs collected on particulate. Used urban dust to demonstrate extraction efficiency.
Roger Ailkson, Janet Ary	CARB report. Did not prepare field controls for PAHs.
Draft ASTM method: PNN in Indoor Air	No field controls specified. Recovery study without storage required before calibration and analysis. NBS SRM specified for instrument calibration.

APPENDIX I

Air Exchange Rate Information Generated During PTEAM Pilot Study

PTEAM Pilot Study – Equations Used to Calculate Air Exchange Rate

The air exchange rate (AER) is calculated as follows:

$$AER=\frac{n\times S+V}{C}$$

where n: number of PFT sources

S: emission rate (pL/hr)

V: house volume (m^3)

C: PFT concentration (pL/L)

The emission rate is defined by the equation:

$$S=E\times 10^6\frac{\mu g}{g}\times\frac{24.5\mu L}{350\mu g}\times 10^6\frac{pL}{\mu L}$$

where E is PFT emission rate (g/hr) and the other quantities are physical constants. Two emission rates are used: 4.57×10^{-5} for sources labeled by HSPH as "NN" series and 4.92×10^{-5} for all other sources. The emission rate used in the equation is the weighted average of these, i.e.:

$$E=4.57\times10^{-5}\times(\%\ NN\ series\ sources)+4.92\times10^{-5}\times(1\ -\ \%\ NN\ series\ sources)$$

There are typically either six or eight sources per household. House volume was estimated in ft^3 in the field; this is converted to m^3 using the relationship 28.31685 cubic feet = 1 cubic meter.

The PFT concentration is calculated as:

$$C=\frac{P}{ELP\times SR}$$

where P: amount of PFT collected by the CAT (pL)

ELP: elapsed time CAT was exposed (hr)

SR: CAT sampling rate = 0.00892 L/hr

PTEAM pilot study AER and associated fields
Created 3/16/92 HSPH, Butler Key below

CAT ID	PID	LOC	Amt PFT collected (pL)	Comments	Date of Analysis	PID house vol (ft3)	tot PFT sources	% NN ser. sources	elapsed time (hr)	AER (hr-1)
C8150	001A	BED	3.00	<	30-Jul-91	4,940	6	100.0%	13.5	5.50
C8164	001A	BED	4.90	<	05-Aug-91	4,940	6	100.0%	8.1	2.03

...

KEY:

Eqs: AER = (n * S)/(V * C)

S = E * 1E+6μg/g * 24.5μL/350μg * 1E+6pL/μL

C = P/(ELP * SR)

where: n – tot PFT sources

S – emission rate

V – PID house vol

C – PFT concentration

E – PFT emission rate = 4.57E-5 for NN ser. sources
4.92E-5 for other sources
(emission rate weighted avg of above using "% NN series sources" field)

P – Amt PFT collected

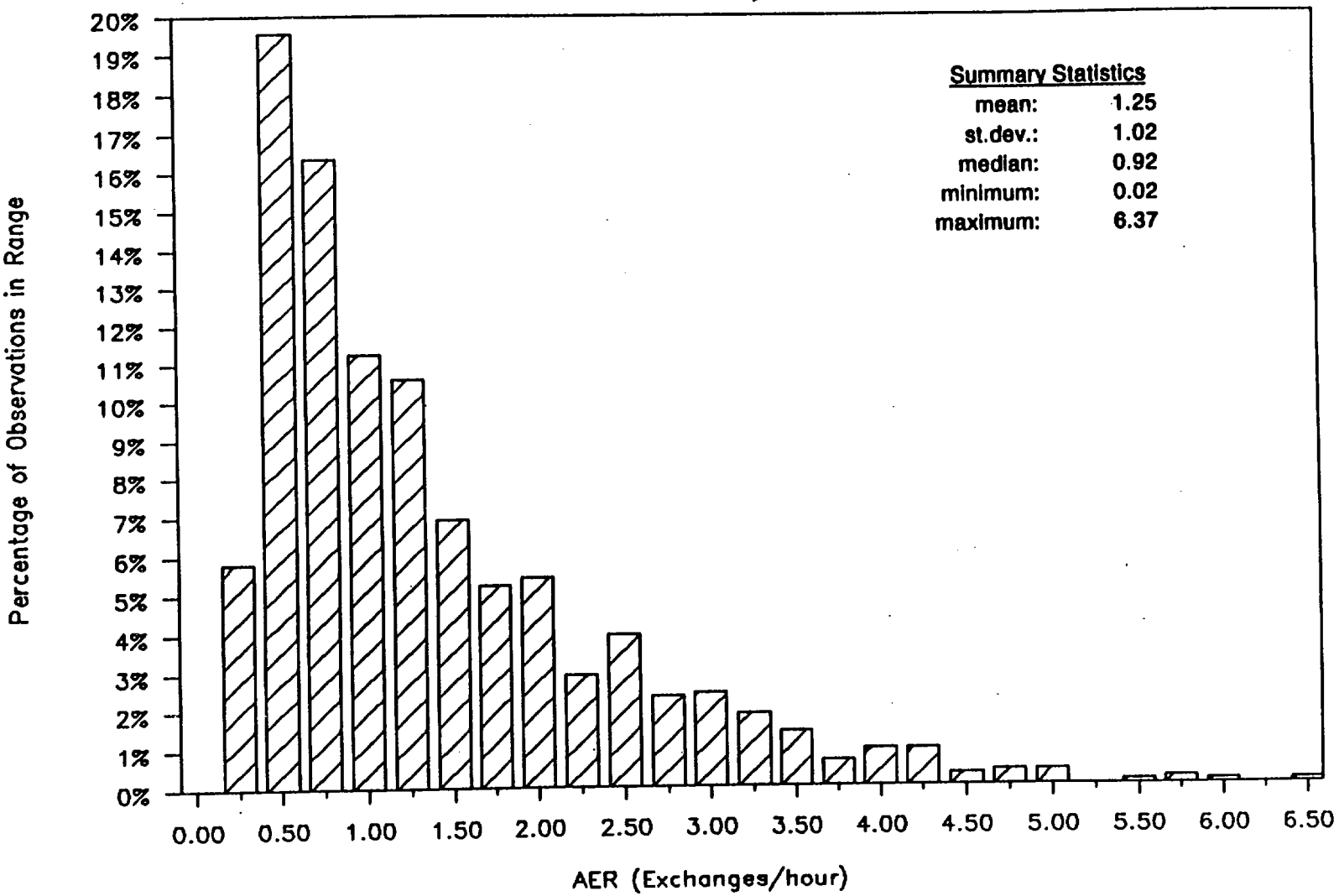
ELP – elapsed time CAT was exposed

SR = CAT sampling rate = 0.00892

hilighted quantities provided as data fields

Distribution of AER Values

PTEAMS Pilot Analysis Data



APPENDIX J

Results of Statistical Analysis on Questionnaire Data

TABLE J-1. COMPOUND CODES

Compound	Code
Acenaphthylene	201
Phenanthrene	202
Anthracene	203
Fluoranthene	204
Pyrene	205
Benzo[a]anthracene	206
Chrysene	207
Benzo[k]fluoranthene	208
Benzo[e]pyrene	209
Benzo[a]pyrene	210
Indeno[1,2,3-cd]pyrene	211
Benzo[ghi]perylene	212
Coronene	213
Diethylphthalate	214
Di-n-butylphthalate	215
Butylbenzylphthalate	217
Di-2-ethylhexylphthalate	218
Di-n-octylphthalate	219

INDOOR DAYTIME ARITHMETIC MEANS
WITH TWO HIGH HOMES DELETED

CMPD	BUSYROAD	NSUM	MEAN	SEMEAN
201	YES	41	6.24	1.24
201	NO	53	6.94	1.94
202	YES	41	17.17	1.31
202	NO	54	18.60	1.68
203	YES	41	0.52	0.06
203	NO	52	0.89	0.40
204	YES	40	1.93	0.17
204	NO	54	2.02	0.20
205	YES	41	2.05	0.22
205	NO	54	2.24	0.27
206	YES	40	0.15	0.03
206	NO	50	0.14	0.03
207	YES	41	0.29	0.05
207	NO	48	0.23	0.03
208	YES	42	0.48	0.14
208	NO	53	0.21	0.08
209	YES	41	0.29	0.04
209	NO	50	0.21	0.03
210	YES	41	0.29	0.04
210	NO	50	0.23	0.04
211	YES	39	0.70	0.10
211	NO	49	0.57	0.10
212	YES	42	1.29	0.19
212	NO	54	1.06	0.17
213	YES	42	1.11	0.17
213	NO	54	1.00	0.16
214	YES	41	465.99	92.11
214	NO	54	438.02	57.46
215	YES	41	639.59	141.68
215	NO	54	620.49	71.89
217	YES	42	61.84	12.30
217	NO	54	63.23	12.27
218	YES	42	159.82	26.14
218	NO	54	121.13	9.92
219	YES	42	23.13	11.53
219	NO	54	14.07	6.70

INDOOR NIGHTTIME ARITHMETIC MEANS
WITH TWO HIGH HOMES DELETED

CMPD	BUSYROAD	NSUM	MEAN	SEMEAN
201	YES	39	6.30	0.98
201	NO	52	6.74	1.41
202	YES	40	15.65	1.38
202	NO	55	17.40	1.36
203	YES	40	1.86	1.19
203	NO	53	0.59	0.09
204	YES	40	1.72	0.13
204	NO	55	1.74	0.15
205	YES	40	1.69	0.13
205	NO	55	2.07	0.29
206	YES	36	0.16	0.02
206	NO	49	0.10	0.01
207	YES	39	0.32	0.06
207	NO	50	0.19	0.02
208	YES	39	0.20	0.05
208	NO	55	0.23	0.05
209	YES	38	0.22	0.03
209	NO	54	0.19	0.03
210	YES	39	0.31	0.05
210	NO	55	0.28	0.05
211	YES	39	0.53	0.09
211	NO	53	0.54	0.09
212	YES	39	1.02	0.12
212	NO	55	1.00	0.16
213	YES	40	0.93	0.12
213	NO	55	0.95	0.14
214	YES	40	404.02	62.51
214	NO	55	415.56	51.77
215	YES	40	521.01	90.98
215	NO	55	623.09	122.44
217	YES	40	46.60	9.36
217	NO	55	49.75	5.51
218	YES	40	107.35	14.54
218	NO	55	104.03	5.99
219	YES	38	15.49	8.59
219	NO	55	2.42	0.20

INDOOR DAYTIME ARITHMETIC MEANS
WITH TWO HIGH HOMES DELETED

CMPD	COOKING	NSUM	MEAN	SEMEAN
201	YES	44	5.45	0.92
201	NO	67	6.56	1.72
202	YES	46	16.90	1.40
202	NO	66	17.82	1.60
203	YES	45	0.57	0.07
203	NO	64	0.78	0.32
204	YES	46	2.10	0.18
204	NO	65	1.86	0.20
205	YES	46	2.21	0.25
205	NO	66	2.04	0.22
206	YES	44	0.15	0.03
206	NO	63	0.13	0.02
207	YES	43	0.30	0.05
207	NO	62	0.23	0.03
208	YES	46	0.40	0.13
208	NO	66	0.32	0.09
209	YES	45	0.24	0.04
209	NO	63	0.24	0.03
210	YES	44	0.21	0.04
210	NO	64	0.27	0.05
211	YES	43	0.71	0.15
211	NO	62	0.61	0.10
212	YES	46	0.97	0.14
212	NO	67	1.18	0.18
213	YES	46	0.91	0.14
213	NO	67	1.06	0.16
214	YES	46	313.45	27.21
214	NO	66	543.21	69.07
215	YES	46	506.53	75.04
215	NO	66	711.67	133.91
217	YES	46	69.83	11.02
217	NO	67	57.96	10.36
218	YES	46	134.16	12.06
218	NO	67	141.82	19.21
219	YES	46	13.69	10.19
219	NO	67	17.70	8.45

INDOOR NIGHTTIME ARITHMETIC MEANS
WITH TWO HIGH HOMES DELETED

CMPD	COOKING	NSUM	MEAN	SEMEAN
201	YES	28	5.76	2.17
201	NO	79	6.10	0.79
202	YES	28	14.96	1.52
202	NO	83	16.70	1.01
203	YES	28	0.56	0.05
203	NO	81	1.23	0.64
204	YES	28	1.83	0.19
204	NO	83	1.69	0.11
205	YES	28	2.04	0.30
205	NO	83	1.82	0.16
206	YES	26	0.16	0.03
206	NO	75	0.13	0.01
207	YES	26	0.30	0.08
207	NO	78	0.25	0.03
208	YES	27	0.27	0.12
208	NO	83	0.21	0.05
209	YES	27	0.24	0.04
209	NO	81	0.20	0.02
210	YES	27	0.30	0.05
210	NO	83	0.28	0.04
211	YES	28	0.54	0.09
211	NO	80	0.52	0.07
212	YES	28	1.01	0.19
212	NO	81	0.94	0.11
213	YES	28	0.93	0.18
213	NO	83	0.87	0.11
214	YES	28	346.38	40.72
214	NO	83	445.29	41.56
215	YES	28	643.60	219.25
215	NO	83	566.43	79.14
217	YES	28	59.96	9.18
217	NO	83	48.06	5.40
218	YES	28	102.30	13.03
218	NO	83	105.07	8.85
219	YES	27	2.21	0.27
219	NO	81	8.77	4.53

INDOOR DAYTIME ARITHMETIC MEANS
WITH TWO HIGH HOMES DELETED

CMPD	SMOKING	NSUM	MEAN	SEMEAN
201	YES	17	11.02	2.50
201	NO	91	5.28	1.30
202	YES	16	20.23	2.05
202	NO	93	17.14	1.32
203	YES	16	0.85	0.07
203	NO	90	0.68	0.23
204	YES	16	2.84	0.33
204	NO	92	1.82	0.15
205	YES	16	2.81	0.49
205	NO	93	2.00	0.17
206	YES	17	0.31	0.06
206	NO	87	0.11	0.01
207	YES	17	0.54	0.08
207	NO	85	0.20	0.03
208	YES	17	0.66	0.32
208	NO	92	0.30	0.08
209	YES	16	0.46	0.05
209	NO	89	0.20	0.03
210	YES	16	0.51	0.10
210	NO	89	0.20	0.03
211	YES	17	1.06	0.16
211	NO	86	0.56	0.09
212	YES	17	1.91	0.33
212	NO	93	0.96	0.13
213	YES	17	1.79	0.31
213	NO	93	0.87	0.12
214	YES	16	631.00	152.14
214	NO	93	424.06	43.02
215	YES	16	435.06	105.29
215	NO	93	671.39	111.40
217	YES	17	75.33	16.74
217	NO	93	61.00	8.36
218	YES	17	219.08	46.41
218	NO	93	125.33	10.26
219	YES	17	24.18	16.53
219	NO	93	14.99	6.71

INDOOR NIGHTTIME ARITHMETIC MEANS
WITH TWO HIGH HOMES DELETED

CMPD	SMOKING	NSUM	MEAN	SEMEAN
201	YES	21	12.19	2.38
201	NO	85	4.44	0.65
202	YES	21	16.34	1.09
202	NO	89	16.29	1.26
203	YES	21	1.03	0.17
203	NO	87	1.06	0.60
204	YES	21	2.13	0.17
204	NO	89	1.64	0.12
205	YES	21	2.31	0.35
205	NO	89	1.78	0.15
206	YES	17	0.21	0.04
206	NO	83	0.12	0.01
207	YES	19	0.46	0.10
207	NO	84	0.22	0.03
208	YES	21	0.46	0.13
208	NO	88	0.17	0.05
209	YES	19	0.28	0.04
209	NO	88	0.19	0.02
210	YES	20	0.43	0.07
210	NO	89	0.25	0.04
211	YES	20	0.75	0.11
211	NO	87	0.47	0.07
212	YES	21	1.25	0.20
212	NO	87	0.88	0.13
213	YES	21	1.23	0.24
213	NO	89	0.80	0.11
214	YES	21	425.64	97.89
214	NO	89	414.58	39.12
215	YES	21	328.33	51.03
215	NO	89	642.83	127.83
217	YES	21	47.11	10.26
217	NO	89	52.60	5.04
218	YES	21	105.38	12.69
218	NO	89	104.31	7.92
219	YES	20	2.93	0.39
219	NO	87	8.05	3.94

INDOOR DAYTIME ARITHMETIC MEANS
WITH TWO HIGH HOMES DELETED

CMPD	CARSTART	NSUM	MEAN	SEMEAN
201	YES	18	3.47	1.30
201	NO	79	7.14	1.62
202	YES	18	13.06	2.37
202	NO	80	18.13	0.97
203	YES	17	0.42	0.08
203	NO	78	0.81	0.28
204	YES	18	1.53	0.36
204	NO	79	2.04	0.13
205	YES	18	1.87	0.47
205	NO	80	2.14	0.19
206	YES	17	0.10	0.04
206	NO	78	0.15	0.02
207	YES	18	0.21	0.07
207	NO	73	0.26	0.04
208	YES	18	0.16	0.05
208	NO	80	0.41	0.12
209	YES	18	0.22	0.08
209	NO	76	0.25	0.04
210	YES	16	0.18	0.06
210	NO	79	0.27	0.04
211	YES	18	0.41	0.11
211	NO	76	0.73	0.11
212	YES	18	1.02	0.36
212	NO	81	1.16	0.16
213	YES	18	0.81	0.23
213	NO	81	1.09	0.16
214	YES	18	329.50	66.80
214	NO	80	442.11	41.95
215	YES	18	803.45	237.98
215	NO	80	577.30	68.03
217	YES	18	50.14	12.18
217	NO	81	61.23	7.40
218	YES	18	83.36	11.91
218	NO	81	155.56	13.66
219	YES	18	2.31	0.56
219	NO	81	22.93	8.30

INDOOR NIGHTTIME ARITHMETIC MEANS
WITH TWO HIGH HOMES DELETED

CMPD	CARSTART	NSUM	MEAN	SEMEAN
201	YES	4	1.24	0.45
201	NO	95	6.34	1.04
202	YES	5	12.19	3.08
202	NO	97	16.62	1.07
203	YES	5	0.30	0.11
203	NO	95	1.14	0.53
204	YES	5	1.09	0.26
204	NO	97	1.78	0.11
205	YES	5	1.29	0.32
205	NO	97	1.92	0.17
206	YES	5	0.09	0.02
206	NO	89	0.14	0.01
207	YES	5	0.11	0.03
207	NO	90	0.28	0.03
208	YES	5	0.00	0.00
208	NO	97	0.24	0.05
209	YES	5	0.15	0.03
209	NO	94	0.21	0.02
210	YES	5	0.15	0.04
210	NO	96	0.30	0.04
211	YES	4	0.30	0.11
211	NO	96	0.53	0.07
212	YES	4	0.75	0.11
212	NO	96	0.96	0.12
213	YES	5	0.60	0.09
213	NO	97	0.89	0.12
214	YES	5	433.55	102.89
214	NO	97	410.53	39.72
215	YES	5	709.11	158.51
215	NO	97	591.29	122.37
217	YES	5	23.95	11.08
217	NO	97	52.53	4.90
218	YES	5	106.17	27.61
218	NO	97	104.05	8.14
219	YES	4	2.83	0.85
219	NO	95	7.52	3.63

INDOOR DAYTIME ARITHMETIC MEANS
WITH TWO HIGH HOMES DELETED

CMPD	OTHRSMOK	NSUM	MEAN	SEMEAN
201	YES	5	7.20	2.13
201	NO	104	6.10	1.31
202	YES	5	25.48	5.29
202	NO	105	17.16	1.25
203	YES	5	0.47	0.08
203	NO	102	0.71	0.20
204	YES	5	2.72	0.49
204	NO	104	1.92	0.16
205	YES	5	3.98	1.71
205	NO	105	2.03	0.16
206	YES	5	0.08	0.03
206	NO	100	0.15	0.02
207	YES	5	0.13	0.05
207	NO	98	0.26	0.03
208	YES	5	0.09	0.09
208	NO	105	0.37	0.09
209	YES	5	0.22	0.04
209	NO	101	0.24	0.03
210	YES	4	0.15	0.04
210	NO	102	0.25	0.04
211	YES	4	0.72	0.26
211	NO	100	0.64	0.09
212	YES	5	1.17	0.24
212	NO	106	1.09	0.14
213	YES	5	1.06	0.26
213	NO	106	1.00	0.13
214	YES	5	462.72	102.95
214	NO	105	453.59	49.99
215	YES	5	546.72	66.06
215	NO	105	639.52	103.79
217	YES	5	34.33	11.76
217	NO	106	64.70	8.09
218	YES	5	179.45	24.83
218	NO	106	137.72	13.05
219	YES	5	4.11	0.71
219	NO	106	16.92	6.10

INDOOR NIGHTTIME ARITHMETIC MEANS
WITH TWO HIGH HOMES DELETED

CMPD	OTHRSMOK	NSUM	MEAN	SEMEAN
201	YES	10	6.12	2.19
201	NO	96	5.99	1.00
202	YES	10	15.71	1.88
202	NO	100	16.35	1.02
203	YES	10	0.48	0.05
203	NO	98	1.11	0.52
204	YES	10	1.57	0.23
204	NO	100	1.75	0.11
205	YES	10	1.66	0.22
205	NO	100	1.91	0.17
206	YES	9	0.10	0.02
206	NO	91	0.14	0.01
207	YES	9	0.17	0.04
207	NO	94	0.27	0.03
208	YES	10	0.30	0.17
208	NO	99	0.22	0.05
209	YES	9	0.20	0.06
209	NO	98	0.21	0.02
210	YES	10	0.26	0.08
210	NO	99	0.29	0.04
211	YES	10	0.58	0.18
211	NO	97	0.52	0.06
212	YES	10	1.08	0.32
212	NO	98	0.95	0.11
213	YES	10	1.18	0.37
213	NO	100	0.86	0.10
214	YES	10	315.49	35.40
214	NO	100	426.17	39.11
215	YES	10	634.82	258.58
215	NO	100	576.54	97.83
217	YES	10	53.26	16.34
217	NO	100	51.37	4.72
218	YES	10	128.32	24.36
218	NO	100	102.30	7.17
219	YES	10	2.60	0.72
219	NO	97	7.53	3.54

OUTDOOR DAYTIME ARITHMETIC MEANS
WITH TWO HIGH HOMES DELETED

CMPD	BUSYROAD	NSUM	MEAN	SEMEAN
201	YES	12	2.46	0.84
201	NO	22	4.57	1.25
202	YES	12	9.58	1.81
202	NO	23	10.25	1.62
203	YES	12	0.33	0.06
203	NO	23	0.47	0.08
204	YES	12	2.77	0.49
204	NO	23	2.49	0.44
205	YES	12	2.07	0.39
205	NO	23	2.11	0.36
206	YES	12	0.14	0.04
206	NO	23	0.15	0.03
207	YES	12	0.42	0.12
207	NO	23	0.34	0.06
208	YES	12	0.08	0.04
208	NO	23	0.26	0.11
209	YES	12	0.21	0.06
209	NO	23	0.23	0.04
210	YES	12	0.16	0.07
210	NO	23	0.18	0.04
211	YES	11	0.28	0.12
211	NO	21	0.45	0.10
212	YES	12	0.52	0.16
212	NO	22	0.81	0.15
213	YES	12	0.48	0.16
213	NO	23	0.60	0.11
214	YES	12	62.59	42.03
214	NO	23	35.49	13.18
215	YES	12	15.86	2.92
215	NO	23	17.84	3.39
217	YES	12	3.01	0.59
217	NO	23	2.55	0.52
218	YES	12	31.25	5.98
218	NO	23	31.73	4.18
219	YES	12	0.52	0.12
219	NO	23	0.40	0.18

OUTDOOR NIGHTTIME ARITHMETIC MEANS
WITH TWO HIGH HOMES DELETED

CMPD	BUSYROAD	NSUM	MEAN	SEMEAN
201	YES	16	16.85	4.33
201	NO	26	10.39	2.40
202	YES	17	13.97	1.87
202	NO	26	12.22	1.83
203	YES	17	0.83	0.13
203	NO	26	0.60	0.12
204	YES	17	2.53	0.29
204	NO	26	2.14	0.28
205	YES	17	2.38	0.29
205	NO	26	2.11	0.25
206	YES	17	0.26	0.06
206	NO	26	0.17	0.04
207	YES	17	0.48	0.10
207	NO	26	0.31	0.07
208	YES	17	0.69	0.23
208	NO	26	0.24	0.13
209	YES	17	0.42	0.08
209	NO	26	0.28	0.06
210	YES	17	0.48	0.11
210	NO	26	0.38	0.11
211	YES	17	0.73	0.14
211	NO	25	0.53	0.14
212	YES	17	1.56	0.32
212	NO	26	1.09	0.24
213	YES	17	1.37	0.28
213	NO	26	0.93	0.21
214	YES	17	205.01	161.20
214	NO	26	50.58	19.63
215	YES	17	25.83	6.24
215	NO	26	50.33	25.20
217	YES	17	2.77	0.58
217	NO	26	4.23	1.93
218	YES	17	19.11	3.53
218	NO	26	16.63	4.18
219	YES	17	0.36	0.11
219	NO	26	0.46	0.16

CMPD	BUSYROAD	NSUM	GEOMEAN	GEOSE
201	YES	39	3.40	0.89
201	NO	52	2.79	0.96
202	YES	40	14.31	1.45
202	NO	55	15.45	1.25
203	YES	40	0.56	0.13
203	NO	53	0.41	0.06
204	YES	40	1.57	0.17
204	NO	55	1.55	0.14
205	YES	40	1.56	0.14
205	NO	55	1.70	0.17
206	YES	36	0.12	0.02
206	NO	49	0.08	0.01
207	YES	39	0.21	0.04
207	NO	50	0.15	0.02
208	YES	39	0.06	0.01
208	NO	55	0.06	0.01
209	YES	38	0.17	0.03
209	NO	54	0.12	0.02
210	YES	39	0.19	0.04
210	NO	55	0.15	0.03
211	YES	39	0.36	0.07
211	NO	53	0.28	0.08
212	YES	39	0.76	0.10
212	NO	55	0.53	0.13
213	YES	40	0.66	0.10
213	NO	55	0.55	0.11
214	YES	40	322.81	50.78
214	NO	55	317.24	43.62
215	YES	40	382.16	67.44
215	NO	55	428.66	75.31
217	YES	40	24.01	7.16
217	NO	55	34.55	4.38
218	YES	40	92.85	10.81
218	NO	55	90.53	7.21
219	YES	38	2.69	0.64
219	NO	55	1.91	0.20

* Geometric means for source and nonsource homes significantly different at the 0.05 level.

CMPD	COOKING	NSUM	GEOMEAN	GEOSE
201	YES	28	1.91	0.80
201	NO	79	3.10	0.73
202	YES	28	13.58	1.44
202	NO	83	14.89	1.00
203	YES	28	0.49	0.04
203	NO	81	0.41	0.07
204	YES	28	1.58	0.16
204	NO	83	1.52	0.12
205	YES	28	1.71	0.18
205	NO	83	1.58	0.11
206	YES	26	0.11	0.01
206	NO	75	0.09	0.01
207	YES	26	0.18	0.02
207	NO	78	0.17	0.02
208	YES	27	0.07	0.03
208	NO	83	0.06	0.01
209	YES	27	0.15	0.02
209	NO	81	0.13	0.02
210	YES	27	0.17	0.04
210	NO	83	0.15	0.03
211	YES	28	0.28	0.06
211	NO	80	0.29	0.07
212	YES	28	0.56	0.14
212	NO	81	0.59	0.09
213	YES	28	0.50	0.13
213	NO	83	0.56	0.08
214	YES	28	286.30	43.52
214	NO	83	339.19	32.57
215	YES	28	422.16	134.95
215	NO	83	415.01	52.86
217	YES	28	35.79	7.73
217	NO	83	28.99	5.13
218	YES	28	81.92	12.07
218	NO	83	94.56	6.82
219	YES	27	1.77	0.19
219	NO	81	2.23	0.33

* Geometric means for source and nonsource homes significantly different at the 0.05 level.

CMPD	SMOKING	NSUM	GEOMEAN	GEOSE	
201	YES	21	8.07	1.72	*
201	NO	85	2.04	0.57	
202	YES	21	15.61	1.12	
202	NO	89	14.34	1.24	
203	YES	21	0.83	0.13	*
203	NO	87	0.36	0.05	
204	YES	21	2.00	0.17	*
204	NO	89	1.45	0.12	
205	YES	21	2.04	0.20	*
205	NO	89	1.53	0.11	
206	YES	17	0.17	0.03	*
206	NO	83	0.08	0.01	
207	YES	19	0.35	0.07	*
207	NO	84	0.15	0.01	
208	YES	21	0.13	0.05	
208	NO	88	0.05	0.01	
209	YES	19	0.25	0.03	*
209	NO	88	0.12	0.02	
210	YES	20	0.35	0.05	*
210	NO	89	0.13	0.02	
211	YES	20	0.55	0.14	*
211	NO	87	0.24	0.05	
212	YES	21	1.01	0.17	*
212	NO	87	0.50	0.09	
213	YES	21	0.95	0.18	
213	NO	89	0.47	0.08	
214	YES	21	312.33	63.82	
214	NO	89	324.45	34.25	
215	YES	21	265.50	48.16	
215	NO	89	459.46	80.36	
217	YES	21	31.91	7.44	
217	NO	89	30.60	4.29	
218	YES	21	95.33	13.65	
218	NO	89	90.13	6.67	
219	YES	20	2.52	0.42	
219	NO	87	2.03	0.25	

* Geometric means for source and nonsource homes significantly different at the 0.05 level.

INDOOR NIGHTTIME GEOMETRIC MEANS
WITH TWO HIGH HOMES DELETED

17:18 Tuesday, July 28, 1992

CMPD	CARSTART	NSUM	GEOMEAN	GEOSE
201	YES	4	0.71	0.37 *
201	NO	95	2.86	0.77
202	YES	5	9.79	3.25
202	NO	97	14.90	1.00
203	YES	5	0.22	0.08 *
203	NO	95	0.45	0.07
204	YES	5	0.92	0.26 *
204	NO	97	1.58	0.11
205	YES	5	1.09	0.28 *
205	NO	97	1.65	0.11
206	YES	5	0.04	0.02 *
206	NO	89	0.10	0.01
207	YES	5	0.06	0.03 *
207	NO	90	0.18	0.02
208	YES	5	0.02	0.00 *
208	NO	97	0.06	0.01
209	YES	5	0.12	0.03
209	NO	94	0.14	0.02
210	YES	5	0.11	0.04
210	NO	96	0.16	0.03
211	YES	4	0.21	0.07
211	NO	96	0.28	0.06
212	YES	4	0.66	0.11
212	NO	96	0.58	0.10
213	YES	5	0.54	0.08
213	NO	97	0.54	0.09
214	YES	5	352.51	102.68
214	NO	97	317.03	31.83
215	YES	5	633.58	149.40
215	NO	97	408.74	69.96
217	YES	5	5.43	6.86*
217	NO	97	33.94	3.51
218	YES	5	88.27	20.17
218	NO	97	90.86	7.03
219	YES	4	2.31	0.83
219	NO	95	2.05	0.22

* Geometric means for source and nonsource homes significantly different at the 0.05 level.

CMPD	OTHRSMOK	NSUM	GEOMEAN	GEOSE
201	YES	10	3.04	1.13
201	NO	96	2.66	0.75
202	YES	10	14.85	2.11
202	NO	100	14.55	1.01
203	YES	10	0.46	0.04
203	NO	98	0.42	0.06
204	YES	10	1.41	0.27
204	NO	100	1.55	0.11
205	YES	10	1.53	0.25
205	NO	100	1.63	0.11
206	YES	9	0.08	0.02
206	NO	91	0.10	0.01
207	YES	9	0.14	0.03
207	NO	94	0.18	0.02
208	YES	10	0.07	0.04
208	NO	99	0.06	0.01
209	YES	9	0.12	0.04
209	NO	98	0.14	0.02
210	YES	10	0.13	0.05
210	NO	99	0.16	0.02
211	YES	10	0.30	0.11
211	NO	97	0.28	0.06
212	YES	10	0.59	0.21
212	NO	98	0.58	0.09
213	YES	10	0.59	0.24
213	NO	100	0.53	0.08
214	YES	10	298.04	35.03
214	NO	100	324.39	31.25
215	YES	10	460.84	145.03
215	NO	100	408.66	60.38
217	YES	10	31.28	15.49
217	NO	100	30.81	4.21
218	YES	10	110.16	18.94
218	NO	100	89.52	6.31
219	YES	10	1.98	0.51
219	NO	97	2.13	0.22

* Geometric means for source and nonsource homes significantly different at the 0.05 level.

CMPD	BUSYROAD	NSUM	GEOMEAN	GEOSE
201	YES	41	2.69	1.01
201	NO	53	2.54	0.79
202	YES	41	15.78	1.30
202	NO	54	16.01	1.63
203	YES	41	0.34	0.07
203	NO	52	0.40	0.06
204	YES	40	1.73	0.18
204	NO	54	1.75	0.18
205	YES	41	1.79	0.18
205	NO	54	1.86	0.18
206	YES	40	0.09	0.03
206	NO	50	0.09	0.01
207	YES	41	0.19	0.04
207	NO	48	0.17	0.02
208	YES	42	0.12	0.04
208	NO	53	0.06	0.01
209	YES	41	0.20	0.04
209	NO	50	0.14	0.02
210	YES	41	0.17	0.03
210	NO	50	0.12	0.02
211	YES	39	0.38	0.10
211	NO	49	0.28	0.08
212	YES	42	0.79	0.14
212	NO	54	0.64	0.11
213	YES	42	0.71	0.11
213	NO	54	0.62	0.10
214	YES	41	373.79	59.37
214	NO	54	340.28	45.17
215	YES	41	451.91	76.17
215	NO	54	463.51	55.76
217	YES	42	34.05	7.14
217	NO	54	37.88	6.59
218	YES	42	121.79	15.21
218	NO	54	107.29	9.48
219	YES	42	4.01	0.90
219	NO	54	2.82	0.53

* Geometric means for source and nonsource homes significantly different at the 0.05 level.

CMPD	COOKING	NSUM	GEOMEAN	GEOSE
201	YES	44	3.28	0.53
201	NO	67	2.21	0.84
202	YES	46	14.81	1.23
202	NO	66	15.88	1.69
203	YES	45	0.44	0.06
203	NO	64	0.33	0.06
204	YES	46	1.86	0.16
204	NO	65	1.64	0.21
205	YES	46	1.90	0.14
205	NO	66	1.75	0.20
206	YES	44	0.08	0.02
206	NO	63	0.08	0.02
207	YES	43	0.18	0.03
207	NO	62	0.17	0.03
208	YES	46	0.09	0.03
208	NO	66	0.08	0.02
209	YES	45	0.16	0.02
209	NO	63	0.15	0.03
210	YES	44	0.12	0.02
210	NO	64	0.14	0.03
211	YES	43	0.26	0.09
211	NO	62	0.33	0.10
212	YES	46	0.64	0.11
212	NO	67	0.66	0.14
213	YES	46	0.60	0.09
213	NO	67	0.62	0.11
214	YES	46	269.32	23.89*
214	NO	66	406.73	49.91
215	YES	46	391.42	49.90
215	NO	66	510.60	79.35
217	YES	46	40.22	7.11
217	NO	67	34.95	5.74
218	YES	46	115.29	11.28
218	NO	67	114.10	12.22
219	YES	46	3.06	0.53
219	NO	67	3.30	0.77

* Geometric means for source and nonsource homes significantly different at the 0.05 level.

INDOOR DAYTIME GEOMETRIC MEANS
WITH TWO HIGH HOMES DELETED

17:18 Tuesday, July 28, 1992

CMPD	SMOKING	NSUM	GEOMEAN	GEOSE
201	YES	17	5.35	3.20
201	NO	91	2.26	0.58
202	YES	16	19.14	1.65
202	NO	93	15.04	1.35
203	YES	16	0.78	0.07*
203	NO	90	0.32	0.05
204	YES	16	2.62	0.28*
204	NO	92	1.61	0.15
205	YES	16	2.44	0.33
205	NO	93	1.72	0.13
206	YES	17	0.18	0.09
206	NO	87	0.07	0.01
207	YES	17	0.39	0.10*
207	NO	85	0.15	0.02
208	YES	17	0.12	0.07
208	NO	92	0.08	0.02
209	YES	16	0.38	0.05*
209	NO	89	0.13	0.02
210	YES	16	0.36	0.06*
210	NO	89	0.11	0.02
211	YES	17	0.81	0.11*
211	NO	86	0.25	0.06
212	YES	17	1.46	0.21
212	NO	93	0.57	0.09
213	YES	17	1.36	0.21*
213	NO	93	0.54	0.08
214	YES	16	476.25	94.19
214	NO	93	328.86	30.69
215	YES	16	338.61	62.80
215	NO	93	489.02	67.40
217	YES	17	50.01	12.71
217	NO	93	35.61	4.60
218	YES	17	178.84	24.02*
218	NO	93	106.33	8.79
219	YES	17	5.60	1.88
219	NO	93	2.91	0.55

* Geometric means for source and nonsource homes significantly different at the 0.05 level.

CMPD	CARSTART	NSUM	GEOMEAN	GEOSE	
201	YES	18	1.10	0.64*	
201	NO	79	3.28	0.73	
202	YES	18	11.49	2.26	
202	NO	80	16.36	0.90	
203	YES	17	0.26	0.08	
203	NO	78	0.41	0.05	
204	YES	18	1.26	0.29	
204	NO	79	1.85	0.11	
205	YES	18	1.49	0.32	
205	NO	80	1.88	0.10	
206	YES	17	0.06	0.02	
206	NO	78	0.08	0.02	
207	YES	18	0.14	0.04	
207	NO	73	0.18	0.02	
208	YES	18	0.05	0.01	
208	NO	80	0.08	0.02	
209	YES	18	0.12	0.06	
209	NO	76	0.17	0.02	
210	YES	16	0.10	0.05	
210	NO	79	0.14	0.02	
211	YES	18	0.19	0.12	
211	NO	76	0.35	0.07	
212	YES	18	0.58	0.27	
212	NO	81	0.71	0.10	
213	YES	18	0.57	0.21	
213	NO	81	0.65	0.11	
214	YES	18	264.35	45.22	
214	NO	80	346.69	32.29	
215	YES	18	563.32	174.61	
215	NO	80	423.97	39.28	
217	YES	18	31.27	7.65	
217	NO	81	37.65	4.61	*
218	YES	18	76.30	8.70	
218	NO	81	128.96	8.86	
219	YES	18	1.56	0.30	*
219	NO	81	4.21	0.83	

* Geometric means for source and nonsource homes significantly different at the 0.05 level.

CMPD	OTHRSMOK	NSUM	GEOMEAN	GEOSE	
201	YES	5	4.83	2.26	
201	NO	104	2.47	0.70	
202	YES	5	23.02	4.11	
202	NO	105	15.25	1.32	
203	YES	5	0.44	0.07	
203	NO	102	0.36	0.05	
204	YES	5	2.52	0.41	
204	NO	104	1.69	0.16	
205	YES	5	2.85	0.80	
205	NO	105	1.77	0.13	
206	YES	5	0.04	0.03	
206	NO	100	0.09	0.02	
207	YES	5	0.08	0.05	
207	NO	98	0.18	0.02	*
208	YES	5	0.03	0.02	*
208	NO	105	0.09	0.02	
209	YES	5	0.20	0.05	
209	NO	101	0.15	0.02	
210	YES	4	0.12	0.04	
210	NO	102	0.13	0.02	
211	YES	4	0.49	0.26	
211	NO	100	0.30	0.07	
212	YES	5	0.93	0.35	
212	NO	106	0.64	0.10	
213	YES	5	0.79	0.32	
213	NO	106	0.61	0.09	
214	YES	5	412.99	94.94	
214	NO	105	344.70	34.27	
215	YES	5	530.02	64.38	
215	NO	105	459.07	60.96	
217	YES	5	27.47	7.51	
217	NO	106	38.29	5.05	*
218	YES	5	172.76	24.33	*
218	NO	106	112.92	9.18	
219	YES	5	3.76	0.69	
219	NO	106	3.19	0.54	

* Geometric means for source and nonsource homes significantly different at the 0.05 level.

CMPD	BUSYROAD	NSUM	GEOMEAN	GEOSE
201	YES	16	7.52	3.04
201	NO	26	4.52	1.60
202	YES	17	10.91	2.26
202	NO	26	9.73	1.85
203	YES	17	0.55	0.14
203	NO	26	0.37	0.10
204	YES	17	2.20	0.32
204	NO	26	1.81	0.28
205	YES	17	2.03	0.30
205	NO	26	1.76	0.24
206	YES	17	0.17	0.04
206	NO	26	0.09	0.02
207	YES	17	0.35	0.07
207	NO	26	0.21	0.04
208	YES	17	0.17	0.09
208	NO	26	0.04	0.01
209	YES	17	0.29	0.07
209	NO	26	0.18	0.04
210	YES	17	0.29	0.08
210	NO	26	0.18	0.05
211	YES	17	0.33	0.16
211	NO	25	0.28	0.07
212	YES	17	0.98	0.24
212	NO	26	0.66	0.14
213	YES	17	0.84	0.21
213	NO	26	0.58	0.13
214	YES	17	22.45	12.78
214	NO	26	12.70	5.78
215	YES	17	14.00	5.45
215	NO	26	16.23	5.18
217	YES	17	1.47	0.48
217	NO	26	1.52	0.45
218	YES	17	12.15	3.28
218	NO	26	8.72	2.19
219	YES	17	0.06	0.04
219	NO	26	0.04	0.03

* Geometric means for source and nonsource homes significantly different at the 0.05 level.

CMPD	BUSYROAD	NSUM	GEOMEAN	GEOSE
201	YES	12	1.72	0.50
201	NO	22	2.71	0.84
202	YES	12	7.61	1.98
202	NO	23	8.22	1.47
203	YES	12	0.24	0.08
203	NO	23	0.36	0.07
204	YES	12	2.28	0.56
204	NO	23	1.98	0.40
205	YES	12	1.69	0.42
205	NO	23	1.70	0.34
206	YES	12	0.10	0.03
206	NO	23	0.10	0.03
207	YES	12	0.31	0.08
207	NO	23	0.25	0.05
208	YES	12	0.04	0.01
208	NO	23	0.06	0.02
209	YES	12	0.15	0.04
209	NO	23	0.17	0.03
210	YES	12	0.10	0.03
210	NO	23	0.12	0.03
211	YES	11	0.08	0.06
211	NO	21	0.25	0.08
212	YES	12	0.34	0.13
212	NO	22	0.49	0.12
213	YES	12	0.29	0.12
213	NO	23	0.39	0.09
214	YES	12	6.32	4.85
214	NO	23	7.16	4.62
215	YES	12	9.37	3.61
215	NO	23	14.58	2.23
217	YES	12	1.98	0.74
217	NO	23	1.79	0.46
218	YES	12	24.04	6.21
218	NO	23	26.92	3.48
219	YES	12	0.20	0.11
219	NO	23	0.03	0.03

* Geometric means for source and nonsource homes significantly different at the 0.05 level.

APPENDIX K

Quality Assurance Statement

QA Statement

Quality Assurance activities undertaken by the Analytical and Chemical Sciences (ACS) Quality Assurance Office in support of this program (RTI Project No. 070N-4570, ARB Contract No. A933-144) included:

-meetings with the Project Leader on matters affecting data quality,
-conducting periodic reviews and audits of the data measurement systems, and
-monitoring situations requiring corrective action.

The ACS QA Office conducts systems audits of current ACS studies to ascertain that data are being recorded properly, SOPs are being implemented, and that the results reported reflect the raw data of the study. Written reports of all reviews and audits are maintained by the ACS QA Officer, and results have been reported to the program management.

Audit/Review	Reported
Data Review (QC Data)	June 20, 1991
Review of Internal QC Systems and Data	July 8, 1991
Review of Preparation of Materials	July 8, 1991
Review of Data Processing	July 15, 1991
Data Review (Sample Data)	Aug. 2, 1991

Regularly scheduled Inspections conducted during the course of this study include:

Inspection	Reported
Instrument Log Notebook (ACS-SOP-815-003)	September, 1991
Notebook (ACS-SOP-815-002)	July, 1991
Laboratory (Systems) (ACS-SOP-815-001)	July, 1991
SOP Review (ACS-SOP-100-001)	August, 1991

Doris Smith
ACS QA Officer

Date

00004290
ASSET