AIR QUALITY DISPERSION MODELING OF THE E-CLASSIC 2300 OUTDOOR WOOD HYDRONIC HEATER

July 2012

tech environmental
FOCUSED KNOWLEDGE. REAL SOLUTIONS.

AIR QUALITY DISPERSION MODELING OF THE E-CLASSIC 2300 OUTDOOR WOOD HYDRONIC HEATER

Prepared for:

Central Boiler
20502 160th Street
Greenbush, MN 56726

Prepared by:

Peter H. Guldberg, C.C.M., Tech Environmental, Inc.
Marc C. Wallace, QEP, Tech Environmental, Inc.

Tech Environmental, Inc.
303 Wyman Street, Suite 295
Waltham, MA 02451
(781) 890-2220

July 26, 2012

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

List of Tables

List of Figures

EXECUTIVE SUMMARY

Air dispersion modeling was performed with the U.S. AERMOD model and following EPA guidance to determine the effect of a Central Boiler Outdoor Wood Hydronic Heater (OWHH) E-Classic Model 2300 on air quality. Air dispersion modeling assumed the OWHH was located at one of five distances (10, 20, 30, 40, or 50 feet) from either a one-story or a two-story house and had a stack height of two-feet above the roof peak, as recommended by Central Boiler's installation recommendations and Best Burn Practices for Phase 2 stick wood models (see Appendix A). Five years of hourly meteorological data for Burlington, Vermont were utilized in the modeling.

The principal air pollutant emitted by OWHHs is particulate matter (PM). The E-Classic 2300 was assumed to emit a maximum of 17.6 grams per hour (g/hr) of PM based on the highest individual test run result from the certification test for the U.S. Environmental Protection Agency (EPA) "List of Cleaner Hydronic Heaters, Phase 2 White Tag Models" table.[1] The EPA-certified annual average emissions level of 6.4 g/hr for the E-Classic 2300 was also modeled. As a conservative assumption in this study, all PM emissions were assumed to be $PM_{2.5}$.

The modeling results demonstrate that maximum predicted 24-hour $PM_{2.5}$ concentrations from operation of a Central Boiler E-Classic 2300 model are in the range of 0.5 to 2.9 $\mu g/m^3$, and therefore, are safely in compliance with the 24-hour National Ambient Air Quality Standards (NAAQS) for fine particulate matter ($PM_{2.5}$) of 35 $\mu g/m^3$. The NAAQS have been established by EPA to protect the most sensitive individuals[2] in the population from any adverse effects, with a margin of safety.

The highest predicted concentrations were obtained using the maximum 17.6 g/hr emission rate and a 20-foot stack height next to a one-story house. For this combination, the $PM_{2.5}$ level was 2.47 ug/m^3 for a stack-house distance of 50 feet, and rose slightly as the stack was moved closer to the house, to a maximum level of 2.93 ug/m^3 for a stack-house distance of 10 feet.

[1] (http://www.epa.gov/woodheaters/models.htm) downloaded March 21, 2009.

[2] For Particulate Matter, these are people with asthma and respiratory disease.

In conclusion, operation of a Central Boiler E-Classic 2300 OWHH with a stack height two feet above the roof peak does not adversely affect air quality or public health, either on the homeowner's property or off-site. For all 20 configurations of stack and building heights, the maximum $PM_{2.5}$ concentrations from the E-Classic 2300 are below 3 $\mu g/m^3$, less than 10% of the NAAQS. Such a small concentration will ensure total $PM_{2.5}$ concentrations remain safely in compliance with the $PM_{2.5}$ NAAQS of 35 $\mu g/m^3$.

1.0 INTRODUCTION

Central Boiler, Inc. of Greenbush, Minnesota is the manufacturer of Outdoor Wood Hydronic Heaters (OWHH) E-Classic 2300 model. These are freestanding units that are located outside the structure being heated and consist of a firebox, water reservoir and ancillary mechanical equipment. The combustion of wood heats water that is pumped from the furnace to a heat exchanger located inside the structure. Combustion gasses are passed over or through heating tubes before being vented to the atmosphere through a metal stack. While similar in principle to other stick wood burning devices, these units are designed to provide continuous on-demand heat and very low stack emissions. The design allows the unit to be placed near the location of the wood supply. The thermal output for an E-Classic 2300 model is listed by EPA as 160,001 Btu/hr. Figure 1 shows a typical installation of a Central Boiler OWHH.

The purpose of this study is to evaluate the air pollutant concentrations resulting from Central Boiler E-Classic 2300 units when installed and operated according to manufacturer's instructions that are shipped with every new unit. The unit is typically installed within 50 feet of the residence served. A stack height 2 feet above the peak of the residence served is recommended. Both a one-story house (roof peak 18 feet and stack height 20 feet) and a two-story house (roof peak 33 feet, stack height 35 feet) were studied, along with five different distances for the OWHH from the side of the house (10, 20, 30, 40 and 50 feet). The modeling analysis was performed using the EPA AERMOD model for PM emission rates of 17.6 (maximum) and 6.4 (annual average) grams per hour (g/hr). These emissions rates were obtained from the certification test results given in the EPA "List of Cleaner Hydronic Heaters, Phase 2 White Tag Models" table for the Central Boiler E-Classic 2300 unit.

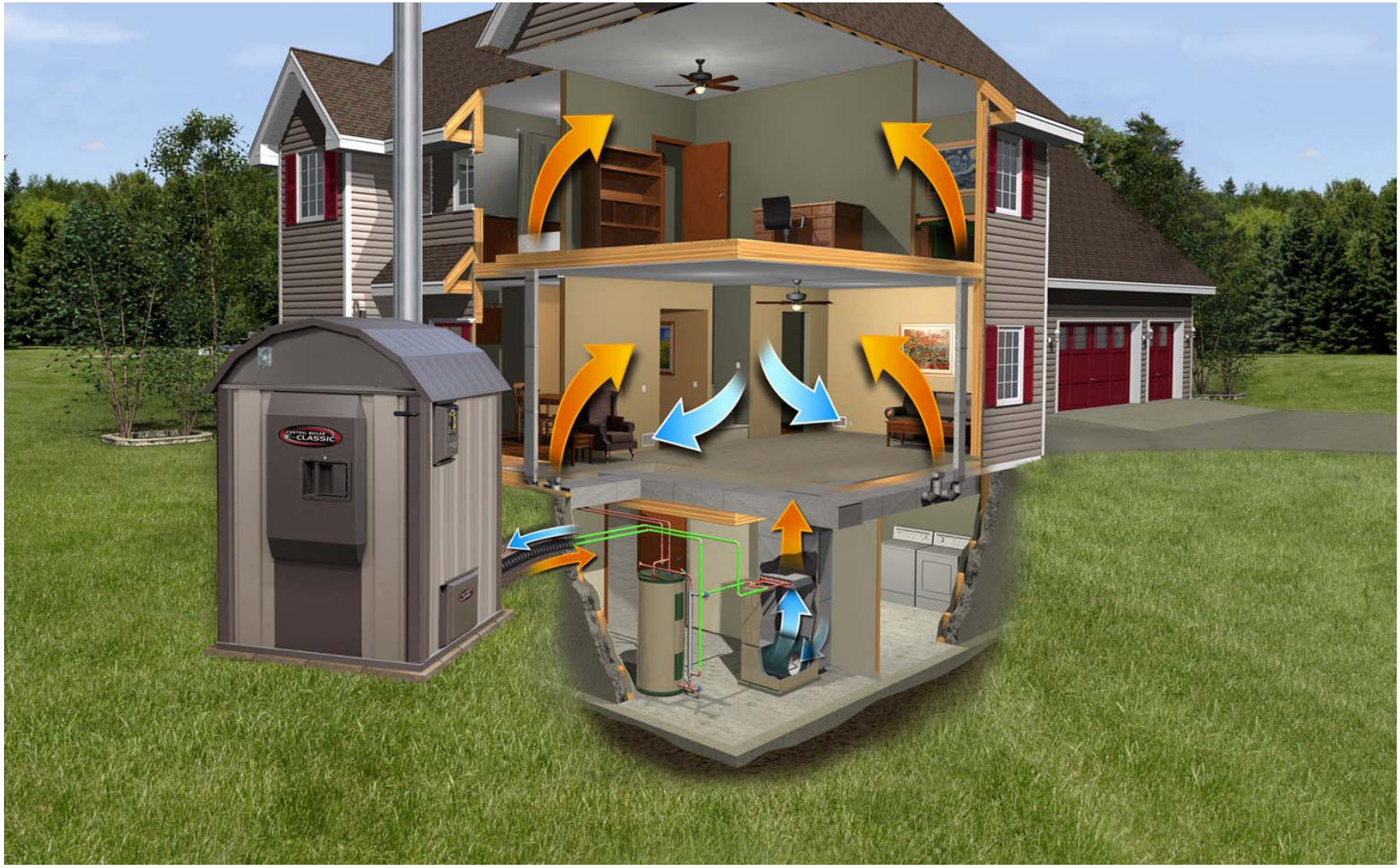


Figure 1: Concept Rendering Showing a Typical Installation of an Outdoor Wood Hydronic Heater Installation

2.0 AIR QUALITY STANDARDS

The principal air pollutant emitted by OWHHs is particulate matter (PM). EPA has established National Ambient Air Quality Standards (NAAQS) for both coarse (PM_{10}) and fine ($PM_{2.5}$) particulate matter. The PM_{10} standard applies to particles with a mass-mean diameter of 10 microns or less, while the $PM_{2.5}$ standard is keyed to particles 2.5 microns in diameter or less. While both long-term (annual) and short-term (24-hour) standards have been established, the 24-hour standards are the controlling set because of their more stringent limits. Also, the $PM_{2.5}$ standard is more stringent than the PM_{10} standard. Thus, only the 24-hour $PM_{2.5}$ levels are examined in this study.

The 24-hour $PM_{2.5}$ standard is 35 $\mu g/m^3$, measured as a 3-year average of 98^{th}-percentile concentrations. In a one-year period, the 8th-highest 24-hour value represents the 98^{th}-percentile concentration. For compliance purposes, the $PM_{2.5}$ design concentration is the 3-year average of the highest, 8^{th}-highest (H8H) values in each year at any receptor location.

The EPA added special processing for $PM_{2.5}$ in the latest versions of AERMOD (versions 06341 and 07026) to predict the design concentrations for each receptor. AERMOD now calculates the 5-year average H8H 24-hour average $PM_{2.5}$ concentration at each receptor over the 5 years of meteorological data provided. EPA considers the five-year average of the H8H 24-hour $PM_{2.5}$ values at each receptor to be unbiased estimates of the 3-year average H8H values, since EPA guidance requires the use of five years of meteorological data when the data are from an off-site National Weather Service meteorological station.[3] Thus, the five-year average H8H values from the AERMOD model are the design values used to establish compliance with the NAAQS.

[3] US EPA, "Addendum User's Guide for the AMS/EPA Regulatory Model – AERMOD (EPA-454/B-03-001, September 2004)", pp. 5 – 7, December 2006.

3.0 AIR DISPERSION MODELING METHODOLOGY

Particulate matter from a fuel combustion process contains a wide distribution of particle sizes. For wood combustion, these range from relatively larger carbon particles (soot) down to sub-micron organic compound aerosols. Research studies of OWHH emissions have used sampling methods that capture the full size distribution of PM, solid particles and condensible organics. EPA particle size distribution data for wood boilers reveal that typically 90% of the total PM mass has a diameter of 10 microns or less, and 76% has a diameter of 2.5 microns or less.[4] As a conservative assumption in this study, all PM emissions were assumed to be $PM_{2.5}$.

Air dispersion modeling assumed the OWHH was located near a one-story (Case 1) or two-story (Case 2) house having a 30-foot by 50-foot footprint. The OWHH building had dimensions of approximately 5.0 feet by 5.3 feet and stood 7.3 feet high (a Central Boiler Model E-Classic 2300). Both the maximum emission rate (Case A) and annual average emission rate (Case B) were examined, for five different stack distances from the house (10, 20, 30, 40 or 50 feet). The EPA AERMOD dispersion model calculated the aerodynamic downwash effects of the house near the OWHH stack. Twenty modeling cases were examined as described in Table 1.

The stack gas exit temperature and exit velocity used in this analysis represent typical values measured in Central Boiler's emissions test report completed by independent test laboratories for qualification in EPA's Phase 2 Program. All stack and emission values used in this study are summarized in Table 2.

[4] EPA publication AP-42, Section 1.6.

TABLE 1

CENTRAL BOILER E- CLASSIC 2300 MODEL
MODELING SCENARIOS

Case No.	No. of Stories on House	Roof Peak (ft)	Stack Height (ft)	PM Emissions (grams/hr)	Stack Distance from House (ft)
1A-10	1	18	20	17.6	10
1A-20	1	18	20	17.6	20
1A-30	1	18	20	17.6	30
1A-40	1	18	20	17.6	40
1A-50	1	18	20	17.6	50
1B-10	1	18	20	6.4	10
1B-20	1	18	20	6.4	20
1B-30	1	18	20	6.4	30
1B-40	1	18	20	6.4	40
1B-50	1	18	20	6.4	50
2A-10	2	33	35	17.6	10
2A-20	2	33	35	17.6	20
2A-30	2	33	35	17.6	30
2A-40	2	33	35	17.6	40
2A-50	2	33	35	17.6	50
2B-10	2	33	35	6.4	10
2B-20	2	33	35	6.4	20
2B-30	2	33	35	6.4	30
2B-40	2	33	35	6.4	40
2B-50	2	33	35	6.4	50

TABLE 2

STACK PARAMETERS AND EMISSIONS FOR AIR DISPERSION MODELING

Parameter	English Units	Metric Units
Stack Height Case 1 Case 2	 20 feet 35 feet	 6.1 meters 10.7 meters
Stack Exit Diameter	8 inches	0.2 m
Stack Exit Velocity	5.2 feet/sec.	1.2 m/s
Stack Exit Temperature	305^{o} F	408.15^{o} K
$PM_{2.5}$ Emission Rate E-Classic 2300 Model EPA Phase 1 Limit E-Classic 2300 Model Highest Test Run	 0.014 lb/hr 0.039 lb/hr	 6.4 g/hr 17.6 g/hr

4.0 MODELING RESULTS AND CONCLUSIONS

Air dispersion modeling was performed using the latest version of AERMOD (Version 12060). The air dispersion modeling reveals that OWHH operation produces $PM_{2.5}$ concentrations ranging from 0.50 to 2.93 $\mu g/m^3$ under the 20 modeled scenarios. The results are summarized in Table 3, and the model output is presented in Appendix B of this report. All maximum predicted $PM_{2.5}$ concentrations are well below the 24-hour $PM_{2.5}$ NAAQS of 35 $\mu g/m^3$, and the maximum predicted concentration represents less than 10 % of the standard.

The highest predicted concentration of 2.93 $\mu g/m^3$ was obtained using the 17.6 g/hr emission rate and a 20-foot stack height, 10 feet from a one-story house (Case No. 1A-10). As shown in Figure 2, for each additional 10 feet the stack was moved from the one-story house, the predicted maximum concentration changed only slightly. Thus, no minimum stack-to-house distance is required so long as the stack height is two feet above the roof peak.

The results reveal that increasing the stack height and increasing the stack distance from the residence served both reduce the expected $PM_{2.5}$ concentration. The lowest concentration was predicted assuming the 6.4 g/hr annual average emission rate and a 35-foot stack height, 50 feet from a two-story house. The modeling results are presented without background levels. The introduction of 2.93 $\mu g/m^3$ or less from an OWHH (an amount less than 10% of the NAAQS) would not adversely affect air quality, and total $PM_{2.5}$ concentrations would remain safely in compliance with the $PM_{2.5}$ NAAQS of 35 $\mu g/m^3$.

TABLE 3

24-HOUR $PM_{2.5}$ AIR MODELING RESULTS FOR CENTRAL BOILER E- CLASSIC 2300 MODEL ($\mu g/m^3$)

Case No.	No. of Stories on House	Roof Peak (ft)	Stack Height (ft)	PM Emissions (grams/hr)	5-Year Average of H8H	24-hr NAAQS
1A-10	1	18	20	17.6	2.93	35
1A-20	1	18	20	17.6	2.78	35
1A-30	1	18	20	17.6	2.78	35
1A-40	1	18	20	17.6	2.86	35
1A-50	1	18	20	17.6	2.59	35
1B-10	1	18	20	6.4	1.07	35
1B-20	1	18	20	6.4	1.01	35
1B-30	1	18	20	6.4	1.01	35
1B-40	1	18	20	6.4	1.04	35
1B-50	1	18	20	6.4	0.94	35
2A-10	2	33	35	17.6	1.68	35
2A-20	2	33	35	17.6	1.48	35
2A-30	2	33	35	17.6	1.56	35
2A-40	2	33	35	17.6	1.57	35
2A-50	2	33	35	17.6	1.37	35
2B-10	2	33	35	6.4	0.61	35
2B-20	2	33	35	6.4	0.54	35
2B-30	2	33	35	6.4	0.57	35
2B-40	2	33	35	6.4	0.57	35
2B-50	2	33	35	6.4	0.50	35

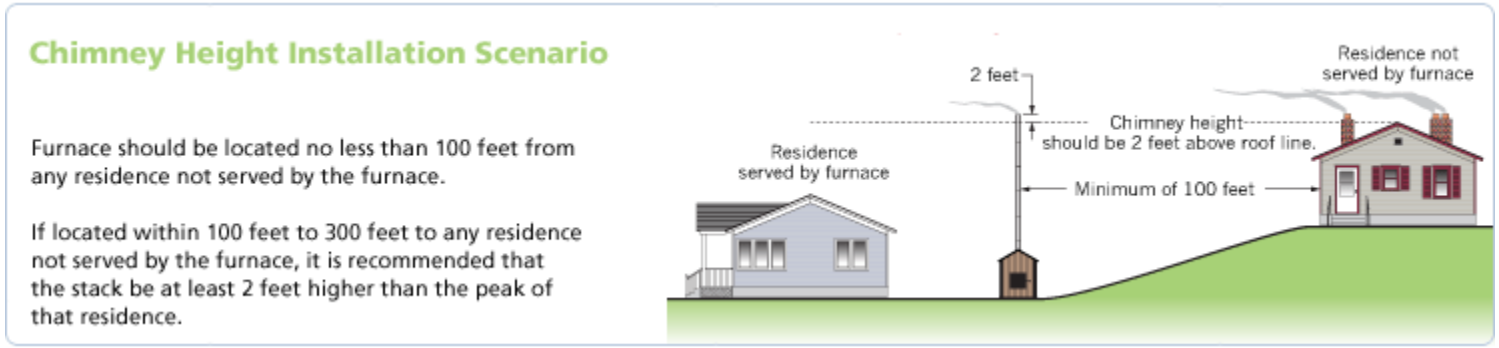
APPENDIX A

BEST BURN PRACTICES

Outdoor Furnace Facts

Outdoor Wood Furnace Best Burn Practices

1. Read and follow all operating instructions supplied by the manufacturer.
2. **FUEL USED:** Only use listed fuels recommended by the manufacturer of your unit. Never use the following: trash, plastics, gasoline, rubber, naphtha, household garbage, material treated with petroleum products (particle board, railroad ties and pressure treated wood), leaves, paper products, and cardboard.
3. **LOADING FUEL:** For a more efficient burn, pay careful attention to loading times and amounts. Follow the manufacturer's written instructions for recommended loading times and amounts.
4. **STARTERS:** Do not use lighter fluids, gasoline or chemicals.
5. **LOCATION:** It is recommended that the unit be located with due consideration to the prevailing wind direction.



6. Always remember to comply with all applicable state and local codes.

Provided by the Hearth, Patio and Barbecue Association (HPBA), Outdoor Furnaces Manufacturers Caucus.

Outdoor Wood Furnace Best Burn Practices EPA HH Phase 2 (0.32 LBS/MM Btu Output) For Stick Wood; Batch Load

1. Read and follow all operating instructions supplied by the manufacturer.
2. **FUEL USED:** Only use listed fuels recommended by the manufacturer of your unit. Never use the following: trash, plastics, gasoline, rubber, naphtha, household garbage, material treated with petroleum products (particle board, railroad

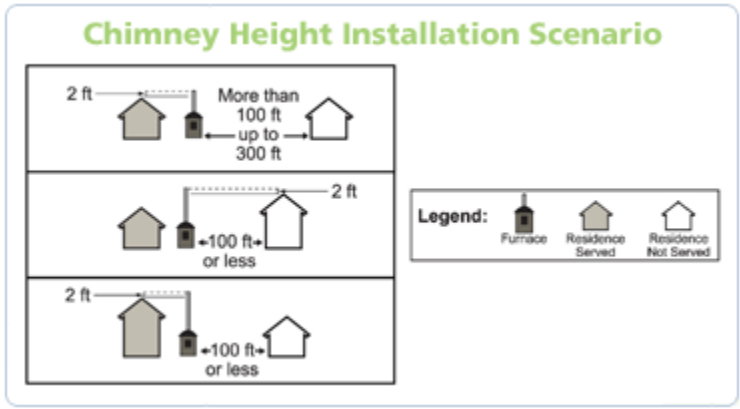
ties and pressure treated wood), leaves, paper products, and cardboard.

3. **LOADING FUEL:** For a more efficient burn, pay careful attention to loading times and amounts. Follow the manufacturer's written instructions for recommended loading times and amounts.

4. **STARTERS:** Do not use lighter fluids, gasoline or chemicals.

5. **LOCATION:** It is recommended that the unit be located with due consideration to the prevailing wind direction.

    - If located within 300 feet to any residence not served by the furnace, it is recommended that the chimney be at least 2 feet higher than the peak of the residence served.
    - If located within 100 feet to any residence not served by the furnace, the chimney must be 2 feet higher than the peak of the residence served or not served, whichever is higher.



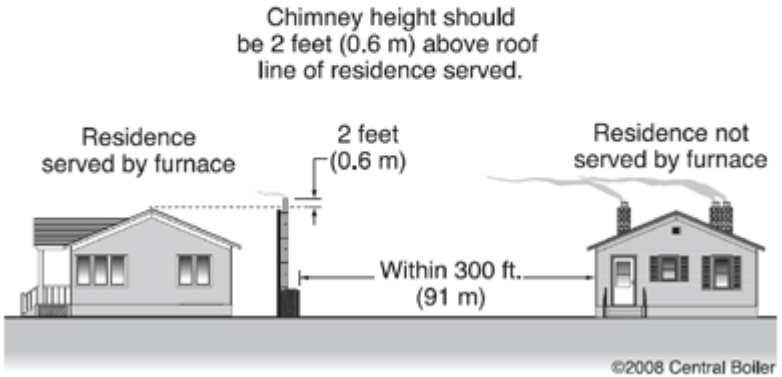
6. Always remember to comply with all applicable state and local codes.

Be considerate of neighbors when operating your furnace. If you use your furnace in the summer months, be certain your chimney exhaust is not adversely affecting neighbors with open windows.

Outdoor Wood Pellet Furnace EPA HH Phase 2 (0.32 LBS/MM Btu Output) For Wood Pellets; Continuous Feed

Chimney Height Installation Scenario

If located within 300 feet (91 m) of any residence not served by the furnace, it is recommended that the chimney be at least 2 feet (0.6 m) higher than the peak of the residence served.



APPENDIX B
AIR MODELING SUMMARY OUTPUTS

CENTRAL BOILER
OUTDOOR WOOD HYDRONIC HEATER
GREENBUSH, MN

20-FOOT STACK WITH ONE-STORY BULDING, 10 FEET FROM HOUSE (CASE 1A-10) (17.6 GRAMS/HOUR)

```
*** AERMOD - VERSION 12060 ***

       Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440


                                          *** POINT SOURCE DATA ***

             NUMBER EMISSION RATE                    BASE     STACK   STACK    STACK     STACK    BLDG   URBAN  CAP/
EMIS RATE
    SOURCE     PART.  (GRAMS/SEC)     X        Y      ELEV.    HEIGHT  TEMP.   EXIT VEL. DIAMETER  EXISTS SOURCE HOR
SCALAR
      ID       CATS.               (METERS) (METERS) (METERS) (METERS) (DEG.K)  (M/SEC)  (METERS)
VARY BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - -

   BOILER        0   0.48900E-02       0.0       7.6     0.0     6.10   449.90     2.20     0.20    YES     NO    NO


                                       *** SOURCE IDs DEFINING SOURCE GROUPS ***

 GROUP ID                                          SOURCE IDs


  ALL       BOILER  ,


                                        ** CONC OF PM25     IN MICROGRAMS/M**3                        **

                                                                                                              NETWORK
  GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      ALL       1ST HIGHEST VALUE IS       2.93137 AT (      25.00,      -25.00,     0.00,     0.00,    0.00)  DC
                2ND HIGHEST VALUE IS       2.84007 AT (     -25.00,        0.00,     0.00,     0.00,    0.00)  DC
                3RD HIGHEST VALUE IS       2.71617 AT (       0.00,       50.00,     0.00,     0.00,    0.00)  DC
                4TH HIGHEST VALUE IS       2.71166 AT (       0.00,      -25.00,     0.00,     0.00,    0.00)  DC
                5TH HIGHEST VALUE IS       2.66580 AT (     -25.00,       50.00,     0.00,     0.00,    0.00)  DC
                6TH HIGHEST VALUE IS       2.30057 AT (     -25.00,      -25.00,     0.00,     0.00,    0.00)  DC
                7TH HIGHEST VALUE IS       2.27373 AT (     -25.00,       75.00,     0.00,     0.00,    0.00)  DC
                8TH HIGHEST VALUE IS       2.13547 AT (     -25.00,       25.00,     0.00,     0.00,    0.00)  DC
                9TH HIGHEST VALUE IS       2.05493 AT (     -50.00,      -25.00,     0.00,     0.00,    0.00)  DC
               10TH HIGHEST VALUE IS       2.04549 AT (      25.00,        0.00,     0.00,     0.00,    0.00)  DC


                                       *** RECEPTOR TYPES:  GC = GRIDCART
                                                            GP = GRIDPOLR
                                                            DC = DISCCART
                                                            DP = DISCPOLR
```

20-FOOT STACK WITH ONE-STORY BULDING, 20 FEET FROM HOUSE (CASE 1A-20) (17.6 GRAMS/HOUR)

*** AERMOD - VERSION 12060***

```
       Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BLDG EXISTS	URBAN SOURCE	CAP/ HOR EMIS RATE SCALAR VARY BY
BOILER	0	0.48900E-02	0.0	10.7	0.0	6.10	449.90	2.20	0.20	YES	NO	NO

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	BOILER ,

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST 24-HR RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF PM25 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)					OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	2.77851 AT	(0.00,	50.00,	0.00,	0.00,	0.00)	DC	
	2ND HIGHEST VALUE IS	2.75132 AT	(-25.00,	50.00,	0.00,	0.00,	0.00)	DC	
	3RD HIGHEST VALUE IS	2.59912 AT	(-25.00,	75.00,	0.00,	0.00,	0.00)	DC	
	4TH HIGHEST VALUE IS	2.50216 AT	(25.00,	-25.00,	0.00,	0.00,	0.00)	DC	
	5TH HIGHEST VALUE IS	2.31787 AT	(0.00,	-25.00,	0.00,	0.00,	0.00)	DC	
	6TH HIGHEST VALUE IS	1.93518 AT	(0.00,	75.00,	0.00,	0.00,	0.00)	DC	
	7TH HIGHEST VALUE IS	1.88355 AT	(-25.00,	100.00,	0.00,	0.00,	0.00)	DC	
	8TH HIGHEST VALUE IS	1.82293 AT	(-25.00,	-25.00,	0.00,	0.00,	0.00)	DC	
	9TH HIGHEST VALUE IS	1.72196 AT	(-50.00,	-25.00,	0.00,	0.00,	0.00)	DC	
	10TH HIGHEST VALUE IS	1.70708 AT	(25.00,	-50.00,	0.00,	0.00,	0.00)	DC	

20-FOOT STACK WITH ONE-STORY BULDING, 30 FEET FROM HOUSE (CASE 1A-30) (17.6 GRAMS/HOUR)

```
*** AERMOD - VERSION 12060 ***

       Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440


                                          *** POINT SOURCE DATA ***

             NUMBER EMISSION RATE                    BASE     STACK   STACK    STACK     STACK    BLDG   URBAN  CAP/
EMIS RATE
    SOURCE     PART.  (GRAMS/SEC)     X        Y      ELEV.    HEIGHT  TEMP.   EXIT VEL. DIAMETER  EXISTS SOURCE HOR
SCALAR
      ID       CATS.               (METERS) (METERS) (METERS) (METERS) (DEG.K)  (M/SEC)  (METERS)
VARY BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - -

   BOILER        0   0.48900E-02       0.0      13.7     0.0     6.10   449.90     2.20     0.20    YES     NO    NO


                                       *** SOURCE IDs DEFINING SOURCE GROUPS ***

 GROUP ID                                          SOURCE IDs


  ALL       BOILER  ,

                         *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST 24-HR RESULTS AVERAGED OVER   5 YEARS ***

                                    ** CONC OF PM25     IN MICROGRAMS/M**3                          **

                                                                                                            NETWORK
GROUP ID                       AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL       1ST HIGHEST VALUE IS       2.77772 AT (     -25.00,       75.00,     0.00,     0.00,    0.00)  DC
          2ND HIGHEST VALUE IS       2.75763 AT (     -25.00,       50.00,     0.00,     0.00,    0.00)  DC
          3RD HIGHEST VALUE IS       2.48017 AT (       0.00,       50.00,     0.00,     0.00,    0.00)  DC
          4TH HIGHEST VALUE IS       2.15699 AT (       0.00,      -25.00,     0.00,     0.00,    0.00)  DC
          5TH HIGHEST VALUE IS       2.05027 AT (     -25.00,      100.00,     0.00,     0.00,    0.00)  DC
          6TH HIGHEST VALUE IS       2.02939 AT (      25.00,      -25.00,     0.00,     0.00,    0.00)  DC
          7TH HIGHEST VALUE IS       1.95497 AT (       0.00,       75.00,     0.00,     0.00,    0.00)  DC
          8TH HIGHEST VALUE IS       1.54153 AT (      25.00,      -50.00,     0.00,     0.00,    0.00)  DC
          9TH HIGHEST VALUE IS       1.48467 AT (       0.00,      -50.00,     0.00,     0.00,    0.00)  DC
         10TH HIGHEST VALUE IS       1.48033 AT (     -50.00,      100.00,     0.00,     0.00,    0.00)  DC
```

20-FOOT STACK WITH ONE-STORY BULDING, 40 FEET FROM HOUSE (CASE 1A-40) (17.6 GRAMS/HOUR)

```
*** AERMOD - VERSION 12060 ***
 *** RESIDENTIAL WOOD BOILER PM -  CASE 1A - 1 STORY BLDG; 20-FT STK & 17 ***


      Number of sources -          1
 Number of source groups -          1
    Number of receptors -        440


                                          *** POINT SOURCE DATA ***

             NUMBER EMISSION RATE                    BASE     STACK   STACK    STACK     STACK    BLDG   URBAN  CAP/
EMIS RATE
    SOURCE     PART.  (GRAMS/SEC)     X        Y      ELEV.    HEIGHT  TEMP.   EXIT VEL. DIAMETER  EXISTS SOURCE HOR
SCALAR
      ID       CATS.               (METERS) (METERS) (METERS) (METERS) (DEG.K)  (M/SEC)  (METERS)                 VARY BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - -

   BOILER        0   0.48900E-02       0.0      16.8     0.0     6.10   449.90     2.20     0.20    YES     NO    NO


                                      *** SOURCE IDs DEFINING SOURCE GROUPS ***

 GROUP ID                                          SOURCE IDs


  ALL       BOILER  ,

                       *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST 24-HR RESULTS AVERAGED OVER   5 YEARS ***

                                    ** CONC OF PM25     IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                       AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL       1ST HIGHEST VALUE IS       2.85737 AT (     -25.00,       75.00,     0.00,     0.00,    0.00)  DC
          2ND HIGHEST VALUE IS       2.15840 AT (     -25.00,      100.00,     0.00,     0.00,    0.00)  DC
          3RD HIGHEST VALUE IS       2.10334 AT (     -25.00,       50.00,     0.00,     0.00,    0.00)  DC
          4TH HIGHEST VALUE IS       2.01946 AT (       0.00,       50.00,     0.00,     0.00,    0.00)  DC
          5TH HIGHEST VALUE IS       1.86149 AT (       0.00,       75.00,     0.00,     0.00,    0.00)  DC
          6TH HIGHEST VALUE IS       1.74420 AT (      25.00,      -25.00,     0.00,     0.00,    0.00)  DC
          7TH HIGHEST VALUE IS       1.58450 AT (       0.00,      -25.00,     0.00,     0.00,    0.00)  DC
          8TH HIGHEST VALUE IS       1.51700 AT (     -50.00,      100.00,     0.00,     0.00,    0.00)  DC
          9TH HIGHEST VALUE IS       1.49396 AT (     -25.00,      125.00,     0.00,     0.00,    0.00)  DC
         10TH HIGHEST VALUE IS       1.49270 AT (      25.00,      -50.00,     0.00,     0.00,    0.00)  DC
```

20-FOOT STACK WITH ONE-STORY BULDING, 50 FEET FROM HOUSE (CASE 1A-50) (17.6 GRAMS/HOUR)

```
*** AERMOD - VERSION 12060 ***

       Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440


                                                *** POINT SOURCE DATA ***

             NUMBER EMISSION RATE                    BASE     STACK   STACK    STACK     STACK    BLDG   URBAN  CAP/
EMIS RATE
    SOURCE     PART.  (GRAMS/SEC)     X        Y      ELEV.    HEIGHT  TEMP.   EXIT VEL. DIAMETER  EXISTS SOURCE HOR
SCALAR
      ID       CATS.               (METERS) (METERS) (METERS) (METERS) (DEG.K)  (M/SEC)  (METERS)
VARY BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - -

   BOILER        0   0.48900E-02       0.0      19.8     0.0     6.10   449.90     2.20     0.20    YES     NO    NO


                                             *** SOURCE IDs DEFINING SOURCE GROUPS ***

 GROUP ID                                              SOURCE IDs


  ALL       BOILER  ,


                            *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST 24-HR RESULTS AVERAGED OVER   5 YEARS ***

                                  ** CONC OF PM25     IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                         AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL       1ST HIGHEST VALUE IS       2.58874 AT (     -25.00,       75.00,     0.00,     0.00,    0.00)  DC
          2ND HIGHEST VALUE IS       2.14612 AT (     -25.00,      100.00,     0.00,     0.00,    0.00)  DC
          3RD HIGHEST VALUE IS       1.72572 AT (       0.00,       75.00,     0.00,     0.00,    0.00)  DC
          4TH HIGHEST VALUE IS       1.53434 AT (     -25.00,      125.00,     0.00,     0.00,    0.00)  DC
          5TH HIGHEST VALUE IS       1.42952 AT (       0.00,       50.00,     0.00,     0.00,    0.00)  DC
          6TH HIGHEST VALUE IS       1.29907 AT (     -50.00,      100.00,     0.00,     0.00,    0.00)  DC
          7TH HIGHEST VALUE IS       1.29848 AT (     -50.00,      125.00,     0.00,     0.00,    0.00)  DC
          8TH HIGHEST VALUE IS       1.29598 AT (       0.00,      100.00,     0.00,     0.00,    0.00)  DC
          9TH HIGHEST VALUE IS       1.28972 AT (      25.00,      -25.00,     0.00,     0.00,    0.00)  DC
         10TH HIGHEST VALUE IS       1.15599 AT (     -50.00,      150.00,     0.00,     0.00,    0.00)  DC
```

20-FOOT STACK WITH ONE-STORY BULDING, 10 FEET FROM HOUSE (CASE 1B-10) (6.4 GRAMS/HOUR)

*** AERMOD - VERSION 12060 ***

```
      Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BLDG EXISTS	URBAN SOURCE	CAP/ HOR EMIS RATE SCALAR VARY BY
BOILER	0	0.17800E-02	0.0	7.6	0.0	6.10	449.90	2.20	0.20	YES	NO	NO

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	BOILER ,

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST 24-HR RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF PM25 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	1.06704 AT	(25.00, -25.00, 0.00, 0.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	1.03381 AT	(-25.00, 0.00, 0.00, 0.00, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.98871 AT	(0.00, 50.00, 0.00, 0.00, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.98707 AT	(0.00, -25.00, 0.00, 0.00, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.97037 AT	(-25.00, 50.00, 0.00, 0.00, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.83742 AT	(-25.00, -25.00, 0.00, 0.00, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.82766 AT	(-25.00, 75.00, 0.00, 0.00, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.77733 AT	(-25.00, 25.00, 0.00, 0.00, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.74801 AT	(-50.00, -25.00, 0.00, 0.00, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.74458 AT	(25.00, 0.00, 0.00, 0.00, 0.00)	DC	

20-FOOT STACK WITH ONE-STORY BULDING, 20 FEET FROM HOUSE (CASE 1B-20) (6.4 GRAMS/HOUR)

```
*** AERMOD - VERSION 12060 ***

       Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440


                                                *** POINT SOURCE DATA ***

             NUMBER EMISSION RATE                    BASE     STACK   STACK    STACK     STACK    BLDG   URBAN  CAP/
EMIS RATE
    SOURCE     PART.  (GRAMS/SEC)     X        Y      ELEV.    HEIGHT  TEMP.   EXIT VEL. DIAMETER  EXISTS SOURCE HOR
SCALAR
      ID       CATS.               (METERS) (METERS) (METERS) (METERS) (DEG.K)  (M/SEC)  (METERS)
VARY BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - -

   BOILER        0   0.17800E-02       0.0      10.7     0.0     6.10   449.90     2.20     0.20    YES     NO    NO


                                          *** SOURCE IDs DEFINING SOURCE GROUPS ***

 GROUP ID                                              SOURCE IDs


  ALL       BOILER  ,


                    *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST 24-HR RESULTS AVERAGED OVER   5 YEARS ***

                                    ** CONC OF PM25     IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                        AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL       1ST HIGHEST VALUE IS       1.01140 AT (       0.00,       50.00,     0.00,     0.00,    0.00)  DC
          2ND HIGHEST VALUE IS       1.00150 AT (     -25.00,       50.00,     0.00,     0.00,    0.00)  DC
          3RD HIGHEST VALUE IS       0.94610 AT (     -25.00,       75.00,     0.00,     0.00,    0.00)  DC
          4TH HIGHEST VALUE IS       0.91081 AT (      25.00,      -25.00,     0.00,     0.00,    0.00)  DC
          5TH HIGHEST VALUE IS       0.84372 AT (       0.00,      -25.00,     0.00,     0.00,    0.00)  DC
          6TH HIGHEST VALUE IS       0.70442 AT (       0.00,       75.00,     0.00,     0.00,    0.00)  DC
          7TH HIGHEST VALUE IS       0.68563 AT (     -25.00,      100.00,     0.00,     0.00,    0.00)  DC
          8TH HIGHEST VALUE IS       0.66356 AT (     -25.00,      -25.00,     0.00,     0.00,    0.00)  DC
          9TH HIGHEST VALUE IS       0.62681 AT (     -50.00,      -25.00,     0.00,     0.00,    0.00)  DC
         10TH HIGHEST VALUE IS       0.62139 AT (      25.00,      -50.00,     0.00,     0.00,    0.00)  DC
```

20-FOOT STACK WITH ONE-STORY BULDING, 30 FEET FROM HOUSE (CASE 1B-30) (6.4 GRAMS/HOUR)

*** AERMOD - VERSION 12060***

```
      Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BLDG EXISTS	URBAN SOURCE	CAP/ HOR EMIS RATE SCALAR VARY BY
BOILER	0	0.17800E-02	0.0	13.7	0.0	6.10	449.90	2.20	0.20	YES	NO	NO

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	BOILER ,

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST 24-HR RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF PM25 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	1.01111 AT	(-25.00, 75.00, 0.00, 0.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	1.00380 AT	(-25.00, 50.00, 0.00, 0.00, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.90280 AT	(0.00, 50.00, 0.00, 0.00, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.78516 AT	(0.00, -25.00, 0.00, 0.00, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.74631 AT	(-25.00, 100.00, 0.00, 0.00, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.73871 AT	(25.00, -25.00, 0.00, 0.00, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.71163 AT	(0.00, 75.00, 0.00, 0.00, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.56113 AT	(25.00, -50.00, 0.00, 0.00, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.54043 AT	(0.00, -50.00, 0.00, 0.00, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.53885 AT	(-50.00, 100.00, 0.00, 0.00, 0.00)	DC	

20-FOOT STACK WITH ONE-STORY BULDING, 40 FEET FROM HOUSE (CASE 1B-40) (6.4 GRAMS/HOUR)

*** AERMOD - VERSION 12060 ***

```
      Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BLDG EXISTS	URBAN SOURCE	CAP/HOR EMIS RATE SCALAR VARY BY
BOILER	0	0.17800E-02	0.0	16.8	0.0	6.10	449.90	2.20	0.20	YES	NO	NO

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	BOILER ,

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST 24-HR RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF PM25 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)					OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	1.04010 AT	(-25.00,	75.00,	0.00,	0.00,	0.00)	DC	
	2ND HIGHEST VALUE IS	0.78568 AT	(-25.00,	100.00,	0.00,	0.00,	0.00)	DC	
	3RD HIGHEST VALUE IS	0.76563 AT	(-25.00,	50.00,	0.00,	0.00,	0.00)	DC	
	4TH HIGHEST VALUE IS	0.73510 AT	(0.00,	50.00,	0.00,	0.00,	0.00)	DC	
	5TH HIGHEST VALUE IS	0.67760 AT	(0.00,	75.00,	0.00,	0.00,	0.00)	DC	
	6TH HIGHEST VALUE IS	0.63490 AT	(25.00,	-25.00,	0.00,	0.00,	0.00)	DC	
	7TH HIGHEST VALUE IS	0.57677 AT	(0.00,	-25.00,	0.00,	0.00,	0.00)	DC	
	8TH HIGHEST VALUE IS	0.55220 AT	(-50.00,	100.00,	0.00,	0.00,	0.00)	DC	
	9TH HIGHEST VALUE IS	0.54381 AT	(-25.00,	125.00,	0.00,	0.00,	0.00)	DC	
	10TH HIGHEST VALUE IS	0.54336 AT	(25.00,	-50.00,	0.00,	0.00,	0.00)	DC	

20-FOOT STACK WITH ONE-STORY BULDING, 50 FEET FROM HOUSE (CASE 1B-50) (6.4 GRAMS/HOUR)

```
*** AERMOD - VERSION 12060 ***

       Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440


                                                *** POINT SOURCE DATA ***

             NUMBER EMISSION RATE                    BASE     STACK   STACK    STACK     STACK    BLDG   URBAN  CAP/
EMIS RATE
    SOURCE     PART.  (GRAMS/SEC)     X        Y      ELEV.    HEIGHT  TEMP.   EXIT VEL. DIAMETER  EXISTS SOURCE HOR
SCALAR
      ID       CATS.               (METERS) (METERS) (METERS) (METERS) (DEG.K)  (M/SEC)  (METERS)
VARY BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - -

   BOILER        0   0.17800E-02       0.0      19.8     0.0     6.10   449.90     2.20     0.20    YES     NO    NO

                                           *** SOURCE IDs DEFINING SOURCE GROUPS ***

 GROUP ID                                              SOURCE IDs


  ALL       BOILER  ,

                      *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST 24-HR RESULTS AVERAGED OVER   5 YEARS ***

                                    ** CONC OF PM25     IN MICROGRAMS/M**3                          **

                                                                                                              NETWORK
GROUP ID                         AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL       1ST HIGHEST VALUE IS       0.94232 AT (     -25.00,       75.00,     0.00,     0.00,    0.00)  DC
          2ND HIGHEST VALUE IS       0.78121 AT (     -25.00,      100.00,     0.00,     0.00,    0.00)  DC
          3RD HIGHEST VALUE IS       0.62817 AT (       0.00,       75.00,     0.00,     0.00,    0.00)  DC
          4TH HIGHEST VALUE IS       0.55851 AT (     -25.00,      125.00,     0.00,     0.00,    0.00)  DC
          5TH HIGHEST VALUE IS       0.52036 AT (       0.00,       50.00,     0.00,     0.00,    0.00)  DC
          6TH HIGHEST VALUE IS       0.47287 AT (     -50.00,      100.00,     0.00,     0.00,    0.00)  DC
          7TH HIGHEST VALUE IS       0.47266 AT (     -50.00,      125.00,     0.00,     0.00,    0.00)  DC
          8TH HIGHEST VALUE IS       0.47175 AT (       0.00,      100.00,     0.00,     0.00,    0.00)  DC
          9TH HIGHEST VALUE IS       0.46947 AT (      25.00,      -25.00,     0.00,     0.00,    0.00)  DC
         10TH HIGHEST VALUE IS       0.42079 AT (     -50.00,      150.00,     0.00,     0.00,    0.00)  DC
```

35-FOOT STACK WITH ONE-STORY BULDING, 10 FEET FROM HOUSE (CASE 2A-10) (17.6 GRAMS/HOUR)

```
*** AERMOD - VERSION 12060 ***
 *

      Number of sources -          1
 Number of source groups -          1
    Number of receptors -        440


                                          *** POINT SOURCE DATA ***

             NUMBER EMISSION RATE                    BASE     STACK   STACK    STACK     STACK    BLDG   URBAN  CAP/
EMIS RATE
    SOURCE     PART.  (GRAMS/SEC)     X        Y      ELEV.    HEIGHT  TEMP.   EXIT VEL. DIAMETER  EXISTS SOURCE HOR
SCALAR
      ID       CATS.               (METERS) (METERS) (METERS) (METERS) (DEG.K)  (M/SEC)  (METERS)
VARY BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - -

   BOILER        0   0.48900E-02       0.0       7.6     0.0    10.67   449.90     2.20     0.20    YES     NO    NO


                                      *** SOURCE IDs DEFINING SOURCE GROUPS ***

 GROUP ID                                          SOURCE IDs


  ALL       BOILER  ,


                    *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST 24-HR RESULTS AVERAGED OVER   5 YEARS ***

                                 ** CONC OF PM25     IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                       AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL       1ST HIGHEST VALUE IS       1.67984 AT (       0.00,      -25.00,     0.00,     0.00,    0.00)  DC
          2ND HIGHEST VALUE IS       1.59838 AT (       0.00,       25.00,     0.00,     0.00,    0.00)  DC
          3RD HIGHEST VALUE IS       1.50809 AT (     -25.00,        0.00,     0.00,     0.00,    0.00)  DC
          4TH HIGHEST VALUE IS       1.50692 AT (      25.00,      -25.00,     0.00,     0.00,    0.00)  DC
          5TH HIGHEST VALUE IS       1.47176 AT (     -25.00,       50.00,     0.00,     0.00,    0.00)  DC
          6TH HIGHEST VALUE IS       1.36975 AT (     -25.00,       75.00,     0.00,     0.00,    0.00)  DC
          7TH HIGHEST VALUE IS       1.24243 AT (       0.00,       50.00,     0.00,     0.00,    0.00)  DC
          8TH HIGHEST VALUE IS       1.16138 AT (     -25.00,      -25.00,     0.00,     0.00,    0.00)  DC
          9TH HIGHEST VALUE IS       1.15957 AT (     -50.00,      -25.00,     0.00,     0.00,    0.00)  DC
         10TH HIGHEST VALUE IS       1.10636 AT (      25.00,      -50.00,     0.00,     0.00,    0.00)  DC
```

35-FOOT STACK WITH ONE-STORY BULDING, 20 FEET FROM HOUSE (CASE 2A-20) (17.6 GRAMS/HOUR)

*** AERMOD - VERSION 12060 ***

```
       Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BLDG EXISTS	URBAN SOURCE	CAP/HOR EMIS RATE SCALAR VARY BY
BOILER	0	0.48900E-02	0.0	10.7	0.0	10.67	449.90	2.20	0.20	YES	NO	NO

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	BOILER ,

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST 24-HR RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF PM25 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)					OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	1.48368 AT	(-25.00,	75.00,	0.00,	0.00,	0.00)	DC	
	2ND HIGHEST VALUE IS	1.40140 AT	(-25.00,	50.00,	0.00,	0.00,	0.00)	DC	
	3RD HIGHEST VALUE IS	1.25541 AT	(0.00,	-25.00,	0.00,	0.00,	0.00)	DC	
	4TH HIGHEST VALUE IS	1.25523 AT	(0.00,	25.00,	0.00,	0.00,	0.00)	DC	
	5TH HIGHEST VALUE IS	1.18325 AT	(-25.00,	100.00,	0.00,	0.00,	0.00)	DC	
	6TH HIGHEST VALUE IS	1.16386 AT	(25.00,	-25.00,	0.00,	0.00,	0.00)	DC	
	7TH HIGHEST VALUE IS	1.13783 AT	(0.00,	50.00,	0.00,	0.00,	0.00)	DC	
	8TH HIGHEST VALUE IS	1.05092 AT	(0.00,	75.00,	0.00,	0.00,	0.00)	DC	
	9TH HIGHEST VALUE IS	0.95798 AT	(-50.00,	-25.00,	0.00,	0.00,	0.00)	DC	
	10TH HIGHEST VALUE IS	0.94196 AT	(25.00,	-50.00,	0.00,	0.00,	0.00)	DC	

35-FOOT STACK WITH ONE-STORY BULDING, 30 FEET FROM HOUSE (CASE 2A-30) (17.6 GRAMS/HOUR)

*** AERMOD - VERSION 12060 ***

```
       Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BLDG EXISTS	URBAN SOURCE	CAP/HOR EMIS RATE SCALAR VARY BY
BOILER	0	0.48900E-02	0.0	13.7	0.0	10.67	449.90	2.20	0.20	YES	NO	NO

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	BOILER ,

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST 24-HR RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF PM25 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	1.56192 AT	(-25.00, 75.00, 0.00, 0.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	1.27867 AT	(-25.00, 100.00, 0.00, 0.00, 0.00)	DC	
	3RD HIGHEST VALUE IS	1.26187 AT	(-25.00, 50.00, 0.00, 0.00, 0.00)	DC	
	4TH HIGHEST VALUE IS	1.11095 AT	(0.00, 75.00, 0.00, 0.00, 0.00)	DC	
	5TH HIGHEST VALUE IS	1.03946 AT	(0.00, -25.00, 0.00, 0.00, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.96745 AT	(-50.00, 100.00, 0.00, 0.00, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.96653 AT	(-25.00, 125.00, 0.00, 0.00, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.92102 AT	(25.00, -25.00, 0.00, 0.00, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.90140 AT	(0.00, 100.00, 0.00, 0.00, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.89014 AT	(-50.00, 125.00, 0.00, 0.00, 0.00)	DC	

35-FOOT STACK WITH ONE-STORY BULDING, 40 FEET FROM HOUSE (CASE 2A-40) (17.6 GRAMS/HOUR)

*** AERMOD - VERSION 12060 ***

```
      Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BLDG EXISTS	URBAN SOURCE	CAP/ HOR EMIS RATE SCALAR VARY BY
BOILER	0	0.48900E-02	0.0	16.8	0.0	10.67	449.90	2.20	0.20	YES	NO	NO

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	BOILER ,

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST 24-HR RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF PM25 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	1.56594 AT	(-25.00, 75.00, 0.00, 0.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	1.33372 AT	(-25.00, 100.00, 0.00, 0.00, 0.00)	DC	
	3RD HIGHEST VALUE IS	1.06870 AT	(0.00, 75.00, 0.00, 0.00, 0.00)	DC	
	4TH HIGHEST VALUE IS	1.06128 AT	(0.00, -25.00, 0.00, 0.00, 0.00)	DC	
	5TH HIGHEST VALUE IS	1.02120 AT	(-25.00, 125.00, 0.00, 0.00, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.96655 AT	(-50.00, 100.00, 0.00, 0.00, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.92004 AT	(-50.00, 125.00, 0.00, 0.00, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.91904 AT	(0.00, 100.00, 0.00, 0.00, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.86558 AT	(-25.00, 50.00, 0.00, 0.00, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.81297 AT	(-50.00, 150.00, 0.00, 0.00, 0.00)	DC	

35-FOOT STACK WITH ONE-STORY BULDING, 50 FEET FROM HOUSE (CASE 2A-50) (17.6 GRAMS/HOUR)

```
*** AERMOD - VERSION 12060 ***

       Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440


                                                *** POINT SOURCE DATA ***

             NUMBER EMISSION RATE                    BASE     STACK   STACK    STACK     STACK    BLDG   URBAN  CAP/
EMIS RATE
    SOURCE     PART.  (GRAMS/SEC)     X        Y      ELEV.    HEIGHT  TEMP.   EXIT VEL. DIAMETER  EXISTS SOURCE HOR
SCALAR
      ID       CATS.               (METERS) (METERS) (METERS) (METERS) (DEG.K)  (M/SEC)  (METERS)
VARY BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - -

   BOILER        0   0.48900E-02       0.0      19.8     0.0    10.67   449.90     2.20     0.20    YES     NO    NO

                                           *** SOURCE IDs DEFINING SOURCE GROUPS ***

 GROUP ID                                              SOURCE IDs


  ALL       BOILER  ,



                          *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST 24-HR RESULTS AVERAGED OVER   5 YEARS ***

                                   ** CONC OF PM25     IN MICROGRAMS/M**3                        **

                                                                                                          NETWORK
GROUP ID                        AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL       1ST HIGHEST VALUE IS       1.37313 AT (     -25.00,       75.00,     0.00,     0.00,    0.00)  DC
          2ND HIGHEST VALUE IS       1.32934 AT (     -25.00,      100.00,     0.00,     0.00,    0.00)  DC
          3RD HIGHEST VALUE IS       1.14405 AT (       0.00,      -25.00,     0.00,     0.00,    0.00)  DC
          4TH HIGHEST VALUE IS       1.05461 AT (     -25.00,      125.00,     0.00,     0.00,    0.00)  DC
          5TH HIGHEST VALUE IS       0.96771 AT (       0.00,       75.00,     0.00,     0.00,    0.00)  DC
          6TH HIGHEST VALUE IS       0.89925 AT (       0.00,      100.00,     0.00,     0.00,    0.00)  DC
          7TH HIGHEST VALUE IS       0.88282 AT (     -50.00,      125.00,     0.00,     0.00,    0.00)  DC
          8TH HIGHEST VALUE IS       0.82785 AT (     -50.00,      150.00,     0.00,     0.00,    0.00)  DC
          9TH HIGHEST VALUE IS       0.81003 AT (     -25.00,      150.00,     0.00,     0.00,    0.00)  DC
         10TH HIGHEST VALUE IS       0.80278 AT (     -50.00,      100.00,     0.00,     0.00,    0.00)  DC
```

35-FOOT STACK WITH ONE-STORY BULDING, 10 FEET FROM HOUSE (CASE 2B-10) (6.4 GRAMS/HOUR)

*** AERMOD - VERSION 12060 ***

```
      Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BLDG EXISTS	URBAN SOURCE	CAP/ HOR EMIS RATE SCALAR VARY BY
BOILER	0	0.17800E-02	0.0	7.6	0.0	10.67	449.90	2.20	0.20	YES	NO	NO

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	BOILER ,

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST 24-HR RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF PM25 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	0.61148 AT	(0.00, -25.00, 0.00, 0.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.58182 AT	(0.00, 25.00, 0.00, 0.00, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.54896 AT	(-25.00, 0.00, 0.00, 0.00, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.54853 AT	(25.00, -25.00, 0.00, 0.00, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.53573 AT	(-25.00, 50.00, 0.00, 0.00, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.49860 AT	(-25.00, 75.00, 0.00, 0.00, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.45226 AT	(0.00, 50.00, 0.00, 0.00, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.42275 AT	(-25.00, -25.00, 0.00, 0.00, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.42209 AT	(-50.00, -25.00, 0.00, 0.00, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.40273 AT	(25.00, -50.00, 0.00, 0.00, 0.00)	DC	

35-FOOT STACK WITH ONE-STORY BULDING, 20 FEET FROM HOUSE (CASE 2B-20) (6.4 GRAMS/HOUR)

```
*** AERMOD - VERSION 12060 ***

       Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440


                                                *** POINT SOURCE DATA ***

             NUMBER EMISSION RATE                    BASE     STACK   STACK    STACK     STACK    BLDG   URBAN  CAP/
EMIS RATE
    SOURCE     PART.  (GRAMS/SEC)     X        Y      ELEV.    HEIGHT  TEMP.   EXIT VEL. DIAMETER  EXISTS SOURCE HOR
SCALAR
      ID       CATS.               (METERS) (METERS) (METERS) (METERS) (DEG.K)  (M/SEC)  (METERS)
VARY BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - -

   BOILER        0   0.17800E-02       0.0      10.7     0.0    10.67   449.90     2.20     0.20    YES     NO    NO


                                             *** SOURCE IDs DEFINING SOURCE GROUPS ***

 GROUP ID                                              SOURCE IDs


  ALL       BOILER  ,


                          *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST 24-HR RESULTS AVERAGED OVER   5 YEARS ***

                                    ** CONC OF PM25     IN MICROGRAMS/M**3                        **

                                                                                                          NETWORK
GROUP ID                        AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL       1ST HIGHEST VALUE IS       0.54007 AT (     -25.00,       75.00,     0.00,     0.00,    0.00)  DC
          2ND HIGHEST VALUE IS       0.51012 AT (     -25.00,       50.00,     0.00,     0.00,    0.00)  DC
          3RD HIGHEST VALUE IS       0.45698 AT (       0.00,      -25.00,     0.00,     0.00,    0.00)  DC
          4TH HIGHEST VALUE IS       0.45691 AT (       0.00,       25.00,     0.00,     0.00,    0.00)  DC
          5TH HIGHEST VALUE IS       0.43071 AT (     -25.00,      100.00,     0.00,     0.00,    0.00)  DC
          6TH HIGHEST VALUE IS       0.42365 AT (      25.00,      -25.00,     0.00,     0.00,    0.00)  DC
          7TH HIGHEST VALUE IS       0.41418 AT (       0.00,       50.00,     0.00,     0.00,    0.00)  DC
          8TH HIGHEST VALUE IS       0.38254 AT (       0.00,       75.00,     0.00,     0.00,    0.00)  DC
          9TH HIGHEST VALUE IS       0.34871 AT (     -50.00,      -25.00,     0.00,     0.00,    0.00)  DC
         10TH HIGHEST VALUE IS       0.34288 AT (      25.00,      -50.00,     0.00,     0.00,    0.00)  DC
```

35-FOOT STACK WITH ONE-STORY BULDING, 30 FEET FROM HOUSE (CASE 2B-30) (6.4 GRAMS/HOUR)

*** AERMOD - VERSION 12060 ***

```
      Number of sources -          1
 Number of source groups -          1
    Number of receptors -        440
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BLDG EXISTS	URBAN SOURCE	CAP/ HOR EMIS RATE SCALAR VARY BY
BOILER	0	0.17800E-02	0.0	13.7	0.0	10.67	449.90	2.20	0.20	YES	NO	NO

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	BOILER ,

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST 24-HR RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF PM25 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	0.56855 AT	(-25.00, 75.00, 0.00, 0.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.46545 AT	(-25.00, 100.00, 0.00, 0.00, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.45933 AT	(-25.00, 50.00, 0.00, 0.00, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.40439 AT	(0.00, 75.00, 0.00, 0.00, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.37837 AT	(0.00, -25.00, 0.00, 0.00, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.35216 AT	(-50.00, 100.00, 0.00, 0.00, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.35183 AT	(-25.00, 125.00, 0.00, 0.00, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.33526 AT	(25.00, -25.00, 0.00, 0.00, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.32812 AT	(0.00, 100.00, 0.00, 0.00, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.32402 AT	(-50.00, 125.00, 0.00, 0.00, 0.00)	DC	

35-FOOT STACK WITH ONE-STORY BULDING, 40 FEET FROM HOUSE (CASE 2B-40) (6.4 GRAMS/HOUR)

```
*** AERMOD - VERSION 12060 ***

      Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440


                                                *** POINT SOURCE DATA ***

             NUMBER EMISSION RATE                    BASE     STACK   STACK    STACK     STACK    BLDG   URBAN  CAP/
EMIS RATE
    SOURCE     PART.  (GRAMS/SEC)     X        Y      ELEV.    HEIGHT  TEMP.   EXIT VEL. DIAMETER  EXISTS SOURCE HOR
SCALAR
      ID       CATS.               (METERS) (METERS) (METERS) (METERS) (DEG.K)  (M/SEC)  (METERS)
VARY BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - -

   BOILER        0   0.17800E-02       0.0      16.8     0.0    10.67   449.90     2.20     0.20    YES     NO    NO


                                           *** SOURCE IDs DEFINING SOURCE GROUPS ***

 GROUP ID                                          SOURCE IDs


  ALL       BOILER  ,


                        *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST 24-HR RESULTS AVERAGED OVER   5 YEARS ***

                                    ** CONC OF PM25     IN MICROGRAMS/M**3                        **

                                                                                                          NETWORK
GROUP ID                       AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL       1ST HIGHEST VALUE IS       0.57002 AT (     -25.00,       75.00,     0.00,     0.00,    0.00)  DC
          2ND HIGHEST VALUE IS       0.48549 AT (     -25.00,      100.00,     0.00,     0.00,    0.00)  DC
          3RD HIGHEST VALUE IS       0.38901 AT (       0.00,       75.00,     0.00,     0.00,    0.00)  DC
          4TH HIGHEST VALUE IS       0.38631 AT (       0.00,      -25.00,     0.00,     0.00,    0.00)  DC
          5TH HIGHEST VALUE IS       0.37173 AT (     -25.00,      125.00,     0.00,     0.00,    0.00)  DC
          6TH HIGHEST VALUE IS       0.35183 AT (     -50.00,      100.00,     0.00,     0.00,    0.00)  DC
          7TH HIGHEST VALUE IS       0.33490 AT (     -50.00,      125.00,     0.00,     0.00,    0.00)  DC
          8TH HIGHEST VALUE IS       0.33454 AT (       0.00,      100.00,     0.00,     0.00,    0.00)  DC
          9TH HIGHEST VALUE IS       0.31508 AT (     -25.00,       50.00,     0.00,     0.00,    0.00)  DC
         10TH HIGHEST VALUE IS       0.29593 AT (     -50.00,      150.00,     0.00,     0.00,    0.00)  DC
```

35-FOOT STACK WITH ONE-STORY BULDING, 50 FEET FROM HOUSE (CASE 2B-50) (6.4 GRAMS/HOUR)

```
*** AERMOD - VERSION 12060***

       Number of sources -          1
 Number of source groups -          1
     Number of receptors -        440


                                                *** POINT SOURCE DATA ***

             NUMBER EMISSION RATE                    BASE     STACK   STACK    STACK     STACK    BLDG   URBAN  CAP/
EMIS RATE
    SOURCE     PART.  (GRAMS/SEC)     X        Y      ELEV.    HEIGHT  TEMP.   EXIT VEL. DIAMETER  EXISTS SOURCE HOR
SCALAR
      ID       CATS.               (METERS) (METERS) (METERS) (METERS) (DEG.K)  (M/SEC)  (METERS)
VARY BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - -

   BOILER        0   0.17800E-02       0.0      19.8     0.0    10.67   449.90     2.20     0.20    YES     NO    NO

                                             *** SOURCE IDs DEFINING SOURCE GROUPS ***

 GROUP ID                                              SOURCE IDs


  ALL       BOILER  ,

                          *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST 24-HR RESULTS AVERAGED OVER   5 YEARS ***

                                     ** CONC OF PM25     IN MICROGRAMS/M**3                        **

                                                                                                          NETWORK
GROUP ID                       AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL       1ST HIGHEST VALUE IS       0.49983 AT (     -25.00,       75.00,     0.00,     0.00,    0.00)  DC
          2ND HIGHEST VALUE IS       0.48389 AT (     -25.00,      100.00,     0.00,     0.00,    0.00)  DC
          3RD HIGHEST VALUE IS       0.41644 AT (       0.00,      -25.00,     0.00,     0.00,    0.00)  DC
          4TH HIGHEST VALUE IS       0.38389 AT (     -25.00,      125.00,     0.00,     0.00,    0.00)  DC
          5TH HIGHEST VALUE IS       0.35226 AT (       0.00,       75.00,     0.00,     0.00,    0.00)  DC
          6TH HIGHEST VALUE IS       0.32733 AT (       0.00,      100.00,     0.00,     0.00,    0.00)  DC
          7TH HIGHEST VALUE IS       0.32135 AT (     -50.00,      125.00,     0.00,     0.00,    0.00)  DC
          8TH HIGHEST VALUE IS       0.30134 AT (     -50.00,      150.00,     0.00,     0.00,    0.00)  DC
          9TH HIGHEST VALUE IS       0.29486 AT (     -25.00,      150.00,     0.00,     0.00,    0.00)  DC
         10TH HIGHEST VALUE IS       0.29222 AT (     -50.00,      100.00,     0.00,     0.00,    0.00)  DC
```